

FCC TEST REPORT

(PART 96)

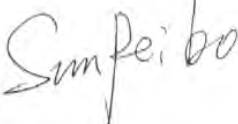
Applicant:	BARTEC GmbH
Address:	Max-Eyth-Str.16 , 97980 Bad Mergentheim, Germany

Manufacturer or Supplier:	BARTEC GmbH
Address:	Max-Eyth-Str.16 , 97980 Bad Mergentheim, Germany
Product:	Smartscanner / Smartphone
Brand Name:	BARTEC
Model Name:	SP9EX1/SC9EX1/SP9EX2/SC9EX2
FCC ID:	TBUSX9EX
Date of tests:	Jan. 02, 2024~ Jul. 26, 2024

The tests have been carried out according to the requirements of the following standard:

☒ **47 CFR FCC Part 96**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
 Date: Jul. 26, 2024	 Date: Jul. 26, 2024

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RELEASE CONTROL RECORD

ISSUE NO.	DESCRIPTION	DATE ISSUED
PSU-QSU2312140113RF05	Original release	Jul. 26, 2024

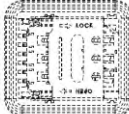
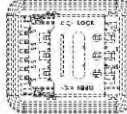
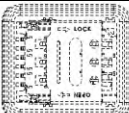
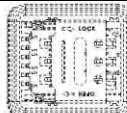
1 SUMMARY OF TEST RESULTS

47 CFR FCC PART 96			
FCC CLAUSE	TEST ITEM	RESULT	TEST LAB*
2.1046 96.41(b)	Maximum Peak Output Power and Maximum EIRP	Compliance	A
2.1051 96.41(e)	Conducted Band Edge	Compliance	B
2.1049	Occupied Bandwidth	Compliance	B
2.1055	Frequency Stability	Compliance	B
2.1051 96.41(e)	Conducted Spurious Emissions	Compliance	B
2.1053 96.41(e)	Radiated Spurious Emissions	Compliance	A
96.41(g)	Peak-to-Average Power Ratio	Compliance	B

NOTE:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- In this report, the test EUT version is EVT, after the test is completed, the customer optimizes the product to DVT, and the final customer's shipment is PVT. For differences between EVT and DVT and PVT, please refer to the documentation provided by the customer (SC9EX1_SP9EX1 PCBA HW Release Note rev 2_0).
- There are no differences on the PCBA between the Model SC9EX1 (FCC ID: TBUSX9EX) and the variants SP9EX1 (FCC ID: TBUSX9EX). All mounted components are the same. No functionality related to any radio interface is affected. The only difference is the presence of the barcode scanner module and the "bump" on the back cover that incorporates the barcode scanner module. Testing has been run on parent product SC9EX1 and the worst cases of power and RSE have been verified also on SP9EX1 variant. Only the worst-case data (SC9EX1) have been reported.
- The devices BARTEC SP9EX1 Smartphone and BARTEC SP9EX2 Smartphone share the same hardware and software. The same applies for the devices BARTEC SC9EX1 Smartscanner and BARTEC SC9EX2 Smartscanner. The only difference are the hazardous area marking of the devices, see table for clarification.



BARTEC SP9EX1 Smartphone	BARTEC SP9EX2 Smartphone
BARTEC SP9EX1 Type: 17-S19P-****/***** Mfr: BARTEC GmbH Max-Eyth-SträÙe 16 97980 Bad Mergentheim, DE www.bartec.com  Nano SIM UL 24 ATEX 3153X II 1G Ex ia IIC T4 Ga II 2D Ex ia IIC T135°C Db IP64 IECEx UL 24.0004X QR-code S/N: TTTTYYSSSSS MFD: MONTHYY reserved for logos of country approvals Class I, Div 1, Groups A, B, C and D; Class II, Div 1, Groups E, F and G; Class III, T4 Zone 0, AEx ia IIC T4 Ga Zone 21, AEx ia IIC T135°C Db Zone 0, Ex ia IIC T4 Ga Zone 21, Ex ia IIC T135°C Db -20° < Ta < +55°C USB port: USB-PD compatible – 5-20 Vdc / max 3 A DC-In port: 12 Vdc / max 1.5 A USB Um = 20 V / DCin Um = 12 V WARNING/ATTENTION: Use only replaceable battery pack BARTEC GmbH type: 17-S1Z0-0020/**** Utiliser uniquement la batterie BARTEC GmbH type: 17-S1Z0-0020/**** INTRINSICALLY SAFE/SECURITÉ INTRINSEQUE Warning - Substitution of components may impair intrinsic safety. Avertissement - La substitution des composants peut nuire à la sécurité intrinsèque.	BARTEC SP9EX2 Type: B7-S29P-****/***** Mfr: BARTEC GmbH Max-Eyth-SträÙe 16 97980 Bad Mergentheim, DE www.bartec.com  Nano SIM UL 24 ATEX xxxxx II 3G Ex ic IIC T4 Gc II 3D Ex ic IIC T135°C Dc IP64 IECEx UL 24.xxxxx QR-code S/N: TTTTYYSSSSS MFD: MONTHYY reserved for logos of country approvals Class I, Div 2, Groups A, B, C and D; Class II, Div 2, Groups E, F and G; Class III, T4 Zone 2, AEx ic IIC T4 Gc Zone 22, AEx ic IIC T135°C Dc Zone 2, Ex ic IIC T4 Gc Zone 22, Ex ic IIC T135°C Dc -20° < Ta < +55°C USB port: USB-PD compatible – 5-20 Vdc / max 3 A DC-In port: 12 Vdc / max 1.5 A USB Um = 20 V / DCin Um = 12 V WARNING/ATTENTION: Use only replaceable battery pack BARTEC GmbH type: B7-A2Z0-0098/**** Utiliser uniquement la batterie BARTEC GmbH type: B7-A2Z0-0098/**** INTRINSICALLY SAFE/SECURITÉ INTRINSEQUE Warning - Substitution of components may impair intrinsic safety. Avertissement - La substitution des composants peut nuire à la sécurité intrinsèque.
BARTEC SC9EX1 Smartscanner	BARTEC SC9EX2 Smartscanner
BARTEC SC9EX1 Type: 17-S19C-****/***** Mfr: BARTEC GmbH Max-Eyth-SträÙe 16 97980 Bad Mergentheim, DE www.bartec.com  Nano SIM UL 24 ATEX 3153X II 1G Ex ia op is IIC T4 Ga II 2D Ex ia op is IIC T135°C Db IP64 IECEx UL 24.0004X QR-code S/N: TTTTYYSSSSS MFD: MONTHYY reserved for logos of country approvals Class I, Div 1, Groups A, B, C and D; Class II, Div 1, Groups E, F and G; Class III, T4 Zone 0, AEx ia op is IIC T4 Ga Zone 21, AEx ia op is IIC T135°C Db Zone 0, Ex ia op is IIC T4 Ga Zone 21, Ex ia op is IIC T135°C Db -20° < Ta < +55°C USB port: USB-PD compatible – 5-20 Vdc / max 3 A DC-In port: 12 Vdc / max 1.5 A USB Um = 20 V / DCin Um = 12 V WARNING/ATTENTION: Use only replaceable battery pack BARTEC GmbH type: 17-S1Z0-0020/**** Utiliser uniquement la batterie BARTEC GmbH type: 17-S1Z0-0020/**** INTRINSICALLY SAFE/SECURITÉ INTRINSEQUE Warning - Substitution of components may impair intrinsic safety. Avertissement - La substitution des composants peut nuire à la sécurité intrinsèque.	BARTEC SC9EX2 Type: B7-S29C-****/***** Mfr: BARTEC GmbH Max-Eyth-SträÙe 16 97980 Bad Mergentheim, DE www.bartec.com  Nano SIM UL 24 ATEX xxxxx II 3G Ex ic op is IIC T4 Gc II 3D Ex ic op is IIC T135°C Dc IP64 IECEx UL 24.xxxxx QR-code S/N: TTTTYYSSSSS MFD: MONTHYY reserved for logos of country approvals Class I, Div 2, Groups A, B, C and D; Class II, Div 2, Groups E, F and G; Class III, T4 Zone 2, AEx ic op is IIC T4 Gc Zone 22, AEx ic op is IIC T135°C Dc Zone 2, Ex ic op is IIC T4 Gc Zone 22, Ex ic op is IIC T135°C Dc -20° < Ta < +55°C USB port: USB-PD compatible – 5-20 Vdc / max 3 A DC-In port: 12 Vdc / max 1.5 A USB Um = 20 V / DCin Um = 12 V WARNING/ATTENTION: Use only replaceable battery pack BARTEC GmbH type: B7-A2Z0-0098/**** Utiliser uniquement la batterie BARTEC GmbH type: B7-A2Z0-0098/**** INTRINSICALLY SAFE/SECURITÉ INTRINSEQUE Warning - Substitution of components may impair intrinsic safety. Avertissement - La substitution des composants peut nuire à la sécurité intrinsèque.



Test Report No.: PSU-QSU2312140113RF05

***Test Lab Information Reference**

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.

Lab B:

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Address:

Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan District
Shenzhen, Guangdong, People's Republic of China

Accredited Test Lab Cert 3939.01

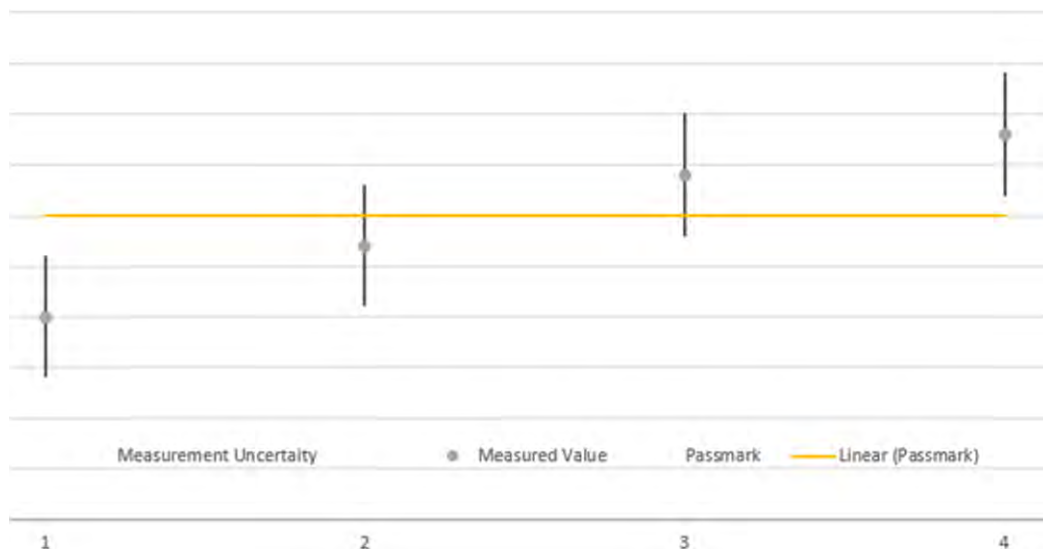
The FCC Site Registration No. is 525120; The Designation No. is CN1171.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Maximum Peak Output Power	±2.06dB
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions (30MHz~1GHz)	±4.98dB
Radiated emissions (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Band Edge Measurements	±4.70dB
Peak to average ratio	±0.76dB

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



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

1.2 TEST SITE AND INSTRUMENTS

Lab A:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.16,22	Feb.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.15,24	Feb.14,26
Signal Generator	R&S	SMB100A	182185	Feb.16,22	Feb.15,24
Signal Generator	R&S	SMB100A	182185	Feb.15,24	Feb.14,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-E MC-01 Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-E MC-02 Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESR26	101734	Feb.25,22	Feb.24,24
EMI TEST Receiver	R&S	ESR26	101734	Feb.24,24	Feb.23,26
EMI TEST Receiver	R&S	ESW44	101973	Feb.25,22	Feb.24,24
EMI TEST Receiver	R&S	ESW44	101973	Feb.24,24	Feb.23,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Feb.28,22	Feb.27,24
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Feb.27,24	Feb.26,26
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.23,22	Feb.22,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.22,24	Feb.21,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,22	Feb.22,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.27,22	Jun.26,24
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.26,24	Jun.25,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	Oct.01,22	Sep.30,24
DC Source	HYELEC	HY3010B	551016	Aug.31,22	Aug.30,24
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CAB	R&S	HF290-NMNM-7.0	N/A	N/A	N/A



LE)		OM			
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.0 OM	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.28,23	Apr.27,24
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.28,23	Apr.27,24
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Temperature Chamber	votsch	VT4002	58566078100050	May.31,22	May.30,24
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

- NOTE:**
1. The calibration interval of the above test instruments is 12/ 24 / 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

Lab B:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 28,23	Mar. 27,24
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 27,24	Mar. 26,25
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.10,23	May.09,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.09,24	May.08,25
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.02,23	Sep.01,24
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 18,23	Feb. 17,24
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 17,24	Feb. 16,25
Horn Antenna	ETS-LINDGREN	3117	00168692	Feb. 18,23	Feb. 17,24
Horn Antenna	ETS-LINDGREN	3117	00168692	Feb. 17,24	Feb. 16,25
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Sep.03, 23	Sep.02, 24
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,23	Feb. 13,24
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 13,24	Feb. 12,25
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 06,23	May. 05,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 05,24	May. 04,25
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.10,23	May.09,24
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.09,24	May.08,25



Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 17,23	Feb.16,24
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb.16,24	Feb.15,25
3m Semi-anechoic Chamber	ETS-LINDGRE N	9m*6m*6m	Euroshieldpn-CT0001143-1216	Nov. 14,23	Nov. 13,26
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120	3.1.36	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	50HF-010-SMA	May. 06,23	May. 05,24
10dB Attenuator	JFW/USA	50HF-010-SMA	50HF-010-SMA	May. 05,24	May. 04,25
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,23	Feb. 13,24
Power Meter	Anritsu	ML2495A	1506002	Feb. 13,24	Feb. 12,25
Power Sensor	Anritsu	MA2411B	1339352	Feb. 14,23	Feb. 13,24
Power Sensor	Anritsu	MA2411B	1339352	Feb. 13,24	Feb. 12,25
Temperature Chamber	ESPEC	SH-242	93000855	May. 06,23	May. 05,24
Temperature Chamber	ESPEC	SH-242	93000855	May. 05,24	May. 04,25
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 14,23	Feb. 13,24
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 13,24	Feb. 12,25
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.10,23	May.09,24
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.09,24	May.08,25
DC Source	Kikusui/JP	PMX18-5A	N/A	Aug. 11,23	Aug. 10,24

- NOTE:**
1. The calibration interval of the above test instruments is 12/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Smartscanner / Smartphone	
BRAND NAME*	BARTEC	
MODEL NAME*	SP9EX1/SC9EX1/SP9EX2/SC9EX2	
NOMINAL VOLTAGE*	5.0V/9.0V/12.0Vdc (adapter) 3.2V/3.8V/4.2V/dc (battery)	
MODULATION TECHNOLOGY*	LTE	QPSK, 16QAM, 64QAM, 256QAM
FREQUENCY RANGE	LTE Band 48 Channel Bandwidth: 5MHz	3552.5MHz ~ 3697.5MHz
	LTE Band 48 Channel Bandwidth: 10MHz	3555MHz ~ 3695MHz
	LTE Band 48 Channel Bandwidth: 15MHz	3557.5MHz ~ 3692.5MHz
	LTE Band 48 Channel Bandwidth: 20MHz	3560MHz ~ 3690MHz
EMISSION DESIGNATOR	LTE Band 48 Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		16QAM: 4M49W7D
		64QAM: 4M49W7D
	LTE Band 48 Channel Bandwidth: 10MHz	QPSK: 8M96G7D
		16QAM: 8M96W7D
		64QAM: 8M96W7D
	LTE Band 48 Channel Bandwidth: 15MHz	QPSK: 13M4G7D
		16QAM: 13M5W7D
		64QAM: 13M4W7D
	LTE Band 48 Channel Bandwidth: 20MHz	QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 18M0W7D
MAX. EIRP POWER	LTE Band 48 Channel Bandwidth: 5MHz	195.88mW
	LTE Band 48 Channel Bandwidth: 10MHz	197.7mW
	LTE Band 48 Channel Bandwidth: 15MHz	196.79mW
	LTE Band 48 Channel Bandwidth: 20MHz	199.07mW

ANTENNA GAIN*	Main TX/RX ANT5: IFA Antenna with 0.9dBi gain for LTE 48 RX ANT SEC ANT3: IFA Antenna with 1.7dBi gain for LTE 48 RX ANT PRIM. MIMO ANT1: IFA Antenna with -0.6dBi gain for LTE 48 RX ANT SEC. MIMO ANT4: IFA Antenna with 1.5dBi gain for LTE 48
HW VERSION*	E
SW VERSION*	TWG1.240820.261
I/O PORTS	Refer to user's manual
DATA CABLE*	USB cable: non-shielded cable, with w/o ferrite core, 0.8 meter
EXTREME TEMPERATURE*	-20℃ -60 ℃
EXTREME VOLTAGE*	3.2V – 4.2V

NOTE:

- *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitters and four receivers.

MODULATION MODE	TX FUNCTION
LTE	1TX/4RX

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.
- For Band Edge and Emission Mask: The all BW combinations were tested. Combination pairs of the same BW are considered generally equivalent. The RB combinations were selected such that the signal is active closest to the band limit, as this is the worst case.
- For Out of Band Emissions: The all combination was tested. The highest power RB combination was selected as worst case.
- Output power measurements were measured on QPSK, 16QAM, 64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM, 64QAM modes.

9. List of Accessory:

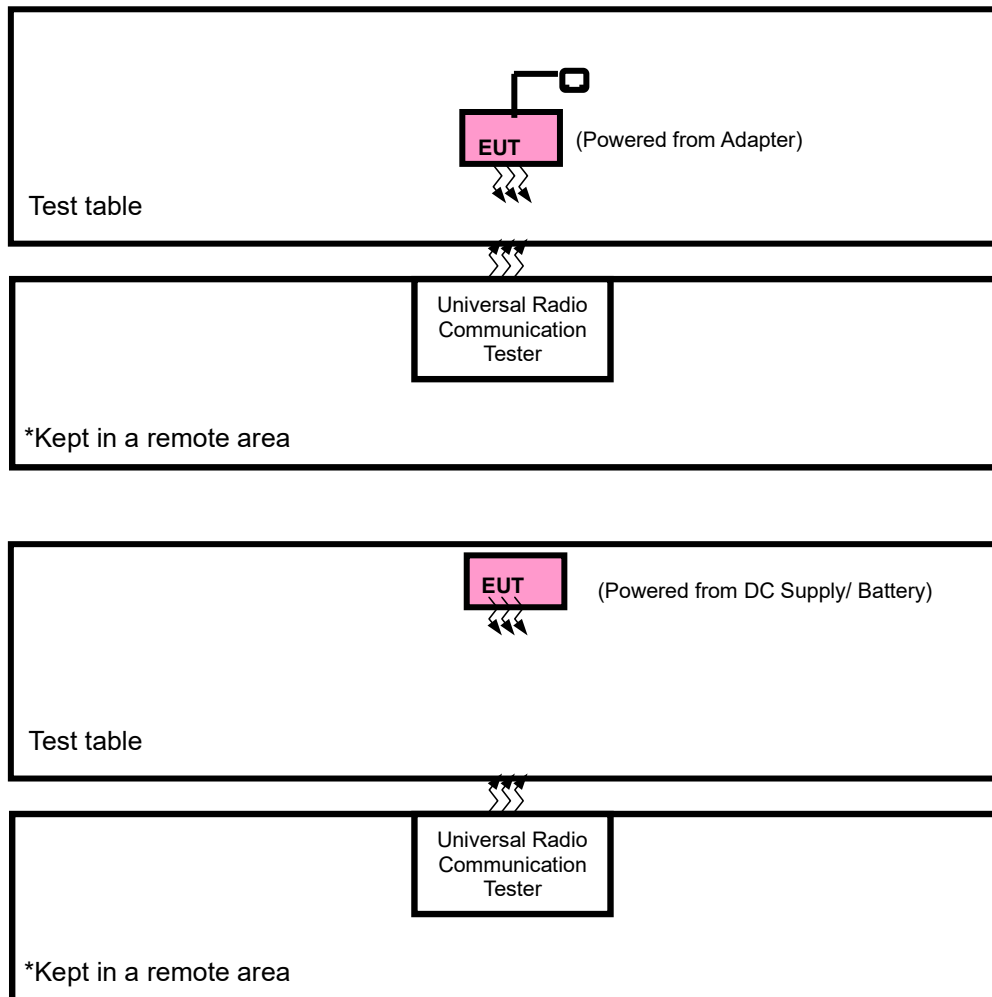
ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Display(AMOLED)	Xiao Xin	N/A	XX611OLED-A002.1	N/A
Back cover	IV Techmould	N/A	N/A	N/A
Bezel	IV Techmould	N/A	N/A	N/A
Photo/Video Camera 1	Sunny Optical	N/A	F48N03A (Auto focus)	N/A
Photo/Video Camera 2	TrulyOpto	N/A	CSF208-B8BF-E(Fix focus)	N/A

**Test Report No.: PSU-QSU2312140113RF05**

CPU	Qualcomm	N/A	QCM6490	N/A
UFS	Kioxia	N/A	THGJFAT0T44BAIL	N/A
BT/WLAN Module	Murata	N/A	LBEE5QG2CX-830	N/A
NFC chipset	NXP	N/A	SN110TUK1	N/A
Battery	BARTEC	N/A	17-S1Z0-0020/****	4300 mAh, 3.68V
USB-C Cable	BARTEC	N/A	G7-A0Z0-0010	Length: 0.8m

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Line: Shielded, Detachable 0.8m;

2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with LTE link
B	EUT + Battery with LTE link



LTE BAND 48 MODE

EUT CONFIGUR E MODE	TEST ITEM	AVAILABL E CHANNEL	TESTED CHANNEL	CHANNEL BANDWID TH	MODULATION	MODE
A	EIRP	55265 to 56715	55265, 55990, 56715	5MHz	QPSK, 16QAM, 64QAM, 256QAM	1 RB / 0 RB Offset
		55290 to 56690	55290, 55990, 56690	10MHz	QPSK, 16QAM, 64QAM, 256QAM	1 RB / 0RB Offset
		55315 to 56665	55315, 55990, 56665	15MHz	QPSK, 16QAM, 64QAM, 256QAM	1 RB / 0 RB Offset
		55340 to 56640	55340, 55990, 56640	20MHz	QPSK, 16QAM, 64QAM, 256QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	55290 to 56690	55290, 55990, 56690	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	55265 to 56715	55265, 55990, 56715	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		55290 to 56690	55290, 55990, 56690	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		55315 to 56665	55315, 55990, 56665	15MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		55340 to 56640	55340, 55990, 56640	20MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	55340 to 56640	55340, 55990, 56640	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	55265 to 56715	55265	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 25 RB / 0 RB Offset
			56715	5MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset 25 RB / 0 RB Offset
			55290	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
			56690	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset 50 RB / 0 RB Offset
		55315 to 56665	55315	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 75 RB / 0 RB Offset
			56665	15MHz	QPSK, 16QAM, 64QAM	1 RB / 74 RB Offset 75 RB / 0 RB Offset
			55340	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
			56640	20MHz	QPSK, 16QAM, 64QAM	1 RB / 99 RB Offset 100 RB / 0 RB Offset
		55265 to 56715	55265, 55990, 56715	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		55290 to 56690	55290, 55990, 56690	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0RB Offset
		55315 to 56665	55315, 55990, 56665	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		55340 to 56640	55340, 55990, 56640	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset



A	RADIATED EMISSION	55265 to 56715	55265, 55990, 56715	5MHz	QPSK	1 RB / 0 RB Offset
		55290 to 56690	55290, 55990, 56690	10MHz	QPSK	1 RB / 0RB Offset
		55315 to 56665	55315, 55990, 56665	15MHz	QPSK	1 RB / 0 RB Offset
		55340 to 56640	55340, 55990, 56640	20MHz	QPSK	1 RB / 0 RB Offset
A	ACLR	55265 to 56715	55265	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
		56715		5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		55290 to 56690	55290	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
		56690		10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		55315 to 56665	55315	15MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
		56665		15MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		55340 to 56640	55340	20MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
		56640		20MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2.Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP&EIRP	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.2V/ 3.8V/ 4.2V By Battery	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
CONDUCTED EMISSION	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 96

KDB 971168 D02 Power Meas License Digital Systems v02r02

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 TEST TYPES AND RESULTS

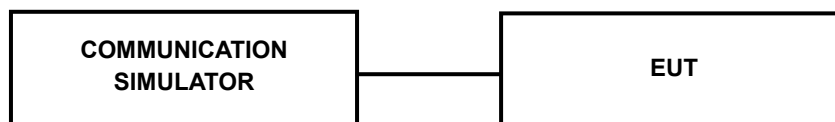
3.1 MAXIMUM EIRP MEASUREMENT

3.1.1 LIMITS OF MAXIMUM EIRP MEASUREMENT

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

3.1.2 TEST SETUP

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.3 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_C$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

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

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

CONDUCTED POWER MEASUREMENT:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths (i.e., 5, 10, 15, 20MHz).

