



FCC Radio Test Report

FCC ID: M82-AIM10W

This report concerns: Original Grant

Project No.	: 1710083
Equipment	: Computer
Test Model	: AIM-10W
Series Model	: AIM-10WXXXXXXXXXXXXXXXXX
	(where X may be any alphanumeric character , blank
	or "-".)
Applicant	: Advantech Co., Ltd.
Address	: No.1, Alley 20, Lane 26, Rueiguang Road, Neihu
	District, Taipei 11491, Taiwan, R.O.C.

: Nov. 13, 2017
: Nov. 13, 2017 ~ Feb. 27, 2018
: Mar. 01, 2018
: BTL Inc.

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REPORT ISSUED HISTORY

Issue No.	Description	Issued Date
BTL-FCCP-7-1710083	Original Issue.	Mar. 01, 2018



1 CERTIFICATION

Equipment Brand Name Test Model Series Model	 Computer ADVANTECH AIM-10W AIM-10WXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Applicant	: Advantech Co., Ltd.
Manufacturer	: Advantech Co., Ltd.
Address	: No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.
Date of Test	: Nov. 13, 2017 ~ Feb. 27, 2018
Test Sample	: Production Unit
Standard(s)	: 47 CRF FCC Part 2
	47 CRF FCC Part 22, Subpart H
	KDB 971168 D01 Power Meas License Digital Systems v03 ANSI/TIA-603-D-2010

The above equipment has been tested and found in compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-7-1710083) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the WCDMA Band V and LTE Band 5.



2 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC Clause No	Description	Test Result	Judgement	Tested By
§2.1046 §22.913(a)	RF Power Output	APPENDIX A	Pass	Kenji Lin
§2.1049 §22.917(b)	Occupied Bandwidth	APPENDIX B	Pass	Kenji Lin
§2.1051 §22.917(a)	Out of Band Emissions	APPENDIX C	Pass	Kenji Lin
§2.1051 §22.917(a)	Spurious Emissions at Antenna Terminals	APPENDIX D	Pass	Kenji Lin
§2.1053 §22.917(a)	Field strength of spurious radiation	APPENDIX E	Pass	Kenji Lin
§2.1055 §22.355	Frequency stability	APPENDIX F	Pass	Kenji Lin

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.





2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

- **CB08:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-1)
- No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
- **CB11:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-2)
- No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.) CB15: (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-5)
- No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
- **CB16:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-6)

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.) TR03: (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted test:

Applied	Parameter	Uncertainty
\square	RF Power Output	± 024 dB
\square	Frequency stability	± 1.2x10 ⁻⁷
\square	Occupied Bandwidth	± 3.8 %
\square	Spurious Emissions at Antenna Terminals	± 2.71dB
\square	Temperature	± 0.08 °C





B. Radiated emissions below 1 GHz test:

Applied	Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
			30 MHz ~ 200 MHz	V	3.48
	CB08		30 MHz ~ 200 MHz	Н	3.08
	(10m)	CISPR	200 MHz ~ 1,000 MHz	V	3.94
			200 MHz ~ 1,000 MHz	Н	3.46
			30 MHz ~ 200 MHz	V	3.68
	CB08		30 MHz ~ 200 MHz	Н	3.28
	(3m)	CISPR	200 MHz ~ 1,000 MHz	V	4.26
			200 MHz ~ 1,000 MHz	Н	3.92
	CB11 (3m)	CB11 (3m) CISPR	30 MHz ~ 200 MHz	V	4.26
			30 MHz ~ 200 MHz	Н	3.76
			200 MHz ~ 1,000 MHz	V	4.46
			200 MHz ~ 1,000 MHz	Н	3.84
			30 MHz ~ 200 MHz	V	4.20
	CB15 (3m)	CB15 (3m) CISPR	30 MHz ~ 200 MHz	Н	3.64
			200 MHz ~ 1,000 MHz	V	4.56
			200 MHz ~ 1,000 MHz	Н	3.90
			30 MHz ~ 200 MHz	V	4.20
	CB16	CB16 (3m) CISPR	30 MHz ~ 200 MHz	Н	3.64
	(3m)		200 MHz ~ 1,000 MHz	V	4.56
			200 MHz ~ 1,000 MHz	Н	3.90

C. Radiated emissions above 1 GHz test:

Applied	Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)	
			1 GHz ~ 6 GHz	V	4.40	
	CB08	CIEDD	1 GHz ~ 6 GHz	Н	3.88	
	(3m)	CISER	6 GHz ~18 GHz	V	4.70	
			6 GHz ~18 GHz	Н	4.08	
			1 GHz ~ 6 GHz	V	4.44	
	CB11 (3m)	1 CISPR	Н	4.40		
			6 GHz ~18 GHz			
			6 GHz ~18 GHz	Н	4.00	
			1 GHz ~ 6 GHz	V	4.46	
	CB15 (3m)	CB15 (3m) CISPR	1 GHz ~ 6 GHz		4.40	
			6 GHz ~18 GHz	V	3.88	
			6 GHz ~18 GHz	Н	4.00	
	CB16 (3m)		1 GHz ~ 6 GHz		V	4.46
		CIEDD	1 GHz ~ 6 GHz		4.40	
		(3m) CISPR	6 GHz ~18 GHz	V	3.88	
			6 GHz ~18 GHz	Н	4.00	





Applied	Test Site	Method	Measurement Frequency Range	U (dB)
	CB08	CB08 18 GHz ~ 26.5 G		4.68
	(1m)	CISEN	26.5 GHz ~ 40 GHz	5.16
	CB11	CIEDD	18 GHz ~ 26.5 GHz	4.76
	(1m)	CISER	26.5 GHz ~ 40 GHz	5.24
	CB15		18 GHz ~ 26.5 GHz	4.62
	(1m)	CISER	26.5 GHz ~ 40 GHz	5.12
	CB16	CIEDD	18 GHz ~ 26.5 GHz	4.62
	(1m)	CISER	26.5 GHz ~ 40 GHz	5.12

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) - 150 kHz - 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz - 1000 MHz : 5.2 dB



GENERAL INFORMATION 3

3.1 DESCRIPTION OF EUT

Equipment		Computer							
Brand Name		ADVANTECH							
Test Model		AIM-10W							
Series Model		AIM-10WX (where X	AIM-10WXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX						
Model Difference		Different r	nodel distribu	te to diffe	ere	ent area.			
Power Source		DC Voltag	e supplied fro	om AC/D	Са	adapter.			
Power Rating		I/P: AC 10 O/P: DC 1	0-240V~, 1.5 9V==-3.42A	A, 50~60	0H:	z, 1.5A			
Products Covered									
AC Adapter Manufa	acturer	TAMURA		Model	X	EW1934N			
WWAN Module Manufacturer	Sierra Wireless		Model	E١	EM7455 (FCC ID: N7NEM7455)				
Specification inform	nation	ļ			•				
		WCDMA		UL: BPSK DL: QPSK					
Modulation Type		LTE		UL: QPSK,16QAM DL: QPSK,16QAM					
Ope Band Freq		eration quency	Modulation Type	Maximum ERP RF Power Output		Maximum Frequency Tolerance	Emission Designator		
	N	/Hz		dBm		W	ppm	-	
WCDMA Band V	826.4	to 846.6	BPSK	14.51		0.026	0.0042	4M16F9W	
	0047	4- 040 0	QPSK	14.64		0.029		8M99G7D	
LIE Band 5	824.7 to 848.3		16QAM	13.84		0.024	0.0077	8M99W7D	

NOTE:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.



