

Partial FCC Test Report

(PART 27)

Report No.: RF170927C14-3

FCC ID: N7NEM7455

Test Model: EM7455

Received Date: Sep. 26, 2017

Test Date: Oct. 28, 2017

Issued Date: Nov. 16, 2017

Applicant: Trimble Navigation Limited

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

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(R.O.C)

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R.O.C



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Release Control Record

Issue No.	Description	Date Issued
RF170927C14-3	Original Release	Nov. 16, 2017

1 Certificate of Conformity

Product: Wireless Modules

Brand: SIERRA

Test Model: EM7455

Sample Status: Production Unit

Applicant: Trimble Navigation Limited

Test Date: Oct. 28, 2017

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 EMC characteristics under the conditions specified in this report.

Prepared by : Evonne Liu , **Date:** Nov. 16, 2017
Evonne Liu / Specialist

Approved by : Dylan Chiou , **Date:** Nov. 16, 2017
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (WCDMA)			
FCC Clause	Test Item	Result	Remarks
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -44.65 dB at 37.56 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -41.55 dB at 186.87 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	Test Item	Result	Remarks
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -48.00 dB at 207.66 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	Test Item	Result	Remarks
2.1053 27.53(g)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -44.72 dB at 38.10 MHz.

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	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 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	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 16, 2016	Dec. 15, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 29, 2016	Dec. 28, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2017	Apr. 16, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1145013	Mar. 07, 2017	Mar. 06, 2018
Power Sensor Anritsu	MA2411B	1126085	Mar. 07, 2017	Mar. 06, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 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
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Nov. 30, 2016	Nov. 29, 2017
Temperature & Humidity Chamber	GTH-120-40-CP-A R	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

- 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 FCC Designation Number is TW0011. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	Wireless Modules	
Brand	SIERRA	
Test Model	EM7455	
Status of EUT	Production Unit	
Power Supply Rating	19.0 Vdc (adapter) 7.27 Vdc (Li-ion battery)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	1712.4 ~ 1752.6 MHz
	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
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
Antenna Type	PIFA Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

- The EUT is authorized for use in specific End-product. Please refer to below for more details.

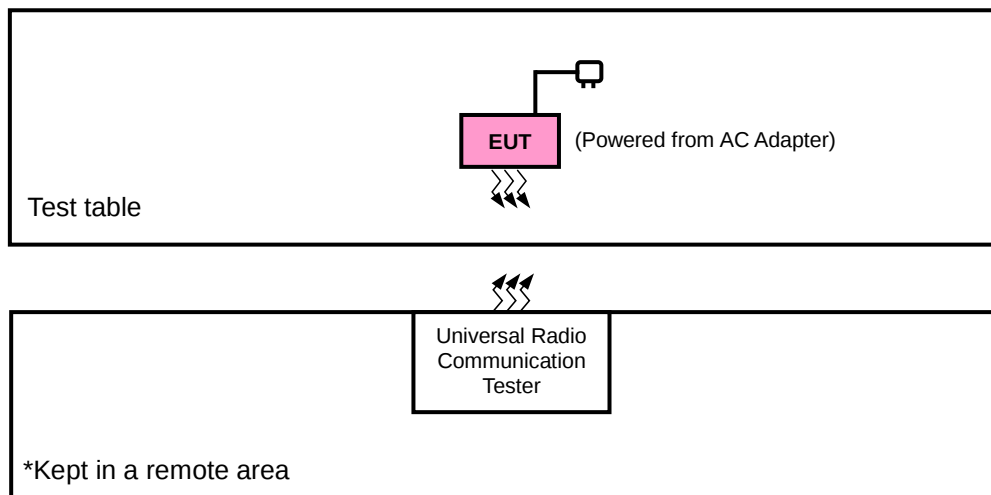
Product	Brand Name	Model Name
Handheld PC	Trimble	121300

- The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	DELTA ELECTRONICS, INC.	ADP-90MD H	I/P: 100-240 Vac, 50-60 Hz, 1.5 A O/P: 19 Vdc, 4.74 A
Battery	Trimble	121300	7.27 Vdc, 3150 mAh, 22.9Wh

- 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

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

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	Radiated Emission	1312 to 1513	1312, 1413, 1513	WCDMA

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission	20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 99 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
-	Radiated Emission	23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 24 RB Offset

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

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission	23230	23230	10 MHz	QPSK	1 RB / 24 RB Offset
						1 RB / 50 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
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee

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-603-E-2016

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 698-787 MHz band are limited to 3 watts ERP

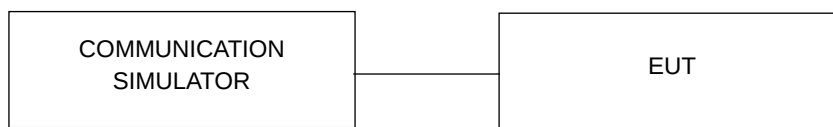
4.1.2 Test Procedures

Conducted Power Measurement:

- The EUT was set up for the maximum power with 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.

