

Partial FCC Test Report

(PART 27)

Report No.: RF171226C11-2

FCC ID: KA2WP902A1

Test Model: DWP-902

Received Date: Dec. 26, 2017

Test Date: Jan. 20, 2018 ~ Jan. 24, 2018

Issued Date: Feb. 02, 2018

Applicant: D-Link Corporation

Address: 289 Xinhua 3rd RD Neihu district Taipei Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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(R.O.C)

Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
Hsien 333, Taiwan, R.O.C.

Test Location (2): No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,
R.O.C

**FCC Registration /
Designation Number:** 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF171226C11-2	Original Release	Feb. 02, 2018

1 Certificate of Conformity

Product: LTE Router

Brand: D-Link Corporation

Test Model: DWP-902

Sample Status: Identical Prototype

Applicant: D-Link Corporation

Test Date: Jan. 20, 2018 ~ Jan. 24, 2018

Standards: FCC Part 27, Subpart C, L

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :



Date: Feb. 02, 2018

Vera Huang / Specialist

Approved by :



Date: Feb. 02, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049 27.53(h)	Occupied Bandwidth	N/A	Refer to Note
27.50(d)(5)	Peak to Average Ratio	N/A	Refer to Note
27.53(h)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(h)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -34.29 dB at 3465.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049 27.53(g)	Occupied Bandwidth	N/A	Refer to Note
27.50(d)(5)	Peak to Average Ratio	N/A	Refer to Note
27.53(g)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(g)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -42.13 dB at 172.56 MHz.

Note:

Only test items for Radiated Emissions and Effective Radiated Power / Effective Isotropic Radiated Power tests were performed for this report. For other test data, please refer to TTL Report No.: B15W50341-FCC-RF-Rev1 for module (Name: Wireless Modules, Model: EM7455).

2.1 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:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna ETS-Lindgren	3117	00143293	Jun. 26, 2017	Jun. 25, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Bluetooth Tester	CBT	100980	Jun. 28, 2017	Jun. 27, 2019
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 26, 2017	Jun. 25, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 26, 2017	Jun. 25, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 08, 2016	Jul. 07, 2017

- Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	LTE Router	
Brand	D-Link Corporation	
Test Model	DWP-902	
Status of EUT	Identical Prototype	
Power Supply Rating	54 Vdc (Adapter or POE)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	901.36 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	896.60 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	900.74 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	919.81 mW
Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	991.97 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	969.39 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	985.14 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	967.61 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	960.51 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	953.89 mW
Antenna Type	Internal PCB Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

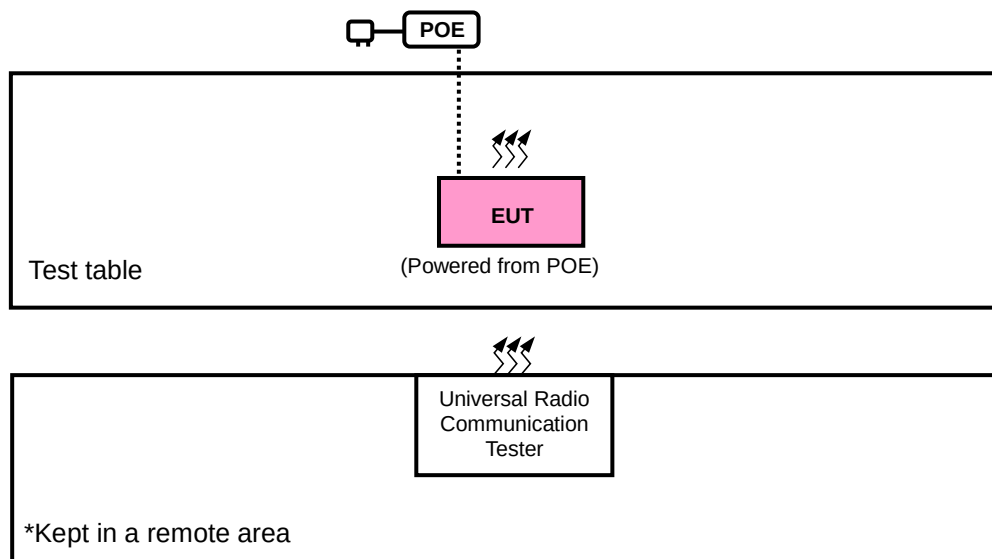
Note:

- The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Gospell Digital Technology Co. Ltd.	G0753-540-060	I/P: 100-240 Vac, 50/60 Hz, 0.75 A O/P: 54 Vdc, 0.6 A 1.2 m non-shielded cable w/o core
POE	D-Link	DPE-301GI	54 Vdc, 0.6 A
WWAN Module	Sierra	EM7455	--

- The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP / EIRP	Radiated Emission
LTE Band 4	X-plane	X-axis
LTE Band 12	X-plane	X-axis

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v02r02

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

Note: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698-716 MHz band are limited to 3 watts ERP

4.1.2 Test Procedures

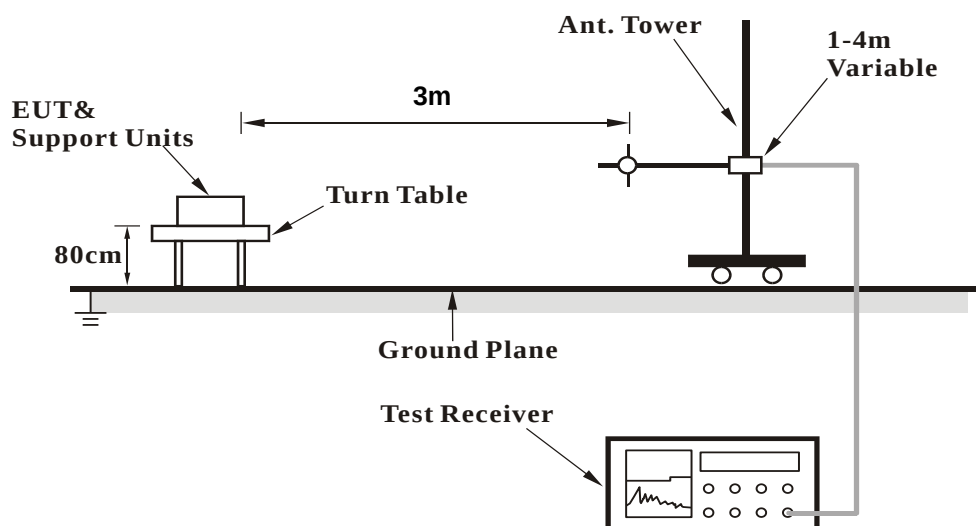
EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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.
- c. 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 b. Record the power level of S.G.
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

