

Partial FCC Test Report

(PART 22)

Report No.: RF180717C29

FCC ID: LY5-PCITP100

Test Model: LE910C1-NA

Received Date: Jul. 17, 2018

Test Date: Jan. 10, 2019 ~ Jan. 11, 2019

788550 / TW0003

Issued Date: Mar. 26, 2019

Applicant: PCI Private Limited

Address: 35 Pioneer Rd North, Singapore 628475

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)

Test Location: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)

FCC Registration / Designation Number:



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Table of Contents

Re	elease Control Record	3
1	Certificate of Conformity	4
2	Summary of Test Results	5
	2.1 Measurement Uncertainty2.2 Test Site and Instruments	
3	General Information	7
	 3.1 General Description of EUT	
4	Test Types and Results	11
	 4.1 Output Power Measurement	
5	Pictures of Test Arrangements	34
	-	



		BUREAU Veritas	
Release Control Record			
Issue No.	Description	Date Issued	
RF180717C29	Original Release	Mar. 26, 2019	



Certificate of Conformity 1

Product: LE910C1-NA Brand: Telit Test Model: LE910C1-NA Sample Status: Production Unit Applicant: PCI Private Limited Test Date: Jan. 10, 2019 ~ Jan. 11, 2019 Standards: FCC Part 22, Subpart H

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.

Lena Wane

Prepared by :

Lena Wang / Specialist

Date: Mar. 26, 2019

Ryhi La

Approved by :

Date: Mar. 26, 2019

Dylan Chiou / Project Engineer



	Applied Standard: FCC Part 22 & Part 2					
FCC Clause	Test Item	Result	Remarks			
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.			
2.1047	Modulation Characteristics	N/A	Refer to Note			
	Peak to Average Ratio	N/A	Refer to Note			
2.1055 22.355	Frequency Stability	N/A	Refer to Note			
2.1049	Occupied Bandwidth	N/A	Refer to Note			
22.917	Band Edge Measurements	N/A	Refer to Note			
2.1051 22.917	Conducted Spurious Emissions	N/A	Refer to Note			
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -26.48 dB at 2509.20 MHz.			

2 Summary of Test Results

Note:

1. 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 DEKRA report no.: 1710065R-HPUSP49V00 for module (Brand: Telit, Model: LE910C1NA)

2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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) (±)
Padiated Emissions up to 1 CHz	30 MHz ~ 200 MHz	2.93 dB
Radiated Emissions up to 1 GHz	200 MHz ~ 1000 MHz	2.95 dB
Dedicted Emissions above 1 CHz	1 GHz ~ 18 GHz	2.26 dB
Radiated Emissions above 1 GHz	18 GHz ~ 40 GHz	1.94 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 Agilent	N9010A	MY52220314	Dec. 13, 2018	Dec. 12, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 23, 2018	Nov. 22, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Nov. 23, 2018	Nov. 22, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 19, 2018	Nov. 18, 2019
Preamplifier EMCI	EMC 012645	980115	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 330H	980112	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM- 8000&3000	140811+170717	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM- 1000(140807)	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 12, 2018	Oct. 11, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	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
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
DC Power Supply Topward	33010D	807748	NA	NA

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 HwaYa Chamber 10.
- 3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
- 4. The IC Site Registration No. is 7450F-10.



