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IC: 2420C-N653

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**FCC 47 CFR PART 27 SUBPART C, L
&
INDUSTRY CANADA RSS-130**

TEST REPORT

For

PRO 8475

**Trade Name:
MiTAC, Webfleet Solutions**

Model: N653

Issued to

FCC:	Mitac Digital Technology Corporation No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383 Taiwan
IC:	MiTAC Digital Technology Corporation No.200, Wenhua 2nd Rd.,, Guishan Dist. Taoyuan City 333 Taiwan

Issued by

**Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan. (R.O.C.)
Issued Date: June 9, 2020**

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 21, 2020	Initial Issue	ALL	Allison Chen
01	June 9, 2020	See the following note Rev.(01)	ALL	Allison Chen

Rev.(01)

- 1. Added test data for power table and radiated emission.*
- 2. Revised product name: PRO 8475, and model name: N653.*



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1. TEST RESULT CERTIFICATION

FCC Applicant: Mitac Digital Technology Corporation
No.200, Wen Hwa 2nd Rd., Kuei Shan Dist. Taoyuan, 33383
Taiwan

IC Applicant: MiTAC Digital Technology Corporation
No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333
Taiwan

Manufacturer: MITAC COMPUTER (KUNSHAN) CO., LTD.
No. 269, 2nd Avenue, District A, Comprehensive Free Trade
Zone, Kunshan, Jiangsu, P.R. China

Equipment Under Test: PRO 8475
Trade Name: MiTAC, Webfleet Solutions
Model: N653
Date of Test: June 1 ~ 6, 2020

APPLICABLE STANDARDS	
Standard	TEST RESULT
FCC Part 27, Subpart C, L, FCC Part 2 & RSS-130 Issue 2 February 2019	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:



Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	PRO 8475	
Model	N653	
Model Discrepancy	Difference of the those trade names (list on this report) are just for marketing purpose only.	
Trade	MiTAC, Webfleet Solutions	
Received Date	April 7, 2020	
Power Supply	1. Powered from Rechargeable Li-ion Polymer Battery. Rating: 3.7VDC, 4000mAh, 14.8Wh 2. Powered from Cradle Fleet cable 12/24V (Pogo power pin) USB Type-C 5V	
Modulation Technology	LTE Band 12	QPSK, 16QAM
	LTE Band 17	QPSK, 16QAM
Frequency Range	LTE Band 12 Channel Bandwidth: 1.4MHz	669.7MHz ~ 715.3MHz
	LTE Band 12 Channel Bandwidth: 3MHz	700.5MHz ~ 714.5MHz
	LTE Band 12 Channel Bandwidth: 5MHz	701.5MHz ~ 713.5MHz
	LTE Band 12 Channel Bandwidth: 10MHz	704MHz ~ 711MHz
	LTE Band 17 Channel Bandwidth: 5MHz	706.5MHz ~ 713.5MHz
	LTE Band 17 Channel Bandwidth: 10MHz	709MHz ~ 711MHz
Antenna Specification	Antenna type: Integral Band 12: -1.58 dBi Band 17: -1.58 dBi	

Note: 1. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST TYPE

The EUT (model: N653) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

LTE Band 12: 699 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	1.4MHz		3MHz		5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	23017	699.7	23025	700.5	23035	701.5	23060	704
Middle CH	23095	707.5	23095	707.5	23095	707.5	23095	707.5
High CH	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 17: 704 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency(MHz)	Channel	Frequency(MHz)
Low channel (L)	23755	706.5	23780	709.0
Middle channel (M)	23790	710.0	23790	710.0
High channel (H)	23825	713.5	23800	711.0

3.2 THE WORST MODE OF MEASUREMENT

3.2.1 The worst mode of measurement

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Battery Mode 2: EUT+Cradle
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Battery Mode 2: EUT+Cradle
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report



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4. TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
-	-	2	Antenna Requirement	Pass
27.50(c)	RSS-130, section 4.6	8.1	ERP and EIRP Measurement	Pass
27.53(g)	RSS-130 section 4.6	8.2	Spurious Radiation Measurement	Pass



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5. INSTRUMENT CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

RF Conducted Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Coaxial Cable	Woken	WC12	CC003	06/28/2019	06/27/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	07/29/2019	07/28/2020
Software	N/A				

3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/25/2020	02/24/2021
Bilog Antenna	Sunol Sciences	JB3	A030105	07/26/2019	07/25/2020
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/25/2020	02/24/2021
Coaxial Cable	EMCI	EMC105	190914+25111	09/20/2019	09/19/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/15/2020	01/14/2021
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	10/04/2019	10/03/2020
High Pass Filter	SOLVANG TECHNOLOGY INC.	STI15	9923	02/25/2020	02/24/2021
High Pass Filters	MICRO TRONICS	HPM13195	003	02/25/2020	02/24/2021
Horn Antenna	ETS LINDGREN	3116	00026370	12/18/2019	12/17/2020
Horn Antenna / Harmonic Mixer	A-INFOMW / ROHDE&SCHWA RZ	LB-19-20-A / FS-Z60	J202020872 / 100142	12/09/2019	12/08/2021
Horn Antenna / Harmonic Mixer	ROHDE&SCHWA RZ	FH-PP-110 / FS-Z110	10003 / 100096	12/09/2019	12/08/2021
Horn Antenna / Harmonic Mixer	ROHDE&SCHWA RZ	FH-PP-75 / FS-Z75	10001 / 100162	12/09/2019	12/08/2021
Horn Antenna / Spectrum Analyzer Mixer	Radiometer Physics GmbH	FH-PP-170 / SAM-170	10003 / 20011	12/09/2019	12/08/2021
Horn Antenna / Spectrum Analyzer Mixer	Radiometer Physics GmbH	FH-PP-220 / SAM-220	10003 / 20013	12/09/2019	12/08/2021
Horn Antenna / Spectrum Analyzer Mixer	Radiometer Physics GmbH	FH-PP-325 / SAM-325	10007 / 20048	12/09/2019	12/08/2021
Loop Ant	COM-POWER	AL-130	121051	03/27/2020	03/26/2021
Pre-Amplifier	EMEC	EM330	060609	02/25/2020	02/24/2021
Pre-Amplifier	HP	8449B	3008A00965	02/25/2020	02/24/2021
Pre-Amplifier	MITEQ	AMF-6F-180040 00-37-8P	985646	06/18/2019	06/17/2020
Signal Analyzer	Agilent	N9010A	MY52220817	03/19/2020	03/18/2021
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180413				

5.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



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6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



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7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

7.2 SUPPORT EQUIPMENT

Support Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC ID
1	NB(L)	Toshiba	PORTEGE R30-A	N/A	PD97260H	N/A
2	DC Power Source	Agilent	E3640A	N/A	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



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8. TEST PROCEDURE AND RESULT

8.1 ERP & EIRP MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 27.50 (c) (10): The portable stations (hand-held devices) in the 600MHz uplink band and the 698-746MHz band, and fixed and mobile stations in the 600MHz uplink band are limited to 3 Watts ERP.

