

# TEST REPORT

Reference No..... : WTX22X12249022W003  
FCC ID ..... : RFD-CSX8  
Applicant ..... : Leica Geosystems AG  
Address..... : Heinrich-Wild-Strasse,9435 Heerbrugg,Switzerland  
Manufacturer ..... : The same as Applicant  
Address..... : The same as Applicant  
Product Name ..... : CSX8  
Model No..... : LGT-08QA-2301  
Standards ..... : FCC Part 22, FCC Part 27  
Date of Receipt sample .... : 2022-12-09  
Date of Test..... : 2022-12-09 to 2023-06-01  
Date of Issue ..... : 2023-06-01  
Test Report Form No. .... : WTX\_Part 22\_Part 27W  
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

**Prepared By:**

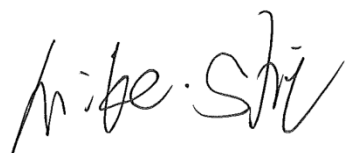
**Waltek Testing Group (Shenzhen) Co., Ltd.**

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,  
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:

Approved by:



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Mike Shi

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Silin Chen

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**Report version**

Version No.	Date of issue	Description
Rev.00	2023-06-01	Original
/	/	/

## 1. GENERAL INFORMATION

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### 1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT:	
Product Name:	CSX8
Trade Name:	Leica
Model No.:	LGT-08QA-2301
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery:	8200mAh
Adapter Model:	MODEL:ASUC71w-050912300 Input: AC100-240V 50/60Hz 0.7A Output:DC5.0V3.0A or DC9.0V2.0A or DC12.0V1.5A
Software Version:	RLC00.50.B8.01
Hardware Version:	V1.04
<i>Note: The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

<b>Technical Characteristics of EUT:</b>	
<b>5G</b>	
Support Networks:	5G NR
Support Band:	n41,n77_3450-3550MHz, n77_3700-3980MHz,n78_3450-3550MHz, n78_3700-3800MHz
EN-DC Mode	2A_N78A_3450-3550MHz, 2A_N78A_3700-3800MHz, 5A_N41A, 12A_N77A_3450-3550MHz, 12A_N77A_3700-3980MHz
Uplink Frequency:	5G NR n41: 2496-2690MHz, 5G NR n77_3450-3550MHz 5G NR n77_3700-3980MHz 5G NR n78_3450-3550MHz 5G NR n78_3700-3800MHz
Downlink Frequency:	5G NR n41: 2496-2690MHz, 5G NR n77_3450-3550MHz 5G NR n77_3700-3980MHz 5G NR n78_3450-3550MHz 5G NR n78_3700-3800MHz
RF Output Power:	5G NR n41: NSA:25.14dBm, SA: 28.20dBm 5G NR n77(3450-3550MHz): NSA:23.91dBm, SA: 27.43dBm 5G NR n77(3700-3980MHz): NSA:24.17dBm, SA: 27.19dBm 5G NR n78(3450-3550MHz): NSA:24.52dBm, SA: 27.57dBm 5G NR n78(3700-3800MHz): NSA:24.42dBm, SA: 26.01dBm
Type of Emission:	5G NR n41: NSA:96M1G7D, 97M4W7D SA: 97M2G7D, 97M2W7D 5G NR n77(3450-3550MHz):NSA: 96M1G7D, 97M2W7D SA: 96M2G7D, 96M2W7D 5G NR n77(3700-3980MHz): NSA: 96M2G7D, 97M4W7D SA: 96M1G7D, 97M3W7D 5G NR n78(3450-3550MHz): NSA: 96M0G7D, 97M3W7D SA: 96M2G7D, 96M2W7D SA: 45M7G7D, 45M7W7D 5G NR n78(3700-3800MHz): NSA: 96M1G7D, 97M3W7D SA: 96M2G7D, 96M2W7D
Type of Modulation:	DFT-s-OFDM: PI/2 BPSK QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
Antenna Type:	FPC Antenna
Antenna Gain:	N41: 4.16dBi N77_3450-3550MHz: 1.92dBi N77_3700-3980MHz: 1.56dBi N78_3450-3550MHz:: 1.92dBi N78_3700-3800MHz: 1.56dBi

Note: The Antenna Gain is provided by the customer.

5G NR Band	SCS(kHz)	SA Power Class(PC)	NSA Power Class(PC)	Bandwidths
N41	30	2	3	20, 40, 60, 100
N77	30	2	3	100
N78	30	2	3	20, 40, 50, 60, 80, 90, 100

## 1.2 Test Standards

The tests were performed according to following standards:

**FCC Rules Part 2:** Frequency Allocations and Radio Treaty Matters; General Rules and Regulations.

**FCC Rules Part 22:** Private Land Mobile Radio Services.

**FCC Rules Part 27:** Miscellaneous Wireless Communications Services.

**TIA/EIA 603 E March 2016:** Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

**ANSI C63.26-2015:** American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.

**KDB 971168 D01 Power Meas License Digital Systems v03r01:** Measurement Guidance for Certification of Licensed Digital Transmitters.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603 E/ KDB 971168/ ANSI C63.26. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

## 1.4 Test Facility

### Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

### FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	5G NR n41(SCS:30 kHz)	Low, Middle, High Channels
TM2	5G NR n77-3450-3550MHz (SCS:30 kHz)	Low, Middle, High Channels
TM3	5G NR n77-3700-3980MHz (SCS:30 kHz)	Low, Middle, High Channels
TM4	5G NR n78-3450-3550MHz (SCS:30 kHz)	Low, Middle, High Channels
TM5	5G NR n78-3700-3800MHz (SCS:30 kHz)	Low, Middle, High Channels

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C Cable	1.0	Shielded	With Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	L13 Yoga	/



**1.6 Measurement Uncertainty**

<b>Measurement uncertainty</b>		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Conducted	$\pm 0.42\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

## 1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022A 1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1091A 1001	UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY574505 25	2023-02-25	2024-02-24
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2023-02-25	2024-02-24
WTXE1044A 1001	Signal Generator	Agilent	83752A	3610A014 53	2023-02-25	2024-02-24
WTXE1045A 1001	Vector Signal Generator	Agilent	N5182A	MY470702 02	2023-02-25	2024-02-24
WTXE1018A 1001	Power Divider	Weinschel	1506A	PM204	2023-02-25	2024-02-24
WTXE1062A 1001	Attenuator	HP	8491A	MY392644 19	2023-02-25	2024-02-24
WTXE1088A 1001	EXA Signal Analyzer	KEYSIGHT	N9010B	MY590704 94	2023-02-25	2024-02-24
WTXE1092A 1001-2	Band Reject Filter Group	Tonscend	JS0806-F	20180603 19	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007A 1001	Amplifier	HP	8447F	2805A034 75	2023-02-25	2024-02-24
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
<input checked="" type="checkbox"/> Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A	EMI Test	Rohde &	ESVB	825471/00	2023-02-25	2024-02-24

1001	Receiver	Schwarz		5		
WTXE1065A 1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber B: Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A101 79	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber C: Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-11A	LP228060 221	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24

<b>Software List</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Version</b>
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
LTE Test System*	Tonscend	JS1120-1	V2.5

\*Remark: indicates software version used in the compliance certification testing.

## 2. SUMMARY OF TEST RESULTS

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FCC Rules	Description of Test Item	Result
§22.913(a), §27.50(d)	RF Output Power	Compliant
§27.50	Peak-to-average Ratio (PAR) of Transmitter	Compliant
§22.917(b), §27.53	Emission Bandwidth	Compliant
§22.917(a), §27.53(h)	Spurious Emissions at Antenna Terminal	Compliant
§22.917(a), §27.53(h)	Spurious Radiation Emissions	Compliant
§22.917(a), §27.53(h)	Out of Band Emissions	Compliant
§22.355, §27.54	Frequency Stability	Compliant

### 3. RF Output Power

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#### 3.1 Standard Applicable

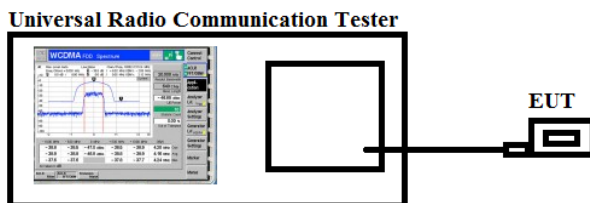
According to §22.913(a)(2), the ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755MHz band and mobile and portable stations operating in the 1695-1710MHz and 1755-1780MHz bands are limited to 1 watt EIRP.

According to §27.50(c)(10), portable stations (hand-held devices) in the 698-746 MHz band are limited to 3 watts ERP.

#### 3.2 Test Procedure

- Conducted output power test method:



- Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

#### 3.3 Summary of Test Results/Plots

**Max. Radiated Power:****Max. Conducted Output Power**

Please refer to Appendix A: Average Power Output Data

Test result: Pass

**5G NR N41**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.49	PASS
	MCH	22.91	PASS
	HCH	22.76	PASS
CP-QPSK	LCH	22.80	PASS
	MCH	22.70	PASS
	HCH	23.20	PASS
CP-16QAM	LCH	22.46	PASS
	MCH	22.63	PASS
	HCH	22.52	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.55	PASS
	MCH	22.85	PASS
	HCH	23.30	PASS
CP-QPSK	LCH	22.00	PASS
	MCH	22.27	PASS
	HCH	22.78	PASS
CP-16QAM	LCH	22.45	PASS
	MCH	22.94	PASS
	HCH	22.68	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	23.05	PASS
	MCH	23.02	PASS
	HCH	23.01	PASS
CP-QPSK	LCH	23.27	PASS
	MCH	22.64	PASS
	HCH	23.03	PASS
CP-16QAM	LCH	22.91	PASS

	MCH	22.69	PASS
	HCH	23.16	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	23.25	PASS
	MCH	22.47	PASS
	HCH	23.27	PASS
CP-QPSK	LCH	22.99	PASS
	MCH	22.51	PASS
	HCH	22.48	PASS
CP-16QAM	LCH	22.65	PASS
	MCH	22.96	PASS
	HCH	23.15	PASS

**5G NR N77\_3450-3550MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.87	PASS
	MCH	21.41	PASS
	HCH	22.23	PASS
CP-QPSK	LCH	21.47	PASS
	MCH	22.07	PASS
	HCH	22.16	PASS
CP-16QAM	LCH	21.50	PASS
	MCH	22.16	PASS
	HCH	22.06	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.91	PASS
	MCH	22.14	PASS
	HCH	21.33	PASS
CP-QPSK	LCH	21.77	PASS
	MCH	22.00	PASS
	HCH	21.37	PASS
CP-16QAM	LCH	21.72	PASS
	MCH	21.83	PASS
	HCH	20.36	PASS
Channel Bandwidth: 50MHz			



Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.10	PASS
	MCH	21.87	PASS
	HCH	21.41	PASS
CP-QPSK	LCH	22.20	PASS
	MCH	21.49	PASS
	HCH	21.92	PASS
CP-16QAM	LCH	21.76	PASS
	MCH	21.82	PASS
	HCH	21.97	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.24	PASS
	MCH	22.28	PASS
	HCH	21.40	PASS
CP-QPSK	LCH	21.92	PASS
	MCH	21.97	PASS
	HCH	21.39	PASS
CP-16QAM	LCH	21.71	PASS
	MCH	21.74	PASS
	HCH	21.63	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.51	PASS
	MCH	21.68	PASS
	HCH	21.31	PASS
CP-QPSK	LCH	21.50	PASS
	MCH	22.25	PASS
	HCH	21.70	PASS
CP-16QAM	LCH	22.16	PASS
	MCH	21.59	PASS
	HCH	21.46	PASS
Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.47	PASS
	MCH	22.21	PASS
	HCH	22.14	PASS

CP-QPSK	LCH	21.88	PASS
	MCH	21.61	PASS
	HCH	21.86	PASS
CP-16QAM	LCH	21.97	PASS
	MCH	21.87	PASS
	HCH	21.99	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.42	PASS
	MCH	21.77	PASS
	HCH	22.09	PASS
CP-QPSK	LCH	21.45	PASS
	MCH	21.98	PASS
	HCH	21.66	PASS
CP-16QAM	LCH	21.29	PASS
	MCH	22.16	PASS
	HCH	22.10	PASS

**5G NR N77\_3700-3980MHz**

Channel Bandwidth: 100MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.16	PASS
	MCH	21.79	PASS
	HCH	22.14	PASS
CP-QPSK	LCH	22.04	PASS
	MCH	21.56	PASS
	HCH	22.20	PASS
CP-16QAM	LCH	21.70	PASS
	MCH	21.31	PASS
	HCH	21.65	PASS

**5G NR N78\_3450-3550MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.63	PASS
	MCH	21.38	PASS
	HCH	21.75	PASS
CP-QPSK	LCH	21.44	PASS
	MCH	21.43	PASS
	HCH	21.85	PASS
CP-16QAM	LCH	21.60	PASS
	MCH	21.54	PASS
	HCH	22.14	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.42	PASS
	MCH	21.50	PASS
	HCH	22.18	PASS
CP-QPSK	LCH	21.72	PASS
	MCH	22.07	PASS
	HCH	21.94	PASS
CP-16QAM	LCH	22.06	PASS
	MCH	21.50	PASS
	HCH	21.73	PASS
Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.16	PASS
	MCH	21.68	PASS
	HCH	21.29	PASS
CP-QPSK	LCH	21.57	PASS
	MCH	21.41	PASS
	HCH	22.07	PASS
CP-16QAM	LCH	21.44	PASS
	MCH	21.77	PASS
	HCH	21.90	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.61	PASS

	MCH	22.00	PASS
	HCH	21.68	PASS
CP-QPSK	LCH	22.20	PASS
	MCH	21.42	PASS
	HCH	21.65	PASS
CP-16QAM	LCH	21.98	PASS
	MCH	22.09	PASS
	HCH	21.81	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.95	PASS
	MCH	21.53	PASS
	HCH	21.68	PASS
CP-QPSK	LCH	21.70	PASS
	MCH	22.14	PASS
	HCH	22.09	PASS
CP-16QAM	LCH	21.82	PASS
	MCH	21.97	PASS
	HCH	22.23	PASS
Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.89	PASS
	MCH	21.60	PASS
	HCH	21.96	PASS
CP-QPSK	LCH	21.55	PASS
	MCH	21.32	PASS
	HCH	21.55	PASS
CP-16QAM	LCH	21.46	PASS
	MCH	22.09	PASS
	HCH	21.35	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.94	PASS
	MCH	21.50	PASS
	HCH	22.14	PASS
CP-QPSK	LCH	21.69	PASS
	MCH	21.84	PASS
	HCH	22.01	PASS

CP-16QAM	LCH	21.99	PASS
	MCH	21.78	PASS
	HCH	22.16	PASS

**5G NR N78\_3700-3800MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.99	PASS
	MCH	22.77	PASS
	HCH	22.77	PASS
CP-QPSK	LCH	22.68	PASS
	MCH	23.14	PASS
	HCH	23.20	PASS
CP-16QAM	LCH	22.32	PASS
	MCH	22.31	PASS
	HCH	22.85	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.33	PASS
	MCH	22.84	PASS
	HCH	23.13	PASS
CP-QPSK	LCH	22.61	PASS
	MCH	22.35	PASS
	HCH	22.84	PASS
CP-16QAM	LCH	22.51	PASS
	MCH	22.95	PASS
	HCH	22.31	PASS
Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	23.06	PASS
	MCH	22.90	PASS
	HCH	22.35	PASS
CP-QPSK	LCH	22.44	PASS
	MCH	22.35	PASS
	HCH	22.77	PASS
CP-16QAM	LCH	22.74	PASS
	MCH	22.68	PASS
	HCH	22.45	PASS

Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.49	PASS
	MCH	23.12	PASS
	HCH	22.70	PASS
CP-QPSK	LCH	22.48	PASS
	MCH	22.61	PASS
	HCH	22.95	PASS
CP-16QAM	LCH	22.75	PASS
	MCH	23.11	PASS
	HCH	22.49	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.93	PASS
	MCH	22.65	PASS
	HCH	23.27	PASS
CP-QPSK	LCH	22.53	PASS
	MCH	22.70	PASS
	HCH	23.23	PASS
CP-16QAM	LCH	22.78	PASS
	MCH	23.20	PASS
	HCH	22.97	PASS
Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.33	PASS
	MCH	22.66	PASS
	HCH	22.34	PASS
CP-QPSK	LCH	22.89	PASS
	MCH	23.03	PASS
	HCH	23.09	PASS
CP-16QAM	LCH	22.59	PASS
	MCH	23.19	PASS
	HCH	23.27	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.92	PASS
	MCH	22.49	PASS

	HCH	22.56	PASS
CP-QPSK	LCH	22.32	PASS
	MCH	22.52	PASS
	HCH	22.46	PASS
CP-16QAM	LCH	22.35	PASS
	MCH	22.56	PASS
	HCH	22.55	PASS

**5G NSA 2A\_N78A\_3450-3550MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.19	PASS
	MCH	22.17	PASS
	HCH	21.43	PASS
CP-QPSK	LCH	21.74	PASS
	MCH	21.48	PASS
	HCH	22.02	PASS
CP-16QAM	LCH	21.36	PASS
	MCH	21.63	PASS
	HCH	21.86	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.09	PASS
	MCH	22.10	PASS
	HCH	22.22	PASS
CP-QPSK	LCH	22.01	PASS
	MCH	21.38	PASS
	HCH	21.43	PASS
CP-16QAM	LCH	22.25	PASS
	MCH	22.27	PASS
	HCH	21.51	PASS
Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.61	PASS
	MCH	21.75	PASS
	HCH	21.61	PASS
CP-QPSK	LCH	21.55	PASS
	MCH	21.98	PASS

	HCH	21.43	PASS
CP-16QAM	LCH	21.97	PASS
	MCH	21.48	PASS
	HCH	21.57	PASS
	Channel Bandwidth: 60MHz		
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.55	PASS
	MCH	22.21	PASS
	HCH	21.59	PASS
CP-QPSK	LCH	22.07	PASS
	MCH	21.45	PASS
	HCH	22.15	PASS
CP-16QAM	LCH	21.95	PASS
	MCH	22.14	PASS
	HCH	22.05	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.44	PASS
	MCH	21.73	PASS
	HCH	22.03	PASS
CP-QPSK	LCH	21.87	PASS
	MCH	21.48	PASS
	HCH	21.68	PASS
CP-16QAM	LCH	21.36	PASS
	MCH	22.17	PASS
	HCH	21.70	PASS
Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.40	PASS
	MCH	22.18	PASS
	HCH	21.75	PASS
CP-QPSK	LCH	21.59	PASS
	MCH	21.48	PASS
	HCH	21.50	PASS
CP-16QAM	LCH	21.53	PASS
	MCH	21.64	PASS
	HCH	21.48	PASS
Channel Bandwidth: 100MHz			



Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.36	PASS
	MCH	21.52	PASS
	HCH	22.16	PASS
CP-QPSK	LCH	21.28	PASS
	MCH	22.03	PASS
	HCH	21.75	PASS
CP-16QAM	LCH	21.67	PASS
	MCH	21.85	PASS
	HCH	21.97	PASS

**5G NSA 2A\_N78A\_3700-3800MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.45	PASS
	MCH	22.08	PASS
	HCH	21.56	PASS
CP-QPSK	LCH	21.96	PASS
	MCH	22.17	PASS
	HCH	22.04	PASS
CP-16QAM	LCH	22.23	PASS
	MCH	21.30	PASS
	HCH	22.03	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.82	PASS
	MCH	21.89	PASS
	HCH	21.65	PASS
CP-QPSK	LCH	22.28	PASS
	MCH	21.61	PASS
	HCH	21.50	PASS
CP-16QAM	LCH	21.37	PASS
	MCH	21.90	PASS
	HCH	22.19	PASS
Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.76	PASS

