6. Circuit Description

6-1 Logic Part

6-1-1 Power Supply

Press "**PWR**" key to turn on the phone and then the **VBAT** and **ON_SW** signals will be connected. This turn on inner regulator(V_MSM,V_ANALOG) of U203(MAX1869) and release them from the shut down state to output regulated 2.8V(V_MSM), 2.6V(V_ANALOG).

The **VBAT** applied to ON_SW will change ON_SW_SENSE signal from HIGH to LOW. This will allow MSM(U101) to send out PS_HOLD(logical HIGH) to turn on inner regulator(V_MSM, V_ANALOG) even after the **PWR** key is released. The others regulators will be controlled the ON/OFF state by I2C-compatible 2 wire serial interface.

The regulated voltage(U203,V_MSMD) from V_MSM is used in the digital part of MSM. The regulated voltage(U203,V_MSMA) from V_PA is used in the analog part of MSM. The regulated volgtage(U203, VTT) from VTT is used in the TX RF part. The regulated voltage from V_RR_RXX is used in the Rx RF part. The regulated Voltage(V_SYNTH) from V_SYNTH is used in the PLL circuit. The regulated voltage(VPA) from TCXO_V is used in the TCXO. The regulated voltage from VPA is used in the IFR3300(U301).

6-1-2 Logic

The logic consists of internal CPU of MSM, SRAM, FROM and EEPROM. The MSM receives TCXO clock signals and controls the phone during the PCS, CDMA and the FM mode. The major components are as follows:

- CPU : ARM`7 CPU core
- FROM / SRAM : U102(AMDL640AG)
  64Mbit Flash ROM & 16Mbit SRAM
- EEPROM : U104 (S524ADOXF1)

CPU(U101:MSM5100-208FBGA)

ARM 7 CMOS type 32/16-bit microprocessor is used for the main processing. The CPU controls all the circuitry. The MSM5100 derives all of its internal clock sources from three clock input TCXO(19.2MHz), SLEEP_XTAL(32.768KHz,in Sleep Mode), 48XTAL(48MHz,If it used USB). 32.768KHz is used for sleep. This is equipped with the ARM 7 CPU core, CDMA and DFM block, vocoder, general purpose interface and other interfaces and is one of the most important components of the CDMA cellular phone.

FROM AND SRAM (U102:AM42DL640AG)

Memories are consist of 64Mbit FROM and 16Mbit SRAM. 32Mbit Flash ROM is used to store the FONT data and terminal's program. Using the down-loading program, the program can be changed even after the terminal is fully assembled. 16Mbit SRAM is used to store the internal flag information,call processing data, and timer data.

EEPROM(U104:S524AD0XF1)

A serial 256Kbit EEPROM is used to store ESN, NAM, power level, volume level, and telephone number.

KEYPAD

For key recognition, key matrix is setup using SCAN(1:6) of STORE signals and KEYSENCE(0:3) of input ports of MSM. 12 backlight LEDs and back-light circuitry are included in the keypad for easy operation in the dark.

LCD MODULE

The Subscriber Units should have a 4096 color TFT LCD of 128 x 160 pixcels. The display shall be capable of presenting animation.

6-1-3 Baseband

MOBILE SYSTEM MODEM (MSM)

The MCU equipped with the ARM 7 CPU core is an important component of the CDMA cellular phone. The MSM comes in a 208-Ball FBGA Package.

MICROPROCESSOR INTERFACE

The interface circuitry consists of reset circuit, address bus(A0-A21), data bus(D0-D15), and memory controls (LWR_N, RAM_CS1_N, RAM_CS2_N, ROM_CS1_N)

CODEC

The MSM5100(U101) integrates an audio voiceband CODEC into the Mobile Station Modem. The integrated CODEC contains all of the required conversion and amplification stages for the audio front end.

GPADC

The MSM5100(U101) has an on-chip 8bit analog-to-degital(GPADC) which is intended to digitalize DC signal corresponding to analog parameters such as Battery voltage, Temperature, and RF power levels.

