



FCC LISTED, REGISTRATION
NUMBER: 2764.01

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NUMBER: 23595-1

Test report No:
2993ERM.001

Test report

**USA FCC Part 96
CITIZENS BROADBAND RADIO SERVICE DEVICES OPERATING WITHIN THE
BAND 3550-3700 MHz.**

(*) Identification of item tested	EM7411 wireless module
(*) Trademark	AirPrime
(*) Model and /or type reference tested	EM7411
Other identification of the product	N/A
(*) Features	--
Manufacturer	SIERRA WIRELESS, INC. 13811 Wireless Way, Richmond, BC, Canada V6V 3A4 Canada.
Test method requested, standard	USA FCC Part 96 CITIZENS BROADBAND RADIO SERVICE DEVICES OPERATING WITHIN THE BAND 3550-3700 MHz. FCC KDB 940660 D01 Part 96 CBRS v03: Certification and Test Procedures for Citizens Broadband Radio Service Devices Authorized Under Part 96 of the Rules ANSI C63.26 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager  Digitally signed by Domingo Galvez DN: cn=Domingo Galvez, o=DEKRA Certification Inc., ou=Regulatory Lab, email=dgalvez@dekra.com, c=US Date: 2020.11.19 16:04:47 -05'00'
Date of issue	11-19-2020
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

To assure the traceability to other national and international laboratories, DEKRA Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Certification internal document PODT000.

	Frequency (MHz)	U(k=2)	Units
Radiated Spurious Emissions	30-180	4.27	dB
	180-1000	3.14	dB
	1000-18000	3.30	dB
	18000-40000	3.49	dB
Conducted Spurious emissions	30-1000	0.48	dB
	1000-40000	0.94	dB

Data provided by the client

The EM7411 wireless module is part of the EM Series delivering high speed connectivity and a wide selection of advanced air interfaces, including LTE Advanced with carrier aggregation.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
2993B.01	Sierra Wireless Module	EM7411	-	09/01/2020
2993B.02	Antenna 1	-	-	09/01/2020
2993B.03	Antenna 2	-	-	09/01/2020

1. Sample S/01 has undergone following test(s):

All conducted and Radiated tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports..... :	No Data Provided						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: Nominal 3.7V Highest 4.4 V Lowest 3.135 V					
☐	DC:						
Rated Power	Nominal 3.7V Highest 4.4 V Lowest 3.135 V						
Clock frequencies	Data not provided						
Other parameters..... :	Data not provided						
Software version	SWI9X50C_01.13.02.00 22fdf9						
Hardware version..... :	1.0						
Dimensions in cm (W x H x D).... :	42x30x2.3mm						
Mounting position..... :	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					

	☐	Hand-held equipment	
	☒	Other: Variable equipment	
Modules/parts	Module/parts of test item	Type	Manufacturer
	<i>Data not provided</i>		
Accessories (not part of the test item)	Description	Type	Manufacturer
	Antenna	PWB-7-60	PANORAMA ANTENNAS
	USB cable		
Documents as provided by the applicant.....	Description	File name	Issue date
	Antenna spec.	Antenna spec_PWB-7-60	
Copy of marking plate:			
No Markup plate found.			

Identification of the client

SIERRA WIRELESS, INC.
13811 Wireless Way, Richmond, BC, Canada V6V 3A4 Canada.

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	09-02-2020
Date (finish)	09-14-2020

Document history

Report number	Date	Description
2993ERM.001	11-19-2020	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semi anechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Sravani Gollamudi, Lourdes Valverde and Koji Nishimoto.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

FCC Part 96 Paragraph				
Section	Part 96. Spec Clause	Test Description	Verdict	Remark
A.1	§ 96.41 (b)	Maximum Effective Isotropic Radiated Power (EIRP)	P	N/A
A.2	§ 2.1046	Conducted Output Power	P	N/A
A.3	§ 2.1049	99% OBW and -26db Bandwidth	P	N/A
A.4	§ 96.41 (b)	Maximum Power Spectral Density (PSD)	N/A	Refer 1
A.5	§ 96.41 (g)	Peak to Average Power Ratio (PAPR)	P	N/A
A.6	§ 2.1051, 96.41 (e)	3.5 GHz Emission and Interference limits	P	N/A
A.7	§ 2.1051, 96.41 (e)	Spurious Emissions at Antenna Terminals	P	N/A
A.8	§ 2.1053	Radiated Spurious Emission	P	N/A
A.9	§ 2.1055	Frequency Stability	P	N/A
<u>Note:</u> 1. The device is declared as an End User device.				

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
1014	Signal analyzer	Rohde & Schwarz	FSV40	2019/04	2021/04
1149	Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	2019/09	2021/09
1010	EMI Test Receiver	Rohde & Schwarz	ESR 7	2019/08	2021/08
101	Climatic chamber	Espec	ESL-2CA	2020/04	2021/04

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber	Frankonia	SAC 3 plus "L"	N/A	N/A
1065	BiconiLog antenna	ETS LINDGREN	3142E	2020/08	2023/08
1056	Double-ridge Waveguide Horn antenna 1-18 GHz	ETS LINDGREN	3116C	2020/01	2023/01
1057	Double-ridge Waveguide Horn antenna 18-40 GHz	ETS LINDGREN	3115	2020/06	2023/06
1012	EMI Test Receiver	Rohde & Schwarz	ESR26	2019/12	2021/12
1014	Spectrum analyzer	Rohde & Schwarz	FSV40	2019/04	2021/04
0981	RF pre-amplifier 1-18 GHz	Bonn Elektronik	BLMA 0118-2A	2018/10	2020/10
0982	RF pre-amplifier 18-40 GHz	Bonn Elektronik	BLMA 1840-1M	2018/10	2020/10
1293	HIGH PASS FILTER 4.5-21GHZ	TEMSTRON	ST-4.5GA3292HS	N/A	N/A
964	HIGH PASS FILTER 18-28GHZ	TEMSTRON	ST-18GA3141-HS	N/A	N/A
1314	EMC32 software	Rohde & Schwarz	-	N/A	N/A

Appendix A: Test results

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PRODUCT INFORMATION

The following information is provided by the client

Product specification	Description	Yes/No
Base Station Class	Wide area Base Station (Macro Cell)	No
	Medium Range Base Stations (Micro Cell)	No
	Local area Base Station (Picocell)	No
	Home Base Station (Femtocell)	No
Category of CBSD	Category A	No
	Category B	No
	End User	Yes
Type of Installation	Professional Installation	
DC power supply voltage (V)	3.7	
RF Test Tool Software of CBS	N/A	
TX Frequency	5 MHz: 3552.2MHz — 3697.5 MHz 10 MHz: 3555 MHz — 3695 MHz 15 MHz: 3557.5 MHz — 3692.5 MHz 20 MHz: 3560 MHz — 3690 MHz	
RX Frequency	5 MHz: 3552.2MHz — 3697.5 MHz 10 MHz: 3555 MHz — 3695 MHz 15 MHz: 3557.5 MHz — 3692.5 MHz 20 MHz: 3560 MHz — 3690 MHz	
Maximum Output Power to Antenna (dBm)	-	
Maximum 99% Occupied Bandwidth (MHz)	5 MHz,10 MHz,15 MHz,20 MHz	
Type of Modulation	QPSK	Yes
	16QAM	Yes
	64QAM	Yes
	256QAM	No
Antenna Information	Gain: 4 dBi	

Test modes available:

1. Band 48:

- 5 MHz Bandwidth (25 RB):
 - . Lowest Channel (3552.5 MHz) / Middle Channel (3625 MHz) / Highest Channel (3697.5 MHz)
- 10 MHz Bandwidth (50 RB):
 - . Lowest Channel (3555 MHz) / Middle Channel (3625 MHz) / Highest Channel (3695 MHz)
- 15 MHz Bandwidth (75 RB):
 - . Lowest Channel (3557.5 MHz) / Middle Channel (3625 MHz) / Highest Channel (3692.5 MHz)
- 20 MHz Bandwidth (100 RB):
 - . Lowest Channel (3560 MHz) / Middle Channel (3625 MHz) / Highest Channel (3690 MHz)

2. Band 42:

- 5 MHz Bandwidth (25 RB):
 - . Lowest Channel (3552.5 MHz) / Middle Channel (3575 MHz) / Highest Channel (3597.5 MHz)
- 10 MHz Bandwidth (50 RB):
 - . Lowest Channel (3555 MHz) / Middle Channel (3575 MHz) / Highest Channel (3595 MHz)
- 15 MHz Bandwidth (75 RB):
 - . Lowest Channel (3557.5 MHz) / Middle Channel (3575 MHz) / Highest Channel (3592.5 MHz)
- 20 MHz Bandwidth (100 RB):
 - . Lowest Channel (3560 MHz) / Middle Channel (3575 MHz) / Highest Channel (3590 MHz)

3. Band 43:

- 5 MHz Bandwidth (25 RB):
 - . Lowest Channel (3602.5 MHz) / Middle Channel (3650 MHz) / Highest Channel (3697.5 MHz)
- 10 MHz Bandwidth (50 RB):
 - . Lowest Channel (3605 MHz) / Middle Channel (3650 MHz) / Highest Channel (3695 MHz)
- 15 MHz Bandwidth (75 RB):
 - . Lowest Channel (3607.5 MHz) / Middle Channel (3650 MHz) / Highest Channel (3692.5 MHz)
- 20 MHz Bandwidth (100 RB):
 - . Lowest Channel (3610 MHz) / Middle Channel (3650 MHz) / Highest Channel (3690 MHz)

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01 LTE Band 48	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.7 \text{ Vdc}$ <u>Type of power supply:</u> DC voltage from AC/DC power supply. <u>Temperature (°C):</u> $T_{\text{nom}} = +15 \text{ to } +35$ $T_{\text{min}} = -40 (*)$ $T_{\text{max}} = +55 (*)$ The subscript nom indicates normal test conditions. The subscripts min and max indicate extreme test conditions (minimum and maximum respectively). N/A: Not Applicable. (*) Declared by applicant.
	The minimum, half, and maximum numbers of RBs for all BWs were evaluated, and 1 RB with middle offset configuration was identified as worst case. All the tests were performed by using the 1 RB with middle offset configuration. All supported modulations were evaluated and QPSK was identified as worst case. All the test results and plots are shown for QPSK modulation only except for A.1, A.2, and A.3 tests (QPSK and 16-QAM). <u>Test Frequencies for Conducted/Radiated tests:</u> -5 MHz Bandwidth (25 RB): Lowest Channel (3552.5 MHz) Middle Channel (3625 MHz) Highest Channel (3697.5 MHz) -10 MHz Bandwidth (50 RB): Lowest Channel (3555 MHz)

	Middle Channel (3625 MHz) Highest Channel (3695 MHz) -15 MHz Bandwidth (75 RB): Lowest Channel (3557.5 MHz) Middle Channel (3625 MHz) Highest Channel (3692.5 MHz) -20 MHz Bandwidth (100 RB): Lowest Channel (3560 MHz) Middle Channel (3625 MHz) Highest Channel (3690 MHz)
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TEST CONDITIONS	DESCRIPTION
TC#02 LTE Band 42	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.7 \text{ Vdc}$ <u>Type of power supply:</u> DC voltage from AC/DC power supply. <u>Temperature (°C):</u> $T_{\text{nom}} = +15 \text{ to } +35$ $T_{\text{min}} = -40 (*)$ $T_{\text{max}} = +55 (*)$ The subscript nom indicates normal test conditions. The subscripts min and max indicate extreme test conditions (minimum and maximum respectively). N/A: Not Applicable. (*) Declared by applicant. The minimum, half, and maximum numbers of RBs for all BWs were evaluated, and 1 RB with middle offset configuration was identified as worst case. All the tests were performed by using the 1 RB with middle offset configuration.

All supported modulations were evaluated and QPSK was identified as worst case. All the test results and plots are shown for QPSK modulation only except for A.1, A.2, and A.3 tests (QPSK and 16-QAM).

Test Frequencies for Conducted/Radiated tests:

-5 MHz Bandwidth (25 RB):

Lowest Channel (3552.5 MHz)

Middle Channel (3575 MHz)

Highest Channel (3597.5 MHz)

-10 MHz Bandwidth (50 RB):

Lowest Channel (3555 MHz)

Middle Channel (3575 MHz)

Highest Channel (3595 MHz)

-15 MHz Bandwidth (75 RB):

Lowest Channel (3557.5 MHz)

Middle Channel (3575 MHz)

Highest Channel (3592.5 MHz)

-20 MHz Bandwidth (100 RB):

Lowest Channel (3560 MHz)

Middle Channel (3575 MHz)

Highest Channel (3590 MHz)

TEST CONDITIONS	DESCRIPTION
TC#03 LTE Band 43	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.7 \text{ Vdc}$ <u>Type of power supply:</u> DC voltage from AC/DC power supply. <u>Temperature (°C):</u> $T_{\text{nom}} = +15 \text{ to } +35$ $T_{\text{min}} = -40 (*)$ $T_{\text{max}} = +55 (*)$ The subscript nom indicates normal test conditions. The subscripts min and max indicate extreme test conditions (minimum and maximum respectively). N/A: Not Applicable. (*) Declared by applicant. The minimum, half, and maximum numbers of RBs for all BWs were evaluated, and 1 RB with middle offset configuration was identified as worst case. All the tests were performed by using the 1 RB with middle offset configuration. All supported modulations were evaluated and QPSK was identified as worst case. All the test results and plots are shown for QPSK modulation only except for A.1, A.2, and A.3 tests (QPSK and 16-QAM). <u>Test Frequencies for Conducted/Radiated tests:</u> -5 MHz Bandwidth (25 RB): Lowest Channel (3602.5 MHz) Middle Channel (3650 MHz) Highest Channel (3697.5 MHz)

	-10 MHz Bandwidth (50 RB): Lowest Channel (3605 MHz) Middle Channel (3650 MHz) Highest Channel (3695 MHz) -15 MHz Bandwidth (75 RB): Lowest Channel (3607.5 MHz) Middle Channel (3650 MHz) Highest Channel (3692.5 MHz) -20 MHz Bandwidth (100 RB): Lowest Channel (3610 MHz) Middle Channel (3650 MHz) Highest Channel (3690 MHz) Highest Channel (3690 MHz)
--	--

TEST A.1: MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER (EIRP) TEST A.2: CONDUCTED OUTPUT POWER

LIMITS:	Product standard:	Part 96.41 Subclause (b)
	Test standard:	ANSI C63.26-2015

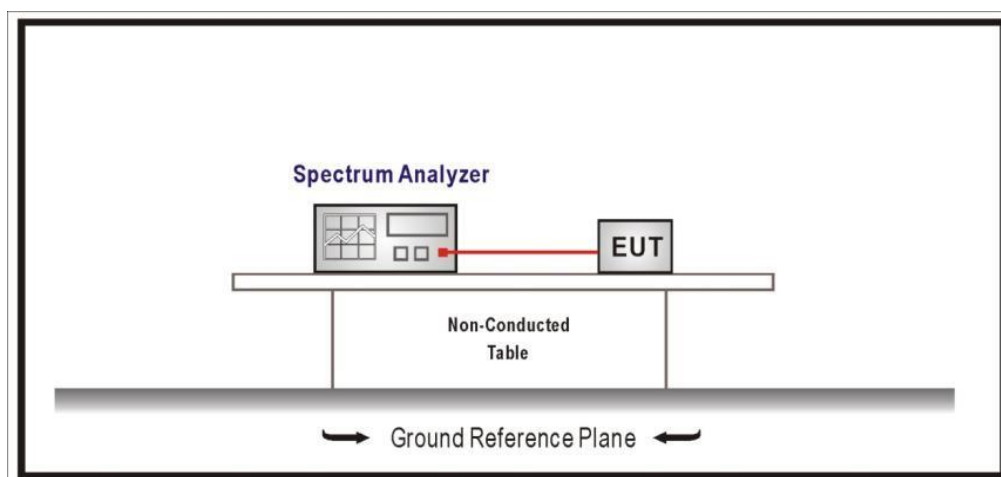
LIMITS

The maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the following table.

Device	Maximum EIRP (dBm/ 10 MHz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD	47	37

TEST SETUP:

The procedure in Section 5.2 of ANSI C63.26-2015 is acceptable for performing power measurements. Measurements can be made using either a peak or average (RMS) detector, if the appropriate procedure is followed. The RMS detector was used for the measurement at each frequency with following the procedure stated in the Section 5.2.4.4.2 of ANSI C63.26-2015.



EIRP was tested with a minimum, half, and maximum number of RBs for all the BWs and identified that the worst case is using full RBs. All the tests were performed by using the 1 RB with middle offset.

The device consists of a non-constant duty cycle so the maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi) and cable losses were added in RF level offset to get the accurate measured power level in the average power measurement.

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 48)
TEST RESULTS:	PASS

5 MHz BW

QPSK

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	18.45	18.29	18.38
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	22.45	22.29	22.38
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	17.54	17.57	17.90
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.54	21.57	21.90
Measurement uncertainty (dB)	<± 1.79		

10 MHz BW

QPSK

	Lowest frequency 3555 MHz	Middle frequency 3625 MHz	Highest frequency 3695 MHz
Measured Power (dBm/10 MHz)	18.44	18.48	18.53
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	22.44	22.48	22.53
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

16QAM

	Lowest frequency 3555 MHz	Middle frequency 3625 MHz	Highest frequency 3695 MHz
Measured Power (dBm/10 MHz)	17.54	17.82	17.80
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.54	21.82	21.80
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	18.19	18.37	18.61
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	22.19	22.37	22.61
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	15.65	15.82	15.96
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	19.65	19.82	19.96
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

20 MHz BW

QPSK

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	18.19	18.50	18.51
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	22.19	22.50	22.51
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	15.62	15.80	15.83
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	19.62	19.80	19.83
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS(Cont.):

Reference only

5 MHz BW

QPSK

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/5 MHz)	18.03	18.27	18.57
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/5 MHz)	22.03	22.27	22.57
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/5 MHz)	17.51	17.55	17.88
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/5 MHz)	21.51	21.55	21.88
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/15 MHz)	18.14	18.41	18.61
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/15 MHz)	22.14	22.41	22.61
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

Reference only

16QAM

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/15 MHz)	15.56	15.80	15.87
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/15 MHz)	19.56	19.80	19.87
Measurement uncertainty (dB)	<± 1.79		

20 MHz BW

QPSK

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
Measured Power (dBm/20 MHz)	18.30	18.57	18.59
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/20 MHz)	22.30	22.57	22.59
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
Measured Power (dBm/20 MHz)	15.70	15.83	15.90
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/20 MHz)	19.70	19.83	19.90
Measurement uncertainty (dB)	<± 1.79		

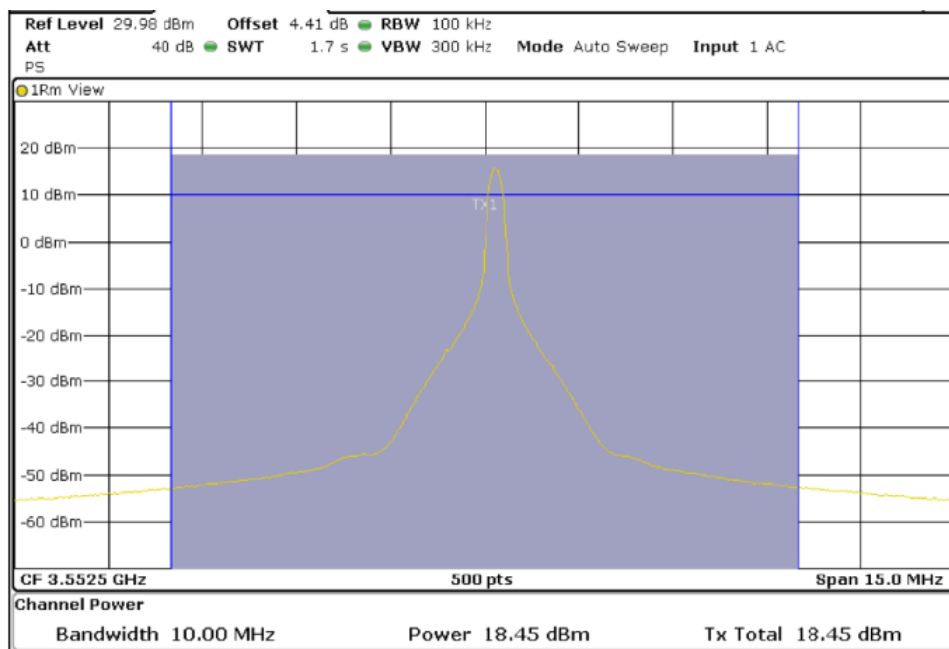
Verdict: PASS

(See next plots for worst-case (QPSK) modulation)

