OPERATIONAL DESCRIPTION

The equipment under test (EUT) is the transmitter of J40E a quad-band (850/1900) GSM/dual-band (W850/1900)WCDMA/GPRS mobile phone. It supports GPRS class 12 and Bluetooth version is 2.1+EDR.The transmitter operates in a half-duplex system according to the GSMs standards. SAR report states: This DUT supports GPRS multi-slot class 12 (max. 4 uplink, 4 downlink, total 5 slots). It is class B device and it can't operate in DTM. Therefore, this DUT can't transmit voice (CS) and data (PS) simultaneously.

The majority of the phone circuitry consists of a two device chipset; the AP6684 Amplifier with transmit/receive switch, the MT6572 Baseband Processor which integrates transceiver module analog baseband digital baseband as well as Power Management Unit(PMU). The remainder of the major radio components are the receiver SAW filters, and a 26MHZ crystal for reference oscillator. There is also a combination Flash Memory/SRAM IC. The system is powered by a recharge able lithium-ion battery with a nominal voltage of 3.7volts.

The transmitter oscillators which comprise the translational loop architecture are internal to the transceiver IC and are phase locked to a 26 MHz reference signal derived from the 26 MHz crystal oscillator. The transmitter local oscillator Fractional-N phase lock loop operates on a fundamental frequency from 2520 MHz to2985MHz. This signal is divided by 28 then multiplied by 9 for use in the 850/900 MHz GSM band, and is divided by 28 then multiplied by 19 for use as the DCS/PCS band. The main oscillators operate fundamentally on their respective GSM, DCS, or PCS band.

The main oscillator signals are amplified by the power amplifier, routed to the inner directional coupler and transmit/receive (T/R) switch, finally delivered to the antenna.

The power settings are calibrated at the factory and stored in the flash memory IC. These settings are used as the reference level for the power control loop. Power ramping functions are also controlled by the mixed signal device.

The GMSK modulation is provided in-loop by quadrature I/Q signals which are sent to the transceiver module from the Baseband processor, but transceiver module is Integrate in MT6166.The RF performance conforms to the ETSI specifications for Spectrum due to modulation, transient switching modulation spectrum, power ramp, and power output, as well as all the other ETSI requirements.

The receiver is a direct-conversion design, therefore an intermediate frequency (IF)

SAW filter is not used in this design. The RFM Low Noise amplifiers (LNAs) are internal to the transceiver and the output directly coupled to the down-converting mixers. The outputs of the mixers are connected to the baseband section through an integrated single Pole filter with normal cut-off frequency of 800KHZ. The baseband amplifiers provide a majority of the analog receiver gain and have programmable gain for system AGC. The receiver baseband outputs are routed to the common TX/RX I/Q ports for connection with the baseband converters.

The Baseband process device MT6572 integrates a mixed-signal Baseband front-end which contains gain and offset calibration, the Baseband front-end receives the I/Q signal from the transceiver module, performs FIR filtering and then send result to DSP.

This Baseband device also has analog-to-digital converters (ADCs) and digital-to-analog converters (DACs) to directly interface to the handset speaker and microphone. The voice band Codec section provides a 32 ohm interface to the speaker and microphone and also provides Line In/Out signals for the headset.

Additional the Baseband device contains all required system power supply regulators. The baseband processor handles all physical layer radio control signals and network interfaces. The 32.768 KHz clock oscillator operates the baseband IC from a backup capacitor when the main battery is removed. The baseband processor is a dual-core device that splits the processing between a DSP core and an ARM7EJ-S processor. The DSP handles the physical and layer 1 processing, while the ARM7 executes the layer 2 and layer 3 protocols and the man-machine interface (MMI). and The dual cores communicate through a dedicated block of dual port memory. It also communicates with the Subscriber Identity Module (SIM). The baseband processor also communicates to the calibration system or external devices through a digital serial link that is available on the system connector. The baseband processor also supports UART as well as Bluetooth interface, necessary peripheral blocks are embedded for a voice centric phone: Keypad Scanner with the capability to detect multiple key presses, dual SIM Controller, Alerter, Real Time Clock, PWM, LCD Controller, USB2.0 HS/FS/LS, MMC/SD/MS/MS Pro/SDIO, IrDA and general purpose programmable I/Os.

The MMI completes the phone design and includes the displays, keypads, vibration motor, LEDs, speaker, microphone, and headset. The more details related operations, please refer to the user manual.

The device is compliant with Bluetooth Core Specification Version 2.1+EDR and provides excellent Bluetooth connectivity performance. The Bluetooth chip is MT6627 and it processes with the GFSK, π/4-DQPSK, or 8DPSK modulation in both directions. The operating frequency is 2402MHz to 2480MHz with 79 channels. The

antenna is a PIFI type.

2G/3G

Operating Frequency	☒GSM850: TX824.2MHz~848.8MHz /RX869.2MHz~893.8MHz; ☒UMTS FDD Band V: TX826.4MHz~846.6MHz /RX871.4MHz~891.6MHz; ☒PCS1900: TX1850.2MHz~1909.8MHz /RX1930.2MHz~1989.8MHz; ☒UMTS FDD Band II: TX1852.4MHz~1907.6MHz /RX1932.4MHz~1987.6MHz;
Modulation	☒GMSK for GSM/GPRS; ☒8PSK (DSKYlink Only); ☒QPSK for UMTS bands;
Number of Channels	☒124 Channels for GSM850; ☒102 Channels for UMTS FDD Band V; ☒299 Channels for PCS1900; ☒277 Channels for UMTS FDD Band II;
GPRS Class	☒Multi-Class12 ☒Only 4 timeslots are used for GPRS
SIM CARD	The Phone Two SIM Card sockets ☒IMEI Code1:354523080001549 ☒IMEI Code2:354523080001556
Antenna Type	FPCB Antenna
Antenna Gain	1 dBi

WiFi

Operating Frequency	2412-2462MHz for 802.11b/g/11n(HT20); 2422-2452MHz for 802.11n(HT40);
Modulation	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Number of Channels	11 channels for 802.11b/g/11n(HT20); 7 channels for 802.11n(HT40);
Antenna	PCB /1dBi

BT

Operating Frequency	2402MHz~2480MHz
Modulation	GFSK,π/4-DQPSK, 8DPSK

Bluetooth Version	BT V3.0(BR+EDR)
Number of Channels	79 Channels
Antenna Type	FPCB Antenna
Antenna Gain	1 dBi

Power supply

Power supply	☒DC supply: DC 3.7V/1150mAh from Battery or DC 5V from Adapter.
	☒Adapter supply: Model:Fuego 4.0M Input:AC 100~240V 50/60Hz 0.15A Output:DC 5V,500mA