

: 1 of 24

Page Number



FCC RADIO TEST REPORT

FCC ID : UDX-60053020

Equipment : LTE & Wi-Fi Router

Brand Name : CISCO

Model Name : Z3C-HW-NA

Applicant : Cisco Systems, Inc.

170 West Tasman Drive, San Jose, CA 95134

Standard : 47 CFR Part 2, 22(H), 24(E), 27

The product was received on Jan. 17, 2018 and testing was started from May 21, 2018 and completed on Jun. 07, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

TEL: 886-3-327-3456

Ince Tsui

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018
Report Template No.: BU5-FGLTE Version 2.1 Report Version : 01

Table of Contents

Report No. : FG811724B

: 2 of 24

: 01

: Jul. 27, 2018

His	story c	of this test report	3
Su	mmar	y of Test Result	4
1	Gene	eral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Modification of EUT	5
	1.3	Testing Location	5
	1.4	Applicable Standards	6
2	Test	Configuration of Equipment Under Test	7
	2.1	Test Mode	7
	2.2	Connection Diagram of Test System	9
	2.3	Support Unit used in test configuration and system	9
	2.4	Measurement Results Explanation Example	9
	2.5	Frequency List of Low/Middle/High Channels	10
3	Conc	lucted Test Items	12
	3.1	Measuring Instruments	12
	3.2	Conducted Output Power and ERP/EIRP	13
	3.3	Peak-to-Average Ratio	14
	3.4	Occupied Bandwidth	15
	3.5	Conducted Band Edge	16
	3.6	Conducted Spurious Emission	18
	3.7	Frequency Stability	19
4	Radia	ated Test Items	20
	4.1	Measuring Instruments	20
	4.2	Radiated Spurious Emission	21
5	List	of Measuring Equipment	22
6	Unce	ertainty of Evaluation	24
Аp	pendi	x A. Test Results of Conducted Test	
Аp	pendi	x B. Test Results of ERP/EIRP and Radiated Test	
Аp	pendi	x C. Test Setup Photographs	

TEL: 886-3-327-3456 Page Number FAX: 886-3-328-4978 Issued Date

History of this test report

Report No. : FG811724B

Report No.	Version	Description	Issued Date
FG811724B	01	Initial issue of report	Jul. 27, 2018

TEL: 886-3-327-3456 Page Number : 3 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

Summary of Test Result

Report No. : FG811724B

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
	§2.1046	Conducted Output Power	Reporting only	
	§22.913 (a)(2)	Effective Radiated Power (Band 5)		
3.2	§27.50 (b)(10) §27.50 (c)(10)	Effective Radiated Power (Band 13) (Band 17)		-
	§24.232 (c)	Equivalent Isotropic Radiated Power (Band 2)	Pass	
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4)		
3.3	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	\$2.1051 \$22.917 (a) \$24.238 (a) \$27.53 (c)(2)(4) \$27.53 (g) \$27.53 (h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 13) (Band 17)	Pass	-
3.6	\$2.1051 \$22.917 (a) \$24.238 (a) \$27.53 (c)(2) \$27.53 (g) \$27.53 (h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 13) (Band 17)	Pass	-
3.7	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	Pass	-
4.2	\$2.1053 \$22.917 (a) \$24.238 (a) \$27.53 (c)(2) \$27.53 (f) \$27.53 (g) \$27.53 (h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 13) (Band 17)	Pass	Under limit 21.87 dB at 1560.000 MHz

Reviewed by: Joseph Lin Report Producer: Polly Tsai

TEL: 886-3-327-3456 Page Number : 4 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, and Wi-Fi 5GHz 802.11a/n/ac.

Product Specification subjective to this standard							
	WWAN: PIFA Antenna						
	WLAN						
Antenna Type	<ant. 1="">: PIFA Antenna</ant.>						
	<ant. 2="">: Dipole Antenna</ant.>						
	Bluetooth: PIFA Antenna						

Report No.: FG811724B

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.					
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978					
Test Site No.	Sporton Site No.					
rest site No.	TH05-HY					

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC.					
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855					
Test Site No.	Sporton Site No. 03CH13-HY					

Note: The test site complies with ANSI C63.4 2014 requirement.

TEL: 886-3-327-3456 Page Number : 5 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Report No.: FG811724B

- + ANSI C63.26-2015
- ANSI / TIA-603-E
- 47 CFR Part 2, 22(H), 24(E), 27
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

TEL: 886-3-327-3456 Page Number : 6 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Report No.: FG811724B

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

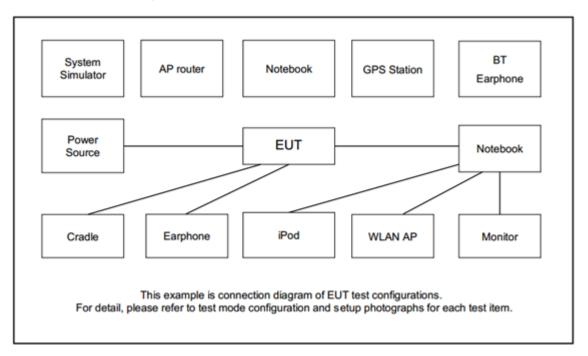
			В	andwic	lth (MH	z)		Modu	lation		RB#		Tes	t Chan	inel
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	М	н
	2	v	٧	v	v	٧	v	v	v	v	v	v	٧	v	v
Max.	4	v	>	٧	V	>	٧	٧	v	٧	٧	v	>	٧	v
Output	5	v	٧	٧	V	•	-	٧	v	v	v	v	٧	٧	v
Power	13	-	•	v	v	•	-	v	v	v	v	v	٧	v	v
	17	-	-	v	v	-	-	v	v	v	v	v	V	٧	v
	2						v	V	v	v		v	٧	٧	v
	4						v	v	v	v		v	٧	v	v
Peak-to-Av erage Ratio	5				v	•	•	v	v	v		v	٧	v	v
3	13	-	•		v	•	-	V	v	v		v	>	v	v
	17	-	•		V	•	-	٧	v	v		v	٧	v	v
	2	v	>	v	v	>	v	V	v			v	>	v	v
26dB and	4	v	٧	v	v	v	v	v	v			v	٧	v	v
99%	5	v	V	v	v	-	-	v	v			v	٧	v	v
Bandwidth	13	-	-	v	v	-	-	v	v			v	٧	v	v
	17	-	-	v	v	-	-	v	v			v	v	٧	v
	2	v	٧	v	v	٧	v	v	v	v		v	٧		v
	4	v	>	v	v	>	v	V	v	v		v	>		v
Conducted Band Edge	5	v	٧	v	v	•	-	v	v	v		v	v		v
90	13	-	-	v	v	-	-	v	v	v		v	v		v
	17	-	-	v	v	-	-	v	v	v		v	v		v

TEL: 886-3-327-3456 Page Number : 7 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

			В	andwid	lth (MH	lz)		Modu	lation		RB#		Test Channel		
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	М	Н
	2	v	v	v	v	v	v	V	٧	٧			٧	v	v
Conducted	4	v	v	v	v	v	v	v	٧	٧			v	v	v
Spurious	5	v	v	v	v	-	-	v	٧	٧			v	v	v
Emission	13	-	-	v	v	-	-	v	٧	>			٧	v	v
	17	-	-	٧	v	-	-	v	٧	>			v	V	V
	2				٧			v				v		٧	
	4				v			v				v		v	
Frequency Stability	5				v	-	-	V				v		v	
,	13	-	-		v	-	-	v				v		v	
	17	-	-		v	-	-	v				v		v	
	2	v	v	٧	v	v	v	V	٧	>	v		>	v	v
	4	v	v	v	v	v	v	v	٧	٧	v		v	v	v
E.R.P / E.I.R.P	5	v	v	v	v	-	-	v	V	v	v		v	v	v
	13	-	-	v	v	-	-	v	V	v			v	v	v
	17	-	-	v	v	-	-	V	V	v			v	v	v
	2						We	orst Case					v	v	v
Radiated	4						W	orst Case					v	v	v
Spurious	5						W	orst Case					v	v	v
Emission	13						W	orst Case					v	v	v
	17							orst Case					v	v	v
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.														