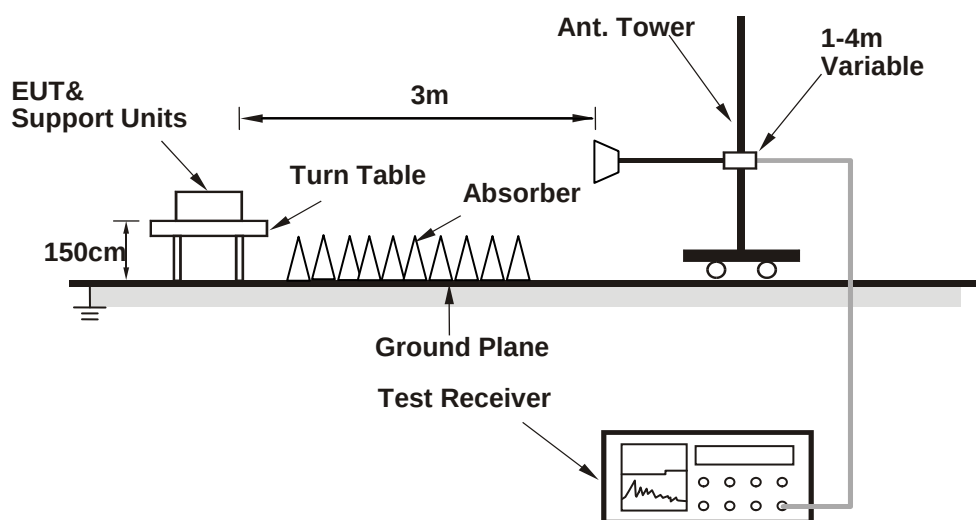
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

ERP Power (dBm)

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23017	699.7	-1.02	32.719	29.55	901.36	H
	23095	707.5	-1.09	32.736	29.50	890.43	
	23173	715.3	-0.98	32.591	29.46	883.28	
	23017	699.7	-7.06	32.69	23.48	222.84	V
	23095	707.5	-7.11	32.81	23.55	226.46	
	23173	715.3	-7.06	32.74	23.53	225.42	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-2.04	32.719	28.53	712.69	H
	23095	707.5	-2.11	32.736	28.48	704.04	
	23173	715.3	-1.98	32.591	28.46	701.62	
	23017	699.7	-8.04	32.69	22.50	177.83	V
	23095	707.5	-8.16	32.81	22.50	177.83	
	23173	715.3	-8.04	32.74	22.55	179.89	

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23025	700.5	-1.05	32.719	29.52	895.16	H
	23095	707.5	-1.06	32.736	29.53	896.60	
	23165	714.5	-1.00	32.591	29.44	879.22	
	23025	700.5	-7.07	32.69	23.47	222.33	V
	23095	707.5	-7.10	32.81	23.56	226.99	
	23165	714.5	-7.06	32.74	23.53	225.42	
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-2.02	32.719	28.55	715.98	H
	23095	707.5	-2.04	32.736	28.55	715.48	
	23165	714.5	-1.93	32.591	28.51	709.74	
	23025	700.5	-8.04	32.69	22.50	177.83	V
	23095	707.5	-8.12	32.81	22.54	179.47	
	23165	714.5	-8.03	32.74	22.56	180.30	

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23035	701.5	-1.05	32.719	29.52	895.16	H
	23095	707.5	-1.04	32.736	29.55	900.74	
	23155	713.5	-0.95	32.591	29.49	889.41	
	23035	701.5	-7.00	32.69	23.54	225.94	V
	23095	707.5	-7.12	32.81	23.54	225.94	
	23155	713.5	-7.07	32.74	23.52	224.91	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-2.08	32.719	28.49	706.15	H
	23095	707.5	-2.02	32.736	28.57	718.79	
	23155	713.5	-1.91	32.591	28.53	713.02	
	23035	701.5	-8.00	32.69	22.54	179.47	V
	23095	707.5	-8.13	32.81	22.53	179.06	
	23155	713.5	-8.12	32.74	22.47	176.60	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23060	704.0	-0.94	32.727	29.64	919.81	H
	23095	707.5	-1.00	32.739	29.59	909.70	
	23130	711.0	-1.04	32.728	29.54	899.08	
	23060	704.0	-6.92	32.75	23.68	233.35	V
	23095	707.5	-7.10	32.81	23.56	226.99	
	23130	711.0	-7.16	32.84	23.53	225.42	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-1.93	32.727	28.65	732.32	H
	23095	707.5	-2.00	32.739	28.59	722.60	
	23130	711.0	-2.03	32.728	28.55	715.81	
	23060	704.0	-7.91	32.75	22.69	185.78	V
	23095	707.5	-8.15	32.81	22.51	178.24	
	23130	711.0	-8.12	32.84	22.57	180.72	

EIRP Power (dBm)

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19957	1710.7	-12.52	42.49	29.97	991.97	H
	20175	1732.5	-12.50	42.33	29.83	960.95	
	20393	1754.3	-12.47	42.10	29.63	918.33	
	19957	1710.7	-14.96	42.99	28.03	635.33	V
	20175	1732.5	-14.71	42.74	28.03	635.33	
	20393	1754.3	-14.16	42.21	28.05	638.26	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-13.52	42.49	28.97	787.95	H
	20175	1732.5	-13.58	42.33	28.75	749.38	
	20393	1754.3	-13.55	42.10	28.55	716.14	
	19957	1710.7	-16.25	42.99	26.74	472.06	V
	20175	1732.5	-15.84	42.74	26.90	489.78	
	20393	1754.3	-15.45	42.21	26.76	474.24	

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19965	1711.5	-12.62	42.49	29.87	969.39	H
	20175	1732.5	-12.47	42.33	29.86	967.61	
	20385	1753.5	-12.55	42.10	29.55	901.57	
	19965	1711.5	-14.92	42.99	28.07	641.21	V
	20175	1732.5	-14.69	42.74	28.05	638.26	
	20385	1753.5	-14.15	42.21	28.06	639.73	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-13.58	42.49	28.91	777.14	H
	20175	1732.5	-13.66	42.33	28.67	735.70	
	20385	1753.5	-13.45	42.10	28.65	732.82	
	19965	1711.5	-15.97	42.99	27.02	503.50	V
	20175	1732.5	-15.94	42.74	26.80	478.63	
	20385	1753.5	-15.48	42.21	26.73	470.98	

