

Partial FCC Test Report

(PART 90S)

Report No.: RF180907C14-11

FCC ID: QYLEM7511V

Test Model: EM7511

Received Date: Sep. 07, 2018

Test Date: Sep. 20, 2018 ~ Sep. 27, 2018

Issued Date: Oct. 05, 2018

Applicant: Getac Technology Corporation.

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

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



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Release Control Record

Issue No.	Description	Date Issued
RF180907C14-11	Original Release	Oct. 05, 2018

1 Certificate of Conformity

Product: Radio Module

Brand: Sierra wireless Inc.

Test Model: EM7511

Sample Status: Identical Prototype

Applicant: Getac Technology Corporation.

Test Date: Sep. 20, 2018 ~ Sep. 27, 2018

Standards: FCC Part 90, Subpart I, R, S
FCC Part 2

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 : Gina Liu, **Date:** Oct. 05, 2018
Gina Liu / Specialist

Approved by : Dylan Chiou, **Date:** Oct. 05, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (LTE 14)			
FCC Clause	Test Item	Result	Remarks
2.1046 90.542 (a)(7)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
2.1055 90.539 (e)	Frequency Stability	N/A	Refer to Note
2.1049	Occupied Bandwidth (*)	N/A	Refer to Note
90.210 (n)	Emission Masks	N/A	Refer to Note
2.1053 90.543 (e)(2)(3)	Band Edge Measurements	N/A	Refer to Note
2.1051 90.543 (e)(3)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 90.543 (e)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -14.11 dB at 1586.00 MHz.

Applied Standard: FCC Part 90 & Part 2 (LTE 26)			
FCC Clause	Test Item	Result	Remarks
2.1046 90.635 (b)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
2.1055	Frequency Stability	N/A	Refer to Note
2.1049	Occupied Bandwidth	N/A	Refer to Note
2.1051 90.210 (b)	Emission Masks	N/A	Refer to Note
2.1051 90.691	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 90.691	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -44.35 dB at 1638.00 MHz.

Note:

This report is a Class II change Partial report. Therefore, only test item of Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to SPORTON report no.: FG791919D for module (Brand: Sierra wireless Inc., Model: EM7511)

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	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Dec. 14, 2017	Dec. 13, 2018
Horn Antenna ETS-Lindgren	3117	00143293	Dec. 13, 2017	Dec. 12, 2018
Fixed Attenuator Mini-Circuits	BW-N4W5+	PAD-ATT4-01	Jan. 29, 2018	Jan. 28, 2019
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
HORN Antenna EMCI	EMC 184045	980116	Dec. 12, 2017	Dec. 11, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RF C-SMS-100-SMS- 120+RFC-SMS-1 00-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RF C-SMS-100-SMS- 24)	Jun. 19, 2018	Jun. 18, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
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
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2017	Dec. 27, 2018
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
Radio Communication Analyzer	MT8821C	6261786083	Dec. 21, 2017	Dec. 20, 2018

- Note:
1. The calibration interval of the above test instruments is 12 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	Radio Module	
Brand	Sierra wireless Inc.	
Test Model	EM7511	
Status of EUT	Identical Prototype	
Power Supply Rating	3.3 Vdc (Host equipment)	
Modulation Type	LTE	QPSK, 16QAM, 64QAM
Frequency Range	LTE Band 14 (Channel Bandwidth: 5 MHz)	790.5 ~ 795.5 MHz
	LTE Band 14 (Channel Bandwidth: 10 MHz)	793 MHz
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	814.7 ~ 823.3 MHz
	LTE Band 26 (Channel Bandwidth: 3 MHz)	815.5 ~ 822.5 MHz
	LTE Band 26 (Channel Bandwidth: 5 MHz)	816.5 ~ 821.5 MHz
	LTE Band 26 (Channel Bandwidth: 10 MHz)	819 MHz
Max. ERP Power	LTE Band 14 (Channel Bandwidth: 5 MHz)	122.77 mW
	LTE Band 14 (Channel Bandwidth: 10 MHz)	123.79 mW
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	112.72 mW
	LTE Band 26 (Channel Bandwidth: 3 MHz)	113.76 mW
	LTE Band 26 (Channel Bandwidth: 5 MHz)	114.82 mW
	LTE Band 26 (Channel Bandwidth: 10 MHz)	115.61 mW
Antenna Type	Refer to Note as below	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

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

Product	Brand	Model
Notebook	Getac	V110

Antenna Type	Brand	Model	Antenna Gain	
			B14	B26
Fixed Internal	Main: M.gear	Main Ant.: 422129000025	Main: 0.82	Main: -0.34
	Aux.: Getac	Aux. Ant.: 421129600001	Aux.: 0.69	Aux.: -0.43

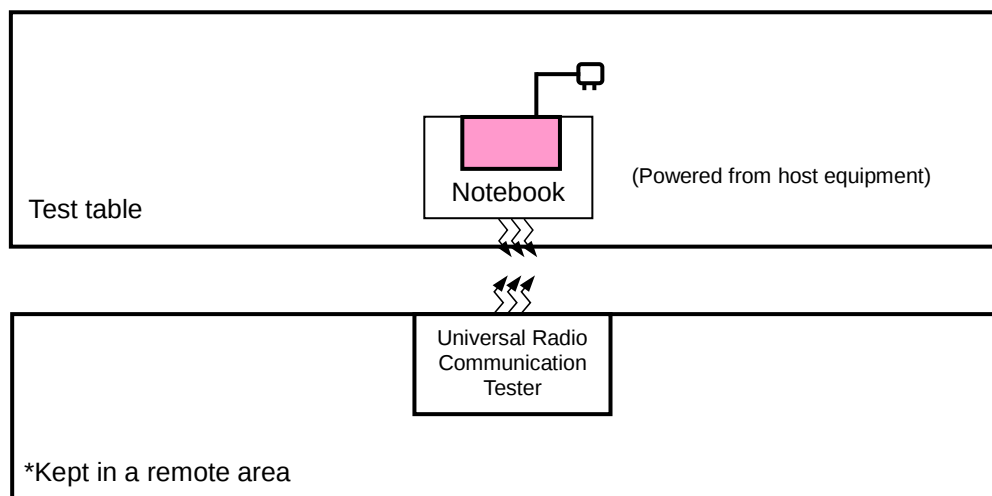
2. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	Chicony	A12-065N2A	I/P: 100-240 Vac, 50/60 Hz, 1.7 A O/P: 19 Vdc, 3.42 A 1.8m DC cable with 1 core attached
Li-Ion Battery	Getac	BP3S1P2100-S	11.1 Vdc, 2100 mA
BT/WLAN Module	Intel	8265NGW	-
WWAN Module	Sierra	EM7511	-
GPS	GlobalSat	MC1010	-
LCD Panel	New IPS KD	KD116N11-30NP-A9	11.6" inch
CPU	Intel	Kabylake	i7-7600U VPRO
DDR	Transcend	-	8GB *2
SSD	Lite-on	-	256GB *1
Barcode	Symbol Technologies Inc.	SE-4710	-

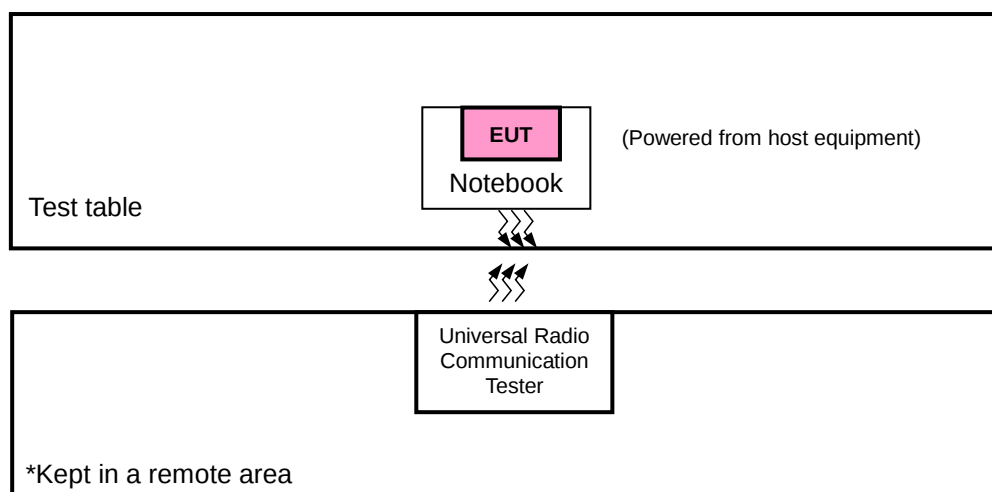
3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.R.P. 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. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook	Getac	V110G4	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 was provided by client.

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	Radiated Emission
LTE Band 14	Z-plane	Y-axis
LTE Band 26	X-plane	X-axis

LTE Band 14

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	23330	23330	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK	1 RB / 0 RB Offset
		23330	23330	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.

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 2 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 7 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 12 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
-	Radiated Emission Below 1GHz	26740	26740	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	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	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
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 90

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

LTE Band 14

Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

LTE Band 26

The maximum output power of the transmitter for mobile stations is 100 watts.

4.1.2 Test Procedures

EIRP / ERP Measurement:

- All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
- 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.
- 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.
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dB}$.

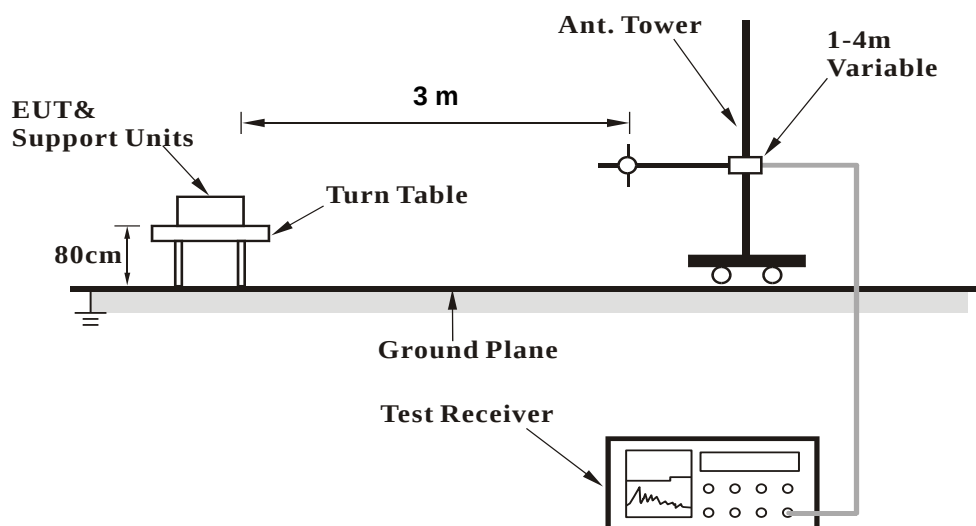
Conducted Power Measurement:

- 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.

