

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Product Name:	Telit Communications S.p.A. Via Stazione di Prosecco 5/b 34010 Sgonico - Trieste LN920A12-WW / LN920A6-WW
Brand Name:	Telit
Model No.:	LN920A12-WW / LN920A6-WW
Model Difference:	 Internal Component is different between two model. Capability is different between two model.
Report Number:	ER/2021/A0028
FCC ID	RI7LN920
Issue Date:	January 11, 2022
Date of Test:	October 6, 2021~December 10, 2021
Date of EUT Received:	October 6, 2021

Alex Lay

Approved By

Blue Yang

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI ANSI C63.26-2015 and the energy emitted by the sample EUT comply with FCC rule part 2, 96.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History					
Report Number	Revision	Description	Issue Date	Revised By	Remark
ER/2021/A0028	00	Original.	January 11, 2022	Susan Lin	

Note:

- 1 The remark "*" indicates modification of the report upon requests from certification body.
- 2 Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received and are assessed as identical in hardware and firmware to each other.

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1 GENERAL PRODUCT INFORMATION

1.1 **Product Description**

Product Name:	LN920A12-WW / LN920A6-WW
Brand Name:	Telit
Model No.:	LN920A12-WW / LN920A6-WW
Model Difference:	 Internal Component is different between two model. Capability is different between two model.
Hardware Version:	1.0
Firmware Version:	LN920A12-WW: M0L.000001 / LN920A6-WW : M0L.010001
EUT Series No.:	35417570001280
Power Supply:	3.3Vdc
Test Software (Name/Version):	N/A

1.2 Antenna Designation

Antenna Type	Antenna Model No.	
Dipole	WE14-S3-2	
Note: Transmission frequencies in this test report are only available by the above antenna(s).		

Туре	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
	LTE-Band 42	3400 ~ 3600	1
Dipole	LTE-Band 43	3600 ~ 3700	1
	LTE-Band 48	3550 ~ 3700	1

Note: Antenna information is provided by the applicant.

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1.3 **Operation Frequencies**

LTE Band	BW (MHz)	Operation Frequency (MHz)		
	5	3552.5	-	3697.5
42/43/48	10	3555.0	-	3695.0
42/43/40	15	3557.5	-	3692.5
	20	3560.0	-	3690.0

Maximum ERP/EIRP 1.4

LTE	BW	Modulation	ERP / I		(W)	99%	Type of
Band	511	Woddiation	(dBm/10)MHz)	(**)	0070	Emission
		QPSK	22.78	EIRP	0.190	4.4904	4M49G7D
48	5	16QAM	22.01	EIRP	0.159	4.4826	4M48D7W
		64QAM	20.79	EIRP	0.120	4.4964	4M50D7W
		QPSK	22.68	EIRP	0.185	8.9618	8M96G7D
48	10	16QAM	22.02	EIRP	0.159	8.9433	8M94D7W
		64QAM	20.80	EIRP	0.120	8.9568	8M96D7W
		QPSK	22.82	EIRP	0.191	13.4270	13M4G7D
48	15	16QAM	22.05	EIRP	0.160	13.4420	13M4D7W
		64QAM	20.81	EIRP	0.121	13.4230	13M4D7W
		QPSK	22.87	EIRP	0.194	17.8840	17M9G7D
48	20	16QAM	22.06	EIRP	0.161	17.8850	17M9D7W
		64QAM	20.74	EIRP	0.119	17.8830	17M9D7W

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1.5 Test Methodology of Applied Standards

FCC 47 CFR Part 2, Part 96E ANSI C63.26-2015 ANSI/ITA C603-E.2016 KDB 971168 D01 Power Meas license Digital System v03r01 KDB 940660 D01 Part 96 CBRS Eqpt v02 KDB 412172 D01 Determining ERP and EIRP V01r01

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
	Γ	SAC 3		
		Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1		
	Industrial Park, Wuku District, New	Conducted 2	TW0027	
	Taipei City, Taiwan.	Conducted 3		TW3702
		Conducted 4		
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
(TAF code 3702)		SAC C		
$(1AI \ COUE \ 510Z)$		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
	Tabydan City, Talwan 555	Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		
	ame is remarked on the equipmen		•	s an indica-
tion where	measurements occurred in specif	ic test site and ad	dress.	

1.7 Special Accessories

No special accessories were used during testing.

1.8 Equipment Modifications

There was no modifications incorporated into the EUT.

1.9 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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 attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation in physical test.

Frequency	RF Cable loss (dB)	Attenuation (dB)	Offset (dB)
HB(over 3GHz)	5.47	10	15.47

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Final Amplifier Voltage and Current Information: 2.5

LTE Band 48

Test Mode	DC voltage (V)	DC current (mA)
LTE Band 48_20M QPSK	3.3	457

2.6 **Test Configuration**

Conducted Setup	Radiated Setup
DC Power Supply EUT	DC Power Supply

Note: Radio Communication Analyzer is placed in remote side for radiated test.

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a) §96.41(b)	Maximum Power Output	Compliant
§2.1046, §96.41(b)	Maximum Power Density	Compliant
§2.1053, §96.41(e)	FIELD STRENGTH OF SPURIOUS RA- DIATION	Compliant
§2.1051 §96.41(e)	OUT OF BAND EMISSION AT AN- TENNA	Compliant
§2.1049,(h)	OCCUPIED BAND- WIDTH	Compliant
§2.1055(a)	Frequency Stability	Compliant

3.1 Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

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DESCRIPTION OF TEST MODES 4

4.1 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Pre-Scan has been conducted to determine the worst-case scenario from all possible combinations among available modulations, data rates and antenna ports, the worst case configurations listed below for the final test.
- 3. The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

Measurement Configuration 4.2

LTE Band 48 MODE

Test Items	Band	Tes	st Chan	nel		В	andwid	th (MH:	z)			Modu	lation			RB #	
rest items	Dallu	L	М	Н	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
Max. Output Power	48	٧	V	V	-	-	v	V	V	v	V	V	V	v	٧	v	v
Freqency	48	-	٧	-	-	-		V			V	-	-	-	-	-	V

Test Items	Band	Tes	st Chan	nel		В	andwid	th (MHz	<u>z)</u>			Modu	lation			RB #	
restitems	Dallu	L	М	Н	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	64QAM	1	Half	Full
26dB and 99% Bandwidth	48	۷	v	v	-	-	v	v	v	v	v	v	v	v		-	v
Peak-to-Av erage Ratio	48	v	v	V	-	-	v	v	v	v	-	-	v	-		-	v

Test Items	Band	Tes	st Chan	nel		В	andwid	th (MHz	<u>z)</u>			Modu	lation			RB #	
restitems	Dallu	L	М	Н	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	64QAM	1	Half	Full
Mask	48	۷	٧	٧	-	-	٧	٧	٧	٧	V	-	-	-	٧	٧	v
Conducted Emission	48	۷	v	V	-	-	-	-	-	V	v	-	-	-	V	-	-

Test Items	Band	Tes	st Chan	nel		Bandwidth (MHz)				Modulation				RB #			
I ESI ILEIIIS	Dallu	L	М	Н	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
Radiated Emission	48	۷	v	۷	-	-	-	-	-	٧	۷	-	-	-	v	-	-

Note: LTE band 42/43 is covered by LTE band 48 because it is a subset of Band 48 and they have same output power.

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MEASUREMENT UNCERTAINTY 5

Test Items	Une	certair	nty
RF Power Output	+/-	1	dB
ERP/ EIRP measurement	+/-	3	dB
	+/-	3	dB
Emission Bandwidth	+/-	1.53	Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/-	1.69	dB
Peak to Average Ratio	+/-	1	dB
Frequency Stability vs. Temperature	+/-	1.53	Hz
Frequency Stability vs. Voltage	+/-	1.53	Hz
Temperature	+/-	0.4	°C
Humidity	+/-	3.5	%
DC / AC Power Source	+/-	1	%

Radiated Spurio	us E	missior	n Meas	surement Uncertainty
	+/-	2.64	dB	9kHz~30MHz
Polarization: Vertical	+/-	4.93	dB	30MHz - 1000MHz
	+/-	4.81	dB	1GHz - 18GHz
	+/-	4.52	dB	18GHz - 40GHz
	+/-	2.64	dB	9kHz~30MHz
Polarization: Horizontal	+/-	4.45	dB	30MHz - 1000MHz
Foranzation: Horizontal	+/-	4.81	dB	1GHz - 18GHz
	+/-	4.52	dB	18GHz - 40GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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MEASUREMENT EQUIPMENT USED 6

6.1 **Conducted Measurement**

	Conducted E	imission Test	Site: Conducted	d 4	
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY54200716	10/13/2021	10/12/2022
Radio Communication Analyer	Anritsu	MT8821C	6262044670	08/18/2021	08/17/2022
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R
Temperature Chamber	Giant Force	GTH-150- 40-CP-AR	MAA0512-018	05/19/2021	05/18/2022
DC Power Supply	Gwinstek	SPS-3610	GEV856761	09/18/2021	09/17/2022
Attenuator	Mini-Circuit	BW- S10W2+	4	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021
Power Divider	RF-LAMBAD	RFLT2W1G1 8G	11-JSPF412- 017	12/16/2020	12/15/2021

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6.2 **Radiated Measurement**

