



Service Manual

Service Manual

KP330



Model : KP330



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1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

1. INTRODUCTION

D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the  sign. Following information is ESD handling:

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

2. PERFORMANCE

1.1 Product Name

KP330

- GSM850(Power Class 4) / GSM900(Power Class 4) /
DCS1800(Power Class 1) / PCS1900(Power Class 1) /
GPRS(Class 12, Type B)
- WCDMA850/1900/2100(Power Class 3, AMR Coding)

1.2 Supporting Standard

Item	Feature	Comment
Supporting Standard	GSM850/EGSM/DCS1800/PCS1900 WCDMA850/1900/2100 SIM AT (Class 3)	
Frequency Range	GSM850 TX 824 – 849 MHz GSM850 RX 869 – 894 MHz EGSM TX 880 – 915 MHz EGSM RX 925 – 960 MHz DCS1800 TX 1710 – 1785 MHz DCS1800 RX 1805 – 1880 MHz PCS1900 TX 1850 – 1910 MHz PCS1900 RX 1930 – 1990 MHz W-850 TX 824 – 849 MHz W-850 RX 869 – 894 MHz W-1900 TX 1850 – 1910 MHz W-1900 RX 1930 – 1990 MHz W-2100 TX 1920 – 1980 MHz W-2100 RX 2110 – 2170 MHz	
Application Standard	NetFront v3.2, DoJa 2.5	

1.3 Main Parts : GSM / WCDMA Solution

Item	Part Name	Comment
Modem	MSM6260	Qualcomm Solution
PMIC	PM6658	
RF Transmitter	RTR6285	

2. PERFORMANCE

1.4 HW Features

1.4.1 System Overview

Item	Specification	Comment
Shape	TFT Main_LCD & Mono Sub LCD/Clam Shell Folder Type	
Size	96 x 49.5 x 18.3mm	
Weight	100.5 g (with 900 mAh Battery)	
Power	3.7V normal, 900 mAh Lithium Ion	
Talk Time (with 900mAh)	Over 180 Min (WCDMA, Tx=13dBm, Voice Call) Over 100 Min (WCDMA, Tx=13dBm, Video Call) Over 190 Min (GSM, Tx=29dBm, Voice Call)	
Stand by Time (with 900mAh)	WCDMA Stand by: Over 333 hrs (WCDMA only mode) GSM Stand by: Over 333 hrs (GSM only mode)	
Antenna	Internal Antenna	
LCD	TFT Main LCD(2', 176 X 220 pixel) Mono Sub LCD(1.3', 128X160)	
LCD Backlight	White	
Camera	Inner (VGA) / Outer (1.3M CMOS) – Dual Camera	
Vibrator	Yes (10 pie Coin cell type)	
MIC	Yes	
Receiver	Yes	
Earphone Jack	Yes	
Connectivity	USB 1.1 Bluetooth	
Volume Key	Push Type(+, -)	
External Memory	Micro SD	
I/O Connect	18 Pin	

1.4.2 Usable environment

1) Environment

Item	Specification	Comment
Voltage	3.7 V(Typ), 3.2 V(Min), [Shut Down : 3.28 V]	
Operation Temp	-20 ~ +60 °C	
Storage Temp	-20 ~ +70 °C	
Humidity	85 % (Max)	

2) Environment (Accessory)

Reference	Spec.	Min	Typ.	Max	Unit
TA Power	Available power	85	220	264	Vac

1.4.3 Radio Performance

1) Transmitter - GSM Mode

No	Item		GSM850/EGSM		DCS & PCS	
1	Conducted Spurious Emission	MS allocated Channel	100k~1GHz	-39dBm	9k~1GHz	-39dBm
					1G~[A]MHz	-33dBm
			1G~12.75GHz	-33dBm	[A]M~[B]MHz	-39dBm
					[B]M~12.75GHz	-33dBm
		Idle Mode	100k~880MHz	-60dBm	100k~880MHz	-60dBm
			880M~915MHz	-62dBm	880M~915MHz	-62dBm
			915M~1GHz	-60dBm	915M~1GHz	-60dBm
			1G~[A]MHz	-50dBm	1G~[A]MHz	-50dBm
2	Radiated Spurious Emission	MS allocated Channel	30M~1GHz	-36dBm	30M~1GHz	-36dBm
					1G~[A]MHz	-30dBm
			1G~4GHz	-30dBm	[A]M~[B]MHz	-36dBm
					[B]M~4GHz	-30dBm
		Idle Mode	30M~880MHz	-57dBm	30M~880MHz	-57dBm
			880M~915MHz	-59dBm	880M~915MHz	-59dBm
			915M~1GHz	-57dBm	915M~1GHz	-57dBm
			1G~[A]MHz	-47dBm	1G~[A]MHz	-47dBm
3	Frequency Error		±0.1ppm		±0.1ppm	
4	Phase Error		±5(RMS)		±5(RMS)	
			±20(PEAK)		±20(PEAK)	
5	Frequency Error Under Multipath and Interference Condition		3dB below reference sensitivity		3dB below reference sensitivity	
			RA250 : ±200Hz		RA250 : ±250Hz	
			HT100 : ±100Hz		HT100 : ±250Hz	
			TU50 : ±100Hz		TU50 : ±150Hz	
			TU3 : ±150Hz		TU1.5: ±200Hz	

*In case of DCS : [A] -> 1710, [B] -> 1785

* In case of PCS : [A] -> 1850, [B] ->

1910

2. PERFORMANCE

No	Item		GSM850/EGSM			DCS & PCS		
6	Output RF Spectrum	Due to Modulation	0~100kHz		+0.5dB	0~100kHz		+0.5dB
			200kHz		-30dB	200kHz		-30dB
			250kHz		-33dB	250kHz		-33dB
			400kHz		-60dB	400kHz		-60dB
			600~1800kHz		-66dB	600~1800kHz		-60dB
			1800~3000kHz		-69dB	1800~6000kHz		-65dB
			3000~6000kHz		-71dB	≥6000kHz		-73dB
			≥6000kHz		-77dB			
		Due to Switching Transient	400kHz		-19dB	400kHz		-22dB
			600kHz		-21dB	600kHz		-24dB
			1200kHz		-21dB	1200kHz		-24dB
			1800kHz		-24dB	1800kHz		-27dB
7	Intermodulation attenuation			-		Frequency offset		800kHz
						Intermodulation product should be less than 55dB below the level of wanted signal		
8	Transmitter Output Power		Power control	Power	Tolerance	Power control	Power	Tolerance
			Level	(dBm)	(dB)	Level	(dBm)	(dB)
			5	33	±3	0	30	±3
			6	31	±3	1	28	±3
			7	29	±3	2	26	±3
			8	27	±3	3	24	±3
			9	25	±3	4	22	±3
			10	23	±3	5	20	±3
			11	21	±3	6	18	±3
			12	19	±3	7	16	±3
			13	17	±3	8	14	±3
			14	15	±3	9	12	±4
			15	13	±3	10	10	±4
			16	11	±5	11	8	±4
			17	9	±5	12	6	±4
			18	7	±5	13	4	±4
			19	5	±5	14	2	±5
						15	0	±5
			9	Burst timing		Mask In		

2) Transmitter - WCDMA Mode

No	Item	Specification
1	Maximum Output Power	Class 3 : +24dBm(+1/-3dB)
2	Frequency Error	±0.1ppm
3	Open Loop Power Control in Uplink	±9dB@normal, ±12dB@extreme
4	Inner Loop Power Control in Uplink	Adjust output(TPC command) cmd 1dB 2dB 3dB +1 +0.5/1.5 +1/3 +1.5/4.5 0 -0.5/+0.5 -0.5/+0.5 -0.5/+0.5 -1 -0.5/-1.5 -1/-3 -1.5/-4.5 Group(10 equal command group) +1 +8/+12 +16/+24
5	Minimum Output Power	-50dBm(3.84MHz)
6	Out-of-synchronization handling of output power	Qin/Qout : PCCH quality levels Toff@DPCCH/lor : -22 -> -28dB Ton@DPCCH/lor : -24 -> -18dB
7	Transmit OFF Power	-56dBm(3.84MHz)
8	Transmit ON/OFF Time Mask	±25us PRACH,CPCH,uplink compressed mode
9	Change of TFC	±25us Power varies according to the data rate DTX : DPCH off (minimize interference between UE)
10	Power setting in uplink compressed	±3dB(after 14slots transmission gap)
11	Occupied Bandwidth(OBW)	5MHz(99%)
12	Spectrum Emission mask	-35-15*(Δf-2.5)dBc@Δf=2.5~3.5MHz,30k -35-1*(Δf-3.5)dBc@Δf=3.5~7.5MHz,1M -39-10*(Δf-7.5)dBc@Δf=7.5~8.5MHz,1M -49dBc@Δf=8.5~12.5MHz,1M
13	Adjacent Channel Leakage Ratio (ACLR)	33dB@5MHz, ACP>-50dBm 43dB@10MHz, ACP>-50dBm

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14	Spurious Emissions (*:additional requirement)	-36dBm@f=9~150KHz, 1K BW -36dBm@f=50KHz~30MHz, 10K BW -36dBm@f=30MHz~1000MHz, 100K BW -30dBm@f=1~12.5GHz, 1M BW (*)-41dBm@f=1893.5~1919.6MHz, 300K (*)-67dBm@f=925~935MHz, 100K BW (*)-79dBm@f=935~960MHz, 100K BW (*)-71dBm@f=1805~1880MHz, 100K BW
15	Transmit Intermodulation	-31dBc@5MHz, Interferer -40dBc -41dBc@10MHz, Interferer -40dBc
16	Error Vector Magnitude (EVM)	17.5%(>-20dBm) (@12.2K, 1DPDCH+1DPCCH)
17	Transmit OFF Power	-15dB@SF=4.768Kbps, Multi-code transmission

3) Receiver - GSM Mode

No	Item		GSM	DCS & PCS
1	Sensitivity (TCH/FS Class II)		-102dBm	-102dBm
2	Co-Channel Rejection (TCH/FS Class II, RBER, TU high/FH)		C/Ic=7dB	Storage -30 ~ +85
3	Adjacent Channel Rejection	200KHz	C/Ia1=-12dB	C/Ia1=-12dB
		400KHz	C/Ia2=-44dB	C/Ia2=-44dB
4	Intermodulation Rejection		Wanted Signal :- 98dBm 1st interferer:-44dBm 2nd interferer:-45dBm	Wanted Signal :- 96dBm 1st interferer:-44dBm 2nd interferer:-44dBm
5	Blocking Response (TCH/FS Class II, RBER)		Wanted Signal :- 101dBm Unwanted : Depend on Frequency	Wanted Signal :- 101dBm Unwanted : Depend on Frequency

4) Receiver – WCDMA Mode

No	Item	Specification
1	Reference Sensitivity Level	-106.7 dBm(3.84 MHz)
2	Maximum Input Level	-25dBm(3.84MHz) -44dBm/3.84MHz(DPCH_Ec) UE@+20dBm output power(Class3)
3	Adjacent Channel Selectivity (ACS)	33dB UE@+20dBm output power(Class3)
4	In-band Blocking	-56dBm/3.84MHz@10MHz UE@+20dBm output power(Class3)
		-44dBm/3.84MHz@15MHz UE@+20dBm output power(Class3)
5	Out-band Blocking	-44dBm/3.84MHz@f=2050~2095 and 2185~2230MHz UE@+20dBm output power(Class3)
		-30dBm/3.84MHz@f=2025~2050 and 2230~2255MHz UE@+20dBm output power(Class3)
		-15dBm/3.84MHz@f=1~2025 and 2255~12500MHz UE@+20dBm output power(Class3)
6	Spurious Response	-44dBm CW UE@+20dBm output power(Class3)
7	Intermodulation Characteristic	-46dBm CW@10MHz -46dBm/3.84MHz@20MHz UE@+20dBm output power(Class3)
8	Spurious Emissions	-57dBm@f=9KHz~1GHz, 100K BW -47dBm@f=1~12.5GHz, 1M BW -60dBm@f=1920MHz~1980MHz, 3.84M BW -60dBm@f=2110MHz~2170MHz, 3.84M BW

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1.5 Current Consumption

	Stand by	Voice Call	VT
WCDMA	333hrs ↑ = 4mA ↓ (1000mAh battery, DRX cycle=1.28)	180mins ↑ = 300mA ↓ (1000mAh battery, Tx=13dBm)	100mins ↑ = 500mA ↓ (1000mAh battery, Tx=13dBm)
	Stand by	Voice Call	
GSM	333 hrs ↑ = 4mA ↓ (1000mAh battery, Paging frame class5)	190mins ↑ = 310mA ↓ (1000mAh battery, Tx = Level 5)	

(Stand by and Voice Call Test Condition : LCD backlight Off)

(VT Test Condition : Speaker off, LCD backlight On)

1.6 Antenna BAR

Antenna Bar	WCDMA	GSM
BAR 5	-87 ± 2dBm ↑	-85 ± 2dBm ↑
BAR 5 → 4	-87 ± 2dBm	-85 ± 2dBm
BAR 4 → 3	-92 ± 2dBm	-90 ± 2dBm
BAR 3 → 2	-97 ± 2dBm	-95 ± 2dBm
BAR 2 → 1	-100 ± 2dBm	-100 ± 2dBm
BAR 1 → 0	-103 ± 2dBm	-105 ± 2dBm

1.7 Battery BAR

Indication	Voltage
Bar 3	$3.73 \pm 0.05V \uparrow$
Bar 3 $\rightarrow$ 2	$3.73 \pm 0.05V$
Bar 2 $\rightarrow$ 1	$3.64 \pm 0.05V$
Bar 1 $\rightarrow$ Empty	$3.56 \pm 0.05V$
Low Voltage, Warning message+ Blinking	$3.35 \pm 0.05V$ ([Interval : 30sec(Talk)] – 5% $3.32 \pm 0.05V$ ([Interval : 2min(Stand by)] – 3%
Power Off	$3.28 \pm 0.05V \downarrow$ (else)

2. PERFORMANCE

1.8 Sound Pressure Level

No	Test Item		Specification	
1	Sending Loudness Rating (SLR)	MS	8 ± 3 dB	
2	Receiving Loudness Rating (RLR)		Nor	2 ± 3 dB
			Max	-10 ± 3 dB
3	Side Tone Masking Rating (STMR)		17 dB	
4	Echo Loss (EL)		46 dB	
5	Sending Distortion (SD)		Refer to Table 30.3	
6	Receiving Distortion (RD)		Refer to Table 30.4	
7	Idle Noise-Sending (INS)		Max	-64 dBm0p
8	Idle Noise-Receiving (INR)		Nor	Under -57 dBPA
			Max	Under -54 dBPA
9	Sending Loudness Rating (SLR)	Headset	8 ± 3 dB	
10	Receiving Loudness Rating (RLR)		Nor	-1 ± 3 dB
			Max	-12 ± 3 dB
11	Side Tone Masking Rating (STMR)		Min	25 dB
12	Echo Loss (EL)		Min	40 dB
13	Sending Distortion (SD)		Refer to Table 30.3	
14	Receiving Distortion (RD)		Refer to Table 30.4	
15	Idle Noise-Sending (INS)		Max	-55 dBm0p
16	Idle Noise-Receiving (INR)		Nor	Under -45 dBPA
			Max	Under -40 dBPA
17	TDMA Noise -. GSM : Power Level : 5 DCS/PCS : Power Level : 0 (Cell Power : -90 ~ -105 dBm)	MS and Headset	Max	-62 dBm

	-. Acoustic (Max Vol.) MS/Headset SLR : $8 \pm 3\text{dB}$ MS/Headset RLR : $-15 \pm 3\text{dB}$ / -12dB (SLR/RLR : Mid-value setting)			
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1.9 Charging

- Charging Method : CC & CV (Constant Current and Constant Voltage)
- Maximum Charging Voltage : 4.2 V
- Normal Charging Current : 600 mA
- Normal Battery Capacity : 900 mAh
- Charging Time : Max 3 hours (except for trickle charging time)
- Full charging indication current (charging icon stop current) : 90 mA
- Cut-off voltage : 3.28 V

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1.10 SW Features

Item	Feature	Comment
RSSI	0 ~ 5 Levels	
Battery Charging	0 ~ 3 Levels	
Key Volume	0 ~ 7 Level	
Audio Volume	0 ~ 7 Level	
Time / Date Display	Yes	
Multi-Language	Yes	English/France/
Quick Access Mode	Camera / Favorite	
PC Sync	Phonebook /BookMark/ Download(Photo, file , Melody)	
Speed Dial	Yes (0~9)	Two Touch. (Number + Send Key)
Profile	Yes	
CLIP / CLIR	Yes	
Phone Book	5 Numbers + 1 Memo + 3 e-mail + Group Select + Picture+ ringtone + email tone + URL + Postal Code + Home Addr + Company Name + Job Title + Company Addr + Memo	Total 500 Member
Last Dial Number	Yes	Redial (30)
Last Received Number	Yes	
Last Missed Number	Yes	
Search by Number / Name	Yes	
Group	30	Possible Rename
Fixed Dial Number	No	
Service Dial Number	Yes	
Own Number	Yes	
Voice Memo	No	
Call Reminder	No	
Network Selection	Yes	
Mute	Yes	
Call Divert	No	BAIC Roaming Only
Call Barring	Yes	
Call Charge (AoC)	No	
Call Duration	Yes	
SMS (EMS)	SMS(400) Only	
SMS Over GPRS	Yes	
EMS Melody / Picture Send / Receive / Save	No	
MMS MPEG4 / Send / Receive / Save	No	
Long Message	No	
Cell Broadcast	No	
Download	Over the AIR	
Game	YES	
Calendar	Yes	

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Memo	50	
World Clock	Yes	
Unit Convert	Currency/Surface/Length/Volume/ Weight/Temperature/Velocity	
Tip Calculator	Calculator	
Wall Paper	Yes	
WAP Browser	NetFront v3.2	i-mode
Download Melody / Wallpaper	Yes	i-mode
SIM Lock	Yes	Operator Dependent
SIM Toolkit	Yes.	(Terminal Profile, Fetch , Terminal Response , SMS- PP Download , Refresh, Send SMS , Display Text, Play Tone)
MMS	No	
EONS	No	
CPHS	No	
ENS	No	
Camera	Yes	Out : 1.3M , In : 0.3M Digital Zoom : x4
JAVA	Yes	DoJa 2.5
Voice Dial	Yes	Japaness/English/Korean
IrDa	No	
Blue tooth	Yes	
GPRS	Yes	
Hold / Retrieve	Yes	
Conference Call	No	
DTMF	Yes	
Memo pad	No	
TTY	No	
AMR	Yes	
Sync ML	No	
IM	No	
Email	Yes	i-mode

3. TECHNICAL BRIEF

3. TECHNICAL BRIEF

3.1 General Description

The KP330 supports UMTS-850, UMTS-1900, UMTS-2100, GSM-850, GSM-900, DCS-1800, and PCS-1900 based GSM/GPRS/EDGE/UMTS. All receivers and the UMTS transmitter use the radioOne¹Zero-IF architecture to eliminate intermediate frequencies, directly converting signals between RF and baseband. The quad-band GSM transmitters use a baseband-to-IF upconversion followed by an offset phase-locked loop that translates the GMSK-modulated or 8-PSK-modulated signal to RF.

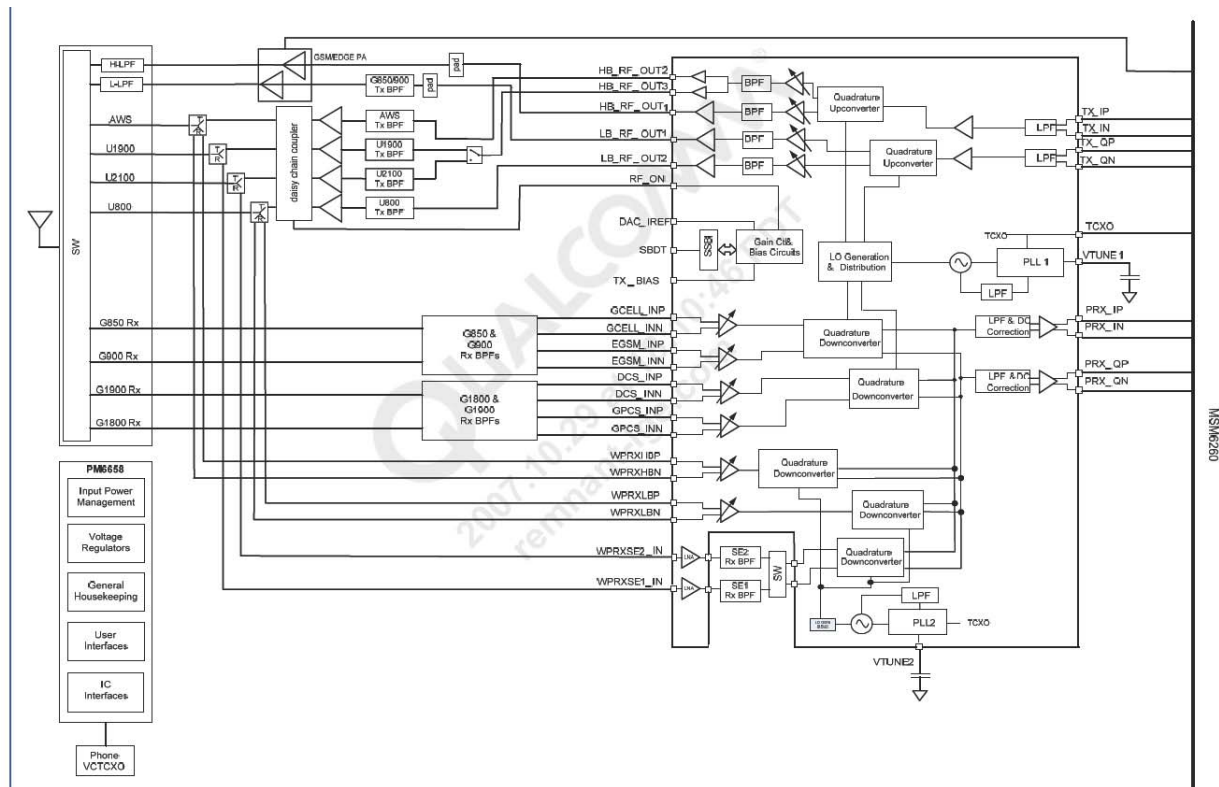


Fig 1.1 Block diagram of RF part

A generic, high-level functional block diagram of KP330 is shown in Figure 1.1. One antenna collects base station forward link signals and radiates handset reverse link signals. The antenna connects with receive and transmit paths through a FEM(Front End Module) (plus three duplexers for UMTS-850, UMTS-1900 and UMTS-2100 operations).

KP330 power supply voltages are managed and regulated by the PM6658 Power Management IC. This versatile device integrates all wireless handset power management, general housekeeping, and user interface support functions into a single mixed signal IC. It monitors and controls the external power source and coordinates battery recharging while maintaining the handset supply voltages using low dropout, programmable regulators.

The device's general housekeeping functions include an ADC and analog multiplexer circuit for monitoring on-chip voltage sources, charging status, and current flow, as well as user-defined off-chip variables such as temperature, RF output power, and battery ID. Various oscillator, clock, and counter circuits support IC and higher-level handset functions. Key parameters such as under-voltage lockout and crystal oscillator signal presence are monitored to protect against detrimental conditions.

3.1.1 Primary receive signal paths

The RTR6285/6280 receive paths include four GSM/EDGE Rx signal paths that support GSM 850, GSM 900, GSM 1800, and GSM 1900 bands and four WCDMA Rx signal paths (two single-ended and two differential) for one UMTS low-band and three UMTS high bands.

The quad-band GSM/EDGE Rx paths start from the handset front-end circuits (GSM Rx filters and antenna switch module). The four differential inputs are amplified with gain-stepped LNA circuits. Gain control is provided through software and serial interface. The LNA outputs drive the RF ports of quadrature RF-to-baseband downconverters. The downconverted baseband outputs are multiplexed and routed to lowpass filters (one I and one Q) whose passband and stopband characteristics supplement MSM device processing. These filter circuits allow DC offset corrections, and their differential outputs are buffered to interface with the MSM IC.

The two RTR6285/6280 UMTS single-ended inputs accept UMTS 2100/1900/1800/1700 input signals from the handset RF front-end filters. The UMTS Rx inputs are provided with on-chip LNAs that amplify the signal before second-stage filters that provide differential signals to a

3. TECHNICAL BRIEF

shared downconverter. This second-stage input is configured differentially to optimize second-order intermodulation and common mode rejection performance. The gain of the UMTS front-end amplifier and the UMTS second-stage differential amplifier is adjustable, under MSM control, to extend the dynamic range of the receivers.

The second-stage UMTS Rx amplifiers drive the RF ports of the quadrature RF-to-baseband downconverters. The downconverted UMTS Rx baseband outputs are routed to lowpass filters having passband and stopband characteristics suitable for UMTS Rx processing. These filter circuits allow DC offset corrections, and their differential outputs are buffered to an interface shared with GSM Rx to the MSM IC. The UMTS baseband outputs are turned off when the RTR6285/6280 is downconverting GSM signals and turned on when the UMTS is operating. The RTR6285/6280 UMTS differential input paths stay on-chip; off-chip interstage filtering is not required. Other than this, the architecture is similar to the single-ended inputs.

3.1.2 Transmit signal paths

The RTR6285/6280 transmit includes four transmit signal paths (two high bands and two low bands) supporting multi-bands and multi-modes GSM/GPRS/EDGE polar transmit and WCDMA/HSDPA transmit architectures.

The transmit path begins with differential baseband signals (I and Q) from the MSM device. These analog input signals are buffered, filtered by low-pass filter, corrected for DC offsets, amplified, and then applied to the quadrature upconverter mixers.

The upconverter outputs are amplified by multiple variable gain stages that provide transmit AGC control. SSBI is used to do the gain control. The specified driver amplifier output level is achieved while supporting the GSM/EDGE and UMTS transmit standard's requirements for GSM ORFS, carrier and image suppression, WCDMA ACLR, spurious emissions, Rx-band noise, and so forth.

These upconverters translate the polar GMSK-modulated or 8-PSK modulated baseband PM signals and/or WCDMA baseband signals directly to the RF signals, which are filtered and feed into the GSM/EDGE polar PA and/or WCDMA PA. The WCDMA TX power is coupled back to the RTR6285/6280 internal power detector input pin, PWD_DET_IN, using a coupler for power measurement.

The low-band drive amplifiers are used to transmit the polar phase modulated (PM) signal for GSM/EDGE 850/900 while the high-band driver amplifiers are for the GSM/EDGE 1800/1900. By using the radioOne architecture, the same high-band transmit path can be used to transmit the UMTS 2100/1900/1800/1700 signal, and the low-band transmit path can be used to transmit the UMTS 800/850/900 signal, depending on the application.

The envelope path is used in polar mode of operation for GSM and EDGE. Input from the MSM IC, the baseband envelope (AM) current signal is applied directly to the ramp control pin of the GSM/EDGE polar PA to modulate the power supply of the PA so that the polar-modulated GSM/EDGE signal in the MSM device can be recovered and transmitted.

3.2 GSM/EDGE receive specifications

The RTR6285/6280 IC includes four receive signal paths: GSM 850, GSM 900, GSM 1800, and GSM 1900. Specifications for all paths are presented in the following sections.

3.2.1 GSM 850/900 receive signal path

The GSM 850 and GSM 900 receive signal path specifications in this subsection are based on the test input described in the notes following [Table 1.2-1](#). This test input allows measurements using standard 50-ohm single-ended test equipment even though the RTR6285/6280 IC requires a differential signal at the GSM 850 input (pins 30 and 31). Handset implementations are expected to accomplish this single-ended to differential transformation using a SAW filter; the filter, matching components; and PCB traces must provide adequate amplitude and phase balance (≤ 1 dB and ≤ 5 degrees, respectively).

3. TECHNICAL BRIEF

Parameter	Comments	Min	Typ	Max	Unit	Notes
RF input						
Input frequency range	GSM 850 band, downlink	869		894	MHz	
	GSM 900 band, downlink	925		960	MHz	
Input VSWR	Based on 100-ohm differential source impedance; includes matching network.			2:1	---	
LO generation and distribution						
RF-to-baseband signal path (valid for all gain modes unless noted otherwise)						
Gain variation	Over frequency range		2.5		dB	
	Over temperature		0.6		dB	
Survivable input level		0			dBm	
Residual sideband level	Due to amplitude and phase imbalance		TBD		dB	
Residual output DC			TBD		mV	
LO to RF leakage	Differential, in RF channel, at LNA input		TBD		dBm	
Gain mode 0						
Gain			72.5		dB	2
Noise figure	Double sideband		2.8		dB	6
P1 dB desense (in band)	In-band signal = -101 dBm		-60		dBm	
P1 dB desense (blocking @ 3 MHz offset)			-25		dBm	3
Input IP ₃		-17			dBm	4
Input IP ₂	In-band tone power = -101 dBm	40			dBm	5
Gain mode 1						
Gain			57.5		dB	2
Noise figure	Double sideband		3.6		dB	6
P1 dB desense (in band)			-60		dBm	
Gain mode 2						
Gain			40		dB	2
Noise figure	Double sideband		7		dB	6
P1 dB desense (in band)			-43		dBm	
Gain mode 3						
Gain			27.5		dB	2
Noise figure	Double sideband		30		dB	6
P1 dB desense (in band)			-26.6		dBm	
Gain mode 4						
Gain			10.5		dB	2
Noise figure	Double sideband		35		dB	6
P1 dB desense (in band)			-26.6		dBm	

Table 1.2-1 GSM 850/900 receive signal path specifications

Notes:

1. The analog baseband output pins from RTR6285/6280 are connected to the MSM ICs. Individual trace and load capacitance should not exceed 15 pF on the I or Q lines to the MSM. The I and Q load resistance and capacitance should be equal.
2. Gain values account for unit conversion from the total input power (dBm) to the output voltage (dBV_{RMS}) of one component (I or Q).
3. Out-of-band jammer (blocker) input power that reduces the in-band output signal power by 1 dB.
4. Test conditions for third-order input intercept point measurements: CW input jammer level = -49 dBm at 800 kHz offset, CW input jammer level = -49 dBm at 1650 kHz offset.
5. Test conditions for in-band second-order input intercept point measurements: CW input jammer #1 level = -33 dBm at 6000 kHz offset, CW input jammer #2 level = -33 dBm at 6050 kHz offset.
6. Noise figure must be met for 2:1 source VSWR in a 100-ohm system. Noise figure or output noise voltage is integrated from 100 Hz to 100 kHz.
7. Performance specifications are based on measurements taken using a hybrid power splitter to create two 50-ohm outputs that are 180 degrees out-of-phase (Figure 1.2-1). The result is a 100-ohm differential input to the test board connected by two coaxial cables, with calibrated traces to the RTR6285/6280 input and its matching components. The matching circuit for IC-level testing is different than recommended handset designs. See the RTR6285/6280 Device User Guide for recommendations. Performance specifications listed in the table include the matching networks but not the hybrid splitter, coaxial cables, or calibrated PCB traces.

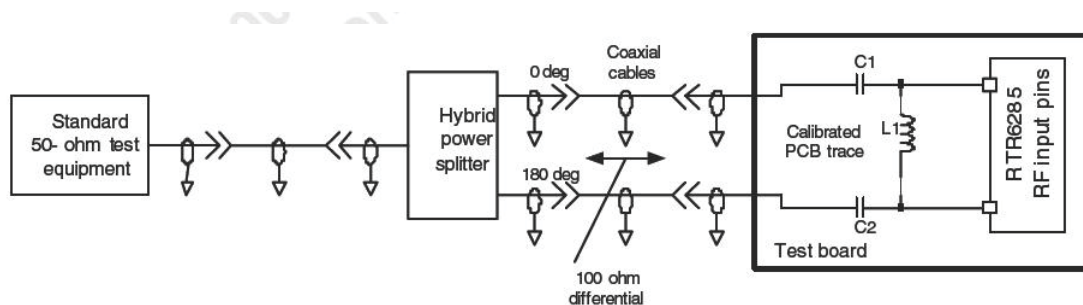


Figure 1.2-1

3.2.2 GSM 1800/1900 receive signal path

The GSM1800 receive signal path specifications given in this subsection are based on the test input described in the Table 1.2-2 notes. This test input allows measurements using standard 50-ohm single-ended test equipment even though the RTR6285/6280 IC requires a differential signal at the GSM 1800 input (pins 36 and 37). Handset implementations are expected to accomplish this single-ended to differential transformation using a SAW filter; the filter, matching components, and PCB traces must provide adequate amplitude and phase balance (≤ 1.5 dB and ≤ 15 degrees, respectively).

3. TECHNICAL BRIEF

Parameter	Comments	Min	Typ	Max	Unit	Notes
RF input						
Input frequency range	GSM1800 band, downlink	1805		1880	MHz	
	GSM1900 band, downlink	1930		1990	MHz	
Input VSWR	Based on 100-ohm differential source impedance; includes matching network.			2:1	--	
LO generation and distribution – see Section 3.8						
RF-to-baseband signal path (valid for all gain modes unless noted otherwise)						
Gain variation	Over frequency range	-1.25		+1.25	dB	
	Over temperature	-0.3		+0.3	dB	
Survivable input level		0			dBm	
Residual sideband level	Due to amplitude and phase imbalance		TBD		dB	
Residual output DC			TBD		mV	
LO to RF leakage	Differential, in RF channel, at LNA input		TBD		dBm	
Gain mode 0						
Gain			72.5		dB	2
Noise figure	Double sideband		2.8		dB	6
P1 dB desense (in band)			-65		dBm	
P1 dB desense (blocking @ 3 MHz offset)	In-band signal = -99 dBm		-26		dBm	3
Input IP ₃		-17			dBm	4
Input IP ₂	In-band tone power = -101 dBm	40			dBm	5
Gain mode 1						
Gain			57.5		dB	2
Noise figure	Double sideband		3.6		dB	6
P1 dB desense (in band)			-60		dBm	
Gain mode 2						
Gain			40		dB	2
Noise figure	Double sideband		7		dB	6
P1 dB desense (in band)			-43		dBm	
Gain mode 3						
Gain			27.5		dB	2
Noise figure	Double sideband		30		dB	6
P1 dB desense (in band)			-26		dBm	
Gain mode 4						
Gain			10.5		dB	2

Parameter	Comments	Min	Typ	Max	Unit	Notes
Noise figure	Double sideband		35		dB	6
P1 dB desense (in band)			-26.6		dBm	

Table 1.2-2 GSM 1800/1900 receive signal path specifications

3.2.3 GSM/EDGE transmit signal path specifications

The RTR6285/6280 IC includes significant circuits for supporting GSM/EDGE polar transmit signal paths, which include low-band path for GSM 850 and GSM 900, and high band path for GSM 1800 and GSM 1900. The baseband I/Q signals from MSM are directly upconverted to RF frequency using ZIF architecture. Specifications for each set of transmitter circuits are given in the following sections.

Specification	Comments	Min	Nom	Max	Units	Notes
Operating frequency	GSM 800 band	824		849	MHz	
	GSM 900 band	880		915	MHz	
Output power			13		dBm	1
Output power variation	Over temperature	-1		+1	dB	
Sideband suppression	67.7 kHz CW I & Q (quadrature) sine wave input		-35		dBc	1
Carrier suppression	67.7 kHz CW I & Q (quadrature) sine wave input		-35		dBc	1

Specification	Comments	Min	Nom	Max	Units	Notes
Output spectrum	PN 9 GMSK modulation					1
200 kHz (30 kHz RBW)				-33	dBc	
250 kHz (30 kHz RBW)				-36	dBc	
400 kHz (30 kHz RBW)				-63	dBc	
1.8 MHz (100 kHz RBW)				-68	dBc	
3 MHz (100 kHz RBW)				-70	dBc	
6 MHz (100 kHz RBW)				-76	dBc	
Output noise	Include the LO phase noise and fractional spurs					1
10 MHz offset			-152		dBc/Hz	
20 MHz offset			-163		dBc/Hz	
Spurs at output in RX band	LB, output spurs no more than 5 cases			-90	dBc	
Spurs greater than -112dBc						
RMS phase error	With RSB and DC cal		2		Degree	1

Notes:

1. Measured low-band RF outputs.
2. For output spectrum measurement, these requirements are in dBc relative to a measurement in 30 kHz on the carrier using the specified resolution bandwidth.

Table 1.2-3 GSM 850/900 transmit signal path specifications

3. TECHNICAL BRIEF

Specification	Comments	Min	Nom	Max	Units	Note
Operating frequency	GSM1800	1705		1785	MHz	
	GSM1900	1850		1910	MHz	
Output power			11		dBm	1
Output power variation	Over temperature	-1		+1	dB	
Sideband suppression	67.7 kHz CW I & Q (quadrature) sine wave input		TBD		dBc	1
Carrier suppression	67.7 kHz CW I & Q (quadrature) sine wave input		TBD		dBc	1
Output spectrum	PN 9 GMSK modulation					1
200 kHz (30 kHz RBW)				-33	dBc	
250 kHz (30 kHz RBW)				-36	dBc	
400 kHz (30 kHz RBW)				-63	dBc	
1.8 MHz (100 kHz RBW)				-68	dBc	
3 MHz (100 kHz RBW)				-70	dBc	
6 MHz (100 kHz RBW)				-76	dBc	
Output noise	Include the LO phase noise and fractional spurs					1
10 MHz offset				-151	dBc/Hz	
20 MHz offset				-157	dBc/Hz	

Specification	Comments	Min	Nom	Max	Units	Note
Spurs at output in RX band	HB, output spurs no more than 5 cases		-90		dBc	
Spurs greater than -112 dBc						
RMS phase error			3		Degree	1

Notes:

1. Measured high-band RF outputs.
2. For output spectrum measurement, these requirements are in dBc relative to a measurement in 30 kHz on the carrier using the specified resolution bandwidth.

Table 1.2-4 GSM 1800/1900 transmit signal path specifications

3.3 WCDMA primary receive signal path specifications

3.3.1 WCDMA balanced high-band primary receive specifications

Specification	Comments	Min	Typ	Max	Units
RF input frequency range	UMTS AWS band UMTS PCS band	2110 1930		2155 1990	MHz
RF input impedance	Differential		100		Ohms
Input return loss	All gain states	10			dB
Gain mode 0	G0				
Voltage conversion gain			58		dB
Noise figure	Small signal		TBD		dB
Input IP3	Jammers 1 and 2 at -44 dBm		-12		dBm
Input IP2	with calibration	55			dBm
Gain mode 1	G1				
Voltage conversion gain			46		dB
Noise figure			15		dB
Input IP3	Jammers 1 and 2 at -28 dBm		-7		dBm
Input IP2			40		dBm
Gain mode 2	G2				
Power gain			34		dB
Noise figure			TBD		dB
Input IP3	Use jammers 5 and 6		-21.5		dBm
Gain mode 3	G3				
Voltage conversion gain			22		dB
Noise figure	DSB		TBD		dB

Specification	Comments	Min	Typ	Max	Units
Input IP3	Use jammers 5 and 6		-9.5		dBm
Gain mode 4	G4				
Voltage conversion gain			10		dB
Noise figure	DSB		TBD		dB
Input IP3	Use jammers 5 and 6		-4.5		dBm

Table 1.3-1 WCDMA balanced high-band primary receive specifications

3. TECHNICAL BRIEF

3.3.2 WCDMA balanced low-band primary receive specifications

Specification	Comments	Min	Typ	Max	Units
RF input frequency range	UMTS Cell band	869		894	MHz
	UMTS 900 band	925		960	MHz
RF input impedance	Differential		100		Ohms
Input return loss	All gain states	10			dB
Gain mode 0	G0				
Voltage conversion gain			58		dB
Noise figure	Small signal		3.0		dB
Input IP3	Jammers 1 and 2 at -44 dBm		-12		dBm
Input IP2	with calibration	55			dBm
Gain mode 1	G1				
Voltage conversion gain			46		dB
Noise figure			15		dB
Input IP3	Jammers 1 and 2 at -28 dBm		-7		dBm
Input IP2			40		dBm
Gain mode 2	G2				
Power gain			34		dB
Noise figure			24		dB
Input IP3	Use jammers 5 and 6		-21.5		dBm
Gain mode 3	G3				
Voltage conversion gain			22		dB
Noise figure	DSB		30		dB
Input IP3	Use jammers 5 and 6		-9.5		dBm
Gain mode 4	G4				
Voltage conversion gain			10		dB
Noise figure	DSB		TBD		dB
Input IP3	Use jammers 5 and 6		-4.5		dBm

Table 1.3-2 WCDMA balanced low-band primary receive specifications

3.3.3 WCDMA unbalanced primary receive specifications (high bands only)

Specification	Comments	Min	Typ	Max	Units
RF input frequency range	UMTS 2100 band	2110		2170	MHz
	UMTS 1900 band	1930		1990	MHz
	UMTS 1700 band	1845		1880	MHz
LNA gain mode 0	G0				
Input return loss	50 ohms w/external match	10			dB
Output return loss	50 ohms w/external match	10			dB
Power gain			17		dB
Noise figure	Small signal		1.5		dB
Input IP3	Jammers 1 and 2 at -30 dBm		0		dBm
Reverse isolation			19		
LNA gain mode 1	G1				
Input return loss	50 ohms w/external match		8		dB
Output return loss	50 ohms w/external match		8		dB
Power gain			-5.5		dB
Noise figure			6		dB
Input IP3	Jammers 1 and 2 at -20 dBm		10		dBm
Reverse isolation			2		
LNA gain mode 2	G2				
Input return loss	50 ohms w/external match		8		dB
Output return loss	50 ohms w/external match		8		dB
Power gain			-20		dB
Noise figure			21		dB
Input IP3	Jammers 1 and 2 at -12 dBm		10		dBm
Reverse isolation			19		
Mixer high-gain mode					
Input VSWR	100-ohm differential, external match			2:1	
Voltage conversion gain			42		dB
Noise figure	Double side band		10.5		dB
Input IP3	IMT band: jammers 1 and 2 at -30 dBm; in-band tone at -86 dBm		5		dBm
	PCS and 1700 band: jammers 1 and 2 at -30 dBm, in-band tone at -81 dBm		0		dBm
Input IP2	Jammers 3 and 4 at -28 dBm; in-band tone at -86 dBm		45		dBm
Mixer low-gain mode					
Input VSWR	100-ohm differential, external match			2:1	
Voltage conversion gain			26		dB
Noise figure	Double side band		27		dB
Input IP3	Jammers 1 and 2 at -32 dBm; in-band tone at -60 dBm		5		dBm
Input IP2	Jammers 3 and 4 at -32 dBm; in-band tone at -60 dBm		30		dBm

Table 1.3-3 WCDMA unbalanced primary receive specifications (high bands only)

3. TECHNICAL BRIEF

3.4 WCDMA transmit signal path specifications

The RTR6285/6280 WCDMA transmit paths share the same transmit paths as GSM and support multi-transmit modes: UMTS 2100, UMTS 1900, and UMTS 1800 on high-band transmit drivers, and UMTS 800 and UMTS 850 on low-band transmit drivers.

3.4.1 UMTS high-band transmit signal path

Parameter	Comments	Min	Typ	Max	Unit	Notes
RF output						
Output frequency range	UMTS 2100	1920		1980	MHz	
	UMTS 1900	1850		1910	MHz	
	UMTS 1700	1749.9		1784.9	MHz	
	UMTS AWS	1710		1785	MHz	

Parameter	Comments	Min	Typ	Max	Unit	Notes
Maximum output power (average channel power)	UMTS 2100 band		7		dBm	7
	UMTS 1900		8		dBm	
	UMTS 1700/AWS		8		dBm	
Minimum output power			-80		dBm	
Output amplitude variation @ gain control of 50%	Part – part		±4.5		dB	
	Vdd		±0.5		dB	
	Temperature		±3		dB	
Baseband-to-RF signal path						
Gain flatness	Over output frequency range at 90% of gain control		±1		dB	
Adjacent channel leakage rejection (ACLR1) @ rated power	$f_C \pm 5.0$ MHz			-37.5	dBc/ 3.84 MHz	1, 2, 6
Alternate channel leakage rejection (ACLR2) @ rated power	$f_C \pm 10.0$ MHz			-53	dBc/ 3.84 MHz	1, 2, 6
Rx band noise power @ rated output power and duplexer offset	UMTS 2100 Rx		-131		dBm/Hz	3
	UMTS 1900 Rx		-131			
	UMTS 1700/AWS		-129			
Composite suppression (carrier and image)	Within Tx band @ rated output power			-25	dBc	4
Composite suppression (carrier and image)	Within Tx band @ -45 dBm output power		TBD		dBc	4
Carrier suppression	1920 MHz to 1980 MHz		TBD		dBc	5

Table 1.4-1 UMTS high-band Tx specifications

3.4.2 UMTS low-band transmit signal path

Parameter	Comments	Min	Typ	Max	Unit	Notes
RF output						
Output frequency range	UMTS 800 band UMTS 850 band UMTS 900 band	824 830 925		849 840 960	MHz MHz MHz	
Maximum output power (average channel power)			8		dBm	7
Minimum output power			-80		dBm	
Output amplitude variation @ gain control range =50%	Part – part Vdd Temperature		±4.5 ±0.5 ±3		dB dB dB	
Baseband-to-RF signal path						
Gain flatness	Over output frequency range at 90% gain control range		±1		dB	
Gain temperature coefficient			±0.1		dB/deg C	
Adjacent channel leakage rejection (ACLR1)	$f_C \pm 5.0$ MHz			-37.5	dBc/ 3.84 MHz	1, 2, 6
Alternate channel leakage rejection (ACLR2)	$f_C \pm 10.0$ MHz			-53	dBc/ 3.84 MHz	1, 2, 6
Rx band noise power	UMTS 800 Rx: 869 to 894 MHz UMTS 850 Rx: 875 to 885 MHz UMTS 900 Rx 925 to 960 MHz @ rated output power		-135 -135 -140		dBm/Hz	3
Composite suppression (carrier and image)	Within Tx band @ rated output power				-25dBc	4
Composite suppression (carrier and image)	Within Tx band @ -45 dBm output power		TBD		dBc	4
Carrier suppression	824 to 849 MHz 830 to 840 MHz		TBD		dBc	5

Table 1.4-2 UMTS low-band Tx specifications

3.5 LO Phase-locked Loop

All LO functions are fully integrated on-chip and do not require any user adjustment.

Qualcomm has established and implemented frequency plans and LO generation schemes that support the radioOne Platform F/G-series chipset. Only one area requires handset designer attention: the loop filters relating to each PLL. These are addressed in this chapter. All the UMTS Tx/Rx, GSM Tx/Rx and GPS PLL circuits are included within the RTR6285: reference dividers, phase detectors, charge pumps, feedback dividers, and digital logic. The RTR6280 integrates all the same PLL circuits as the RTR6285 with the exception of GPS. There are three integrated VCOs and PLLs within the Platform F/G (RFCMOS) chipset as shown in [Figure 1.5-1](#):

- **PLL1 produces the LO for up-/down-conversion of GSM Tx/Rx, and UMTS Tx**
- **PLL2 produces the Rx LO for the UMTS primary and diversity down-conversion**
- **PLL3 produces the LO for GPS down-conversion**

A buffered 19.2 MHz VCTCXO signal provides the synthesizer input (VCTCXO), the frequency reference to which the PLL is phase- and frequency-locked. The reference is divided by the Rcounters to create a fixed-frequency input to the phase detector, F_R . The other phase detector input (F_V) varies as the loop acquires lock, and is generated by dividing the VCO frequency using the feedback path N-counter. The closed loop will force F_V to equal F_R when locked. If the loop is not locked, the error between F_V and F_R will create an error signal at the output of the charge pump. This error signal is filtered by the loop filter components and applied to the VCO, tuning the output frequency so that the error is decreased. Ultimately, the loop forces the error to approach zero and the PLL is phase- and frequency-locked. All of the key PLL components affecting the PLL performance – such as VCO sensitivity, charge pump circuit current, PLL topology and loop filter (with the exception of one capacitor) – are integrated into the RFIC. This means that proper handset performance is assured.

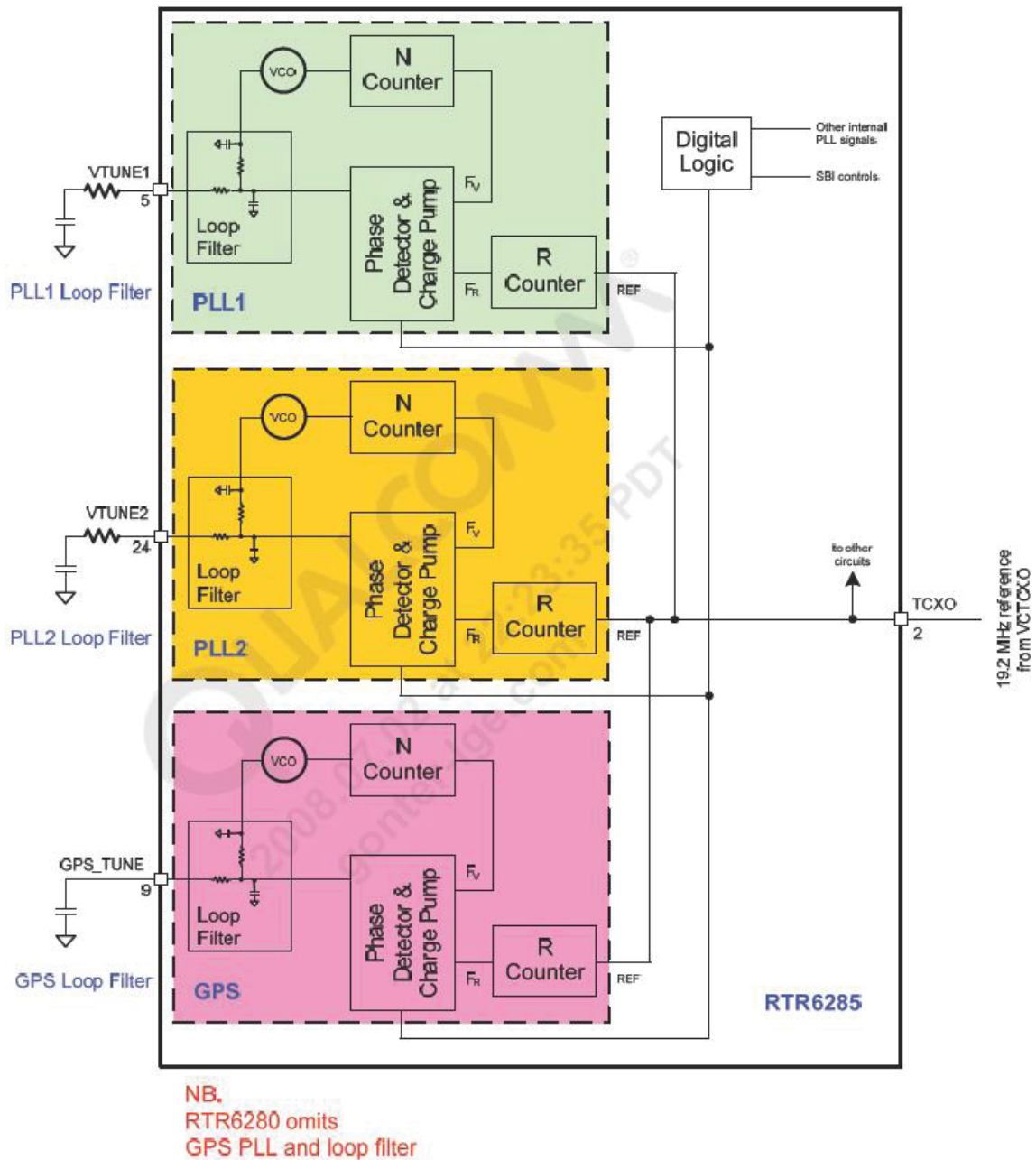


Fig 1.5-1 RTR6285 PLLs functional block diagram

3. TECHNICAL BRIEF

3.6 Off-chip RF Components

3.6.1 Antenna Switch Module

TERMINAL CONFIGURATION

Terminal No.	Terminal Name	Terminal No.	Terminal Name
(1)	GSM850Rx	(13)	ANT
(2)	GSM850Rx	(14)	Vc1
(3)	GSM900Rx	(15)	Vc2
(4)	GSM900Rx	(16)	Vc3
(5)	GSM1800Rx	(17)	Vc4
(6)	GSM1800Rx	(18)	Vdd
(7)	GSM1900Rx	(19)	GND
(8)	GSM1900Rx	(20)	GSM1800/1900Tx
(9)	UMTS1	(21)	GND
(10)	UMTS2	(22)	GSM850/900Tx
(11)	UMTS3	(23)	GND
(12)	GND	(24)	GND

CONTROL LOGIC

Mode	Vc1	Vc2	Vc3	Vc4	Vdd
GSM850/900 Tx	High	High	Low	Low	2.65-2.85V
GSM1800/1900 Tx	High	Low	Low	Low	2.65-2.85V
GSM850 Rx	Low	High	High	Low	2.65-2.85V
GSM900 Rx	Low	Low	High	Low	2.65-2.85V
GSM1800 Rx	Low	High	Low	Low	2.65-2.85V
GSM1900 Rx	Low	Low	Low	Low	2.65-2.85V
UMTS1	Low	Low	High	High	2.65-2.85V
UMTS2	Low	High	Low	High	2.65-2.85V
UMTS3	Low	Low	Low	High	2.65-2.85V

High : 1.4 - Vdd (V)

Low : 0 - 0.4 (V)

Table 1.6-1 Terminal configuration and Control logic

3.6.2 UMTS duplexer

A UMTS duplexer splits a single operating band into receive and transmit paths. Important performance requirements include;

Insertion loss . this component is also in the receive and transmit paths ;

In the KP330 typical losses : UMTS2100_Tx =1.2 dB, UMTS2100_Rx = 1.4 dB,
UMTS1900_ Tx = 2.7 dB, UMTS1900_ Rx = 3.0dB and UMTS850_ Tx =1.9 dB,
UMTS850_ Rx = 2.7 dB

Out-of-band rejection or attenuation. The duplexer provides input selectivity for the receiver, output filtering for the transmitter, and isolation between the two. Rejection levels for both

paths are specified over a number of frequency ranges. Two Tx-to-Rx isolation levels are critical to receiver performance:

Rx-band isolation. The transmitter is specified for out-of-band noise falling into the Rx band. This noise leaks from the transmit path into the receive path, and must be limited to avoid degrading receiver sensitivity. The required Rx-band isolation depends on the PA out of-band noise levels and Rx-band losses between the PA and LNA. Minimum duplexer Rx band isolation value is about 45 dB.

Tx-band isolation. The transmit channel power also leaks into the receiver. In this case, the leakage is outside the receiver passband but at a relatively high level. It combines with Rx band jammers to create cross-modulation products that fall in-band to desensitize the receiver. The required Tx-band isolation depends on the PA channel power and Tx-band losses between the PA and LNA. Minimum duplexer Tx-band isolation value is about 55 dB.

Passband ripple. The loss of this fairly narrowband device is not flat across its passband. Passband ripple increases the receive or transmit insertion loss at specific frequencies, creating performance variations across the band.s channels, and should be controlled.

Return loss. Minimize mismatch losses with typical return losses of 10 dB or more (VSWR <2:1).

Power handling. High power levels in the transmit path must be accommodated without degraded performance. The specified level depends on the operating band class and mobile station class (per the applicable standard), as well as circuit losses and antenna EIRP. Several duplexer characteristics depend upon its source and load impedances. QUALCOMM strongly recommends an isolator be used between the UMTS PA and duplexer to assure proper performance.

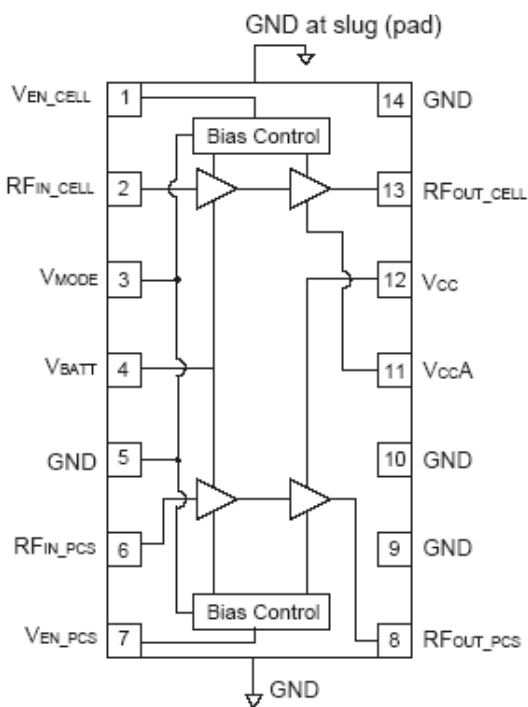
3.6.3 UMTS Power Amplifier

3.6.3.1 UMTS-1900 and UMTS-850 Power Amplifier

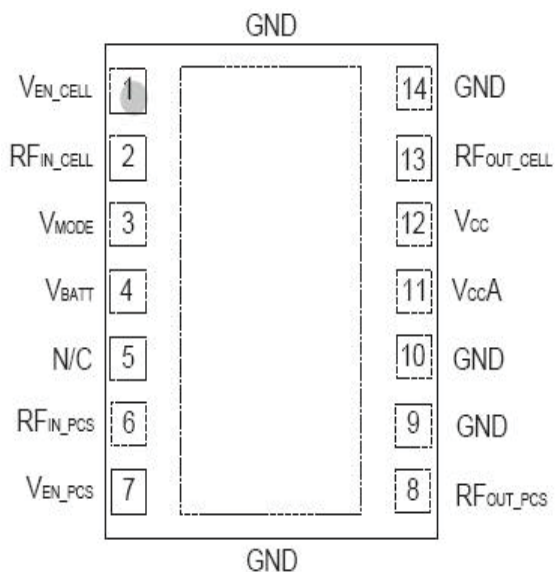
The AWT6321 addresses the demand for increased integration in dual-band handsets for North American CDMA network deployments. The small footprint 3 mm x 5 mm x 1 mm surface mount RoHS compliant package contains independent RF PA paths to ensure optimal performance in both frequency bands, while achieving a 25% PCB space savings compared with solutions requiring two single-band PAs. The package pinout was chosen to enable handset manufacturers to easily route VCC to both power amplifiers and simplify control with a common VMODE pin. The device is manufactured on an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. The

3. TECHNICAL BRIEF

AWT6321 is part of ANADIGICS' high-Efficiency-at-Low-Power (HELP™) family of CDMA power amplifiers, which deliver low quiescent currents and significantly greater efficiency without a costly external DAC or DC-DC converter. Through selectable bias modes, the AWT6321 achieves optimal efficiency across different output power levels, specifically at low- and mid-range power levels where the PA typically operates, thereby dramatically increasing handset talk-time and standby-time. Its built-in voltage regulator eliminates the need for external switches. The 3 mm x 5 mm x 1 mm surface mount package incorporates matching networks optimized for output power, efficiency and linearity in a 50 Ω system.



Block Diagram



Pinout

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(T_c = +25 °C, V_{BATT} = V_{CC} = +3.4 V, V_{ENABLE} = +2.4 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25 15 16	26.5 16.5 17.5	30 19 20	dB	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V P _{OUT} = +17 dBm, V _{MODE} = +2.4 V, V _{CC} = +3.7 V
Adjacent Channel Power at ± 885 kHz offset ⁽¹⁾ Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- - -	-50 -57 -55	-47 -47 -47	dBc	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V P _{OUT} = +17 dBm, V _{MODE} = +2.4 V, V _{CC} = +3.7 V
Adjacent Channel Power at ± 1.98 MHz offset ⁽¹⁾ Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-63 -61	-57 -57	dBc	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V
Power-Added Efficiency ⁽¹⁾	36 17	38 22	- -	%	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V
Quiescent Current (I _q)	-	14	20	mA	V _{MODE} = +2.4 V, Low Bias
Enable Current	-	0.4	0.8	mA	through V _{EN} pin, V _{MODE} = +2.4 V
Battery Current	-	2.5	5	mA	through V _{BATT} pin, V _{MODE} = +2.4 V
Mode Control Current	-	0.5	0.8	mA	through V _{MODE} pin, V _{MODE} = +2.4 V
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{EN} = 0 V, V _{MODE} = 0 V
Noise in Receive Band	-	-133	-131	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	- -	-42 -50	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-65	dBc	P _{OUT} ≤ +28 dBm In-band Load VSWR < 5:1 Out-of-band Load VSWR < 10:1 Applies over all operating conditions
Load mismatch stress with no permanent degradation or failure	8:1	-	-	VSWR	Applies over all operating conditions

Table 1.6-3-1 Electrical specifications-Cellular Band

3. TECHNICAL BRIEF

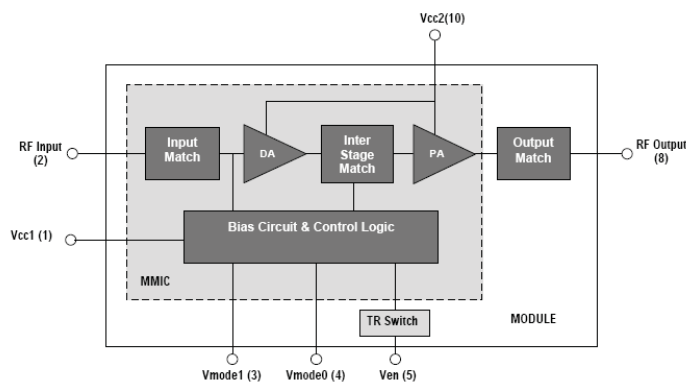
(T_C = +25 °C, V_{BATT} = V_{CC} = +3.4 V, V_{ENABLE} = +2.4 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25 13 14	26.5 14.5 16	29 18 18	dB	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V P _{OUT} = +18 dBm, V _{MODE} = +2.4 V, V _{CC} = +3.7 V
Adjacent Channel Power at ±1.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz	- - -	-51 -58 -52	-47 -47 -47	dBc	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V P _{OUT} = +18 dBm, V _{MODE} = +2.4 V, V _{CC} = +3.7 V
Adjacent Channel Power at +2.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-62 -62	-57 -57	dBc	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V
Power-Added Efficiency	36 16	39 17	- -	%	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.4 V
Quiescent Current (I _{cq})	-	14	20	mA	through V _{CC} pin, V _{MODE} = +2.4 V
Enable Current	-	0.3	0.8	mA	through V _{EN} pin, PA "on"
Mode Control Current	-	0.3	0.8	mA	through V _{MODE} pin, V _{MODE} = +2.4 V
Battery Current	-	3	5	mA	through V _{BATT} pin, V _{MODE} = +2.4 V
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{EN} = 0 V, V _{MODE} = 0 V
Noise in Receive Band	-	-135	-133	dBm/Hz	1930 MHz to 1990 MHz
Harmonics 2fo 3fo, 4fo	- -	-43 -55	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-65	dBc	P _{OUT} ≤ +28 dBm In-band load VSWR < 5:1 Out-of-band load VSWR < 10:1 Applies over all operating ranges
Load mismatch stress with no permanent degradation or failure	8:1	-	-	VSWR	Applies over full operating range

Table 1.6-3-2 Electrical specifications-PCS Band

3.6.3.2 UMTS-2100 Power Amplifier

The ACPM-7381, a Wide-band Code Division Multiple Access(WCDMA) Power Amplifier (PA), is a fully matched 10-pin surface mount module developed for WCDMA handset applications. This power amplifier module is developed to cover 1920-1980MHz bandwidth. The ACPM-7381 meets the stringent WCDMA linearity requirements for output power of up to 28dBm. The ACPM-7381 is also developed to meet HSDPA specs. The ACPM-7381 is designed to enhance the efficiency at low and medium output power range by using 3-mode control scheme with 2 mode control pins. This provides extended talk time. The ACPM-7381 is self contained, incorporating 50ohm input and output matching networks.