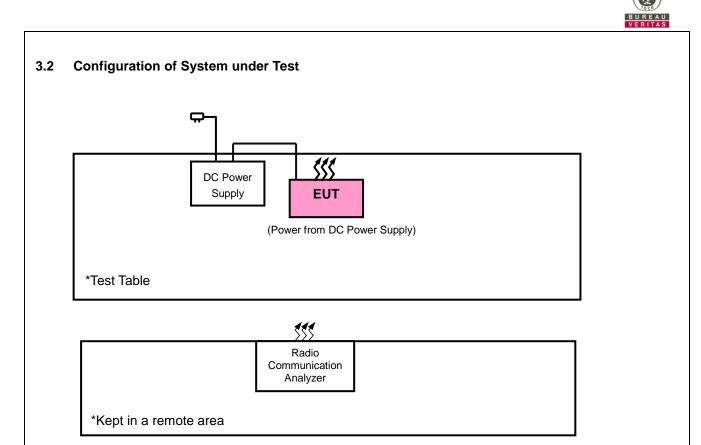
3 General Information

3.1 General Description of EUT

Product	LE910C1-NA		
Brand	Telit		
Test Model	LE910C1-NA		
Status of EUT	Production Unit		
Power Supply Rating	12 or 24 Vdc (DC Power Supply)		
	GSM/GPRS	GMSK	
Modulation Type	EDGE	GMSK, 8PSK	
	WCDMA	QPSK	
	GSM/GPRS/EDGE	824.2 ~ 848.8 MHz	
Frequency Range	WCDMA	826.4 ~ 846.6 MHz	
	GSM/GPRS	690.24 mW	
Max. ERP Power	EDGE	388.15 mW	
	WCDMA	534.56 mW	
Antenna Type	Metal stamp antenna with 0.65 dBi gain		
Accessory Device	N/A		
Data Cable Supplied	N/A		

Note:

- 1. The EUT was installed in Telematics Platform 1 (Brand: PCI, Model: PCI-TP1).
- 2. 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.



3.2.1 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.	DC Power Supply	Topward	33010D	807748	N/A
2.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).

2. Items 1~2 acted as communication partners to transfer data.



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
GSM	Z-plane	Z-axis
EDGE	Z-plane	Z-axis
WCDMA	Z-plane	Z-axis

GSM

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	128 to 251	128, 189, 251	GSM, EDGE
-	Radiated Emission	128 to 251	128, 189, 251	GSM, EDGE

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
-	Radiated Emission	4132 to 4233	4132, 4182, 4233	WCDMA

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	12 Vdc	Jisyong Wang
Radiated Emission	25 deg. C, 65 % RH	12 Vdc	Jisyong Wang



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 22 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

Mobile / Portable station are limited to 7 watts e.r.p.

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 1 MHz for GSM, GPRS & EDGE, and 5 MHz for WCDMA and CDMA, 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 = Output power level of S.G TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power 2.15 dB.

Conducted Power Measurement:

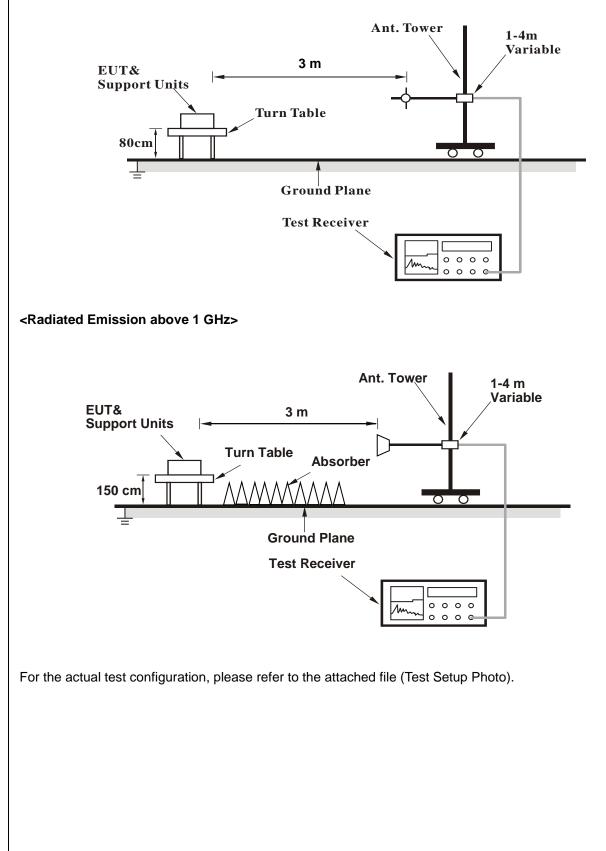
The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, CDMA, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>