	Radiated	Emission Te	st Site: SAC 1		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWARZBECK	VULB9168	300	11/18/2020	11/17/2021
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/18/2021	05/17/2022
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/11/2020	12/10/2021
Horn Antenna	SCHWARZBECK	BBHA9170	185	08/06/2021	08/05/2022
Site Cal	SGS	SAC I chamber	N/A	01/01/2021	12/31/2021
Horn Antenna	SCHWARZBECK	BBHA9120D	D803	12/17/2020	12/16/2021
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT- N0555	01/13/2021	01/12/2022
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/26/2020	10/25/2022
Radio Communication Analyer	Anritsu	MT8815B	6200711454	04/07/2021	04/06/2022
Radio Communication Analyer	Anritsu	MT8821C	6262044751	10/27/2021	10/26/2022
DC Power Supply	Agilent	E3640A	MY40005907	10/12/2021	10/11/2022
Pre-Amplifier	EMC Instruments	EMC184045 B	980135	10/27/2021	10/26/2022
Pre-Amplifier	НР	8449B	3008A01973	12/16/2020	12/15/2021
Pre-Amplifier	HP	8447D	2944A09469	12/16/2020	12/15/2021
Bandreject Filter 3300- 3800	Micro-Tronics	WI	1	12/16/2020	12/15/2021
High Pass Filter	WI	WHKX6.0/1 8G-10SS	WHKX6.0/18G -10SS	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	EMC 104- SM-SM- 2000	160123	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	160125	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 106	76096/6	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102	MY2630/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102	MY22962/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102	SN 520430/2	12/16/2020	12/15/2021

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7 MAXIMUM OUTPUT POWER MEASUREMENT

7.1 Standard Applicable

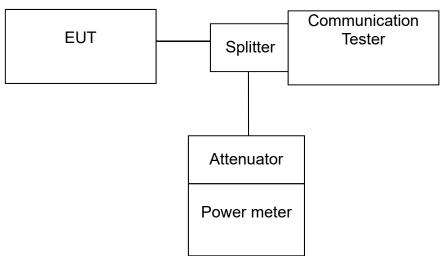
FCC §2.1046 & 96.41

- (a) FCC 96.41(a) Digital modulation. Systems operating in the Citizens Broadband Radio Service must use digital modulation techniques.
- (b) FCC 96.41(b) Power limits. Unless otherwise specified in this section, the maximum effective iso tropic radiated power (EIRP) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10 megahertz)
End User Device	23
Category A CBSD	30
Category B CBSD ¹	47

Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

7.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

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7.3 Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

Determining ERP and/or EIRP from conducted RF output power measurements ERP/EIRP = PMeas + GT-LC

Where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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7.4 **Measurement Result**

RF Conducted Output Power

LTE MODE:

Antenna	gain (dBi)	1							
		L	TE Band 48_Up	link freq	uency ba	nd : 3550 to 370	00 MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
				1	0	21.65	22.65	23	-0.35
	55265	3552.5	QPSK	1	24	21.69	22.69	23	-0.31
	55205	5552.5	QFSK	12	6	20.66	21.66	23	-1.34
				25	0	20.64	21.64	23	-1.36
				1	0	21.65	22.65	23	-0.35
F	55000	2625	QPSK	1	24	21.65	22.65	23	-0.35
5	55990	3625	QPSK	12	6	20.64	21.64	23	-1.36
				25	0	20.62	21.62	23	-1.38
				1	0	21.76	22.76	23	-0.24
	50745	0007 5	0001/	1	24	21.78	22.78	23	-0.22
	56715	3697.5	QPSK	12	6	20.79	21.79	23	-1.21
				25	0	20.77	21.77	23	-1.23
				1	0	20.96	21.96	23	-1.04
			16QAM	1	24	20.91	21.91	23	-1.09
	55265	3552.5		12	6	19.71	20.71	23	-2.29
				25	0	19.68	20.68	23	-2.32
			16QAM	1	0	20.90	21.90	23	-1.1
_				1	24	20.86	21.86	23	-1.14
5	55990	3625		12	6	19.71	20.71	23	-2.29
				25	0	19.67	20.67	23	-2.33
				1	0	21.01	22.01	23	-0.99
				1	24	20.98	21.98	23	-1.02
	56715	3697.5	16QAM	12	6	19.84	20.84	23	-2.16
				25	0	19.80	20.80	23	-2.2
				1	0	19.66	20.66	23	-2.34
				1	24	19.70	20.70	23	-2.3
	55265	3552.5	64QAM	12	6	18.79	19.79	23	-3.21
				25	0	18.73	19.73	23	-3.27
				1	0	19.64	20.64	23	-2.36
				1	24	19.62	20.62	23	-2.38
5	55990	3625	64QAM	12	6	18.73	19.73	23	-3.27
				25	0	18.69	19.69	23	-3.31
				1	0	19.78	20.78	23	-2.22
				1	24	19.78	20.78 20.79	23	-2.22
	56715	3697.5	64QAM	12	6	18.84	19.84	23	-2.21
				25	0			23	
				20	U	18.82	19.82	23	-3.18

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Antenna	gain (dBi)	1							
		L	TE Band 48_Up	link freq	uency ba	nd : 3550 to 370	00 MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
				1	0	21.57	22.57	23	-0.43
	55290	3555	QPSK	1	49	21.65	22.65	23	-0.35
	55290	3000	QFSK	25	12	20.70	21.70	23	-1.3
				50	0	20.69	21.69	23	-1.31
				1	0	21.55	22.55	23	-0.45
10	55990	3625	QPSK	1	49	21.52	22.52	23	-0.48
10	00000	0020	QION	25	12	20.66	21.66	23	-1.34
				50	0	20.65	21.65	23	-1.35
				1	0	21.67	22.67	23	-0.33
	56690	3695	QPSK	1	49	21.68	22.68	23	-0.32
	00000	0000		25	12	20.80	21.80	23	-1.2
				50	0	20.76	21.76	23	-1.24
			16QAM	1	0	20.90	21.90	23	-1.1
	55290	3555		1	49	20.95	21.95	23	-1.05
	00200	3000		25	12	19.75	20.75	23	-2.25
				50	0	19.76	20.76	23	-2.24
			16QAM	1	0	20.91	21.91	23	-1.09
10	55990	3625		1	49	20.89	21.89	23	-1.11
				25	12	19.68	20.68	23	-2.32
				50	0	19.69	20.69	23	-2.31
				1	0	20.98	21.98	23	-1.02
	56690	3695	16QAM	1	49	21.02	22.02	23	-0.98
		0000	i o do um	25	12	19.83	20.83	23	-2.17
				50	0	19.81	20.81	23	-2.19
				1	0	19.61	20.61	23	-2.39
	55290	3555	64QAM	1	49	19.69	20.69	23	-2.31
	00200	0000		25	12	18.79	19.79	23	-3.21
				50	0	18.71	19.71	23	-3.29
				1	0	19.64	20.64	23	-2.36
10	55990	3625	64QAM	1	49	19.62	20.62	23	-2.38
				25	12	18.75	19.75	23	-3.25
	L			50	0	18.68	19.68	23	-3.32
				1	0	19.78	20.78	23	-2.22
	56690	3695	64QAM	1	49	19.80	20.80	23	-2.2
				25	12	18.90	19.90	23	-3.1
				50	0	18.78	19.78	23	-3.22

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Antenna	gain (dBi)	1							
		L	TE Band 48_Up	link freq	uency ba	nd : 3550 to 370	00 MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
				1	0	21.69	22.69	23	-0.31
	55315	3557.5	QPSK	1	74	21.77	22.77	23	-0.23
	55515	5557.5	QFON	36	18	20.68	21.68	23	-1.32
				75	0	20.67	21.67	23	-1.33
				1	0	21.61	22.61	23	-0.39
15	55990	3625	QPSK	1	74	21.61	22.61	23	-0.39
15	55990	5025	QFON	36	18	20.66	21.66	23	-1.34
				75	0	20.65	21.65	23	-1.35
				1	0	21.74	22.74	23	-0.26
	56665	3692.5	QPSK	1	74	21.82	22.82	23	-0.18
	50005	3092.5		36	18	20.80	21.80	23	-1.2
				75	0	20.79	21.79	23	-1.21
				1	0	20.86	21.86	23	-1.14
	55245		16QAM	1	74	21.02	22.02	23	-0.98
	55315	3557.5		36	18	19.70	20.70	23	-2.3
				75	0	19.69	20.69	23	-2.31
			160414	1	0	20.87	21.87	23	-1.13
15	55990	3625		1	74	20.90	21.90	23	-1.1
15	55990	3025	16QAM	36	18	19.64	20.64	23	-2.36
				75	0	19.68	20.68	23	-2.32
				1	0	20.94	21.94	23	-1.06
	FCCCF	2602 5	160414	1	74	21.05	22.05	23	-0.95
	56665	3692.5	16QAM	36	18	19.78	20.78	23	-2.22
				75	0	19.82	20.82	23	-2.18
				1	0	19.58	20.58	23	-2.42
	55315	3557.5	64QAM	1	74	19.66	20.66	23	-2.34
	55515	3007.5	04QAIVI	36	18	18.73	19.73	23	-3.27
				75	0	18.73	19.73	23	-3.27
				1	0	19.58	20.58	23	-2.42
15	55000	2605	640414	1	74	19.59	20.59	23	-2.41
10	55990	3625	64QAM	36	18	18.64	19.64	23	-3.36
				75	0	18.65	19.65	23	-3.35
				1	0	19.69	20.69	23	-2.31
	FREEF	2602 5	64QAM	1	74	19.81	20.81	23	-2.19
	56665	3692.5	04QAIVI	36	18	18.79	19.79	23	-3.21
				75	0	18.80	19.80	23	-3.2