Block Diagram

1 Vcc1	Vcc2 10
2 RF In	GND 9
3 Vmode1	RF Out
4 Vmode0	GND 7
5 Ven	GND 6

Pinout

3. TECHNICAL BRIEF

Electrical Characteristics for WCDMA Mode (Vcc=3.4V, Ven=2.6V, T=25 °C, Zin/Zout=50ohm) ^[1]

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Frequency Range	F		1920	–	1980	MHz
Gain	Gain_hi	High Power Mode, Pout=28dBm	23.5	27		dB
	Gain_mid	Mid Power Mode, Pout=16dBm	13.5	17		dB
	Gain_low	Low Power Mode, Pout=8dBm	13	16.5		dB
Power Added Efficiency	PAE_hi	High Power Mode, Pout=28dBm	34.9	39.8		%
	PAE_mid	Mid Power Mode, Pout=16dBm	11.8	15.3		%
	PAE_low	Low Power Mode, Pout=8dBm	4.2	6.0		%
Total Supply Current	Icc_hi	High Power Mode, Pout=28dBm		465	530	mA
	Icc_mid	Mid Power Mode, Pout=16dBm		75	97	mA
	Icc_low	Low Power Mode, Pout=8dBm		30	43	mA
Quiescent Current	Iq_hi	High Power Mode		96	120	mA
	Iq_mid	Mid Power Mode		20	26	mA
	Iq_low	Low Power Mode		14	18	mA
Enable Current	Ien_hi	High Power Mode		0.18	1	mA
	Ien_mid	Mid Power Mode		0.18	1	mA
	Ien_low	Low Power Mode		0.18	1	mA
Control Current	Imode0_mid	Mid Power Mode		0.4	1	mA
	Imode1_low	Low Power Mode		0.18	1	mA
	Imode0_low	Low Power Mode		0.4	1	mA
Total Current in Power-down mode	Ipd	Ven=0V		0.2	5	μA
Adjacent Channel Leakage Ratio ^[2]	5 MHz offset	ACLR1_hi	High Power Mode, Pout=28dBm	-43	-37	dBc
	10 MHz offset	ACLR2_hi		-54	-46	dBc
	5 MHz offset	ACLR1_mid	Mid Power Mode, Pout=16dBm	-42	-37	dBc
	10 MHz offset	ACLR2_mid		-63	-46	dBc
	5 MHz offset	ACLR1_low	Low Power Mode, Pout=8dBm	-45	-37	dBc
	10 MHz offset	ACLR2_low		-60	-46	dBc
Harmonic Suppression	Second	2f0	High Power Mode, Pout=28dBm	-42	-35	dBc
	Third	3f0		-69	-50	dBc
Input VSWR	VSWR			1.8:1	2.2:1	
Stability (Spurious Output)	S	VSWR 6:1, All phase			-60	dBc
Noise Power in Rx Band	RxNB	High Power Mode, Pout=28dBm		-138	-135	dBm/Hz
Phase Discontinuity	PDlow_mid	low power mode↔mid power mode, at Pout=8dBm			10	Deg
	PDmid_high	mid power mode↔high power mode, at Pout=16dBm			15	deg
Ruggedness	Ru	Pout<28dBm, Pin<10dBm, All phase High Power Mode			10:1	VSWR

Notes:

1. Electrical characteristics are specified under WCDMA modulated (3GPP Uplink DPCH + 1DPCH) signal
2. ACP is expressed as a ratio of total adjacent power to signal power, both with 3.84MHz bandwidth at specified offsets.

Table 1.6-3-3 Electrical specifications-WCDMA2100 Band

3.6.4 Thermistor

This thermistor senses temperature variations around UMTS PA to adjust PA gain deviation for assure compliance with the applicable transmit power control standards. Negative temperature compensation thermistor is used in the KP330.

3.6.5 GSM/GPRS/EDGE Power Amplifier

The TQM7M5012 is a ultra-small (5x5mm), GSM/EDGE Polar PAM for handset applications. This module has been optimized for excellent EDGE efficiency, ACPR and EVM in an open loop polar modulation environment at EDGE class E2+ operation while maintaining high GSM/GPRS efficiency. The TQM7M5012 was optimized for operation with the Qualcomm RTR6285 regarding input power range and Rx band performance.

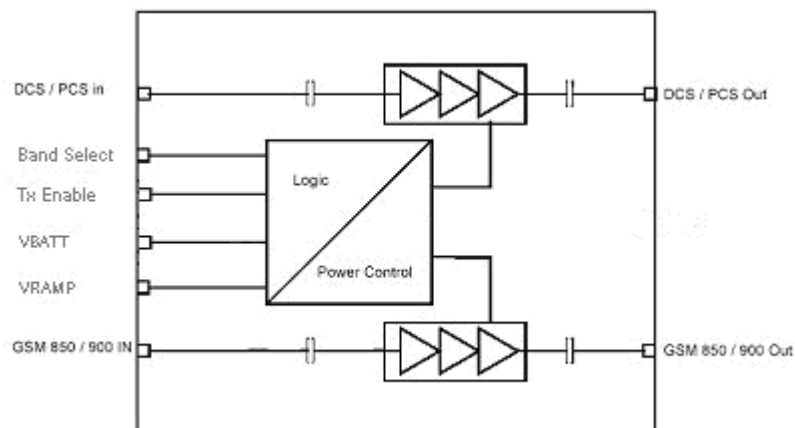


Fig 1.6-5-1 GSM PA functional block diagram

3. TECHNICAL BRIEF

Parameter	Conditions	Min.	Typ/Nom	Max.	Units
Supply Voltage, V_{BATT}		3.0	3.5	4.8	V_{dc}
Supply Current, I_{BATT}	$P_{out} = \max$			2	A
Transmit Enable, TX_EN Voltage	Logic High	1.25		3	V
	Logic Low	-0.2		0.4	V
Transmit Enable, TX_EN Current	Logic High			10	μA
	Logic Low			1	μA
Band Select Voltage	Logic High: DCS	1.25		3	V
	Logic Low: GSM	-0.2		0.4	V
Band Select Current- DCS/GSM	High/Low			10	μA
Leakage Current TX_EN Low	$V_{ramp} = 0.2V$; $T = -25^{\circ}C, +85^{\circ}C$		5	15	μA
Input and Output Load Impedance			50		Ω
$V_{ramp} MIN$			0	0.25	V
V_{ramp}		0		1.6	V
V_{ramp} Input Current	$V_{ramp} = 0.2V, 1.6V$			10	μA
Operating Case Temperature		-25		+85	$^{\circ}C$

Fig 1.6-5-2 Operating Parameter

3.6.6 UMTS primary Rx RF filter

RF filters are located between the UMTS LNA and the mixer inputs for UMTS 2100, UMTS 1900, and UMTS 1700. Insertion loss is important, but not as critical as losses before the LNA. The most important parameters of this component include:

■ Out-of-band rejection or attenuation levels, usually specified to meet these conditions:

□ Far out-of-band signals – Ranging from DC up to the first band of particular concern and from the last band of particular concern to beyond three times the highest pass-band frequency.

□ Tx-band leakage – The transmitter channel power, although attenuated by the duplexer, still presents a cross-modulation threat in combination with Rx-band jammers. The RF filter must provide rejection of this Tx-band leakage.

□ Other frequencies of particular concern – Bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.

■ Phase and amplitude balance – The ZIF architecture requires well-balanced differential inputs to the RTR6285/RTR6280. This is accomplished by the RF filter, which takes a single-ended output from the RTR6285/RTR6280 IC, and provides differential outputs having nominal 180° phase separation. Phase and/or amplitude imbalance degrades common-mode rejection and second-order, non-linearity so their requirements are specified jointly.

3.6.7 UMTS Diversity Rx RF filter

The diversity receiver path does not require a duplexer to separate Rx and Tx signals, but must include an Rx filter before the first gain stage to achieve performance comparable to the Rx-path within a duplexer. In the UMTS paths the first gain stage is at the RTR6285 input.

Key performance requirements of the first bandpass filter include:

- Insertion loss – this component is positioned before the first gain stage, so its loss degrades receiver noise figure (sensitivity) directly. Insertion loss is most critical here!
- Out-of-band rejection or attenuation – this filter provides input selectivity for the receiver and suppresses transmitter leakage. Rejection levels are specified over a number of frequency ranges (see device data sheets for representative values).
 - Tx-band leakage – the transmitter channel power combines with Rx-band jammers to create cross-modulation within the LNA or pre-LNA that falls in-band and corrupts receiver performance. Furthermore, the secondary UMTS chains have low operating points and might be driven into compression if sufficient suppression is not achieved. The RF filter must provide rejection of this Tx-band leakage.
 - Other frequencies of particular concern – bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.

Of course, passband ripple and return loss are still important in all cases for the same reasons explained in the duplexer section. This Rx input filter has a single-ended configuration at its input and output.

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3.6.8 Bluetooth

The MSM6281 includes BT baseband embedded BT 2.0+EDR, compliant baseband core, so the other bluetooth components are an bluetooth RF module and Antenna. Figure1.5.12-1 shows the bluetooth system architecture in the KP330.

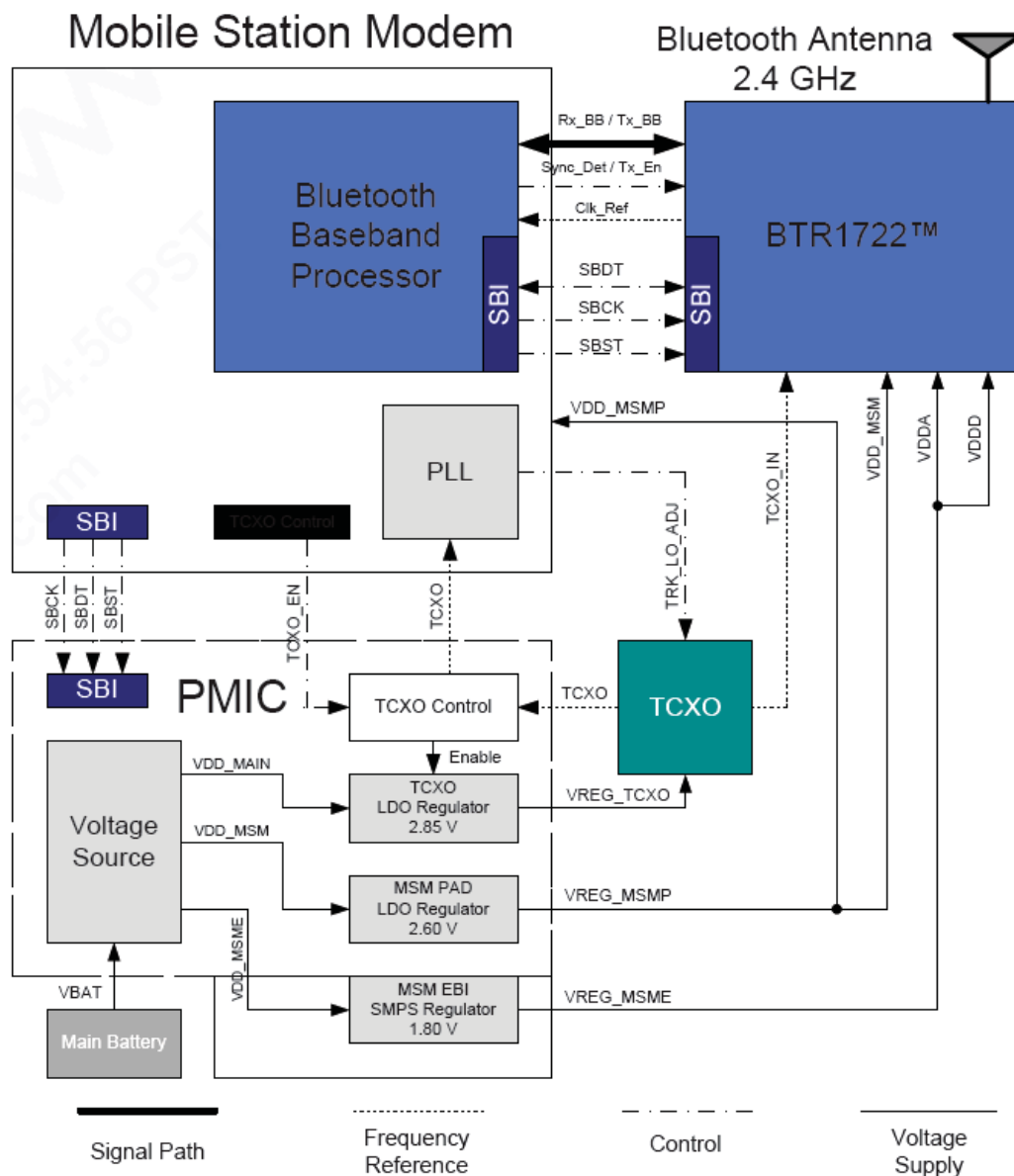


Fig 1.6-8 Bluetooth system architecture

3.7 Digital Baseband (DBB/MSM6260)

3.7.1 General Description

A. Features (MSM6260)

- Support for multimode operation – HSDPA, tri-band WCDMA (UMTS), quad GSM/GPRS/EDGE, and GPS, HSDPA.
- Support for HSDPA downlink up to 3.6Mbps.
- Support for WCDMA (UMTS) uplink data rate up to 384 kbps
- High-performance ARM926EJ-S running at up to 225 MHz
- ARM Jazelle Java hardware acceleration for faster Java-based games and other applets
- QDSP4000 high-performance DSP cores
- Integrated Bluetooth 1.2 baseband processor for wireless connectivity to peripherals
- Qcamera™ with 30 fps QCIF viewfinder resolution, and support for 3 MP camera sensors
- Direct interface to digital camera module with video front end (VFE) image processing
- True 3D graphics for advanced wireless gaming
- SecureMSM v2.0 includes support for Open Mobile Alliance (OMA) DRM v2.0, SIM-lock and IMEI integrity. Support for Q-fuse.
- Audio on par with portable music players
- Vocoder support (AMR, FR, EFR, HR)
- Advanced 14 x 14 mm, 0.5 mm pitch, 409-pin lead-free CSP packaging technology
- SD/SDIO hardware support

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3.7.2 Hardware Architecture

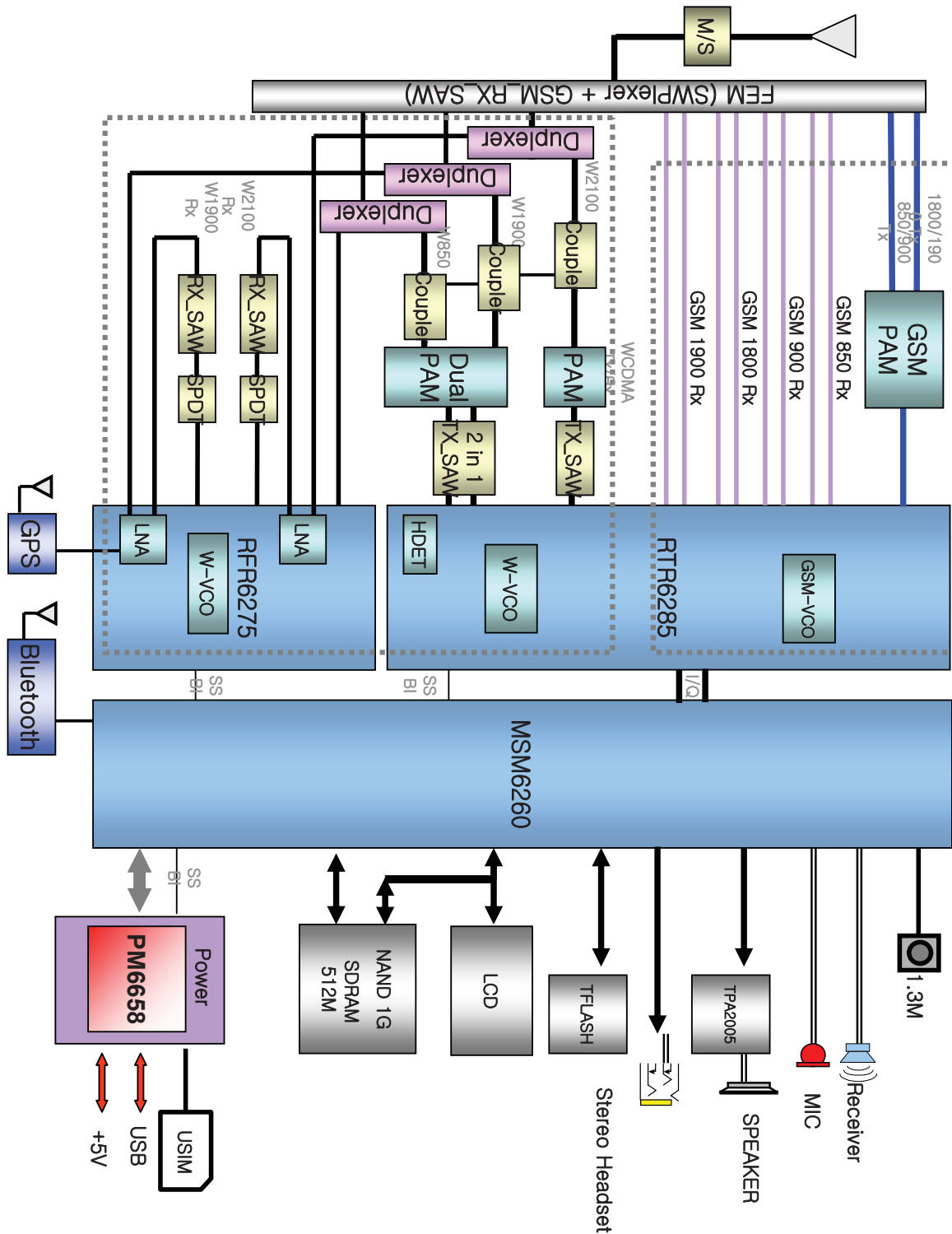


Figure. Simplified Block Diagram

3.7.3. Block Diagram(MSM6260)

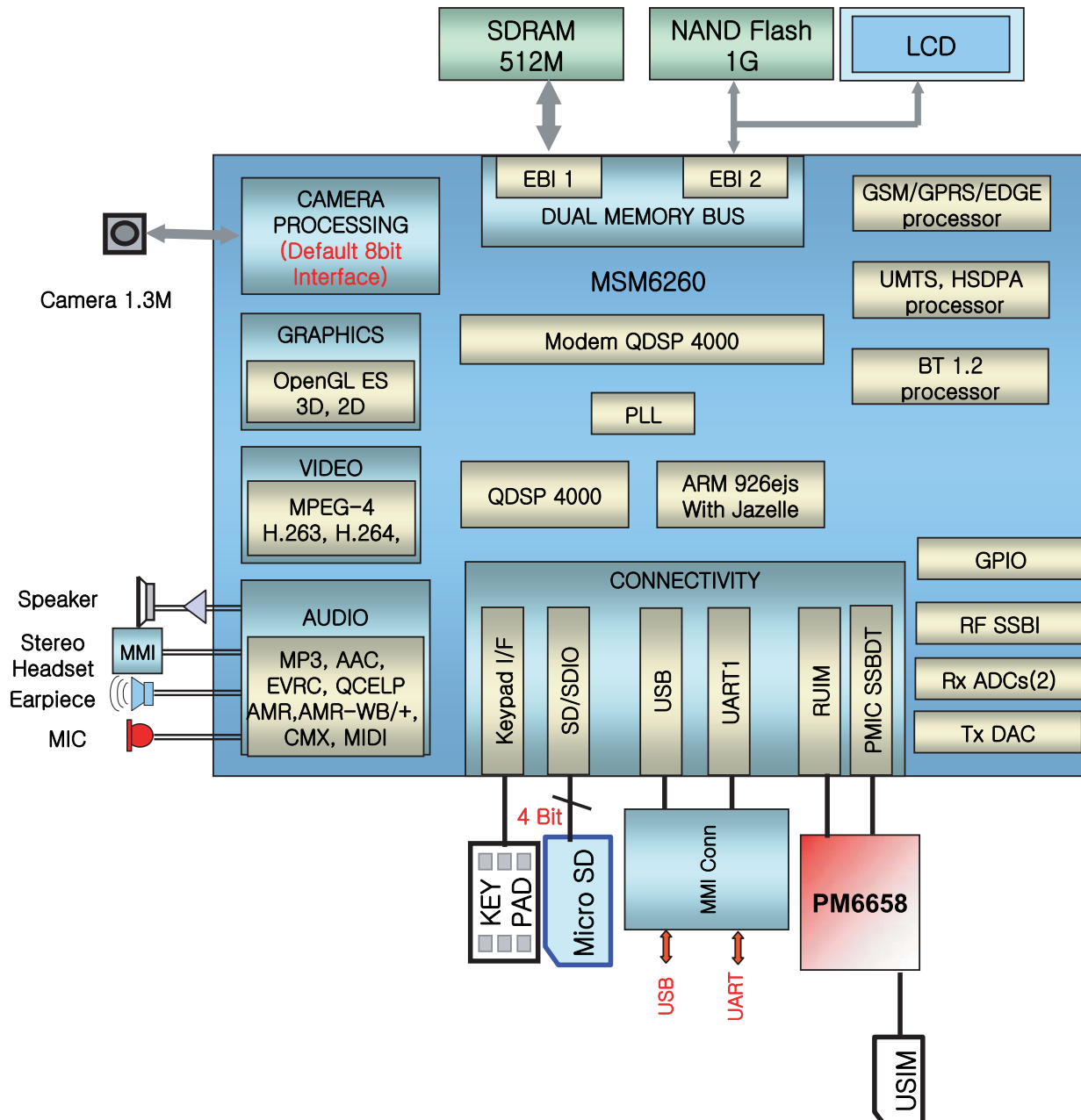


Figure. Simplified Block Diagram of MSM6260

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3.8. Subsystem(MSM6260)

3.8.1. ARM Microprocessor Subsystem

The MSM6260 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM, including control of the external peripherals such as the keypad, LCD, SDRAM, and NAND-Flash devices. Through a QUALCOMM proprietary serial bus interface (SBI) the ARM926EJ-S configures and controls the functionality of the RTR6285 and PM6658 devices.

3.8.2. WCDMA R99 features

The MSM6260 device supports release 99, including the following features:

- All modes and data rates for W-CDMA frequency division duplex (FDD), with the following restrictions:
 - The downlink supports the following specifications:
 - Up to four physical channels, including the broadcast channel (BCH), if present
 - Up to three dedicated physical channels (DPCHs)
 - Spreading factor (SF) range support from 4 to 256
 - The following transmit diversity modes are supported:
 - Space time transmit diversity (STTD)
 - Time-switched transmit diversity (TSTD)
 - Closed-loop feedback transmit diversity (CLTD)
 - The uplink supports the following specifications:
 - The uplink provides the following UE support:
 - One physical channel, eight TrCH, and 16 TrBks starting at any frame boundary
 - A maximum data rate of 384 kbps
 - Full SF range support from 4 to 256
- SMS (CS and PS)
- PS data rate – 384 kbps DL / 384 kbps UL
- CS data rate – 64 kbps DL / 64 kbps UL
- AMR (all rates)

3.8.3 HSDPA features

The MSM6260 device supports the HSDPA release 5 standard:

- Supports HS-DSCH (HS-SCCH, HS-PDSCH and HS-DPCCH) in addition to the R99 transport channels as defined in 3GPP specifications.
- Supports a maximum of four simultaneous HS-SCCH channels as defined in 3GPP specifications.
- Supports a maximum of 10 HS-PDSCH channels and supports both QPSK and 16 QAM modulation. It supports UE category 6 in SW release 2.0 and category 8 in SW release 4.0.
- Supports CQI, and ACK/NACK on HS-DPCCH channel as defined in 3GPP specifications.
- Supports all incremental redundancy versions for HARQ, as defined in 3GPP specifications.
- Can switch between HS-PDSCH and DPCH channel resources, as directed by the network.
- Can be configured to support any of the two power classes 3 or 4 as defined in 3GPP R5 specifications (25.101).
- Supports network activation of compressed mode by SF/2 or HLS on the DPCH for conducting inter-frequency or inter-RAT measurements when the HS-DSCH is active.
- Supports STTD on both associated DPCH and HS-DSCH simultaneously.
- Supports CLTD mode 1 on the DPCH when the HS-PDSCH is active.

- Supports STTD on HS-SCCH when either STTD or CLTD Mode 1 are configured on the associated DPCH.
- Supports TFC selection limitation on the UL factoring in the transmissions on the HS-DPCCH as required in TS 25.133.

3.8.4. GSM features

The following GSM modes and data rates are supported by the MSM6260 device hardware. Support modes conform to release '99 specifications of the sub-feature.

- Voice features
 - ☐ FR
 - ☐ EFR
 - ☐ AMR
 - ☐ HR
 - ☐ A5/1, A5/2, and A5/3 ciphering
- Circuit-switched data features
 - ☐ 9.6k
 - ☐ 14.4k
 - ☐ Fax
 - ☐ Transparent and non-transparent modes for CS data and fax
 - ☐ No sub-rates are supported.

3.8.5 GPRS features

- Packet switched data (GPRS)
 - ☐ DTM (Simple Class A) operation
 - ☐ Multi-slot class 12 data services
 - ☐ CS schemes: CS1, CS2, CS3, and CS4
 - ☐ GEA1, GEA2, and GEA3 ciphering
- Maximum of four Rx timeslots per frame

3.8.6 EDGE features

- EDGE E2 power class for 8 PSK
- DTM (simple Class A), multi-slot class 12
- Downlink coding schemes – CS 1–4, MCS 1–9
- Uplink coding schemes – CS 1–4, MCS 1–9
- BEP reporting
- SRB loopback and test mode B
- 8-bit, 11-bit RACH
- PBCCH support
- 1 phase/2 phase access procedures
- Link adaptation and IR
- NACC, extended UL TBF.

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3.8.7. MSM6260 device audio processing features

- Integrated wideband stereo CODEC
 - ☐ 16-bit DAC with typical 88 dB dynamic range
 - ☐ Supports sampling rates up to 48 kHz on the speaker path and 16 kHz on the microphone path
- VR- Voice mail + voice memo
- Acoustic echo cancellation
- Audio AGC
- Audio Codecs: AMR-NB, AAC, AAC Plus, Enhanced AAC Plus, Windows Audio v9, Real Audio 8 (G2)
- Internal vocoder supporting AMR, FR, EFR, and HR

3.8.8 MSM6260 microprocessor subsystem

- Industry standard ARM926EJ-S embedded microprocessor subsystem
 - ☐ 16 kB instruction and 16 kB data cache
 - ☐ Instruction set compatible with ARM7TDMI®
 - ☐ ARM version 5TEJ instructions
 - ☐ Higher performance 5 stage pipeline, Harvard cached architecture
 - ☐ Higher internal CPU clock rate with on-chip cache
- Java hardware acceleration
- Enhanced memory support

Please note that NOR/PSRAM will not be supported on MSM6260 device at this time.

 - ☐ 75 MHz and 90 MHz bus clock for SDRAM
 - ☐ 32-bit SDRAM
 - ☐ Dual memory buses separating the high-speed memory subsystem (EBI1) from low-speed peripherals (EBI2) such as LCD panels
 - ☐ 1.8V memory interface support for EBI1 and 1.8V or 2.6V memory interface support for EBI2
 - ☐ NAND FLASH memory interface
 - 8/16-bit data I/O width NAND flash support
 - 1- or 4-bit ECC
 - 512-byte/2KB page-size support
 - 2 chip selects supported for NAND Flash
 - Boot from NAND
 - Low-power SDRAM (LP-SDRAM) interface
- Internal watchdog and sleep timers

3.8.9 Supported interface features

- USB On-the-Go core supports both slave and host functionality
- Three universal asynchronous receiver transmitter (UART) serial ports
- USIM controller (via UART)
- Integrated 4-bit secure digital (SD) controller for SD and Mini SD cards
- Parallel LCD interface
- General-purpose I/O pins
- External keypad interface

3.8.10 Supported multimedia features

- Provide additional general purpose MIPS by using:
 - ☐ Two QDSP4000s
 - ☐ Dedicated hardware accelerators and compression engines
- Improve Java, BREW, and game performance
 - ☐ Integrated Java and 2D/3D graphics accelerator with Sprite engine
- Enable various accessories via USB host connectivity.
 - ☐ Integrated USB host controller functionality
- Enable compelling visual and audio applications.

Qcamera™

- High-quality digital camera processing, supporting CCD or CMOS image sensors up to 3-megapixels.
- 30 fps QCIF viewfinder

Qtv™

- Audio and video decoder that supports VOD, MOD and Broadcast multimedia services.
- Audio Codecs supported: AMR-NB, AMR-WB, AMR-WB+, AAC, AAC Plus, Enhanced AAC Plus, Windows Media Audio v9, RealAudio® v8
- Integrated stereo wideband Codec for music/digital clips
- CMX
- Video Codecs supported: MPEG-4, H.263, H.264, Windows Media v9 and RealNetworks® v10

Video telephony services: Qvideophone™

- A two-way mobile video conferencing solution that delivers 15 fps @ QCIF, 64Kbps
- Video Codecs supported: MPEG-4 and H.263
- Audio Codecs supported: AMR-NB.

Qcamcorder™

- Real time mobile video encoder
- Video Codecs supported: MPEG-4, H.263
- Audio Codecs supported: AMR-NB
- Recording performance: 15 fps @ QCIF, 192 kbps

gpsOne™

- Integrated gpsOne processing
- Standalone gpsOne mode in which the handset acts as a GPS receiver

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CMX™ (MIDI and still image, animation, text, LED/vibrate support)

- 72 simultaneous polyphonic tones
- 44 kHz sampling rate
- 512 kB wave table
- Support of universal file formats
 - ☐ Standard MIDI Format (SMF)
 - ☐ SP-MIDI
 - ☐ SMAF Audio playback (MA-2, MA-3, MA-5)
 - ☐ XMF/DLS
 - ☐ MFi (requires Docomo license)
- PNG decoder
- Pitch bend range support
- LED/vibrate support
- Scalable Vector Graphics (SVG- Tiny 1.1 + SVG Tiny 1.2)
- MLZ decoder
- Integrated PNG/SAF A.T.

Table. Summary of MSM6260 device features

Features	MSM6260
Modem	Tri-band WCDMA Quad-band GSM/GPRS/EDGE HEDGE 3.6 Mbps HSDPA GPS DTM
Processor	ARM926 EJ-S – 270 MHz AHB – 90 MHz for 3.6 Mbps HSDPA ARM926 EJ-S – 225 MHz AHB – 75 MHz for no HSDPA ARM926 EJ-S – 122 MHz AHB – 61 MHz for no HSDPA and limited multimedia QDSP – 100 MHz
Process technology	65 nm
Supported RF platforms (see Description of RF configurations for platform definition)	Platform B (RTR6275+ RFR6275) Platform E (RTR6275+ RFR6275) Platform F (RTR6285 + receive diversity)
HSDPA	3.6 Mbps, category 5/6
Enhanced antenna	SAIC, equalizer, receive diversity
Memory configuration	8/16-bit NAND and 32-bit SDRAM (See Note 2)
Broadcast interface	Not supported
Power management IC	PMIC 6650-2
USB	3-wire USB-OTG
MDDI	Supported
Qcamera (camera interface) Viewfinder frame rate	Up to 3.0 M pixel support 30 fps @ QCIF
Qcamcorder (recording performance)	15 fps @ QCIF
QTV (video decode)	15 fps QCIF streaming, 15 fps QCIF playback
Audio / video decoders	MP3, AAC, AAC+, ADPCM, MPEG4, H.263, H.264, Real networks, Windows media, WB-AMR/+
Qvideophone (video telephony)	15 fps @ QCIF
LCD HW interface	Up to 24 bpp
Boot mode	Trusted boot mode only

Table 1-1 Summary of MSM6260 device features

3. TECHNICAL BRIEF

3.8.11. Serial Bus Interface(SBI)

The MSM6260 device's SSBI is designed specifically to be a quick, low pin count control protocol for QUALCOMM's RTR6285 and PM6658 ASICs. Using the SSBI, the RTR6285 and PM6658 device can be configured for different operating modes and for minimum power consumption, extending battery life in Standby mode. The SSBI also controls DC baseband offset errors.

3.8.12. Wideband CODEC

The MSM6260 device integrates a wideband voice/audio CODEC into the mobile station modem (MSM). The CODEC supports two differential microphone inputs, one differential earphone output, one single-ended earphone output, and a differential analog auxiliary interface.

The CODEC integrates the microphone and earphone amplifiers into the MSM6260 device, reducing the external component count to just a few passive components.

The microphone (Tx) audio path consists of a two-stage amplifier with the gain of the second stage set internally. The Rx/Tx paths are designed to meet the ITU-G.712 requirements for digital transmission systems.

3.8.13. Vocoder Subsystem

The MSM6260 device's QDSP4000 supports AMR,FR,EFR and HR. In addition, the QDSP4000 has modules to support the following audio functions: DTMF tone generation, DTMF tone detection, Tx/Rx volume controls, Tx/Rx automatic gain control (AGC), Rx Automatic Volume Control (AVC), EarSeal Echo Canceller (ESEC), Acoustic Echo Canceller (AEC), Noise Suppression (NS), and programmable, 13-tap, Type-I, FIR, Tx/Rx compensation filters. The MSM6260 device's integrated ARM9TDMI processor downloads the firmware into the QDSP4000 and configures QDSP4000 to support the desired functionality.

3.8.14. ARM Microprocessor subsystem

The MSM6260 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM device, including control of the external peripherals such as the keypad, LCD, RAM, ROM, and EEPROM devices. Through a generic single serial bus interface (SSBI) the ARM926EJ-S configures and controls the functionality of the RTR6285, and PM6658 devices.

3.8.15. Mode Select and JTAG Interfaces

The mode pins to the MSM6260 device determine the overall operating mode of the ASIC. The options under the control of the mode inputs are Native mode, which is the normal subscriber unit operation, ETM mode, which enables the built-in trace mode, and test mode for factory testing. The MSM6260 device meets the intent of the ANSI/IEEE 1149.1A-1993 feature list. The JTAG interface can be used to test digital interconnects between devices within the mobile station during manufacture.

3.8.16. General-Purpose Input/Output Interface

The MSM6260 device has general-purpose bidirectional input/output pins. Some of the GPIO pins have alternate functions supported on them. The alternate functions include USB interface, additional RAM, ROM, general-purpose chip selects, parallel LCD interface, and a UART interface. The function of these pins is documented in the various software releases.

3.8.17. UART

The MSM6260 device employs three UARTs. UART1 has dedicated pins while UART2 and UART3 share multiplexed pins.

- UART1 for data
- UART2 (can be used for USIM interface)
- UART3 for data

3.8.18. USB

The MSM6260 device integrates a universal serial bus (USB) controller that supports both unidirectional and bidirectional transceiver interfaces. The USB controller acts as a USB peripheral communicating with the USB host.

3. TECHNICAL BRIEF

3.9. Power Block

3.9.1. General

MSM6260, included RF, is fully covered by PM6658(Qualcomm PMIC). PM6658 cover the power of MSM6260, MSM memory, RF block, Bluetooth, USIM and TCXO.

Major power components are :

PM6658 (U602) : Phone power supply

AAT3157ITP(U700) : LCD Backlight/Flash charge pump

3.9.2 PM6658

The PM6658 device (Figure 1-1) integrates all wireless handset power management. The power management portion accepts power from all the most common sources – battery, external charger, adapter, coin cell back-up – and generates all the regulated voltages needed to power the appropriate handset electronics. It monitors and controls the power sources, detecting which sources are applied, verifying that they are within acceptable operational limits, and coordinates battery and coin cell recharging while maintaining the handset electronics supply voltages. Eight programmable output voltages are generated using low dropout voltage regulators, all derived from a common trimmed voltage reference. A dedicated controller manages the TCXO warm-up and signal buffering, and key parameters (under-voltage lockout and crystal oscillator signal presence) are monitored to protect against detrimental conditions.

MSM device controls and statuses the PM6658 IC using Single Serial Bus Interface (SSBI) supplemented by an Interrupt Manager for time-critical information. Another dedicated IC Interface circuit monitors multiple trigger events and controls the power-on sequence.

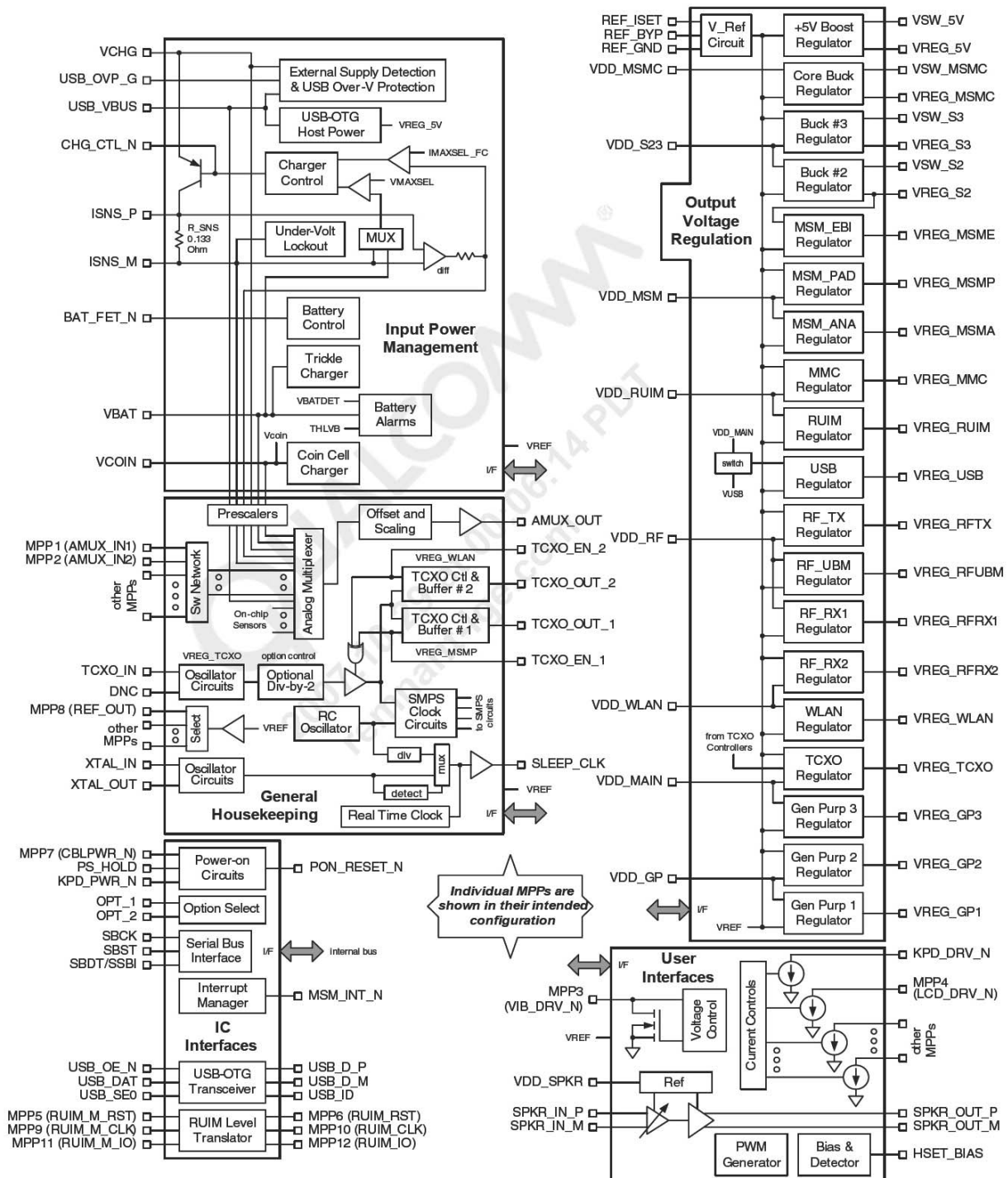


Figure. PM6658 Functional Block Diagram

3. TECHNICAL BRIEF

3.9.3. Charging control

A programmable charging block in PM6658 is used for battery charging. It is possible to set limits for the charging current. The external supply typically connects directly to pin (VCHG). The voltage on this pin (VCHG) is monitored by detection circuitry to ascertain whether a valid external supply is applied or not. For additional accuracy or to capture variations over time, this voltage is routed internally to the housekeeping ADC via the analog multiplexer. PM6658 circuits monitor voltages at VCHARGER and ICHARGE pins to determine which supply should be used and when to switch between the two supplies.

- 1) Pass active transistor is “on” –

Continuously closed-loop controlled
to regulate the total current

- 2) Battery transistor is turned on,

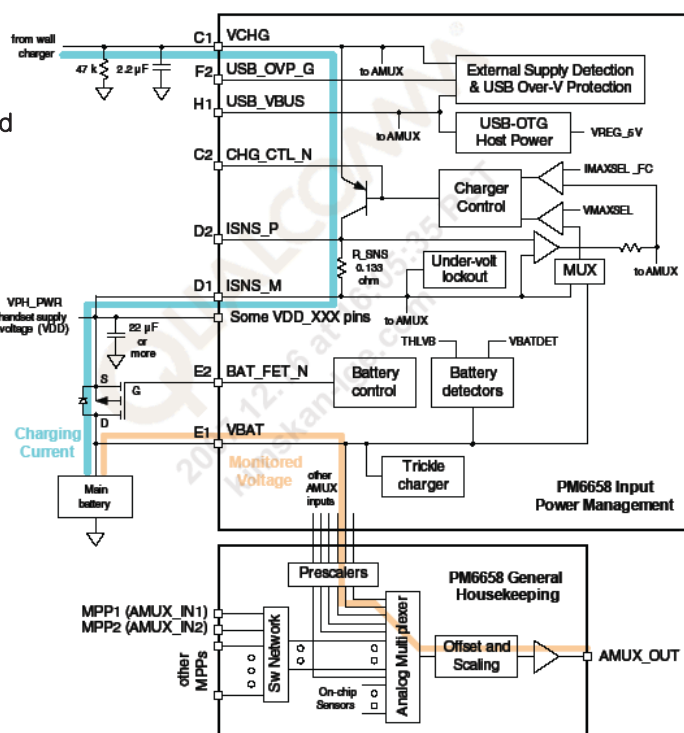
connecting battery to VDD node

- 3) Charging current(blue) flows from
the external supply

- 4) Total current is set by the current
regulation loop

- 5) Battery voltage is routed to MSM :
MSM HKADC measures VBAT

- 6) Constant current charging is
finished when the battery reaches
its target voltage



KP330 Charging Control block



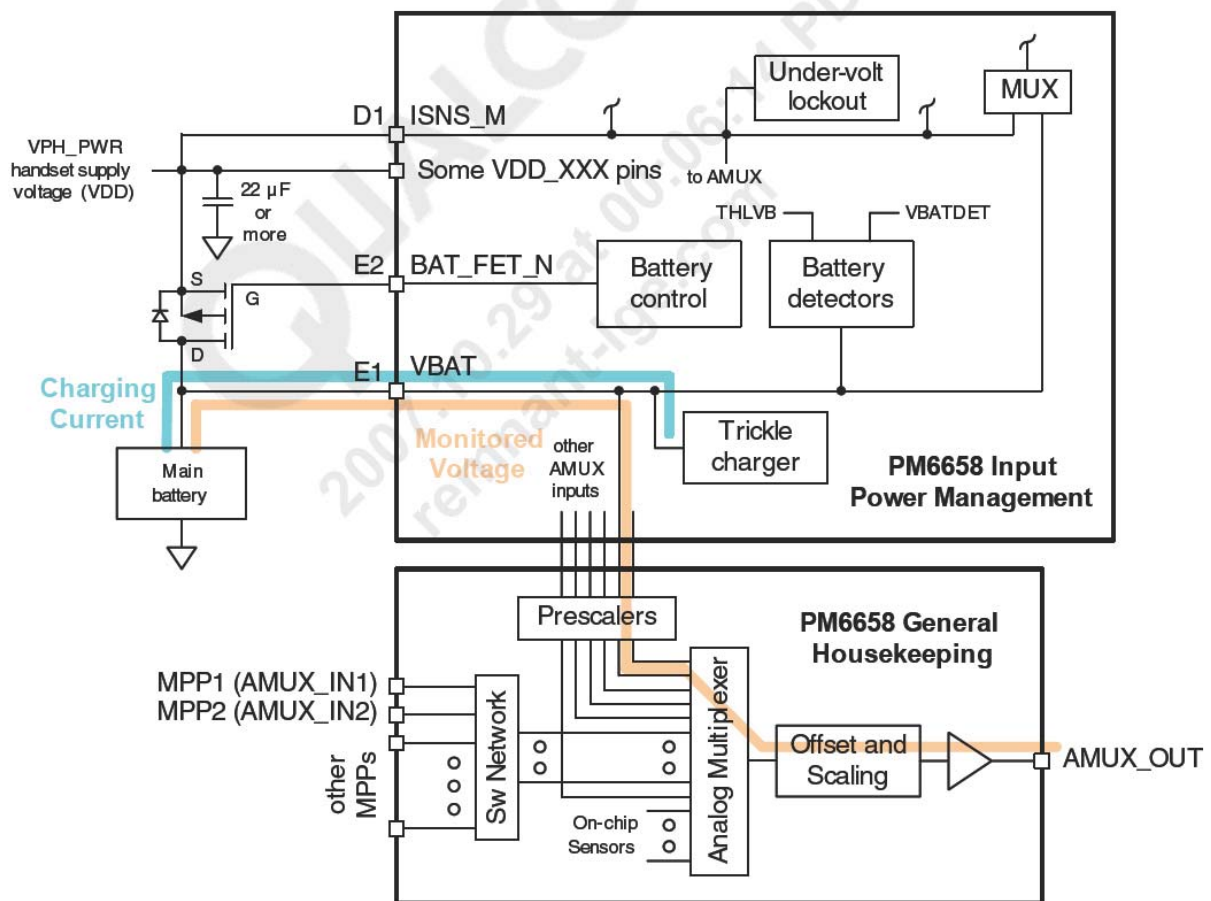
KP330 Battery Bar Display(Stand By Condition)

3.9.4 Trickle Charging

Trickle charging of the main battery, enabled through MSM control and powered from VDD, is provided by the PM6658 IC. This mode is used to raise a severely depleted battery's voltage to a level sufficient to begin fast charging.

The trickle charger is an on-chip programmable current source that supplies current from VDD to pin E1 (VBAT). Trickle charging is enabled through MSM control and should be used until the main battery reaches its desired threshold, usually about 3.0V for Li-ion batteries.

Software sets the desired trickle charging current. Valid settings are 0, 20, 30, 40, 50, 60, 70, and 80 mA, with 0 mA effectively disabling the trickle charge.



3. TECHNICAL BRIEF

3.9.5 Constant Current Charging

The PM6658 IC supports constant current charging of the main battery by closing the battery MOSFET (connecting the battery to VDD), and closed-loop controlling the pass transistor. The constant current charging continues until the battery reaches its target voltage, 4.185V.

3.9.6 Constant Voltage Charging

Constant voltage charging begins when the battery voltage reaches a target voltage, 4.185V.

The end of constant voltage charging is commonly detected 10% of the full charging current

- Charging Method : CC & CV (Constant Current & Constant Voltage)
- Maximum Charging Voltage : 4.2V
- Maximum Charging Current : 600mA
- Nominal Battery Capacity : 900 mAh
- Charger Voltage : 4.6V
- Charging time : Max 3h (Except time trickle charging)
- Low battery POP UP : 3.42V
- Low battery alarm interval : standby – 3 min, talk – 1min
- Cut-off voltage : 3.15V

3.10. External memory interface

The MSM6260 device was designed to provide two distinct memory interfaces. EBI1 was targeted for supporting high speed synchronous memory devices. EBI2 was targeted towards supporting slower asynchronous devices such as LCD, NAND flash, SRAM, etc.

- EBI1 Features
 - 16 bit static and dynamic memory interface
 - 32 bit dynamic memory interface
 - 24 bits of address for static memory devices which can support up to 32MBytes on each chip select
 - Synchronous burst memories supported (burst NOR, burst PSRAM)
 - Synchronous DRAM memories supported
 - Byte addressable memory supporting 8 bit, 16 bit and 32 bit accesses
 - Pseudo SRAM (PSRAM) memory support
- EBI2 Features
 - Support for asynchronous FLASH and SRAM(16bit & 8bit).
 - Interface support for byte addressable 16bit devices (UB_N & LB_N signals).
 - 2Mbytes of memory per chip select.
 - Support for 8 bit/16bit wide NAND flash.
 - Support for parallel LCD interfaces, port mapped of memory mapped(18 or 16 bit).
- 1Gb NAND(16bit) flash memory + 512Mb SDRAM (32bit)
- 1-CS(Chip Select) are used.

Interface Spec				
Device	Part Name	Maker	Read Access Time	Write Access Time
FLASH	TY9000A800KOGG	Toshiba	50 ns	50 ns
SDRAM	TY9000A800KOGG	Toshiba	15 ns	15 ns

Table#1. External memory interface for KP330

3. TECHNICAL BRIEF

3.11. H/W Sub System

3.11.1. RF Interface

A. RTR6285(WCDMA_Tx, GSM_Tx/Rx)

MSM6260 controls RF part(RTR6285) using these signals.

- SBST : SSBI I/F signals for control Sub-chipset
- PA_ON1 : Power AMP on RF part
- RX0_I/Q_M/P,TX_I/Q_M/P : I/Q for T/Rx of RF
- TX_AGC_ADJ : control the gain of the Tx signal prior to the power amplifier
- DAC_REF : Reference input to the MSM Tx data DACs

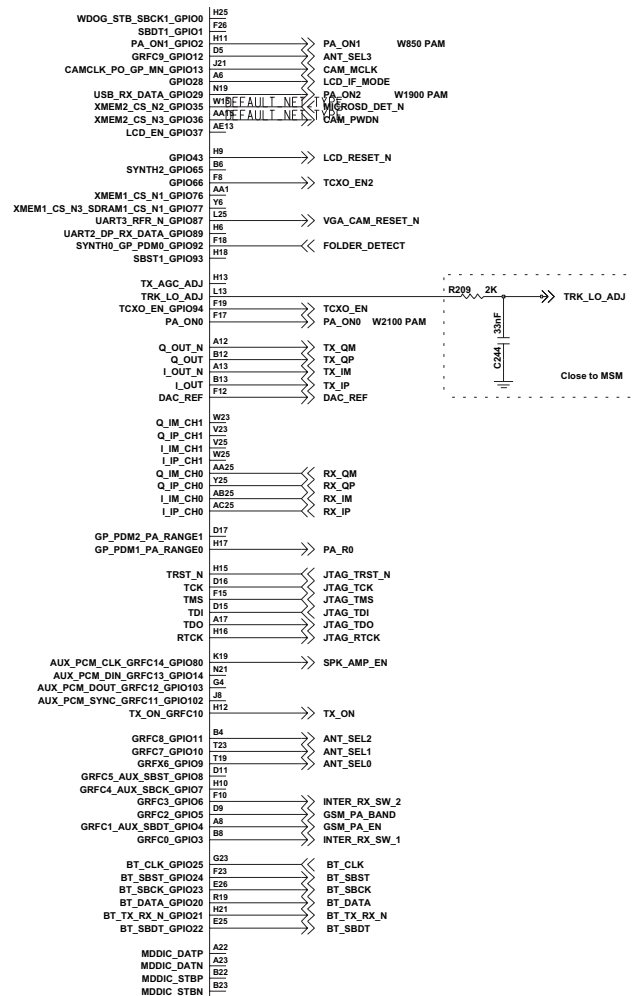


Figure. Schematic of RF Interface of MSM6260

B. the others

- TRK_LO_ADJ : TCXO(19.2M) Control
- PA_ON : WCDMA(2100) TX Power Amp Enable
- ANT_SEL[0-2] : Ant Switch Module Mode Selection(WCDMA,GSM Tx/Rx,DCS-PCS Tx/Rx)
- GSM_PA_BAND : GSM/DCS-PCS Band Selection of Power Amp
- GSM_PA_RAMP : Power Amp Gain Control of APC_IC
- GSM_PA_EN : Power Amp Gain Control Enable of APC_IC

3. TECHNICAL BRIEF

3.11.2. MSM Sub System

3.11.2.1. USIM Interface

SIM interface scheme is shown in Figure.

And, there control signals are followed

- USIM_CLK : USIM Clock
- USIM_Reset : USIM Reset
- USIM_Data : USIM Data T/Rx

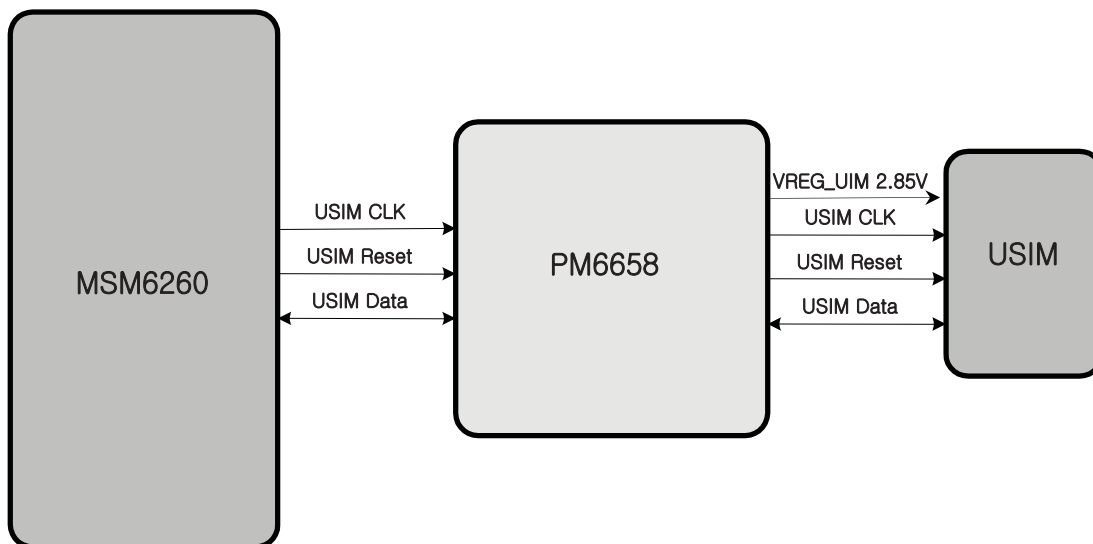


Figure. SIM Interface

3.11.2.2. UART Interface

UART signals are connected to MSM GPIO through IO connector with 115200 bps speed.

GPIO_Map	Name	Note
GPIO_96	UART_RXD	Data_Rx
GPIO_95	UART_TXD	Data_Tx

Table. UART Interface

3.11.2.3. USB

The MSM6260 device contains a Universal Serial Bus (USB) interface to provide an efficient interconnect between the mobile phone and a personal computer (PC). The USB interface of the MSM6260 was designed to comply with the definition of a peripheral as specified in USB Specification, Revision 1.1. Therefore, by definition, the USB interface is also compliant as a peripheral with the USB Specification, Revision 2.0. The USB Specification Revision 1.1 defines two speeds of operation, namely low-speed (1.5 Mbps) and full-speed (12 Mbps), both of which are supported by the MSM6260.

Name	Note
USB_DAT	Data to/from MSM
USB_SE0	Data to/from MSM
USB_OE_N	Out-Put Enable of Transceiver
USB_VBUS	USB_Power From Host(PC)
USB_D+	USB Data+ to Host
USB_D-	USB Data- to Host

Table. USB Signal Interface

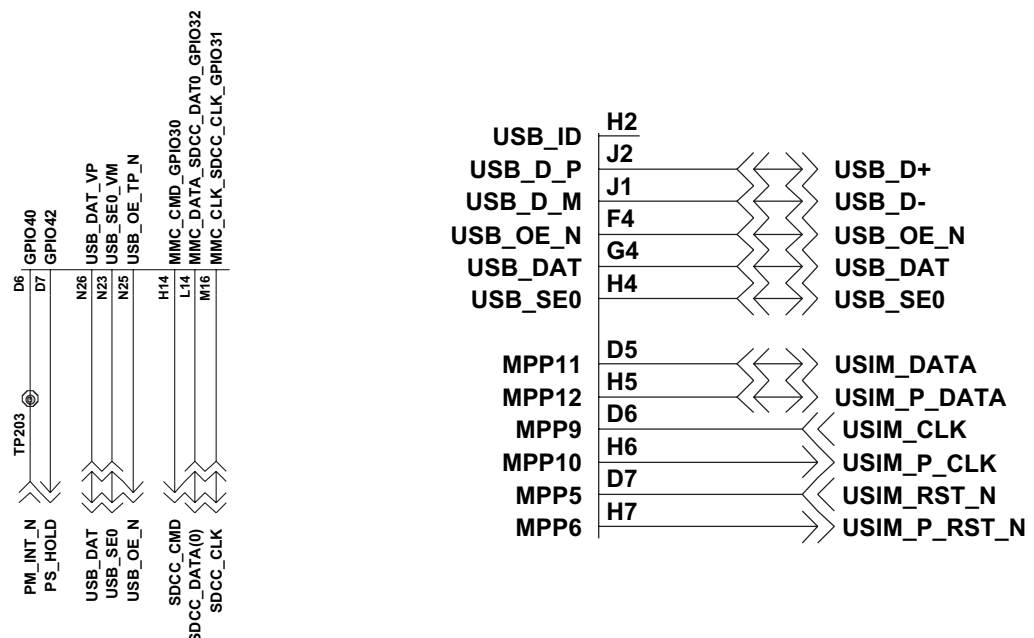


Figure. Schematic of USB block(MSM6260 Side & PM6658 Side)

3. TECHNICAL BRIEF

3.11.3 HKADC(House Keeping ADC)

The MSM6260 device has an on-chip 8-bit analog-to-digital converter (HKADC) which is tended to digitize DC signals corresponding to analog parameters such as battery voltage, temperature, and RF power levels. The MSM6260 device has six analog input pins which are multiplexed to the input of the internal HKADC.

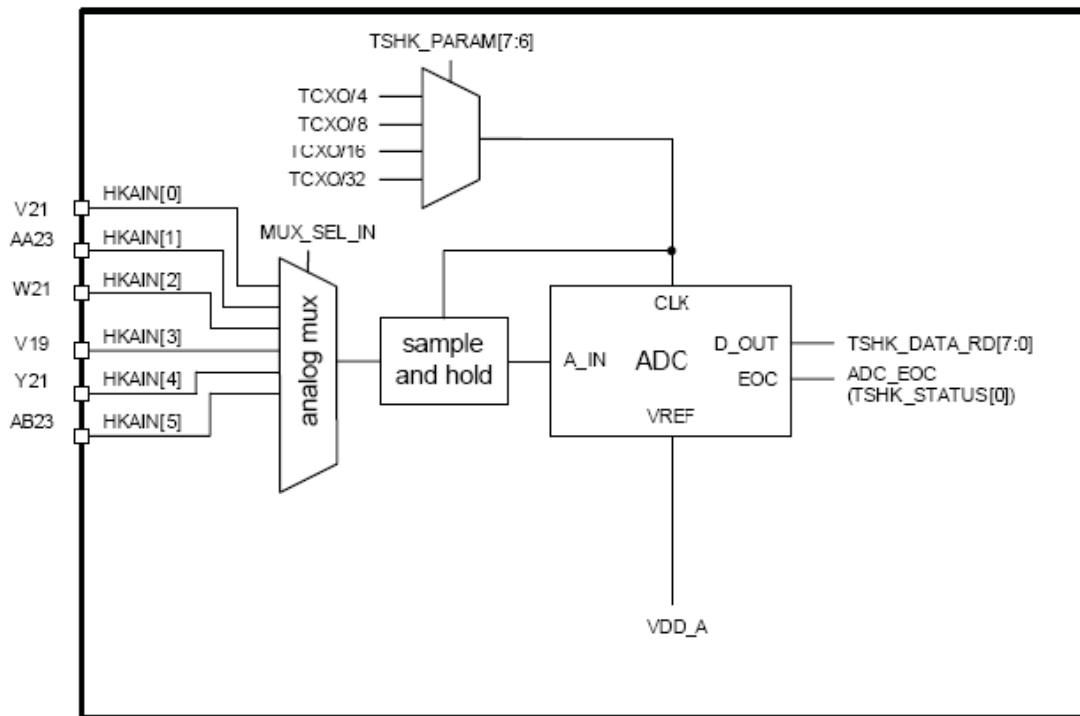


Figure. MSM6260 HKADC Block diagram

Channel	Signal	Note
HKADC0	AMUX_OUT	RF PAM Temperature Check
HKADC1	VBATT_SENSE	Battery voltage level
HKADC2	No use	
HKADC3	TTY_ADC_DET	Ear jack Delection for TTY
HKADC4	PCB_Rev_ADC	PCB Version Check
HKADC5	VBATT_TEMP	Battery Temperature Check

Table. HKADC channel table

3.11.4. Key Pad

There are 18 key buttons. Shows the Key Matrix & Keypad circuit.
'END' Key is connected to PMIC(PM6658).

	COL(0)	COL(1)	COL(2)	COL(3)	COL(4)	COL(5)
ROW(0)			Multi	CLR	MENU	Side(up)
ROW(1)	1	2	3	LEFT	UP	Side(down)
ROW(2)	4	5	6	OK	RIGHT	SPK
ROW(3)	7	8	9	SEND	SEARCH	
ROW(4)	*	0	#	DOWN	CAMERA	

Table. Key Matrix Mapping Table

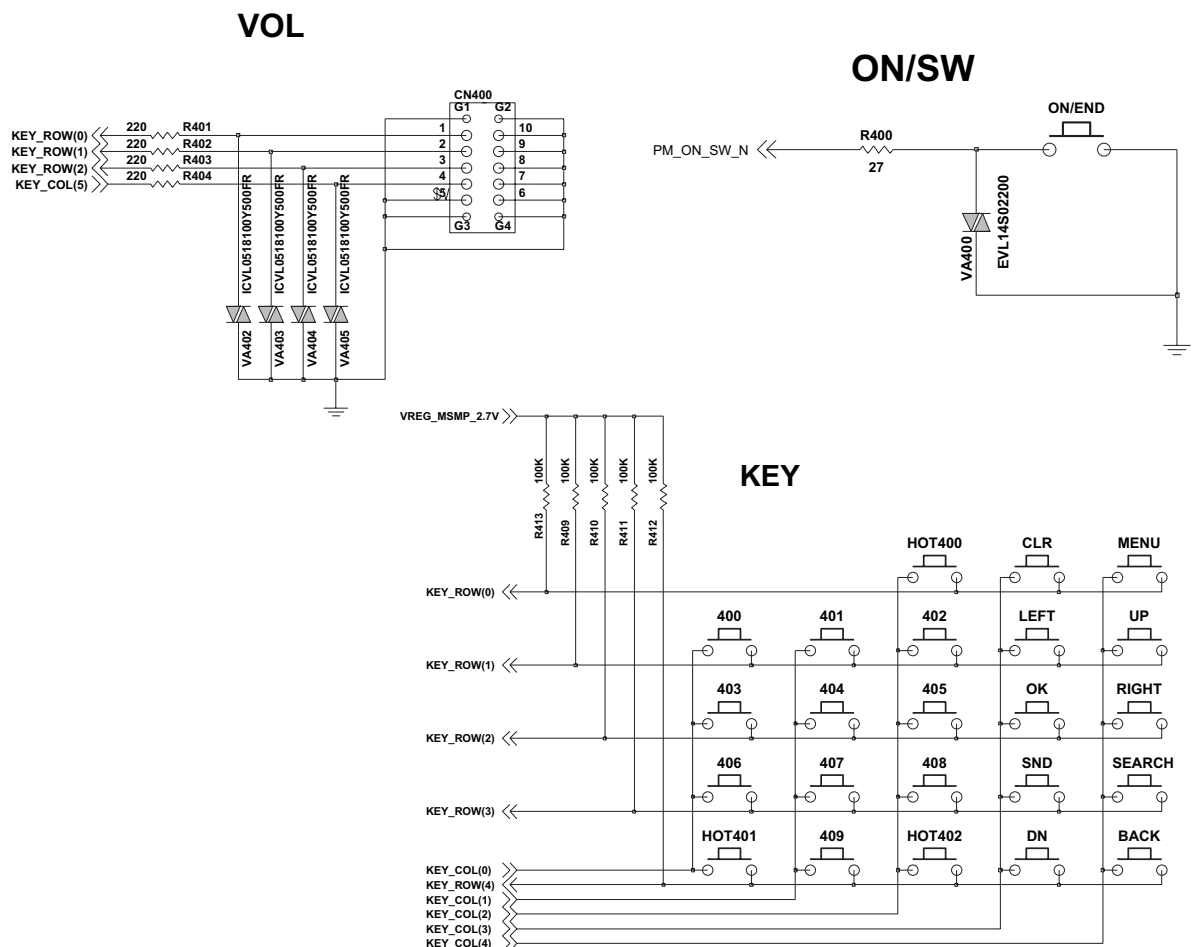


Figure. Keypad Circuit (Vol Key , Key, ON/SW)

3. TECHNICAL BRIEF

3.11.5 Camera Interface

KP330 Installed a 1.3M Pixel and VGA Camera.

Below figure shows the camera board to board connector and camera I/F signal.