Clock

- CPU clock : 19.2MHz. This clock signal from the TCXO
- Sleep clock : 32.768KHz. This clock signal is used for sleep.
- TCXO/N : This 19.2MHz clock source is used by various blocks of the MSM5100 device, such as the ARM7TDMI ringer, UARTs, general-purpose PDMs, and the Digital FM circuits. TCXO can be used as a vocoder clock source for EVRC support. TCXO is also used by the MSM5100 device to produce CHIPX8.
- CHIPX8 : 9.8304 MHz clock source in CDMA mode. 360 kHz clock source in digital FM mode.
- USB clock : 48MHz. This clock signal is used to drive the USB interface on the MSM5100.

IRR3300, RFT3100 AND MSM INTERFACE

A. CDMA, FM Data Interface

- I_OUT, I_OUT_N and Q_OUT, Q_OUT_N(U403 pins 3,4 / 1,2) : Differential analog output for I and Q component used during CDMA and FM mode.
- RX_IDATA2-3 (U301 pins 45-46) and RX_QDATA0-3(U301 pins 39-42) : RX data bus used during CDMA.
- FM_RX_IDATA(U301 pin 47) and FM_RX_QDATA(U301 pin 48) : RX data bus used during FM mode.

B. Clock

- CHIPX8 : ADC reference clock(9.590MHz) used in CDMA RX mode.
- CX8_FM_CLK : Reference clock(360KHz) in FM RX mode.

C. RF Interface

- TX : TX_AGC_ADJ(U101 pin A12) port is used to control the TX power, PA_ON_PCS(U101 pin C11) signal used to control the PCS power amplifier and PA_ON_CELL(U101 pin D6) signal used to control CDMA power amplifier.
- RX : RX_AGC_ADJ(U101 pin A11) port is used to control the RX gain and TRK_LO_ADJ(U101 pin B11) is used to compensate the TCXO clock.

6-1-4 Audio Part

The MSM5100 integrates an audio voiceband Codec into Mobile Station Modem. The integrated Codec contains all of the required conversion and amplification stages for the audio front end.
The Codec operates as a 13bit linear Codec with the transmit(TX) and receive(RX) filters designed to meet ITU-TG.712 requirement. The CODEC contains the software controller amplifier for both the receiving and transmitting sections. Also, the vocoding schemes used will be 13kbps QCELP and 8Kbps EVRC. The QCELP vocoder is based in the MSM internally.

TX AUDIO PATH

The voice signal from the microphone is inputted to the internal CODEC. The voice signal is then amplified by the internal amplifier and is converted to PCM data to be outputted to the MSM as 13bit data. This data is then processed by the MSM(U101)'s internal.

RX AUDIO PATH

The PCM data from the MSM(U101)'s internal is inputted to the internal CODEC and the data will be decoded by the internal DAC and audio levels are adjusted by the amplifier. The final audio is then sent to the audio receiver.

BUZZER DRIVING CIRCUITRY

A speaker generates alert tone and melody. When the MSM(U101) receives the data, it generates alert tone and melody. Ringer signal generated in MSM5100 is intended to drive a speaker.

KEY TONE GENERATOR

The CODEC data out from the MSM5100 is converted to DTMF signal by TONE generator of internal CODEC, is then amplified by the internal audio amplifier to be sent to the speaker unit.

DIGITAL FM BLOCK

The digital FM processor is included in the MSM5100.

FM TRANSMIT PROCESSOR

A. Pre-Emphasis Circuit

This part features +6dB/oct to reduce signal loss and noise in Tx path.

B. Compressor

The compressor features 2:1 level compressor to reduce signal loss and noise in Tx path. The zero crossing level of the compressor is ±2.9 kHz/dev, attack time is 3ms, and release time is 13.5ms.

C. Limiter

The limiter performs to cut ±0.53 Vp-p or higher audio signal level so that the FM frequency deviation is not over ±12kHz/dev. The function is used to avoid confusion over phone line LPF is used to reduce a specific high frequency of limited signal.

FM RECEIVER AUDIO PATH

A. De-Emphasis Circuit

This part features -6dB/oct filter to reduce signal loss and noise in Rx path.

B. Expandor
The expandor features 1:2 level increaser to reduce signal loss and noise in Rx path.
The zero crossing level of the expander is ±2.9kHz/dev, attack time is 3ms, and release time is 13.5ms.

6-1-5 TX WBD, ST, And SAT

The WBD and ST are generated by the MSM5100 but the SAT is generated by the RFT3100.
The modulation level of TX WBD and ST is ±8kHz/dev and SAT is ±2kHz/dev.