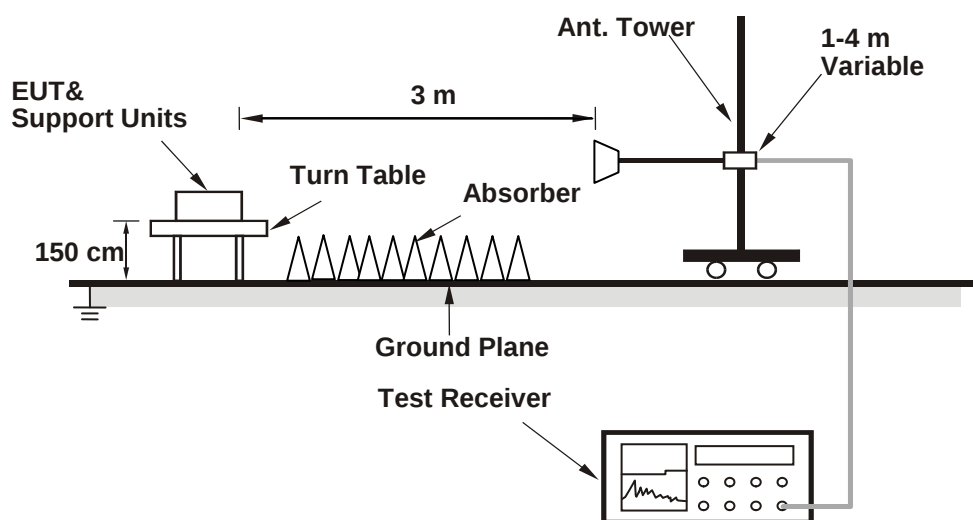
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

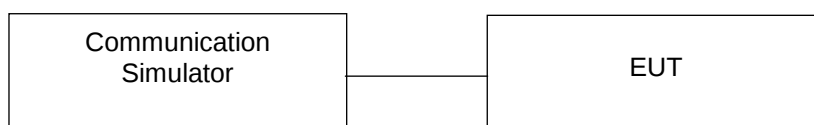


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 14															
BW	MCS Index	RB Size	RB Offset		Mid		3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel			23330					Channel		23305	23330	23355	
		Frequency (MHz)			793					Frequency (MHz)		795.5	793	795.5	
10M	QPSK	1	0		22.27		0	5M	QPSK	1	0	22.14	22.17	22.08	0
		1	24		22.17		0			1	12	22.11	22.14	22.05	0
		1	49		22.22		0			1	24	22.12	22.15	22.06	0
		25	0		22.23		1			12	0	22.17	22.20	22.11	1
		25	12		22.22		1			12	6	22.16	22.19	22.10	1
		25	25		22.26		1			12	13	22.22	22.25	22.16	1
	16QAM	50	0		22.23		1		25	0	22.12	22.15	22.06	1	
		1	0		22.11		1		16QAM	1	0	22.05	22.08	21.99	1
		1	24		22.09		1			1	12	22.06	22.09	22.00	1
		1	49		22.19		1			1	24	22.04	22.07	21.98	1
		25	0		22.16		2			12	0	22.08	22.11	22.02	2
		25	12		22.12		2			12	6	22.14	22.17	22.08	2
	64QAM	25	25		22.19		2			12	13	22.12	22.15	22.06	2
		50	0		22.13		2		25	0	22.11	22.14	22.05	2	
		1	0		22.11		2		64QAM	1	0	21.99	22.02	21.93	2
		1	24		22.17		2			1	12	22.06	22.09	22.00	2
		1	49		22.19		2			1	24	22.15	22.18	22.09	2
		25	0		22.16		3			12	0	22.17	22.20	22.11	3
	25	12		22.15		3	12			6	22.07	22.10	22.01	3	
	25	25		22.25		3	12			13	22.07	22.10	22.01	3	
	50	0		22.20		3	25		0	22.05	22.08	21.99	3		

LTE Band 26															
BW	MCS Index	RB Size	RB Offset		Mid		3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel			26740					Channel		26715	26740	26765	
		Frequency (MHz)			819.0					Frequency (MHz)		816.5	819.0	821.5	
10M	QPSK	1	0		20.63		0	5M	QPSK	1	0	20.65	20.63	20.93	0
		1	24		20.69		0			1	12	20.47	20.69	20.89	0
		1	49		20.58		0			1	24	20.49	20.58	20.85	0
		25	0		20.60		1			12	0	20.45	20.60	20.86	1
		25	12		20.67		1			12	6	20.59	20.67	20.89	1
		25	25		20.57		1			12	13	20.52	20.57	20.84	1
	16QAM	50	0		20.65		1		25	0	20.47	20.65	20.88	1	
		1	0		20.55		1		16QAM	1	0	20.52	20.55	20.64	1
		1	24		20.55		1			1	12	20.46	20.55	20.70	1
		1	49		20.50		1			1	24	20.48	20.50	20.55	1
		25	0		20.56		2			12	0	20.61	20.56	20.56	2
		25	12		20.63		2			12	6	20.54	20.63	20.59	2
	64QAM	25	25		20.47		2			12	13	20.54	20.47	20.57	2
		50	0		20.65		2		25	0	20.51	20.65	20.60	2	
		1	0		20.53		2		64QAM	1	0	20.47	20.53	20.72	2
		1	24		20.69		2			1	12	20.48	20.69	20.63	2
		1	49		20.53		2			1	24	20.41	20.53	20.65	2
		25	0		20.61		3			12	0	20.45	20.61	20.62	3
	25	12		20.58		3	12			6	20.38	20.58	20.63	3	
	25	25		20.60		3	12			13	20.49	20.60	20.61	3	
	50	0		20.68		3	25		0	20.49	20.68	20.59	3		

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26705	26740	26775				Channel		26697	26740	26783	
		Frequency (MHz)		815.5	819.0	822.5				Frequency (MHz)		814.7	819.0	823.3	
3M	QPSK	1	0	20.57	20.48	20.84	0	1.4M	QPSK	1	0	20.56	20.48	20.92	0
		1	7	20.62	20.65	20.80	0			1	2	20.59	20.62	20.80	0
		1	14	20.47	20.54	20.71	0			1	5	20.60	20.50	20.81	0
		8	0	20.52	20.46	20.85	1			3	0	20.52	20.55	20.75	0
		8	3	20.62	20.55	20.87	1			3	1	20.57	20.54	20.89	0
		8	7	20.52	20.52	20.74	1			3	3	20.57	20.53	20.76	0
	16QAM	15	0	20.57	20.59	20.76	1		6	0	20.53	20.59	20.85	1	
		1	0	20.61	20.43	20.62	1		16QAM	1	0	20.68	20.53	20.52	1
		1	7	20.50	20.47	20.57	1			1	2	20.43	20.47	20.56	1
		1	14	20.47	20.43	20.50	1			1	5	20.49	20.49	20.44	1
		8	0	20.35	20.53	20.43	2			3	0	20.57	20.41	20.43	1
		8	3	20.51	20.56	20.51	2			3	1	20.50	20.50	20.49	1
	64QAM	8	7	20.49	20.34	20.46	2			3	3	20.47	20.38	20.43	1
		15	0	20.56	20.57	20.48	2		6	0	20.49	20.61	20.55	2	
		1	0	20.63	20.41	20.65	2		64QAM	1	0	20.57	20.51	20.65	2
		1	7	20.50	20.54	20.54	2			1	2	20.60	20.61	20.54	2
		1	14	20.37	20.53	20.52	2			1	5	20.49	20.52	20.60	2
		8	0	20.41	20.51	20.58	3			3	0	20.44	20.57	20.52	2
	8	3	20.46	20.49	20.54	3	3			1	20.47	20.53	20.54	2	
	8	7	20.47	20.60	20.46	3	3			3	20.34	20.50	20.54	2	
	15	0	20.53	20.61	20.50	3	6		0	20.44	20.60	20.46	3		

ERP Power (dBm)

LTE Band 14							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23305	790.5	-9.77	32.771	20.85	121.65	H
	23330	793.0	-9.70	32.741	20.89	122.77	
	23355	795.5	-9.89	32.854	20.81	120.61	
	23305	790.5	-13.48	32.5	16.87	48.64	V
	23330	793.0	-13.46	32.52	16.91	49.09	
	23355	795.5	-13.64	32.62	16.83	48.19	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23305	790.5	-10.78	32.771	19.84	96.41	H
	23330	793.0	-10.71	32.741	19.88	97.30	
	23355	795.5	-10.90	32.854	19.80	95.59	
	23305	790.5	-14.49	32.5	15.86	38.55	V
	23330	793.0	-14.47	32.52	15.90	38.90	
	23355	795.5	-14.65	32.62	15.82	38.19	
Channel Bandwidth: 5 MHz / 64QAM							
Z	23305	790.5	-11.80	32.771	18.82	76.23	H
	23330	793.0	-11.72	32.741	18.87	77.11	
	23355	795.5	-11.90	32.854	18.80	75.93	
	23305	790.5	-15.50	32.5	14.85	30.55	V
	23330	793.0	-15.48	32.52	14.89	30.83	
	23355	795.5	-15.67	32.62	14.80	30.20	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 14							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23330	793.0	-9.66	32.737	20.93	123.79	H
	23330	793.0	-13.42	32.52	16.95	49.55	V
Channel Bandwidth: 10 MHz / 16QAM							
Z	23330	793.0	-10.67	32.737	19.92	98.11	H
	23330	793.0	-14.43	32.52	15.94	39.26	V
Channel Bandwidth: 10 MHz / 64QAM							
Z	23330	793.0	-11.68	32.737	18.91	77.75	H
	23330	793.0	-15.44	32.52	14.93	31.12	V