4.1.4 Test Results

ERP Power (dBm)

				GSM			
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
	128	824.2	-8.58	32.62	21.89	154.53	
	189	836.4	-8.55	32.52	21.82	152.05	н
z	251	848.8	-8.34	32.65	22.16	164.44	
Z	128	824.2	-2.49	32.76	28.12	648.63	
	189	836.4	-2.19	32.39	28.05	638.26	V
	251	848.8	-2.00	32.54	28.39	690.24	

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

				EDGE			
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
	128	824.2	-11.82	32.62	18.65	73.28	
	189	836.4	-10.98	32.52	19.39	86.90	н
Z	251	848.8	-10.85	32.65	19.65	92.26	
2	128	824.2	-5.72	32.76	24.89	308.32	
	189	836.4	-4.61	32.39	25.63	365.59	V
	251	848.8	-4.50	32.54	25.89	388.15	

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

				WCDMA			
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
	4132	826.4	-9.14	32.62	21.33	135.83	
	4182	836.4	-9.31	32.52	21.06	127.64	н
Z	4233	846.6	-9.56	32.65	20.94	124.17	
2	4132	826.4	-3.33	32.76	27.28	534.56	
	4182	836.4	-3.23	32.39	27.01	502.34	V
	4233	846.6	-3.50	32.54	26.89	488.65	

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



4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

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

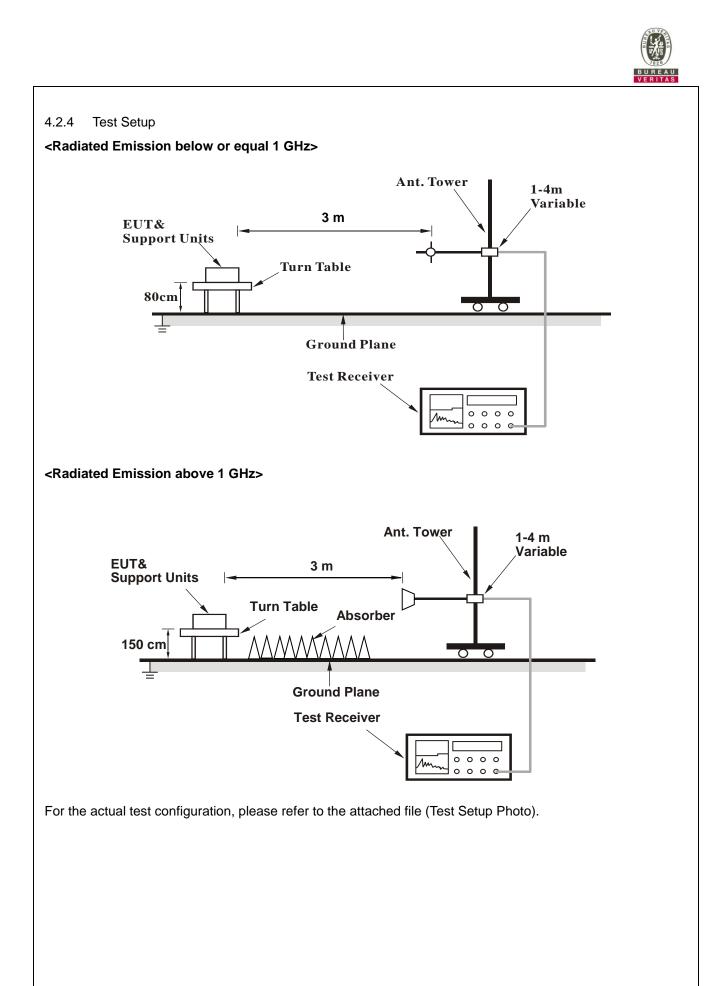
4.2.2 Test Procedure

- 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 = Output power level of S.G TX cable loss + 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 power = E.I.R.P power 2.15 dB.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

4.2.3 Deviation from Test Standard

No deviation.