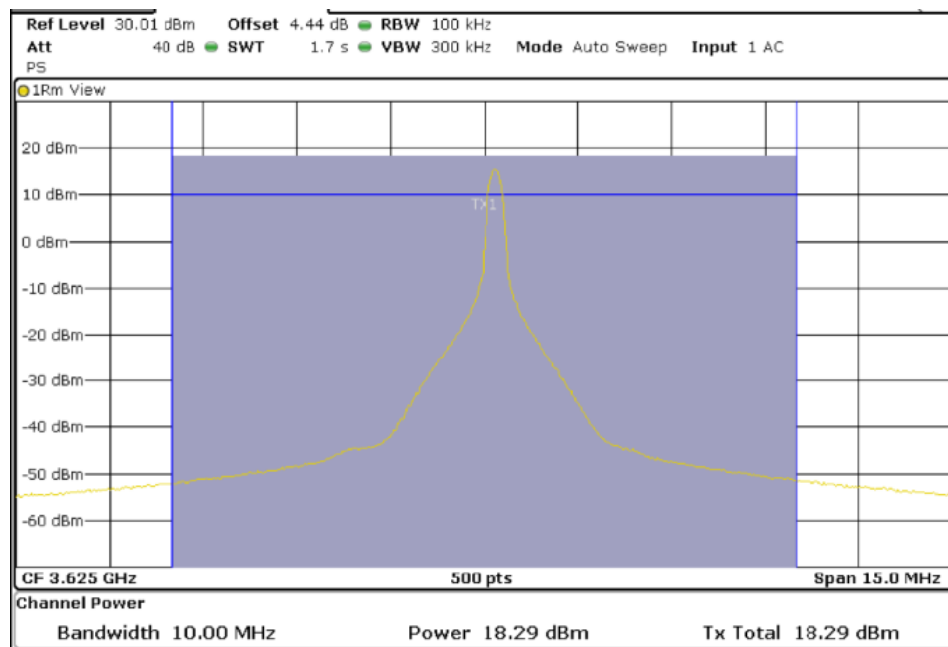
TEST RESULTS (Cont.):

5 MHz BW

Lowest Channel (3552.5 MHz)

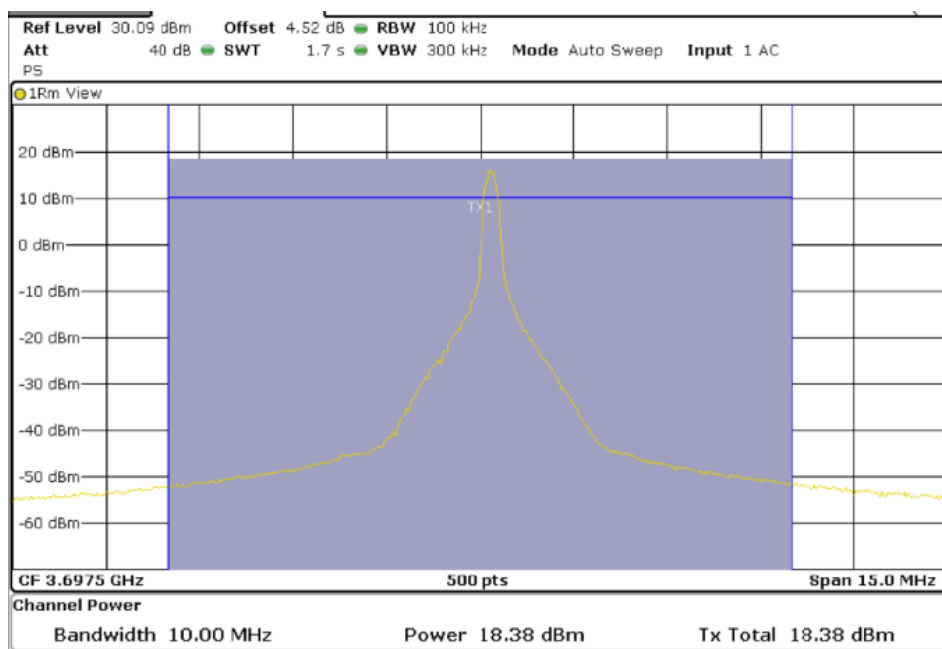


Middle Channel (3625 MHz)



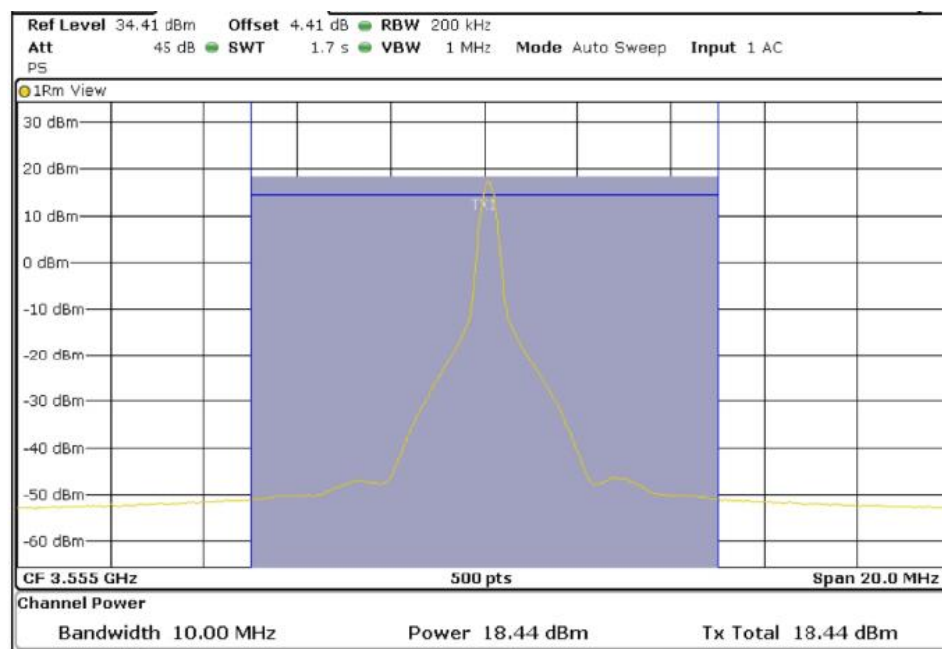
TEST RESULTS (Cont.):

Highest Channel (3697.5 MHz)



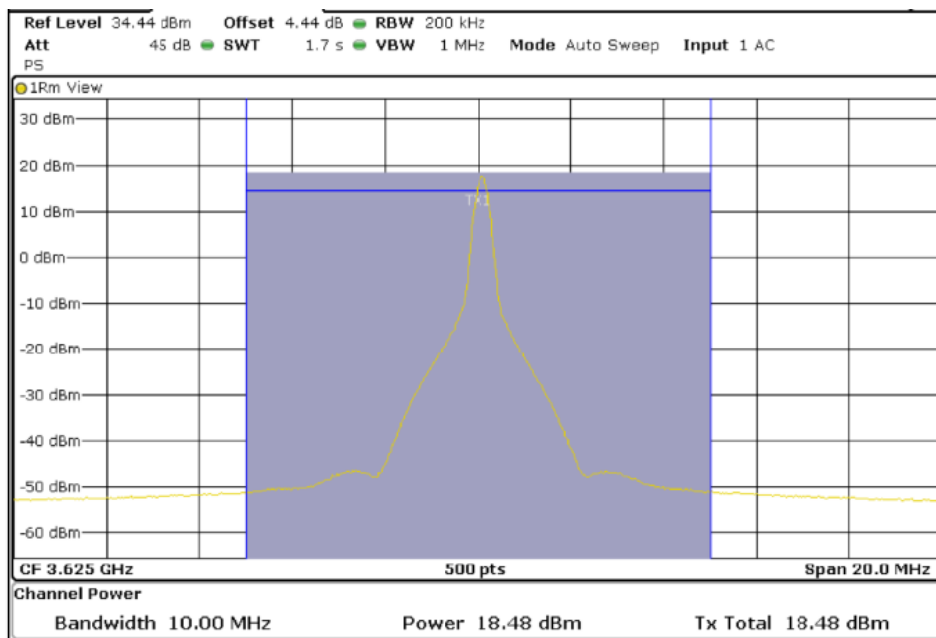
10 MHz BW

Lowest Channel (3555 MHz)

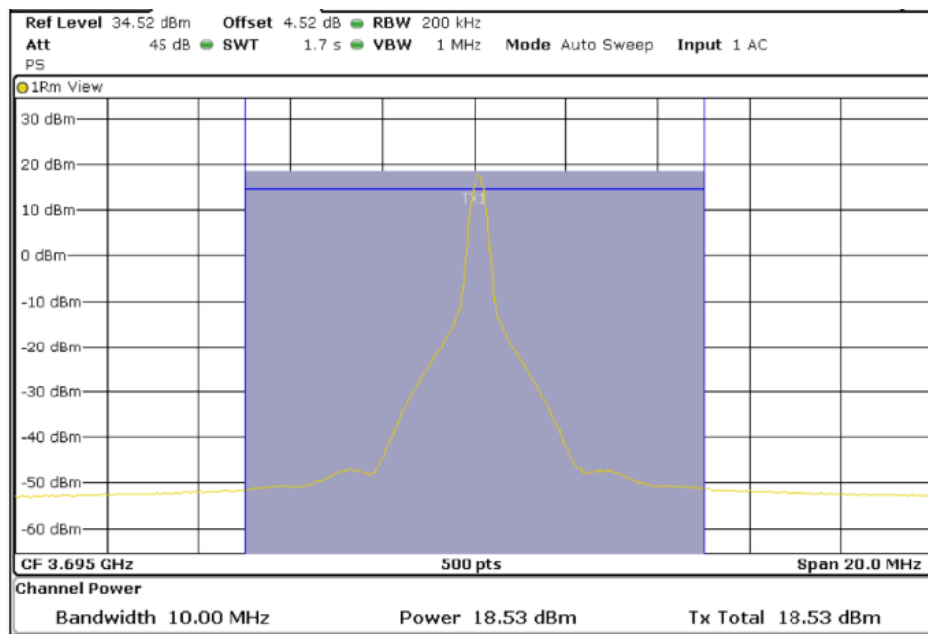


TEST RESULTS (Cont.):

Middle Channel (3625 MHz)



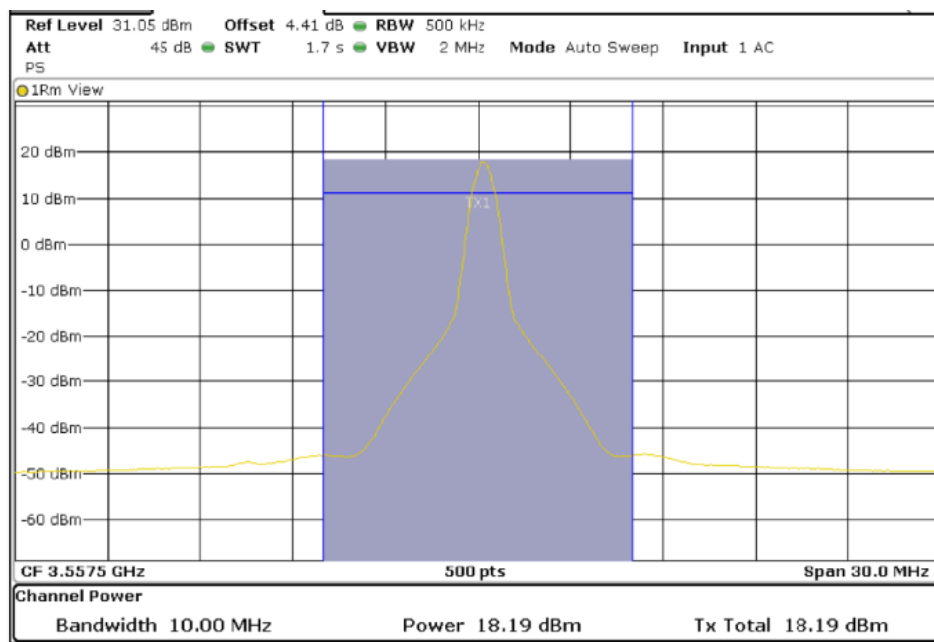
Highest Channel (3695 MHz)



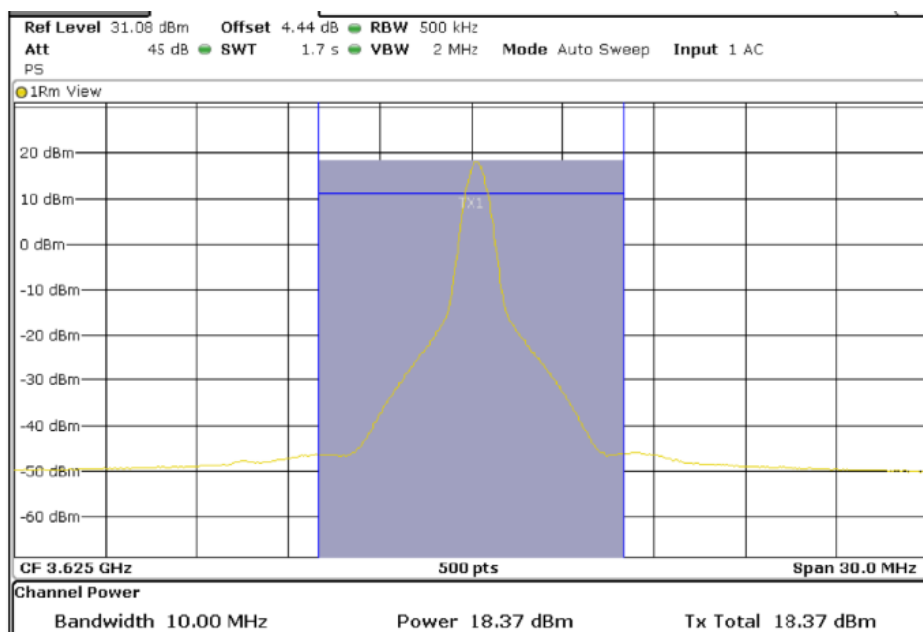
TEST RESULTS (Cont.):

15 MHz BW

Lowest Channel (3557.5 MHz)

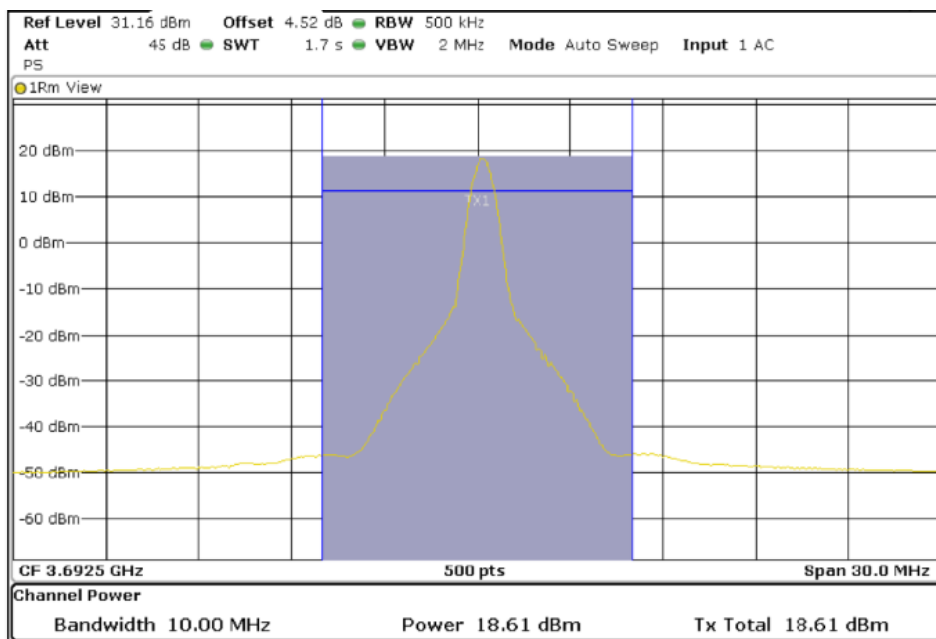


Middle Channel (3625 MHz)



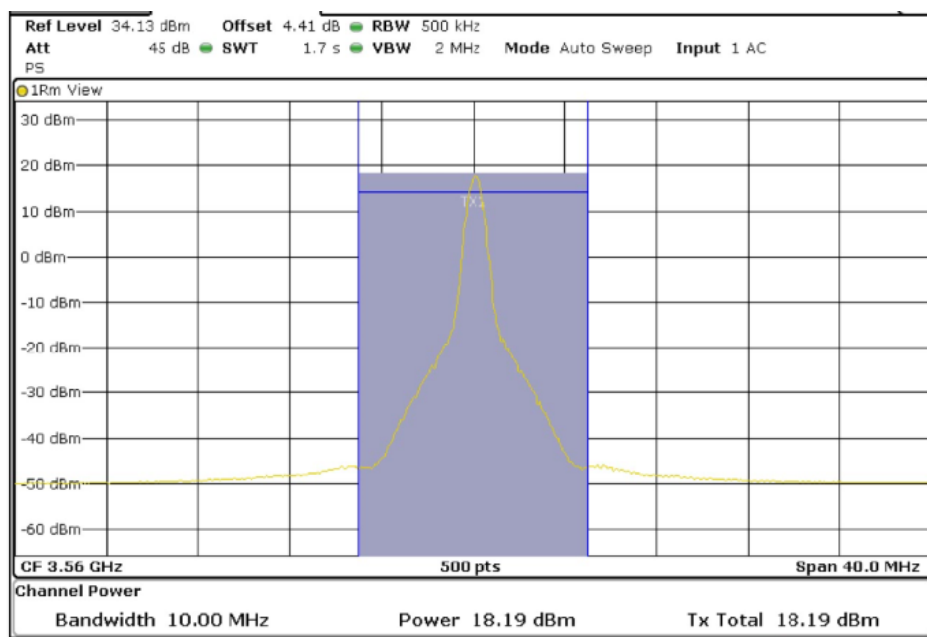
TEST RESULTS (Cont.):

Highest Channel (3692.5 MHz)



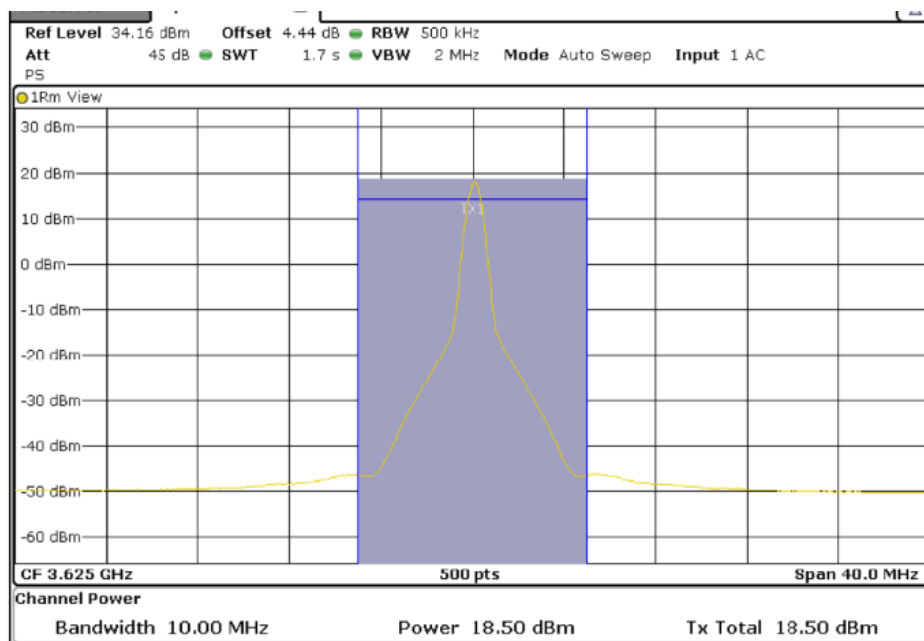
20 MHz BW (QPSK only)

Lowest Channel (3560 MHz)

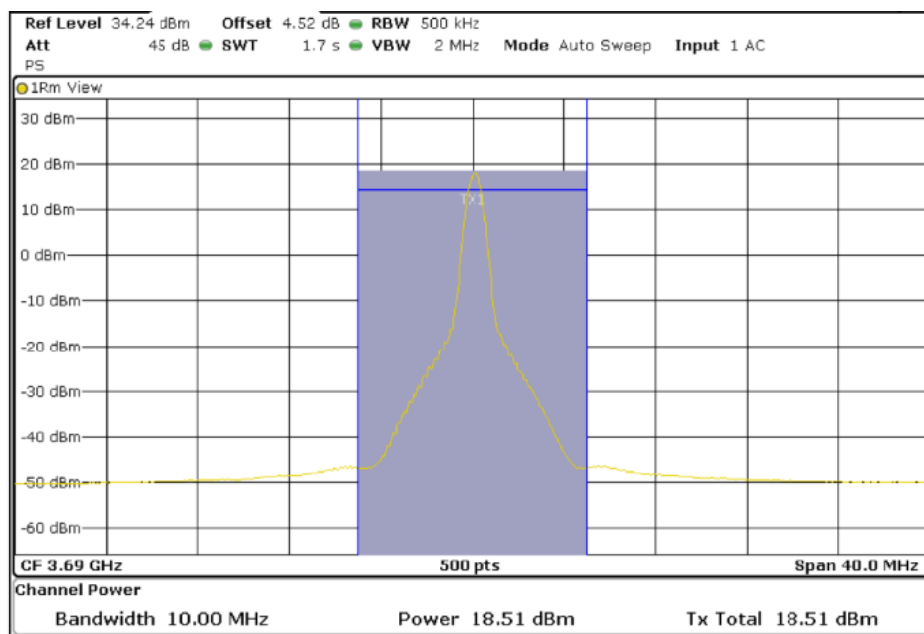


TEST RESULTS (Cont.):

