

# FCC Test Report

**FCC ID** : SQG-IGUPCAT1  
**Equipment** : Sentrius IG60 Category-1 LTE Module  
**Model No.** : IGUP-CAT1  
**Brand Name** : Laird  
**Applicant** : Laird Connectivity, Inc.  
**Address** : W66N220 Commerce Court, Cedarburg,  
Wisconsin 53012, USA  
**Standard** : 47 CFR FCC Part 22 Subpart H  
**Received Date** : Aug. 19, 2019  
**Tested Date** : Sep. 24, 2019

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

Approved by:

  
\_\_\_\_\_  
Gary Chang / Manager



---

## Table of Contents

<b>1</b>	<b>GENERAL DESCRIPTION .....</b>	<b>5</b>
1.1	Information.....	5
1.2	Local Support Equipment List .....	7
1.3	Test Setup Chart .....	7
1.4	The Equipment List .....	8
1.5	Test Standards .....	8
1.6	Deviation from Test Standard and Measurement Procedure.....	8
1.7	Measurement Uncertainty .....	9
<b>2</b>	<b>TEST CONFIGURATION .....</b>	<b>10</b>
2.1	Testing Condition and Location Information.....	10
2.2	The Worst Test Modes and Channel Details .....	10
<b>3</b>	<b>TEST RESULTS.....</b>	<b>11</b>
3.1	Effective Radiated Power .....	11
3.2	Radiated Emissions.....	16
<b>4</b>	<b>TEST LABORATORY INFORMATION .....</b>	<b>27</b>

---

## Release Record

Report No.	Version	Description	Issued Date
FG981901P22	Rev. 01	Initial issue	Nov. 01, 2019

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 22.913(a)(5)	Effective Radiated Power	Power[dBm]: 32.06 dBm	Pass
2.1053 / 22.917(a)	Radiated Emissions	Meet the requirement of limit	Pass
2.1051 / 22.917(a)	Conducted Emissions	Note	Pass
2.1051 / 22.917(a)	Band Edge	Note	Pass
2.1049 / 22.917(a)	Occupied Bandwidth	Note	Pass
-	Peak to Average Ratio	Note	Pass
2.1055 / 22.355	Frequency Stability	Note	Pass

Note: Refers to test report of FCC ID: QIPPLS62-W. Test report no.: I17D00184-SRD05 / I17D00184-SRD06

### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

<b>Operating Frequency</b>	GSM850 WCDMA BAND V LTE Band 5
<b>Modulation</b>	GPRS/EDGE: GMSK/8PSK WCDMA/HSDPA/HSUPA/HSPA+: BPSK LTE: QPSK/16QAM

### 1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Dipole	SMA_MALE	0.5	--

### 1.1.3 EUT Operational Condition

<b>Supply Voltage</b>	Voltage Range: 4.75 VDC-5.25 VDC
-----------------------	----------------------------------

### 1.1.4 Operating Channel List

GPRS & EDGE		
	Channel	Frequency (MHz)
Low	128	824.2
Middle	189	836.4
High	251	848.8

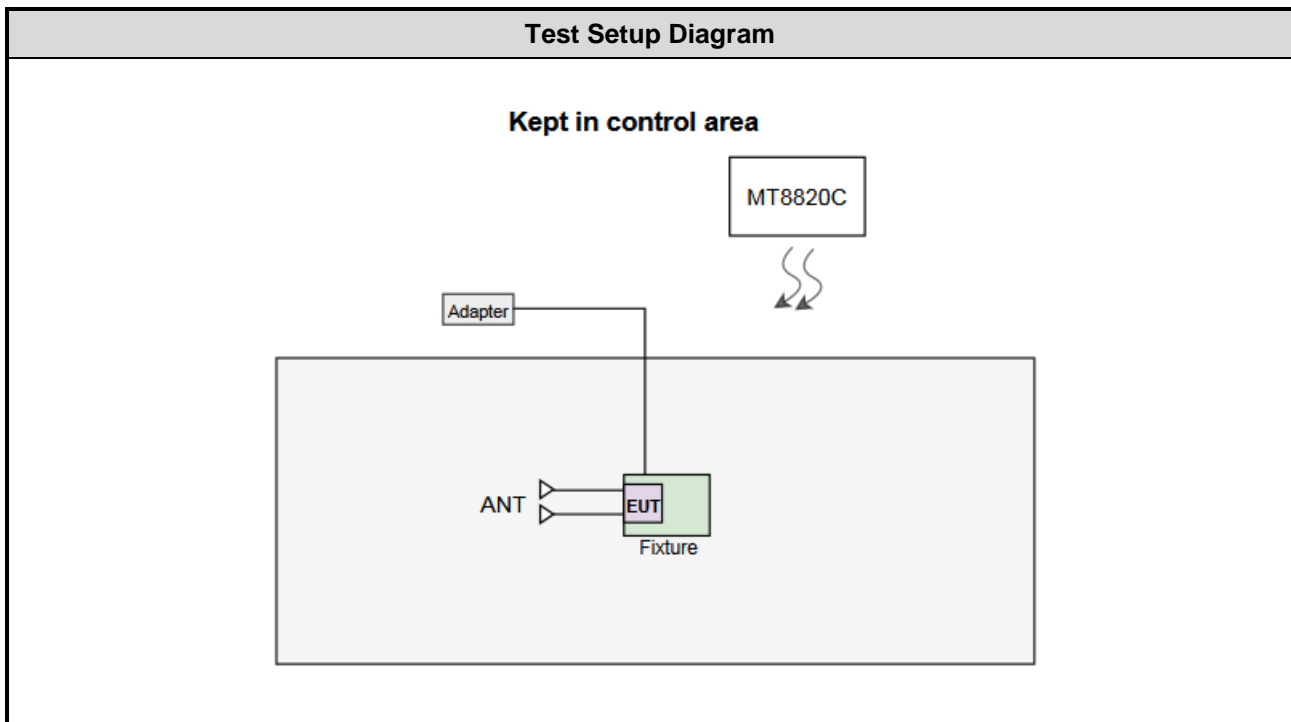
WCDMA BAND V		
Channel Location	Channel	Frequency (MHz)
Low	4132	826.4
Middle	4183	836.6
High	4233	846.6