(2) Table for Filed Antenna:

BIL

Ant.	Brand	Model	Туре	Connector	Frequency Range (MHz)	Gain w/ Cable loss (dBi)	Gain w/o Cable Loss (dBi)	Cable Loss (dBi)
					699-715	-3.70	-3.34	0.36
					704-716	-3.67	-3.21	0.36
					824-849	-5.77	-5.39	0.38
				I-PEX	777-787	-5.44	-5.07	0.37
					832-862	-7.24	-6.86	0.38
		5.41			880-915	-11.97	-11.38	0.59
		P/N:			1710-1755	-2.29	-1.7	0.59
MAIN	INPAQ	6036B0207401	PIFA		1710-1785	-2.45	-1.86	0.59
	Corporation	2-001)		WIIIF4-∟	1710-1780	-2.15	-1.56	0.59
					1850-1910	-7.51	-6.91	0.6
					1920-1980	-5.71	-5.10	0.61
					2305-2315	-5.27	-4.58	0.69
					2500-2570	-6.37	-5.66	0.71
					2496-2690	-5.57	-4.86	0.71
					2620-2690	-5.38	-4.67	0.71
					717-728	-11.63	-11.53	0.10
					729-745	-11.03	-10.93	0.10
					734-746	-10.89	-10.79	0.10
					746-756	-10.46	-10.35	0.11
					869-894	-11.61	-11.5	0.11
		P/N:			791-821	-4.85	-4.74	0.11
	INPAQ	6036B0207201		I-PEX	925-960	-6.54	-6.42	0.12
	Corporation	(WA-F-LTE12LB	T II A	MHF4-L	1805-1880	-2.91	-2.75	0.16
		G1-12-001)	001)		1930-1990	-2.71	-2.54	0.17
					2110-2155	-1.72	-1.55	0.17
					2110-2200	-1.73	-1.55	0.18
					2350-2360	-2.88	-2.7	0.18
					2496-2690	0.19	0.38	0.19
					2620-2690	0.19	0.38	0.19



3.2 TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

WCDMA									
Tost Itoms	Band		Test Channel						
lescitems	Dariu	L	М	Н					
RF Power Output	V	V	V	V					
Occupied Bandwidth	V	V	V	V					
Out of Band Emissions	V	V		V					
Spurious Emissions at Antenna Terminals	V		V						
Field strength of spurious radiation	V		V						
Frequency stability	V		V						

LTE															
Test Itoms	Pond	Bandwidth (MHz)				Hz)		Modulation		RB Size		Test Channel		nnel	
Test items	Danu	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	М	Η
RF Power Output	5	V	V	V	V	-	-	V	V	V	V	V	V	V	V
Occupied Bandwidth	5	V	V	۷	V	-	-	V	V			V	V	V	V
Out of Band Emissions	5	۷	V	۷	V	-	-	V	V	V		V	V		۷
Spurious Emissions at Antenna Terminals	5	V	V	۷	V	-	-	V	V	V				V	
Field strength of spurious radiation	5				۷	-	-	V		V				V	
Frequency stability	5	V	V	V	V	-	-	V		V				V	

NOTE:

(1) The marker "V" means this configuration is used for testing.

(2) The gray marker "-" means this bandwidth is not supported.

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage		
RF Power Output	25 °C, 60 % RH	AC 120V/60Hz		
Occupied Bandwidth	25 °C, 60 % RH	AC 120V/60Hz		
Out of Band Emissions	25 °C, 60 % RH	AC 120V/60Hz		
Spurious Emissions at Antenna Terminals	25 °C, 60 % RH	AC 120V/60Hz		
Field strength of spurious radiation	23 °C, 70 % RH	AC 120V/60Hz		
Frequency stability	Normal and Extreme	Normal and Extreme		





3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Typ	e No.	FCC ID	Series No.
-	-	-	-		-	-
Item	Shielded Type	Shielded Type Ferrite		Core Leng		Note
-	-	-			-	-





4 RF POWER OUTPUT TEST

4.1 LIMIT

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

4.2 TEST PROCEDURE

EIRP / ERP Power Measurement:

EIRP = Conducted Power + Antenna gain. ERP power = EIPR power - 2.15 dBi.

Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.3 DEVIATION FROM TEST STANDARD

No deviation.

4.4 TEST SETUP

Conducted Power Measurement:

Communication	FUT
Simulator	201

4.5 TEST RESULT

Please refer to the APPENDIX A.



5 OCCUPIED BANDWIDTH TEST

5.1 TEST PROCEDURE

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26 dB bandwidth.

5.2 DEVIATION FROM TEST STANDARD

No deviation.

5.3 TEST SETUP



Communication simulator

5.4 TEST RESULT

Please refer to the APPENDIX B.



6 OUT OF BAND EMISSIONS TEST

6.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

6.2 TEST PROCEDURE

- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 13 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 5MHz/10MHz).
- f. Record the max trace plot into the test report.

6.3 DEVIATION FROM TEST STANDARD

No deviation.

6.4 TEST SETUP



Communication simulator

6.5 TEST RESULT

Please refer to the APPENDIX C.





7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS TEST

7.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$. The emission limit is equal to -13 dBm.

7.2 TEST PROCEDURE

- a. The testing follows FCC KDB 971168 D01 Power Meas License Digital Systems v03.
- b. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- c. The band edges of low and high channels for the highest RF powers were measured. Set RBW ≥ 1% EBW in the 1 MHz band immediately outside and adjacent to the band edge.
- d. Set spectrum analyzer with RMS detector.
- e. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- f. The limit line is derived from 43 + 10log(P) dB below the transmitter power P (Watts)
 = P(W) [43 + 10 log(P)] (dB)
 - $= [30 + 10 \log(P)] (dBm) [43 + 10 \log(P)] (dB)$
 - = 13 dBm

7.3 DEVIATION FROM TEST STANDARD

No deviation.

7.4 TEST SETUP



Communication simulator

7.5 TEST RESULT

Please refer to the APPENDIX D.





8 FIELD STRENGTH OF SPURIOUS RADIATION TEST

8.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$. The emission limit is equal to -13 dBm.

8.2 TEST PROCEDURE

- a. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G.
- c. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.
- d. ERP power can be calculated form EIRP power by subtracting the gain of dipole, ERP power = EIRP power - 2.15 dBi.
- e. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz / 3 MHz.

8.3 DEVIATION FROM TEST STANDARD

No deviation.