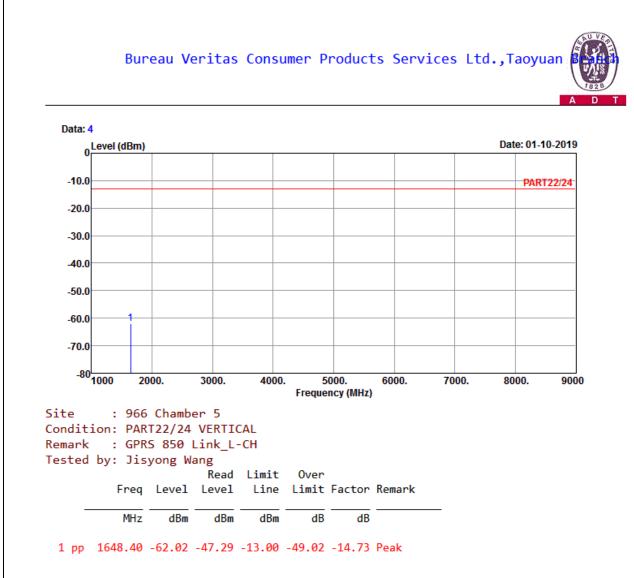


4.2.5 Test Results

GSM: Low Channel

Data: 3									
0 ^L	.evel (dB	m)							Date: 01-10-2019
-10.0									PART22/24
-20.0									
-30.0									
-40.0									
-50.0									
-60.0	1								
-70.0									
-80	1000	2000.	3000.	4000		5000. ency (MHz)	6000.	7000.	8000. 900
ite	: 9	66 Cham	ber 5						
			4 HORIZ						
		PRS 850 isyong	Link_L	-CH					
esteu	by. J	Tayong	<u> </u>	Limit	0ver				
	F		l Level	Line	1 4 - 4 +	Factor	Remark		