LTE Band 5		
Channel Bandwidths (MHz)	Channel	Frequency (MHz)
1.4	20407	824.7
1.4	20525	836.5
1.4	20643	848.3
3	20415	825.5
3	20525	836.5
3	20635	847.5
5	20425	826.5
5	20525	836.5
5	20625	846.5
10	20450	829.0
10	20525	836.5
10	20600	844.0

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	S/N	Remarks
1	Adapter	Samsung	ETA-U90JWA	---	---
2	Fixture	---	---	---	Provided by applicant.

## 1.3 Test Setup Chart



## 1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 27, 2018	Dec. 26, 2019
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 18, 2018	Dec. 17, 2019
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 08, 2018	Oct. 07, 2019
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 04, 2018	Oct. 03, 2019
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC104-SM-SM-80 00	181106	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 08, 2018	Oct. 07, 2019
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 08, 2018	Oct. 07, 2019
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 08, 2018	Oct. 07, 2019
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 08, 2018	Oct. 07, 2019
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

## 1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 22 Subpart H

ANSI C63.4-2014

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

FCC KDB 971168 D02 Misc Rev Approv License Devices v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

## 1.6 Deviation from Test Standard and Measurement Procedure

None



## 1.7 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
Radiated emission $\leq$ 1GHz	$\pm 3.41$ dB
Radiated emission $>$ 1GHz	$\pm 4.59$ dB

## 2 Test Configuration

### 2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	22°C / 61%	Aska Huang

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

### 2.2 The Worst Test Modes and Channel Details

GPRS 850 / WCDMA BAND V		
Test item	Mode	Test Channel
Effective Radiated Power	GPRS WCDMA	128, 189, 251 4132, 4183, 4233
Radiated Emissions ≤ 1GHz	GPRS WCDMA	251 4233
Radiated Emissions > 1GHz	GPRS WCDMA	128, 189, 251 4132, 4183, 4233

LTE Band 5			
Test item	Channel Bandwidths	Modulation	Test channel
Effective Radiated Power	1.4 MHz	QPSK / 16QAM	20407 / 20525 / 20643
	3 MHz	QPSK / 16QAM	20415 / 20525 / 20635
	5 MHz	QPSK / 16QAM	20425 / 20525 / 20625
	10 MHz	QPSK / 16QAM	20450 / 20525 / 20600
Radiated Emission ≤ 1GHz	1.4 MHz	QPSK	20407
	3 MHz	QPSK	20415
	5 MHz	QPSK	20425
	10 MHz	QPSK	20450
Radiated Emission > 1GHz	1.4 MHz	QPSK	20407 / 20525 / 20643
	3 MHz	QPSK	20415 / 20525 / 20635
	5 MHz	QPSK	20425 / 20525 / 20625
	10 MHz	QPSK	20450 / 20525 / 20600

## 3 Test Results

### 3.1 Effective Radiated Power

#### 3.1.1 Limit of Effective Radiated Power

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

#### 3.1.2 Test Procedures

##### For E.R.P measurement

EPR can be calculated by below formula from KDB 412172 D01.

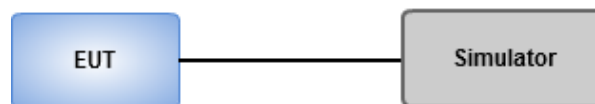
1.  $EIRP = P_T + G_T - L_C$   
 $P_T$  = transmitter output power, in dBm.  
 $G_T$  = gain of the transmitting antenna, in dBi (EIRP).  
 $L_C$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.
2.  $ERP = EIRP - 2.15 \text{ dB}$ .

##### For Conducted power measurement

1. The EUT links up with simulator and is set to maximum output power level at low / middle / high channel.
2. Measure the output power of low / middle / high channel of the EUT

#### 3.1.3 Test Setup

##### Conducted Power Measurement



### 3.1.4 Test Result of Effective Radiated Power (dBm)

Mode		GPRS 850 (GMSK 1 Slot)					
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (W)	Limit (W)
128	824.2	33.62	0.5	34.12	31.97	1.574	7
189	836.4	33.41	0.5	33.91	31.76	1.500	7
251	848.8	33.71	0.5	34.21	32.06	1.607	7

Mode		EDGE 850 (8PSK 1 Slot)					
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (W)	Limit (W)
128	824.2	26.98	0.5	27.48	25.33	0.341	7
189	836.4	26.92	0.5	27.42	25.27	0.337	7
251	848.8	26.96	0.5	27.46	25.31	0.340	7

Mode		WCDMA BAND V					
Channel	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (W)	Limit (W)
4132	826.4	22.17	0.5	22.67	20.52	0.113	7
4182	836.4	22.25	0.5	22.75	20.6	0.115	7
4233	846.6	22.29	0.5	22.79	20.64	0.116	7

Note1: EIRP = Conducted Output Power + Antenna Gain.