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19975	1712.5	-12.55	42.49	29.94	985.14	H
	20175	1732.5	-12.54	42.33	29.79	952.14	
	20375	1752.5	-12.65	42.10	29.45	881.05	
	19975	1712.5	-14.95	42.99	28.04	636.80	V
	20175	1732.5	-14.68	42.74	28.06	639.73	
	20375	1752.5	-14.13	42.21	28.08	642.69	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-13.69	42.49	28.80	757.70	H
	20175	1732.5	-13.77	42.33	28.56	717.30	
	20375	1752.5	-13.54	42.10	28.56	717.79	
	19975	1712.5	-15.96	42.99	27.03	504.66	V
	20175	1732.5	-15.84	42.74	26.90	489.78	
	20375	1752.5	-15.78	42.21	26.43	439.54	

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20000	1715.0	-12.69	42.49	29.80	953.89	H
	20175	1732.5	-12.47	42.33	29.86	967.61	
	20350	1750.0	-12.57	42.10	29.53	898.05	
	20000	1715.0	-14.92	42.99	28.07	641.21	V
	20175	1732.5	-14.68	42.74	28.06	639.73	
	20350	1750.0	-14.12	42.21	28.09	644.17	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-13.80	42.49	28.69	738.75	H
	20175	1732.5	-13.54	42.33	28.79	756.14	
	20350	1750.0	-13.57	42.10	28.53	713.51	
	20000	1715.0	-15.69	42.99	27.30	537.03	V
	20175	1732.5	-15.84	42.74	26.90	489.67	
	20350	1750.0	-15.99	42.21	26.22	418.79	

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20025	1717.5	-12.66	42.49	29.83	960.51	H
	20175	1732.5	-12.52	42.33	29.81	956.53	
	20325	1747.5	-12.41	42.10	29.69	931.11	
	20025	1717.5	-14.93	42.99	28.06	639.73	V
	20175	1732.5	-14.72	42.74	28.02	633.87	
	20325	1747.5	-14.15	42.21	28.06	639.73	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-13.70	42.49	28.79	756.31	H
	20175	1732.5	-13.75	42.33	28.58	721.44	
	20325	1747.5	-13.84	42.10	28.26	669.88	
	20025	1717.5	-15.74	42.99	27.25	530.88	V
	20175	1732.5	-15.99	42.74	26.75	473.15	
	20325	1747.5	-15.84	42.21	26.37	433.51	

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20050	1720.0	-12.69	42.49	29.80	953.89	H
	20175	1732.5	-12.85	42.33	29.48	886.54	
	20300	1745.0	-12.79	42.10	29.31	853.69	
	20050	1720.0	-14.95	42.99	28.04	636.80	V
	20175	1732.5	-14.61	42.74	28.13	649.83	
	20300	1745.0	-14.11	42.21	28.10	645.65	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-13.50	42.49	28.99	791.59	H
	20175	1732.5	-13.84	42.33	28.49	705.83	
	20300	1745.0	-13.44	42.10	28.66	734.51	
	20050	1720.0	-15.84	42.99	27.15	518.80	V
	20175	1732.5	-15.88	42.74	26.86	485.29	
	20300	1745.0	-15.71	42.21	26.50	446.68	

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

- a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.

4.2.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

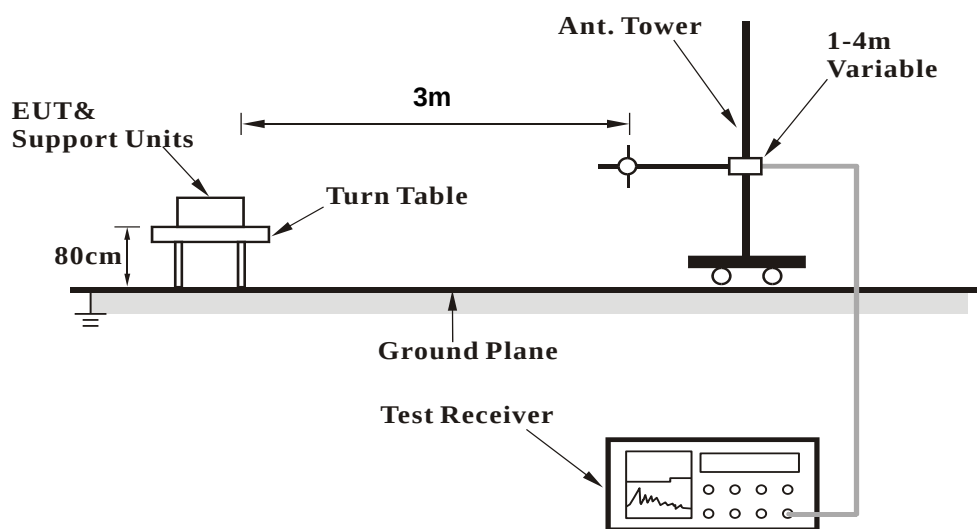
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

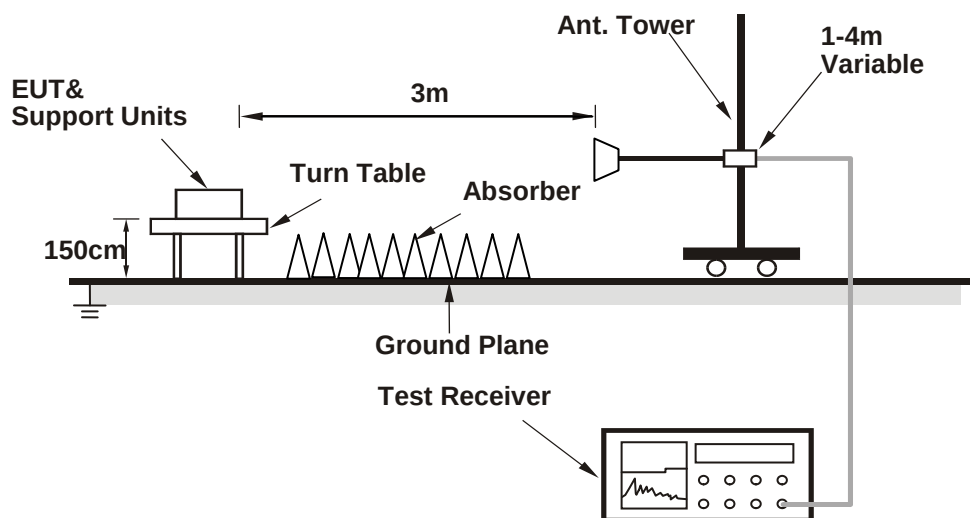
No deviation.