8.4 TEST SETUP



30 MHz to 1 GHz

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8.5 TEST RESULT

Please refer to the APPENDIX E.





9 FREQUENCY STABILITY TEST

9.1 LIMIT

Frequency range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
821 to 896	1.5	2.5	2.5

9.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
- d. The frequency error was recorded frequency error from the communication simulator.

9.3 DEVIATION FROM TEST STANDARD

No deviation.

9.4 TEST SETUP



9.5 TEST RESULT

Please refer to the APPENDIX F.



10 LIST OF MEASURING EQUIPMENTS

	RF Power Output and Frequency stability											
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until							
1	Wireless Communications Test Set (WCDMA)	Agilent	8960	US38080149	Oct. 16, 2018							
2	Radio Communication Analyzer (LTE)	Anritsu	MT8820C	6201525878	Nov. 04, 2018							
000	uniad Pandwidth	ut of Pond Emic	sions and Spuriou	Emissions at An	tonno Torminolo							
ltom	Kind of Equipmont	Monufacturor		Sorial No	Calibrated until							
1	EXA Signal	Agilent	N9010A	MY54200240	Oct. 01, 2018							
2	Wireless Communications Test Set (WCDMA)	Agilent	8960	US38080149	Oct. 16, 2018							
3	Radio Communication Analyzer (LTE)	Anritsu	MT8820C	6201525878	Nov. 04, 2018							
		Field streng	th of spurious rad	liation								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until							
1	Preamplifier	EMCI	012645B	980267	Feb. 27, 2019							
2	Preamplifier	EMCI	EMC02325	980217	Dec. 27, 2019							
3	Test Cable	EMCI	EMC104-SM-SM- 8000	8m	Jan. 03, 2019							
4	Test Cable	EMCI	EMC104-SM-SM- 800	150207	Jan. 03, 2019							
5	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 03, 2019							
6	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 08, 2019							
7	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 21, 2019							
8	Loop Ant	EMCO	6502	42960	Nov. 23, 2018							
9	Horm Ant	SCHWARZBEC K	BBHA 9120D	9120D-1342	Feb. 27, 2019							
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 15, 2019							
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 15, 2019							
12	Wireless Communications Test Set (WCDMA)	Agilent	8960	US38080149	Oct. 16, 2018							
13	Radio Communication Analyzer (LTE)	Anritsu	MT8820C	6201525878	Nov. 04, 2018							

Remark: "N/A" denotes no model name, no serial no. or no calibration specified. All calibration period of equipment list is one year.





APPENDIX A RF POWER OUTPUT



	Band		WCDMA Band V							
Antenna Gain (dBi)	-5.77	Conducted Power (dBm)			ERP Power (dBm)					
	Tx Channel	4132	4182	4233	4132	4182	4233			
	Rx Channel	4357	4407	4458	4357	4407	4458			
Fre	equency (MHz)	826.4	836.4	846.6	826.4	836.4	846.6			
	RMC 12.2K	22.38	22.30	22.43	14.46	14.38	14.51			
HS	DPA Subtest-1	21.21	21.13	21.26	13.29	13.21	13.34			
HS	HSDPA Subtest-2		21.15	21.29	13.38	13.23	13.37			
HS	DPA Subtest-3	20.80	20.66	20.80	12.88	12.74	12.88			
HS	DPA Subtest-4	20.78	20.66	20.80	12.86	12.74	12.88			
HS	UPA Subtest-1	21.07	21.01	21.13	13.15	13.09	13.21			
HS	HSUPA Subtest-2		20.02	20.14	12.16	12.10	12.22			
HS	UPA Subtest-3	20.29	20.23	20.35	12.37	12.31	12.43			
HS	UPA Subtest-4	20.36	20.30	20.42	12.44	12.38	12.50			
HS	UPA Subtest-5	21.28	21.22	21.34	13.36	13.30	13.42			

Remark: ERP power = Conducted Power + Antenna gain - 2.15.

BIL





	Band					LTE B	and 5			
Antenna Gain (dBi)	-5	5.77		Conduc	ted Powe	r (dBm)	ERF	Power (d	IBm)	
				Low CH	Mid CH	High CH	Low CH	Mid CH	High CH	
Channel	Modulation	RB	RB	20407	20525	20643	20407	20525	20643	
(MHz)	wouldtion	Size	Offset	824.7	836.5	848.3	824.7	836.5	848.3	
()				MHz	MHz	MHz	MHz	MHz	MHz	
		1	0	22.12	22.20	21.99	14.20	14.28	14.07	
		1	2	22.04	22.07	21.91	14.12	14.15	13.99	
		1	5	21.96	21.99	21.83	14.04	14.07	13.91	
	QPSK	3	0	21.79	21.82	21.66	13.87	13.90	13.74	
		3	1	21.87	21.90	21.74	13.95	13.98	13.82	
		3	3	21.80	21.83	21.67	13.88	13.91	13.75	
1.4		6	0	21.33	21.42	21.48	13.41	13.50	13.56	
		1	0	21.40	21.35	21.27	13.48	13.43	13.35	
		1	2	21.28	21.23	21.15	13.36	13.31	13.23	
		1	5	21.25	21.20	21.12	13.33	13.28	13.20	
	16QAM	3	0	21.32	21.27	21.19	13.40	13.35	13.27	
		3	1	21.20	21.15	21.07	13.28	13.23	13.15	
		3	3	21.17	21.12	21.04	13.25	13.20	13.12	
		6	0	20.16	20.11	20.03	12.24	12.19	12.11	
	Band			LTE Band 5						
Antenna Gain (dBi)	-5	5.77		Conducted Power (dBm)			ERP Power (dBm)			
Channal				Low CH	Mid CH	High CH	Low CH	Mid CH	High CH	
Channel Bandwidth	Modulation	RB	RB	20415	20525	20635	20415	20525	20635	
(MHz)	modulation	Size	Offset	825.5	836.5	847.5	825.5	836.5	847.5	
. ,				MHz	MHz	MHz	MHz	MHz	MHz	
		1	0	22.23	22.31	22.10	14.31	14.39	14.18	
		1	7	22.15	22.18	22.02	14.23	14.26	14.10	
		1	14	22.07	22.10	21.94	14.15	14.18	14.02	
	QPSK	8	0	21.02	21.05	20.89	13.10	13.13	12.97	
		8	3	21.10	21.13	20.97	13.18	13.21	13.05	
		8	7	21.03	21.06	20.90	13.11	13.14	12.98	
2		15	0	20.96	20.99	20.83	13.04	13.07	12.91	
5		1	0	21.51	21.46	21.38	13.59	13.54	13.46	
		1	7	21.39	21.34	21.26	13.47	13.42	13.34	
		1	14	21.36	21.31	21.23	13.44	13.39	13.31	
	16QAM	8	0	20.14	20.09	20.01	12.22	12.17	12.09	

Remark: ERP power = Conducted Power + Antenna gain - 2.15.