Note2: ERP = EIRP - 2.15.

Note3: Conducted power refers to test report of FCC ID: QIPPLS62-W. Test report no.: I17D00184-SRD05

Bandwidth	RB size/offset	Freq. (MHz)	Power (dBm)			Antenna Gain (dBi)	E.I.R.P Power (dBm)	E.R.P Power (dBm)	E.R.P Power (W)	E.R.P Limit (W)
			QPSK	16QAM	max Power					
1.4MHz	1 RB high	848.3	22.12	21.28	22.12	0.5	22.62	20.47	0.111	7
		836.5	22.17	21.17	22.17	0.5	22.67	20.52	0.113	7
		824.7	23.01	22.17	23.01	0.5	23.51	21.36	0.137	7
	1 RB low	848.3	22.3	21.34	22.3	0.5	22.8	20.65	0.116	7
		836.5	22.28	21.21	22.28	0.5	22.78	20.63	0.116	7
		824.7	23.06	22.14	23.06	0.5	23.56	21.41	0.138	7
	50% RB mid	848.3	22.19	22.18	22.19	0.5	22.69	20.54	0.113	7
		836.5	22.21	22.2	22.21	0.5	22.71	20.56	0.114	7
		824.7	23.05	23.08	23.08	0.5	23.58	21.43	0.139	7
	100% RB	848.3	21.17	20.1	21.17	0.5	21.67	19.52	0.090	7
		836.5	21.04	20.13	21.04	0.5	21.54	19.39	0.087	7
		824.7	21.96	20.91	21.96	0.5	22.46	20.31	0.107	7
3MHz	1 RB high	847.5	22.11	21.3	22.11	0.5	22.61	20.46	0.111	7
		836.5	22.01	21.38	22.01	0.5	22.51	20.36	0.109	7
		825.5	22.18	21.38	22.18	0.5	22.68	20.53	0.113	7
	1 RB low	847.5	22.22	21.44	22.22	0.5	22.72	20.57	0.114	7
		836.5	22.25	21.47	22.25	0.5	22.75	20.6	0.115	7
		825.5	22.3	21.51	22.3	0.5	22.8	20.65	0.116	7
	50% RB mid	847.5	21.04	20.2	21.04	0.5	21.54	19.39	0.087	7
		836.5	20.99	20.12	20.99	0.5	21.49	19.34	0.086	7
		825.5	21.28	20.31	21.28	0.5	21.78	19.63	0.092	7
	100% RB	847.5	21.19	20.23	21.19	0.5	21.69	19.54	0.090	7
		836.5	21.03	20.1	21.03	0.5	21.53	19.38	0.087	7
		825.5	21.19	20.28	21.19	0.5	21.69	19.54	0.090	7

Note1: EIRP = Conducted Output Power + Antenna Gain.

Note2: ERP = EIRP - 2.15.

Note3: Conducted power refers to test report of FCC ID: QIPPLS62-W. Test report no.: I17D00184-SRD06

Bandwidth	RB size/offset	Freq. (MHz)	Power (dBm)			Antenna Gain (dBi)	E.I.R.P Power (dBm)	E.R.P Power (dBm)	E.R.P Power (W)	E.R.P Limit (W)
			QPSK	16QAM	max Power					
5MHz	1 RB high	846.5	22.07	21.22	22.07	0.5	22.57	20.42	0.110	7
		836.5	22.08	20.78	22.08	0.5	22.58	20.43	0.110	7
		826.5	22.17	21.24	22.17	0.5	22.67	20.52	0.113	7
	1 RB low	846.5	22.3	21.27	22.3	0.5	22.8	20.65	0.116	7
		836.5	22.17	20.75	22.17	0.5	22.67	20.52	0.113	7
		826.5	22.35	21.41	22.35	0.5	22.85	20.7	0.117	7
	50% RB mid	846.5	21.12	21.12	21.12	0.5	21.62	19.47	0.089	7
		836.5	21.02	21.02	21.02	0.5	21.52	19.37	0.086	7
		826.5	21.17	21.21	21.21	0.5	21.71	19.56	0.090	7
	100% RB	846.5	21.13	20.22	21.13	0.5	21.63	19.48	0.089	7
		836.5	21.05	20.08	21.05	0.5	21.55	19.4	0.087	7
		826.5	21.04	20.38	21.04	0.5	21.54	19.39	0.087	7
10MHz	1 RB high	844	22.02	21.12	22.02	0.5	22.52	20.37	0.109	7
		836.5	21.89	21.33	21.89	0.5	22.39	20.24	0.106	7
		829	21.88	21.07	21.88	0.5	22.38	20.23	0.105	7
	1 RB low	844	22.03	21.26	22.03	0.5	22.53	20.38	0.109	7
		836.5	21.99	21.48	21.99	0.5	22.49	20.34	0.108	7
		829	22.19	21.39	22.19	0.5	22.69	20.54	0.113	7
	50% RB mid	844	21.08	21.07	21.08	0.5	21.58	19.43	0.088	7
		836.5	20.93	20.92	20.93	0.5	21.43	19.28	0.085	7
		829	20.99	20.97	20.99	0.5	21.49	19.34	0.086	7
	100% RB	844	21.08	20.14	21.08	0.5	21.58	19.43	0.088	7
		836.5	20.99	20.09	20.99	0.5	21.49	19.34	0.086	7
		829	21.18	20.13	21.18	0.5	21.68	19.53	0.090	7

Note1: EIRP = Conducted Output Power + Antenna Gain.