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	22.99	22.95	22.98
HSDPA Subtest-1	21.70	21.64	21.65
HSDPA Subtest-2	21.75	21.69	21.70
HSDPA Subtest-3	21.25	21.19	21.20
HSDPA Subtest-4	21.24	21.18	21.19
HSUPA Subtest-1	21.50	21.44	21.45
HSUPA Subtest-2	20.85	20.79	20.80
HSUPA Subtest-3	20.43	20.37	20.38
HSUPA Subtest-4	20.73	20.67	20.68
HSUPA Subtest-5	21.86	21.80	21.81

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19957	Mid Ch 20175	High Ch 20393		Low Ch 19957	Mid Ch 20175	High Ch 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
4 / 1.4M	1	0	22.97	23.01	22.98	0	22.05	22.09	22.06	1
	1	2	22.90	22.94	22.91	0	21.98	22.02	21.99	1
	1	5	22.66	22.70	22.67	0	21.74	21.78	21.75	1
	3	0	22.05	22.09	22.06	0	21.13	21.17	21.14	1
	3	1	22.03	22.07	22.04	0	21.11	21.15	21.12	1
	3	3	22.01	22.04	22.01	0	21.08	21.12	21.09	1
	6	0	21.82	21.86	21.83	1	20.90	20.94	20.91	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19965	Mid Ch 20175	High Ch 20385		Low Ch 19965	Mid Ch 20175	High Ch 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
4 / 3M	1	0	23.02	23.06	23.03	0	22.10	22.14	22.11	1
	1	7	22.95	22.99	22.96	0	22.03	22.07	22.04	1
	1	14	22.71	22.75	22.72	0	21.79	21.83	21.80	1
	8	0	21.97	22.01	21.98	1	21.05	21.09	21.06	2
	8	3	21.95	21.99	21.96	1	21.03	21.07	21.04	2
	8	7	21.92	21.96	21.93	1	21.00	21.04	21.01	2
	15	0	21.87	21.91	21.88	1	20.95	20.99	20.96	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19975	Mid Ch 20175	High Ch 20375		Low Ch 19975	Mid Ch 20175	High Ch 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
4 / 5M	1	0	23.06	23.10	23.07	0	22.14	22.18	22.15	1
	1	12	22.99	23.03	23.00	0	22.07	22.11	22.08	1
	1	24	22.75	22.79	22.76	0	21.83	21.87	21.84	1
	12	0	22.01	22.05	22.02	1	21.09	21.13	21.10	2
	12	6	21.99	22.03	22.00	1	21.07	21.11	21.08	2
	12	13	21.96	22.00	21.97	1	21.04	21.08	21.05	2
	25	0	21.91	21.95	21.92	1	20.99	21.03	21.00	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20000	Mid Ch 20175	High Ch 20350		Low Ch 20000	Mid Ch 20175	High Ch 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
4 / 10M	1	0	23.12	23.16	23.13	0	22.20	22.24	22.21	1
	1	24	23.05	23.09	23.06	0	22.13	22.17	22.14	1
	1	49	22.81	22.85	22.82	0	21.89	21.93	21.90	1
	25	0	22.07	22.11	22.08	1	21.15	21.19	21.16	2
	25	12	22.05	22.09	22.06	1	21.13	21.17	21.14	2
	25	25	22.02	22.06	22.03	1	21.10	21.14	21.11	2
	50	0	21.97	22.01	21.98	1	21.05	21.09	21.06	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20025	Mid Ch 20175	High Ch 20325		Low Ch 20025	Mid Ch 20175	High Ch 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	23.16	23.20	23.17	0	22.24	22.28	22.25	1
	1	37	23.09	23.13	23.10	0	22.17	22.21	22.18	1
	1	74	22.85	22.89	22.86	0	21.93	21.97	21.94	1
	36	0	22.11	22.15	22.12	1	21.19	21.23	21.20	2
	36	19	22.09	22.13	22.10	1	21.17	21.21	21.18	2
	36	39	22.06	22.10	22.07	1	21.14	21.18	21.15	2
	75	0	22.01	22.05	22.02	1	21.09	21.13	21.10	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20050	Mid Ch 20175	High Ch 20300		Low Ch 20050	Mid Ch 20175	High Ch 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	23.19	23.23	23.20	0	22.27	22.31	22.28	1
	1	50	23.12	23.16	23.13	0	22.20	22.24	22.21	1
	1	99	22.88	22.92	22.89	0	21.96	22.00	21.97	1
	50	0	22.14	22.18	22.15	1	21.22	21.26	21.23	2
	50	25	22.12	22.16	22.13	1	21.20	21.24	21.21	2
	50	50	22.09	22.13	22.10	1	21.17	21.21	21.18	2
	100	0	22.04	22.08	22.05	1	21.12	21.16	21.13	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23017	Mid Ch 23095	High Ch 23173		Low Ch 23017	Mid Ch 23095	High Ch 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
12 / 1.4M	1	0	23.23	23.26	23.12	0	22.28	22.31	22.17	1
	1	2	23.01	23.04	22.90	0	22.06	22.09	21.95	1
	1	5	23.05	23.08	22.94	0	22.10	22.13	21.99	1
	3	0	22.03	22.06	22.07	0	21.08	21.11	21.07	1
	3	1	22.40	22.03	22.04	0	21.45	21.08	21.04	1
	3	3	22.02	22.04	22.01	0	21.07	21.05	21.01	1
	6	0	22.00	22.03	21.89	1	21.05	21.08	20.94	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23025	Mid Ch 23095	High Ch 23165		Low Ch 23025	Mid Ch 23095	High Ch 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
12 / 3M	1	0	23.27	23.30	23.16	0	22.32	22.35	22.21	1
	1	7	23.05	23.08	22.94	0	22.10	22.13	21.99	1
	1	14	23.09	23.12	22.98	0	22.14	22.17	22.03	1
	8	0	22.07	22.10	21.96	1	21.12	21.15	21.01	2
	8	3	22.04	22.07	21.93	1	21.09	21.12	20.98	2
	8	7	22.01	22.04	21.90	1	21.06	21.09	20.95	2
	15	0	22.04	22.07	21.93	1	21.09	21.12	20.98	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23035	Mid Ch 23095	High Ch 23155		Low Ch 23035	Mid Ch 23095	High Ch 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
12 / 5M	1	0	23.30	23.33	23.19	0	22.35	22.38	22.24	1
	1	12	23.08	23.11	22.97	0	22.13	22.16	22.02	1
	1	24	23.12	23.15	23.01	0	22.17	22.20	22.06	1
	12	0	22.10	22.13	21.99	1	21.15	21.18	21.04	2
	12	6	22.07	22.10	21.96	1	21.12	21.15	21.01	2
	12	13	22.04	22.07	21.93	1	21.09	21.12	20.98	2
	25	0	22.07	22.10	21.96	1	21.12	21.15	21.01	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23060	Mid Ch 23095	High Ch 23130		Low Ch 23060	Mid Ch 23095	High Ch 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
12 / 10M	1	0	23.34	23.37	23.23	0	22.39	22.42	22.28	1
	1	24	23.12	23.15	23.01	0	22.17	22.20	22.06	1
	1	49	23.16	23.19	23.05	0	22.21	22.24	22.10	1
	25	0	22.14	22.17	22.03	1	21.19	21.22	21.08	2
	25	12	22.11	22.14	22.00	1	21.16	21.19	21.05	2
	25	25	22.08	22.11	21.97	1	21.13	21.16	21.02	2
	50	0	22.11	22.14	22.00	1	21.16	21.19	21.05	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23205	Mid Ch 23230	High Ch 23255		Low Ch 23205	Mid Ch 23230	High Ch 23255	
			779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz	
13 / 5M	1	0	22.15	22.80	22.93	0	21.22	21.87	22.00	1
	1	12	22.11	22.76	22.89	0	21.18	21.83	21.96	1
	1	24	22.04	22.69	22.82	0	21.11	21.76	21.89	1
	12	0	21.26	21.81	21.94	1	20.33	20.88	21.01	2
	12	6	21.25	21.80	21.93	1	20.32	20.87	21.00	2
	12	13	21.09	21.64	21.77	1	20.16	20.71	20.84	2
	25	0	21.27	21.82	21.95	1	20.34	20.89	21.02	2