6-2 RF Part

6-2-1 Transmitter (For CDMA PCS(1900MHz))

ANTENNA

Antenna sends signal to the base station and receives the signal from the base station. It is a tri-band Antenna and covers PCS band, CDMA band, AMPS band and GPS band.

RF SWITCH

It(U405:GN04022NOL) is used to switch the PCS/AMPS path and the GPS path, The RF signal pass through PCS/AMPS path when GPS_MODE is low and GPS_MODE is high.
GPS_MODE and GPS_MODE_ are digital signals from MSM5100 GPIO.

SEPARATOR

This components(F402) separate Cellular Band(824~894MHz) and PCS Band(1850~1990MHz)

DUPLEXER

Duplexer(F400) allows to transmit only the signals within acceptable Tx frequency range (1880 ± 30 MHz) through the antenna.

POWER AMP

Power amplifier module(U408:CX77133) amplifiers signal to be sent to the base station through the antenna.

DRIVER AMP

The driver amp(U403 ; included in RFT3100) allows the signal to be inputted to the power amp(U408) as a specified level.

Up-converter(Mixer)

The up-converter(U403 ; also included in RFT3100) receives the first local signal 2143.6±30MHz and the 263.6MHz IF signal controlled by TX AGC amp(in RFT3100) to generate Tx RF signal 1880±30MHz which signal comes out from the mixer output by adding 263.6MHz IF signal to 2143.6±30MHz first local signal.

IF Automatic Gain Control

The TX IF AGC amp (in RFT3100) controls gain of AGC to deliver power level needed at driver amp. Dynamic range is 85dB, and its control voltage varies from 0.2V to 2.5V.

6-2-2 Transmitter (For CDMA(800MHz) PCS)

ANTENNA

Antenna sends signal to the base station and receives the signal from the base station. It is a tri-band Antenna and covers PCS band, CDMA band, AMPS band and GPS band.

RF SWITCH

It(U405:GN04022NOL) is used to switch the PCS/AMPS path and the GPS path, The RF signal pass through PCS/AMPS path when GPS_MODE is low and GPS_MODE is high. GPS_MODE and GPS_MODE_ are digital signals from MSM5100 GPIO.

SEPARATOR

This component(F402) separate Cellular Band(824~894MHz) and PCS Band(1850~1990MHz)

DUPLEXER

Duplexer(F404) allows Rx frequency range(881.49 ±12.5 MHz) and Tx frequency range (836.49 ±12.5 MHz) from the antenna to pass through LNA. It also matches LNA input in receiving part and PA(U402:ACPM-7812) output in transmitter part with the antenna.

POWER AMP

Power amplifier module(U404:RM912) amplifiers signal to be sent to the base station through the antenna.

RF BAND PASS FILTER(TX RF SAW FILTER)

The RF BPF(F405) pass only specific frequency(836.49 ±12.5MHz) to send it to power amp(U402:RM-912).

DRIVER AMP

The driver amp(U403 ; It is included in RFT3100) allows the signal to be inputted to the power amp(U402) as a specified level.

UP-CONVERTER(MIXER)

The up-converter(U403 ; It is also included in RFT3100) receives the first local signal 836.49 ± 12.5MHz and the signal controlled by TX AGC amp(in RFT3100). 836.49 ± 12.5MHz signal comes out from the mixer output by substracting 228.6MHz IF signal to 1065.09 ±12.5 MHz first local signal.

IF AUTOMATIC GAIN CONTROL

The TX IF AGC amp in RFT3100 controls gain of AGC to deliver power level to be needed at Driver amp. Dynamic range is 90dB, and its control voltage varies from 0.2V to 2.5V.

6-2-3 Receiver (For CDMA PCS(1900MHz))

LOW NOISE AMPLIFIER(LNA)

The low noise amplifier(It is included in RFR3300 : U300) amplifies a weak signal received from the base station to obtain the optimum signal level.

RF BAND PASS FILTER(RX RF SAW FILTER)

The RF BPF(F302) passes only a specific frequency(1960±30 MHz) from the signal received from the mobile station. The bandwidth is 60 MHz.

DOWN CONVERTER(MIXER)

The first local signal is applied to the down converter in RFR3300 : U300.
This component converts the RF signal from the LNA to IF signal(183.6MHz). The IF signal is made by subtracting first local signal(2143.6±30 MHz) from RF signal(1960±30MHz).