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

LTE band 48 (ANT 5) :

Band/BW	Modulation	RB Size	RB Offset	Low CH (55265)	Mid CH (55990)	High CH (56715)
				Frequency (3552.5)MHz	Frequency (3625.0)MHz	Frequency (3697.5)MHz
48/ 5	QPSK	1	0	21.46	21.79	22.02
		1	12	21.13	21.53	21.99
		1	24	21.47	21.30	21.96
		12	0	21.05	20.69	21.16
		12	6	21.05	20.74	21.20
		12	13	20.92	20.55	21.12
		25	0	20.92	20.54	21.26
	16QAM	1	0	21.10	21.13	21.17
		1	12	20.98	20.98	21.23
		1	24	20.99	20.75	21.20
		12	0	20.08	20.12	20.12
		12	6	20.00	19.86	20.27
		12	13	19.95	19.89	20.07
		25	0	19.89	19.94	20.23
	64QAM	1	0	20.75	19.76	19.98
		1	12	20.75	19.47	20.03
		1	24	20.59	19.31	19.98
		12	0	20.01	19.10	19.73
		12	6	19.97	18.86	19.39
		12	13	19.88	18.78	19.37
		25	0	19.92	19.02	19.02
	256QAM	1	0	19.63	18.61	18.95
		1	12	19.75	18.52	18.93
		1	24	19.49	18.04	18.90
		12	0	18.98	18.00	18.75
		12	6	18.78	17.87	18.40
		12	13	18.71	17.87	18.31
		25	0	18.92	18.03	17.94

Band/BW	Modulation	RB Size	RB Offset	Low CH (55290)	Mid CH (55990)	High CH (56690)
				Frequency (3555)MHz	Frequency (3625.0)MHz	Frequency (3695)MHz
48/ 10	QPSK	1	0	21.49	21.73	22.06
		1	24	21.15	21.57	21.92
		1	49	21.42	21.28	21.99
		25	0	21.10	20.78	21.21
		25	12	21.02	20.72	21.24
		25	25	20.99	20.51	21.19
		50	0	20.87	20.53	21.25
	16QAM	1	0	21.10	21.25	21.27
		1	24	20.97	21.02	21.21
		1	49	21.01	20.77	21.28
		25	0	20.03	20.09	20.11
		25	12	19.98	19.88	20.18
		25	25	19.99	19.75	20.13
		50	0	19.94	19.96	20.31
	64QAM	1	0	20.64	19.73	20.10
		1	24	20.68	19.50	20.09
		1	49	20.53	19.33	20.09
		25	0	20.09	19.14	19.87
		25	12	19.95	18.93	19.40
		25	25	19.92	18.80	19.40
		50	0	19.95	19.01	19.02
	256QAM	1	0	19.57	18.53	19.00
		1	24	19.72	18.45	19.01
		1	49	19.44	18.07	18.96
		25	0	18.95	17.94	18.68
		25	12	18.82	17.88	18.35
		25	25	18.83	17.80	18.41
		50	0	18.86	18.08	17.84

Band/BW	Modulation	RB Size	RB Offset	Low CH (55315)	Mid CH (55990)	High CH (56665)
				Frequency (3557.5)MHz	Frequency (3625.0)MHz	Frequency (3692.5)MHz
48/ 15	QPSK	1	0	21.51	21.72	22.02
		1	37	21.21	21.50	22.04
		1	74	21.42	21.36	21.96
		36	0	21.03	20.78	21.18
		36	19	21.00	20.86	21.14
		36	39	21.03	20.56	21.18
		75	0	20.92	20.53	21.18
	16QAM	1	0	20.97	21.22	21.21
		1	37	20.95	20.96	21.22
		1	74	20.95	20.81	21.27
		36	0	20.02	20.06	20.14
		36	19	19.94	19.85	20.29
		36	39	19.97	19.89	20.09
		75	0	20.02	19.83	20.27
	64QAM	1	0	20.71	19.70	20.11
		1	37	20.70	19.49	20.09
		1	74	20.60	19.19	20.02
		36	0	20.00	19.14	19.77
		36	19	19.95	18.91	19.38
		36	39	19.89	18.90	19.49
		75	0	19.83	19.04	19.00
	256QAM	1	0	19.58	18.55	19.01
		1	37	19.66	18.42	18.97
		1	74	19.40	18.17	18.92
		36	0	18.99	18.08	18.68
		36	19	18.92	17.86	18.31
		36	39	18.79	17.83	18.33
		75	0	18.92	18.01	17.85

Band/BW	Modulation	RB Size	RB Offset	Low CH (55340)	Mid CH (55990)	High CH (56640)
				Frequency (3560)MHz	Frequency (3625.0)MHz	Frequency (3690)MHz
48/ 20	QPSK	1	0	21.57	21.85	22.09
		1	50	21.24	21.62	22.05
		1	99	21.52	21.38	22.02
		50	0	21.12	20.80	21.27
		50	25	21.15	20.87	21.29
		50	50	21.04	20.65	21.23
		100	0	21.02	20.64	21.31
	16QAM	1	0	21.11	21.28	21.28
		1	50	21.08	21.11	21.29
		1	99	21.02	20.86	21.32
		50	0	20.14	20.15	20.26
		50	25	20.07	19.98	20.30
		50	50	20.09	19.90	20.22
		100	0	20.04	19.97	20.32
	64QAM	1	0	20.78	19.83	20.12
		1	50	20.77	19.61	20.18
		1	99	20.66	19.34	20.12
		50	0	20.10	19.20	19.88
		50	25	19.99	18.96	19.50
		50	50	20.00	18.93	19.51
		100	0	19.98	19.15	19.10
	256QAM	1	0	19.71	18.68	19.09
		1	50	19.76	18.53	19.04
		1	99	19.52	18.18	19.01
		50	0	19.03	18.09	18.83
		50	25	18.93	17.89	18.43
		50	50	18.86	17.86	18.45
		100	0	18.94	18.11	17.95



EIRP

LTE Band 48 (ANT 5)

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55265	3552.5	21.47	0.9	22.37	172.58	23
55990	3625	21.79	0.9	22.69	185.78	23
56715	3697.5	22.02	0.9	22.92	195.88	23

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55265	3552.5	21.1	0.9	22	158.49	23
55990	3625	21.13	0.9	22.03	159.59	23
56715	3697.5	21.23	0.9	22.13	163.31	23

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55265	3552.5	20.75	0.9	21.65	146.22	23
55990	3625	19.76	0.9	20.66	116.41	23
56715	3697.5	20.03	0.9	20.93	123.88	23

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55265	3552.5	19.75	0.9	20.65	116.14	23
55990	3625	18.61	0.9	19.51	89.33	23
56715	3697.5	18.95	0.9	19.85	96.61	23

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55290	3555	21.49	0.9	22.39	173.38	23
55990	3625	21.73	0.9	22.63	183.23	23
56690	3695	22.06	0.9	22.96	197.7	23

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55290	3555	21.1	0.9	22	158.49	23
55990	3625	21.25	0.9	22.15	164.06	23
56690	3695	21.28	0.9	22.18	165.2	23

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55290	3555	20.68	0.9	21.58	143.88	23
55990	3625	19.73	0.9	20.63	115.61	23
56690	3695	20.1	0.9	21	125.89	23

CHANNEL BANDWIDTH: 10MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55290	3555	19.72	0.9	20.62	115.35	23
55990	3625	18.53	0.9	19.43	87.7	23
56690	3695	19.01	0.9	19.91	97.95	23

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55315	3557.5	21.51	0.9	22.41	174.18	23
55990	3625	21.72	0.9	22.62	182.81	23
56665	3692.5	22.04	0.9	22.94	196.79	23

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55315	3557.5	20.97	0.9	21.87	153.82	23
55990	3625	21.22	0.9	22.12	162.93	23
56665	3692.5	21.27	0.9	22.17	164.82	23

CHANNEL BANDWIDTH: 15MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55315	3557.5	20.71	0.9	21.61	144.88	23
55990	3625	19.7	0.9	20.6	114.82	23
56665	3692.5	20.11	0.9	21.01	126.18	23

CHANNEL BANDWIDTH: 15MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55315	3557.5	19.66	0.9	20.56	113.76	23
55990	3625	18.55	0.9	19.45	88.1	23
56665	3692.5	19.01	0.9	19.91	97.95	23

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55340	3560	21.57	0.9	22.47	176.6	23
55990	3625	21.85	0.9	22.75	188.36	23
56640	3690	22.09	0.9	22.99	199.07	23

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55340	3560	21.11	0.9	22.01	158.85	23
55990	3625	21.28	0.9	22.18	165.2	23
56640	3690	21.32	0.9	22.22	166.72	23

CHANNEL BANDWIDTH: 20MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55340	3560	20.78	0.9	21.68	147.23	23
55990	3625	19.83	0.9	20.73	118.3	23
56640	3690	20.18	0.9	21.08	128.23	23

CHANNEL BANDWIDTH: 20MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm/10MHz)
55340	3560	19.76	0.9	20.66	116.41	23
55990	3625	18.68	0.9	19.58	90.78	23
56640	3690	19.09	0.9	19.99	99.77	23

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

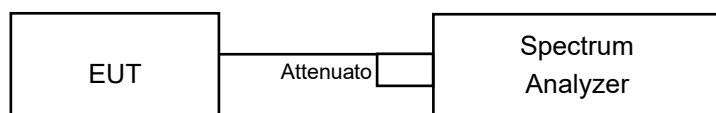
Note: The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths (i.e., 5, 10, 15, 20MHz).

3.2 CONDUCTED BAND EDGE

3.2.1 LIMITS OF CONDUCTED BAND EDGE MEASUREMENT

The conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

3.2.2 TEST SETUP



3.2.3 TEST INSTRUMENTS

Refer to section 1.2 to get information of above instrument.

3.2.4 TEST PROCEDURE

For the Conducted Band Edge:

- a. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
- b. Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).
- c. Set the resolution bandwidth (RBW) $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
- d. Beyond the 1MHz band from the band edge, RBW=1MHz was used.
- e. Set the video bandwidth (VBW) to $\geq 3 \times$ RBW.
- f. Select the average power (RMS) display detector.
- g. Set the number of measurement points to ≥ 1001 .
- h. Use auto-coupled sweep time.
- i. Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.
- j. The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.
- k. Record the max trace plot into the test report.

For Adjacent Channel Leakage Ratio (ACLR) measurement:

1. The Adjacent Channel Leakage Ratio (ACLR) is the ratio of the average power in the assigned aggregated channel bandwidth to the average power over the equivalent adjacent channel bandwidth.
2. The option ACLR of spectrum analyzer is used and measures the ACLR ratio by setting equivalent channel bandwidth.
3. The measured ACLR ratio shall be at least 30 dB.

3.2.5 DEVIATION FROM TEST STANDARD

No deviation.



Test Report No.: PSU-QSU2312140113RF05

3.2.6 TEST RESULTS

Please Refer to Appendix Of this test report.



3.3 FREQUENCY STABILITY MEASUREMENT

3.3.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

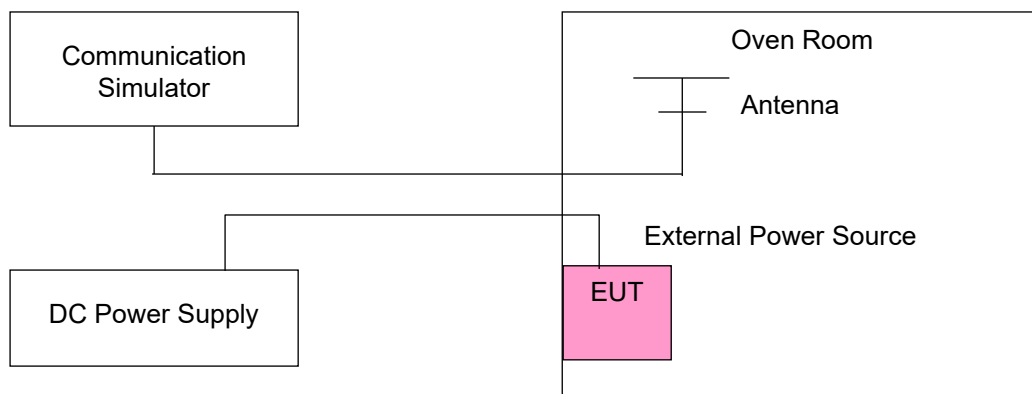
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

3.3.2 TEST PROCEDURE

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.3.3 TEST SETUP





3.3.4 TEST RESULTS

Please Refer to Appendix Of this test report.

Note: VL = Low voltage(3.2V); VN/NV = Normal voltage(3.8V); VH = High voltage(4.2V);
NT = Normal temperature (25°C)

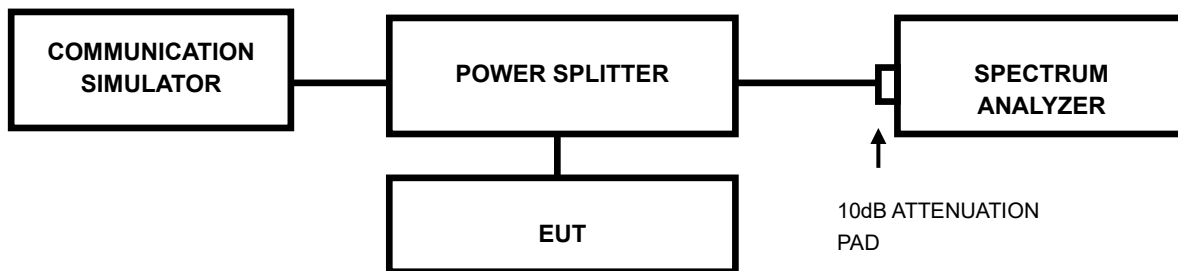


3.4 OCCUPIED BANDWIDTH MEASUREMENT

3.4.1 OCCUPIED BANDWIDTH MEASUREMENT

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

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 1.2 to get information of above instrument.

3.4.4 TEST PROCEDURE

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.



Test Report No.: PSU-QSU2312140113RF05

3.4.6 TEST RESULT

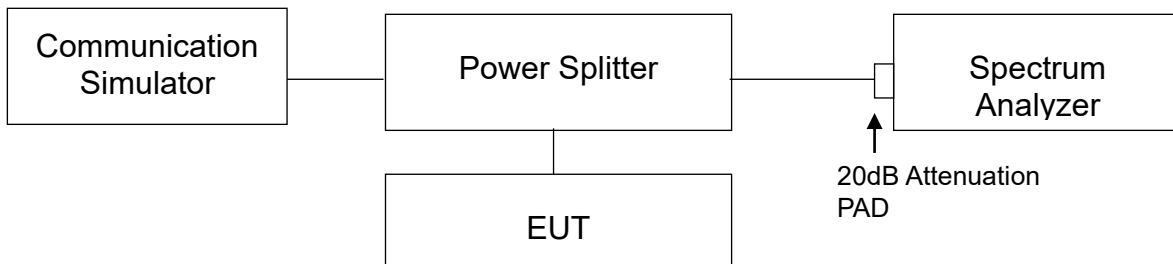
Please Refer to Appendix Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

3.5.2 TEST SETUP



3.5.3 TEST PROCEDURE

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 40 GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.



Test Report No.: PSU-QSU2312140113RF05

3.5.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

3.6.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
$$\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$$

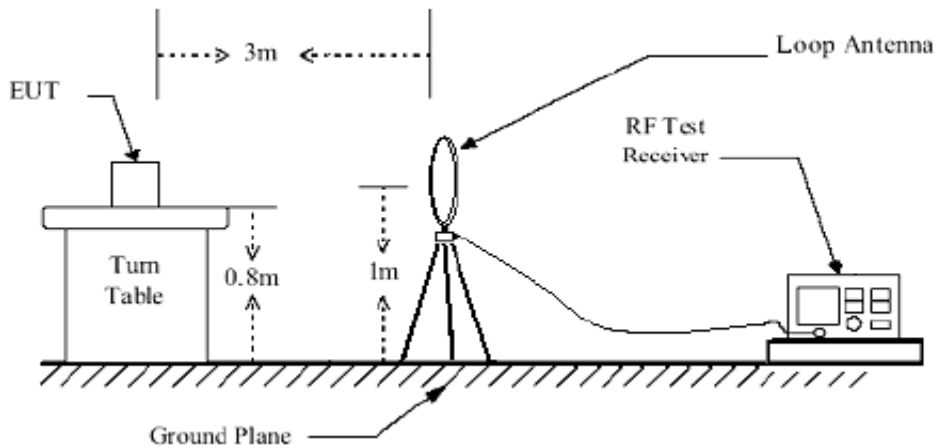
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

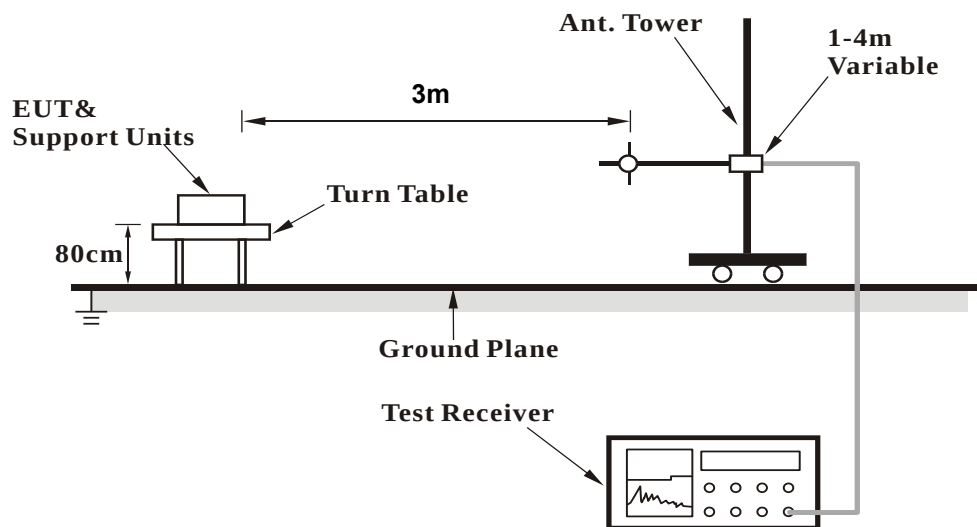
No deviation.

3.6.4 TEST SET UP

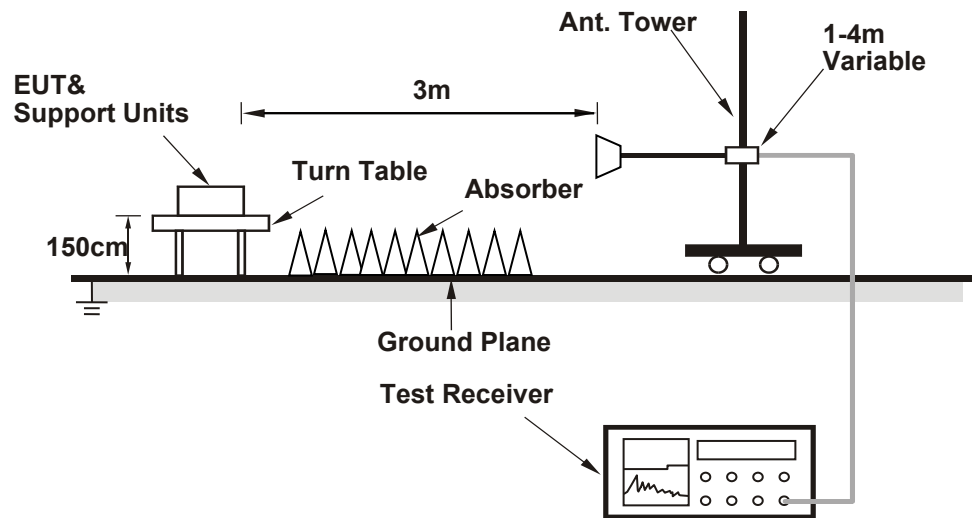
< Frequency Range below 30MHz >



<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.6.5 TEST RESULTS

NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

BELOW 1GHz WORST-CASE DATA

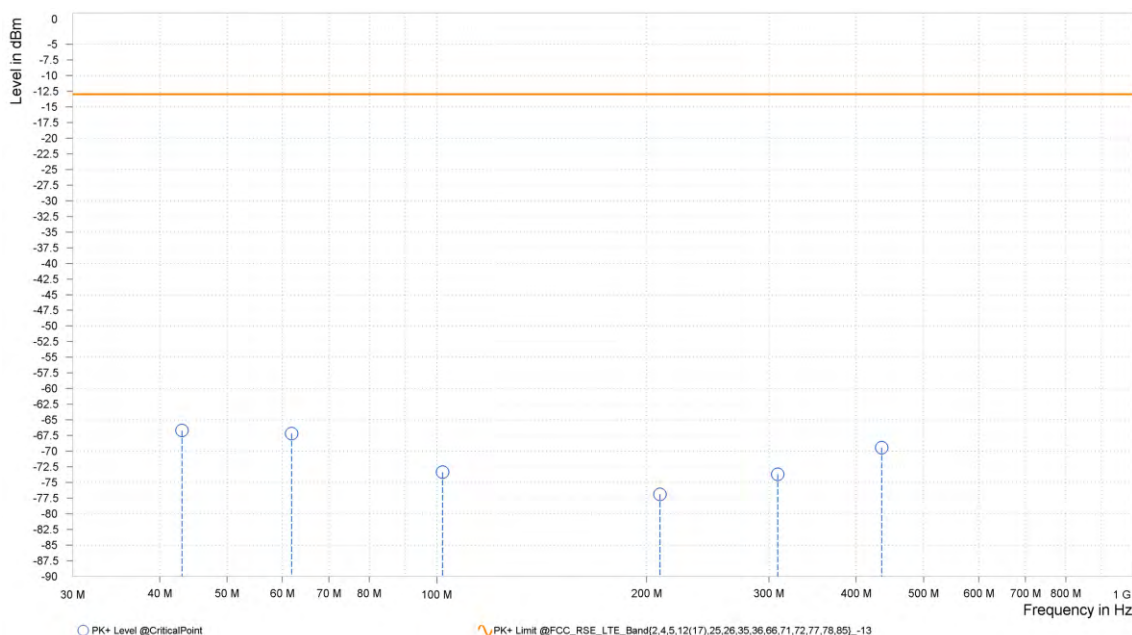
30 MHz – 1GHz data:

LTE Band 48

CHANNEL BANDWIDTH: 20MHz / QPSK

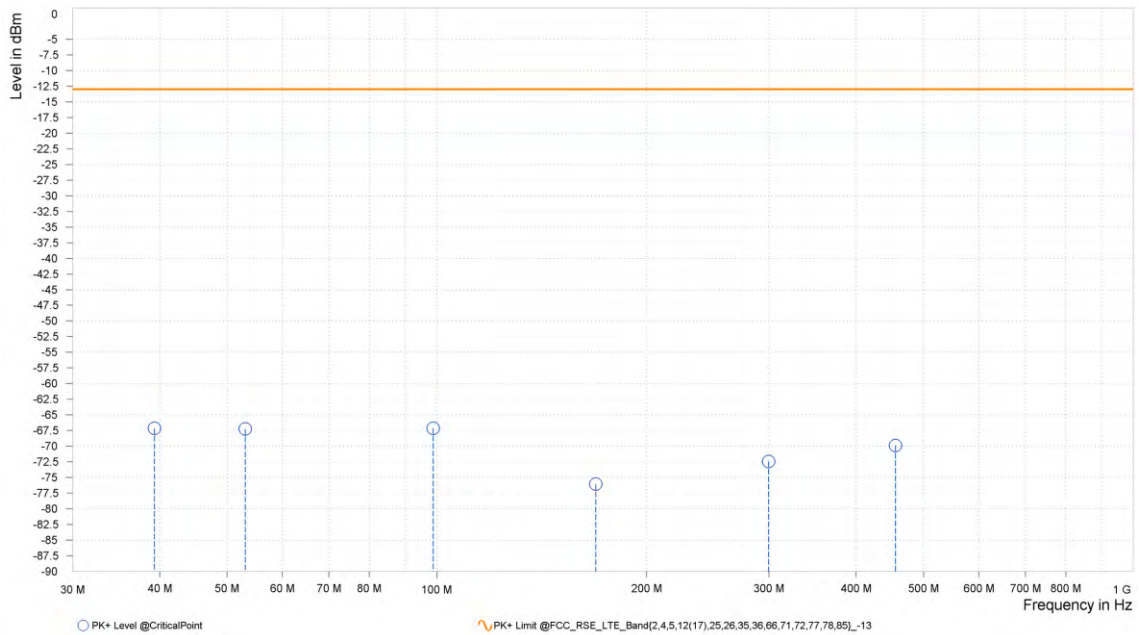
MODE	TX channel 55990	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	43.050	-66.70	-13.00	53.70	3.27	H	131	2.00
1	61.850	-67.17	-13.00	54.17	2.86	H	359.1	1.00
1	101.950	-73.36	-13.00	60.36	-1.08	H	0.9	2.00
1	209.200	-76.87	-13.00	63.87	-1.31	H	359.1	1.00
1	308.850	-73.69	-13.00	60.69	5.77	H	229.1	2.00
1	435.150	-69.43	-13.00	56.43	6.27	H	227.9	1.00



MODE	TX channel 55990	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	39.300	-67.15	-13.00	54.15	2.97	V	5.1	1.00
1	53.100	-67.24	-13.00	54.24	3.86	V	339.5	1.00
1	98.800	-67.13	-13.00	54.13	4.52	V	131	1.00
1	169.050	-76.07	-13.00	63.07	-1.79	V	34.2	2.00
1	299.600	-72.43	-13.00	59.43	5.21	V	339.5	1.00
2	455.775	-69.87	-13.00	56.87	6.74	V	190.7	1.00



ABOVE 1GHz

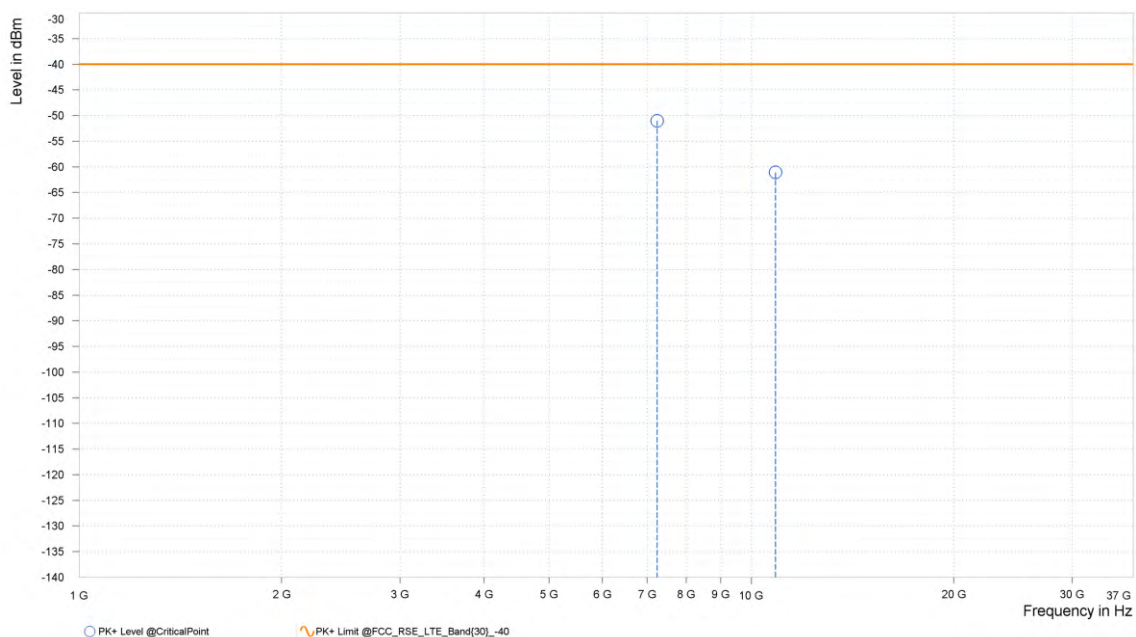
Note: For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.