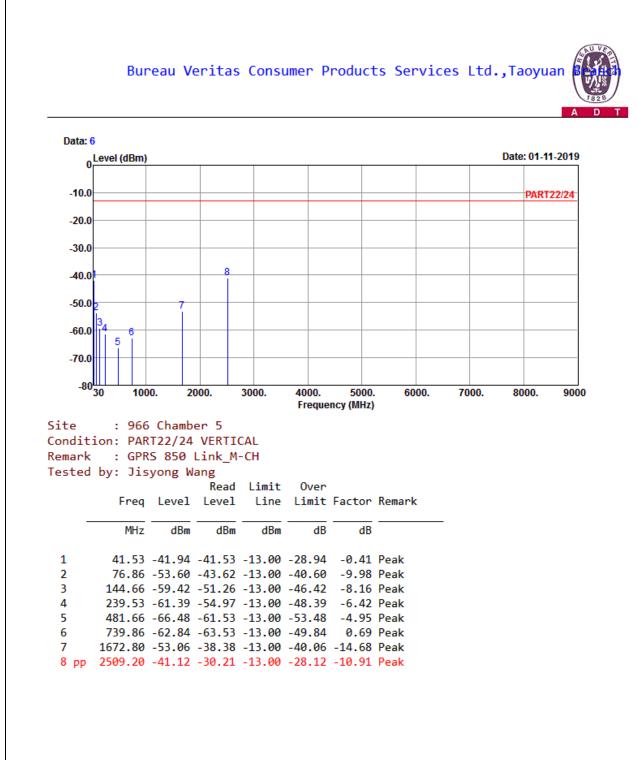






Middle Channel Bureau Veritas Consumer Products Services Ltd., Taoyuan Data: 5 0 Level (dBm) Date: 01-11-2019 -10.0 PART22/24 -20.0 -30.0 8 -40.0 -50.0, 2 -60.0 56 -70.0 1000. 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 Frequency (MHz) Site : 966 Chamber 5 Condition: PART22/24 HORIZONTAL Remark : GPRS 850 Link_M-CH Tested by: Jisyong Wang Read Limit **Over** Freq Level Level Line Limit Factor Remark MHz dBm dBm dBm dB dB 42.52 -55.02 -54.08 -13.00 -42.02 -0.94 Peak 1 162.53 -52.57 -47.52 -13.00 -39.57 -5.05 Peak 2 255.85 -54.77 -48.66 -13.00 -41.77 -6.11 Peak 3 477.53 -67.06 -62.02 -13.00 -54.06 -5.04 Peak 4 5 662.53 -62.83 -62.14 -13.00 -49.83 -0.69 Peak 6 833.26 -63.09 -63.53 -13.00 -50.09 0.44 Peak 7 1672.80 -53.90 -39.22 -13.00 -40.90 -14.68 Peak 8 pp 2509.20 -39.48 -28.57 -13.00 -26.48 -10.91 Peak

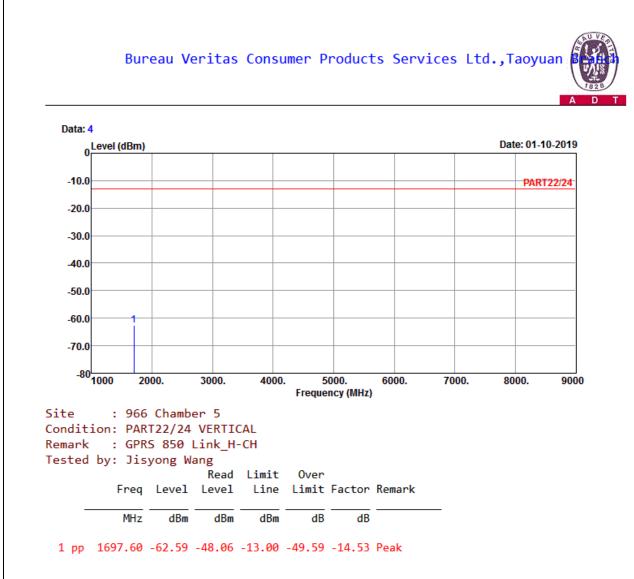






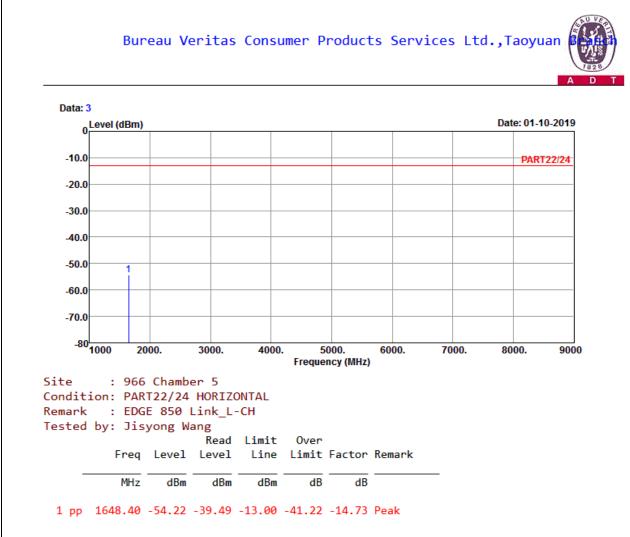
High Channel Bureau Veritas Consumer Products Services Ltd., Taoyuan Data: 3 0 Level (dBm) Date: 01-10-2019 -10.0 PART22/24 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0 -80<mark>1000</mark> 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 Frequency (MHz) Site : 966 Chamber 5 Condition: PART22/24 HORIZONTAL : GPRS 850 Link_H-CH Remark Tested by: Jisyong Wang Read Limit **Over** Freq Level Level Line Limit Factor Remark dB MHz dBm dBm dBm dB 1 pp 1697.60 -63.08 -48.55 -13.00 -50.08 -14.53 Peak