TEL: 886-3-327-3456 Page Number : 8 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

2.2 Connection Diagram of Test System



Report No.: FG811724B

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example:

 $Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$

= 4.2 + 10 = 14.2 (dB)

TEL: 886-3-327-3456 Page Number : 9 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

2.5 Frequency List of Low/Middle/High Channels

	LTE Band 2 Channel and Frequency List											
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest								
20	Channel	18700	18900	19100								
20	Frequency	1860	1880	1900								
15	Channel	18675	18900	19125								
15	Frequency	1857.5	1880	1902.5								
10	Channel	18650	18900	19150								
10	Frequency	1855	1880	1905								
5	Channel	18625	18900	19175								
5	Frequency	1852.5	1880	1907.5								
3	Channel	18615	18900	19185								
3	Frequency	1851.5	1880	1908.5								
1.4	Channel	18607	18900	19193								
1.4	Frequency	1850.7	1880	1909.3								

Report No. : FG811724B

	LTE Band 4 Channel and Frequency List											
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest								
20	Channel	20050	20175	20300								
20	Frequency	1720	1732.5	1745								
15	Channel	20025	20175	20325								
15	Frequency	1717.5	1732.5	1747.5								
10	Channel	20000	20175	20350								
10	Frequency	1715	1732.5	1750								
5	Channel	19975	20175	20375								
5	Frequency	1712.5	1732.5	1752.5								
3	Channel	19965	20175	20385								
3	Frequency	1711.5	1732.5	1753.5								
1.4	Channel	19957	20175	20393								
1.4	Frequency	1710.7	1732.5	1754.3								

TEL: 886-3-327-3456 Page Number : 10 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

LTE Band 5 Channel and Frequency List											
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest							
10	Channel	20450	20525	20600							
10	Frequency	829	836.5	844							
5	Channel	20425	20525	20625							
5	Frequency	826.5	836.5	846.5							
3	Channel	20415	20525	20635							
3	Frequency	825.5	836.5	847.5							
1.4	Channel	20407	20525	20643							
1.4	Frequency	824.7	836.5	848.3							

LTE Band 13 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz) Lowest Middle High								
10	Channel	-	23230	-					
10	Frequency	-	782	-					
	Channel	23205	23230	23255					
5	Frequency	779.5	782	784.5					

LTE Band 17 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz) Lowest Middle High								
10	Channel	23780	23790	23800					
10	Frequency	709	710	711					
E	Channel	23755	23790	23825					
5	Frequency	706.5	710	713.5					

TEL: 886-3-327-3456 Page Number : 11 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

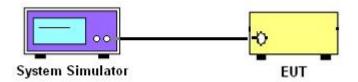
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

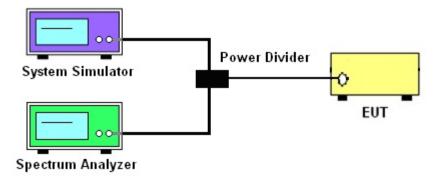
3.1.1 Test Setup

3.1.2 Conducted Output Power

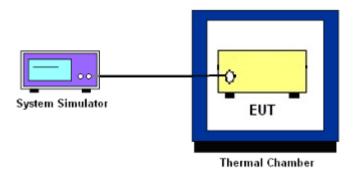


Report No.: FG811724B

3.1.3 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 12 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

Report No.: FG811724B

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 13 and Band 17.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2.

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4.

According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_C$, ERP = EIRP - 2.15, where

 P_T = transmitter output power in dBm

 G_T = gain of the transmitting antenna in dBi

 L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2.2 Test Procedures

- 1. The transmitter output port was connected to the system simulator.
- 2. Set EUT at maximum power through the system simulator.
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Measure and record the power level from the system simulator.

TEL: 886-3-327-3456 Page Number : 13 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Report No.: FG811724B

3.3.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.7.1

- 1. The EUT was connected to spectrum and system simulator via a power divider.
- 2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- 3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
- 4. Record the deviation as Peak to Average Ratio.

TEL: 886-3-327-3456 Page Number : 14 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.4 Occupied Bandwidth

3.4.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

Report No.: FG811724B

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 4.2

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
 The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
- 3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- 4. Set the detection mode to peak, and the trace mode to max hold.
- Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
 (this is the reference value)
- 6. Determine the "-26 dB down amplitude" as equal to (Reference Value X).
- 7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "–X dB down amplitude" determined in step 6. If a marker is below this "-X dB down amplitude" value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- 8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

TEL: 886-3-327-3456 Page Number : 15 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 - 849 MHz band, the FCC limit is $43 + 10\log_{10}(P[Watts])$ dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Report No.: FG811724B

24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + 10log₁₀(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (c)

For operations in the 776-788 MHz band, the FCC limit is $43 + 10\log_{10}(P[Watts])$ dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. In addition, the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least 65 + 10 log10 p(watts), dB, for mobile and portable equipment.

27.53 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53 (h)

For operations in the 1710 - 1755 MHz band, the FCC limit is $43 + 10\log_{10}(P[Watts])$ dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

TEL: 886-3-327-3456 Page Number : 16 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 2. The band edges of low and high channels for the highest RF powers were measured.
- 3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

Report No.: FG811724B

- 4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
- 5. Set spectrum analyzer with RMS detector.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- Checked that all the results comply with the emission limit line.
 The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

TEL: 886-3-327-3456 Page Number : 17 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

Report No.: FG811724B

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
 The path loss was compensated to the results for each measurement.
- 3. The middle channel for the highest RF power within the transmitting frequency was measured.
- 4. The conducted spurious emission for the whole frequency range was taken.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
- 6. Set spectrum analyzer with RMS detector.
- 7. Taking the record of maximum spurious emission.
- 8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 9. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

TEL: 886-3-327-3456 Page Number : 18 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

22.355

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

Report No.: FG811724B

24.235 & 27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

- 1. The EUT was set up in the thermal chamber and connected with the system simulator.
- 2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
- 3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

- 1. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
- 2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
- 3. The variation in frequency was measured for the worst case.

TEL: 886-3-327-3456 Page Number : 19 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

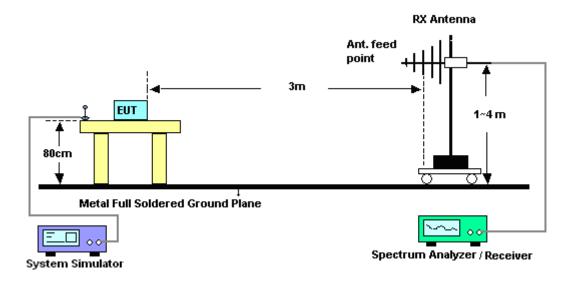
4 Radiated Test Items

4.1 Measuring Instruments

See list of measuring instruments of this test report.

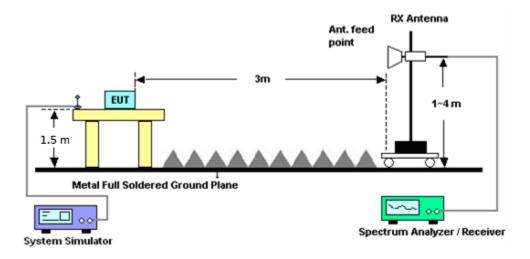
4.1.1 Test Setup

For radiated test from 30MHz to 1GHz



Report No.: FG811724B

For radiated test above 1GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

TEL: 886-3-327-3456 Page Number : 20 of 24 FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

4.2 Radiated Spurious Emission

4.2.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

Report No.: FG811724B

For LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions 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.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI / TIA-603-E Section 2.2.12.

- 1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- 6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- 7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- 8. Taking the record of output power at antenna port.
- Repeat step 7 to step 8 for another polarization.
- 10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

TEL: 886-3-327-3456 Page Number : 21 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	620143282 1	GSM/GPRS /WCDMA/LTE	Oct. 13, 2017	May 21, 2018~ May 22, 2018	Oct. 12, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 07, 2017	May 21, 2018~ May 22, 2018	Nov. 06, 2018	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-30°℃~70°℃	Aug. 28, 2017	May 21, 2018~ May 22, 2018	Aug. 27, 2018	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890001	1V~20V 0.5A~5A	Oct. 06, 2017	May 21, 2018~ May 22, 2018	Oct. 05, 2018	Conducted (TH05-HY)
Coupler	Warison	1-18GHz 20d B 25WSMA Directional C oupler	#B	1G~18GHz	Dec. 04, 2017	May 21, 2018~ May 22, 2018	Dec. 03, 2018	Conducted (TH05-HY)
Amplifier	Sonoma-Instru ment	310 N	187282	9KHz~1GHz	Jan. 19, 2018	May 31, 2018~ Jun. 07, 2018	Jan. 18, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&07	30MHz to 1GHz	Jan. 10, 2018	May 31, 2018~ Jun. 07, 2018	Jan. 09, 2019	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-124 1	1GHz ~ 18GHz	Jun. 15, 2017	May 31, 2018~ Jun. 07, 2018	Jun. 14, 2018	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 21, 2018	May 31, 2018~ Jun. 07, 2018	May 20, 2019	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY532701 47	1GHz~26.5GHz	Feb. 02, 2018	May 31, 2018~ Jun. 07, 2018	Feb. 01, 2019	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 15, 2018	May 31, 2018~ Jun. 07, 2018	Mar. 14, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN2	3G High Pass	Sep. 18, 2017	May 31, 2018~ Jun. 07, 2018	Sep. 17, 2018	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	May 31, 2018~ Jun. 07, 2018	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 31, 2018~ Jun. 07, 2018	N/A	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 251	18GHz- 40GHz	Nov. 10, 2017	May 31, 2018~ Jun. 07, 2018	Nov. 09, 2018	Radiation (03CH13-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 15, 2018	May 31, 2018~ Jun. 07, 2018	Jan. 14, 2019	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	May 31, 2018~ Jun. 07, 2018	Nov. 26, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-152 2	1G~18GHz	May 10, 2018	May 31, 2018~ Jun. 07, 2018	May 09, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-108 0-1200-15000 -60ST	SN3	1.2GHz High Pass Filter	Jul. 06, 2017	May 31, 2018~ Jun. 07, 2018	Jul. 05, 2018	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	May 31, 2018~ Jun. 07, 2018	N/A	Radiation (03CH13-HY)