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 26							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26697	814.7	-8.58	31.208	20.48	111.63	H
	26740	819.0	-8.63	31.3	20.52	112.72	
	26783	823.3	-8.60	31.222	20.47	111.48	
	26697	814.7	-11.87	31.504	17.48	56.03	V
	26740	819.0	-11.43	31.117	17.54	56.72	
	26783	823.3	-12.32	31.922	17.45	55.62	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	26697	814.7	-9.59	31.208	19.47	88.47	H
	26740	819.0	-9.63	31.3	19.52	89.54	
	26783	823.3	-9.61	31.222	19.46	88.35	
	26697	814.7	-12.88	31.504	16.47	44.40	V
	26740	819.0	-12.44	31.117	16.53	44.95	
	26783	823.3	-13.34	31.922	16.43	43.97	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	26697	814.7	-10.60	31.208	18.46	70.11	H
	26740	819.0	-10.64	31.3	18.51	70.96	
	26783	823.3	-10.62	31.222	18.45	70.02	
	26697	814.7	-13.89	31.504	15.46	35.19	V
	26740	819.0	-13.45	31.117	15.52	35.62	
	26783	823.3	-14.35	31.922	15.42	34.85	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 26							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26705	815.5	-8.54	31.208	20.52	112.67	H
	26740	819.0	-8.59	31.3	20.56	113.76	
	26775	822.5	-8.57	31.222	20.50	112.25	
	26705	815.5	-11.84	31.504	17.51	56.42	V
	26740	819.0	-11.40	31.117	17.57	57.11	
	26775	822.5	-12.28	31.922	17.49	56.13	
Channel Bandwidth: 3 MHz / 16QAM							
X	26705	815.5	-9.55	31.208	19.51	89.29	H
	26740	819.0	-9.60	31.3	19.55	90.16	
	26775	822.5	-9.58	31.222	19.49	88.96	
	26705	815.5	-12.85	31.504	16.50	44.71	V
	26740	819.0	-12.41	31.117	16.56	45.26	
	26775	822.5	-13.29	31.922	16.48	44.48	
Channel Bandwidth: 3 MHz / 64QAM							
X	26705	815.5	-10.56	31.208	18.50	70.76	H
	26740	819.0	-10.61	31.3	18.54	71.45	
	26775	822.5	-10.59	31.222	18.48	70.50	
	26705	815.5	-13.86	31.504	15.49	35.43	V
	26740	819.0	-13.42	31.117	15.55	35.87	
	26775	822.5	-14.30	31.922	15.47	35.25	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 26							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26715	816.5	-8.50	31.208	20.56	113.71	H
	26740	819.0	-8.55	31.3	20.60	114.82	
	26765	821.5	-8.53	31.222	20.54	113.29	
	26715	816.5	-11.80	31.504	17.55	56.94	V
	26740	819.0	-11.36	31.117	17.61	57.64	
	26765	821.5	-12.25	31.922	17.52	56.52	
Channel Bandwidth: 5 MHz / 16QAM							
X	26715	816.5	-9.50	31.208	19.56	90.32	H
	26740	819.0	-9.56	31.3	19.59	90.99	
	26765	821.5	-9.54	31.222	19.53	89.78	
	26715	816.5	-12.81	31.504	16.54	45.12	V
	26740	819.0	-12.36	31.117	16.61	45.78	
	26765	821.5	-13.25	31.922	16.52	44.90	
Channel Bandwidth: 5 MHz / 64QAM							
X	26715	816.5	-10.50	31.208	18.56	71.75	H
	26740	819.0	-10.56	31.3	18.59	72.28	
	26765	821.5	-10.54	31.222	18.53	71.32	
	26715	816.5	-13.82	31.504	15.53	35.76	V
	26740	819.0	-13.37	31.117	15.60	36.28	
	26765	821.5	-14.26	31.922	15.51	35.58	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 26							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26740	819.0	-8.52	31.3	20.63	115.61	H
	26740	819.0	-11.33	31.117	17.64	58.04	V
Channel Bandwidth: 10 MHz / 16QAM							
X	26740	819.0	-9.53	31.3	19.62	91.62	H
	26740	819.0	-12.34	31.117	16.63	45.99	V
Channel Bandwidth: 10 MHz / 64QAM							
X	26740	819.0	-10.54	31.3	18.61	72.61	H
	26740	819.0	-13.35	31.117	15.62	36.45	V

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

- (1) 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.
- (2) For operations in the 746-758 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

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, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dB}$.

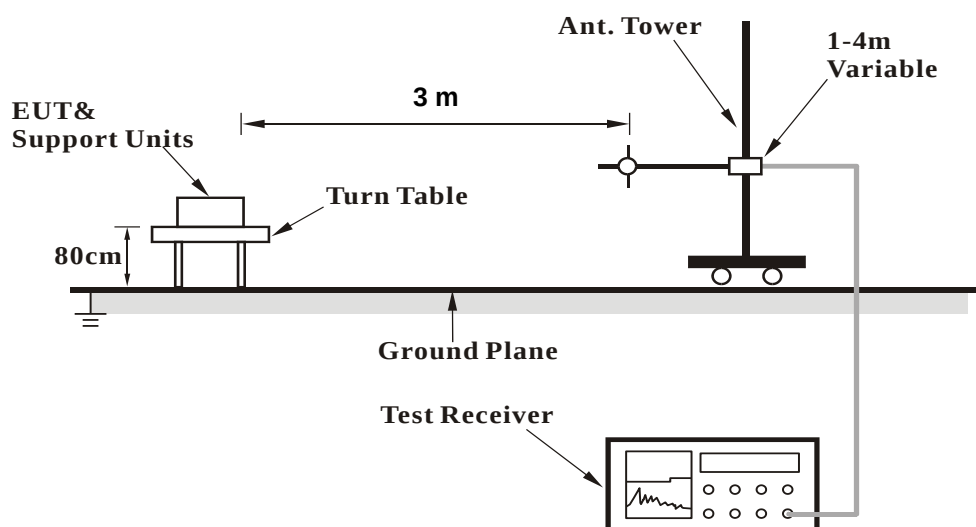
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

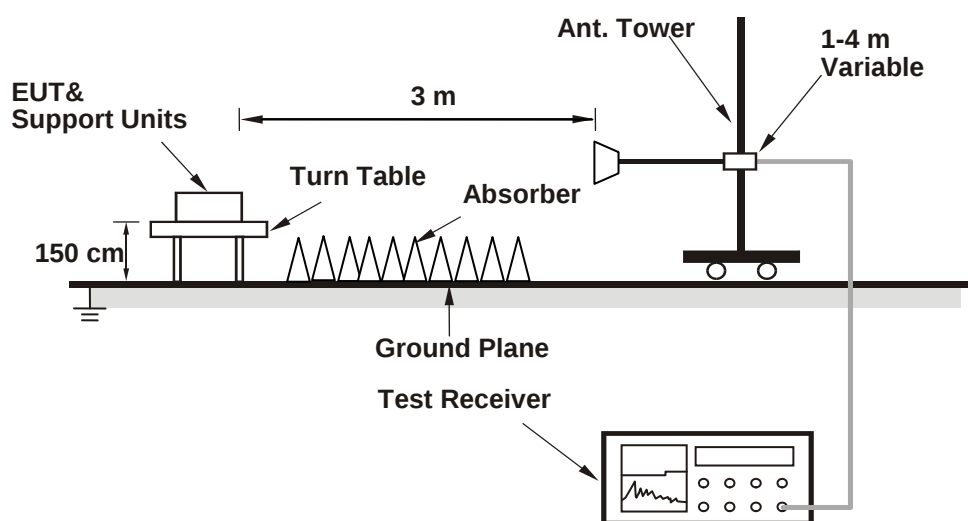
No deviation.

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 14

Channel Bandwidth: 5 MHz / QPSK

Low Channel

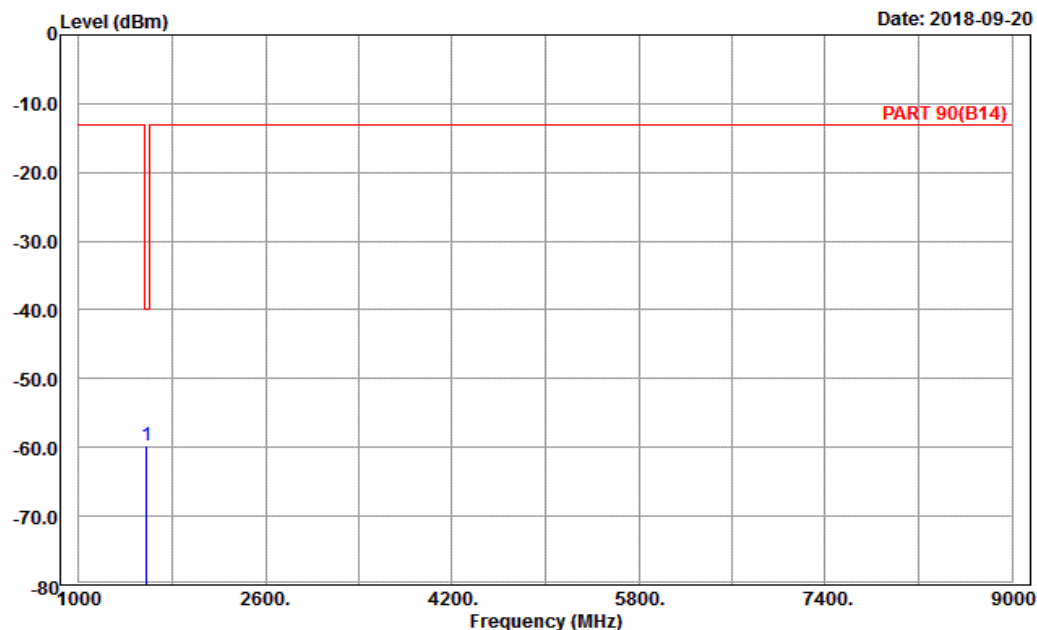


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Data: 5

Date: 2018-09-20



Site : 966 chamber 1
Condition: PART 90(B14) Horizontal
Remark : LTE_Band 14_Link_CH23305
Tested by: Karl Lee

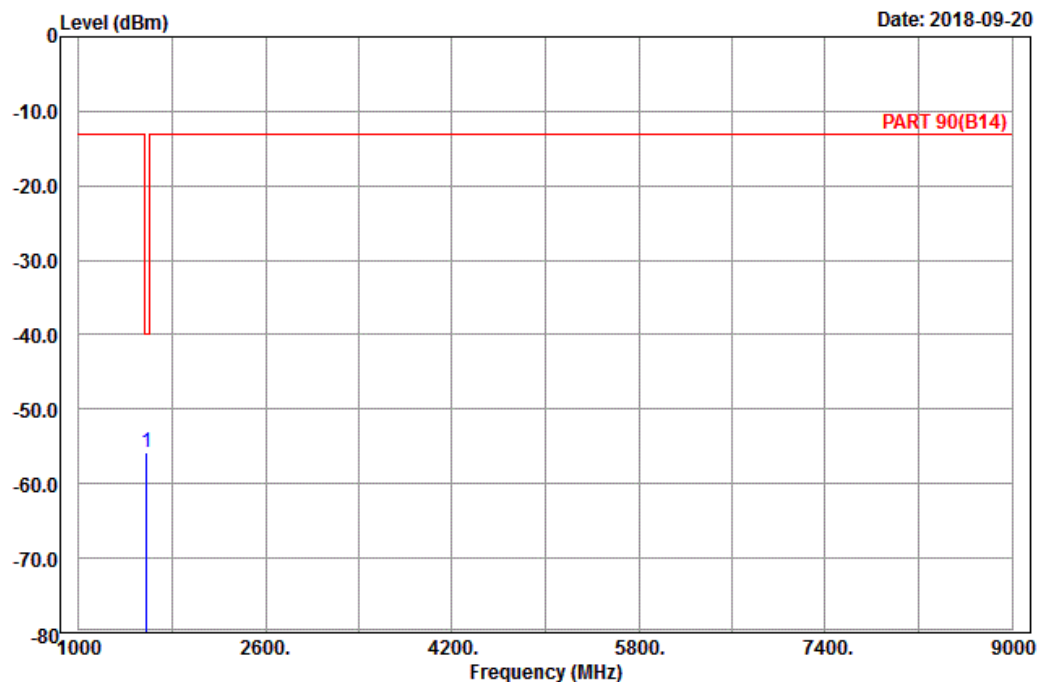
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1581.00	-59.67	-66.71	-40.00	-19.67	7.04	Peak



