

FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Notebook computer
BRAND NAME : acer
MODEL NAME : N18H2
FCC ID : Contains FCC ID:HLZL850GLA
STANDARD : 47 CFR Part 2, 27(D)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was installed a LTE module (Brand Name: acer, Model Name: L850-GL, FCC ID: HLZL850GLA) during test.

The product was received on Aug. 23, 2018 and completely tested on Nov. 13, 2018. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.



Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City

Guangdong Province 518055 China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG882306C	Rev. 01	Initial issue of report	Nov. 28, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
-	-	Peak-to-Average Ratio	<13dB	N/A	1
3.5	§27.50 (a)(3)	EIRP Power Density	EIRP < 250mW/5MHz	Pass	-
-	§2.1049	Occupied Bandwidth	Reporting Only	Pass	1
-	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Refer standard	Pass	1
-	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	< 70+10log ₁₀ (P[Watts])	Pass	1
-	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within the band	Pass	1
4.4	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	< 70+10log ₁₀ (P[Watts])	PASS	Under limit 3.02 dB at 11527.50 MHz
Remark 1: The test items were leverage from module RF report which can refer to Report No. "RF170106C02-3".					

1 General Description

1.1 Applicant

Acer Incorporated

8F, 88, Sec.1 Xintai 5th Rd. Xizhi, New Taipei City 221, Taiwan, R.O.C

1.2 Manufacturer

Acer Incorporated

8F, 88, Sec.1 Xintai 5th Rd. Xizhi, New Taipei City 221, Taiwan, R.O.C

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook computer
Brand Name	acer
Model Name	N18H2
FCC ID	Contains FCC ID:HLZL850GLA
EUT supports Radios application	WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE WLAN 2.4GHz 802.11b/g/n/ac HT20/HT40/VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
EUT Stage	Identical Prototype

Module Feature & Specification	
Equipment	LTE module
Brand Name	acer
Model Name	L850-GL
FCC ID	HLZL850GLA

Remark:

The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Feature	
Tx Frequency	LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz
Rx Frequency	LTE Band 30 : 2352.5 MHz ~ 2357.5 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 30 : 22.55 dBm
Antenna Gain	Top Antenna: LTE Band 30 : 1.11 dBi Bottom Antenna: LTE Band 30 : 0.33 dBi
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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

1.6 Maximum Conducted power, Frequency Tolerance and Emission Designator

LTE Band 30		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted power(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted power(W)
5	2307.5 ~ 2312.5	-	-	0.1799	-	-	0.1489
10	2310.0	-	-	0.1791	-	-	0.1476

1.7 Testing Site

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No. are CN5018 and CN5019.

Test Site	Sporton International (Shenzhen) Inc.	
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	TH01-SZ	337463

Test Site	Sporton International (Shenzhen) Inc.	
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District Shenzhen City Guangdong Province 518055 China TEL: +86-755-3320-2398	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	03CH02-SZ	577730

1.8 Applied Standards

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

- ♦ 47 CFR Part 2, Part 27(D)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 Power Meas License Digital Systems D01 v03r01

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.