Report No. : FG811724B

TEL: 886-3-327-3456 Page Number : 22 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER +	SUCOFLEX	0030/126E	30M-18G	Jan. 22. 2018	May 31, 2018~	Jan. 21, 2019	Radiation
RF Cable	SUHNER	126E	0030/126E	30IVI-10G	Jan. 22, 2016	Jun. 07, 2018	Jan. 21, 2019	(03CH13-HY)
RF Cable	HUBER +	SUCOFLEX	225044/4	30M-18G	lon 22 2019	May 31, 2018~	l 04 0040	Radiation
RF Cable	SUHNER	104	335041/4		Jan. 22, 2018	Jun. 07, 2018	Jan. 21, 2019	(03CH13-HY)
DE Cabla	HUBER +	SUCOFLEX	MY24961/	2014 40011-	lam 00 0040	May 31, 2018~	lan 04 0040	Radiation
RF Cable	SUHNER	104	4	30M~18GHz	Jan. 22, 2018	Jun. 07, 2018	Jan. 21, 2019	(03CH13-HY)

TEL: 886-3-327-3456 Page Number : 23 of 24 FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of	3.07
Confidence of 95% (U = 2Uc(y))	

Report No.: FG811724B

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of	2.49
Confidence of 95% (U = 2Uc(y))	3.48

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of	3.92
Confidence of 95% (U = 2Uc(y))	3.92

TEL: 886-3-327-3456 Page Number : 24 of 24
FAX: 886-3-328-4978 Issued Date : Jul. 27, 2018

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

	LTE Band 2 Maximum Average Power [dBm]							
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
20	1	0		23.33	22.91	22.62		
20	1	49		23.05	23.11	22.68		
20	1	99		22.98	22.72	22.05		
20	50	0	QPSK	21.99	21.66	21.45		
20	50	24		21.85	21.74	21.33		
20	50	50		21.67	21.75	21.12		
20	100	0		21.89	21.79	21.33		
20	1	0		22.23	21.81	21.56		
20	1	49		22.14	22.14	21.66		
20	1	99		22.00	21.81	21.05		
20	50	0	16-QAM	21.01	20.63	20.42		
20	50	24		20.81	20.68	20.39		
20	50	50		20.70	20.69	20.21		
20	100	0		20.86	20.75	20.38		
15	1	0		23.31	22.97	22.68		
15	1	37		23.31	23.08	22.39		
15	1	74		22.96	22.84	22.02		
15	36	0	QPSK	22.10	21.76	21.42		
15	36	20		21.97	21.81	21.24		
15	36	39		21.85	21.69	21.19		
15	75	0		21.91	21.78	21.23		
15	1	0		22.35	21.95	21.67		
15	1	37		22.50	22.15	21.51		
15	1	74		21.97	21.84	21.01		
15	36	0	16-QAM	21.12	20.78	20.51		
15	36	20		21.00	21.00	20.30		
15	36	39		20.85	20.72	20.18		
15	75	0		20.93	20.81	20.30		

	LTE Band 2 Maximum Average Power [dBm]							
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
10	1	0		23.25	23.10	22.61		
10	1	25		23.29	23.08	22.32		
10	1	49		23.04	22.96	22.06		
10	25	0	QPSK	22.26	21.84	21.27		
10	25	12		22.16	22.00	21.27		
10	25	25		22.11	21.92	21.18		
10	50	0		21.92	21.79	21.06		
10	1	0		22.26	22.14	21.87		
10	1	25		22.42	21.97	21.43		
10	1	49		22.05	21.99	21.06		
10	25	0	16-QAM	21.20	20.90	20.34		
10	25	12		21.20	21.06	20.26		
10	25	25		21.12	20.97	20.17		
10	50	0		20.96	20.85	20.13		
5	1	0		23.22	22.99	22.44		
5	1	12		23.30	23.12	22.34		
5	1	24		23.22	22.98	22.06		
5	12	0	QPSK	22.24	22.14	21.38		
5	12	7		22.32	22.16	21.29		
5	12	13		22.30	22.10	21.10		
5	25	0		22.17	22.02	21.16		
5	1	0		22.22	21.96	21.52		
5	1	12		22.46	22.10	21.32		
5	1	24		22.36	21.92	21.01		
5	12	0	16-QAM	21.37	21.16	20.49		
5	12	7		21.37	21.13	20.41		
5	12	13		21.35	21.17	20.11		
5	25	0		21.22	21.03	20.25		

		LTE	Band 2 Max	kimum Average Po	wer [dBm]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0		23.19	22.94	22.46
3	1	8		23.32	23.15	22.10
3	1	14		23.30	23.08	22.07
3	8	0	QPSK	22.27	22.25	21.31
3	8	4		22.31	22.15	21.15
3	8	7		22.34	22.13	21.04
3	15	0		22.31	22.19	21.08
3	1	0		22.17	22.12	21.48
3	1	8		22.33	22.10	21.12
3	1	14		22.41	22.07	21.04
3	8	0	16-QAM	21.30	21.12	20.28
3	8	4		21.29	21.18	20.07
3	8	7		21.36	21.16	20.01
3	15	0		21.28	21.15	20.18
1.4	1	0		23.26	23.17	22.13
1.4	1	3		23.24	23.20	22.08
1.4	1	5		23.29	23.20	22.04
1.4	3	0	QPSK	23.28	23.17	22.09
1.4	3	1		23.32	23.19	22.09
1.4	3	3		23.26	23.12	22.07
1.4	6	0		22.40	22.29	21.02
1.4	1	0		22.26	22.24	21.25
1.4	1	3		22.23	22.18	22.03
1.4	1	5		22.12	22.16	21.03
1.4	3	0	16-QAM	22.32	22.24	21.17
1.4	3	1		22.39	22.23	21.10
1.4	3	3		22.40	22.29	21.03
1.4	6	0		21.37	21.33	20.10

	LTE Band 4 Maximum Average Power [dBm]							
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
20	1	0		23.70	23.48	23.53		
20	1	49		23.59	23.44	23.45		
20	1	99		23.32	23.45	23.24		
20	50	0	QPSK	22.10	22.24	22.28		
20	50	24		22.29	22.36	22.15		
20	50	50		22.32	22.35	22.27		
20	100	0		22.36	22.28	22.18		
20	1	0		22.61	22.56	22.68		
20	1	49		22.68	22.52	22.50		
20	1	99		22.64	22.50	22.30		
20	50	0	16-QAM	21.29	21.32	21.22		
20	50	24		21.34	21.28	21.20		
20	50	50		21.25	21.28	21.22		
20	100	0		21.38	21.30	21.22		
15	1	0		23.66	23.48	23.40		
15	1	37		23.59	23.45	23.31		
15	1	74		23.54	23.53	23.24		
15	36	0	QPSK	22.36	22.29	22.22		
15	36	20		22.36	22.34	22.34		
15	36	39		22.43	22.41	22.09		
15	75	0		22.27	22.30	22.24		
15	1	0		22.55	22.54	22.45		
15	1	37		22.63	22.40	22.39		
15	1	74		22.42	22.55	22.13		
15	36	0	16-QAM	21.40	21.41	21.26		
15	36	20		21.40	21.33	21.43		
15	36	39		21.42	21.37	21.09		
15	75	0		21.21	21.33	21.09		

		LTE	Band 4 Max	kimum Average Po	wer [dBm]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0		23.63	23.67	23.31
10	1	25		23.45	23.52	23.33
10	1	49		23.63	23.56	23.12
10	25	0	QPSK	22.43	22.47	22.29
10	25	12		22.43	22.47	22.19
10	25	25		22.60	22.54	22.15
10	50	0		22.35	22.34	22.06
10	1	0		22.68	22.38	22.34
10	1	25		22.35	22.38	22.25
10	1	49		22.64	22.61	22.32
10	25	0	16-QAM	21.49	21.51	21.24
10	25	12		21.47	21.31	21.26
10	25	25		21.40	21.67	21.16
10	50	0		21.44	21.34	21.13
5	1	0		22.65	23.26	23.46
5	1	12		23.30	23.47	23.17
5	1	24		23.47	23.61	23.32
5	12	0	QPSK	22.68	22.43	22.28
5	12	7		22.59	22.48	22.23
5	12	13		22.62	22.62	22.17
5	25	0		22.47	22.40	22.18
5	1	0		22.62	22.79	22.32
5	1	12		22.53	22.42	22.11
5	1	24		22.45	22.54	22.17
5	12	0	16-QAM	21.72	21.50	21.33
5	12	7		21.60	21.54	21.24
5	12	13		21.64	21.58	21.27
5	25	0		21.47	21.47	21.29



LTE Band 4 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
3	1	0		23.60	23.48	23.30		
3	1	8		23.65	23.40	23.17		
3	1	14		23.66	23.57	23.06		
3	8	0	QPSK	22.72	22.56	22.29		
3	8	4		22.72	22.56	22.31		
3	8	7		22.77	22.48	22.29		
3	15	0		22.65	22.53	22.24		
3	1	0		22.72	22.47	22.36		
3	1	8		22.58	22.46	22.15		
3	1	14		22.74	22.46	22.36		
3	8	0	16-QAM	21.73	21.59	21.21		
3	8	4		21.69	21.52	21.26		
3	8	7		21.71	21.40	21.26		
3	15	0		21.66	21.40	21.26		
1.4	1	0		23.68	23.52	23.60		
1.4	1	3		23.62	23.51	23.19		
1.4	1	5		23.61	23.33	23.19		
1.4	3	0	QPSK	23.66	23.61	23.39		
1.4	3	1		23.63	23.35	23.22		
1.4	3	3		23.59	23.40	23.49		
1.4	6	0		22.83	22.54	22.33		
1.4	1	0		22.60	22.65	22.41		
1.4	1	3		22.60	22.39	22.43		
1.4	1	5		22.74	22.42	22.39		
1.4	3	0	16-QAM	22.75	22.46	22.47		
1.4	3	1		22.99	22.45	22.39		
1.4	3	3		22.79	22.35	22.26		
1.4	6	0		21.92	21.71	21.43		