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Site : 966 chamber 1
 Condition: PART 90(B14) Vertical
 Remark : LTE_Band 14_Link_CH23305
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1581.00	-55.76	-62.80	-40.00	-15.76	7.04	Peak

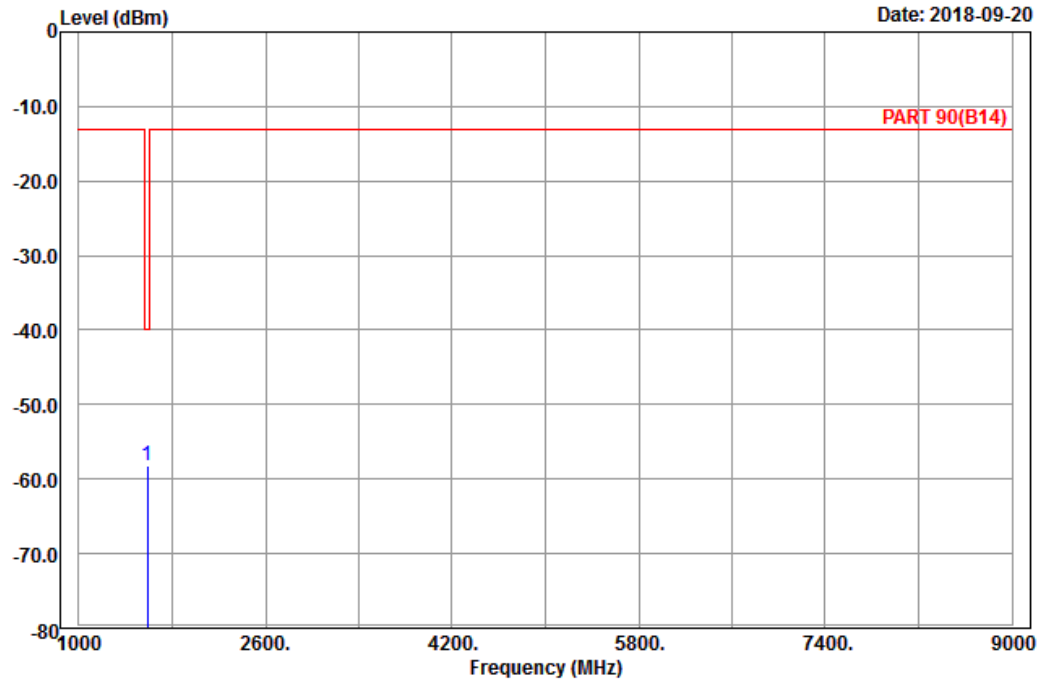
Middle Channel



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Data: 5



Site : 966 chamber 1
Condition: PART 90(B14) Horizontal
Remark : LTE_Band 14_Link_CH23330
Tested by: Karl Lee

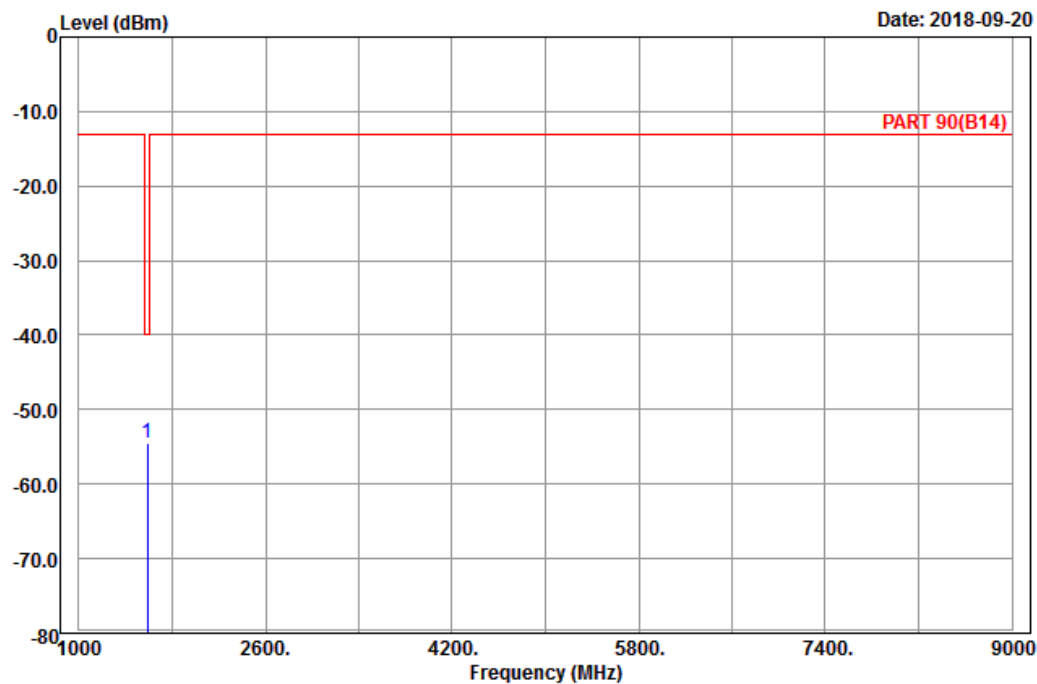
			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1586.00	-58.17	-65.38	-40.00	-18.17	7.21	Peak	



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Data: 6



Site : 966 chamber 1
 Condition: PART 90(B14) Vertical
 Remark : LTE_Band 14_Link_CH23330
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1586.00	-54.41	-61.62	-40.00	-14.41	7.21	Peak

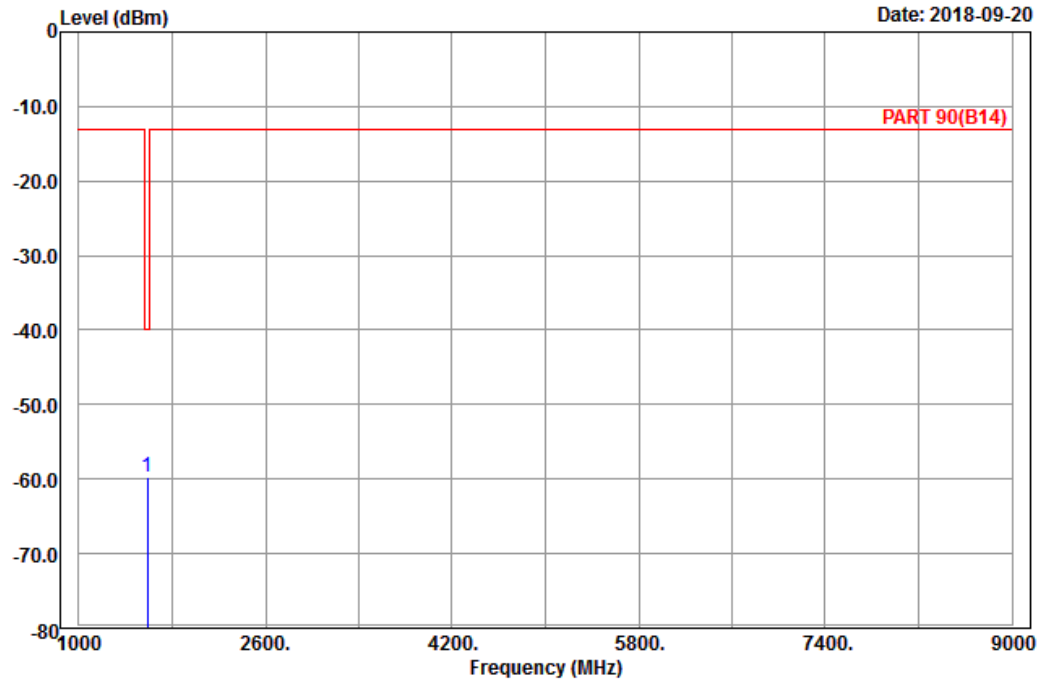
High Channel



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Data: 5



Site : 966 chamber 1
Condition: PART 90(B14) Horizontal
Remark : LTE_Band 14_Link_CH23355
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1591.00	-59.67	-66.88	-40.00	-19.67	7.21	Peak

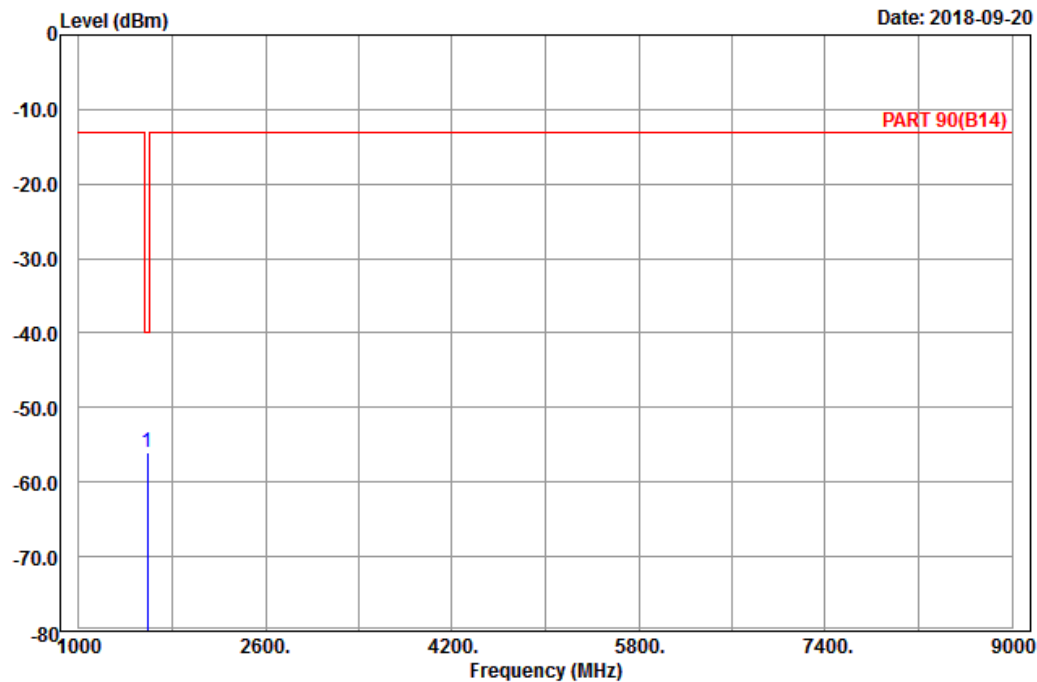


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Data: 6

Date: 2018-09-20



Site : 966 chamber 1
Condition: PART 90(B14) Vertical
Remark : LTE_Band 14_Link_CH23355
Tested by: Karl Lee