Middle Channel (3625 MHz)



Highest Channel (3690 MHz)



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 42)
TEST RESULTS:	PASS

5 MHz BW

QPSK

	Lowest frequency 3552.5 MHz	Middle frequency 3575 MHz	Highest frequency 3597.5 MHz
Measured Power (dBm/10 MHz)	17.86	17.90	17.97
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.86	21.90	21.97
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	17.08	16.94	17.26
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.08	20.94	21.26
Measurement uncertainty (dB)	<± 1.79		

10 MHz BW

QPSK

	Lowest frequency 3555 MHz	Middle frequency 3575 MHz	Highest frequency 3595 MHz
Measured Power (dBm/10 MHz)	17.84	17.91	18.02
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.84	21.91	22.02
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

16QAM

	Lowest frequency 3555 MHz	Middle frequency 3575 MHz	Highest frequency 3595 MHz
Measured Power (dBm/10 MHz)	17.54	17.13	17.38
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.54	21.13	21.38
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3557.5 MHz	Middle frequency 3575 MHz	Highest frequency 3592.5 MHz
Measured Power (dBm/10 MHz)	17.80	17.71	17.99
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.80	21.71	21.99
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3557.5 MHz	Middle frequency 3575 MHz	Highest frequency 3592.5 MHz
Measured Power (dBm/10 MHz)	17.16	17.10	17.25
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.16	21.10	21.25
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

20 MHz BW

QPSK

	Lowest frequency 3560 MHz	Middle frequency 3575 MHz	Highest frequency 3590 MHz
Measured Power (dBm/10 MHz)	17.81	17.66	17.86
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.81	21.66	21.86
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3560 MHz	Middle frequency 3575 MHz	Highest frequency 3590 MHz
Measured Power (dBm/10 MHz)	17.19	17.12	17.20
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.19	21.12	21.20
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS:

Reference only

5 MHz BW

QPSK

	Lowest frequency 3552.5 MHz	Middle frequency 3575 MHz	Highest frequency 3597.5 MHz
Measured Power (dBm/5 MHz)	17.71	17.85	17.90
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/5 MHz)	21.71	21.85	21.90
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/5 MHz)	16.97	17.05	17.21
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/5 MHz)	20.97	21.05	21.21
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3557.5 MHz	Middle frequency 3575 MHz	Highest frequency 3592.5 MHz
Measured Power (dBm/15 MHz)	17.81	17.70	17.89
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/15 MHz)	21.81	21.70	21.89
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

Reference only

16QAM

	Lowest frequency 3557.5 MHz	Middle frequency 3575 MHz	Highest frequency 3592.5 MHz
Measured Power (dBm/15 MHz)	17.17	17.10	17.36
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/15 MHz)	21.17	21.10	21.36
Measurement uncertainty (dB)	<± 1.79		

20 MHz BW

QPSK

	Lowest frequency 3560 MHz	Middle frequency 3575 MHz	Highest frequency 3590 MHz
Measured Power (dBm/20 MHz)	17.81	17.59	17.80
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/20 MHz)	21.81	21.59	21.80
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3560 MHz	Middle frequency 3575 MHz	Highest frequency 3590 MHz
Measured Power (dBm/20 MHz)	17.14	17.02	17.29
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/20 MHz)	21.14	21.02	21.29
Measurement uncertainty (dB)	<± 1.79		

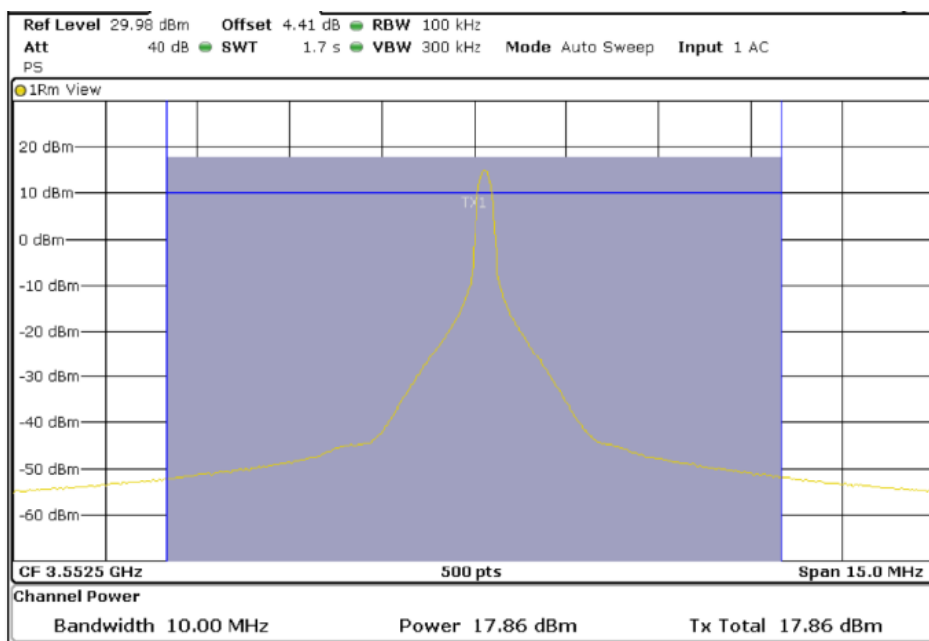
Verdict: PASS

(See next plots for worst case (QPSK) modulation)

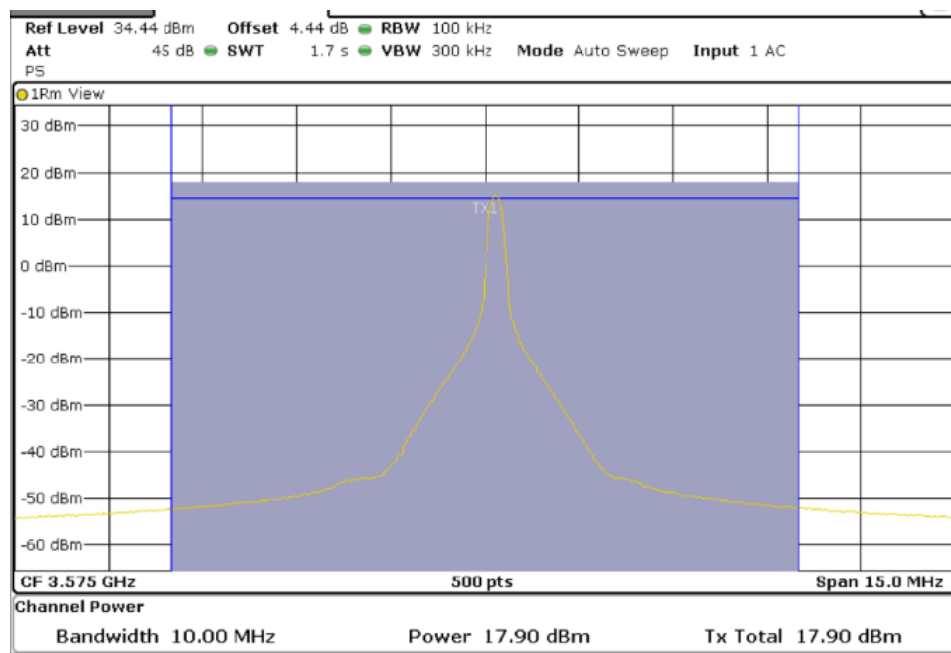
TEST RESULTS (Cont.):

5 MHz BW

Lowest Channel (3552.5 MHz)

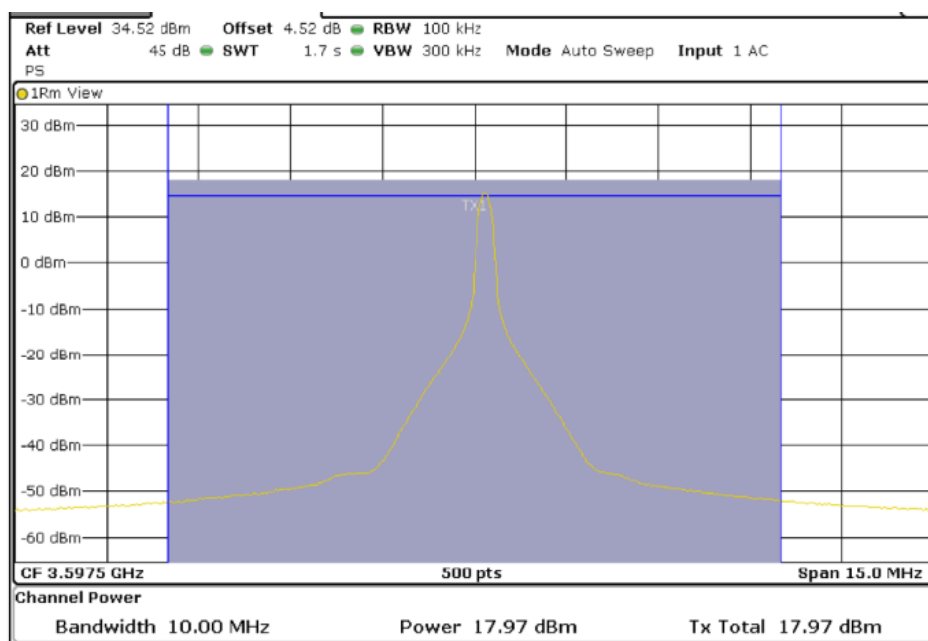


Middle Channel (3575 MHz)



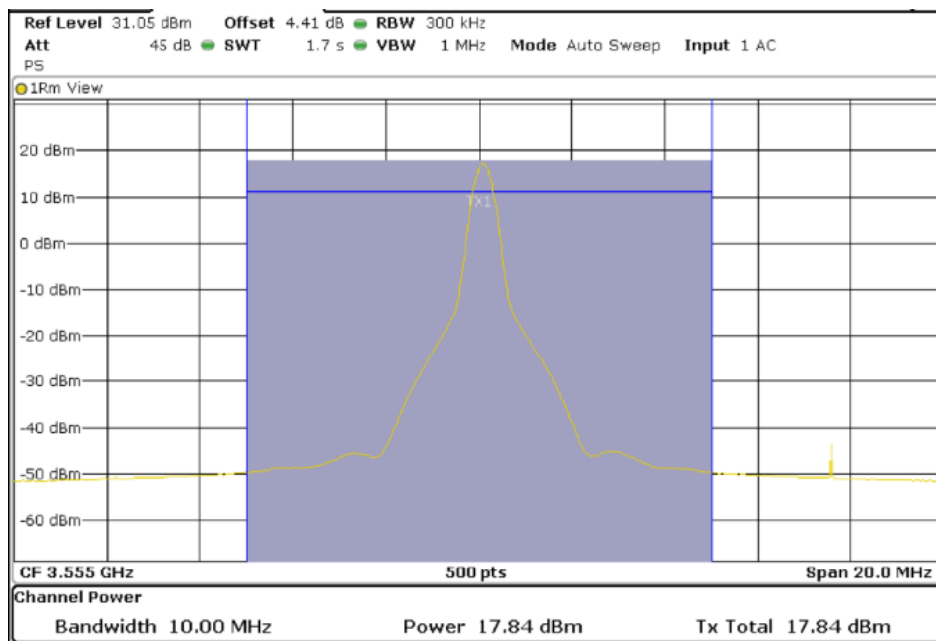
TEST RESULTS (Cont.):

Highest Channel (3597.5 MHz)



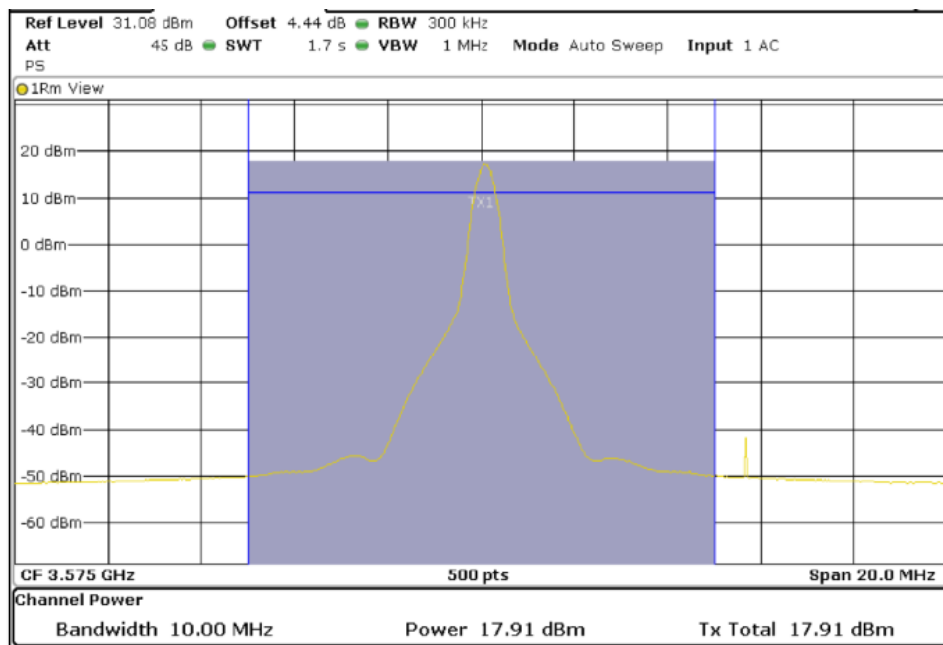
10 MHz BW

Lowest Channel (3555 MHz)

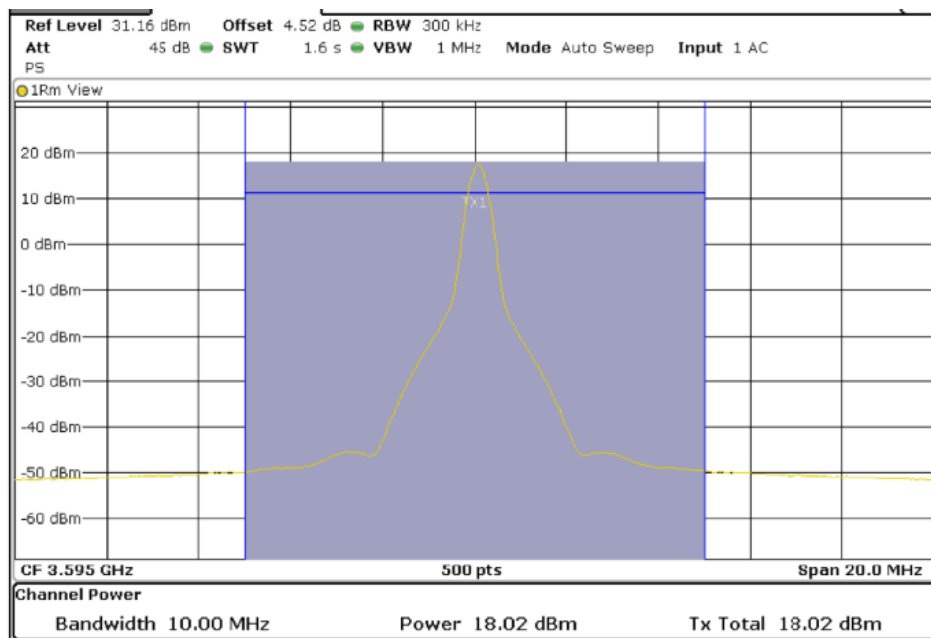


TEST RESULTS (Cont.):

Middle Channel (3575 MHz)



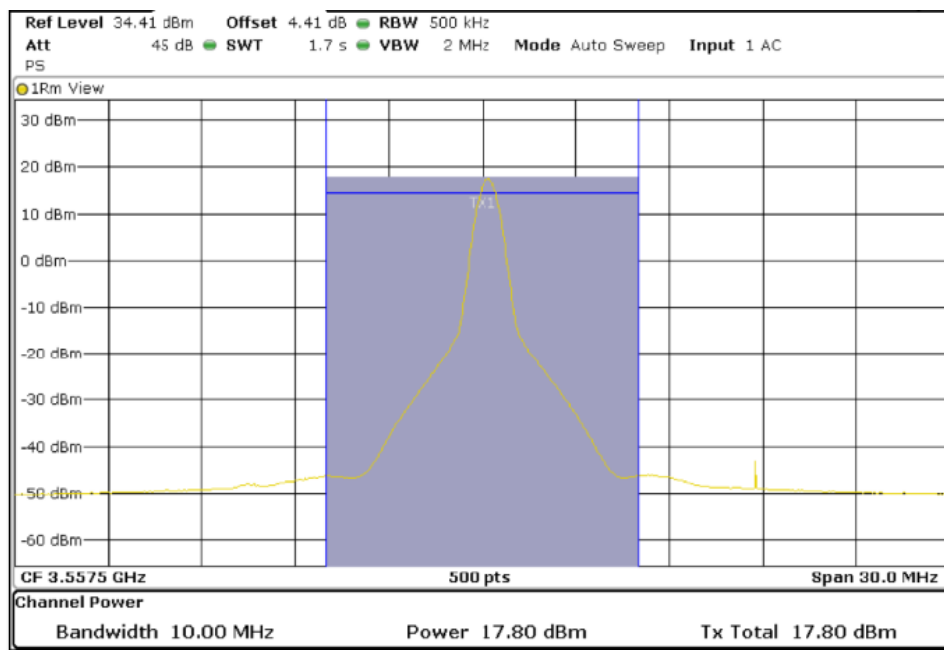
Highest Channel (3595 MHz)



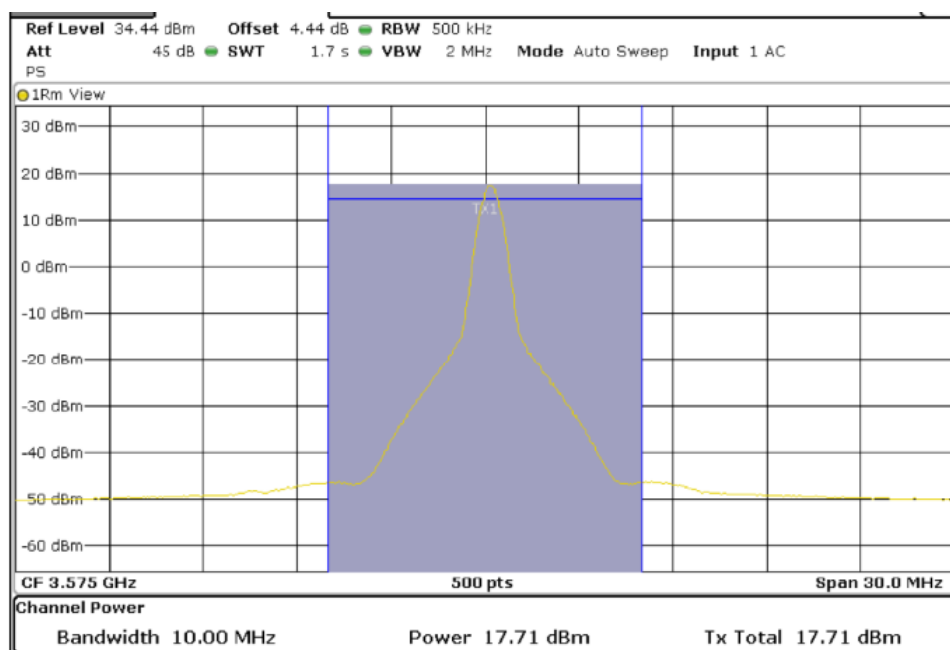
TEST RESULTS (Cont.):

15 MHz BW

Lowest Channel (3557.5 MHz)