2 Test Configuration of Equipment Under Test

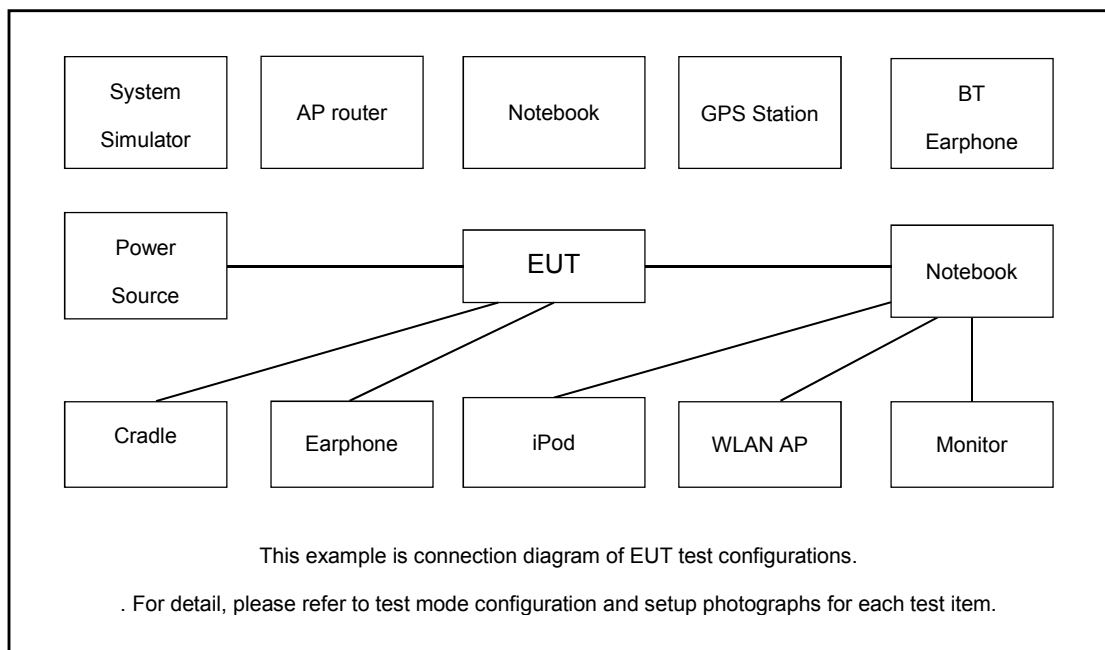
2.1 Test Mode

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.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	30	-	-	V		-	-	V	V	-	V	V	V	V	V	V
		-	-		V	-	-	V	V	-	V	V	V		V	
E.I.R.P PSD	30	-	-	V		-	-	V	V	-	V			V	V	V
		-	-		V	-	-	V	V	-	V				V	
Radiated Spurious Emission	30	-	-	V		-	-	V		-	V			V	V	V
					V			V		-	V				V	
Note		1. The mark "v " means that this configuration is chosen for testing														
		2. The mark "-" means that this bandwidth is not supported.														
Note		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.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Frequency List of Low/Middle/High Channels

LTE Band 30 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	27710	-
	Frequency	-	2310	-
5	Channel	27685	27710	27735
	Frequency	2307.5	2310	2312.5

3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Test Setup

Conducted Output Power



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power Measurement

3.4.1 Description of the Conducted Output Power Measurement

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

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 EIRP Power Density

3.5.1 Description of EIRP Power Density

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.4.5
2. Set instrument center frequency to OBW center frequency.
3. Set span to at least 1.5 times the OBW.
4. Set the RBW to the specified reference bandwidth (5MHz).
5. Set VBW $\geq 3 \times$ RBW.
6. Detector = RMS (power averaging).
7. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
8. Sweep time = auto couple.
9. Employ trace averaging (RMS) mode over a minimum of 100 traces.
10. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).