1.3M Camera

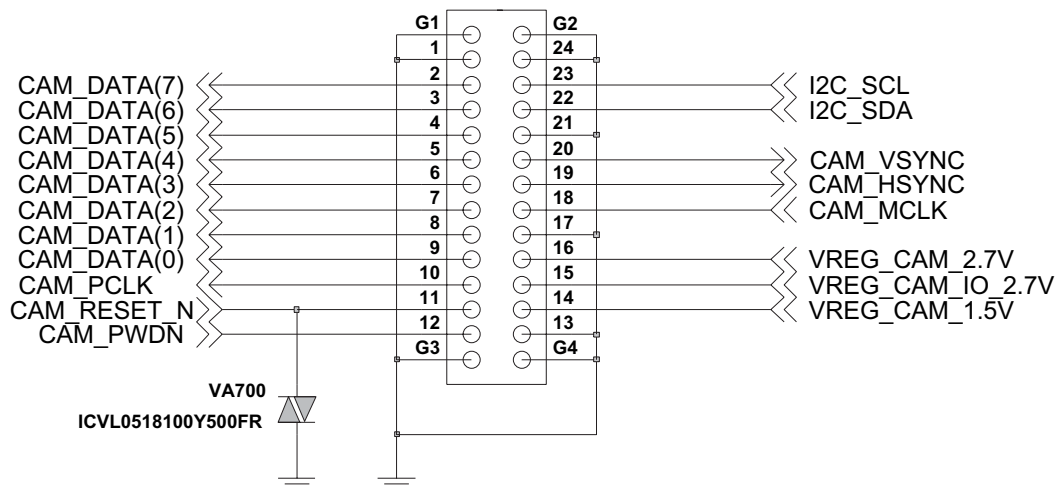


Figure. Camera PCB Board to Board Connector

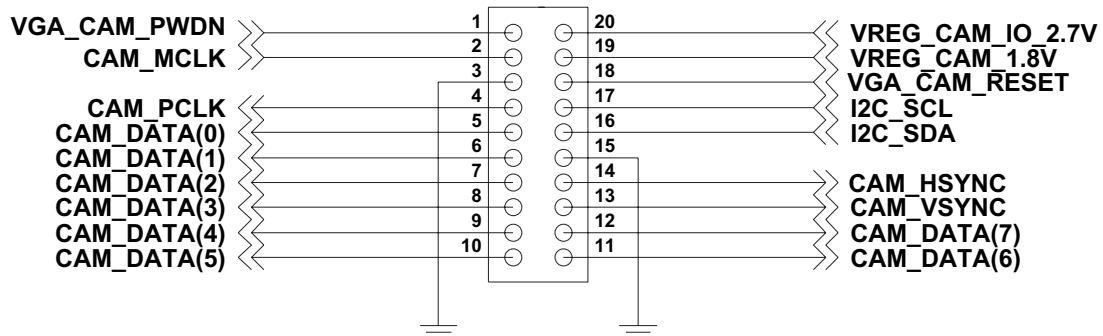


Figure. Camera PCB Board to Board Connector

The Camera module is connected to LCD FPCB with 24pin Board to Board connector. Its interface is dedicated camera interface port in MSM6260. The camera port supply 24Mhz master clock to camera module and receive 48Mhz pixel clock(15fps), Vertical sync signal, reset signal and 8bits data from camera module. The camera module is controlled by I2C port from MSM6260

[Pin Description]

No	Name	Port	Note
1	GND	GND	GND
2	CAM_DATA(7)	O	Data
3	CAM_DATA(6)	O	Data
4	CAM_DATA(5)	O	Data
5	CAM_DATA(4)	O	Data
6	CAM_DATA(3)	O	Data
7	CAM_DATA(2)	O	Data
8	CAM_DATA(1)	O	Data
9	CAM_DATA(0)	O	Data
10	CAM_PCLK	O	Camera pixel clock
11	CAM_RESET	I	Camera reset
12	CAM_PWDN	I	Camera Power Down(Enable)
13	GND	GND	GND
14	VREG_CAM_1.5V	I	Camera core power
15	VREG_CAM_IO_2.7V	I	Camera I/O power
16	VREG_CAM_2.7V	I	Camera Analog power
17	GND	GND	GND
18	CAM_MCLK	O	Main clock
19	CAM_HSYNC	O	Horizontal Sync
20	CAM_VSYNC	O	Vertical Sync
21	GND	GND	GND
22	I2C_SDA	I	I2C data
23	I2C_SCL	I	I2C clock
24	GND	GND	GND

Table. Interface between MEGA Camera Module and MAIN PCB (in camera module)

3. TECHNICAL BRIEF

The VGA Camera module is connected to FPCB with 20pin Board to Board connector (AXK720147G). Its interface is dedicated camera interface port in MSM6260. The camera port supply 24.576MHz master clock to camera module and receive 24.576MHz pixel clock (30fps), vertical sync signal, horizontal sync signal, reset signal and 8bits data from camera module. The camera module is controlled by I2C port from MSM6260.

[Pin Description]

No	Name	Port	Note
1	CAM_PWDN	i	Camera power down
2	CAM_MCLK	I	Master Clock(24M)
3	GND	GND	GND
4	CAM_PCLK	O	Clock for Camera Data Out(13M)
5	CAM_DATA(0)	O	Data
6	CAM_DATA(1)	O	Data
7	CAM_DATA(2)	O	Data
8	CAM_DATA(3)	O	Data
9	CAM_DATA(4)	O	Data
10	CAM_DATA(5)	O	Data
11	CAM_DATA(6)	O	Data
12	CAM_DATA(7)	O	Data
13	CAM_VSYNC	O	Vertical Synch
14	CAM_HSYNC	O	Horizontal Sync
15	GND	GND	GND
16	I2C_SDA	I	I2C Clock
17	I2C_SCL	I	I2C Clock
18	CAM_RESET_N	I	Camera reset signal
19	VREG_MSMP_1.8V	I	Camera I/O Power
20	VREG_CAM_2.8V	I	Camera I/O Power

Table. Interface between VGA Camera Module and FPCB (in camera module)

3.11.9. LCD Module (IM200CSM2A : LG Innotek)

– The IM200CSM2A model is a Color TFT Main & Mono STN(sub) LCD supplied by LG Innotek. This main Module has a 2.0 inch diagonally measured active display area with 176(RGB)X220 resolution and sub Module has a 0.98 inch diagonally measured active display area with 96X64 (Mono) resolution Each pixel is divided into Red, Green and Blue sub-pixels and dots which are Arranged in vertical stripes.

–General Features

Item	Main Display	Sub Display	Remark
Display Mode	Normally White, Transmissive LCD	Normally Black, Transmissive LCD	
User Viewing Direction	6 O' Clock	12 O' Clock	
Driving Method	A-Si TFT Active Matrix	STN Mono	
Input Signals	9/16Bit, CPU I/F Parallel	8Bit, CPU I/F Parallel	
Outside Dimensions	38.5mm(W) x 51.8mm(H) x 3.2mm(D)(Typ.)		
Active Area	31.68mm(W) x 39.60mm(H)	20.15mm(W) x 14.71mm(H)	
Number of Pixels	176×RGB×220 Pixels	96×64 (mono) Pixels	
Pixel Pitch	0.18mm(W) X 0.18mm(H)	0.21mm(W) X 0.23mm(H)	Note 1)
Pixel Arrangement	RGB Vertical stripes	Mono stripes	Note 1)
Drive IC	LGDP4523	UC1603	
Weight	10.203g(typ)±10%		

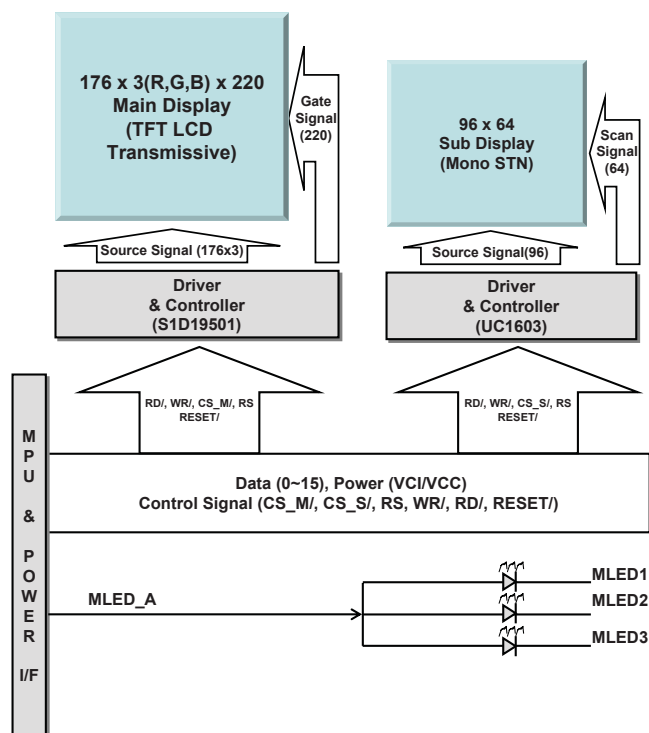


Figure. LCD Module Block Diagram

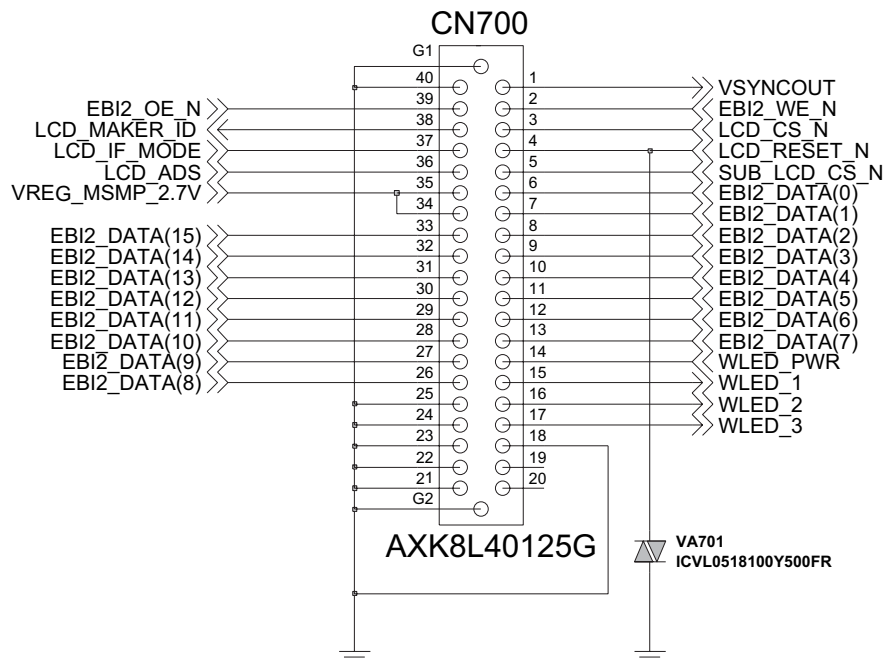
3. TECHNICAL BRIEF

3.11.10. Display

LCD module is connected to LCD F-PCB with 40 pin B TO B connector

The LCD module is controlled by 16-bit EBI2 in MSM6260.

FPCB_TO_LCD CONNECTOR



3.11.11 Keypad Light

There are 2 Side View White LEDs in Main board backlight circuit, which are driven KYBD_BACKLIGHT line from PM6658.

KEY_BACK_LIGHT

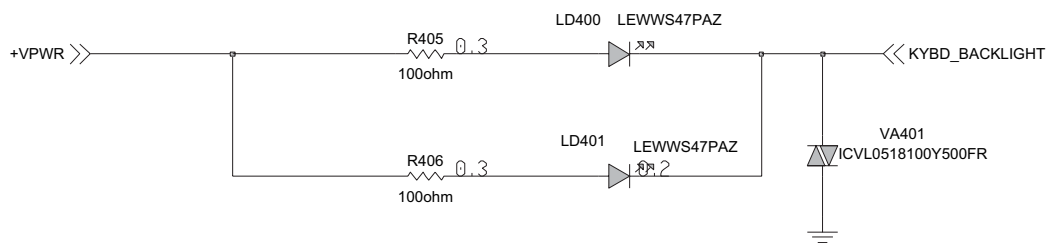


Figure. Keypad Backlight Circuit

3. TECHNICAL BRIEF

3.11.12 Folder ON/OFF Operation

There is a magnet to detect the Folder status, opened or closed.

If a magnet is close to the hall-effect switch, the voltage at pin OUT of U600 goes to 0V. Otherwise, 2.7V.

This folder signal is delivered to MSM6260 GPIO92

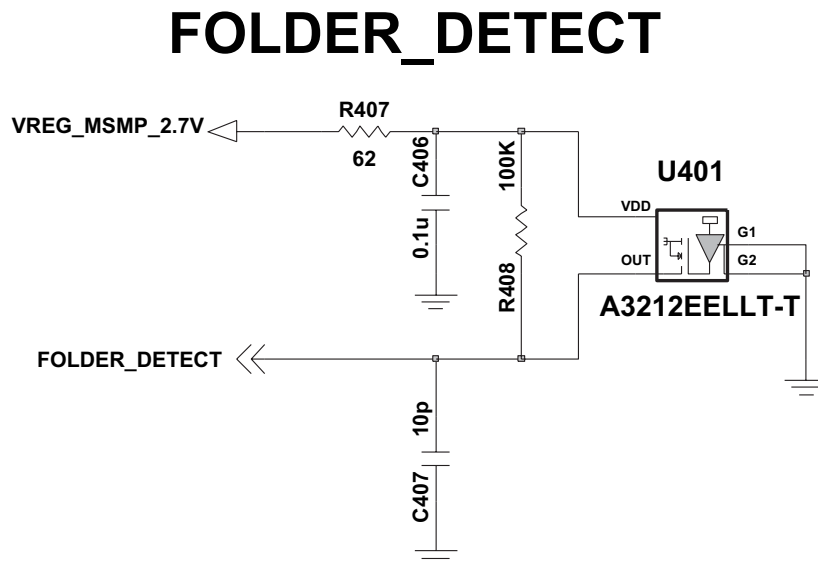


Figure. Schematic of Folder ON/OFF detection circuit

3.11.13 Audio Signal Processing & Interface

Audio signal processing is divided uplink path and downlink path.

The uplink path amplifies the audio signal from MIC and converts this analog signal to digital signal and then transmits it to DBB Chip (MSM6260).

This transmitted signal is reformed to fit in GSM & WCDMA frame format and delivered to RF Chipset. The downlink path amplifies the signal from DBB chip (MSM6260) and outputs it to receiver (or speaker).

The receive path can be directed to either one of two earphone amplifiers or the auxiliary output. The outputs earphone1 (EAR1OP, EAR1ON) and auxiliary out (LINE_OP, LINE_ON) are differential outputs. Earphone2 (HPH_L, HPH_R) is a single-ended output stage designed to drive a headset speaker.

The microphone interface consists of two differential microphone inputs, one differential auxiliary input and a two-stage audio amplifier.

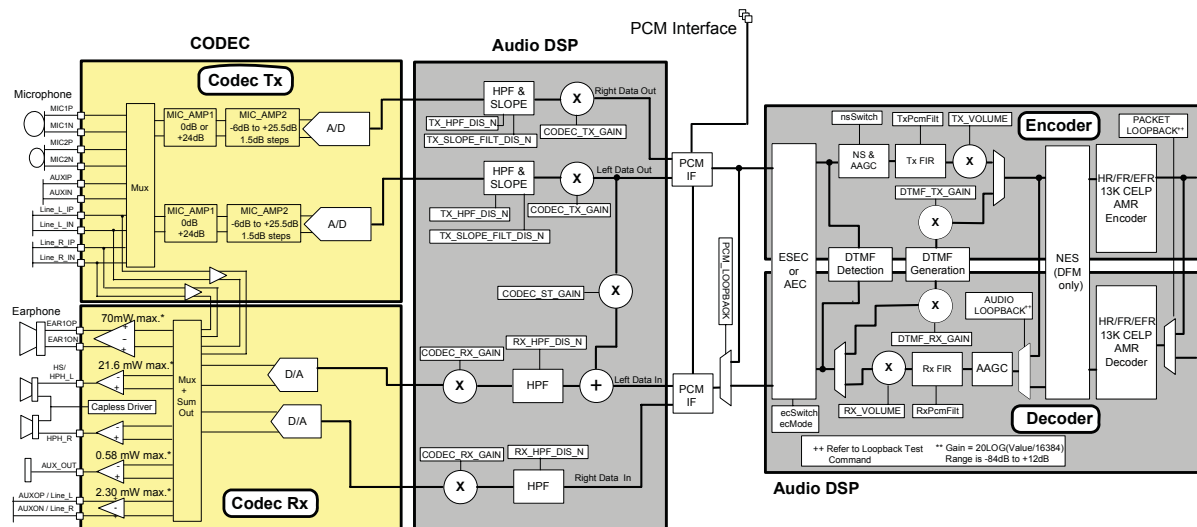


Figure. Audio Interface Detailed Diagram(MSM6260)

3. TECHNICAL BRIEF

MSM6260 Audio CODEC pins

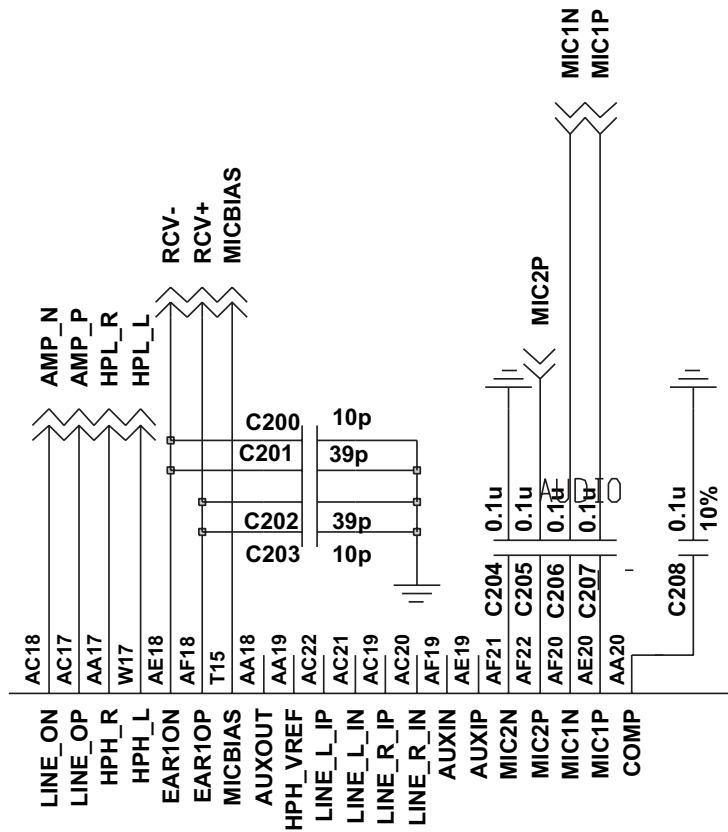
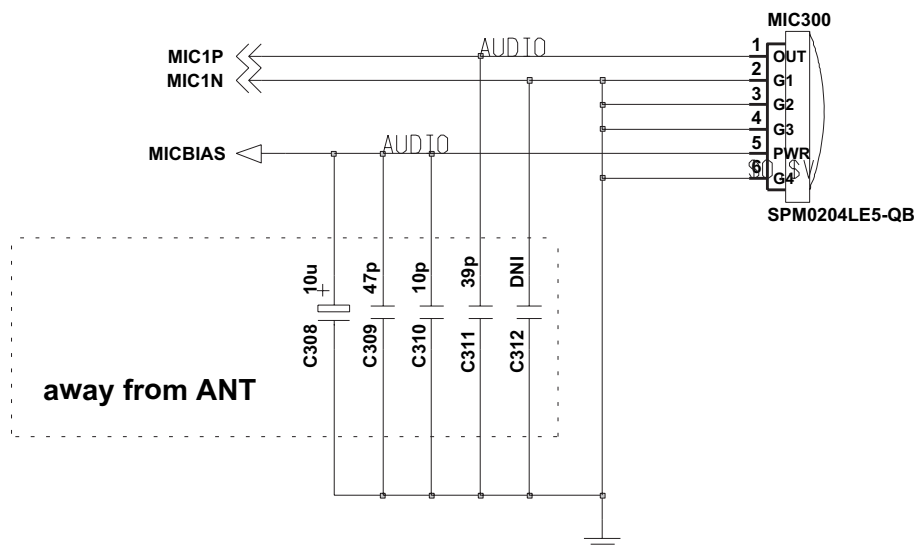


Figure . Audio part schematics

Handset main MIC

MIC



Speaker Amp

Audio AMP

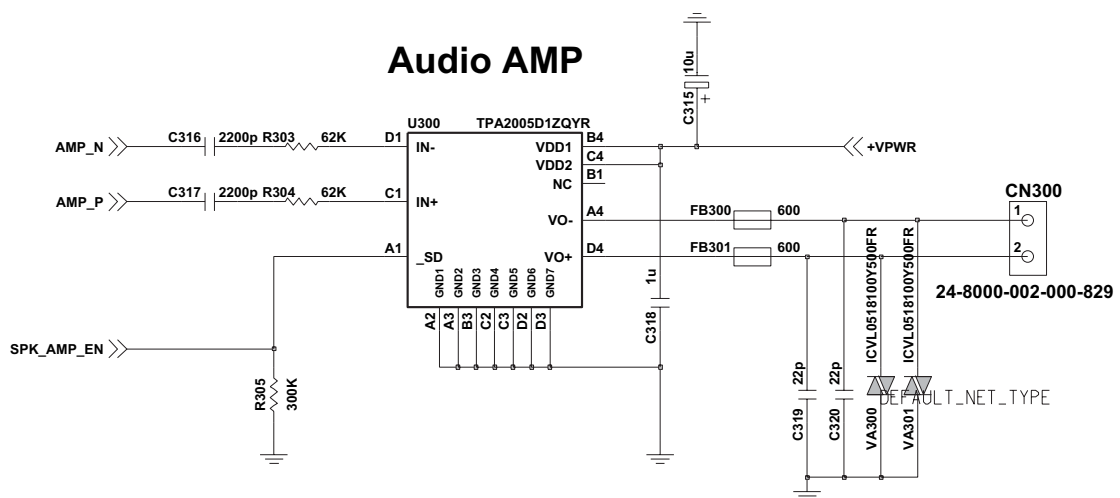


Figure . Audio part schematics

3. TECHNICAL BRIEF

Audio Schematic of MMI

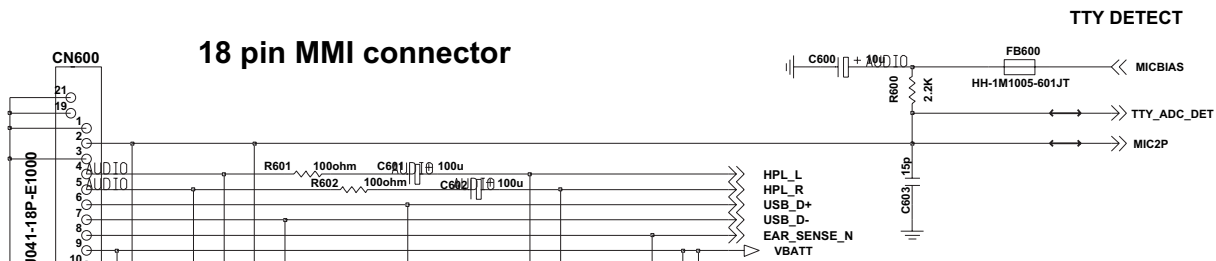


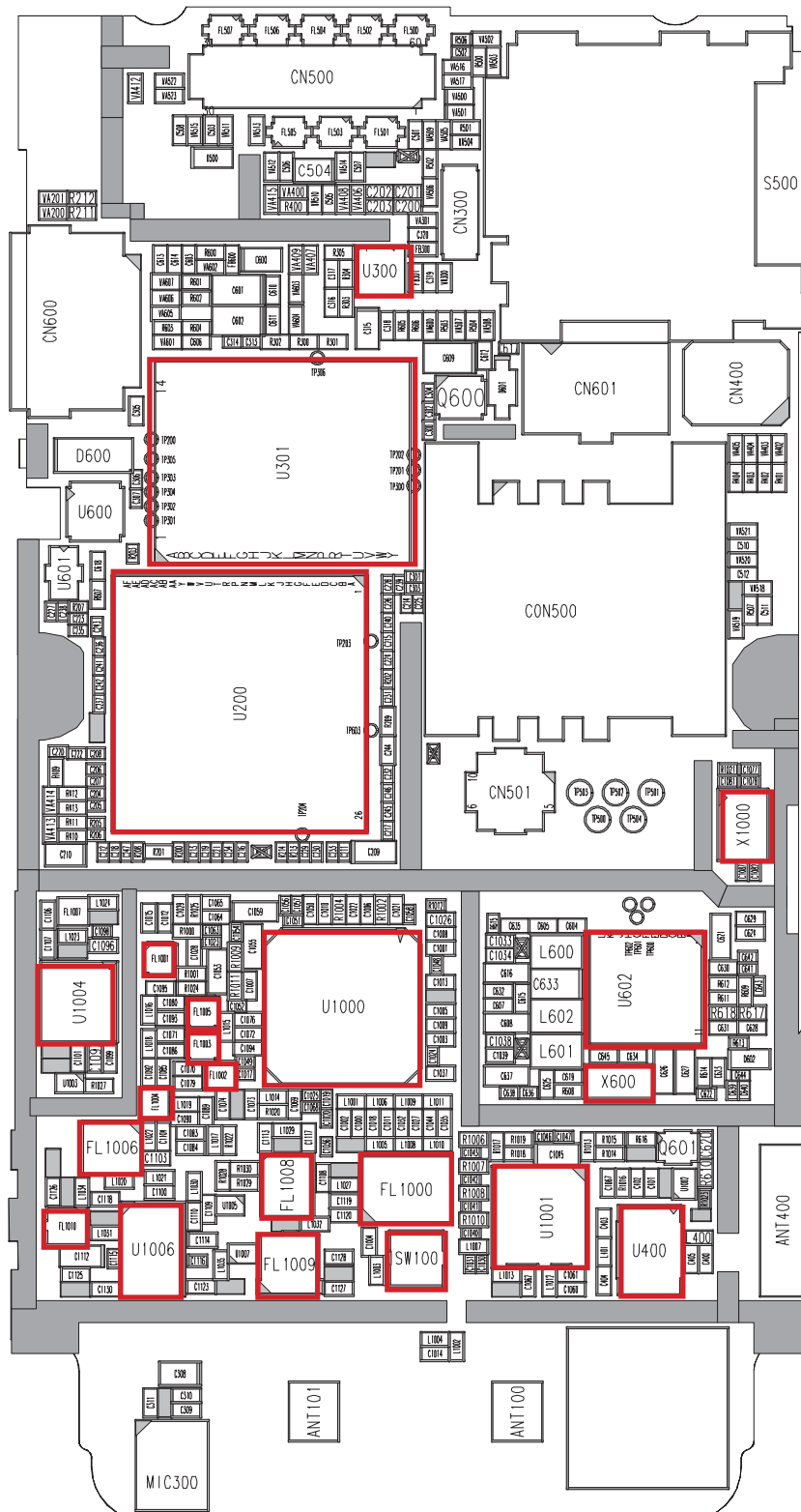
Figure . Audio part schematics

3.12 LG-KP330 Main features

- Dual Clamshell Type
- WCDMA(850, 1900, 2100) + EDGE Quad(Class10)
- Color LCD(Main:65K TFT, 2.0', Sub : MSTN)
- 1.3M Camera
- VGA Camera
- 16 phi speaker
- Stereo Headset
- Speaker phone (in GSM and WCDMA)
- MP3/AAC decoder and play
- MPEG4 encoder/decoder and play/save
- JPEG en/decoder
- Supports Bluetooth, USB
- Support Micro SD Card
- 900 mAh (Li-Ion)

4. TROUBLE SHOOTING

4.1 RF Component

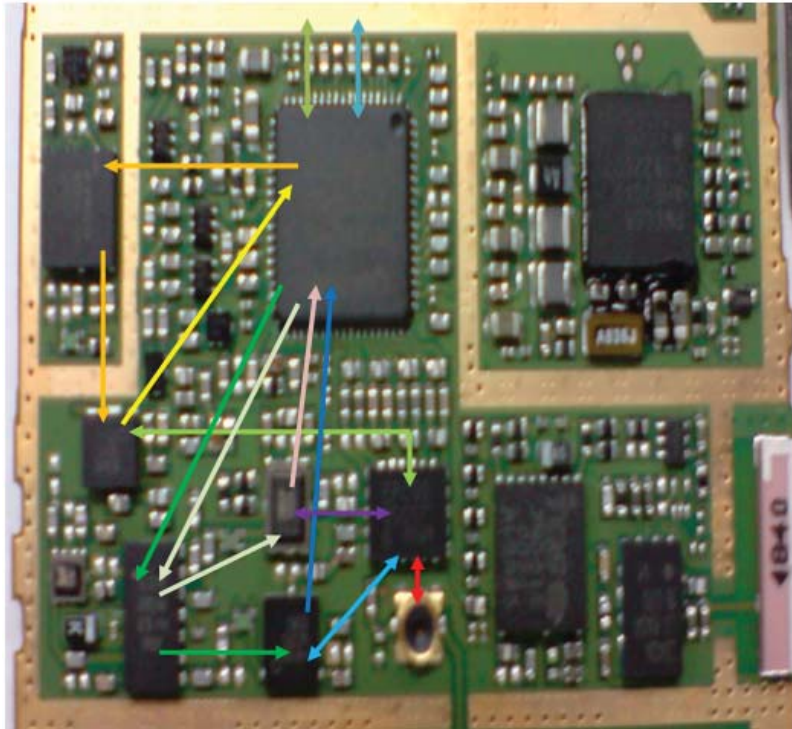


4. TROUBLE SHOOTING

Block Diagram	Ref. Name	Part Name	Function	Comment
Common	U200	MSM6260	Main Control	Main Chipset
	U301	TY9000A800KOGG40	Memory	1G/512M
	U602	PM6658	Power Control	Power Supply
	X600	CM315(12.5pF)	Sleep Clock	32.768kHz
	X1000	TG-5010LH-75A	VCTCXO	19.2MHz
	U300	TPA2005D1ZQYR	Audio Amplifier	Amplifier
	SW100	MM8130-2600	Test Connector	Calibration etc.
	FL1000	D5017	Switch	Band Select
	U1000	RTR6285	RF Transceiver	TRX
	U400	LBRQ-2B43A	Bluetooth RF Module	TRX
UMTS	U1004	ACPM-7381	UMTS 2100 PA	TX
	U1006	AWT6321R	UMTS 1900/ 850 Dual PA	TX
	U1003	LDC151G8820Q-359	UMTS 2100 TX Coupler	TX
	U1005	LDC15836M20Q-360	UMTS 850 TX Coupler	TX
	U1007	LDC151G8820Q-359	UMTS 1900 TX Coupler	TX
	FL1001	UPG2214TK	UMTS 2100/1900 TX SPDT	TX
	FL1002	SAFEB2G14FB0F00	UMTS 2100 RX SAW Filter	RX
	FL1003	UPG2214TK	UMTS 2100 SPDT	RX
	FL1004	SAFEB1G96FL0F00	UMTS 1900 RX SAW Filter	RX
	FL1005	UPG2214TK	UMTS 1900 SPDT	RX
GSM	FL1006	ACMD-7602	UMTS 2100 Duplexer	TRX
	FL1007	SAFEB1G95KA0F00	UMTS 2100 TX SAW Filter	TX
	FL1008	B7683	UMTS 850 Duplexer	TRX
	FL1009	ACMD-7403	UMTS 1900 Duplexer	TRX
	FL1010	B9314	UMTS 1900/850 Dual TX SAW Filter	TX
	U1001	TQM7M5012	GSM Dual PA	TX

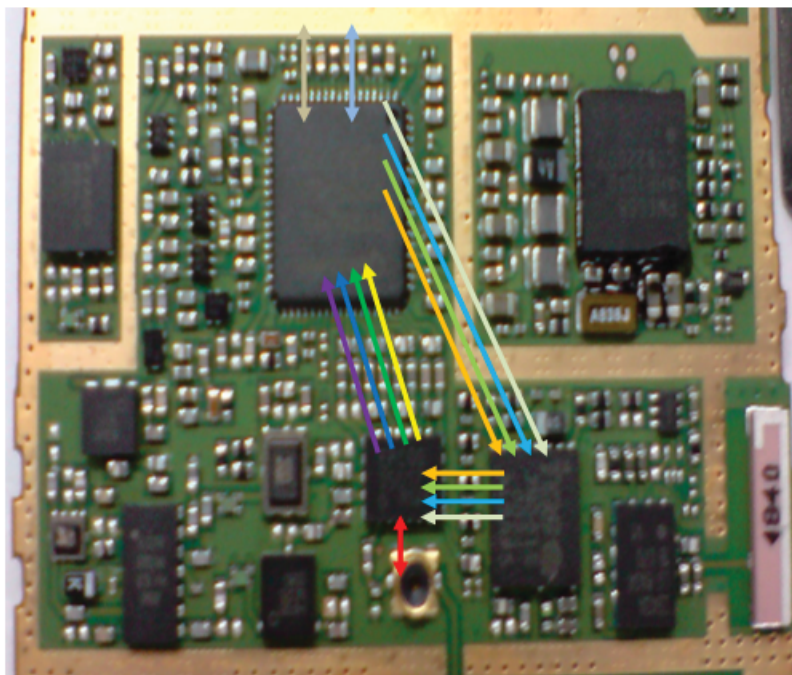
4. TROUBLE SHOOTING

4.1.1 SIGNAL PATH_UMTS RF



	COMMON TX/RX ^①
	UMTS 2100 TX ^②
	UMTS 2100 TX/RX ^③
	UMTS 2100 RX ^④
	UMTS 1900 TX ^⑤
	UMTS 1900 TX/RX ^⑥
	UMTS 1900 Rx ^⑦
	UMTS 850 TX ^⑧
	UMTS 850 TX/RX ^⑨
	UMTS 850 RX ^⑩
	TX_I/Q ^⑪
	RX_I/Q ^⑫

4.1.2 SIGNAL PATH_GSM RF



	COMMON TX/RX ^①
	GSM 850 TX ^②
	GSM 850 RX ^③
	GSM 900 TX ^④
	GSM 900 RX ^⑤
	GSM 1800 TX ^⑥
	GSM 1800 Rx ^⑦
	GSM 1900 TX ^⑧
	GSM 1900 RX ^⑨
	TX_I/Q ^⑪
	RX_I/Q ^⑫

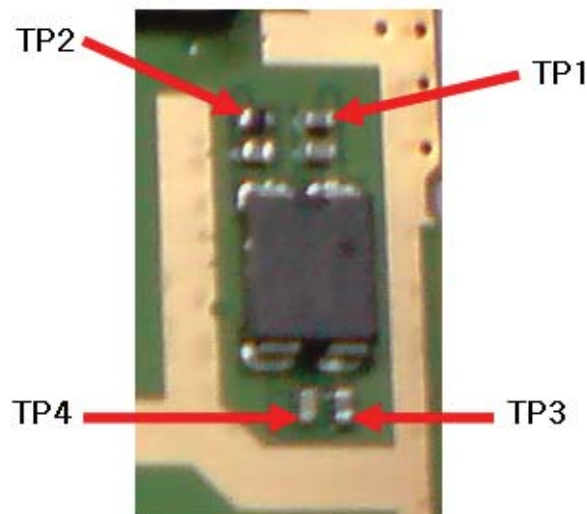
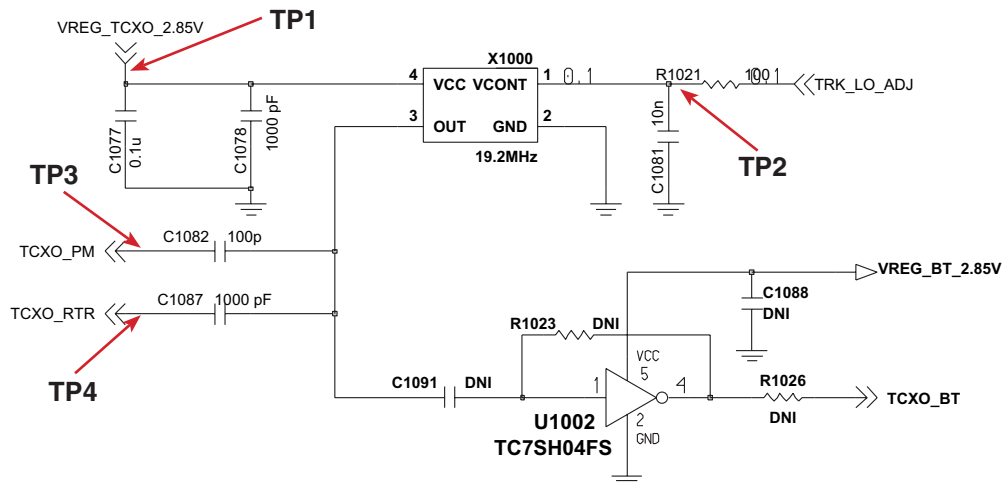
4. TROUBLE SHOOTING

4.2 Checking TCXO Block

The reference frequency (19.2MHz) from X1000 (TCXO) is used in UMTS TX part, GSM part and BB part.

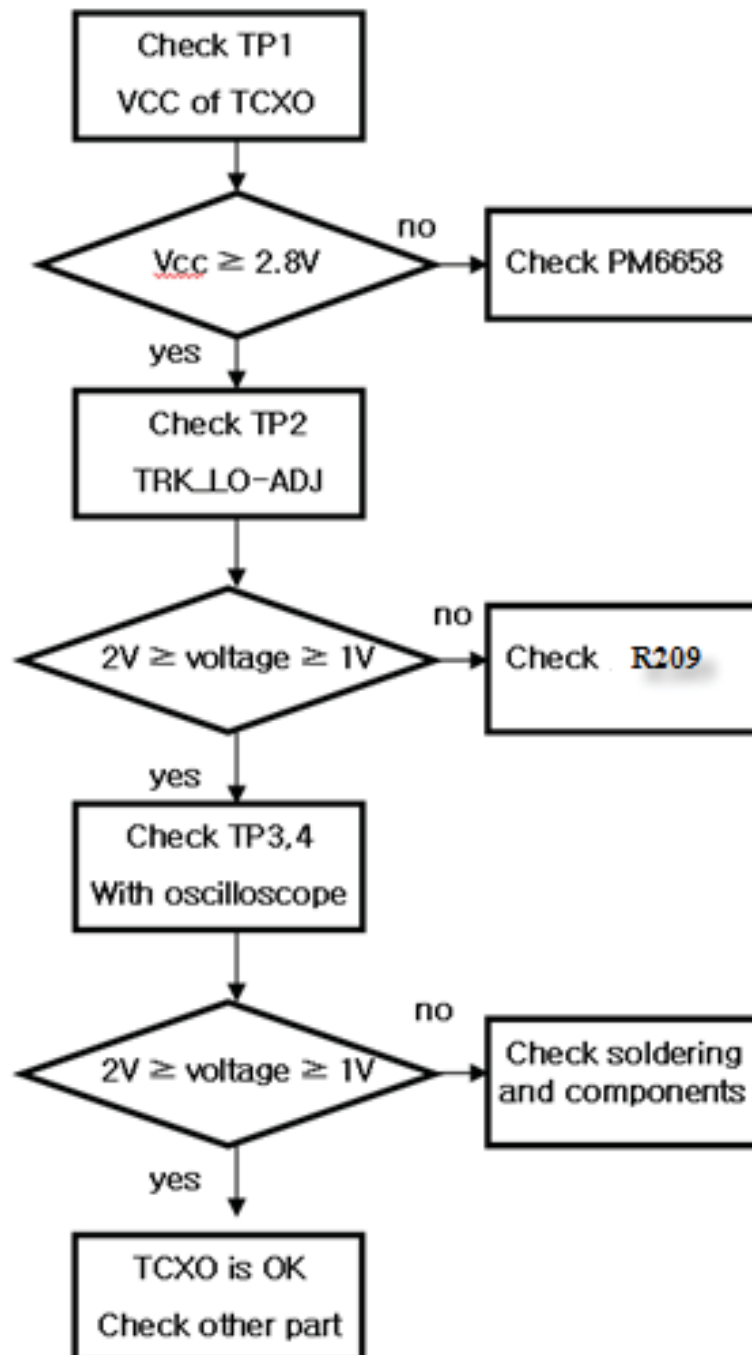
Check 1. Crystal part

If you already check this crystal part, you can skip check 1.



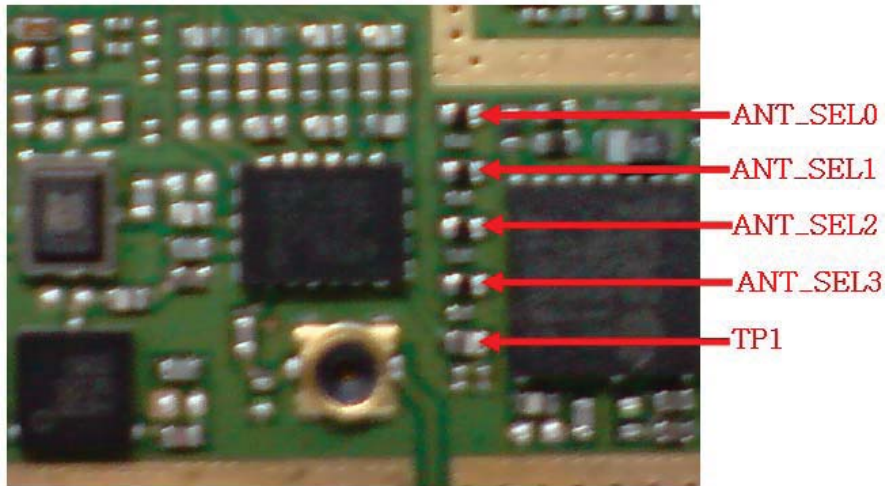
Test Point (Crystal Part)

Checking TCXO Voltage

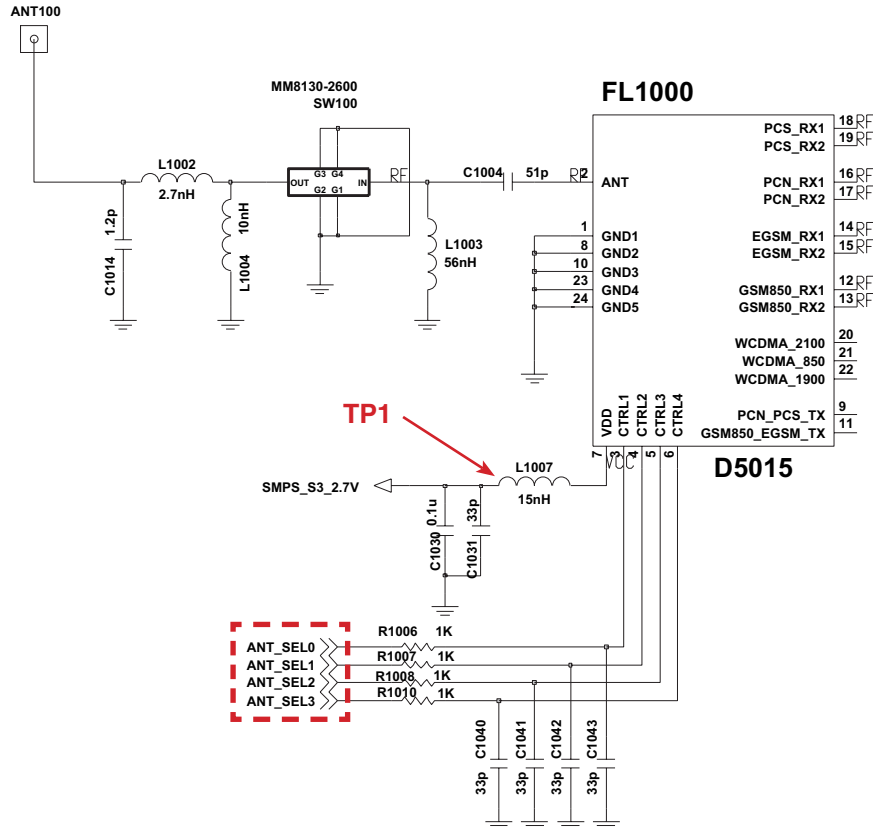


4. TROUBLE SHOOTING

4.3 Checking Ant. SW Module Block



Antenna Switch Block (Bottom)



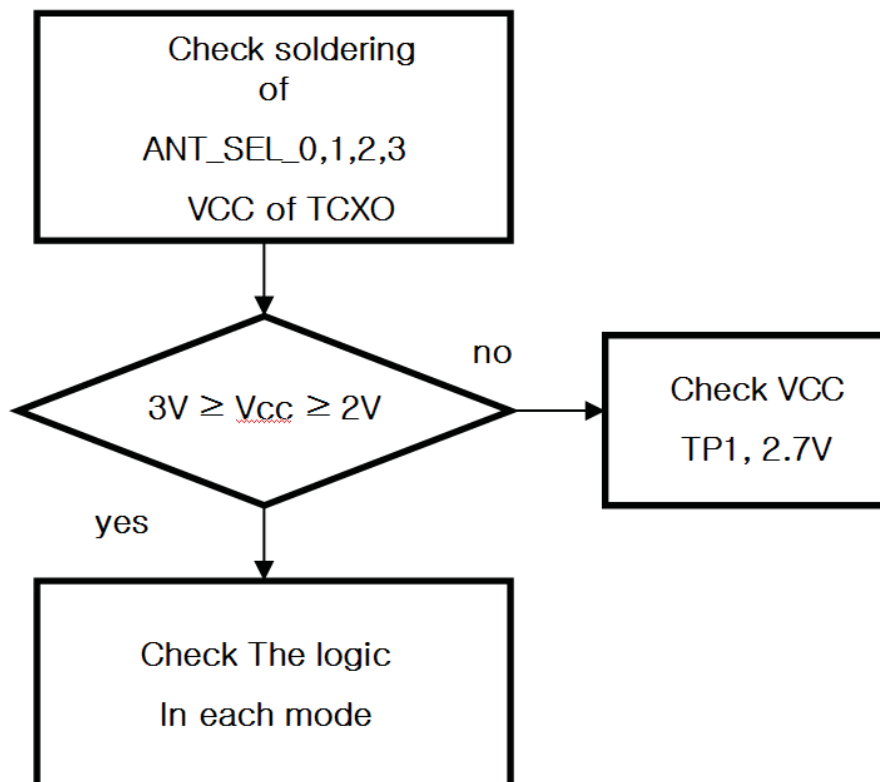
Schematic of the Antenna Switch Block

ANTENNA SWITCH MODULE LOGIC

	ANT_SEL0	ANT_SEL1	ANT_SEL2	ANT_SEL3
GSM850/EGSM TX	HIGH	HIGH	LOW	LOW
PCN/PCS TX	HIGH	LOW	LOW	LOW
WB850	LOW	HIGH	LOW	HIGH
WB 1900	LOW	LOW	LOW	HIGH
WB 2100	LOW	LOW	HIGH	HIGH
GSM850 RX	LOW	HIGH	HIGH	LOW
EGSM RX	LOW	LOW	HIGH	LOW
PCN RX	LOW	HIGH	LOW	LOW
PCS RX	LOW	LOW	LOW	LOW

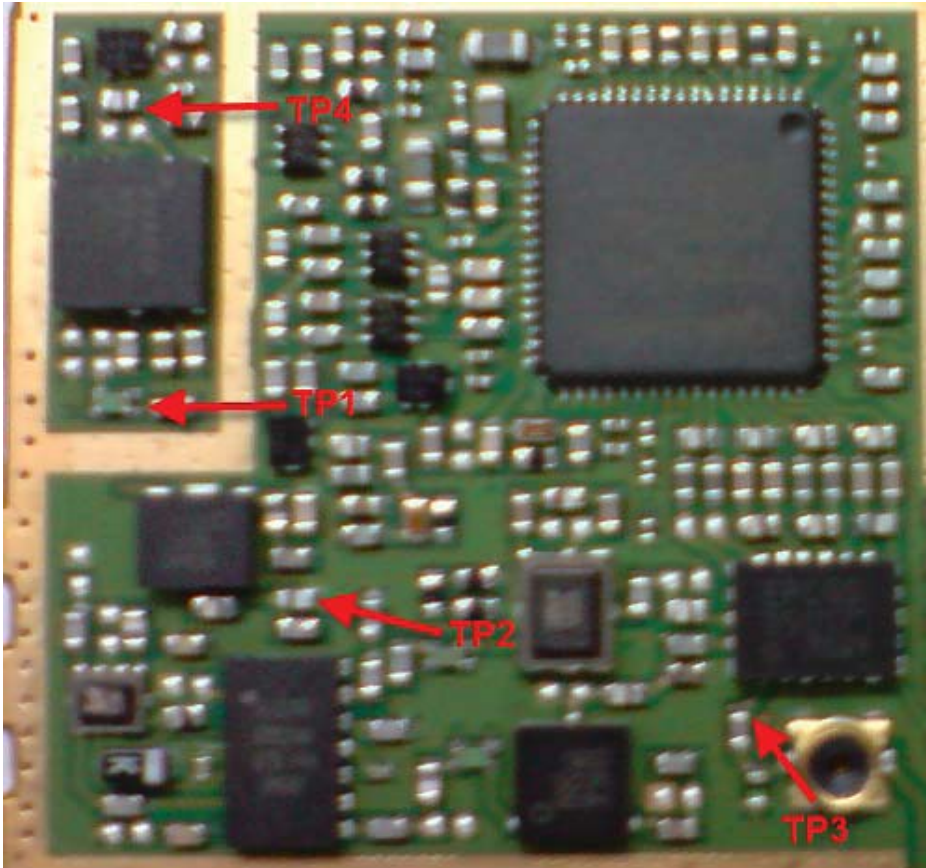
Logic Table of the Antenna Switch

Checking Switch Block power source



4. TROUBLE SHOOTING

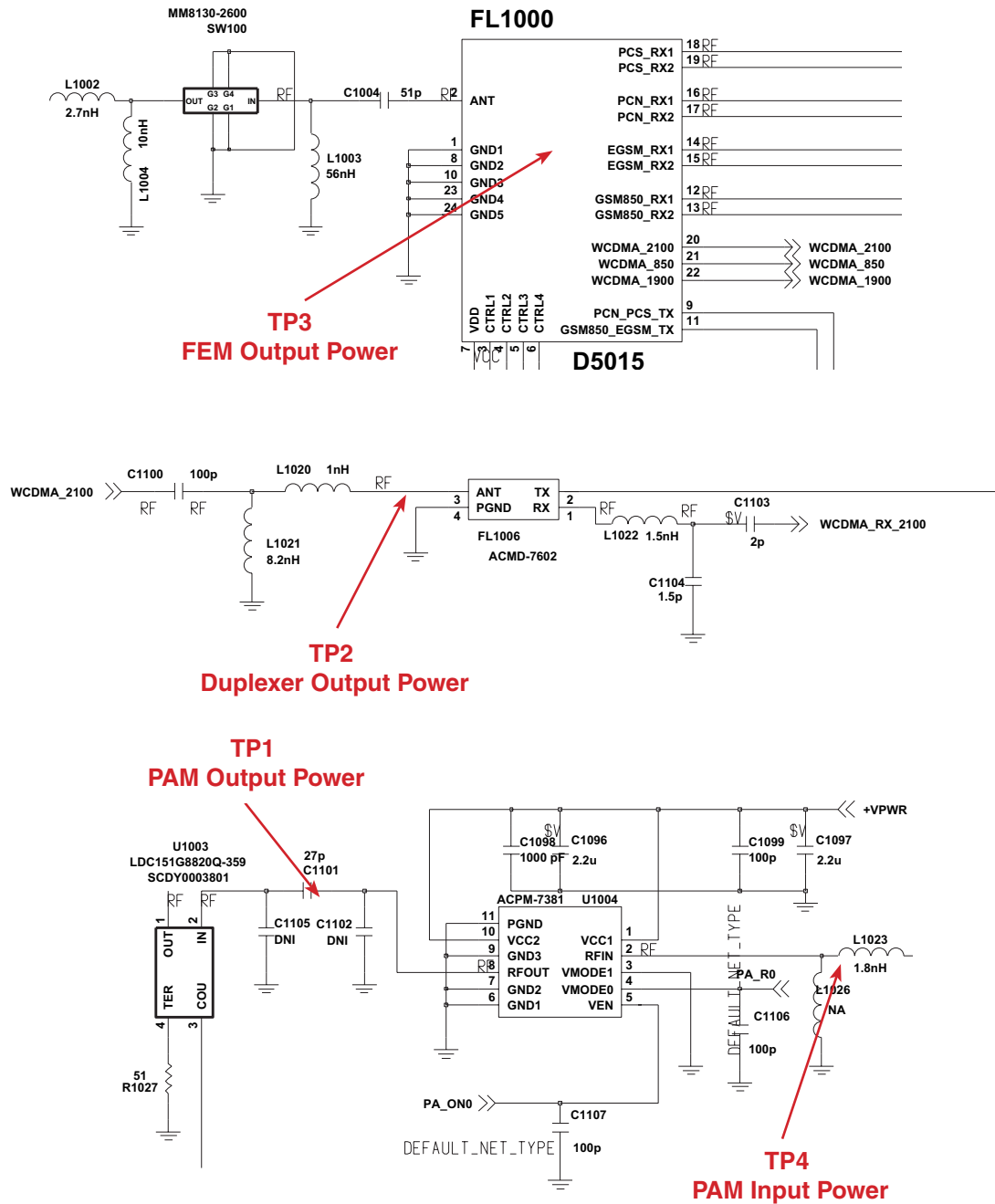
4.4 Checking TX POWER of UMTS 2100MHz



Test Point (RF TX POWER of UMTS 2100)

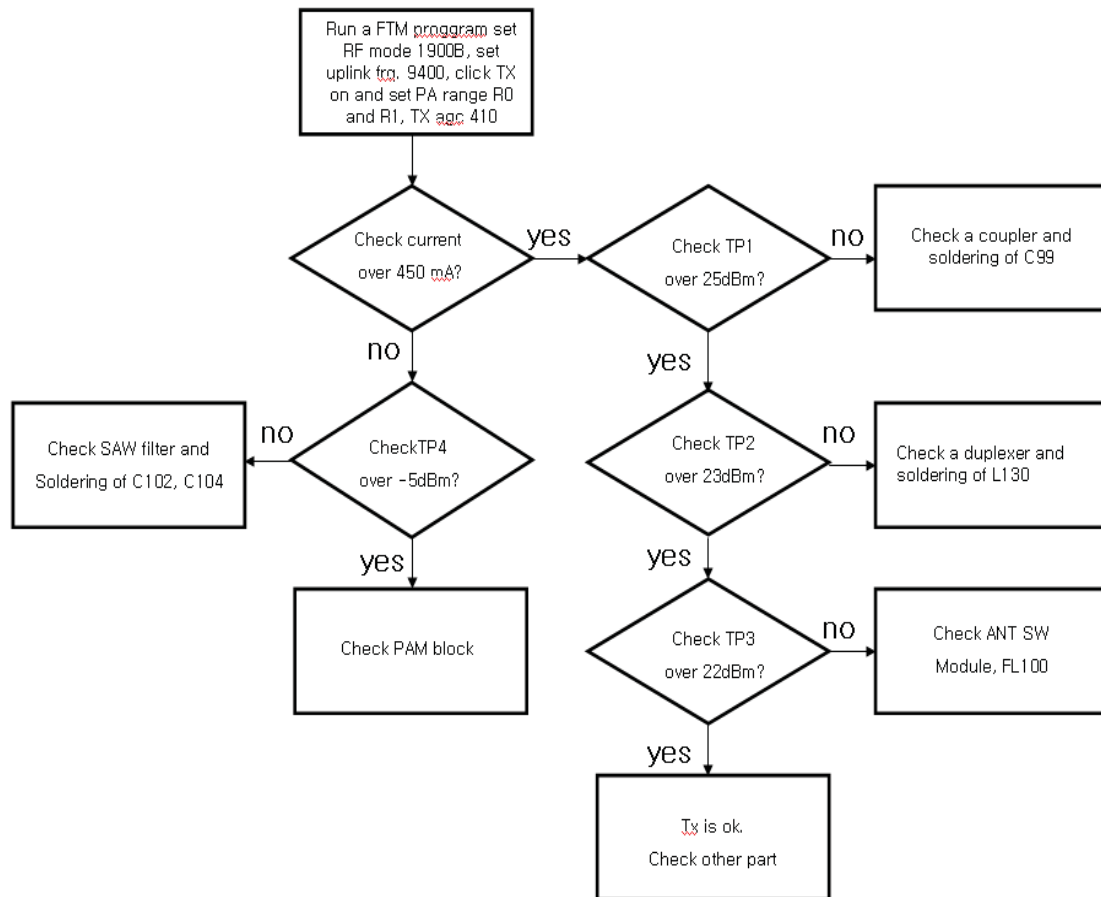
For testing, Max power of UMTS 2100MHz is needed.

4. TROUBLE SHOOTING

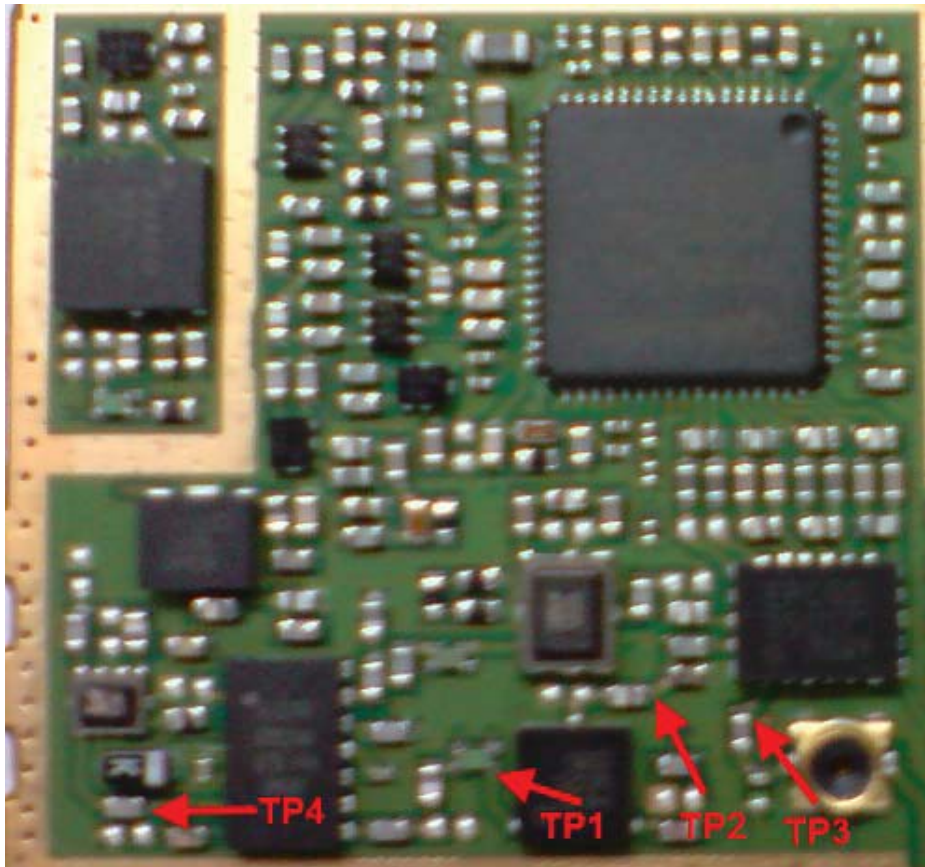


Schematic of the Antenna Switch Block

4. TROUBLE SHOOTING



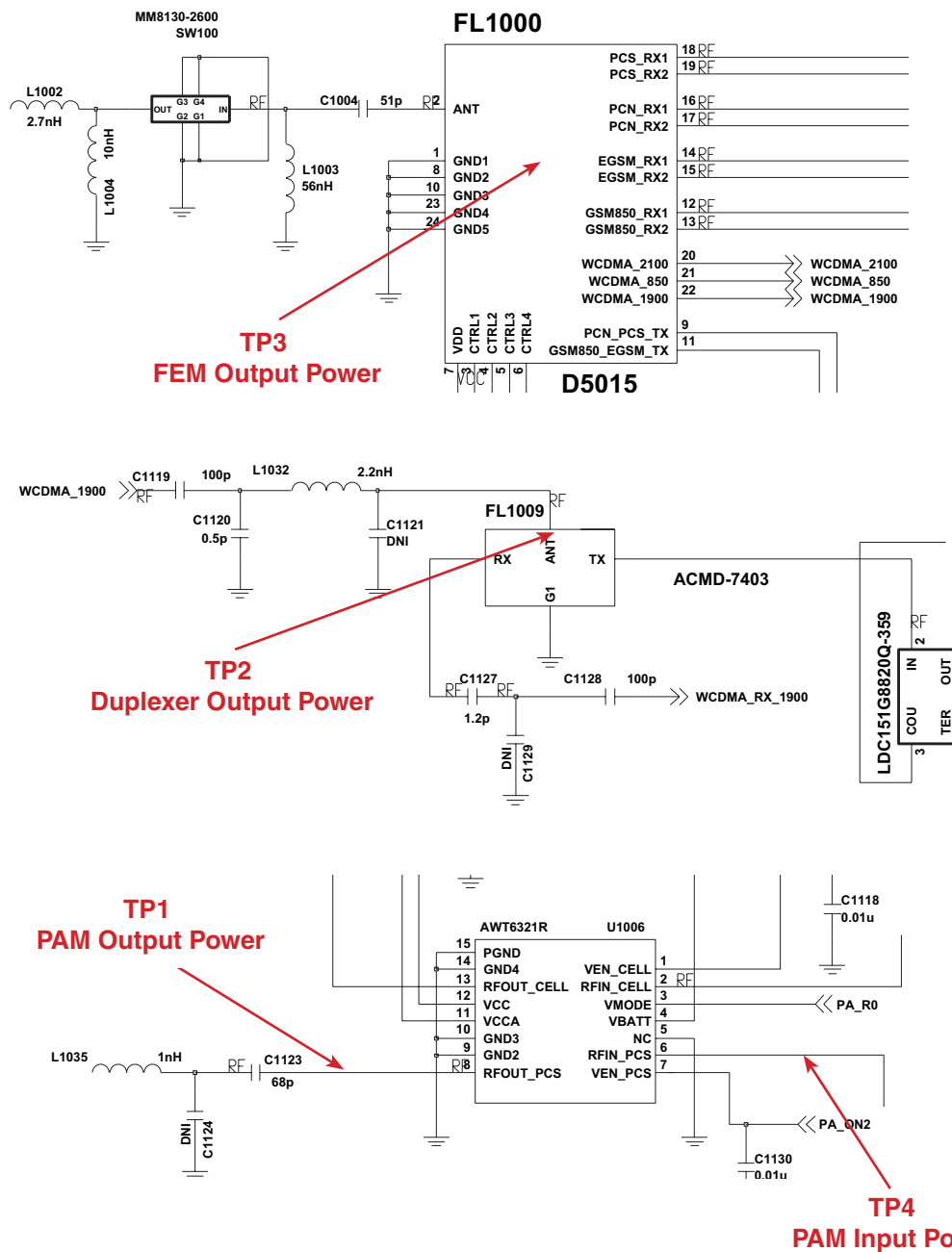
4.5 Checking TX POWER of UMTS 1900MHz



Test Point (RF TX POWER of UMTS 1900)

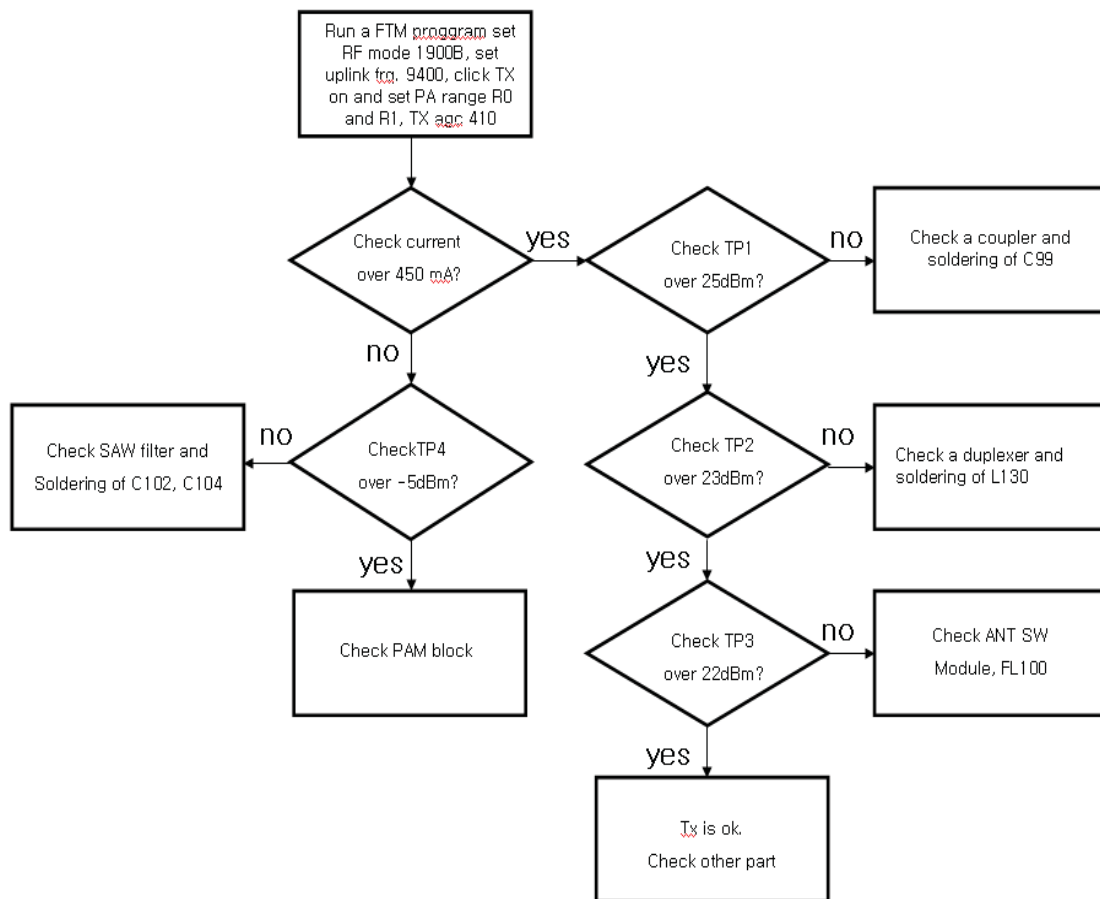
For testing, Max power of UMTS 1900MHz is needed.