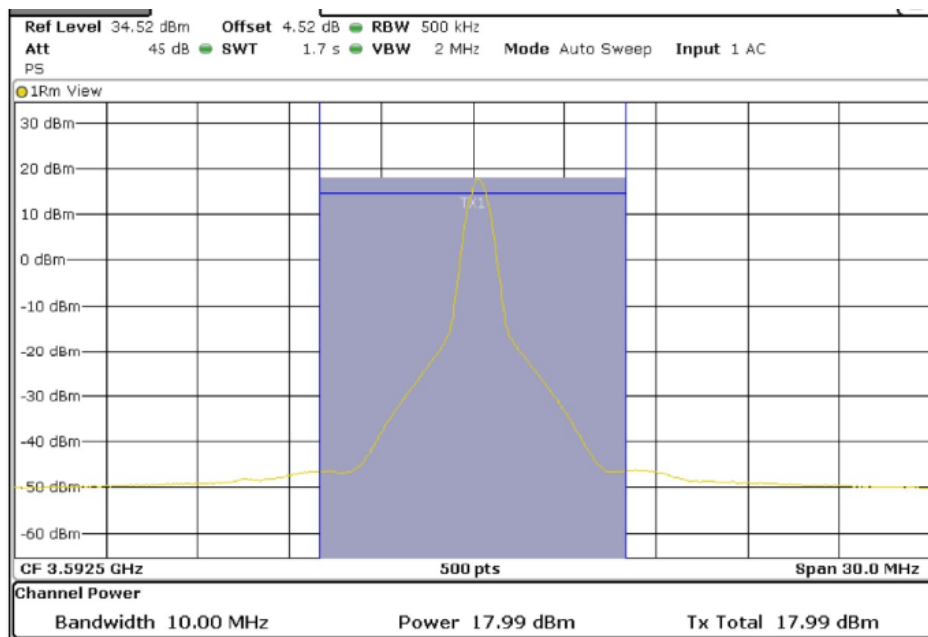


Middle Channel (3575 MHz)



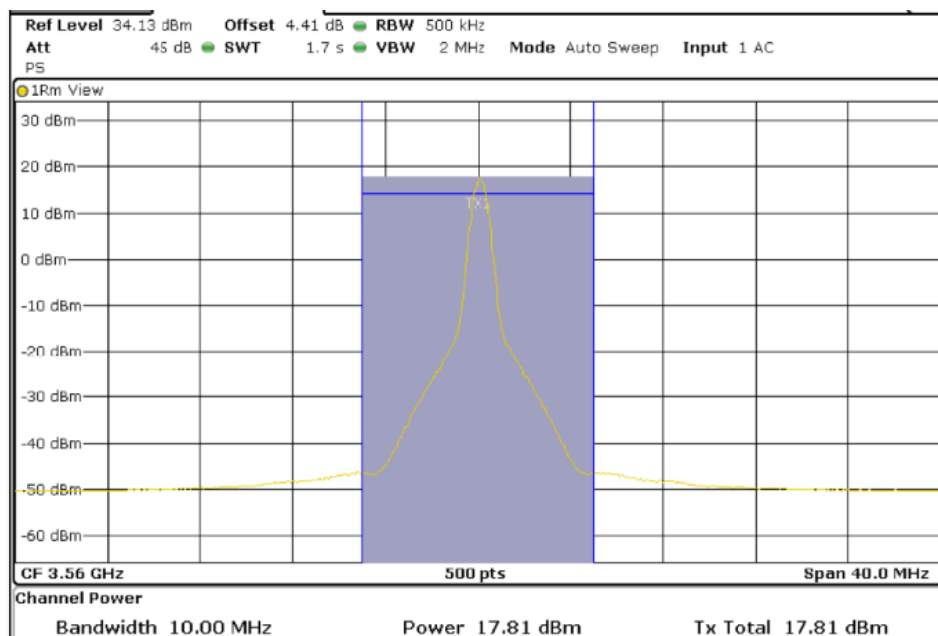
TEST RESULTS (Cont.):

Highest Channel (3592.5 MHz)



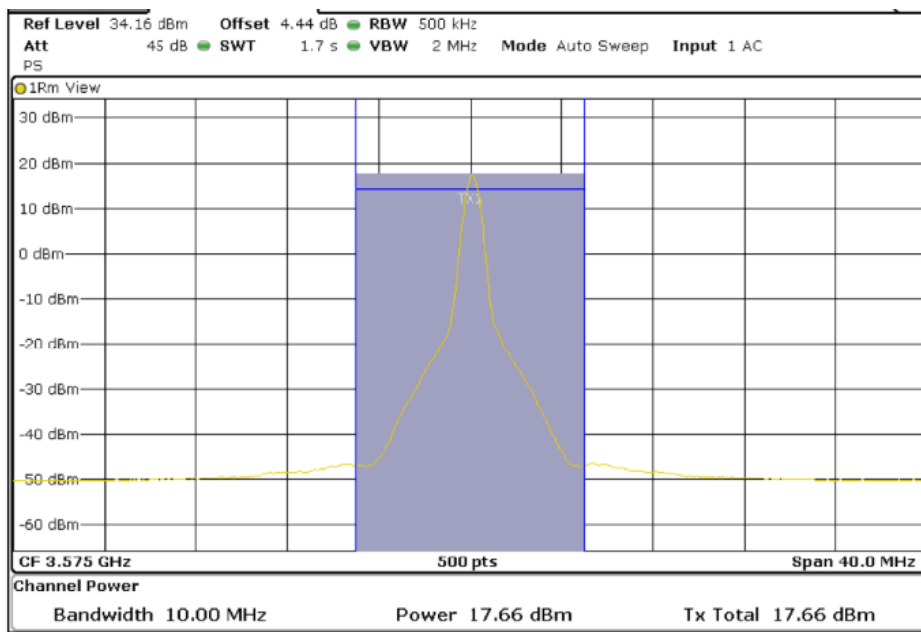
20 MHz BW

Lowest Channel (3560 MHz)

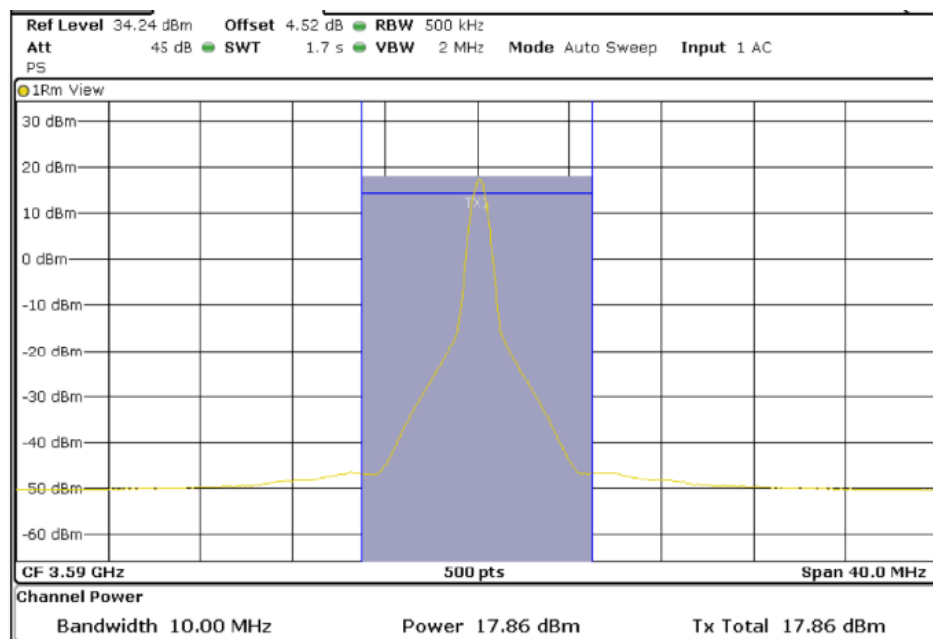


TEST RESULTS (Cont.):

Middle Channel (3575 MHz)



Highest Channel (3590 MHz)



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (Band 43)
TEST RESULTS:	PASS

5 MHz BW

QPSK

	Lowest frequency 3602.5 MHz	Middle frequency 3650 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	17.84	17.96	18.02
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.84	21.96	22.02
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3602.5 MHz	Middle frequency 3650 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	17.01	17.15	17.38
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.01	21.15	21.38
Measurement uncertainty (dB)	<± 1.79		

10 MHz BW

QPSK

	Lowest frequency 3605 MHz	Middle frequency 3650 MHz	Highest frequency 3695 MHz
Measured Power (dBm/10 MHz)	17.92	18.06	18.30
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.92	22.06	22.30
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

16QAM

	Lowest frequency 3605 MHz	Middle frequency 3650 MHz	Highest frequency 3695 MHz
Measured Power (dBm/10 MHz)	17.31	17.20	17.51
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.31	21.20	21.51
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3607.5 MHz	Middle frequency 3650 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	17.67	17.74	17.98
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.67	21.74	21.98
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3607.5 MHz	Middle frequency 3650 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	17.10	17.05	17.25
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.10	21.05	21.25
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

20 MHz BW

QPSK

	Lowest frequency 3610 MHz	Middle frequency 3650 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	17.73	17.70	17.89
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.73	21.70	21.89
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3610 MHz	Middle frequency 3650 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	17.01	17.03	17.22
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.01	21.03	21.22
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

Reference only

5 MHz BW

QPSK

	Lowest frequency 3602.5 MHz	Middle frequency 3650 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	17.67	17.98	17.99
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.67	21.98	21.99
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3602.5 MHz	Middle frequency 3650 MHz	Highest frequency 3697.5 MHz
Measured Power (dBm/10 MHz)	16.85	17.31	17.28
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	20.85	21.31	21.28
Measurement uncertainty (dB)	<± 1.79		

15 MHz BW

QPSK

	Lowest frequency 3607.5 MHz	Middle frequency 3650 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	17.65	17.76	18.01
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.65	21.76	22.01
Measurement uncertainty (dB)	<± 1.79		

TEST RESULTS (Cont.):

Reference only

16QAM

	Lowest frequency 3607.5 MHz	Middle frequency 3650 MHz	Highest frequency 3692.5 MHz
Measured Power (dBm/10 MHz)	17.07	17.13	17.31
Maximum declared Antenna gain	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.07	21.13	21.31
Measurement uncertainty (dB)	<± 1.79		

20 MHz BW

QPSK

	Lowest frequency 3610 MHz	Middle frequency 3650 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	17.74	17.71	17.88
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.74	21.71	21.88
Measurement uncertainty (dB)	<± 1.79		

16QAM

	Lowest frequency 3610 MHz	Middle frequency 3650 MHz	Highest frequency 3690 MHz
Measured Power (dBm/10 MHz)	17.01	17.01	17.18
Maximum declared Antenna gain (dBi)	4.00	4.00	4.00
Maximum EIRP (dBm/10 MHz)	21.01	21.01	21.18
Measurement uncertainty (dB)	<± 1.79		

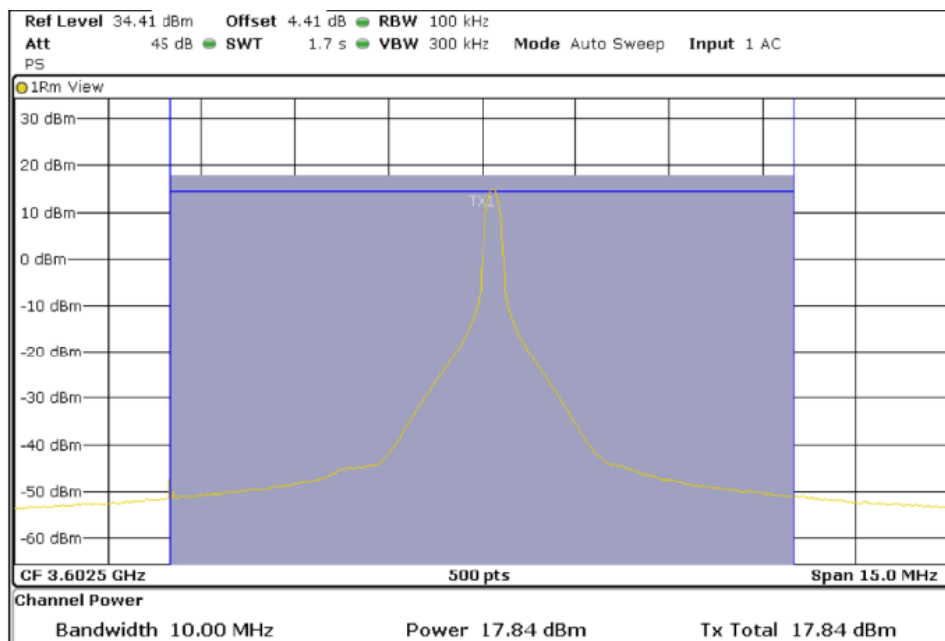
Verdict: PASS

(See next plots for worst case (QPSK) modulation)

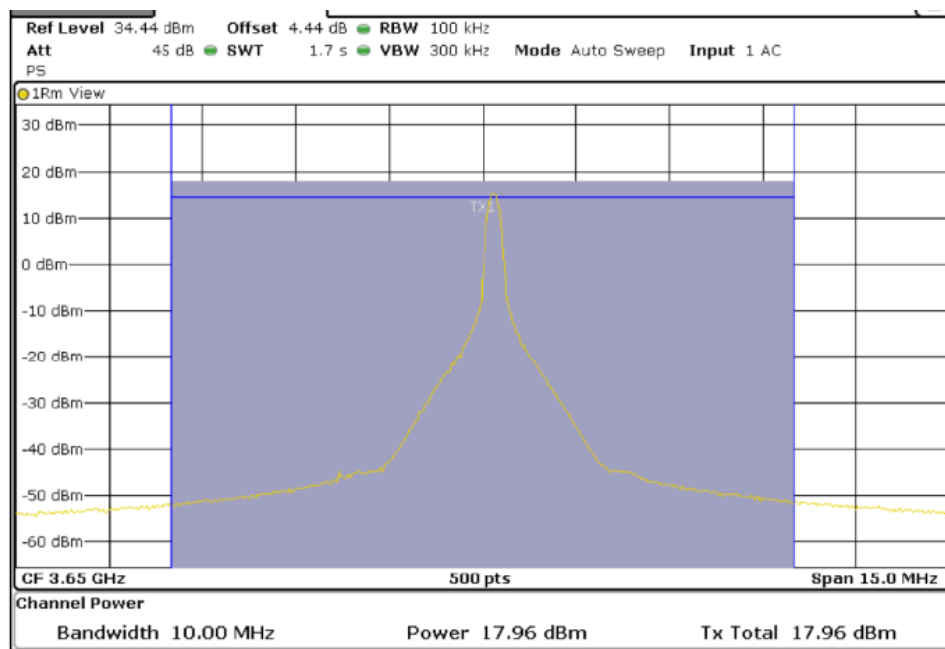
TEST RESULTS (Cont.):

5 MHz BW

Lowest Channel (3602.5 MHz)

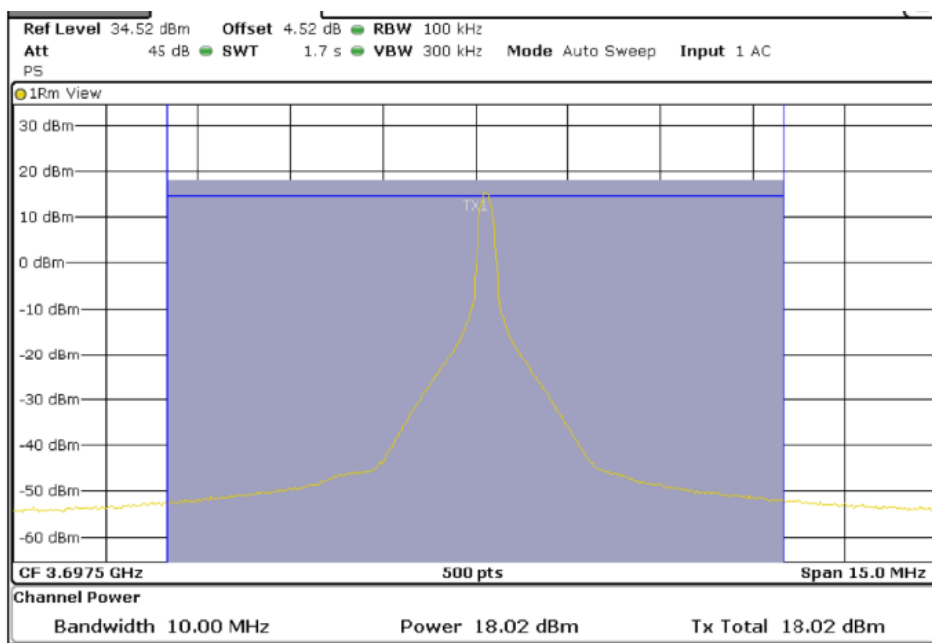


Middle Channel (3650 MHz)



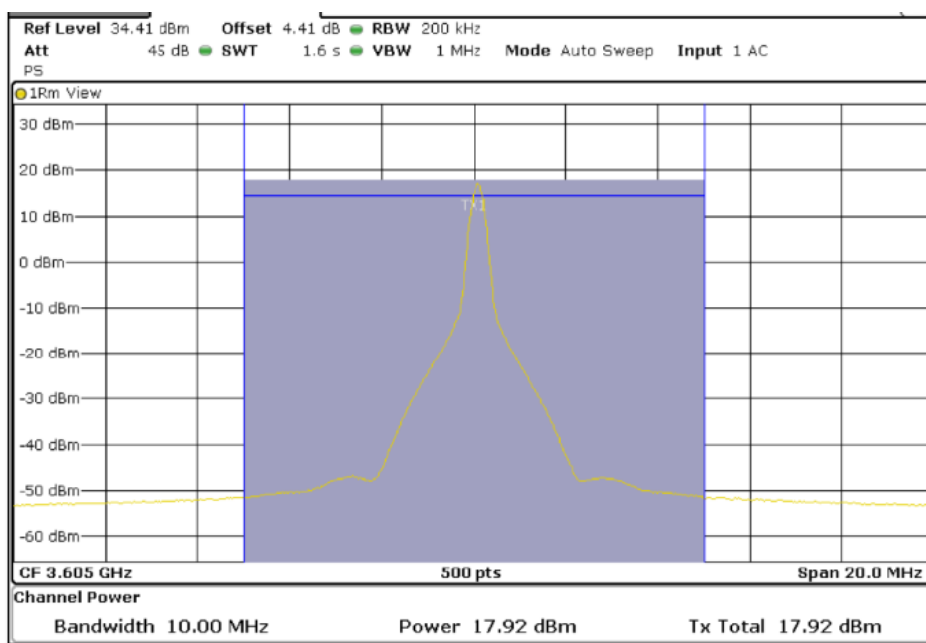
TEST RESULTS (Cont.):

Highest Channel (3697.5 MHz)



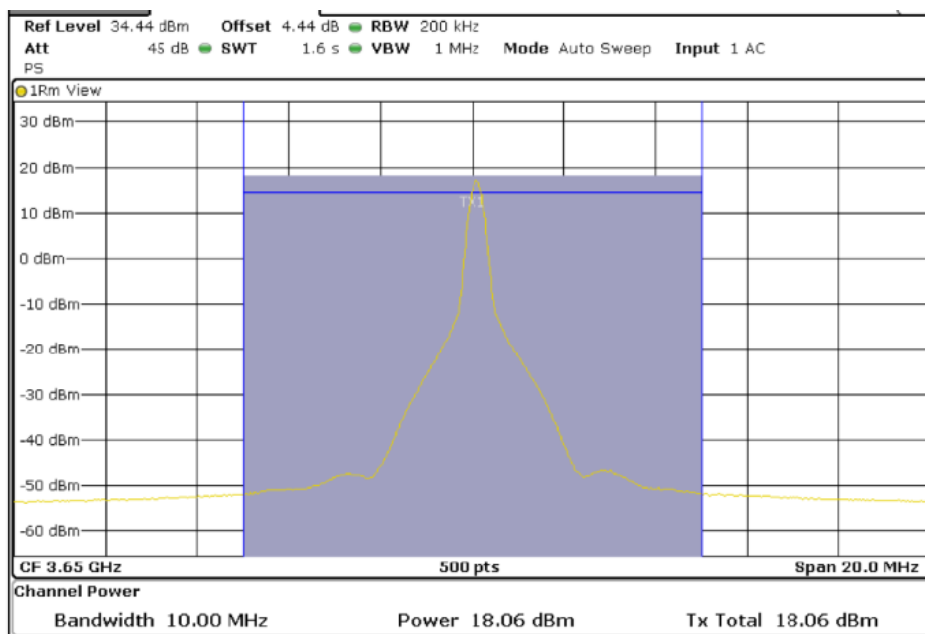
10 MHz BW

Lowest Channel (3605 MHz)

