

# Tune Up

Specific Operating Power Range:

GSM850 Band:

Power Class 1;

Power Control Level 5	+33dBm	+0.3dB/-0.3dB
Power Control Level 6	+31dBm	+2.0dB/-2.0dB
Power Control Level 7	+29dBm	+2.0dB/-2.0dB
Power Control Level 8	+27dBm	+2.0dB/-2.0dB
Power Control Level 9	+25dBm	+2.0dB/-2.0dB
Power Control Level 10	+23dBm	+2.0dB/-2.0dB
Power Control Level 11	+21dBm	+2.0dB/-2.0dB
Power Control Level 12	+19dBm	+2.0dB/-2.0dB
Power Control Level 13	+17dBm	+2.0dB/-2.0dB
Power Control Level 14	+15dBm	+2.0dB/-2.0dB
Power Control Level 15	+13dBm	+2.0dB/-2.0dB
Power Control Level 16	+11dBm	+2.0dB/-2.0dB
Power Control Level 17	+9dBm	+2.0dB/-2.0dB
Power Control Level 18	+7dBm	+2.0dB/-2.0dB
Power Control Level 19	+5dBm	+2.0dB/-2.0dB

GSM1900 Band:

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  $-3.7\text{dB}$

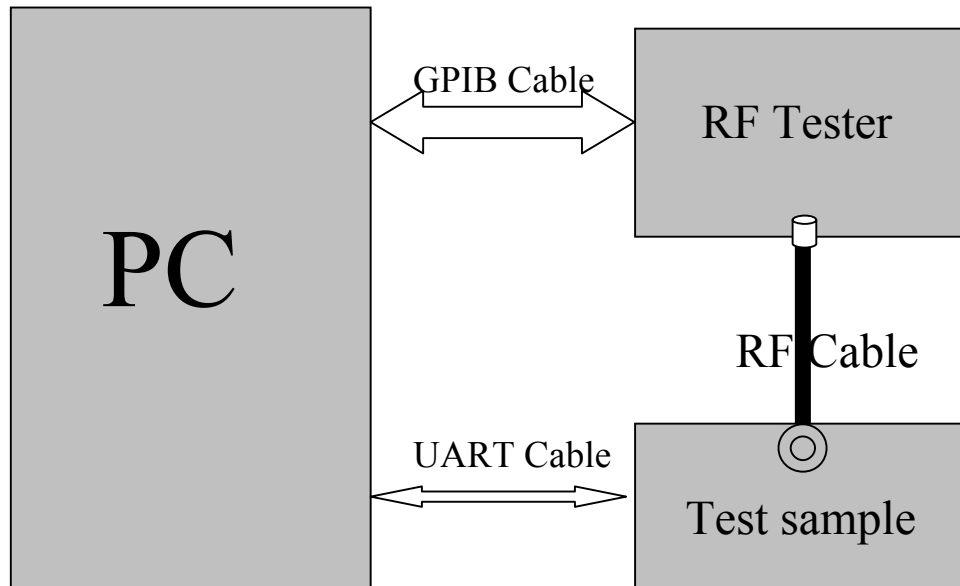


Figure 1

### 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 32.4dBm (+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 written to flash memory.

Select PCS1900 Band:

1) Set PCS Band.

2) Set ARFCN: 661.

3) TX ON.

4) Adjust the power to 29.0 dBm (+2.0dB/-2.0dB, 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 written 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  $V_{afc}=1.4V$ ).

2) Set CapID=0, and verify that frequency error  $\gg 10KHz$ .

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

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 BER II error at TCH ARFCN: 128, 190, 251.

5) Tune up the RX matching circuit to make sure  $BER II < 2\%$  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 BER II error at TCH ARFCN:512, 661, 810.

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

## 2

### 2.1 Product Information

Description:	GSM mobile phone
Model Name:	P300
Series Number:	N/A
Model Difference description:	N/A
Power Supply:	DC 5V by AC/DC adapter 100~240V 50/60Hz DC 3.7V by Lithium-ion Battery
Frequency Range:	2412MHz – 2462MHz
Number of Channels:	IEEE 802.11b/g mode: 11 Channels
Modulation Technique:	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps)
Antenna Gain:	0dBi
Temperature Range:	-20°C ~ +50°C

**2.2 Product Information-BT**

<b>Product</b>	GSM mobile phone
<b>Trade Name</b>	Plum
<b>Model Number</b>	P300
<b>Series Number:</b>	N/A
<b>Description of Differences:</b>	N/A
<b>Power Supply</b>	DC 5V by AC/DC adapter 100-240V~50/60Hz DC 3.7V by battery
<b>Frequency Range</b>	2402MHz -2480MHz
<b>Modulation Type</b>	FHSS
<b>Antenna Type:</b>	Internal Fixed
<b>Channel Spacing:</b>	1MHz
<b>Channel Number</b>	79(CH Low: 2402MHz, CH Mid: 2441MHz, CH High: 2480MHz)
<b>Temperature Range</b>	-20°C ~ 50°C