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Antenna	gain (dBi)	1							
		L	TE Band 48_Up	link freq	uency ba	nd : 3550 to 370	00 MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
				1	0	21.68	22.68	23	-0.32
	55340	3560	QPSK	1	99	21.77	22.77	23	-0.23
	55540	3300	QFSK	50	25	20.72	21.72	23	-1.28
				100	0	20.74	21.74	23	-1.26
				1	0	21.66	22.66	23	-0.34
20	55990	2605	QPSK	1	99	21.66	22.66	23	-0.34
20	55990	3625	QFSK	50	25	20.65	21.65	23	-1.35
				100	0	20.64	21.64	23	-1.36
				1	0	21.87	22.87	23	-0.13
	56640	3690		1	99	21.74	22.74	23	-0.26
	50040	2090	QPSK	50	25	20.75	21.75	23	-1.25
				100	0	20.74	21.74	23	-1.26
				1	0	20.90	21.90	23	-1.1
	55240	2560	16QAM	1	99	20.99	21.99	23	-1.01
	55340	3560		50	25	19.76	20.76	23	-2.24
				100	0	19.75	20.75	23	-2.25
			160414	1	0	20.90	21.90	23	-1.1
20	55990	3625		1	99	20.88	21.88	23	-1.12
20	55990	3025	16QAM	50	25	19.70	20.70	23	-2.3
				100	0	19.67	20.67	23	-2.33
				1	0	20.98	21.98	23	-1.02
	56640	3600	160414	1	99	21.06	22.06	23	-0.94
	56640	3690	16QAM	50	25	19.80	20.80	23	-2.2
				100	0	19.78	20.78	23	-2.22
				1	0	19.60	20.60	23	-2.4
	55240	2560	640414	1	99	19.67	20.67	23	-2.33
	55340	3560	64QAM	50	25	18.72	19.72	23	-3.28
				100	0	18.71	19.71	23	-3.29
				1	0	19.56	20.56	23	-2.44
20	55000	2605	640444	1	99	19.58	20.58	23	-2.42
20	55990	3625	64QAM	50	25	18.68	19.68	23	-3.32
				100	0	18.66	19.66	23	-3.34
				1	0	19.62	20.62	23	-2.38
	FREAD	2600	640444	1	99	19.74	20.74	23	-2.26
	56640	3690	64QAM	50	25	18.78	19.78	23	-3.22
				100	0	18.76	19.76	23	-3.24

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MAXIMUM POWER DENSITY MEASUREMENT 8

8.1 Standard Applicable

FCC §2.1046 & 96.41

- (a) FCC 96.41(a) Digital modulation. Systems operating in the Citizens Broadband Radio Service must use digital modulation techniques.
- (b) FCC 96.41(b) Power limits. Unless otherwise specified in this section, the maximum effective iso tropic radiated power (EIRP) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum PSD (dBm/MHz)
End User Device	n/a
Category A CBSD	20
Category B CBSD ¹	37

Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

- (c) Power management. CBSDs and End User Devices shall limit their operating power to the minimum necessary for successful operations
 - (1) CBSDs must support transmit power control capability and the capability to limit their maximum EIRP and the maximum EIRP of associated End User Devices in response to instructions from an SAS.
 - (2) End User Devices shall include transmit power control capability and the capability to limit their maximum EIRP in response to instructions from their associated CBSDs.

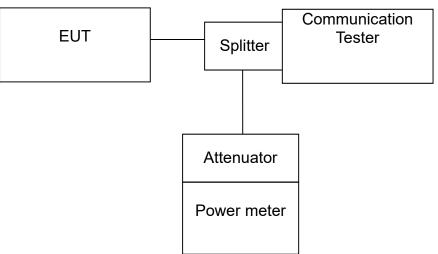
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8.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

8.3 Measurement Procedure

- 1. Set instrument center frequency to OBW center frequency.
- 2. Set span to at least 1.5 times the OBW.
- 3. Set the RBW to the specified reference bandwidth (often 1 MHz).
- 4. Set VBW \geq 3 × RBW.
- 5. Detector = RMS (power averaging).
- 6. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- 7. Sweep time = auto couple.
- 8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- 9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
- 10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

8.4 Measurement Result

Peak Power Density Results:

N/A, this is an End user device.

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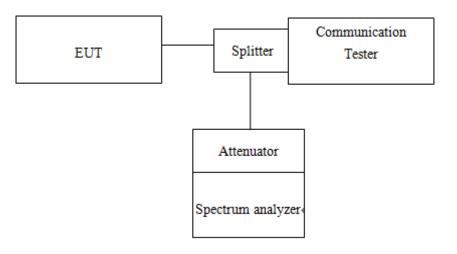
9 OCCUPIED BANDWIDTH MEASUREMENT

9.1 Standard Applicable

FCC Part 2.1049(h)

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

9.2 Test Set-up



9.3 Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

9.4 Measurement Result

	LTE BAND 48 Channel bandwidth: 5MHz											
Freq.	СН	99	% BW (Mł	Hz)	26 dB BW (MHz)							
(MHz)	GIT	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM					
3552.5	55265	4.4866	4.4826	4.4964	5.038	4.959	4.902					
3625.0	55990	4.4759	4.4697	4.4691	4.962	4.807	4.960					
3697.5	56715	4.4904	4.4538	4.4771	4.910	4.842	4.791					

	LTE BAND 48 Channel bandwidth: 15MHz											
Freq.	СН	99	% BW (Mł	Hz)	26 dB BW (MHz)							
(MHz)	GIT	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM					
3557.5	55315	13.427	13.437	13.423	14.44	14.65	14.53					
3625.0	55990	13.422	13.379	13.367	14.37	14.16	14.35					
3692.5	56665	13.367	13.442	13.397	14.13	14.19	14.24					

	LTE BAND 48 Channel bandwidth: 10MHz											
Freq.	СН	99	% BW (Mł	lz)	26 dB BW (MHz)							
(MHz)	GIT	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM					
3555.0	55290	8.9618	8.9403	8.9568	9.708	9.688	9.729					
3625.0	55990	8.9489	8.9356	8.9505	9.462	9.395	9.565					
3695.0	56690	8.9479	8.9433	8.9703	9.542	9.408	9.578					

LTE BAND 48 Channel bandwidth: 20MHz												
Freq.	СН	99	% BW (Mł	lz)	26 dB BW (MHz)							
(MHz)	СП	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM					
3650.0	55340	17.884	17.885	17.883	19.30	19.25	19.23					
3625.0	55990	17.822	17.804	17.848	18.83	19.09	18.77					
3690.0	56640	17.852	17.881	29.730	18.90	19.02	30.00					

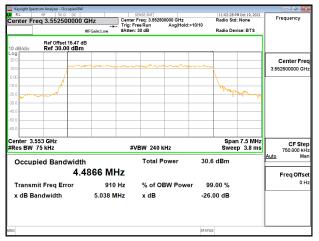
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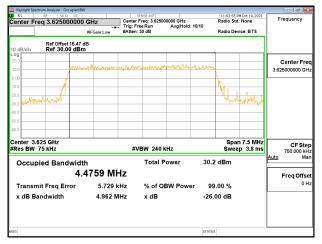
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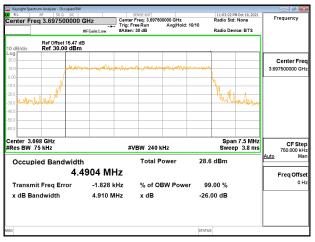
Band48_5MHz_QPSK_RB25_0_CH55265



Band48_5MHz_QPSK_RB25_0_CH55990



Band48 5MHz QPSK RB25 0 CH56715



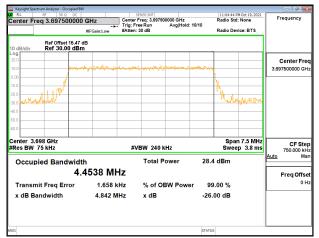
Band48_5MHz_16QAM_RB25_0_CH55265



Band48_5MHz_16QAM_RB25_0_CH55990



Band48 5MHz 16QAM RB25 0 CH56715



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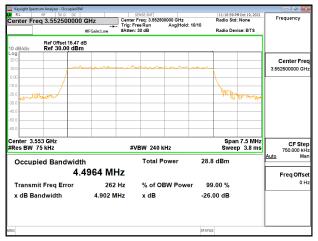
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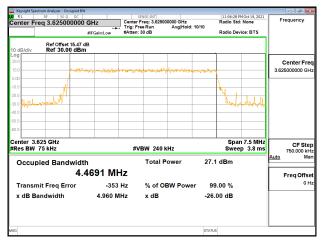
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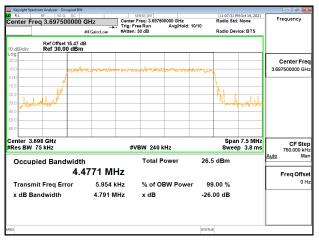
Band48_5MHz_64QAM_RB25_0_CH55265



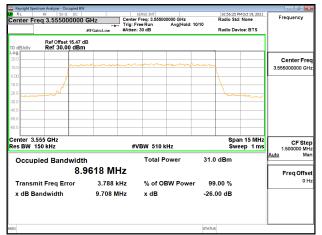
Band48_5MHz_64QAM_RB25_0_CH55990



Band48 5MHz 64QAM RB25 0 CH56715



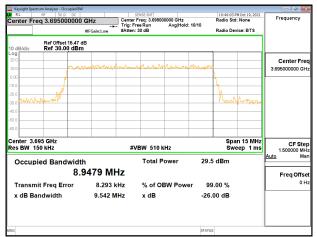
Band48_10MHz_QPSK_RB50_0_CH55290



Band48_10MHz_QPSK_RB50_0_CH55990

Keysight Spectrum A	50 Ω	DC		SENSE:INT		10:45:36 P Radio Std	M Oct 19, 2021	Frequency
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Occupied	Bandy	/idth		Total Power	28.	9 dBm		Auto M
		8. 9 489	MHz					Freq Offs
Transmit F	req Erro	r -1	.035 kHz	% of OBW Por	wer 9	9.00 %		0
x dB Band	width	9.	462 MHz	x dB	-26	.00 dB		
\$G					STATU	IS		