4. TROUBLE SHOOTING



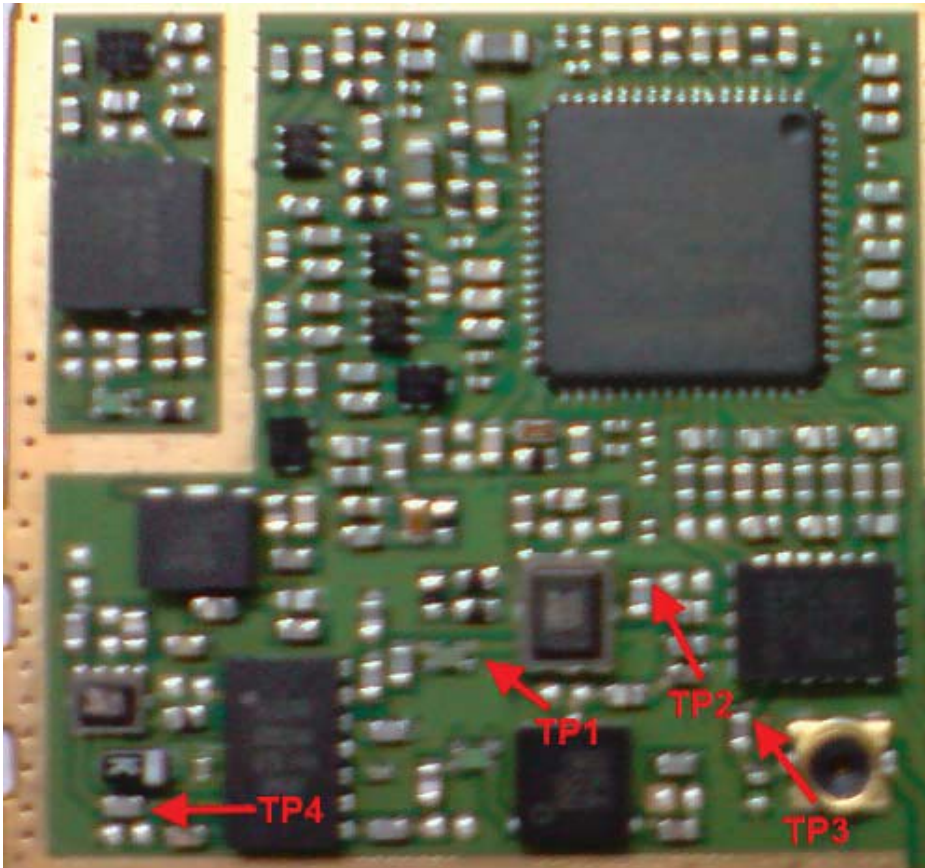
Schematic of the Antenna Switch Block

4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

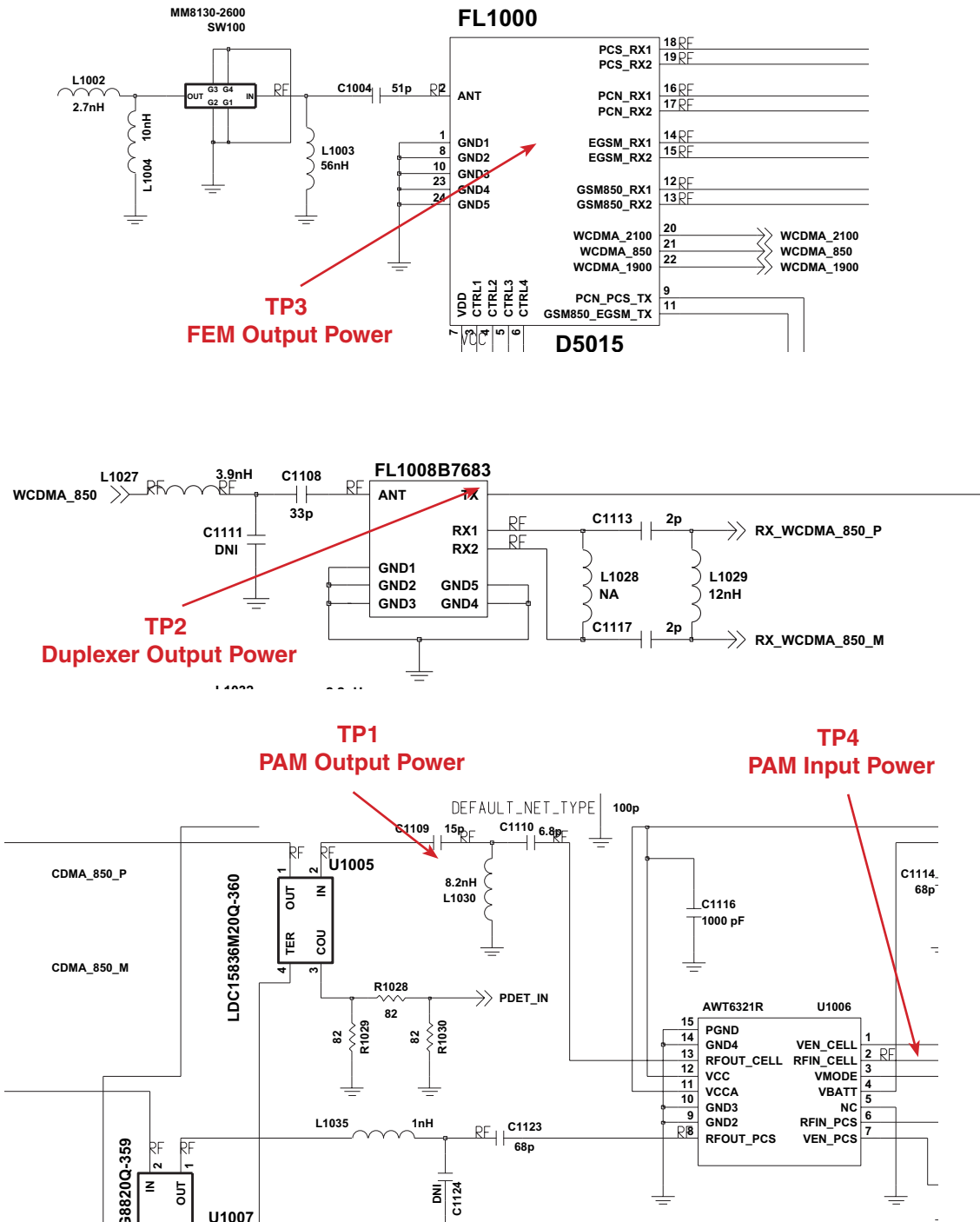
4.6 Checking TX POWER of UMTS 850MHz



Test Point (RF TX POWER of UMTS 850)

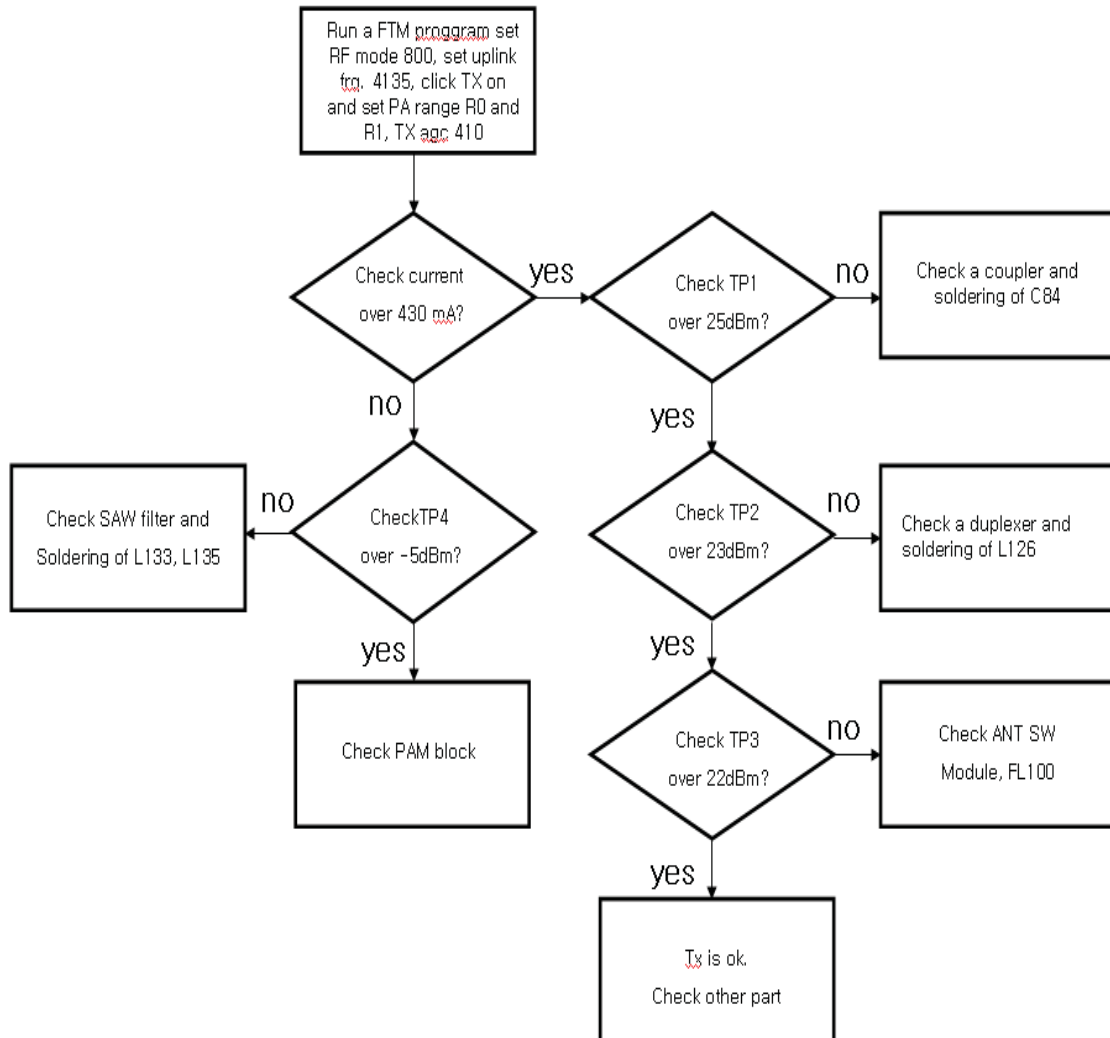
For testing, Max power of UMT 850MHz is needed.

4. TROUBLE SHOOTING



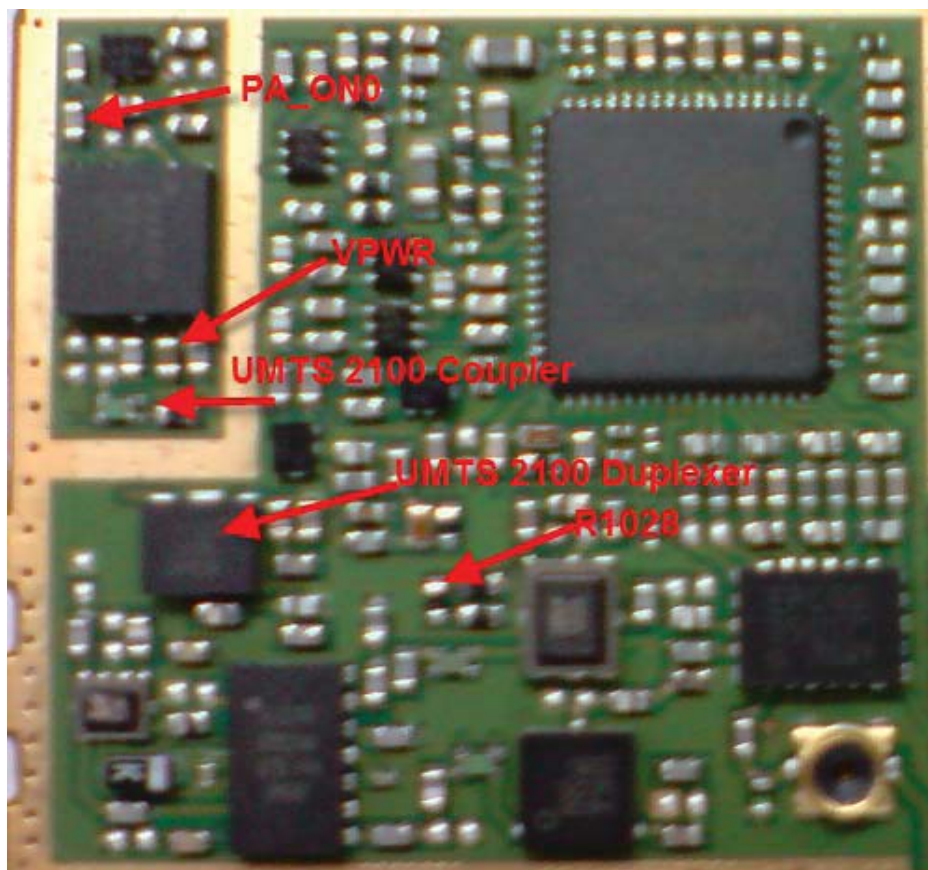
Schematic of the Antenna Switch Block

4. TROUBLE SHOOTING



4.7 Checking UMTS 2100 PAM Control Block

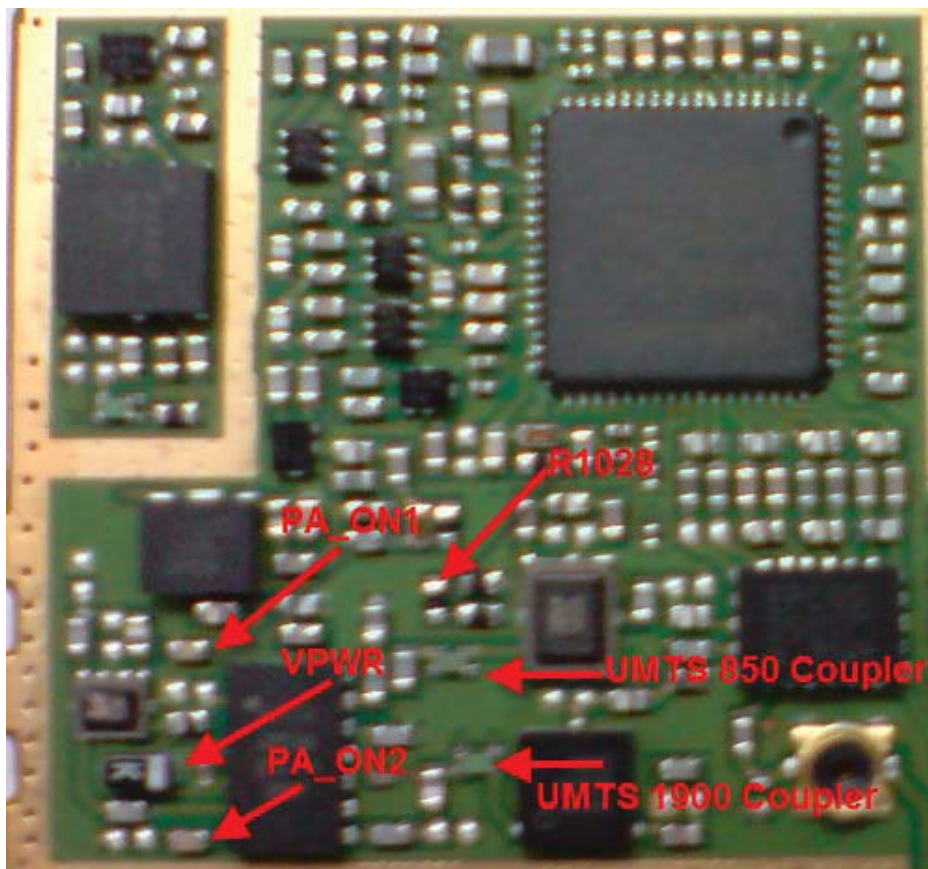
- PAM control signal
 1. PWR_DET : UMTS 2100 Tx Power Detected value (Check R1028)
 2. PAM_ON0 : UMTS 2100 PAM enable (about 2.85V)
 3. PA_R0 : Mode Control Voltage for UMTS 2100
 4. VPWR : UMTS 2100 PAM Main Voltage ($3V < +VPWR < 4.2V$)



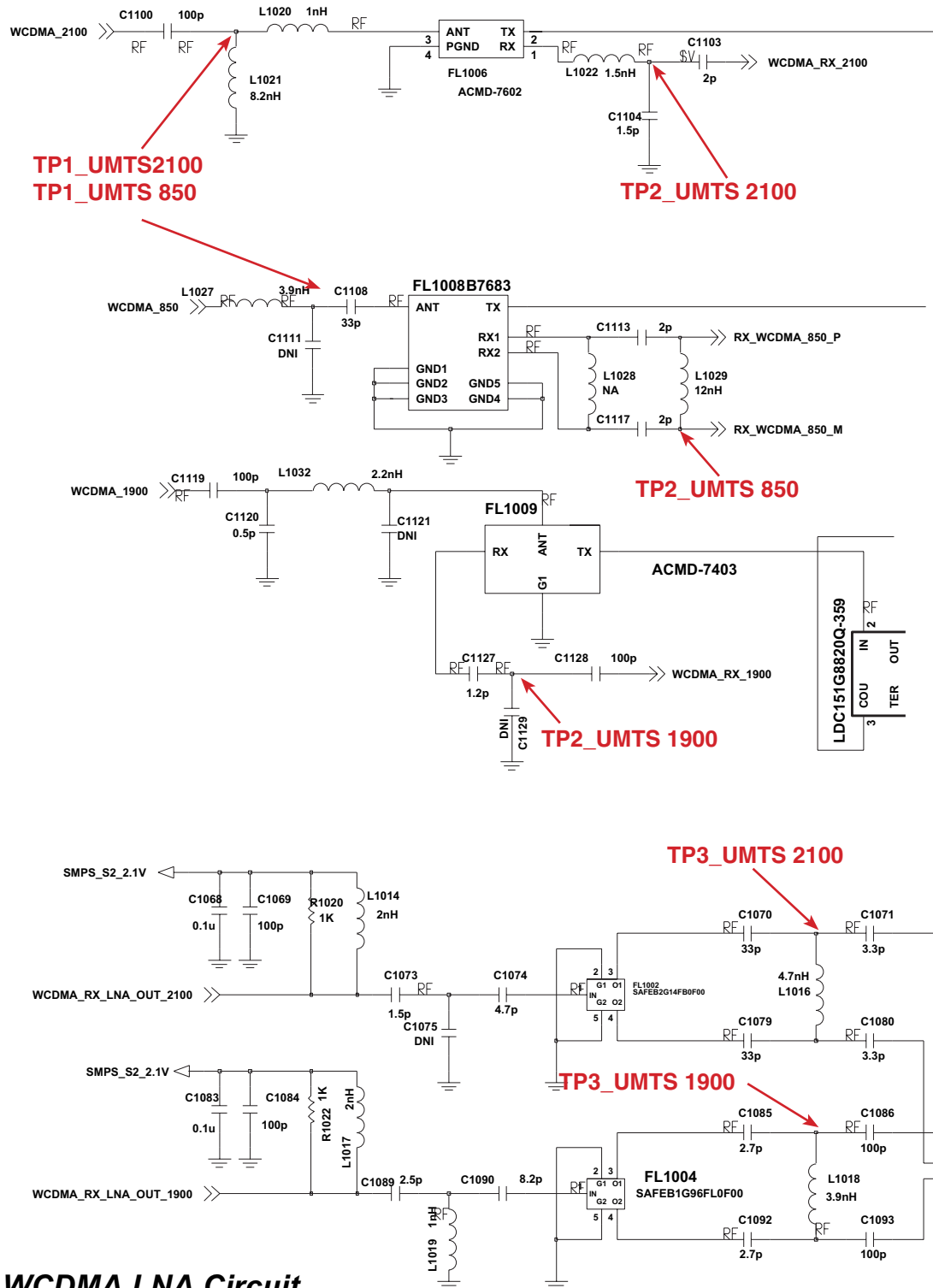
4. TROUBLE SHOOTING

4.8 Checking UMTS 1900/850 Dual PAM Control Block

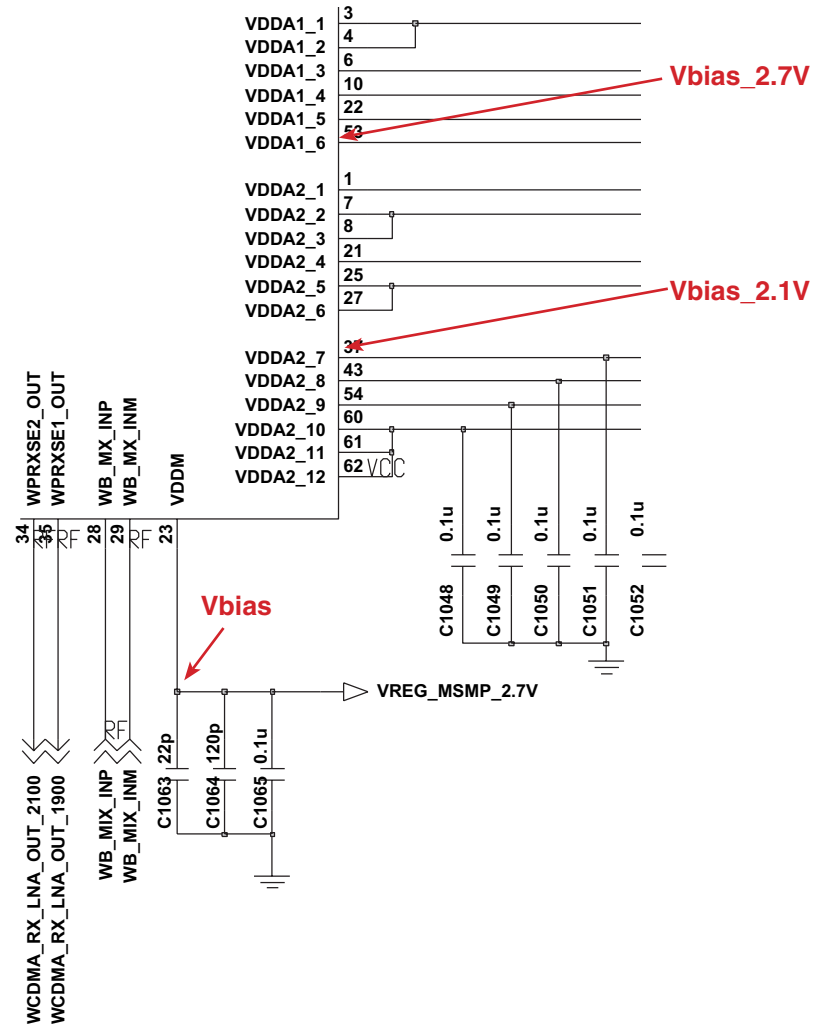
- PAM control signal
 1. PWR_DET : UMTS 1900/850 Tx Power Detected value (Check R1028)
 2. PA_R0 : Mode Control Voltage for UMTS 1900/850
 3. PAM_ON1 : UMTS 850 PAM enable (about 2.85V)
 4. PAM_ON2 : UMTS 1900 PAM enable (About 2.85V)
 5. VPWR : UMTS 1900/850 PAM Main Voltage ($3V < +VPWR < 4.2V$)

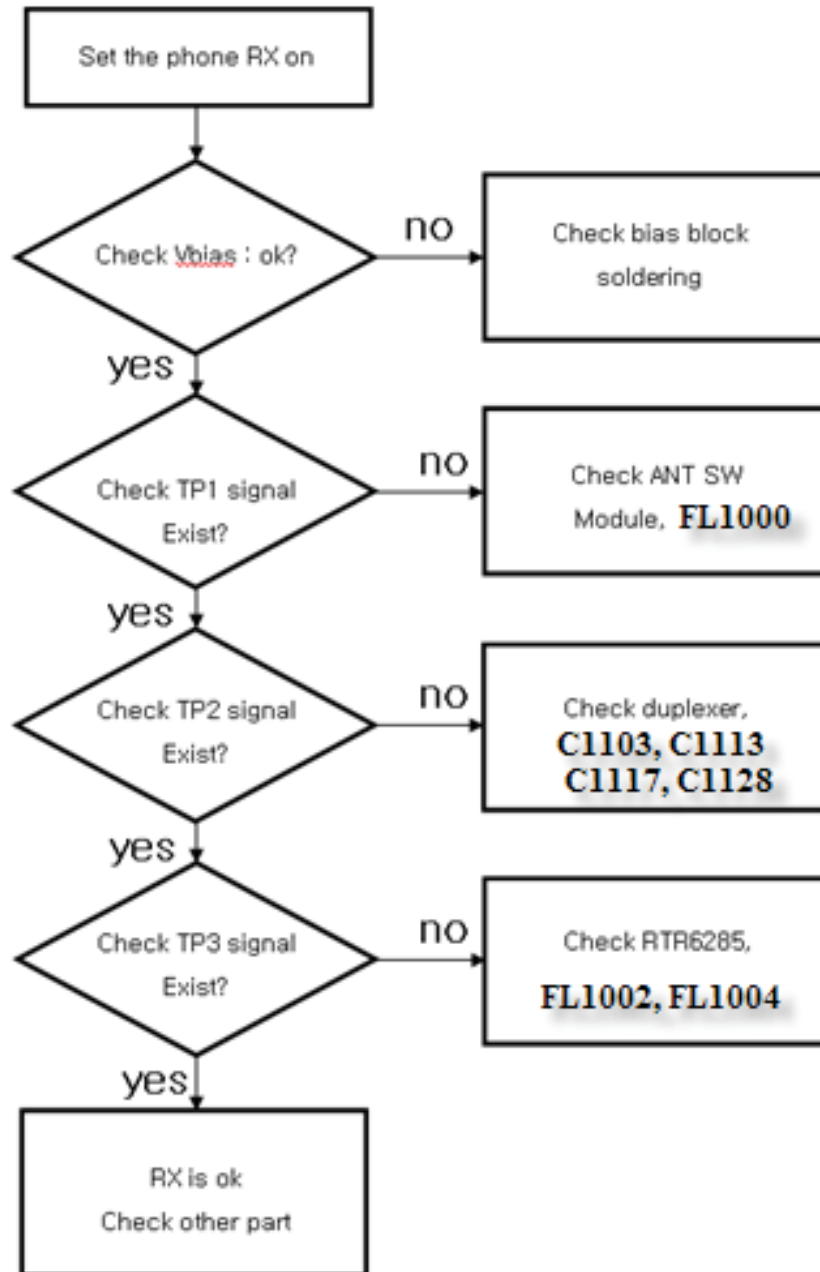


4.9 Checking UMTS 2100/1900/850 Rx Level



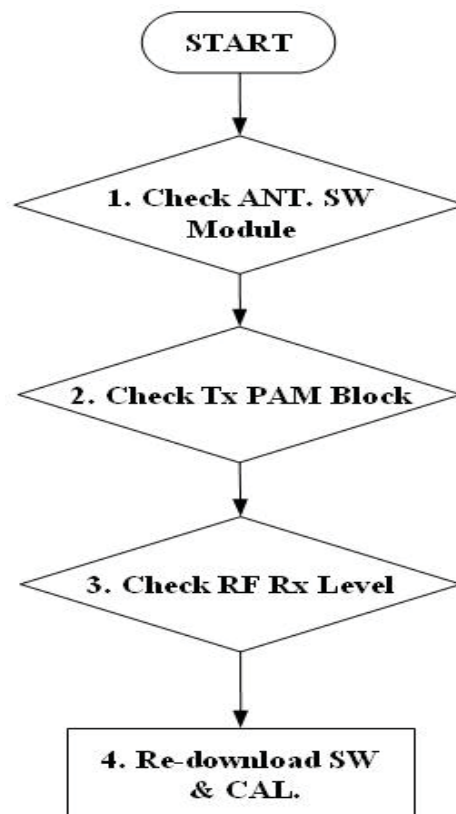
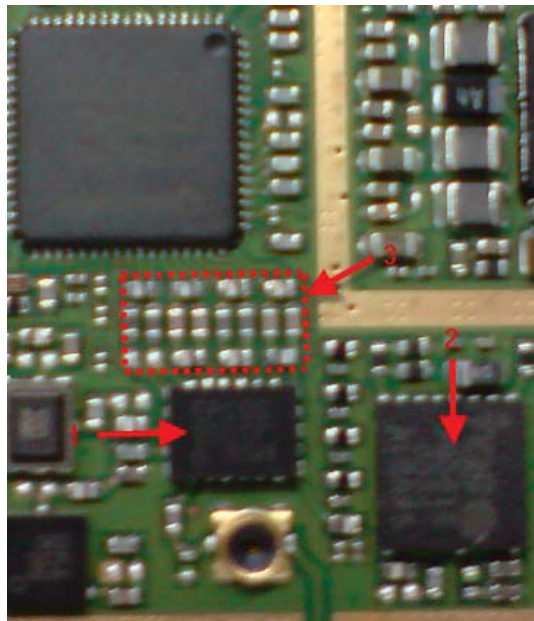
4. TROUBLE SHOOTING





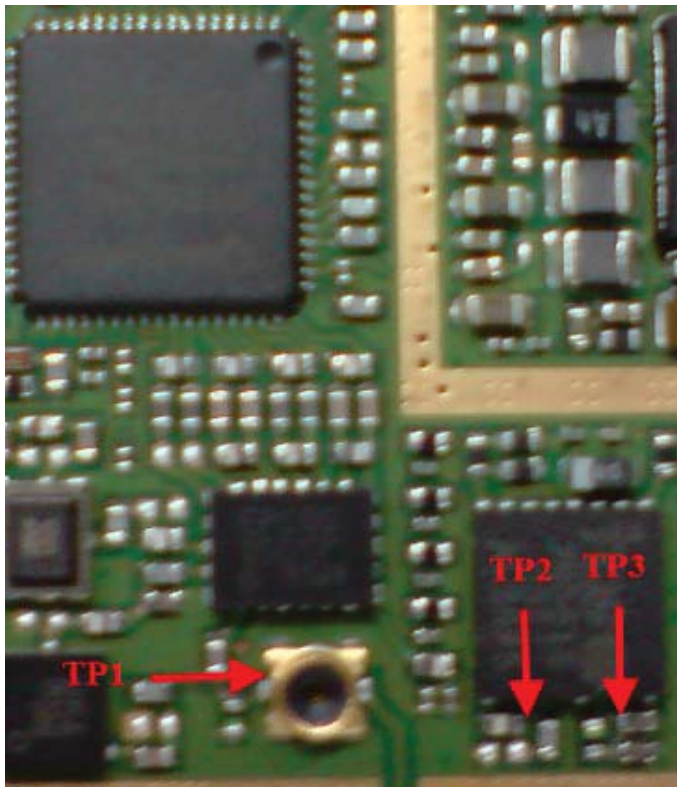
4. TROUBLE SHOOTING

4.10 Checking GSM Block

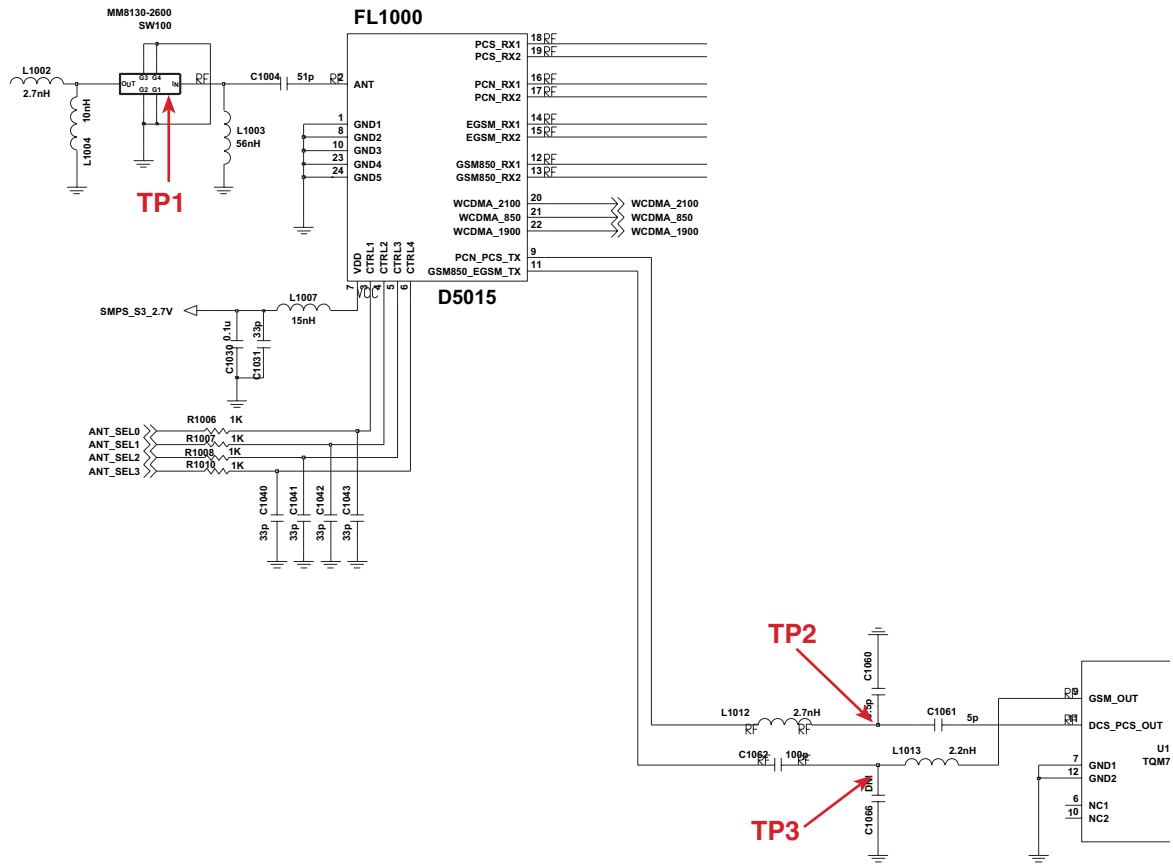


4.11 Checking Ant. SW Module

Refer to chapter 2.3

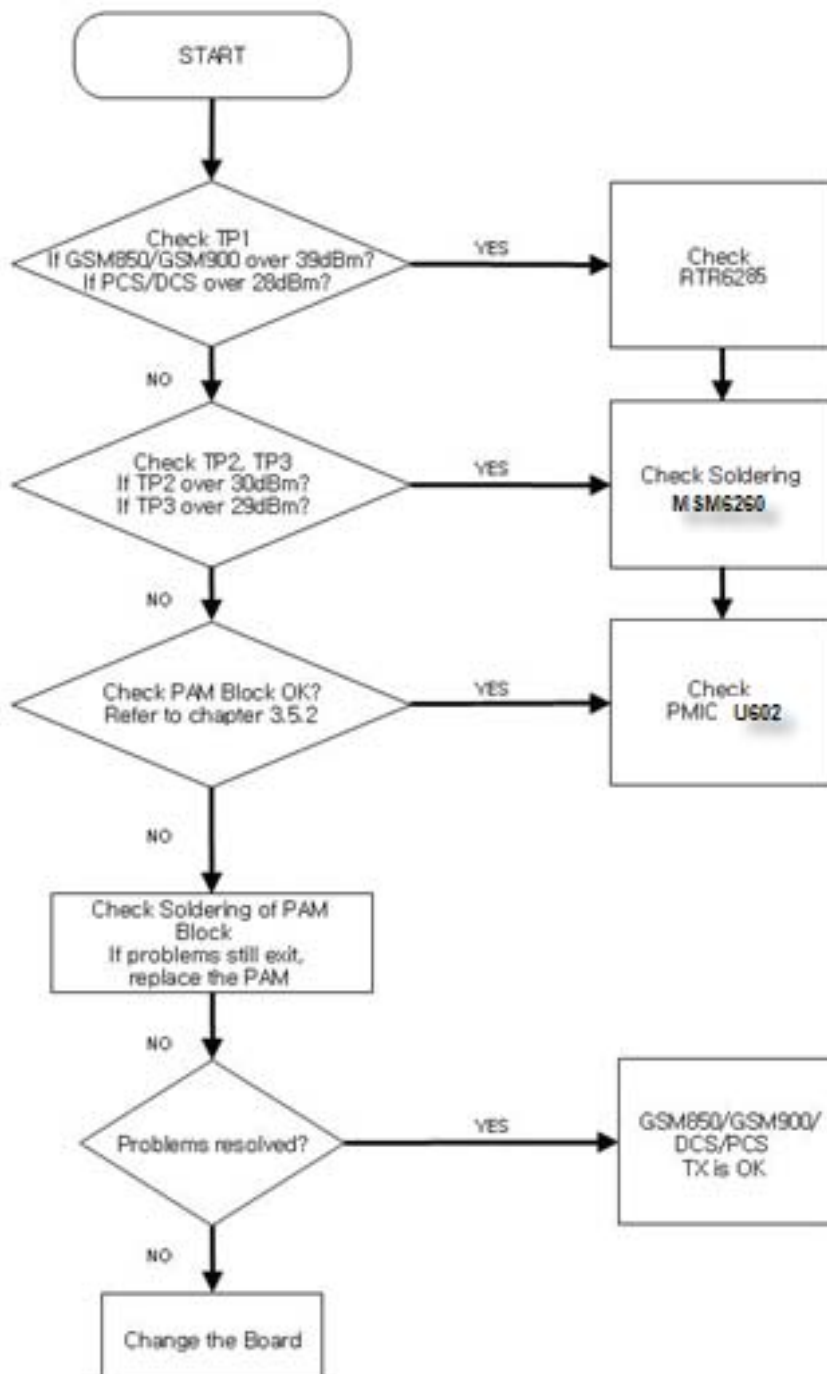


4. TROUBLE SHOOTING



Schematic of GSM Tx level

Checking GSM Tx level

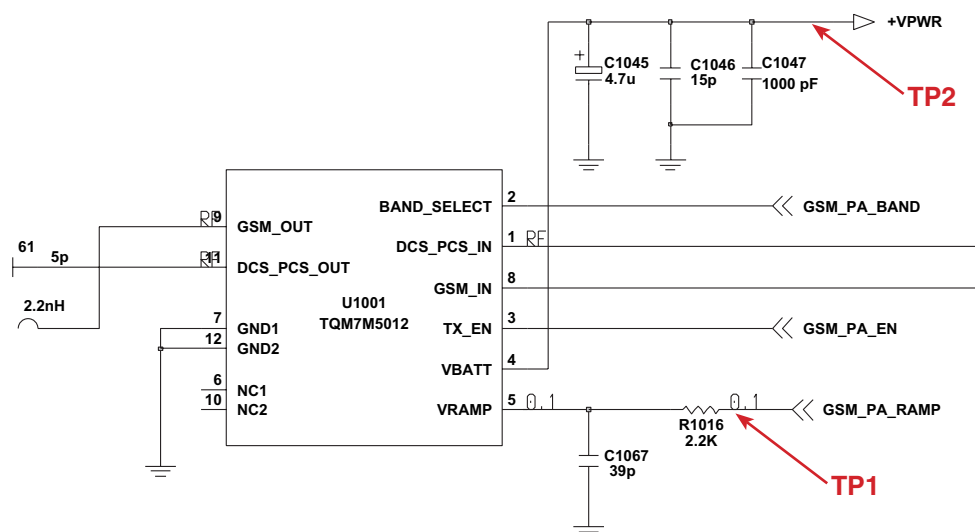
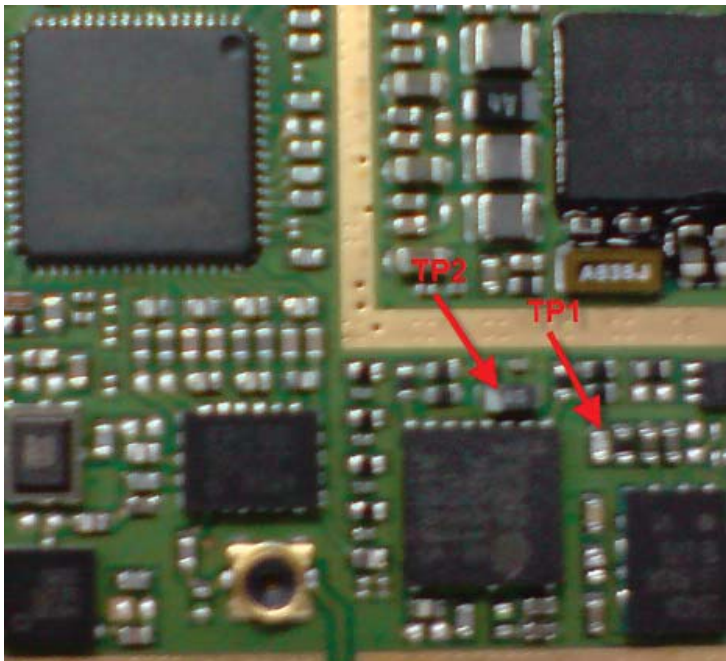


4. TROUBLE SHOOTING

4.12 Checking PAM Block

TP1. GSM_PA_RAMP : Power Amp Gain Control. typically, $0.2V < V_{ramp} < 1.6V$

TP2. +VPWR : PAM Supply Voltage Vcc higher than 3.0V



Schematic of GSM PAM Block

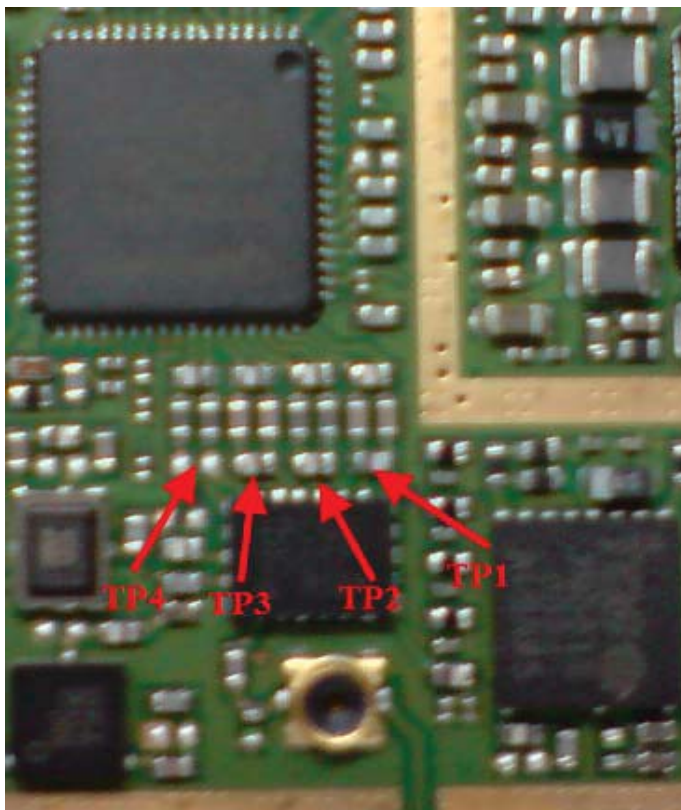
4.13 Checking GSM Rx Block

TP1. GSM850 Rx Input

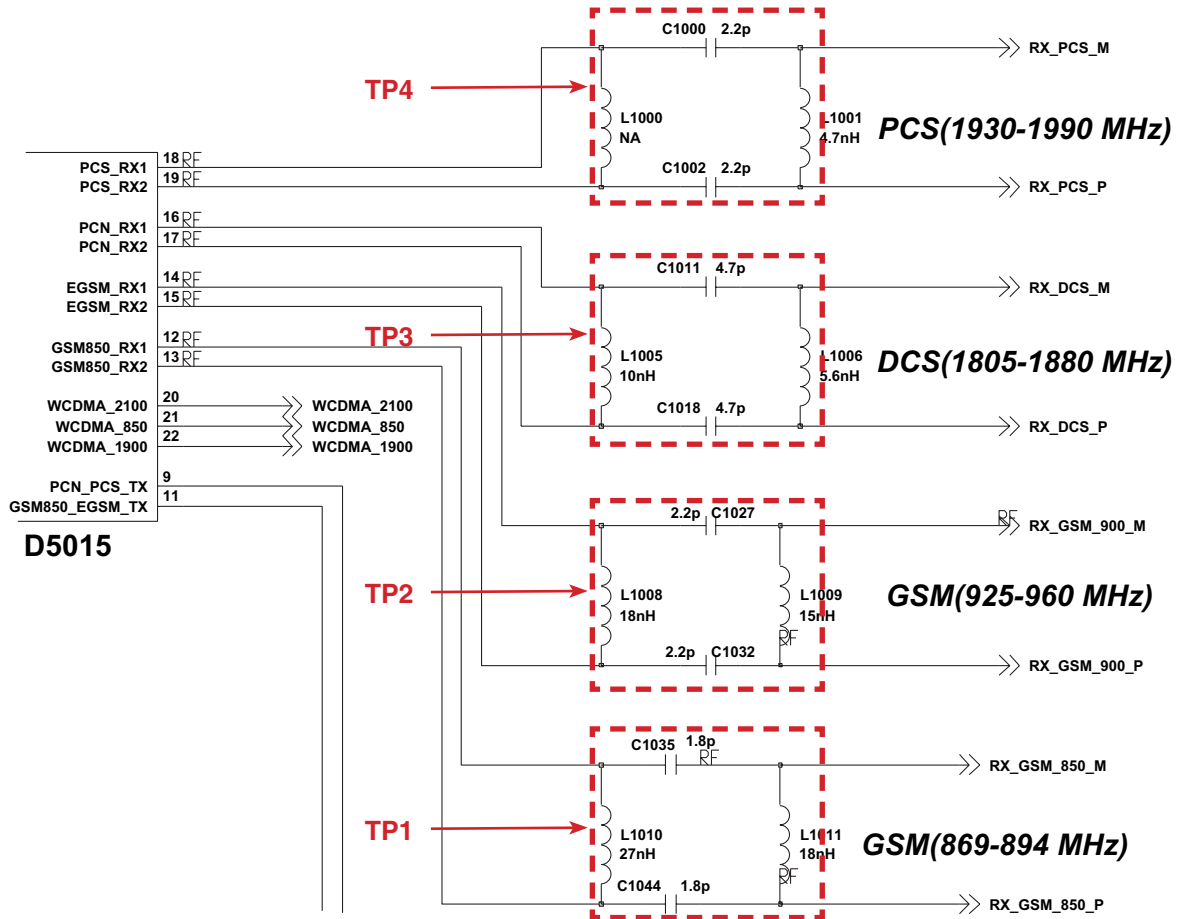
TP2. GSM900 Rx Input

TP3. DCS Rx Input

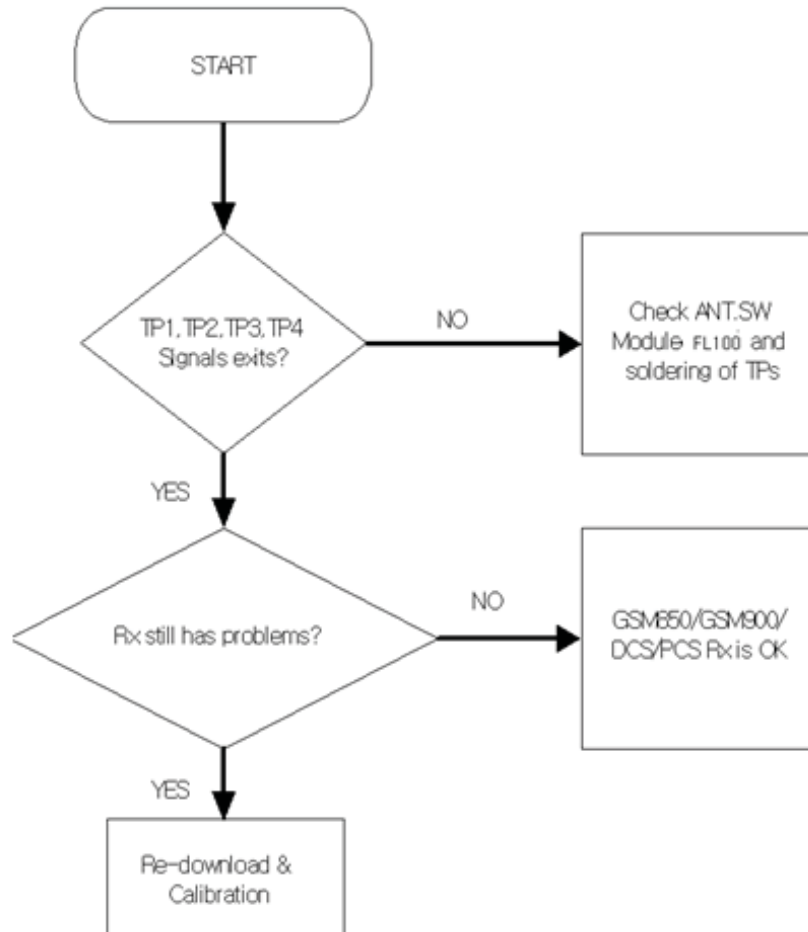
TP4. PCS Rx Input



4. TROUBLE SHOOTING



Schematic of GSM850/GSM900/DCS/PCS Rx Block



4. TROUBLE SHOOTING

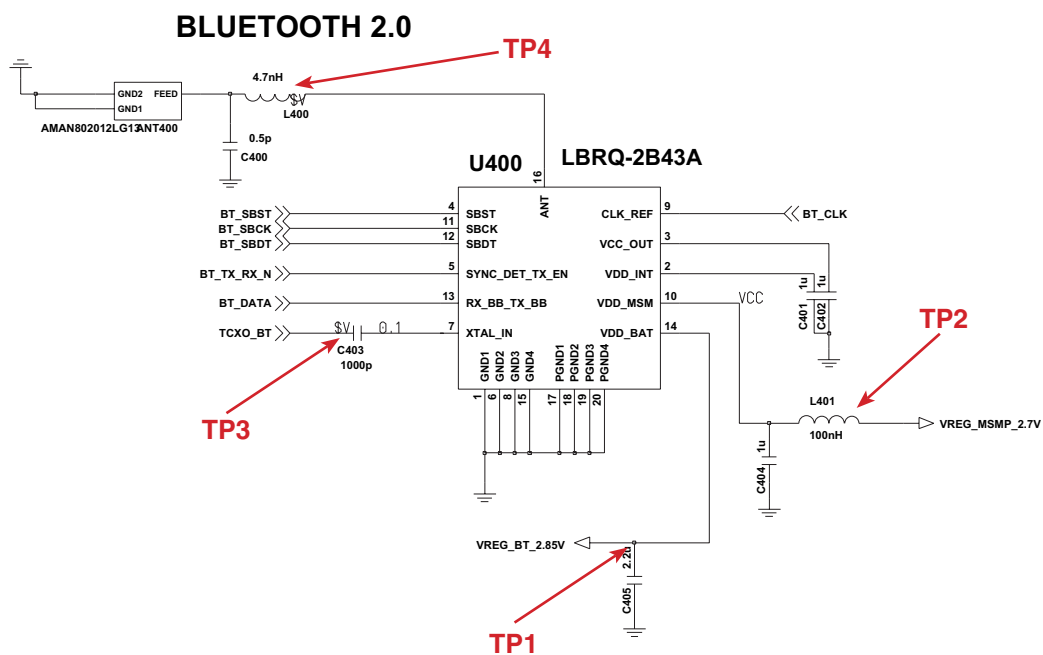
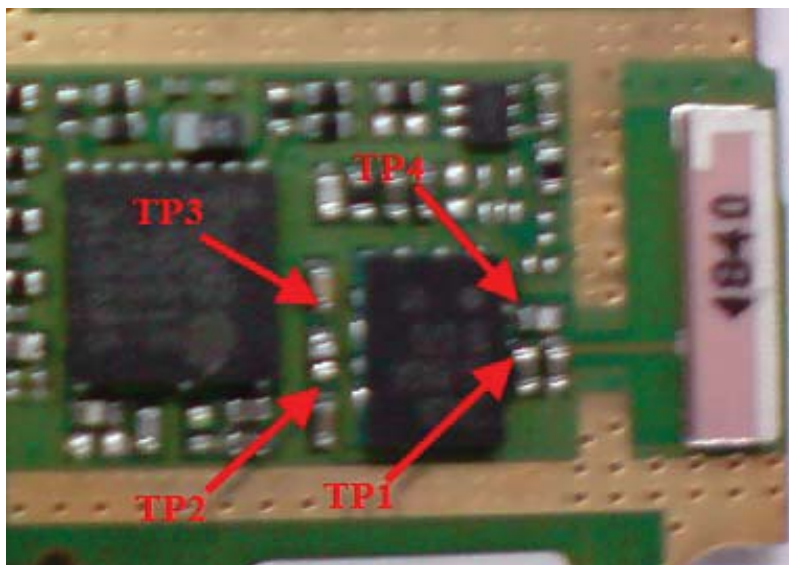
4.14 BLUETOOTH Checking Block

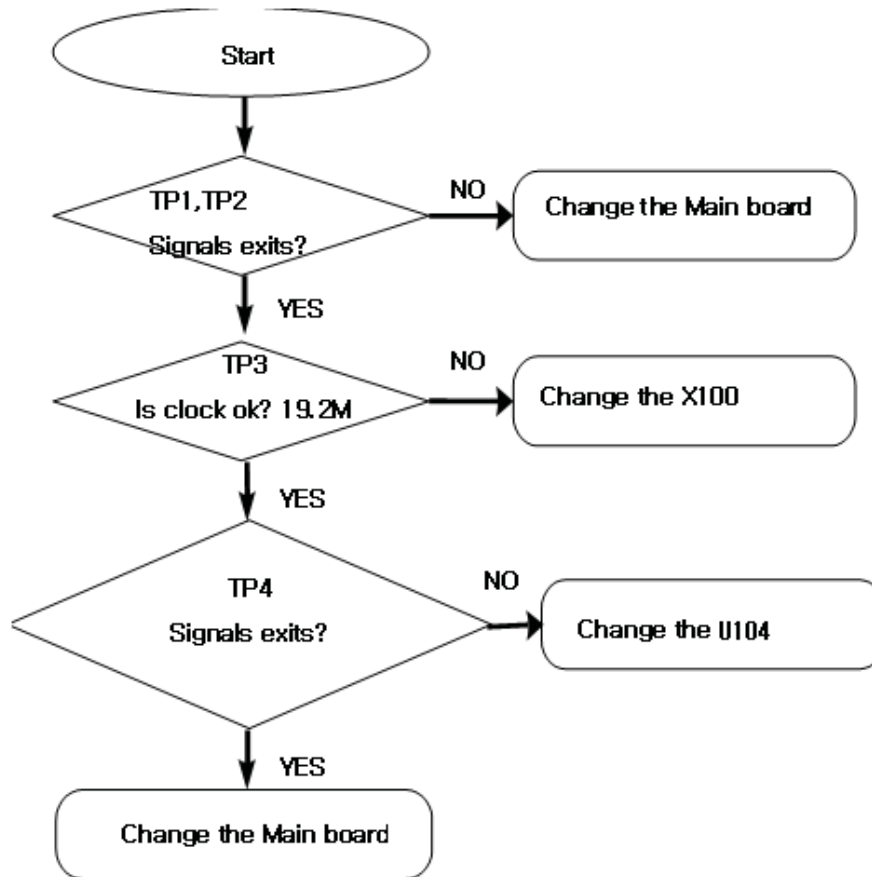
TP1: VREG_BT_2.85, typically 2.8V, Range is 2.3~3.63V.

TP2: VREG_MSMP_2.7V, typically 2.8V, Range is 2.3~3.63V.

