Tune-up Procedure

During manufacturing each phone will be individually calibrated.

The measurement is done in a fully calibrated setup, which is based on RS CMW500 ,

Furthermore, the highest power level is verified afterwards in a call measurement on three channels (low, mid and high).

Procedure:

1. Set the phone to operational voltage and on one certain channel in a special service mode by means of company proprietary software.

2. The actual power is measured at several power levels.

3. The gain factors of each individual phone are adjusted via the Board-test SW using automatic adjustment arithmetic until the target value is met.

4．The tune-up target value is below:

> GSM
> GSM 850：
> PCL =05, PWR = 32.5dBm, target = 32.5± 1dBm
>
> PCS 1900：
> PCL =00, PWR = 30.0dBm, target =30 ± 1 dBm
>
> GPRS/EGPRS (GMSK)
> GPRS/EGPRS 850 multi-slot power (GMSK)
> PCL=5
> SLOTS=1, PWR=32.5dBm, target =32.5 ± 1dBm
> SLOTS=2, PWR=31.0dBm, target =31.0 ± 1dBm
> SLOTS=3, PWR=29.3 dBm, target =29.3 ± 1dBm
> SLOTS=4, PWR=28.2 dBm, target =28.0 ± 1dBm
>
> GPRS 1900 multi-slot power (GMSK)
> PCL=0
> SLOTS=1, PWR=30.0 dBm, target =30 ± 1dBm
> SLOTS=2, PWR=28.0 dBm, target =28.0 ± 1dBm
> SLOTS=3, PWR=26.5 dBm, target = 26.5 ± 1dBm
> SLOTS=4, PWR=25.5 dBm, target =25.5 ± 1dBm

EGPRS (8PSK)

EPRS 850 multi-slot power(8PSK)

PCL=5

SLOTS=1, PWR=26dBm, target =26 ± 1dBm

SLOTS=2, PWR=24.5dBm, target = 24.5 ± 1dBm

SLOTS=3, PWR= 23 dBm, target = 23 ± 1dBm

SLOTS=4, PWR=21.5 dBm, target =21.5 ± 1dBm

EPRS 1900 multi-slot power(8PSK)

PCL=0

SLOTS=1, PWR=25.5dBm, target =25.5 ± 1dBm

SLOTS=2, PWR=24dBm, target = 24 ± 1dBm

SLOTS=3, PWR= 21.5dBm, target = 21.5 ± 1dBm

SLOTS=4, PWR=20.5 dBm, target =20.5 ± 1dBm

WCDMA (QPSK)

BC2 Maximum Output Power =24.0Bm, target = 24.0±1 dBM

BC4 Maximum Output Power =24.0dBm, target = 24.0±1 dBM

BC5 Maximum Output Power =24.0dBm, target = 24.0±1 dBM

LTE (BW 10MHz,1RB,QPSK)

BC2 Maximum Output Power =23dBm, target = 23±1 dBm

BC4 Maximum Output Power =23dBm, target = 23±1 dBm

BC5 Maximum Output Power =23dBm, target = 23±1 dBm

BC17 Maximum Output Power =23dBm, target = 23±1 dBm

LTE MPR will follow up 3GPP setting as below:

Modulation	Channel bandwidth / Transmission bandwidth (NRB)						MPR (dB)
	1.4MHz	3.0MHz	5MHz	10MHz	15MHz	20MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	2

The appropriate gain control settings are stored in RF table (a special section in Flash marked with Read only and untouchable for end user) each phone individually (for each power level).

The user has no possibility to change these settings later on.