Band48 10MHz QPSK RB50 0 CH56690



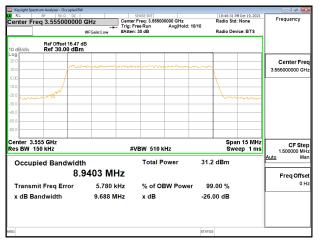
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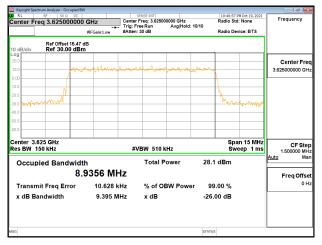
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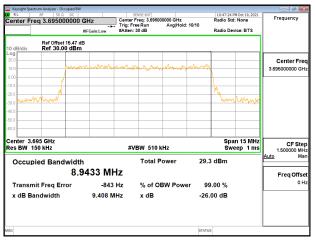
Band48_10MHz_16QAM_RB50_0_CH55290



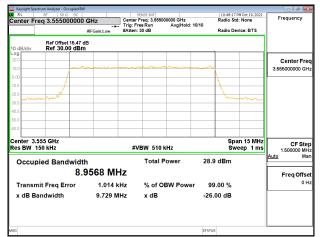
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Band48 10MHz 16QAM RB50 0 CH56690



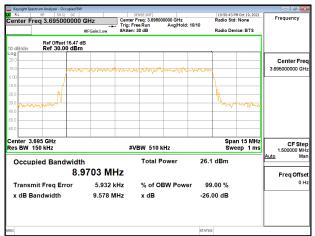
Band48_10MHz_64QAM_RB50_0_CH55290



Band48_10MHz_64QAM_RB50_0_CH55990

Keysight Spectrum Analyzer - O RL RF 50 4 Center Freq 3.6250	2 DC	SENSE:INT Center Freq: 3.6250	000000 GHz Avg Hold: 10/	Radio Std	M Oct 19, 2021 None	Frequency
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Occupied Ban	dwidth	Total I	Power	27.0 dBm		<u>Auto</u> M
	8.9505 I	//Hz				Freq Offs
Transmit Freq Er	ror 13.19	2 kHz % of C	BW Power	99.00 %		0
x dB Bandwidth	9.56	óMHz xdB		-26.00 dB		
39				STATUS		

Band48 10MHz 64QAM RB50 0 CH56690



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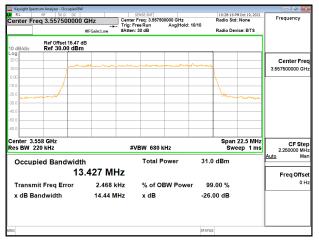
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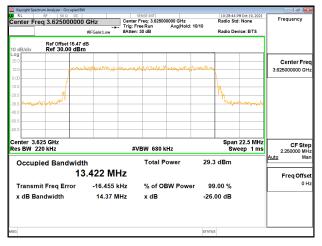
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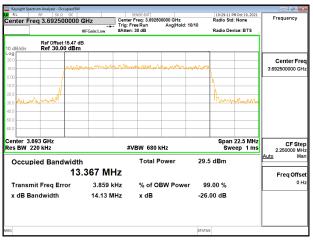
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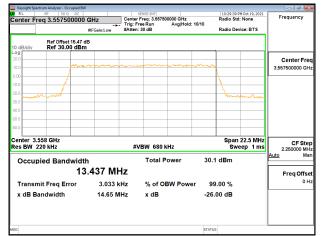
Band48_15MHz_QPSK_RB75_0_CH55990



Band48 15MHz QPSK RB75 0 CH56665



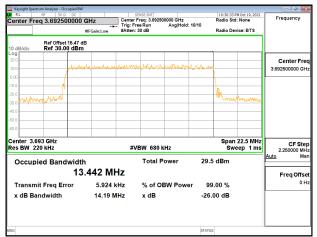
Band48_15MHz_16QAM_RB75_0_CH55315



Band48_15MHz_16QAM_RB75_0_CH55990

RL RF Center Freq 3.6	50 Q DO		Trig: F	SENSE:INT r Freq: 3.62500 Free Run	0000 GHz Avg Hold:	10/10	Radio Std		Frequency
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C3 DW 220 KH			"					еер тшэ	2.250000 MI Auto Mi
Occupied E				Total P	ower	28.9	dBm		
		13.379	MHz						Freq Offs
Transmit Fre	q Error	12.4	10 kHz	% of OE	3W Powe	er 99	0.00 %		0
x dB Bandwi	dth	14.1	6 MHz	x dB		-26.	00 dB		
g						STATU			

Band48 15MHz 16QAM RB75 0 CH56665



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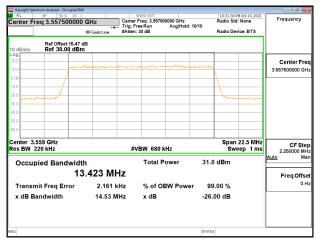
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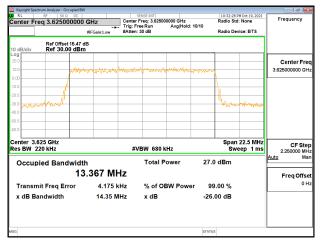
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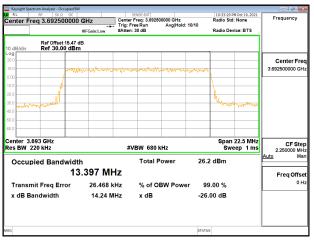
Band48_15MHz_64QAM_RB75_0_CH55315

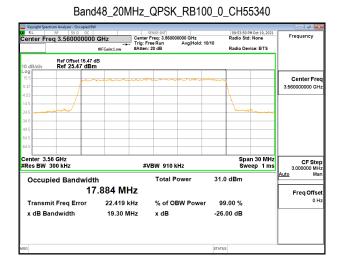


Band48_15MHz_64QAM_RB75_0_CH55990

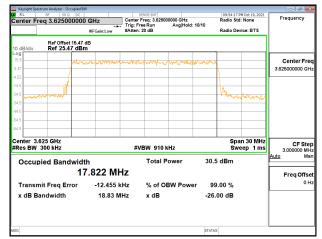


Band48 15MHz 64QAM RB75 0 CH56665

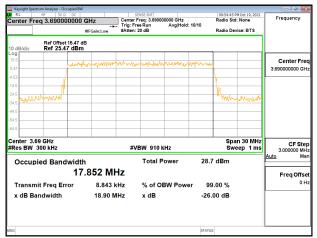




Band48_20MHz_QPSK_RB100_0_CH55990



Band48 20MHz QPSK RB100 0 CH56640



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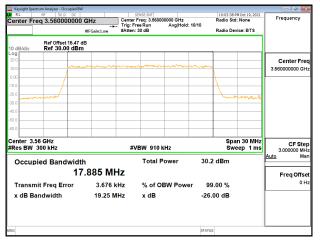
台灣檢驗科技股份有限公	司

SGS TaiwaniLtd.

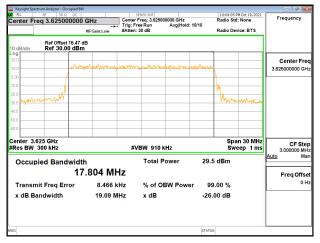
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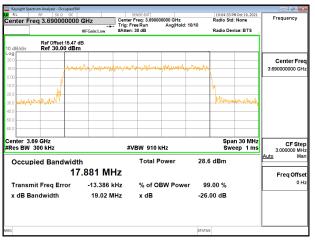
Band48_20MHz_16QAM_RB100_0_CH55340



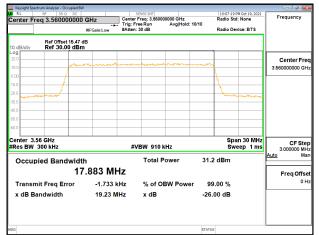
Band48_20MHz_16QAM_RB100_0_CH55990



Band48 20MHz 16QAM RB100 0 CH56640



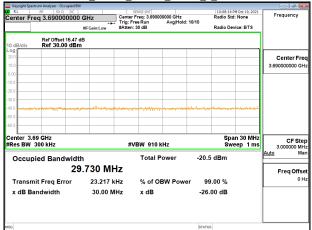
Band48_20MHz_64QAM_RB100_0_CH55340



Band48_20MHz_64QAM_RB100_0_CH55990

Keysight Spectrum Analyzer - Occupie RL RF 50 Ω D Center Freq 3.6250000	C Cen	SENSE:INT ter Freq: 3.625000000 GHz : Free Run Avg Hold:	Radio Std 10/10		Frequency
	#IFGain:Low #Att	en: 30 dB	Radio Dev	vice: BTS	
Ref Offset 15. I0 dB/div Ref 30.00 d			<u> </u>		
.0g 20.0					Center Fre
10.0	anny anno 1995 and a	epistanpan Mala Manufa	when have		3.625000000 GH
1.00					
0.0					
10.0 WWWWWWWWWW			Marth at	www.ww	
0.0 Moto contraction				and the second day of	
0.0					
0.0					
enter 3.625 GHz Res BW 300 kHz		#VBW 910 kHz		n 30 MHz eep 1 ms	CF Ste 3.000000 M
Occupied Bandw	dth	Total Power	29.4 dBm		Auto M
	17.848 MHz				Freq Offs
Transmit Freq Error	8.518 kHz	% of OBW Powe	r 99.00 %		0
x dB Bandwidth	18.77 MHz	x dB	-26.00 dB	Ē	
G			STATUS		

Band48 20MHz 64QAM RB100 0 CH56640



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10 OUT OF BAND EMISSION AT ANTENNA TERMINALS

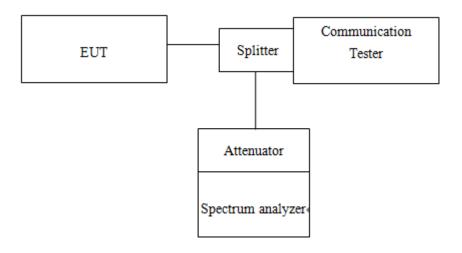
10.1 Standard Applicable

FCC Part 2.1051, Part 96.41, C63.26 Clause 5.7.

For channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

For CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

10.2 Test SET-UP



10.3 Measurement Procedure

10.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

To connect Antenna Port of EUT to Spectrum.

Set RBW = 1MHz & VBW = 1MHz on Spectrum.

Allow trace to fully stabilize

Repeat above procedures until all default test channel measured were complete.

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10.3.2 Band Edge

- 1. To connect Antenna Port of EUT to Spectrum.
- The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

10.4 Test Results:

Refer to next page for test plots.

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10.4.1 **Unwanted Emission**

Band48_20MHz_QPSK_RB1_0_CH55340



Band48_20MHz_QPSK_RB1_0_CH55990

- d -					pectrum Anal	
Frequency	05:48:21 PM Oct 19, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWWW	#Avg Type: RMS	SENSE:INT	15000000 GHz	R⊧ Freq 20	enter l
Auto Tun	kr3 39.266 GHz -29.81 dBm	м	#Atten: 20 dB	PNO: Fast IFGain:Low et 15.47 dB 47 dBm		0 dB/div
Center Fre 20.015000000 GH					1	-og 15.5 5.47 4.53
Start Fre 30.000000 MH	DL1 -13.00 oBn			^2		4.55 14.5 24.5
Stop Fre 40.000000000 GH						44.5 54.5
CF Ste 3.997000000 GH Auto Ma	Span 39.97 GHz .62 ms (39971 pts)	Sweep 66	/ 3.0 MHz		0.02 GH 1.0 MH	
Freq Offs	PUNCTION VALUE	I FUNCTION WOTH	28.61 dBm -42.00 dBm -29.81 dBm	X 3.616 GHz 7.226 GHz 39.266 GHz	1 f 1 f 1 f	1 N 2 N 3 N 4
Scale Typ						6 7 8 9
Log <u>Li</u>						10 11
	•	STATU	m			sg

Band48_20MHz_QPSK_RB1_0_CH56640



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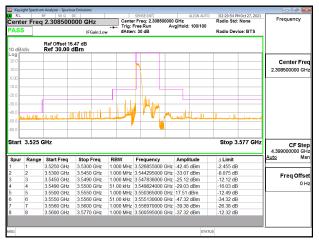
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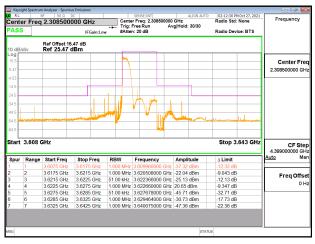


10.4.2 Band Edge:

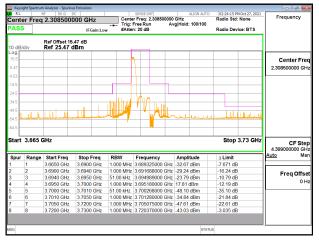
Emission Mask_Band48_5MHz_QPSK_RB1_0_CH55265

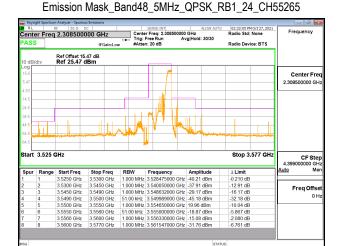


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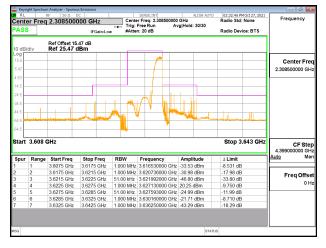


Emission Mask_Band48_5MHz_QPSK_RB1_0_CH56715

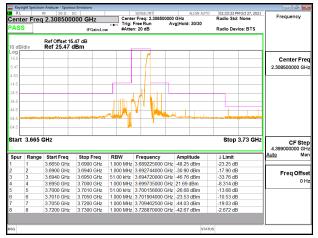




Emission Mask_Band48_5MHz_QPSK_RB1_24_CH55990



Emission Mask_Band48_5MHz_QPSK_RB1_24_CH56715



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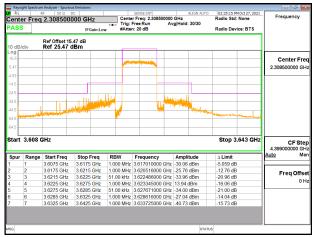


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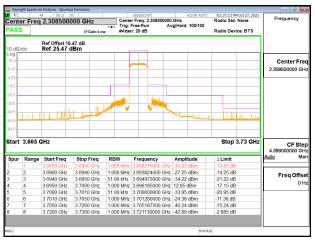
Emission Mask_Band48_5MHz_QPSK_RB25_0_CH55265

			DC		SENSE:INT	ALIGN AUTO	02:34:34 PM Oct 27, 2021	Frequency
Cento PASS		IFGain:Low		Trig: I	Center Freq: 2.308500000 GHz Trig: Free Run Avg Hold: 30/30 #Atten: 20 dB		Radio Std: None Radio Device: BTS	Trequency
10 dB/	ídiv	Ref Offset 15 Ref 25.47 (
-og 15.5 - 5.47 -								Center Fre 2.308500000 GH
4.53 - 14.5 - 24.5 -						_		-
-34.5 -44.5			للمسلسل	المستجليل	a later	Martin and Martin		
64.6 64.5	فأسبب إلغبنا						and the second	
Start	3.525 0	3Hz					Stop 3.577 GH	
			Stop Freg	RBW	Frequency	Amplitude	Stop 3.577 GH	CF Step 4.399000000 GH Auto Ma
	3.525 (Range		Stop Freq 3,5300 GHz		Frequency 3.525970000 GHz	Amplitude	•	4.399000000 GH
	Range	Start Freq		1.000 MHz		-40.45 dBm	∆ Limit	4.399000000 GH Auto Ma
Spur	Range 1	Start Freq 3.5250 GHz	3.5300 GHz	1.000 MHz 1.000 MHz	3.525970000 GHz	-40.45 dBm -32.13 dBm	∆ Limit -0.447 dB	4.399000000 GH Auto Ma
Spur	Range 1 2	Start Freq 3.5250 GHz 3.5300 GHz	3.5300 GHz 3.5450 GHz	1.000 MHz 1.000 MHz 1.000 MHz	3.525970000 GHz 3.543155000 GHz	-40.45 dBm -32.13 dBm -23.31 dBm	Δ Limit -0.447 dB -7.128 dB	4.399000000 GH Auto Ma
Spur	Range 1 2 3	Start Freq 3.5250 GHz 3.5300 GHz 3.5450 GHz	3.5300 GHz 3.5450 GHz 3.5490 GHz	1.000 MHz 1.000 MHz 1.000 MHz 51.00 KHz	3.525970000 GHz 3.543155000 GHz 3.548576000 GHz	-40.45 dBm -32.13 dBm -23.31 dBm -29.48 dBm	Δ Limit -0.447 dB -7.128 dB -10.31 dB	4.399000000 GH Auto Ma
Spur	Range 1 2 3 4	Start Freq 3.5250 GHz 3.5300 GHz 3.5450 GHz 3.5490 GHz	3.5300 GHz 3.5450 GHz 3.5490 GHz 3.5500 GHz	1.000 MHz 1.000 MHz 1.000 MHz 51.00 KHz 1.000 MHz	3.525970000 GHz 3.543155000 GHz 3.548576000 GHz 3.550000000 GHz	-40.45 dBm -32.13 dBm -23.31 dBm -29.48 dBm 13.89 dBm	Δ Limit -0.447 dB -7.128 dB -10.31 dB -16.48 dB	4.399000000 GH Auto Ma
Spur 1 2 3 4	Range 1 2 3 4 5	Start Freq 3.5250 GHz 3.5300 GHz 3.5450 GHz 3.5490 GHz 3.5500 GHz	3.5300 GHz 3.5450 GHz 3.5490 GHz 3.5500 GHz 3.5550 GHz	1.000 MHz 1.000 MHz 1.000 MHz 51.00 kHz 1.000 MHz 51.00 kHz	3.525970000 GHz 3.543155000 GHz 3.548576000 GHz 3.550000000 GHz 3.554105000 GHz	-40.45 dBm -32.13 dBm -23.31 dBm -29.48 dBm 13.89 dBm -29.40 dBm	Δ Limit -0.447 dB -7.128 dB -10.31 dB -16.48 dB -16.11 dB	4.399000000 GH Auto Ma
Start Spur 1 2 3 4 5 5 5 7 8	Range 1 2 3 4 5 6	Start Freq 3.5250 GHz 3.5300 GHz 3.5450 GHz 3.5490 GHz 3.5500 GHz 3.5550 GHz	3.5300 GHz 3.5450 GHz 3.5490 GHz 3.5500 GHz 3.5550 GHz 3.5560 GHz	1.000 MHz 1.000 MHz 1.000 MHz 51.00 kHz 1.000 MHz 51.00 kHz 1.000 MHz	3.525970000 GHz 3.543155000 GHz 3.548576000 GHz 3.550000000 GHz 3.554105000 GHz 3.555040000 GHz	-40.45 dBm -32.13 dBm -23.31 dBm -29.48 dBm 13.89 dBm -29.40 dBm -31.06 dBm	Δ Limit -0.447 dB -7.128 dB -10.31 dB -16.48 dB -16.11 dB -16.40 dB	4.399000000 GH