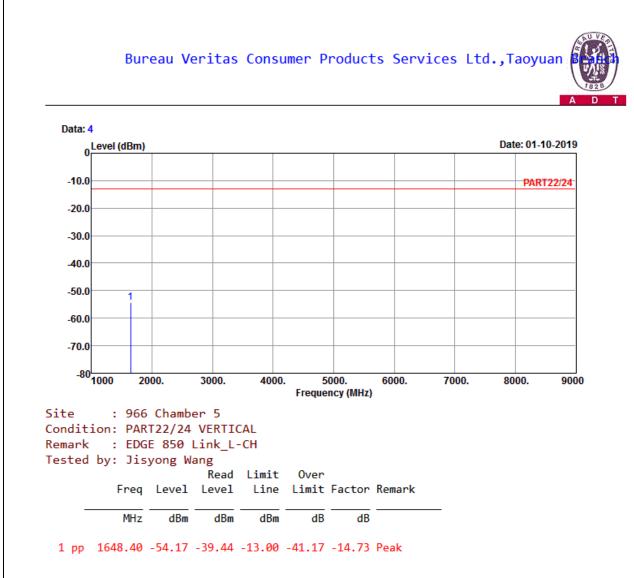




EDGE: Low Channel



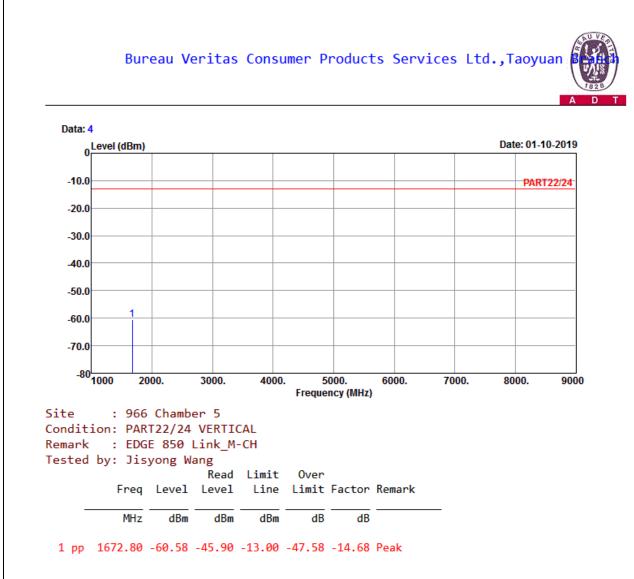






Middle Channel Bureau Veritas Consumer Products Services Ltd., Taoyuan Data: 3 0 Level (dBm) Date: 01-10-2019 -10.0 PART22/24 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0 -80<mark>1000</mark> 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 Frequency (MHz) Site : 966 Chamber 5 Condition: PART22/24 HORIZONTAL : EDGE 850 Link_M-CH Remark Tested by: Jisyong Wang Read Limit **Over** Freq Level Level Line Limit Factor Remark dB MHz dBm dBm dBm dB 1 pp 1672.80 -59.17 -44.49 -13.00 -46.17 -14.68 Peak