	MCH	21.49	PASS
	HCH	21.66	PASS
CP-QPSK	LCH	22.25	PASS
	MCH	21.68	PASS
	HCH	21.48	PASS
CP-16QAM	LCH	21.84	PASS
	MCH	21.49	PASS
	HCH	20.21	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.54	PASS
	MCH	21.48	PASS
	HCH	22.21	PASS
CP-QPSK	LCH	21.51	PASS
	MCH	22.21	PASS
	HCH	21.50	PASS
CP-16QAM	LCH	21.45	PASS
	MCH	21.72	PASS
	HCH	22.16	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.16	PASS
	MCH	21.89	PASS
	HCH	21.61	PASS
CP-QPSK	LCH	21.44	PASS
	MCH	21.31	PASS
	HCH	21.70	PASS
CP-16QAM	LCH	21.85	PASS
	MCH	21.62	PASS
	HCH	21.30	PASS
Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.53	PASS
	MCH	22.27	PASS
	HCH	22.22	PASS
CP-QPSK	LCH	21.76	PASS
	MCH	21.87	PASS
	HCH	21.38	PASS

CP-16QAM	LCH	22.26	PASS
	MCH	21.76	PASS
	HCH	21.42	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.16	PASS
	MCH	21.41	PASS
	HCH	22.03	PASS
CP-QPSK	LCH	21.46	PASS
	MCH	22.06	PASS
	HCH	21.38	PASS
CP-16QAM	LCH	21.69	PASS
	MCH	21.39	PASS
	HCH	21.85	PASS

**5G NSA 5A\_N41A**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.07	PASS
	MCH	22.15	PASS
	HCH	21.45	PASS
CP-QPSK	LCH	21.80	PASS
	MCH	21.59	PASS
	HCH	21.60	PASS
CP-16QAM	LCH	21.45	PASS
	MCH	21.29	PASS
	HCH	22.10	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.59	PASS
	MCH	22.18	PASS
	HCH	21.55	PASS
CP-QPSK	LCH	21.43	PASS
	MCH	21.74	PASS
	HCH	22.10	PASS
CP-16QAM	LCH	22.09	PASS
	MCH	22.10	PASS
	HCH	21.77	PASS

Channel Bandwidth: 60MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.74	PASS
	MCH	21.48	PASS
	HCH	21.30	PASS
CP-QPSK	LCH	22.08	PASS
	MCH	21.54	PASS
	HCH	22.14	PASS
CP-16QAM	LCH	22.27	PASS
	MCH	21.63	PASS
	HCH	21.64	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.90	PASS
	MCH	22.23	PASS
	HCH	21.48	PASS
CP-QPSK	LCH	21.80	PASS
	MCH	21.69	PASS
	HCH	21.34	PASS
CP-16QAM	LCH	21.71	PASS
	MCH	21.51	PASS
	HCH	22.09	PASS

**5G NSA 12A\_N77A\_3450-3550MHz**

Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.61	PASS
	MCH	21.39	PASS
	HCH	21.89	PASS
CP-QPSK	LCH	21.43	PASS
	MCH	21.65	PASS
	HCH	21.82	PASS
CP-16QAM	LCH	21.36	PASS
	MCH	21.95	PASS
	HCH	21.63	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict

DFT-QPSK	LCH	22.08	PASS
	MCH	21.80	PASS
	HCH	21.66	PASS
CP-QPSK	LCH	21.83	PASS
	MCH	21.97	PASS
	HCH	21.46	PASS
CP-16QAM	LCH	21.34	PASS
	MCH	22.06	PASS
	HCH	21.31	PASS
Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.88	PASS
	MCH	21.99	PASS
	HCH	22.01	PASS
CP-QPSK	LCH	21.78	PASS
	MCH	21.44	PASS
	HCH	22.10	PASS
CP-16QAM	LCH	21.38	PASS
	MCH	22.23	PASS
	HCH	21.78	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.23	PASS
	MCH	22.06	PASS
	HCH	21.79	PASS
CP-QPSK	LCH	21.61	PASS
	MCH	21.53	PASS
	HCH	21.65	PASS
CP-16QAM	LCH	21.53	PASS
	MCH	21.74	PASS
	HCH	21.79	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.20	PASS
	MCH	21.92	PASS
	HCH	22.25	PASS
CP-QPSK	LCH	21.66	PASS
	MCH	21.30	PASS

	HCH	21.81	PASS
CP-16QAM	LCH	21.36	PASS
	MCH	21.81	PASS
	HCH	22.00	PASS
	Channel Bandwidth: 90MHz		
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.38	PASS
	MCH	21.32	PASS
	HCH	21.69	PASS
CP-QPSK	LCH	22.13	PASS
	MCH	21.70	PASS
	HCH	21.30	PASS
CP-16QAM	LCH	21.71	PASS
	MCH	21.34	PASS
	HCH	21.57	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	21.94	PASS
	MCH	21.88	PASS
	HCH	21.45	PASS
CP-QPSK	LCH	21.84	PASS
	MCH	21.69	PASS
	HCH	21.78	PASS
CP-16QAM	LCH	21.34	PASS
	MCH	21.62	PASS
	HCH	21.94	PASS

**5G NSA 12A\_N77A\_3700-3980MHz**

Channel Bandwidth: 100MHz			
Modulation	Channel	E.r.p [dBm]	Verdict
DFT-QPSK	LCH	22.09	PASS
	MCH	21.45	PASS
	HCH	21.49	PASS
CP-QPSK	LCH	21.47	PASS
	MCH	22.23	PASS
	HCH	21.75	PASS
CP-16QAM	LCH	22.27	PASS
	MCH	21.61	PASS

Reference No.: WTX22X12249022W003

	HCH	21.65	PASS
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## 4. Peak-to-average Ratio (PAR) of Transmitter

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### 4.1 Standard Applicable

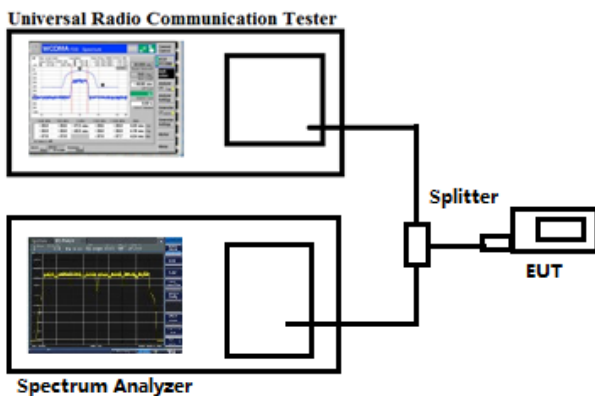
According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

### 4.2 Test Procedure

According with KDB 971168

1. The signal analyzer's CCDF measurement profile is enabled.
2. Frequency = carrier center frequency.
3. Measurement BW > Emission bandwidth of signal.
4. The signal analyzer was set to collect one million samples to generate the CCDF curve.
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power.

Test Configuration for the emission bandwidth testing:



### 4.3 Summary of Test Results

Please refer to Appendix B: Peak-to-Average Ratio

Test result: Pass



## 5. Emission Bandwidth

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### 5.1 Standard Applicable

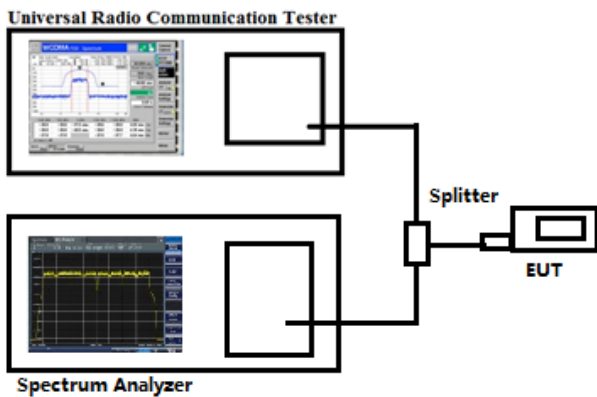
According to §22.917(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

According to §27.53, the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

### 5.2 Test Procedure

According to §22.917(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

Test Configuration for the emission bandwidth testing:



### 5.3 Summary of Test Results/Plots

Please refer to Appendix C: 26dB Bandwidth and Occupied Bandwidth

Test result: Pass

## 6. Out of Band Emissions at Antenna Terminal

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### 6.1 Standard Applicable

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

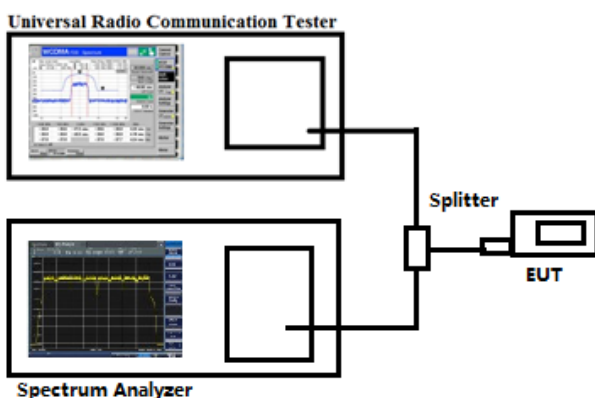
According to §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB.

According to §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log(P)$  dB on all frequencies between 2490.5MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5MHz.

### 6.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10<sup>th</sup> harmonic.

Test Configuration for the out of band emissions testing:



Reference No.: WTX22X12249022W003

### **6.3 Summary of Test Results/Plots**

Please refer to Appendix D & E: Band Edge & Conducted Spurious Emission

Test result: Pass

## 7. Spurious Radiated Emissions

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### 7.1 Standard Applicable

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

According to §27.53(g) the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB.

### 7.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA-603-E and ANSI C63.4-2014 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

$$\text{Spurious attenuation limit in dB} = 43 + 10 \log_{10}(\text{power out in Watts})$$

### 7.3 Summary of Test Results/Plots

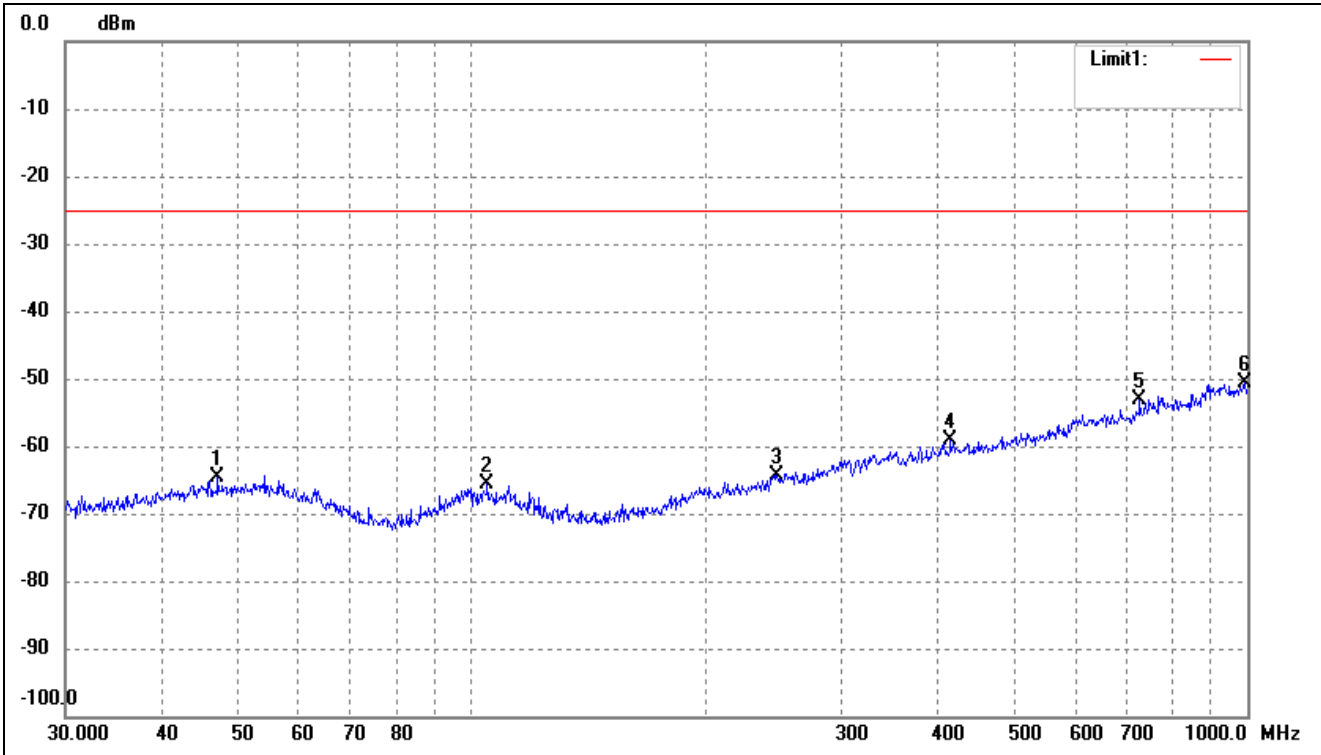
*Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

*2. All test modes (different bandwidth and different modulation) are performed, but only the worst case is recorded in this report.*

➤ Spurious Emissions Below 1GHz

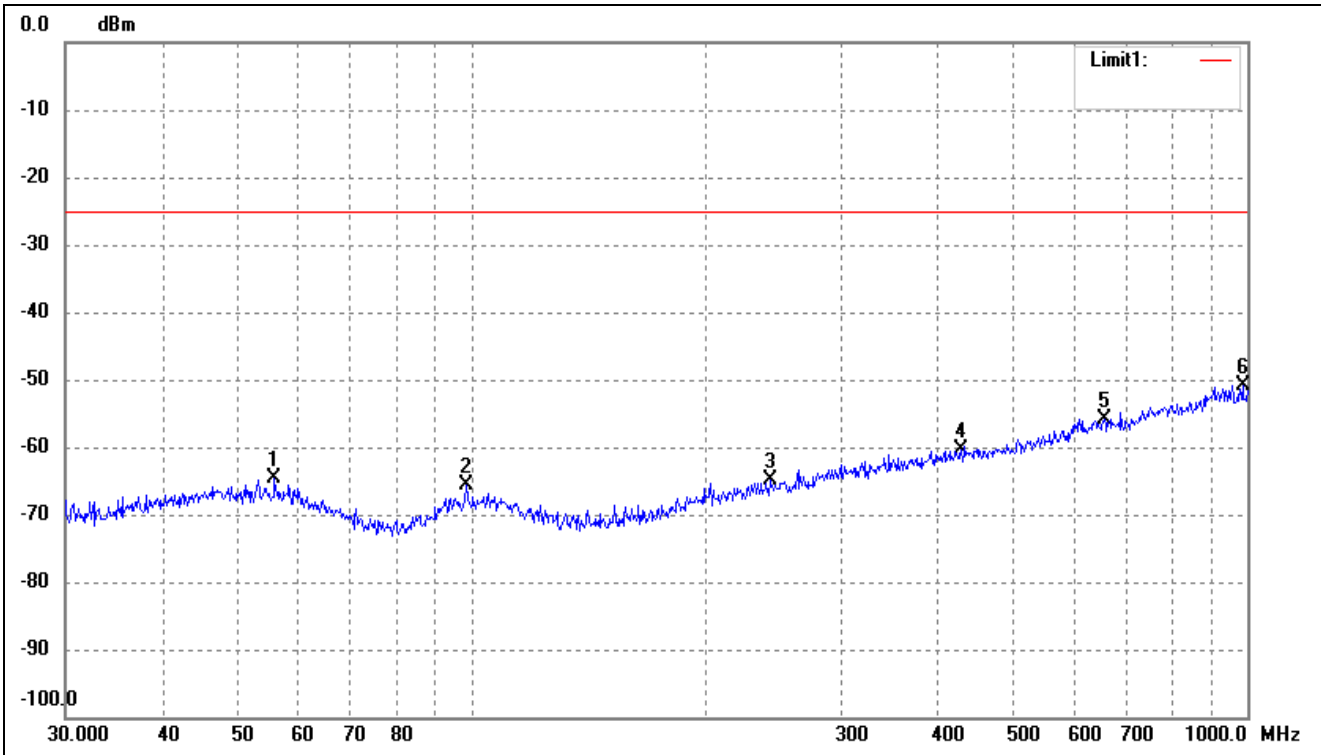
NSA

Test Mode                      5G NR n41                      Polarity:                      Horizontal



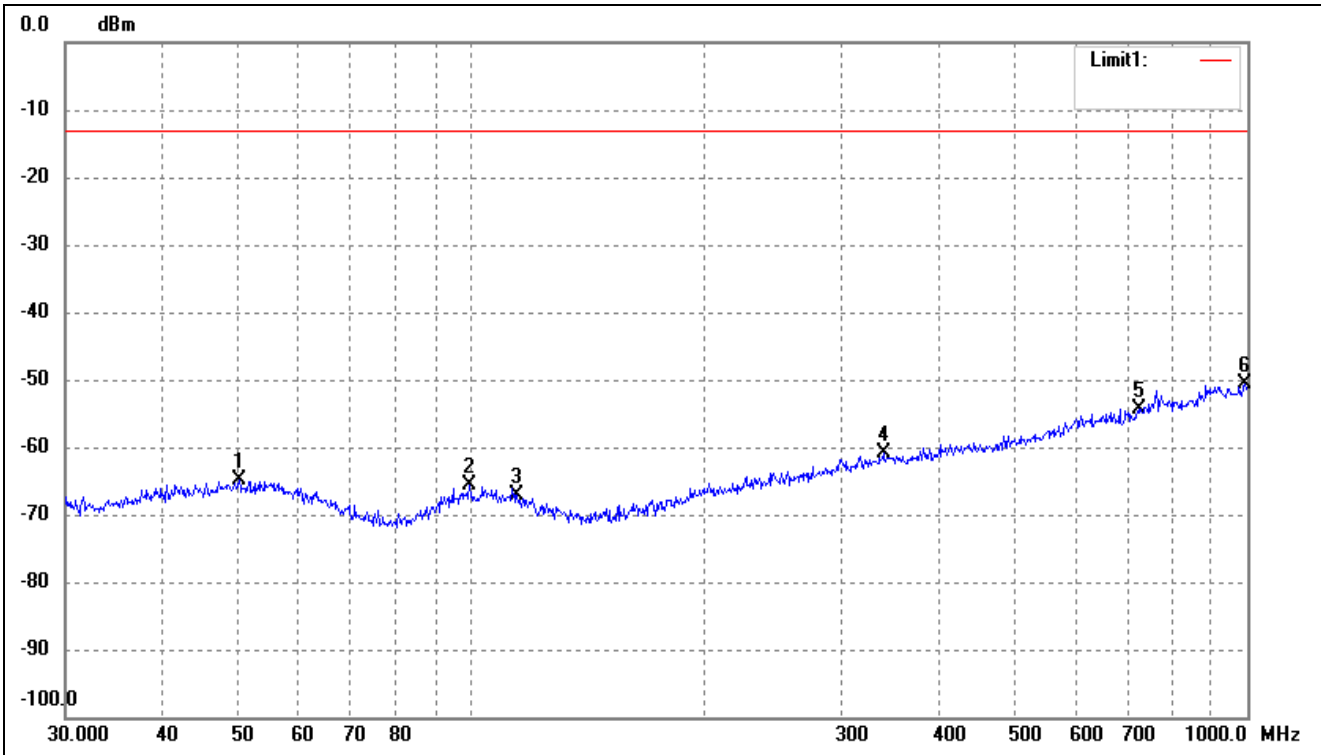
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	47.1599	-69.04	4.32	-64.72	-25.00	-39.72	ERP
2	104.9033	-69.04	3.36	-65.68	-25.00	-40.68	ERP
3	247.6819	-69.67	5.38	-64.29	-25.00	-39.29	ERP
4	414.7223	-68.76	9.55	-59.21	-25.00	-34.21	ERP
5	726.8052	-68.17	14.94	-53.23	-25.00	-28.23	ERP
6	993.0114	-68.47	17.94	-50.53	-25.00	-25.53	ERP