Note2: ERP = EIRP - 2.15.

Note3: Conducted power refers to test report of FCC ID: QIPPLS62-W. Test report no.: I17D00184-SRD06

### 3.1.5 Verification of Conducted Output Power

Mode	GPRS 850 (GMSK 1 Slot)		
Channel	Frequency (MHz)	Conducted Output Power (dBm)	
		Original	Verified
128	824.2	33.62	32.68
189	836.4	33.41	32.56
251	848.8	33.71	33.02

Mode	EDGE 850 (8PSK 1 Slot)		
Channel	Frequency (MHz)	Conducted Output Power (dBm)	
		Original	Verified
128	824.2	26.98	26.61
189	836.4	26.92	26.56
251	848.8	26.96	26.51

Mode	WCDMA BAND V		
Channel	Frequency (MHz)	Conducted Output Power (dBm)	
		Original	Verified
4132	826.4	22.17	23.08
4182	836.4	22.25	22.94
4233	846.6	22.29	23.16

Mode	LTE					
Bandwidth	RB size/offset	Freq. (MHz)	Conducted Output Power (dBm)			
			QPSK		16QAM	
			Original	Verified	Original	Verified
1.4MHz	1 RB high	848.3	22.12	22.73	21.28	22.07
		836.5	22.17	22.65	21.17	21.71
		824.7	23.01	22.86	22.17	21.86
	1 RB low	848.3	22.3	22.74	21.34	22.01
		836.5	22.28	22.77	21.21	21.76
		824.7	23.06	22.95	22.14	21.96
	50% RB mid	848.3	22.19	22.67	22.18	21.84
		836.5	22.21	22.58	22.2	21.72
		824.7	23.05	22.88	23.08	22.11
	100% RB	848.3	21.17	21.74	20.1	20.77
		836.5	21.04	21.67	20.13	20.91
		824.7	21.96	21.89	20.91	21.04

## 3.2 Radiated Emissions

### 3.2.1 Limit of Radiated Emissions

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 equal to -13dBm.

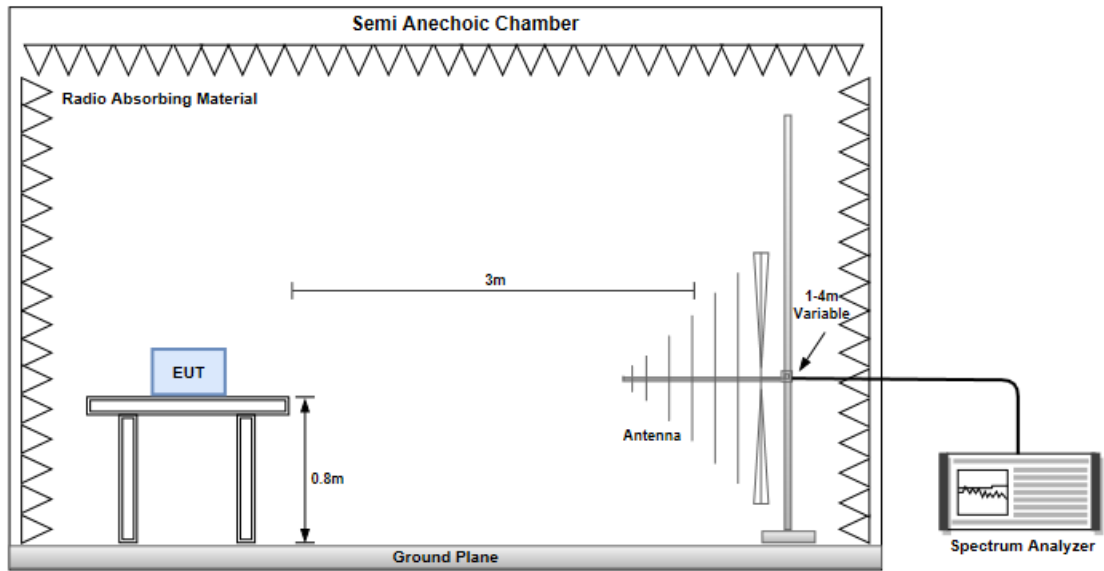
### 3.2.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:  
 $E.R.P = E.I.R.P - 2.15dB.$