Band / BW	RB Size	RB Offset	QPSK	3GPP MPR (dB)	16QAM	3GPP MPR (dB)
			Mid Ch 23230		Mid Ch 23230	
			782.0 MHz		782.0 MHz	
13 / 10M	1	0	22.98	0	22.04	1
	1	24	22.06	0	21.12	1
	1	49	22.85	0	21.91	1
	25	0	21.93	1	20.99	2
	25	12	21.92	1	20.98	2
	25	25	21.91	1	20.97	2
	50	0	22.05	1	21.11	2

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.
- b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

4.2.2 Test Procedure

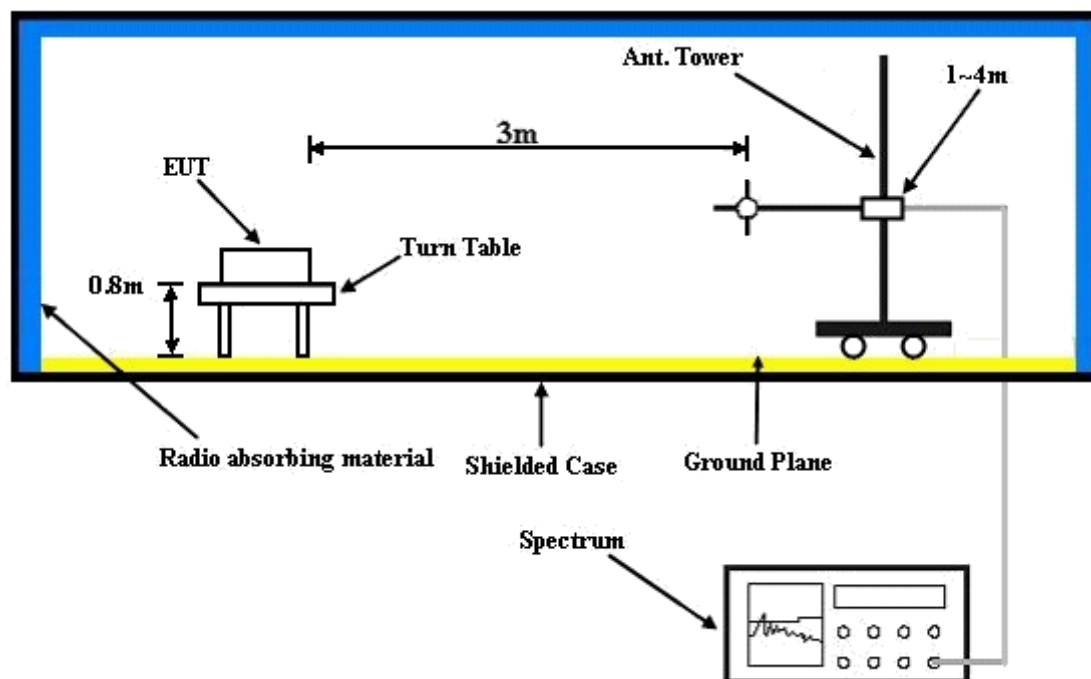
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height 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



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

4.2.5 Test Results

WCDMA:

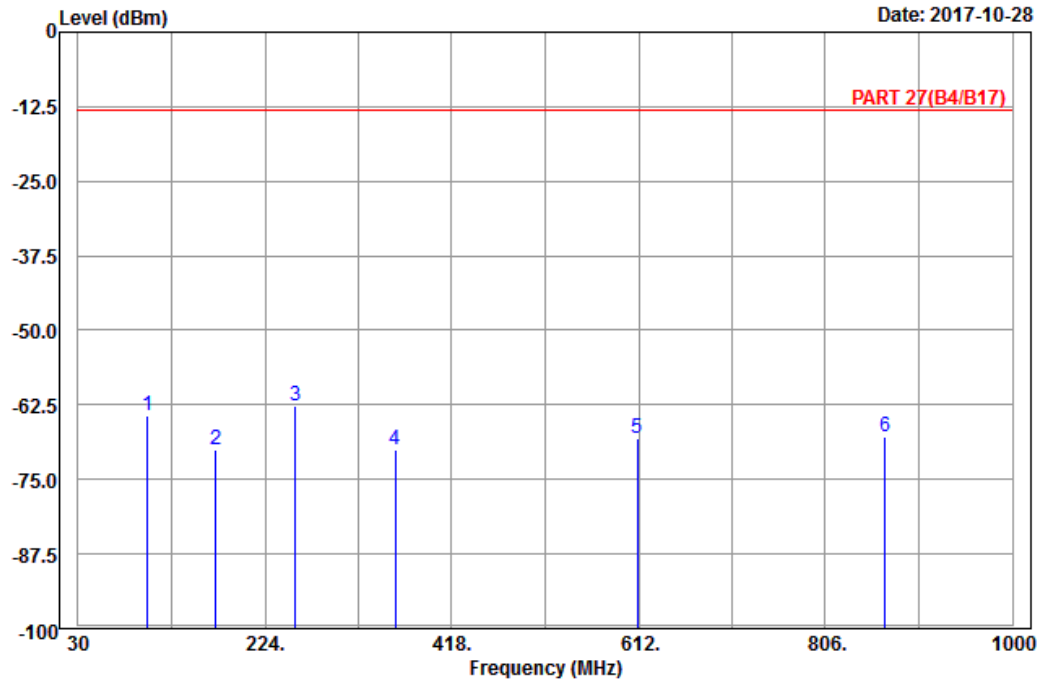


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-10-28



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1413
Tested by: Karl Lee

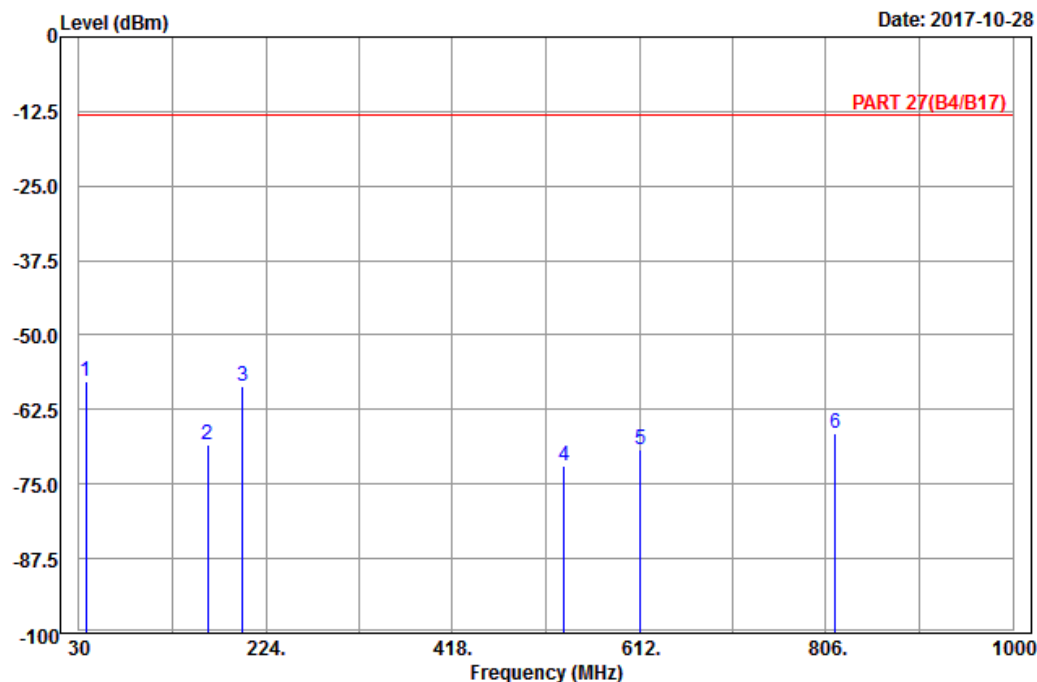
			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	102.09	-64.26	-54.37	-13.00	-51.26	-9.89	Peak
2	172.83	-70.14	-63.74	-13.00	-57.14	-6.40	Peak
3 pp	255.45	-62.77	-57.22	-13.00	-49.77	-5.55	Peak
4	359.50	-70.13	-65.27	-13.00	-57.13	-4.86	Peak
5	610.80	-68.02	-68.33	-13.00	-55.02	0.31	Peak
6	867.70	-67.74	-69.71	-13.00	-54.74	1.97	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 6