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0

20.13

20.10

20.04

20.08

20.05

19.99

20.00

19.97

19.91

12.21

12.18

12.12

12.16

12.13

12.07

8

8

15

12.08

12.05

11.99





	Band			LTE Band 5							
Antenna Gain (dBi)	-5	5.77		Conduc	ted Powe	r (dBm)	ERF	Power (d	lBm)		
				Low CH	Mid CH	High CH	Low CH	Mid CH	High CH		
Channel	Modulation	RB	RB	20425	20525	20625	20425	20525	20625		
(MHz)	Modulation	Size	Offset	826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz		
		1	0	22.36	22.44	22.23	14.44	14.52	14.31		
		1	12	22.28	22.31	22.15	14.36	14.39	14.23		
		1	24	22.20	22.23	22.07	14.28	14.31	14.15		
5	QPSK	12	0	21.15	21.18	21.02	13.23	13.26	13.10		
		12	6	21.23	21.26	21.10	13.31	13.34	13.18		
		12	13	21.16	21.19	21.03	13.24	13.27	13.11		
		25	0	21.09	21.12	20.96	13.17	13.20	13.04		
		1	0	21.64	21.59	21.51	13.72	13.67	13.59		
		1	12	21.52	21.47	21.39	13.60	13.55	13.47		
	16QAM	1	24	21.49	21.44	21.36	13.57	13.52	13.44		
		12	0	20.27	20.22	20.14	12.35	12.30	12.22		
		12	6	20.26	20.21	20.13	12.34	12.29	12.21		
		12	13	20.23	20.18	20.10	12.31	12.26	12.18		
		25	0	20.17	20.12	20.04	12.25	12.20	12.12		
	- ·					. == 5	• -				
A	Band					LTE B	and 5				
Antenna Gain (dBi)	Band -5	5.77		Conduc	ted Powe	LTE B r (dBm)	and 5 ERF	Power (d	IBm)		
Antenna Gain (dBi) Channel	Band -5	5.77		Conduc Low CH	ted Powe Mid CH	LTE B r (dBm) High CH	and 5 ERF Low CH	Power (d Mid CH	IBm) High CH		
Antenna Gain (dBi) Channel Bandwidth	Band -5 Modulation	6.77 RB	RB	Conduc Low CH 20450	ted Powe Mid CH 20525	LTE B r (dBm) High CH 20600	and 5 ERF Low CH 20450	Power (d Mid CH 20525	IBm) High CH 20600		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	.77 RB Size	RB Offset	Conduc Low CH 20450 829 MHz	ted Powe Mid CH 20525 836.5 MHz	LTE B r (dBm) High CH 20600 844 MHz	and 5 ERF Low CH 20450 829 MHz	Power (d Mid CH 20525 836.5 MHz	IBm) High CH 20600 844 MHz		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	5.77 RB Size 1	RB Offset	Conduc Low CH 20450 829 MHz 22.48	ted Powe Mid CH 20525 836.5 MHz 22.56	LTE B r (dBm) High CH 20600 844 MHz 22.35	and 5 ERF Low CH 20450 829 MHz 14.56	Power (d Mid CH 20525 836.5 MHz 14.64	IBm) High CH 20600 844 MHz 14.43		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	5.77 RB Size 1 1	RB Offset 0 24	Conduc Low CH 20450 829 MHz 22.48 22.40	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27	and 5 ERF Low CH 20450 829 MHz 14.56 14.48	Power (d Mid CH 20525 836.5 MHz 14.64 14.51	IBm) High CH 20600 844 MHz 14.43 14.35		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	5.77 RB Size 1 1 1	RB Offset 0 24 49	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43	IBm) High CH 20600 844 MHz 14.43 14.35 14.27		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation QPSK	5.77 RB Size 1 1 1 25	RB Offset 0 24 49 0	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35	 Power (d) Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	5.77 RB Size 1 1 1 25 25	RB Offset 0 24 49 0 12	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43	 Power (d) Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 	IBm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation QPSK	5.77 RB Size 1 1 1 25 25 25	RB Offset 0 24 49 0 12 25	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36	 Power (d) Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation	5.77 RB Size 1 1 1 25 25 25 50	RB Offset 0 24 49 0 12 25 0	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32	IBm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation QPSK	5.77 RB Size 1 1 1 25 25 25 50 1	RB Offset 0 24 49 0 12 25 0 0	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08 21.63	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation QPSK	5.77 RB Size 1 1 1 25 25 25 50 1 1 1	RB Offset 0 24 49 0 12 25 0 0 24	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76 21.64	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71 21.59	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08 21.63 21.51	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84 13.72	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79 13.67	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71 13.59		
Antenna Gain (dBi) Channel Bandwidth (MHz)	Band -5 Modulation QPSK	5.77 RB Size 1 1 1 25 25 25 50 1 1 1 1 1	RB Offset 0 24 49 0 12 25 0 25 0 0 24 49	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76 21.64 21.61	tted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71 21.59 21.56	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08 21.63 21.51 21.48	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84 13.72 13.69	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79 13.67 13.64	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71 13.59 13.56		
Antenna Gain (dBi) Channel Bandwidth (MHz) 10	Band -5 Modulation QPSK 16QAM	5.77 RB Size 1 1 1 25 25 50 1 1 1 1 25 50 1 1 1 25	RB Offset 0 24 49 0 12 25 0 12 25 0 24 49 0	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76 21.64 21.61 20.39	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71 21.59 21.56 20.34	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08 21.63 21.51 21.48 20.26	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84 13.72 13.69 12.47	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79 13.67 13.64 12.42	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71 13.59 13.56 12.34		
Antenna Gain (dBi) Channel Bandwidth (MHz) 10	Band -5 Modulation QPSK 16QAM	5.77 RB Size 1 1 1 25 25 50 1 1 1 25 25 50 1 1 25 25 50 1 1 25 25 50 1 1 25 25 50 1 1 25 25 25 25 25 25 25 25 25 25	RB Offset 0 24 49 0 12 25 0 0 24 49 0 24 49 0 12	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76 21.64 21.61 20.39 20.38	tted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71 21.59 21.56 20.34 20.33	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.63 21.63 21.63 21.51 21.48 20.26 20.25	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84 13.72 13.69 12.47 12.46	 Power (d) Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79 13.67 13.64 12.42 12.41 	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71 13.59 13.56 12.34 12.33		
Antenna Gain (dBi) Channel Bandwidth (MHz) 10	Band -5 Modulation QPSK 16QAM	5.77 RB Size 1 1 1 25 25 50 1 1 1 25 25 25 25 25 25 25 25 25 25	RB Offset 0 24 49 0 12 25 0 25 0 24 49 0 12 25	Conduct Low CH 20450 829 MHz 22.48 22.40 22.32 21.27 21.35 21.28 21.21 21.76 21.64 21.61 20.39 20.38 20.35	ted Powe Mid CH 20525 836.5 MHz 22.56 22.43 22.35 21.30 21.38 21.31 21.24 21.71 21.59 21.56 20.34 20.33 20.30	LTE B r (dBm) High CH 20600 844 MHz 22.35 22.27 22.19 21.14 21.22 21.15 21.08 21.63 21.51 21.48 20.26 20.25 20.22	and 5 ERF Low CH 20450 829 MHz 14.56 14.48 14.40 13.35 13.43 13.36 13.29 13.84 13.72 13.69 12.47 12.46 12.43	Power (d Mid CH 20525 836.5 MHz 14.64 14.51 14.43 13.38 13.46 13.39 13.32 13.79 13.67 13.64 12.42 12.41 12.38	Bm) High CH 20600 844 MHz 14.43 14.35 14.27 13.22 13.30 13.23 13.16 13.71 13.59 13.56 12.34 12.33 12.30		

Remark: ERP power = Conducted Power + Antenna gain - 2.15.