Test Mode                      5G NR n41                      Polarity:                      Vertical



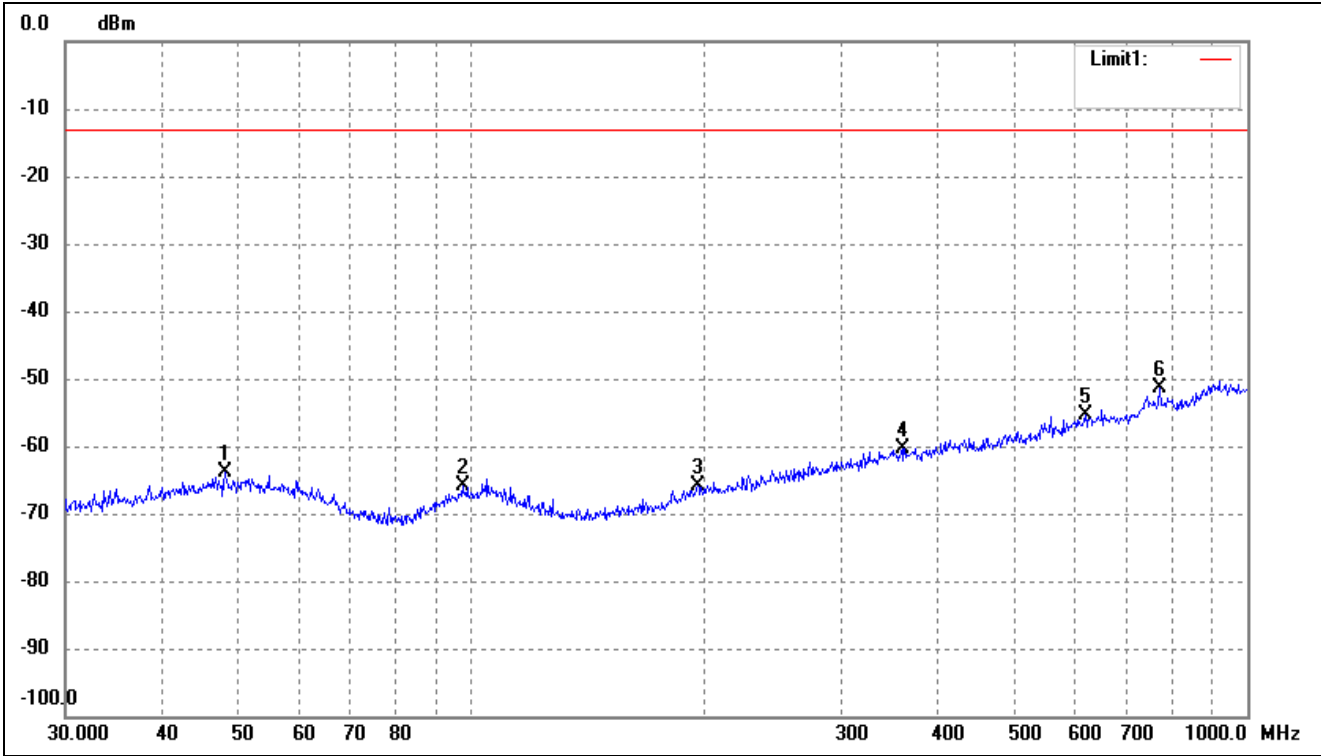
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	55.8047	-68.72	4.08	-64.64	-25.00	-39.64	ERP
2	98.4866	-68.68	2.99	-65.69	-25.00	-40.69	ERP
3	242.5253	-70.13	5.24	-64.89	-25.00	-39.89	ERP
4	428.0193	-70.03	9.71	-60.32	-25.00	-35.32	ERP
5	654.2318	-69.70	13.83	-55.87	-25.00	-30.87	ERP
6	986.0717	-68.72	17.86	-50.86	-25.00	-25.86	ERP

Test Mode	5G NR n77 (3450-3550MHz)	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.2325	-69.35	4.45	-64.90	-13.00	-51.90	ERP
2	99.5281	-68.77	3.14	-65.63	-13.00	-52.63	ERP
3	114.5146	-69.55	2.48	-67.07	-13.00	-54.07	ERP
4	339.5888	-69.27	8.36	-60.91	-13.00	-47.91	ERP
5	726.8052	-69.27	14.94	-54.33	-13.00	-41.33	ERP
6	993.0114	-68.53	17.94	-50.59	-13.00	-37.59	ERP

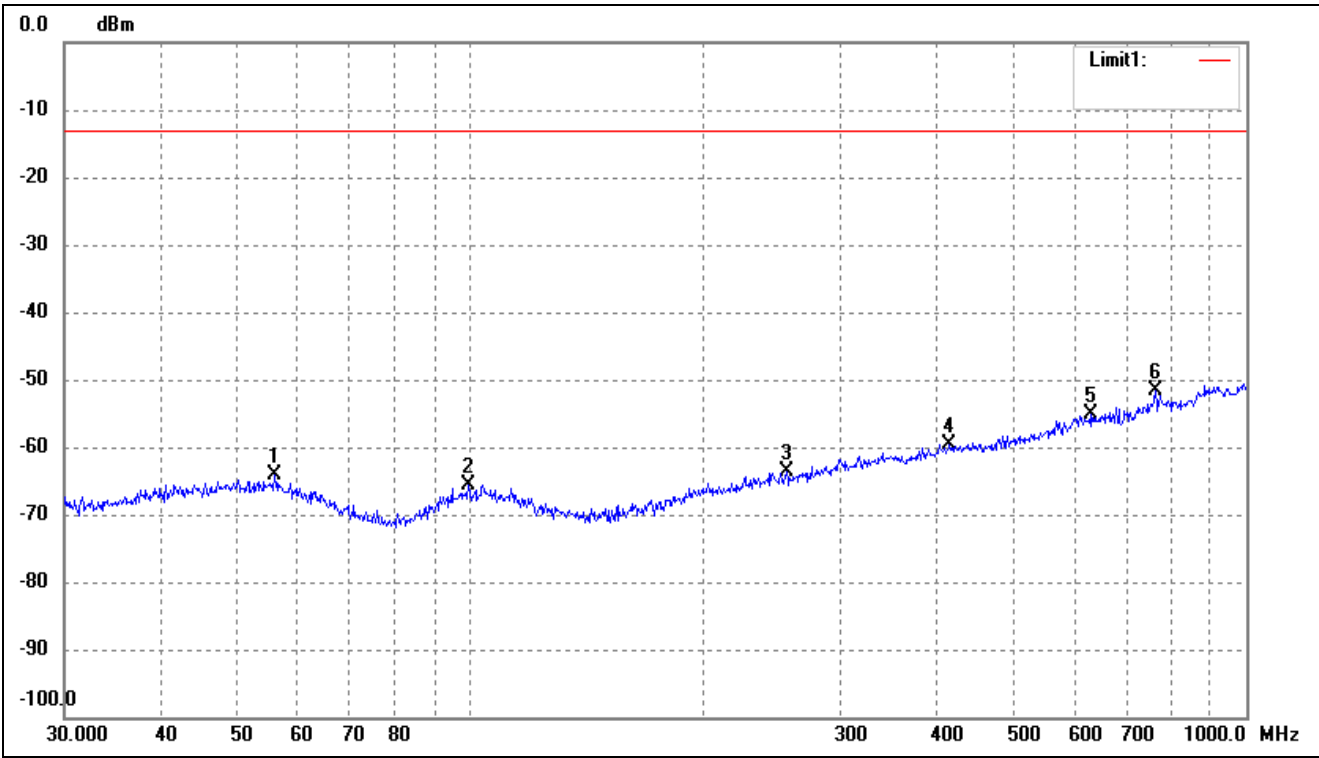
Test Mode                      5G NR n77                      Polarity:                      Vertical  
 (3450-3550MHz)



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	48.1626	-68.20	4.38	-63.82	-13.00	-50.82	ERP
2	97.4560	-68.67	2.83	-65.84	-13.00	-52.84	ERP
3	195.8220	-69.52	3.64	-65.88	-13.00	-52.88	ERP
4	359.1860	-68.60	8.27	-60.33	-13.00	-47.33	ERP
5	618.5369	-68.52	13.25	-55.27	-13.00	-42.27	ERP
6	771.4486	-67.27	15.79	-51.48	-13.00	-38.48	ERP

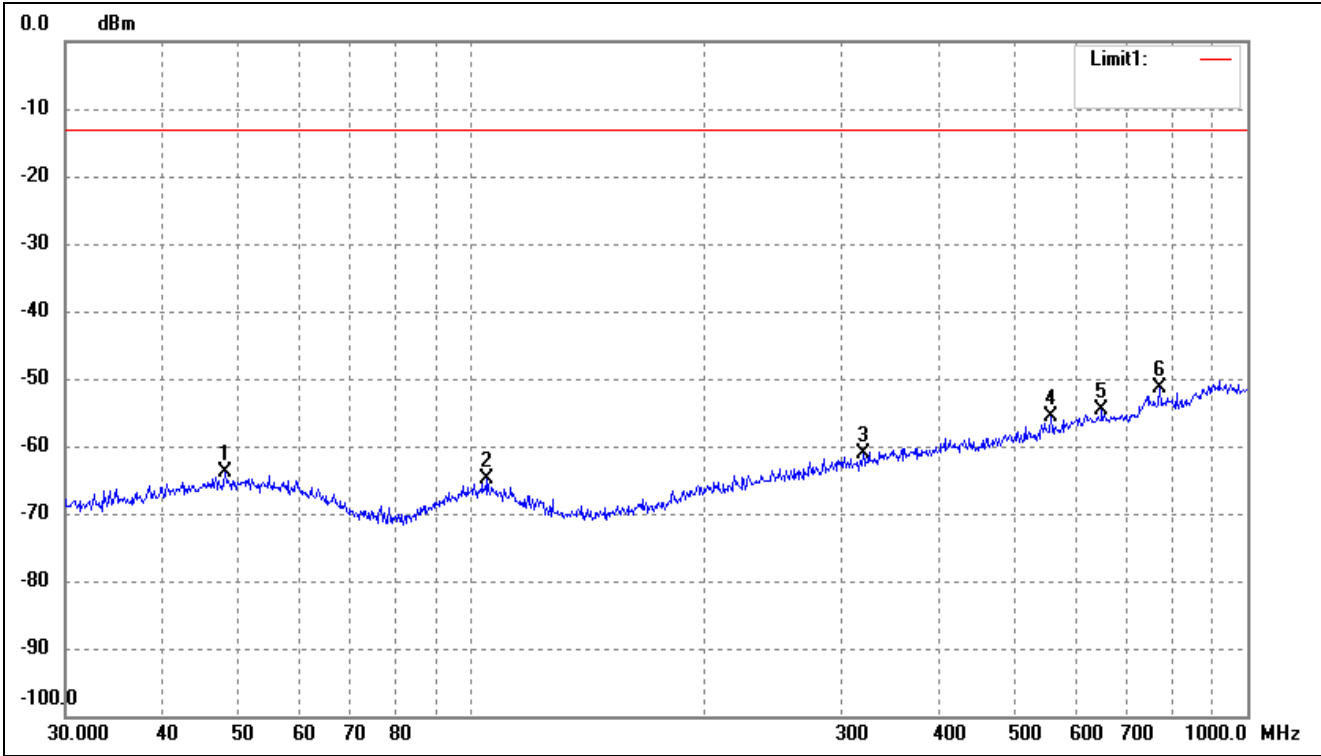


Test Mode	5G NR n77 (3700-3980MHz)	Polarity:	Horizontal
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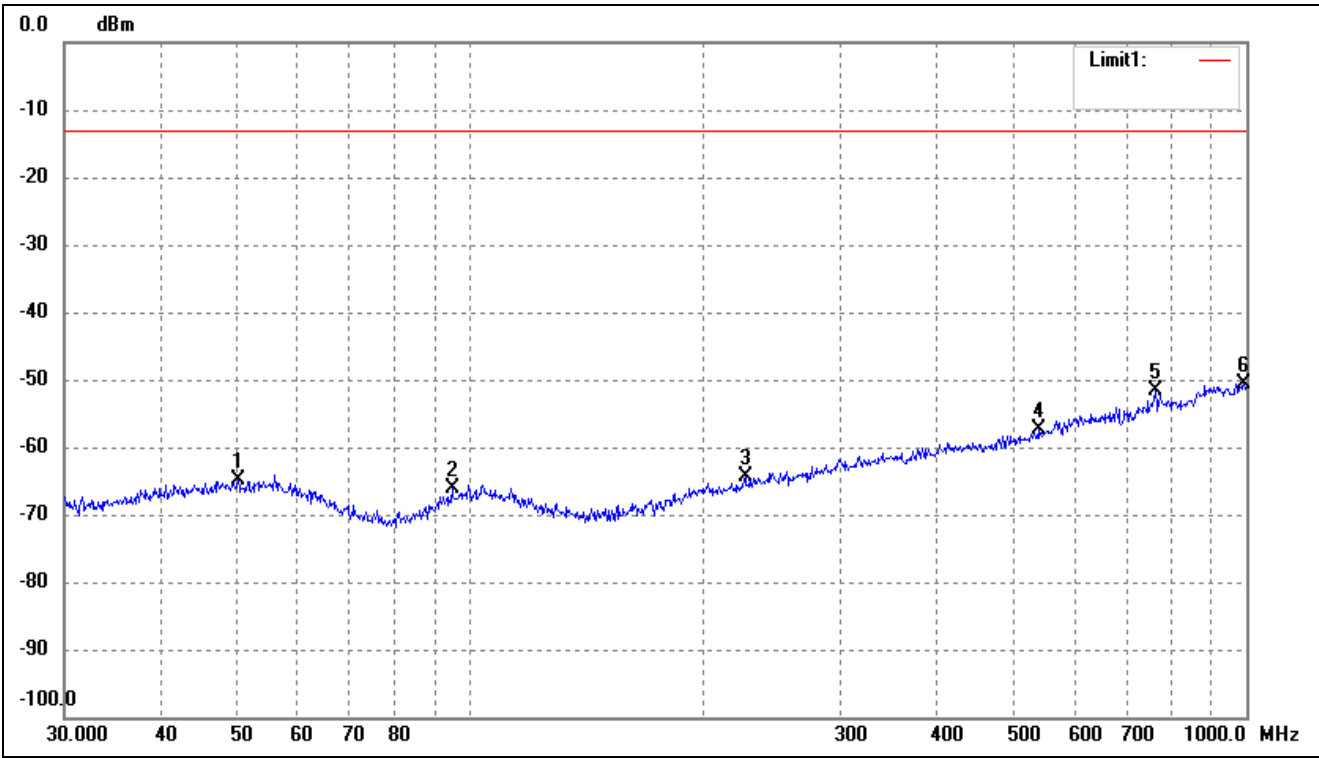
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	56.0007	-68.14	4.05	-64.09	-13.00	-51.09	ERP
2	99.5281	-68.77	3.14	-65.63	-13.00	-52.63	ERP
3	255.6231	-69.02	5.46	-63.56	-13.00	-50.56	ERP
4	414.7223	-69.15	9.55	-59.60	-13.00	-46.60	ERP
5	629.4772	-68.55	13.33	-55.22	-13.00	-42.22	ERP
6	763.3757	-67.44	15.70	-51.74	-13.00	-38.74	ERP

Test Mode                      5G NR n77                      Polarity:                      Vertical  
 (3700-3980MHz)



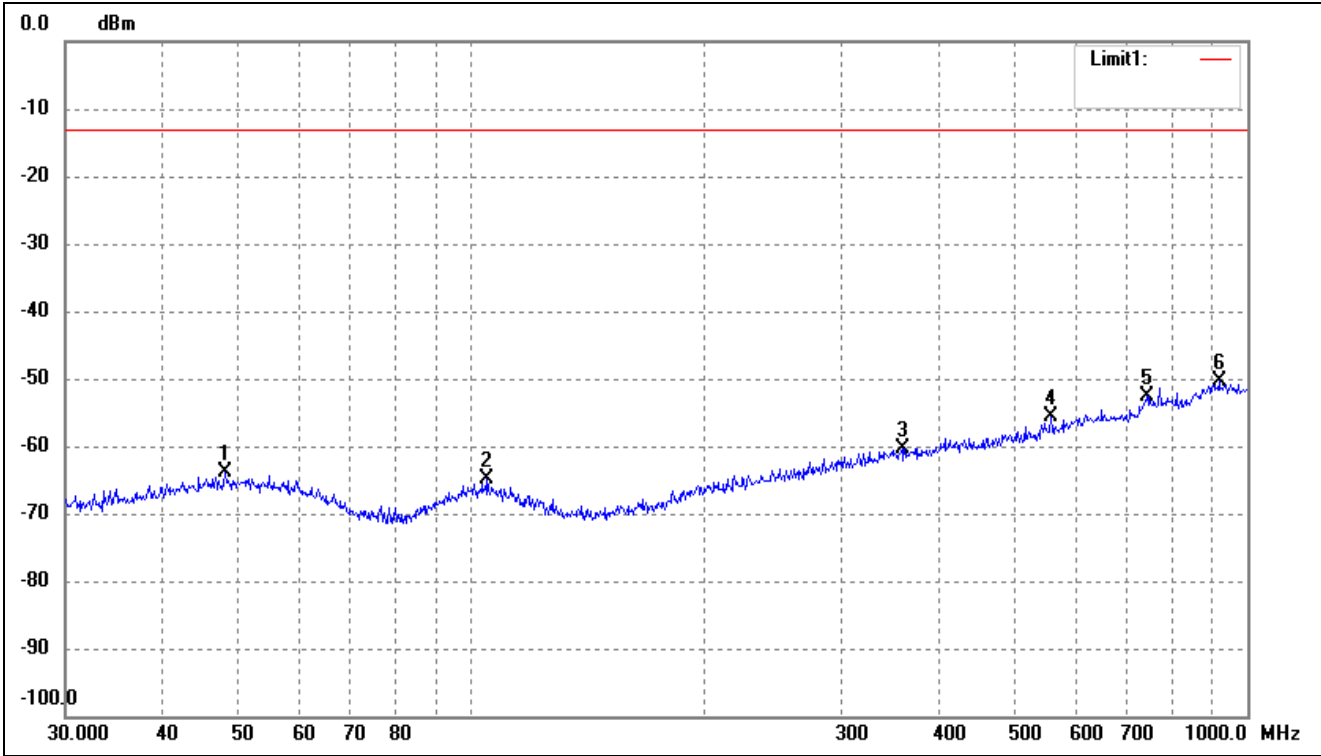
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	48.1626	-68.20	4.38	-63.82	-13.00	-50.82	ERP
2	104.9033	-68.21	3.36	-64.85	-13.00	-51.85	ERP
3	319.9370	-68.65	7.52	-61.13	-13.00	-48.13	ERP
4	558.7302	-67.55	11.82	-55.73	-13.00	-42.73	ERP
5	649.6597	-68.38	13.80	-54.58	-13.00	-41.58	ERP
6	771.4486	-67.27	15.79	-51.48	-13.00	-38.48	ERP