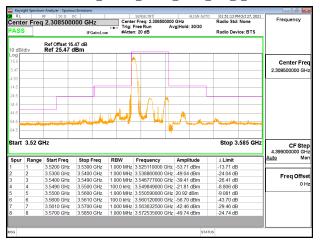
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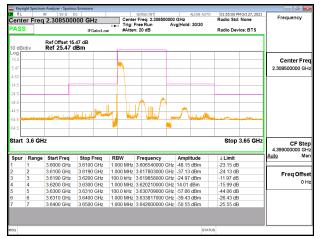
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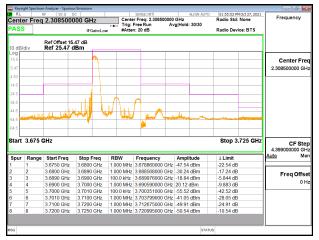
Emission Mask Band48 10MHz QPSK RB1 0 CH55290



Emission Mask_Band48_10MHz_QPSK_RB1_0_CH55990



Emission Mask_Band48_10MHz_QPSK_RB1_0_CH56690



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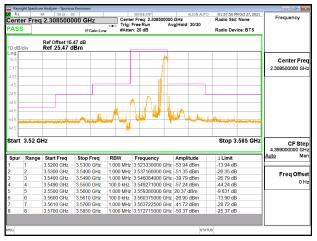
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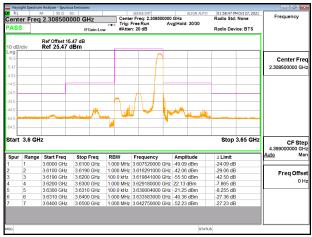


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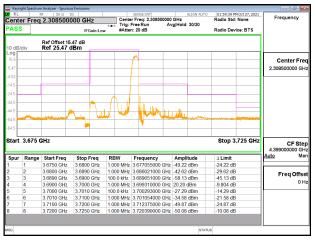
Emission Mask_Band48_10MHz_QPSK_RB1_49_CH55290



Emission Mask_Band48_10MHz_QPSK_RB1_49_CH55990

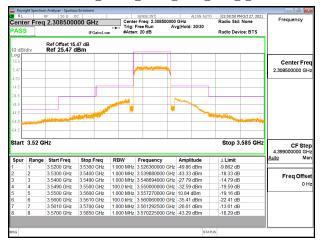


Emission Mask_Band48_10MHz_QPSK_RB1_49_CH56690

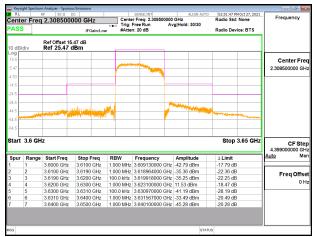


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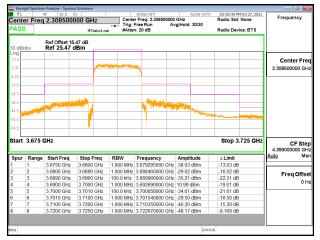
Emission Mask Band48 10MHz QPSK RB50 0 CH55290



Emission Mask_Band48_10MHz_QPSK_RB50_0_CH55990



Emission Mask_Band48_10MHz_QPSK_RB50_0_CH56690



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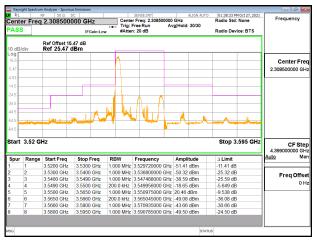
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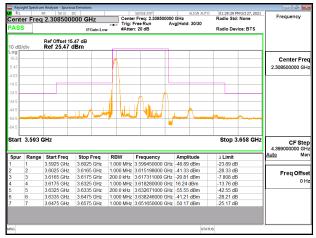


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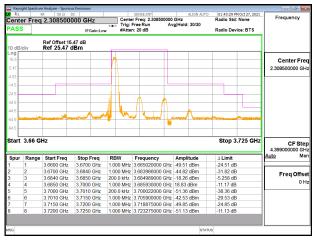
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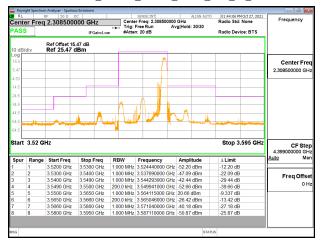
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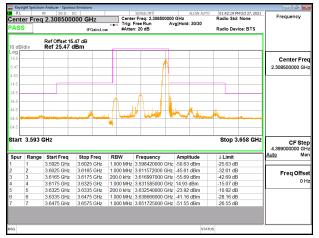
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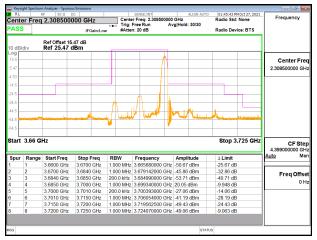
Emission Mask Band48 15MHz QPSK RB1 74 CH55315



Emission Mask_Band48_15MHz_QPSK_RB1_74_CH55990



Emission Mask_Band48_15MHz_QPSK_RB1_74_CH56665



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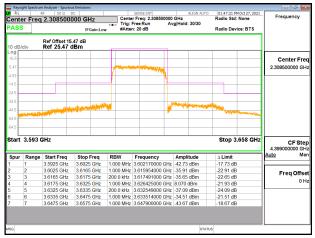


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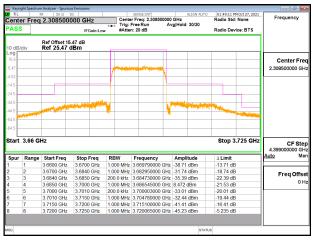
Emission Mask_Band48_15MHz_QPSK_RB75_0_CH55315

ente	ht Spectrum Analyzer - Spurious Emissions RF 50 Q DC r Freq 2.308500000 GHz				SENSE:INT ALIGN AUTO Center Freq: 2.308500000 GHz Trig: Free Run Avg Hold: 30/30		01:46:20 PM Oct 27, 2021 Radio Std: None	Frequency
PASS			IFGain:Lov		n: 20 dB	Avginola. coloc	Radio Device: BTS	
10 dB/	div	Ref Offset 15 Ref 25.47 (
-og 15.5								Center Free
5.47 -					Manager and			2.308500000 GH
4.53								
14.5							-	
24.5				-	_			
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44.5	-	and the state of the state			-	han an a	Padd and in sec.	
54.5 <mark>A</mark>			e			The second se	A CONTRACTOR OF A CONTRACTOR O	
64.5								
Start	3.52 G	Hz					Stop 3.595 GHz	CF Step 4.399000000 GH
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit	<u>Auto</u> Ma
	1	3.5200 GHz	3.5300 GHz		3.527610000 G		-7.212 dB	
2	2	3.5300 GHz	3.5400 GHz		3.539690000 G		-14.23 dB	Freq Offse
5	3	3.5400 GHz	3.5490 GHz		3.547884000 G		-16.72 dB	0 H
1	4	3.5490 GHz	3.5500 GHz		3.549971000 G		-20.60 dB	
5	5	3.5500 GHz	3.5650 GHz		3.561025000 G		-20.93 dB	
3	6	3.5650 GHz	3.5660 GHz		3.565123000 G		-21.25 dB	
7	7	3.5660 GHz	3.5800 GHz		3.566245000 G		-24.55 dB	
8	8	3.5800 GHz	3.5950 GHz	1.000 MHz	3.580105000 G	Hz -43.98 dBm	-18.98 dB	

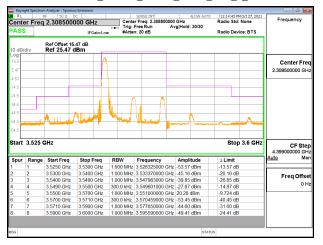
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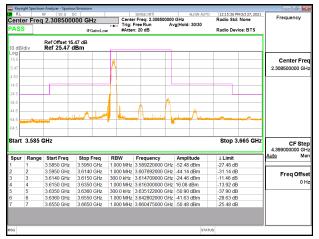
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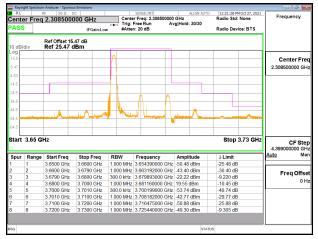
Emission Mask Band48 20MHz QPSK RB1 0 CH55340



Emission Mask_Band48_20MHz_QPSK_RB1_0_CH55990



Emission Mask_Band48_20MHz_QPSK_RB1_0_CH56640



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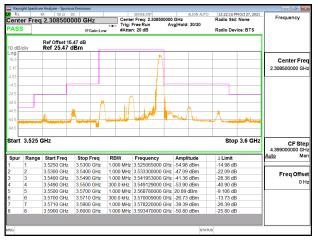
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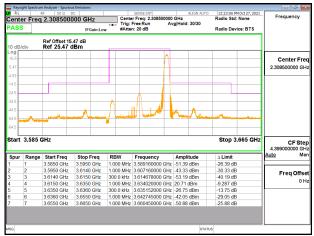