IF BAND PASS FILTER(RX IF SAW FILTER)

This filter(F304) eliminates the image products generated by the mixer. The bandwidth is 1.25MHz.

IF AUTOMATIC GAIN CONTROLLER(AGC) AMP

IF signal(183.6MHz) is applied to IF AGC amplifier(in IFR3300) and AGC level is applied to next stage in IFR3300. The AGC amp(in IFR3300) keeps the signal at a constant level by controlling the gain. Dynamic range is 90 dB with control voltage range from 0.5 to 2.5 voltage.

6-2-4 Receiver (For CDMA(800MHz) and AMPS)

LOW NOISE AMPLIFIER(LNA)

The low noise amplifier(It is included in RFR3300 : U300) amplifies a weak signal received from the base station to obtain the optimum signal level.

RF BAND PASS FILTER(RX RF SAW FILTER)

The RF BPF in F300 passes only a specific frequency(881.49±12.5 MHz) from the signal received from the mobile station. The bandwidth is 25 MHz.

DOWN CONVERTER(MIXER)

The first local signal is applied to this down converter in RFR3300 : U300. The down converter converts the signal from LNA into 183.6MHz IF signal. 183.6MHz IF signal is made by subtracting 881.49 ±12.5 MHz from first local signal 1065.09 ±12.5 MHz RF signal.

IF BAND PASS FILTER(RX IF SAW FILTER)

This filter(CDMA:F304, AMPS:F301) eliminates the image products generated by the mixer.

IF AUTOMATIC GAIN CONTROLLER(AGC)

IF signal(183.6MHz) is applied to IF AGC amplifier in IFR3300 : U301 and AGC level is applied to next stage in IFR3300. The AGC amp in IFR3300 keeps the signal at a constant level by controlling the gain. Dynamic range is 90 dB, up gain 45dB, and down gain -45dB.

6-2-5 GPS(1575.42MHz)

ANTENNA

Antenna receives signal from GPS satellites.
It is a tri-band Antenna and covers PCS band, CDMA band, AMPS band and GPS band.

RF SWITCH

It(U405:GN04022NOL)is used to switch the PCS/AMPS path and the GPS path, The RF signal pass through PCS/AMPS path when GPS_MODE is low and GPS_MODE is high.
GPS_MODE and GPS_MODE_ are digital signals from MSM5100 GPIO.

PRE-FILTER

The RF Pre-filter(F303 : DFM2R1575MDA) passes only a specific frequency(1575.42±2MHz) from the signal received from the satellite. The bandwidth is 2 MHz.

LOW NOISE AMPLIFIER(LNA)

The low noise amplifier(It is included in RFR3300 : U300) amplifies a weak signal received from the base station to obtain the optimum signal level.

RF BAND PASS FILTER(RX RF SAW FILTER)

The RF BPF (F305:855969) passes only a specific frequency(1575.42±2 MHz) from the signal received from the satellite. The bandwidth is 2 MHz.

DOWN CONVERTER(MIXER)

The first local signal is applied to this down converter in RFR3300(U300). The down converter converts the signal from LNA into 183.6MHz IF signal. 183.6MHz IF signal is made by subtracting first local signal (1391.82 MHz) from the RF signal(1575.42MHz).

IF BAND PASS FILTER(RX IF SAW FILTER)

This is composed of discrete capacitor and inductor (L329,C368,C369,C361,C366,C367,L328).
It allows only an IF frequency (183.6 MHz) to pass to the detection circuitry(IFR3300)

SWITCH

It(D300) is used to isolate the AMPS signal and the GPS signal from the each other because the dectection circuitry (IFR3300) is common in AMPS mode and GPS mode.
If GPS_MODE is hgh and FM_MODE is low, the GPS signal pass through the IFR3300 while AMPS path is grounded. It is composed of two pin diodes in one package.

IF AUTOMATIC GAIN CONTROLLER(AGC) AMP

IF signal(183.6MHz) is applied to IF AGC amplifier in S1M8660 : U301 and AGC level is applied to next stage in S1M8660. The AGC amp in S1M8660 keeps the signal at a constant level by controlling the gain. Dynamic range is 90 dB, up gain 45dB, and down gain -45dB.