RSS-130 § 4.6,

The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

TEST PROCEDURES

CONDUCTED POWER MEASUREMENT:

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

TEST RESULTS

No non-compliance noted.

TEST RESULTS**LTE Band 12**

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 12	1.4M	23017	699.7	QPSK	1	0	0	21.51	17.78
					1	2	0	21.25	17.52
					1	5	0	22.03	18.30
					3	0	1	20.97	17.24
					3	1	1	20.96	17.23
					3	2	1	20.91	17.18
					6	0	1	20.93	17.20
				16QAM	1	0	1	21.57	17.84
					1	2	1	20.97	17.24
					1	5	1	21.18	17.45
					3	0	2	19.98	16.25
					3	1	2	19.97	16.24
					3	2	2	20.16	16.43
					6	0	2	20.10	16.37
		23095	707.5	QPSK	1	0	0	21.61	17.88
					1	2	0	21.63	17.90
					1	5	0	21.74	18.01
					3	0	1	20.84	17.11
					3	1	1	20.83	17.10
					3	2	1	21.12	17.39
					6	0	1	20.78	17.05
				16QAM	1	0	1	20.87	17.14
					1	2	1	20.79	17.06
					1	5	1	21.24	17.51
					3	0	2	19.85	16.12
					3	1	2	19.73	16.00
					3	2	2	19.79	16.06
					6	0	2	19.83	16.10
		23173	715.3	QPSK	1	0	0	21.82	18.09
					1	2	0	21.73	18.00
					1	5	0	21.83	18.10
					3	0	1	20.90	17.17
					3	1	1	20.87	17.14
					3	2	1	20.85	17.12
					6	0	1	20.88	17.15
				16QAM	1	0	1	21.68	17.95
					1	2	1	21.39	17.66
					1	5	1	21.74	18.01
					3	0	2	20.01	16.28
					3	1	2	19.86	16.13
					3	2	2	19.85	16.12
					6	0	2	19.91	16.18

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 12	3M	23025	700.5	QPSK	1	0	0	21.54	17.81
					1	7	0	21.28	17.55
					1	14	0	22.06	18.33
					8	0	1	21.00	17.27
					8	4	1	20.99	17.26
					8	7	1	20.94	17.21
					15	0	1	20.96	17.23
				16QAM	1	0	1	21.60	17.87
					1	7	1	21.00	17.27
					1	14	1	21.21	17.48
					8	0	2	20.01	16.28
					8	4	2	20.00	16.27
					8	7	2	20.19	16.46
					15	0	2	20.13	16.40
		23095	707.5	QPSK	1	0	0	21.62	17.89
					1	7	0	21.64	17.91
					1	14	0	21.75	18.02
					8	0	1	20.85	17.12
					8	4	1	20.84	17.11
					8	7	1	21.13	17.40
					15	0	1	20.79	17.06
				16QAM	1	0	1	20.88	17.15
					1	7	1	20.80	17.07
					1	14	1	21.25	17.52
					8	0	2	19.86	16.13
					8	4	2	19.74	16.01
					8	7	2	19.80	16.07
					15	0	2	19.84	16.11
		23165	714.5	QPSK	1	0	0	21.84	18.11
					1	7	0	21.75	18.02
					1	14	0	21.85	18.12
					8	0	1	20.92	17.19
					8	4	1	20.89	17.16
					8	7	1	20.87	17.14
					15	0	1	20.90	17.17
				16QAM	1	0	1	21.70	17.97
					1	7	1	21.41	17.68
					1	14	1	21.76	18.03
					8	0	2	20.03	16.30
					8	4	2	19.88	16.15
					8	7	2	19.87	16.14
					15	0	2	19.93	16.20



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Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 12	5M	23035	701.5	QPSK	1	0	0	21.56	17.83
					1	12	0	21.30	17.57
					1	24	0	22.08	18.35
					12	0	1	21.02	17.29
					12	6	1	21.01	17.28
					12	11	1	20.96	17.23
					25	0	1	20.98	17.25
				16QAM	1	0	1	21.62	17.89
					1	12	1	21.02	17.29
					1	24	1	21.23	17.50
					12	0	2	20.03	16.30
					12	6	2	20.02	16.29
					12	11	2	20.21	16.48
					25	0	2	20.15	16.42
		23095	707.5	QPSK	1	0	0	21.63	17.90
					1	12	0	21.65	17.92
					1	24	0	21.76	18.03
					12	0	1	20.86	17.13
					12	6	1	20.85	17.12
					12	11	1	21.14	17.41
					25	0	1	20.80	17.07
				16QAM	1	0	1	20.89	17.16
					1	12	1	20.81	17.08
					1	24	1	21.26	17.53
					12	0	2	19.87	16.14
					12	6	2	19.75	16.02
					12	11	2	19.81	16.08
					25	0	2	19.85	16.12
		23155	713.5	QPSK	1	0	0	21.86	18.13
					1	12	0	21.77	18.04
					1	24	0	21.87	18.14
					12	0	1	20.94	17.21
					12	6	1	20.91	17.18
					12	11	1	20.89	17.16
					25	0	1	20.92	17.19
				16QAM	1	0	1	21.72	17.99
					1	12	1	21.43	17.70
					1	24	1	21.78	18.05
					12	0	2	20.05	16.32
					12	6	2	19.90	16.17
					12	11	2	19.89	16.16
					25	0	2	19.95	16.22

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 12	10M	23060	704.0	QPSK	1	0	0	21.61	17.88
					1	24	0	21.35	17.62
					1	49	0	22.13	18.40
					25	0	1	21.07	17.34
					25	12	1	21.06	17.33
					25	24	1	21.01	17.28
					50	0	1	21.03	17.30
				16QAM	1	0	1	21.67	17.94
					1	24	1	21.07	17.34
					1	49	1	21.28	17.55
					25	0	2	20.08	16.35
					25	12	2	20.07	16.34
					25	24	2	20.26	16.53
					50	0	2	20.20	16.47
		23095	707.5	QPSK	1	0	0	21.67	17.94
					1	24	0	21.69	17.96
					1	49	0	21.80	18.07
					25	0	1	20.90	17.17
					25	12	1	20.89	17.16
					25	24	1	21.18	17.45
					50	0	1	20.84	17.11
				16QAM	1	0	1	20.93	17.20
					1	24	1	20.85	17.12
					1	49	1	21.30	17.57
					25	0	2	19.91	16.18
					25	12	2	19.79	16.06
					25	24	2	19.85	16.12
					50	0	2	19.89	16.16
		23130	711.0	QPSK	1	0	0	21.93	18.20
					1	24	0	21.84	18.11
					1	49	0	21.94	18.21
					25	0	1	21.01	17.28
					25	12	1	20.98	17.25
					25	24	1	20.96	17.23
					50	0	1	20.99	17.26
				16QAM	1	0	1	21.79	18.06
					1	24	1	21.50	17.77
					1	49	1	21.85	18.12
					25	0	2	20.12	16.39
					25	12	2	19.97	16.24
					25	24	2	19.96	16.23
					50	0	2	20.02	16.29