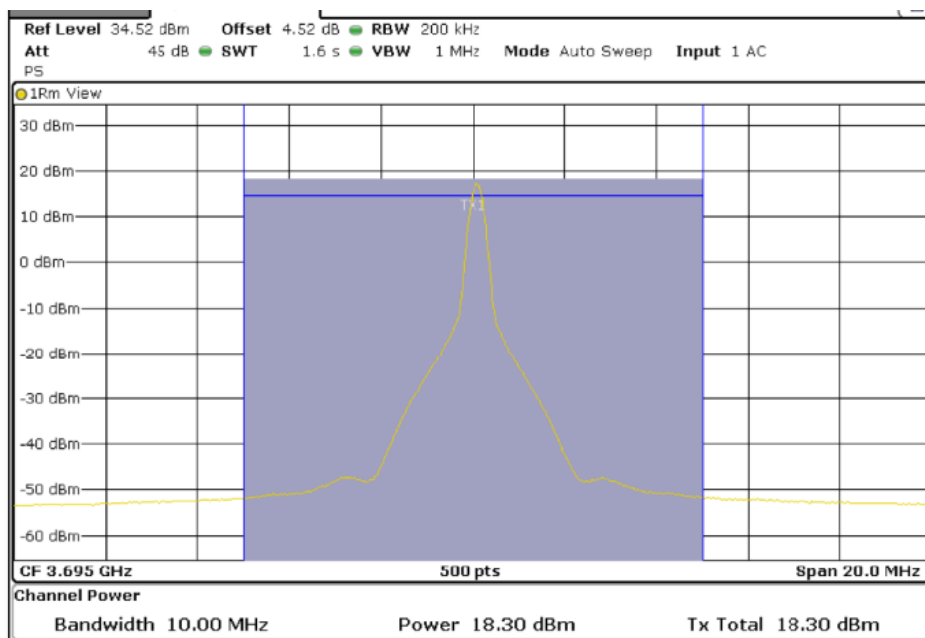


TEST RESULTS (Cont.):

Middle Channel (3650 MHz)



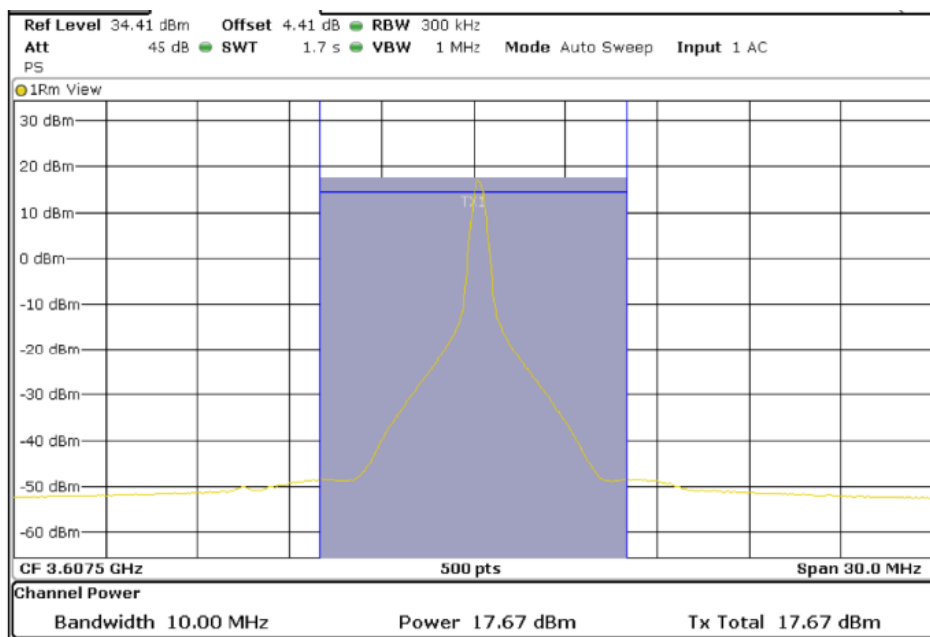
Highest Channel (3695 MHz)



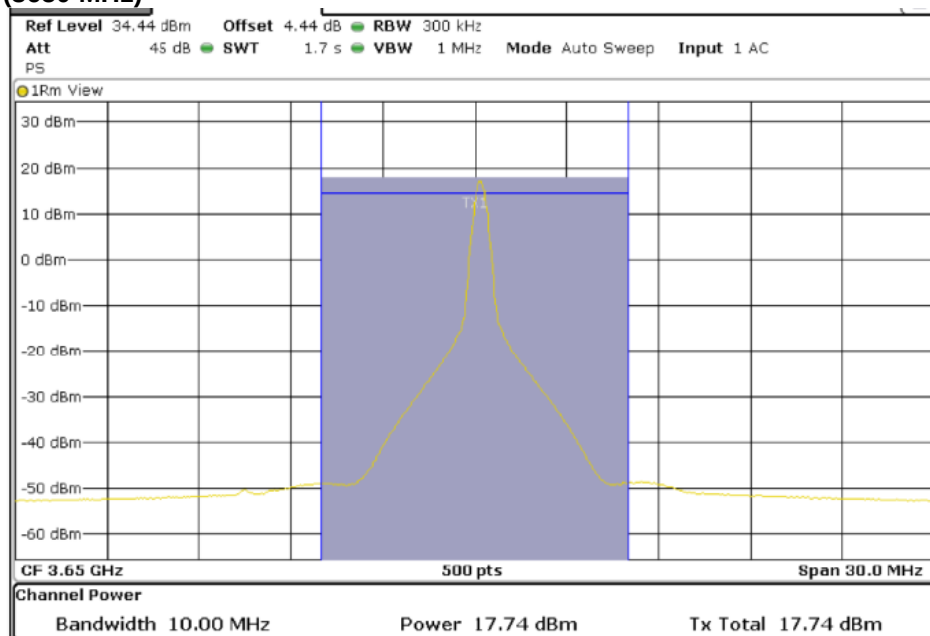
TEST RESULTS (Cont.):

15 MHz BW

Lowest Channel (3607.5 MHz)

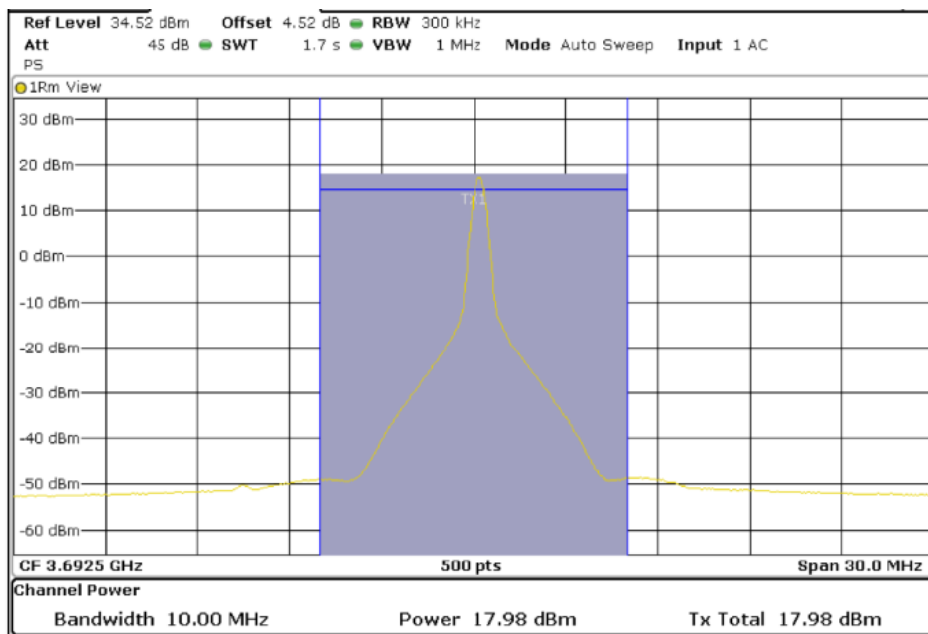


Middle Channel (3650 MHz)



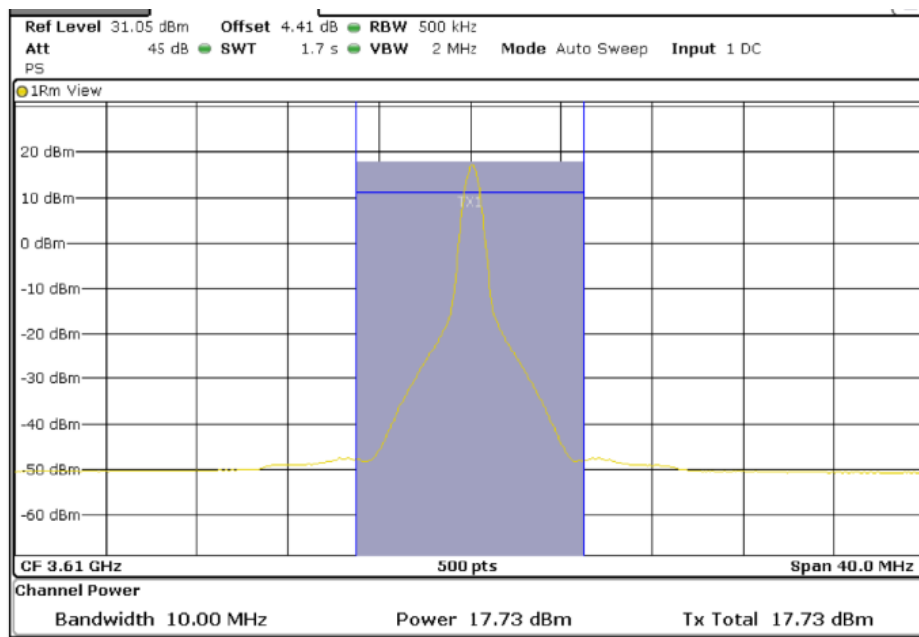
TEST RESULTS (Cont.):

Highest Channel (3692.5 MHz)



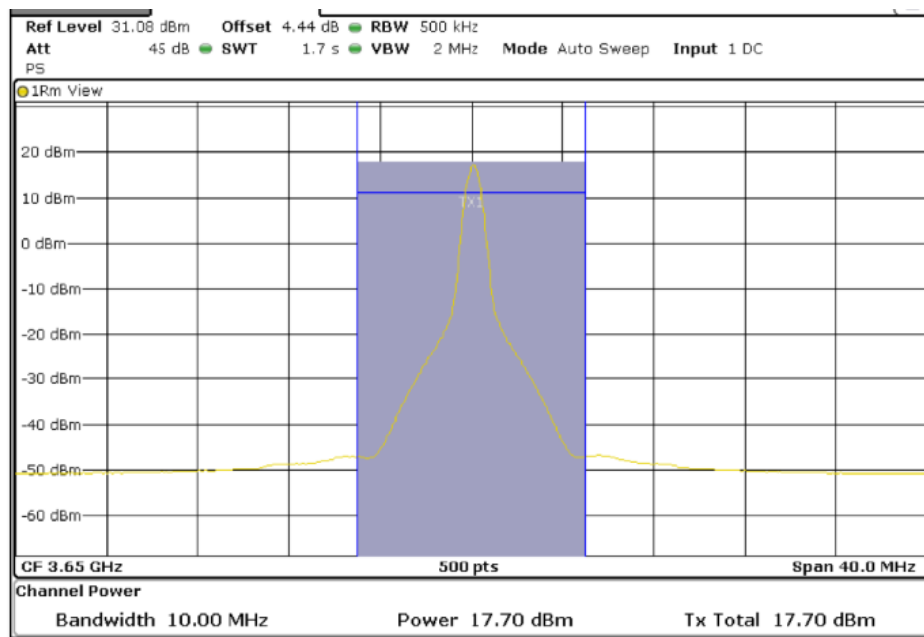
20 MHz BW

Lowest Channel (3610 MHz)

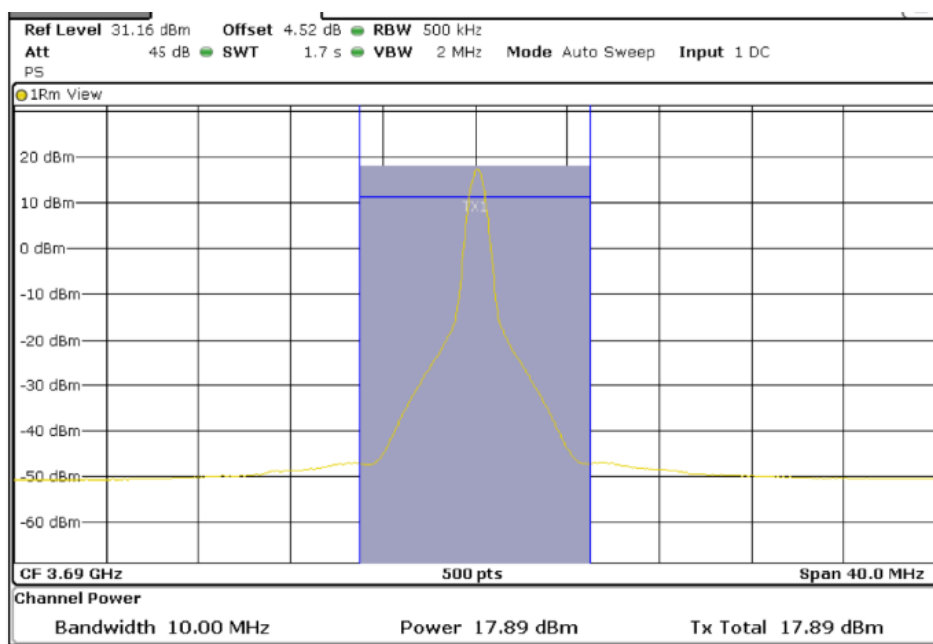


TEST RESULTS (Cont.):

Middle Channel (3650 MHz)



Highest Channel (3690 MHz)



TEST A.3: 99% OBW AND -26 DB BANDWIDTH

LIMITS:	Product standard:	Part 2.1049
	Test standard:	ANSI C63.26-2015

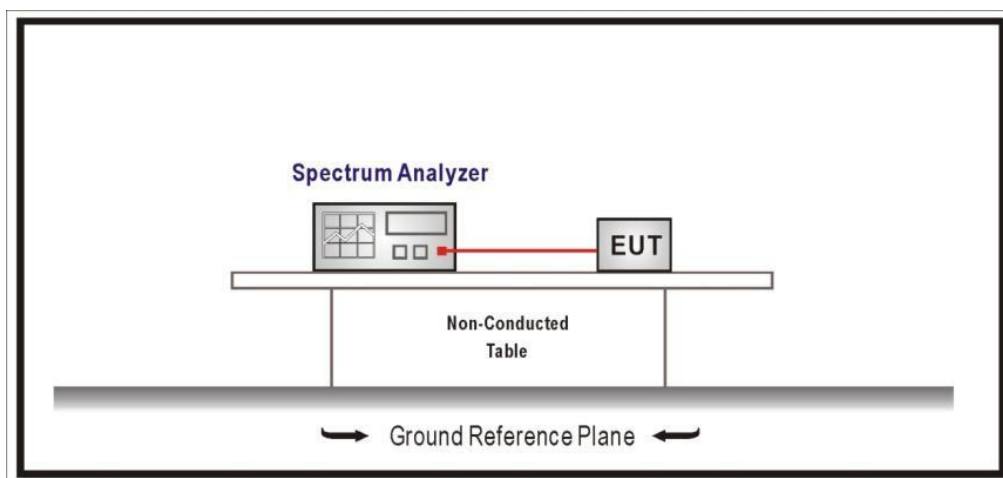
LIMITS

The 99% occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

The -26 dB Bandwidth is the bandwidth 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 26 dB from the peak of the carrier.

TEST SETUP:

The 99% occupied bandwidth and the -26dB bandwidth were measured directly using the built-in bandwidth measuring option of signal analyzer with following the procedure stated in the section 5.4.3 and 5.4.4 of ANSI C63.26-2015 and the section 4.2 and 4.3 of FCC KDB 971168 D01 v03 r01.



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 48)
TEST RESULTS:	PASS

5 MHz BW

QPSK

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
99% OBW (MHz)	4.50	4.52	4.56
-26 dB Bandwidth (MHz)	5.38	5.06	5.40
Measurement uncertainty (%)	<±1.87		

16QAM

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
99% OBW (MHz)	4.50	4.52	4.50
-26 dB Bandwidth (MHz)	5.32	5.18	5.00
Measurement uncertainty (%)	<±1.87		

10 MHz BW

QPSK

	Lowest frequency 3555 MHz	Middle frequency 3625 MHz	Highest frequency 3695 MHz
99% OBW (MHz)	8.96	9.00	8.98
-26 dB Bandwidth (MHz)	9.96	9.87	9.90
Measurement uncertainty (%)	<±1.87		

16QAM

	Lowest frequency 3555 MHz	Middle frequency 3625 MHz	Highest frequency 3695 MHz
99% OBW (MHz)	8.94	8.96	8.98
-26 dB Bandwidth (MHz)	9.93	9.87	9.96
Measurement uncertainty (%)	<±1.87		

TEST RESULTS (Cont.):

15 MHz BW

QPSK

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
99% OBW (MHz)	13.62	13.62	13.56
-26 dB Bandwidth (MHz)	15.09	15.18	15.06
Measurement uncertainty (%)	<±1.87		

16QAM

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
99% OBW (MHz)	13.56	13.62	13.62
-26 dB Bandwidth (MHz)	15.09	15.24	15.18
Measurement uncertainty (%)	<±1.87		

20 MHz BW

QPSK

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
99% OBW (MHz)	18.00	18.00	18.08
-26 dB Bandwidth (MHz)	19.88	19.68	19.76
Measurement uncertainty (%)	<±1.87		

16QAM

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
99% OBW (MHz)	18.00	18.00	18.00
-26 dB Bandwidth (MHz)	19.88	19.76	19.68
Measurement uncertainty (%)	<±1.87		

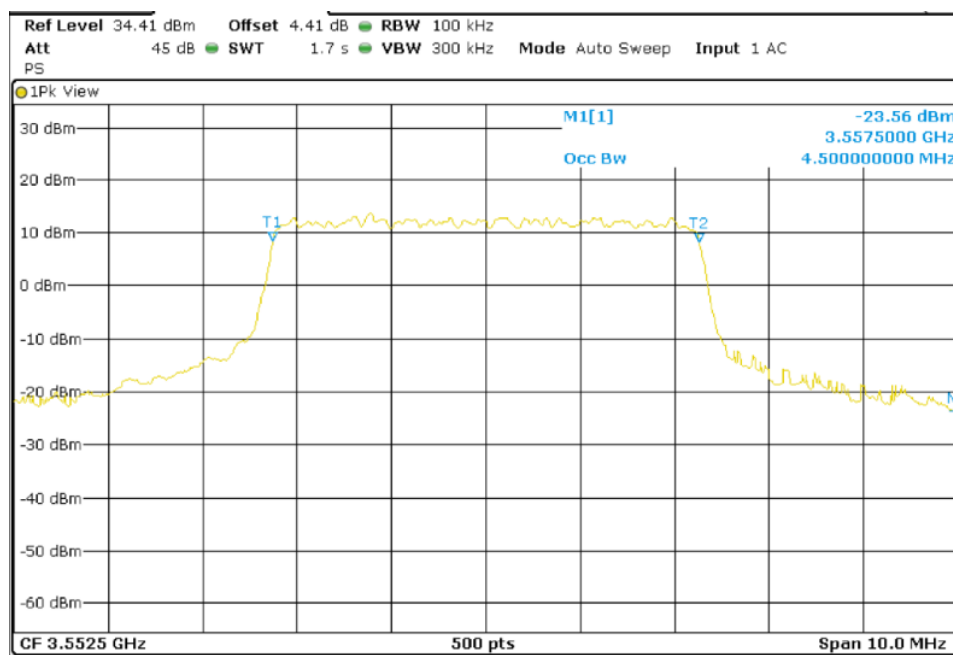
Verdict: PASS
(See next plots)

TEST RESULTS (Cont.):