LTE Band 5 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
10	1	0		22.84	23.06	22.98		
10	1	25		22.89	22.90	22.82		
10	1	49		22.91	22.92	22.80		
10	25	0	QPSK	21.86	21.78	21.79		
10	25	12		21.87	21.79	21.82		
10	25	25		21.87	21.92	21.76		
10	50	0		21.66	21.68	21.72		
10	1	0		22.05	21.93	22.07		
10	1	25		21.88	21.93	22.06		
10	1	49		21.88	21.86	21.88		
10	25	0	16-QAM	20.79	20.81	20.82		
10	25	12		20.81	20.89	20.80		
10	25	25		20.81	20.87	20.78		
10	50	0		20.67	20.73	20.68		
5	1	0		23.03	22.85	22.89		
5	1	12		22.91	22.95	22.84		
5	1	24		22.89	23.05	22.80		
5	12	0	QPSK	21.87	21.99	21.97		
5	12	7		21.98	22.04	21.98		
5	12	13		21.89	22.01	21.93		
5	25	0		21.85	21.93	21.76		
5	1	0		21.93	21.86	22.03		
5	1	12		21.82	21.97	22.14		
5	1	24		21.98	22.06	21.87		
5	12	0	16-QAM	20.99	21.04	21.00		
5	12	7		21.03	21.05	20.91		
5	12	13		20.95	21.07	20.97		
5	25	0		20.90	20.85	20.78		

LTE Band 5 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
3	1	0		22.95	22.91	22.89		
3	1	8		22.91	22.93	22.95		
3	1	14		22.98	23.05	22.81		
3	8	0	QPSK	22.05	21.99	21.95		
3	8	4		22.04	22.05	21.99		
3	8	7		22.06	22.01	21.90		
3	15	0		21.93	21.95	21.88		
3	1	0		22.11	22.07	21.90		
3	1	8		22.08	21.91	21.96		
3	1	14		21.89	21.97	21.84		
3	8	0	16-QAM	21.01	20.96	20.89		
3	8	4		20.90	20.94	20.96		
3	8	7		20.94	20.99	20.87		
3	15	0		20.91	21.01	20.92		
1.4	1	0		23.04	23.01	23.02		
1.4	1	3	Ī	22.96	23.05	22.90		
1.4	1	5		22.99	23.02	22.88		
1.4	3	0	QPSK	22.97	22.97	22.97		
1.4	3	1		22.91	22.99	22.96		
1.4	3	3		22.97	23.04	22.89		
1.4	6	0		22.03	22.13	21.95		
1.4	1	0		22.05	22.03	22.11		
1.4	1	3		21.86	22.05	21.99		
1.4	1	5		21.98	22.08	21.79		
1.4	3	0	16-QAM	21.97	22.15	21.97		
1.4	3	1		22.03	22.11	21.97		
1.4	3	3		22.02	22.13	21.88		
1.4	6	0		21.05	21.14	21.04		

LTE Band 13 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
10	1	0			22.87			
10	1	25			22.76			
10	1	49			22.86			
10	25	0	QPSK		22.45			
10	25	12			22.41			
10	25	25			22.41			
10	50	0			22.33			
10	1	0		-	22.17	1		
10	1	25			22.72			
10	1	49			22.73			
10	25	0	16-QAM		22.42			
10	25	12			22.42			
10	25	25			22.44			
10	50	0			22.24			
5	1	0		22.71	22.70	22.75		
5	1	12		22.58	22.71	22.66		
5	1	24		22.71	22.64	22.84		
5	12	0	QPSK	22.48	22.60	22.71		
5	12	7		22.72	22.56	22.69		
5	12	13		22.61	22.62	22.80		
5	25	0		22.40	22.40	22.58		
5	1	0		21.59	22.58	22.76		
5	1	12		22.45	22.64	22.67		
5	1	24		22.70	22.69	22.78		
5	12	0	16-QAM	22.51	22.57	22.64		
5	12	7		22.69	22.64	22.71		
5	12	13		22.63	22.67	22.74		
5	25	0		22.38	22.41	22.51		

	LTE Band 17 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
10	1	0		22.43	22.73	22.63			
10	1	25		22.66	22.62	22.65			
10	1	49		22.55	22.40	22.37			
10	25	0	QPSK	21.52	21.51	21.59			
10	25	12		21.53	21.58	21.52			
10	25	25		21.43	21.47	21.36			
10	50	0		21.30	21.32	21.33			
10	1	0		21.41	21.43	21.74			
10	1	25		21.79	21.51	21.75			
10	1	49		21.60	21.37	21.52			
10	25	0	16-QAM	20.42	20.53	20.61			
10	25	12		20.56	20.62	20.55			
10	25	25		20.45	20.44	20.34			
10	50	0		20.31	20.36	20.23			
5	1	0		22.57	22.72	22.65			
5	1	12		22.58	22.57	22.55			
5	1	24		22.71	22.53	22.28			
5	12	0	QPSK	21.50	21.81	21.60			
5	12	7		21.56	21.76	21.60			
5	12	13		21.75	21.76	21.38			
5	25	0		21.50	21.59	21.49			
5	1	0		21.66	21.71	21.70			
5	1	12		21.63	21.64	21.67			
5	1	24	16-QAM	21.87	21.69	21.44			
5	12	0		20.71	20.79	20.61			
5	12	7		20.62	20.81	20.63			
5	12	13		20.69	20.74	20.39			
5	25	0		20.46	20.64	20.49			

LTE Band 2

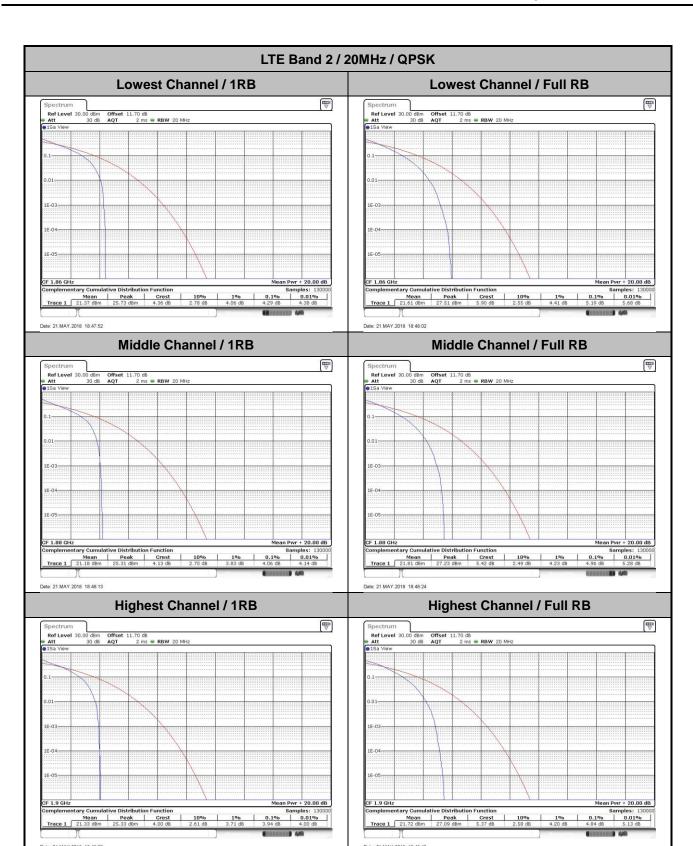
Peak-to-Average Ratio

Mode					
Mod.	QP	SK	16C	Limit: 13dB	
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	4.29	5.19	6.09	6.14	
Middle CH	4.06	4.96	4.9	5.97	PASS
Highest CH	3.94	4.84	4.78	5.68	

Report No. : FG811724B

TEL: 886-3-327-3456 Page Number : A2-1 of 41

FAX: 886-3-328-4978



TEL: 886-3-327-3456 Page Number : A2-2 of 41

FAX: 886-3-328-4978

LTE Band 2 / 20MHz / 16QAM Lowest Channel / 1RB Lowest Channel / Full RB Ref Level 30.00 dBm Att 30 dB Ref Level 30.0 Att 8amples: 13000 0.1% 0.01% 6.09 d8 6.20 d9 Date: 21.MAY.2018 18:46:36 Date: 21.MAY.2018 18:46:47 Middle Channel / 1RB Middle Channel / Full RB Date: 21 MAY 2018 18:47:17 Date: 21 MAY 2018 18:47:02 **Highest Channel / 1RB Highest Channel / Full RB**

