



Tune Up Procedure

Tune-up procedure

GSM/WCDMA/LTE TEST

Measurement Procedure:

WCDMA/LTE

1.Connect EUT with CMU200(E5515C)/CMW500, through RF cable. Make a call from CMU200(E5515C)/CMW500;

2.Measure the Output Power Average value;

3.Remarks: All Output Power are tested in Average Value specification.

For WIFI/BT

1: Connect to Power meter (NRVD) through RF cable and let the EUT Continuously transmit

2: Measure the Output Power Average value

Manufacturing tolerance

The conducted power measurement results for GSM900/DCS1800

GSM900	Conducted Power (dBm)			Tune Up (dbm)
	Channel 124 (914.80MHz)	Channel 63 (902.60MHz)	Channel 975 (880.20MHz)	
	32.50	32.47	32.50	
				33.00
DCS1800	Conducted Power (dBm)			Tune Up (dbm)
	Channel 885 (1784.80MHz)	Channel 698 (1747.40MHz)	Channel 512 (1710.20MHz)	
	29.68	29.65	29.51	
				30.00

The conducted power measurement results for GPRS

GPRS 900 (GMSK)	Measured Power (dBm)			Tune Up (dbm)	Calculation (dB)	Averaged Power (dBm)			Tune Up (dbm)
	880.2 MHz	902.6 MHz	914.8 MHz			880.2 MHz	902.6 MHz	914.8 MHz	
1 Txslot	30.08	30.01	29.98	31.00	-9.03	21.05	20.98	20.95	22.00
2 Txslot	28.47	28.59	28.52	29.00	-6.02	22.45	22.57	22.50	23.00
3 Txslot	26.25	26.21	26.20	27.00	-4.26	21.99	21.95	21.94	22.00
4 Txslot	25.45	25.44	25.40	26.00	-3.01	22.44	22.43	22.39	22.00
GPRS 1800 (GMSK)	Measured Power (dBm)			Tune Up (dbm)	Calculation (dB)	Averaged Power (dBm)			Tune Up (dbm)
	1710.2 MHz	1747.4 MHz	1784.8 MHz			1710.2 MHz	1747.4 MHz	1784.8 MHz	
1 Txslot	28.32	28.20	28.27	29.00	-9.03	19.29	19.17	19.24	20.00
2 Txslot	26.32	26.31	26.39	27.00	-6.02	20.30	20.29	20.37	21.00



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Txslot									
3 Txslot	23.65	23.72	23.67	24.00	-4.26	19.39	19.46	19.41	20.00
4 Txslot	20.96	20.98	21.01	22.00	-3.01	17.95	17.97	18.00	19.00

The conducted power measurement results for WCDMA

Item	band	FDD Band VIII result (dBm)			Tune Up (dbm)	FDD Band I result (dBm)			Tune Up (dbm)
		Test Channel				Test Channel			
	sub-test	2713	2788	2862		9612	9750	9888	
WCDMA	\	23.06	23.11	23.13	24.00	23.17	23.14	23.09	24.00
HSDPA	1	21.91	21.96	21.97	23.00	22.27	22.29	22.31	23.00
	2	21.90	21.93	21.73	22.00	21.93	22.16	22.13	23.00
	3	21.55	21.68	21.43	22.00	21.91	21.93	22.00	22.00
	4	21.41	21.31	21.22	22.00	21.61	21.70	21.98	22.00
HSUPA	1	22.1	22.15	22.15	23.00	22.25	22.31	22.3	23.00
	2	22.03	21.90	21.93	23.00	22.07	22.06	22.30	23.00
	3	21.76	21.79	21.69	23.00	22.04	22.11	22.16	23.00
	4	21.53	21.68	21.61	23.00	22.07	21.86	21.97	23.00
	5	21.61	21.47	21.49	23.00	22.12	21.69	21.73	23.00