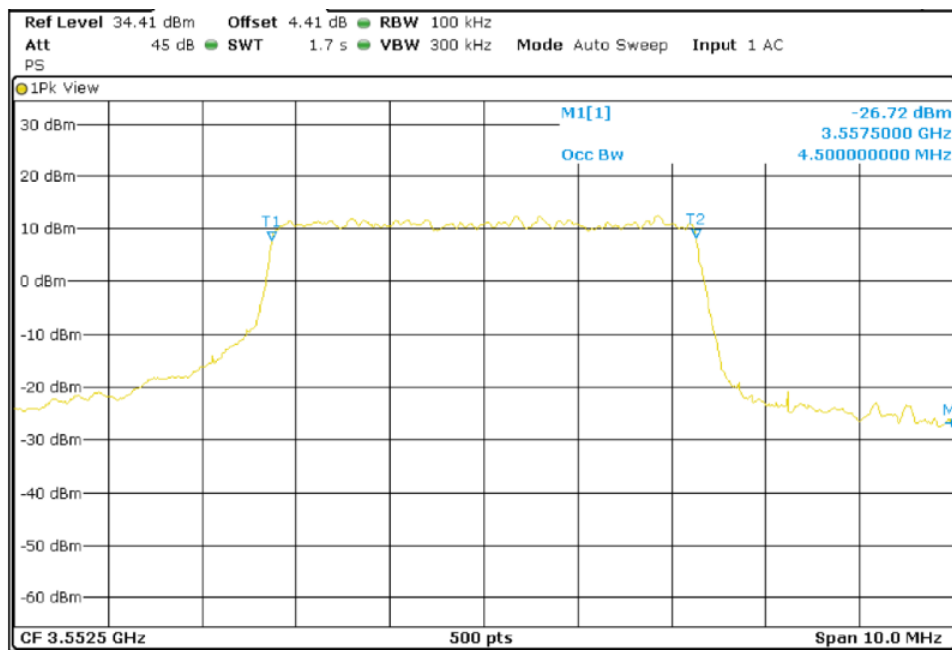
OBW

5 MHz BW

Lowest Channel (3552.5 MHz) QPSK

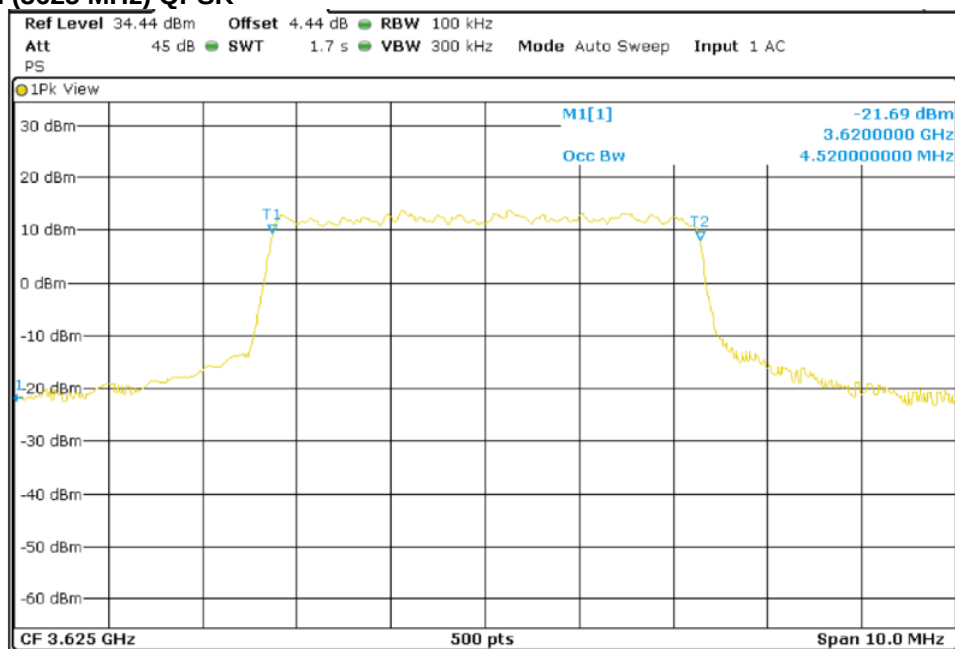


Lowest Channel (3552.5 MHz) 16QAM

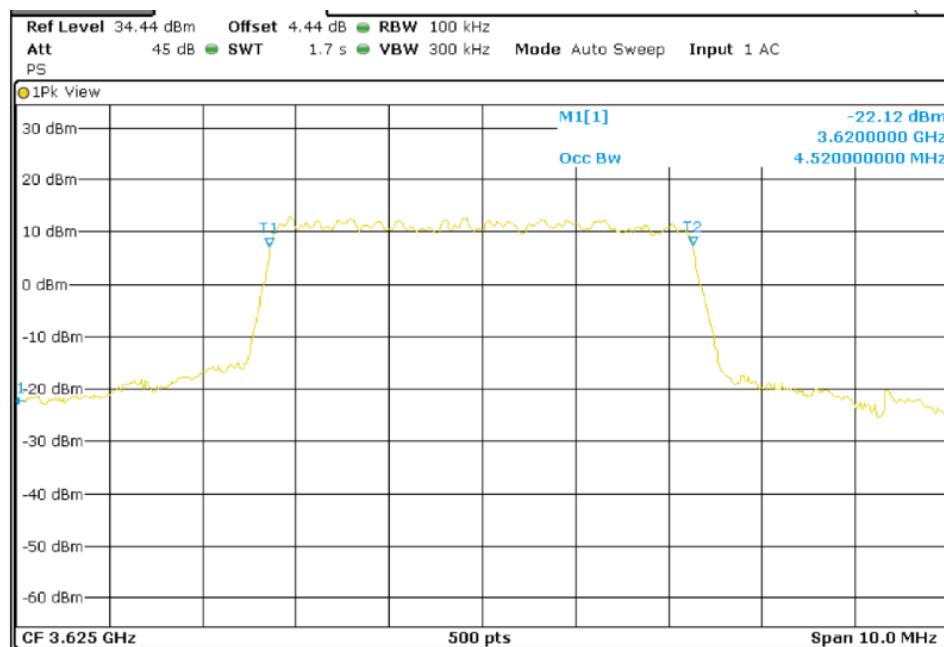


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

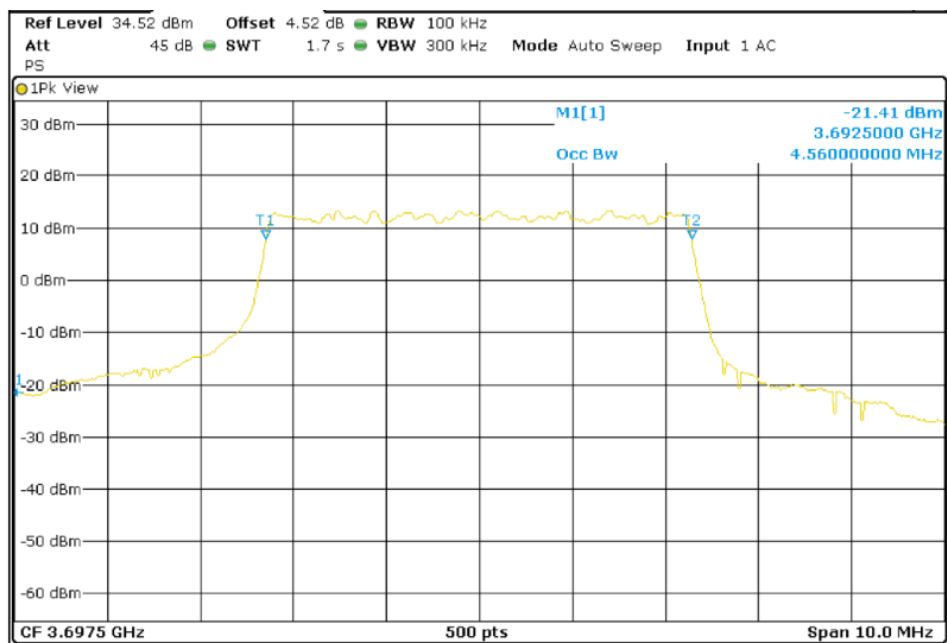


Middle Channel (3625 MHz) 16QAM

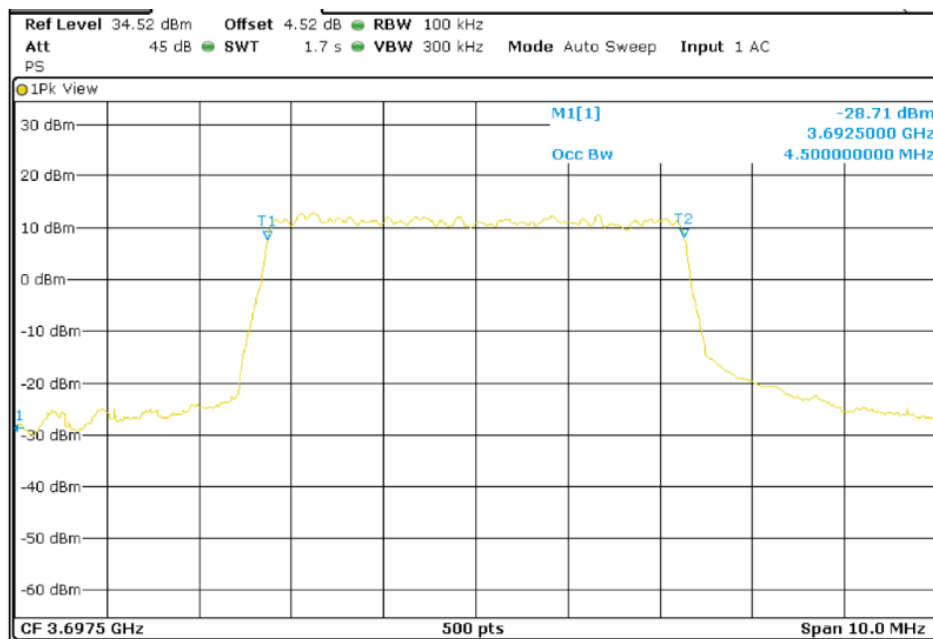


TEST RESULTS (Cont.):

Highest Channel (3697.5 MHz) QPSK



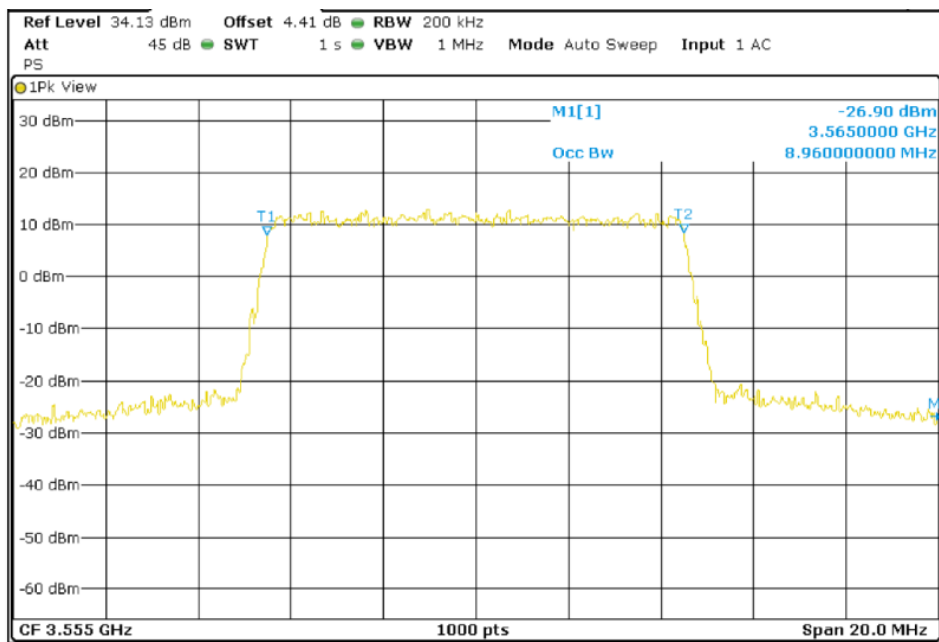
Highest Channel (3697.5 MHz) 16QAM



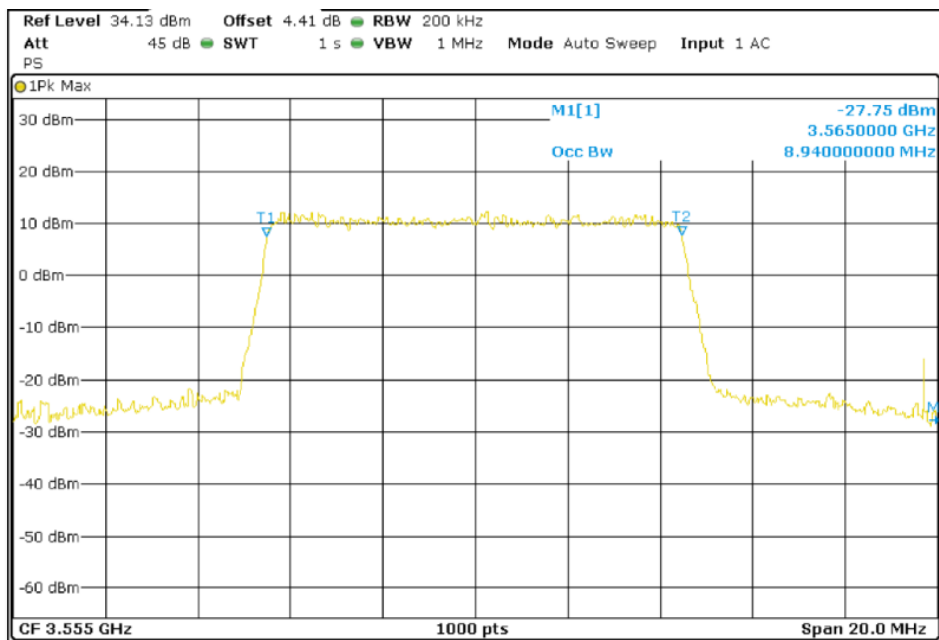
TEST RESULTS (Cont.):

10 MHz BW

Lowest Channel (3555 MHz) QPSK

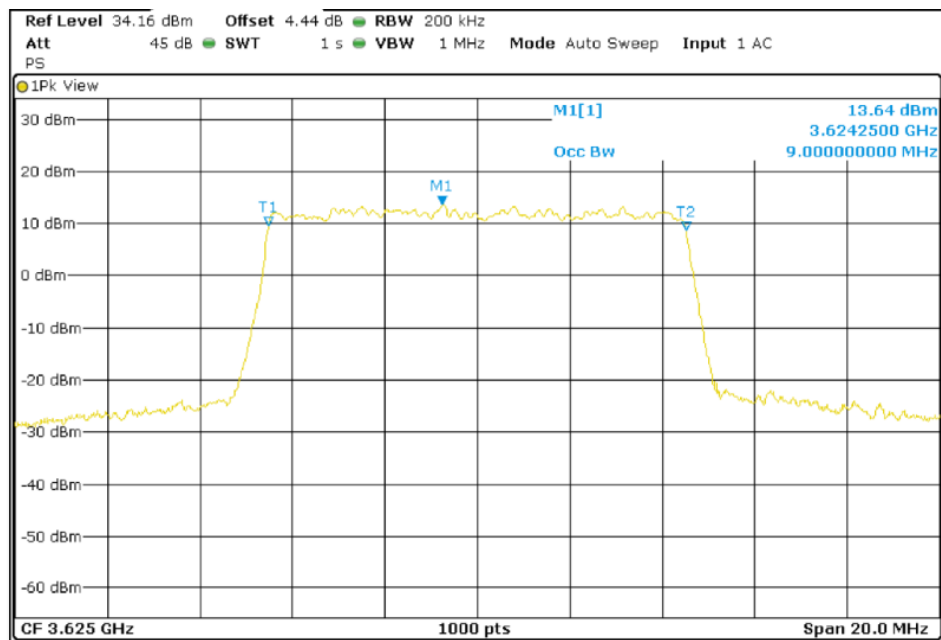


Lowest Channel (3555 MHz) 16QAM

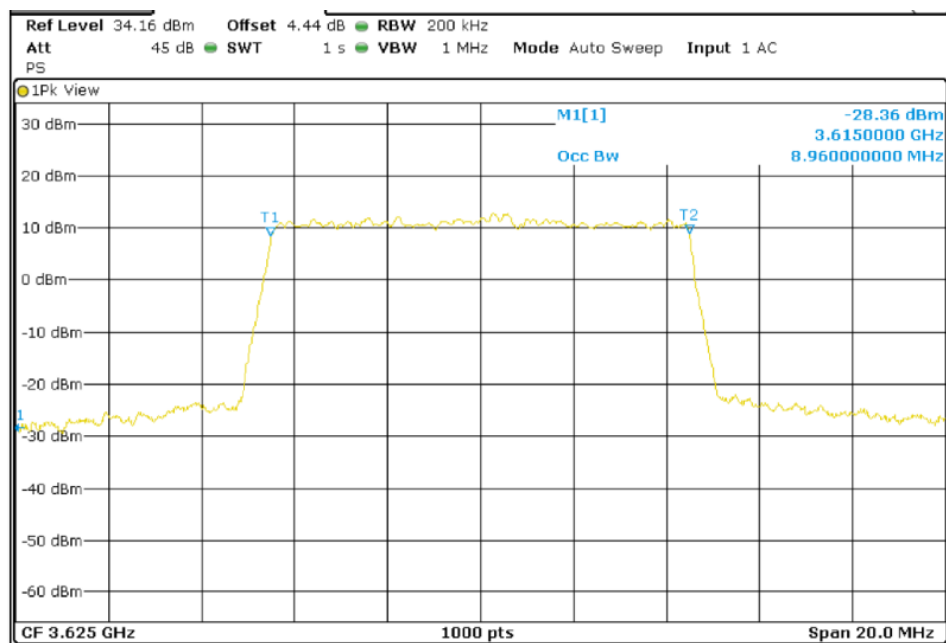


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

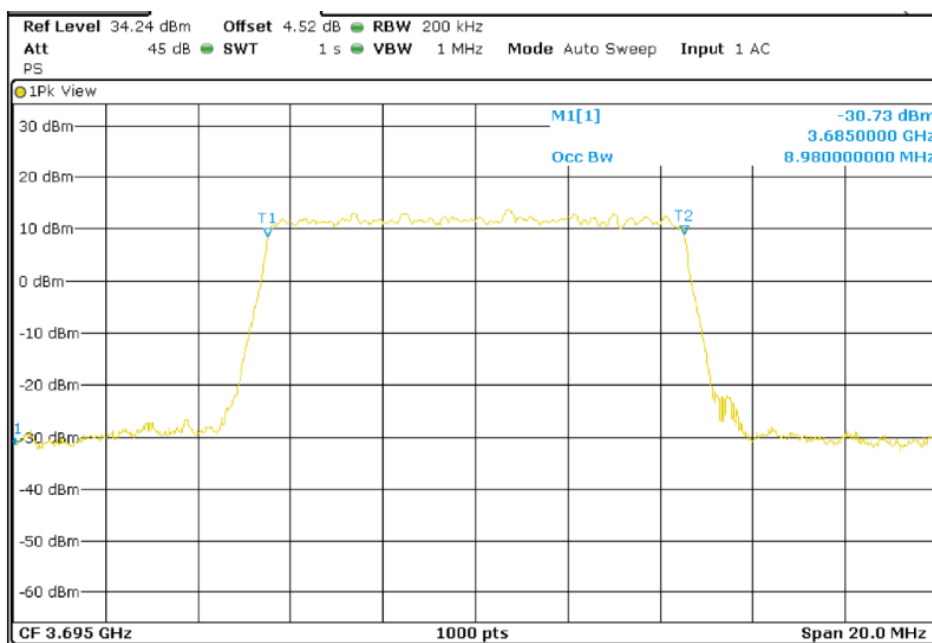


Middle Channel (3625 MHz) 16QAM

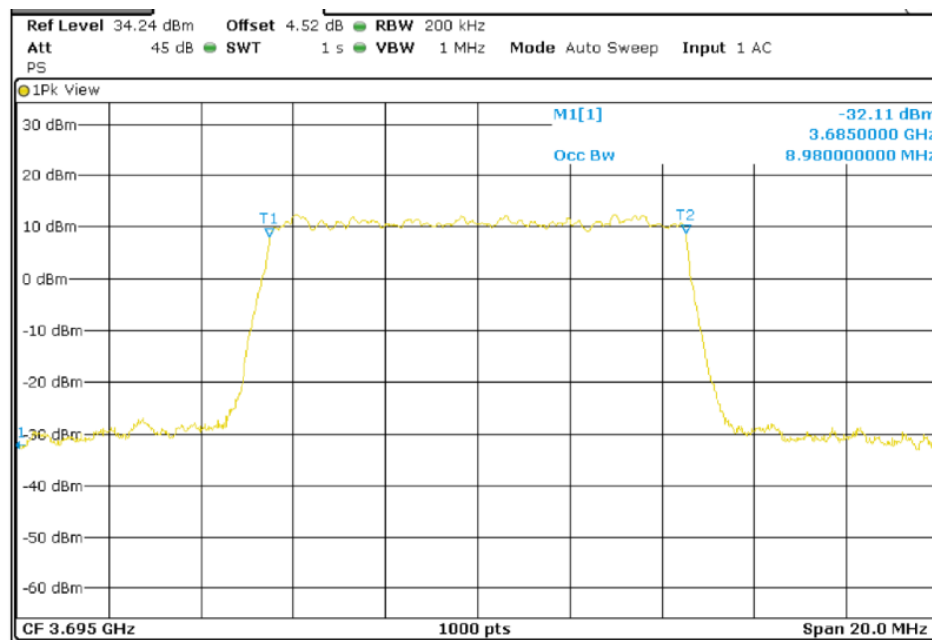


TEST RESULTS (Cont.):