Report No.: FG811724B

Samples: 130000 0.1% 0.01% 5.68 dB 6.12 dB

TEL: 886-3-327-3456 Page Number: A2-3 of 41

Samples: 130000 0.1% 0.01% 4.78 dB 4.90 dB

26dB Bandwidth

Mode	LTE Band 2 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.25	1.30	3.05	3.11	5.14	5.01	10.01	9.85	14.18	14.36	20.22	20.22
Middle CH	1.30	1.30	3.08	3.02	4.94	4.98	9.87	9.71	14.60	14.45	20.10	20.10
Highest CH	1.29	1.29	3.06	3.09	4.97	4.81	9.83	9.81	14.66	14.81	20.10	20.10

Report No. : FG811724B

TEL: 886-3-327-3456 Page Number : A2-4 of 41

LTE Band 2 Lowest Channel / 1.4MHz / QPSK Lowest Channel / 1.4MHz / 16QAM 17.42 dBn 1.85077830 GH 26.00 dE 1.247600000 MH 14.48 dBn 10 dBm-1483 1420. -10 dBm--20 dBm--30 dBm 30 dBm-40 dBm -50 dBm--60 dBm -60 dBm Span 2.8 MHz
 X-value
 Y-value
 Function

 1.8510888 GHz
 14.48 dBm
 ndB down

 1.8500566 GHz
 -11.53 dBm
 ndB

 1.8513601 GHz
 -11.40 dBm
 Q factor
 Type | Ref | Trc | Type | Ref | Trc |
 X-value
 Y-value
 Function

 1.8507783 GHz
 17.42 dBm
 ndB down
 Date: 21.MAY.2018 16:14:48 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 30 kHz Att 30 dB SWT 63.2 µs VBW 100 kHz Mode Auto FFT SGL Count 100/100 SPK Max 16.75 dBn 1.88008670 GH 26.00 df 1.295100000 MH 1451. 15.48 dBn 1.88038040 GH; 26.00 dE 1.297900000 MH; 1448. -20 dBm--20 dBpn -40 dBm CF 1.88 GH Span 2.8 MHz Span 2.8 MHz
 Y-value
 Function

 2
 16.75 dBm
 ndB down

 2
 -9.30 dBm
 ndB

 z
 -9.41 dBm
 Q factor
 Type | Ref | Trc | Date: 21 MAY 2018 16:21:44 Date: 21 MAY 2018 16:21:55 Highest Channel / 1.4MHz / QPSK Highest Channel / 1.4MHz / 16QAM SGL Count 100/100 00 dBm Offset 30 dB SWT 11.70 dB **© RBW** 30 kHz 63.2 μs **© VBW** 100 kHz **Mode** Auto FFT 11.70 dB **Θ RBW** 30 kHz 63.2 μs **Θ VBW** 100 kHz **Mode** Auto FFT 15.80 dBn 1.90948180 GH 26.00 df 1.286700000 MH 1484. M1[1] M1[1] 14.59 dBm 1.908 20 dBm 26.00 de 1.289500000 MH: 1480.3 dBm--10 dBm 20,dB0 -20 dBm--30 dBm 50 dBm 50 dBm CF 1.9093 GHz Function Result 1,2895 MHz 26,00 dB 1480.3 Function Result
 X-value
 Y-value
 Function

 1,9094818 GHz
 15.80 dBm
 nd8 down

 1,9085538 GHz
 10.00 dBm
 nd8

 1,9099406 GHz
 -10.13 dBm
 Q factor

 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.0068524 GHz
 14.570 dbm
 nd8 dbm

 T1
 1
 1.0068538 GHz
 -11.24 dbm
 nd8 dbm

 T2
 1
 1.9099434 GHz
 -11.29 dbm
 Q factor
 Type | Ref | Trc |

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number: A2-5 of 41

Date: 21.MAY.2018 16:24:25

LTE Band 2 Lowest Channel / 3MHz / QPSK Lowest Channel / 3MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 100 kHz

Att 30 dB SWT 19 με VBW 300 kHz Mode Auto FFT

SGL Count 100/100

1Pk Max 17.22 dB M1[1] 15.77 dBr 1.85055290 GH 26.00 d 3.050900000 MH 10 dBm Q factor 606 Q factor 596. -10 dBm -30 dBm -50 dBm-Function Result 3.0509 MHz 26.00 dB 606.5 Function Result
3.1049 MHz
26.00 dB
596.3
 X-value
 Y-value
 Function

 1.8505529 GHz
 17.22 dBm
 ndB down

 1.8499595 GHz
 -8.71 dBm
 ndB

 1.8530105 GHz
 -8.61 dBm
 Q factor

 X-value
 Y-value
 Function

 1.851458 GHz
 15.77 dBm
 ndB down

 1.8499835 GHz
 -10.31 dBm
 ndB

 1.8530884 GHz
 -10.47 dBm
 Q factor
 Type | Ref | Trc | Type | Ref | Trc | Middle Channel / 3MHz / QPSK Middle Channel /3MHz / 16QAM 17.91 dBi 1.88030570 GH 26.00 d 3.080900000 MH 610. 1.88104900 GH 26.00 dt 3.0210000000 MH 622. -20 dBm 20 dBm 40 dBm CF 1.88 GH Span 6.0 MHz Span 6.0 MHz X-value 1.8803057 GHz 1.8784715 GHz 1.8815524 GHz X-value 1.881049 GHz 1.8784895 GHz 1.8815105 GHz Type | Ref | Trc | Function m ndB down Function ndB down Date: 21.MAY.2018 15:05:19 Date: 21 MAY 2018 15:05:29 Highest Channel /3MHz / QPSK Highest Channel /3MHz / 16QAM M1[1] 16.64 dB 1.90882970 GF 15.94 dBr 1.90953100 GH Function Result
3.0929 MHz
26.00 dB
617.4 Function Result 3.0629 MHz X-value Y-value Function
1,9088297 GHz 16.64 dBm ndB down
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.909531 GHz
 15.94 dBm
 nd8 down
 Type | Ref | Trc |

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-6 of 41

LTE Band 2 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 100 kHz

Att 30 dB SWT 19 με VBW 300 kHz Mode Auto FFT

SGL Count 100/100

1Pk Max 14.55 dB M1[1] 14.93 dBr 14.55 dBr 1.85439800 GH 26.00 d 5.135000000 MH 10 dBm 361. 370. -10 dBm--50 dBm--60 dBm Function Result 5.135 MHz 26.00 dB 361.1 Function Result

5.005 MHz
26.00 dB
370.2
 X-value
 Y-value
 Function

 1.854398 GHz
 14.55 dBm
 ndB down

 1.849963 GHz
 -11.67 dBm
 ndB

 1.855097 GHz
 -11.66 dBm
 Q factor

 Marker
 Tre
 X-value
 Y-value
 Function

 M1
 1
 1.85286 GHz
 14.93 dBm
 nd8 down

 T1
 1
 1.85002 GHz
 -11.04 dBm
 nd8

 T2
 1
 1.855027 GHz
 -11.03 dBm
 Q factor
 Type | Ref | Trc | Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 15.74 dBn 1.88089900 GH 26.00 df 4.935000000 MH 381... 1.87808200 GH 26.00 di 4.975000000 MH 377. -10 dBm--20 dBmmon 40 dBm CF 1.88 GHz Span 10.0 MHz Span 10.0 MHz Y-value 2 14.05 dBm 2 -11.92 dBm 2 -11.94 dBm
 Y-value
 Function

 2
 15.74 dBm
 ndB down

 2
 -10.34 dBm
 ndB

 z
 -10.12 dBm
 Q factor
 Type | Ref | Trc | Function ndB down Date: 21 MAY 2018 15:22:06 Date: 21 MAY 2018 15:22:16 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM SGL Count 100/100 14.54 dBm 1.90786000 M1[1] 14.98 dBn 1.90540200 GH M1[1] 20 dBm 26.00 de 4.805000000 MH: 397.0 dBm--10 dBm 20 dBm -20 dBmmm -50 d8m 50 dBm CF 1.9075 GHz Span 10.0 MHz Span 10.0 MHz Function Result 4.805 MHz 26.00 dB 397.0 | Market | Trc | X-value | Y-value | Function | M1 | 1 | 1,905402 GHz | 14,98 dism | nd8 down | T1 | 1 | 1,905525 GHz | 114,66 dism | nd8 | T2 | 1 | 1,910017 GHz | -10.79 dism | Q factor | Function Result 4.965 MHz
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1,90786 GHz
 14.54 dbm
 nd8 dom

 T1
 1
 1,909072 GHz
 -11.17 dbm
 nd8 dom

 T2
 1
 1,909078 GHz
 -11.59 dbm
 Q factor

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-7 of 41

Date: 21.MAY.2018 15:24:47

LTE Band 2 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 300 kHz

Att 30 dB SWT 12.6 μs VBW 1 MHz Mode Auto FFT

SGL Count 100/100

1Pk Max 17.36 dB M1[1] 15.19 dBr 17.36 dBn 1.8555390 GH 26.00 dB 10.010000000 MH 10 dBm Q factor 185 188. -10 dBm-40 dBm -50 dBm-Function Result 10.01 MHz 26.00 dB 185.4
 X-value
 Y-value
 Function

 1.85539 GHz
 17.36 dBm
 ndB down

 1.850045 GHz
 -8.46 dBm
 ndB

 1.860055 GHz
 -9.78 dBm
 Q factor
 | X-value | Y-value | Function | 1.857438 GHz | 15.19 dBm | nd8 down | 1.850125 GHz | -10.99 dBm | nd8 | 1.859975 GHz | -10.31 dBm | Q factor | Type | Ref | Trc | Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 17.88 dBr 1.8823980 GH 26.00 d 9.870000000 MH 190. 16.03 dBn 1.8825570 GH: 26.00 dE 9.710000000 MH: 193.9 20 dBm CF 1.88 GH Span 20.0 MHz Span 20.0 MHz
 Y-value
 Function