LTE Band 17

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 17	5M	23755	706.5	QPSK	1	0	0	21.50	17.77
					1	12	0	22.84	19.11
					1	24	0	22.86	19.13
					12	0	1	21.50	17.77
					12	6	1	21.71	17.98
					12	11	1	21.82	18.09
					25	0	1	21.53	17.80
				16QAM	1	0	1	21.56	17.83
					1	12	1	21.75	18.02
					1	24	1	21.88	18.15
					12	0	2	20.58	16.85
					12	6	2	20.75	17.02
					12	11	2	20.89	17.16
					25	0	2	20.49	16.76
		23790	710.0	QPSK	1	0	0	21.42	17.69
					1	12	0	21.65	17.92
					1	24	0	21.81	18.08
					12	0	1	20.83	17.10
					12	6	1	20.82	17.09
					12	11	1	20.84	17.11
					25	0	1	20.68	16.95
				16QAM	1	0	1	21.09	17.36
					1	12	1	21.26	17.53
					1	24	1	21.37	17.64
					12	0	2	19.70	15.97
					12	6	2	19.73	16.00
					12	11	2	19.90	16.17
					25	0	2	19.84	16.11
		23825	713.5	QPSK	1	0	0	21.42	17.69
					1	12	0	21.64	17.91
					1	24	0	21.54	17.81
					12	0	1	20.81	17.08
					12	6	1	20.67	16.94
					12	11	1	20.79	17.06
					25	0	1	20.77	17.04
				16QAM	1	0	1	21.64	17.91
					1	12	1	21.38	17.65
					1	24	1	21.01	17.28
					12	0	2	19.76	16.03
					12	6	2	19.65	15.92
					12	11	2	19.60	15.87
					25	0	2	19.68	15.95

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	ERP Power
Band 17	10M	23780	709.0	QPSK	1	0	0	21.57	21.26
					1	24	0	21.74	21.43
					1	49	0	21.61	21.30
					25	0	1	20.82	20.51
					25	12	1	20.80	20.49
					25	24	1	20.74	20.43
					50	0	1	20.72	20.41
				16QAM	1	0	1	20.97	20.66
					1	24	1	21.15	20.84
					1	49	1	21.41	21.10
					25	0	2	19.78	19.47
					25	12	2	19.80	19.49
					25	24	2	19.74	19.43
					50	0	2	19.78	19.47
		23790	710.0	QPSK	1	0	0	21.50	21.19
					1	24	0	21.73	21.42
					1	49	0	21.89	21.58
					25	0	1	20.91	20.60
					25	12	1	20.90	20.59
					25	24	1	20.92	20.61
					50	0	1	20.76	20.45
				16QAM	1	0	1	21.17	20.86
					1	24	1	21.34	21.03
					1	49	1	21.45	21.14
					25	0	2	19.78	19.47
					25	12	2	19.81	19.50
					25	24	2	19.98	19.67
					50	0	2	19.92	19.61
		23800	711.0	QPSK	1	0	0	21.51	21.20
					1	24	0	21.73	21.42
					1	49	0	21.63	21.32
					25	0	1	20.90	20.59
					25	12	1	20.76	20.45
					25	24	1	20.88	20.57
					50	0	1	20.86	20.55
				16QAM	1	0	1	21.73	21.42
					1	24	1	21.47	21.16
					1	49	1	21.10	20.79
					25	0	2	19.85	19.54
					25	12	2	19.74	19.43
					25	24	2	19.69	19.38
					50	0	2	19.77	19.46

8.2 RADIATED EMISSION MEASUREMENT

LIMITS

FCC §27.53(g), Band 12 & Band 17

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to RSS-130, Band 12 & Band 17

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

TEST PROCEDURES

1. According to KDB 971168 D01 and TIA-603-E.
2. The EUT was placed on a turntable
 - (1) Below 1G : 0.8m
 - (2) Above 1G : 1.5m
 - (3) EUT set 3m from the receiving antenna
 - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

Test Results**LTE Band 17 / BW: 10MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

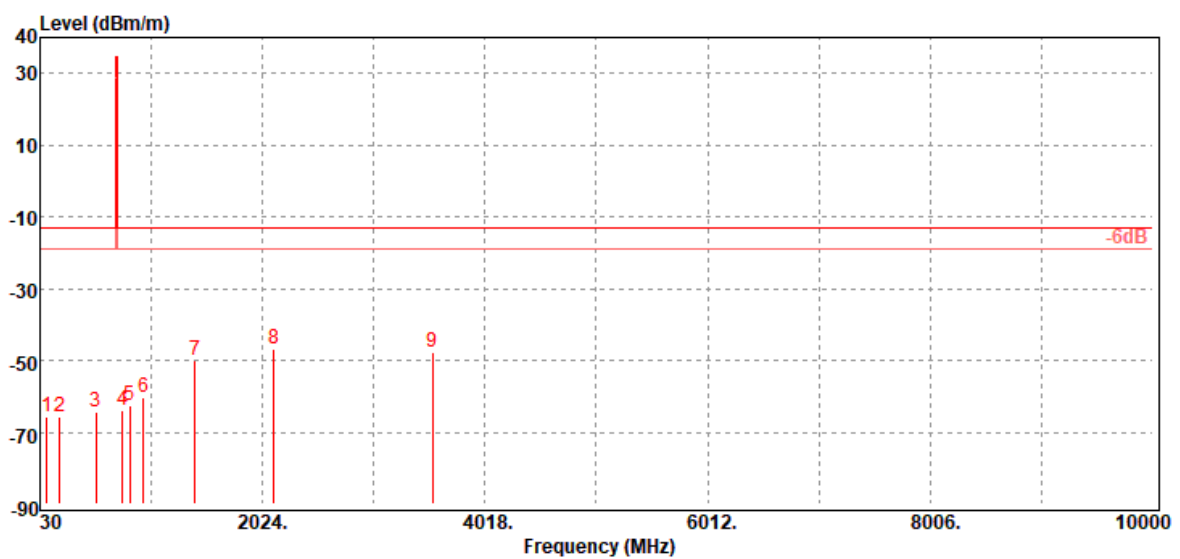
June 6, 2020

Temperature: 24.9°C**Tested by:**

Jerry Chang

Humidity: 51 %RH**Polarity:**

Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
89.17	-65.68	-57.91	-7.00	-0.77	-13.00	-52.68	V
206.54	-65.88	-62.12	-2.58	-1.18	-13.00	-52.88	V
529.55	-64.20	-60.98	-1.30	-1.92	-13.00	-51.20	V
772.05	-64.12	-60.39	-1.40	-2.33	-13.00	-51.12	V
832.19	-62.64	-58.71	-1.50	-2.43	-13.00	-49.64	V
958.29	-60.54	-56.65	-1.27	-2.62	-13.00	-47.54	V
1418.00	-49.81	-54.66	8.11	-3.26	-13.00	-36.81	V
2127.00	-46.82	-52.27	9.58	-4.13	-13.00	-33.82	V
3545.00	-47.62	-54.44	12.41	-5.59	-13.00	-34.62	V



