

OPERATIONAL DESCRIPTION

APPLICANT: HELI (SHENZHEN) DIGITAL CO., LTD

Manufacturer: HELI (SHENZHEN) DIGITAL CO., LTD

FCC ID: ZEX-PLUMT300

Instruction Book:
Users Manual

Frequency Range GSM

Transmit Frequency Band:	824.2-848.8 MHz
Receive Frequency Band:	849.2-893.8 MHz

Transmit Frequency Band:	1850.2-1909.8 MHz
Receive Frequency Band:	1930.2-1989.8 MHz

Specific Operating Power Range:

Power Class 1;

Power Control Level 0	+30dBm +2.0dB/-2.0dB
Power Control Level 1	+28dBm +3.0dB/-3.0dB
Power Control Level 2	+26dBm +3.0dB/-3.0dB
Power Control Level 3	+24dBm +3.0dB/-3.0dB
Power Control Level 4	+22dBm +3.0dB/-3.0dB
Power Control Level 5	+20dBm +3.0dB/-3.0dB
Power Control Level 6	+18dBm +3.0dB/-3.0dB
Power Control Level 7	+16dBm +3.0dB/-3.0dB
Power Control Level 8	+14dBm +3.0dB/-3.0dB
Power Control Level 9	+12dBm +4.0dB/-4.0dB
Power Control Level 10	+10dBm +4.0dB/-4.0dB
Power Control Level 11	+8dBm +4.0dB/-4.0dB
Power Control Level 12	+6dBm +4.0dB/-4.0dB
Power Control Level 13	+4dBm +4.0dB/-4.0dB
Power Control Level 14	+2dBm +5.0dB/-5.0dB
Power Control Level 15	+0dBm +5.0dB/-5.0dB

Note; Effective radiation efficiency is -3.7dB

DC Voltage and Current into the Final Amplifier Module:

Supply Voltage	= 5.0Vdc
Supply Current	= ~0.5Amp.

Tune-up Procedure:

Tune-up Procedure

Equipment Identification:

Equipment's Identification label and its intended Location are as shown in EXHIBIT Type "ID Label / Location Information" (FCC ID Nameplate), and in EXHIBIT Type "Internal Photo"(Photograph of inside)

Photographs:

A complete set of the Photographs showing External and Internal Views of Circuit Details and Construction are provided by from EXHIBIT Type "External Photos" and "Internal Photos".

Accessories:



Figure 1.2: Terminal Components (Accessories)

Technical Descriptions

TX synthesizer uses an Offset-PLL circuit. The Offset-PLL circuit consists of PLL-IC and TX_VCO and loop filter. Reference frequency of the above synthesizers is 26MHz and generated by VCTCXO. Control signal is sent from Baseband section and keeps frequency stability.

TX IQ signal is input from Baseband section to MT6235, The Bluetooth signal is input form MT6601 and FM signal is input form TLG1120 section to MT6235.

TX IQ signal is applied to the quadrature up-converter, and the up-converter LO signal is generated from the transceiver VCO within MT6139B. This up-converter translates the GMSK-modulated signal to an intermediate frequency (IF) that forms one input to a frequency/phase detector circuit. This IF signal is the reference input to an Offset-PLL circuit. The feedback path of this Offset-PLL circuit includes a down-conversion from the RF output frequency range to the IF range. The two inputs to this down-conversion mixer are formed the TX_VCO output and the LO generation circuits. The mixer output is the offset feedback signal that forms the variable input to a frequency/phase detector circuit. The detector compares its variable input to its reference input and generates an error signal that is low-pass filtered by the loop filter and applied to TX_VCO to force the RF frequency in the direction that minimizes errors.

The TX_VCO output passes PA, Antenna SW, Coaxial connector with switch and emitted from embedded antenna.

Digital Modulation:

Analog speech produced by a microphone is encoded to digital PCM samples using a CODEC. The PCM samples are passed to a Vocoder for AMR (Advanced Multi Rate) encoding, to compress the speech samples. The encoding rate is determined by the Vocoder which formats the speech samples as data packets. A new data packet with data rate information is read by the microprocessor every 20 ms. The speech CODEC becomes AMR, FR(Full Rate), EFR(Enhanced FR) and HR(Half Rate). The microprocessor then sends the data packet to the transmit subsystem, and passed DAC to covert analog signal. I/Q base band signal is filtered and is inputted into 6M4003 containing quadrature phase modulator.