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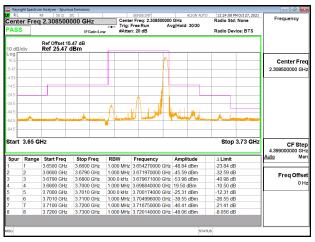
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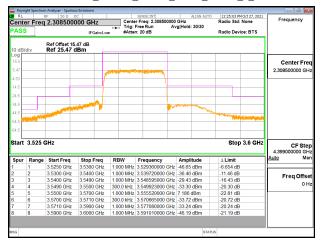
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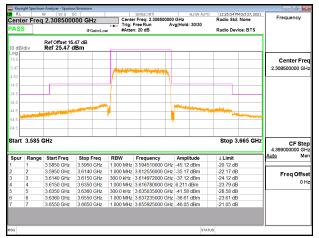
Emission Mask_Band48_20MHz_QPSK_RB1_99_CH56640



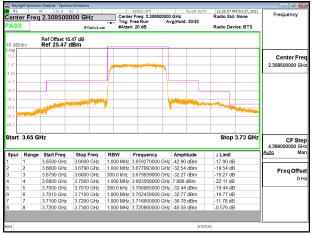
Emission Mask Band48 20MHz QPSK RB100 0 CH55340



Emission Mask_Band48_20MHz_QPSK_RB100_0_CH55990



Emission Mask_Band48_20MHz_QPSK_RB100_0_CH56640



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11 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

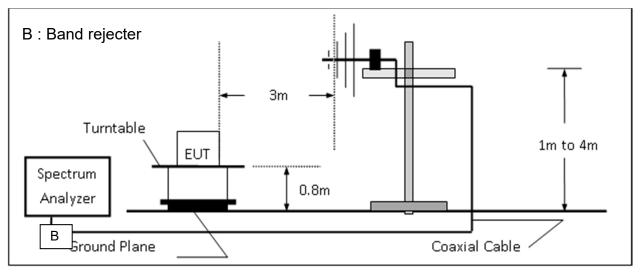
11.1 Standard Applicable

FCC Part 2.1053, Part 96.41, C63.26 Clause 5.7

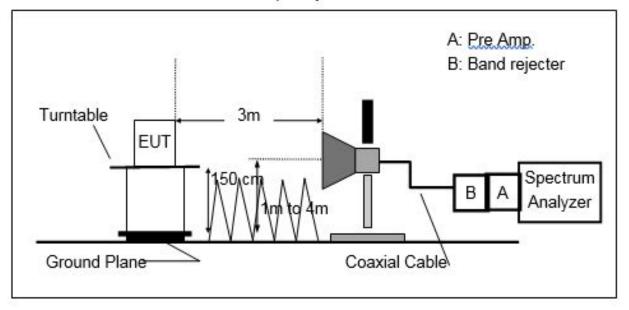
- . within 0 MHz to 10 MHz above and below the **assigned channel** ≤ -13 dBm/MHz
- 2. greater than 10 MHz above and below the **assigned channel** \leq -25 dBm/MHz
- 3. any emission below 3530 MHz and above 3720 MHz ≤ -40 dBm/MHz

11.2 EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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11.3 Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

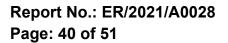
The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP (dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

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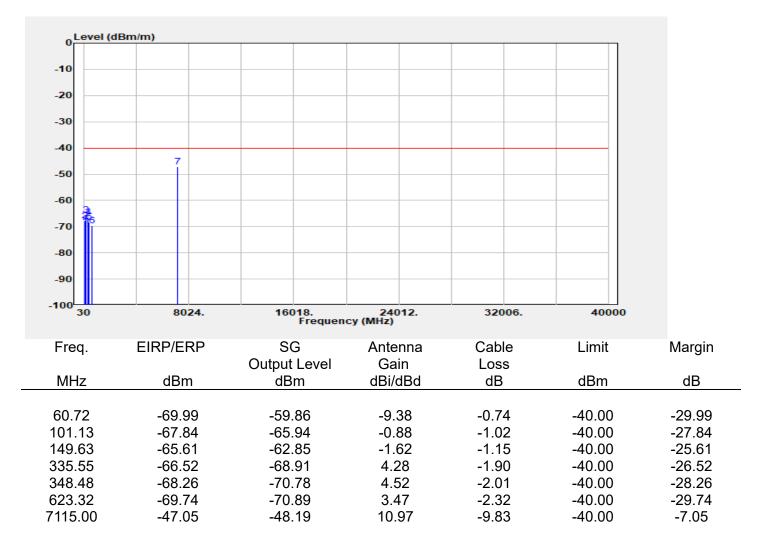
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11.4 Measurement Result:

Report Number	:ER/2021/A0028	Test Site	:SAC 1
Operation Mode	:LTE B48	Test Date	:2021-11-12
Test Mode	:Tx CH Low	Temp./Humi.	:23.8/53
EUT Pol	:H Plane	Antenna Pol.	:Vertical
Test Frequency	:3557.5 MHz	Engineer	:GN Lin



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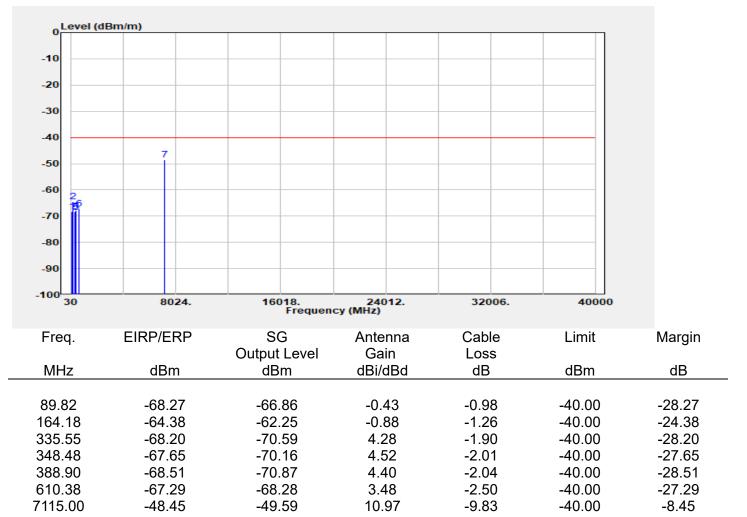
:SAC 1

:23.8/53 :Horizontal :GN Lin

:2021-11-12



Report Number	:ER/2021/A0028	Test Site	:
Operation Mode	:LTE B48	Test Date	:
Test Mode	:Tx CH Low	Temp./Humi.	:
EUT Pol	:H Plane	Antenna Pol.	:
Test Frequency	:3557.5 MHz	Engineer	:



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

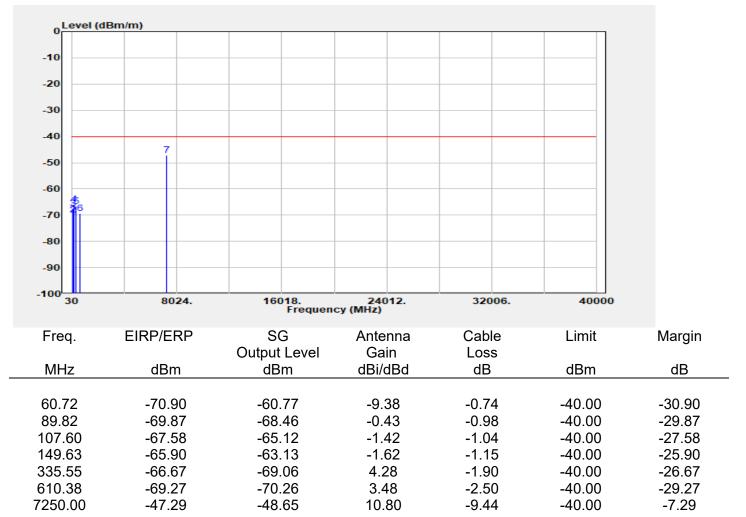
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Report Number	:ER/2021/A0028	Test Site	:SAC 1
Operation Mode	:LTE B48	Test Date	:2021-11-12
Test Mode	:Tx CH Mid	Temp./Humi.	:23.8/53
EUT Pol	:H Plane	Antenna Pol.	:Vertical
Test Frequency	:3625 MHz	Engineer	:GN Lin



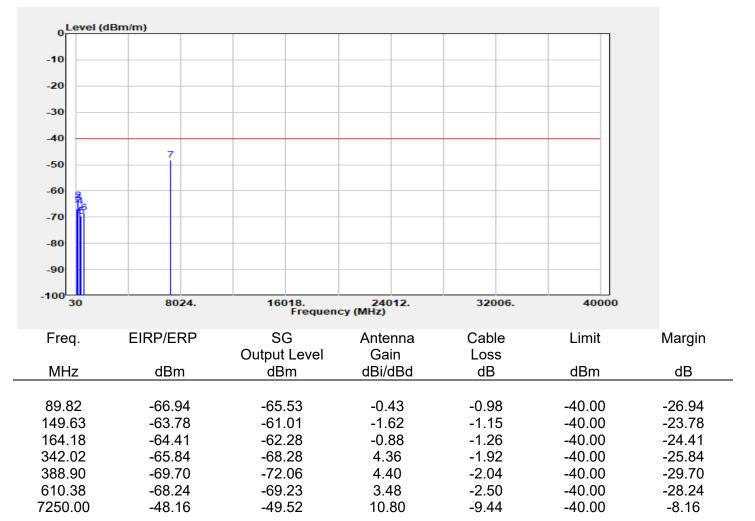
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Report Number	:ER/2021/A0028	Test Site	:SAC 1
Operation Mode	:LTE B48	Test Date	:2021-11-12
Test Mode	:Tx CH Mid	Temp./Humi.	:23.8/53
EUT Pol	:H Plane	Antenna Pol.	:Horizontal
Test Frequency	:3625 MHz	Engineer	:GN Lin