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Operation Mode: Tx / Low CH

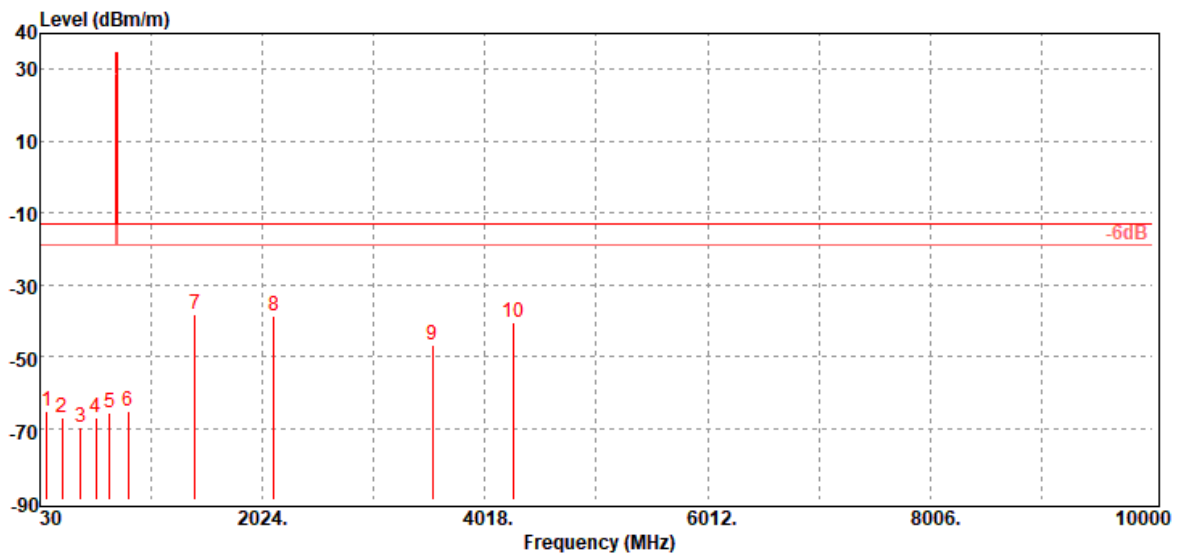
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
91.11	-65.39	-57.70	-6.91	-0.78	-13.00	-52.39	H
231.76	-67.11	-63.76	-2.10	-1.25	-13.00	-54.11	H
395.69	-69.78	-66.52	-1.61	-1.65	-13.00	-56.78	H
534.40	-66.93	-63.70	-1.30	-1.93	-13.00	-53.93	H
651.77	-65.59	-61.78	-1.66	-2.15	-13.00	-52.59	H
818.61	-65.35	-61.41	-1.54	-2.40	-13.00	-52.35	H
1418.00	-38.47	-43.32	8.11	-3.26	-13.00	-25.47	H
2127.00	-38.80	-44.25	9.58	-4.13	-13.00	-25.80	H
3545.00	-46.65	-53.47	12.41	-5.59	-13.00	-33.65	H
4276.00	-40.49	-47.15	12.80	-6.14	-13.00	-27.49	H



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Operation Mode: Tx / Mid CH

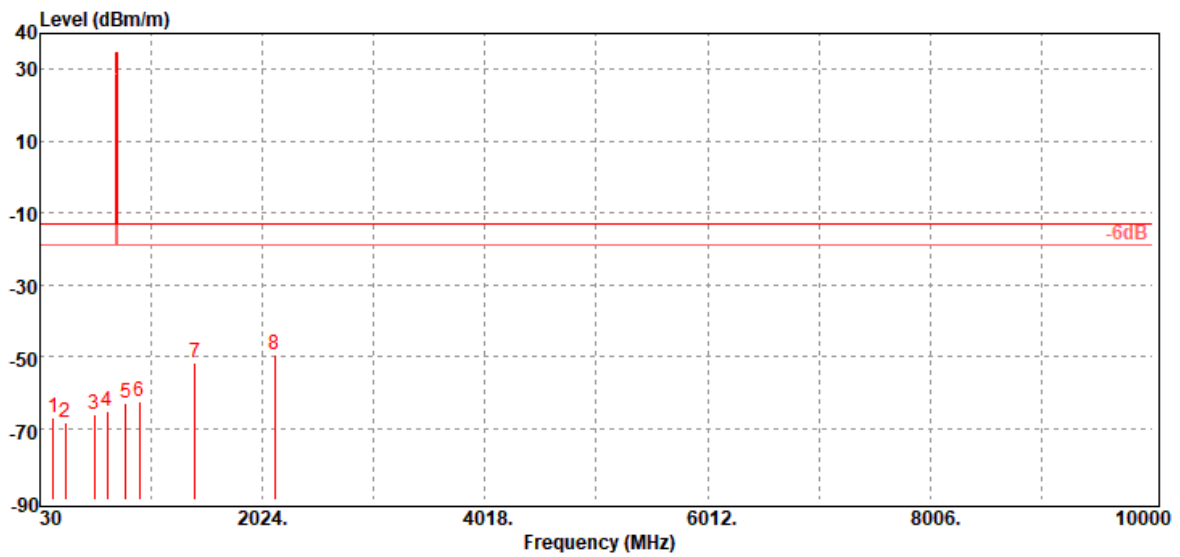
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
148.34	-67.14	-58.87	-7.27	-1.00	-13.00	-54.14	V
256.01	-68.19	-65.23	-1.64	-1.32	-13.00	-55.19	V
517.91	-66.10	-62.76	-1.44	-1.90	-13.00	-53.10	V
633.34	-65.45	-61.70	-1.63	-2.12	-13.00	-52.45	V
801.15	-63.08	-59.39	-1.32	-2.37	-13.00	-50.08	V
924.34	-62.54	-58.66	-1.30	-2.58	-13.00	-49.54	V
1420.00	-51.73	-56.59	8.12	-3.26	-13.00	-38.73	V
2130.00	-49.63	-55.06	9.56	-4.13	-13.00	-36.63	V