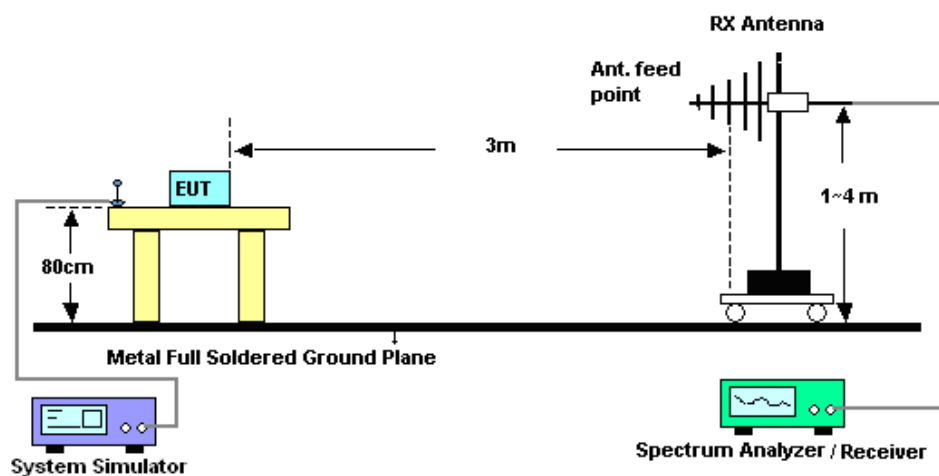
4 Radiated Test Items

4.1 Measuring Instruments

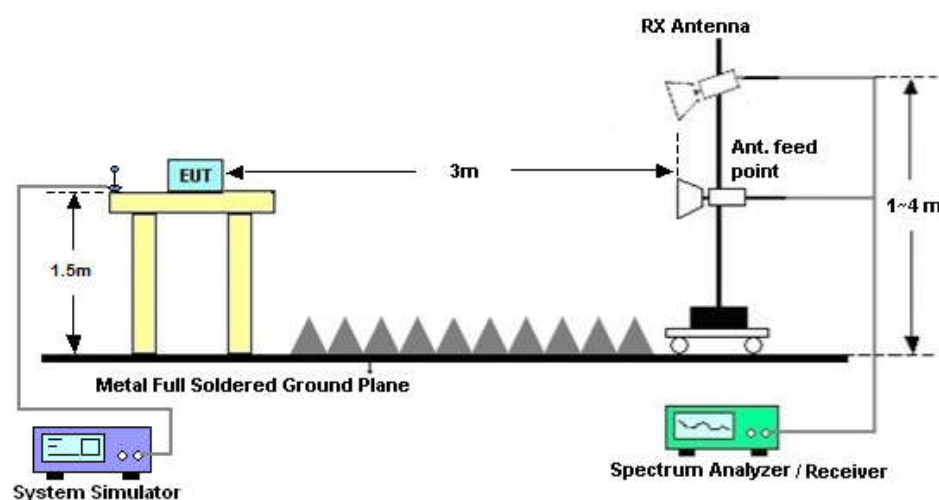
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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 $70 + 10 \log (P)$ dB.

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

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna 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 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$

$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$

9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $70 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [70 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [70 + 10\log(P)] \text{ (dB)}$$

$$= -40\text{dBm}.$$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	Apr. 19, 2018	Oct. 19, 2018~ Nov. 13, 2018	Apr. 18, 2019	Conducted (TH01-SZ)
Radio Communication Analyzer	Anritsu	MT8820C	6201563777	2G/3G/4G (CDMA)	Jan. 03, 2018	Oct. 19, 2018~ Nov. 13, 2018	Jan. 02, 2019	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz;Ma x 30dBm	Oct.20, 2017	Oct. 26, 2018	Oct 19, 2019	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	May. 10, 2018	Oct. 26, 2018	May. 09, 2019	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1285	1GHz~18GHz	Dec. 13, 2017	Oct. 26, 2018	Dec. 12, 2018	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz-40GHz	Mar.30, 2018	Oct. 26, 2018	Mar.29, 2019	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct.20, 2018	Oct. 26, 2018	Oct 19, 2019	Radiation (03CH02-SZ)
HF Amplifier	Agilent	8449B	3008A01023	1GHz~26.5GHz	Oct.20, 2018	Oct. 26, 2018	Oct 19, 2019	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul.30, 2018	Oct. 26, 2018	Jul.29, 2019	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	61601000247 0	N/A	NCR	Oct. 26, 2018	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Oct. 26, 2018	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Oct. 26, 2018	NCR	Radiation (03CH02-SZ)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.3dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.7dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 30 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	-	22.39	-
5	1	12			22.40	
5	1	24			22.55	
5	12	0			21.51	
5	12	7			21.53	
5	12	13			21.56	
5	25	0			21.65	
5	1	0	16-QAM	-	21.73	-
5	1	12			21.69	
5	1	24			21.65	
5	12	0			20.50	
5	12	7			20.57	
5	12	13			20.58	
5	25	0			20.67	
10	1	0	QPSK	22.53	22.37	22.31
10	1	25		22.46	22.40	22.20
10	1	49		22.46	22.37	22.24
10	25	0		21.49	21.37	21.21
10	25	12		21.39	21.36	21.20
10	25	25		21.44	21.41	21.21
10	50	0		21.43	21.45	21.24
10	1	0	16-QAM	21.69	21.56	21.52
10	1	25		21.56	21.64	21.43
10	1	49		21.66	21.56	21.47
10	25	0		20.44	20.30	20.27
10	25	12		20.40	20.34	20.28
10	25	25		20.45	20.38	20.28
10	50	0		20.36	20.40	20.27