Site : 966 chamber 1
 Condition: PART 27(B4/B17) Vertical
 Remark : Band IV_Link_CH1413
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	37.56	-57.65	-47.68	-13.00	-44.65	-9.97	Peak
2	163.92	-68.51	-61.23	-13.00	-55.51	-7.28	Peak
3	199.83	-58.71	-52.53	-13.00	-45.71	-6.18	Peak
4	533.80	-71.97	-69.10	-13.00	-58.97	-2.87	Peak
5	613.60	-69.33	-69.60	-13.00	-56.33	0.27	Peak
6	815.90	-66.44	-68.27	-13.00	-53.44	1.83	Peak

LTE Band 4

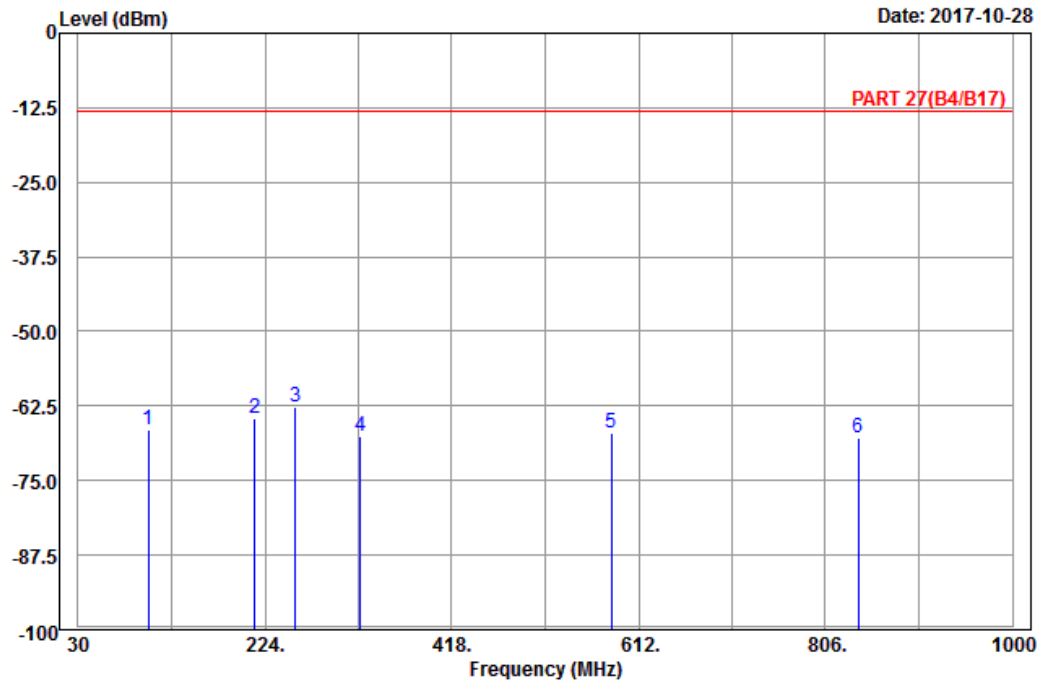
Channel Bandwidth: 20 MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