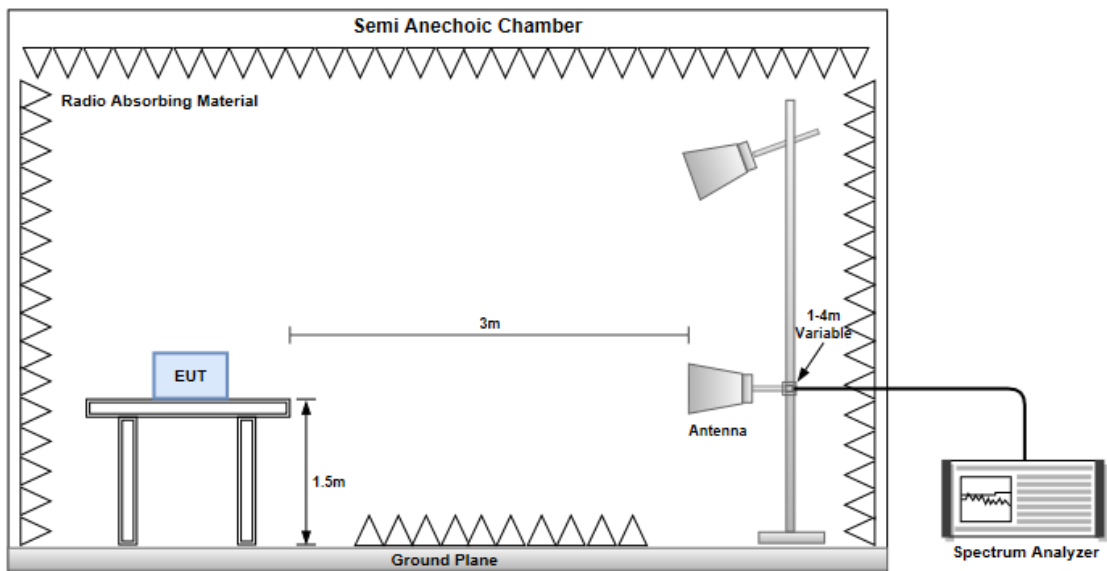


### 3.2.3 Test Setup

#### Radiated Emissions below 1 GHz



#### Radiated Emissions above 1 GHz



### 3.2.4 Test Result of Radiated Emissions below 1GHz

Mode		GPRS, Channel : 251					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
202.66	H	-70.51	-13.00	-57.51	-64.08	-65.93	-2.43
520.82	H	-65.36	-13.00	-52.36	-66.38	-61.78	-1.43
641.10	H	-35.48	-13.00	-22.48	-38.34	-31.55	-1.78
911.73	H	-41.57	-13.00	-28.57	-48.52	-36.72	-2.70
940.83	H	-41.62	-13.00	-28.62	-48.80	-36.56	-2.91
997.09	H	-43.11	-13.00	-30.11	-50.52	-38.20	-2.76
90.14	V	-64.77	-13.00	-51.77	-62.77	-57.49	-5.13
520.82	V	-75.15	-13.00	-62.15	-63.09	-71.57	-1.43
641.10	V	-37.86	-13.00	-24.86	-43.50	-33.93	-1.78
909.79	V	-43.70	-13.00	-30.70	-53.00	-38.86	-2.69
940.83	V	-39.52	-13.00	-26.52	-48.90	-34.46	-2.91
997.09	V	-41.70	-13.00	-28.70	-51.05	-36.79	-2.76

Mode		WCDMA RMC, Channel : 4233					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
202.66	H	-70.39	-13.00	-57.39	-63.96	-63.11	-5.13
520.82	H	-65.32	-13.00	-52.32	-66.34	-61.74	-1.43
641.10	H	-35.43	-13.00	-22.43	-38.29	-31.50	-1.78
911.73	H	-28.45	-13.00	-15.45	-35.40	-23.61	-2.69
940.83	H	-41.56	-13.00	-28.56	-48.74	-36.50	-2.91
997.09	H	-112.15	-13.00	-99.15	-37.39	-107.24	-2.76
90.14	V	-64.74	-13.00	-51.74	-62.74	-42.62	-19.97
520.82	V	-60.15	-13.00	-47.15	-62.94	-52.87	-5.13
641.10	V	-37.81	-13.00	-24.81	-43.45	-30.50	-5.16
909.79	V	-43.84	-13.00	-30.84	-53.14	-35.94	-5.75
940.83	V	-39.59	-13.00	-26.59	-48.97	-36.17	-1.27
997.09	V	-41.68	-13.00	-28.68	-51.03	-36.58	-2.95

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode							
LTE Band 5, QPSK, CB:1.4 MHz, 1 RB Offset 0, Channel: 20407							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.97	H	-66.36	-13.00	-53.36	-73.73	-44.51	-19.70
52.31	H	-71.68	-13.00	-58.68	-72.82	-53.83	-15.70
90.14	H	-67.66	-13.00	-54.66	-64.06	-60.38	-5.13
154.16	H	-65.69	-13.00	-52.69	-62.85	-56.80	-6.74
814.73	H	-51.06	-13.00	-38.06	-57.16	-46.69	-2.22
936.95	H	-65.99	-13.00	-52.99	-73.13	-60.96	-2.88
30.97	V	-61.46	-13.00	-48.46	-59.37	-39.61	-19.70
57.16	V	-70.27	-13.00	-57.27	-67.53	-53.43	-14.69
90.14	V	-67.49	-13.00	-54.49	-65.49	-60.21	-5.13
814.73	V	-47.98	-13.00	-34.98	-54.29	-43.61	-2.22
953.44	V	-58.80	-13.00	-45.80	-68.19	-53.70	-2.95
959.26	V	-60.82	-13.00	-47.82	-70.21	-55.74	-2.93