4.2.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

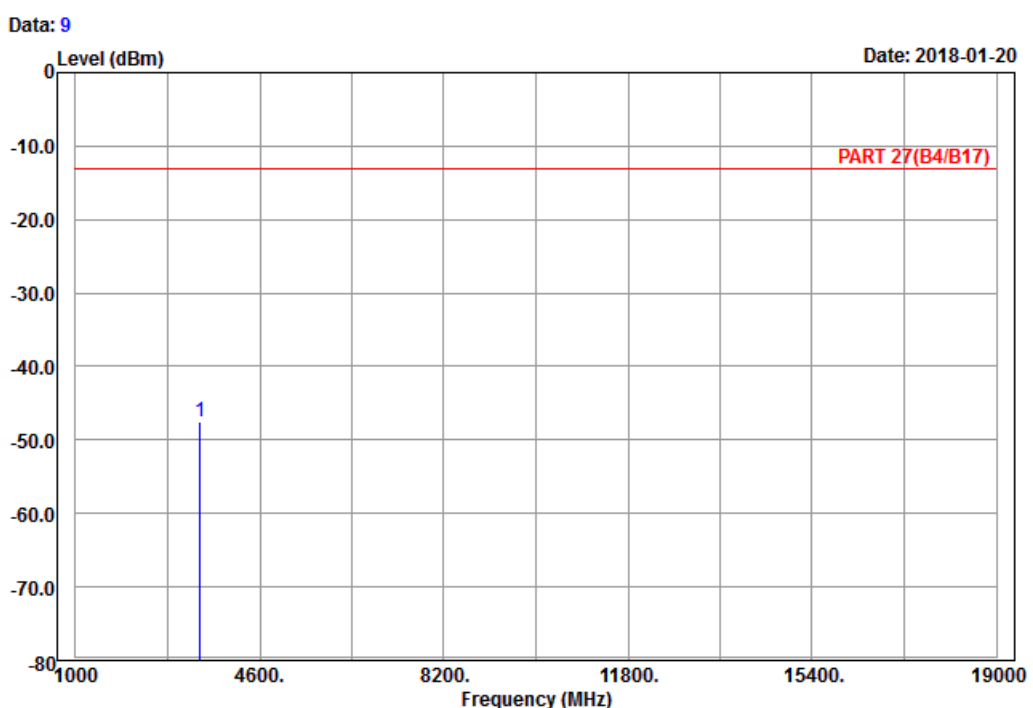
4.2.5 Test Results

LTE Band 4
Channel Bandwidth: 20 MHz / QPSK
Low Channel



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A D T



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3440.00	-47.46	-61.81	-13.00	-34.46	14.35	Peak

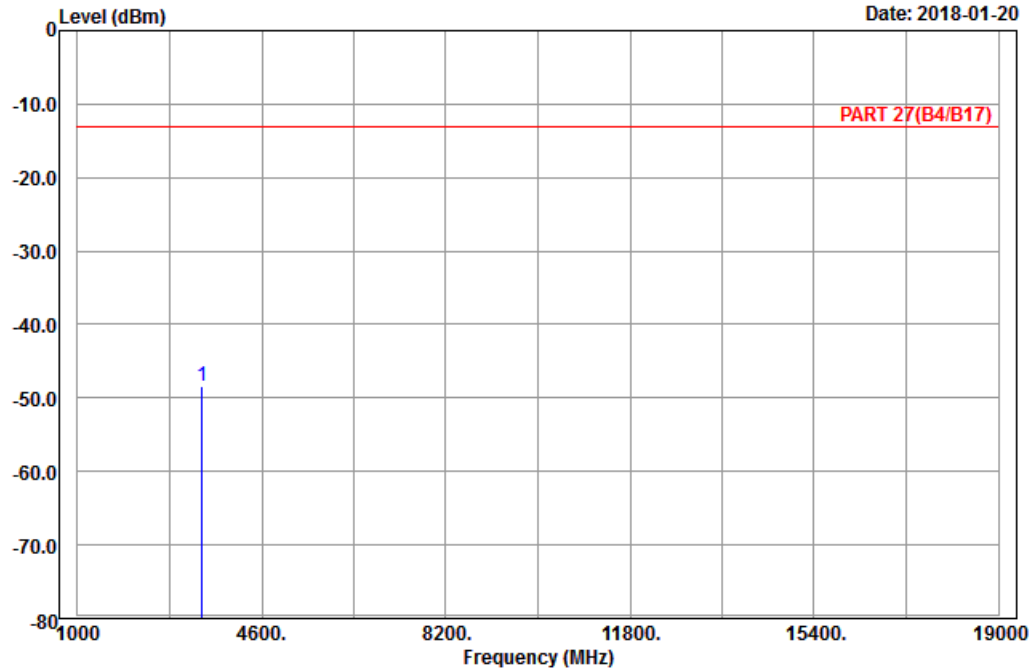


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A D T

Data: 10

Date: 2018-01-20



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3440.00 -48.49 -62.84 -13.00 -35.49 14.35 Peak