TP3: TCXO_BT, BT clock, typically 19.2MHz

TP4: BT RF signal I/O



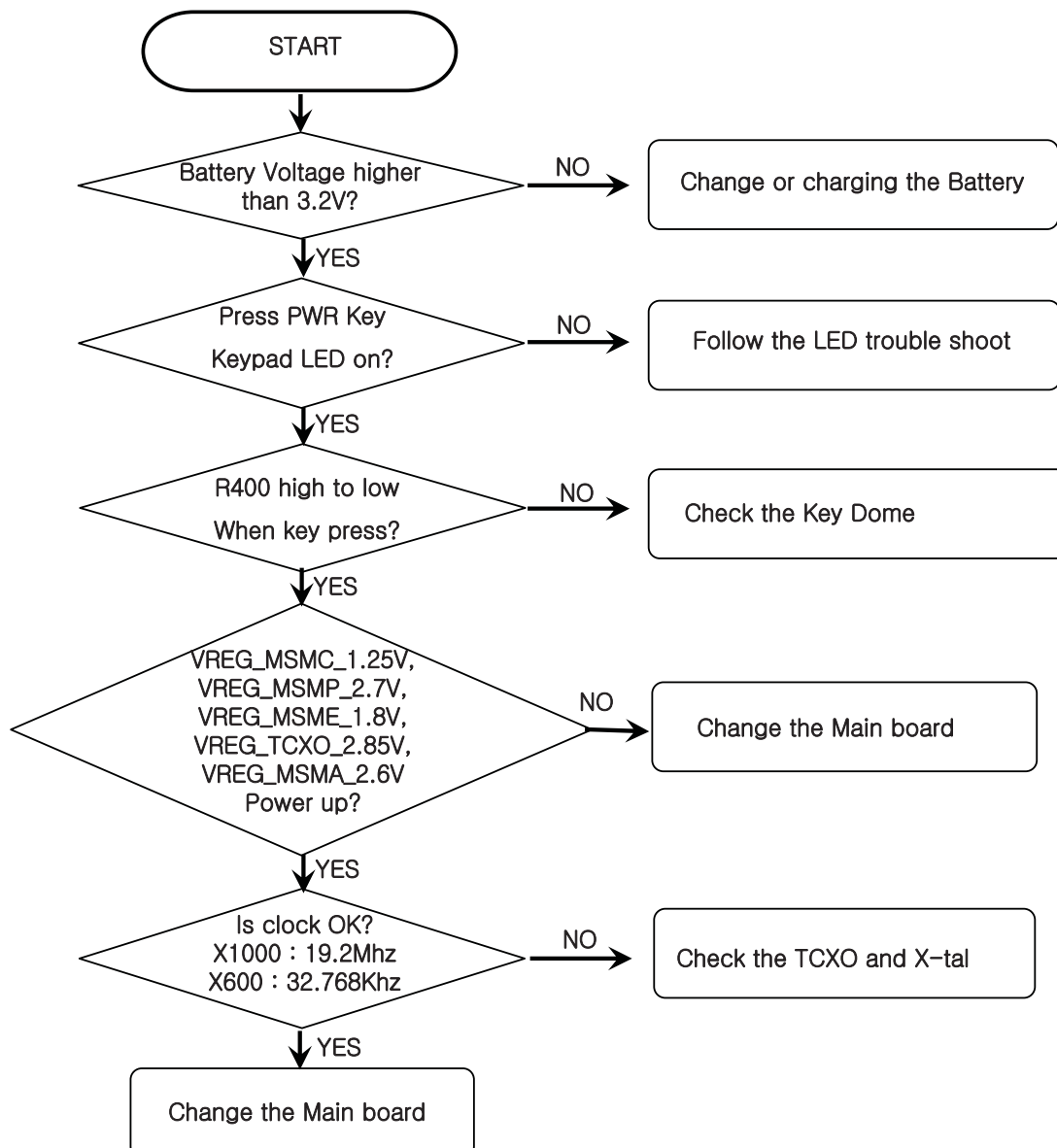


4. TROUBLE SHOOTING

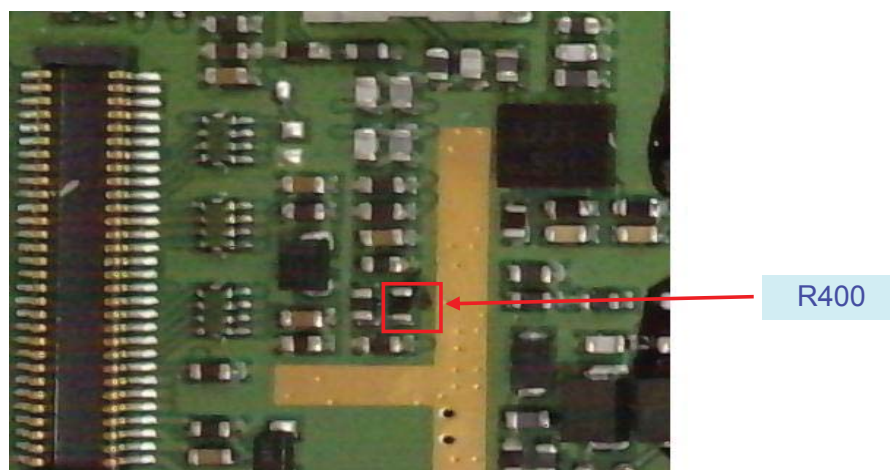
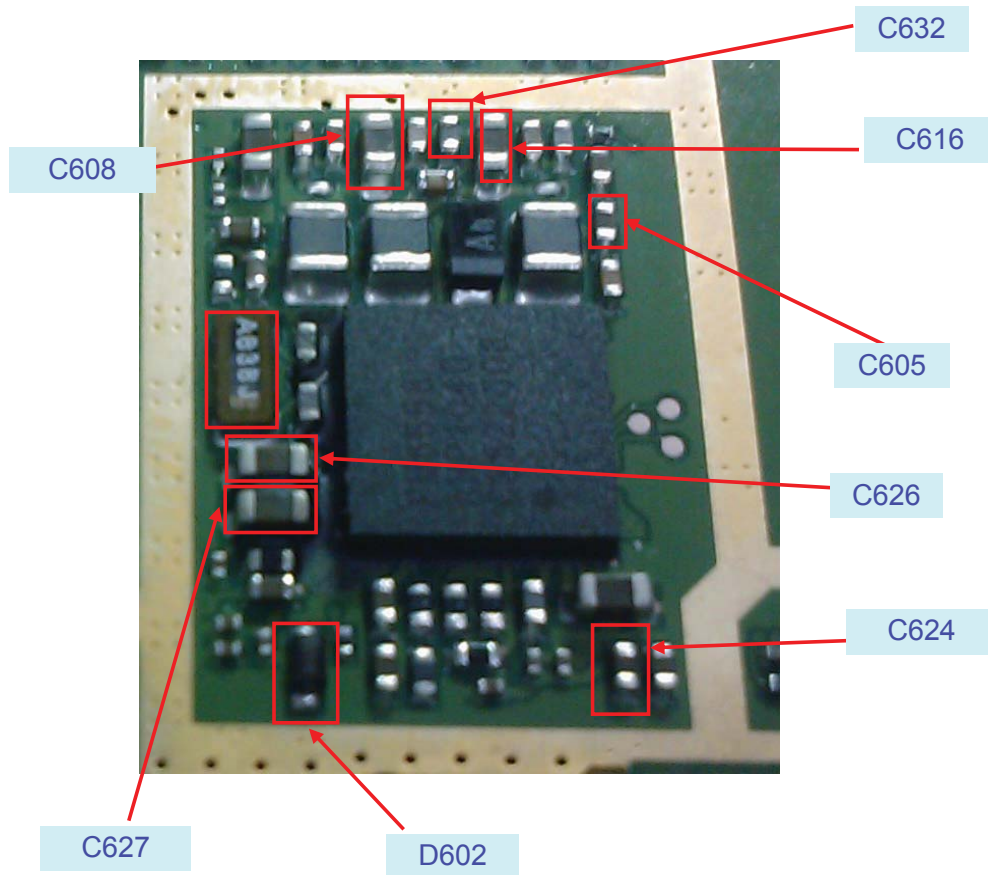
4.15. Power on trouble

Power on sequence of KP330 is :

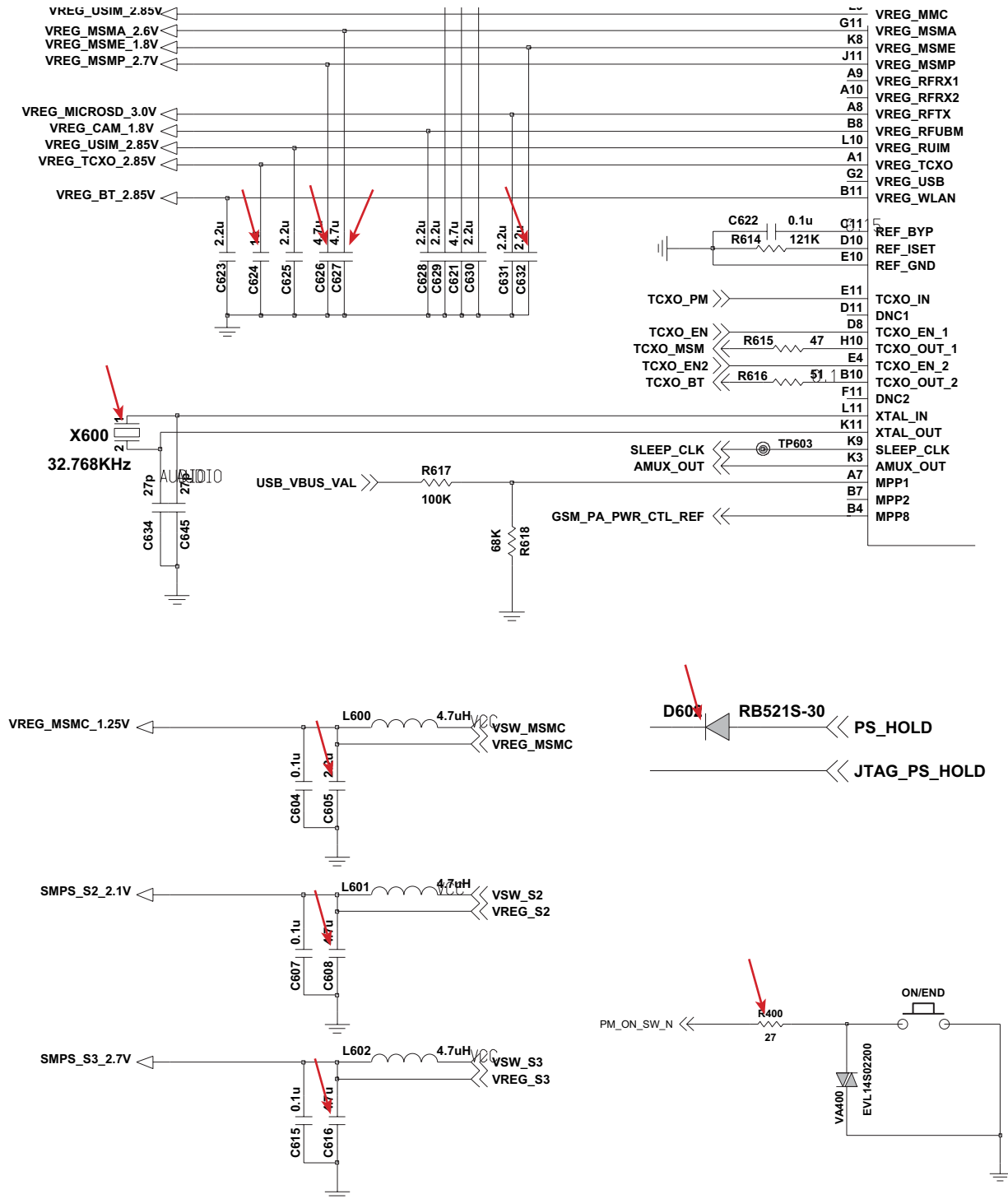
PWR key press → PM_ON_SW_N go to low (R400, PM6658-2M KPDPWR_N pin(L4))
→ PM6658-2M Power Up → VREG_MSMC_1.25V(C605), VREG_MSME_1.8V(C632),
SMPS_S2_2.1V(C608), SMPS_S3_2.7V(C616), VREG_MSMP_2.7V(C626),
VREG_MSMA_2.6V(C627), VREG_TCXO_2.85V(C624) power up
→ PON_RESET_N assert to MSM → Phone booting & PS_HOLD(D602) assert High to
PMIC(PM6658-2M)



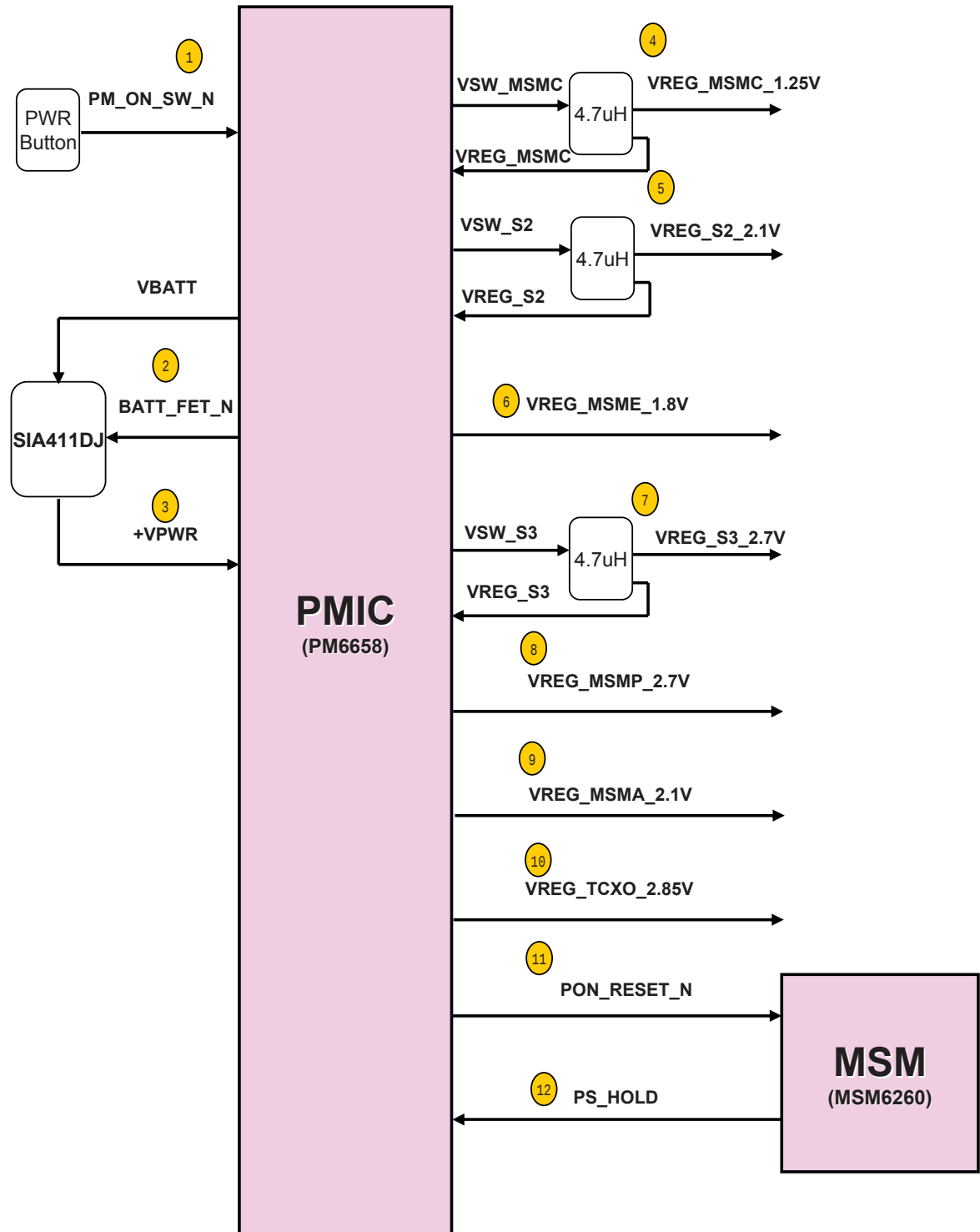
4. TROUBLE SHOOTING



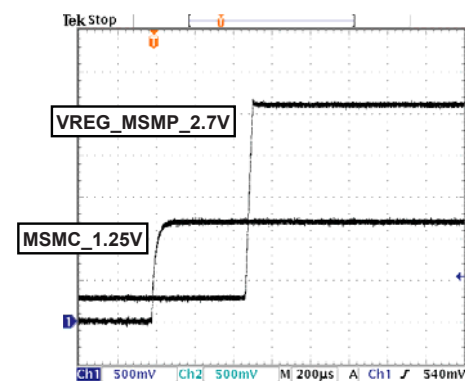
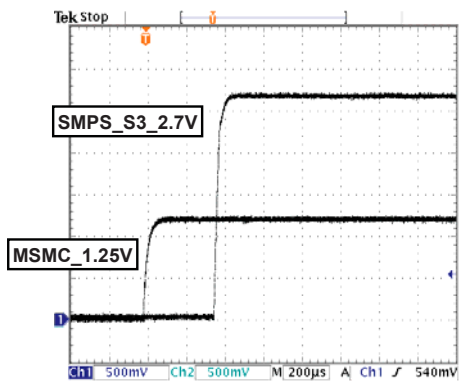
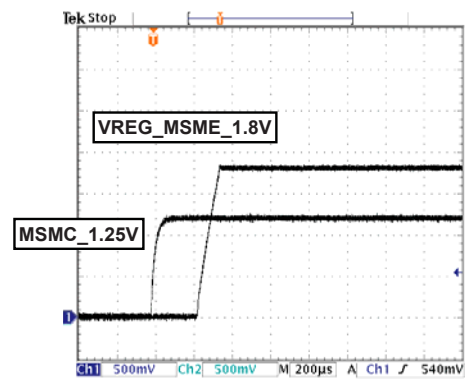
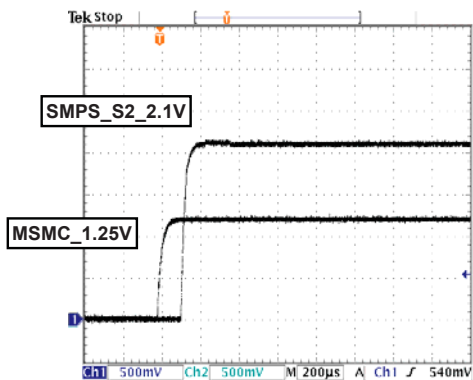
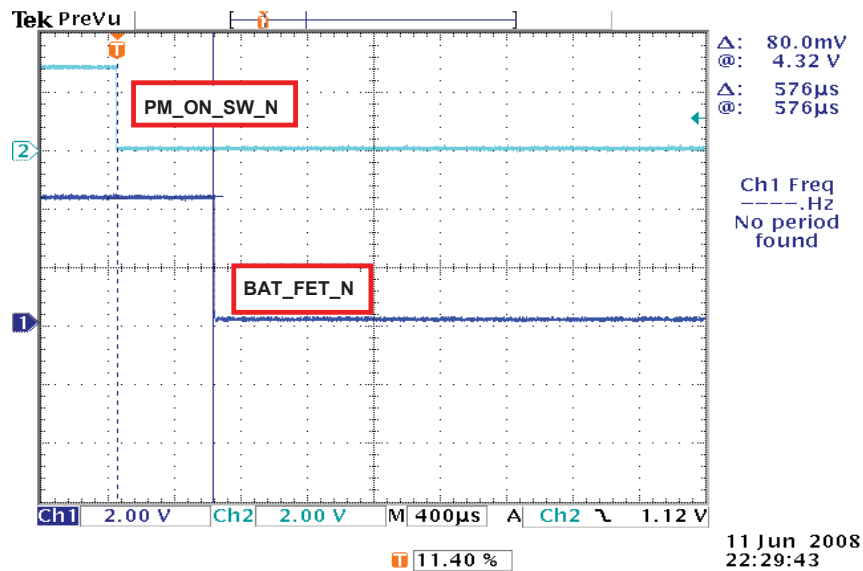
4. TROUBLE SHOOTING



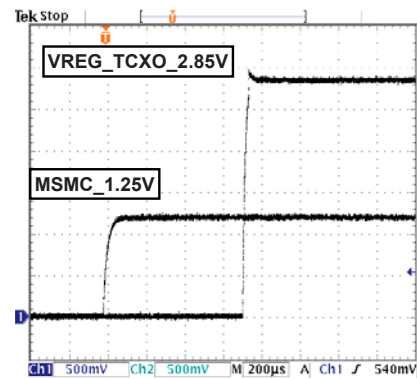
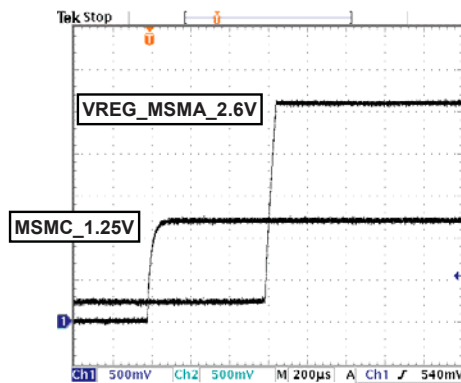
KP330 Power Sequence



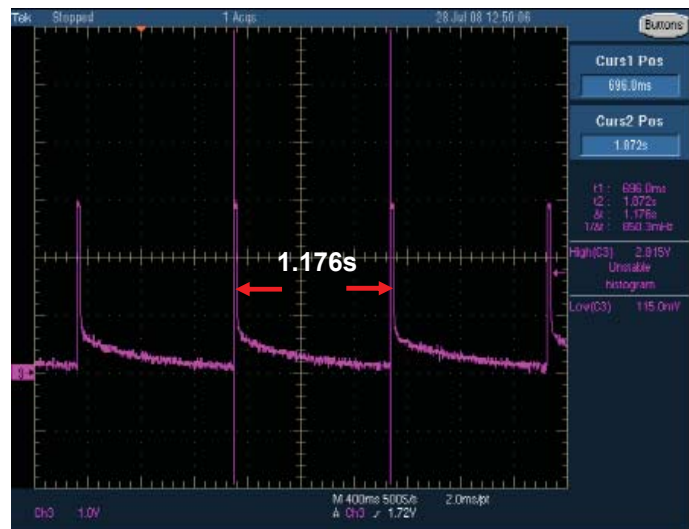
4. TROUBLE SHOOTING



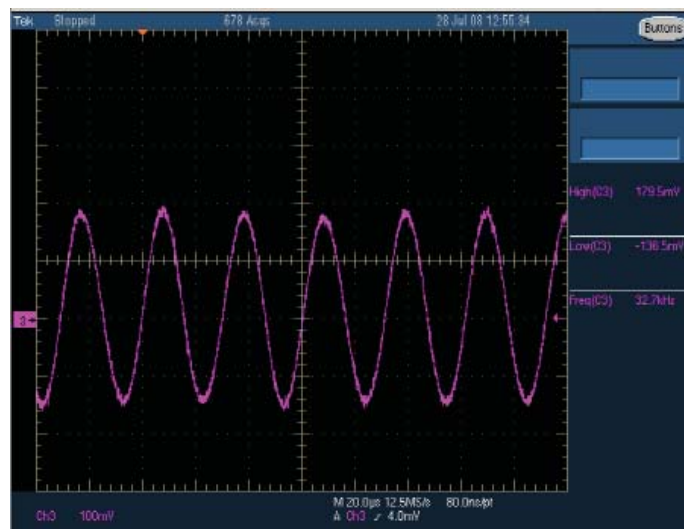
4. TROUBLE SHOOTING



➤ Sleep\ VREG_TCXO_2.85

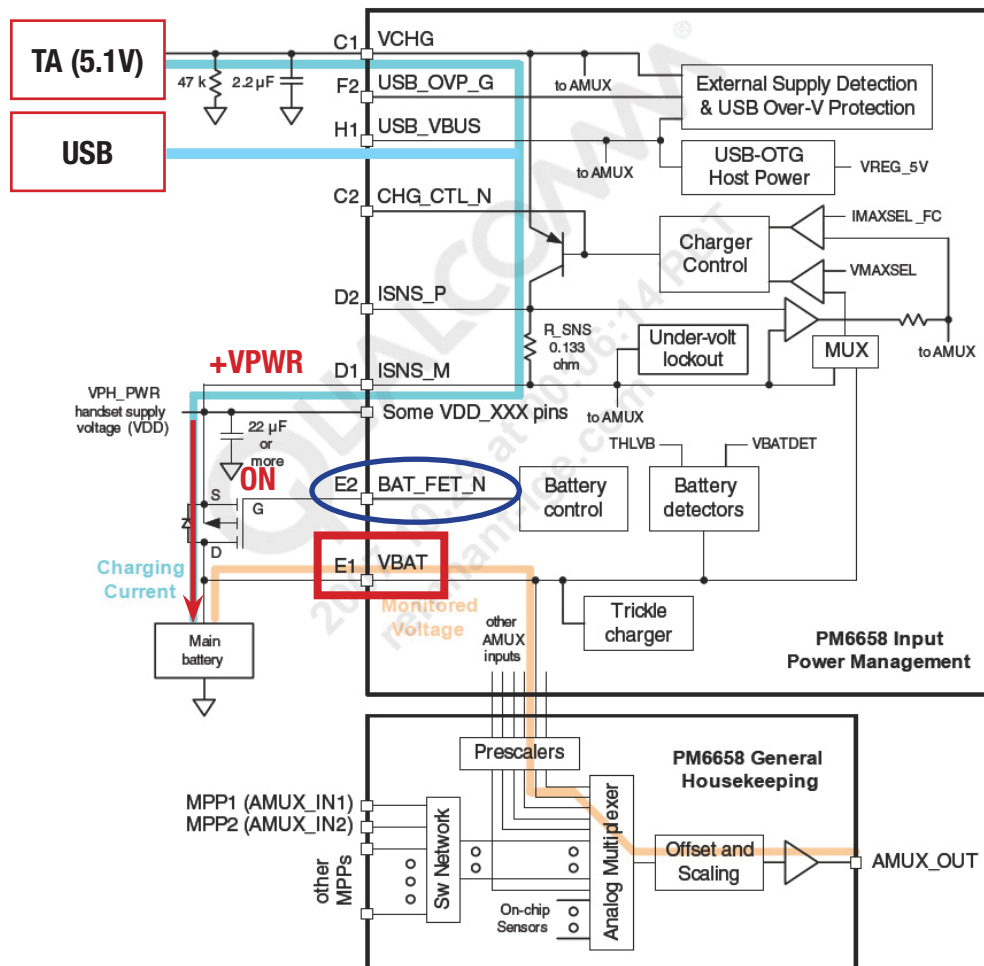


➤ 32.768KHz



4. TROUBLE SHOOTING

4.16 Charger TROUBLE SHOOTING



Charging procedure

- Connect TA
- Control the charging current by PM6650 IC
- Charging current flows into the battery

Check Point

- Connection of TA
- Charging current path
- Battery

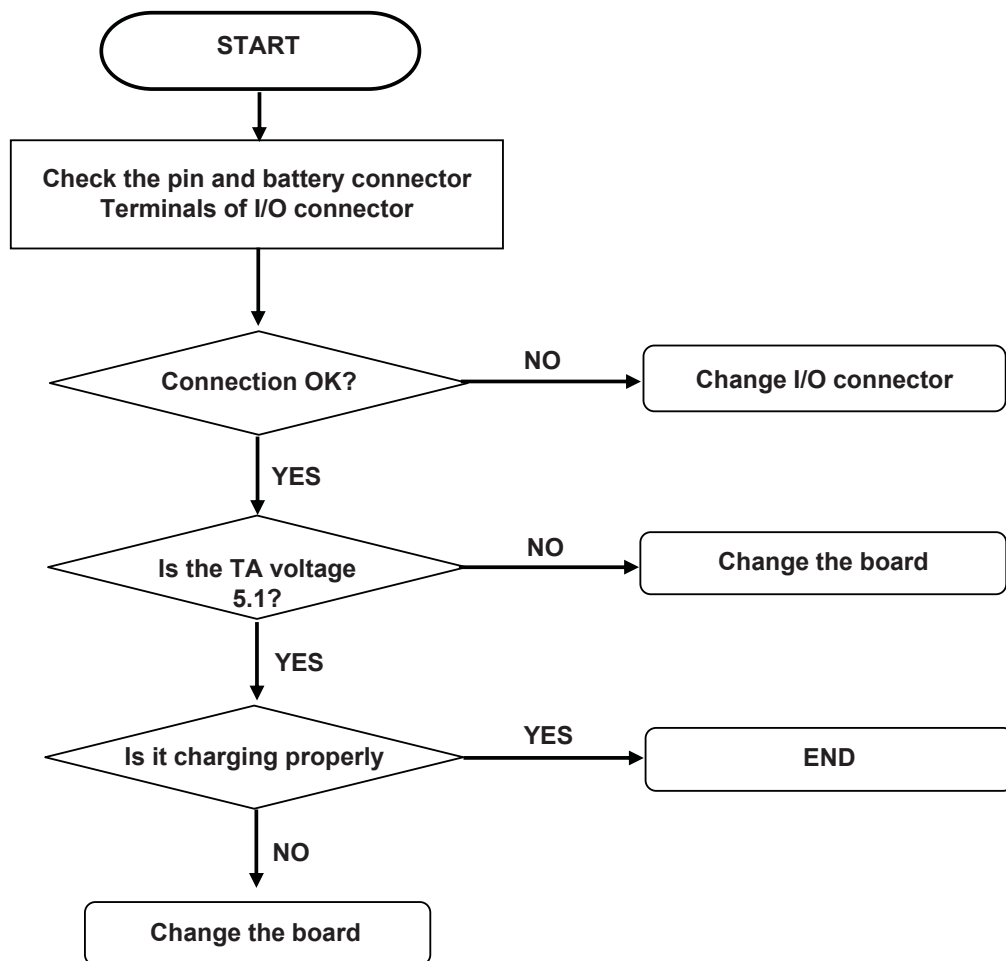
Troubleshooting Setup

- Connect TA and battery to the phone

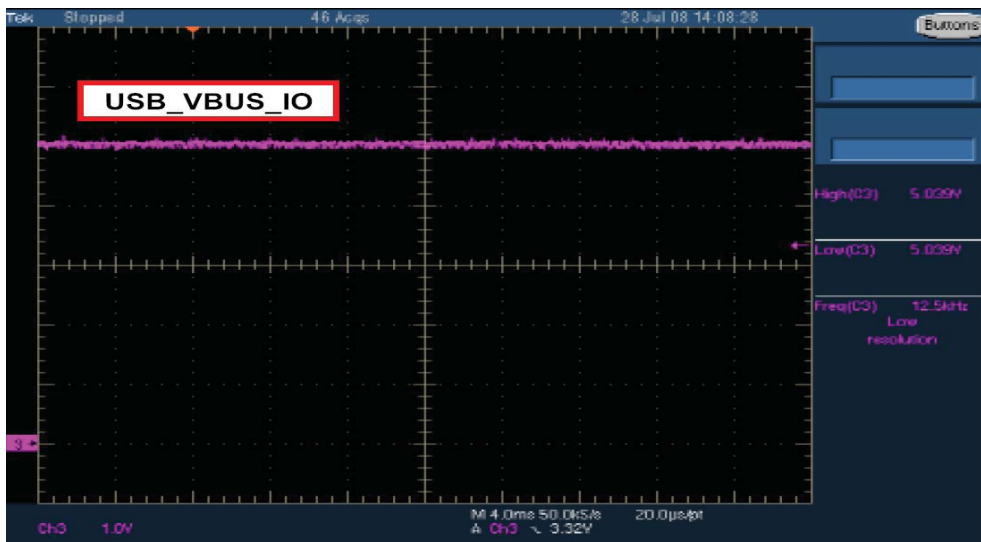
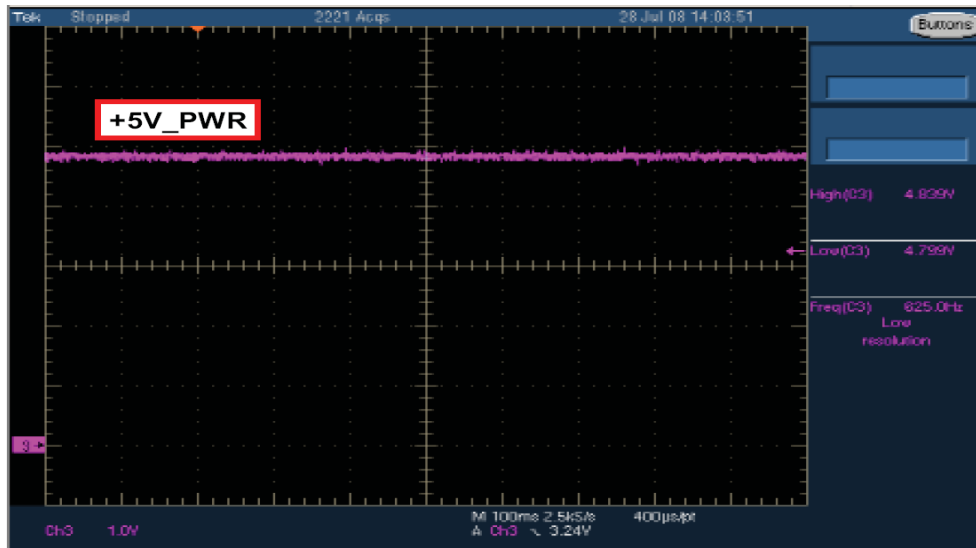
Troubleshooting Procedure

- Check the charger connector
- Check the charging current Path
- Check the battery

4.16.1 TROUBLE SHOOTING FLOW

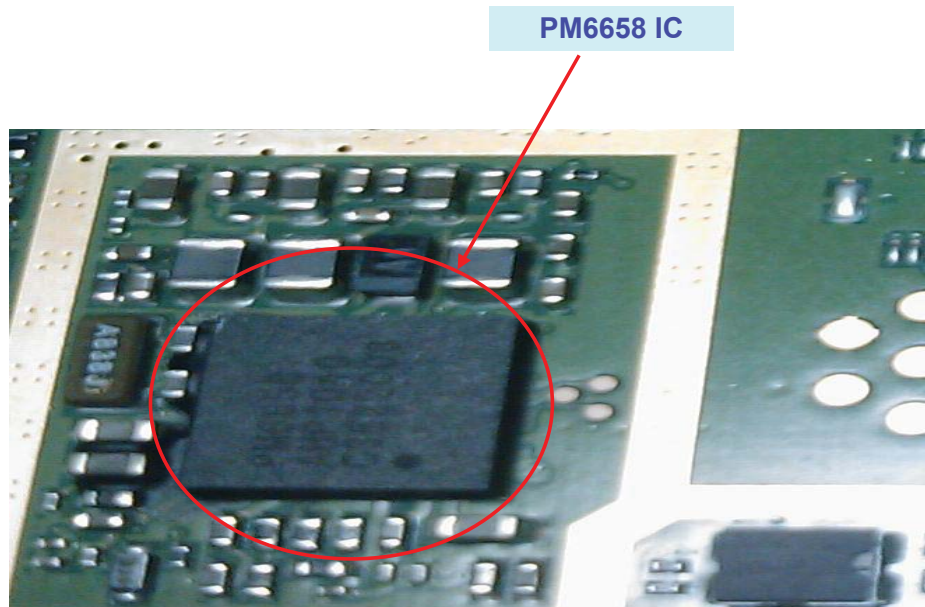
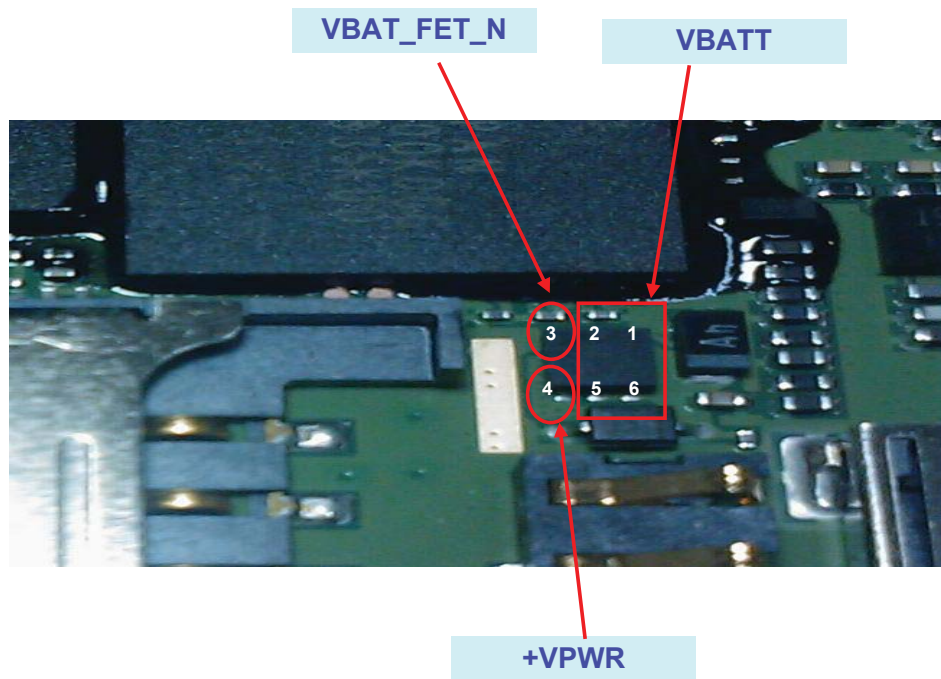


4. TROUBLE SHOOTING



- TA : +5V_PWR : 5V, USB_VBUS_IO : 0V
- USB : +%5V_PWR : 5V, USB_VBUS_IO : 5V

4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

4.16.2 PM6658

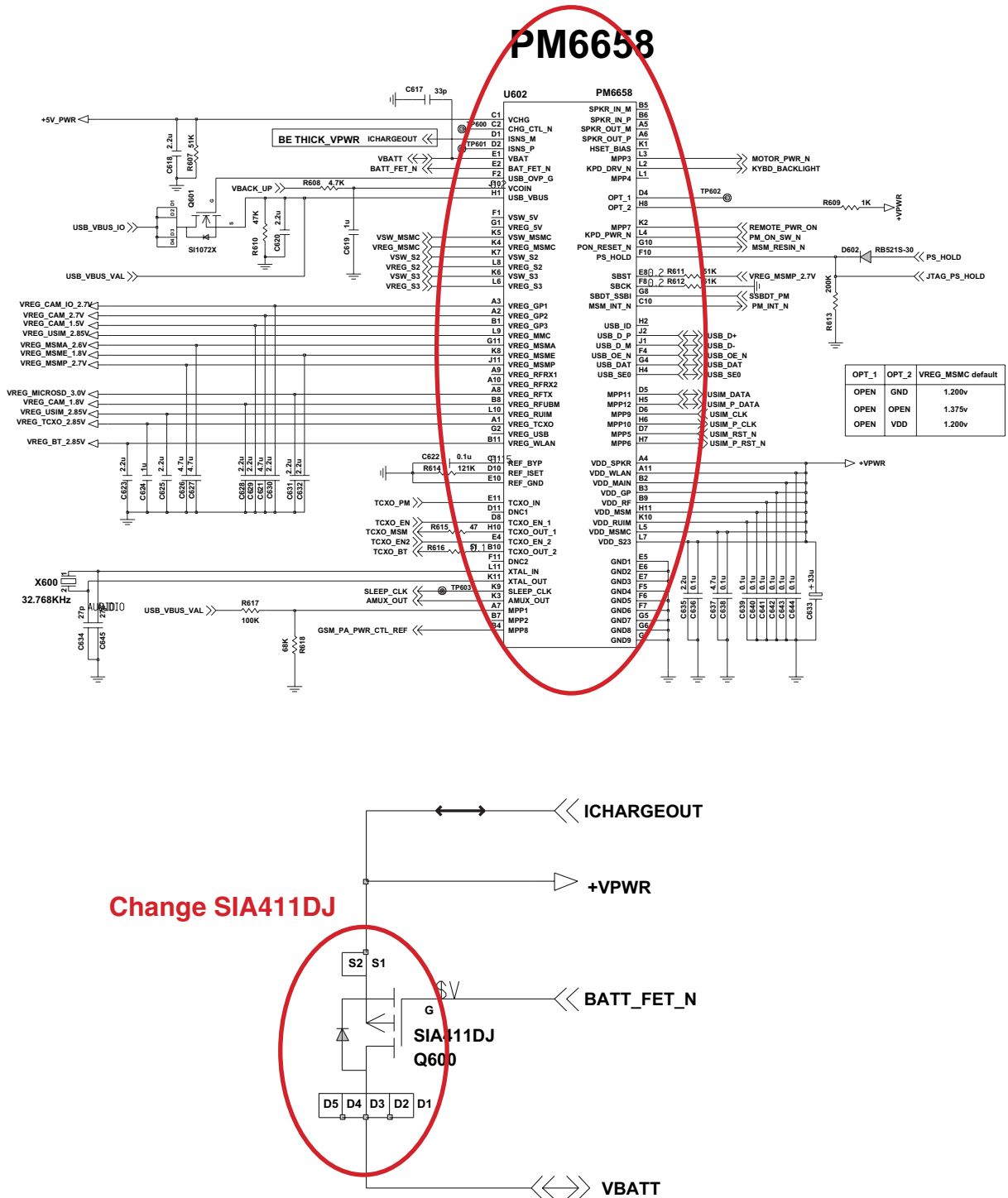


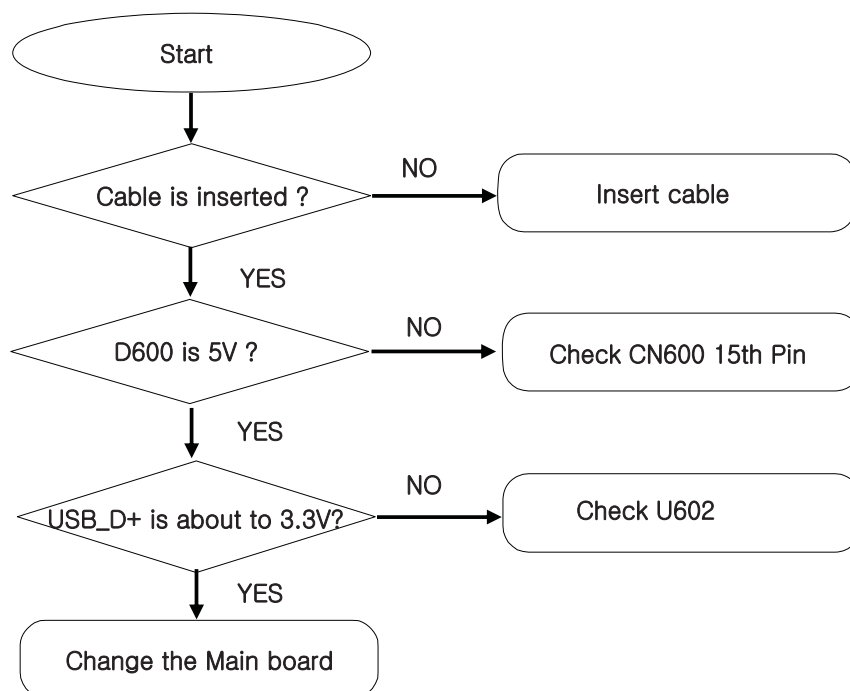
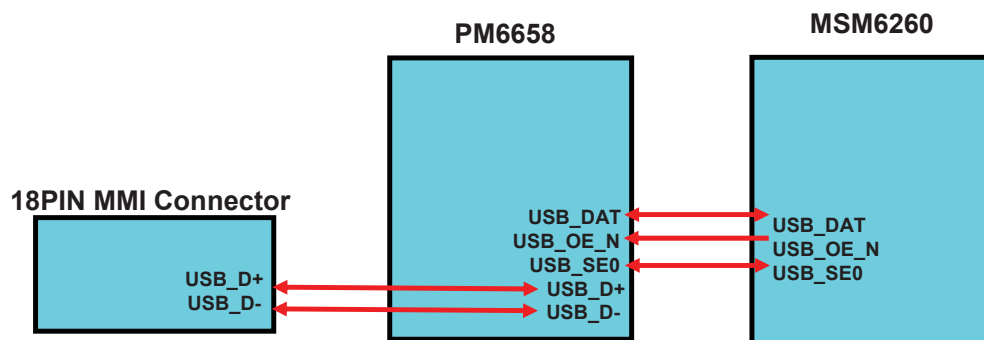
Figure . Charging part schematics

4.17 USB trouble

USB Initial sequence of KP330 is :

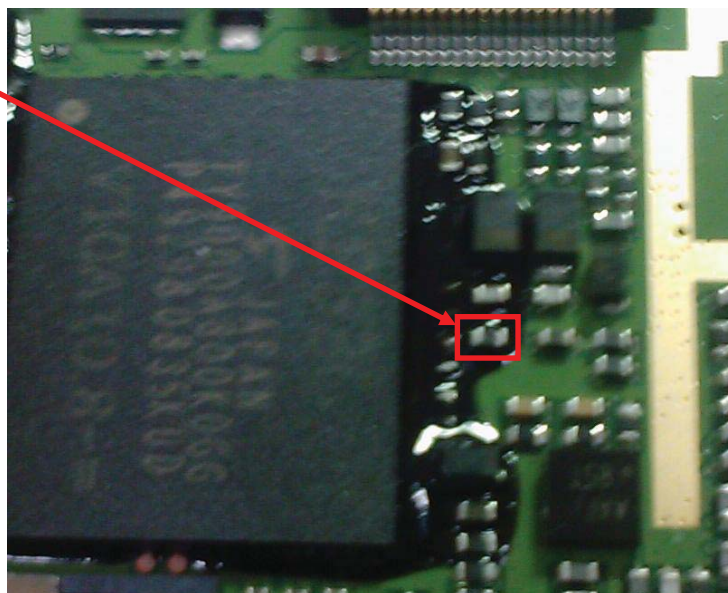
USB connected to KP330 → USB_VBUS(D600) go to 5V

→ USB_D+(VA604) go to 3.3V → USB_DATA is triggered → USB work

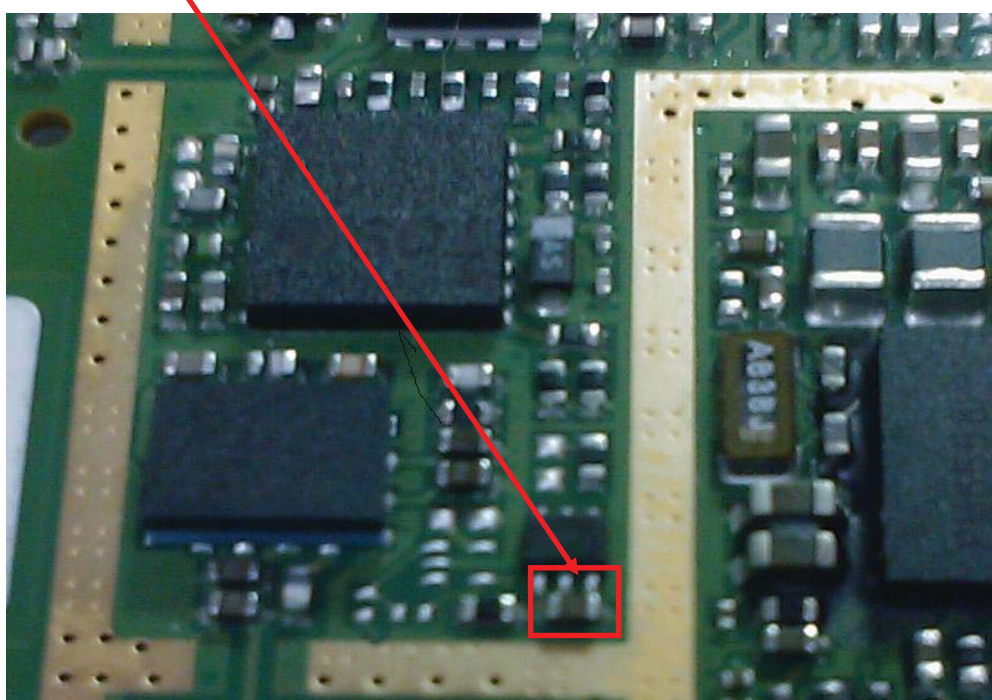


4. TROUBLE SHOOTING

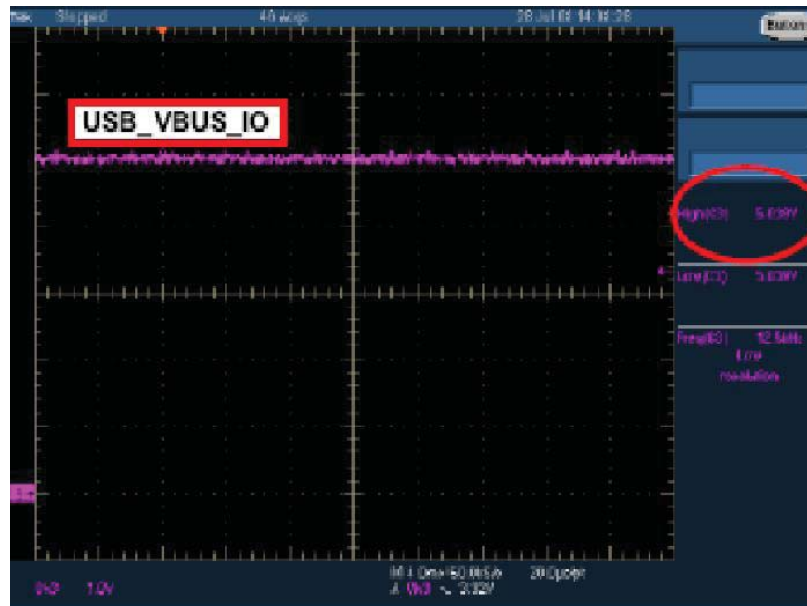
VA604 (USB_D+)



C620 (USB_VBUS) → D600



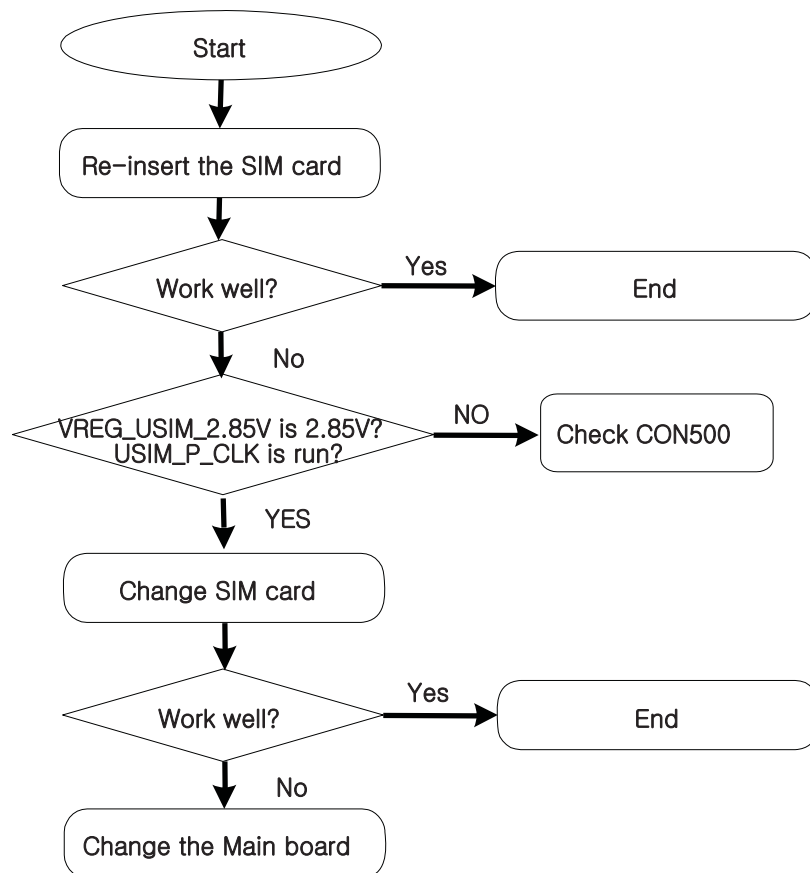
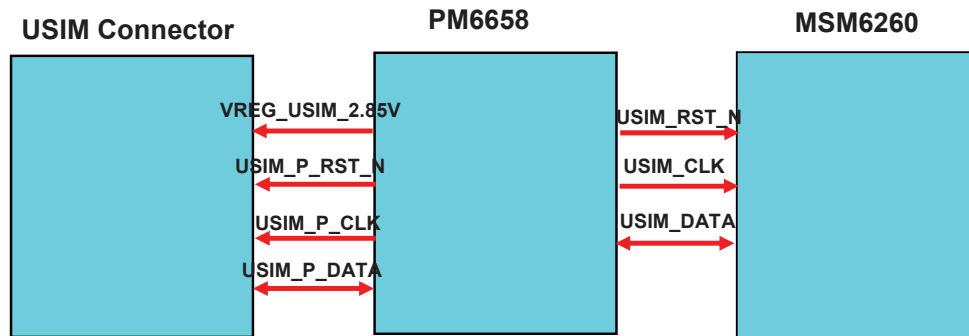
4. TROUBLE SHOOTING



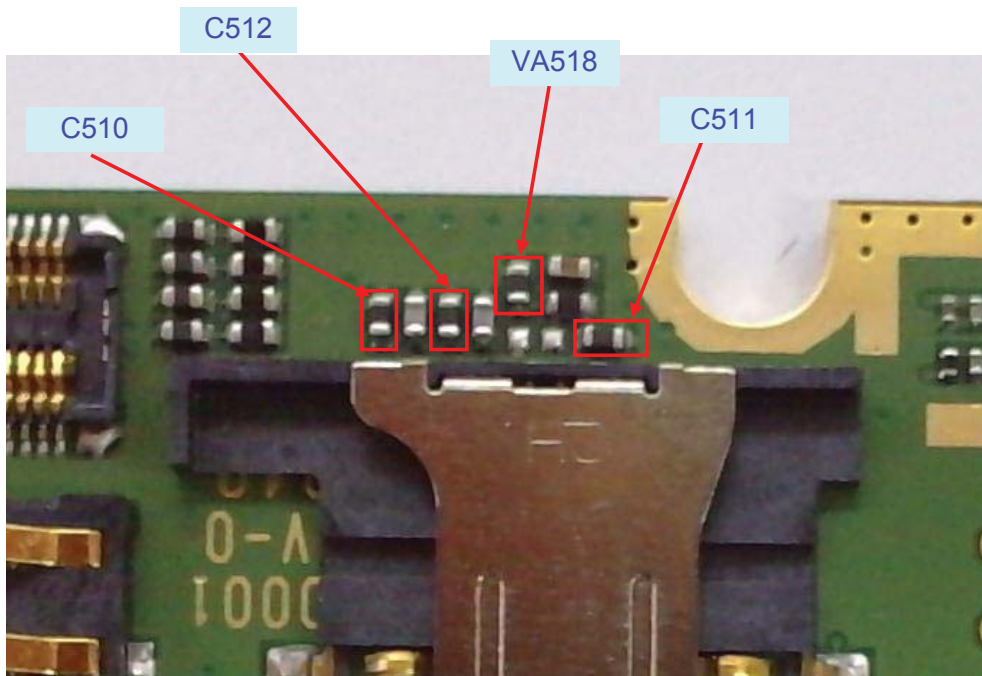
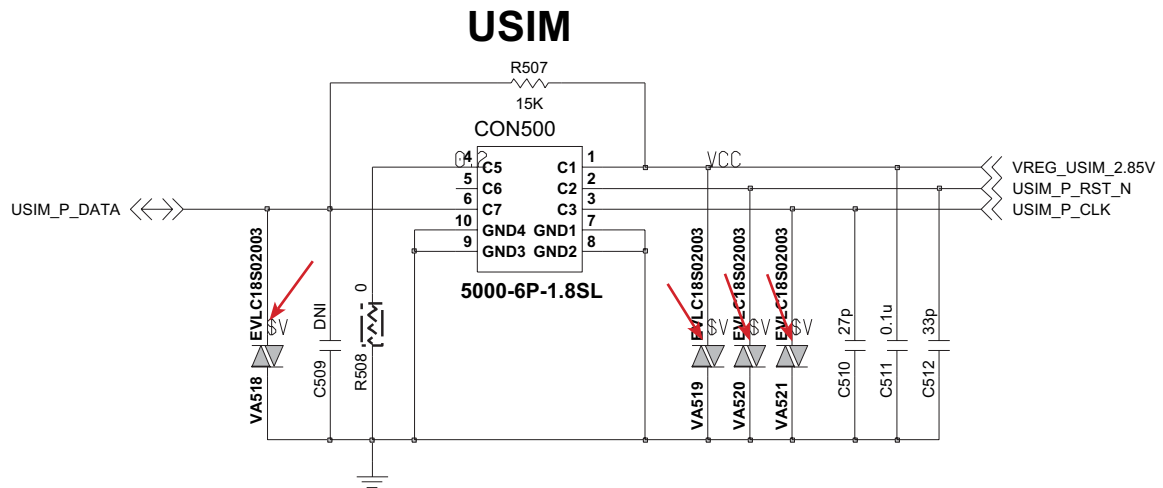


4.18 SIM detect trouble

USB Initial sequence of KP330 is :
VREG_USIM_2.85V(C625 of PM6658) up to 3.0V → USIM clock, reset and data triggered



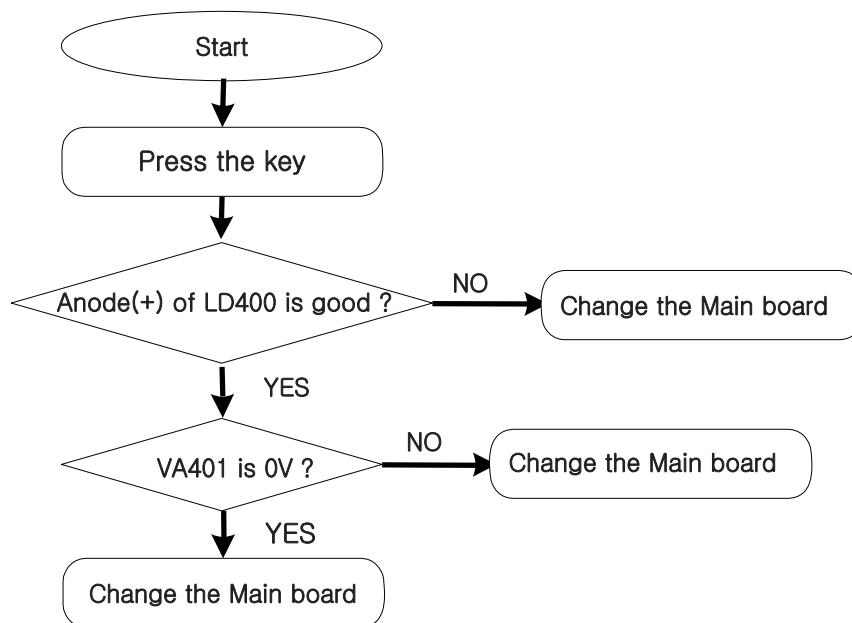
4. TROUBLE SHOOTING



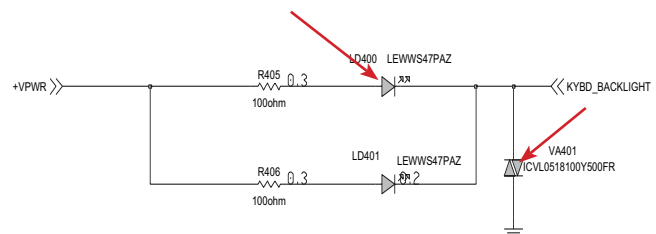
4.19 Keypad Backlight Troubleshooting

Keypad Backlight sequence of KP330 is :

Press the key → KYBD_BACKLIGHT(VA401) go to 0V → Main LED on



KEY_BACK_LIGHT



4. TROUBLE SHOOTING

➤ KEYPAD Backlight On 시

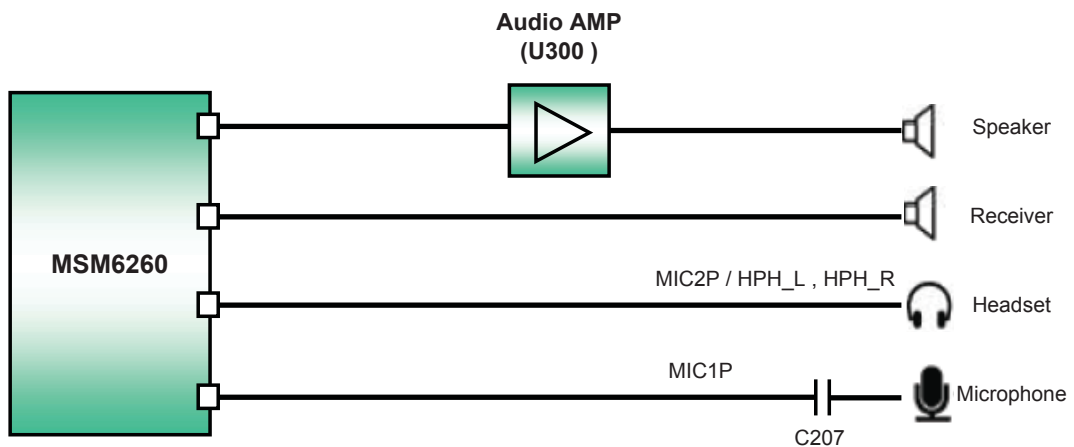


➤ KEYPAD Backlight Off 시

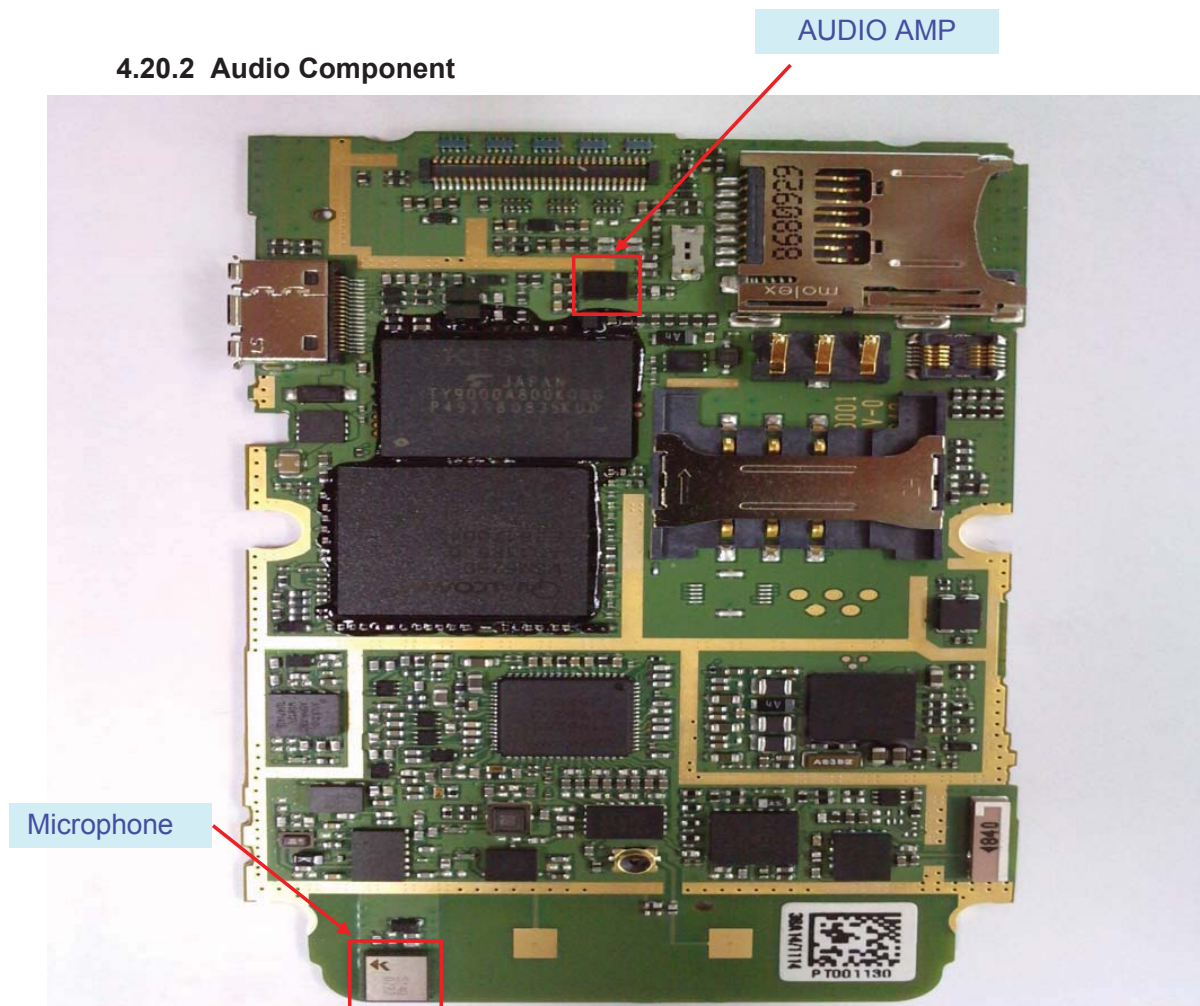


4.20 Audio Troubleshooting

4.20.1 Audio Block Diagram



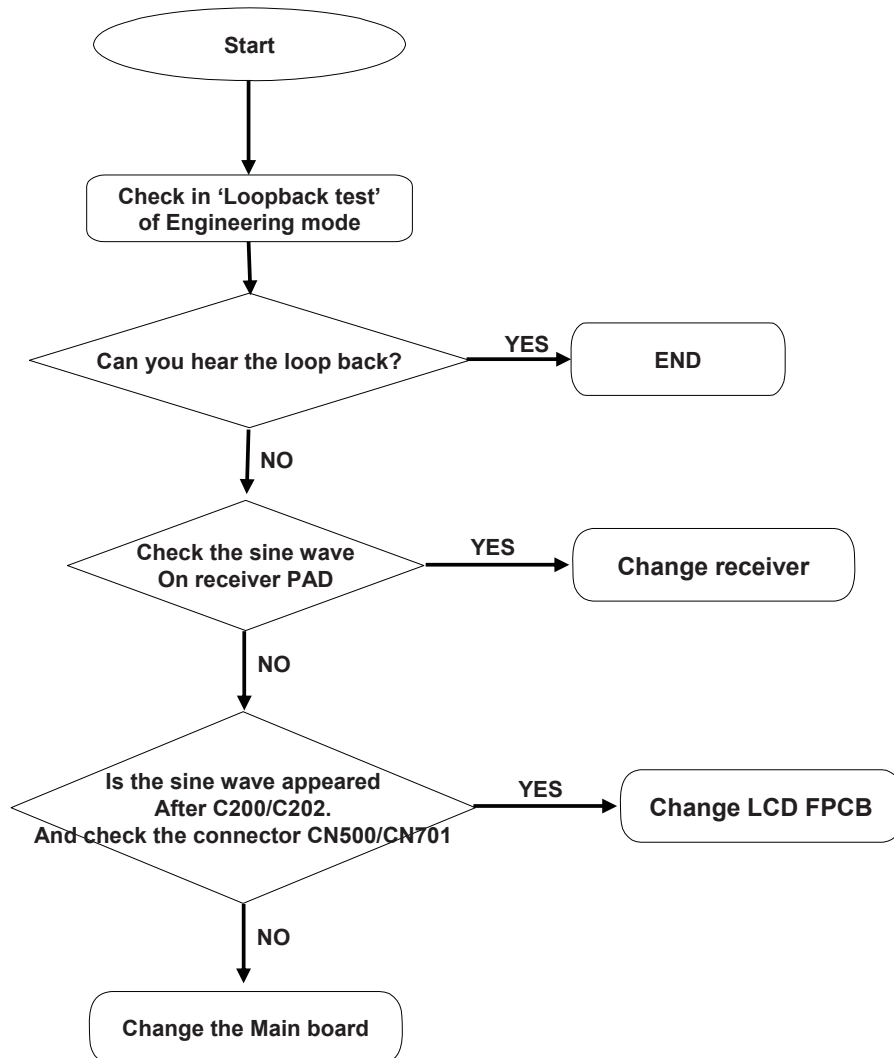
4.20.2 Audio Component



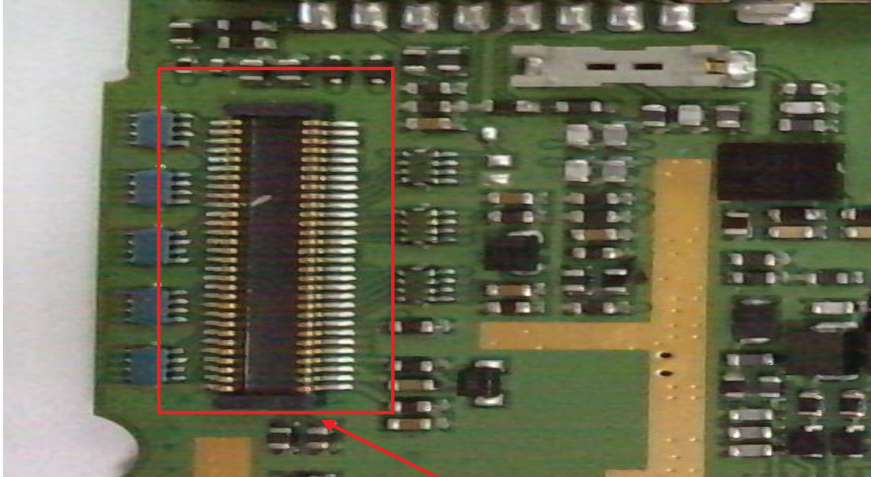
4. TROUBLE SHOOTING

4.20.3 Receiver Path (Voice Call)

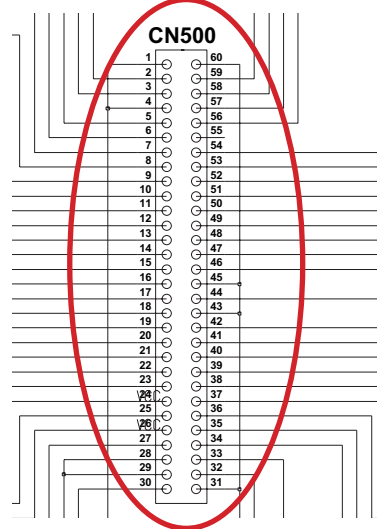
MSM6260 EAR1ON/EAR1OP → CN500 LCD connector → CN701 FPCB_To_Main connector
→ Fpcb pad → Receiver