Mode							
LTE Band 5, QPSK, CB:3 MHz, 1 RB Offset 0, Channel: 20415							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.97	H	-66.32	-13.00	-53.32	-73.69	-44.47	-19.70
52.31	H	-71.57	-13.00	-58.57	-72.71	-53.72	-15.70
90.14	H	-67.80	-13.00	-54.80	-64.20	-60.52	-5.13
154.16	H	-65.75	-13.00	-52.75	-62.91	-56.86	-6.74
814.73	H	-51.29	-13.00	-38.29	-57.39	-46.92	-2.22
936.95	H	-66.12	-13.00	-53.12	-73.26	-61.09	-2.88
30.97	V	-61.58	-13.00	-48.58	-59.37	-39.73	-19.70
57.16	V	-69.60	-13.00	-56.60	-68.04	-52.76	-14.69
90.14	V	-67.75	-13.00	-54.75	-65.45	-60.47	-5.13
814.73	V	-56.52	-13.00	-43.52	-45.91	-52.15	-2.22
953.44	V	-70.36	-13.00	-57.36	-56.67	-65.26	-2.95
959.26	V	-59.27	-13.00	-46.27	-45.58	-54.19	-2.93

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode							
LTE Band 5, QPSK, CB:5 MHz, 1 RB Offset 0, Channel: 20425							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.97	H	-66.10	-13.00	-53.10	-73.47	-44.25	-19.70
52.31	H	-71.62	-13.00	-58.62	-72.76	-53.77	-15.70
90.14	H	-67.77	-13.00	-54.77	-64.17	-60.49	-5.13
154.16	H	-65.59	-13.00	-52.59	-62.75	-56.70	-6.74
814.73	H	-50.95	-13.00	-37.95	-57.05	-46.58	-2.22
936.95	H	-65.87	-13.00	-52.87	-73.01	-60.84	-2.88
30.97	V	-61.43	-13.00	-48.43	-59.34	-39.58	-19.70
57.16	V	-70.48	-13.00	-57.48	-67.74	-53.64	-14.69
90.14	V	-67.44	-13.00	-54.44	-65.44	-60.16	-5.13
814.73	V	-47.85	-13.00	-34.85	-54.16	-43.48	-2.22
953.44	V	-51.92	-13.00	-38.92	-61.31	-46.82	-2.95
959.26	V	-61.14	-13.00	-48.14	-70.53	-56.06	-2.93

Mode							
LTE Band 5, QPSK, CB:10 MHz, 1 RB Offset 0, Channel: 20450							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.97	H	-66.44	-13.00	-53.44	-51.29	-44.59	-19.70
52.31	H	-71.45	-13.00	-58.45	-56.30	-53.60	-15.70
90.14	H	-67.67	-13.00	-54.67	-52.52	-60.39	-5.13
154.16	H	-65.71	-13.00	-52.71	-50.56	-56.82	-6.74
814.73	H	-51.43	-13.00	-38.43	-36.28	-47.06	-2.22
936.95	H	-65.96	-13.00	-52.96	-50.81	-60.93	-2.88
30.97	V	-61.35	-13.00	-48.35	-59.26	-39.50	-19.70
57.16	V	-70.39	-13.00	-57.39	-67.65	-53.55	-14.69
90.14	V	-67.54	-13.00	-54.54	-65.54	-60.26	-5.13
814.73	V	-48.26	-13.00	-35.26	-54.57	-43.89	-2.22
953.44	V	-58.69	-13.00	-45.69	-68.08	-53.59	-2.95
959.26	V	-47.81	-13.00	-34.81	-57.20	-42.73	-2.93

NOTE: ERP = S.G power value + correction factor - 2.15.

### 3.2.5 Test Result of Radiated Emissions above 1GHz

Mode		GPRS, Channel : 128					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
2472.60	H	-55.43	-13.00	-42.43	-62.65	-59.59	6.31
7417.80	H	-35.94	-13.00	-22.94	-53.48	-37.12	3.33
8242.00	H	-41.18	-13.00	-28.18	-59.17	-42.07	3.04
2472.60	V	-44.86	-13.00	-31.86	-52.00	-49.02	6.31
7417.80	V	-34.33	-13.00	-21.33	-52.35	-35.51	3.33
8242.00	V	-41.00	-13.00	-28.00	-59.03	-41.89	3.04

Mode		GPRS, Channel : 189					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
2509.20	H	-49.56	-13.00	-36.56	-56.79	-53.86	6.45
7527.60	H	-39.72	-13.00	-26.72	-56.49	-40.99	3.42
8364.00	H	-43.09	-13.00	-30.09	-61.56	-44.25	3.31
2509.20	V	-41.55	-13.00	-28.55	-48.60	-45.85	6.45
7527.60	V	-37.87	-13.00	-24.87	-55.27	-39.14	3.42
8364.00	V	-42.21	-13.00	-29.21	-60.40	-43.37	3.31

Mode		GPRS, Channel : 251					
Frequency (MHz)	Antenna Polarity.	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
2546.40	H	-47.92	-13.00	-34.92	-55.15	-52.35	6.58
7639.20	H	-36.33	-13.00	-23.33	-52.89	-37.64	3.46
8488.00	H	-40.06	-13.00	-27.06	-58.87	-41.07	3.16
2546.40	V	-42.65	-13.00	-29.65	-49.60	-47.08	6.58
7639.20	V	-34.47	-13.00	-21.47	-51.68	-35.78	3.46
8488.00	V	-39.39	-13.00	-26.39	-57.80	-40.40	3.16