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

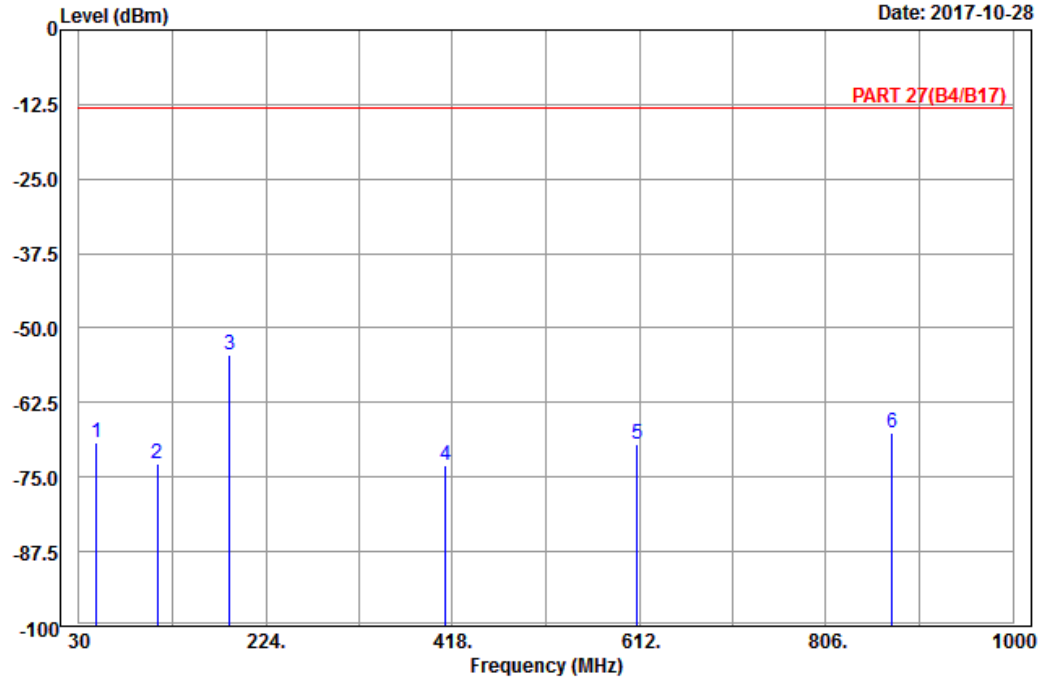
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	103.17	-66.52	-56.75	-13.00	-53.52	-9.77	Peak
2	213.06	-64.55	-58.55	-13.00	-51.55	-6.00	Peak
3 pp	255.45	-62.77	-57.22	-13.00	-49.77	-5.55	Peak
4	323.10	-67.60	-61.91	-13.00	-54.60	-5.69	Peak
5	583.50	-67.10	-66.84	-13.00	-54.10	-0.26	Peak
6	840.40	-67.75	-69.31	-13.00	-54.75	1.56	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	48.09	-69.13	-55.70	-13.00	-56.13	-13.43	Peak
2	111.00	-72.73	-63.91	-13.00	-59.73	-8.82	Peak
3 pp	186.87	-54.55	-48.86	-13.00	-41.55	-5.69	Peak
4	410.60	-72.99	-70.02	-13.00	-59.99	-2.97	Peak
5	610.10	-69.45	-69.77	-13.00	-56.45	0.32	Peak
6	874.70	-67.68	-69.85	-13.00	-54.68	2.17	Peak

LTE Band 12

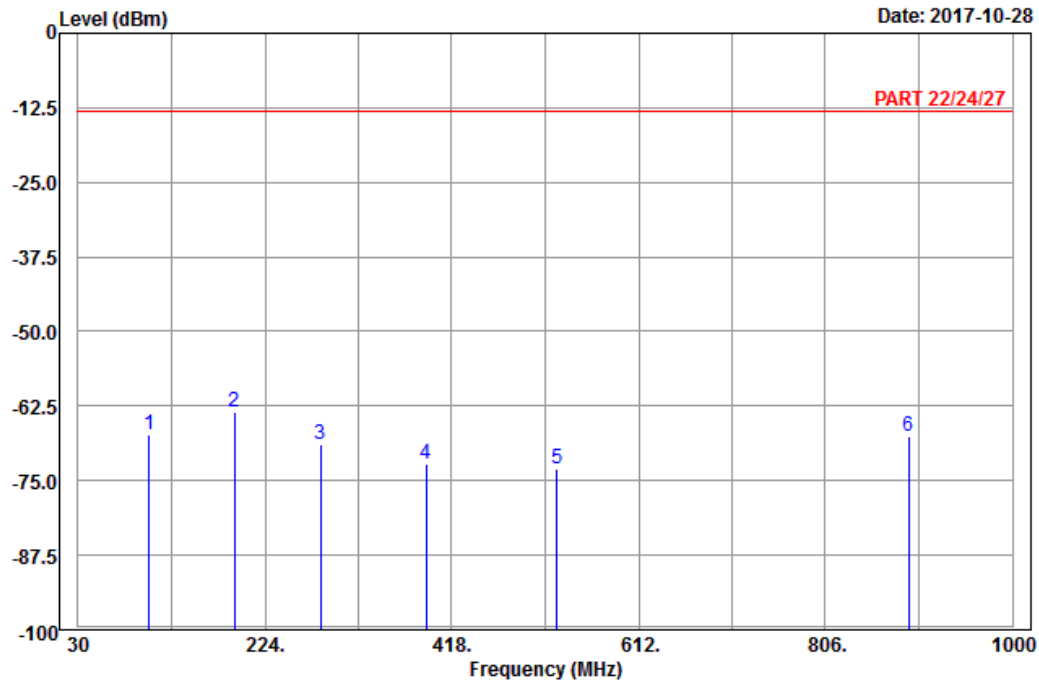
Channel Bandwidth: 10 MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