LTE BAND 48

CHANNEL BANDWIDTH: 5MHz / QPSK

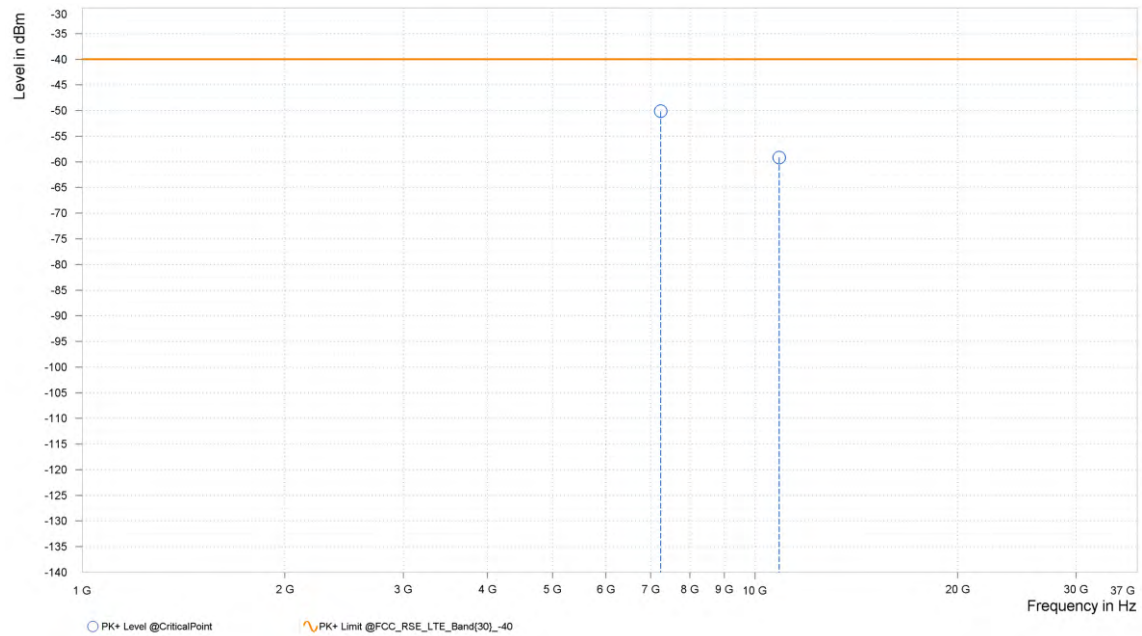
MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,245.000	-51.02	-40.00	11.02	22.52	H	78.6	2.00
6	10,868.000	-61.09	-40.00	21.09	9.62	H	155	2.00



MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

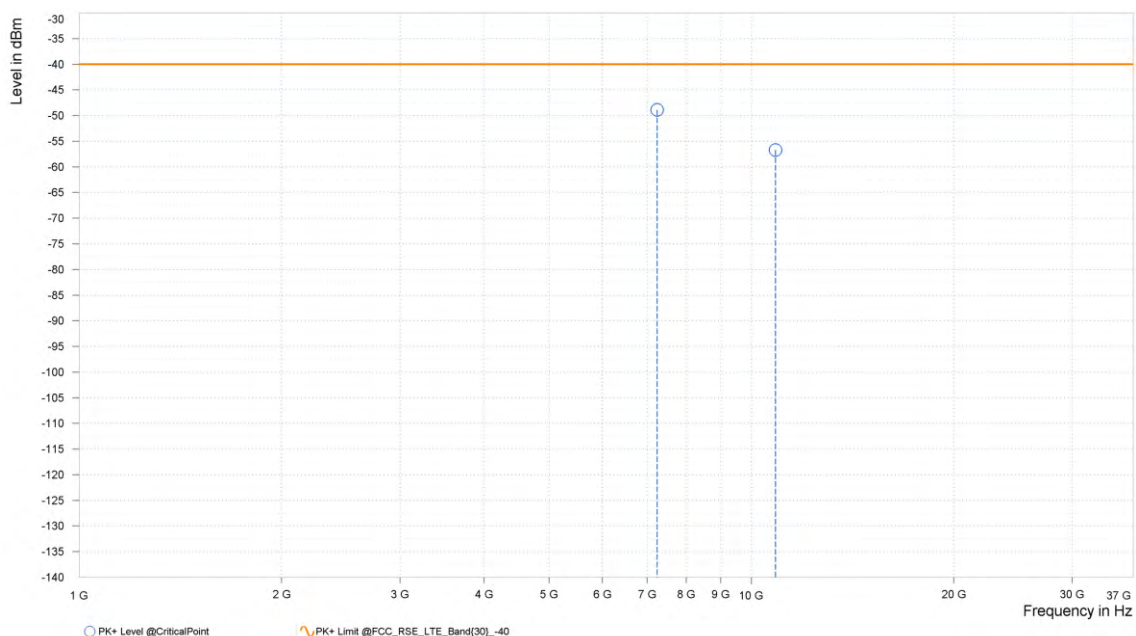
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,245.000	-50.14	-40.00	10.14	22.52	V	152.3	1.00
6	10,868.000	-59.15	-40.00	19.15	9.62	V	203.8	1.00



CHANNEL BANDWIDTH: 10MHz / QPSK

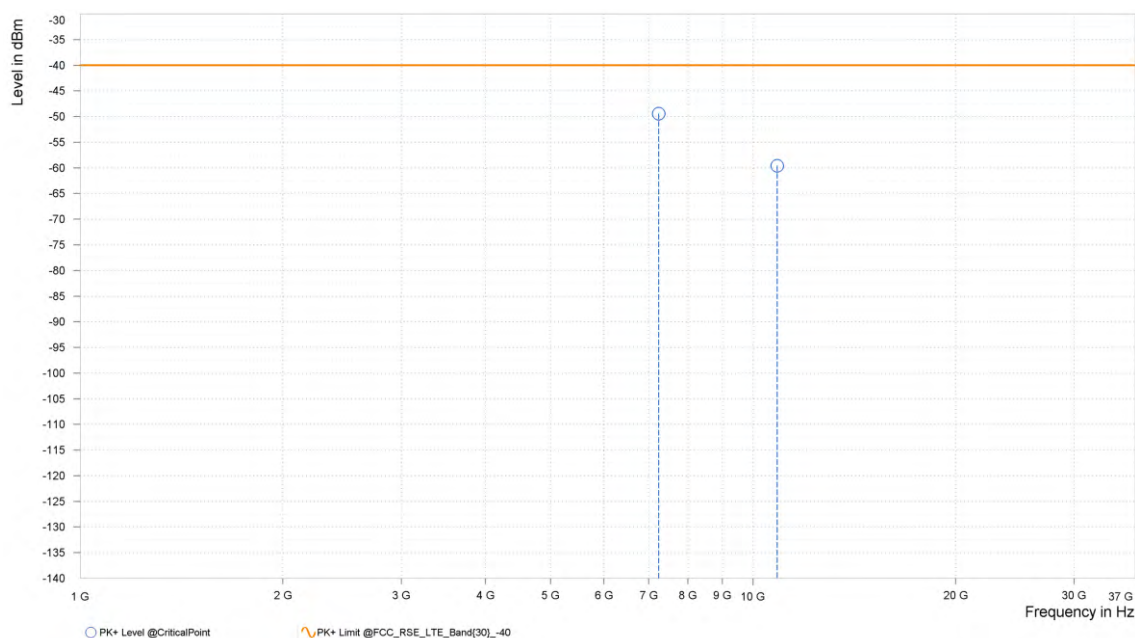
MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,241.000	-48.90	-40.00	8.90	22.51	H	0.9	2.00
6	10,861.500	-56.70	-40.00	16.70	9.62	H	157.4	2.00



MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

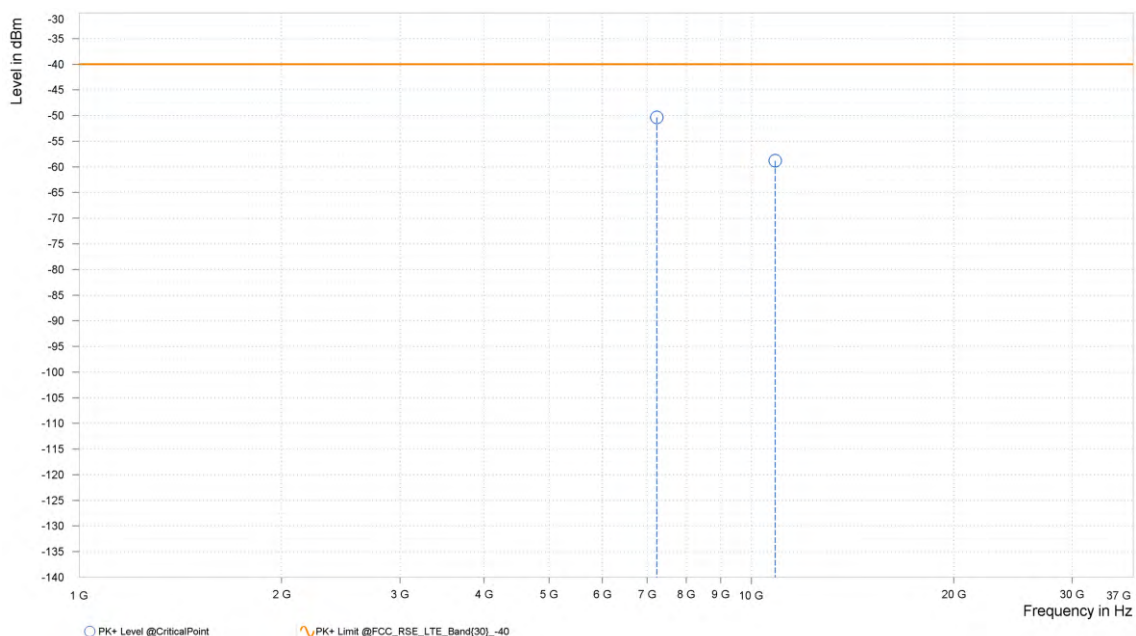
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,241.000	-49.42	-40.00	9.42	22.51	V	359	2.00
6	10,861.500	-59.59	-40.00	19.59	9.62	V	292.2	1.00



CHANNEL BANDWIDTH: 15MHz / QPSK

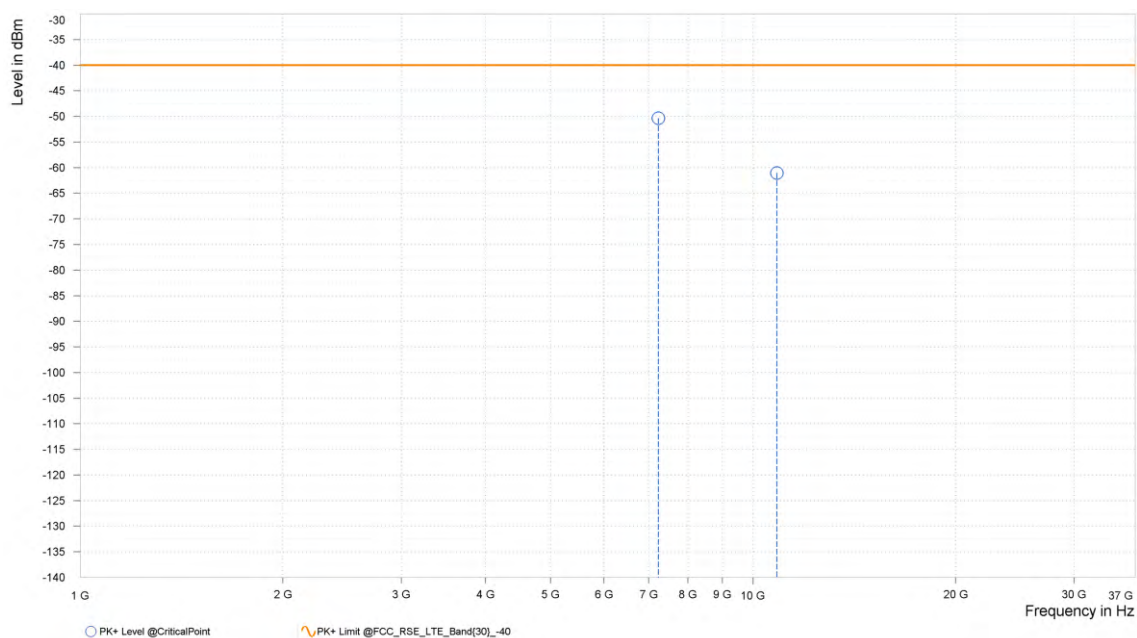
MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,236.000	-50.35	-40.00	10.35	22.49	H	282.6	1.00
6	10,855.000	-58.82	-40.00	18.82	9.63	H	1.7	2.00



MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,236.000	-50.35	-40.00	10.35	22.49	V	1	2.00
6	10,855.000	-61.06	-40.00	21.06	9.63	V	203.8	1.00

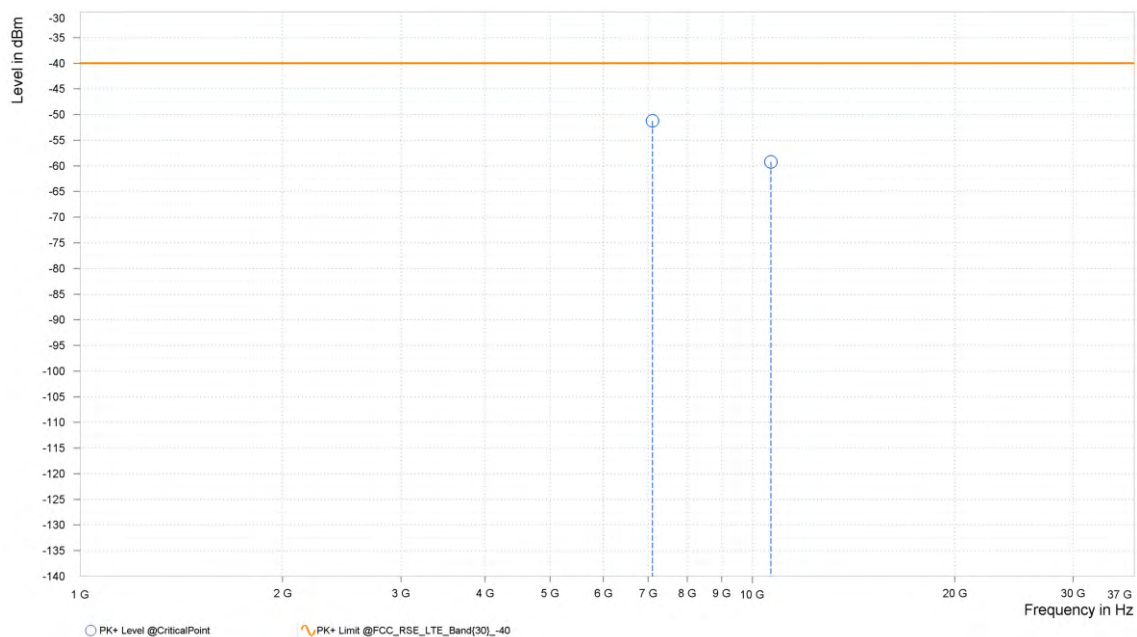


CHANNEL BANDWIDTH: 20MHz / QPSK

CH55340

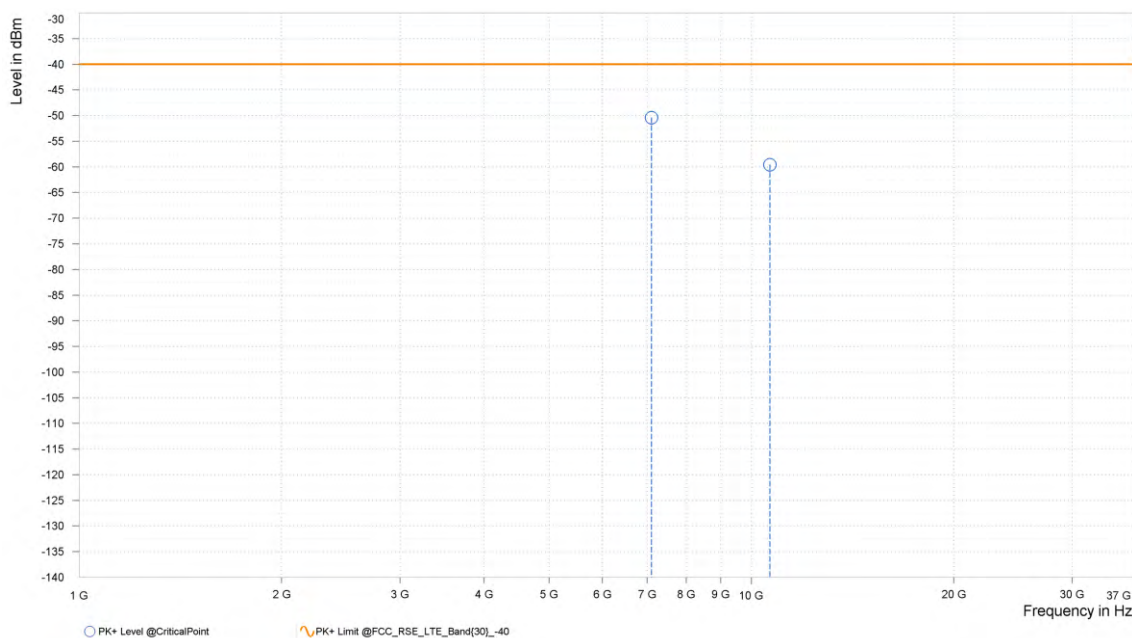
MODE	TX channel 55340	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,102.000	-51.23	-40.00	11.23	22.50	H	1	1.00
6	10,653.000	-59.23	-40.00	19.23	10.04	H	0.9	2.00



MODE	TX channel 55340	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,102.000	-50.40	-40.00	10.40	22.50	V	280.2	1.00
6	10,653.000	-59.59	-40.00	19.59	10.04	V	1	2.00





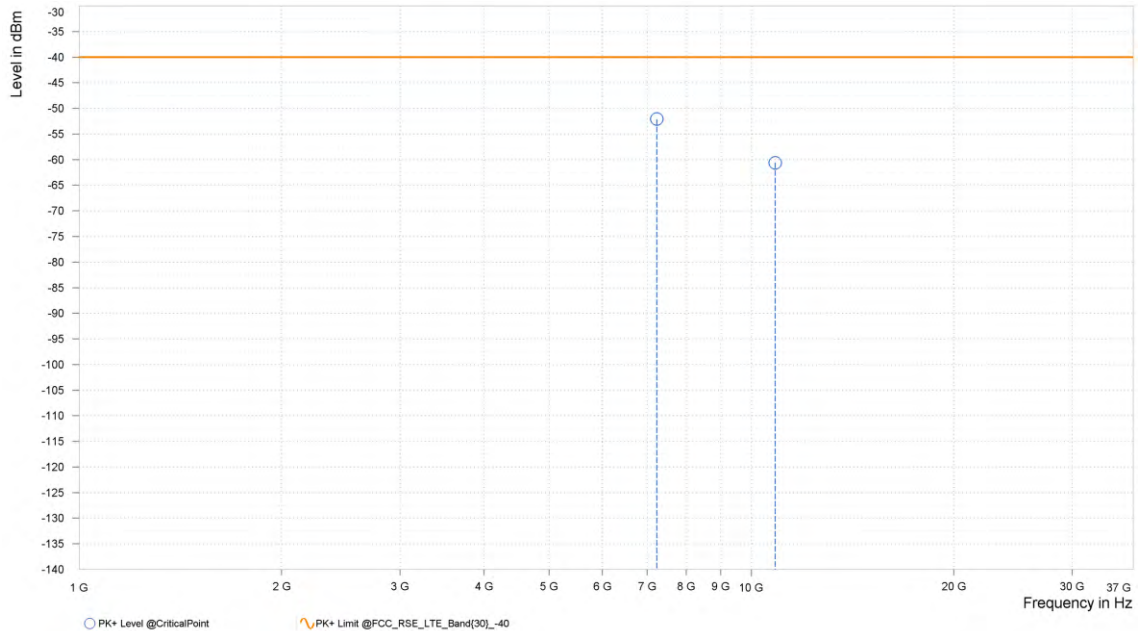
BUREAU
VERITAS

Test Report No.: PSU-QSU2312140113RF05

CH55990

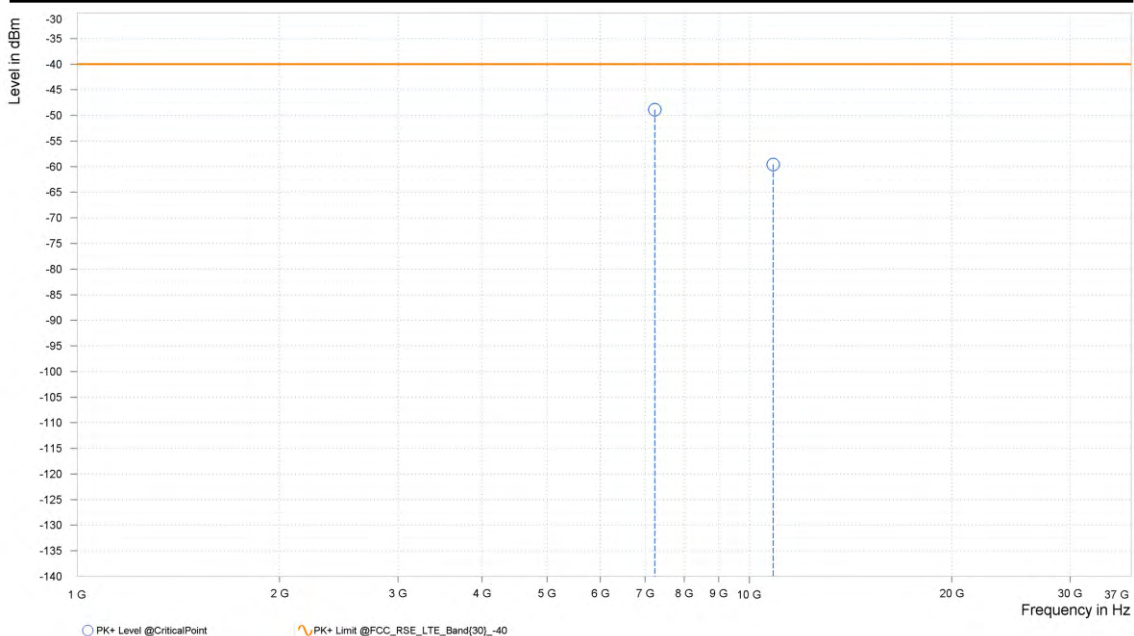
MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,232.000	-52.09	-40.00	12.09	22.47	H	356.8	1.00
6	10,848.000	-60.61	-40.00	20.61	9.63	H	2.1	2.00