Middle Channel

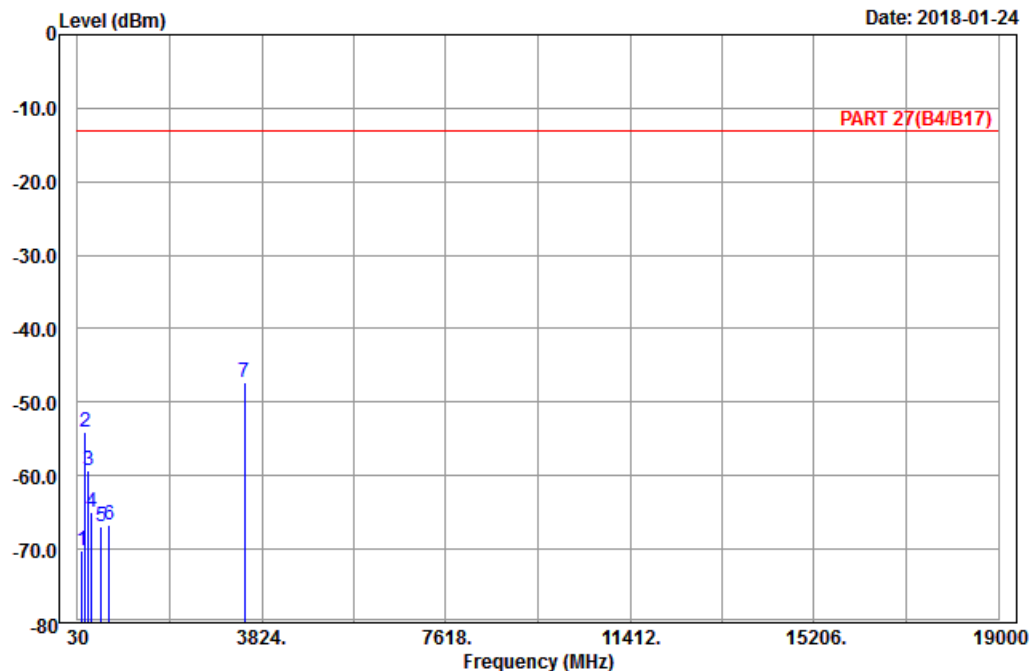


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A D T

Data: 13

Date: 2018-01-24



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Charles Hsiao

		Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor Remark
	MHz	dBm	dBm	dBm	dB	dB
1	122.88	-70.29	-62.22	-13.00	-57.29	-8.07 Peak
2	194.70	-53.97	-48.01	-13.00	-40.97	-5.96 Peak
3	253.83	-59.38	-53.84	-13.00	-46.38	-5.54 Peak
4	326.60	-65.02	-59.37	-13.00	-52.02	-5.65 Peak
5	512.10	-66.89	-62.46	-13.00	-53.89	-4.43 Peak
6	682.90	-66.78	-66.49	-13.00	-53.78	-0.29 Peak
7 pp	3465.00	-47.29	-61.63	-13.00	-34.29	14.34 Peak

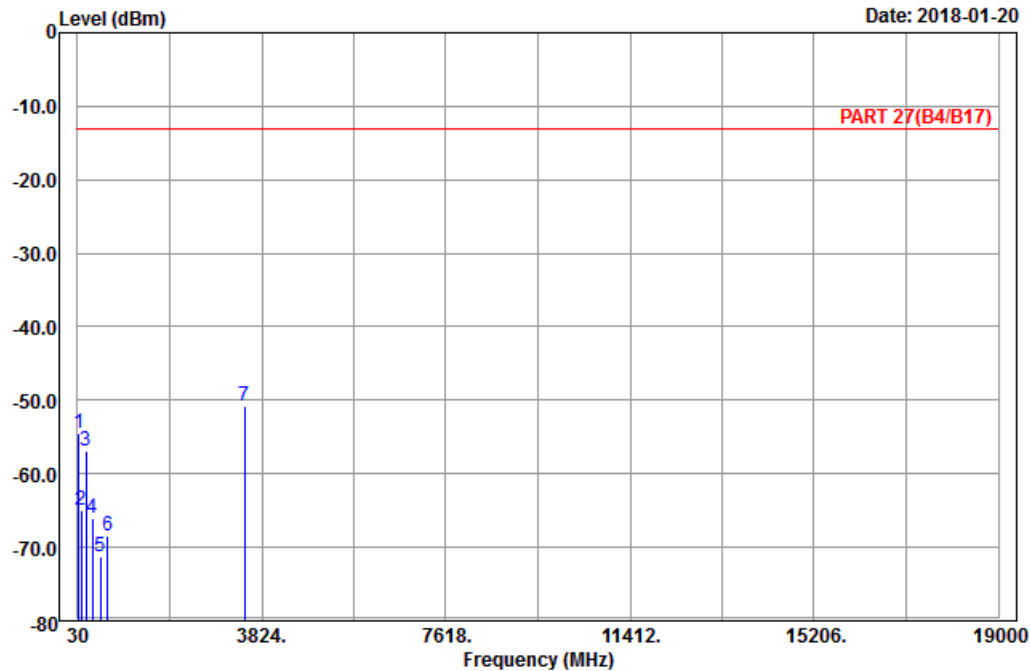


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A D T

Data: 14

Date: 2018-01-20



Site : 966 chamber 1

Condition: PART 27(B4/B17) Vertical

Remark : LTE_Band 4_Link_CH20175

Tested by: Charles Hsiao

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	52.95	-54.59	-40.53	-13.00	-41.59	-14.06	Peak
2	110.19	-65.05	-56.17	-13.00	-52.05	-8.88	Peak
3	208.74	-56.87	-50.80	-13.00	-43.87	-6.07	Peak
4	339.20	-66.16	-60.66	-13.00	-53.16	-5.50	Peak
5	498.10	-71.33	-66.10	-13.00	-58.33	-5.23	Peak
6	645.80	-68.52	-68.43	-13.00	-55.52	-0.09	Peak
7 pp	3465.00	-50.83	-65.17	-13.00	-37.83	14.34	Peak

High Channel

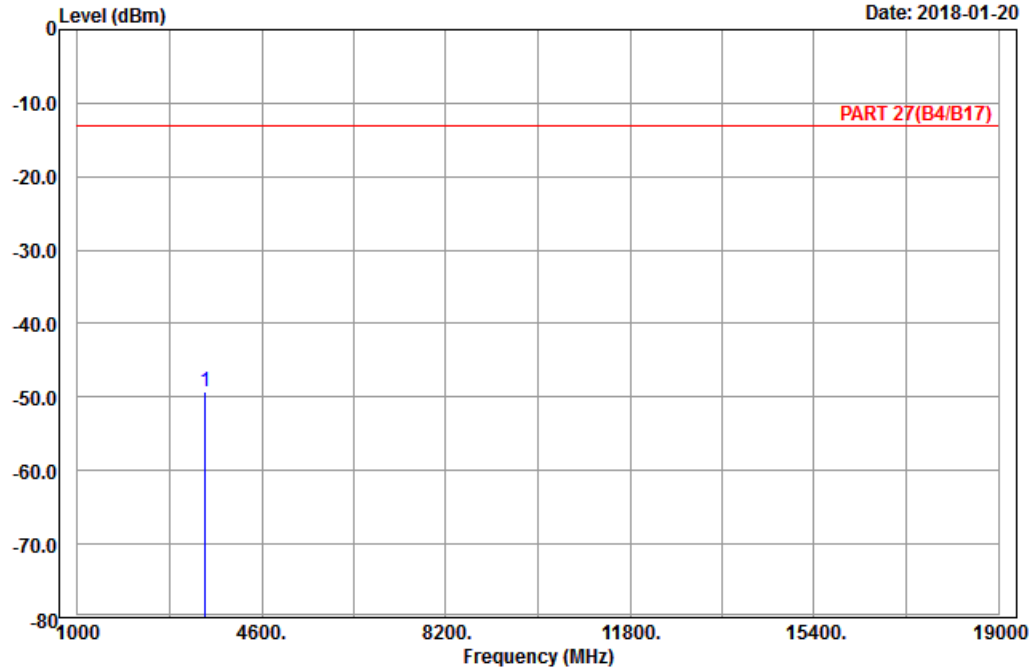


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A D T

Data: 9

Date: 2018-01-20



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20300
Tested by: Charles Hsiao