EIRP Power Density

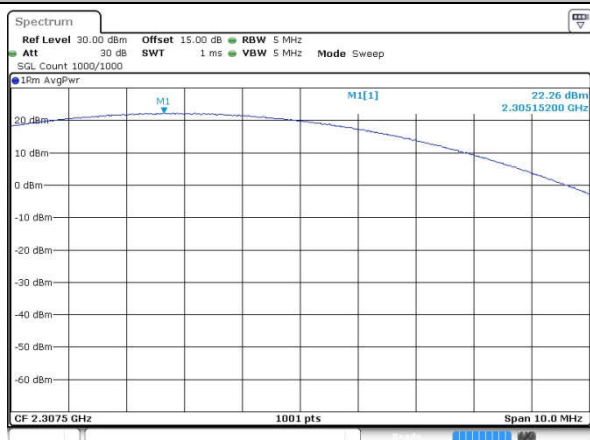
Mode	LTE Band 30 : Conducted Power Density (dBm/5MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Lowest CH	22.26	21.49		
Middle CH	22.14	21.52	22.26	21.54
Highest CH	22.39	21.61		

Mode	LTE Band 30 : EIRP Power Density (dBm/5MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Lowest CH	23.37	22.60		
Middle CH	23.25	22.63	23.37	22.65
Highest CH	23.50	22.72		
Antenna Gain	1.11dBi			
Limit	250mW / 5MHz = 24dBm / 5MHz			
Result	Pass			