MODE	TX channel 55990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,232.000	-48.87	-40.00	8.87	22.47	V	206.6	2.00
6	10,848.000	-59.58	-40.00	19.58	9.63	V	1.8	2.00





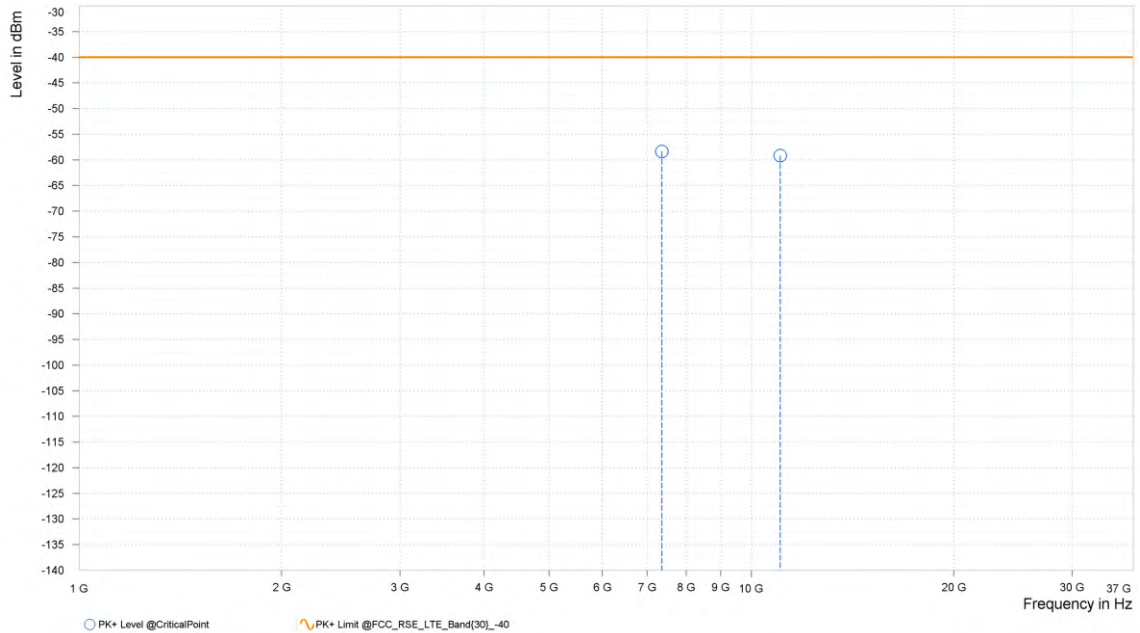
BUREAU
VERITAS

Test Report No.: PSU-QSU2312140113RF05

CH56640

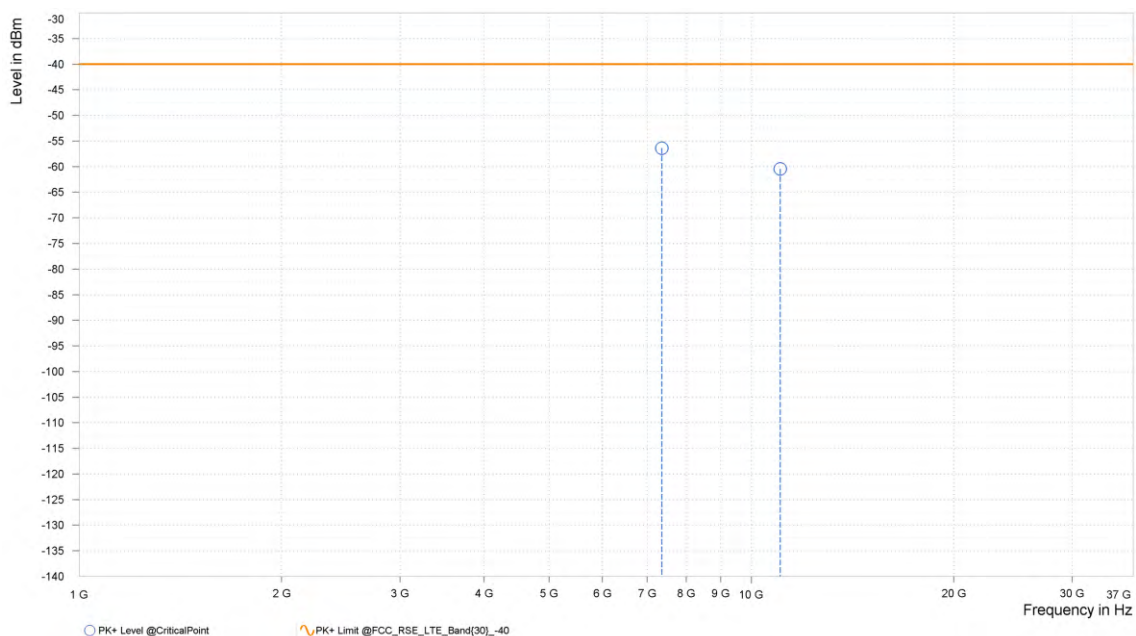
MODE	TX channel 56640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,362.000	-58.37	-40.00	18.37	14.90	H	1	1.00
6	11,043.000	-59.19	-40.00	19.19	9.68	H	201.4	1.00



MODE	TX channel 56640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60Hz
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	7,362.000	-56.40	-40.00	16.40	14.90	V	281.4	1.00
6	11,043.000	-60.44	-40.00	20.44	9.68	V	358.2	1.00

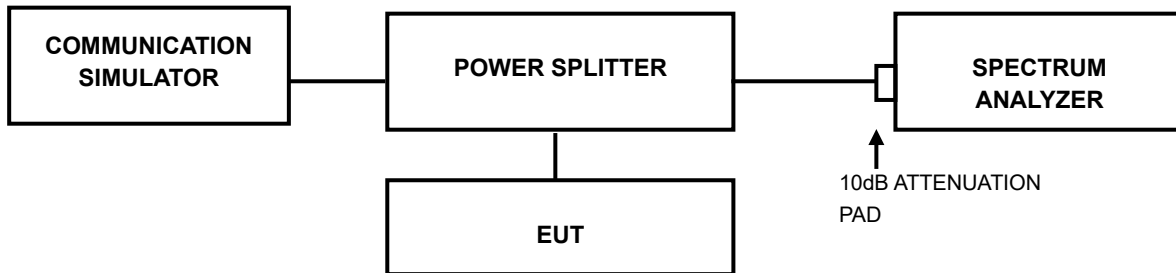


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.



Test Report No.: PSU-QSU2312140113RF05

3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.



Test Report No.: PSU-QSU2312140113RF05

4 INFORMATION ON THE TESTING LABORATORIES

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

If you have any comments, please feel free to contact us at the following:

Suzhou EMC/RF Lab:

Tel: +86 (0557) 368 1008



Test Report No.: PSU-QSU2312140113RF05

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

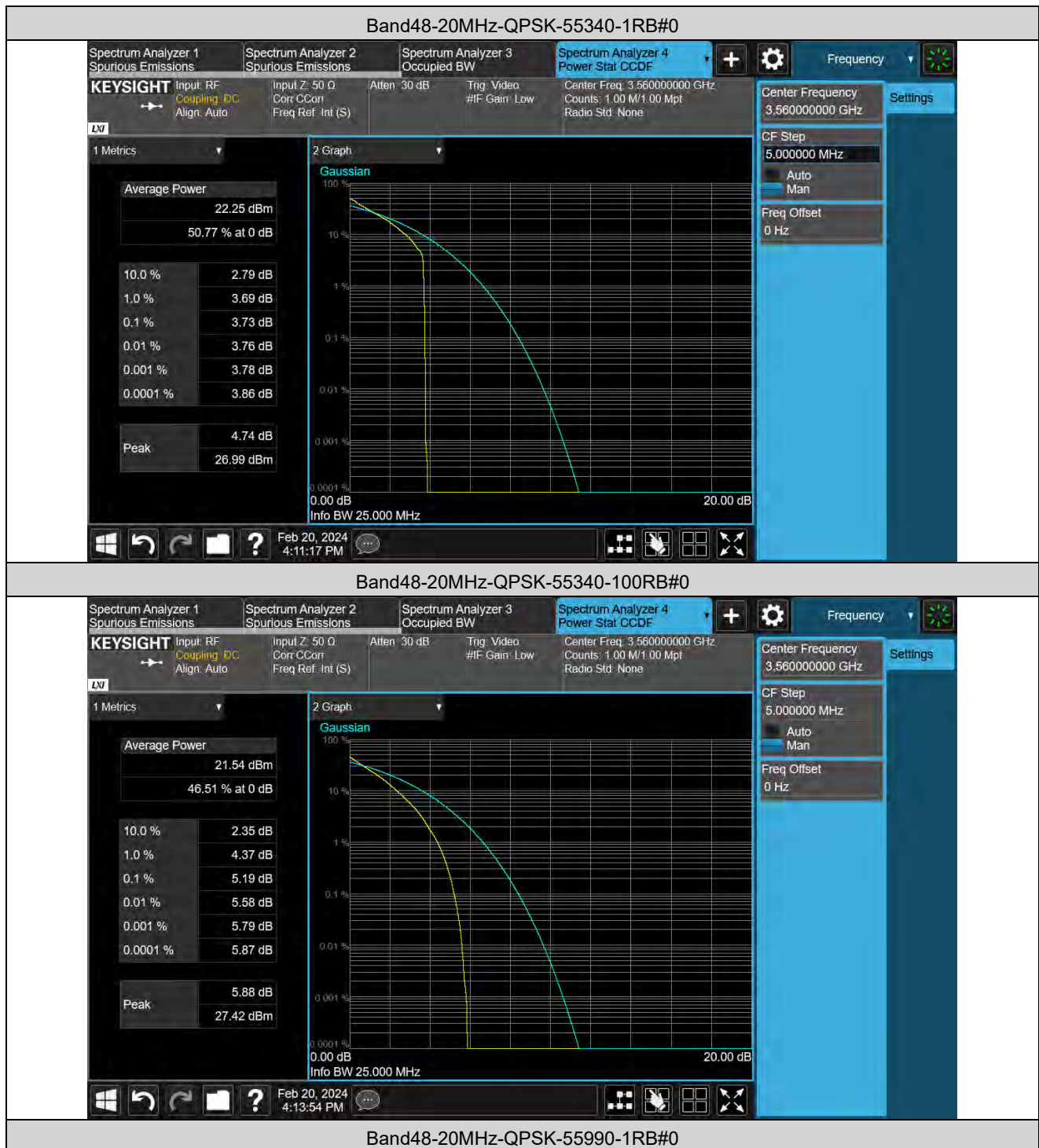
6 APPENDIX

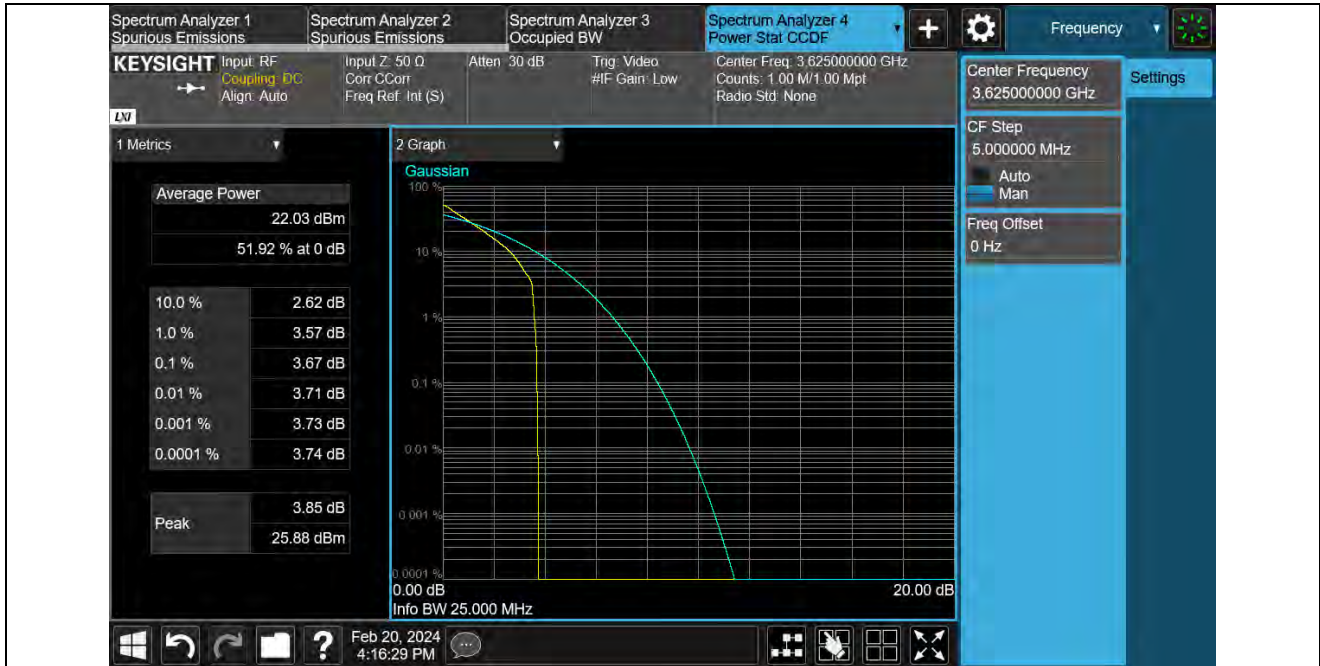
LTE BAND48

PEAK-TO-AVERAGE RATIO(CCDF) TEST RESULT

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band48	20MHz	QPSK	55340	1RB#0	3.73	13	PASS
Band48	20MHz	QPSK	55340	100RB#0	5.19	13	PASS
Band48	20MHz	QPSK	55990	1RB#0	3.67	13	PASS
Band48	20MHz	QPSK	55990	100RB#0	5.26	13	PASS
Band48	20MHz	QPSK	56640	1RB#0	3.51	13	PASS
Band48	20MHz	QPSK	56640	100RB#0	5.34	13	PASS
Band48	20MHz	16QAM	55340	1RB#0	5.62	13	PASS
Band48	20MHz	16QAM	55340	100RB#0	6.33	13	PASS
Band48	20MHz	16QAM	55990	1RB#0	5.47	13	PASS
Band48	20MHz	16QAM	55990	100RB#0	6.65	13	PASS
Band48	20MHz	16QAM	56640	1RB#0	5.70	13	PASS
Band48	20MHz	16QAM	56640	100RB#0	6.33	13	PASS
Band48	20MHz	64QAM	55340	1RB#0	6.75	13	PASS
Band48	20MHz	64QAM	55340	100RB#0	6.64	13	PASS
Band48	20MHz	64QAM	55990	1RB#0	7.48	13	PASS
Band48	20MHz	64QAM	55990	100RB#0	6.82	13	PASS
Band48	20MHz	64QAM	56640	1RB#0	7.77	13	PASS
Band48	20MHz	64QAM	56640	100RB#0	6.99	13	PASS

TEST GRAPHS

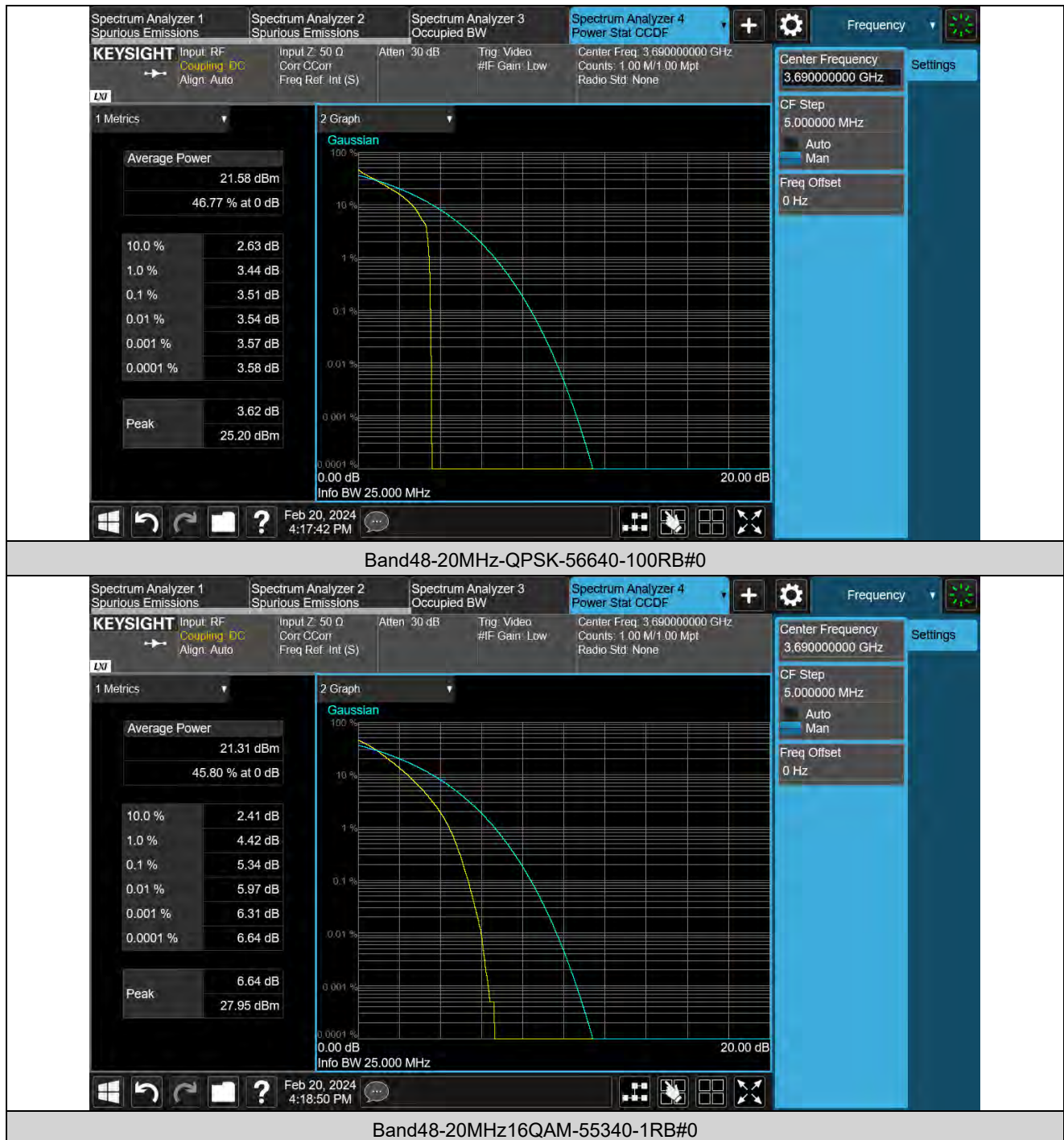


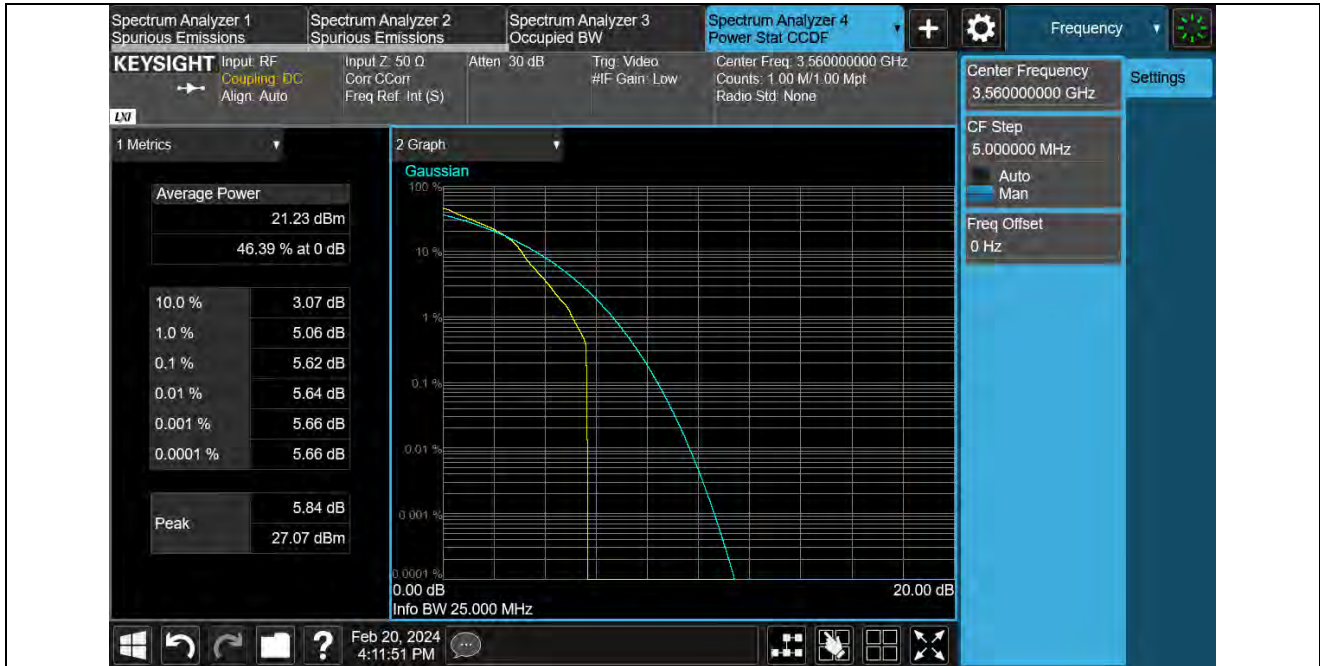


Band48-20MHz-QPSK-55990-100RB#0



Band48-20MHz-QPSK-56640-1RB#0

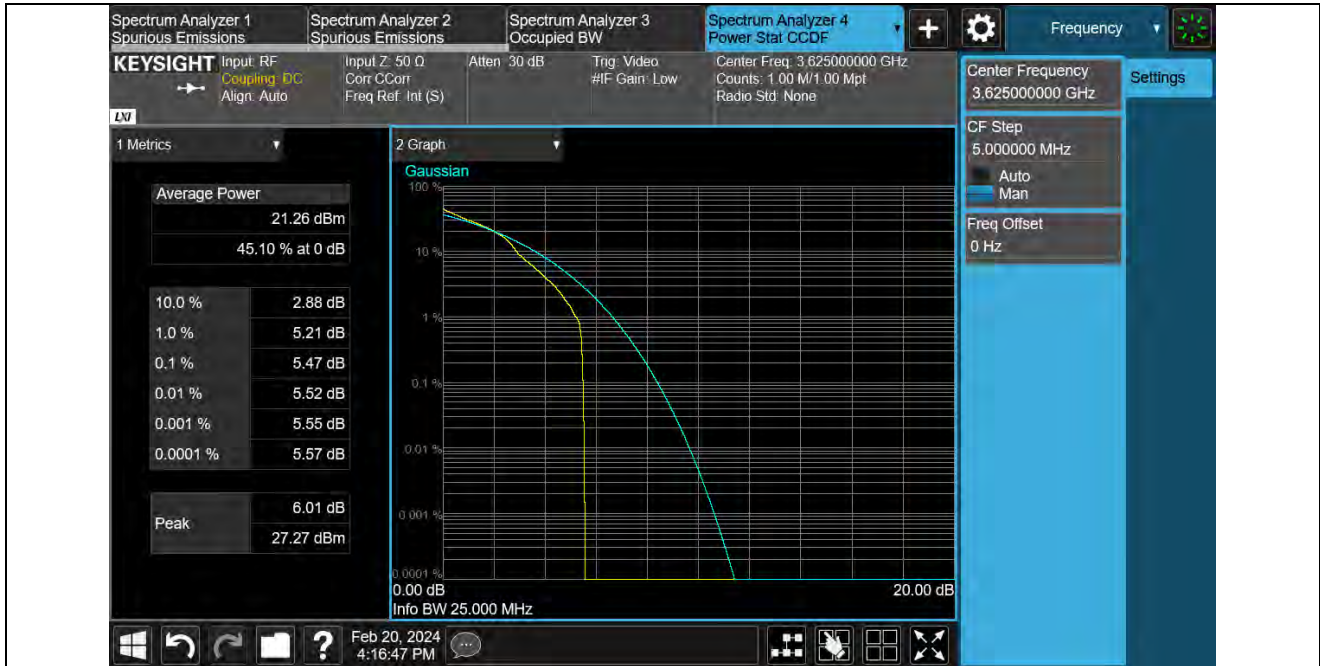




Band48-20MHz-16QAM-55340-100RB#0



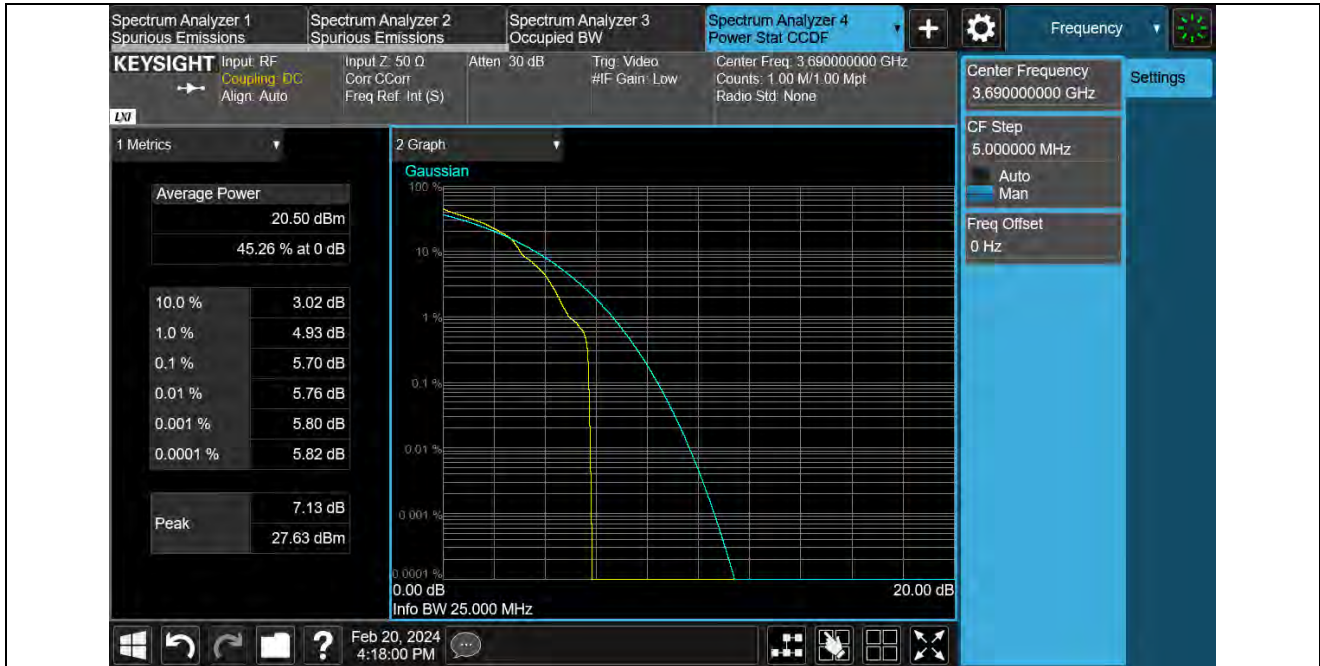
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Band48-20MHz-16QAM-55990-100RB#0