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode		WCDMA, Channel : 4132					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1652.80	H	-50.35	-13.00	-37.35	-52.42	-54.04	5.84
2479.20	H	-45.42	-13.00	-32.42	-52.65	-49.61	6.34
3305.60	H	-46.30	-13.00	-33.30	-55.37	-51.24	7.09
1652.80	V	-46.48	-13.00	-33.48	-48.56	-50.17	5.84
2479.20	V	-48.24	-13.00	-35.24	-55.37	-52.43	6.34
3305.60	V	-46.09	-13.00	-33.09	-55.22	-51.03	7.09

Mode		WCDMA, Channel : 4182					
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1673.20	H	-48.14	-13.00	-35.14	-50.39	-51.91	5.92
2509.80	H	-46.55	-13.00	-33.55	-53.78	-50.85	6.45
3346.40	H	-48.37	-13.00	-35.37	-57.22	-53.47	7.25
1673.20	V	-44.79	-13.00	-31.79	-47.01	-48.56	5.92
2509.80	V	-48.97	-13.00	-35.97	-56.02	-53.27	6.45
3346.40	V	-48.26	-13.00	-35.26	-57.16	-53.36	7.25

Mode		WCDMA, Channel : 4233					
Frequency (MHz)	Antenna Polarity.	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1693.20	H	-49.00	-13.00	-36.00	-51.42	-52.86	6.01
2539.80	H	-44.42	-13.00	-31.42	-51.65	-48.83	6.56
3386.40	H	-49.83	-13.00	-36.83	-58.45	-55.10	7.42
1693.20	V	-45.34	-13.00	-32.34	-47.68	-49.20	6.01
2539.80	V	-47.42	-13.00	-34.42	-54.39	-51.83	6.56
3386.40	V	-50.02	-13.00	-37.02	-58.68	-55.29	7.42

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode							
LTE Band 5, QPSK, CB:1.4 MHz, 1 RB Offset 0, Channel: 20407							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1648.40	H	-43.56	-13.00	-30.56	-45.59	-47.23	5.82
2472.60	H	-43.21	-13.00	-30.21	-50.43	-47.37	6.31
3296.80	H	-38.98	-13.00	-25.98	-48.09	-43.88	7.05
1648.40	V	-40.32	-13.00	-27.32	-42.37	-43.99	5.82
2472.60	V	-47.98	-13.00	-34.98	-55.12	-52.14	6.31
3296.80	V	-39.45	-13.00	-26.45	-48.63	-44.35	7.05

Mode							
LTE Band 5, QPSK, CB:1.4 MHz, 1 RB Offset 0, Channel: 20525							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1672.00	H	-41.89	-13.00	-28.89	-44.12	-45.66	5.92
2508.00	H	-44.43	-13.00	-31.43	-51.66	-48.72	6.44
3344.00	H	-41.31	-13.00	-28.31	-50.16	-46.41	7.25
1672.00	V	-38.00	-13.00	-25.00	-40.20	-41.77	5.92
2508.00	V	-49.00	-13.00	-36.00	-56.05	-53.29	6.44
3344.00	V	-42.04	-13.00	-29.04	-50.94	-47.14	7.25

Mode							
LTE Band 5, QPSK, CB:1.4 MHz, 1 RB Offset 0, Channel: 20643							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1695.60	H	-42.73	-13.00	-29.73	-45.18	-46.60	6.02
2543.40	H	-40.51	-13.00	-27.51	-47.74	-44.93	6.57
3391.20	H	-42.78	-13.00	-29.78	-51.38	-48.07	7.44
1695.60	V	-38.99	-13.00	-25.99	-41.36	-42.86	6.02
2543.40	V	-46.16	-13.00	-33.16	-53.12	-50.58	6.57
3391.20	V	-43.26	-13.00	-30.26	-51.90	-48.55	7.44

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode							
LTE Band 5, QPSK, CB:3 MHz, 1 RB Offset 0, Channel: 20415							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1648.80	H	-44.21	-13.00	-31.21	-46.24	-47.88	5.82
2473.20	H	-44.55	-13.00	-31.55	-51.77	-48.72	6.32
3297.60	H	-39.45	-13.00	-26.45	-48.55	-44.36	7.06
1648.80	V	-40.38	-13.00	-27.38	-42.43	-44.05	5.82
2473.20	V	-48.15	-13.00	-35.15	-55.29	-52.32	6.32
3297.60	V	-39.71	-13.00	-26.71	-48.88	-44.62	7.06

Mode							
LTE Band 5, QPSK, CB:3 MHz, 1 RB Offset 0, Channel: 20525							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1670.80	H	-42.01	-13.00	-29.01	-44.23	-45.77	5.91
2506.20	H	-44.66	-13.00	-31.66	-51.89	-48.95	6.44
3341.60	H	-41.65	-13.00	-28.65	-50.52	-46.74	7.24
1670.80	V	-38.11	-13.00	-25.11	-40.31	-41.87	5.91
2506.20	V	-49.14	-13.00	-36.14	-56.20	-53.43	6.44
3341.60	V	-42.27	-13.00	-29.27	-51.19	-47.36	7.24