Test Mode	5G NR n78 (3450-3550MHz)	Polarity:	Horizontal
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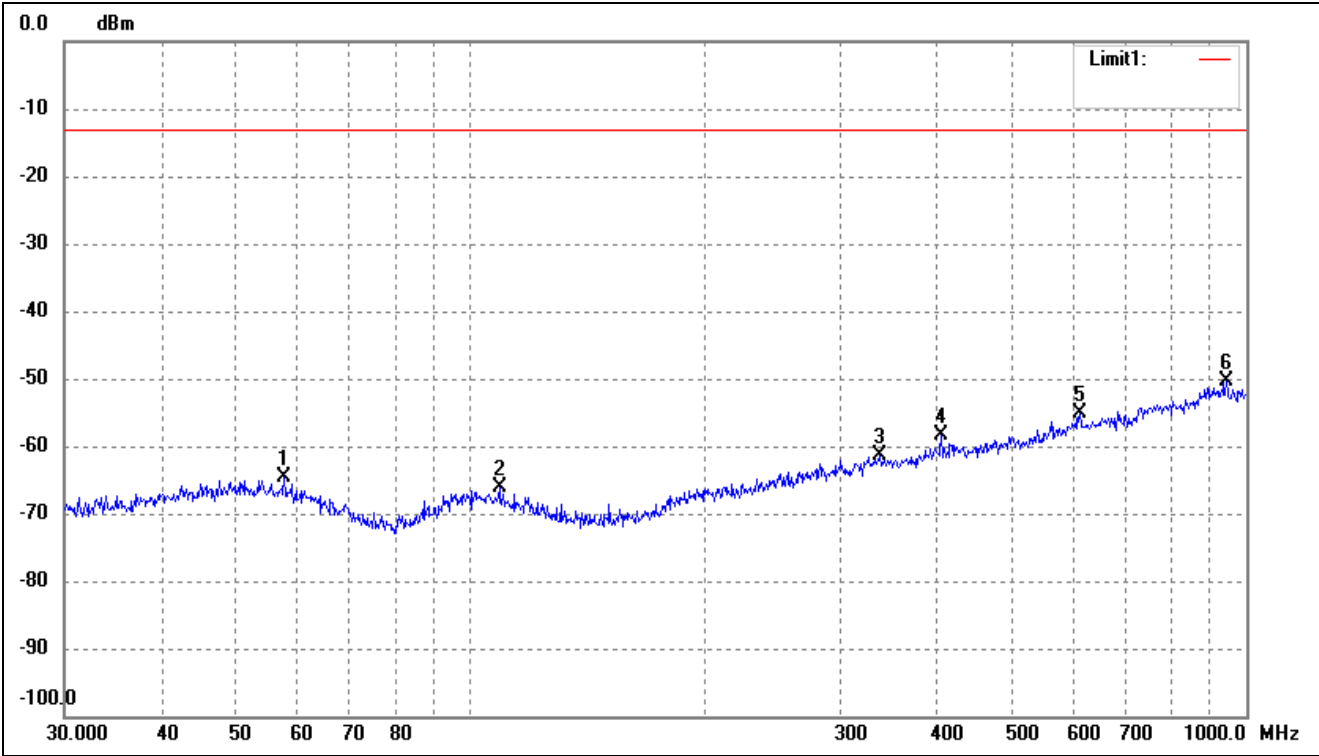
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.2325	-69.35	4.45	-64.90	-13.00	-51.90	ERP
2	94.7601	-68.33	2.30	-66.03	-13.00	-53.03	ERP
3	226.0994	-68.83	4.46	-64.37	-13.00	-51.37	ERP
4	539.4775	-68.85	11.38	-57.47	-13.00	-44.47	ERP
5	763.3757	-67.44	15.70	-51.74	-13.00	-38.74	ERP
6	993.0114	-68.53	17.94	-50.59	-13.00	-37.59	ERP

Test Mode                      5G NR n78                      Polarity:                      Vertical  
 (3450-3550MHz)



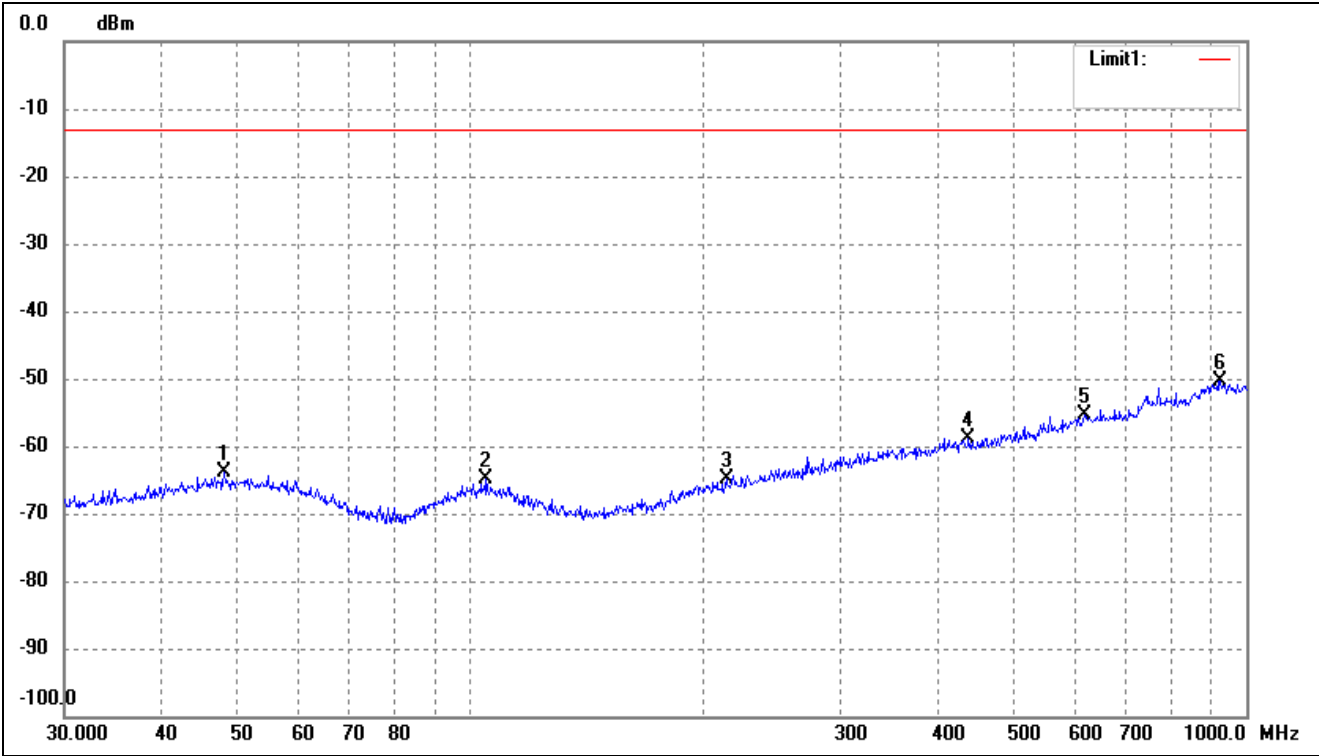
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	48.1626	-68.20	4.38	-63.82	-13.00	-50.82	ERP
2	104.9033	-68.21	3.36	-64.85	-13.00	-51.85	ERP
3	359.1860	-68.60	8.27	-60.33	-13.00	-47.33	ERP
4	558.7302	-67.55	11.82	-55.73	-13.00	-42.73	ERP
5	742.2587	-68.11	15.55	-52.56	-13.00	-39.56	ERP
6	919.2866	-68.41	18.06	-50.35	-13.00	-37.35	ERP

Test Mode                      5G NR n78                      Polarity:                      Horizontal  
 (3700-3800MHz)



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	57.5939	-68.49	3.81	-64.68	-13.00	-51.68	ERP
2	109.0286	-69.40	3.16	-66.24	-13.00	-53.24	ERP
3	337.2155	-69.54	8.26	-61.28	-13.00	-48.28	ERP
4	404.6665	-67.79	9.38	-58.41	-13.00	-45.41	ERP
5	609.9217	-68.45	13.33	-55.12	-13.00	-42.12	ERP
6	942.1305	-68.14	17.73	-50.41	-13.00	-37.41	ERP

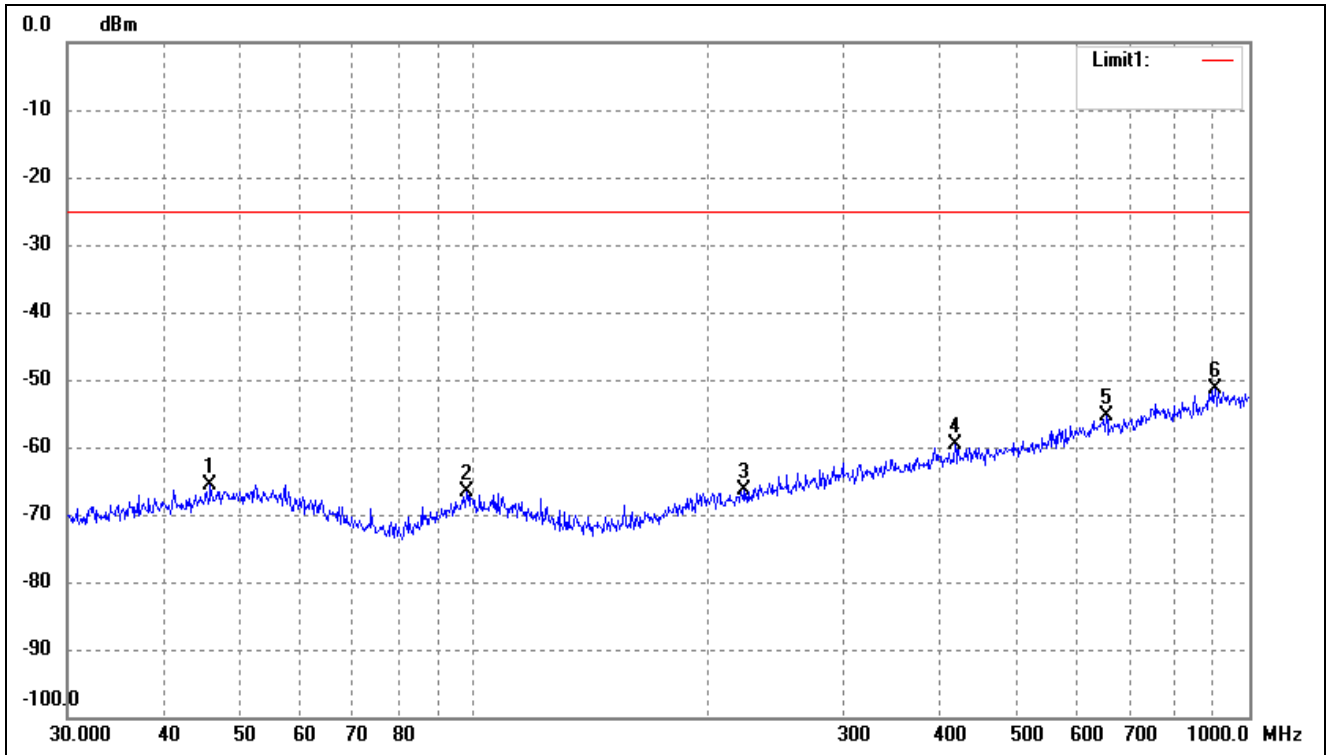
Test Mode	5G NR n78 (3700-3800MHz)	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	48.1626	-68.20	4.38	-63.82	-13.00	-50.82	ERP
2	104.9033	-68.21	3.36	-64.85	-13.00	-51.85	ERP
3	213.7634	-68.67	3.83	-64.84	-13.00	-51.84	ERP
4	438.6554	-68.46	9.71	-58.75	-13.00	-45.75	ERP
5	618.5369	-68.52	13.25	-55.27	-13.00	-42.27	ERP
6	925.7563	-68.31	18.04	-50.27	-13.00	-37.27	ERP

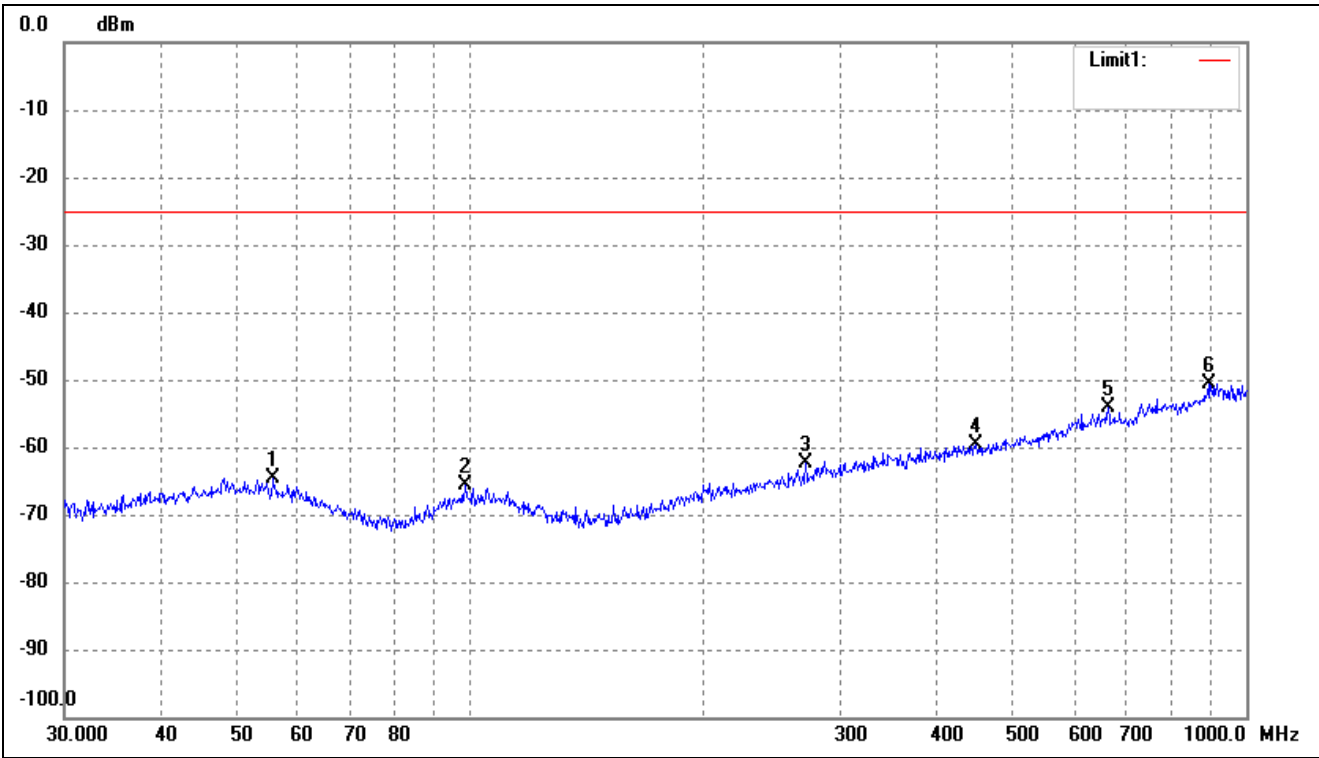
SA

Test Mode      5G NR n41      Polarity:      Horizontal



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	45.8553	-69.82	4.18	-65.64	-25.00	-40.64	ERP
2	98.1419	-69.59	2.95	-66.64	-25.00	-41.64	ERP
3	223.7334	-70.81	4.34	-66.47	-25.00	-41.47	ERP
4	417.6411	-69.13	9.59	-59.54	-25.00	-34.54	ERP
5	654.2318	-69.13	13.83	-55.30	-25.00	-30.30	ERP
6	903.3094	-69.37	17.89	-51.48	-25.00	-26.48	ERP

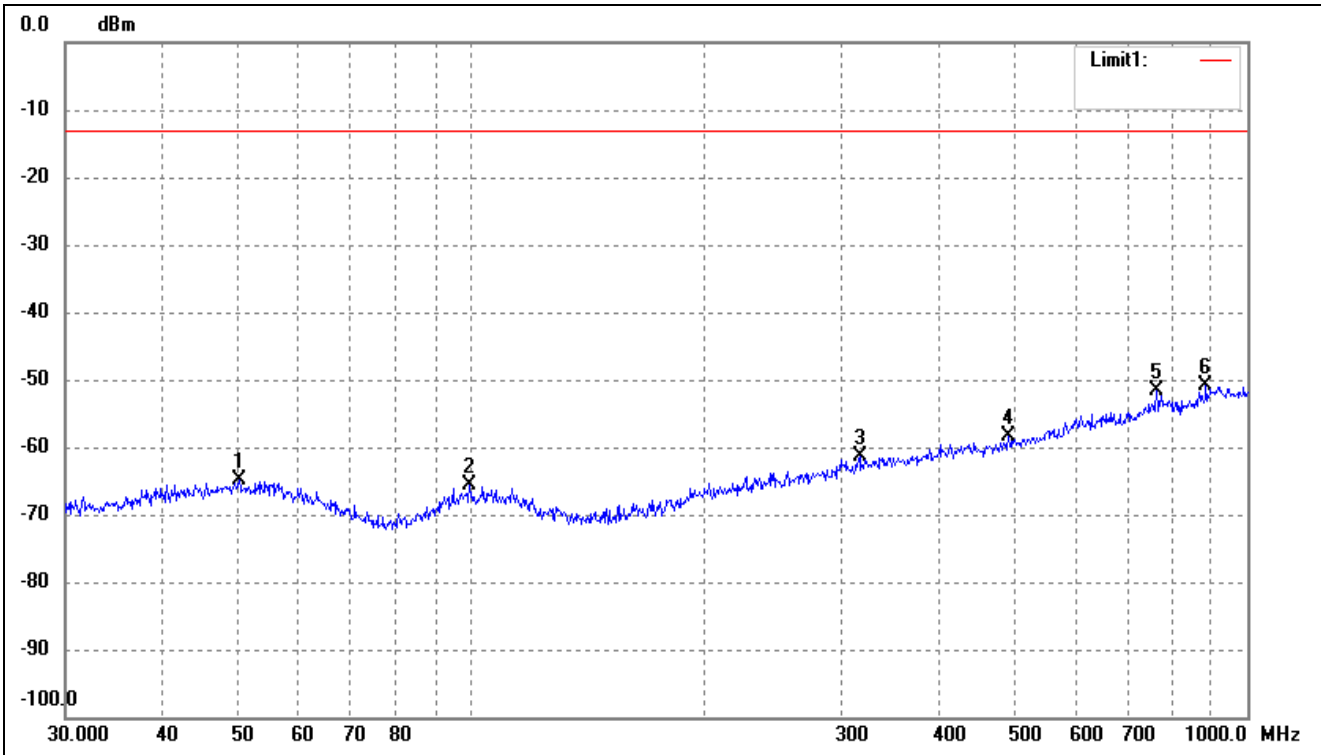
Test Mode                      5G NR n41                      Polarity:                      Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	55.8047	-68.72	4.08	-64.64	-25.00	-39.64	ERP
2	98.4866	-68.68	2.99	-65.69	-25.00	-40.69	ERP
3	270.3748	-68.34	5.87	-62.47	-25.00	-37.47	ERP
4	447.9822	-69.36	9.73	-59.63	-25.00	-34.63	ERP
5	663.4729	-68.05	13.90	-54.15	-25.00	-29.15	ERP
6	893.8567	-68.40	17.68	-50.72	-25.00	-25.72	ERP