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 1591.00	-56.00	-63.21	-40.00	-16.00	7.21	Peak

Channel Bandwidth: 10 MHz / QPSK
Middle Channel

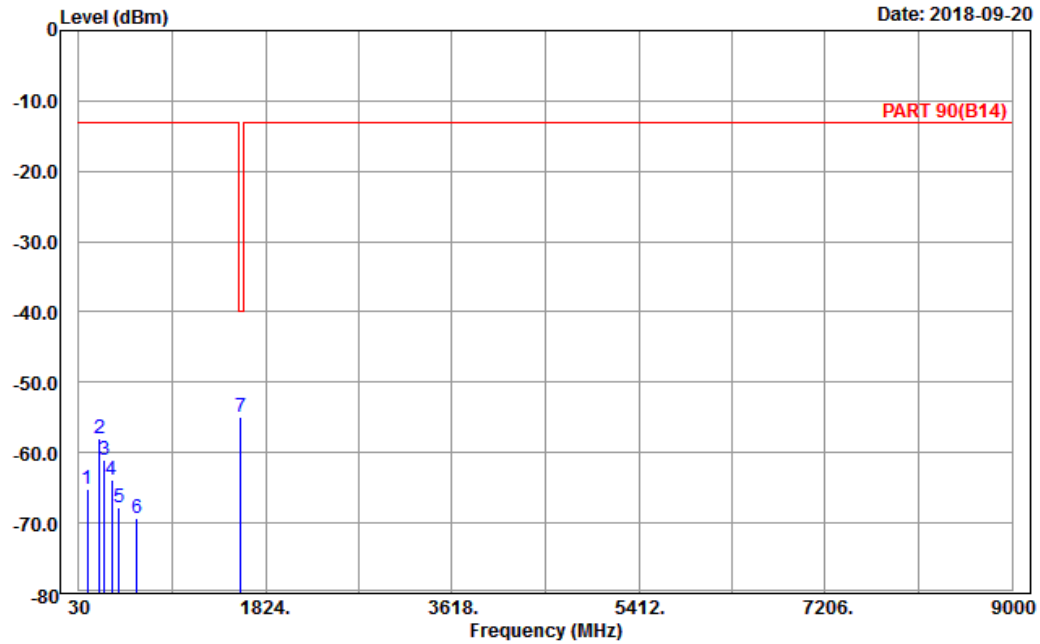


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Data: 9

Date: 2018-09-20



Site : 966 chamber 1
Condition: PART 90(B14) Horizontal
Remark : LTE_Band 14_Link_CH23330
Tested by: Karl Lee

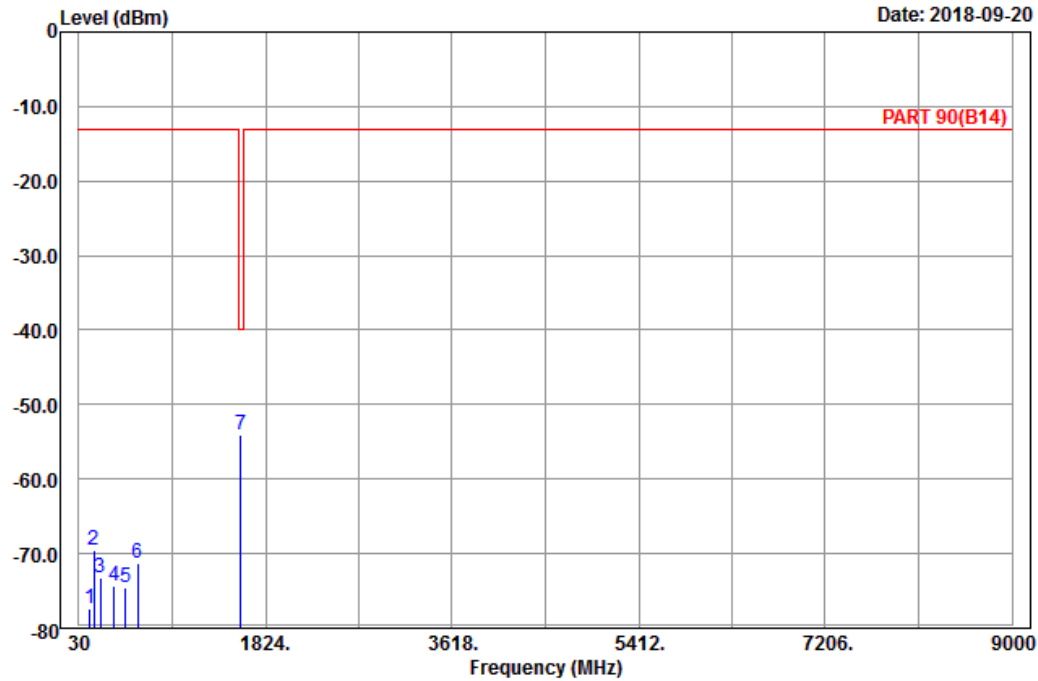
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	114.24	-65.16	-56.53	-13.00	-52.16	-8.63	Peak
2	225.75	-58.02	-52.19	-13.00	-45.02	-5.83	Peak
3	276.78	-61.14	-55.39	-13.00	-48.14	-5.75	Peak
4	342.70	-63.97	-58.50	-13.00	-50.97	-5.47	Peak
5	416.20	-67.73	-64.63	-13.00	-54.73	-3.10	Peak
6	589.80	-69.22	-69.21	-13.00	-56.22	-0.01	Peak
7 pp	1586.00	-54.97	-62.18	-40.00	-14.97	7.21	Peak



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Data: 10



Site : 966 chamber 1
Condition: PART 90(B14) Vertical
Remark : LTE_Band 14_Link_CH23330
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	136.11	-77.45	-69.78	-13.00	-64.45	-7.67	Peak
2	175.26	-69.47	-63.38	-13.00	-56.47	-6.09	Peak
3	239.25	-73.24	-67.59	-13.00	-60.24	-5.65	Peak
4	370.00	-74.25	-69.96	-13.00	-61.25	-4.29	Peak
5	475.70	-74.47	-69.91	-13.00	-61.47	-4.56	Peak
6	596.10	-71.20	-71.47	-13.00	-58.20	0.27	Peak
7 pp	1586.00	-54.11	-61.32	-40.00	-14.11	7.21	Peak

LTE Band 26
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

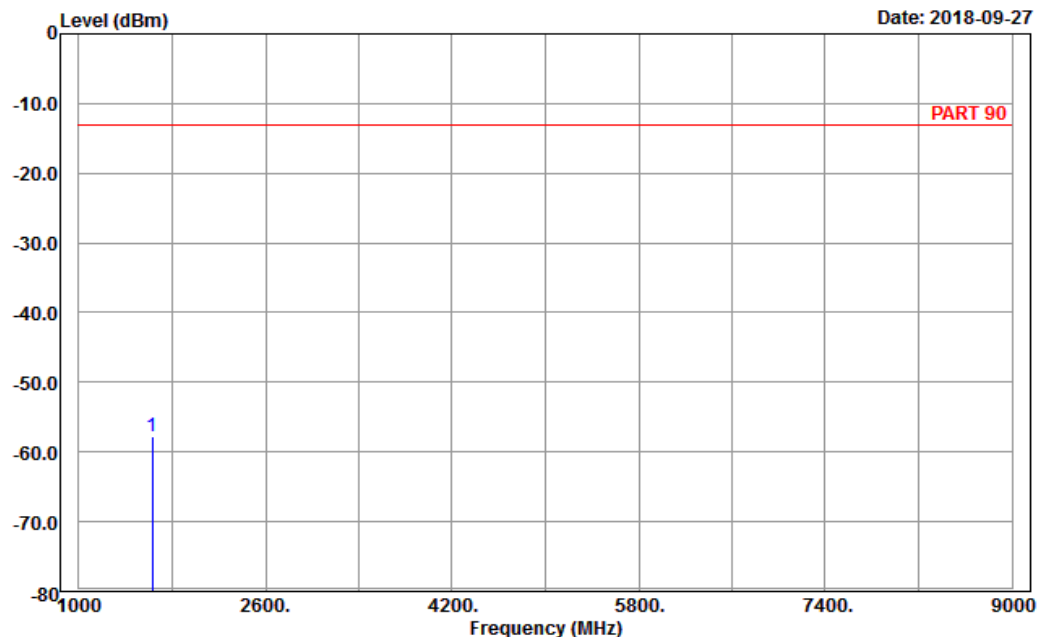


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Data: 5

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26697
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1629.40	-57.75	-65.31	-13.00	-44.75	7.56	Peak

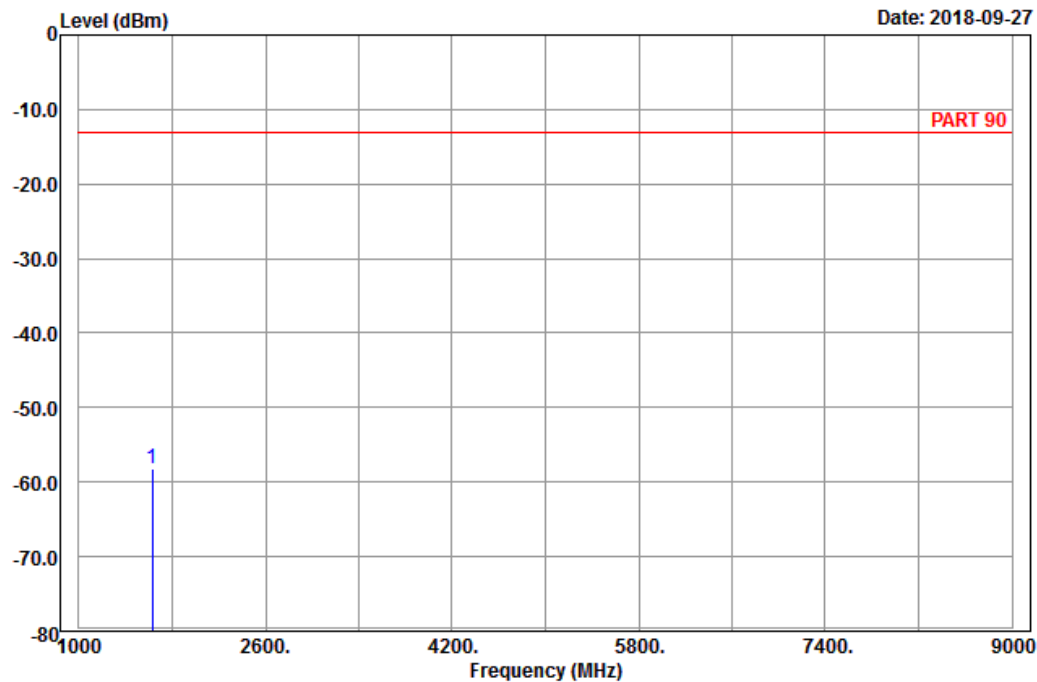


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Data: 6

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Vertical
Remark : LTE_Band 26_Link_CH26697
Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1629.40	-58.22	-65.78	-13.00	-45.22	7.56	Peak	