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Operation Mode: Tx / Mid CH

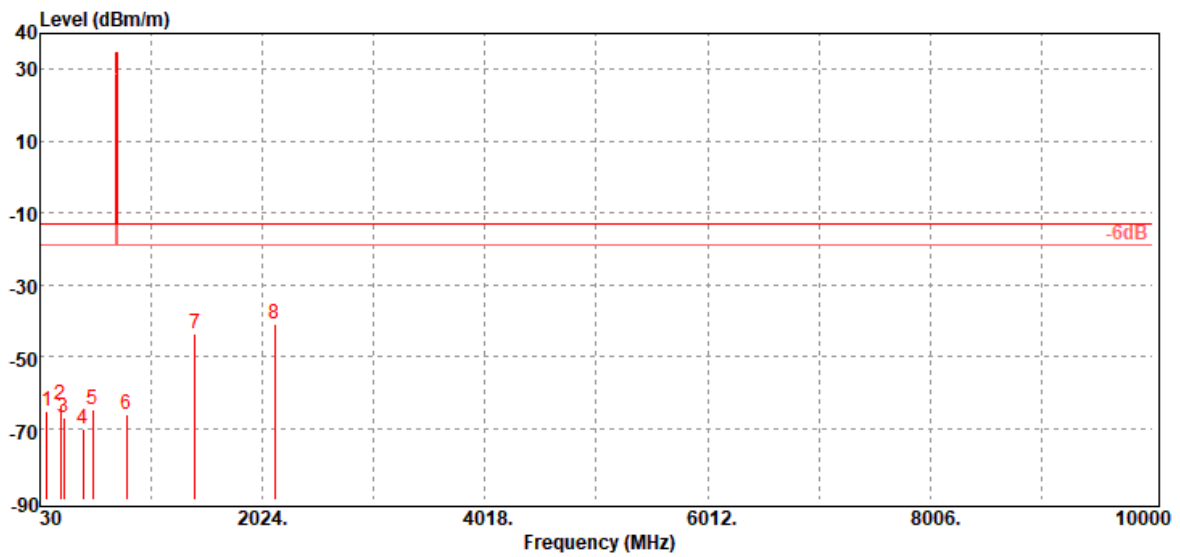
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
91.11	-65.07	-57.38	-6.91	-0.78	-13.00	-52.07	H
217.21	-63.42	-60.15	-2.06	-1.21	-13.00	-50.42	H
246.31	-66.99	-63.83	-1.87	-1.29	-13.00	-53.99	H
418.97	-70.18	-66.58	-1.90	-1.70	-13.00	-57.18	H
503.36	-64.73	-60.92	-1.93	-1.88	-13.00	-51.73	H
808.91	-66.02	-62.15	-1.48	-2.39	-13.00	-53.02	H
1420.00	-43.50	-48.36	8.12	-3.26	-13.00	-30.50	H
2130.00	-40.85	-46.28	9.56	-4.13	-13.00	-27.85	H



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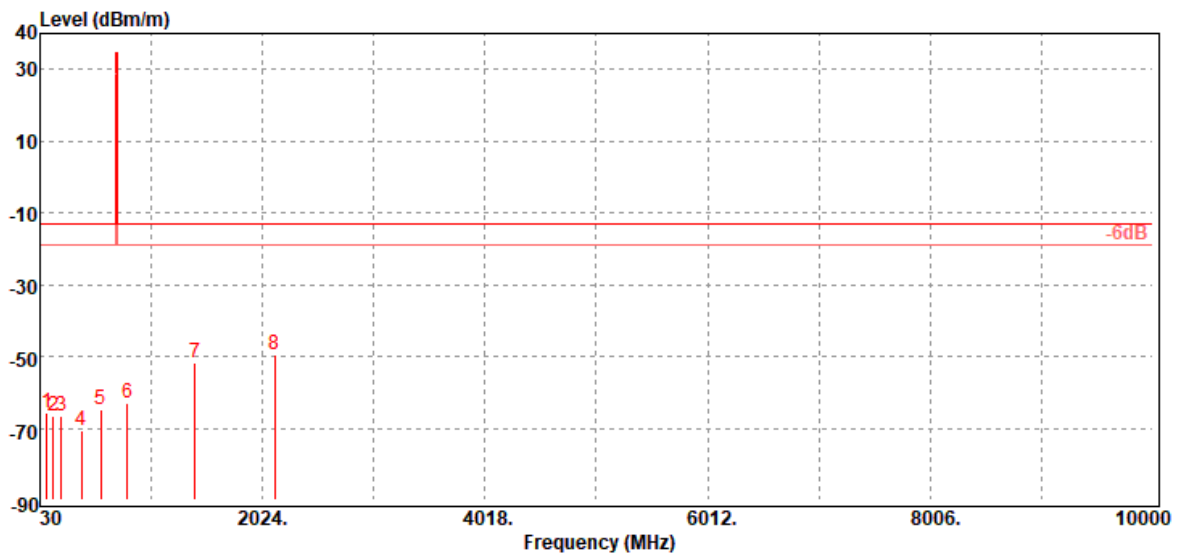
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
88.20	-65.82	-57.89	-7.16	-0.77	-13.00	-52.82	V
146.40	-66.73	-58.20	-7.54	-0.99	-13.00	-53.73	V
222.06	-66.50	-63.32	-1.96	-1.22	-13.00	-53.50	V
404.42	-70.44	-66.98	-1.79	-1.67	-13.00	-57.44	V
578.05	-64.70	-61.28	-1.40	-2.02	-13.00	-51.70	V
812.79	-63.20	-59.37	-1.44	-2.39	-13.00	-50.20	V
1422.00	-51.82	-56.69	8.13	-3.26	-13.00	-38.82	V
2133.00	-49.50	-54.90	9.54	-4.14	-13.00	-36.50	V



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Operation Mode: Tx / High CH