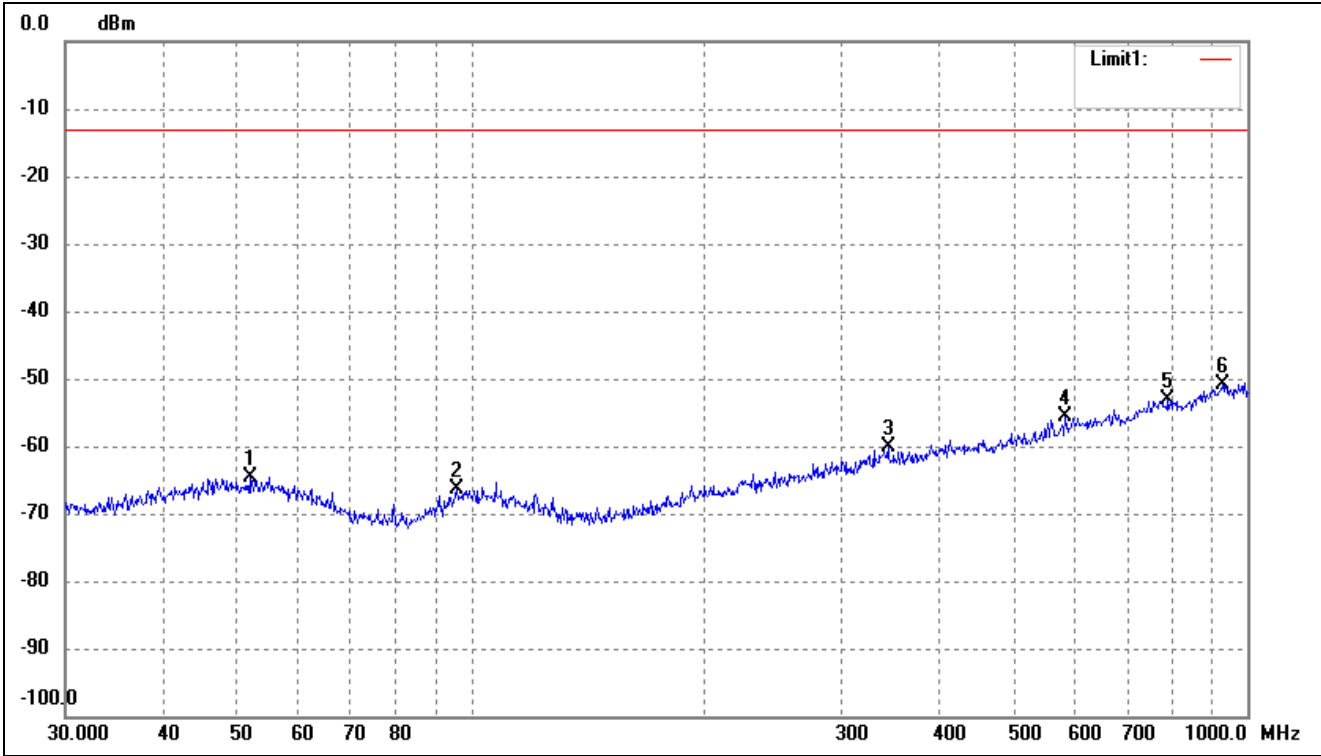


Test Mode	5G NR n77 (3450-3550MHz)	Polarity:	Horizontal
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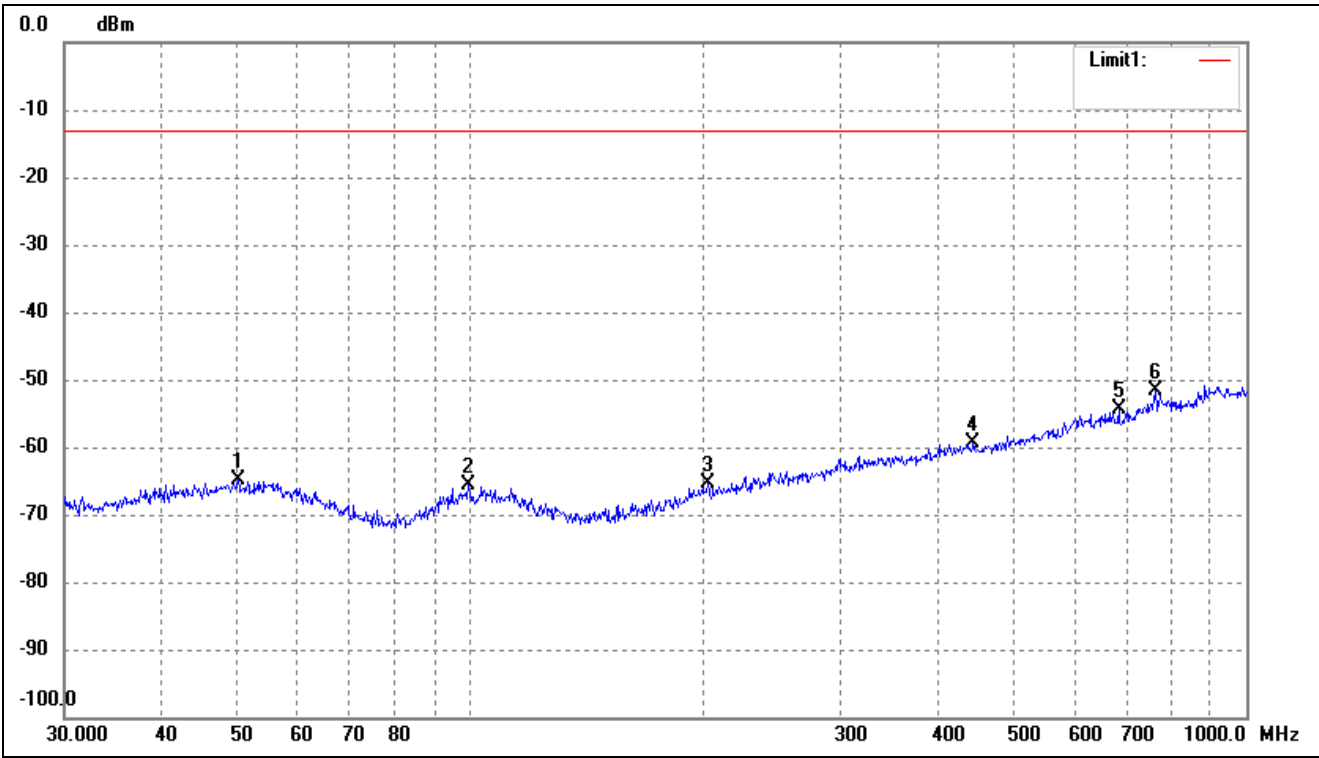
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.2325	-69.35	4.45	-64.90	-13.00	-51.90	ERP
2	99.5281	-68.77	3.14	-65.63	-13.00	-52.63	ERP
3	316.5890	-68.70	7.39	-61.31	-13.00	-48.31	ERP
4	492.4685	-68.97	10.65	-58.32	-13.00	-45.32	ERP
5	763.3757	-67.44	15.70	-51.74	-13.00	-38.74	ERP
6	884.5029	-68.34	17.36	-50.98	-13.00	-37.98	ERP

Test Mode                      5G NR n77                      Polarity:                      Vertical  
 (3450-3550MHz)



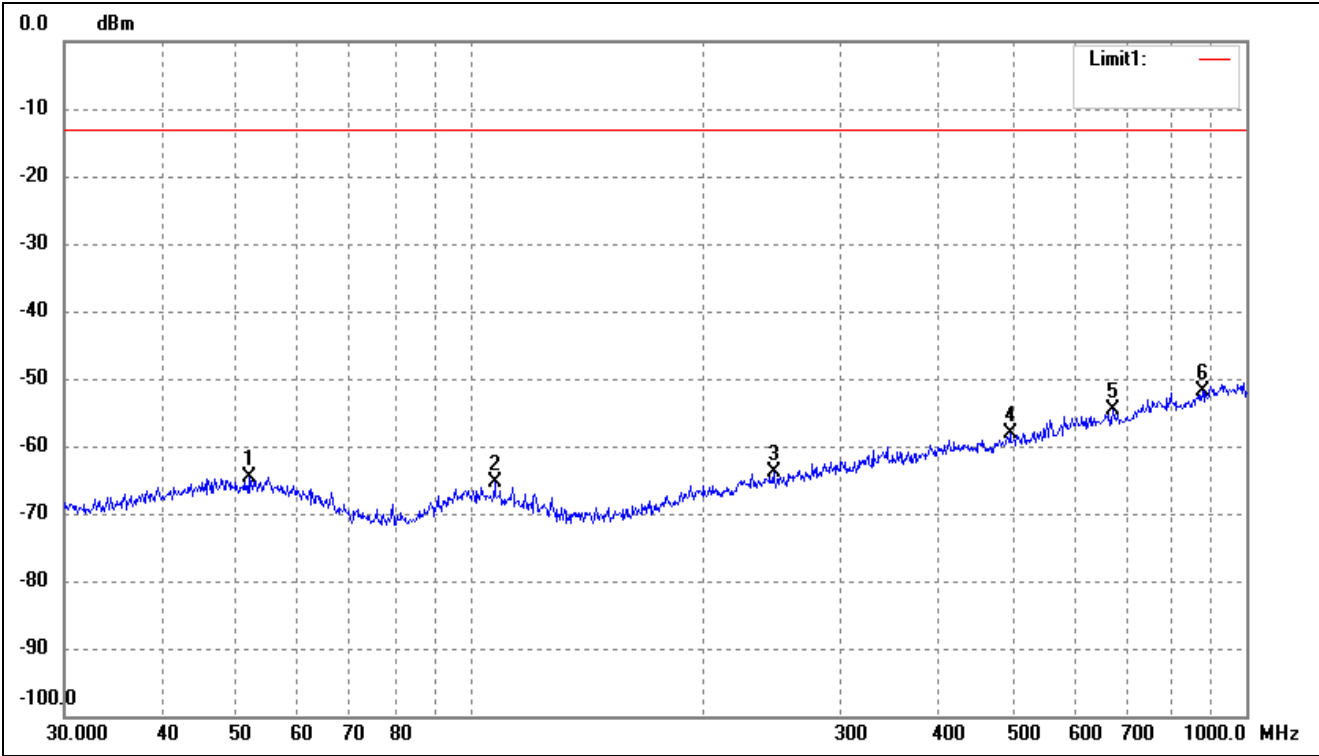
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.8430	-68.97	4.41	-64.56	-13.00	-51.56	ERP
2	95.7622	-68.99	2.52	-66.47	-13.00	-53.47	ERP
3	344.3855	-68.69	8.51	-60.18	-13.00	-47.18	ERP
4	582.7425	-68.02	12.33	-55.69	-13.00	-42.69	ERP
5	790.6188	-68.97	15.94	-53.03	-13.00	-40.03	ERP
6	929.0082	-68.76	18.01	-50.75	-13.00	-37.75	ERP

Test Mode	5G NR n77 (3700-3980MHz)	Polarity:	Horizontal
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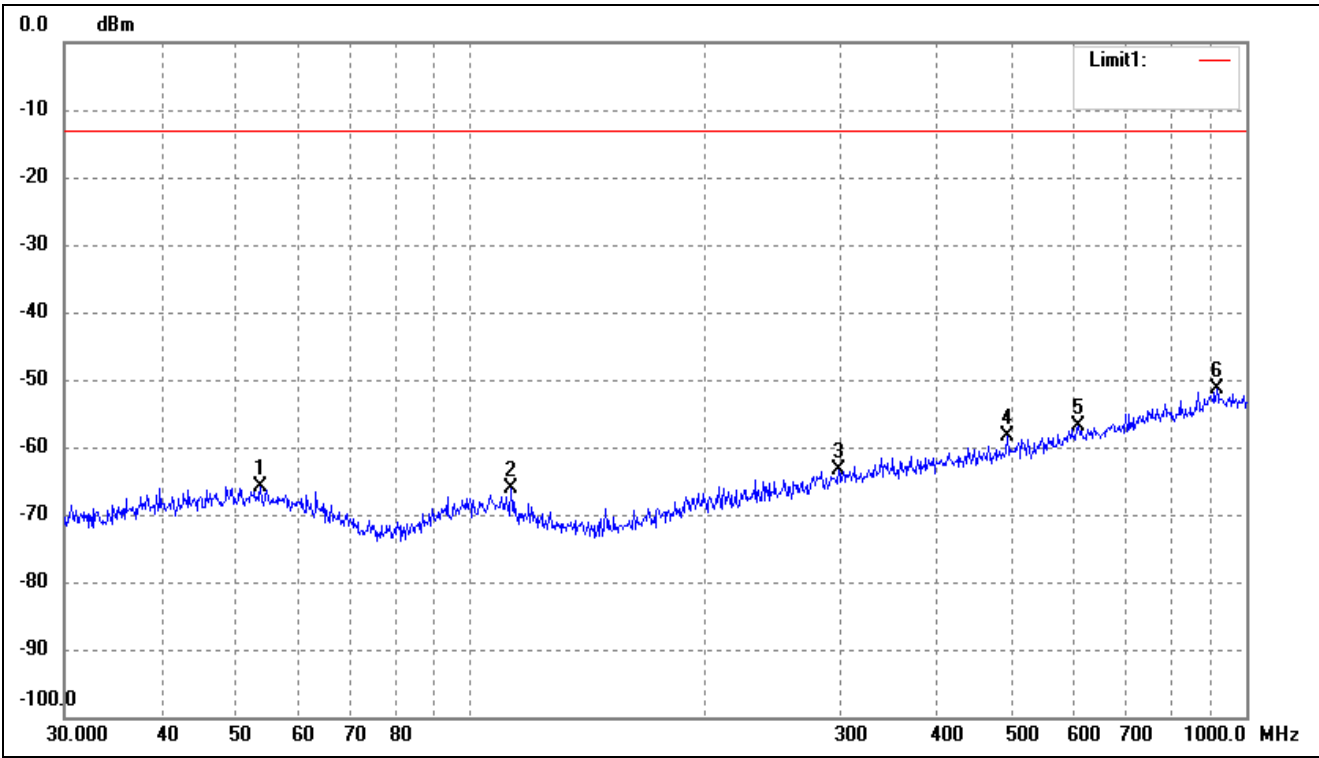
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.2325	-69.35	4.45	-64.90	-13.00	-51.90	ERP
2	99.5281	-68.77	3.14	-65.63	-13.00	-52.63	ERP
3	202.8104	-69.17	3.79	-65.38	-13.00	-52.38	ERP
4	444.8514	-69.11	9.72	-59.39	-13.00	-46.39	ERP
5	684.7454	-68.18	13.83	-54.35	-13.00	-41.35	ERP
6	763.3757	-67.44	15.70	-51.74	-13.00	-38.74	ERP

Test Mode                      5G NR n77                      Polarity:                      Vertical  
 (3700-3980MHz)



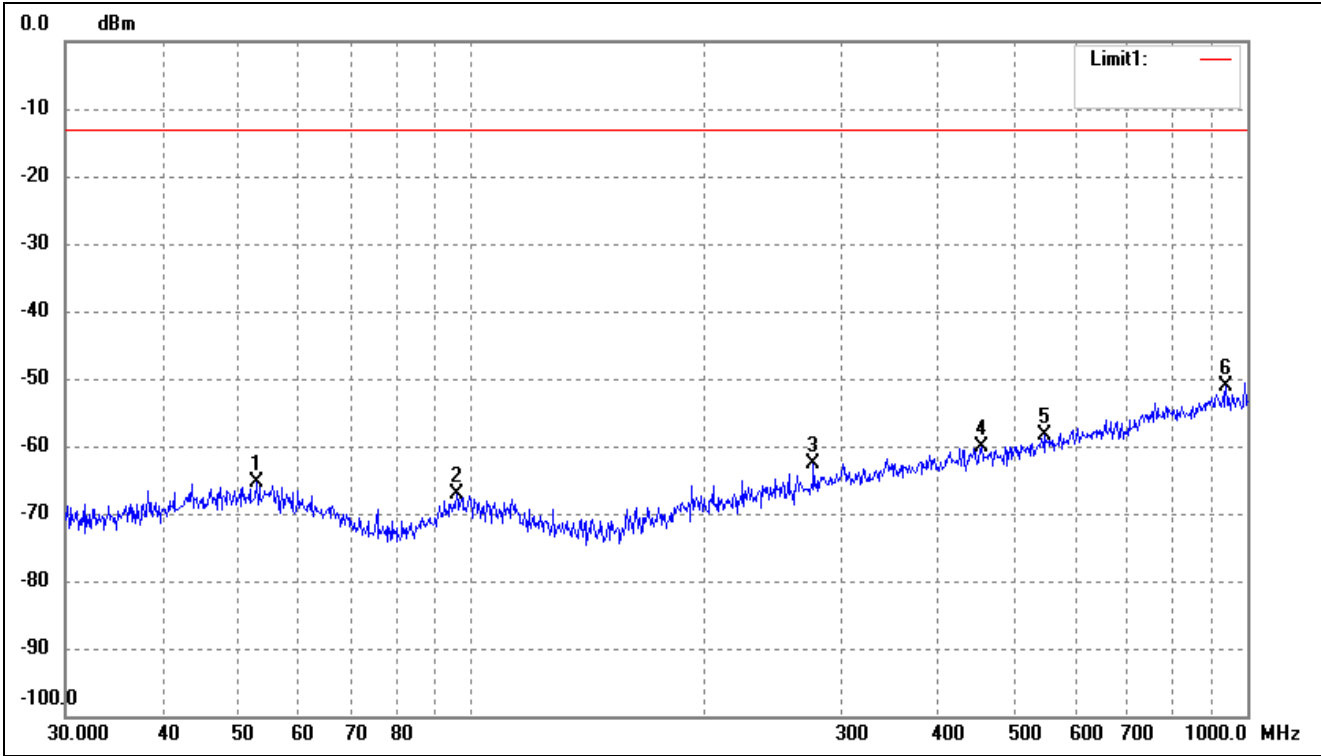
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.8430	-68.97	4.41	-64.56	-13.00	-51.56	ERP
2	107.5101	-68.57	3.26	-65.31	-13.00	-52.31	ERP
3	245.9509	-69.28	5.35	-63.93	-13.00	-50.93	ERP
4	495.9344	-68.80	10.71	-58.09	-13.00	-45.09	ERP
5	672.8445	-68.44	13.74	-54.70	-13.00	-41.70	ERP
6	878.3214	-69.03	17.14	-51.89	-13.00	-38.89	ERP