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

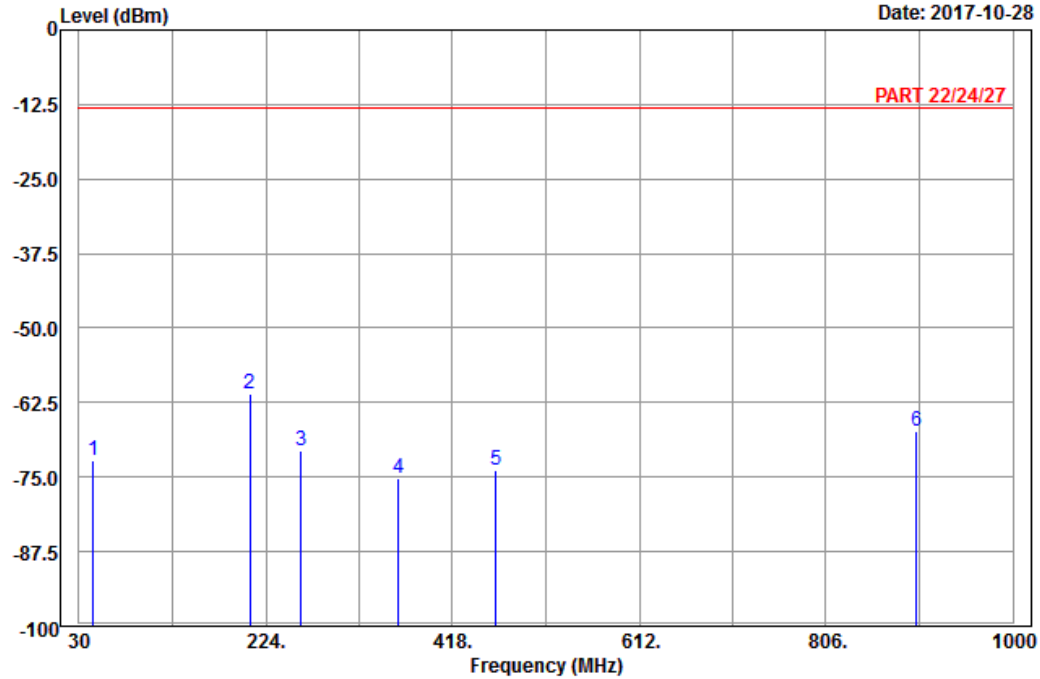
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	103.71	-67.39	-57.74	-13.00	-54.39	-9.65	Peak
2 pp	192.54	-63.41	-57.54	-13.00	-50.41	-5.87	Peak
3	281.37	-68.81	-63.02	-13.00	-55.81	-5.79	Peak
4	391.70	-72.09	-68.94	-13.00	-59.09	-3.15	Peak
5	527.50	-73.10	-69.81	-13.00	-60.10	-3.29	Peak
6	892.20	-67.70	-70.37	-13.00	-54.70	2.67	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.58	-72.21	-60.04	-13.00	-59.21	-12.17	Peak
2	pp 207.66	-61.00	-54.92	-13.00	-48.00	-6.08	Peak
3	260.85	-70.50	-64.90	-13.00	-57.50	-5.60	Peak
4	362.30	-75.31	-70.60	-13.00	-62.31	-4.71	Peak
5	463.10	-73.85	-69.64	-13.00	-60.85	-4.21	Peak
6	899.90	-67.40	-70.29	-13.00	-54.40	2.89	Peak