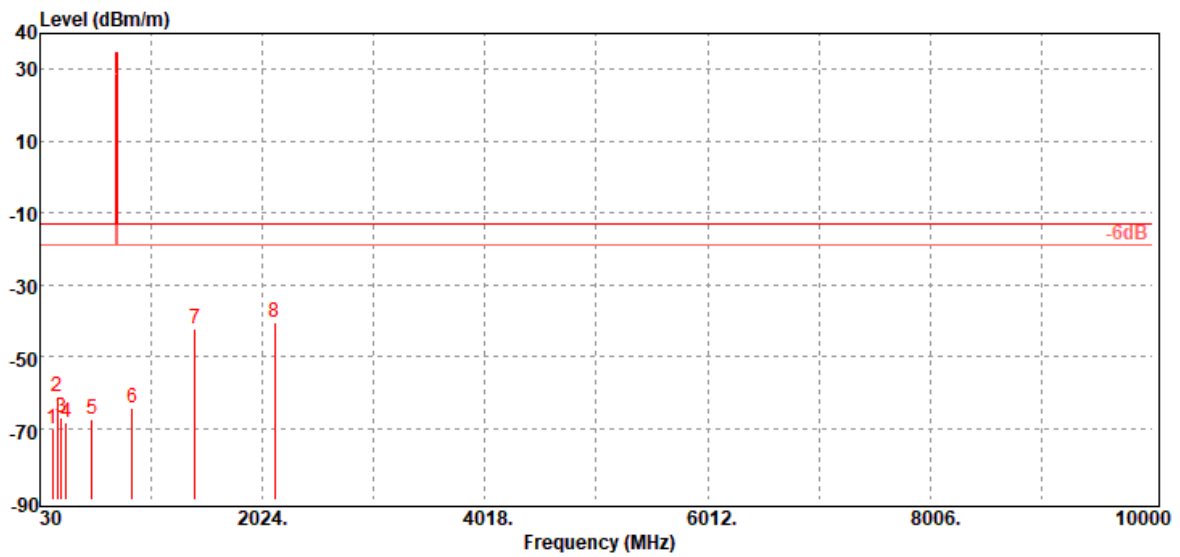
Test Date: June 6, 2020

Temperature: 24.9°C

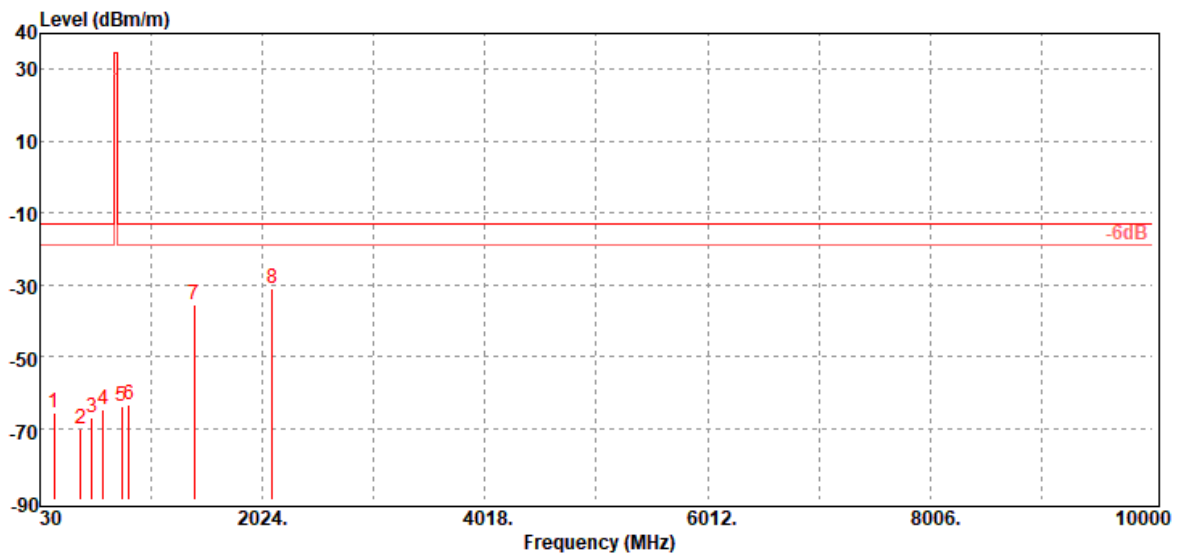
Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
143.49	-70.00	-61.02	-8.00	-0.98	-13.00	-57.00	H
185.20	-61.41	-56.21	-4.08	-1.12	-13.00	-48.41	H
221.09	-66.94	-63.74	-1.98	-1.22	-13.00	-53.94	H
262.80	-68.37	-64.89	-2.14	-1.34	-13.00	-55.37	H
493.66	-67.63	-63.73	-2.05	-1.85	-13.00	-54.63	H
858.38	-64.23	-60.46	-1.30	-2.47	-13.00	-51.23	H
1422.00	-42.46	-47.33	8.13	-3.26	-13.00	-29.46	H
2133.00	-40.56	-45.96	9.54	-4.14	-13.00	-27.56	H

LTE Band 12 / BW: 20MHz / QPSK / RB =1, RB Offset = 0**Operation Mode:** Tx / Low CH**Test Date:** June 6, 2020**Temperature:** 24.9°C**Tested by:** Jerry Chang**Humidity:** 51 %RH**Polarity:** Ver.

Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
153.19	-65.74	-58.00	-6.72	-1.02	-13.00	-52.74	V
390.84	-70.16	-67.09	-1.43	-1.64	-13.00	-57.16	V
493.66	-66.95	-63.05	-2.05	-1.85	-13.00	-53.95	V
594.54	-64.61	-61.73	-0.82	-2.06	-13.00	-51.61	V
760.41	-64.03	-60.31	-1.40	-2.32	-13.00	-51.03	V
826.37	-63.58	-59.66	-1.50	-2.42	-13.00	-50.58	V
1408.00	-35.65	-40.45	8.05	-3.25	-13.00	-22.65	V
2112.00	-31.21	-36.80	9.70	-4.11	-13.00	-18.21	V



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Operation Mode: Tx / Low CH

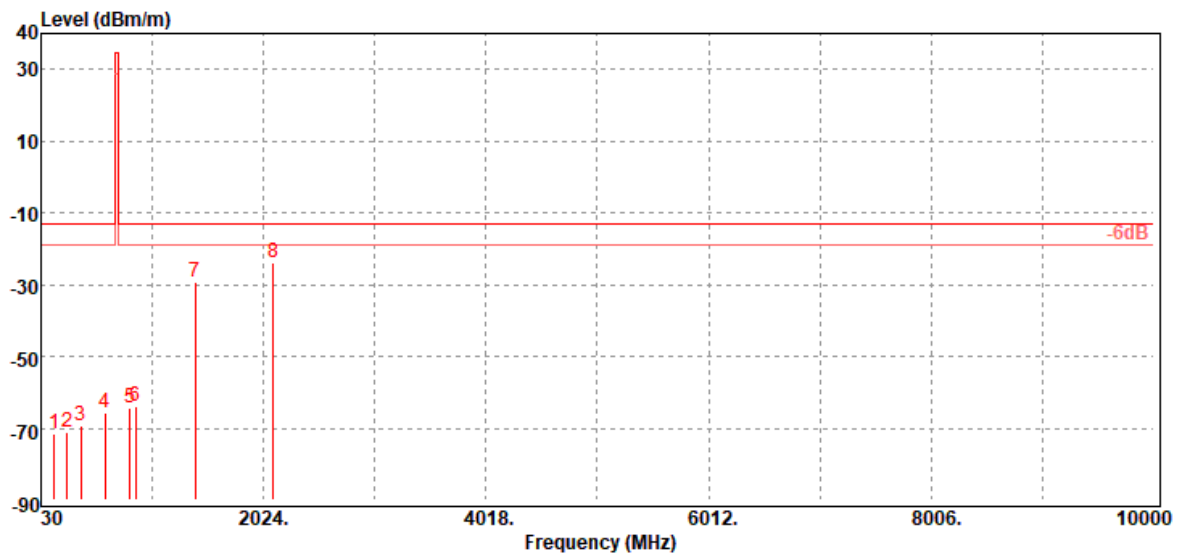
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
152.22	-71.60	-63.73	-6.86	-1.01	-13.00	-58.60	H
262.80	-71.01	-67.53	-2.14	-1.34	-13.00	-58.01	H
384.05	-69.37	-66.33	-1.42	-1.62	-13.00	-56.37	H
602.30	-65.79	-62.77	-0.95	-2.07	-13.00	-52.79	H
830.25	-64.34	-60.42	-1.50	-2.42	-13.00	-51.34	H
875.84	-63.74	-59.96	-1.28	-2.50	-13.00	-50.74	H
1408.00	-29.43	-34.23	8.05	-3.25	-13.00	-16.43	H
2112.00	-24.02	-29.61	9.70	-4.11	-13.00	-11.02	H

