Tune Up

Specific Operating Power Range:
GSM850 Band:

Power Class 1;

Power Contorl Level 5   +32.5dBm +1dB/-1dB

Power Contorl Level 6	+31dBm +2.0dB/-2.0dB
Power Contorl Level 7	+29dBm +2.0dB/-2.0dB
Power Contorl Level 8	+27dBm +2.0dB/-2.0dB
Power Contorl Level 9	+25dBm +2.0dB/-2.0dB
Power Contorl Level 10	+23dBm +2.0dB/-2.0dB
Power Contorl Level 11	+21dBm +2.0dB/-2.0dB
Power Contorl Level 12	+19dBm +2.0dB/-2.0dB
Power Contorl Level 13	+17dBm +2.0dB/-2.0dB
Power Contorl Level 14	+15dBm +2.0dB/-2.0dB
Power Contorl Level 15	+13dBm +2.0dB/-2.0dB
Power Contorl Level 16	+11dBm +2.0dB/-2.0dB
Power Contorl Level 17	+9dBm +2.0dB/-2.0dB
Power Contorl Level 18	+7dBm +2.0dB/-2.0dB
Power Contorl Level 19	+5dBm +2.0dB/-2.0dB

GSM1900 Band:
Power Class 1;

Power Control Level 0	+29.5dBm +1.0dB/-1.0dB
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

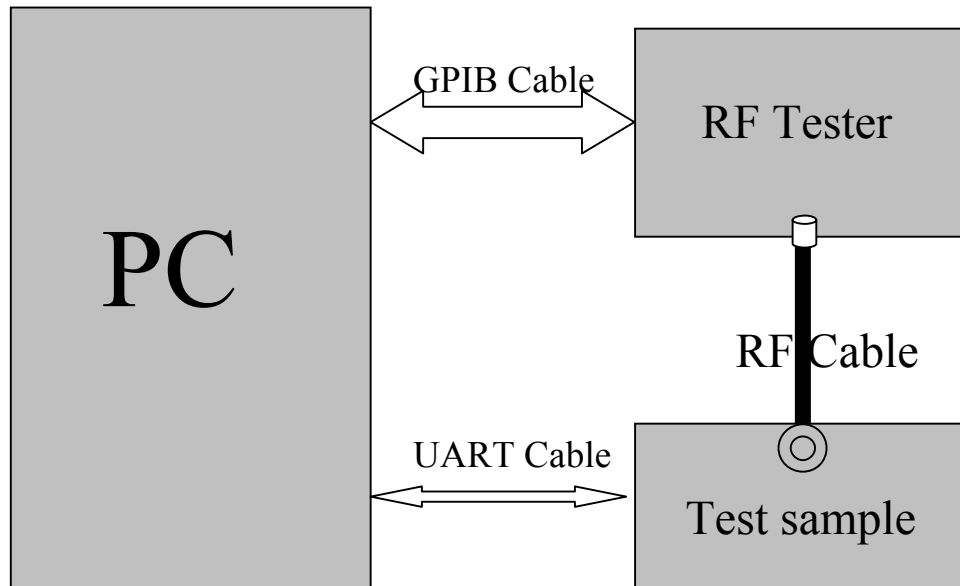Note; Effective radiation efficiency is –3.7dB

Figure 1

1 Adjustment of RF Output Power:

(1) The equipment setup as shown in Figure 1.

(2) Operation of PC adjusts equipment.

(3) Use RF Engineering Tools at PC side.

Select GSM850 Band:

1) Set GSM850 Band.

2) Set ARFCN: 190

3) TX ON.

4) Adjust the power to 32.5dBm (+1.0dB/-1.0dB, Power control level: PCL=5) by PA DAC value.

5) Repeat 4) for 15 times,and adjust the power level to 30.5, 28.8, 27, 25, 23, 21, 19, 17, 15, 13, 11, 9, 7, 5.

6) Make 16 Ramp-Up/Ramp-Down data from the adjustment value of (5) and (6).

7)　Data of 5) and 6) is writen to flash memory.

Select PCS1900 Band:

1)　Set PCS Band.

2)　Set ARFCN: 661.

3)　TX ON.

4)　Adjust the power to 29.5 dBm (+1.0dB/-1.0dB, Power control level: PCL=0) by PA DAC value.

5)　Repeat 4) for 15 times,and adjust the power level to 27.5, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0.

6)　Make 16 Ramp-Up/Ramp-Down data from the adjustment value of (5) and (6).

7)　Data of 5) and 6) is writen to flash memory.

2   Adjustment of oscillation frequency of VCXO:

(1) The equipment setup as shown in Figure 1.

(2) Use Crystal AFC Control Tools to Set CapID and AFC DAC value.

(3) Set Band=GSM850,Set ARFCN=190,Set PCL=12.

1)　Set AFC DAC=4096,fixed.(Check that Vafc=1.4V).

2)　Set CapID=0, and verify that frequency error >>10KHz.

3)　Set CapID=63, and verify that frequency error <<-10KHz.

4)　If the above 3 items are verified, then change CapID value to make frequency error be closed to 0 Hz as possible, record this CapID value.

5)　Set CapID value got from step 4), then change AFC DAC value to make frequency error be closed to 0 Hz as possible, record this AFC DAC value.

6)　Download the CapID value and AFC DAC value to flash memory.

3   Adjustment of RX Sensitivity:

(1) Select GSM850 Band:

1) Set BCCH level:-85dBm;ARFCN:128.

2) Test sample make a call to connect RF Tester..

3) Set TCH level:-106dBm.

4) Measure BERⅡ error at TCH ARFCN:128, 190，251.

5) Tuen up the RX matching cricuit to make sure BERⅡ<2% at each ARFCN.

（2）Select PCS Band:

1) Set BCCH level:-85dBm;ARFCN:512.

2) Test sample make a call to connect RF Tester..

3) Set TCH level:-106dBm.

4) Measure BERⅡ error at TCH ARFCN:512, 661, 810.

5）Tuen up the RX matching cricuit to make sure BERⅡ<2% at each ARFCN.

2.Bluetooth GENERAL INFORMATION

2.1 Product Information

Product	GSM Mobile Phone
Trade Name	Snapfon
Model Number	EZ TWO
Series Number:	N/A
Description of Differences:	N/A
Power Supply	DC 5V by AC/DC adapter 100-240V~50/60Hz DC 3.7V by battery
Frequency Range	2402MHz -2480MHz
Modulation Type	FHSS
Antenna Type:	Internal Fixed
Channel Spacing:	1MHz
Channel Number	79(CH Low: 2402MHz, CH Mid: 2441MHz, CH High: 2480MHz)
Temperature Range	-20°C ~ 50°C

\<Bluetooth Conducted Power\>

Channel	Frequency	Bluetooth RF Output Power (dBm)		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	3.03	1.11	1.01
Ch39	2441MHz	2.89	0.93	0.88
Ch78	2480MHz	2.54	0.57	0.51