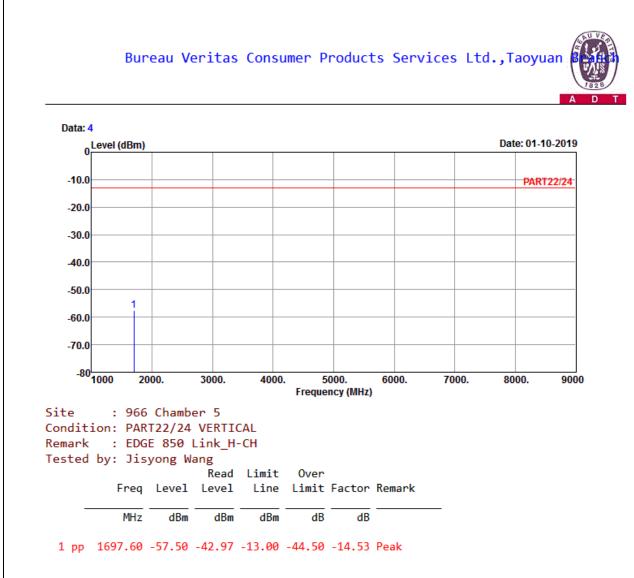






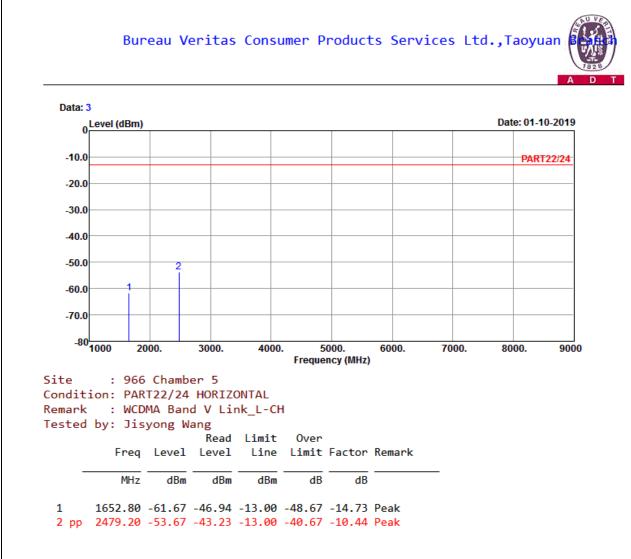
High Channel Bureau Veritas Consumer Products Services Ltd., Taoyuan Data: 3 0 Level (dBm) Date: 01-10-2019 -10.0 PART22/24 -20.0 -30.0 -40.0 -50.0 1 -60.0 -70.0 -80<mark>1000</mark> 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 Frequency (MHz) Site : 966 Chamber 5 Condition: PART22/24 HORIZONTAL : EDGE 850 Link_H-CH Remark Tested by: Jisyong Wang Read Limit **Over** Freq Level Level Line Limit Factor Remark dB MHz dBm dBm dBm dB 1 pp 1697.60 -56.04 -41.51 -13.00 -43.04 -14.53 Peak