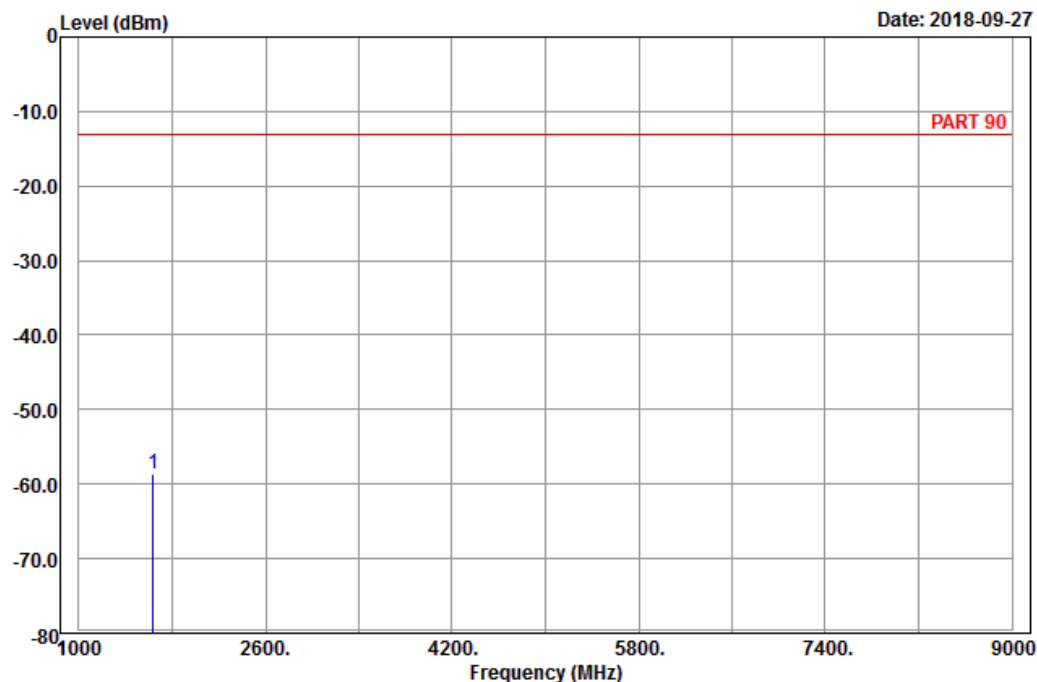
Middle Channel



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Data: 5



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26740
Tested by: Charles Hsiao

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1638.00	-58.54	-66.10	-13.00	-45.54	7.56	Peak

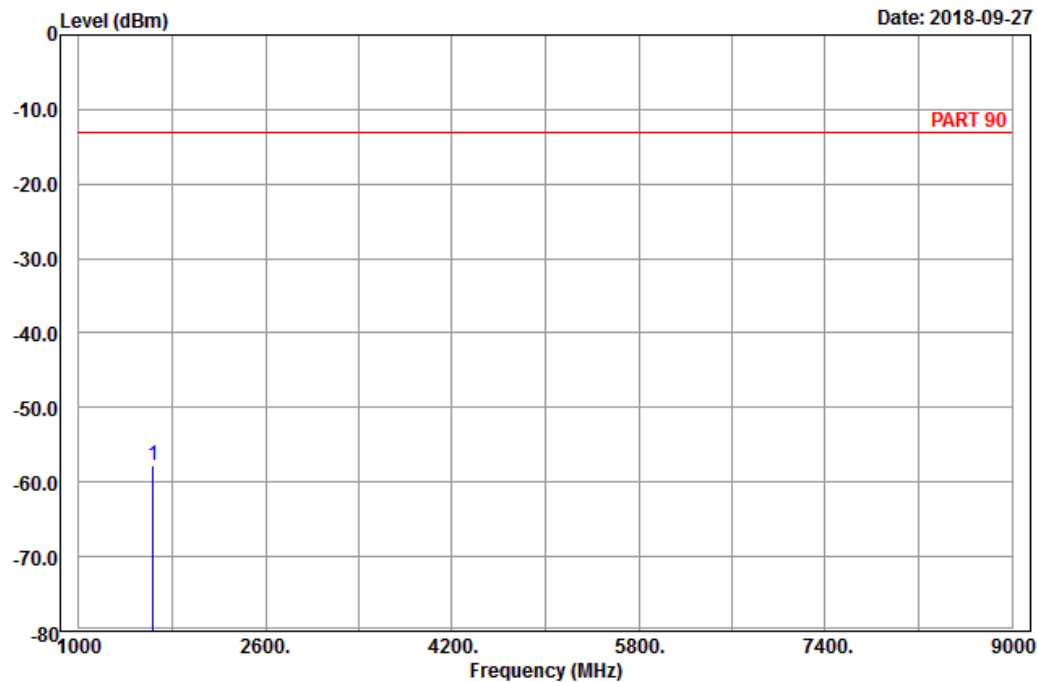


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Data: 6

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Vertical
Remark : LTE_Band 26_Link_CH26740
Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1638.00	-57.82	-65.38	-13.00	-44.82	7.56	Peak	

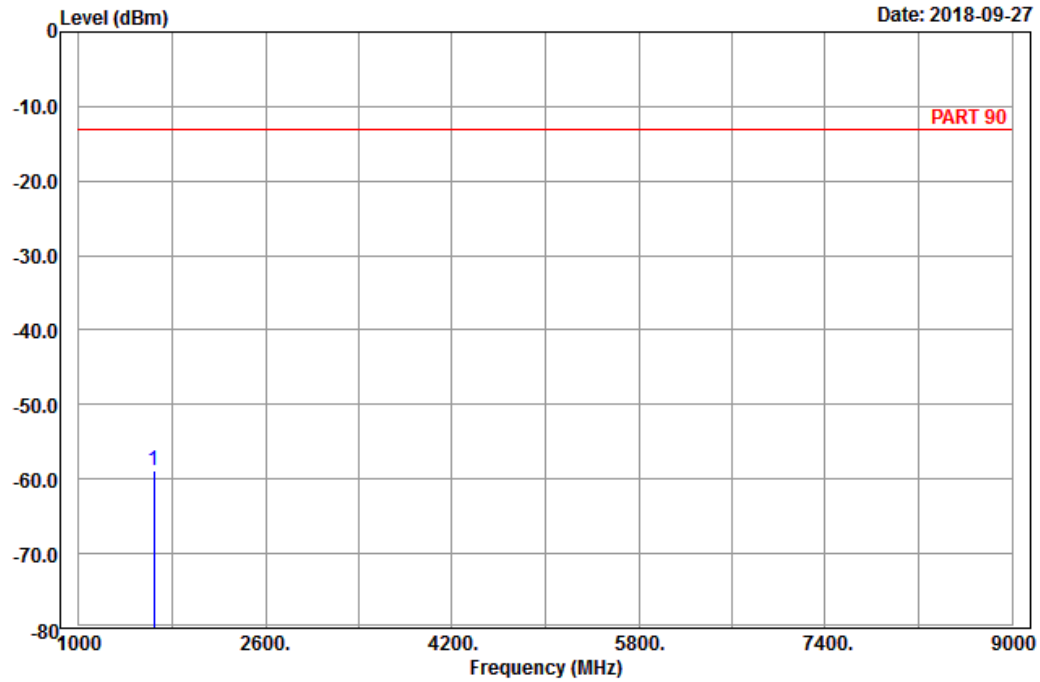
High Channel



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A D T

Data: 5



Site : 966 chamber 1
 Condition: PART 90 Horizontal
 Remark : LTE_Band 26_Link_CH26783
 Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1646.60	-58.88	-66.61	-13.00	-45.88	7.73	Peak	

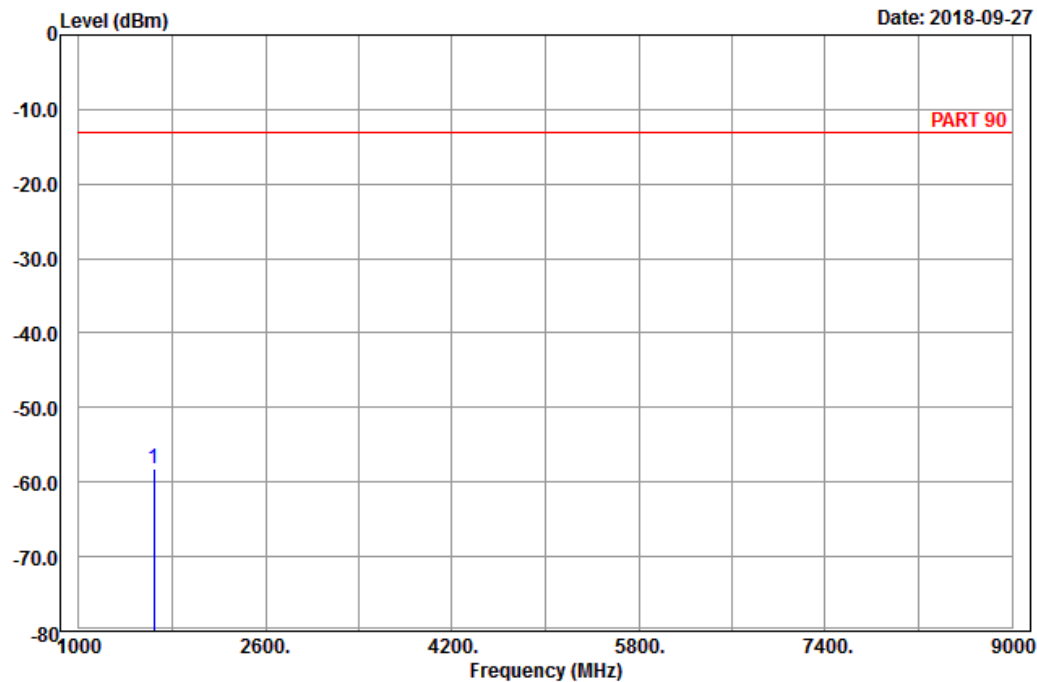


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Data: 6

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Vertical
Remark : LTE_Band 26_Link_CH26783
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1646.60	-58.27	-66.00	-13.00	-45.27	7.73	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