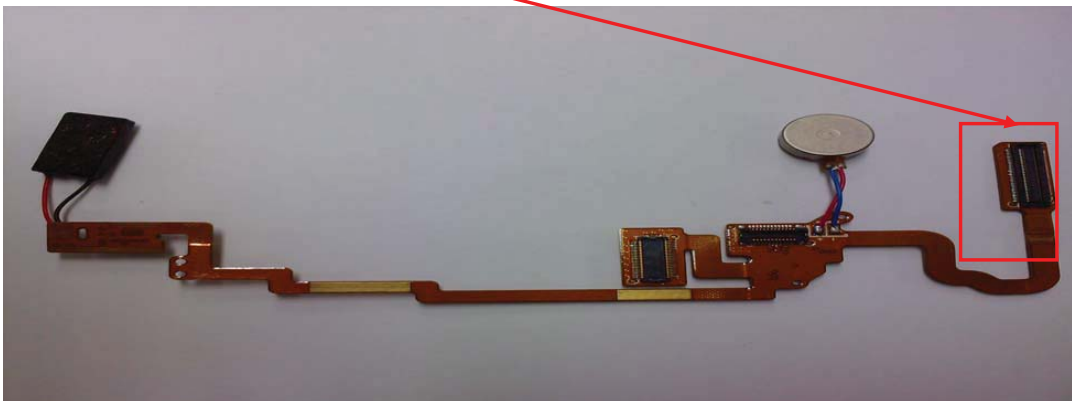
4. TROUBLE SHOOTING



Mainboard connector



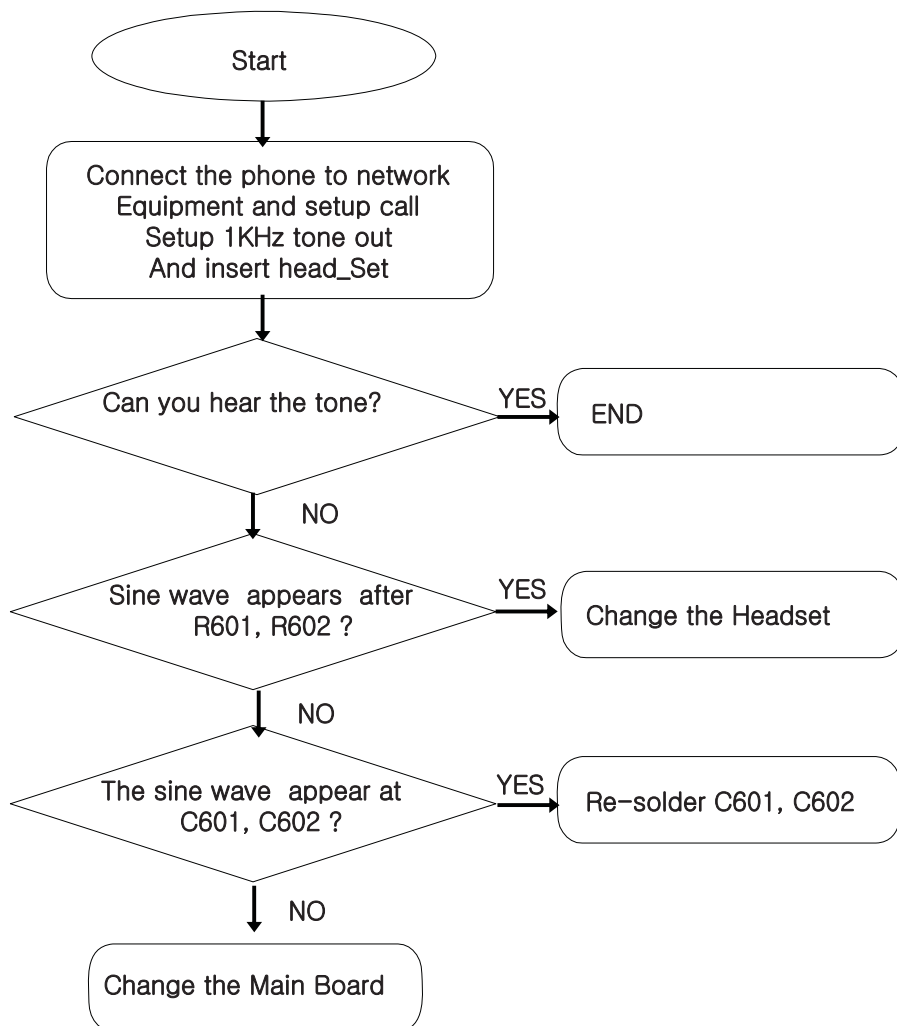
Fpcb connector

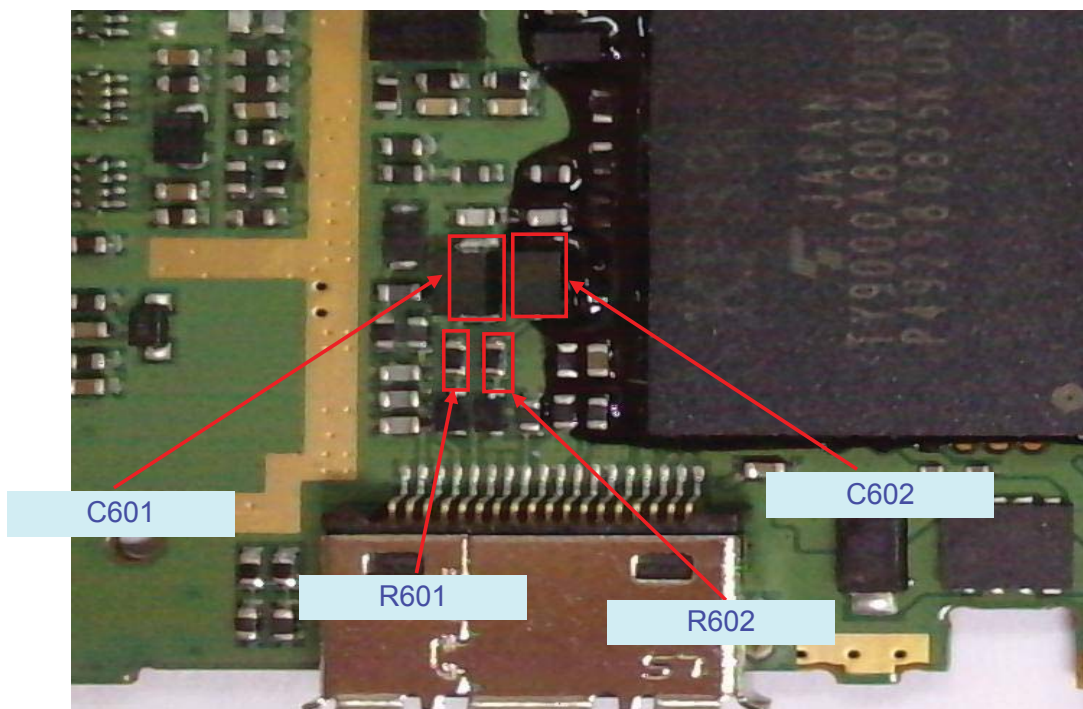
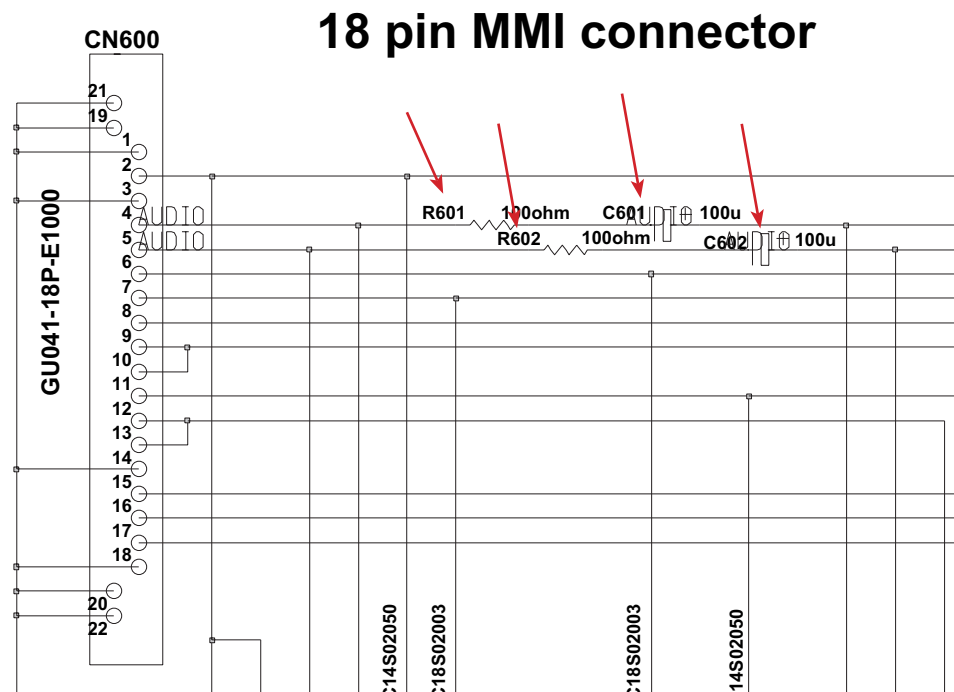


4. TROUBLE SHOOTING

4.20.4. Headset Path

MSM6260 HPH_R, HPH_L → C601,C602→ R601,R602 → CN600 headset Jack

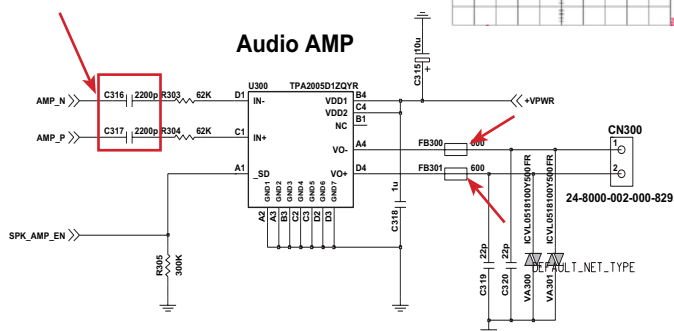
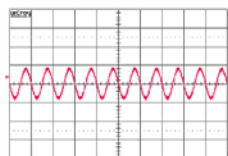
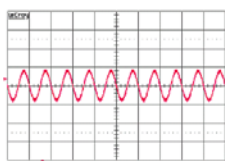
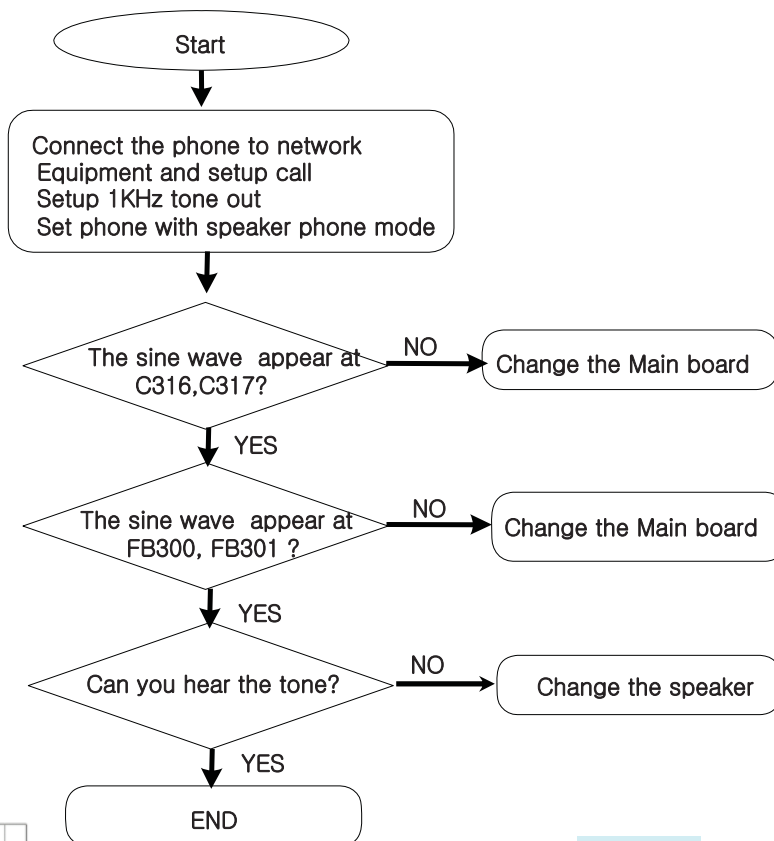




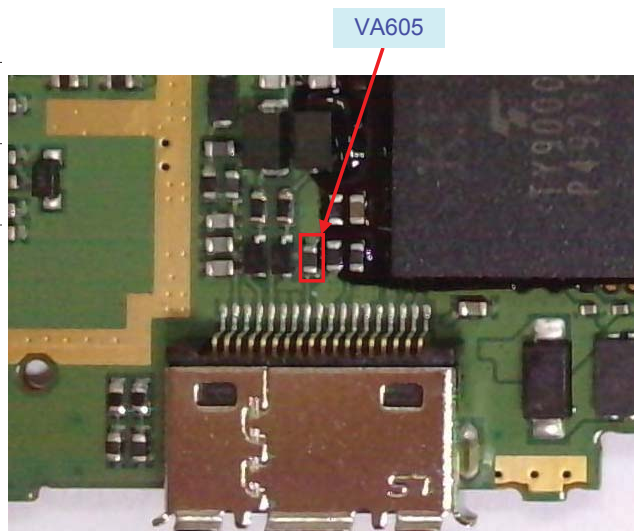
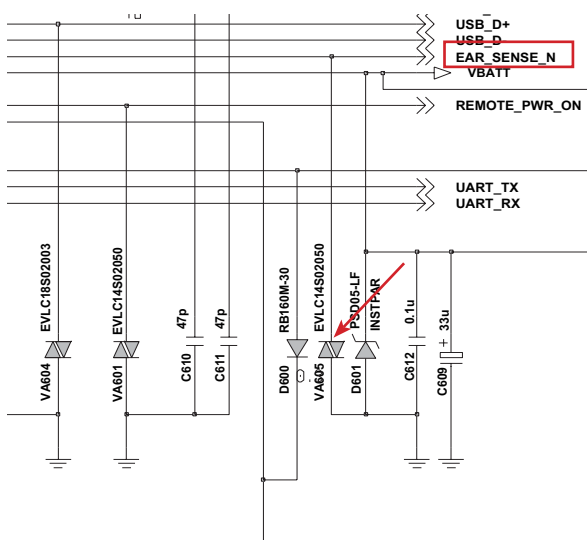
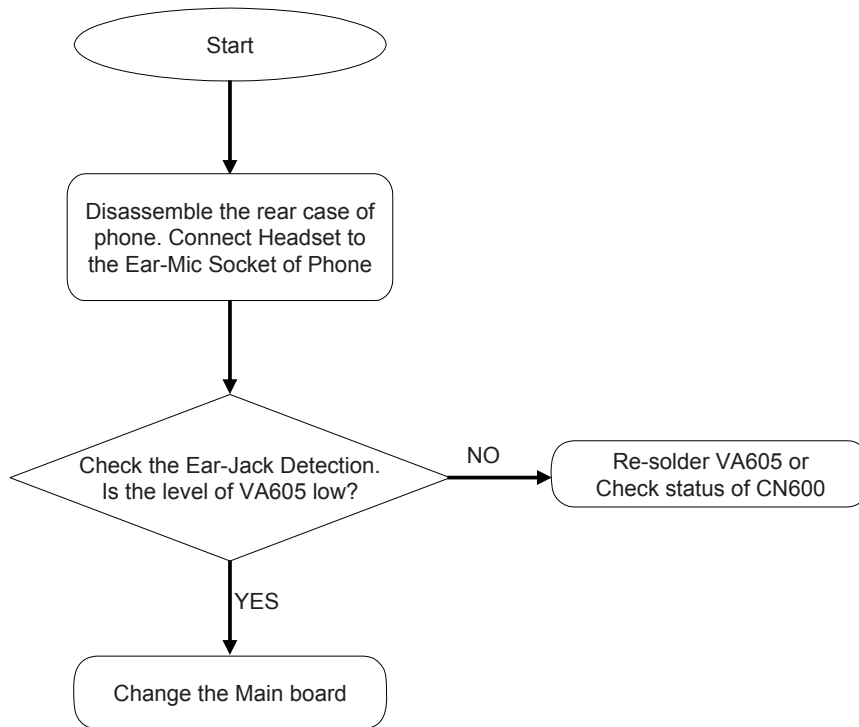
4. TROUBLE SHOOTING

4.20.5 Speaker Path (MP3 , Speakerphone , Key tone)

MSM6260 LINE_ON/OP → U300 (Amplifier) → FB300 / FB301 → CN300 Connector → Speaker



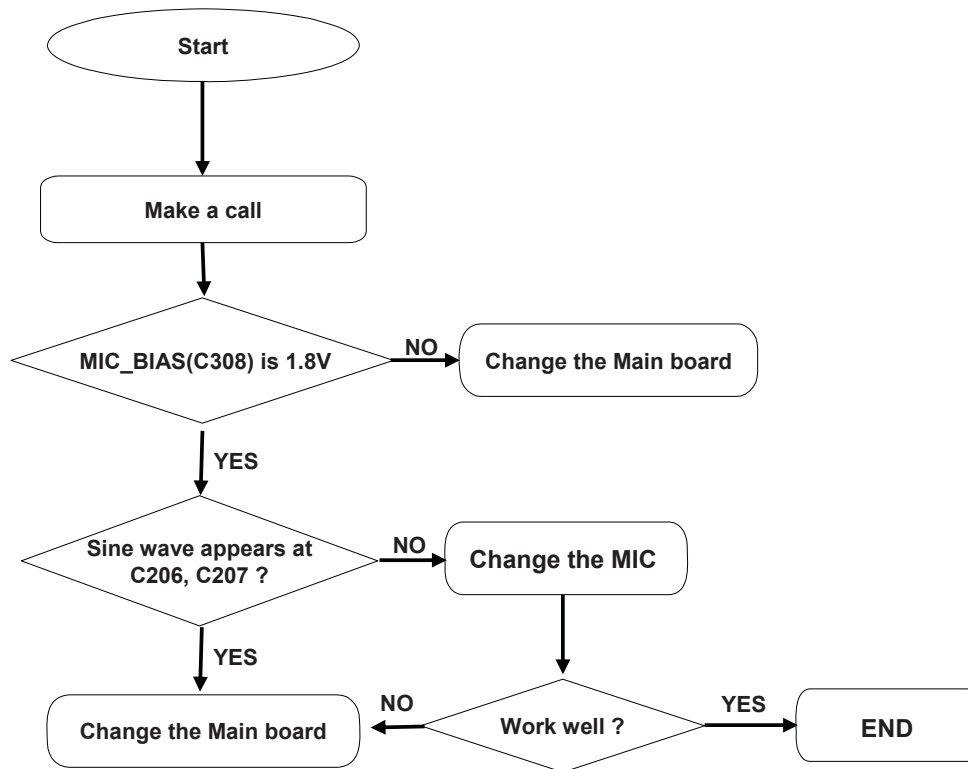
4.20.6 Ear-Mic jack Detection Troubleshooting



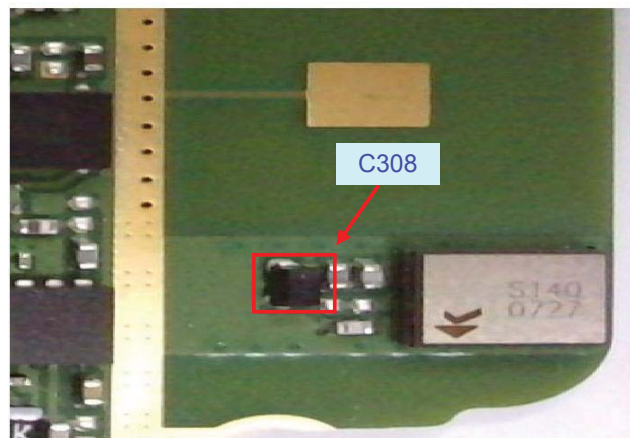
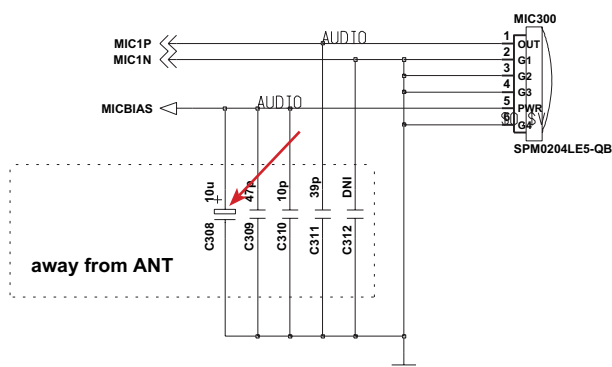
4. TROUBLE SHOOTING

4.20.7 Main microphone

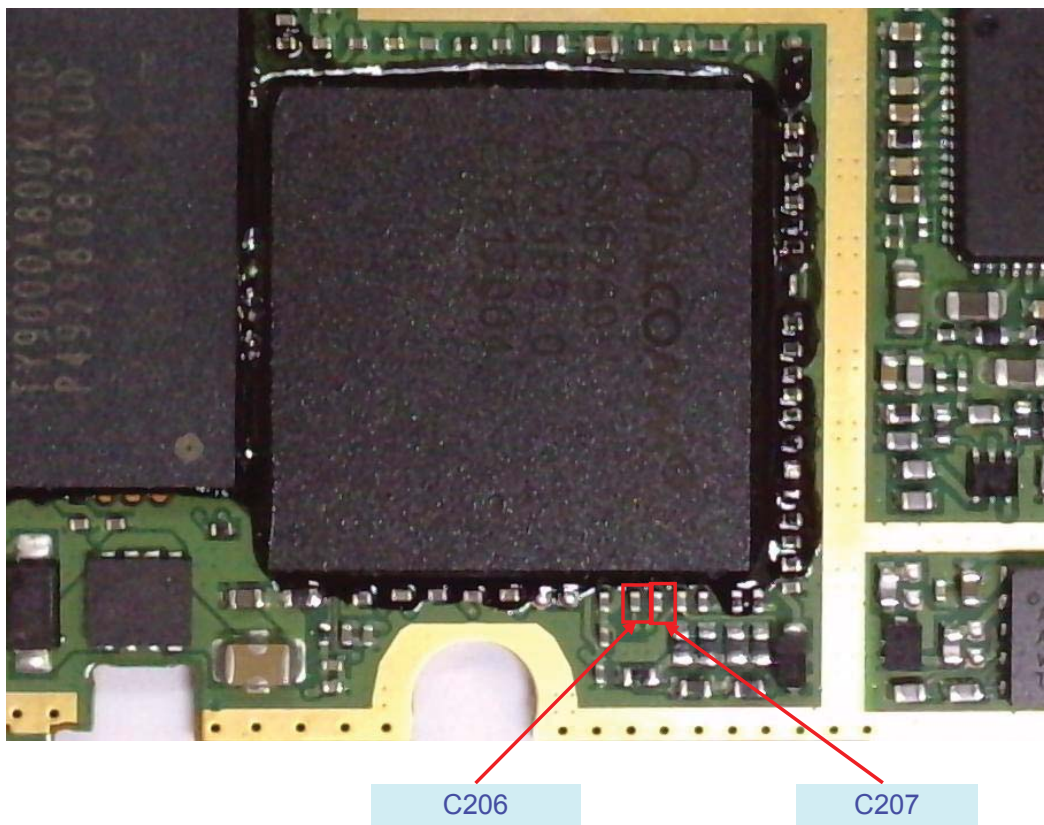
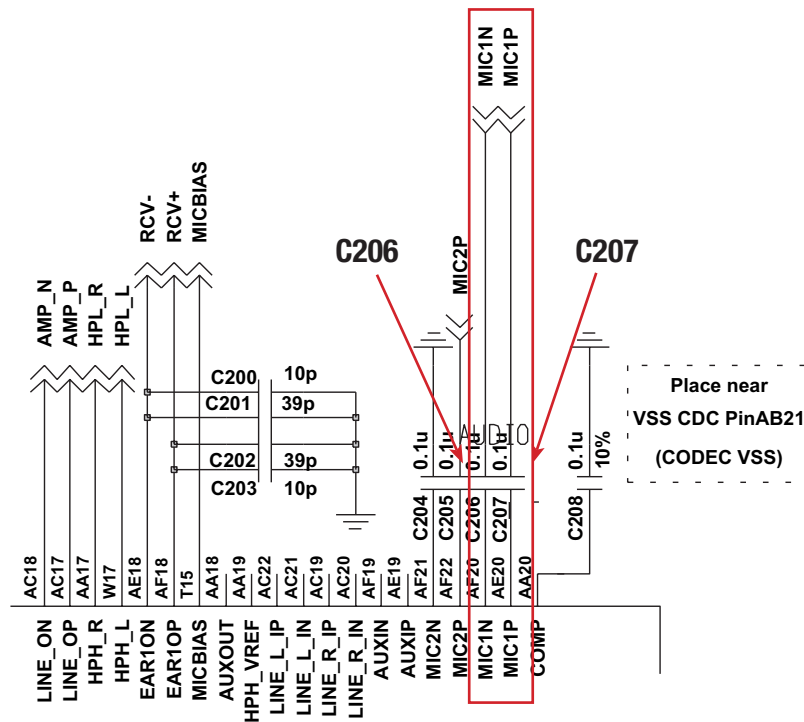
MIC300 → C206, C207 → MIC1P, MIC1N(MSM6260)



MIC



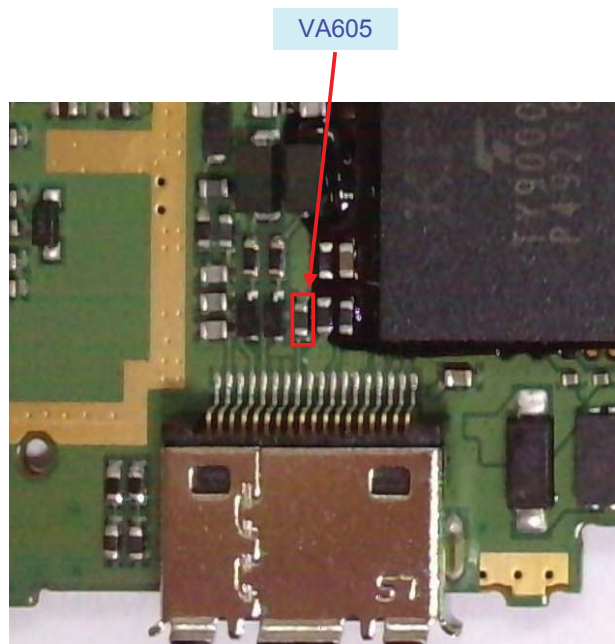
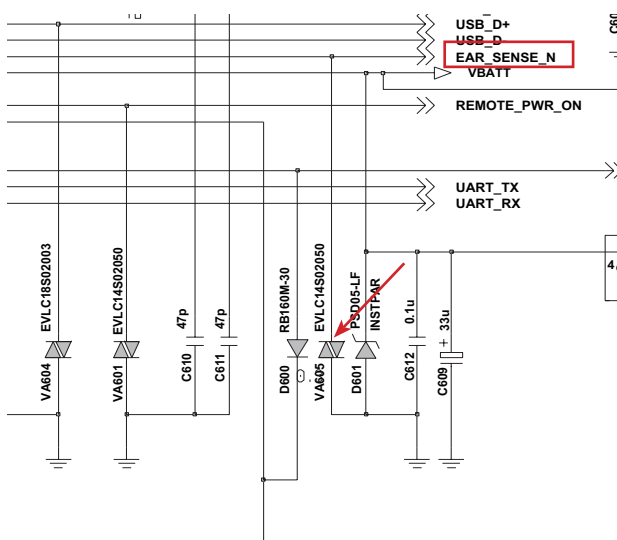
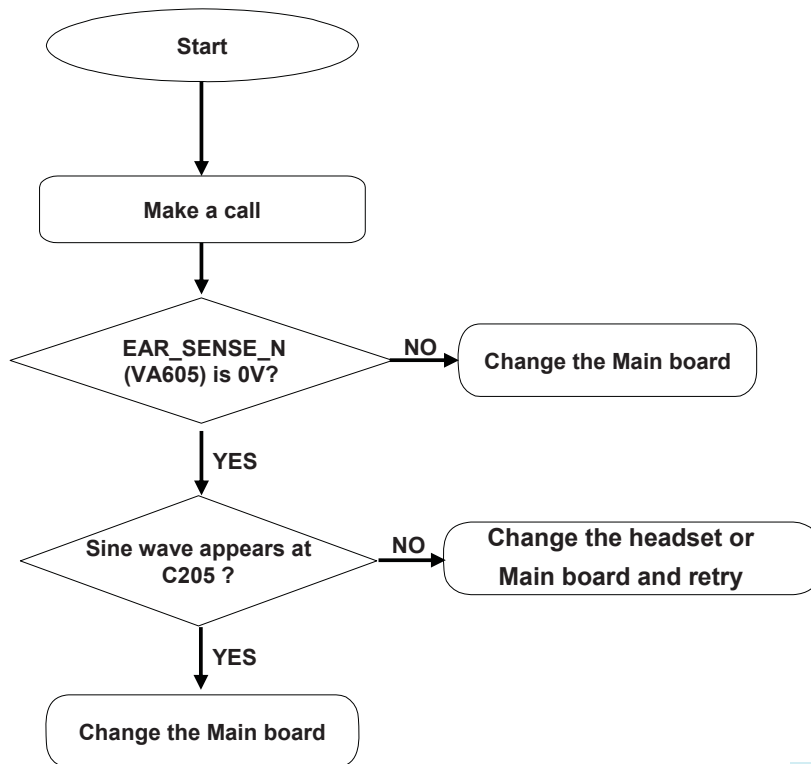
4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

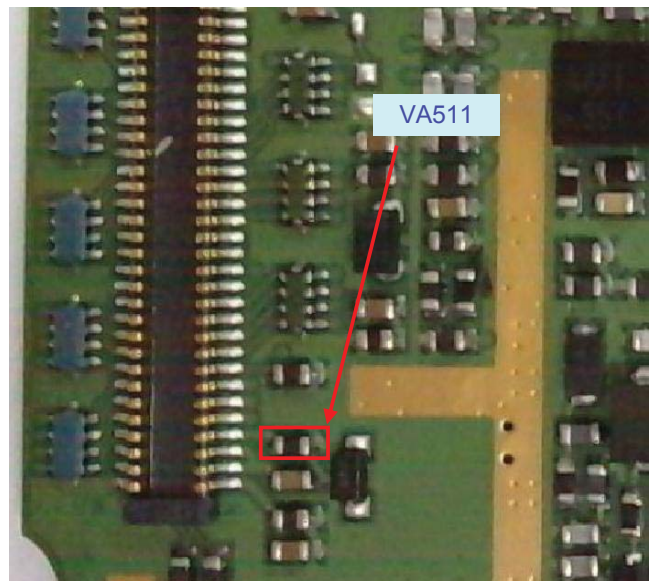
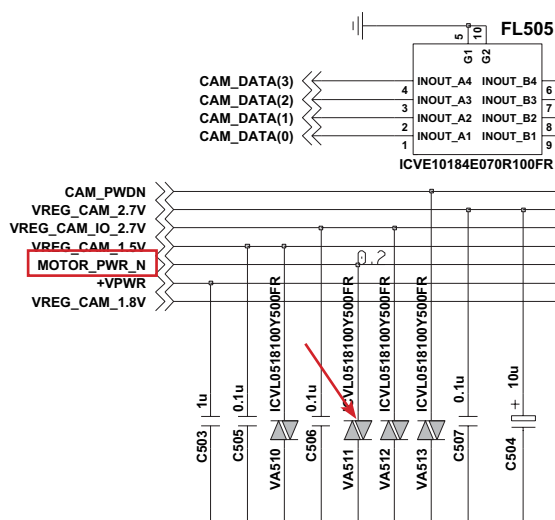
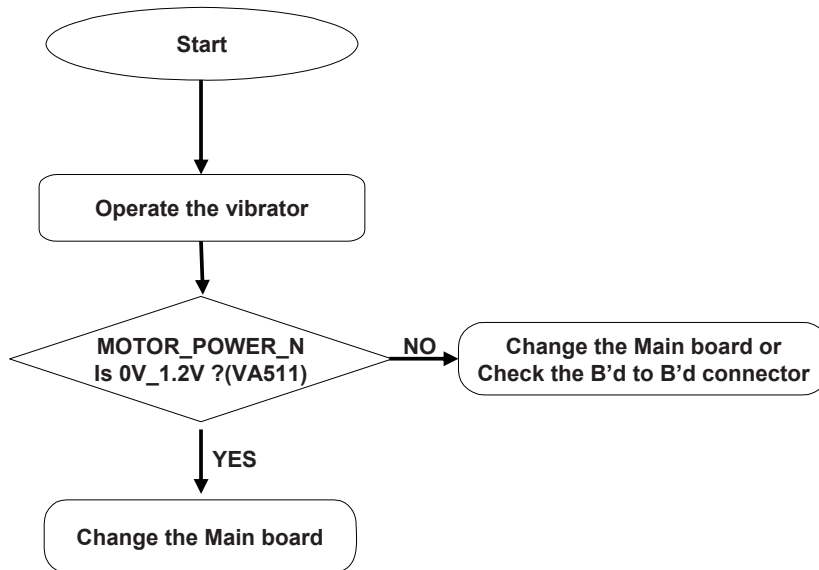
4.20.8 Headset microphone

Headset → C205 → MIC2P(MSM6260)



4.20.9 Vibrator

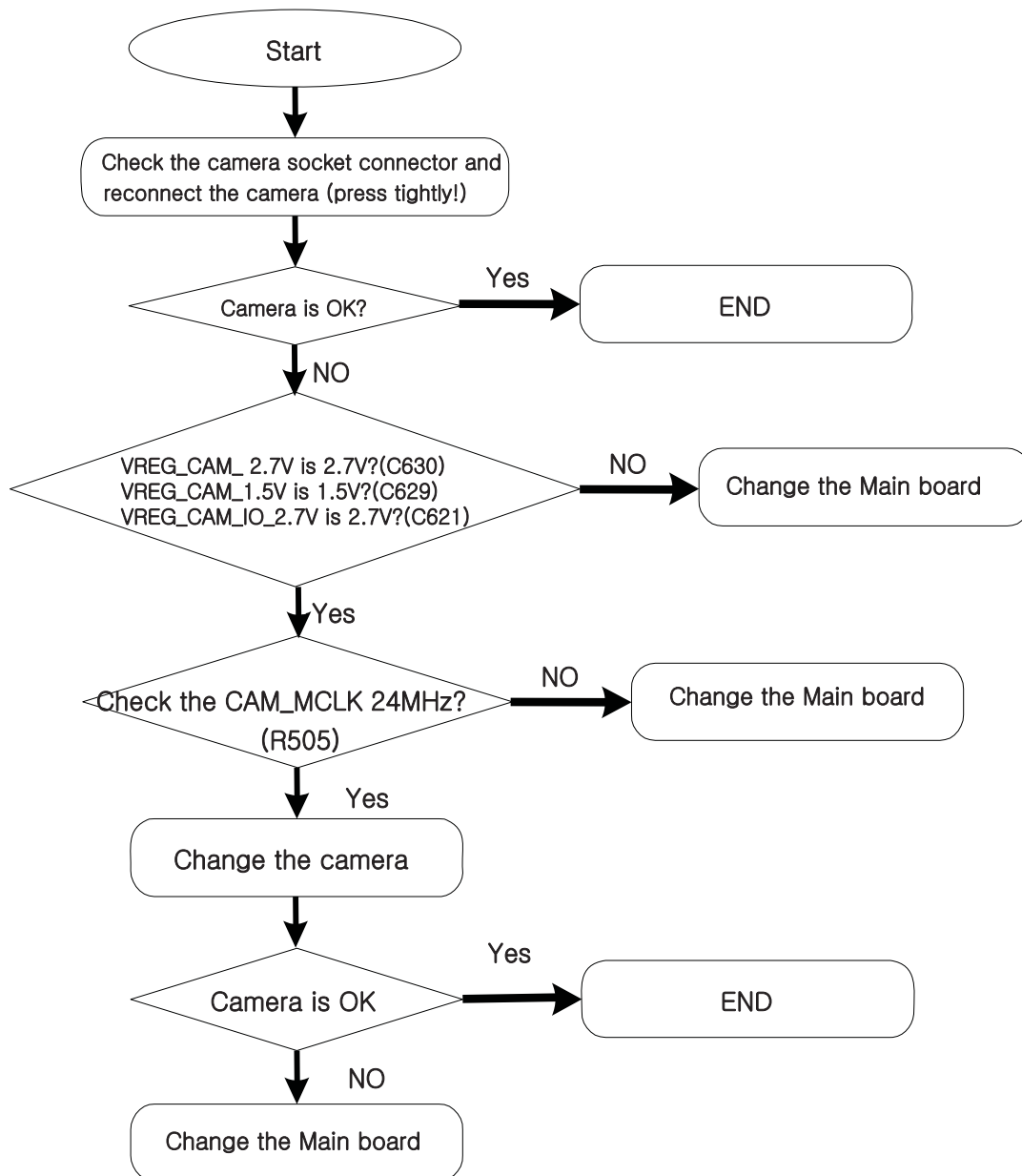
PM6658 MOTOR_POWER_N goes to 0V ~ 1.2V → B'd to B'd connector → Motor



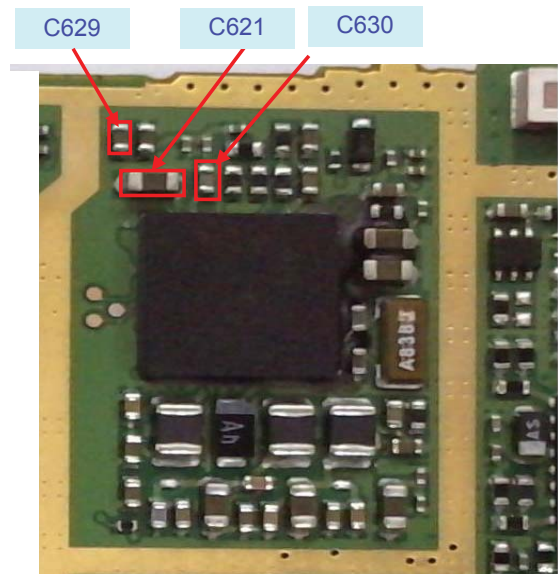
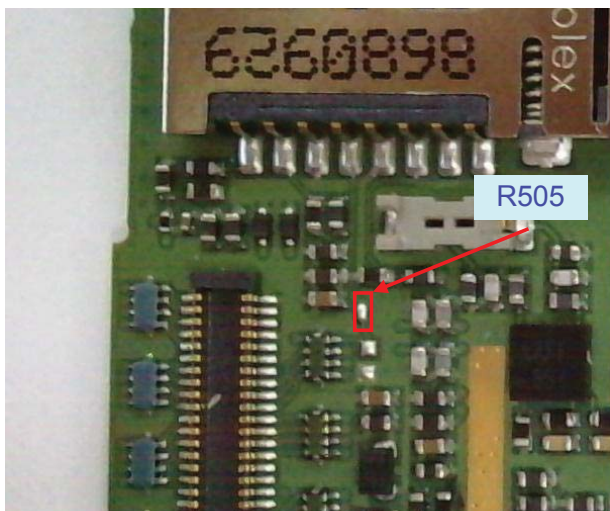
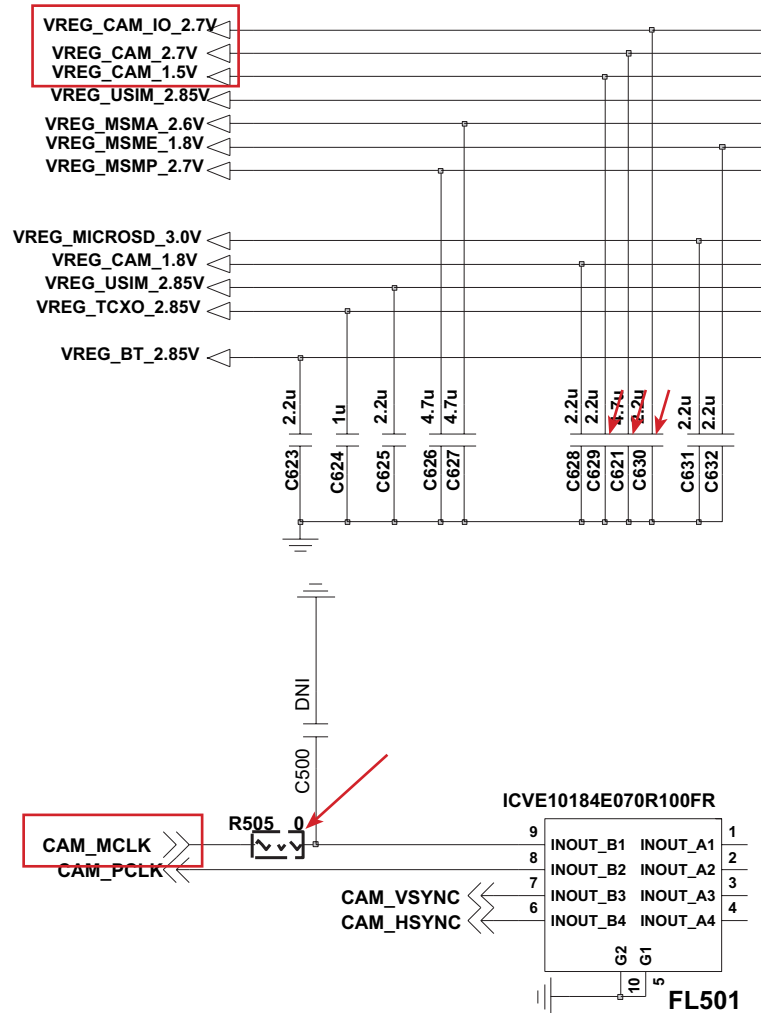
4. TROUBLE SHOOTING

4.20.10 Camera Troubleshooting

Camera control signals are generated by MSM6260 & PM6658.
Check the camera Socket first!



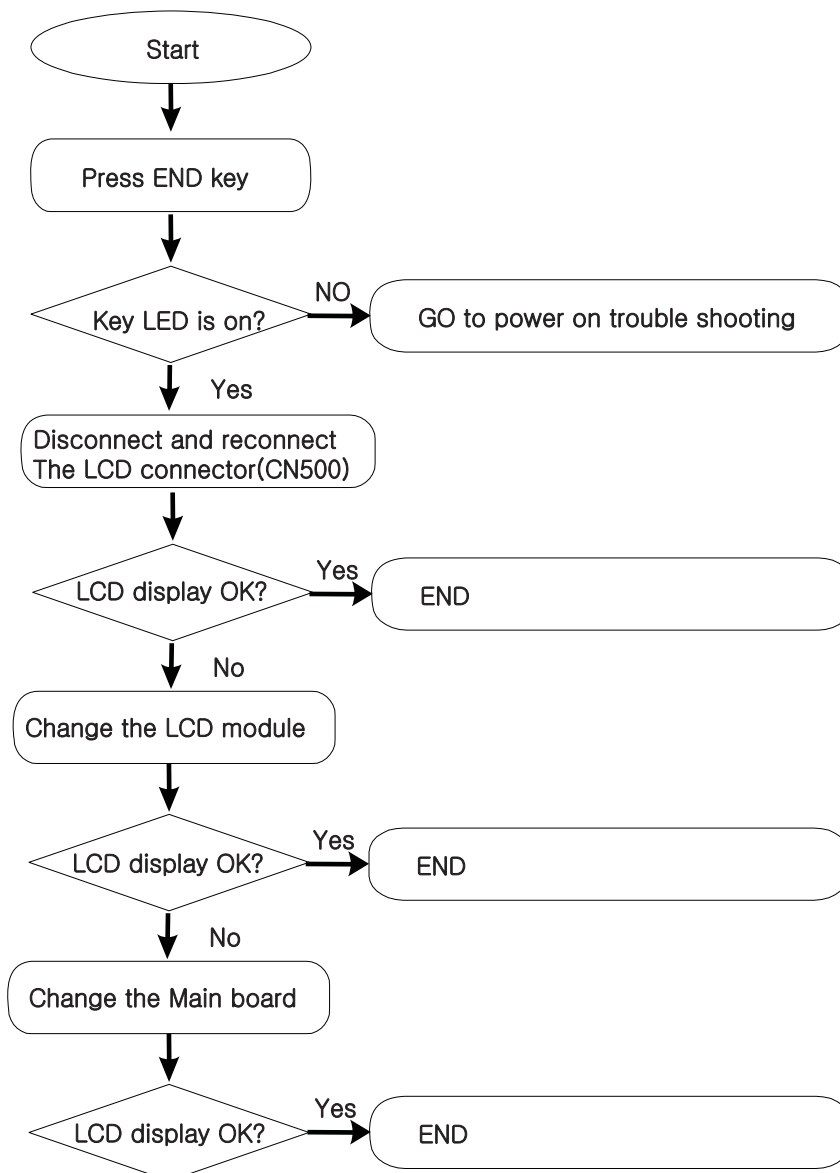
4. TROUBLE SHOOTING



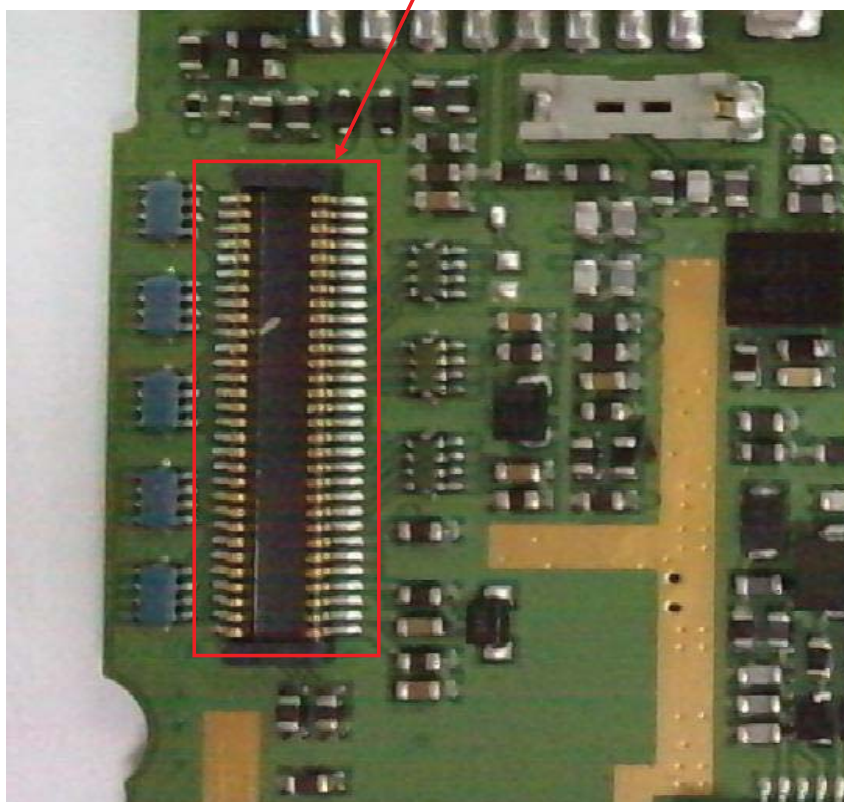
4. TROUBLE SHOOTING

4.20.11 Main LCD Troubleshooting

Main LCD control signals are generated by MSM6260. The signal path is :
MSM6260 → CN500 → LCD Module



CN500



5. Download Instruction

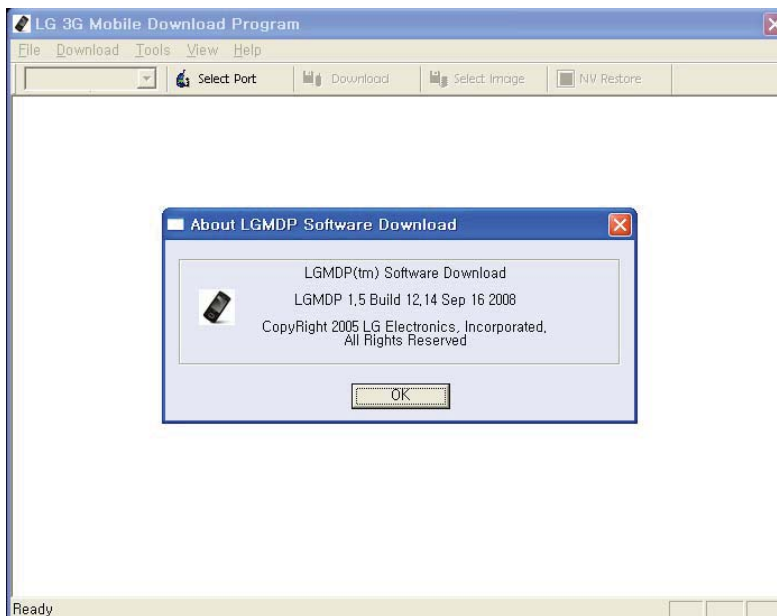
5. Download Instruction

5.1 Preparation

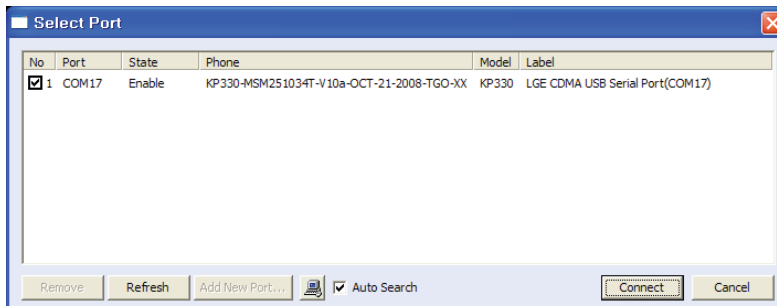
- ✓ Check the version of LGMDP. The version should be newer than LGMDP 1.5 Build 12. 14 (Sep 16 2008)
- ✓ 18 pins USB cable is needed

5.2 Downloading Procedure

1. Turn the phone on and connect the phone to PC via USB
2. Execute LGMDP.exe



3. Click "Select Port" from the menu. Then the window will popup and show the port and the status. Note that the status becomes "Enable".

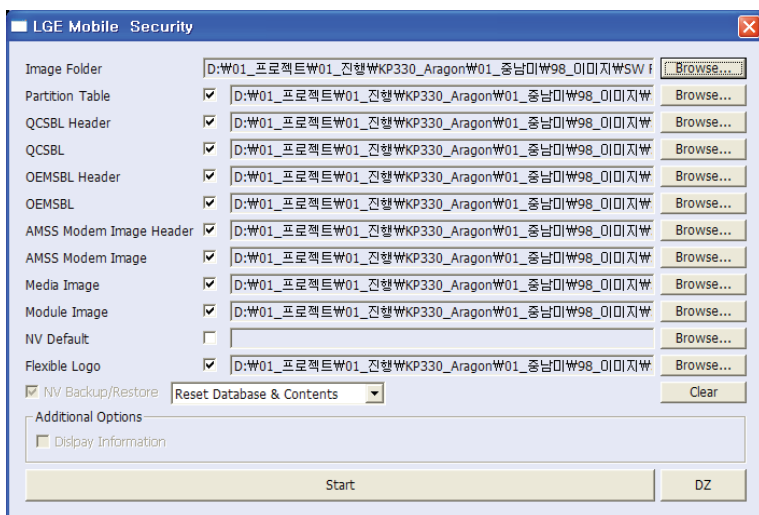


5. Download Instruction

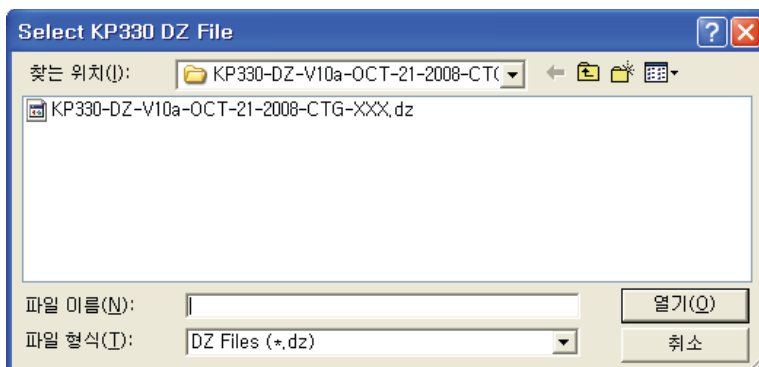
4. Click “Connect” then you will see the following popup.



If You have the following window then click “DZ” button to have the above popup.

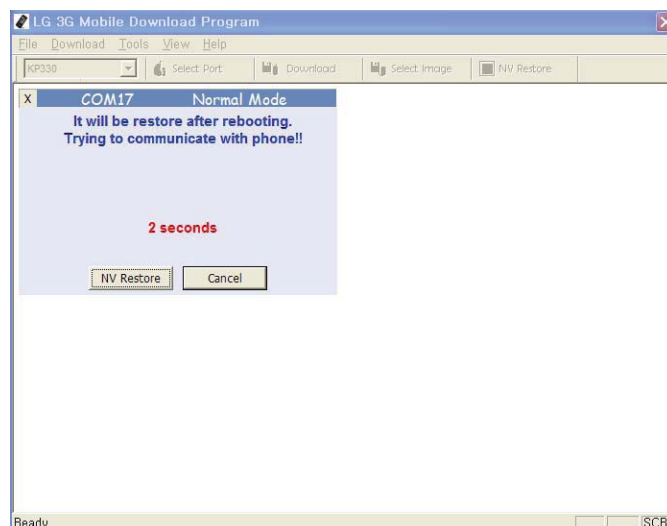
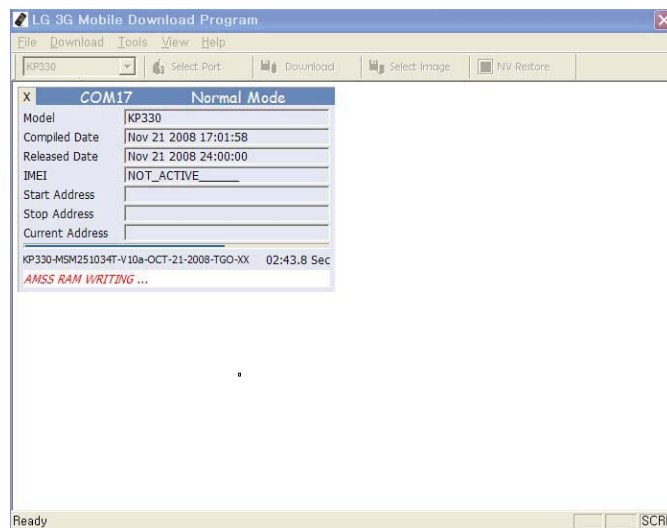
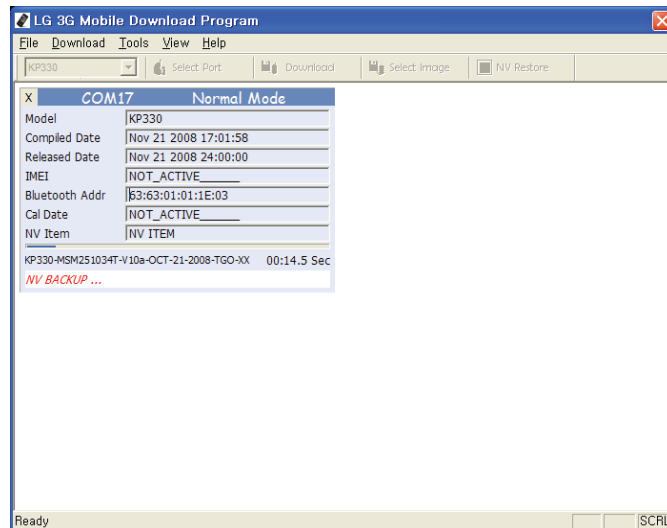


5. Click “Browse..” button and select the location of your DZ file.



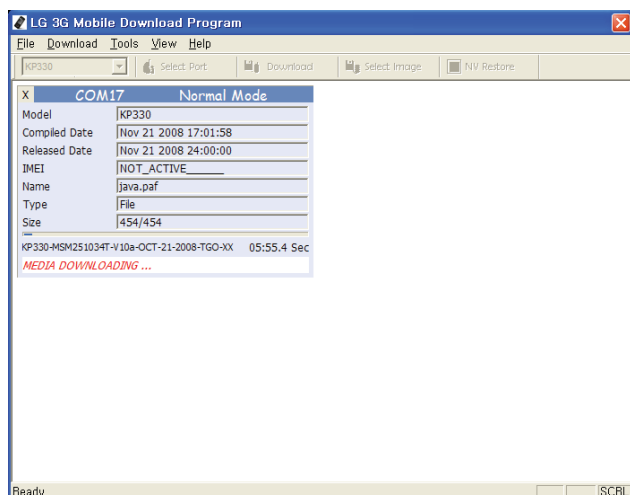
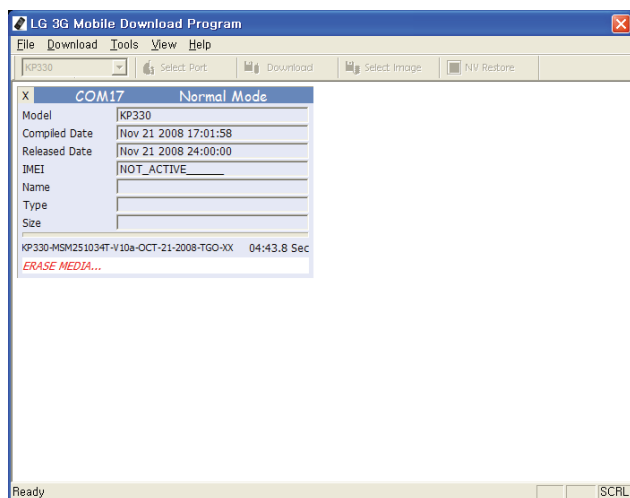
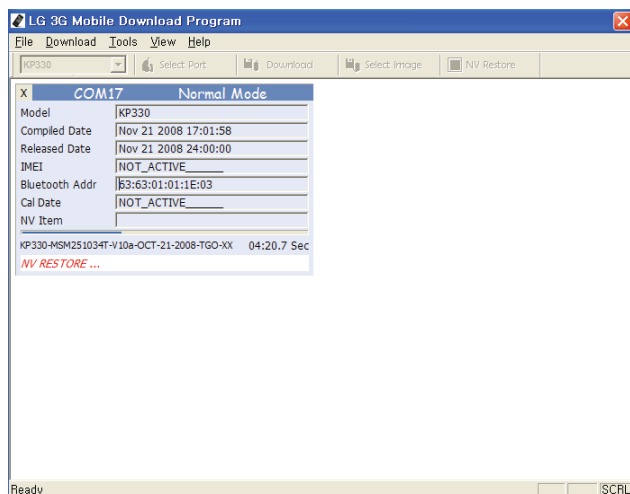
Then the download program will automatically start downloading and the following progress will be observed.

5. Download Instruction

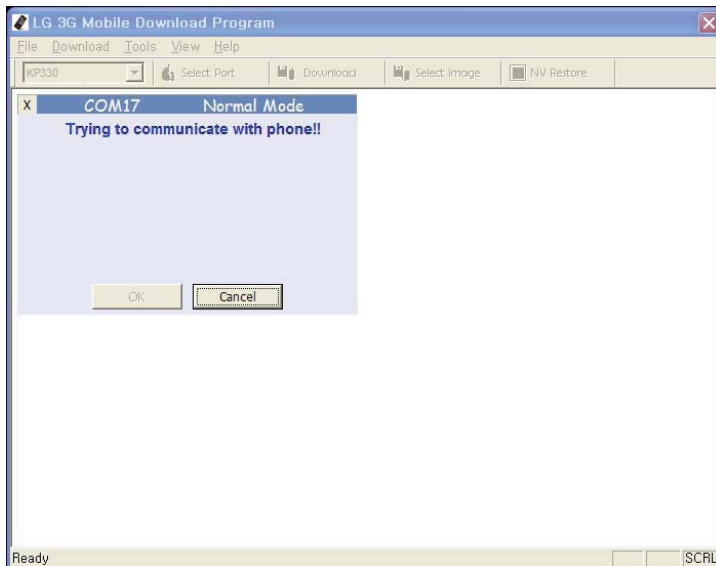


5. Download Instruction

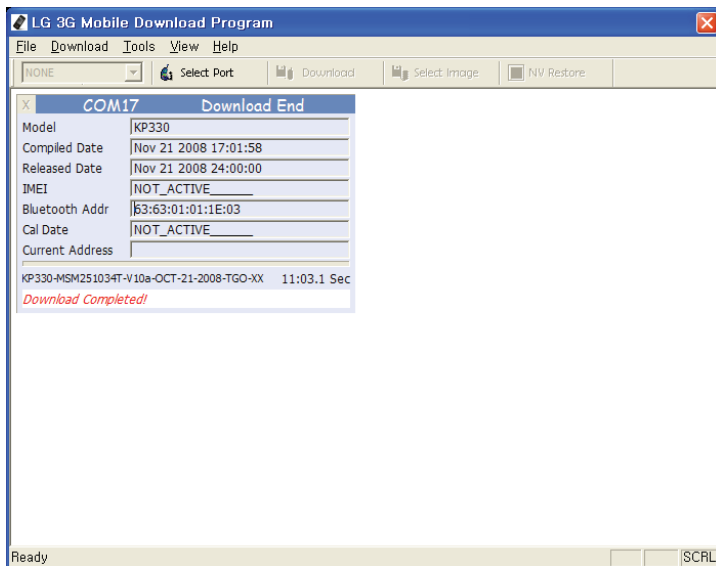
In the middle of the download process, the phone will be automatically rebooted once and restarts downloading.



5. Download Instruction



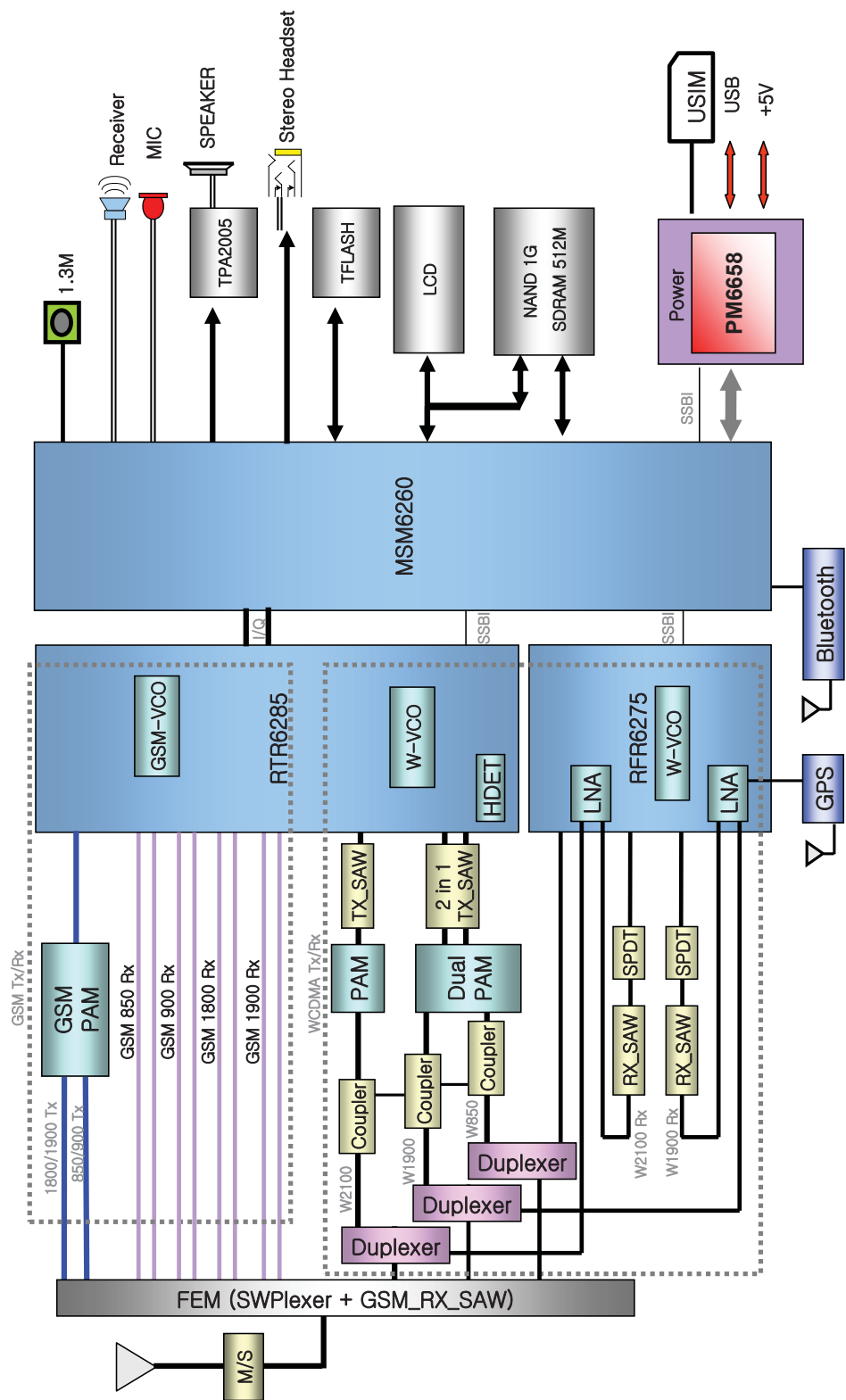
10. When the download is completed, you will see the following screen. Finish!!