APPENDIX B OCCUPIED BANDWIDTH





Band	WCDMA Band V							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)					
4132	826.4	4.1561	4.742					
4182	836.4	4.1525	4.732					
4233	846.6	4.1500	4.734					







Band		LTE Band 5		
Channel Bandwidth (MHz)	1.4	Modulation	QPSK	
Channel Frequency (MHz		99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)	
20407	824.7	1.0874	1.218	
20525	836.5	1.0890	1.215	
20643	848.3	1.0932	1.223	



Band	LTE Band 5							
Channel Bandwidth (MHz)	1.4	Modulation	16QAM					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)					
20407	824.7	1.0902	1.216					
20525	836.5	1.0900	1.219					
20643	848.3	1.0890	1.214					

20407	20525	20643
Control Server Annuel 10 Control Part State Control International Internation	Construction of the set of t	Constructions index in Constant III Construction Constant III Construction Constant III Construction Construction Constru
0 0 000 v Ref 3130 0 Bm 10 11 12 13 14 15 15 15 15 15 15 15 15 15 15	10 GB(6) Ref 3130 GBm 210 211 212 213 214 214 215 215 215 215 215 215 215 215	10 G GROV Ref 31.80 dBm 11 12 13 14 15 15 15 15 15 15 15 15 15 15
Center 824,7 MHz Span 3 MHz CF Step #Res BW 30 kHz #VBW 100 kHz #Sweep 300 ms 300,000 kHz	Center \$36,5 MHz Span 3 MHz CF Step #Res BW 30 kHz #VBW 100 kHz #Sweep 300 ms 300,000 kHz	Center 848.3 MHz Span 3 MHz GF Step #Res BW 30 kHz #VBW 100 kHz #Sweep 300 ms 300,000 kHz
Occupied Bandwidth Total Power 20.6 dBm Auto Man 1.0902 MHz Preq Offset	Occupied Bandwidth Total Power 20.7 dBm Add Man 1.0900 MHz Preq Offset	Occupied Bandwidth Total Power 20.8 dBm dug Man 1.0890 MHz Freq Offset
Transmit Freq Error -10 Hz % of OBW Power 99,00 % 9Hz x dB Bendwidth 1.216 MHz x dB -26.00 dB	Transmit Freq Error - 1.999 kHz % of OBW Power 99.00 % Bits x dB Bandwidth 1.219 MHz x dB -26.00 dB	Transmit Fire Error 370 Hz % of OBW Power 99.00 % 040 x dB Bandwidth 1.214 MHz x dB -25.00 dB
M50 87A/U8	MND BTAINS	MB0 BTATUS





Band		LTE Band 5		
Channel Bandwidth (MHz)	3	Modulation	QPSK	
Channel Frequency (MHz)		99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)	
20415	825.5	2.6887	2.910	
20525	836.5	2.6884	2.903	
20635	847.5	2.6908	2.908	



Band	LTE Band 5							
Channel Bandwidth (MHz)	3	Modulation	16QAM					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)					
20415	825.5	2.6924	2.919					
20525	836.5	2.6901	2.909					
20635	847.5	2.6900	2.913					







Band		LTE Band 5			
Channel Bandwidth (MHz)	5	Modulation	QPSK		
Channel Frequency (MHz)		99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)		
20425	826.5	4.4964	4.825		
20525	836.5	4.4972	4.857		
20625	846.5	4.4988	4.871		



Band	LTE Band 5							
Channel Bandwidth (MHz)	5	Modulation	16QAM					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)					
20425	826.5	4.4930	4.823					
20525	836.5	4.4943	4.826					
20625	846.5	4.4931	4.829					







Band		LTE Band 5			
Channel Bandwidth (MHz)	10	Modulation	QPSK		
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)		
20450	829.0	8.9830	9.568		
20525	836.5	8.9937	9.622		
20600	844.0	8.9775	9.572		



Band	LTE Band 5							
Channel Bandwidth (MHz)	10	Modulation	16QAM					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)					
20450	829.0	8.9737	9.588					
20525	836.5	8.9924	9.572					
20600	844.0	8.9759	9.538					







APPENDIX C OUT OF BAND EMISSIONS



































APPENDIX D SPURIOUS EMISSIONS AT ANTENNA TERMINALS





Band	WCDMA Band V	Channel	4182
Ill Koyoget Spectrum Andyrer, Snerg SA Strate Darit So Co Marker 1 2.50600905545528 GHz PND: Fast IFGsint.ow BrGsint.ow BrGsint.ow	Ardion OFF 0249499 Mblc 23, 2017 Arg Type: RNS TRACE D 24 5 47 Arg(Hold: 1/1 Dref Arg Type: RNS Processing Arg Type: RN		
10 dB/div Ref 24.00 dBm	-50.175 dBm Next Pk Right		
4.00	Next Pk Left		
	Marker Delta		
	MkrCF		
26.0 Start 0.003 CHz	Stop 9.000 CHz 1 of 2		
#Res BW 1.0 WHZ #VBW 3.0 WHZ*	#Sweep 501.5 ms (20000 pts)		









APPENDIX E FIELD STRENGTH OF SPURIOUS RADIATION





Fest N	Node	M	/CDMA	Band '	V Witho	ut D	ockina		P	olarization	Vertical	
							5					
0.0	dB	m										1
-10												
-20												
-30												
-40												
-50												
-60												
-70	1 2 X X	З Х		4 ×	5 X	Ş	2					
-80												
-90												
-100	0.0											
3	0.000	127.00	224.00	321.	00 418	.00	515.00	612.00) 709.00	806.00	1000.00	MHz
lo. M	lk.	Freq.	Reading Level	Corre Facto	ct Meas or me	sure- nt	Limit	Over				
		MHz	dBm	dB	dBr	n	dBm	dB	Detector	Comment		
1	47	.4600	-64.27	-6.03	3 -70.3	30	-13.00	-57.30	peak			
2	69	.7700	-68.30	-1.92	2 -70.2	22	-13.00	-57.22	peak			
3 *	124	.0900	-66.57	-1.81	-68.3	38	-13.00	-55.38	peak			
4	262	.8000	-66.04	-2.56	68.0	60	-13.00	-55.60	peak			
5	348	.1600	-70.44	0.83	-69.0	61	-13.00	-56.61	peak			
6	467	.4700	-72.92	4.17	-68.	75	-13.00	-55.75	peak			