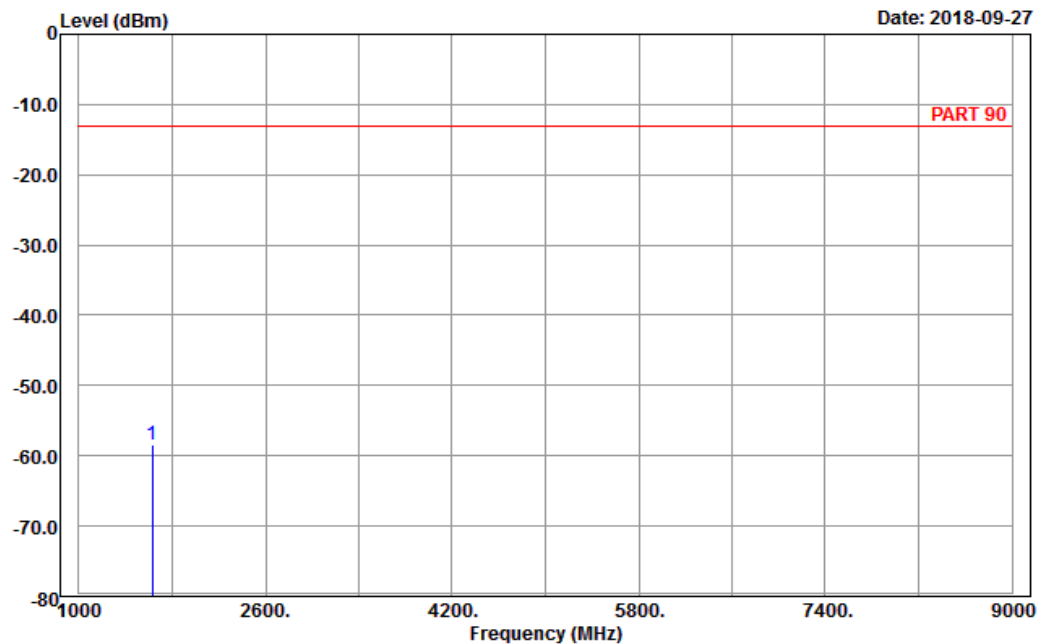


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Data: 5

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26715
Tested by: Karl Lee

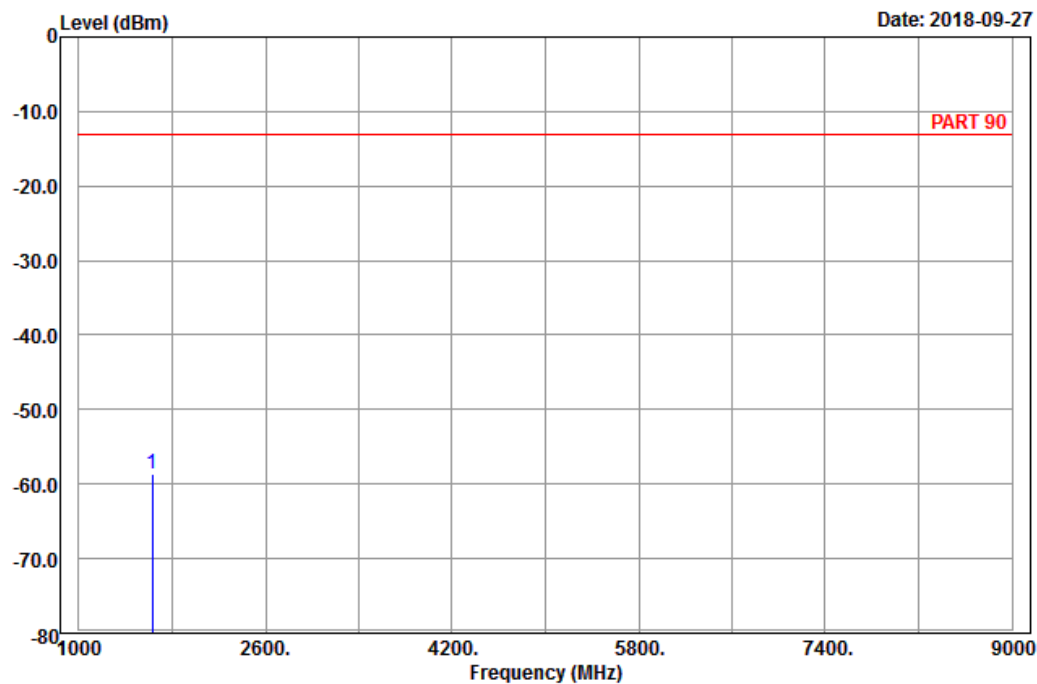
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1633.00	-58.47	-66.03	-13.00	-45.47	7.56	Peak



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A D T

Data: 6



Site : 966 chamber 1
 Condition: PART 90 Vertical
 Remark : LTE_Band 26_Link_CH26715
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1633.00	-58.73	-66.29	-13.00	-45.73	7.56	Peak

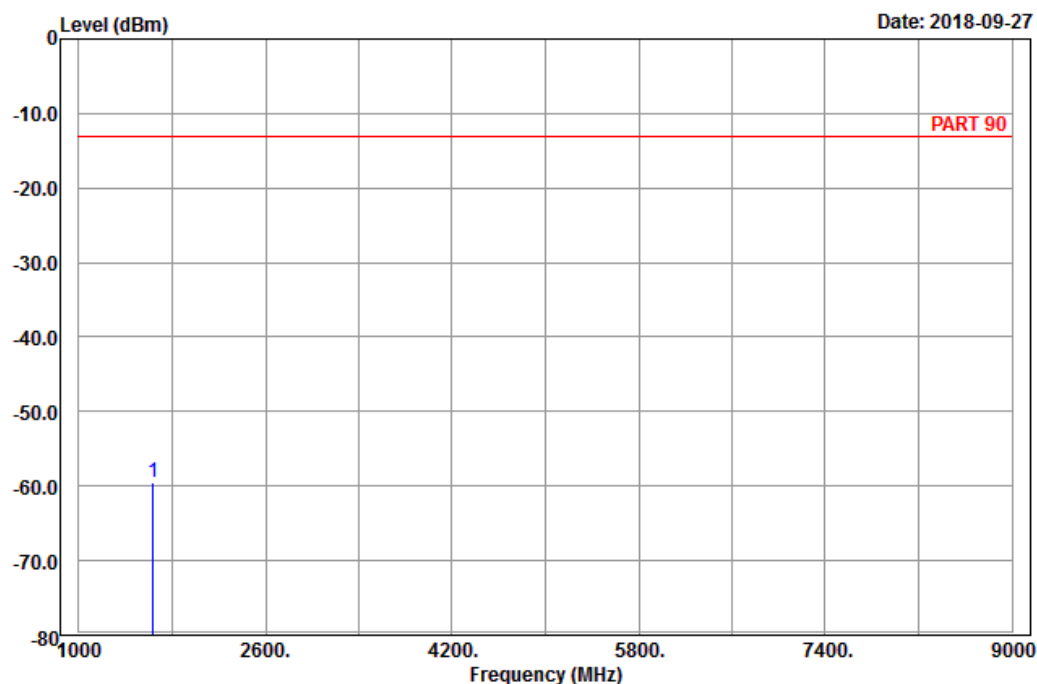
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26740
Tested by: Karl Lee

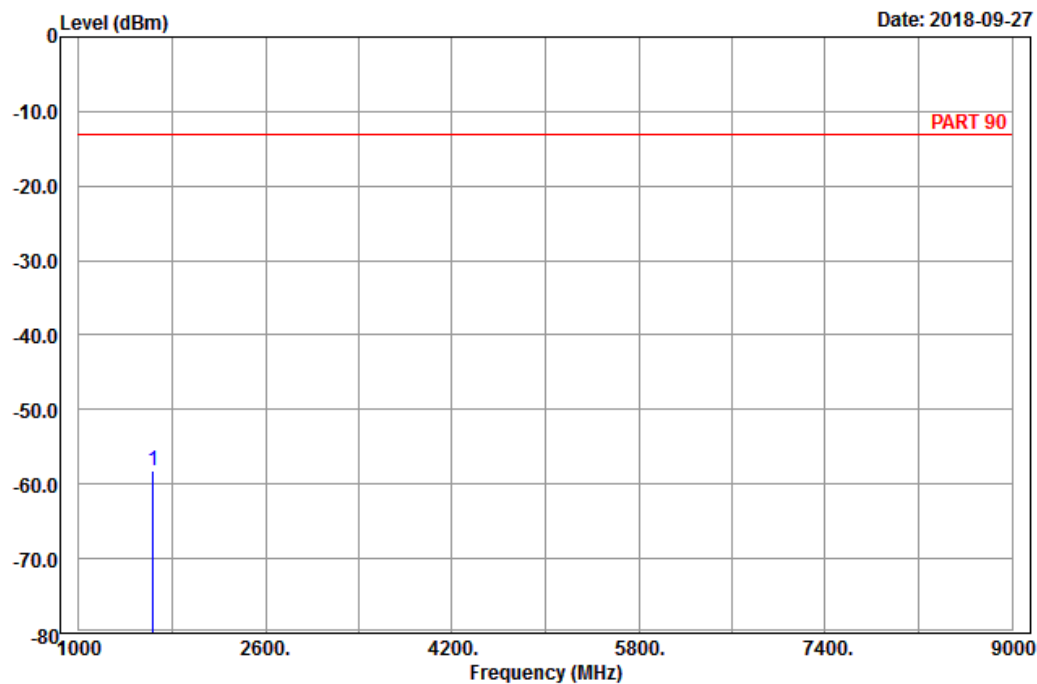
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1638.00	-59.44	-67.00	-13.00	-46.44	7.56	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1
Condition: PART 90 Vertical
Remark : LTE_Band 26_Link_CH26740
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1638.00	-58.27	-65.83	-13.00	-45.27	7.56	Peak

