Tune Up Procedure

Tune-up procedure

During manufacturing each Tablet Device is individually calibrated. Measurement is performed in a fully calibrated setup using an Agilent 8960 base station simulator (system tester). Measurement procedure is outlined below:

Measurement Procedure:

1. Set the device to nominal operating voltage (4.0Volts) and on a predefined channel in a special test mode.
2. The actual output power is measured at several power levels.
3. The gain factors of each individual device are adjusted until the target value is met.

The appropriate gain control settings for each output power level are stored in each device individually.

The user has no possibility to change these settings.

4. The maximum gains of each individual device are adjusted and measured until the target value is met. The production target power with tolerance compiles with the maximum power in test report.

Table 1: GSM Speech

Target Value is Average Output Power Value

GSM 850			
Channel	Channel 251	Channel 190	Channel 128
Target (dBm)	32.5	32.5	32.5
Tolerance ±(dB)	1	1	1
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	29	29	29
Tolerance ±(dB)	1	1	1

Table 11.1: **GPRS & EGPRS & 8PSK**

GSM 850 GPRS&EGPRS (GMSK)				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	32	32	32
	Tolerance ±(dB)	1	1	1
2 Txslots	Target (dBm)	30	30	30
	Tolerance ±(dB)	1	1	1
3Txslots	Target (dBm)	28	28	28
	Tolerance ±(dB)	1	1	1
4 Txslots	Target (dBm)	27	27	27
	Tolerance ±(dB)	1	1	1

GSM 1900 GPRS&EGPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	29	29	29
	Tolerance ±(dB)	1	1	1
2 Txslots	Target (dBm)	27	27	27
	Tolerance ±(dB)	1	1	1
3Txslots	Target (dBm)	25	25	25
	Tolerance ±(dB)	1	1	1
4 Txslots	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	1	1	1

Table 11.2: WCDMA

UMTS Band V		Conducted Power (dBm)		
		Channel 4233	Channel 4183	Channel 4132
CS	Target (dBm)	23	23	23
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 1	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 2	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 3	Target (dBm)	21	21	21
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 4	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 5	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1
HSDPA sub-test 1-4	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1
UMTS Band IV		Conducted Power (dBm)		
		Channel 1513	Channel 1413	Channel 1312
CS	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 1	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 2	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 3	Target (dBm)	21	21	21
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 4	Target (dBm)	19.5	19.5	19.5
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 5	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1
HSDPA sub-test 1-4	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1

UMTS Band II		Conducted Power (dBm)		
		Channel 9538	Channel 9400	Channel 9262
CS	Target (dBm)	23	23	23
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 1	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 2	Target (dBm)	20	20	20
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 3	Target (dBm)	21	21	21
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 4	Target (dBm)	19.5	19.5	19.5
	Tolerance ±(dB)	1	1	1
HSUPA sub-test 5	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1
HSDPA sub-test 1-4	Target (dBm)	22	22	22
	Tolerance ±(dB)	1	1	1

Table 11.3: LTE

LTE Band 2			
Channel	Channel 19100	Channel 18900	Channel 18700
Target (dBm)	23	23	23
Tolerance ±(dB)	1	1	1
LTE Band 4			
Channel	Channel 20300	Channel 20175	Channel 20050
Target (dBm)	22.5	22.5	22.5
Tolerance ±(dB)	1	1	1
LTE Band 5			
Channel	Channel 20600	Channel 20525	Channel 20450
Target (dBm)	23	23	23
Tolerance ±(dB)	1	1	1
LTE Band 7			
Channel	Channel 21350	Channel 21100	Channel 20850
Target (dBm)	22	22	22
Tolerance ±(dB)	1	1	1
LTE Band 12			
Channel	Channel 23130	Channel 23095	Channel 23060
Target (dBm)	23	23	23
Tolerance ±(dB)	1	1	1

Table 11.4: WiFi

Mode	Channel/Data rate	Target (dBm)	Tolerance ±(dB)
802.11 b (2.4GHz)	1Mbps	17	1
	2Mbps	17	1
	5.5Mbps	17	1
	11Mbps	17	1
802.11 g (2.4GHz)	6-18Mbps	13	1
	24-36Mbps	12.6	1
	48-54Mbps	12.5	1
802.11 n (2.4GHz HT20)	MCS0-4	12.8	1
	MCS5-7	12	1
802.11 n (2.4GHz HT40)	MCS0-4	12	1
	MCS5-7	10	1

Table 5: BT

Target Value is Average Output Power Value

Mode	Target (dBm)	Tolerance ±(dB)
GFSK	5	1
GFSK(BLE)	-1	1
π/4 DQPSK	5	1
8DPSK	5	1

Then these appropriate gain settings are stored in each device individually.

The user has no possibility to change these settings later on, and during manufacturing each device will be individual calibrated in this range. The measurement is done in a fully calibrated setup, which is based on the base station simulator. Furthermore, the highest power level is verified afterwards in a call measurement on three channels (low, middle and high).