Operation Mode: Tx / Mid CH

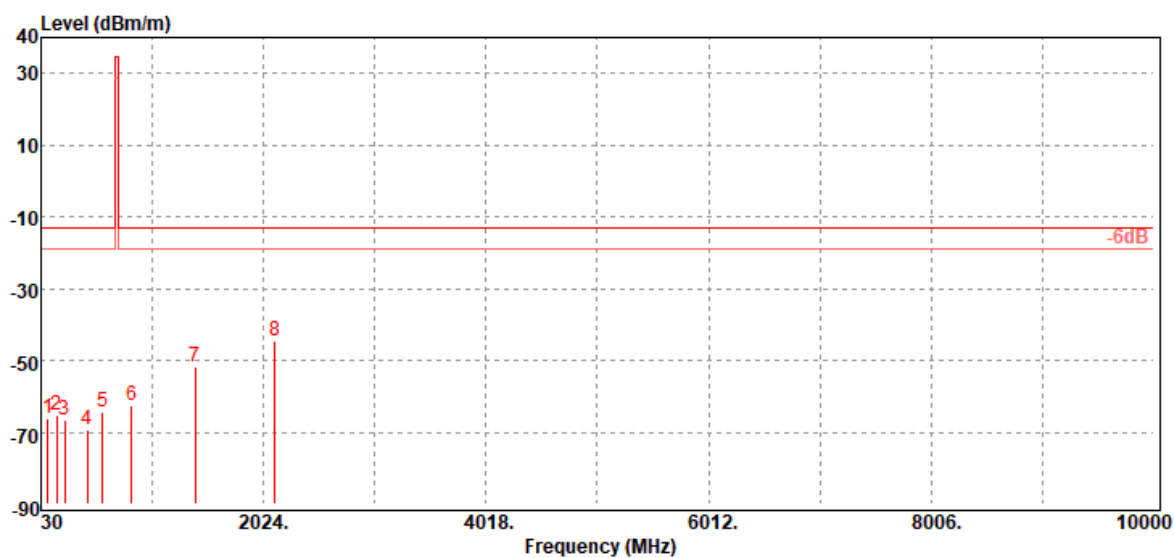
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
88.20	-66.01	-58.08	-7.16	-0.77	-13.00	-53.01	V
168.71	-65.09	-58.59	-5.43	-1.07	-13.00	-52.09	V
246.31	-66.68	-63.52	-1.87	-1.29	-13.00	-53.68	V
444.19	-69.32	-65.47	-2.10	-1.75	-13.00	-56.32	V
580.96	-64.53	-61.14	-1.36	-2.03	-13.00	-51.53	V
842.86	-62.60	-58.76	-1.40	-2.44	-13.00	-49.60	V
1415.00	-51.97	-56.81	8.09	-3.25	-13.00	-38.97	V
2122.50	-44.75	-50.25	9.62	-4.12	-13.00	-31.75	V

Operation Mode: Tx / Mid CH

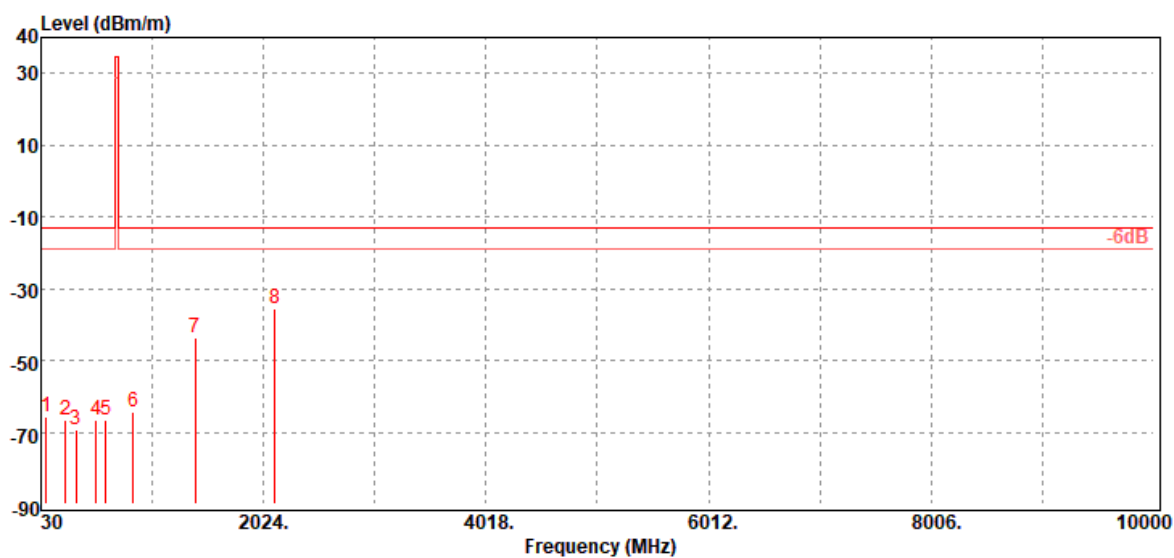
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-65.84	-56.65	-8.46	-0.73	-13.00	-52.84	H
248.25	-66.48	-63.35	-1.83	-1.30	-13.00	-53.48	H
347.19	-69.34	-66.30	-1.50	-1.54	-13.00	-56.34	H
521.79	-66.49	-63.22	-1.36	-1.91	-13.00	-53.49	H
609.09	-66.40	-63.24	-1.08	-2.08	-13.00	-53.40	H
859.35	-64.50	-60.73	-1.30	-2.47	-13.00	-51.50	H
1415.00	-43.64	-48.48	8.09	-3.25	-13.00	-30.64	H
2122.50	-35.68	-41.18	9.62	-4.12	-13.00	-22.68	H