The conducted power measurement results for WLAN 2.4G

Mode	Channel	Frequency (MHz)	Conducted Output Power	Tune Up (dbm)
			(dBm)	
802.11b	1	2412	15.35	15.50
	7	2442	15.09	15.50
	13	2472	14.38	15.50
802.11g	1	2412	12.59	13.00
	7	2442	12.00	13.00
	13	2472	11.27	13.00
802.11n(20MHz)	1	2412	12.46	12.50
	7	2442	12.23	12.50
	13	2472	11.24	12.50

The conducted power measurement results for Bluetooth

Mode	Channel	Frequency (MHz)	Conducted Output Power	Tune Up (dbm)
			(dBm)	
GFSK	00	2402	5.52	6.00
	78	2480	5.80	6.00
$\pi/4$ -DQPSK	00	2402	4.99	6.00



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	78	2480	5.42	6.00
8DPSK	00	2402	5.13	6.00
	78	2480	5.40	6.00

The conducted power measurement results for LTE**LTE-BAND1**

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 1					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
5MHz	Low Range	1	1RB#0	23.94	24.00
			8RB#0	23.68	24.00
	Mid Range	1	1RB#0	23.60	24.00
			8RB#0	23.61	24.00
	High Range	1	1RB#24	24.10	25.00
			8RB#17	24.26	25.00
20MHz	Low Range	1	1RB#0	23.80	24.00
			18RB#0	23.69	24.00
	Mid Range	1	1RB#0	24.32	25.00
			18RB#0	24.14	25.00
	High Range	1	1RB#99	24.66	25.00
			18RB#82	24.57	25.00

LTE-BAND3

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 3					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
1.4MHz	Low Range	1	1RB#0	24.23	25.00





	Mid Range	1	1RB#0	24.28	25.00
	High Range	1	1RB#0	24.24	25.00
			5RB#0	24.18	25.00
5MHz	Low Range	1	1RB#0	24.37	25.00
			1RB#24	23.28	24.00
	Mid Range	1	1RB#0	23.99	24.00
			1RB#24	23.55	24.00
	High Range	1	1RB#0	24.66	25.00
			1RB#24	24.15	25.00
			8RB#0	24.45	25.00
20MHz	Low Range	1	1RB#0	24.01	25.00
			1RB#99	22.05	23.00
	Mid Range	1	1RB#0	23.62	24.00
			1RB#99	23.41	24.00
	High Range	1	1RB#0	24.27	25.00
			1RB#99	23.37	24.00
			18RB#0	24.42	25.00



**LTE-BAND7**

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 7					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
5MHz	Low Range	1	1RB#0	24.64	25.00
			1RB#24	24.60	25.00
	Mid Range	1	1RB#0	22.33	23.00
			1RB#24	23.74	24.00
	High Range	1	1RB#0	23.78	24.00
			1RB#24	24.53	25.00
			8RB#0	23.85	24.00
20MHz	Low Range	1	1RB#0	24.45	25.00
			1RB#99	22.55	23.00
	Mid Range	1	1RB#0	21.10	22.00
			1RB#99	23.27	24.00
	High Range	1	1RB#0	22.90	23.00
			1RB#99	23.62	24.00
			18RB#0	22.82	23.00

LTE-BAND8

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 8					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
1.4MHz	Low Range	1	1RB#0	23.23	24.00
	Mid Range	1	1RB#0	23.19	24.00
	High Range	1	1RB#0	23.16	24.00
			5RB#0	23.17	24.00





5MHz	Low Range	1	1RB#0	23.65	24.00
			1RB#24	24.17	25.00
	Mid Range	1	1RB#0	23.27	24.00
			1RB#24	23.32	24.00
	High Range	1	1RB#0	23.79	24.00
			1RB#24	23.26	24.00
			8RB#0	23.37	24.00
10MHz	Low Range	1	1RB#0	23.32	24.00
			1RB#49	24.20	25.00
	Mid Range	1	1RB#0	22.77	23.00
			1RB#49	23.02	24.00
	High Range	1	1RB#0	23.94	24.00
			1RB#49	22.84	23.00
			12RB#0	23.53	24.00