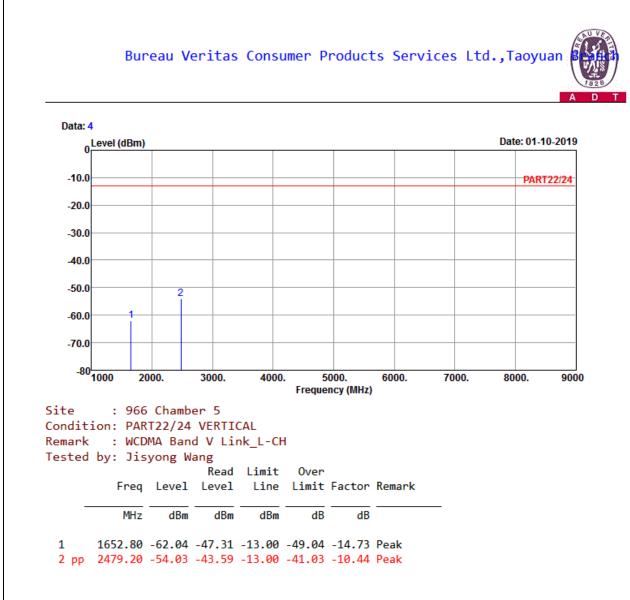




WCDMA: Low Channel



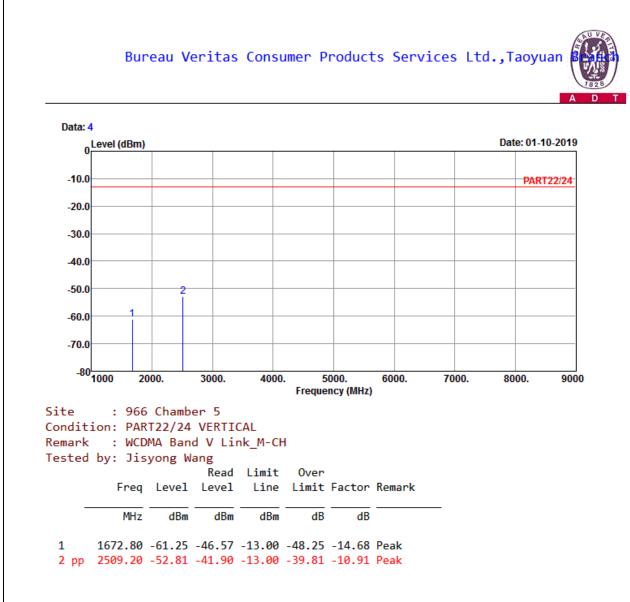






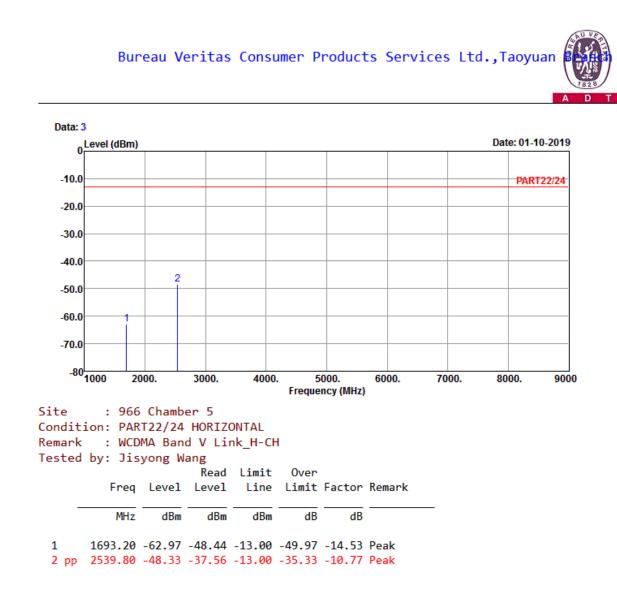
Middle Channel Bureau Veritas Consumer Products Services Ltd., Taoyuan Data: 3 0 Level (dBm) Date: 01-10-2019 -10.0 PART22/24 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0 -80^L 1000 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 Frequency (MHz) Site : 966 Chamber 5 Condition: PART22/24 HORIZONTAL Remark : WCDMA Band V Link_M-CH Tested by: Jisyong Wang Read Limit **Over** Freq Level Level Line Limit Factor Remark MHz dBm dBm dBm dB dB 1672.80 -62.63 -47.95 -13.00 -49.63 -14.68 Peak 1 2 pp 2509.20 -52.74 -41.83 -13.00 -39.74 -10.91 Peak



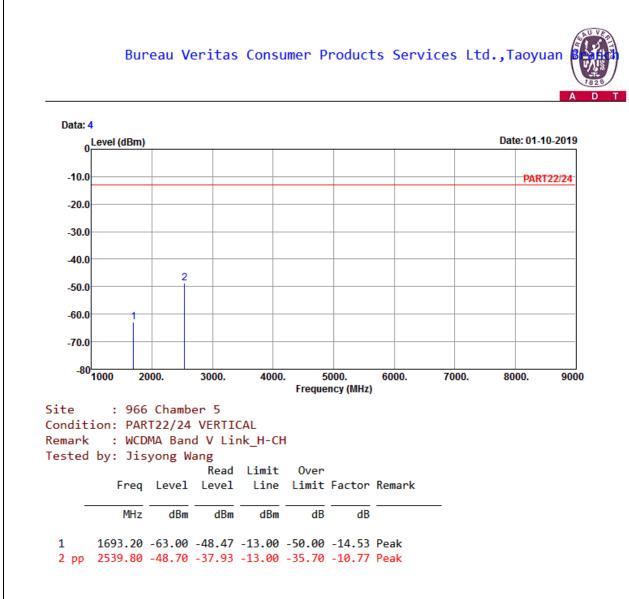




High Channel









5 Pictures of Test Arrangements

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



Appendix – Information of 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:

Lin Kou EMC/RF Lab Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF/Telecom Lab Tel: 886-3-6668565 Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Tel: 886-3-3183232 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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