

# Star Tune up procedure

Tune up procedures shall be over the power range or at specific operating power levels.

1. It must provide an operational voltage (Input DC 12V or DC 3.7V 1900mAh battery) to turn on the device and on one certain channel in service mode by means of company proprietary software.
2. Base station simulator (CMW500) measures the Mobile phone device specific RF characteristics.
3. The maximum gain of each individual device are adjusted until the target value met.

GSM850		Tune-up
GPRS (GMSK)	1Tx slot	30.00±1.0
	2Tx slots	30.50±1.0
	3Tx slots	30.50±1.0
	4Tx slots	30.00±1.0
EGPRS (8PSK)	1Tx slot	25.50±1.0
	2Tx slots	25.50±1.0
	3Tx slots	25.50±1.0
	4Tx slots	25.50±1.0

GSM1900		Tune-up
GPRS (GMSK)	1Tx slot	28.00±1.0
	2Tx slots	28.00±1.0
	3Tx slots	28.00±1.0
	4Tx slots	28.00±1.0
EGPRS (8PSK)	1Tx slot	24.50±1.0
	2Tx slots	25.00±1.0
	3Tx slots	24.50±1.0
	4Tx slots	24.50±1.0

WCDMA BandII		Tune-up
AMR12.2K		22.50±1.0
RMC12.2K		22.50±1.0
HSDPA	Subtest-1	21.00±1.0
	Subtest-2	21.00±1.0
	Subtest-3	20.50±1.0
	Subtest-4	20.50±1.0
HSUPA	Subtest-1	21.50±1.0
	Subtest-2	20.50±1.0
	Subtest-3	20.50±1.0
	Subtest-4	20.50±1.0
	Subtest-5	21.50±1.0

WCDMA BandIV		Tune-up
AMR12.2K		22.00±1.0
RMC12.2K		22.00±1.0
HSDPA	Subtest-1	21.00±1.0
	Subtest-2	21.00±1.0
	Subtest-3	20.50±1.0
	Subtest-4	20.50±1.0
HSUPA	Subtest-1	21.00±1.0
	Subtest-2	20.00±1.0
	Subtest-3	20.00±1.0
	Subtest-4	21.00±1.0
	Subtest-5	21.50±1.0

WCDMA BandV		Tune-up
AMR12.2K		23.00±1.0
RMC12.2K		23.00±1.0
HSDPA	Subtest-1	22.00±1.0
	Subtest-2	22.00±1.0
	Subtest-3	21.50±1.0
	Subtest-4	21.50±1.0
HSUPA	Subtest-1	22.00±1.0
	Subtest-2	21.00±1.0
	Subtest-3	21.00±1.0
	Subtest-4	21.50±1.0
	Subtest-5	22.00±1.0

Bluetooth			
Mode		Channel	Tune-up
BLE	GFSK	0	-5.00±1.0
		19	-4.50±1.0
		39	-4.00±1.0

Band2				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
1.4MHz	QPSK	1	22	±1.0
		3	22	±1.0
		6	21.5	±1.0
	16QAM	1	22	±1.0
		3	22	±1.0
		6	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
3MHz	QPSK	1	22	±1.0
		8	21.5	±1.0
		15	22	±1.0
	16QAM	1	22	±1.0
		8	22	±1.0
		15	21	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	21.5	±1.0
		12	22	±1.0
		25	22	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	22	±1.0
		50	21.5	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
15MHz	QPSK	1	22	±1.0
		38	22	±1.0
		75	21.5	±1.0
	16QAM	1	22	±1.0
		38	22	±1.0
		75	21	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance

20MHz	QPSK	1	22	±1.0
		50	22	±1.0
		100	21.5	±1.0
	16QAM	1	22	±1.0
		50	22	±1.0
		100	22	±1.0

Band4				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
1.4MHz	QPSK	1	22	±1.0
		3	22	±1.0
		6	22	±1.0
	16QAM	1	22	±1.0
		3	22	±1.0
		6	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
3MHz	QPSK	1	22	±1.0
		8	22	±1.0
		15	22	±1.0
	16QAM	1	22	±1.0
		8	22	±1.0
		15	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	22.5	±1.0
		25	21	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
15MHz	QPSK	1	22	±1.0
		38	21.5	±1.0
		75	22	±1.0
	16QAM	1	22	±1.0
		38	22	±1.0
		75	21.5	±1.0

Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
20MHz	QPSK	1	22	±1.0
		50	22	±1.0
		100	22	±1.0
	16QAM	1	22	±1.0
		50	22	±1.0
		100	21.5	±1.0

Band5				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
1.4MHz	QPSK	1	22	±1.0
		3	22	±1.0
		6	20.5	±1.0
	16QAM	1	21.5	±1.0
		3	22	±1.0
		6	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
3MHz	QPSK	1	22	±1.0
		8	22	±1.0
		15	21.5	±1.0
	16QAM	1	22	±1.0
		8	22	±1.0
		15	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	22	±1.0
		25	21.5	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	21.5	±1.0

Band7				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	21.5	±1.0
		12	22	±1.0
		25	21.5	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	22	±1.0
		50	21	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
15MHz	QPSK	1	22	±1.0
		38	21.5	±1.0
		75	22	±1.0
	16QAM	1	22	±1.0
		38	22	±1.0
		75	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
20MHz	QPSK	1	22	±1.0
		50	22	±1.0
		100	22	±1.0
	16QAM	1	22	±1.0
		50	22	±1.0
		100	21.5	±1.0

Band12				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
1.4MHz	QPSK	1	22	±1.0
		3	22	±1.0
		6	21.5	±1.0
	16QAM	1	22	±1.0
		3	22	±1.0
		6	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
3MHz	QPSK	1	22	±1.0
		8	22	±1.0
		15	21.5	±1.0
	16QAM	1	22	±1.0
		8	22	±1.0
		15	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	22	±1.0
		25	21.5	±1.0
	16QAM	1	22	±1.0
		12	21.5	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22.5	±1.0
		25	22	±1.0
		50	22	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	21	±1.0

Band13				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	21	±1.0
		50	20.5	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	22	±1.0

Band14				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	22	±1.0
		25	21.5	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	21.5	±1.0
		50	22	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	21.5	±1.0



Band26				
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
1.4MHz	QPSK	1	22	±1.0
		3	22	±1.0
		6	22	±1.0
	16QAM	1	22	±1.0
		3	22	±1.0
		6	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
3MHz	QPSK	1	22	±1.0
		8	22	±1.0
		15	22	±1.0
	16QAM	1	22	±1.0
		8	22	±1.0
		15	21.5	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
5MHz	QPSK	1	22	±1.0
		12	21.5	±1.0
		25	22	±1.0
	16QAM	1	22	±1.0
		12	22	±1.0
		25	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
10MHz	QPSK	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
	16QAM	1	22	±1.0
		25	22	±1.0
		50	22	±1.0
Bandwidth	Mode	RBSize	Maximum(dBm)	Tolerance
15MHz	QPSK	1	22	±1.0
		38	21.5	±1.0
		75	22	±1.0
	16QAM	1	22	±1.0
		38	22	±1.0
		75	22	±1.0

Theseseappropriategainsettingsarestoredineachdeviceindividually.

Theuserhasnopossibilitytochangethesesettingslateron,andduringmanufacturingeachdevicewil lbeindividualcalibrated.Themeasurementisdoneinfullycalibratedsetup, whichisbasedonaCMW500basestationsimulator.Furthermore,thehighestpowerlevel is verified afterwards in a call measurement on three channels (low, middle and high).