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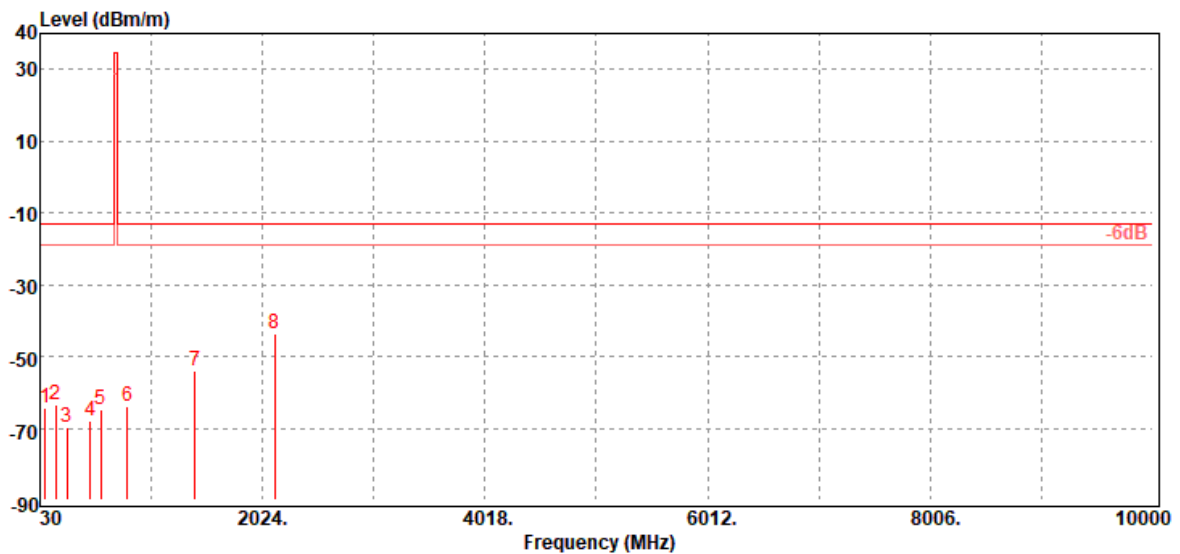
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
78.50	-64.29	-55.01	-8.55	-0.73	-13.00	-51.29	V
172.59	-63.62	-57.40	-5.14	-1.08	-13.00	-50.62	V
274.44	-69.76	-65.79	-2.60	-1.37	-13.00	-56.76	V
482.99	-68.01	-63.84	-2.34	-1.83	-13.00	-55.01	V
573.20	-64.94	-61.53	-1.40	-2.01	-13.00	-51.94	V
810.85	-64.11	-60.24	-1.48	-2.39	-13.00	-51.11	V
1422.00	-53.97	-58.84	8.13	-3.26	-13.00	-40.97	V
2133.00	-43.57	-48.97	9.54	-4.14	-13.00	-30.57	V



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Operation Mode: Tx / High CH

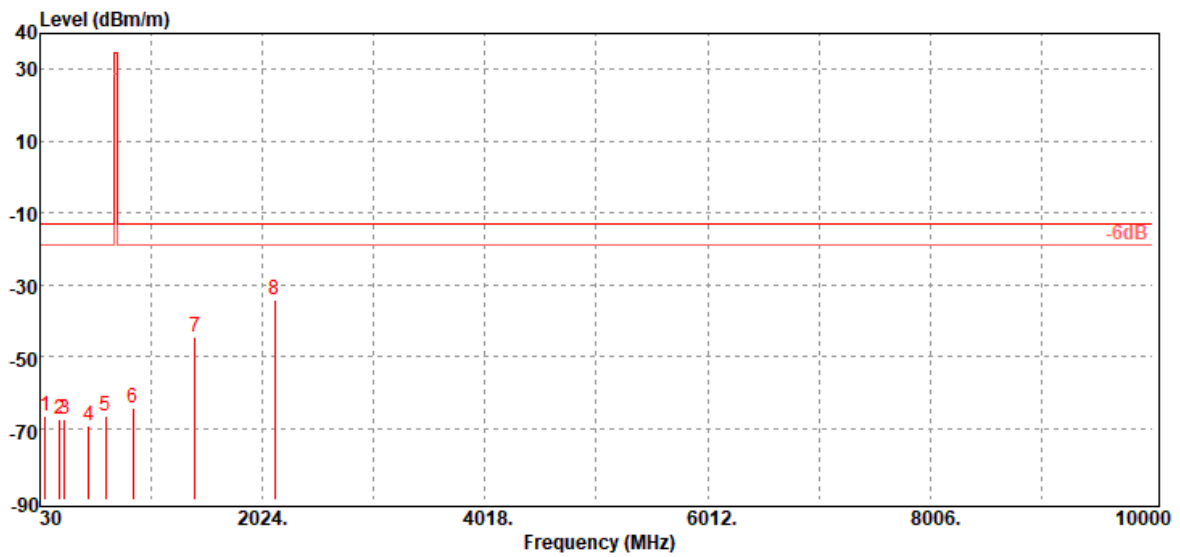
Test Date: June 6, 2020

Temperature: 24.9°C

Tested by: Jerry Chang

Humidity: 51 %RH

Polarity: Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-66.57	-57.38	-8.46	-0.73	-13.00	-53.57	H
206.54	-67.61	-63.85	-2.58	-1.18	-13.00	-54.61	H
251.16	-67.35	-64.30	-1.75	-1.30	-13.00	-54.35	H
469.41	-69.34	-65.15	-2.39	-1.80	-13.00	-56.34	H
617.82	-66.53	-63.07	-1.36	-2.10	-13.00	-53.53	H
864.20	-64.52	-60.74	-1.30	-2.48	-13.00	-51.52	H
1422.00	-44.62	-49.49	8.13	-3.26	-13.00	-31.62	H
2133.00	-34.34	-39.74	9.54	-4.14	-13.00	-21.34	H



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8.3 TEST DATA RE-USE SUMMARY

Introduction Section:

The application re-uses data collected on a similar device. The subject device of this application (Model: N653, FCC ID: P4Q-N653, IC: 2420C-N653) is electrically identical to the reference device (Model: N635, FCC ID: P4Q-N635A, IC: 2420C-N635A) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

Differences Brief Description:

The WLAN, WWAN, BT and RFID hardware of this device are identical to the implementation in

FCC ID: P4Q-N653.

IC: 2420C-N653

The Product Equality Declaration document includes detailed information about the changes between the devices. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary table below.



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Spot Check Verification Result Summary

Equipment Class	Reference FCC ID / IC No.	Folder Test	Report Title/ Section
Part 27 / RSS-130	P4Q-N635A / 2420C-N635A	T191105W01-RP11	All Section (Except for ERP/EIRP Measurement, Spurious Radiation Measurement)

Summary of the spot check for Unlicensed bands and Licensed bands

In order to confirm hardware similarity of the subject device with the reference device, we used same setting power to radiated emission measurement were performed on the subject device for the Band edge and Harmonic, the test result were similar with FCC ID: P4Q-N635A / IC: 2420C-N635A.

WWAN: LTE

Report	Test Item	Frequency (MHz)	Channel	P4Q-N635A / 2420C-N635A		P4Q-N653 / 2420C-N653		Gap (dB)
				Measured Frequency (MHz)	EIRP/ERP	Measured Frequency (MHz)	EIRP/ERP	
Band 12	RSE	707.5	23095	2122.5	-36.75	2122.5	-35.68	-1.07
Band 17	RSE	710	23790	2130	-42	2130	-40.85	-1.15

- End of Test Report -