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**LTE-BAND20**

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 20					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
5MHz	Low Range	1	1RB#0	23.81	24.00
			1RB#24	23.40	24.00
	Mid Range	1	1RB#0	24.27	25.00
			1RB#24	24.17	25.00
	High Range	1	1RB#0	24.01	25.00
			1RB#24	24.44	25.00
			8RB#0	23.30	24.00
20MHz	Low Range	1	1RB#0	23.80	24.00
			1RB#99	24.35	25.00
	Mid Range	1	1RB#0	23.39	24.00
			1RB#99	23.98	24.00
	High Range	1	1RB#0	23.27	24.00
			1RB#99	24.37	25.00
			18RB#0	22.90	23.00

LTE-BAND28

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 28					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
3MHz	Low Range	1	1RB#0	24.40	25.00
			4RB#0	24.61	25.00
	Mid Range	1	1RB#0	23.64	24.00
			4RB#0	23.77	24.00
	High Range	1	1RB#14	24.17	25.00





			4RB#11	24.23	25.00
5MHz	Low Range	1	1RB#0	24.51	25.00
			8RB#0	24.37	25.00
	Mid Range	1	1RB#0	23.41	24.00
			8RB#0	23.66	24.00
	High Range	1	1RB#24	24.30	25.00
			8RB#17	24.44	25.00
20MHz	Low Range	1	1RB#0	24.12	25.00
			18RB#0	23.82	24.00
	Mid Range	1	1RB#0	22.94	23.00
			18RB#0	23.02	24.00
	High Range	1	1RB#99	24.82	25.00
			18RB#82	24.14	25.00



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**LTE-BAND38**

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 38					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
5MHz	Low Range	1	1RB#0	23.63	24.00
			8RB#0	23.89	24.00
	Mid Range	1	1RB#0	21.39	22.00
			8RB#0	21.51	22.00
	High Range	1	1RB#24	23.45	24.00
			8RB#17	23.55	24.00
20MHz	Low Range	1	1RB#0	23.75	24.00
			18RB#0	24.19	25.00
	Mid Range	1	1RB#0	22.48	23.00
			18RB#0	22.14	23.00
	High Range	1	1RB#99	23.81	24.00
			18RB#82	23.93	24.00

LTE-BAND40

The Conducted Power Measurement Result for LTE Band					
Test Result for LTE Band 40					
Channel Bandwidth	Channel	RB Allocation		Average Power (dBm, QPSK)	Tune Up (dbm)
		RB Size	RB Offset		
5MHz	Low Range	1	1RB#0	23.93	24.00
			8RB#0	24.07	25.00
	Mid Range	1	1RB#0	24.67	25.00
			8RB#0	24.56	25.00
	High Range	1	1RB#24	24.13	25.00
			8RB#17	23.92	24.00
20MHz	Low Range	1	1RB#0	23.86	24.00





	Mid Range	1	18RB#0	24.38	25.00
			1RB#0	24.63	25.00
			18RB#0	24.55	25.00
	High Range	1	1RB#99	23.94	24.00
			18RB#82	23.88	24.00

Tune Up Procedure

1. RX Gain Calibration
 - a. Put DUT in test mode
 - b. Put DUT in BCH mode
 - c. Put DUT in selected channel band
 - d. Total gain chain calibration at center ARFCN
 - e. Frequency Ripple calibration
 - f. Complete RX_AGC Gain table
2. TX Power Calibration
 - a. Put DUT in test mode
 - b. Put DUT in BCH mode
 - c. Put DUT in selected channel band
 - d. Total gain chain calibration at center ARFCN
 - e. Frequency Ripple calibration
 - f. Complete TX_APC Gain table
3. AFC calibration
 - a. Put DUT in test mode
 - b. Put DUT in selected channel mode
 - c. Calibration AFC at center ARFCN
 - d. Complete AFC result table