High Channel (3695 MHz) QPSK



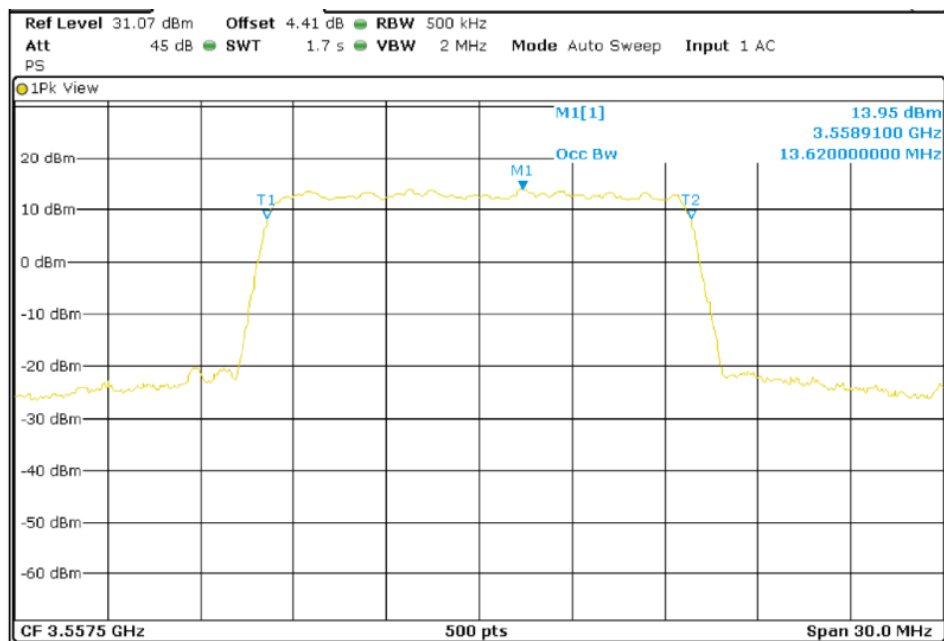
High Channel (3695 MHz) 16QAM



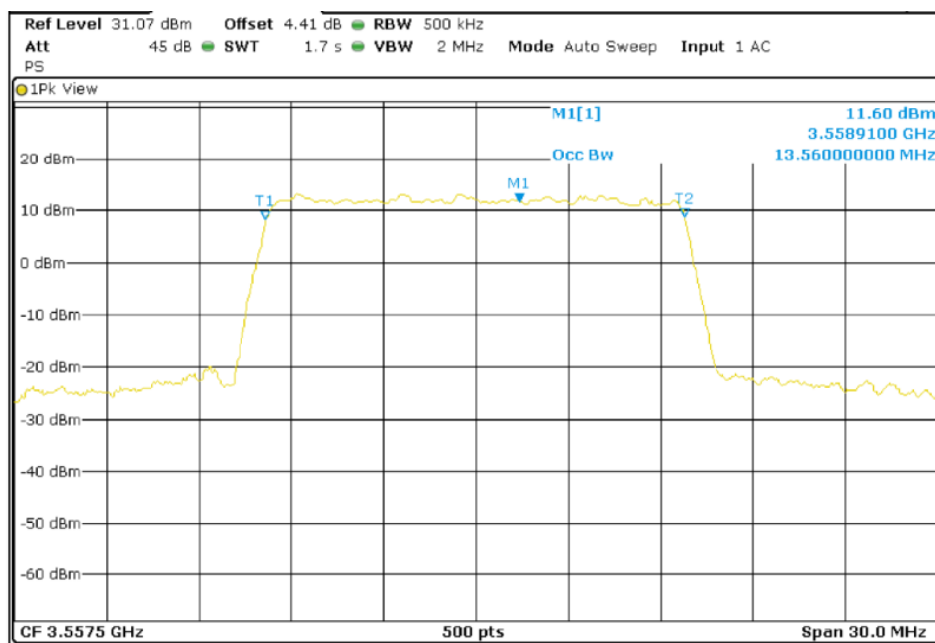
TEST RESULTS (Cont.):

15 MHz BW

Lowest Channel (3557.5 MHz) QPSK

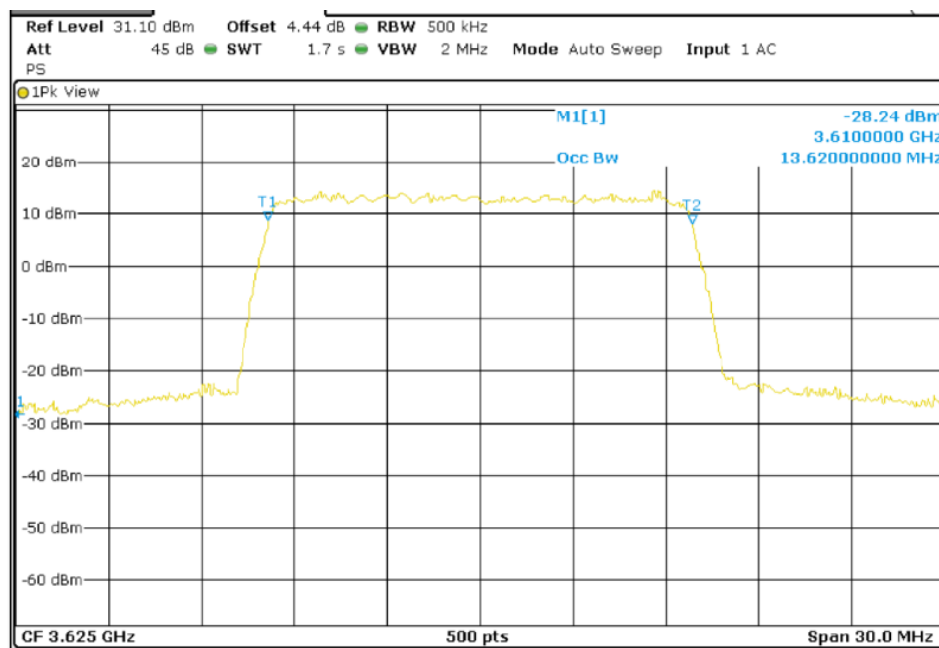


Lowest Channel (3557.5 MHz) 16QAM

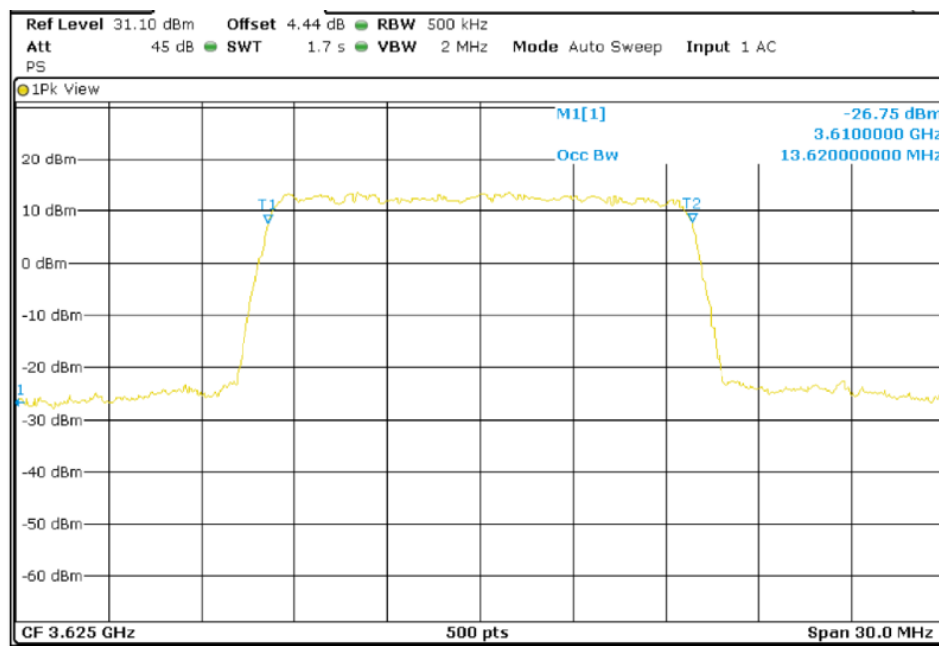


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

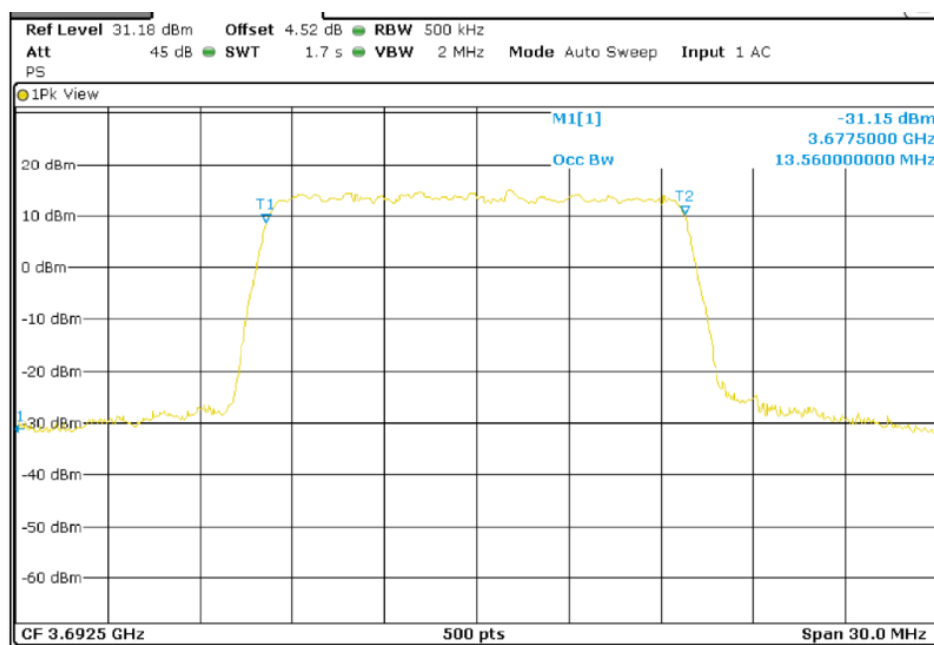


Middle Channel (3625 MHz) 16QAM

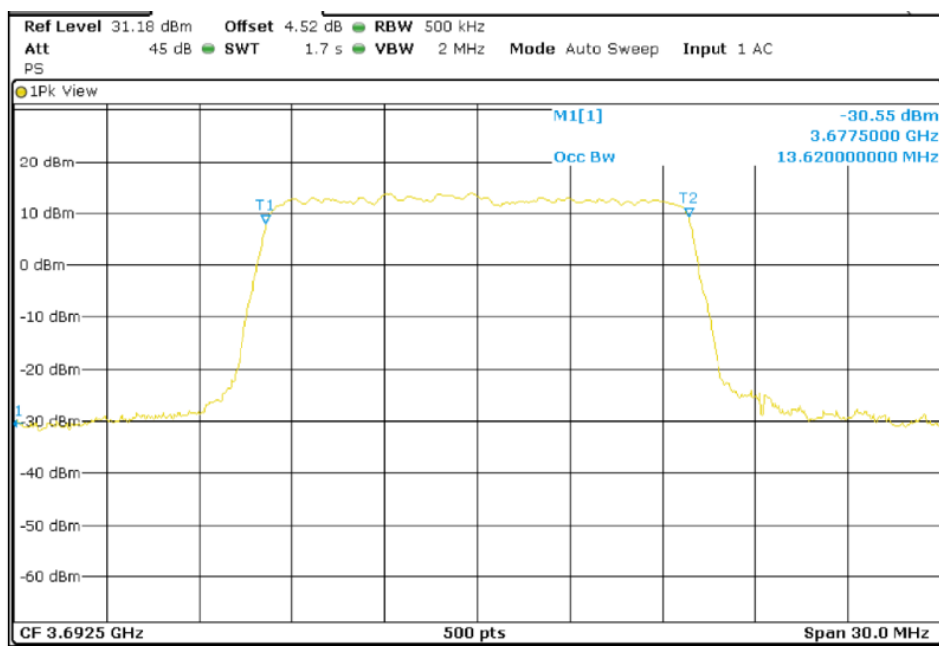


TEST RESULTS (Cont.):

Highest Channel (3692.5 MHz) QPSK



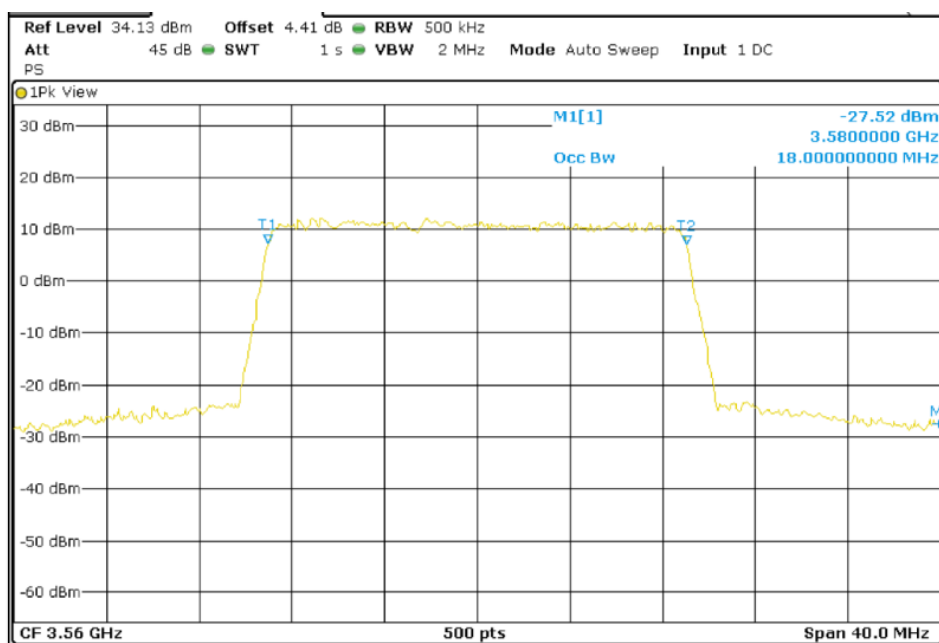
Highest Channel (3692.5 MHz) 16QAM



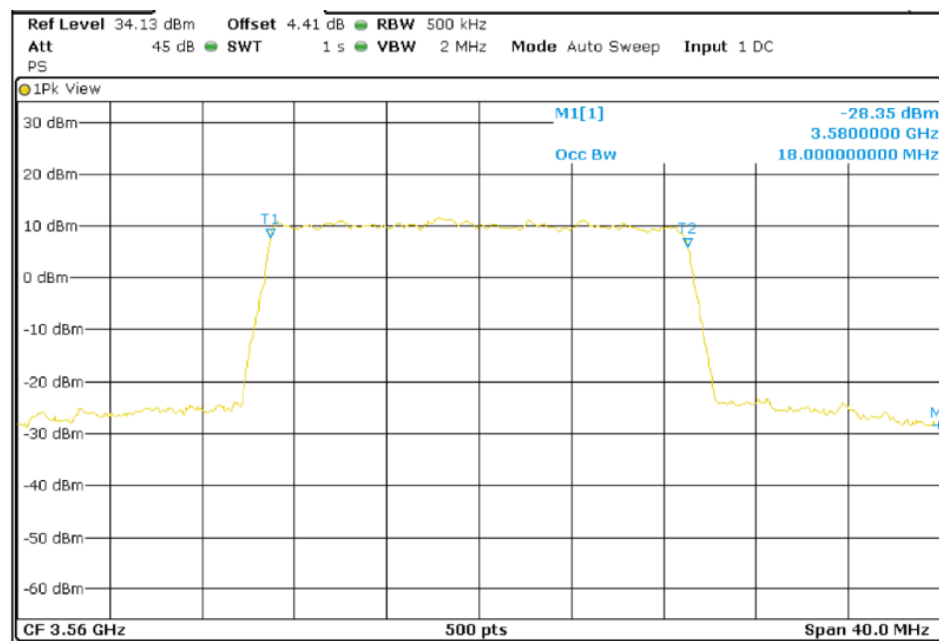
TEST RESULTS (Cont.):

20 MHz BW

Lowest Channel (3560 MHz) QPSK

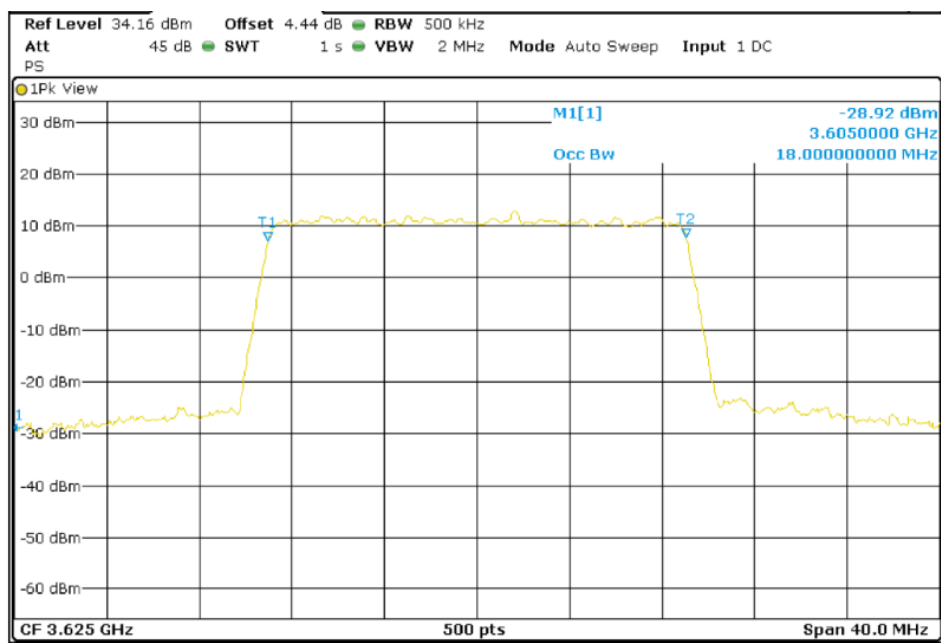


Lowest Channel (3560 MHz) 16QAM

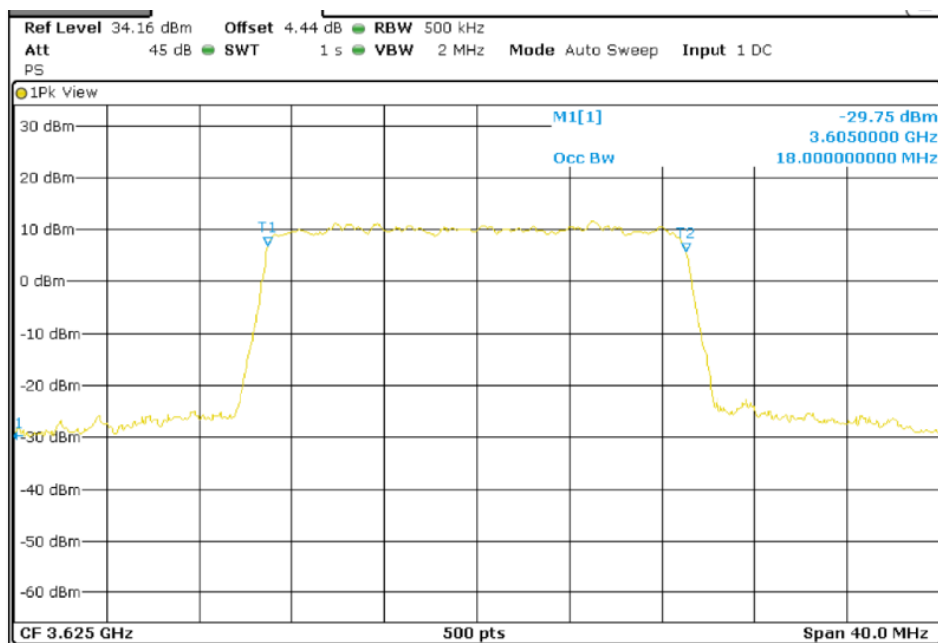


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

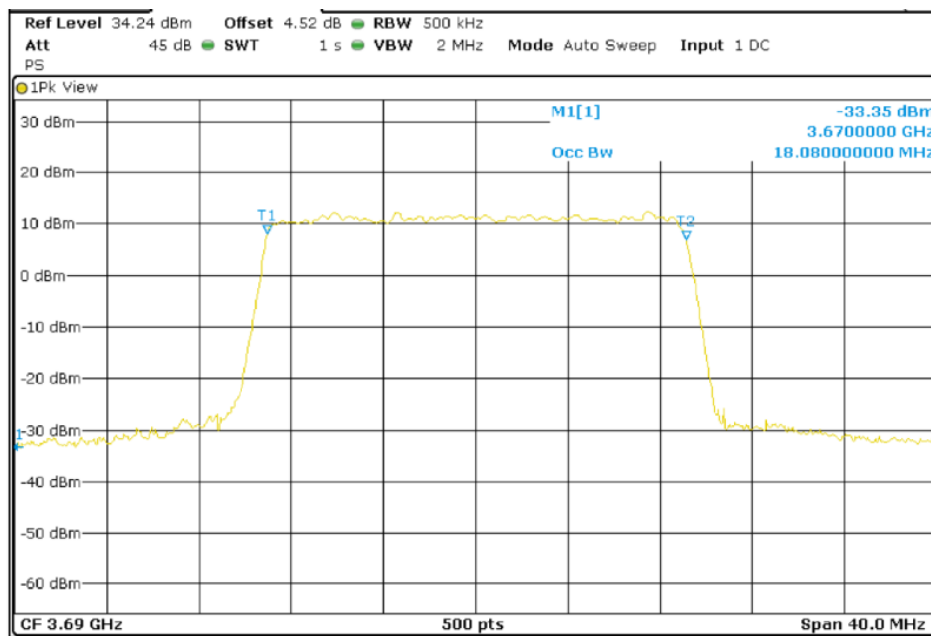


Middle Channel (3625 MHz) 16QAM

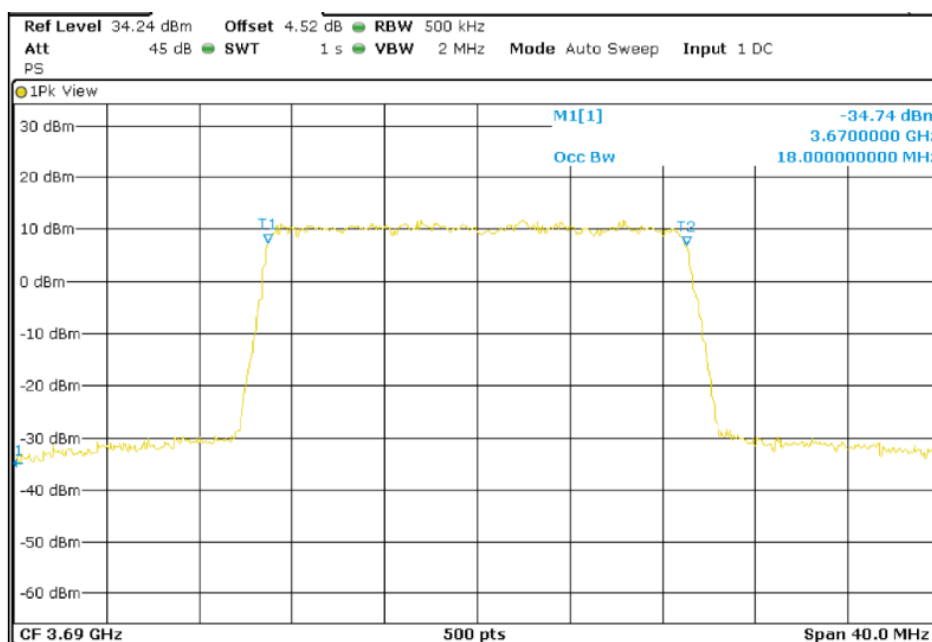


TEST RESULTS (Cont.):