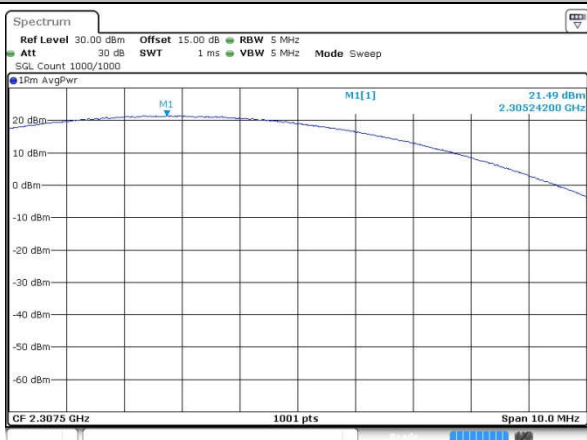
LTE Band 30 / 5MHz

Lowest Channel / 5MHz / 1RB0 / QPSK



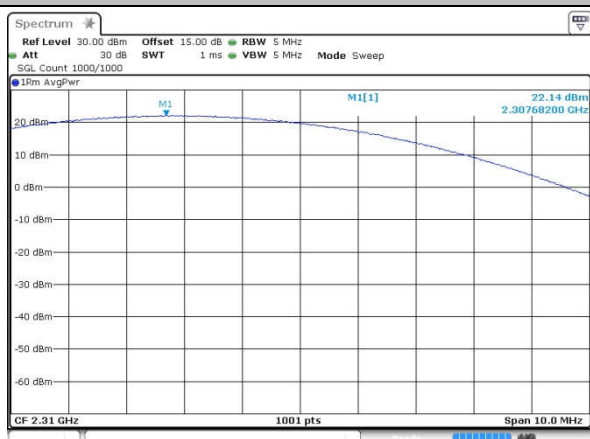
Date: 19.OCT.2018 16:53:33

Lowest Channel / 5MHz / 1RB0 / 16QAM



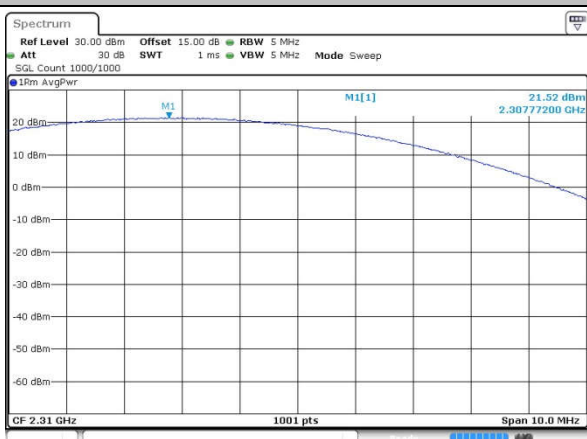
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Middle Channel / 5MHz / 1RB0 / QPSK



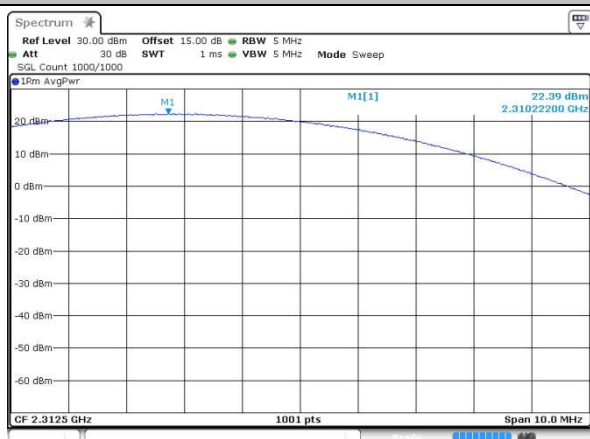
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Middle Channel / 5MHz / 1RB0 / 16QAM



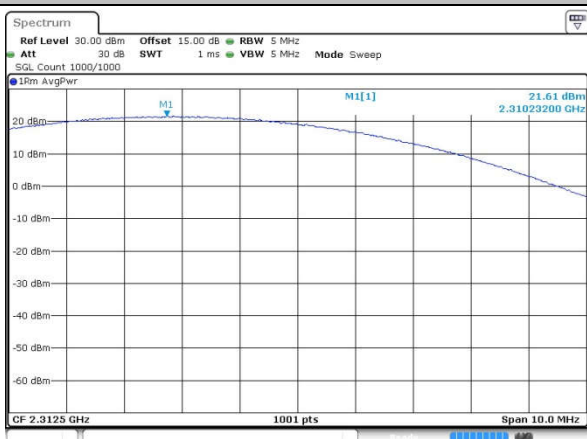
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Highest Channel / 5MHz / 1RB0 / QPSK