11. Now, you can disconnect the cable.

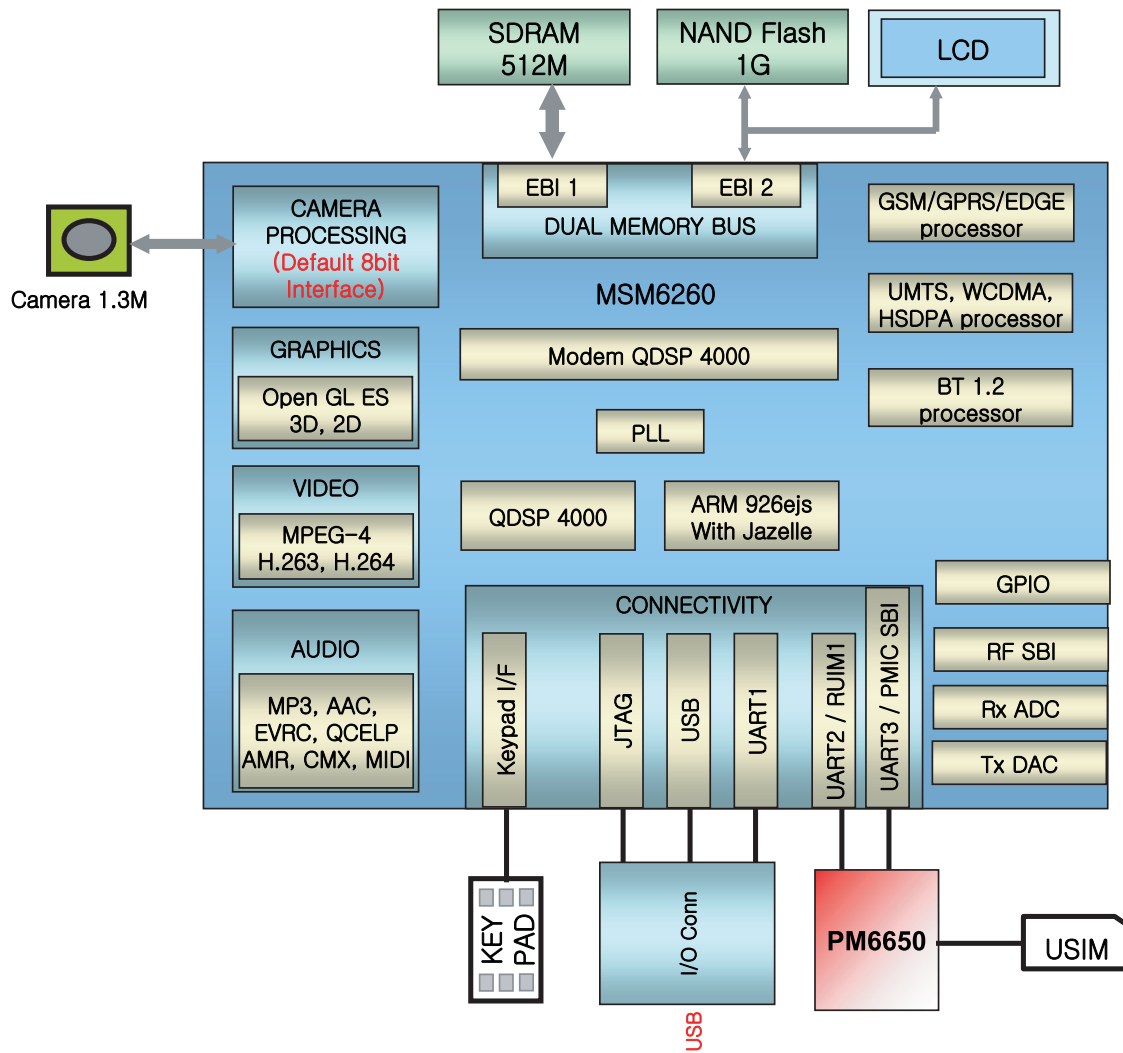
6. Block Diagram

KU-515 Block Diagram

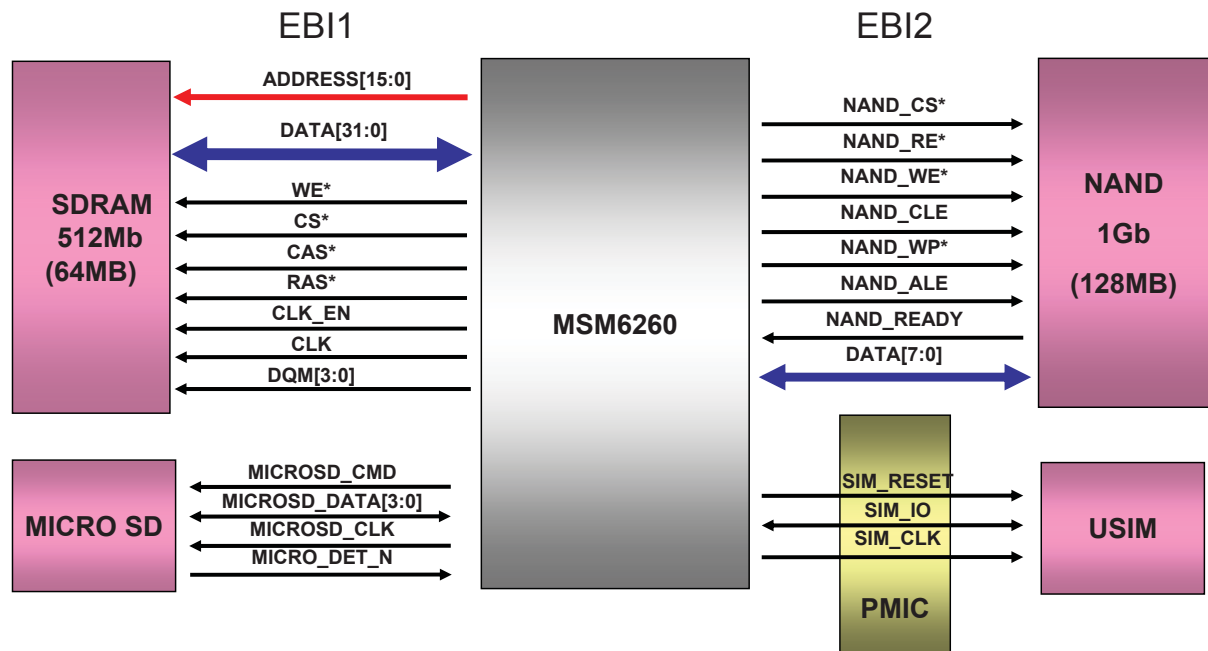


6. BLOCK DIAGRAM

MSM6260 (Block Diagram)

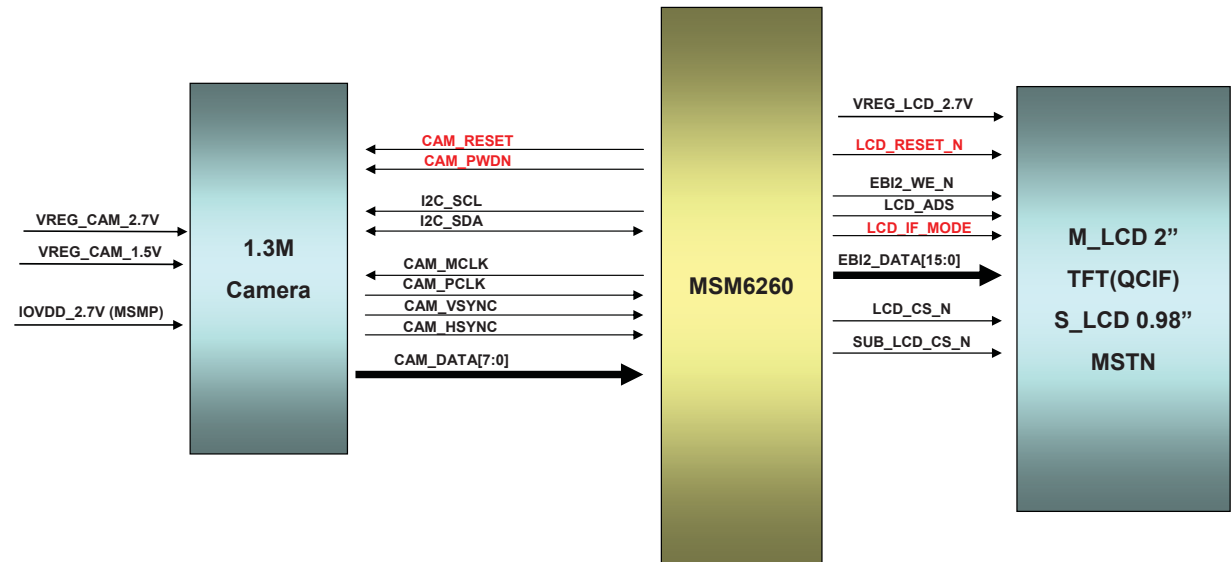


Camera & LCD Interface

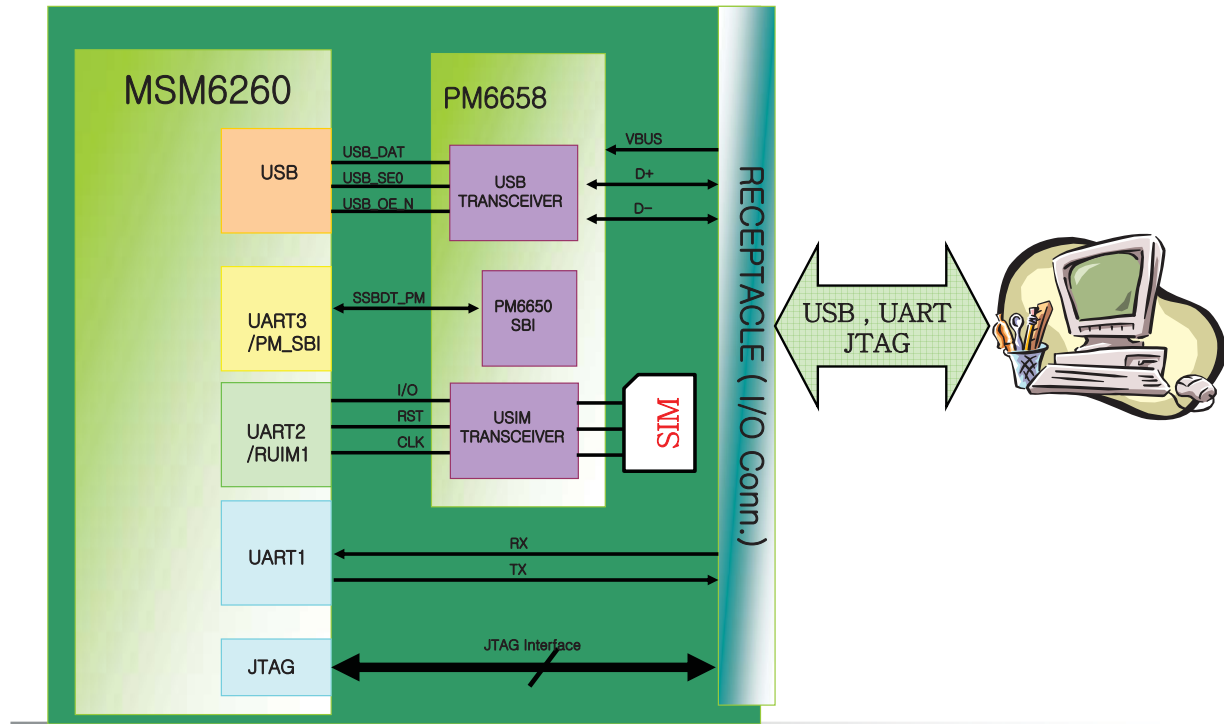


6. BLOCK DIAGRAM

Camera & LCD Interface

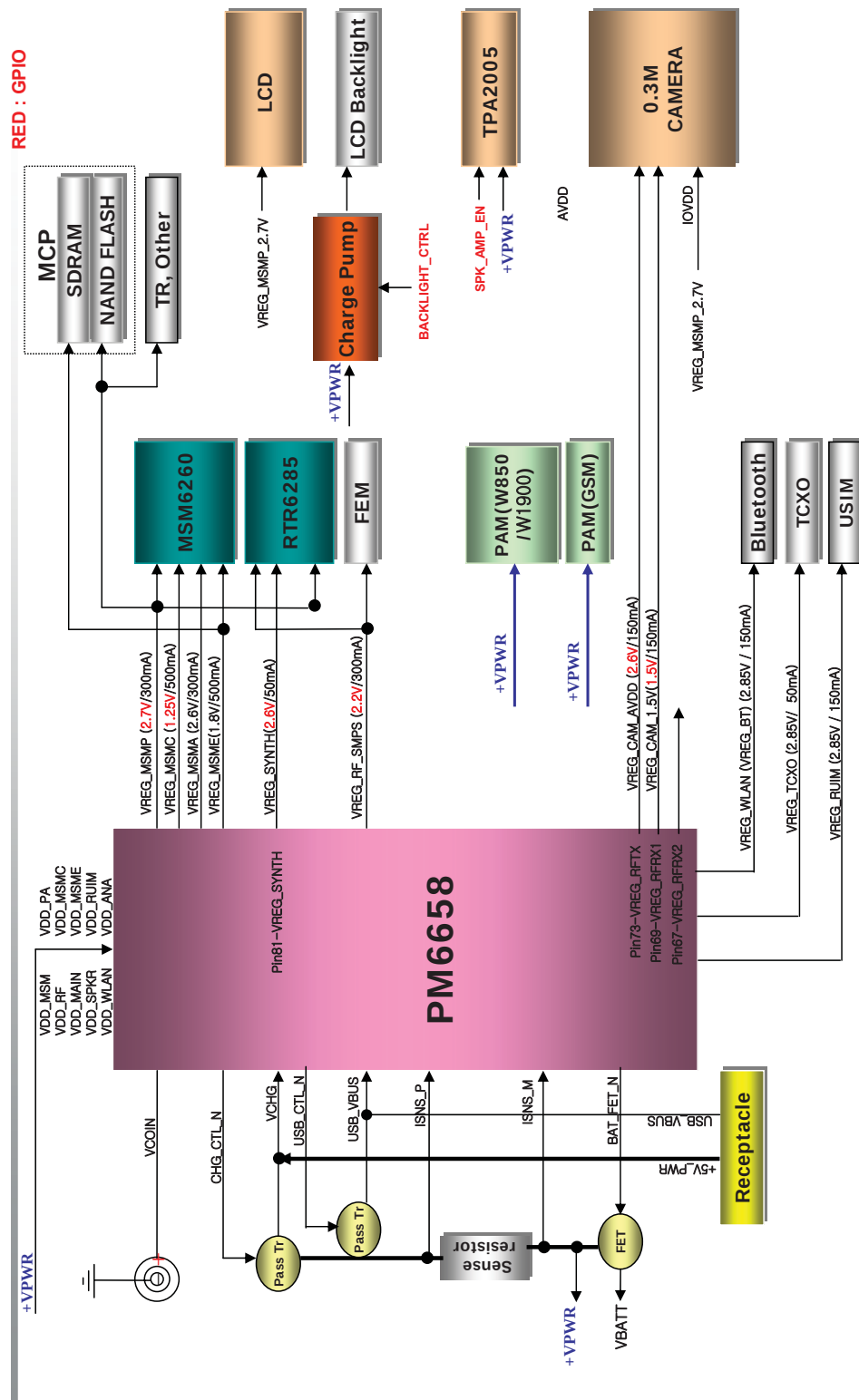


Interface USB,UART,SIM,JTAG

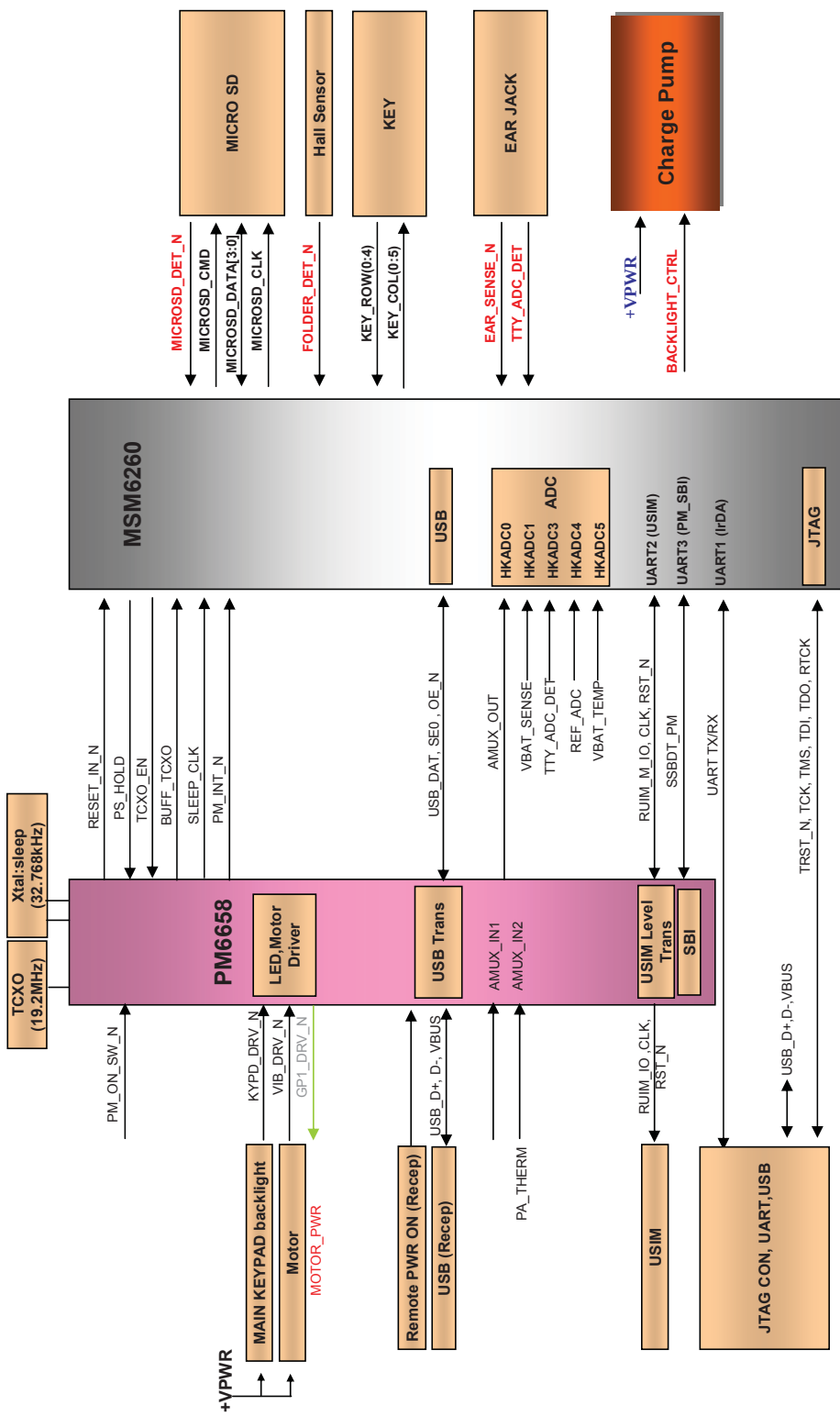


6. BLOCK DIAGRAM

Power Block Diagram

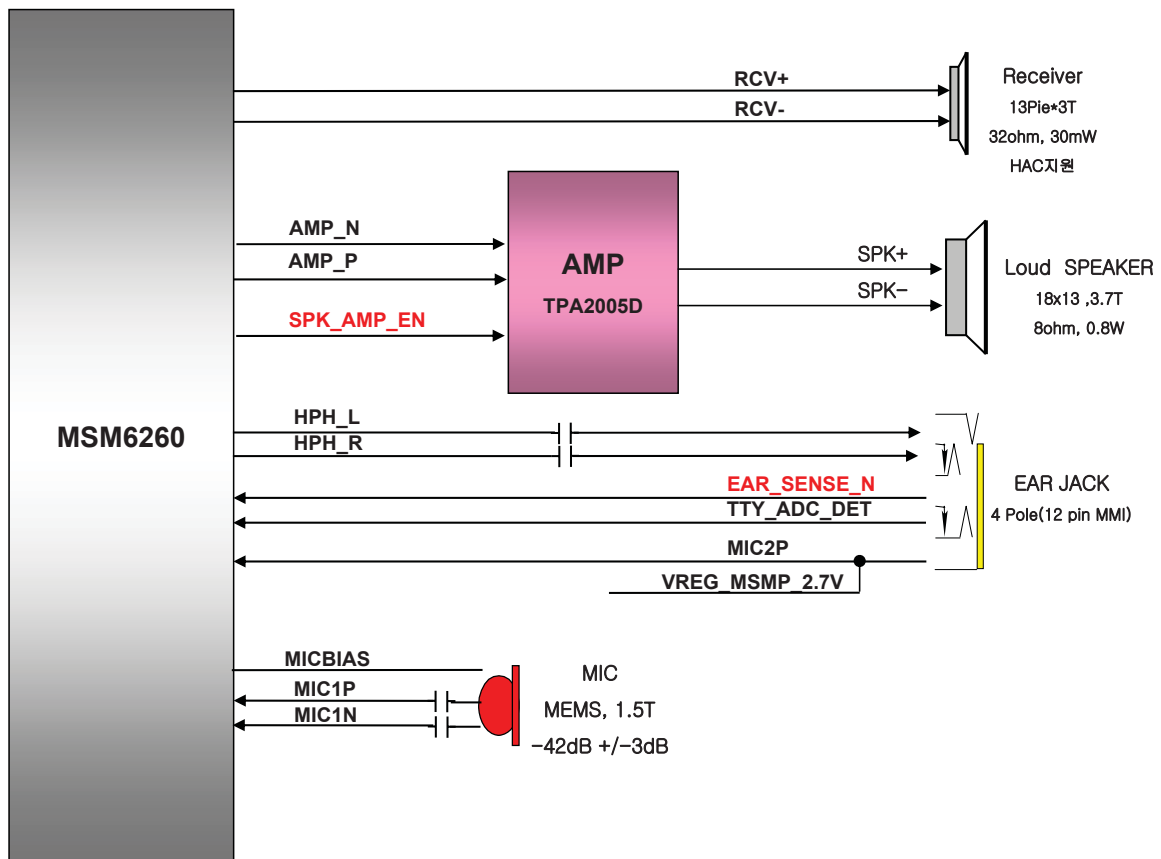


Peripheral

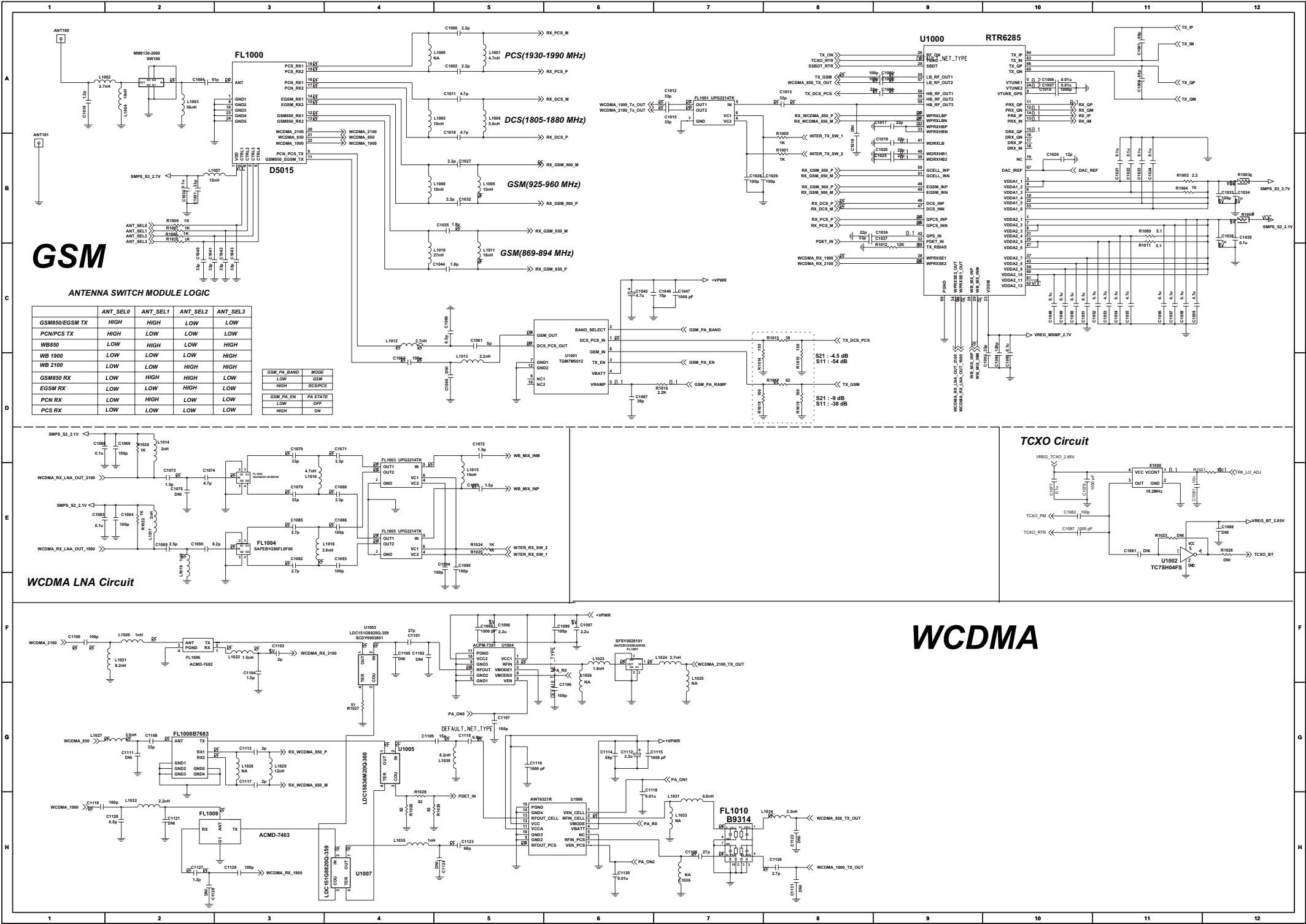


6. BLOCK DIAGRAM

Audio Block Diagram



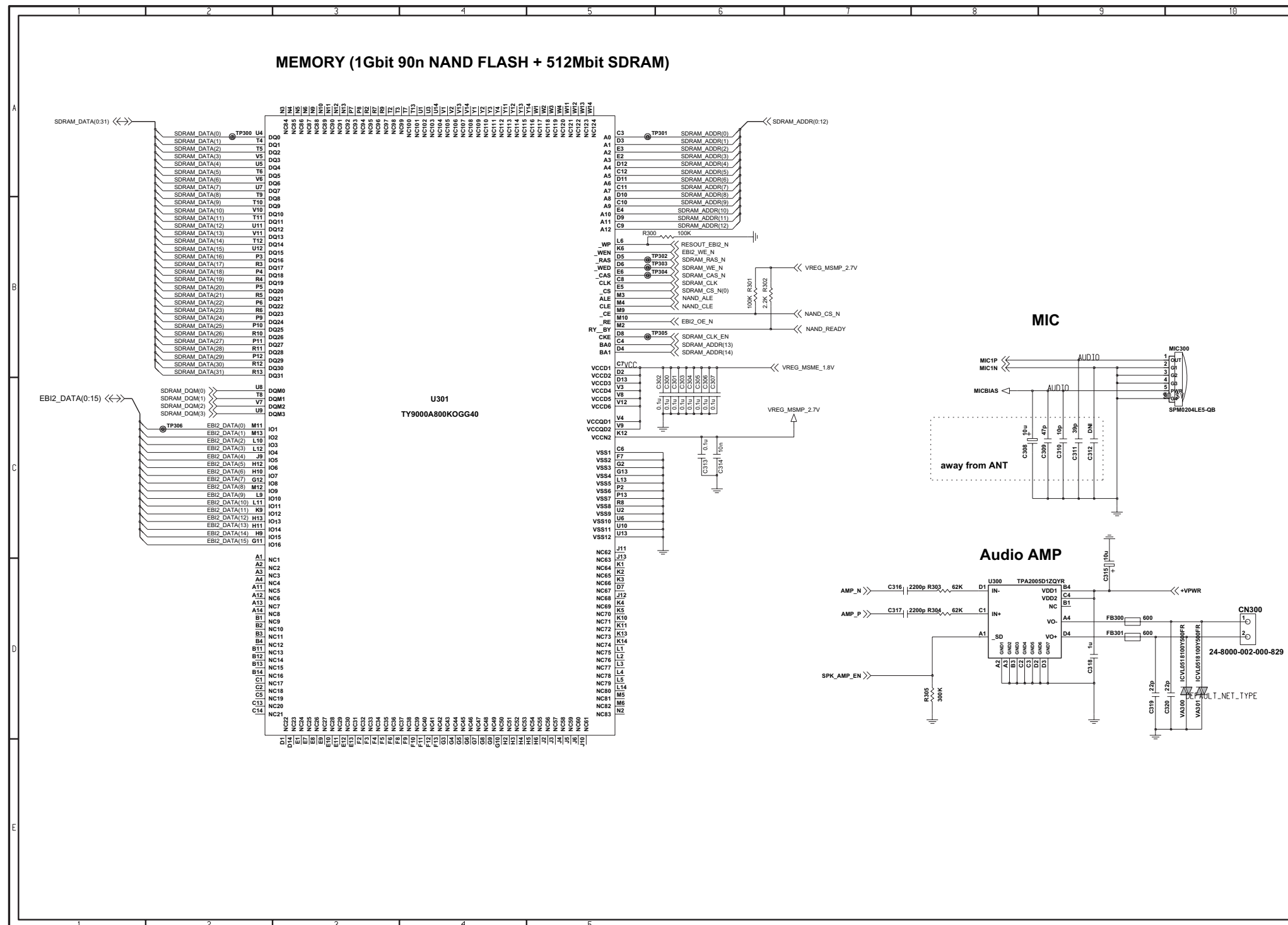
7. CIRCUIT DIAGRAM



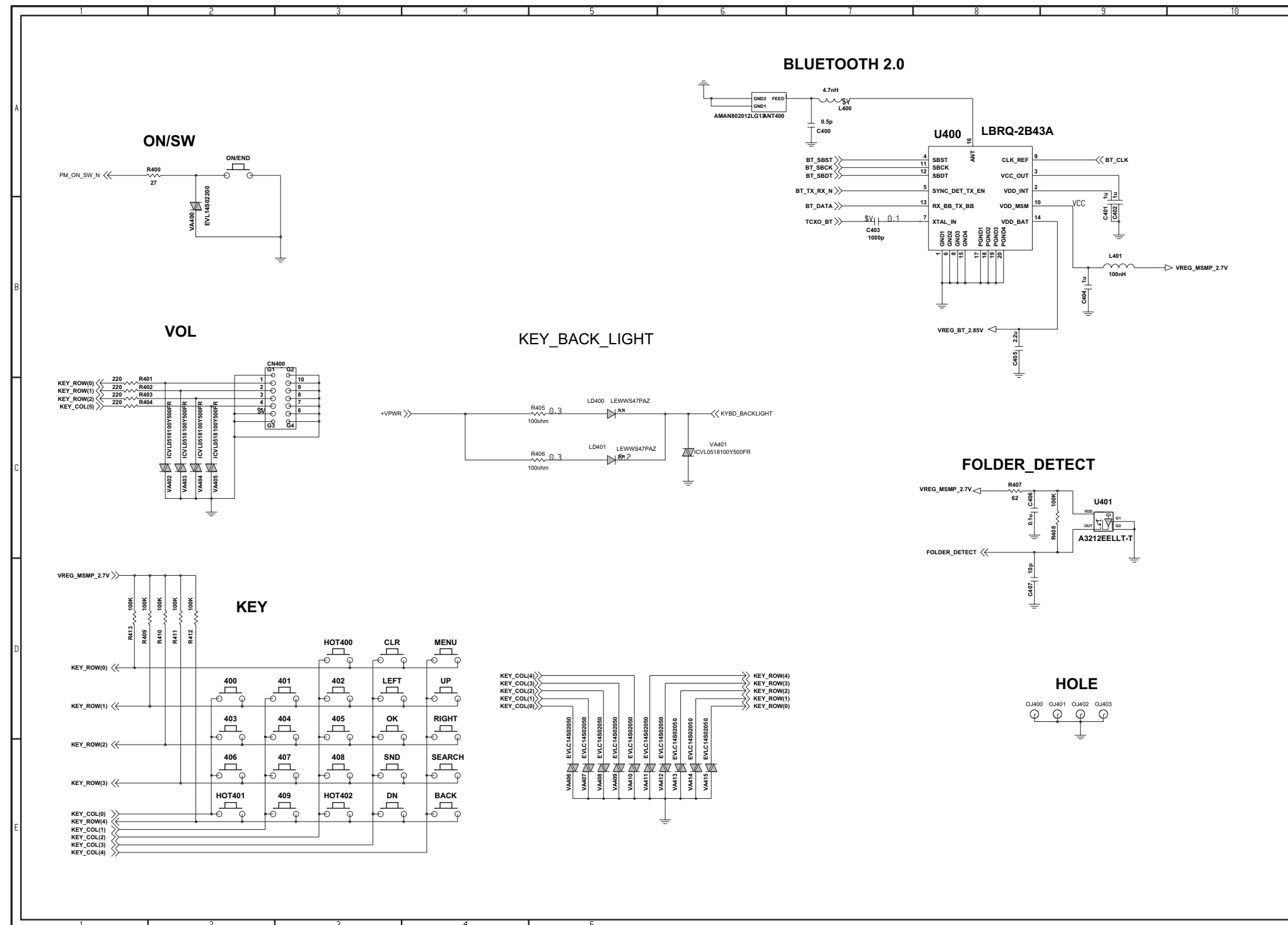
LGE Internal Use Only



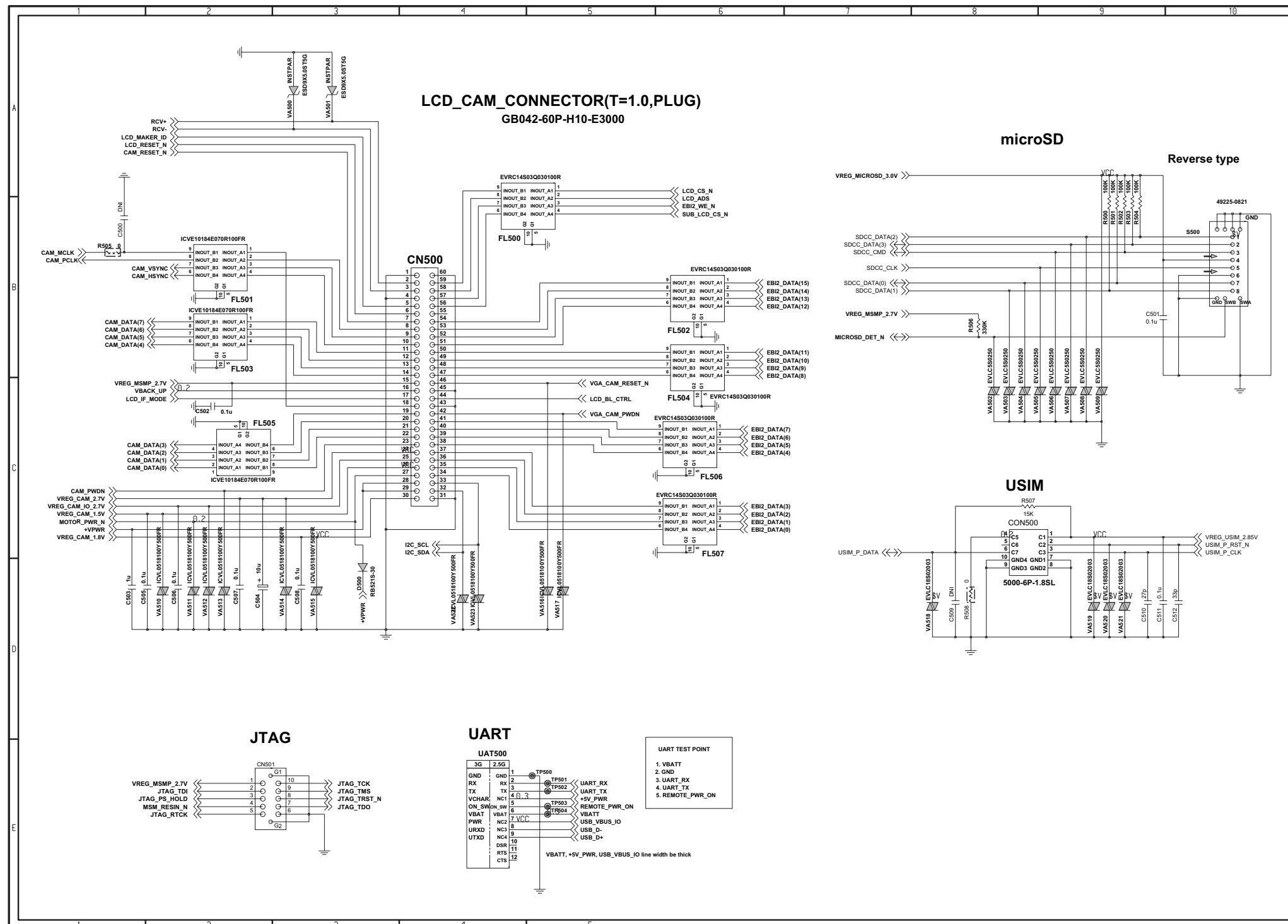
7. CIRCUIT DIAGRAM



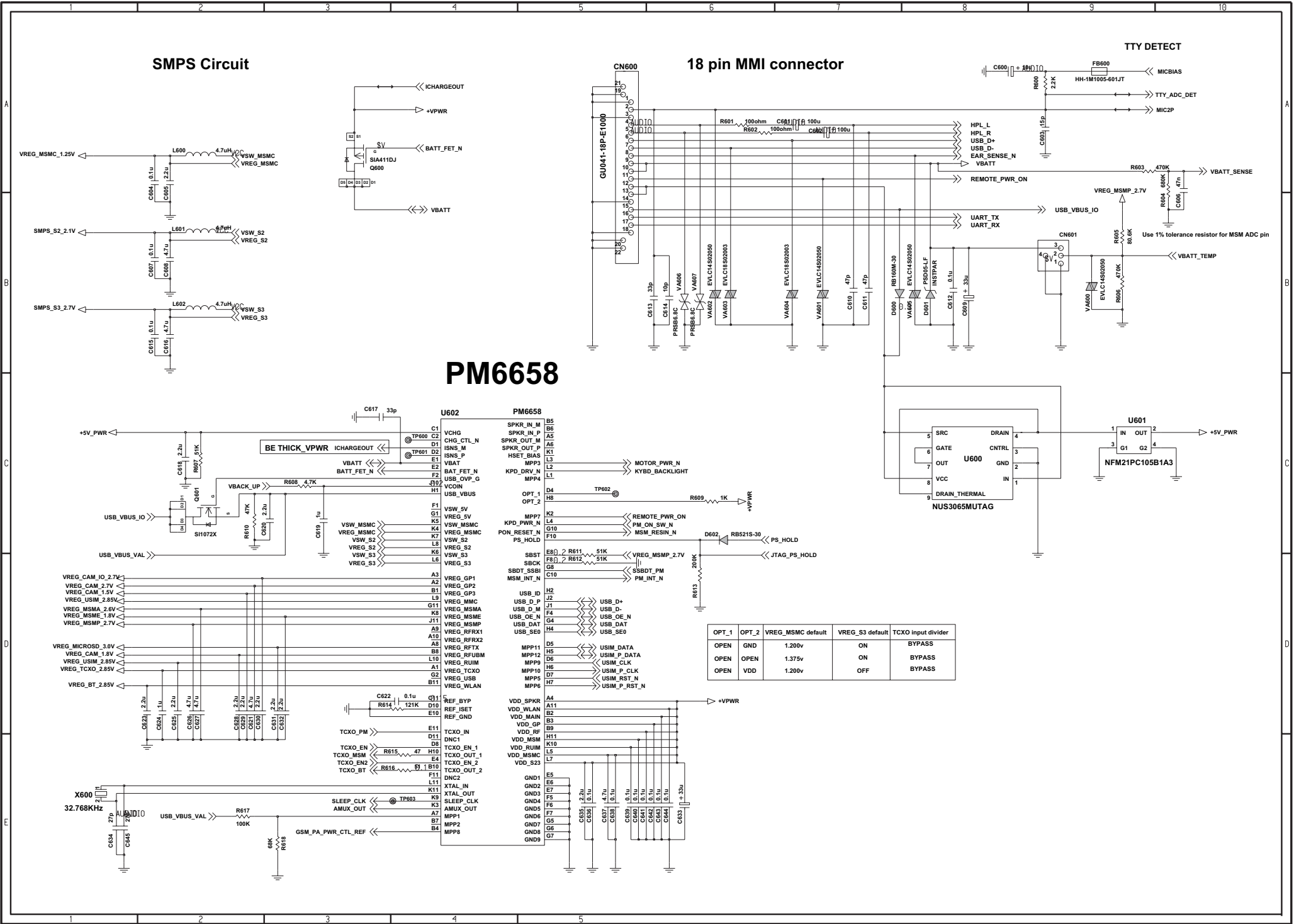
7. CIRCUIT DIAGRAM



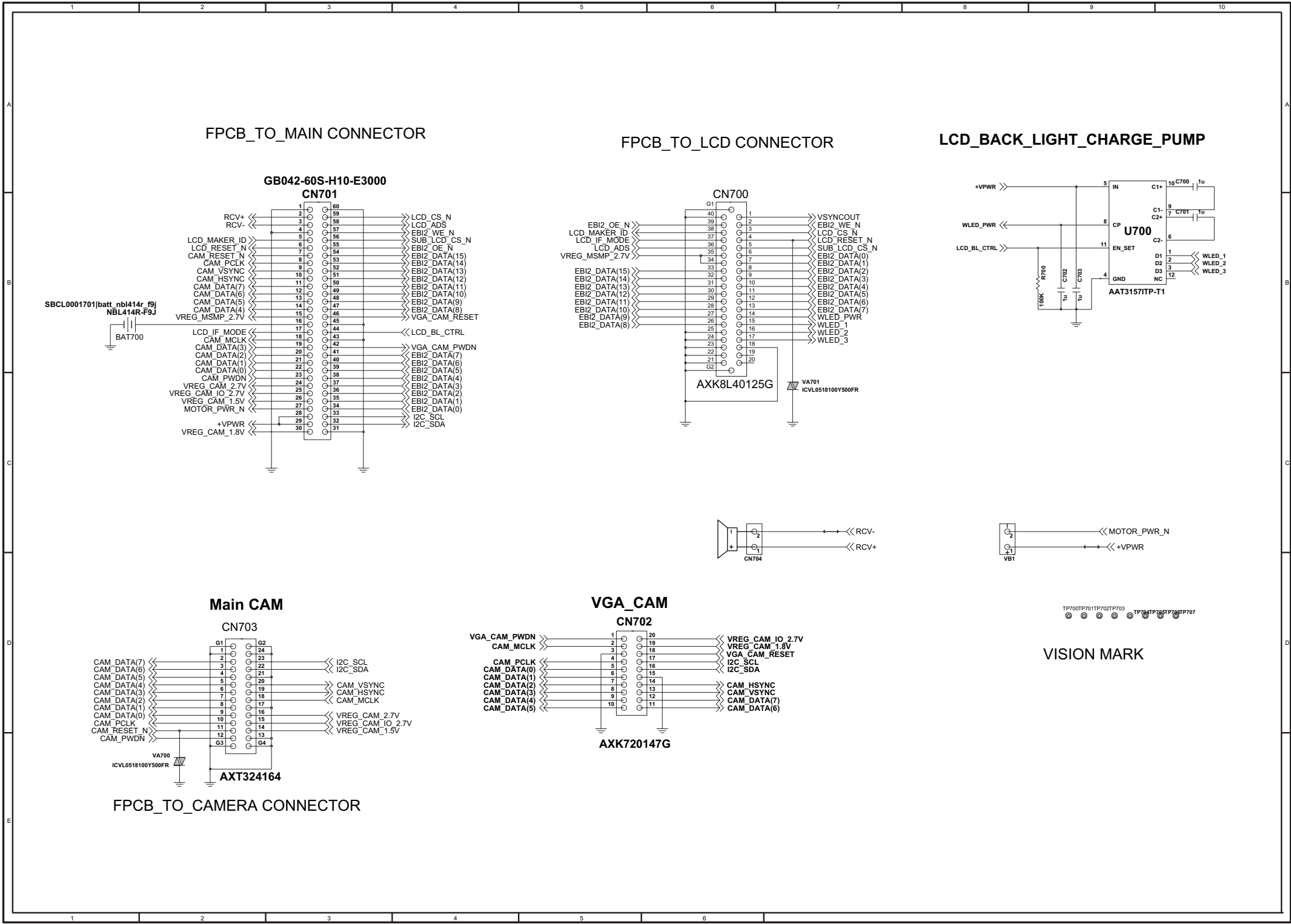
7. CIRCUIT DIAGRAM



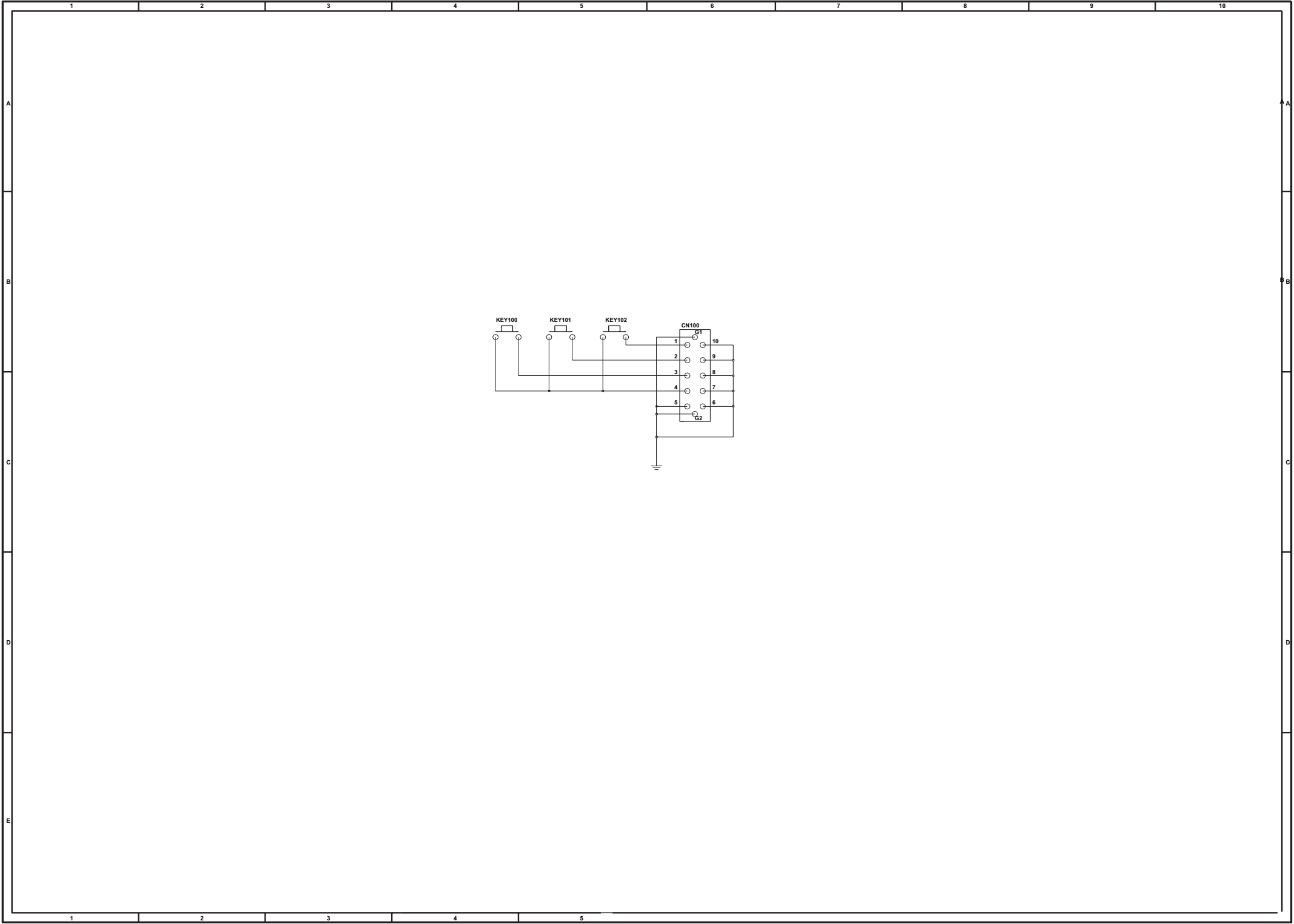
7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM



8. BGA Pin Map

PIN ASSIGNMENT (TOP VIEW)

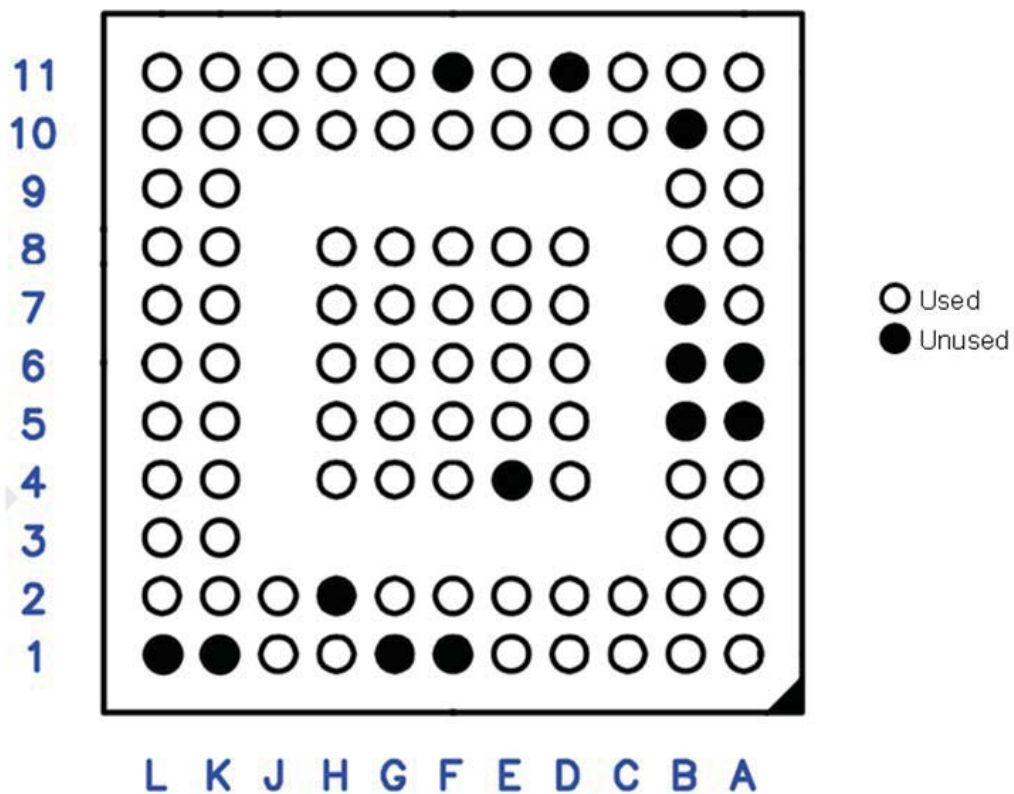
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	NC	NC	NC	NC							NC	NC	NC	NC
B	NC	NC	NC	NC							NC	NC	NC	NC
C	NC	NC	○	○	○	○	○	○	○	○	○	○	NC	NC
D	NC	○	○	○	○	○	NC	○	○	○	○	○	○	NC
E	NC	○	○	○	○	○	NC	NC	NC	NC	NC	NC	NC	
F		NC	NC	NC	NC	NC	○	NC	NC	NC	NC	NC	NC	
G		○	NC	NC	NC	NC	NC	NC	NC	NC	○	○	○	
H		NC	NC	NC	NC	NC			○	○	○	○	○	
J		NC	NC	NC	NC	NC			○	NC	NC	NC	NC	
K	NC	NC	NC	NC	NC	○			○	NC	NC	○	NC	NC
L	NC	NC	NC	NC	NC	○			○	○	○	○	○	NC
M		○	○	○	NC	NC			○	○	○	○	○	
N		NC	NC	NC	NC	NC			NC	NC	NC	NC	NC	
P		○	○	○	○	○	NC	NC	○	○	○	○	○	
R		NC	○	○	○	○	NC	○	NC	○	○	○	○	
T		NC	NC	○	○	○	NC	○	○	○	○	○	NC	
U	NC	○	NC	○	○	○	○	○	○	○	○	○	○	NC
V	NC	NC	○	○	○	○	○	○	○	○	○	○	NC	NC
W	NC	NC	NC	NC							NC	NC	NC	NC
Y	NC	NC	NC	NC							NC	NC	NC	NC

○ Used

NC Unused



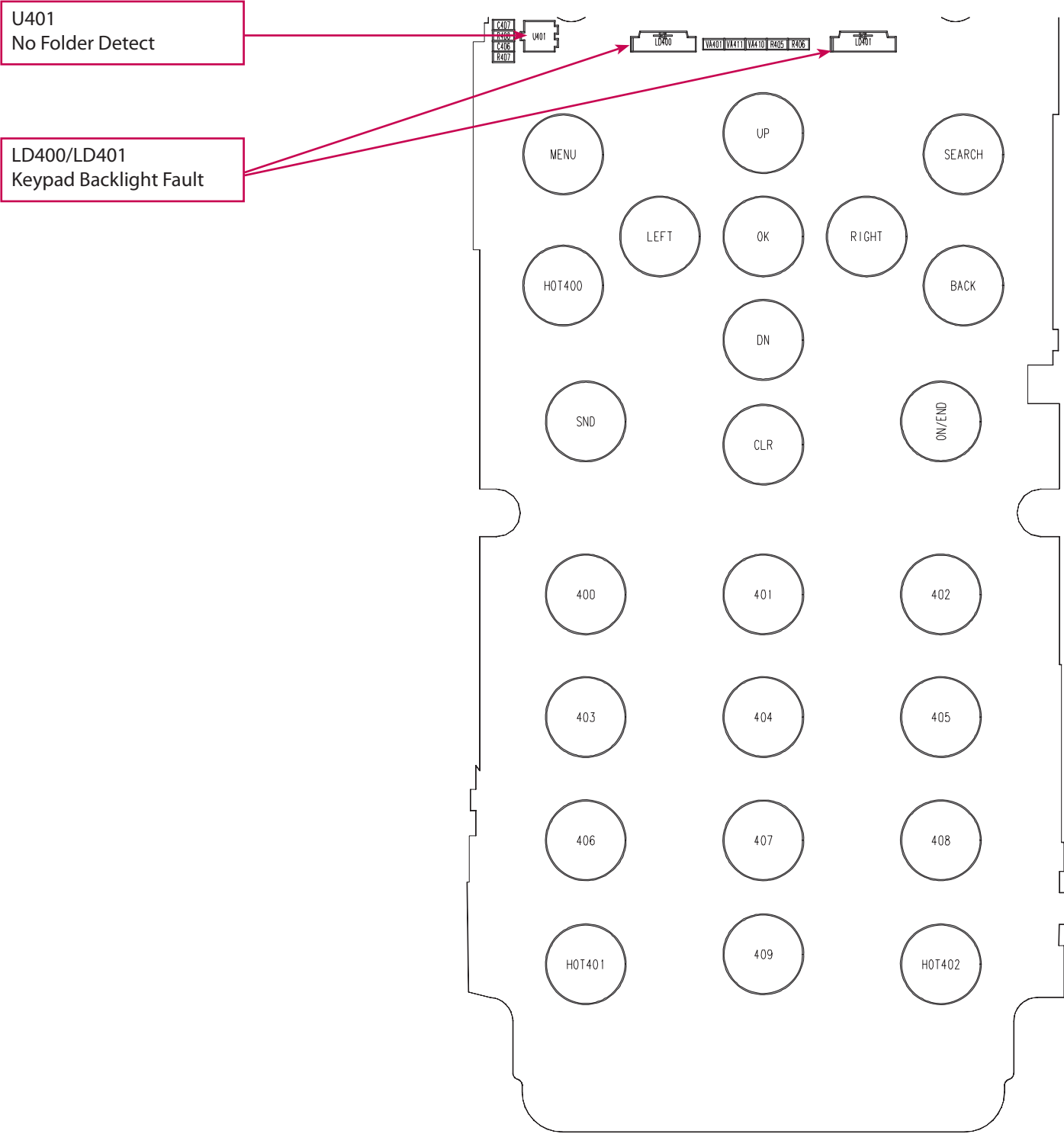
< Bottom view >



U602 (PM6658 - EUSY0350001)