Test M	lode	WCDM	A B	and \	/ V	Vitho	ut D	Ockino			Pc	olarizat	ion	Vertical	
0.0	dBm		<u> </u>		<u> </u>										
0.0															1
-10															
-20															
-30															
40															
-40															1
-50															
-60		2	3		5										
-70	1		x	4 X	X		ł.								-
-80	×														
00															
-90	n														1
30	0 0.000 127	.00 224	l.00	321.	00	418.	00	515.00	612.	00	709.00	806.	00	1000.00	MHz
		Readi	ng	Corre	ct	Meas	ure-	Limit	Over						
NO. IVI	K. Freq MHz	. Leve		Hacto	or	dBr		dBm	dB		Detector	Comme	nt		
1	69.770	0 -71.3	8	-1.92	2	-73.3	0	-13.00	-60.3	0	peak				
2 *	125.060	0 -62.3	2	-1.87	7	-64.1	9	-13.00	-51.1	9	peak				
3	251.160	0 -63.3	9	-2.76	6	-66.1	5	-13.00	-53.1	5	peak				
4	302.570) -68.2	4	-0.97	7	-69.2	1	-13.00	-56.2	1	peak				
5	344.280	0 -66.9	7	0.67		-66.3	0	-13.00	-53.3	0	peak				
6	421.880	0 -70.5	6	3.63		-66.9	3	-13.00	-53.9	3	peak				





Toot	Ν.4	odo	1.0.4		Pond V			kina	lr		Horizon	tol
rest	IVI	oue					ESK DUC	king	<u>I</u> F	roianzation		iai
0.	0	dBm										7
-1	0											
-2	0											
-3	0											
-4	0											
-5												
-6	U	12 XX	з Х	4 X	5 X	6 X						1
-7	0											1
-8	0											
-9	0											
-1	00.0 00	0	7 00	224.00	321.00	1 418.00	1 515.0	0 612 (NN 709 N	0 806 00	1000 00	MH7
				Peading	Correct	Moasu	ro-	012.0	100.0		1000.00	
No.	Mk	. Fred] .	Level	Factor	ment	Limit	t Over				
		MHz	!	dBm	dB	dBm	dBm	dB	Detector	Comment		
1		48.430	0	-62.96	-5.41	-68.37	-13.00) -55.37	7 peak			
2		65.890	0	-64.28	-3.68	-67.96	-13.00	-54.96	b peak			
3		133.790	0	-65.44	-1.29	-66.73	-13.00) -53.73	3 peak			
4	*	219.150	0	-59.63	-4.69	-64.32	-13.00) -51.32	2 peak			
5		281.230	0	-64.35	-1.35	-65.70	-13.00) -52.70) peak			
6		406.360	0	-69.90	3.43	-66.47	-13.00) -53.47	7 peak			





- ·									<u> </u>]					
lest	Mode	W	CDMA	∙_ Β	and	۷_۱	/Vith De	esk Do	ckir	ng	F	'olarıza	tion	Ho	rizon	tal
0.0)dBm															_
-1()															
-20)															
-3(ı															
-4()															
-5()								_							
-6()			4 ×	5 X	6 X										
-7(3 X														
-80)															
-9()															
-1(0.0															
	30.000 12	7.00	224.	00	321.	00	418.00) 51	5.00	612.00) 709.0	0 806	.00	10	00.00	MHz
No. I	Mk. Fre	q.	Readin Level	g	Corre Fact	ct or	Measu ment	re- Lii	nit	Over						
	MH	Z	dBm		dB		dBm	dB	m	dB	Detector	Comme	ent			
1	69.770	00	-66.04	1	-1.92	2	-67.96	-13	00	-54.96	peak					
2	94.020	00	-64.06	6	-2.3	3	-66.44	-13.	00	-53.44	peak					
3	123.120	00	-65.93	3	-1.74	1	-67.67	-13	00	-54.67	peak					
4	250.190	00	-55.19)	-2.70	3	-57.95	-13	00	-44.95	peak					
5	* 276.380)0	-55.45	5	-1.6	5	-57.10	-13.	00	-44.10	peak					
6	335.550	00	-61.75	5	0.33	}	-61.42	-13	00	-48.42	peak					





Test N	Node	W	CDMA	B	and V	With VE	SA Doc	kina	F	olarizatio	n Horiz	ontal
0.0	dBm					-						
-10												
-20												
-30												
40												
-40												
-50												
-60	12	3 X		4		6						
-70					5 X	×						
-80												_
-90												
-100 c).0 20.000 12	7.00	224 (0	221.00	419.00	515.00	612.0	0 709 0	0 906 00	1000	
J	10.000 12	7.00	Roadin	a	Correct	Moasure	JI J. 00	012.0	0 703.0	0 000.00	1000.	
No. M	lk. Fre	q.	Level	y	Factor	ment	Limit	Over				
	MH	Z	dBm		dB	dBm	dBm	dB	Detector	Comment		
1	48.430	00	-62.10)	-5.41	-67.51	-13.00	-54.51	peak			
2	69.770	00	-65.60)	-1.92	-67.52	-13.00	-54.52	peak			
3 *	124.090	00	-61.29)	-1.81	-63.10	-13.00	-50.10	peak			
4	247.280	00	-63.32	2	-2.93	-66.25	-13.00	-53.25	peak			
5	324.880	00	-70.79)	-0.09	-70.88	-13.00	-57.88	peak			
6	413.150	00	-72.98	3	3.52	-69.46	-13.00	-56.46	peak			





Test M	Inde	N/			and V	With V		ocki	na	Þ	olarizati	on	Horizon	tal
100110				<u>`_</u> L					<u>''9</u>		Junzali			
0.0	dBm													1
-10														
-20														
-30														
-30														
-40														1
-50					5									
-60		3		4 X	×	6								
-70	1	Î	3 X			×								
00														
-00														1
-90														1
-100. 30	U).000 12	7.00	224.	00	321.00	418.0	0 515	.00	612.00	709.00) 806.0	0	1000.00	MHz
No. MI	k. Fre	q.	Readin Level	g	Correct Factor	Measu ment	re- Lim	nit	Over					
	MH	Z	dBm		dB	dBm	dBn	n	dB	Detector	Commer	t		
1	66.860)0	-68.17	7	-3.24	-71.41	-13.0	00	-58.41	peak				
2	125.060)0	-61.39)	-1.87	-63.26	-13.0	00	-50.26	peak				
3	171.620	00	-67.09)	-1.66	-68.75	-13.0	00	-55.75	peak				
4	248.250)0	-55.80)	-2.87	-58.67	-13.0	00	-45.67	peak				
5 *	276.380)0	-55.49)	-1.65	-57.14	-13.0	00	-44.14	peak				
6	405.390	00	-67.50)	3.42	-64.08	-13.0	00	-51.08	peak				