Band48-20MHz-16QAM-56640-1RB#0



Band48-20MHz-16QAM-56640-100RB#0



Band48-20MHz-64QAM-55340-1RB#0



Band48-20MHz-64QAM-55340-100RB#0



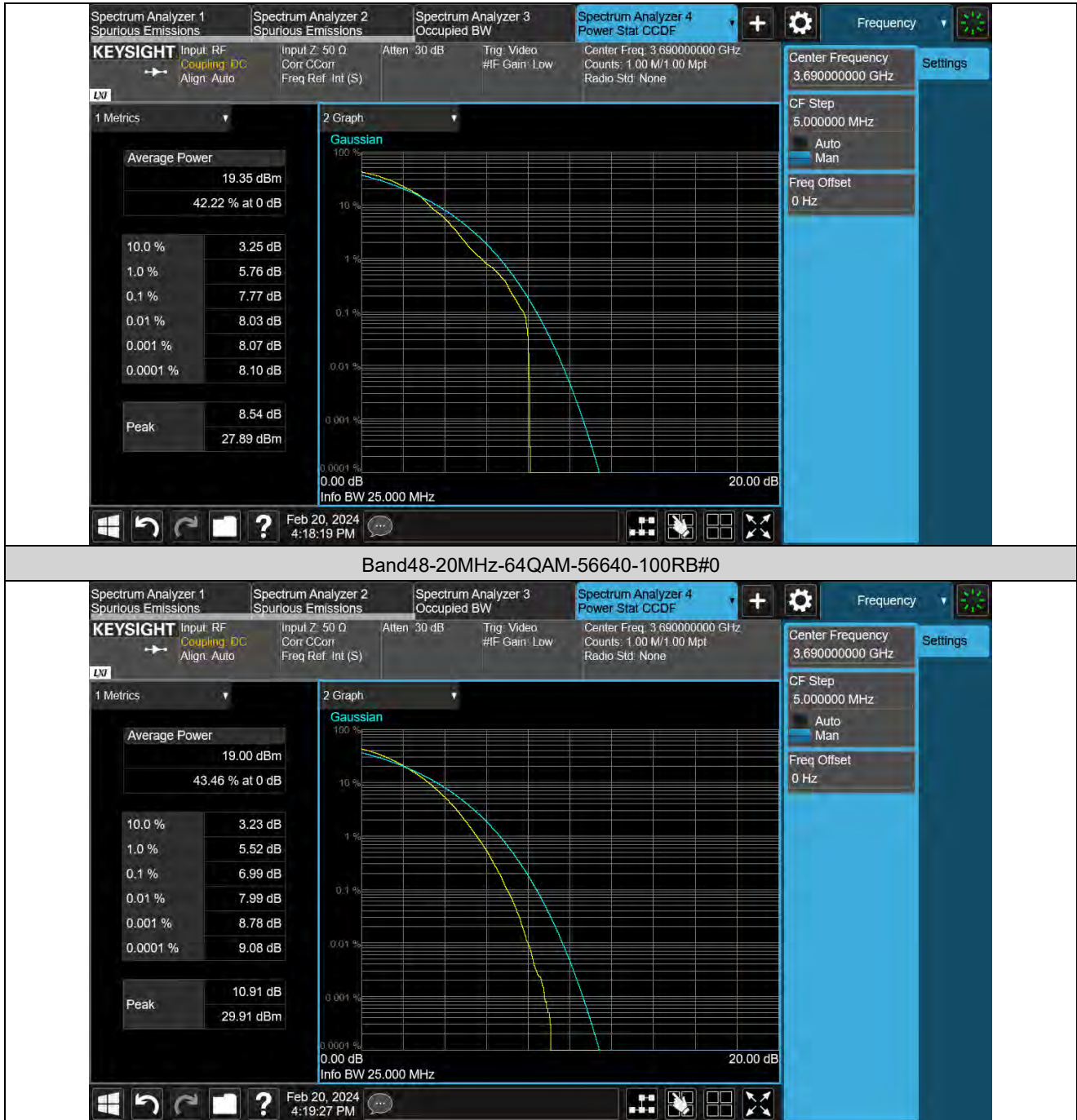
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Band48-20MHz-64QAM-55990-100RB#0



Band48-20MHz-64QAM-56640-1RB#0



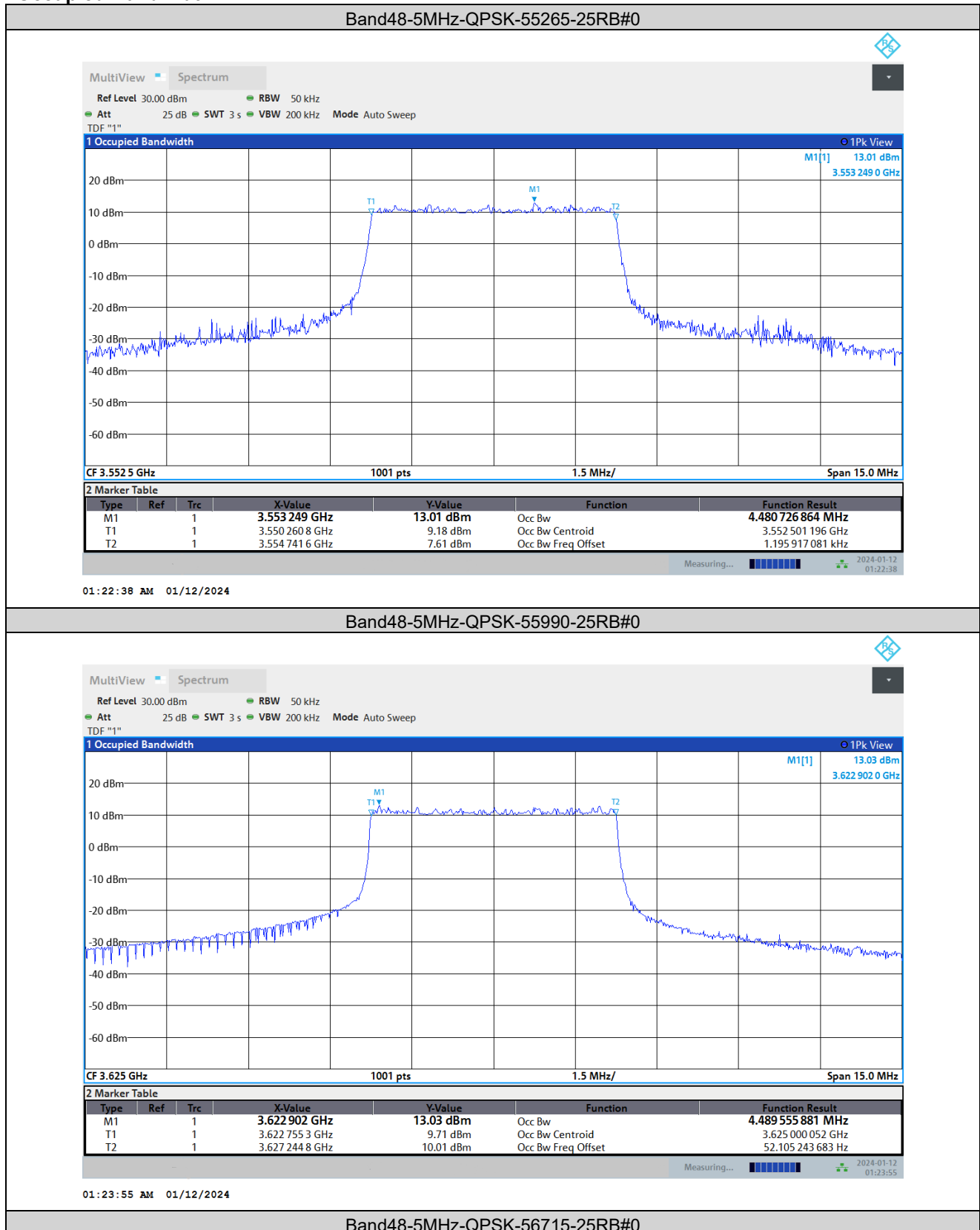
26DB BANDWIDTH AND OCCUPIED BANDWIDTH TEST RESULT

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band48	5MHz	QPSK	55265	25RB#0	4.481	4.88	PASS
Band48	5MHz	QPSK	55990	25RB#0	4.490	4.83	PASS
Band48	5MHz	QPSK	56715	25RB#0	4.478	4.84	PASS
Band48	5MHz	16QAM	55265	25RB#0	4.477	4.87	PASS
Band48	5MHz	16QAM	55990	25RB#0	4.490	4.87	PASS
Band48	5MHz	16QAM	56715	25RB#0	4.483	4.84	PASS
Band48	5MHz	64QAM	55265	25RB#0	4.490	4.88	PASS
Band48	5MHz	64QAM	55990	25RB#0	4.487	4.86	PASS
Band48	5MHz	64QAM	56715	25RB#0	4.470	4.87	PASS
Band48	10MHz	QPSK	55290	50RB#0	8.959	9.65	PASS
Band48	10MHz	QPSK	55990	50RB#0	8.951	9.65	PASS
Band48	10MHz	QPSK	56690	50RB#0	8.956	9.65	PASS
Band48	10MHz	16QAM	55290	50RB#0	8.957	9.56	PASS
Band48	10MHz	16QAM	55990	50RB#0	8.942	9.59	PASS
Band48	10MHz	16QAM	56690	50RB#0	8.953	9.68	PASS
Band48	10MHz	64QAM	55290	50RB#0	8.961	9.59	PASS
Band48	10MHz	64QAM	55990	50RB#0	8.944	9.56	PASS
Band48	10MHz	64QAM	56690	50RB#0	8.960	9.68	PASS
Band48	15MHz	QPSK	55315	75RB#0	13.444	14.52	PASS
Band48	15MHz	QPSK	55990	75RB#0	13.416	14.61	PASS
Band48	15MHz	QPSK	56665	75RB#0	13.414	14.52	PASS
Band48	15MHz	16QAM	55315	75RB#0	13.441	14.65	PASS
Band48	15MHz	16QAM	55990	75RB#0	13.479	14.52	PASS
Band48	15MHz	16QAM	56665	75RB#0	13.464	14.52	PASS
Band48	15MHz	64QAM	55315	75RB#0	13.409	14.39	PASS
Band48	15MHz	64QAM	55990	75RB#0	13.443	14.56	PASS
Band48	15MHz	64QAM	56665	75RB#0	13.447	14.48	PASS
Band48	20MHz	QPSK	55340	100RB#0	17.911	19.24	PASS
Band48	20MHz	QPSK	55990	100RB#0	17.875	19.00	PASS
Band48	20MHz	QPSK	56640	100RB#0	17.872	19.24	PASS
Band48	20MHz	16QAM	55340	100RB#0	17.887	19.18	PASS
Band48	20MHz	16QAM	55990	100RB#0	17.897	19.42	PASS
Band48	20MHz	16QAM	56640	100RB#0	17.867	19.06	PASS
Band48	20MHz	64QAM	55340	100RB#0	17.879	19.42	PASS
Band48	20MHz	64QAM	55990	100RB#0	17.891	19.18	PASS
Band48	20MHz	64QAM	56640	100RB#0	17.995	19.12	PASS



TEST GRAPHS

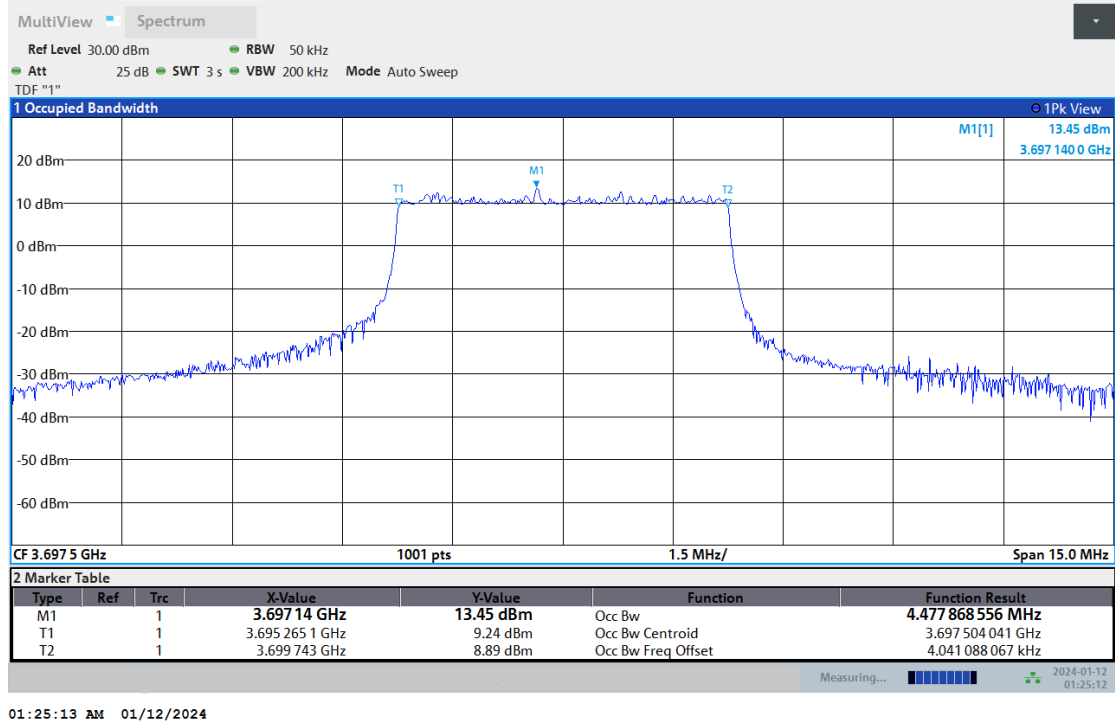
Occupied Bandwidth



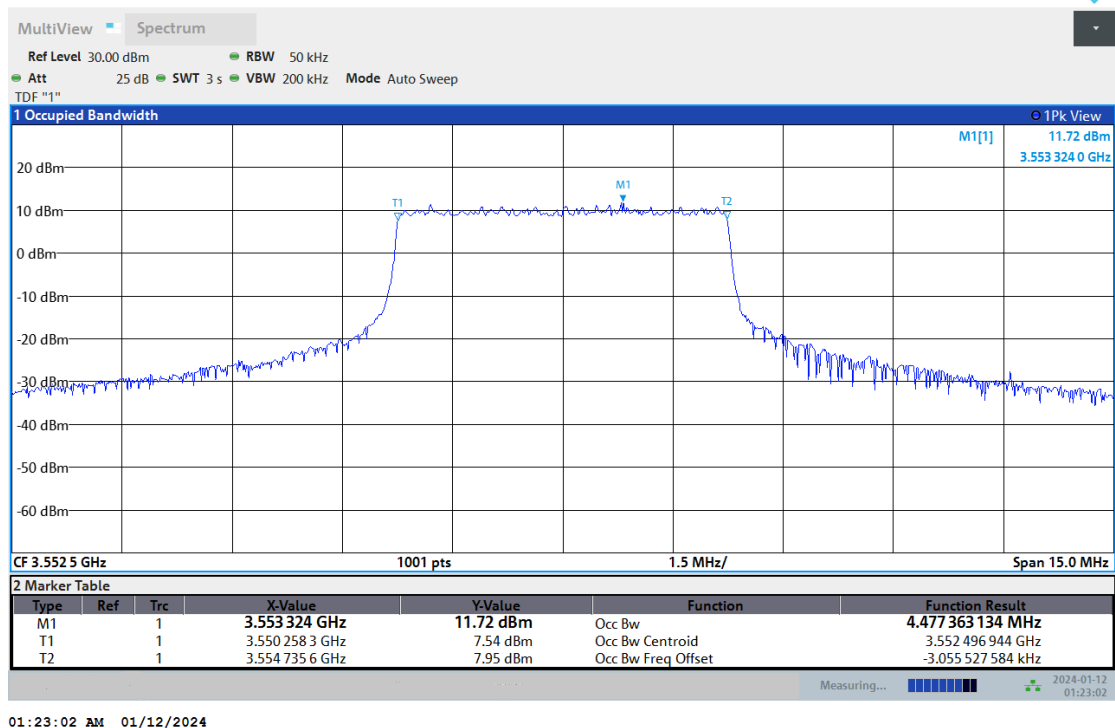


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Test Report No.: PSU-QSU2312140113RF05



Band48-5MHz-16QAM-55265-25RB#0

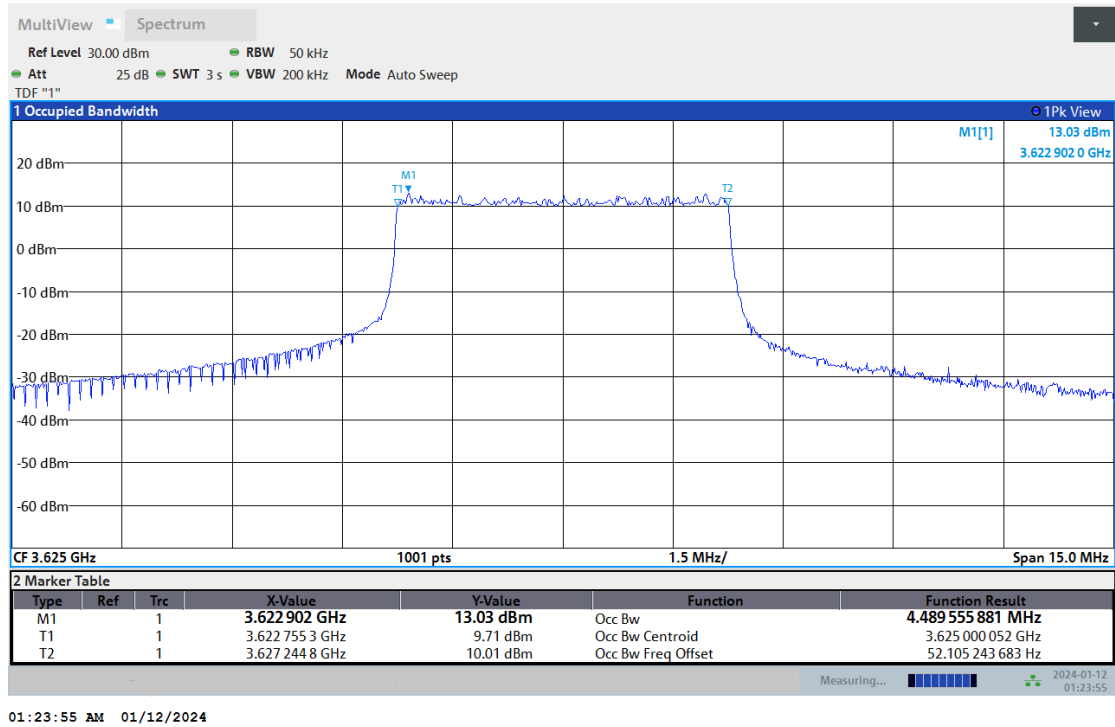


Band48-5MHz-16QAM-55990-25RB#0

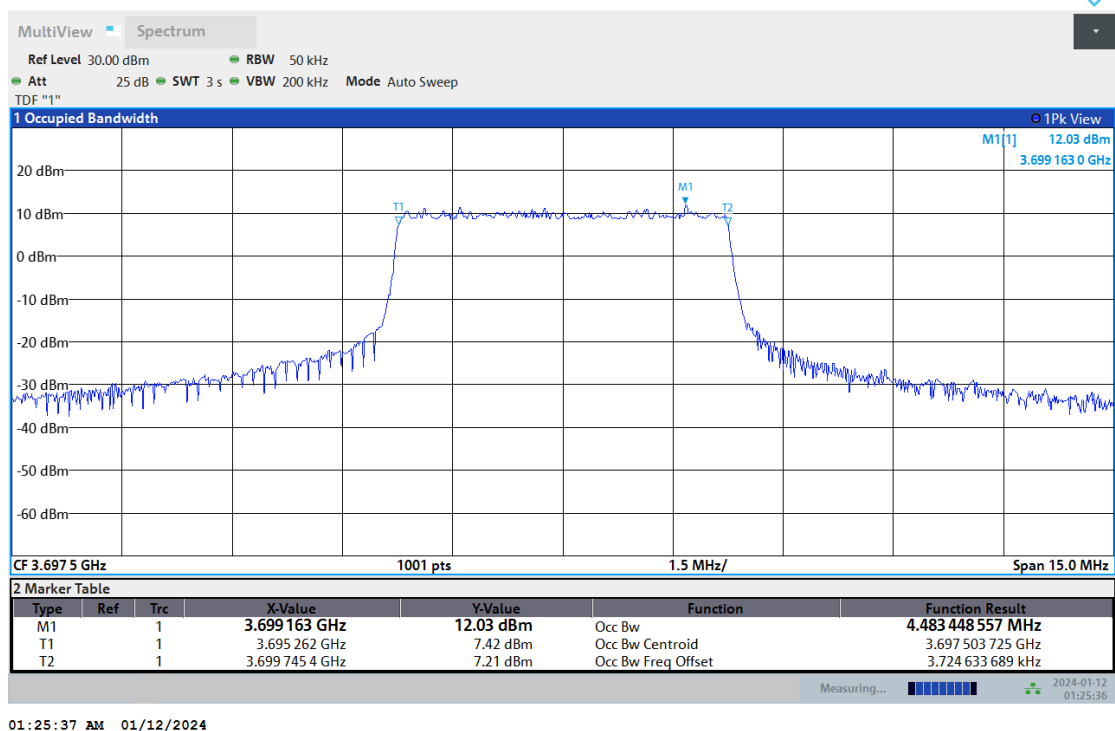


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Test Report No.: PSU-QSU2312140113RF05