Date: 19.OCT.2018 16:58:07

Highest Channel / 5MHz / 1RB0 / 16QAM



Date: 19.OCT.2018 16:58:33



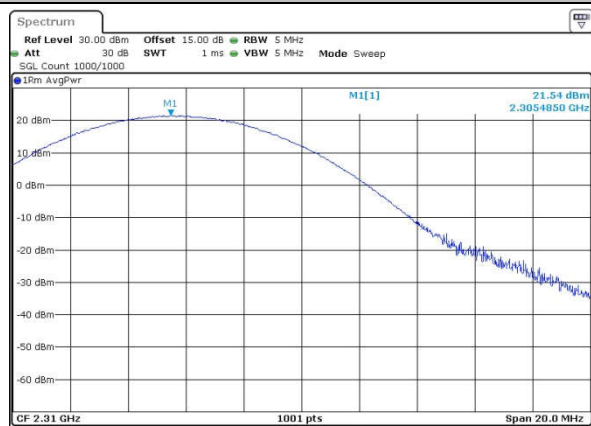
LTE Band 30 / 10MHz

Middle Channel / 10MHz / 1RB0 / QPSK



Date: 19.OCT.2018 17:02:00

Middle Channel / 10MHz / 1RB25 / 16QAM



Date: 19.OCT.2018 17:02:24

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

LTE Band 30 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4610.50	-68.23	-40	-28.23	-62.61	-74.48	6.30	12.55	H
	6915.75	-57.04	-40	-17.04	-55.92	-60.44	8.25	11.65	H
	9221.00	-57.81	-40	-17.81	-60.92	-60.16	9.50	11.85	H
	11526.25	-55.69	-40	-15.69	-61.52	-56.77	10.97	12.05	H
	4610.50	-67.95	-40	-27.95	-62.39	-74.20	6.30	12.55	V
	6915.75	-56.37	-40	-16.37	-55.39	-59.77	8.25	11.65	V
	9221.00	-59.01	-40	-19.01	-60.85	-61.36	9.50	11.85	V
	11526.25	-55.60	-40	-15.60	-61.85	-56.68	10.97	12.05	V
Middle	4615.50	-61.83	-40	-21.83	-56.09	-68.08	6.45	12.70	H
	6923.25	-56.65	-40	-16.65	-55.97	-60.05	8.40	11.80	H
	9231.00	-53.78	-40	-13.78	-61.92	-56.13	9.65	12.00	H
	11538.75	-51.57	-40	-11.57	-61.77	-52.65	11.12	12.20	H
	4615.50	-61.81	-40	-21.81	-56.14	-68.06	6.45	12.70	V
	6923.25	-56.46	-40	-16.46	-55.92	-59.86	8.40	11.80	V
	9231.00	-55.10	-40	-15.10	-61.97	-57.45	9.65	12.00	V
	11538.75	-51.08	-40	-11.08	-61.67	-52.16	11.12	12.20	V
Highest	4620.50	-68.17	-40	-28.17	-62.59	-74.42	6.61	12.86	H
	6930.75	-60.22	-40	-20.22	-59.18	-63.60	8.56	11.94	H
	9241.00	-57.94	-40	-17.94	-61.04	-60.29	9.81	12.16	H
	11551.25	-56.01	-40	-16.01	-61.86	-57.06	11.28	12.33	H
	4620.50	-68.04	-40	-28.04	-62.53	-74.29	6.61	12.86	V
	6930.75	-58.60	-40	-18.60	-57.67	-61.98	8.56	11.94	V
	9241.00	-59.33	-40	-19.33	-61.16	-61.68	9.81	12.16	V
	11551.25	-55.76	-40	-15.76	-61.99	-56.81	11.28	12.33	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 30 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	4611.00	-57.51	-40	-17.51	-51.70	-63.76	6.45	12.70	H
	6916.50	-44.25	-40	-4.25	-43.57	-47.65	8.40	11.80	H
	9222.00	-52.05	-40	-12.05	-60.19	-54.40	9.65	12.00	H
	11527.50	-43.02	-40	-3.02	-53.18	-44.10	11.12	12.20	H
	4611.00	-57.80	-40	-17.80	-52.05	-64.05	6.45	12.70	V
	6916.50	-45.03	-40	-5.03	-44.49	-48.43	8.40	11.80	V
	9222.00	-54.30	-40	-14.30	-61.17	-56.65	9.65	12.00	V
	11527.50	-43.18	-40	-3.18	-53.76	-44.26	11.12	12.20	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.