.0	t M	ode	V	VCDMA_	Band \	V_With	out D	Dockinę	9			Polar	izati	ion	Ho	orizon	tal
0	.0	dBm															
-																	1
-:	20																
-;	30																{
	40		1 X														
-!	50																
-1	50 -																
	70																
-,																	1
-1	BO -																ĺ
-!	90						_										
-	100-0) D0.000	1800.0	0 2600.00	3400). 00 42	00.00	5000.0)0 580	10.00	6600).00	7400	.00	9	000.00	MHz
_				Reading	Corre	ct Mea	curo										
Ο.	IVIK				E (isure-	Limit	Ovo	-							
		. F	Freq.	Level dBm	Facto	or me	ent Bm	Limit	Ove dB	r	Detector	Co	mmer	nt			
1	*	. F 1693	Freq. MHz .200	Level dBm -40.78	Facto dB 0.00	or m de -40	ent 3m .78	Limit dBm -13.00	Ove dB -27.7	r 18	Detector peak	Co	ommer	nt			
1	*	. F	.200	Level dBm -40.78	Facto dB 0.00	or ma de -40	sure- ent	Limit dBm -13.00	Ove dB -27.7	r 78	peak	Cc	mmer	nt			
1	*	. F	Treq. MHz .200	Level dBm -40.78	Facto dB 0.00	or m(sure- ent 3m 78	Limit dBm -13.00	Ove dB -27.7	r 78	peak	Cc	mmer	nt			





st M	ode	WCDMA_E	Band V_\	Nithout D	Ocking		Po	larization	Horizon	tal
0.0	dBm									_
-10										
-20										1
-30	1×									
-40										
-50		2 X								
-60										
-70										
-80										
-90										
-100.0)			4000.00				7400.00		
10	00.000 1800.	00 2600.00	3400.00	4200.00	5000.00	5800.00	6600.00	7400.00	9000.00	MHz
Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over				
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment		
*	1693.200	-30.86	0.00	-30.86	-13.00	-17.86	peak			





Test M	lode	LTE_Bar MHz_QF	nd 5_Chai PSK_1RB0	nnel Band 0_Without	width 10 Dockin	D g	Ρ	olarization	Vertical	
0.0	dBm									7
-10										
-20										
-30										
50										
-40										1
-50										
-60	1 2									
-70	× ·· 3 ×		4 5 X X			6 X				
-80										
-90										
-100.	0									
30).000 127.0	0 224.0	0 321.00	418.00	51 5.00	612.00	709.00	D 806.00	1000.00	MHz
No. Mł	k. Freq.	Reading Level	g Correct Factor	Measure- ment	Limit	Over				
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment		
1	49.4000	-61.87	-4.80	-66.67	-13.00	-53.67	peak			
2 *	68.8000	-62.50	-2.36	-64.86	-13.00	-51.86	peak			
3	124.0900	-71.38	-1.81	-73.19	-13.00	-60.19	peak			
4	250.1900	-68.36	-2.76	-71.12	-13.00	-58.12	peak			
5	271.5300	-70.31	-2.03	-72.34	-13.00	-59.34	peak			
6	600.3600	-75.19	6.04	-69.15	-13.00	-56.15	peak			





Fest M	lode	LTE_ MHz_	Band _QPS	5_Chai K_1RB	nnel Bar)_Witho	ndwidth ´ ut Docki	l0 ng	Ρ	olarization	Vertical	
0.0	dBm	1									7
-10											
-20											
-30											
10											
-40											1
-50											1
-60		1	2 X		4 ×	5	6				
-70		^		×		×	X				
-80											
-90											
-100.	0										
30	0.000 127	.00	224.00	321.00	418.00) 515.00	612.00) 709.0	0 806.00	1000.00	MHz
lo. Mk	k. Fred	Re: I. Le	adıng əvel	Correct Factor	Measu ment	re- Limit	Over				
	MHz	d	IBm	dB	dBm	dBm	dB	Detector	Comment		
1	155.130	0 -6	5.36	-0.40	-65.76	-13.00	-52.76	peak			
2 *	242.430	0 -5	9.26	-3.23	-62.49	-13.00	-49.49	peak			
3	328.760	0 -6	8.96	0.06	-68.90	-13.00	-55.90	peak			
4	411.210	0 -6	9.16	3.49	-65.67	-13.00	-52.67	peak			
5	461.650	0 -7	1.02	4.11	-66.91	-13.00	-53.91	peak			
6	600.360	0 -7	4.15	6.04	-68.11	-13.00	-55.11	peak			





Test M	lode	LT Mł	E_Band Iz_QPS	5_Chan K_1RB0	nel Band _With De	width 10 esk Doc) king	Ρ	olarizatior	n Horizor	ital
0.0	dBm										_
-10											
20											1
-20											
-30											
-40											{
-50											
60											
-00	1 x 2						6 X				1
-70	×	* 4 × ×			5 X						
-80											
-90											
-100.	0										
30).000 127	7.00	224.00	321.00	418.00	51 5.00	612.00	709.0	0 806.00	1000.00	MHz
No. Mł	k. Fred] .	Reading Level	Correct Factor	Measure- ment	Limit	Over				
	MHz	:	dBm	dB	dBm	dBm	dB	Detector	Comment		
1 *	49.400	0	-60.38	-4.80	-65.18	-13.00	-52.18	peak			
2	71.710	0	-67.22	-1.85	-69.07	-13.00	-56.07	peak			
3	127.000	0	-69.05	-2.01	-71.06	-13.00	-58.06	peak			
4	155.130	0	-72.88	-0.40	-73.28	-13.00	-60.28	peak			
5	415.090	0	-76.42	3.54	-72.88	-13.00	-59.88	peak			
6	600.360	0	-73.52	6.04	-67.48	-13.00	-54.48	peak			





Test N	Mode	LTE_Band MHz_QPS	5_Chan K_1RB0	nel Band _With De	width 10 esk Docl) king	P	olarization	Horizon	tal
0.0	dPm	•				-				
0.0										1
-10										}
-20										
-30										ĺ
-40										{
-50										
-60										
-00		_ 3	4 ×	6						
-70	X	× ×		^						1
-80										
-90										ļ
-100	D.O									
Э	30.000 127.	00 224.00	321.00	418.00	515.00	612.00	709.00) 806.00	1000.00	MHz
No M	lk Erea	Reading	Correct Eactor	Measure-	Limit	Over				
10. 11	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment		
1	70.7400	0 -70.49	-1.83	-72.32	-13.00	-59.32	peak			
2	151.2500	71.80	-0.11	-71.91	-13.00	-58.91	peak			
3	230.7900	-66.80	-3.87	-70.67	-13.00	-57.67	peak			
4	331.6700	-66.86	0.18	-66.68	-13.00	-53.68	peak			
5 *	348.1600) -65.41	0.83	-64.58	-13.00	-51.58	peak			
6	365.6200	-70.25	1.67	-68.58	-13.00	-55.58	peak			