BT Power：

BT EDR

GFSK			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	7	7	7
Tolerance ±(dB)	1	1	1
EDR2M-4_DQPSK			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	6	6	6
Tolerance ±(dB)	1	1	1
EDR3M-8DPSK			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	6	6	6
Tolerance ±(dB)	1	1	1

BT BLE

GFSK			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	0	0	0
Tolerance ±(dB)	1	1	1

WIFI Power:

802.11b

Channel\rate	1Mbps		2Mbps		5.5Mbps		11Mbps	
	dBm	±	dBm	±	dBm	±	dBm	±
1	17.5	1	17.5	1	17.5	1	17.5	1
6	17.2	1	17.2	1	17.2	1	17.2	1
11	17.5	1	17.5	1	17.5	1	17.5	1

802.11g

Channel\rate	6Mbps		9Mbps		12Mbps		18Mbps		24Mbps		36Mbps		48Mbps		54Mbps	
	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±
1	15.2	1	14.9	1	14.7	1	14.4	1	14.0	1	12.5	1	12.0	1	10.8	1
6	14.6	1	14.9	1	14.7	1	14.4	1	14.0	1	12.5	1	12.0	1	10.8	1
11	14.9	1	14.9	1	14.7	1	14.4	1	14.0	1	12.5	1	12.0	1	10.8	1

802.11n-20M

Channel\rate	MCS0		MCS1		MCS2		MCS3		MCS4		MCS5		MCS6		MCS7	
	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±	dBm	±
1	13.1	1	12.7	1	12.3	1	12.0	1	11.5	1	10.0	1	8.8	1	8.6	1
6	12.6	1	12.7	1	12.3	1	12.0	1	11.5	1	10.0	1	8.8	1	8.6	1
11	12.9	1	12.7	1	12.3	1	12.0	1	11.5	1	10.0	1	8.8	1	8.6	1

WIFI Hotspot Enable: TX Power need to be rolled back;

GPRS 1900

SLOTS=1, PWR=25.5dBm, target =25.5 ± 1dBm

SLOTS=2, PWR=23.5dBm, target =23.5 ± 1dBm

SLOTS=3, PWR=21.5 dBm, target =21.5 ± 1dBm

SLOTS=4, PWR=20.5 dBm, target =20.5 ± 1dBm

WCDMA

BC2 Maximum Output Power =20 dBm, target = 20.0±1 dBm

BC4 Maximum Output Power =20 dBm, target = 20.0±1 dBm

LTE (BW 10MHz,1RB,QPSK)

BC2 Maximum Output Power =20 dBm, target = 20.0±1 dBm

BC4 Maximum Output Power =20 dBm, target = 20.0±1 dBm

HSUPA:

BC2

Subtest1 Maximum Output Power =21.5dBm , target = 21.5±1 dBm

Subtest2 Maximum Output Power =21.0dBm , target = 21.0±1 dBm

Subtest3 Maximum Output Power =20.5dBm , target = 20.5±1 dBm

Subtest4 Maximum Output Power =21.5dBm , target = 21.5±1 dBm

Subtest5 Maximum Output Power =22.0dBm , target = 22.0±1 dBm

BC4

Subtest1 Maximum Output Power =22.0dBm , target = 22.0±1 dBm

Subtest2 Maximum Output Power =21.0dBm , target = 21.0±1 dBm

Subtest3 Maximum Output Power =21.0dBm , target = 21.0±1 dBm

Subtest4 Maximum Output Power =21.5dBm , target = 21.5±1 dBm

Subtest5 Maximum Output Power =22.0dBm , target = 22.0±1 dBm

BC5

Subtest1 Maximum Output Power =22.5dBm , target = 22.5±1 dBm

Subtest2 Maximum Output Power =21.5dBm , target = 21.5±1 dBm

Subtest3 Maximum Output Power =21.0dBm , target = 21.0±1 dBm

Subtest4 Maximum Output Power =22.0dBm , target = 22.0±1 dBm

Subtest5 Maximum Output Power =22.5dBm , target = 22.5±1 dBm

DC-HSDPA:

BC2

Subtest1 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest2 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest3 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest4 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

BC4

Subtest1 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest2 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest3 Maximum Output Power =22.5 dBm , target = 22.5±1 dBm

Subtest4 Maximum Output Power =22.5 dBm，target = 22.5±1 dBm

BC5

Subtest1 Maximum Output Power =22.5 dBm，target = 22.5±1 dBm

Subtest2 Maximum Output Power =22.5 dBm，target = 22.5±1 dBm

Subtest3 Maximum Output Power =22.5 dBm，target = 22.5±1 dBm

Subtest4 Maximum Output Power =22.5 dBm，target = 22.5±1 dBm