Test Mode	5G NR n78 (3450-3550MHz)	Polarity:	Horizontal
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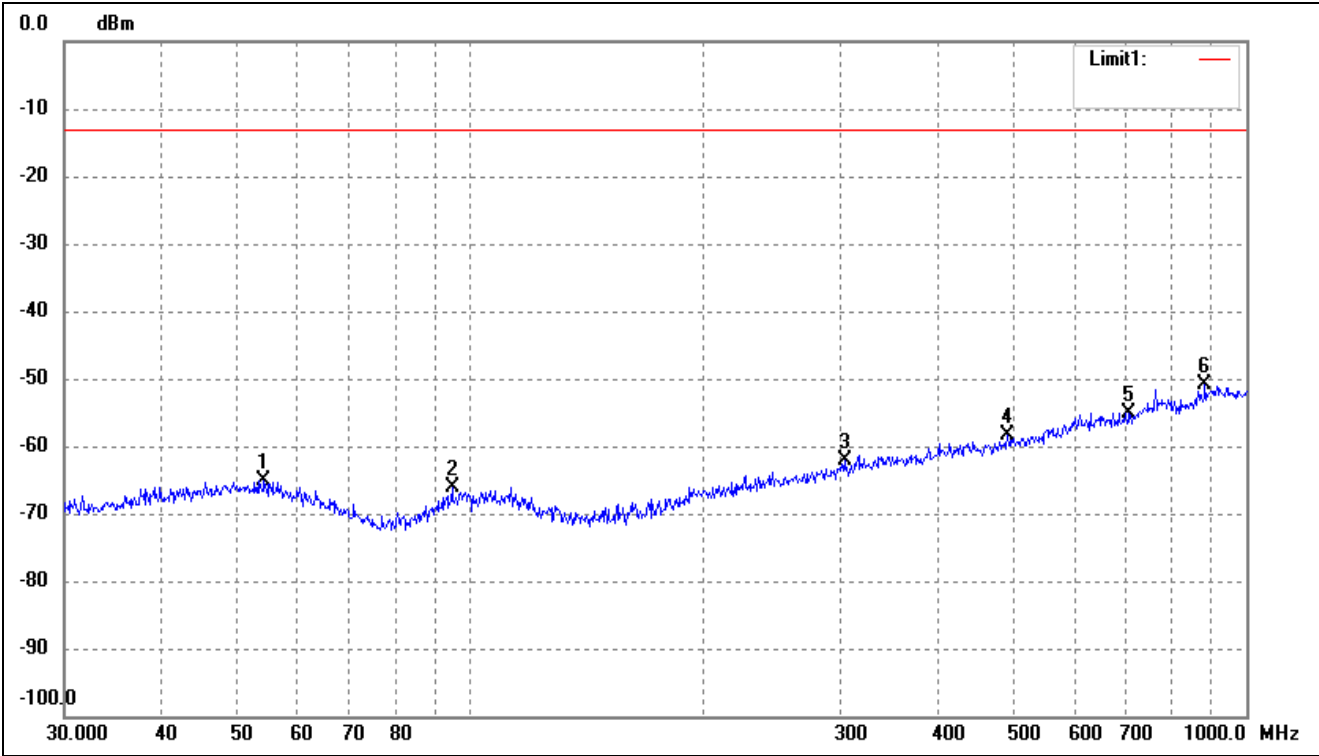
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	53.6932	-70.17	4.31	-65.86	-13.00	-52.86	ERP
2	112.9196	-68.91	2.70	-66.21	-13.00	-53.21	ERP
3	298.2681	-70.54	7.05	-63.49	-13.00	-50.49	ERP
4	492.4685	-68.97	10.65	-58.32	-13.00	-45.32	ERP
5	607.7867	-70.27	13.32	-56.95	-13.00	-43.95	ERP
6	916.0687	-69.35	18.04	-51.31	-13.00	-38.31	ERP

Test Mode                      5G NR n78                      Polarity:                      Vertical  
 (3450-3550MHz)



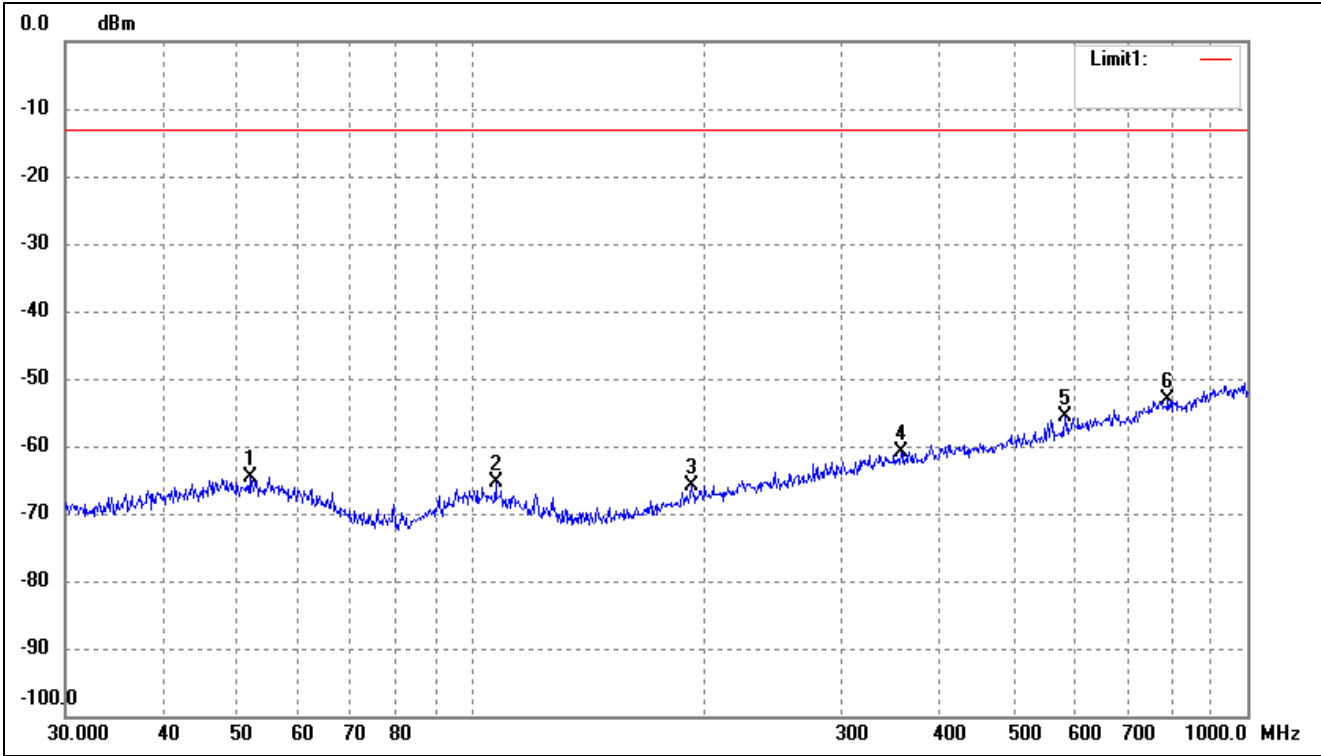
No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	52.9453	-69.62	4.36	-65.26	-13.00	-52.26	ERP
2	95.7622	-69.52	2.52	-67.00	-13.00	-54.00	ERP
3	276.1236	-68.94	6.22	-62.72	-13.00	-49.72	ERP
4	454.3100	-69.86	9.75	-60.11	-13.00	-47.11	ERP
5	549.0195	-70.02	11.62	-58.40	-13.00	-45.40	ERP
6	938.8326	-69.04	17.80	-51.24	-13.00	-38.24	ERP

Test Mode                      5G NR n78                      Polarity:                      Horizontal  
 (3700-3800MHz)



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	54.2610	-69.35	4.27	-65.08	-13.00	-52.08	ERP
2	94.7601	-68.33	2.30	-66.03	-13.00	-53.03	ERP
3	303.5437	-69.18	7.12	-62.06	-13.00	-49.06	ERP
4	492.4685	-68.97	10.65	-58.32	-13.00	-45.32	ERP
5	706.6999	-69.02	13.86	-55.16	-13.00	-42.16	ERP
6	884.5029	-68.34	17.36	-50.98	-13.00	-37.98	ERP

Test Mode                      5G NR n78                      Polarity:                      Vertical  
 (3700-3800MHz)



No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.8430	-68.97	4.41	-64.56	-13.00	-51.56	ERP
2	107.5101	-68.57	3.26	-65.31	-13.00	-52.31	ERP
3	192.4186	-69.34	3.38	-65.96	-13.00	-52.96	ERP
4	357.9287	-69.04	8.28	-60.76	-13.00	-47.76	ERP
5	582.7425	-68.02	12.33	-55.69	-13.00	-42.69	ERP
6	790.6188	-68.97	15.94	-53.03	-13.00	-40.03	ERP

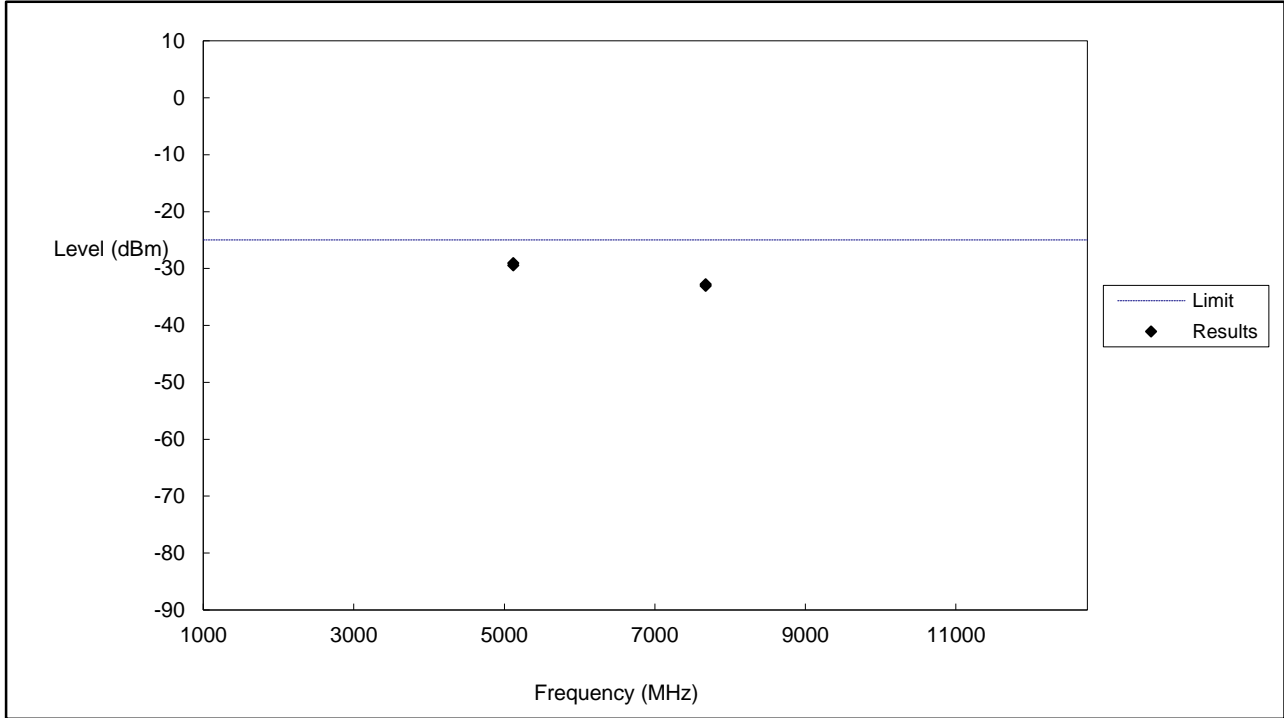
Note: Margin= (Reading+ Correct)- Limit



➤ Spurious Emissions Above 1GHz

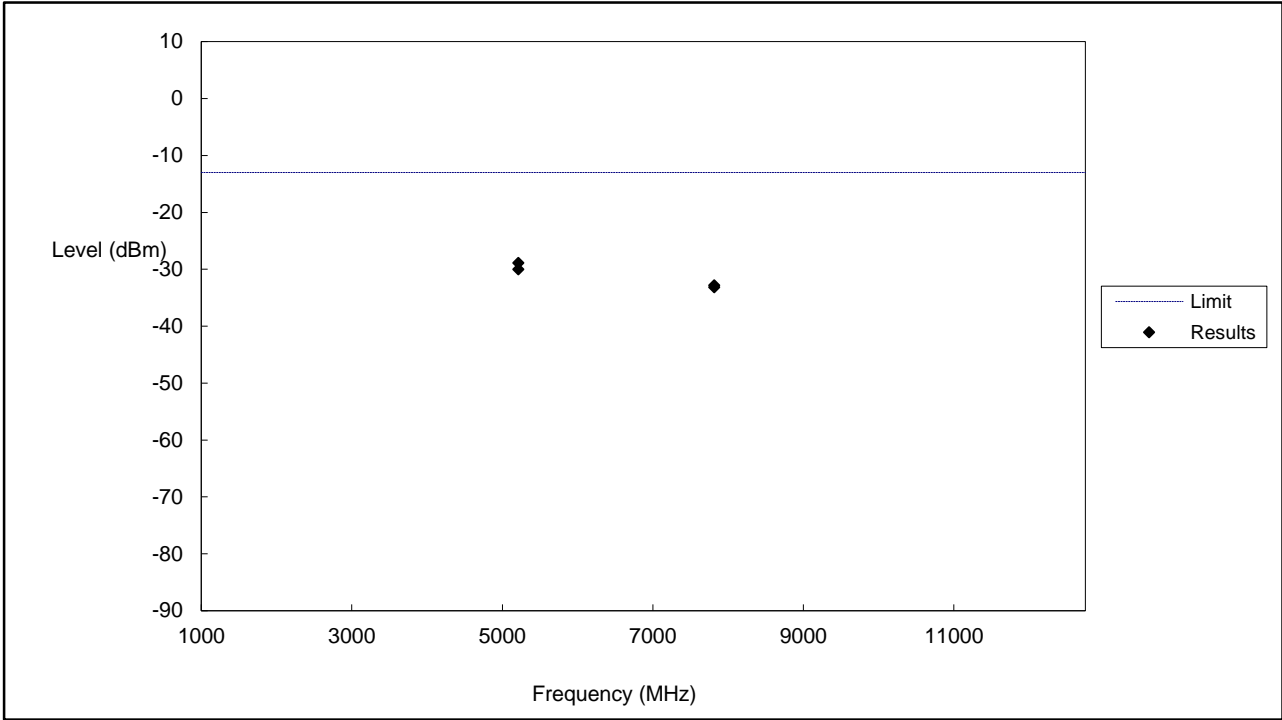
For TDD\_SA n 41 Mode

Low Channel



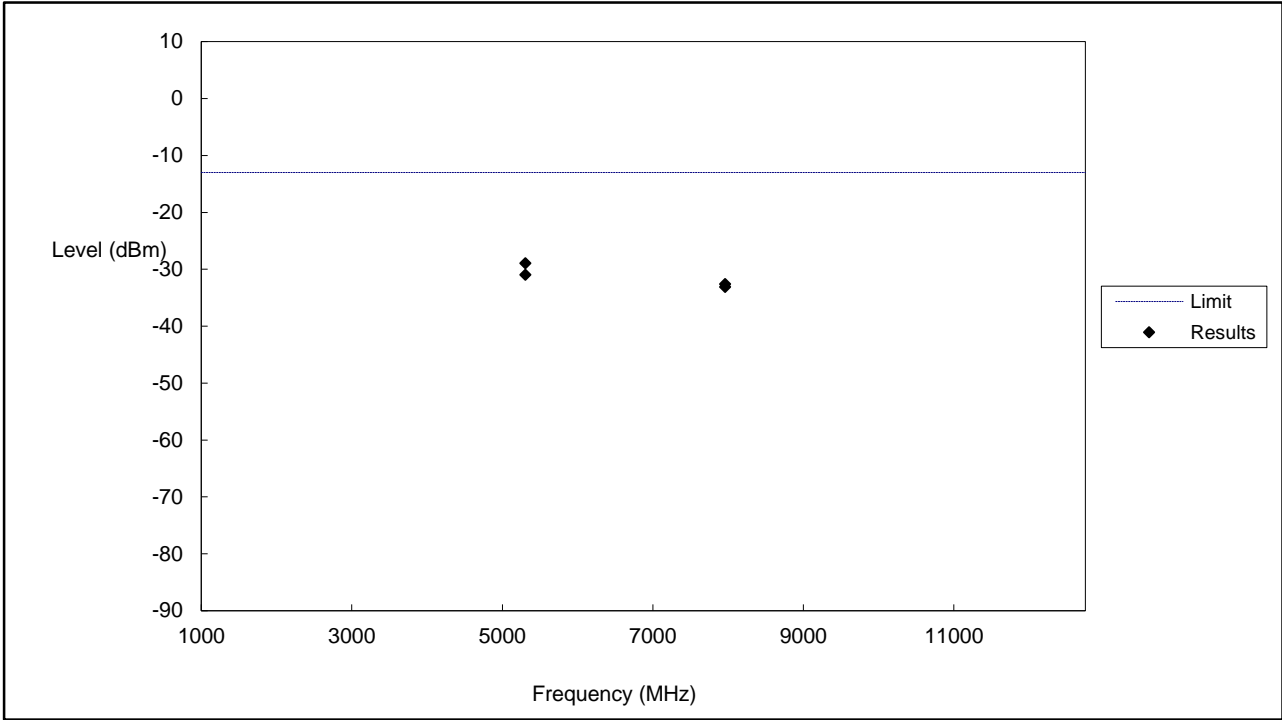
No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	5115.00	-29.44	-25	-4.44	H	RMS
2	7672.50	-33.04	-25	-8.04	H	RMS
1	5115.00	-29.05	-25	-4.05	V	RMS
2	7672.50	-32.73	-25	-7.73	V	RMS

Middle Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	5210.00	-28.85	-25	-3.85	H	RMS
2	7815.00	-32.82	-25	-7.82	H	RMS
1	5210.00	-30.00	-25	-5.00	V	RMS
2	7815.00	-33.14	-25	-8.14	V	RMS

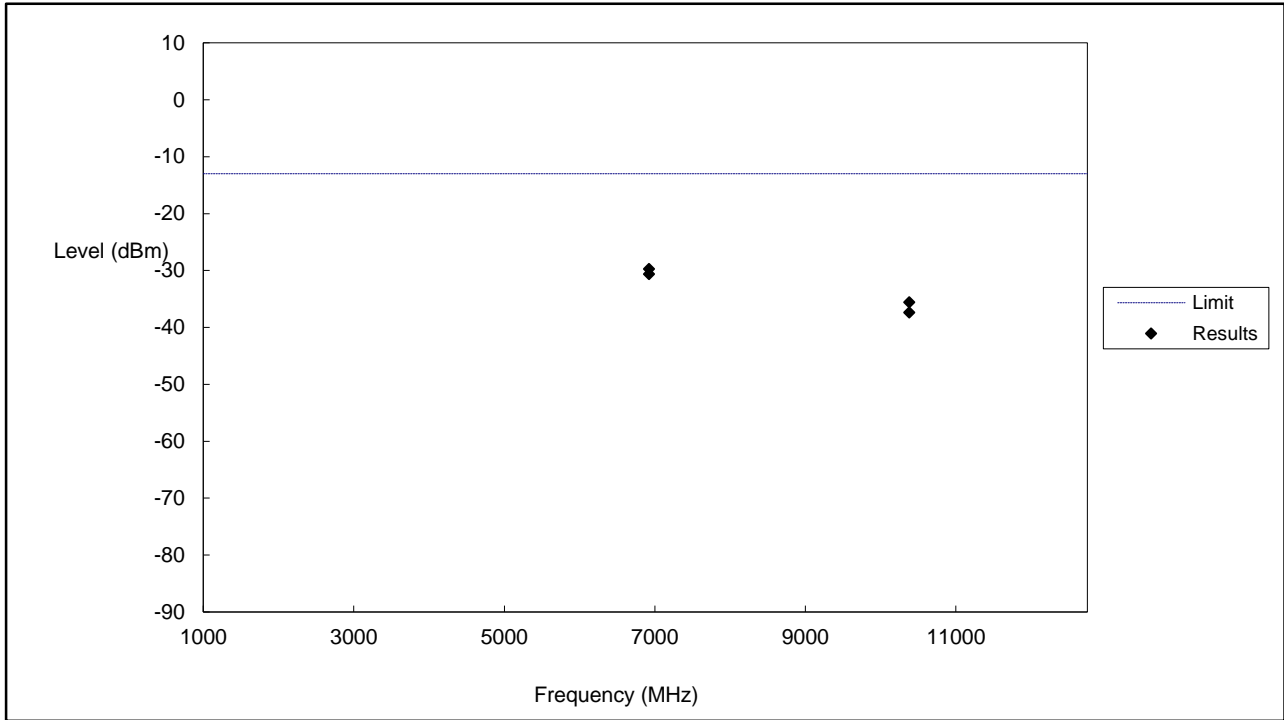
High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	5305.00	-28.92	-25	-3.92	H	RMS
2	7957.50	-33.07	-25	-8.07	H	RMS
1	5305.00	-30.96	-25	-5.96	V	RMS
2	7957.50	-32.59	-25	-7.59	V	RMS