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:SAC 1

:23.8/53 :Vertical :GN Lin

:2021-11-12



Report Number	:ER/2021/A0028	Test Site	
Operation Mode	:LTE B48	Test Date	
Test Mode	:Tx CH High	Temp./Humi.	
EUT Pol	:H Plane	Antenna Pol.	
Test Frequency	:3692.5 MHz	Engineer	

Level ((dBm/m)					
oLever						
-10						
-20						
-20						
-30						
-40						
-50	7					
-30						
-60						
-70						
-80						
-00						
-90						
-100 30	8024.	16018.	24012.	32006.	40000	
30	8024.	Frequent	24012. cy (MHz)	52006.	40000	
Freq.	EIRP/ERP	SG	Antenna	Cable	Limit	Margin
		Output Level	Gain	Loss		U
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
00.70	00.00	50.00	0.00	0.74	40.00	00.00
60.72	-69.20	-59.08	-9.38	-0.74	-40.00	-29.20
89.82	-69.26	-67.85	-0.43	-0.98	-40.00	-29.26
164.18	-70.88	-68.75	-0.88	-1.26	-40.00	-30.88
240.17	-72.28	-75.05	4.38	-1.61	-40.00	-32.28
342.02	-68.61	-71.05	4.36	-1.92	-40.00	-28.61
610.38	-69.98	-70.97	3.48	-2.50	-40.00	-29.98

10.97

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-49.11

-47.15

7385.00

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-40.00

-7.15

-9.01

Report No.: ER/2021/A0028 Page: 45 of 51

:SAC 1

:23.8/53 :Horizontal :GN Lin

:2021-11-12



610.38

7385.00

-68.57

-48.31

F	Report Number	:ER/2021/A0028	Test Site
(Operation Mode	:LTE B48	Test Date
-	Test Mode	:Tx CH High	Temp./Humi.
E	EUT Pol	:H Plane	Antenna Pol.
-	Test Frequency	:3692.5 MHz	Engineer

0 Level (dBm/m)					
-10						
-10						
-20						
-30						
-40						
-50	7					
-60 2						
-70						
-80						
-90						
-100						
-100 30	8024.	16018. Frequen	24012. cy (MHz)	32006.	40000	
Freq.	EIRP/ERP	SG	Antenna	Cable	Limit	Margin
		Output Level	Gain	Loss		-
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
89.82	-67.34	-65.93	-0.43	-0.98	-40.00	-27.34
149.63	-63.25	-60.48	-1.62	-1.15	-40.00	-23.25
164.18	-62.53	-60.40	-0.88	-1.26	-40.00	-22.53
335.55	-67.41	-69.80	4.28	-1.90	-40.00	-27.41
388.90	-68.81	-71.17	4.40	-2.04	-40.00	-28.81

3.48

10.97

-69.56

-50.26

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-40.00

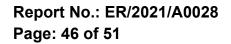
-40.00

-28.57

-8.31

-2.50

-9.01





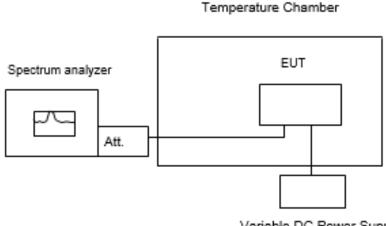
12 FREQUENCY STABILITY MEASUREMENT

Standard Applicabl 12.1

FCC §2.1055(a)

The frequency stability shall be sufficient to ensure that the fundamental emis sion stays within the authorized frequency band. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency.

12.2 Test Set-up



Variable DC Power Supply

Note: Measurement setup for testing on Antenna connector

12.3 **Measurement Procedure**

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as

declared by the manufacturer, record the maximum frequency change.

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12.4 **Measurement Result**

Reference Freq.:	LTE B48 Mid Channel		3625.0000	MHz 10M QPSK CH 55990				
Power Supply Vdc	Temp. (℃)	Freq. (MHz)	(ppm)	Limit				
Freq. ERROR vs. VOLTAGE								
3.795	25	3624.999993	-0.0019					
3.3	25	3624.999997	-0.0008					
2.805	25	3624.999999	-0.0003	+/- 2.5 ppm				
2.4 (End Point)	25	3625.000010	0.0028					
		Freq. ERROR vs.	Temp.					
3.3	-30	3625.000006	0.0017					
3.3	-20	3624.999989	-0.0030					
3.3	-10	3624.999998	-0.0006					
3.3	0	3624.999994	-0.0017					
3.3	10	3624.999992	-0.0022	+/- 2.5 ppm				
3.3	20	3625.000007	0.0019					
3.3	30	3624.999991	-0.0025					
3.3	40	3625.000005	0.0014					
3.3	50	3624.999998	-0.0006					

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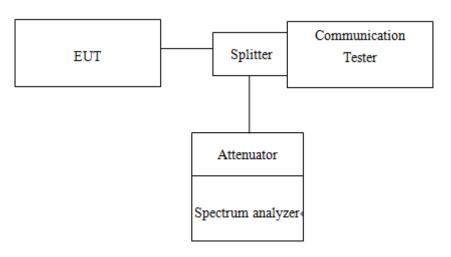


13 PEAK TO AVERAGE RATIO

13.1 Standard Applicable

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

13.2 Test SET-UP



13.3 Measurement Procedure

- 1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
- 2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth; & internal =1ms
- 3. Set the number of counts to a value that stabilizes the measured CCDF curve.

13.4 Measurement Result

	LTE BAND 48								
Cha	nnel band	lwidth: 5M	Hz	Channel bandwidth: 10MHz					
Freq.	СН	PAPR	(dB)	Freq.	PAPR (dB)		(dB)		
(MHz)	GI	64QAM	Limit	(MHz)	СН	64QAM	Limit		
3552.5	55265	7.22	13	3555.0	55290	6.45	13		
3625.0	55990	7.07	13	3625.0	55990	6.72	13		
3697.5	56715	6.27	13	3695.0	56690	6.46	13		

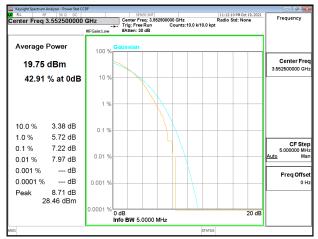
LTE BAND 48									
Char	nel band	width: 15N	1Hz	Channel bandwidth: 20MHz					
Freq.	СН	PAPR	(dB)	Freq.	PAPR (dB		(dB)		
(MHz)	GH	64QAM	Limit	(MHz)	СН	64QAM	Limit		
3557.5	55315	9.00	13	3650.0	55340	6.43	13		
3625.0	55990	6.74	13	3625.0	55990	6.61	13		
3692.5	56665	6.28	13	3690.0	56640	6.61	13		

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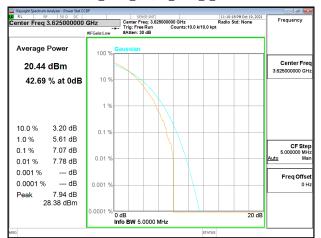
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Band48_5MHz_64QAM_RB25_0_CH55265



Band48_5MHz_64QAM_RB25_0_CH55990



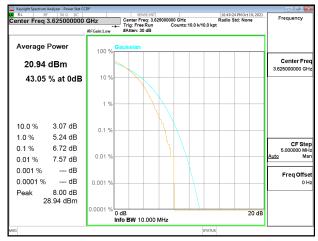
Band48 5MHz 64QAM RB25 0 CH56715



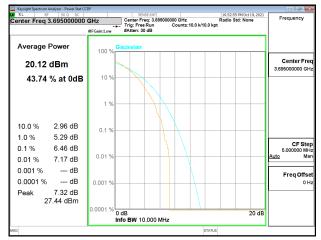
Band48_10MHz_64QAM_RB50_0_CH55290



Band48_10MHz_64QAM_RB50_0_CH55990



Band48_10MHz_64QAM_RB50_0_CH56690



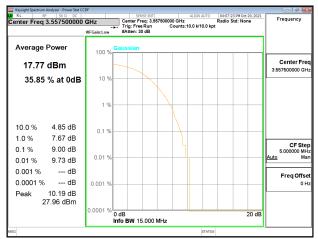
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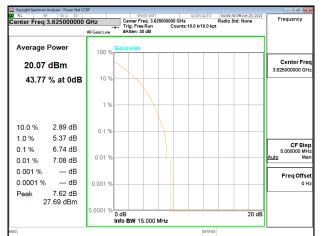
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Band48_15MHz_64QAM_RB75_0_CH55315



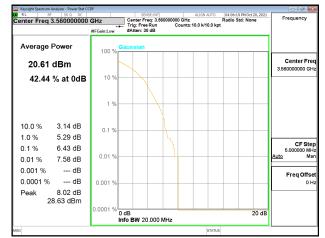
Band48_15MHz_64QAM_RB75_0_CH55990



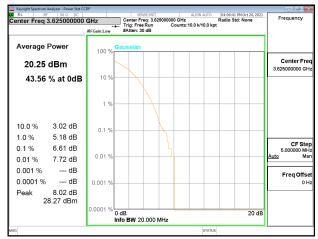
Band48 15MHz 64QAM RB75 0 CH56665



Band48_20MHz_64QAM_RB100_0_CH55340



Band48_20MHz_64QAM_RB100_0_CH55990



Band48 20MHz 64QAM RB100 0 CH56640



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~ End of Report ~

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