Mode							
LTE Band 5, QPSK, CB:3 MHz, 1 RB Offset 0, Channel: 20635							
Frequency (MHz)	Antenna Polarity.	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1692.80	H	-42.94	-13.00	-29.94	-45.36	-46.80	6.01
2539.20	H	-40.66	-13.00	-27.66	-47.89	-45.07	6.56
3385.60	H	-42.87	-13.00	-29.87	-51.50	-48.14	7.42
1692.80	V	-39.20	-13.00	-26.20	-41.54	-43.06	6.01
2539.20	V	-46.31	-13.00	-33.31	-53.29	-50.72	6.56
3385.60	V	-43.63	-13.00	-30.63	-52.29	-48.90	7.42

NOTE: ERP = S.G power value + correction factor - 2.15.



Mode							
LTE Band 5, QPSK, CB:5 MHz, 1 RB Offset 0, Channel: 20425							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1648.60	H	-43.48	-13.00	-30.48	-45.51	-47.15	5.82
2472.90	H	-44.36	-13.00	-31.36	-51.58	-48.53	6.32
3297.20	H	-39.60	-13.00	-26.60	-48.71	-44.50	7.05
1648.60	V	-40.48	-13.00	-27.48	-42.53	-44.15	5.82
2472.90	V	-47.33	-13.00	-34.33	-54.47	-51.50	6.32
3297.20	V	-39.23	-13.00	-26.23	-48.40	-44.13	7.05

Mode							
LTE Band 5, QPSK, CB:5 MHz, 1 RB Offset 0, Channel: 20525							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1668.60	H	-42.11	-13.00	-29.11	-44.32	-45.86	5.90
2502.90	H	-44.52	-13.00	-31.52	-51.75	-48.80	6.43
3337.20	H	-41.64	-13.00	-28.64	-50.53	-46.71	7.22
1668.60	V	-38.16	-13.00	-25.16	-40.35	-41.91	5.90
2502.90	V	-49.16	-13.00	-36.16	-56.23	-53.44	6.43
3337.20	V	-42.33	-13.00	-29.33	-51.28	-47.40	7.22

Mode							
LTE Band 5, QPSK, CB:5 MHz, 1 RB Offset 0, Channel: 20625							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1688.60	H	-42.84	-13.00	-29.84	-45.23	-46.68	5.99
2532.90	H	-41.66	-13.00	-28.66	-48.89	-46.05	6.54
3377.20	H	-42.23	-13.00	-29.23	-50.91	-47.47	7.39
1688.60	V	-38.34	-13.00	-25.34	-40.66	-42.18	5.99
2532.90	V	-46.36	-13.00	-33.36	-53.35	-50.75	6.54
3377.20	V	-42.72	-13.00	-29.72	-51.44	-47.96	7.39

NOTE: ERP = S.G power value + correction factor - 2.15.

Mode							
LTE Band 5, QPSK, CB:10 MHz, 1 RB Offset 0, Channel: 20450							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1649.20	H	-39.45	-13.00	-26.45	-41.48	-43.12	5.82
2473.80	H	-44.29	-13.00	-31.29	-51.51	-48.46	6.32
3298.40	H	-40.11	-13.00	-27.11	-49.21	-45.02	7.06
1649.20	V	-40.84	-13.00	-27.84	-42.90	-44.51	5.82
2473.80	V	-48.45	-13.00	-35.45	-55.58	-52.62	6.32
3298.40	V	-39.65	-13.00	-26.65	-48.82	-44.56	7.06

Mode							
LTE Band 5, QPSK, CB:10 MHz, 1 RB Offset 0, Channel: 20525							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1664.20	H	-41.36	-13.00	-28.36	-43.53	-45.10	5.89
2496.30	H	-44.42	-13.00	-31.42	-51.65	-48.67	6.40
3328.40	H	-41.25	-13.00	-28.25	-50.19	-46.28	7.18
1664.20	V	-36.52	-13.00	-23.52	-38.67	-40.26	5.89
2496.30	V	-49.24	-13.00	-36.24	-56.33	-53.49	6.40
3328.40	V	-42.74	-13.00	-29.74	-51.73	-47.77	7.18

Mode							
LTE Band 5, QPSK, CB:10 MHz, 1 RB Offset 0, Channel: 20600							
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
1679.20	H	-43.16	-13.00	-30.16	-45.46	-46.96	5.95
2518.80	H	-40.66	-13.00	-27.66	-47.89	-44.99	6.48
3358.40	H	-43.18	-13.00	-30.18	-51.95	-48.34	7.31
1679.20	V	-39.14	-13.00	-26.14	-41.39	-42.94	5.95
2518.80	V	-47.27	-13.00	-34.27	-54.30	-51.60	6.48
3358.40	V	-42.90	-13.00	-29.90	-51.72	-48.06	7.31

NOTE: ERP = S.G power value + correction factor - 2.15.

## 4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

### **Linkou**

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin  
Kou District, New Taipei City,  
Taiwan, R.O.C.

### **Kwei Shan**

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,  
Kwei Shan District, Tao Yuan City  
333, Taiwan, R.O.C.

### **Kwei Shan Site II**

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd  
St., Kwei Shan District, Tao Yuan  
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

==END==