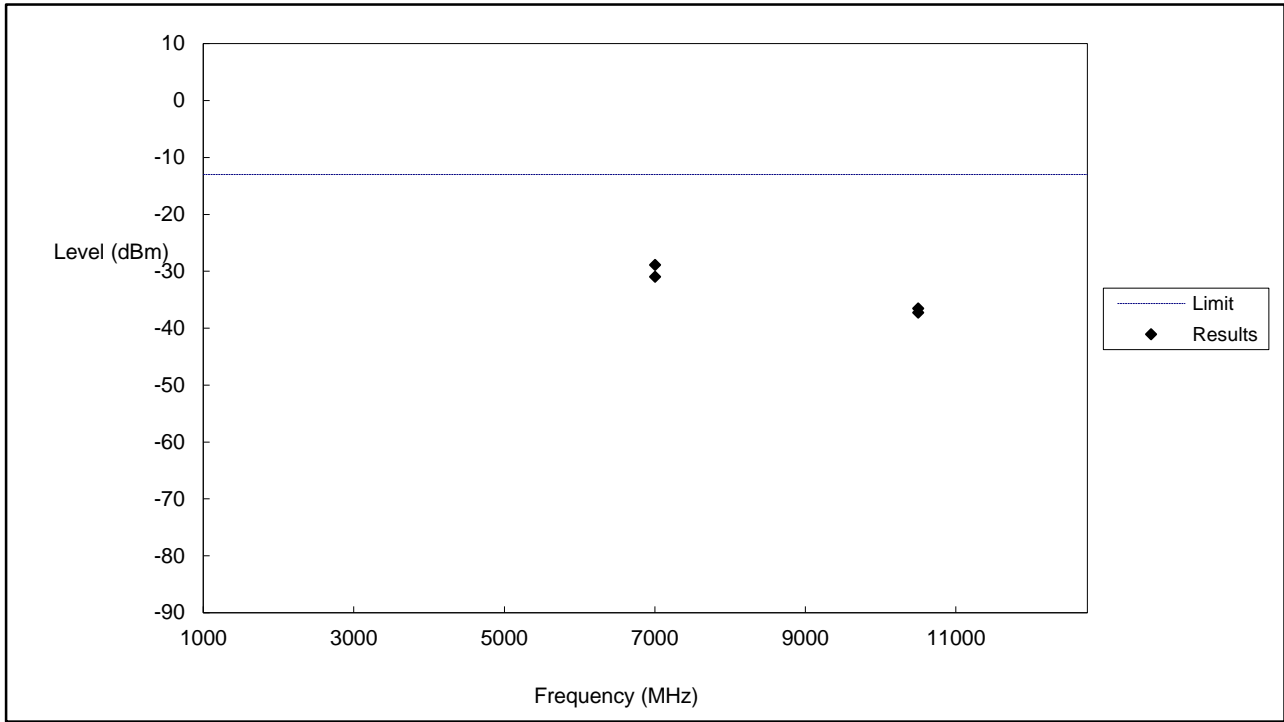
For TDD\_SA N77\_3450-3550MHz Mode

Low Channel



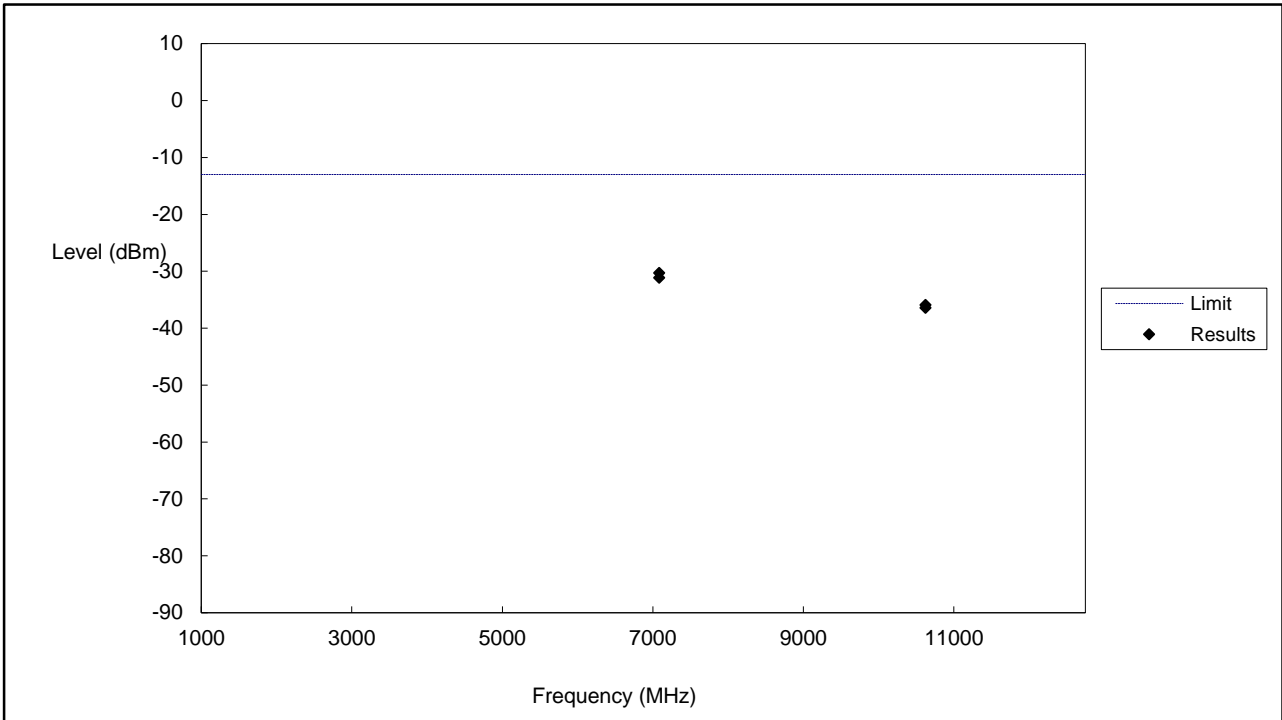
No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	6919.98	-30.61	-13	-17.61	H	RMS
2	10379.97	-37.33	-13	-24.33	H	RMS
1	6919.98	-29.72	-13	-16.72	V	RMS
2	10379.97	-35.57	-13	-22.57	V	RMS

Middle Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7000.02	-28.83	-13	-15.83	H	RMS
2	10500.03	-36.48	-13	-23.48	H	RMS
1	7000.02	-30.91	-13	-17.91	V	RMS
2	10500.03	-37.22	-13	-24.22	V	RMS

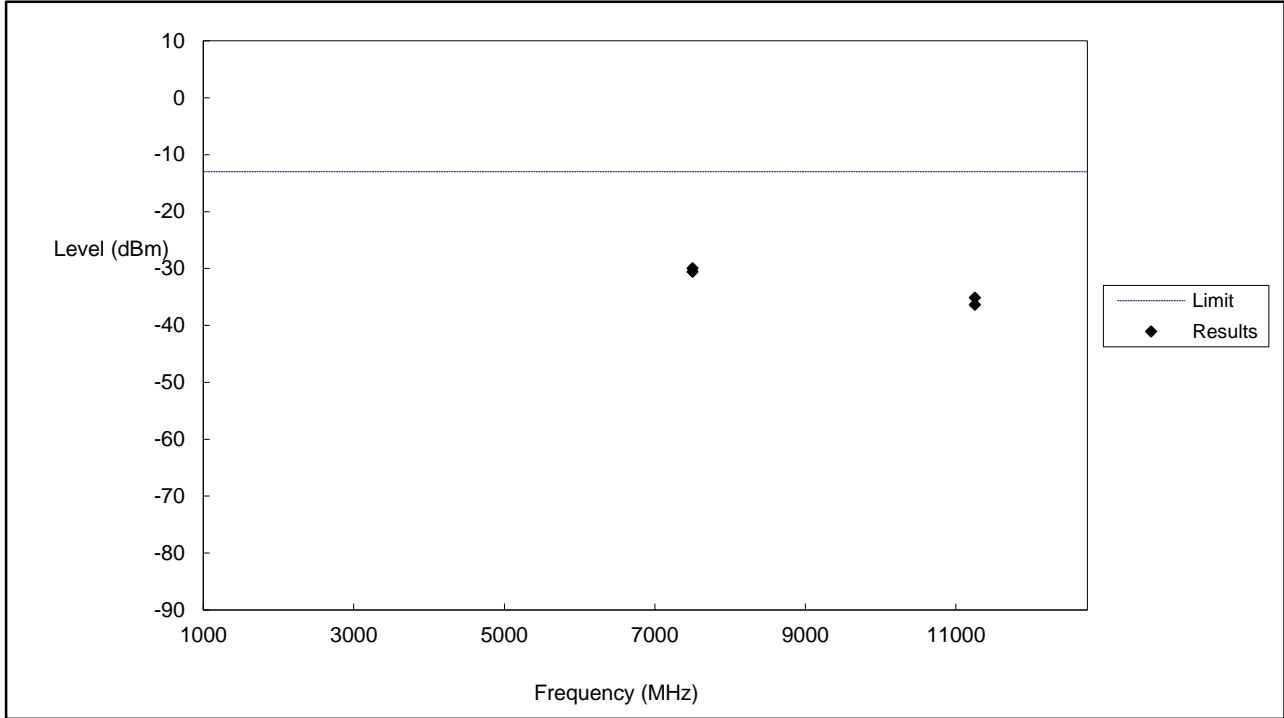
High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7080.00	-31.10	-13	-18.10	H	RMS
2	10620.00	-35.89	-13	-22.89	H	RMS
1	7080.00	-30.28	-13	-17.28	V	RMS
2	10620.00	-36.40	-13	-23.40	V	RMS

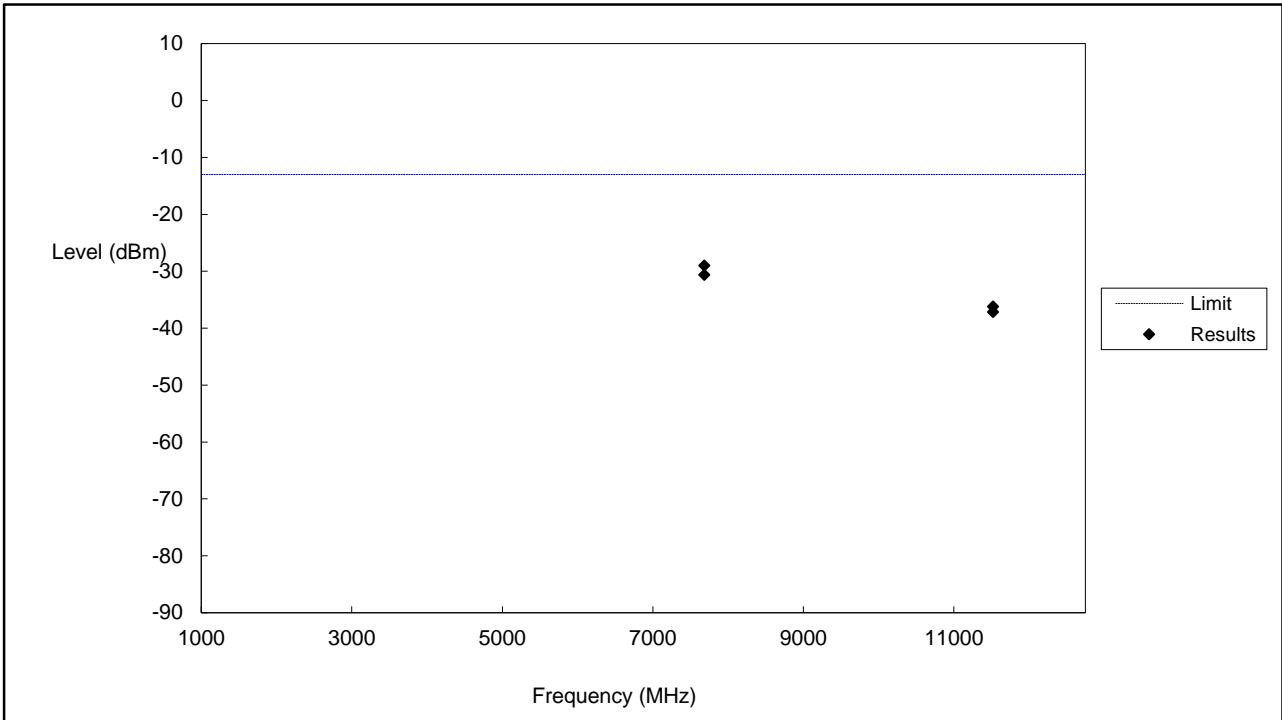
For TDD\_SA N77\_3700-3980MHz Mode

Low Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7500.00	-29.93	-13	-16.93	H	RMS
2	11250.00	-36.34	-13	-23.34	H	RMS
1	7500.00	-30.54	-13	-17.54	V	RMS
2	11250.00	-35.09	-13	-22.09	V	RMS

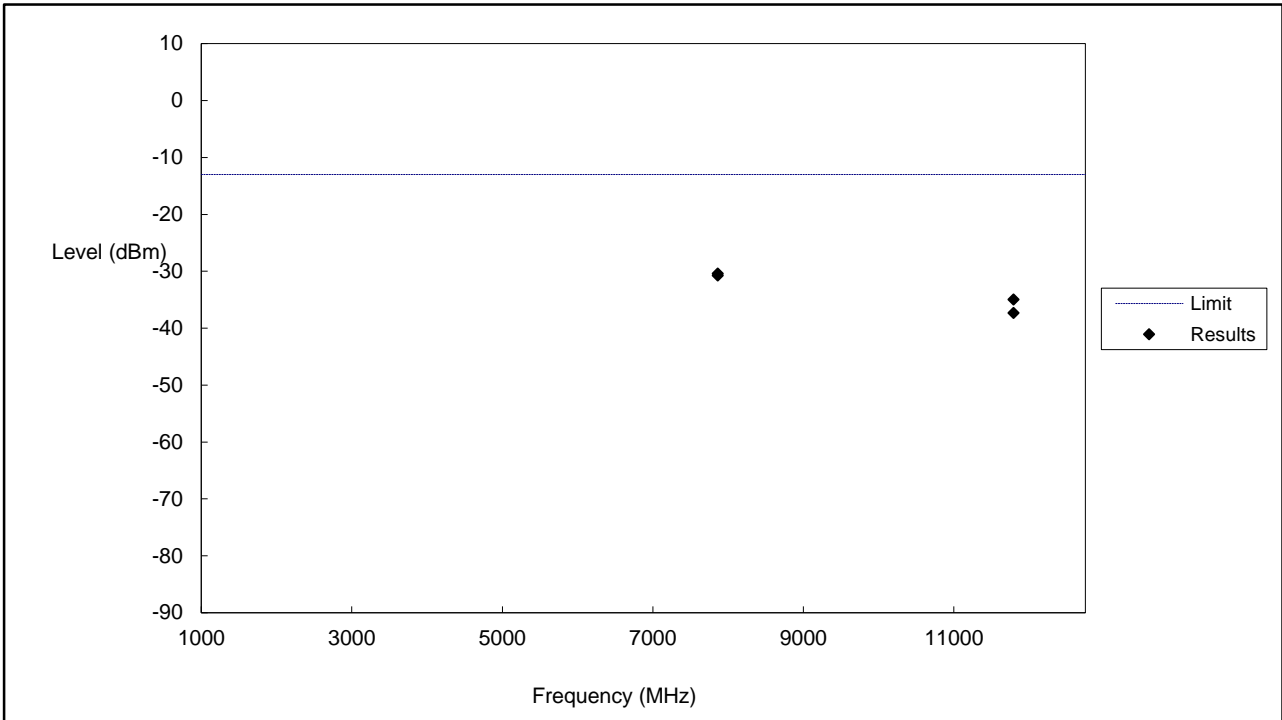
Middle Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7680.00	-30.60	-13	-17.60	H	RMS
2	11520.00	-37.14	-13	-24.14	H	RMS
1	7680.00	-28.95	-13	-15.95	V	RMS
2	11520.00	-36.15	-13	-23.15	V	RMS



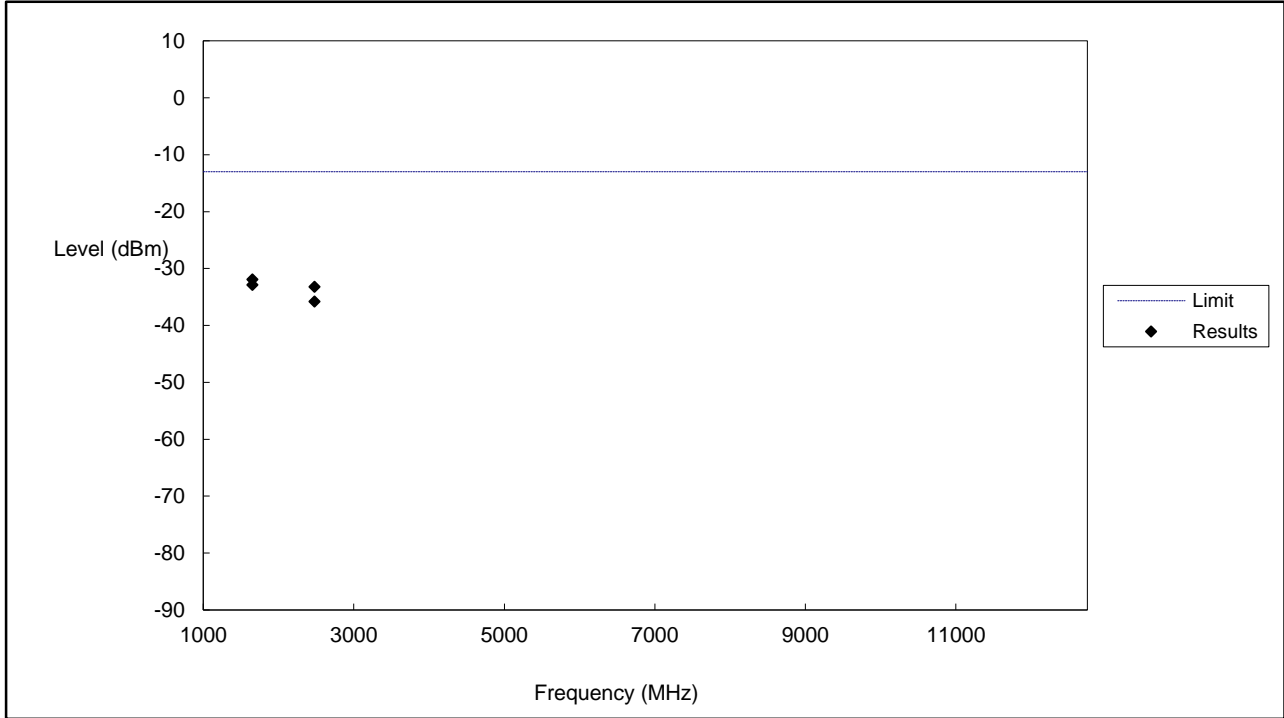
High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7860.00	-30.74	-13	-17.74	H	RMS
2	11790.00	-37.28	-13	-24.28	H	RMS
1	7860.00	-30.38	-13	-17.38	V	RMS
2	11790.00	-34.92	-13	-21.92	V	RMS