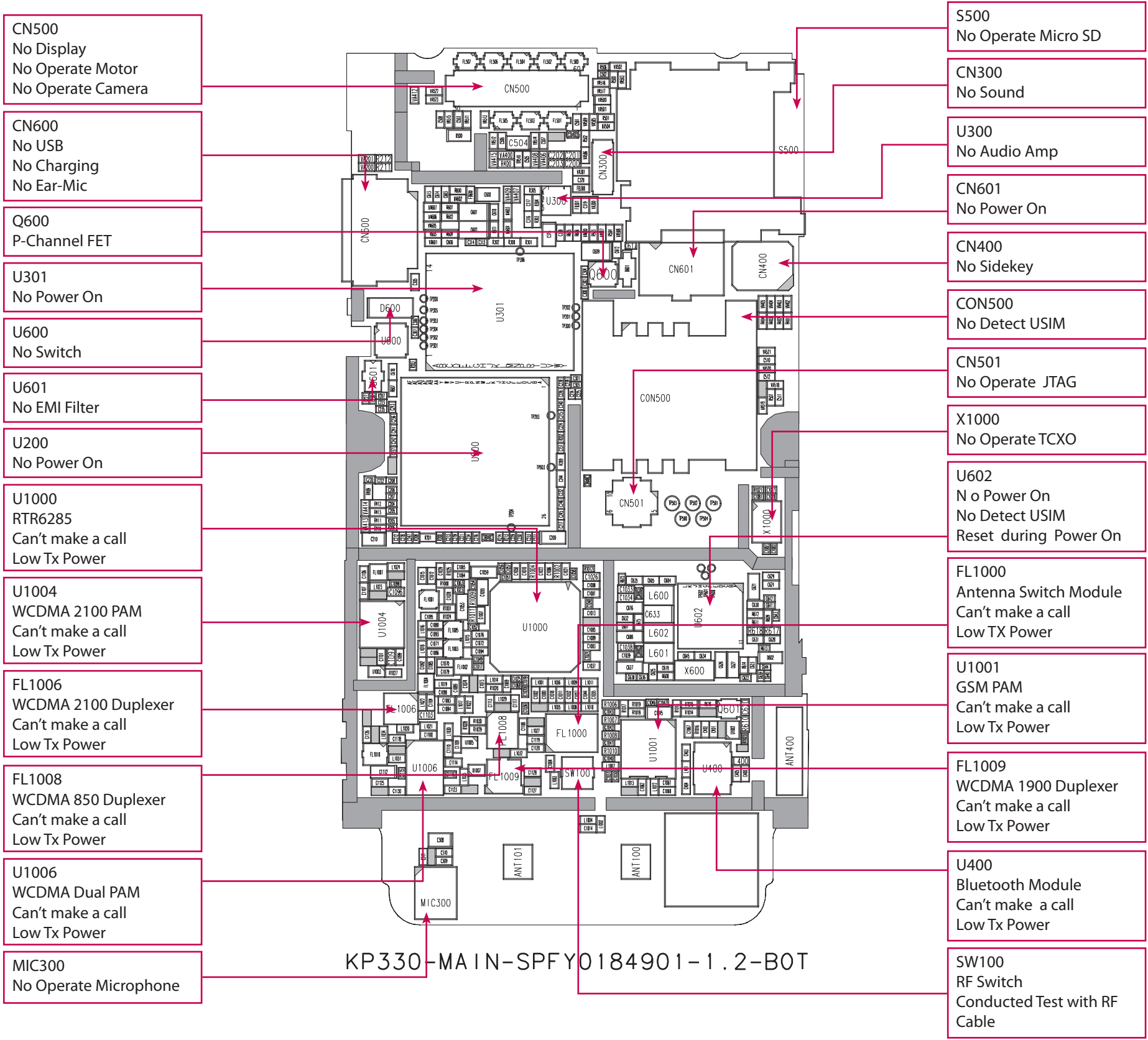


9. PCB LAYOUT

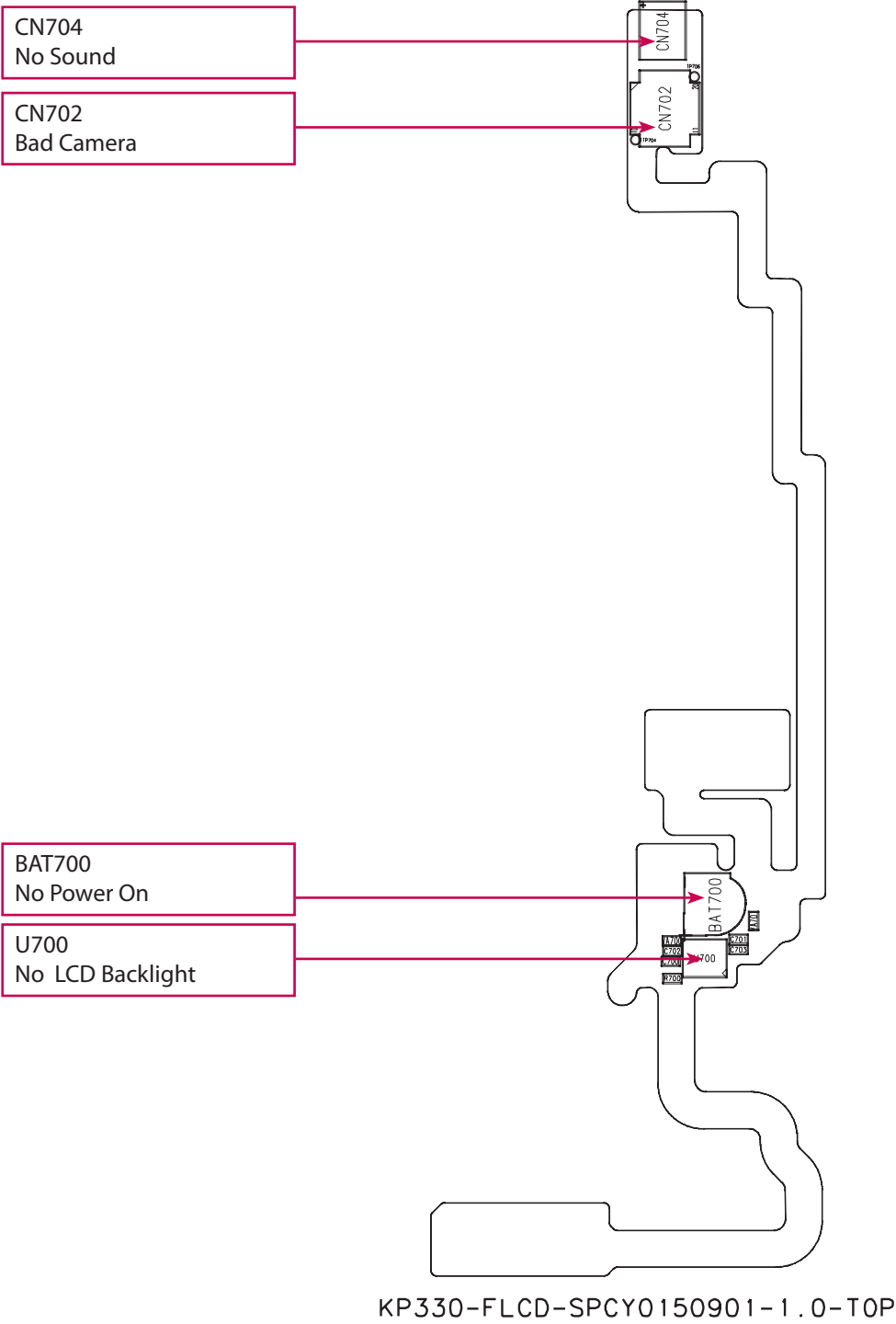


KP330-MAIN-SPFY0184901-1.2-TOP

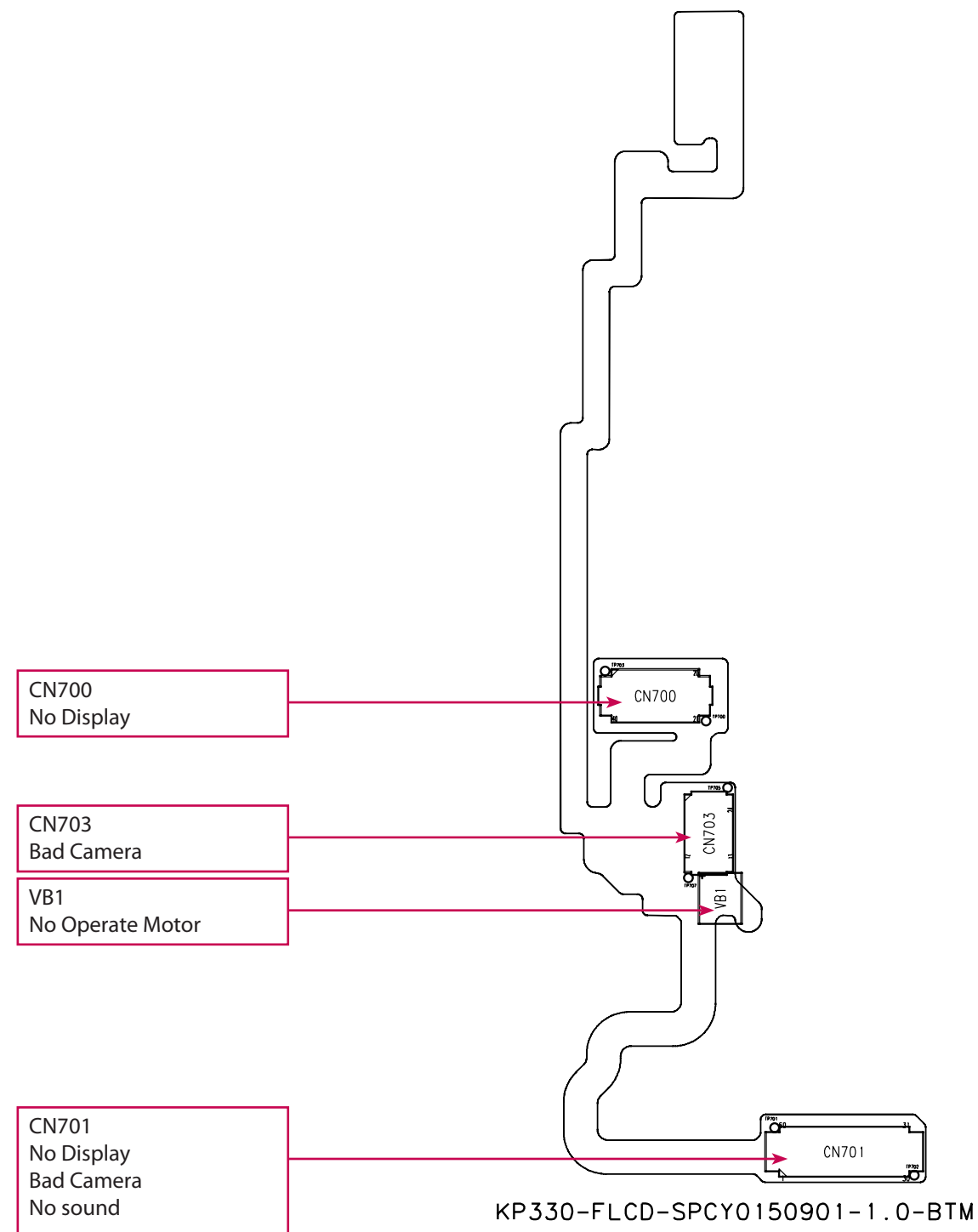
9. PCB LAYOUT



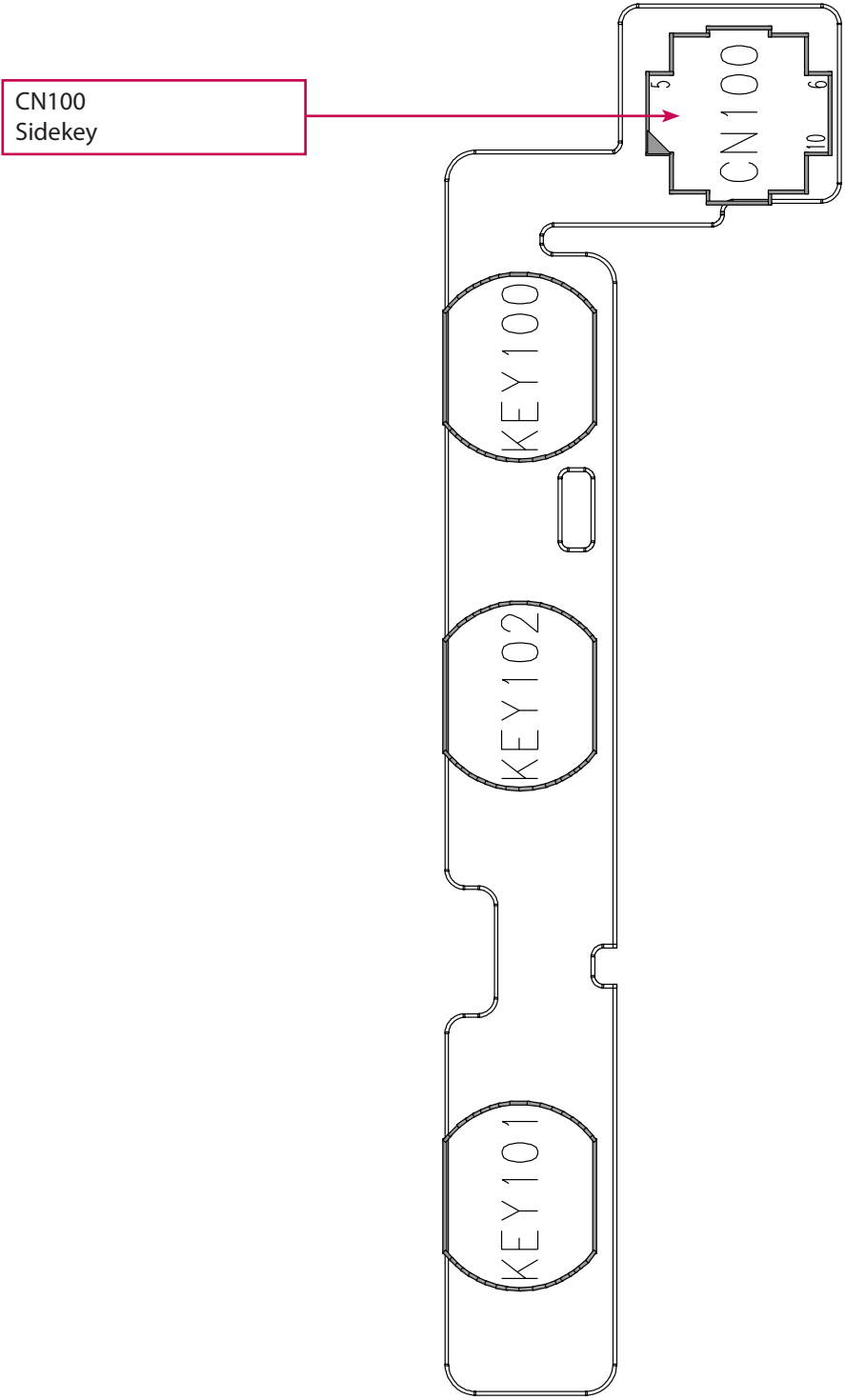
9. PCB LAYOUT



9. PCB LAYOUT



9. PCB LAYOUT

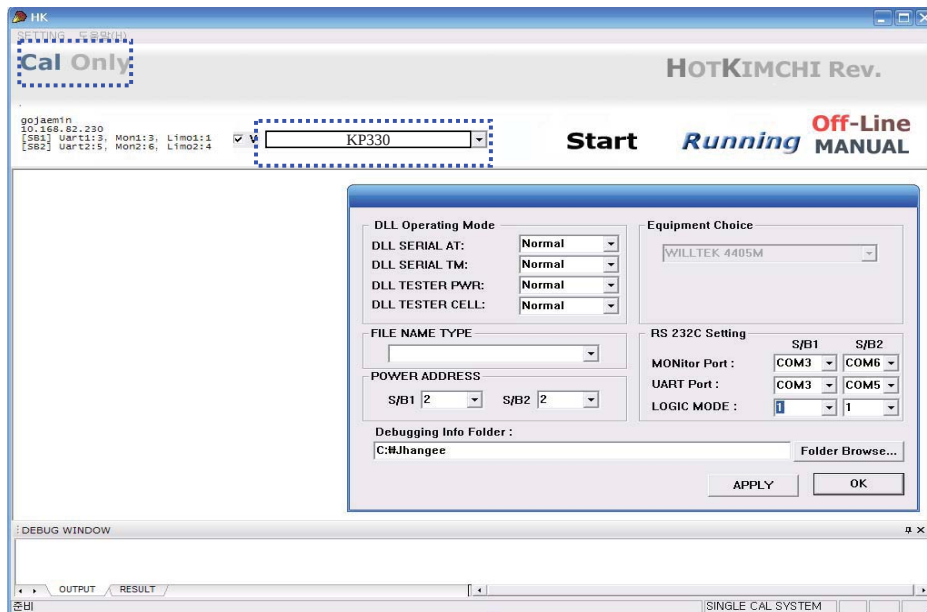


KP330 SIDEKEY-1.0 TOP

10. CALIBRATION

10.1 Usage of Hot-Kimchi

10.1.1 Calibration



Calibration Only

● Procedure

1. Click **SETTING** in menu, and logic operation in sub-menu.
Choose "1" in **LOGIC MODE** (means calibration alone)
2. Select the model name which you want in list box
3. Click **Start** button to calibrate a phone

10. CALIBRATION

10.1.2 Basic Setting

DLL Operating Mode
DLL SERIAL AT: Normal
DLL SERIAL TM: Normal
DLL TESTER PWR: Normal
DLL TESTER CELL: Normal

Equipment Choice
WILLTEK 4405M

FILE NAME TYPE
[Dropdown]

POWER ADDRESS
S/B1 2 S/B2 9

RS 232C Setting
MONitor Port : COM3 S/B1 COM6 S/B2
UART Port : COM2 COM5
LOGIC MODE : 1 1

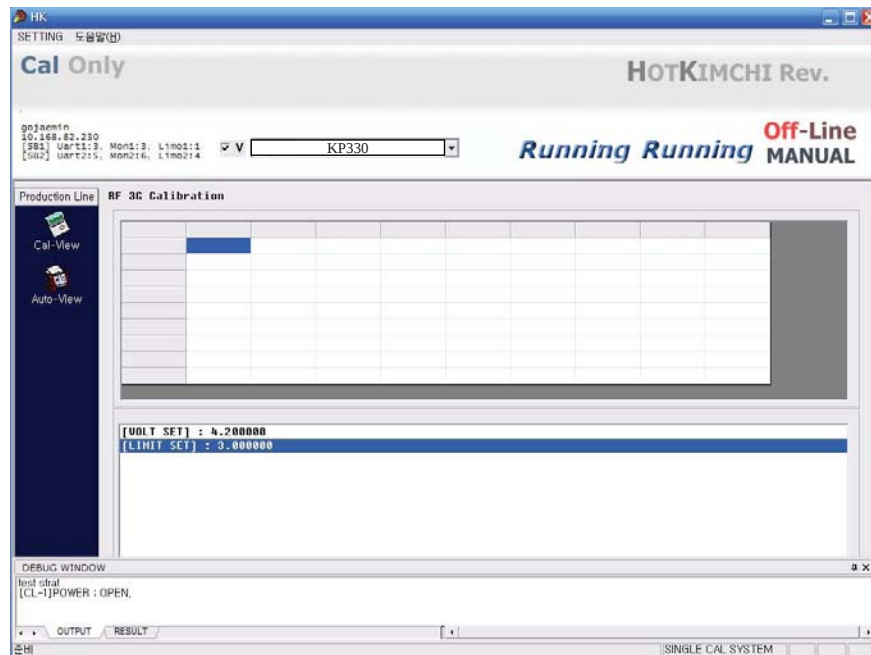
Debugging Info Folder :
D:\Jhangee Folder Browse...

APPLY OK

● Contents

- ✓ Click SETTING in menu, and logic operation in sub-menu.
- ✓ You can select how to control AT comm, Testset, and Power supply in DLL Operating Mode.
- ✓ You can set UART Port and logic mode. (mode 1 : Calibration alone)
- ✓ You can set Result File's name type. If you choose "TIME", the saved files' name is saved in a run - time.
- ✓ You can run the multi mode (S/B1,S/B2 : You can use S/B1 for only one port.)
- ✓ You can set the path of HOTKIMCHI program.

10.1.3 Log of Calibration and Test



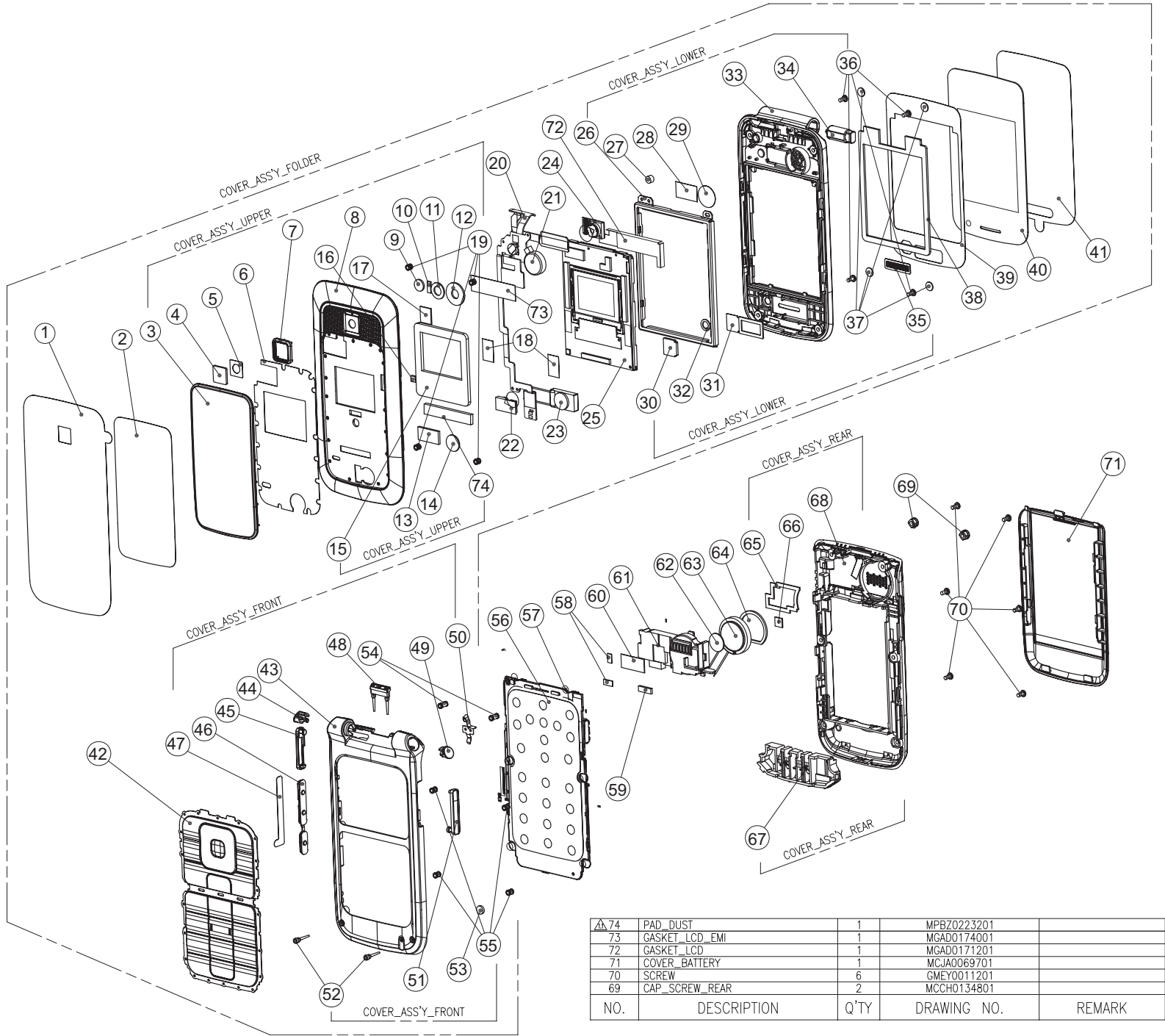
● Contents

- ✓ On Running, Log window is created in center area. It displays logs of command, and measurements of Calibration or Autotest.
- ✓ The result files are saved in the directory “~janghee\debug\Cal”, “~janghee\debug\Auto”, or “~janghee\debug\CalAuto”.



11. EXPLODED VIEW & REPLACEMENT PART LIST

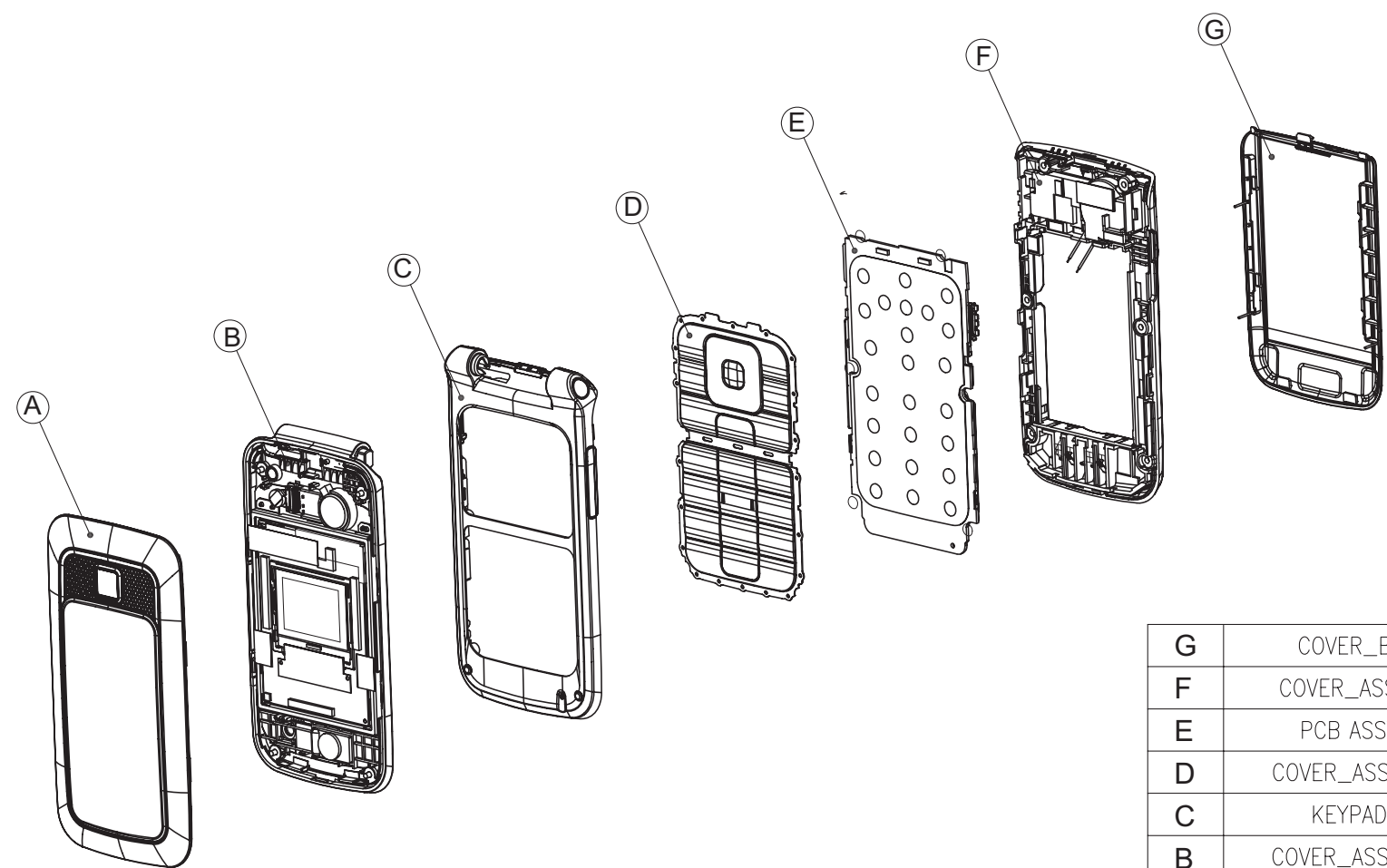
11.1 EXPLODED VIEW



68	COVER_REAR	1	MCJN0088901	
67	ANTENNA	1	SNGF0039202	
66	PAD_SIDE_FPCB	1	MPBZ0218001	
65	PAD_REAR_BOT	1	MPBZ0217901	
64	FILTER_SPEAKER	1	MFBC0042601	
63	SPEAKER	1	SUSY0023801	
62	PAD_SPEAKER	1	MPBZ0212301	
61	BRACKET_SPEAKER	1	MBFK0004701	
60	GASKET_MAIN_60P	1	MGAD0171301	
59	PAD_SHIELD_3	1	MGAD0174201	
58	PAD_SHIELD_2	2	MPBZ0218101	
57	PCB_ASSY	1	SAFY0283401	
56	METAL_DOME_ASSY	1	ADCA0084801	
55	INSERT	4	MICZ0025401	
54	INSERT	2	MICA0013901	
53	FILTER_MIC	1	MFBD0032301	
52	BUMPER	2	MSGC0004901	
51	CAP_MMI	1	MCCE0045201	
50	HINGE_CONTACT_FRONT	1	MCIB0001901	
49	CAP_FRONT_LEFT	1	MDAC0023001	
48	HINGE_STOPPER	1	MSGB0029401	
47	TAPE_PROTECTION_SIDEKEY	1	MTAG0008301	
46	BOTTOM_VOLUME	1	MBIL0064401	
45	CAP_T_FLASH	1	MCCG0014801	
44	CAP_FRONT_LEFT	1	MDAC0023201	
43	COVER_FRONT	1	MCJK0091801	
42	KEYPAD	1	MKAG0010701	
41	PROTECTION_MAIN	1	MTAB0251201	
40	WINDOW_MAIN	1	MWAC0105001	
39	TAPE_WINDOW_MAIN	1	MTAD0090901	
38	PAD_LCD_MAIN	1	MPBG0081701	
37	CAP_SCREW	4	MCCH0134701	
36	SCREW	4	GMEY0011201	
35	FILTER_RECEIVER	1	MFBB0027701	
34	HINGE	1	MHFD0016201	
33	COVER_LOWER	1	MCJH0044301	
32	PAD_CAMERA_VGA_LOWER	1	MPBT0061901	
31	PAD_FILTER_RECEIVER	1	MFBB0027801	
30	PAD_RECEIVER_LOWER	1	MPBZ0217701	
29	TAPE_MOTOR	1	MTAF0020301	
28	TAPE_CAMERA_MAIN	1	MTAK0014901	
27	MAGNET_SWITCH	1	MMAA0001601	
26	BRACKET_LCD	1	MBFF0020701	
25	LCD	1	SVLM0025603	
24	CAMERA_MAIN	1	SVCY0017201	
23	RECEIVER	1	SURY0012602	
22	CAMERA_VGA	1	SVCY0012601	
21	MOTOR	1	SJMY0007106	
20	FPCB_ASSY	1	SACY0079801	
19	INSERT	4	MICC0010301	
18	GASKET_EMI_FOLDER	2	MGAD0173901	
17	PAD_BT0B_LCD	1	MPBZ0222101	
16	PAD_FPCB_UPPER	1	MPBZ0217601	
15	PAD_LCD_SUB	1	MPBQ0037301	
14	PAD_RECEIVER	1	MPBM0025001	
13	PAD_CAMERA_VGA_UPPER	1	MPBT0062101	
12	PAD_MOTOR	1	MPBJ0056401	
11	PAD_WINDOW_CAMERA	1	MPBT0062001	
10	PAD_CAMERA_CONNECTOR	1	MPBZ0217401	
9	PAD_BACKUP_BATTERY	1	MPBZ0212201	
8	COVER_UPPER	1	MCJU0054201	
7	DECO_CAMERA	1	MDAD0038401	
6	TAPE_WINDOW_SUB	1	MTAE0036301	
5	TAPE_WINDOW_CAMERA	1	MTAD0091001	
4	WINDOW_CAMERA	1	MWAC0105101	
3	WINDOW_SUB_ASSY	1	AWAB0035101	
2	PROTECTION_SUB_IN	1	MTAB0272301	
1	PROTECTION_SUB	1	MTAB0251601	

NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK
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ASS'Y EXPLODED VIEW



G	COVER_BATTERY	1	MCJA0069701	
F	COVER_ASS'Y_REAR	1	ACGM0117001	
E	PCB ASSY_MAIN	1	SAFY0283401	
D	COVER_ASS'Y_FRONT	1	ACGK0119001	
C	KEYPAD_MAIN	1	MKAG0010701	
B	COVER_ASS'Y_LOWER	1	ACGH0054401	
A	COVER_ASS'Y_UPPER	1	ACGJ0072101	
NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK

11. EXPLODED VIEW & REPLACEMENT PART LIST

11.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
2	AAAY00	ADDITION	AAAY0318401		IVORY	
3	MCJA00	COVER,BATTERY	MCJA0069701	MOLD, PC LUPOY SC-1004A, , , ,	CHAMPAIGN GOLD	G, 71
2	APAY00	PACKAGE	APAY0113801		Without Color	
2	APEY00	PHONE	APEY0657401		IVORY	
3	ACGG00	COVER ASSY,FOLDER	ACGG0094001		CHAMPAIGN GOLD	
4	ACGH00	COVER ASSY,FOLDER(LOWER)	ACGH0054401		CHAMPAIGN GOLD	B
5	MBFF00	BRACKET,LCD	MBFF0020701	PRESS, STS, 0.4, , , ,	Without Color	26
5	MCJH00	COVER,FOLDER(LOWER)	MCJH0044301	MOLD, PC LUPOY SC-1004A, , , ,	CHAMPAIGN GOLD	33
5	MFBB00	FILTER,RECEIVER	MFBB0027701	COMPLEX, (empty), , , ,	Without Color	35
5	MFBB01	FILTER,RECEIVER	MFBB0027801	COMPLEX, (empty), , , ,	Without Color	31
5	MHFD00	HINGE,FOLDER	MHFD0016201	PRESS, STS, , , , ,	Black	34
5	MMAA00	MAGNET,SWITCH	MMAA0011001	COMPLEX, (empty), , , ,	WITHOUT COLOR	27
5	MPBT00	PAD,CAMERA	MPBT0061901	COMPLEX, (empty), , , ,	Without Color	32
5	MPBZ00	PAD	MPBZ0217701	COMPLEX, (empty), , , ,	Without Color	30
5	MTAF00	TAPE,MOTOR	MTAF0020301	COMPLEX, (empty), , , ,	Without Color	29
5	MTAK00	TAPE,CAMERA	MTAK0014901	COMPLEX, (empty), , , ,	Without Color	28
4	ACGJ00	COVER ASSY,FOLDER(UPPER)	ACGJ0072101		CHAMPAIGN GOLD	A
5	AWAB00	WINDOW ASSY,LCD	AWAB0035101		Black	3
6	MWAF00	WINDOW,LCD(SUB)	MWAF0042001	MOLD, PMMA HI835M, , , ,	Champaign Gold	
5	AWAZ00	WINDOW ASSY	AWAZ0011301		Without Color	
6	MTAD00	TAPE,WINDOW	MTAD0091001	COMPLEX, (empty), , , ,	WITHOUT COLOR	5

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	MWAE00	WINDOW,CAMERA	MWAE0042601	CUTTING, PMMA MR 200, , , , ,	Without Color	
5	MCJJ00	COVER,FOLDER(UPPER)	MCJJ0054201	MOLD, PC LUPOY SC-1004A, , , , ,	Champaign Gold	8
6	MICC00	INSERT,FRONT(UPPER)	MICC0010301		Without Color	19
5	MDAD00	DECO,CAMERA	MDAD0038401	MOLD, ABS MP-211, , , , ,	Silver	7
5	MPBJ00	PAD,MOTOR	MPBJ0056401	COMPLEX, (empty), , , , ,	Without Color	12
5	MPBM00	PAD,RECEIVER	MPBM0025001	COMPLEX, (empty), , , , ,	Without Color	14
5	MPBQ00	PAD,LCD(SUB)	MPBQ0037301	COMPLEX, (empty), , , , ,	WITHOUT COLOR	15
5	MPBT00	PAD,CAMERA	MPBT0062001	COMPLEX, (empty), , , , ,	WITHOUT COLOR	11
5	MPBT01	PAD,CAMERA	MPBT0062101	COMPLEX, (empty), , , , ,	Without Color	13
5	MPBZ	PAD	MPBZ0223201	COMPLEX, (empty), , , , ,	Without Color	74
5	MPBZ00	PAD	MPBZ0212201	COMPLEX, (empty), , , , ,	Without Color	9
5	MPBZ01	PAD	MPBZ0222101	COMPLEX, (empty), , , , ,	Without Color	17
5	MPBZ02	PAD	MPBZ0217601	COMPLEX, (empty), , , , ,	Without Color	16
5	MPBZ03	PAD	MPBZ0217401	COMPLEX, (empty), , , , ,	Without Color	10
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0036301	COMPLEX, (empty), , , , ,	Without Color	6
4	ACGK00	COVER ASSY,FRONT	ACGK0119001		Champaign Gold	D
5	MBJL00	BUTTON,SIDE	MBJL0064401	COMPLEX, (empty), , , , ,	CHAMPAIGN GOLD	46
5	MCCE00	CAP,RECEPTACLE	MCCE0045201	COMPLEX, (empty), , , , ,	Champaign Gold	51
5	MCCG00	CAP,MULTIMEDIA CARD	MCCG0014801	COMPLEX, (empty), , , , ,	Champaign Gold	45
5	MCIB00	CONTACT,HINGE	MCIB0001901	PRESS, PB, 0.15, , , ,	Without Color	50
5	MCJK00	COVER,FRONT	MCJK0091801	MOLD, PC LUPOY SC-1004A, , , , ,	CHAMPAIGN GOLD	43
6	MICA00	INSERT,FRONT	MICA0013901	2.2X4.0	Without Color	54

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	MICZ	INSERT	MICZ0025401		Without Color	55
5	MDAC00	DECO,SIDE	MDAC0023001	MOLD, PC LUPOY SC-1004A, , , ,	Champaign Gold	49
5	MDAC01	DECO,SIDE	MDAC0023201	MOLD, PC LUPOY SC-1004A, , , ,	Champaign Gold	44
5	MFBD00	FILTER,MIKE	MFBD0032301	COMPLEX, (empty), , , ,	Without Color	53
5	MSGB00	STOPPER,HINGE	MSGB0029401	MOLD, Urethane Rubber S190A, , , ,	CHAMPAIGN GOLD	48
5	MSGC00	STOPPER,FOLDER	MSGC0004901	MOLD, Urethane Rubber S190A, , , ,	Champaign Gold	52
5	MTAG00	TAPE,BUTTON	MTAG0008301	COMPLEX, (empty), , , ,	Without Color	47
4	AWAB	WINDOW ASSY,LCD	AWAB0035501		Without Color	
5	MPBG00	PAD,LCD	MPBG0081701	COMPLEX, (empty), , , ,	WITHOUT COLOR	38
5	MTAD00	TAPE,WINDOW	MTAD0090901	COMPLEX, (empty), , , ,	Without Color	39
5	MWAC00	WINDOW,LCD	MWAC0105001	CUTTING, PMMA MR 200, , , ,	Champaign Gold	40
4	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	36 ,70
4	MCCH00	CAP,SCREW	MCCH0134701	COMPLEX, (empty), , , ,	Champaign Gold	37
4	MGAD00	GASKET,SHIELD FORM	MGAD0171201	COMPLEX, (empty), , , ,	Without Color	72
4	MGAD01	GASKET,SHIELD FORM	MGAD0173901	COMPLEX, (empty), , , ,	Without Color	18
4	MGAD02	GASKET,SHIELD FORM	MGAD0174001	COMPLEX, (empty), , , ,	Without Color	73
4	MKAG00	KEYPAD,MAIN	MKAG0010701	COMPLEX, (empty), , , ,	Champaign Gold	C, 42
4	MTAB00	TAPE,PROTECTION	MTAB0251201	COMPLEX, (empty), , , ,	Without Color	41
4	MTAB01	TAPE,PROTECTION	MTAB0251601	COMPLEX, (empty), , , ,	Without Color	1
4	MTAB02	TAPE,PROTECTION	MTAB0272301	COMPLEX, (empty), , , ,	Without Color	2
3	ACGM00	COVER ASSY,REAR	ACGM0117001		CHAMPAIGN GOLD	F
4	ABFE00	BRACKET ASSY,SPEAKER	ABFE0001301		WITHOUT COLOR	

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
5	MBFK00	BRACKET,SPEAKER	MBFK0004701	MOLD, PC LUPOY SC-1004A, , , , ,	Black	61
5	MGAD00	GASKET,SHIELD FORM	MGAD0171301	COMPLEX, (empty), , , , ,	Without Color	60
5	MGAD01	GASKET,SHIELD FORM	MGAD0174201	COMPLEX, (empty), , , , ,	WITHOUT COLOR	59
5	MPBZ00	PAD	MPBZ0212301	COMPLEX, (empty), , , , ,	Without Color	62
5	MPBZ01	PAD	MPBZ0218101	COMPLEX, (empty), , , , ,	Without Color	58
4	MCJN00	COVER,REAR	MCJN0088901	MOLD, PC LUPOY SC-1004A, , , , ,	CHAMPAIGN GOLD	68
4	MFBC00	FILTER,SPEAKER	MFBC0042601	COMPLEX, (empty), , , , ,	Without Color	64
4	MPBZ00	PAD	MPBZ0217901	COMPLEX, (empty), , , , ,	Without Color	65
4	MPBZ01	PAD	MPBZ0218001	COMPLEX, (empty), , , , ,	Without Color	66
3	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	
3	MCCH00	CAP,SCREW	MCCH0134801	MOLD, Urethane Rubber S190A, , , , ,	Champaign Gold	69
3	MLAK00	LABEL,MODEL	MLAK0022301	PRINTING, (empty), , , , ,	WHITE	
5	ACKA00	CAN ASSY,SHIELD	ACKA0010901		Silver	
6	MCBA00	CAN,SHIELD	MCBA0035501	PRESS, STS, 0.3, , , ,	WITHOUT COLOR	
6	MGAD00	GASKET,SHIELD FORM	MGAD0181401	COMPLEX, (empty), , , , ,	Without Color	
6	MIDZ00	INSULATOR	MIDZ0193001	COMPLEX, (empty), , , , ,	Without Color	
6	MIDZ01	INSULATOR	MIDZ0193101	COMPLEX, (empty), , , , ,	Without Color	
6	MIDZ02	INSULATOR	MIDZ0193201	COMPLEX, (empty), , , , ,	Without Color	
6	MLAB00	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	WHITE	
5	ADCA00	DOME ASSY,METAL	ADCA0084801		WITHOUT COLOR	56

11. EXPLODED VIEW & REPLACEMENT PART LIST

11.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
1		IMT,FOLDER	TIFF0018001		IVORY	
3	ENSY00	CONN,SOCKET	ENSY0015401	9 PIN,ETC , , mm,SD Adaptor for TFR		
6	BFAA01	FILM,INMOLD	BFAA0104501	; ,BLACK ,0.01 ,600 ,500	Black	
4	SACY00	PCB ASSY,FLEXIBLE	SACY0079801			20
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0074301			
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0050101			
7	CN700	CONNECTOR,BOARD TO BOARD	ENBY0020201	40 PIN,0.4 mm,ETC , ,H=0.9, Header		
7	CN701	CONNECTOR,BOARD TO BOARD	ENBY0036801	60 PIN,0.4 mm,ETC , ,H=1.0, Socket		
7	CN703	CONNECTOR,BOARD TO BOARD	ENBY0034001	24 PIN,0.4 mm,ETC , ,P4S H=1.5, Socket		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0063001			
7	BAT700	BATTERY,CELL,LITHIUM	SBCL0001701	2 V,0.5 mAh,CYLINDER ,Reflow type BB, Max T 1.67, phi 4.8, Pb-Free		
7	C700	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
7	C701	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
7	C702	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
7	C703	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
7	CN702	CONNECTOR,BOARD TO BOARD	ENBY0019501	20 PIN,.4 mm,ETC , ,H=1.5, Socket		
7	R700	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
7	U700	IC	EUSY0238702	TSOPJW-12 ,12 PIN,R/TP ,3PORT Charge Pump(AAT2154 Low cost version)		
7	VA700	VARISTOR	SEVY0004301	18 V , ,SMD ,10pF, 1005		
7	VA701	VARISTOR	SEVY0004301	18 V , ,SMD ,10pF, 1005		
6	SPCY01	PCB,FLEXIBLE	SPCY0150901	POLYI , mm,MULTI-5 , ; , , , , , , , , ,		
4	SJMY00	VIBRATOR,MOTOR	SJMY0007106	3 V,.08 A,10*3.0T ,17mm ; ,3V , , ,12000 rpm , , , ,		21
4	SURY00	RECEIVER	SURY0012602	ASSY ,103 dB,32 ohm,13.5*7.5 ,3.4t 15mm ; , , , , , , ,WIRE ,		23
4	SVCY00	CAMERA	SVCY0017201	CMOS ,MEGA ,1.3M SS-LSI (1/5"), 7x12x4.1t, HPCB (8" wafer)		24
4	SVCY01	CAMERA	SVCY0012601	CMOS ,VGA ,MAGNACHIP 1/7.4"		22

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
4	SVLM00	LCD MODULE	SVLM0025603	MAIN ,176*220 ,38.5*51.8*3.2 ,262k ,TFT ,TM ,LGDP4523 ,Sub Mono(96*64)		25
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0039202	3.0 ,-2.0 dBd, ,GSM850+EGSM+DCS+PCS+W-BAND I+II+V, INTERNAL ,; ,MULTI ,-2.0 ,50 ,3.0		67
4	SUSY00	SPEAKER	SUSY0024601	ASSY ,8 ohm,90 dB,16 mm,3.4T, elco8000 20mm ,; , , , , , , ,CONNECTOR		63
3	SAFY00	PCB ASSY,MAIN	SAFY0283401			E, 57
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0089601			
5	SAKY00	PCB ASSY,SIDEKEY	SAKY0007501			
6	SAKF00	PCB ASSY,SIDEKEY,SMT	SAKF0000901			
7	SAKC00	PCB ASSY,SIDEKEY,SMT BOTTOM	SAKC0000701			
7	SAKD00	PCB ASSY,SIDEKEY,SMT TOP	SAKD0000901			
8	ENBY00	CONNECTOR,BOARD TO BOARD	ENBY0018501	10 PIN,.4 mm,STRAIGHT , ,H=0.9,HEADER		
7	SPKY00	PCB,SIDEKEY	SPKY0064101	POLYI , mm,DOUBLE , ,; , , , , , , , ,		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0197201			
5	MLAZ00	LABEL	MLAZ0038301	PID Label 4 Array	WITHOUT COLOR	
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0115301			
6	ANT400	ANTENNA,MOBILE,FIXED	SNMF0036201	3:1 ,-4 dB,Pb-free_Chip_BT Class1 ,; ,SINGLE ,-4 ,50 ,3:1		
6	C1000	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1001	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1002	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1003	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1004	CAP,CERAMIC,CHIP	ECCH0000123	51 pF,50V,J,NP0,TC,1005,R/TP		
6	C1005	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1006	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1007	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1008	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1009	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C1010	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1011	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1012	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C1013	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1014	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1015	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1017	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1018	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1019	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1020	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1021	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1022	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1023	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1024	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1025	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1026	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1027	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1028	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1029	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1030	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1031	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1032	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1033	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1034	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C1035	CAP,CERAMIC,CHIP	ECCH0000183	1.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1036	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1037	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1038	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C1039	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1040	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1041	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1042	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1043	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1044	CAP,CERAMIC,CHIP	ECCH0000183	1.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1045	CAP,TANTAL,CHIP	ECTH0002202	4.7 uF,10V ,M ,STD ,1608 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C1046	CAP,CERAMIC,CHIP	ECCH0009520	15 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1047	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C1048	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1049	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1050	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1051	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1052	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1053	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C1054	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1055	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C1056	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1057	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1058	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1059	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C1060	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C1061	CAP,CHIP,MAKER	ECZH0000806	5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1062	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1063	CAP,CERAMIC,CHIP	ECCH0009216	22 pF,25V ,J ,X7R ,TC ,0603 ,R/TP		
6	C1064	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1065	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1067	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1068	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1069	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1070	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1071	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1072	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1073	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1074	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1076	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1077	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C1078	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C1079	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C1080	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1081	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C1082	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP , , [empty] , [empty] ,C0G , [empty] , [empty] , [empty] ,0.3 mm		
6	C1083	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1084	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1085	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C1086	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1087	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C1089	CAP,CERAMIC,CHIP	ECCH0004906	2.5 pF,50V ,C ,X7R ,TC ,1005 ,R/TP		
6	C1090	CAP,CHIP,MAKER	ECZH0000846	8.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1092	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C1093	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1094	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1095	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1096	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C1097	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C1098	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C1099	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1100	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1101	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C1103	CAP,CHIP,MAKER	ECZH0000803	2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1104	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1106	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1107	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1108	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1109	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1110	CAP,CERAMIC,CHIP	ECCH0001001	6.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1112	CAP,TANTAL,CHIP	ECTH0005101	2.2 uF,10V ,M ,STD ,1608 ,R/TP		
6	C1113	CAP,CHIP,MAKER	ECZH0000803	2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1114	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1115	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C1116	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C1117	CAP,CHIP,MAKER	ECZH0000803	2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1118	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1119	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1120	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C1123	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1125	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C1126	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C1127	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1128	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1130	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C200	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C202	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C203	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C204	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C206	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C209	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C210	CAP,TANTAL,CHIP	ECTH0004801	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C214	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C221	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C223	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C224	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C225	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C230	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0009107	2.2 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C233	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C234	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C235	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C236	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C237	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C238	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C239	CAP,CHIP,MAKER	ECZH0025920	1000 pF,16V ,K ,X7R ,HD ,0603 ,R/TP		
6	C240	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C241	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C242	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C243	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C244	CAP,CERAMIC,CHIP	ECCH0000161	33 nF,16V,K,X7R,HD,1005,R/TP		
6	C245	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C246	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C247	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C300	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C305	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C308	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP , , , [empty] , [empty] , -55TO+125C , , [empty] , [empty] , [empty] , [empty]		
6	C309	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C315	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP , , , [empty] , [empty] , -55TO+125C , , [empty] , [empty] , [empty] , [empty]		
6	C316	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C400	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C404	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C502	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C503	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C504	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP , , , [empty] , [empty] , -55TO+125C , , [empty] , [empty] , [empty] , [empty]		
6	C505	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C507	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C508	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C510	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C511	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C512	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C600	CAP,TANTAL,CHIP	ECTH0004807	10 uF,10V ,M ,STD ,1608 ,R/TP ,; , ,[empty] ,[empty] , , -55TO+125C , , [empty] , [empty] , [empty] , [empty]		
6	C601	CAP,TANTAL,CHIP	ECTH0005202	100 uF,4V ,M ,L ,ESR ,2012 ,R/TP ,; , , [empty] , [empty] , , [empty] , , [empty] , [empty] , [empty] , [empty]		
6	C602	CAP,TANTAL,CHIP	ECTH0005202	100 uF,4V ,M ,L ,ESR ,2012 ,R/TP ,; , , [empty] , [empty] , , [empty] , , [empty] , [empty] , [empty] , [empty]		
6	C603	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C604	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C605	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C606	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C607	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C608	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C609	CAP,TANTAL,CHIP	ECTH0002002	33 uF,10V ,M ,L ,ESR ,2012 ,R/TP ,; , , [empty] , [empty] , , -55TO+125C , , 2.2X1.1X1.1MM , [empty] , [empty] , [empty]		
6	C610	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C611	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C612	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C613	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C614	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C615	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C616	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C617	CAP,CERAMIC,CHIP	ECCH0009104	33 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C618	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C619	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C620	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C621	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C622	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C623	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C624	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C625	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C626	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C627	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C628	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C629	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C630	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C631	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C632	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C633	CAP,TANTAL,CHIP	ECTH0002002	33 uF,10V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,2.2X1.1X1.1MM ,[empty] ,[empty] , [empty]		
6	C634	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C635	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C636	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C637	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C638	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C639	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C640	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C641	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C642	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C643	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C644	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C645	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	CN300	CONN,RECEPTACLE	ENEY0003801	2 PIN, , ,		
6	CN400	CONNECTOR,BOARD TO BOARD	ENBY0018601	10 PIN,.4 mm,STRAIGHT , ,H=0.9, SOCKET		
6	CN500	CONNECTOR,BOARD TO BOARD	ENBY0036701	60 PIN,0.4 mm,ETC , ,H=1.0, Plug		
6	CN501	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	
6	CN600	CONNECTOR,I/O	ENRY0006801	18 PIN,0.4 mm,ETC , , , ,18 ,0.40MM ,ANGLE ,RECEPTACLE ,SMD ,R/TP ,		
6	CN601	CONNECTOR,ETC	ENZY0022201	3 ,2.5 mm,ETC , ,		
6	CON500	CONN,SOCKET	ENSY0018701	6 PIN,ETC , ,2.54 mm,H=1.8		
6	D500	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	D600	DIODE,SWITCHING	EDSY0006601	PMDU , V, A,R/TP ,2.6*1.6, Protect Reverse Voltage		
6	D601	DIODE,TVS	EDTY0008601	SOD-323 ,6 V,400 W,R/TP ,PB-FREE		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	D602	DIODE,SWITCHING	EDSY0011901	EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V)		
6	FB300	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB301	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FB600	FILTER,BEAD,CHIP	SFBH0009801	600 ohm,1005 ,DC Res.0.6ohm, R.C.500mA		
6	FL1000	FILTER,SEPERATOR	SFAY0012501	, , dB, dB, dB, dB,4532 ,		
6	FL1001	FILTER,SEPERATOR,SPDT	SFAC0002001	1GHz , MHz,0.25 dB,29 dB,2GHz , MHz,0.35 dB,26 dB,SMD ,ETC ,SPDT, 1511size, DC to 3GHz		
6	FL1002	FILTER,SAW	SFSY0028201	2140 MHz,1.4*1.1*0.6 ,SMD ,2110M~2170M, IL 2.5, 5pin, U-B, 50-100_27, W-BAND I Rx , ,2140 ,1.4*1.1*0.6 ,SMD ,R/TP		
6	FL1003	FILTER,SEPERATOR,SPDT	SFAC0002001	1GHz , MHz,0.25 dB,29 dB,2GHz , MHz,0.35 dB,26 dB,SMD ,ETC ,SPDT, 1511size, DC to 3GHz		
6	FL1004	FILTER,SAW	SFSY0034601	1960 MHz,1.4*1.1*0.6 ,SMD ,1930M~1990M, IL 3.3, 5pin, U-B, 50-100, USPCS Rx , , ,1960 ,1.4*1.1*0.6 ,SMD ,R/TP		
6	FL1005	FILTER,SEPERATOR,SPDT	SFAC0002001	1GHz , MHz,0.25 dB,29 dB,2GHz , MHz,0.35 dB,26 dB,SMD ,ETC ,SPDT, 1511size, DC to 3GHz		
6	FL1006	DUPLEXER,IMT	SDMY0001301	1950 MHz,2140 MHz,1.6 dB,2.0 dB,53 dB,44 dB,3.0*2.5*1.2 ,SMD ,FBAR, WCDMA duplexer , , ,2140 ,44 ,1950 ,53 ,2.0 ,1.6 ,3.0X2.5X1.2 ,DUAL ,SMD ,R/TP		
6	FL1007	FILTER,SAW	SFSY0028101	1950 MHz,1.4*1.1*0.6 ,SMD ,1920M~1980M, IL 2.9, 5pin, U-U, 50-50, W-BAND I Tx , ,1950 ,1.4*1.1*0.6 ,SMD ,R/TP		
6	FL1008	DUPLEXER,DCN	SDDY0004701	836.5 MHz,881.5 MHz,2.3 dB,2.7 dB,50 dB,45 dB,3.0*2.5*1.25 ,SMD ,UMTS Band5 Balanced Duplexer, SAW, 3025size, , ,881.5 ,869to894 ,836.5 ,824to849 ,2.7 ,2.3 ,3.0x2.5x1.25 ,DUAL ,SMD ,[empty]		
6	FL1009	DUPLEXER,PCS	SDPY0004401	1880 MHz,1960 MHz,2.7 dB,3.2 dB,54 dB,44 dB,3.0*3.0*1.2 ,SMD ,Band2 Duplexer, FBAR, only use UMTS , , ,1960 ,1930.5 to 1989.5 ,1880 ,1850.5 to 1909.5 ,3.2 ,2.7 ,3.0x3.0x1.2 ,DUAL ,SMD ,[empty]		
6	FL1010	FILTER,SAW,DUAL	SFSB0001601	836.5 MHz,25 MHz,2.2 dB,40 dB,1880 MHz,58.75 MHz,4 dB,30 dB,2.0*1.6*0.68 ,SMD ,824M~849M,1850.625M~1909.375M,10p.B,50,50,DCN+ USPCS Tx,BIDIR , ,836.5, 1880 ,2.0*1.6*0.68 ,SMD ,R/TP		
6	FL500	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL501	FILTER,EMI/POWER	SFEY0011701	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (10 Ohm,7.5pF)		
6	FL502	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL503	FILTER,EMI/POWER	SFEY0011701	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (10 Ohm,7.5pF)		
6	FL504	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL505	FILTER,EMI/POWER	SFEY0011701	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (10 Ohm,7.5pF)		
6	FL506	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	FL507	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	L1000	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	
6	L1001	INDUCTOR,CHIP	ELCH0001035	4.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1002	INDUCTOR,CHIP	ELCH0001416	2.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1003	INDUCTOR,CHIP	ELCH0003825	56 nH,J ,1005 ,R/TP ,chip inductor,PBFREE		
6	L1004	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1005	INDUCTOR,CHIP	ELCH0001048	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1006	INDUCTOR,CHIP	ELCH0001036	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L1007	INDUCTOR,CHIP	ELCH0004710	15 nH,J ,1005 ,R/TP ,		
6	L1008	INDUCTOR,CHIP	ELCH0004714	18 nH,J ,1005 ,R/TP ,		
6	L1009	INDUCTOR,CHIP	ELCH0004710	15 nH,J ,1005 ,R/TP ,		
6	L1010	INDUCTOR,CHIP	ELCH0005005	27 nH,J ,1005 ,R/TP ,		
6	L1011	INDUCTOR,CHIP	ELCH0004714	18 nH,J ,1005 ,R/TP ,		
6	L1012	INDUCTOR,CHIP	ELCH0003815	2.7 nH,S ,1005 ,R/TP ,		
6	L1013	INDUCTOR,CHIP	ELCH0005001	2.2 nH,S ,1005 ,R/TP ,		
6	L1014	INDUCTOR,CHIP	ELCH0012508	2 nH,S ,1005 ,R/TP ,Film chip, tolerance0.1nH		
6	L1015	INDUCTOR,CHIP	ELCH0001048	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L1016	INDUCTOR,CHIP	ELCH0001035	4.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L1017	INDUCTOR,CHIP	ELCH0012508	2 nH,S ,1005 ,R/TP ,Film chip, tolerance0.1nH		
6	L1018	INDUCTOR,CHIP	ELCH0001040	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L1019	INDUCTOR,CHIP	ELCH0004703	1 nH,S ,1005 ,R/TP ,		
6	L1020	INDUCTOR,CHIP	ELCH0004703	1 nH,S ,1005 ,R/TP ,		
6	L1021	INDUCTOR,CHIP	ELCH0005016	8.2 nH,J ,1005 ,R/TP ,		
6	L1022	INDUCTOR,CHIP	ELCH0005011	1.5 nH,S ,1005 ,R/TP ,		
6	L1023	INDUCTOR,CHIP	ELCH0005010	1.8 nH,S ,1005 ,R/TP ,		
6	L1024	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,		
6	L1025	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	
6	L1026	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	
6	L1027	INDUCTOR,CHIP	ELCH0001057	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L1028	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	L1029	INDUCTOR,CHIP	ELCH0004701	12 nH,J ,1005 ,R/TP ,		
6	L1030	INDUCTOR,CHIP	ELCH0005016	8.2 nH,J ,1005 ,R/TP ,		
6	L1031	INDUCTOR,CHIP	ELCH0001408	6.8 nH,J ,1005 ,R/TP ,Pb Free		
6	L1032	INDUCTOR,CHIP	ELCH0005001	2.2 nH,S ,1005 ,R/TP ,		
6	L1033	NOT ASSEMBLE	9999999999	NOT ASSEMBLE	Color Unfixed	
6	L1034	INDUCTOR,CHIP	ELCH0004709	3.3 nH,S ,1005 ,R/TP ,		
6	L1035	INDUCTOR,CHIP	ELCH0004703	1 nH,S ,1005 ,R/TP ,		
6	L1036	NOT ASSEMBLE	9999999999	NOT ASSEMBLE	Color Unfixed	
6	L400	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L401	INDUCTOR,CHIP	ELCH0001430	100 nH,J ,1005 ,R/TP ,PBFREE		
6	L600	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ; , ,0.3NH , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	L601	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ; , ,0.3NH , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	L602	INDUCTOR,SMD,POWER	ELCP0008004	4.7 uH,M ,1 ,R/TP , ; , ,0.3NH , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP		
6	MIC300	MICROPHONE	SUMY0010604	UNIT , -38 dB,4.72*3.76 ,1.25T Bottom Silicon type ; , , ,UNI ,1.5V , ,SMD		
6	Q600	TR,FET,P-CHANNEL	EQFP0009401	SC75-6 ,19 W,-20 V,-12 A,R/TP ,P-Channel FET ; ,P-CHANNEL ,MOSFET ,-20 ,8 ,-12 ,0.041 ,19 ,SC75 ,R/TP ,6P		
6	Q601	TR,FET,N-CHANNEL	EQFN0008501	SC-89 ,0.236 W,30 V,1.3 A,R/TP ,N-Channel FET ; ,N-CHANNEL ,MOSFET ,30 ,20 ,1.3 ,0.129 ,1.3 ,SC89 ,R/TP ,6P		
6	R1000	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1001	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1002	RES,CHIP,MAKER	ERHZ0000456	2.2 ohm,1/16W ,J ,1005 ,R/TP		
6	R1003	PCB ASSY,MAIN,PAD SHORT	SAFP0000401			
6	R1004	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R1005	PCB ASSY,MAIN,PAD SHORT	SAFP0000401			
6	R1006	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1007	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1008	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1009	RES,CHIP,MAKER	ERHZ0003801	5.1 ohm,1/16W ,J ,1005 ,R/TP		
6	R1010	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R1011	RES,CHIP,MAKER	ERHZ0003801	5.1 ohm,1/16W ,J ,1005 ,R/TP		
6	R1012	RES,CHIP	ERHY0009555	12 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R1013	RES,CHIP,MAKER	ERHZ0000469	36 ohm,1/16W ,J ,1005 ,R/TP		
6	R1014	RES,CHIP,MAKER	ERHZ0000219	150 ohm,1/16W ,F ,1005 ,R/TP		
6	R1015	RES,CHIP,MAKER	ERHZ0000219	150 ohm,1/16W ,F ,1005 ,R/TP		
6	R1016	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R1017	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R1018	RES,CHIP,MAKER	ERHZ0000201	100 ohm,1/16W ,F ,1005 ,R/TP		
6	R1019	RES,CHIP,MAKER	ERHZ0000201	100 ohm,1/16W ,F ,1005 ,R/TP		
6	R1020	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1021	RES,CHIP	ERHY0009503	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R1022	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1024	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1025	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1027	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1028	RES,CHIP,MAKER	ERHZ0000512	82 ohm,1/16W ,J ,1005 ,R/TP		
6	R1029	RES,CHIP,MAKER	ERHZ0000512	82 ohm,1/16W ,J ,1005 ,R/TP		
6	R1030	RES,CHIP,MAKER	ERHZ0000512	82 ohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP	ERHY0009536	100 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R201	RES,CHIP	ERHY0000162	215K ohm,1/16W,F,1005,R/TP		
6	R202	RES,CHIP	ERHY0009527	47 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R203	RES,CHIP	ERHY0018001	20 ohm,1/20W(0.05W) ,J ,0603 ,R/TP ,; ,20 ,5% ,1/20W ,0603 ,R/TP		
6	R205	RES,CHIP	ERHY0009527	47 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R206	RES,CHIP	ERHY0009527	47 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R207	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R208	RES,CHIP	ERHY0009302	1 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R209	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R210	PCB ASSY,MAIN,PAD SHORT	SAFP0000401			
6	R211	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP		
6	R212	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP		
6	R213	RES,CHIP	ERHY0009516	2.2 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R214	RES,CHIP	ERHY0009516	2.2 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R300	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R302	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R304	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R305	RES,CHIP	ERHY0000290	300K ohm,1/16W,J,1005,R/TP		
6	R400	RES,CHIP,MAKER	ERHZ0000451	27 ohm,1/16W ,J ,1005 ,R/TP		
6	R401	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R403	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R409	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R410	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R411	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R412	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R413	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R500	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R501	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R502	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R503	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R504	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R505	PCB ASSY,MAIN,PAD SHORT	SAFP0000401			
6	R506	RES,CHIP	ERHY0017901	330000 ohm,1/20W(0.05W) ,J ,0603 ,R/TP , ,330000 ,5% ,1/20W ,0603 ,R/TP		
6	R507	RES,CHIP,MAKER	ERHZ0000422	15 Kohm,1/16W ,J ,1005 ,R/TP		
6	R508	PCB ASSY,MAIN,PAD SHORT	SAFP0000401			
6	R600	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R601	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R602	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R603	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R604	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R605	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP		
6	R606	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R607	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R608	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R609	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R610	RES,CHIP,MAKER	ERHZ0000287	47 Kohm,1/16W ,F ,1005 ,R/TP		
6	R611	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R612	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R613	RES,CHIP	ERHY0009547	200 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R614	RES,CHIP,MAKER	ERHZ0004201	121000 ohm,1/16W ,F ,1005 ,R/TP		
6	R615	RES,CHIP	ERHY0009524	47 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R616	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R617	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R618	RES,CHIP,MAKER	ERHZ0000312	68 Kohm,1/16W ,F ,1005 ,R/TP		
6	S500	CONN,SOCKET	ENSY0014701	8 PIN,ETC , ,1.1 mm,H=1.95, Reverse		
6	SW100	CONN,RF SWITCH	ENWY0006801	,SMD , dB, , ,0.40MM ,STRAIGHT ,SOCKET ,SMD ,[empty] ,[empty] , ,		
6	U1000	IC	EUSY0344001	QFN ,68 ,R/TP ,Quad GSM, Tri WCDMA RF Transceiver ; ,IC,Tx/Rx		
6	U1001	PAM	SMPY0017001	dBm, %, A, dBc, dB, AXI , , , , , , , , , ,[empty] ,P/TP ,		
6	U1002	NOT ASSEMBLE	99999999999	NOT ASSEMBLE	Color Unfixed	
6	U1003	COUPLER,RF DIRECTIONAL	SCDY0003801	20.5 dB,0.25 dB,34 dB,1.0*0.5*0.4 ,SMD ,Pb-free_Coupler_USPCS Tx , ,[empty] ,1880MHz ,60MHz ,SMD ,R/TP		
6	U1004	PAM	SMPY0015501	28 dBm,40 %,90 mA,-40 dBc,26.5 dB,4x4x1.1 ,SMD ,MSM6280. Tr Switch Func included , , , , , , , , , ,R/TP ,10		
6	U1005	COUPLER,RF DIRECTIONAL	SCDY0003901	19.8 dB,0.28 dB,33 dB,1.0*0.5*0.4 ,SMD ,Pb-free_Coupler_DCN Tx , ,[empty] ,836.5MHz ,25MHz ,SMD ,R/TP		
6	U1006	PAM	SMPY0015801	28 dBm,39 %, A, dBc, dB,3x5x1 ,SMD ,HELP3 Dual PAM ; , , , , , , , , , ,R/TP ,R/TP ,14		
6	U1007	COUPLER,RF DIRECTIONAL	SCDY0003801	20.5 dB,0.25 dB,34 dB,1.0*0.5*0.4 ,SMD ,Pb-free_Coupler_USPCS Tx , ,[empty] ,1880MHz ,60MHz ,SMD ,R/TP		
6	U200	IC	EUSY0334501	CSP ,409 PIN,R/TP ,HSDPA3.6Mbps Baseband		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	U300	IC	EUSY0160001	MicroStar Junior ,15 PIN,R/TP ,1.1W Class-D Mono Audio AMP		
6	U301	IC	EUSY0336902	FBGA ,225 PIN,ETC ,1G(LB/64Mx16/2.7V) NAND+512(4Mx32x4) SDRAM ,; ,IC,MCP		
6	U400	MODULE,ETC	SMZY0012601	4.5x3.2x1.2 Bluetooth RF Module		
6	U600	IC	EUSY0333701	TLLGA ,8 PIN,R/TP ,OVP		
6	U601	FILTER,EMI/POWER	SFEY0006501	SMD ,3 TERMINAL EMI FILTER		
6	U602	IC	EUSY0350001	CSP ,97 PIN,R/TP ,PMIC, CMOSRF RTR6285 reference ,; ,IC,PMIC		
6	VA200	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA201	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA300	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA301	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA400	VARISTOR	SEVY0000701	14 V ,SMD ,120pF, 1005		
6	VA402	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA403	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA404	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA405	VARISTOR	SEVY0004301	18 V ,SMD ,10pF, 1005		
6	VA406	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA407	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA408	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA409	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA412	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA413	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA414	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA415	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA500	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	VA501	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	VA502	VARISTOR	SEVY0005201	5.5 V ,SMD ,1005, 50pF		
6	VA503	VARISTOR	SEVY0005201	5.5 V ,SMD ,1005, 50pF		
6	VA504	VARISTOR	SEVY0005201	5.5 V ,SMD ,1005, 50pF		
6	VA505	VARISTOR	SEVY0005201	5.5 V ,SMD ,1005, 50pF		
6	VA506	VARISTOR	SEVY0005201	5.5 V ,SMD ,1005, 50pF		

11. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	VA507	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA508	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA509	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA510	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA511	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA512	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA513	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA514	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA515	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA516	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA517	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA518	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA519	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA520	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA521	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA522	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA523	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA600	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA601	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA602	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA603	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA604	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA605	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA606	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA607	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	X1000	VCTCXO	EXSK0007802	19.2 MHz,1.5 PPM,10 pF,SMD ,3.3*2.5*1.0 , , , ,2PPM ,2.8V , , , ,SMD ,P/TP		
6	X600	X-TAL	EXXY0018701	32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 ,		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0113801			
6	C406	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	LD400	DIODE,LED,CHIP	EDLH0013403	WHITE ,ETC ,R/TP ,3.8*1.2*0.6T ,; ,[empty] ,2.9~3.2V ,20mA ,1200~1400mcd , ,126mW ,[empty] ,[empty] ,2P		
6	LD401	DIODE,LED,CHIP	EDLH0013403	WHITE ,ETC ,R/TP ,3.8*1.2*0.6T ,; ,[empty] ,2.9~3.2V ,20mA ,1200~1400mcd , ,126mW ,[empty] ,[empty] ,2P		
6	PCB	PCB,MAIN	SPFY0184901	FR-4 ,0.8 mm,STAGGERED-8 ,; , , , , , , , , ,		
6	R405	RES,CHIP,MAKER	ERHZ0003801	5.1 ohm,1/16W ,J ,1005 ,R/TP		
6	R406	RES,CHIP,MAKER	ERHZ0003801	5.1 ohm,1/16W ,J ,1005 ,R/TP		
6	R407	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R408	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	U401	IC	EUSY0129503	2x2 mm MLPS ,3 PIN,R/TP ,Hall Effect Switch, Pb Free		
6	VA401	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005		
6	VA410	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA411	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
3	SMZY00	MODULE,ETC	SMZY0017701	1GB / MICROSD / SSE MLC 1 DIE ,; ,Module Assembly		

11. EXPLODED VIEW & REPLACEMENT PART LIST

11.3 Accessory

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0090903	3.7 V,900 mAh,1 CELL,PRISMATIC ,463450 Latin America Label ,; , , , ,PRISMATIC , , ,BLACK , ,	Black	
3	SGDY00	DATA CABLE	SGDY0014401	; ,[empty] ,[empty] ,1.2M , ,BLACK ,4, 18Pin Plug USB Datacable ,N		
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0005558	; ,RMS 20mW(0.56V,RMS) ,16 OHM ,116dB,1KHZ,3mW ,96dB100HZ ,116dB 1KHZ ,[empty] ,BLACK ,18P MMI CONNECTOR ,PSP alternation HERO GENDER ,Earphone,Stereo		