 2
 17.88 dBm
 ndB down

 2
 -8.29 dBm
 ndB

 z
 -7.94 dBm
 Q factor
 Type | Ref | Trc | Function ndB down Date: 21 MAY 2018 15:38:52 Date: 21 MAY 2018 15:39:03 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM SGL Count 100/100 00 dBm Offset 30 dB SWT 11.70 dB **RBW** 300 kHz 12.6 µs **VBW** 1 MHz **Mode** Auto FFT 11.70 dB **© RBW** 300 kHz 12.6 μs **© VBW** 1 MHz **Mode** Auto FFT 16.13 dBm 1.9044210 GHz 17.11 dBn 1.9017630 GH M1[1] 20 dBm dBm-20 dBm 20 dB -30 dBm -50 d8m 50 dBm CF 1.905 GHz
 X-value
 Y-value
 Function

 1,901763 GHz
 17.11 dBm
 nd8 down

 1,900065 GHz
 -8.60 dBm
 nd8

 1,909895 GHz
 -9.01 dBm
 Q factor

 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1,904421 GHz
 16.13 dbm
 nd8 dbm
 qbm
 Type | Ref | Trc | **Function Result Function Result**

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-8 of 41

Date: 21.MAY.2018 15:41:33

LTE Band 2 Lowest Channel / 15MHz / QPSK Lowest Channel / 15MHz / 16QAM M1[1] 15.70 dB M1[1] 14.25 dBr 15.70 dBn 1.8540530 GH 26.00 dB 14.176000000 MH 10 dBm 130 129. -10 dBm 50 d8m -50 dBm--60 dBm -60 dBm-Function Result 14.176 MHz 26.00 dB 130.8
 X-value
 Y-value
 Function

 1.854053 GHz
 15.70 dBm
 ndB down

 1.850427 GHz
 -10.69 dBm
 ndB

 1.864603 GHz
 -10.61 dBm
 Q factor

 X-value
 Y-value
 Function

 1.861456 GHz
 14.25 dBm
 nd8 down

 1.863907 GHz
 -11.69 dBm
 nd8

 1.864663 GHz
 -11.55 dBm
 Q factor
 Type | Ref | Trc | Type | Ref | Trc | Middle Channel / 15MHz / QPSK Middle Channel / 15MHz / 16QAM
 Ref Level
 30.00 dBm
 Offset
 11.70 dB ■ RBW
 300 kHz

 Att
 30 dB
 SWT
 12.6 µs ■ VBW
 1 MHz
 Mode
 Auto FFT
 15.32 dBr 1.8776020 GH 26.00 d 14.595000000 MH 128. 1.8806590 GH 26.00 dl 14.446000000 MH 130. more -40 dBm CF 1.88 GHz Span 30.0 MHz Span 30.0 MHz Y-value 2 14.70 dBm 2 -11.67 dBm 2 -11.28 dBm Type | Ref | Trc | Function n ndB down Date: 21 MAY 2018 15:55:38 Date: 21 MAY 2018 15:55:49 Highest Channel / 15MHz / QPSK Highest Channel / 15MHz / 16QAM 00 dBm Offset 30 dB SWT 11.70 dB **RBW** 300 kHz 12.6 µs **VBW** 1 MHz **Mode** Auto FFT 11.70 dB **© RBW** 300 kHz 12.6 μs **© VBW** 1 MHz **Mode** Auto FFT SGL Count 100/100 14.63 dBm 1.8992330 C 16.31 dBn 1.8969560 GH M1[1] M1[1] 20 dBm 26.00 di 14.805000000 MH 128. dBm--10 dBm 20 dBm-50 dBm CF 1.9025 GHz Function Result 14.655 MHz 26.00 dB 129.4 Function Result 14.805 MHz 26.00 db 128.3
 X-value
 Y-value
 Function

 1.896956 GHz
 16.31 dBm
 nd8 down

 1.895067 GHz
 -9.37 dBm
 nd8

 1.909723 GHz
 -9.38 dBm
 Q factor

 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.899233 GHz
 14.63 dBm
 nd8 dom

 T1
 1
 1.8990297 GHz
 -11.44 dBm
 nd8

 T2
 1
 1.909903 GHz
 -11.43 dBm
 Q factor
 Type | Ref | Trc |

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number: A2-9 of 41 FAX: 886-3-328-4978

Date: 21.MAY.2018 15:58:20

LTE Band 2 Lowest Channel / 20MHz / QPSK Lowest Channel / 20MHz / 16QAM Ref Level 30.00 dbm Offset 11.70 db = RBW 1 MHz Att 30 db SWT 5.7 µs = VBW 3 MHz Mode Auto FFT SGL Count 100/100 41Pk Max
 Ref Level 30.00 dBm
 Offset 11.70 dB ⇒ RBW 1 MHz

 Att
 30.dB
 SWT
 5.7 μs ⇒ VBW 3 MHz
 Mode Auto FFT

 SGL Count 100/100
 40.00 mg/s
 <t 17.73 dBn M1[1] 19.25 dB 1,8610790 GH 26,00 df 20,220000000 MH 10 dBm-Q factor 92. Q factor -10 dBm--10 dBm 30 dBm-40 dBm 50 d8m -50 d8m--60 dBm -60 dBm-Function Result 20.22 MHz 26.00 dB 92.0 Function Result 20.22 MHz 26.00 dB 92.3
 X-value
 Y-value
 Function

 1.861079 GHz
 19.25 dBm
 nd8 down

 1.84993 GHz
 -7.13 dBm
 nd8

 1.87015 GHz
 -6.40 dBm
 Q factor

 X-value
 Y-value
 Function

 1.865574 GHz
 17.73 dBm
 nd8 down

 1.84985 GHz
 -8.66 dBm
 nd8

 1.87007 GHz
 -7.66 dBm
 Q factor
 Type | Ref | Trc | Middle Channel / 20MHz / QPSK Middle Channel / 20MHz / 16QAM
 Ref Level
 30.00 dBm
 Offset
 11.70 dB ● RBW
 1 MHz

 Att
 30 dB
 SWT
 5.7 µs ● VBW
 3 MHz
 Mode
 Auto FFT
 18.71 dBn 1.8840360 cv 19.55 dBn 1.8762440 GH 26.00 di 20.100000000 MH 93. 1.8840360 GH 26.00 dl 20.100000000 MH 93. 10 dBm dBm--20 dBm -20 dBm-40 dBm -40 dBm 50 dBm CF 1.88 GHz Span 40.0 MHz Span 40.0 MHz Function Result
20.1
26.0 X-value Y-value
1.884036 GHz 18.71 dBm
1.86993 GHz -7.09 dBm
1.89003 GHz -7.31 dBm
 Y-value
 Function

 2
 19.55 dBm
 ndB down

 2
 -6.59 dBm
 ndB

 z
 -6.77 dBm
 Q factor
 Type | Ref | Trc | Function n ndB down Date: 21 MAY 2018 16:12:25 Date: 21 MAY 2018 16:12:36 Highest Channel / 20MHz / QPSK Highest Channel / 20MHz / 16QAM SGL Count 100/100 91Pk Max 18.55 dBm 1.8970830 c 1.89 20 dBm 26.00 d 20.100000000 MH 94. 26.00 di 20.100000000 MH 94. dBm--10 dBm -20.dBg -30 dBm -50 dBm-50 dBm CF 1.9 GHz Span 40.0 MHz
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.893896 GHz
 19.23 d8m
 n08 down

 T1
 1
 1.899393 GHz
 6-5.98 d8m
 n08 down

 T2
 1
 1.91003 GHz
 -6.67 d8m
 Q factor
 Function Result **Function Result**

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-10 of 41 FAX: 886-3-328-4978

Date: 21.MAY.2018 16:33:21

Occupied Bandwidth

Mode	LTE Band 2 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.1	1.1	2.72	2.73	4.48	4.49	8.99	9.05	13.43	13.52	18.26	18.1
Middle CH	1.09	1.1	2.76	2.71	4.49	4.47	9.01	8.97	13.43	13.46	18.38	18.5
Highest CH	1.09	1.11	2.71	2.73	4.49	4.51	9.03	8.97	13.46	13.4	18.14	18.22

Report No. : FG811724B

TEL: 886-3-327-3456 Page Number : A2-11 of 41

LTE Band 2 Lowest Channel / 1.4MHz / QPSK Lowest Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 10 dBm -10 dBm -10 dBn 20 dBm -40 dBm 40 dBm -60 dBn -60 dBm CF 1.8507 GHz CF 1.8507 GHz 1001 pts Span 2.8 MHz X-value 1.850879 GHz 1.85015455 GHz 1.85125944 GHz Y-value 2 14.58 dBm 2 6.73 dBm 2 6.72 dBm X-value 1.8507727 GHz 1.85014895 GHz 1.85125105 GHz Type | Ref | Trc | Function Result Type Ref Trc Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM 0 dBm Offset 11.70 dB • RBW 30 kHz 30 dB SWT 63.2 µs • VBW 100 kHz Mode Auto FFT 16.76 dBi 1.87999160 GF 1.090909091 MF -20 dBm--50 dBm 50 dBm
 X-value
 Y-value
 Function