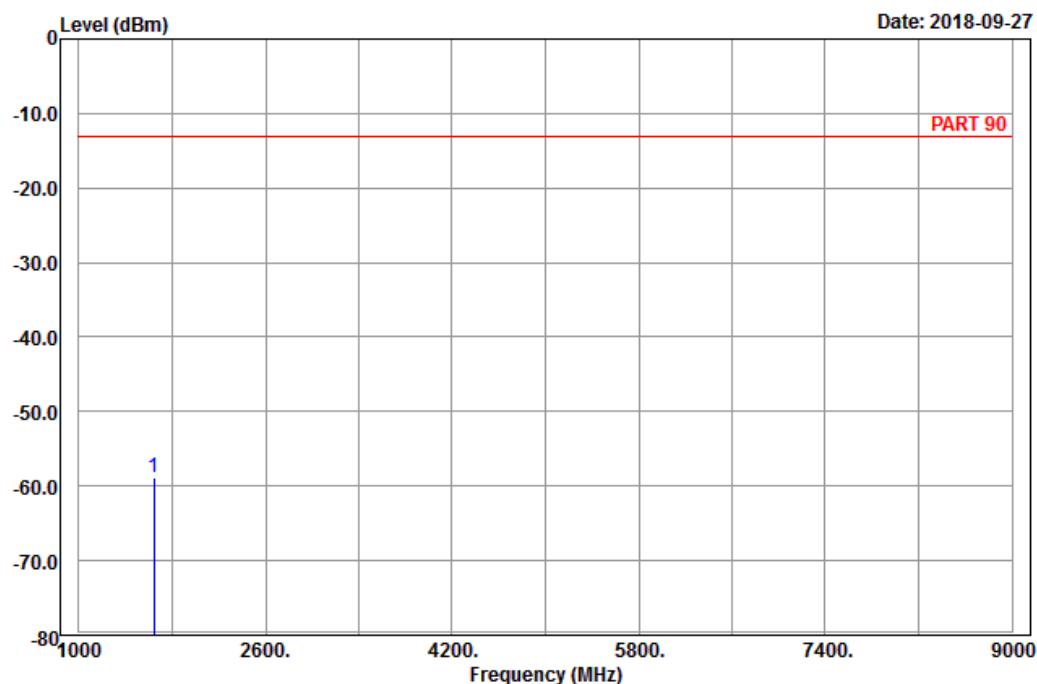
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26765
Tested by: Karl Lee

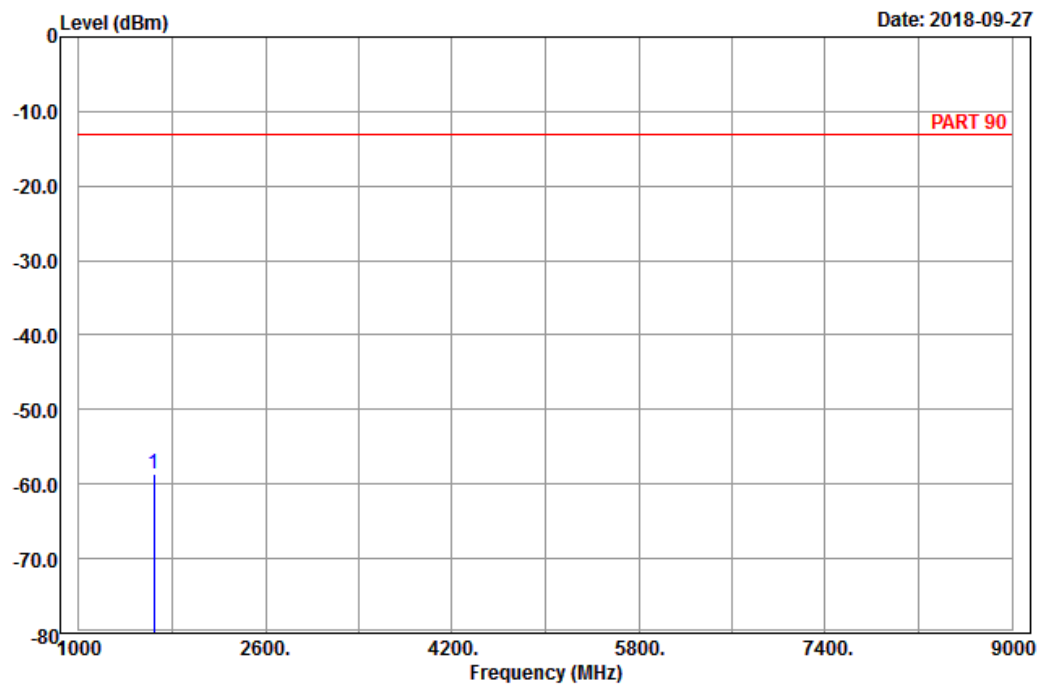
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1643.00	-58.76	-66.49	-13.00	-45.76	7.73	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1
 Condition: PART 90 Vertical
 Remark : LTE_Band 26_Link_CH26765
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1643.00	-58.70	-66.43	-13.00	-45.70	7.73	Peak

Channel Bandwidth: 10 MHz / QPSK
Middle Channel

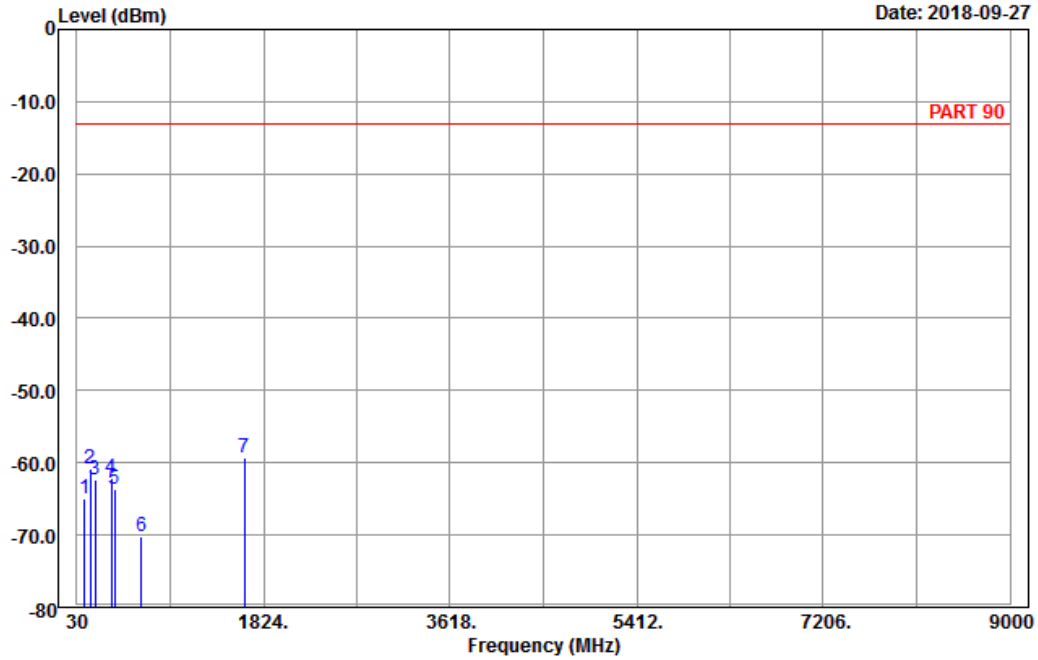


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Horizontal
Remark : LTE_Band 26_Link_CH26740
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	106.95	-64.90	-55.60	-13.00	-51.90	-9.30	Peak
2	159.87	-60.80	-53.13	-13.00	-47.80	-7.67	Peak
3	205.23	-62.31	-56.20	-13.00	-49.31	-6.11	Peak
4	359.50	-62.10	-57.24	-13.00	-49.10	-4.86	Peak
5	388.90	-63.69	-60.38	-13.00	-50.69	-3.31	Peak
6	653.50	-70.23	-70.08	-13.00	-57.23	-0.15	Peak
7 pp	1638.00	-59.22	-66.78	-13.00	-46.22	7.56	Peak

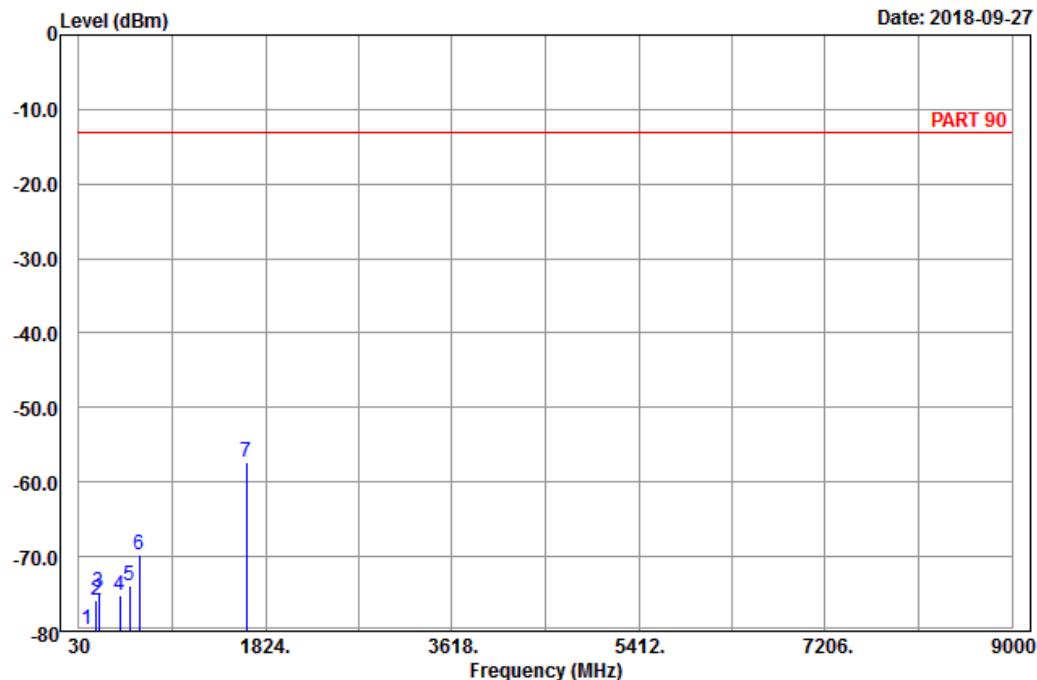


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-09-27



Site : 966 chamber 1
Condition: PART 90 Vertical
Remark : LTE_Band 26_Link_CH26740
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	115.32	-79.75	-71.18	-13.00	-66.75	-8.57	Peak
2	196.32	-75.87	-69.87	-13.00	-62.87	-6.00	Peak
3	220.08	-74.85	-68.94	-13.00	-61.85	-5.91	Peak
4	427.40	-75.12	-71.76	-13.00	-62.12	-3.36	Peak
5	519.80	-73.80	-69.94	-13.00	-60.80	-3.86	Peak
6	609.40	-69.79	-70.12	-13.00	-56.79	0.33	Peak
7 pp	1638.00	-57.35	-64.91	-13.00	-44.35	7.56	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

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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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