Band48-5MHz-16QAM-56715-25RB#0

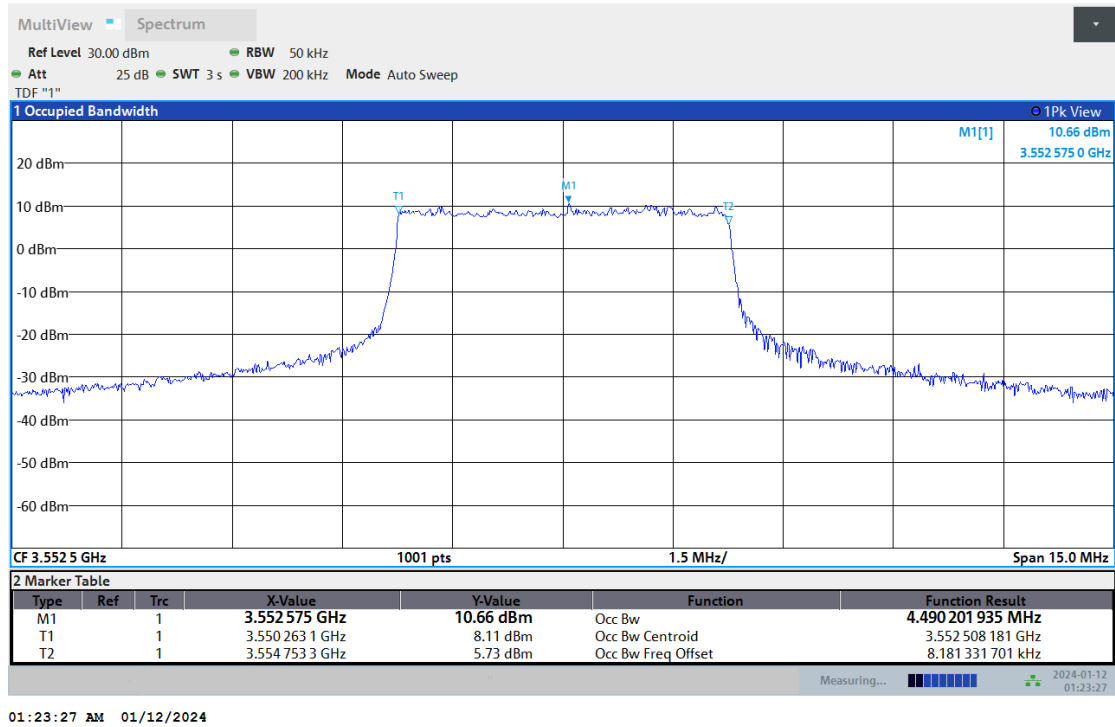


Band48-5MHz-64QAM-55265-25RB#0

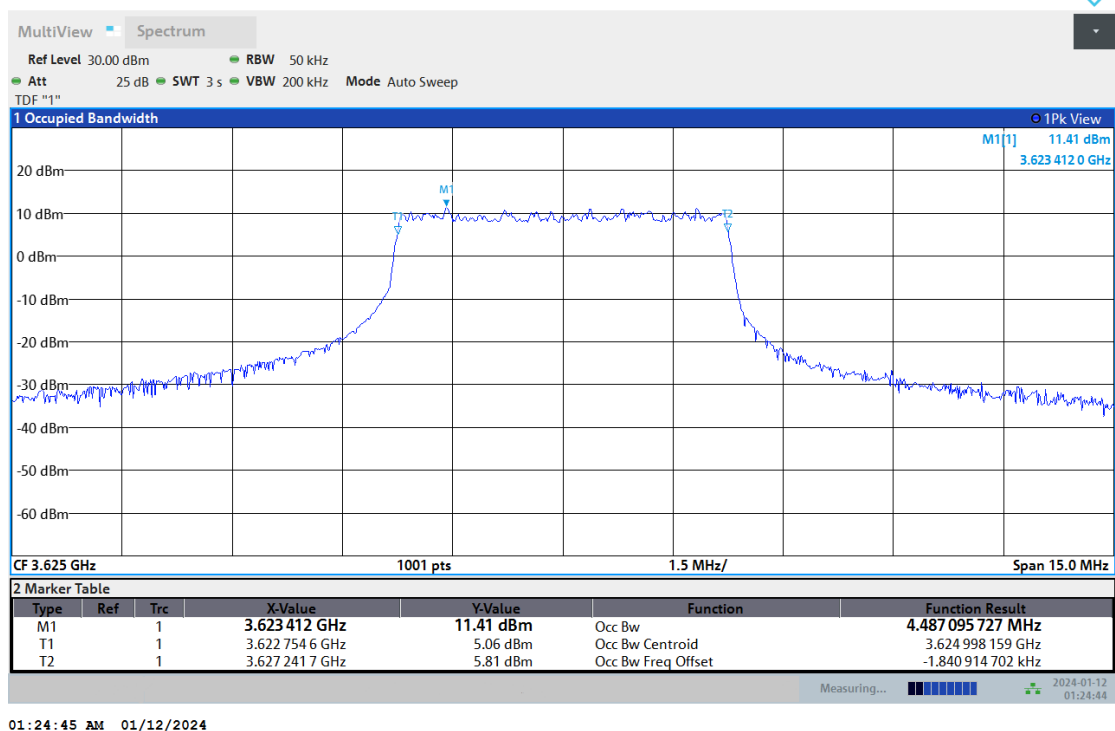


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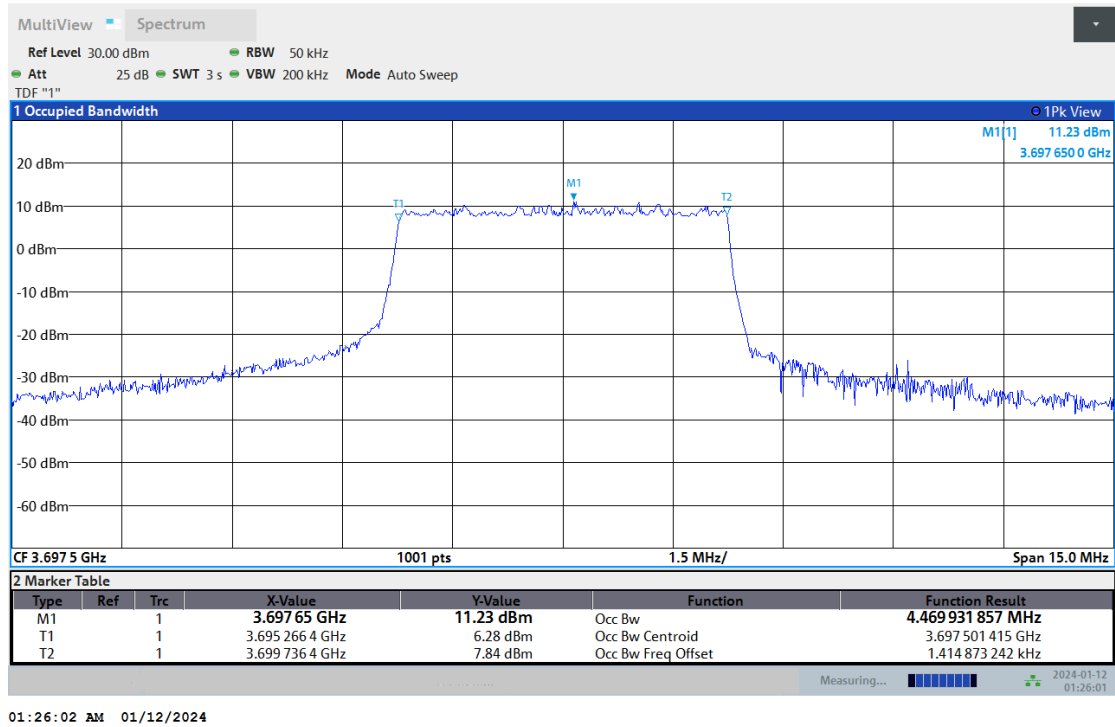
Test Report No.: PSU-QSU2312140113RF05



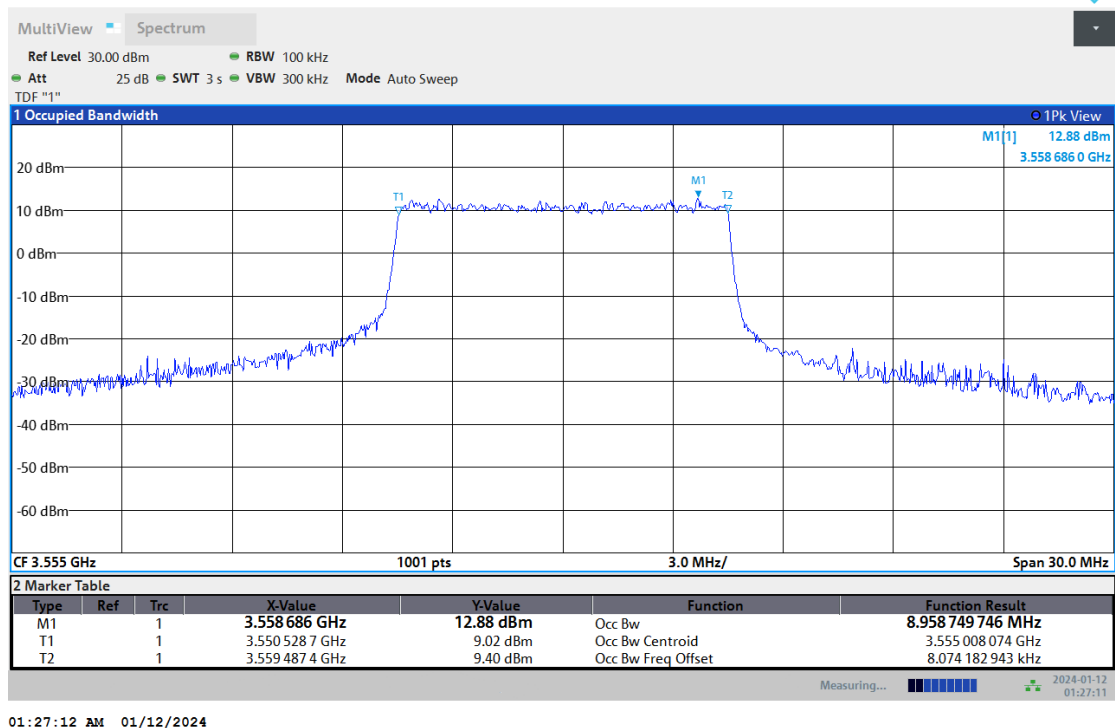
Band48-5MHz-64QAM-55990-25RB#0



Band48-5MHz-64QAM-56715-25RB#0



Band48-10MHz-QPSK-55290-50RB#0

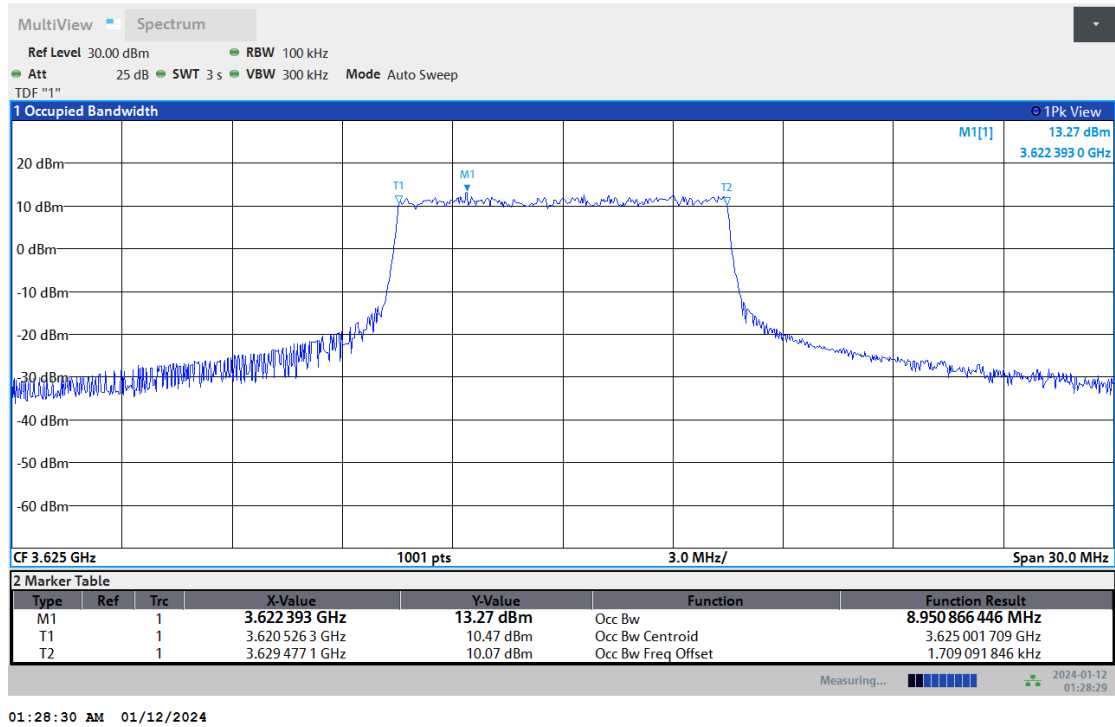


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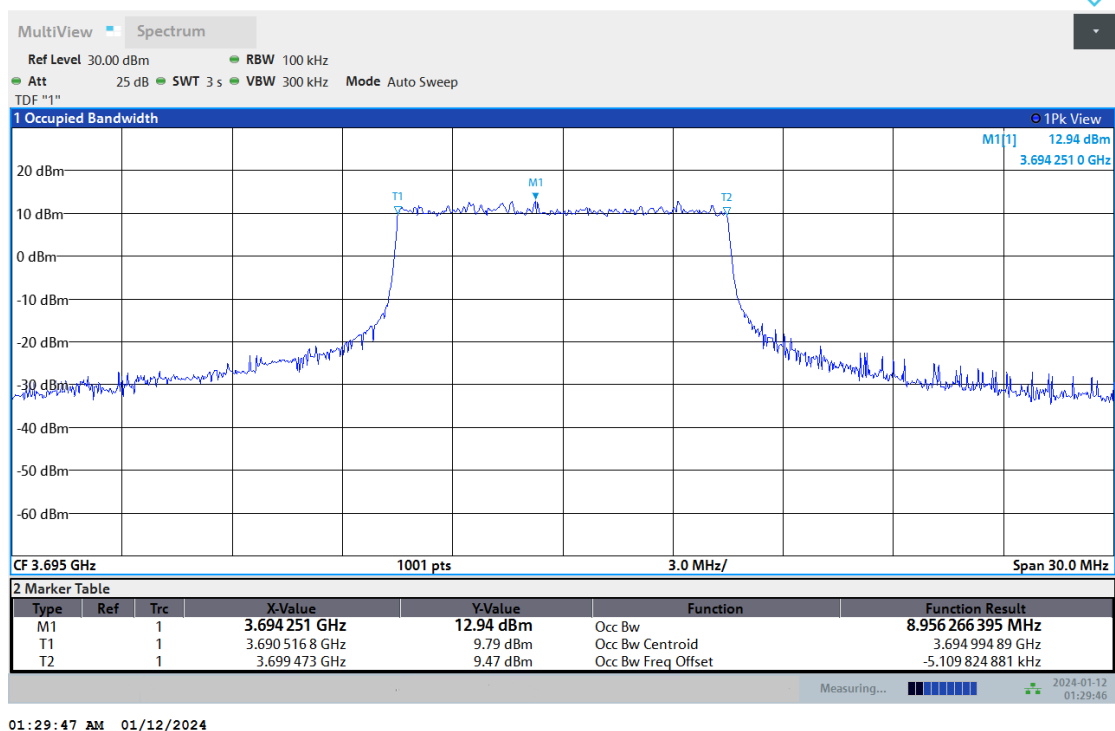


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Test Report No.: PSU-QSU2312140113RF05



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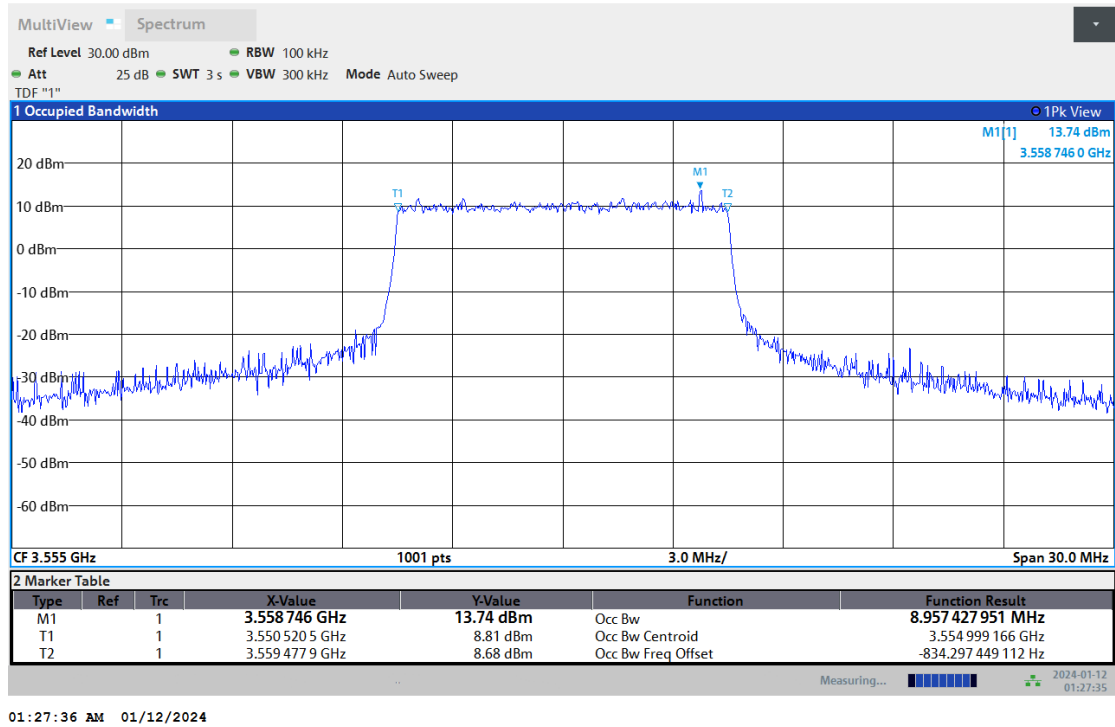


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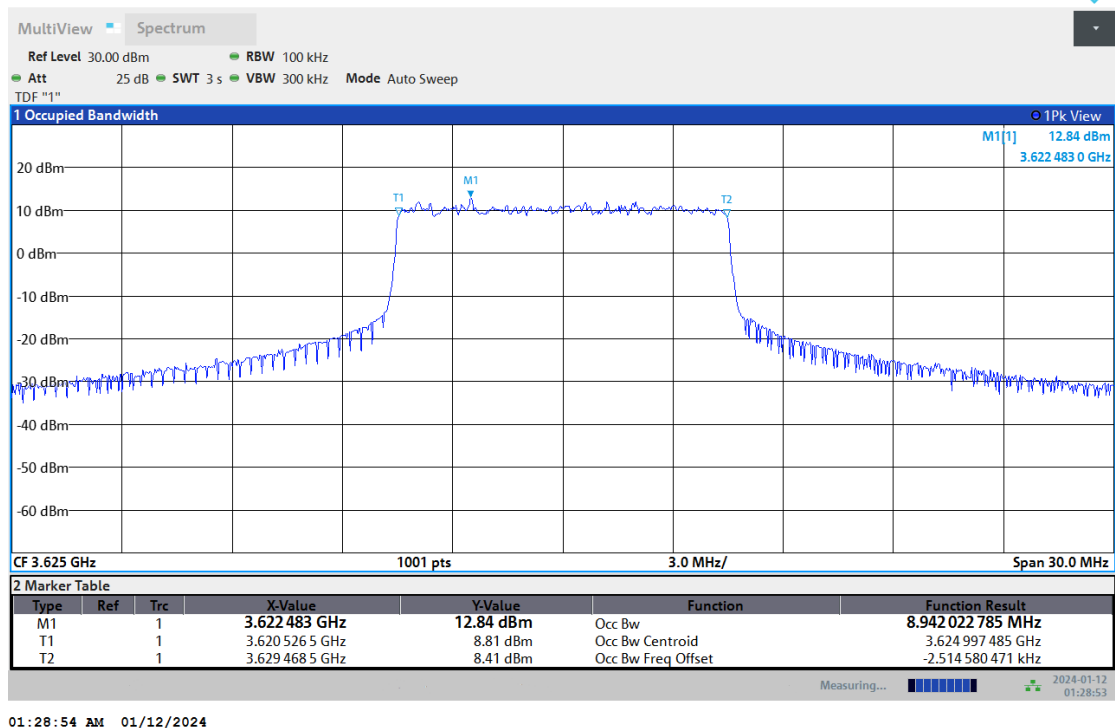


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Test Report No.: PSU-QSU2312140113RF05



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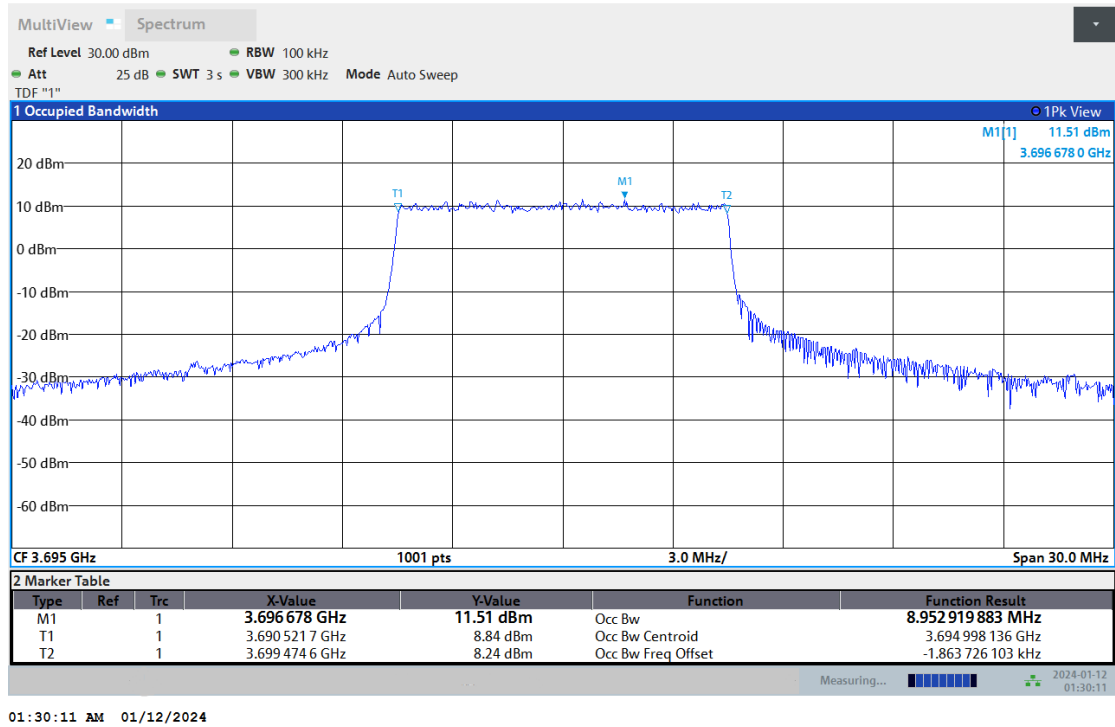


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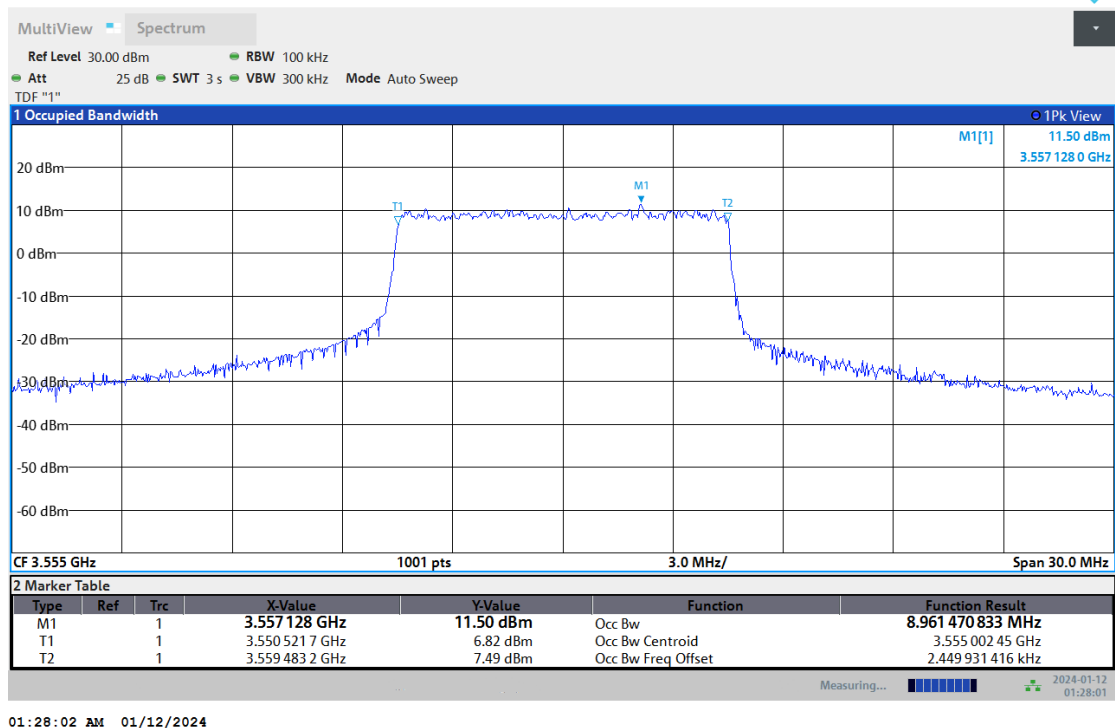