 1.8799916 GHz
 16.76 dBm
 CCC BW

 1.87945175 GHz
 10.53 dBm
 Occ BW

 1.88054266 GHz
 10.76 dBm
 Occ BW

 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.8796839 GHz
 14.78 d Bm
 1

 T1
 1
 1.87944995 GHz
 6.12 dBm
 Occ Bw

 T2
 1
 1.88054925 GHz
 6.17 dBm
 Occ Bw
 Type | Ref | Trc | Function Result **Function Result** 1.090909091 MHz 1.099300699 MHz Date: 21.MAY.2018 16:21:24 Date: 21.MAY.2018 16:21:34 Highest Channel / 1.4MHz / QPSK Highest Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB = RBW 30 kHz Att SGL Count 100/100 SWT 63.2 µs = VBW 100 kHz Mode Auto FFT SGL Count 100/100 15.22 dBn 1.90975870 GH 1.093706294 MH 14.67 dBm 1.90968040 GHz 1.107692308 MHz MILII MILII man -10 dBm -20 dBm -30 dBm--60 dBm--60 dBm-Type | Ref | Trc | Type | Ref | Trc | 1.093706294 MHz Occ Bw 1.107692308 MHz

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-12 of 41

LTE Band 2 Lowest Channel / 3MHz / QPSK Lowest Channel / 3MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB = RBW 100 kHz Auto FFT SGL Count 100/100 SHZ 19 µs = VBW 300 kHz Mode Auto FFT GLP Max 17.09 dBn 1.85182970 GH 2.715284715 MH 17.16 dBn 1.85197350 GH: 2.733266733 MH: M1[1] 10 dBm--10 dBm -10 dBm 20 dBm-20 dBm -30 dBm -30 dBm-40 dBm -50 d8m-50 dBm -60 dBm -60 dBm-
 X-value
 Y-value
 Function
 Function Result

 1.8518937 GHz
 17.09 dBm
 1.85803936 GHz
 2.71528

 1.85019396 GHz
 11.49 dBm
 Occ 8w
 2.71528

 1.85285465 GHz
 10.55 dBm
 Occ 8w
 2.71528

 X-value
 Y-value
 Function

 1.8519735 GHz
 17.16 dBm
 18.519336 GHz

 1.85193936 GHz
 10.08 dBm
 Occ Bw

 1.85287263 GHz
 9.99 dBm
 Type | Ref | Trc | Type Ref Trc Date: 21.MAY.2018 14:58:00 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM SGL Count 100/100 1Pk Max 17.06 dBi 1.88020380 GF 2.757242757 MF 20 d8m -20 dBm--40 dBm 40 dBm 50 dBm CF 1.88 GHz 1001 pts Span 6.0 MHz 1001 pts
 X-value
 Y-value
 Function

 1.8802038 GHz
 17.06 dBm
 1.87860939 GHz
 9.12 dBm
 Occ Bw

 1.88136663 GHz
 11.29 dBm
 0cc Bw
 0cc Bw
 0cc Bw
 0cc Bw
 Type | Ref | Trc | **Function Result Function Result** 2.757242757 MHz 2.709290709 MHz Date: 21 MAY 2018 15:04:58 Date: 21 MAY 2018 15:05:08 Highest Channel / 3MHz / QPSK Highest Channel / 3MHz / 16QAM Ref Level 30.00 SGL Count 100/100 1Pk Max 17.32 dBm 1.90817030 GHz 2.727272727 MHz M1[1] 16.35 dBn 1.90881770 GH 2.709290709 MH 20 dBm dBm--10 dBm SD-dBm -30 dBm 40 dBm -50 dBm-50 dBm CF 1.9085 GHz Span 6.0 MHz
 Marker
 Trope
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1,9088177 GHz
 16.35 dbm
 Dcc 8w
 2.709200

 T1
 1
 1,9078435 GHz
 10.04 dbm
 Occ 8w
 2.709200

 T2
 1
 1,90985465 GHz
 9.52 dbm
 2.709290709 MHz 2.727272727 MHz

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-13 of 41

FAX: 886-3-328-4978

Date: 21.MAY.2018 15:07:39

LTE Band 2 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 100 kHz
Att 30 dB SWT 19 µs WBW 300 kHz Mode Auto FFT

61Pk Max 14.92 dB M1[1] M1[1] 14.80 dBr of Bw 10 dBm--10 dBm-30 dBm 40 dBm -50 d8m-50 dBm -60 dBm -60 dBm-
 X-value
 Y-value
 Function
 Function Result

 1.853539 GHz
 14.92 dbm
 Occ Bw
 4.47552

 1.8505282 GHz
 10.99 dbm
 Occ Bw
 4.47552

 1.8547278 GHz
 10.07 dbm
 Occ Bw
 4.47552
 Type | Ref | Trc | Date: 21.MAY.2018 15:14:47 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM
 Ref Level
 30.00 dBm
 Offset
 11.70 dB
 RBW
 100 kHz

 Att
 30 dB
 SWT
 19 µs
 VBW
 300 kHz
 Mode
 Auto FFT
 SGL Count 100/100 1Pk Max dBm--10 dBm -20 dBm--30 dBmm 1/1 40 dBm -40 dBm 50 dBm CF 1.88 GH: CF 1.88 GHz 1001 pts Span 10.0 MHz Span 10.0 MHz 1001 pts
 X-value
 Y-value
 Function

 1.880729 GHz
 15.46 dBm
 Occ 8w

 1.8777522 GHz
 10.02 dBm
 Occ 8w

 1.8922378 GHz
 10.39 dBm
 Occ 8w
 Type | Ref | Trc | **Function Result Function Result** 4.485514486 MHz 4.465534466 MHz Date: 21 MAY 2018 15:21:45 Date: 21 MAY 2018 15:21:55 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM Ref Level 30.00 SGL Count 100/100 1Pk Max SGL Count 100/100 91Pk Max 15.32 dBn 1.90701000 GH 4.485514486 MH 14.54 dBm 1.90607100 GHz 4.505494505 MHz M1[1] 20 dBm dBm--10 dBm -20 d8m-29 9807 40 dBm -50 dBm-50 dBm CF 1.9075 GHz CF 1.9075 GHz Span 10.0 MHz
 Marker
 Trope
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1,90701 GHz
 15.32 dbm
 Process
 11
 1
 1,905252 GHz
 10.34 dbm
 Occ Bw
 4.485514

 T2
 1
 1,9097378 GHz
 10.45 dbm
 Occ Bw
 4.485514

 Marker
 Type
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1.906071 GHz
 14.54 dbm
 Percentage
 1.155 dbm
 Occ 8w
 4.50549

 T2
 1
 1.9097478 GHz
 9.14 dbm
 Occ 8w
 4.50549 4.485514486 MHz 4.505494505 MHz

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-14 of 41 FAX: 886-3-328-4978

Date: 21.MAY.2018 15:24:26

LTE Band 2 Lowest Channel / 10MHz / QPSK Lowest Channel / 10MHz / 16QAM 16.81 dB 15.91 dBn M1[1] 10 dBm--10 dBm--30 dBm 40 dBm -50 d8m-50 dBm -60 dBm -60 dBm-
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 1.853641 GHz
 15.91 dBm
 15.91 dBm

 T1
 1
 1.85964485 GHz
 10.10 dBm
 Occ Bw

 T2
 1
 1.8596355 GHz
 8.97 dBm
 8.97 dBm

 X-value
 Y-value
 Function
 Function Result

 1.85546 GHz
 16.81 dbm
 Tool But State Type | Ref | Trc | Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM
 Ref Level
 30.00 dBm
 Offset
 11.70 dB ■ RBW
 300 kHz

 Att
 30 dB
 SWT
 12.6 µs ■ VBW
 1 MHz
 Mode
 Auto FFT
 -20 dBm 40 dBm -40 dBm 50 dBm CF 1.88 GH: CF 1.88 GHz 1001 pts Span 20.0 MHz Span 20.0 MHz
 X-value
 Y-value
 Function

 1.875944 GHz
 15.55 dBm
 CC Bw

 1.8755245 GHz
 9.21 dBm
 Occ Bw

 1.8844955 GHz
 10.37 dBm

 X-value
 Y-value
 Function

 1.878482 GHz
 17.82 dBm
 0.00 BW

 1.8755045 GHz
 11.69 dBm
 0cc BW

 1.8945155 GHz
 10.55 dBm
 Type Ref Trc Type | Ref | Trc | **Function Result Function Result** 9.010989011 MHz 8.971028971 MHz Date: 21 MAY 2018 15:38:31 Date: 21 MAY 2018 15:38:42 Highest Channel / 10MHz / QPSK Highest Channel / 10MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB • RBW 300 kHz Att 30 dB SWT 12.6 µs • VBW 1 MHz Mode Auto FFT SGL Count 100/100 17.28 dBn 1.9033620 GH 9.030969031 MH 17.02 dBm 1.9022830 GHz 8.971028971 MHz 20 dBm dBm--10 dBm 20 dB# -20 dBm--30 dBm--50 dBm-50 dBm CF 1.905 GHz Span 20.0 MHz | Market | Trc | X-value | Y-value | Function | Function Result | M1 | 1 | 1,002283 GHz | 17.02 dbm | | T1 | 1 | 1,00444 GHz | 10.80 dbm | Occ 8w | 8.971024 | T2 | 1 | 1,0094555 GHz | 9.65 dbm | Occ 8w | 8.971024 | T2 | 1 | 1,0094555 GHz | 9.65 dbm | Occ 8w | 1,0094555 GHz | 1,0094555
 Marker
 Trope
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1.0903302 GHz
 17.28 dBm
 Punction
 9.03096