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3490.00	-49.33	-63.64	-13.00	-36.33	14.31	Peak

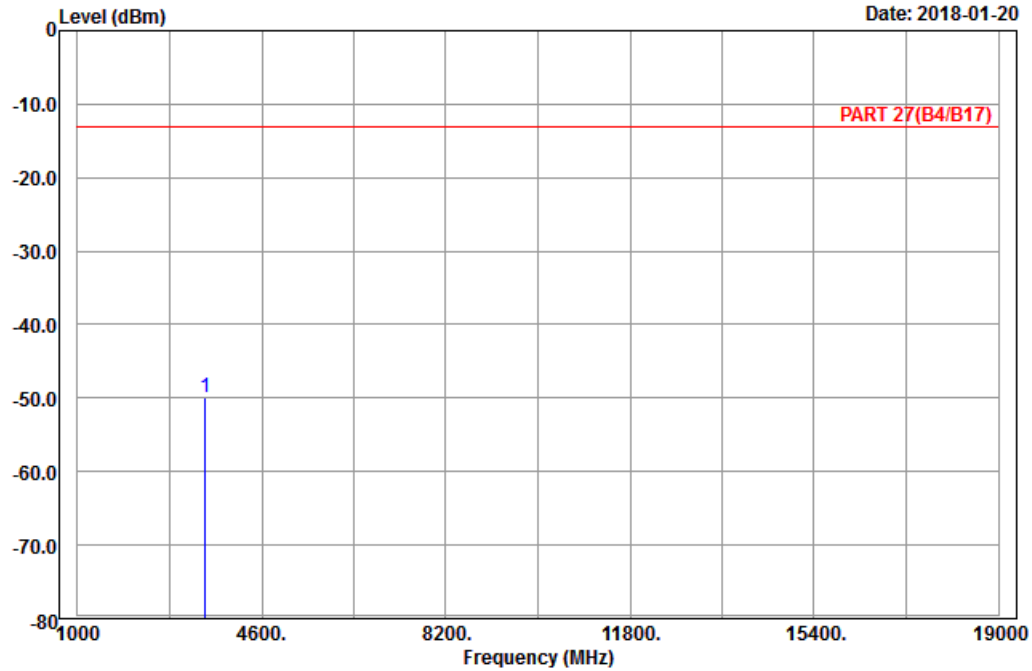


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A D T

Data: 10

Date: 2018-01-20



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20300
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3490.00 -50.02 -64.33 -13.00 -37.02 14.31 Peak

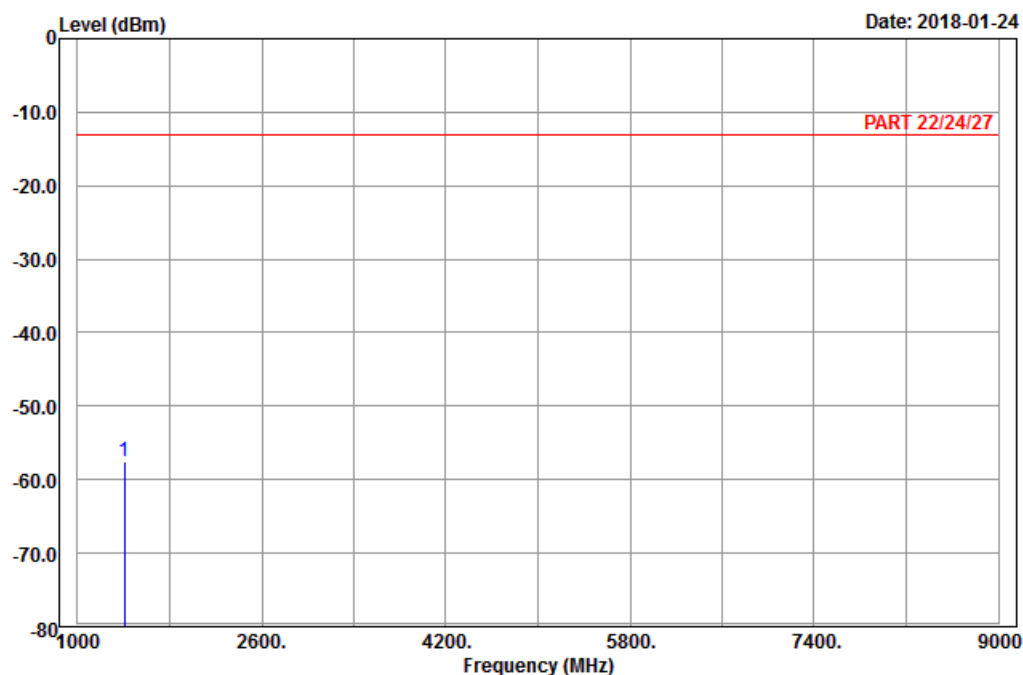
LTE Band 12
Channel Bandwidth: 10 MHz / QPSK
Low Channel



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Data: 5



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23060
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1408.00	-57.46	-63.82	-13.00	-44.46	6.36	Peak