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Test Report No.: PSU-QSU2312140113RF05



Band48-10MHz-64QAM-55290-50RB#0

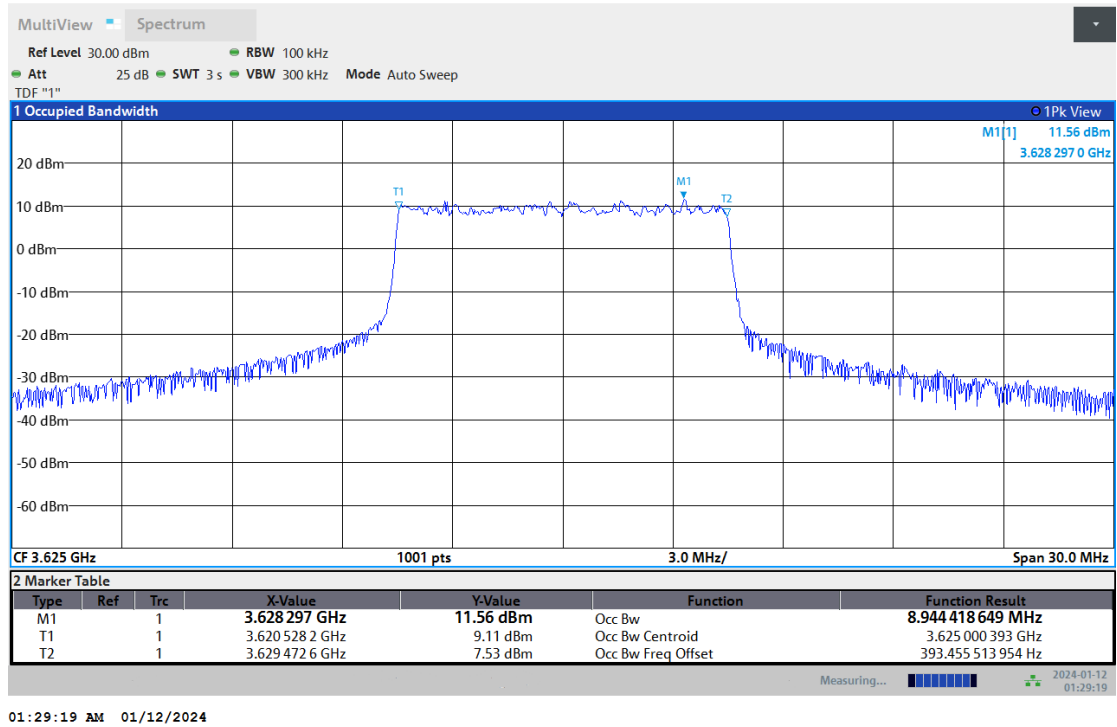


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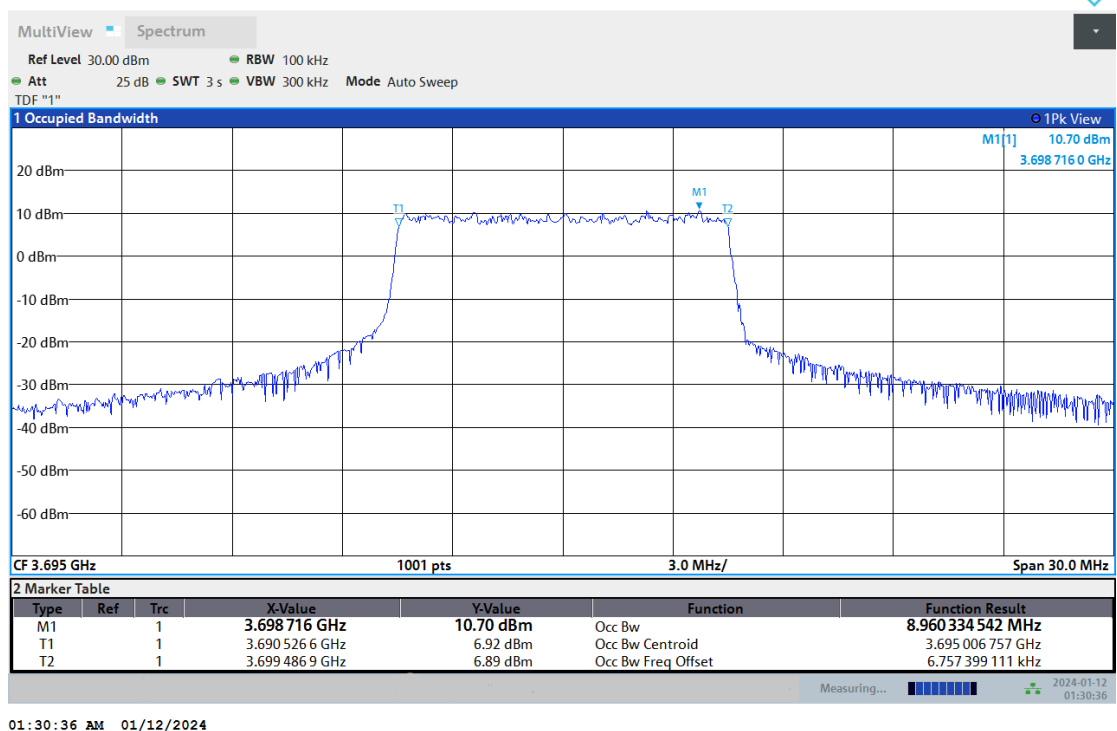


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Test Report No.: PSU-QSU2312140113RF05



Band48-10MHz-64QAM-56690-50RB#0

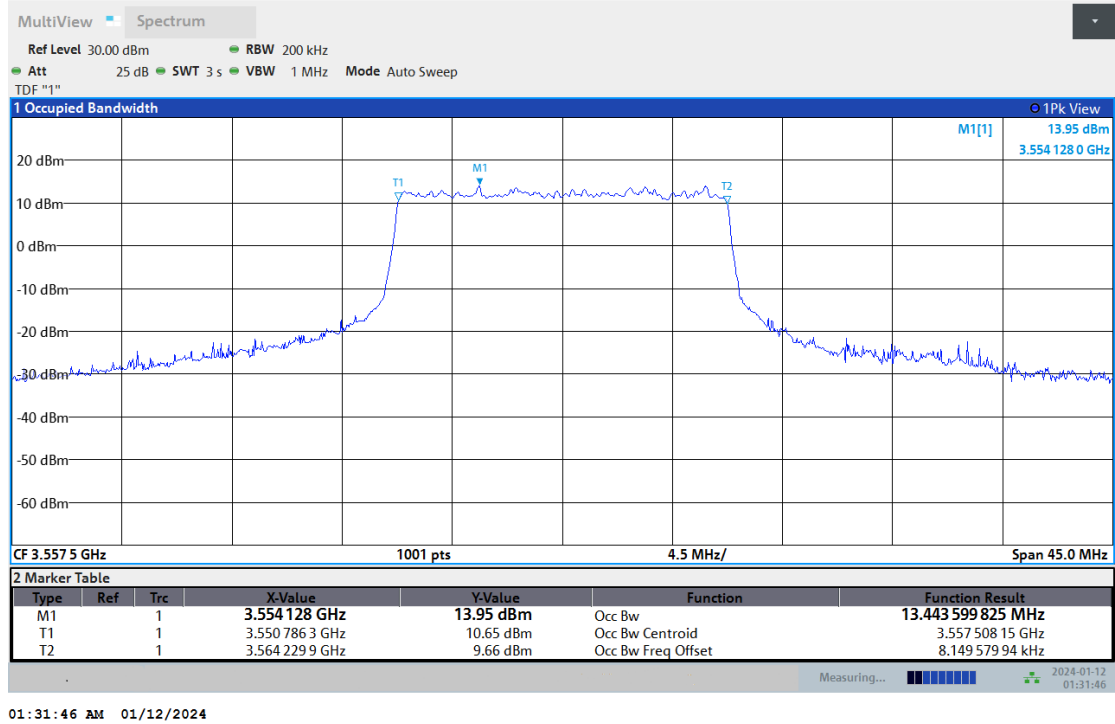


Band48-15MHz-QPSK-55315-75RB#0

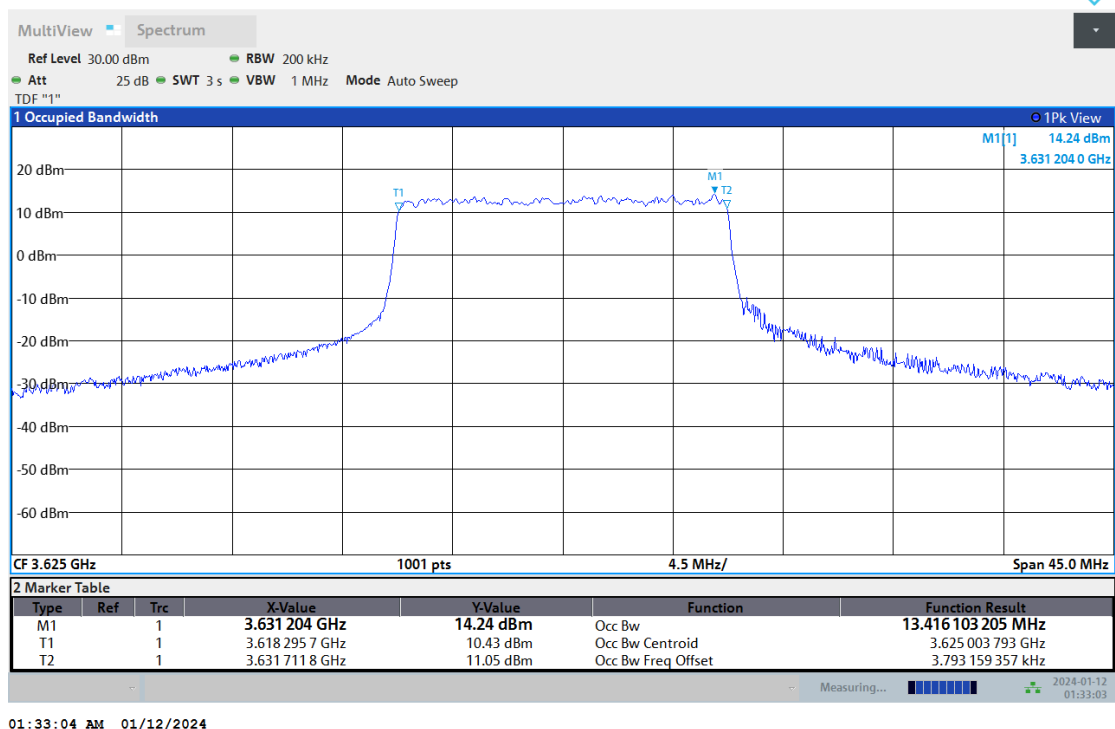


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Test Report No.: PSU-QSU2312140113RF05



Band48-15MHz-QPSK-55990-75RB#0

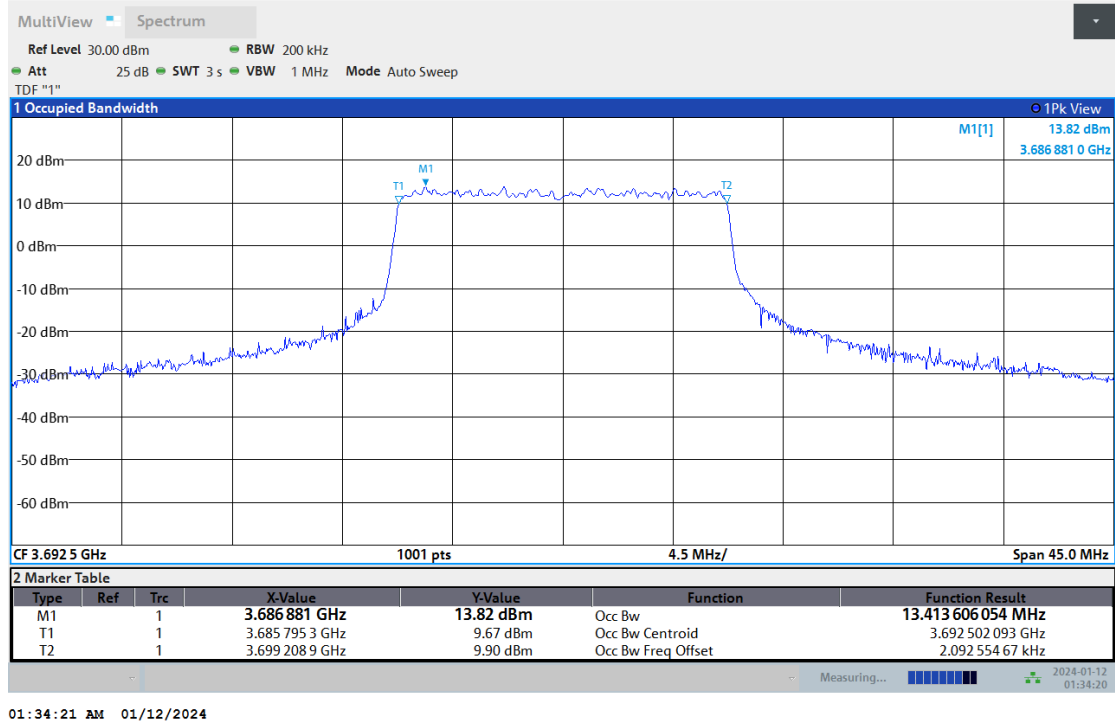


Band48-15MHz-QPSK-56665-75RB#0

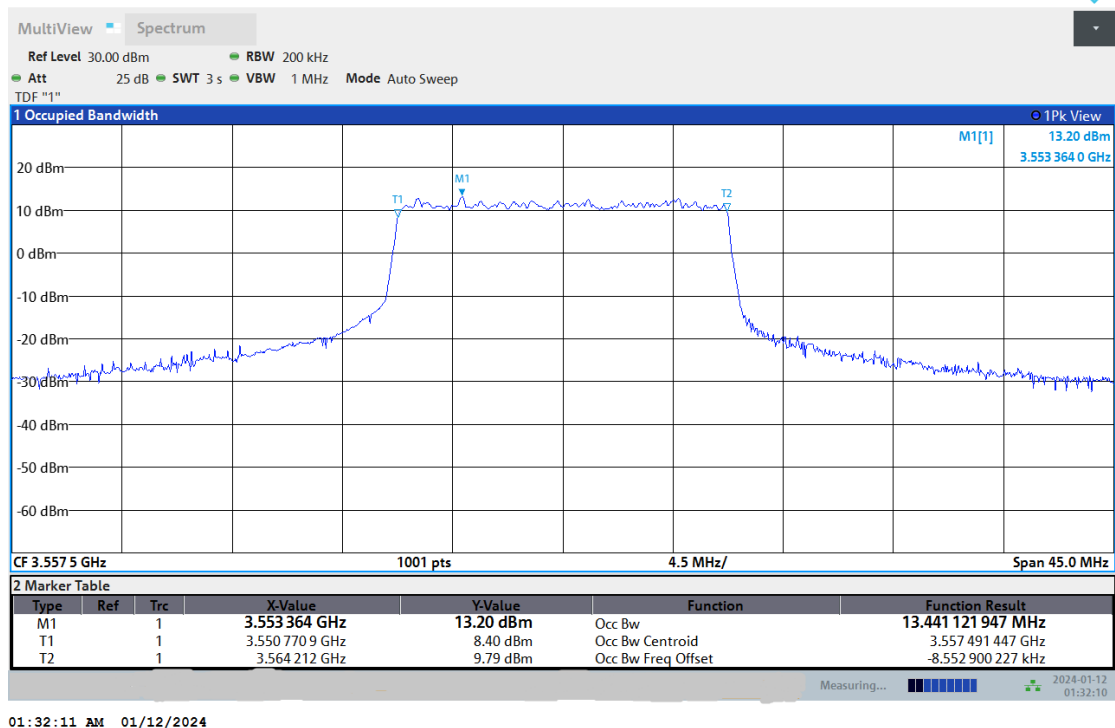


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Test Report No.: PSU-QSU2312140113RF05



Band48-15MHz-16QAM-55315-75RB#0

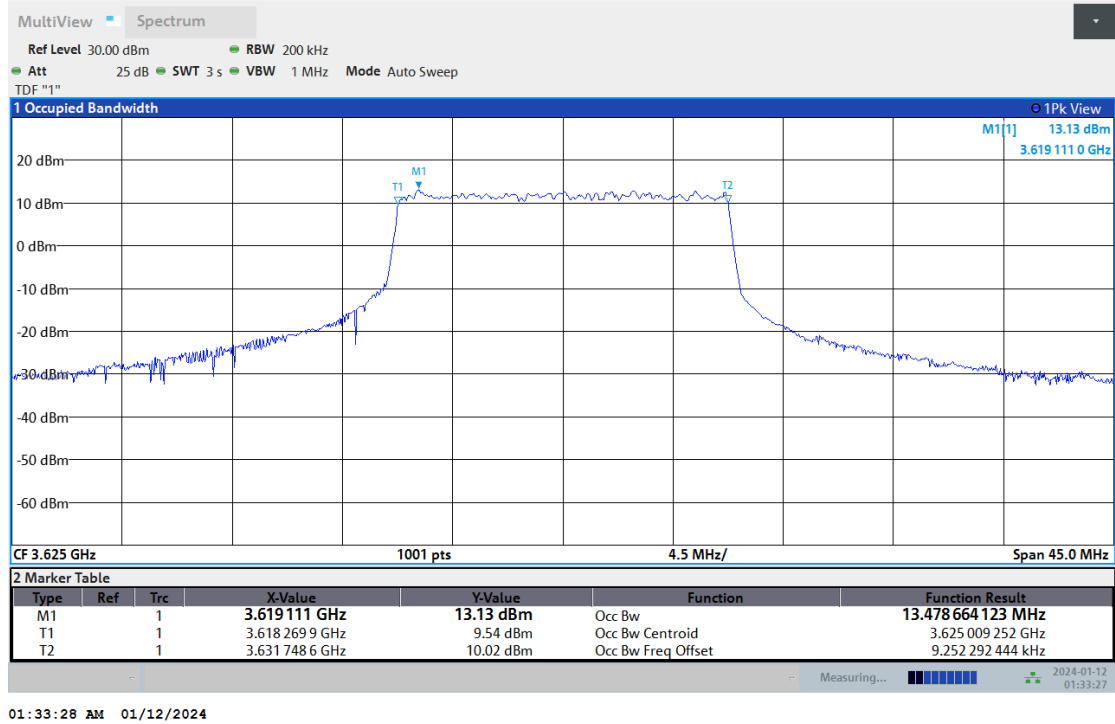


Band48-15MHz-16QAM-55990-75RB#0

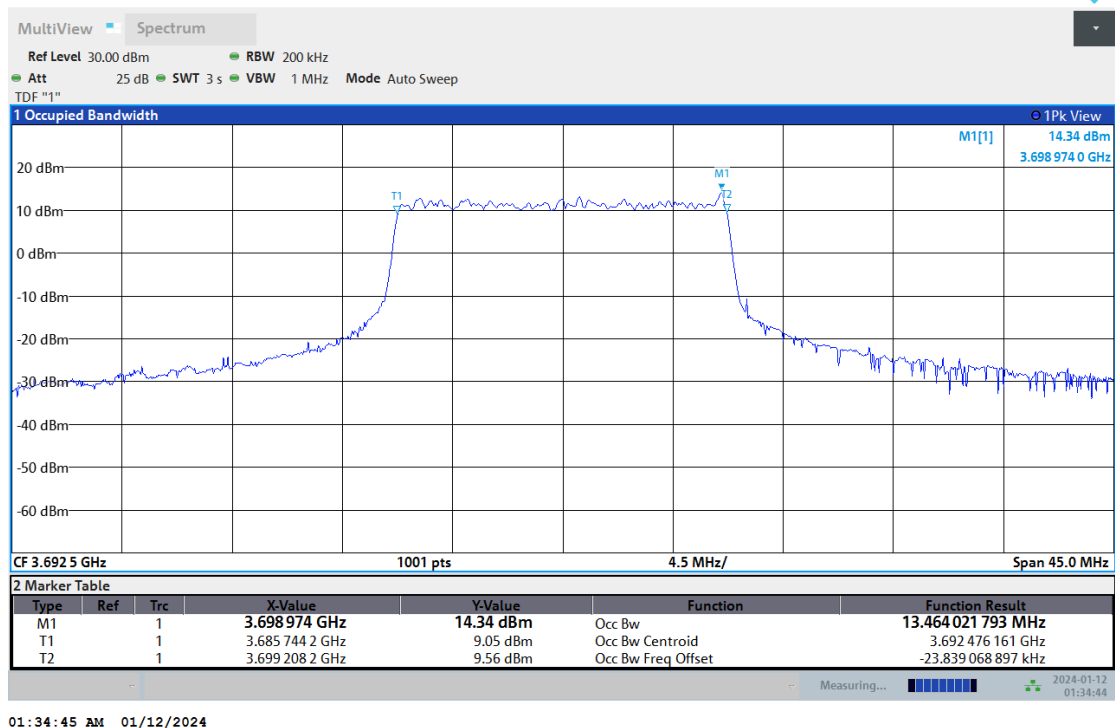


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Test Report No.: PSU-QSU2312140113RF05



Band48-15MHz-16QAM-56665-75RB#0

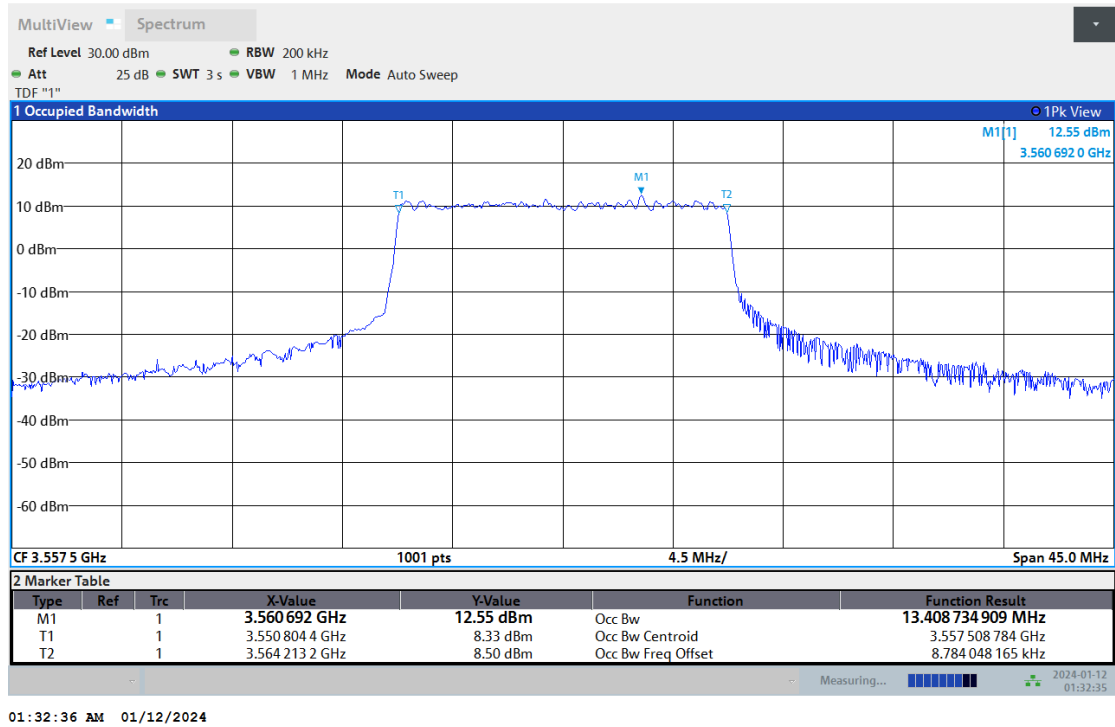


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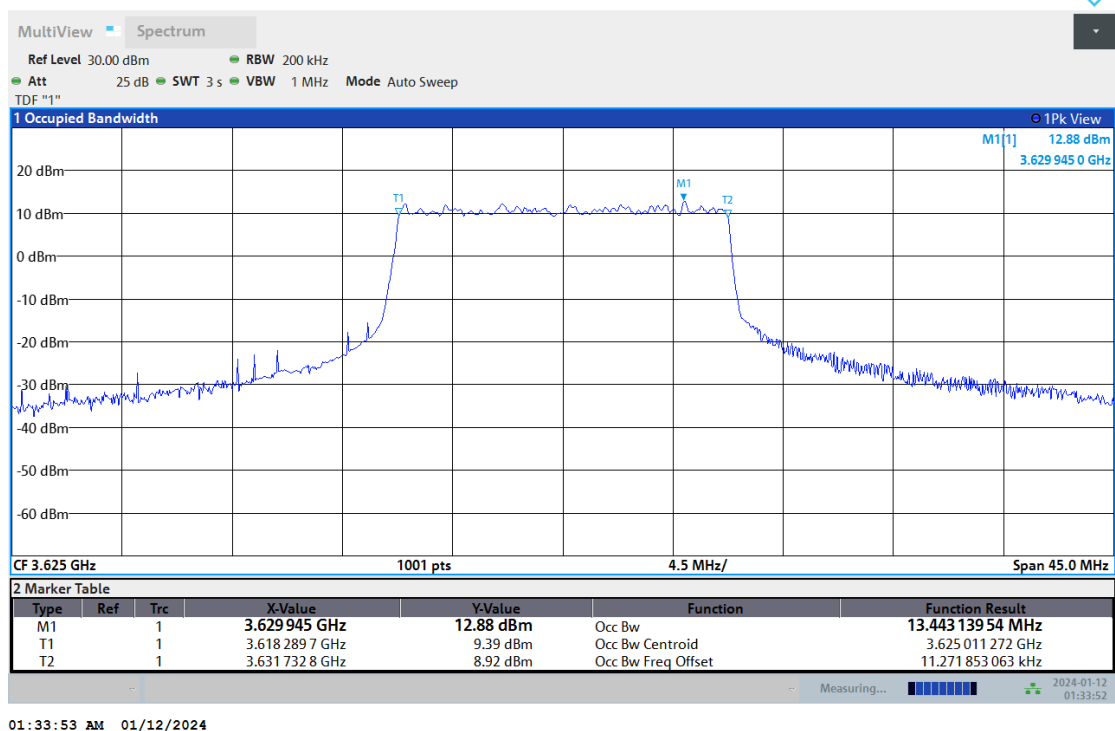