 T1
 1
 1.9004945 GHz
 10.84 dBm
 Occ Bw
 9.03096

 T2
 1
 1.9095185 GHz
 10.77 dBm
 Occ Bw
 9.03096
 9.030969031 MHz 8.971028971 MHz Date: 21.MAY.2018 15:41:13

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-15 of 41 FAX: 886-3-328-4978

LTE Band 2 Lowest Channel / 15MHz / QPSK Lowest Channel / 15MHz / 16QAM
 Ref Level
 30.00 dRm
 Offset
 11.70 dB
 RBW
 300 kHz

 Att
 30 dB
 SWT
 12.6 µs
 VBW
 1 MHz
 Mode
 Auto FFT

 SGL Count 100/100
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 300/200
 M1[1] 15.18 dB M1[1] 14.09 dBn 10 dBm--10 dBm--10 dBm 30 ABM-40 dBm 50 d8m -50 d8m--60 dBm -60 dBm-
 X-value
 Y-value
 Function
 Function Result

 1.858849 GHz
 15.18 dbm
 0cc 8w
 13.42657.

 1.8509167 GHz
 9.50 dbm
 0cc 8w
 13.42657.

 1.8642433 GHz
 11.50 dbm
 0cc 8w
 13.42657.
 Type | Ref | Trc | Middle Channel / 15MHz / QPSK Middle Channel / 15MHz / 16QAM
 Ref Level
 30.00 dBm
 Offset
 11.70 dB ■ RBW
 300 kHz

 Att
 30 dB
 SWT
 12.6 µs ■ VBW
 1 MHz
 Mode
 Auto FFT
 SGL Count 100/100 15.15 dBi 1.8856040 GF 13.426573427 MF 14.99 dBm 1.8830870 GHz 13.456543457 MHz mm -20 dBm ~~~ -40 dBm 40 dBm 50 dBm CF 1.88 GH: CF 1.88 GHz 1001 pts Span 30.0 MHz | Type | Ref | Trc | X-value | Y-value | Function | M1 | 1 | 1.883087 GHz | 14.99 dBm | T1 | 1 | 1.873287 GHz | 11.000 dBm | Occ Bw | T2 | 1 | 1.8867433 GHz | 8.90 dBm |
 X-value
 Y-value
 Function

 1.885604 GHz
 15.15 dBm
 Occ Bw

 1.8733167 GHz
 10.30 dBm
 Occ Bw

 1.8967433 GHz
 10.32 dBm
 Occ Bw
 Type | Ref | Trc | **Function Result Function Result** 13.426573427 MHz 13.456543457 MHz Date: 21.MAY.2018 15:55:17 Date: 21 MAY 2018 15:55:28 Highest Channel / 15MHz / QPSK Highest Channel / 15MHz / 16QAM SGL Count 100/100 M1[1] 15.76 dBn 1.8980040 GH 13.456543457 MH 15.66 dBm 1.8987240 GHz 13.396603397 MHz m 20 dBm dBm--10 dBm -20 dBr 20 dBmmm -50 dBm-50 dBm-CF 1.9025 GHz Span 30.0 MHz
 Marker
 Trope
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1.699000 GHz
 15.76 dbm
 5.76 dbm

 Marker
 Type
 Ref
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1.898724 GHz
 15.65 dbm
 Text
 13.456543457 MHz 13.396603397 MHz Date: 21.MAY.2018 15:57:59

Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-16 of 41 FAX: 886-3-328-4978

LTE Band 2 Lowest Channel / 20MHz / QPSK Lowest Channel / 20MHz / 16QAM
 Ref Level 30.00 dBm
 Offset 11.70 dB ⇒ RBW 1 MHz

 Att
 30.dB
 SWT
 5.7 μs ⇒ VBW 3 MHz
 Mode Auto FFT

 SGL Count 100/100
 40.00 mg/s
 <t 19.83 dBn 1.8673130 GH: 18.101898102 MH: 10 dBm--10 dBm--10 dBm 40 dBm -50 d8m-50 dBm -60 dBm -60 dBm-
 X-value
 Y-value
 Function
 Function Result

 1.859441 GHz
 19.42 dbm
 B
 18.958891 GHz
 13.33 dbm
 Occ BW
 18.261731

 1.86991508 GHz
 10.67 dbm
 Occ BW
 18.261731

 X-value
 Y-value
 Function

 1.867313 GHz
 19.83 dBm

 1.851090 GHz
 9.18 dBm
 Occ Bw

 1.8691109 GHz
 11.11 dBm
 Type | Ref | Trc | Date: 21.MAY.2018 16:05:07 Middle Channel / 20MHz / QPSK Middle Channel / 20MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB = RBW 1 MHz Auto FFT SGL Count 100/100 SWT 5.7 µs = VBW 3 MHz Mode Auto FFT SGL Count 100/100
 Ref Level
 30.00 dBm
 Offset
 11.70 dB
 ■ RBW
 1 MHz

 Att
 30 dB
 SWT
 5.7 µs
 ■ VBW
 3 MHz
 Mode
 Auto FFT
 18.51 dBi 1.8716080 GF 18.381618382 MF 18.81 dBm 1.8751250 GHz 18.501498501 MHz 20 d8m -20 d8m 40 dBm -40 dBm 50 dBm CF 1.88 GHz 1001 pts Span 40.0 MHz
 X-value
 Y-value
 Function

 1.871508 GHz
 18.51 dBm
 18.51 dBm

 1.8707692 GHz
 12.46 dBm
 Occ Bw

 1.8991508 GHz
 11.90 dBm
 Type | Ref | Trc | **Function Result Function Result** 18.381618382 MHz 18.501498501 MHz Date: 21 MAY 2018 16:12:04 Date: 21 MAY 2018 16:12:15 Highest Channel / 20MHz / QPSK Highest Channel / 20MHz / 16QAM 18.63 dBm 1.8942860 GHz 18.221778222 MHz 1.8926870 GH 18.141858142 MH 20 dBm dBm--10 dBm -20 dBm -30 dBm--50 dBm-50 dBm CF 1.9 GHz
 Marker
 Trc
 X-value
 Y-value
 Function
 Function Result

 M1
 1
 1.892687 GHz
 2.1.09 dbm
 Process
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1.1
 1.1 18.141858142 MHz 18.221778222 MHz Date: 21.MAY.2018 16:33:00

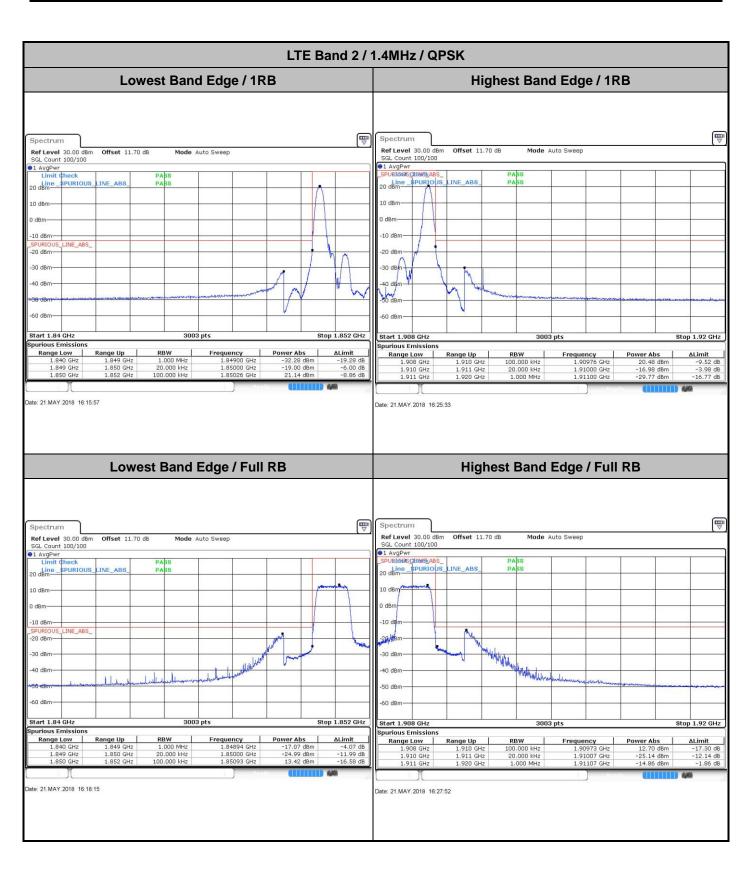
Report No.: FG811724B

TEL: 886-3-327-3456 Page Number : A2-17 of 41 FAX: 886-3-328-4978

Conducted Band Edge

Report No. : FG811724B

TEL: 886-3-327-3456 Page Number : A2-18 of 41



Report No.: FG811724B

TEL: 886-3-327-3456 Page Number: A2-19 of 41