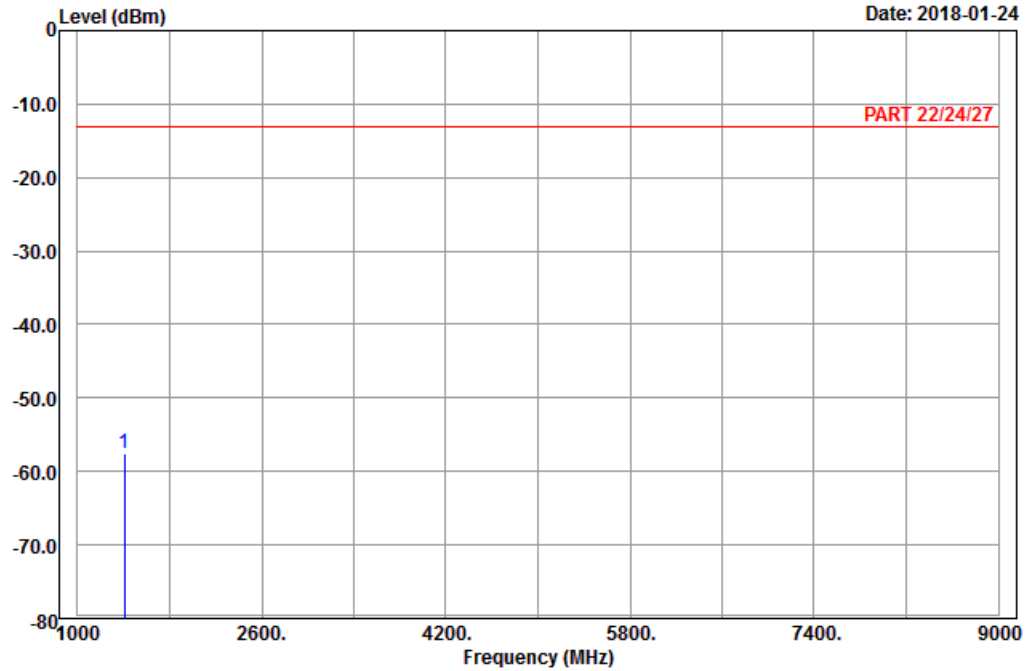


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A D T

Data: 6

Date: 2018-01-24



Site : 966 chamber 1
 Condition: PART 22/24/27 Vertical
 Remark : LTE_Band 12_Link_CH23060
 Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1408.00	-57.44	-63.80	-13.00	-44.44	6.36	Peak

Middle Channel

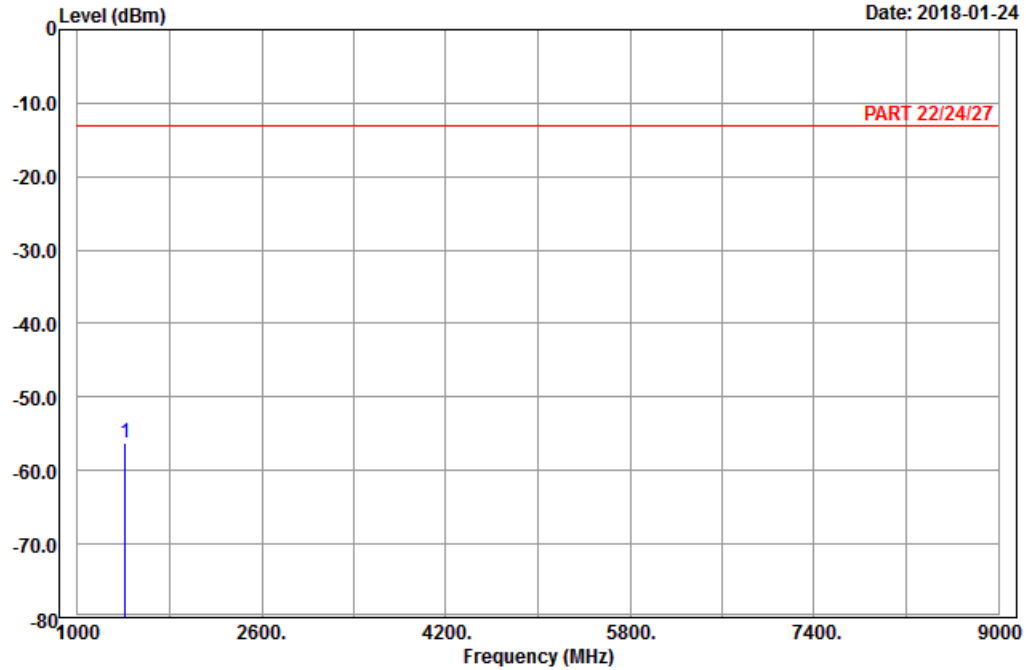


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A D T

Data: 5

Date: 2018-01-24



Site : 966 chamber 1
 Condition: PART 22/24/27 Horizontal
 Remark : LTE_Band 12_Link_CH23095
 Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1415.00	-56.17	-62.53	-13.00	-43.17	6.36	Peak

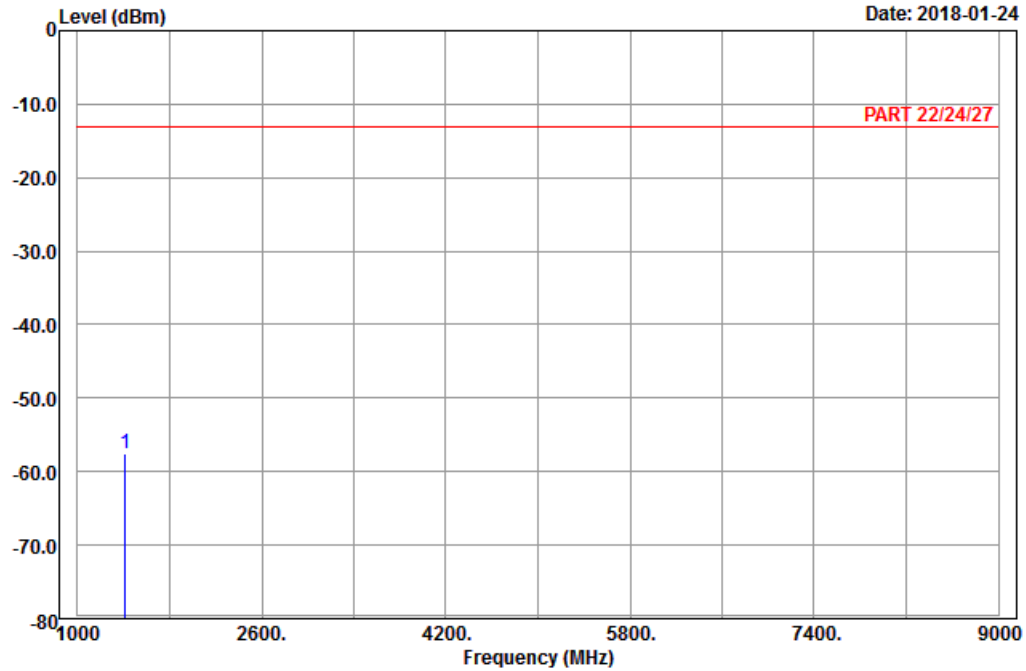


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A D T

Data: 6

Date: 2018-01-24



Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1415.00	-57.47	-63.83	-13.00	-44.47	6.36	Peak