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VERITAS

Test Report No.: PSU-QSU2312140113RF05



Band48-15MHz-64QAM-55990-75RB#0

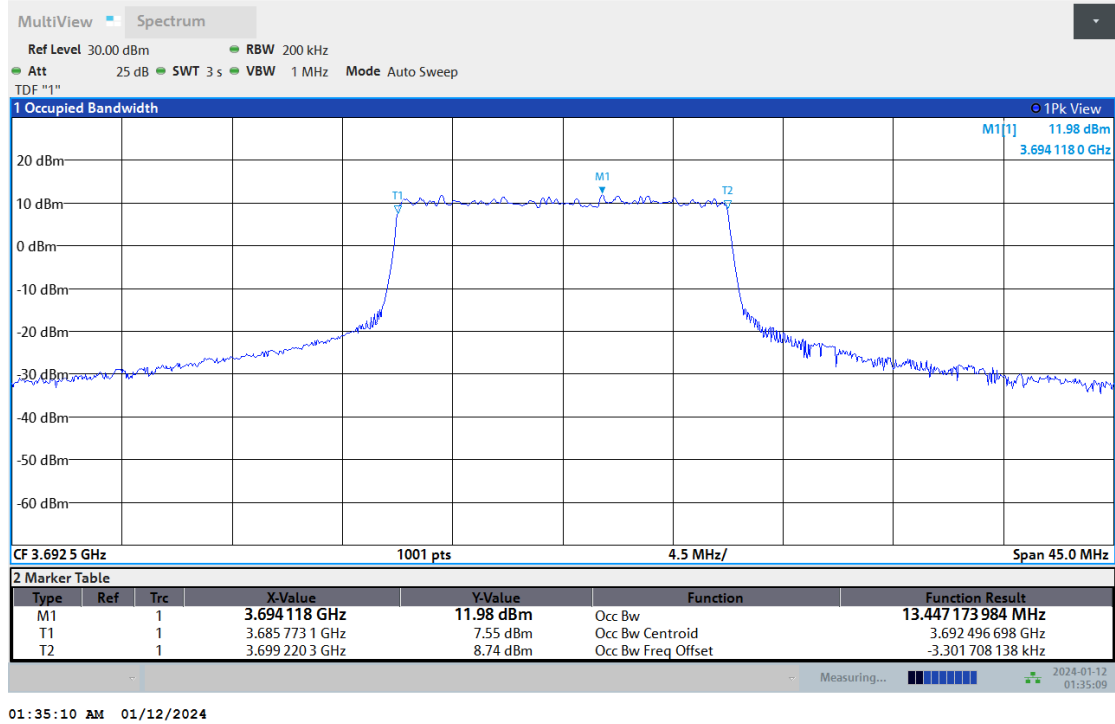


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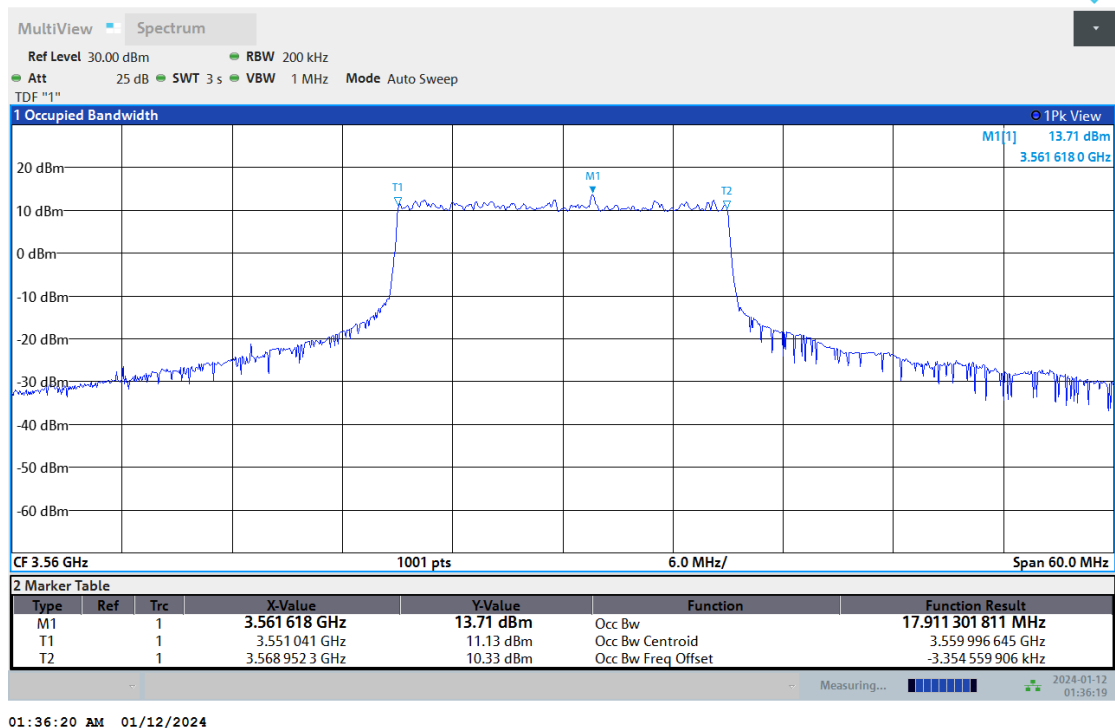


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Test Report No.: PSU-QSU2312140113RF05



Band48-20MHz-QPSK-55340-100RB#0

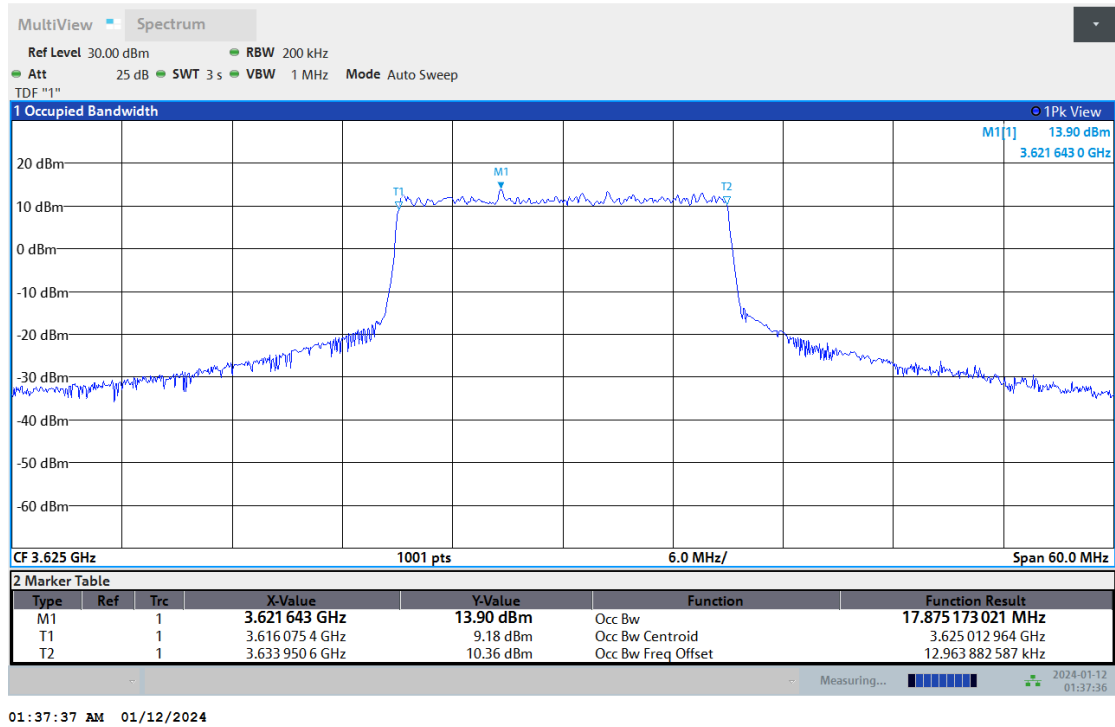


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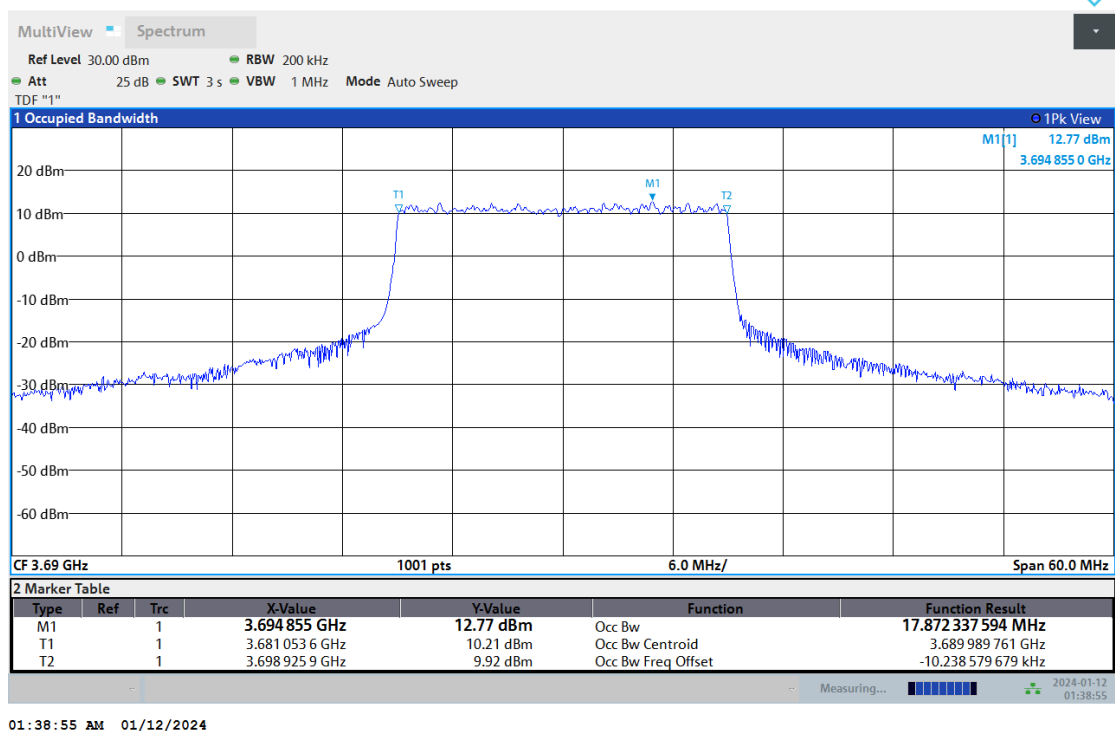


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VERITAS

Test Report No.: PSU-QSU2312140113RF05



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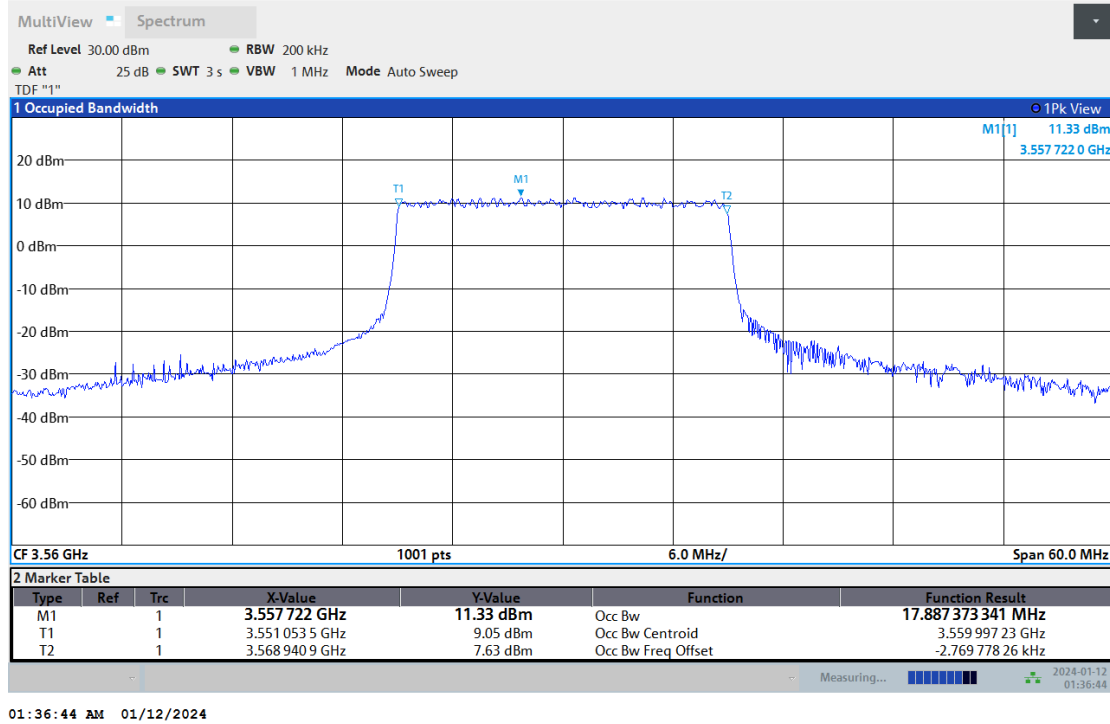


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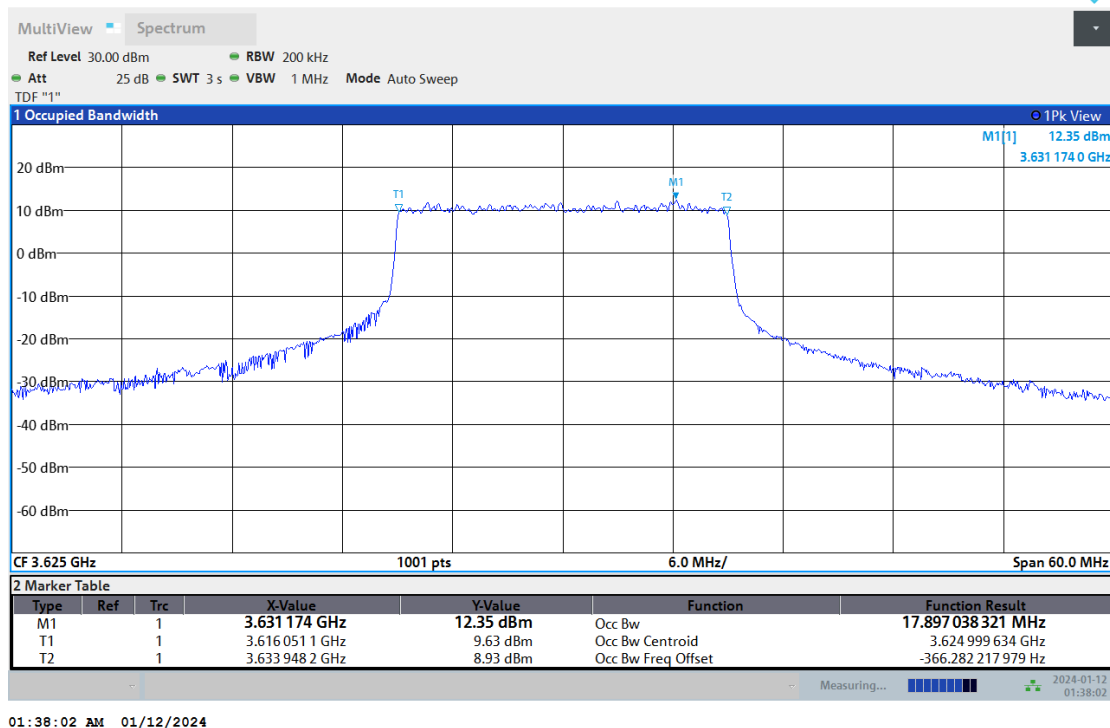


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Test Report No.: PSU-QSU2312140113RF05



Band48-20MHz-16QAM-55990-100RB#0

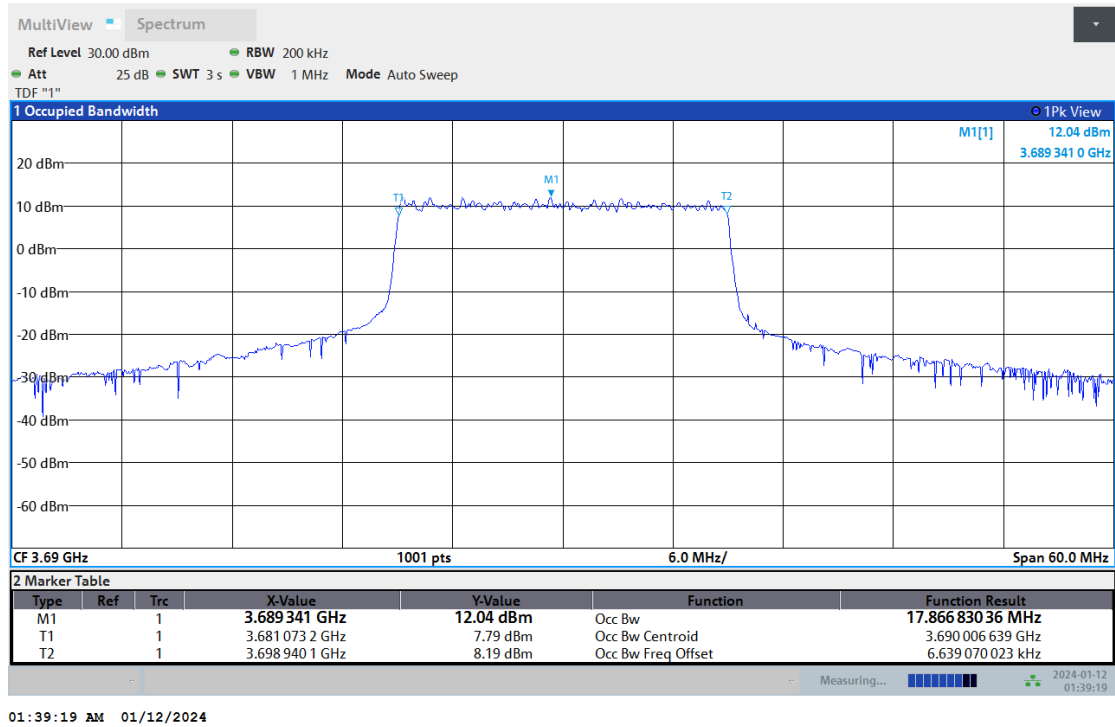


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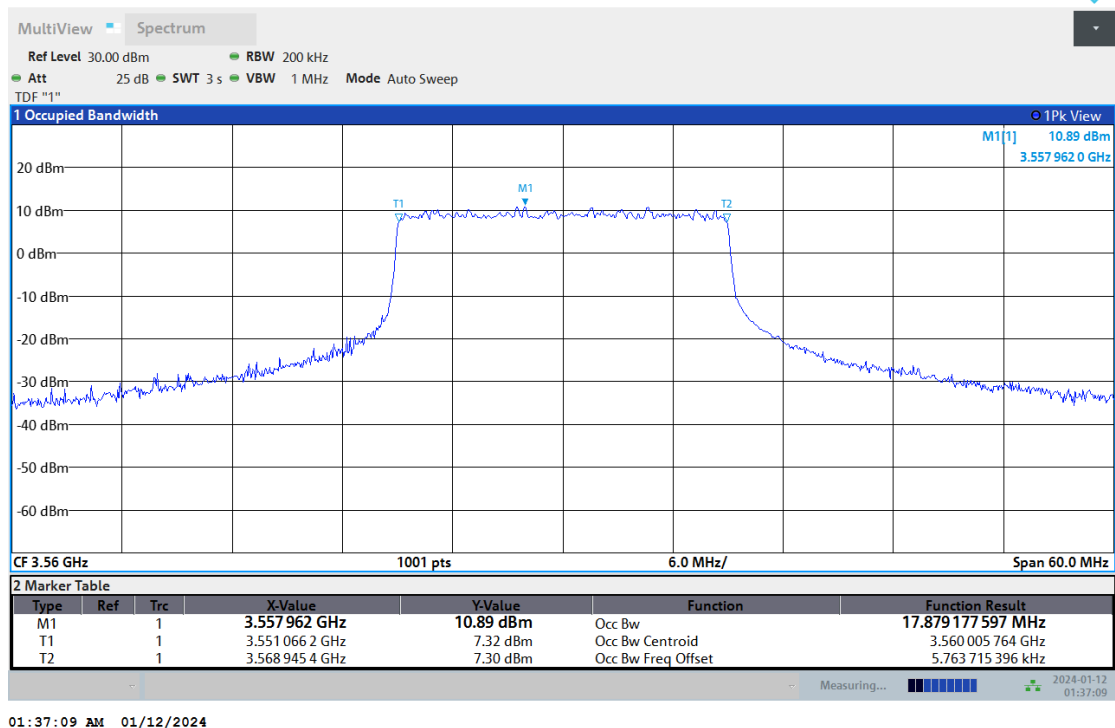


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VERITAS

Test Report No.: PSU-QSU2312140113RF05



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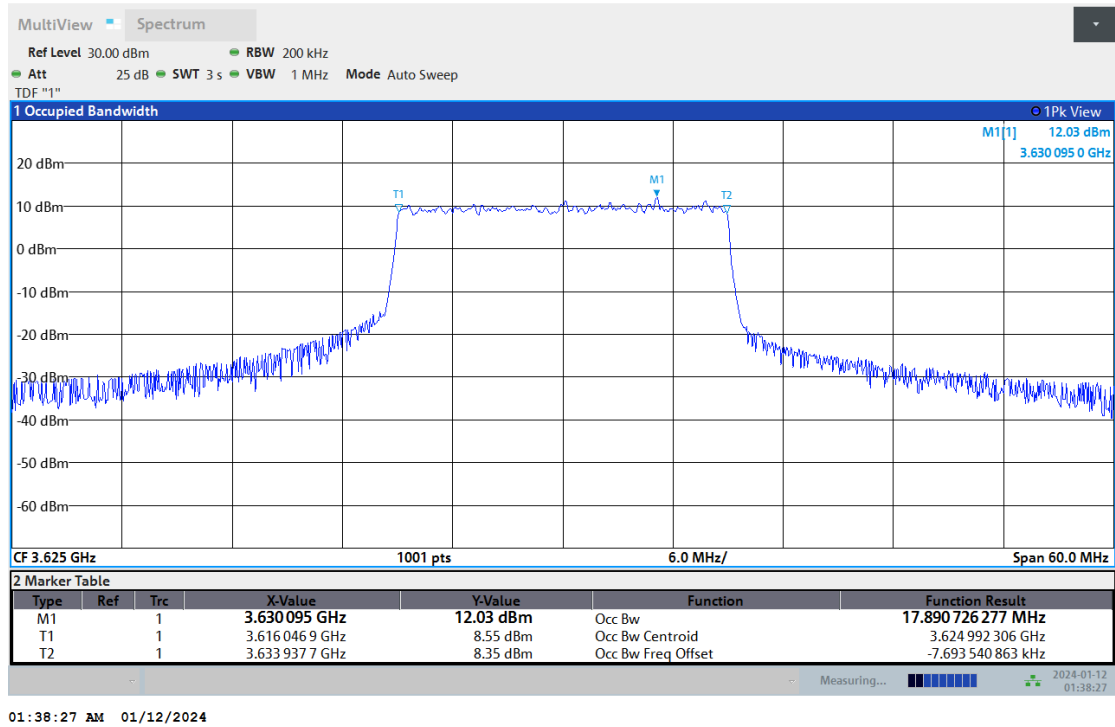


Band48-20MHz-64QAM-55990-100RB#0



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VERITAS

Test Report No.: PSU-QSU2312140113RF05



Band48-20MHz-64QAM-56640-100RB#0