Test M	lode	Ľ	TE_Ba 1Hz_QI	nd : PSł	5_Ch (_1RI	anı 30 <u>-</u>	nel Band _With VE	width 1 ESA Do	0 cking	F	Polarizat	ion	Horizon	tal
0.0	dBm													7
-10														
-20														1
-30														
-50														
-40														
-50														
-60	18	3 X		4		5	e							
-70	X^			^		x	×							
-80														
-90														
-100.	0	107.00		00			410.00	515.00	010.00	700 0	0.000		1000.00	
31	1.000	127.00	224.	00	321.0	JU	418.00	515.00	612.0	J 709.L	IU 806.	00	1000.00	MHZ
No. Mł	k. Fi	req.	Level	ıg	Facto	ot or	ment	Limit	Over					
	Μ	Hz	dBm		dB		dBm	dBm	dB	Detector	Comme	nt		
1	49.4	000	-62.21	1	-4.80		-67.01	-13.00	-54.01	peak				
2	65.8	900	-62.16	6	-3.68		-65.84	-13.00	-52.84	peak				
3 *	127.9	700	-61.65	5	-2.08		-63.73	-13.00	-50.73	peak				
4	252.1	300	-63.66	6	-2.75		-66.41	-13.00	-53.41	peak				
5	337.4	900	-67.46	6	0.41		-67.05	-13.00	-54.05	peak				
6	415.0	900	-71.89	9	3.54		-68.35	-13.00	-55.35	peak				





Test N	Node	L	TE_Ba 1Hz_QI	nd : PSł	5_Ch <_1R	an B0	nel Banc _With VI	width 1 ESA Do	0 cking	Р	olarization	Horizor	ital
												·	
0.0	dBn	n											1
-10													
-20													
20													
-30													1
-40													
-50				4									{
-60		2	3	X		5 X	6						
-70			×										
00													
-00													1
-90													1
-100	30.000	127.00	224.	00	321.	00	418.00	51 5.00	612.00) 709.0	D 806.00	1000.00	MHz
			Readir	ng	Corre	ct	Measure	-	0				
NO. IM	IK. I	Freq.	Level		Facto	or	dBm	dRm	dP	Dotoctor	Commont		
1	67.	8300	-67.9	1	-2.80)	-70,71	-13.00	-57.71	peak	Comment		
2	124.	0900	-60.55	5	-1.81		-62.36	-13.00	-49.36	peak			
3	192.	9600	-61.97	7	-2.86	6	-64.83	-13.00	-51.83	peak			
4 *	251.	1600	-52.29	9	-2.76	6	-55.05	-13.00	-42.05	peak			
5	342.	3400	-59.94	1	0.60		-59.34	-13.00	-46.34	peak			
6	409.	2700	-65.10)	3.47		-61.63	-13.00	-48.63	peak			





i ivi	ode	LTE_Bar MHz_QF	PSK_1R	B0_With	iout Doc	king		Polari	ization	Horizon	tal
D.O [dBm										1
10											
20											
30											
40											
50											
60	1 X										
70											
80											
90											
100	0	00 2000	00 2400	00 420	0.00 500	00 E000	00 00		7400.00	0000.00	
10	00.000 1800.	Readin	a Corre	ct Meas	ure-	1.00 3800	1.00 66	JU.UU	7400.00	3000.00	MIN
Mk	. Freq.	Level	Facto	or me	nt Lim	it Over					
	MH-	dBm	dB	dBr	a dBa	dB	Dotoctr	or Co	mmont		
*	MHz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto 1 peak	or Cor	mment		
*	MHz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto 4 peak	or Coi	mment		
*	МНz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto	or Coi	mment		
*	МНz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto 1 peak	or Coi	mment		
*	МHz 1672.800	dBm -52.81	dB -9.03	dBr	n dBn 34 -13.0	n dB 0 -48.84	Detecto 4 peak	or Coi	mment		
*	MHz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto 1 peak	or Coi	mment		
*	MHz 1672.800	dBm -52.81	dB -9.03	dBr 3 -61.8	n dBn 34 -13.0	n dB 0 -48.84	Detecto 4 peak	or Coi	mment		





	lode	MHz_QPS	SK_1RB0	_Without	t Docking	, <u>,</u>		Polariz	ation	Horizon	tal
0.0	dBm										
-10											
-20											
-30											
-40											
-60	1										
-70	×										
-80											
-90											
-100.	0										
10	00.000 1800.	Reading) 3400.00 Correct	4200.00 Measure	5000.00	5800.0	0 660	0.00 74	100.00	9000.00	MHz
M	K. Freq.	Level	Factor	ment	Limit	Over	Detecto				
*	1672 800	-52.87	-9.03	-61.90	-13.00	-48.90	neak	r Comr	nent		





APPENDIX F FREQUENCY STABILITY



	Band	WCDMA Band II					
Temperature vs. Frequency Stability							
Temperature (°C)	mperature Frequency Error (°C) (ppm)						
-20		0.0028	2.5				
-10		0.0036	2.5				
0	-0.0022		2.5				
10	0.0013		2.5				
20	0.0042		2.5				
30	-	0.0032	2.5				
40		0.0028	2.5				
50		0.0041	2.5				
60	-	0.0014	2.5				
Maximum Deviation (ppm)		0.0042	2.5				

	Band	WCDMA Band II					
Voltage vs. Frequency Stability							
Voltage (V)	Frequ	iency Error (ppm)	Limit (ppm)				
100	(0.0032	2.5				
120	-(0.0031	2.5				
240	(0.0025	2.5				
Maximum Deviation (ppm)	(0.0032	2.5				



	Band		LTE Band 5					
Temperature vs. Frequency Stability								
Channel Bandwidth (MHz)		Limit						
Temperature (°C)	1.4	3	5	10	(ppm)			
-20	0.0028	0.0051	0.0039	-0.0045	2.5			
-10	0.0036	-0.0022	0.0072	0.0031	2.5			
0	-0.0022	-0.0029	0.0012	0.0073	2.5			
10	0.0013	0.0048	0.0062	-0.0025	2.5			
20	0.0042	0.0018	-0.0016	0.0021	2.5			
30	-0.0032	-0.0027	-0.0078	0.0043	2.5			
40	0.0028	-0.0012	0.0033	-0.0029	2.5			
50	0.0041	0.0058	0.0024	0.0077	2.5			
60	-0.0014	0.0023	-0.0022	0.0051	2.5			
Maximum Deviation (ppm)	2.5							

	Band		LTE Band 5					
Voltage vs. Frequency Stability								
Channel Bandwidth (MHz)		Limit						
Voltage (V)	1.4	3	5	10	(ppm)			
100	-0.0041	0.0031	-0.0003	-0.0034	2.5			
120	-0.0038	0.0009	-0.0032	-0.0042	2.5			
240	0.0025	-0.0021	0.0052	-0.0021	2.5			
Maximum Deviation (ppm)		0	.0052		2.5			