6-2-6 PLL Block

FREQUENCY SYNTHESIZER CIRCUIT

The PLL(Phased Locked Loop) block consists of VC-TCXO(OSC301), PLL in RFT3100 and VCO(OSC302). Input reference frequency is generated at VC-TCXO(OSC301) and the RF local signal is generated at VCO. PLL compares the two signals and generates the desired signal with a preprogrammed counter which controls voltage.

VC-TCXO

The VC-TCXO (OSC301) is a reference source of the frequency synthesizer. It provides 19.2MHz reference frequency to PLL-IC. It is a voltage controlled temperature compensated crystal oscillator having 19.2MHz ±2.5ppm frequency stability over all useful temperature range.
A correct frequency tuning is made by the control voltage.

VOLTAGE CONTROLLED OSCILLATOR(DUAL VCO)

The VCO(OSC302) generates the signal having center frequency 2143.6±30MHz and 1065.09 ±12.5MHz deviation by voltage control in PCS mode and CDMA/AMPS mode each frequency range with the voltage control. The PLL in RFT3100 controls this signal.

TEMPERATURE TO VOLTAGE CONVERTER

The temperature to voltage converter(TH100:NTCCM10054) detects temperature.
It is used to compensate active component characteristics due to the temperature difference.

6-3 Test Command Table

To change the phone from normal mode to test mode, you should enter the following keys. :
Press [4 7 * 8 6 9 # 1 2 3 5]

Command No.	Command SW Name	Description
1	T_SUSPEND_I	Enter to TestMode
2	T_RESTART_I	Escape from TestMode
3	T_SAVE_VAL_I	Save values to EEPROM
4	T_WRITE_NV_I	Write the EEPROM item
5	T_VOLUME_UP_I	Electric Volume Up
6	T_VOLUME_DOWN_I	Electric Volume Down
7	T_CARRIERON_I	Turn on the carrier
12	T_CARRIEROFF_I	Turn off the carrier
13	T_LOADSYN_I	Load the synthesizer for locking
14	T_CDATA_I	Send TX Control data continuously
15	T_CDTRK_ADJ_I	Adjust CDMA tracking local
16	T_CDMA_TXADJ_I	Set CDMA/PCS Tx AGC code
17	T_TRK_ADJ_I	TRK LOCAL ADJUST
18	T_FM_TXADJ_I	sets tx_agc_adj for fm mode
19	T_LNA_GAIN_WR_I	Adjust LNA gain
20	T_LNA_RAS_ADJ_I	Adjust LNA Ras code in array
21	T_SIO_MODE_I	Change SIO mode
22	T_TEST_SYS_I	Change band & channel
23	T_DATASVC_ON_I	Data Service ON for Manufacturing Test
24	T_DATASVC_OFF_I	Data Service OFF for Manufacturing Test
25	T_MRU2_TABLE_I	Reset MRU
26	T_LCD_BUFFER_IC_I	
27	T_NAI_SET_I	
31	T_VERSION_I	Send model/sw ver/hw ver/buyer
32	T_SNDNAM_I	Send NAM Information
33	T_SNDVERSION_I	Send Software Version

Command No.	Command SW Name	Description
34	T_SNDESN_I	Send ESN
35	T_WRT_PLINFO_I	Write Product line information
36	T_RD_PLINFO_I	Read Product line information
37	T_REBUILD_I	Rebuilding EEPROM
38	T_PHONE_RESET_I	UI Features reset
39	T_FORMAT_REBUILD_I	
41	T_BACKLIGHT_ON_I	Backlight on
42	T_BACKLIGHT_OFF_I	Backlight off
43	T_LAMP_ON_I	LAMP on
44	T_LAMP_OFF_I	LAMP off
45	T_VIBRATOR_ON_I	Activate a vibrator
46	T_VIBRATOR_OFF_I	Inactivate a vibrator
47	T_DTMFON_I	Turn on DTMF
48	T_DTMFOFF_I	Turn off DTMF
49	T_SUB_LCD_CONTRAST	FRONT_LCD_CONTRAST
51	T_BATT_TYPE_I	Check battery type
52	T_READ_BATT_I	Saved low battery value read
53	T_VBATT1_I	Set low battey value in the standby
54	T_VBATT2_I	Set low battey value in the talking
55	T_WRITE_BATT_I	Write a battery value
56	T_THERM_READ_I	Read a thermister
61	T_PCS_RXRAS_ADJ_M_	Adjust PCS Rx Ras code in array
62	T_PCS_RXRAS_ADJ_A_	Adjust PCS Rx Ras code in array
63	T_PCS_TXRAS_ADJ_I_	Adjust PCS Tx Ras ccode in array
64	T_PCS_CH_FLATNESS_	Adjust PCS Tx Ras channel in flatness:dBm
65	T_PCS_PWR_LIMIT_I	Limit PCS Tx power
66	T_PCS_TEMPCOMP_I	Compensate PCS Tx Ras code at any temperature
67	T_PCS_BTF_I	
71	T_CDMA_RXRAS_ADJ_M	Adjust CDMA Rx Ras code in array
72	T_CDMA_RXRAS_ADJ_A	Adjust CDMA Tx Ras code in array
73	e T_CDMA_TXRAS_ADJ	Adjust CDMA Tx Ras code in array
74	T_CDMA_CH_FLATNESS	Adjust CDMA Tx Ras channel flatness : 23dBm