High Channel

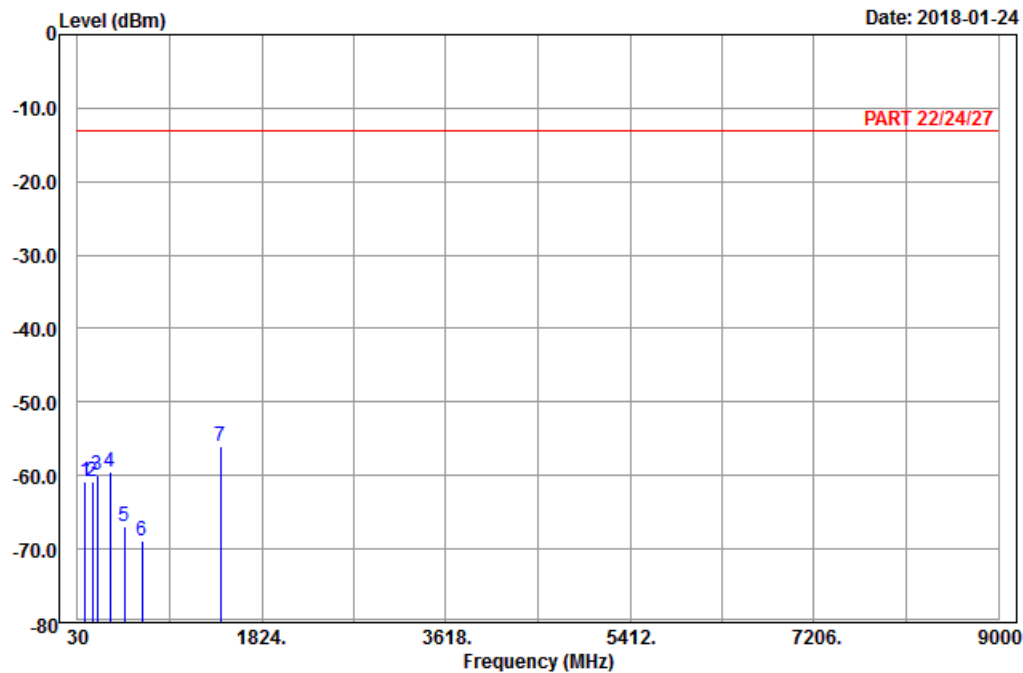


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A D T

Data: 9

Date: 2018-01-24



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23130
Tested by: Charles Hsiao

		Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor Remark
	MHz	dBm	dBm	dBm	dB	dB
1	102.90	-60.85	-51.08	-13.00	-47.85	-9.77 Peak
2	171.48	-60.77	-54.27	-13.00	-47.77	-6.50 Peak
3	224.67	-59.97	-54.12	-13.00	-46.97	-5.85 Peak
4	349.00	-59.59	-54.20	-13.00	-46.59	-5.39 Peak
5	487.60	-66.89	-61.97	-13.00	-53.89	-4.92 Peak
6	659.10	-68.95	-68.77	-13.00	-55.95	-0.18 Peak
7 pp	1422.00	-55.97	-62.33	-13.00	-42.97	6.36 Peak

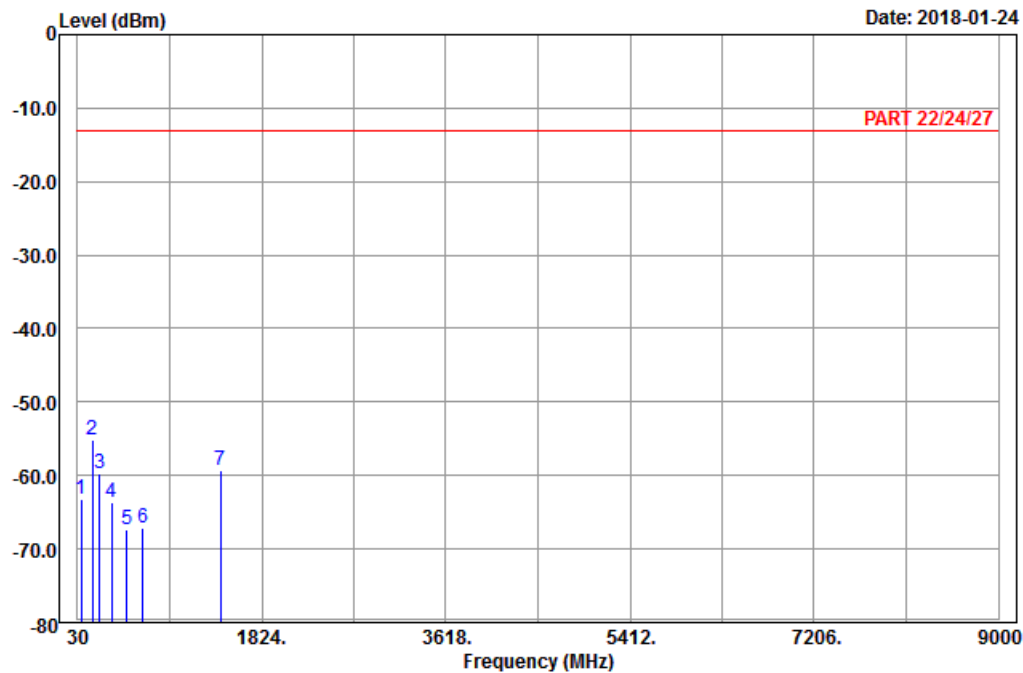


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A D T

Data: 10

Date: 2018-01-24



Site : 966 chamber 1

Condition: PART 22/24/27 Vertical

Remark : LTE_Band 12_Link_CH23130

Tested by: Charles Hsiao

		Read	Limit	Over			
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	65.10	-63.31	-49.93	-13.00	-50.31	-13.38	Peak
2 pp	172.56	-55.13	-48.73	-13.00	-42.13	-6.40	Peak
3	245.73	-59.63	-54.06	-13.00	-46.63	-5.57	Peak
4	362.30	-63.72	-59.01	-13.00	-50.72	-4.71	Peak
5	506.50	-67.29	-62.43	-13.00	-54.29	-4.86	Peak
6	666.80	-67.18	-66.97	-13.00	-54.18	-0.21	Peak
7	1422.00	-59.26	-65.62	-13.00	-46.26	6.36	Peak

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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