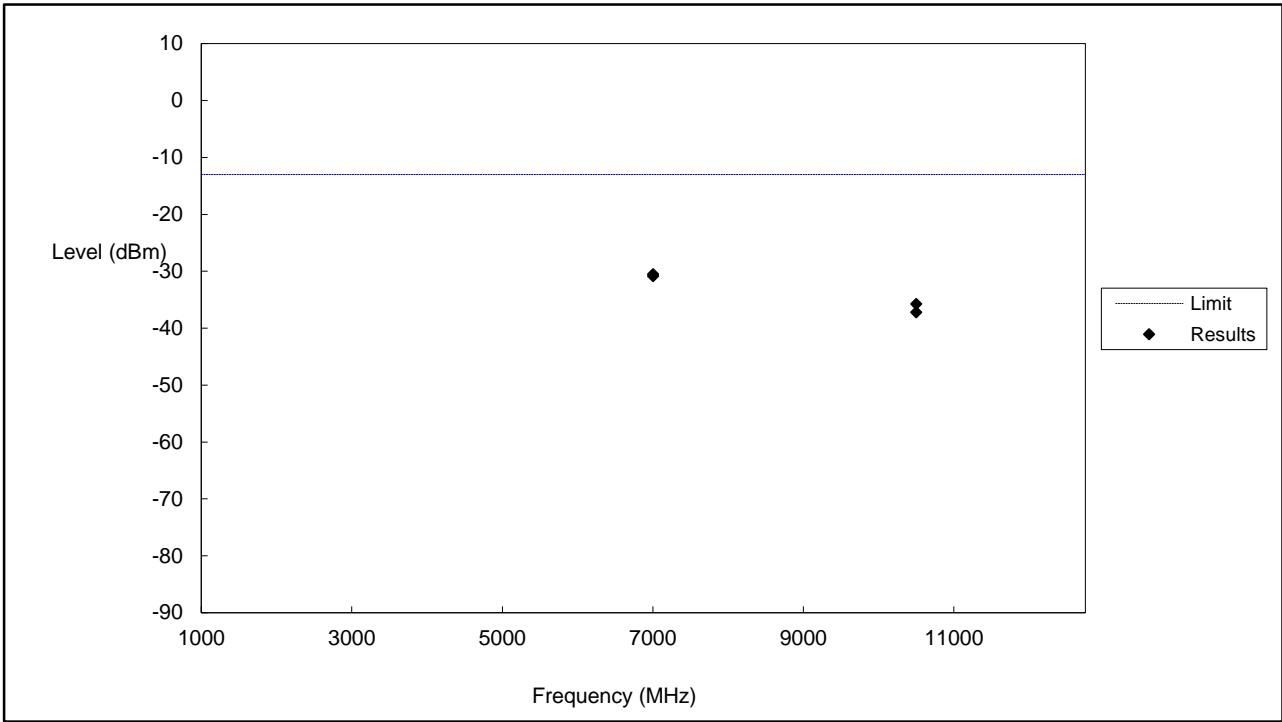
For TDD\_SA N78\_3450-3550MHz Mode

Low Channel



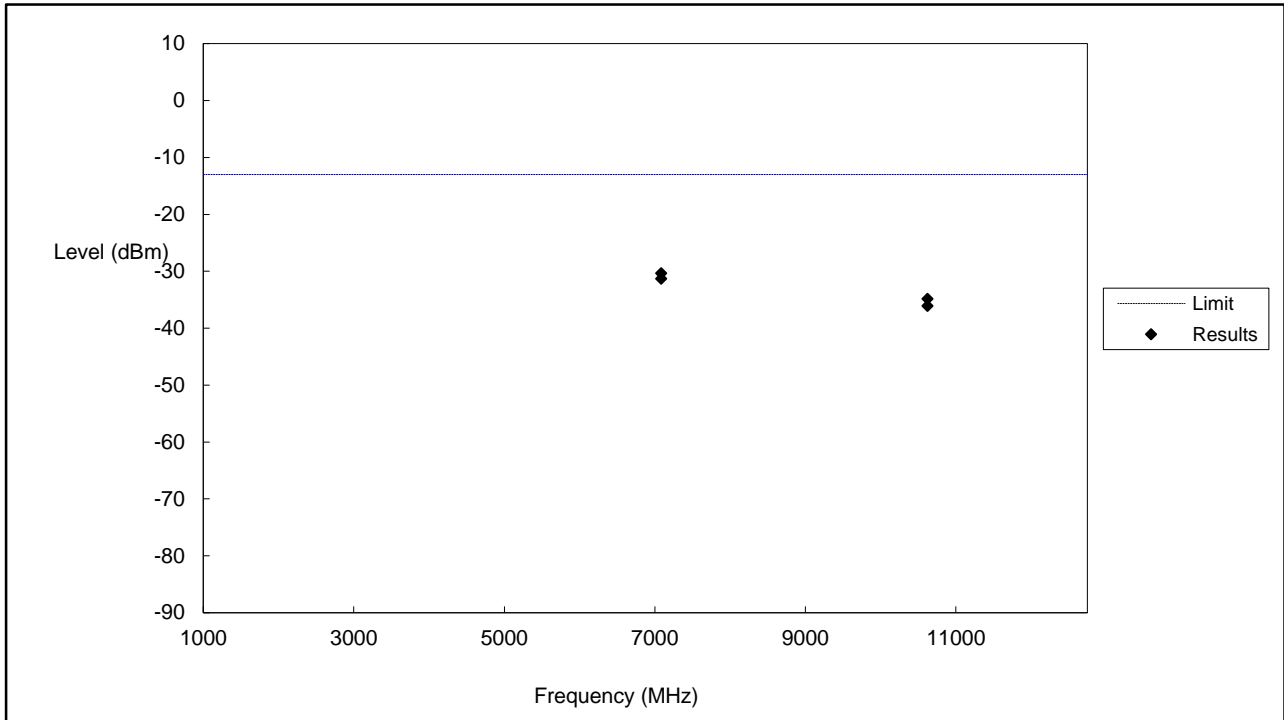
No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	6919.98	-30.25	-13	-17.25	H	RMS
2	10379.97	-36.00	-13	-23.00	H	RMS
1	6919.98	-29.92	-13	-16.92	V	RMS
2	10379.97	-36.18	-13	-23.18	V	RMS

Middle Channel



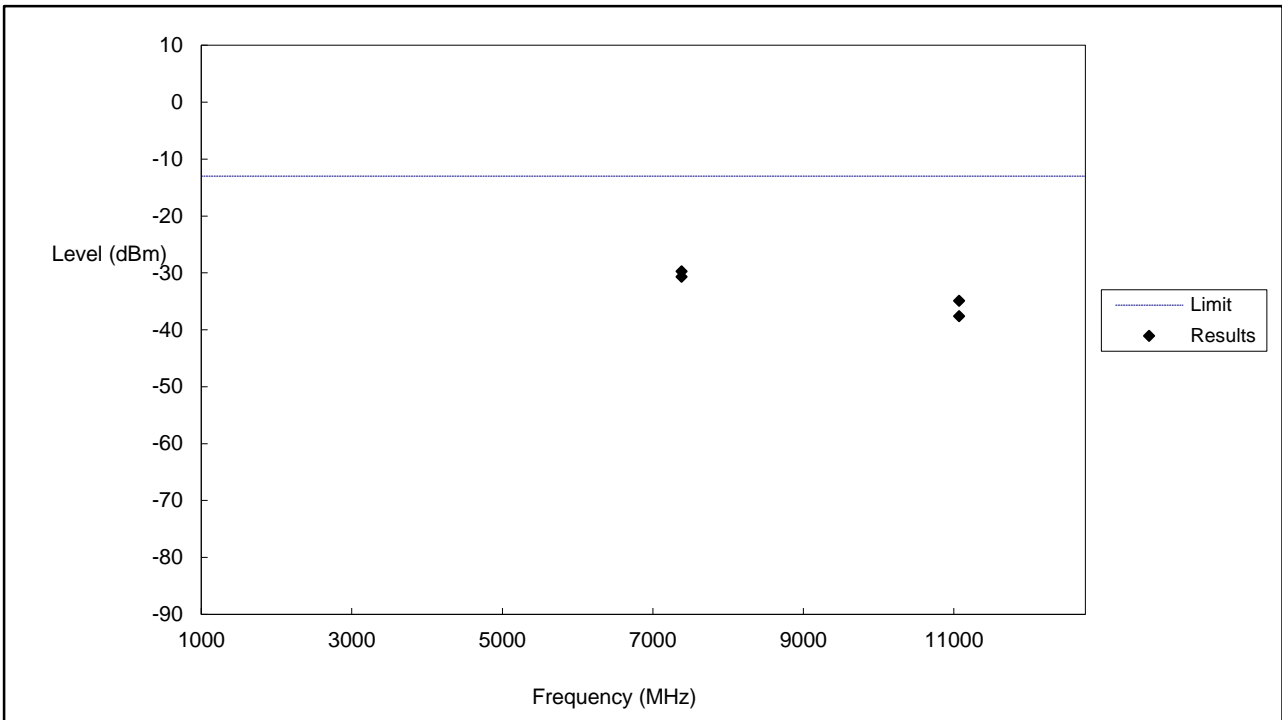
No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7000.02	-30.80	-13	-17.80	H	RMS
2	10500.03	-37.17	-13	-24.17	H	RMS
1	7000.02	-30.49	-13	-17.49	V	RMS
2	10500.03	-35.73	-13	-22.73	V	RMS

High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7080.00	-31.28	-13	-18.28	H	RMS
2	10620.00	-36.05	-13	-23.05	H	RMS
1	7080.00	-30.32	-13	-17.32	V	RMS
2	10620.00	-34.84	-13	-21.84	V	RMS

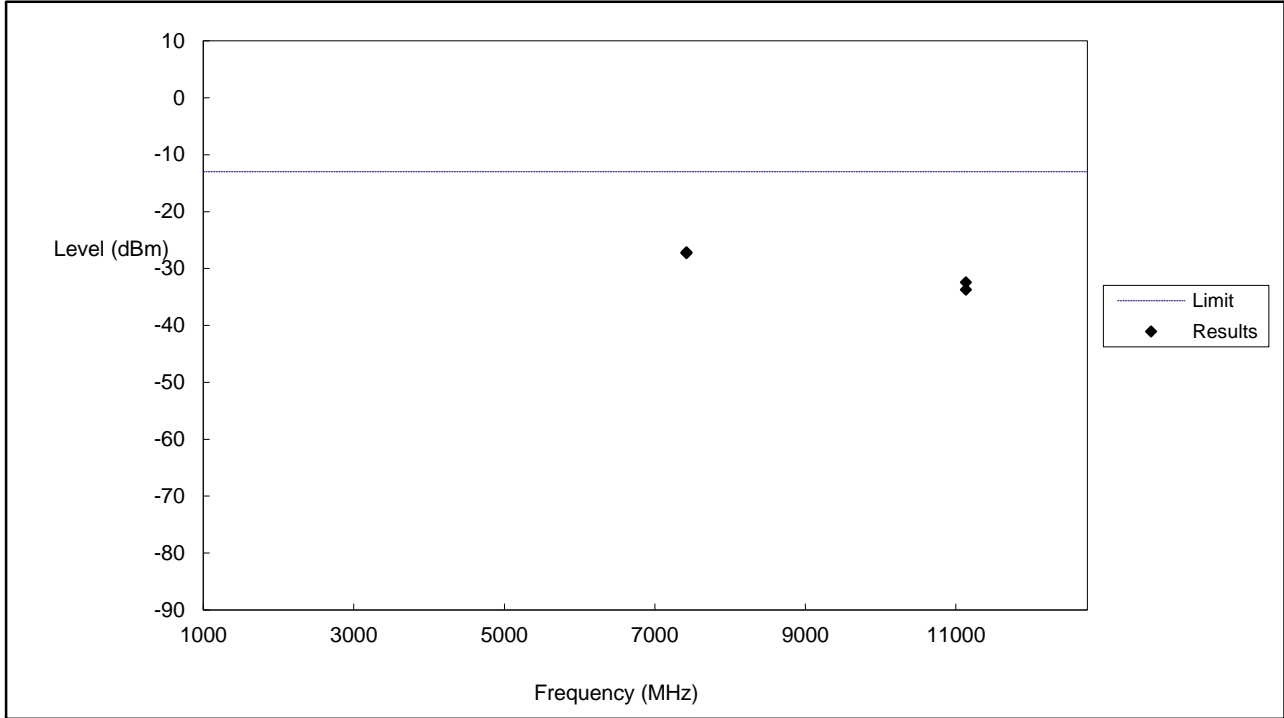
High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7380.00	-30.63	-13	-17.63	H	RMS
2	11070.00	-37.58	-13	-24.58	H	RMS
1	7380.00	-29.70	-13	-16.70	V	RMS
2	11070.00	-34.90	-13	-21.90	V	RMS

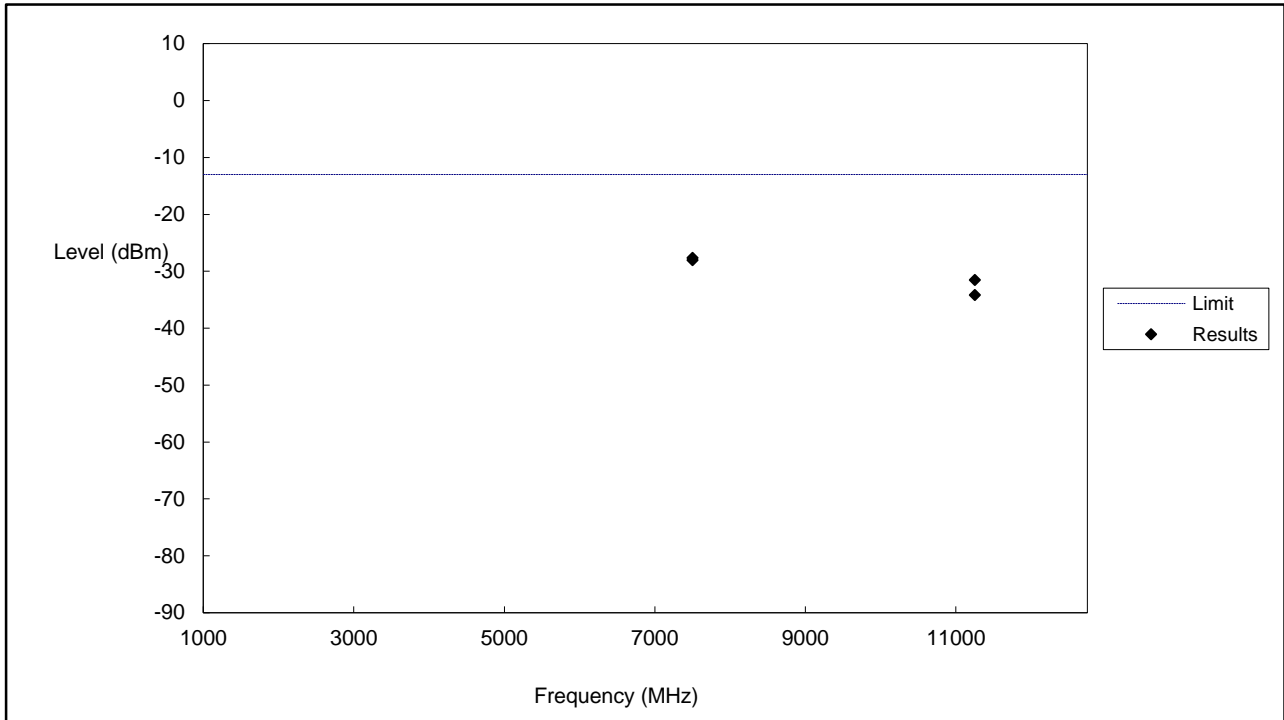
For TDD\_SA N78\_3700-3800MHz Mode

Low Channel



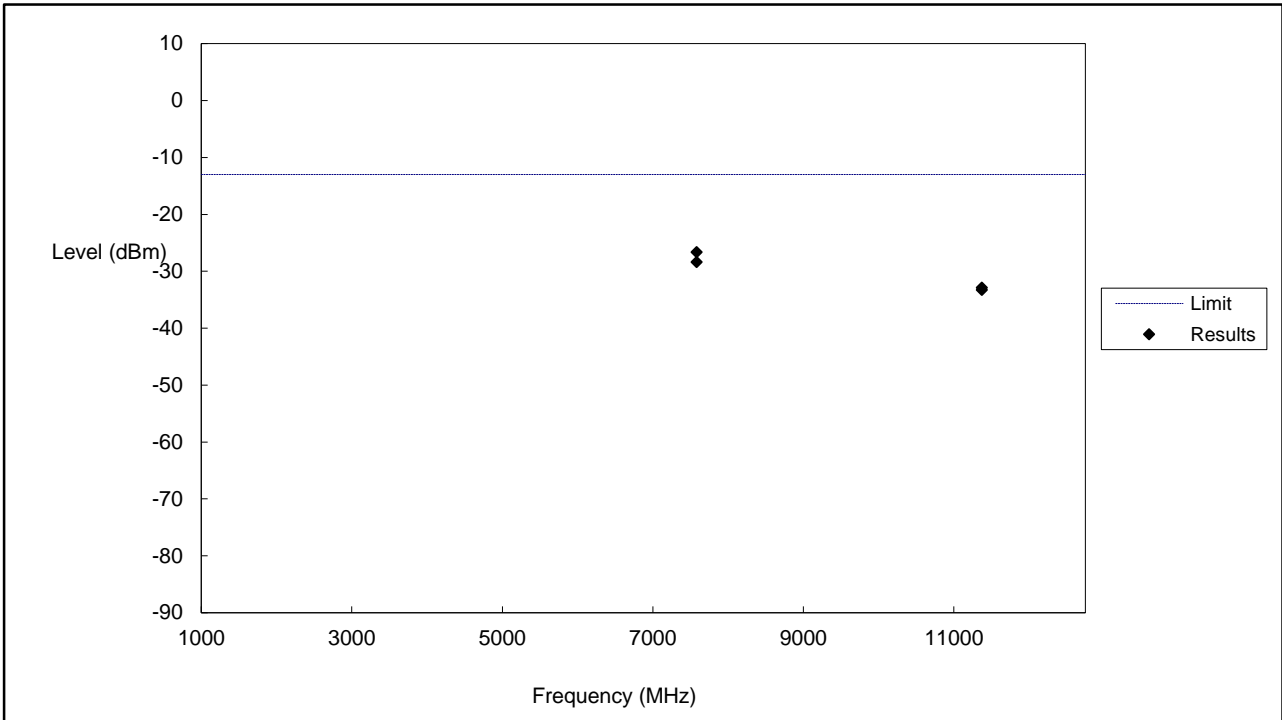
No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7420.02	-27.26	-13	-14.26	H	RMS
2	11130.03	-33.72	-13	-20.72	H	RMS
1	7420.02	-27.09	-13	-14.09	V	RMS
2	11130.03	-32.38	-13	-19.38	V	RMS

Middle Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7500.00	-28.01	-13	-15.01	H	RMS
2	11250.00	-34.12	-13	-21.12	H	RMS
1	7500.00	-27.62	-13	-14.62	V	RMS
2	11250.00	-31.49	-13	-18.49	V	RMS

High Channel



No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polarity	Remark
1	7579.98	-28.34	-13	-15.34	H	RMS
2	11369.97	-33.22	-13	-20.22	H	RMS
1	7579.98	-26.63	-13	-13.63	V	RMS
2	11369.97	-32.86	-13	-19.86	V	RMS

*Note: Result=Reading+ Correct, Margin= Result- Limit*

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*



## 8. Frequency Stability

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### 8.1 Standard Applicable

According to §22.355 , §27.54 the limit is 2.5ppm.

### 8.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

### 8.3 Summary of Test Results/Plots

Note: 1.Normal Voltage NV=DC3.85V; Low Voltage LV=DC3.5V; High Voltage HV=DC4.4V

Please refer to Appendix F: Frequency Stability

Test result: Pass

## APPENDIX PHOTOGRAPHS

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Please refer to "ANNEX"

\*\*\*\* END OF REPORT \*\*\*\*