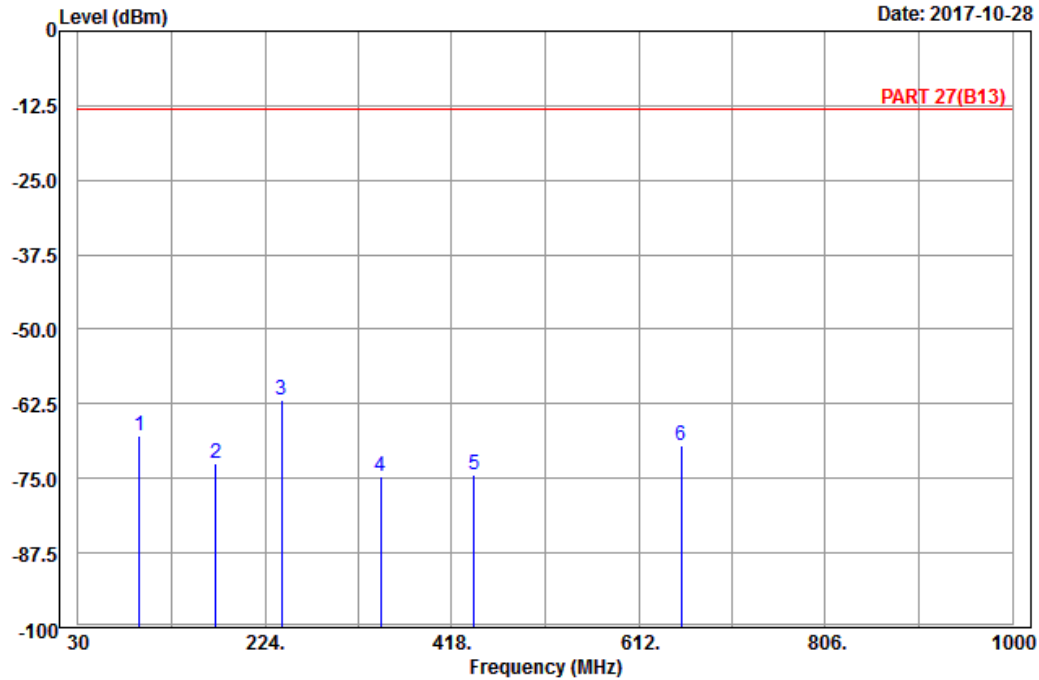
LTE Band 13
Channel Bandwidth: 10 MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 5



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	93.72	-67.93	-57.48	-13.00	-54.93	-10.45	Peak
2	172.56	-72.44	-66.04	-13.00	-59.44	-6.40	Peak
3 pp	241.41	-61.88	-56.26	-13.00	-48.88	-5.62	Peak
4	344.10	-74.65	-69.20	-13.00	-61.65	-5.45	Peak
5	441.40	-74.31	-70.66	-13.00	-61.31	-3.65	Peak
6	656.30	-69.43	-69.26	-13.00	-56.43	-0.17	Peak

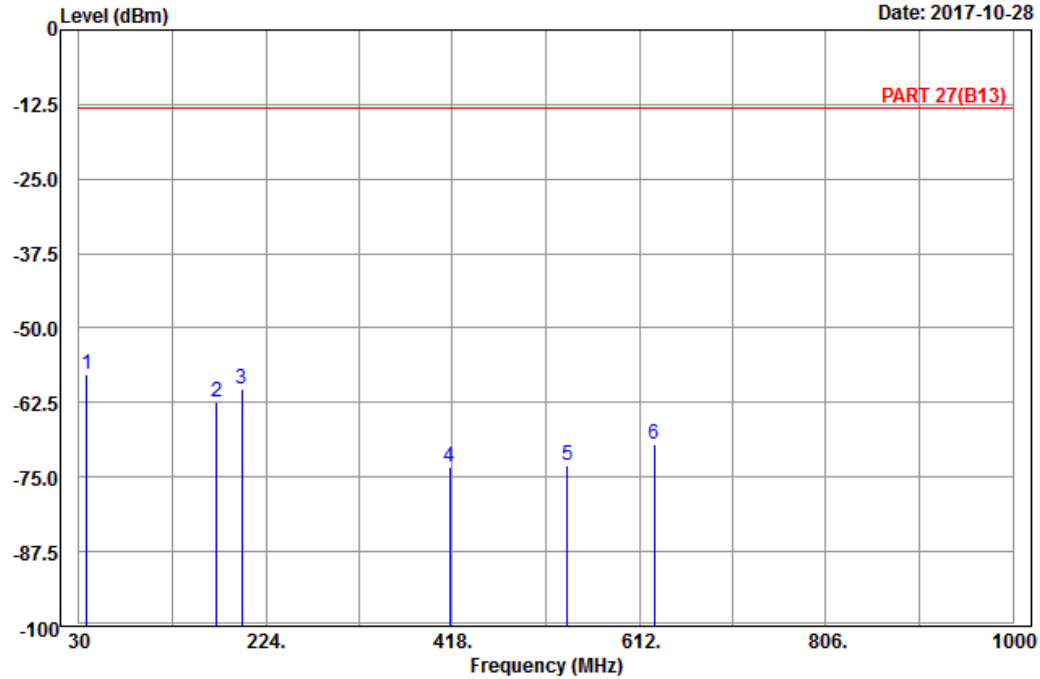


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A D T

Data: 6

Date: 2017-10-28



Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	38.10	-57.72	-47.75	-13.00	-44.72	-9.97	Peak
2	173.10	-62.45	-56.15	-13.00	-49.45	-6.30	Peak
3	199.29	-60.10	-53.92	-13.00	-47.10	-6.18	Peak
4	414.80	-73.35	-70.27	-13.00	-60.35	-3.08	Peak
5	537.30	-73.13	-70.55	-13.00	-60.13	-2.58	Peak
6	627.60	-69.54	-69.66	-13.00	-56.54	0.12	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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Hsin Chu EMC/RF/Telecom Lab

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Hwa Ya EMC/RF/Safety

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Fax: 886-3-3270892

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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