Command No. (OP, AB, RB)	Command SW Name	Description
75	T_CDMA_PWR_LIMIT_I	Limit CDMA Tx power
76	T_CDMA_TEMPCOMP_I	Compensate CDMA Tx Ras code at any temperature
77	T_CDMA_BTF_I	
81	T_FM_TX_PWR_I	Adjust AMPS Tx power level(2-7)
82	T_FM_CHAN_FLAT_I	Adjust AMPS Tx power channel flatness
83	T_FM_TEMPCOMP_I	Compensate AMPS Tx power at any temperature
84	T_FM_PWRLEVEL_I	Change AMPS power level
85	T_FM_RSSI_I	
91	T_GPSONE_MODE_I	Set single/continuous mode
92	T_GPSONE_GPS_RF_DELAY_FOR_PCS	
93	T_GPSONE_PCS_RF_DELAY_I	
94	T_GPSONE_ACCURACY_	
95	T_GPSONE_ANT_OFF_DB_I	
96	T_GPSONE_LO_BIAS_UPDATE_CNT	
97	T_GPSONE_GPS_LO_CAL_I	
98	T_GPSONE_GPS_RF_LOSS_I	Set gps rf loss
99	T_GPSONE_GPS_RF_DELAY_I	Set gps rf delay
100	T_GPSONE_CDMA_RF_DELAY_I	Set cdma rf delay
101	T_SET_EXT_AUDIO_I	External audio path on/off
102	T_FM_VCLINE_I	Enetr FM voice state
103	T_ALLPATH_I	Tune on the all audio path
104	T_RXMUTE_I	Mute rx audio
105	T_RXUNMUTE_I	Unmute rx audio
106	T_TXMUTE_I	Mute tx audio
107	T_TXUNMUTE_I	Unmute tx audio
108	T_LOOPBACK_I	
109	T_STON_I	Turn on ST
110	T_STOFF_I	Turn off ST
111	T_SATON_I	Turn on SAT
112	T_SATOFF_I	Turn off SAT
113	T_COMPANDORON_I	Turn on compandor
114	T_COMPANDOROFF_I	Turn off compandor

Command No.	Command SW Name	Description
115	T_FM_ST_GAIN_I	Adjust FM ST gain
116	T_FM_SAT_LEVEL_I	Adjust FM SAT level
117	T_FM_FREQ_SGAIN_I	Adjust FM fequency sense gain
121	T_TX_LIMITER_I	Adjust Tx Limiter
122	T_VOC_PCMLPON_I	Turn on to play a PCM LOOP BACK
123	T_VOC_PCMLPOFF_I	Turn off to play a PCM LOOP BACK
124	T_PCM_FORMAT_I	/
125	T_SND_VOC_CAL_I	/
126	T_MAX_I	

1) The AB (Input Argument Byte Number) values of these commands are used only in the manual test. In automatic test mode, the AB is regarded as 0.

2) You can assign the value for these commands. If the AB value is assigned without argument, the test is achieved with the value stored in EEPROM.

3) After you get a desired test value by performing these commands, if you want to save the value into EEPROM, use T-SAVE-VAL-I command to store the test value into the corresponding position.

*OP: Operation Command Number
AB: Input Argument Byte Number
RB: Return Byte Number
*SAT 32, 33 are not operating in MSM2 CHIP test
*46 command is required in Rx, and Tx path test at AMPS mode.