High Channel (3690 MHz) QPSK



High Channel (3690 MHz) 16QAM

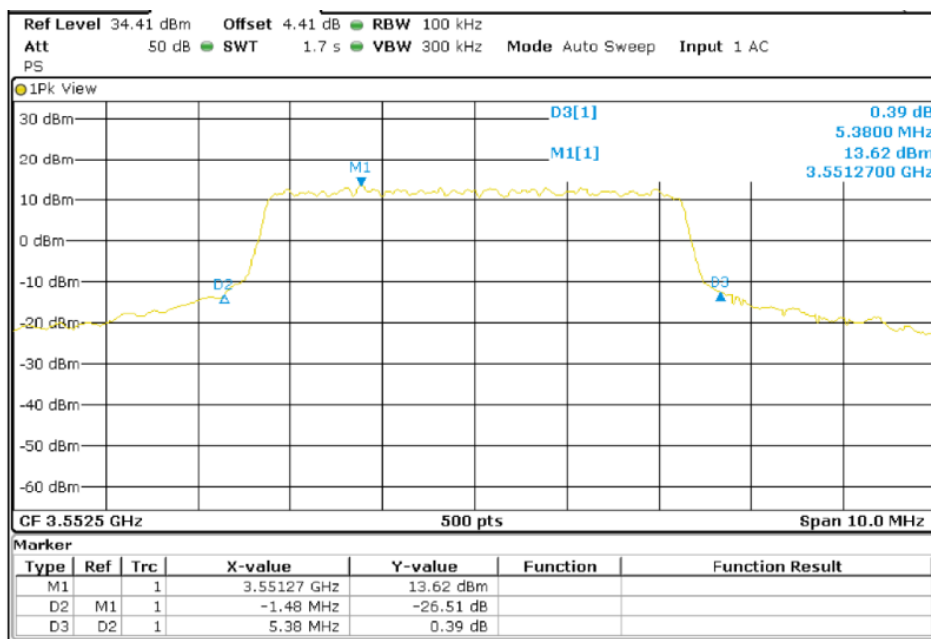


TEST RESULTS (Cont.):

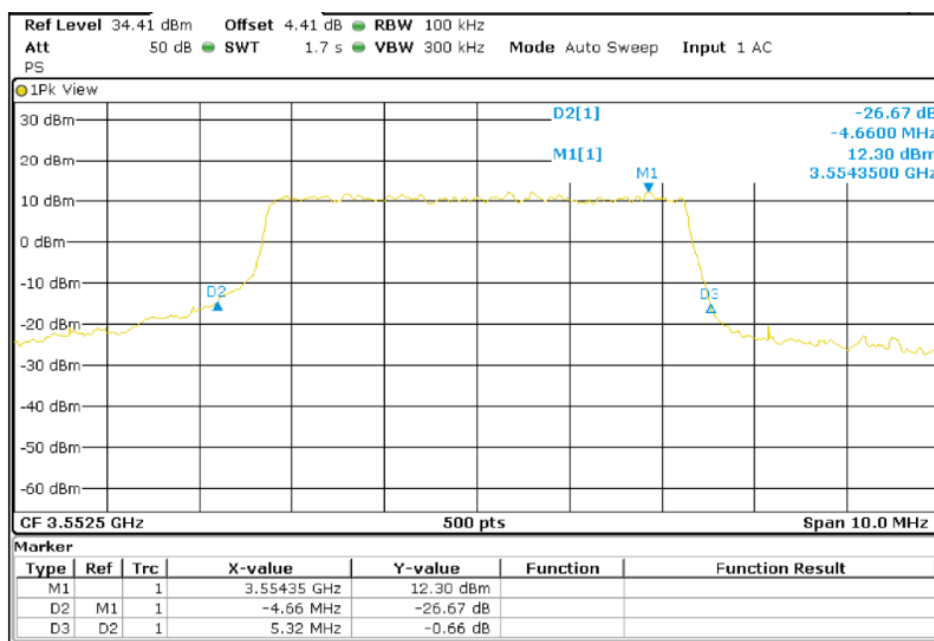
-26dB Bandwidth

5 MHz BW

Lowest Channel (3552.5 MHz) QPSK

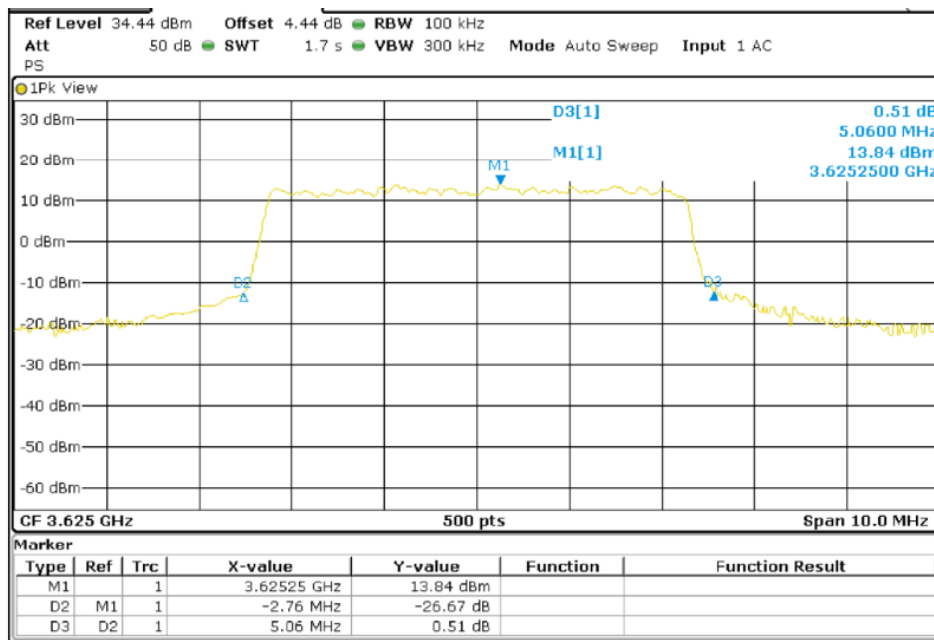


Lowest Channel (3552.5 MHz) 16QAM

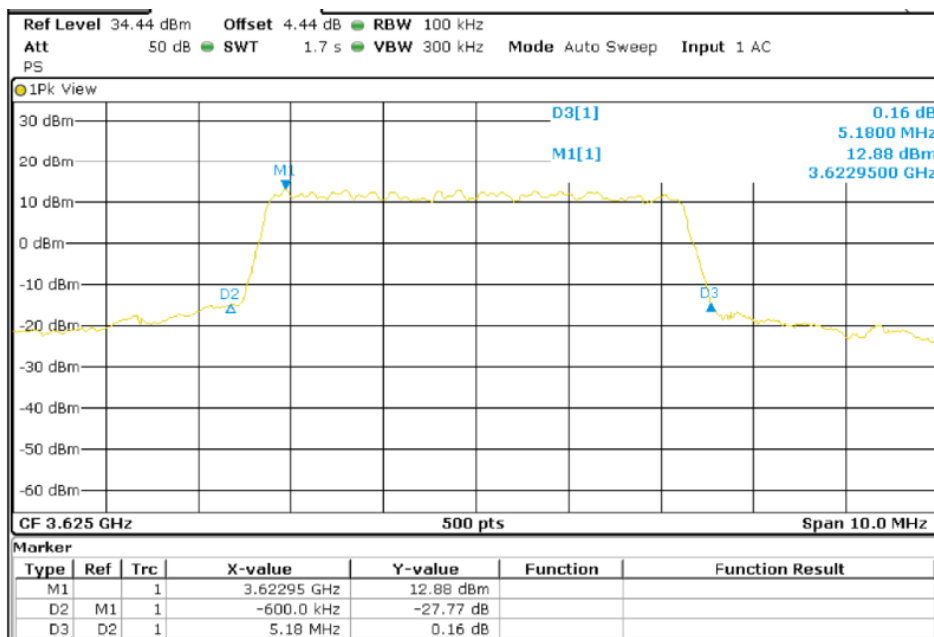


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

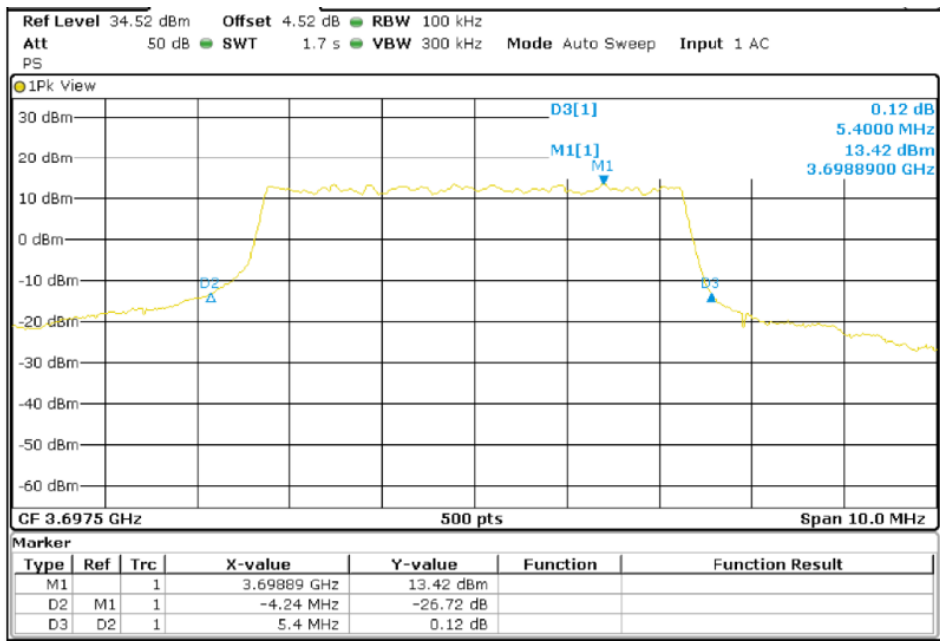


Middle Channel (3625 MHz) 16QAM

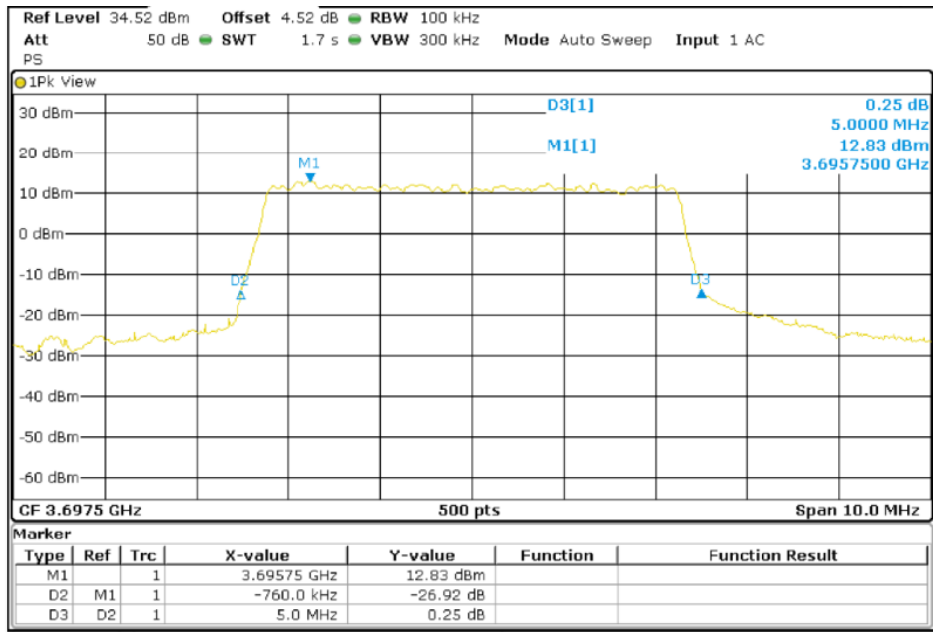


TEST RESULTS (Cont.):

Highest Channel (3697.5 MHz) QPSK



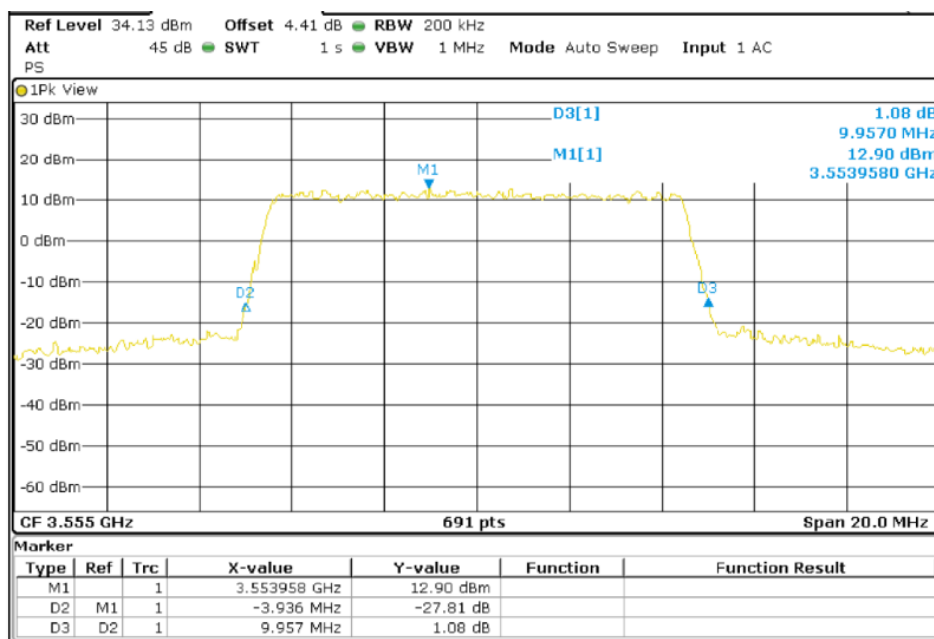
Highest Channel (3697.5 MHz) 16QAM



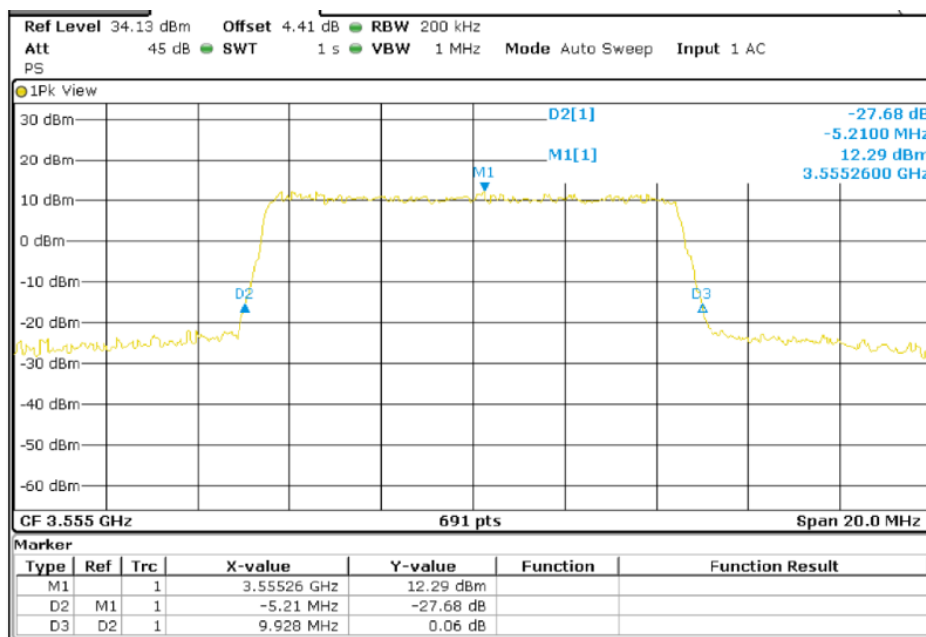
TEST RESULTS (Cont.):

10 MHz BW

Lowest Channel (3555 MHz) QPSK

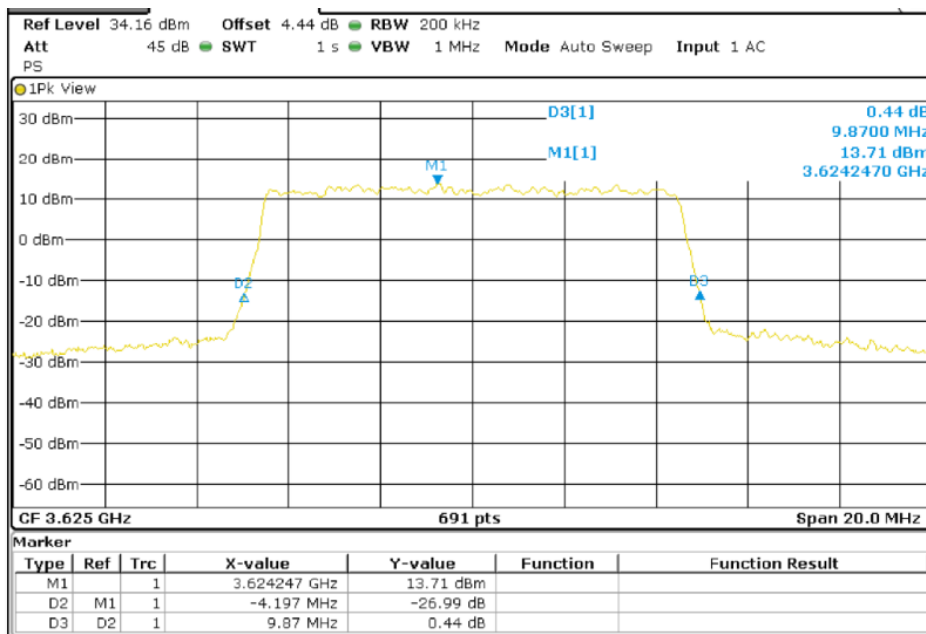


Lowest Channel (3555 MHz) 16QAM

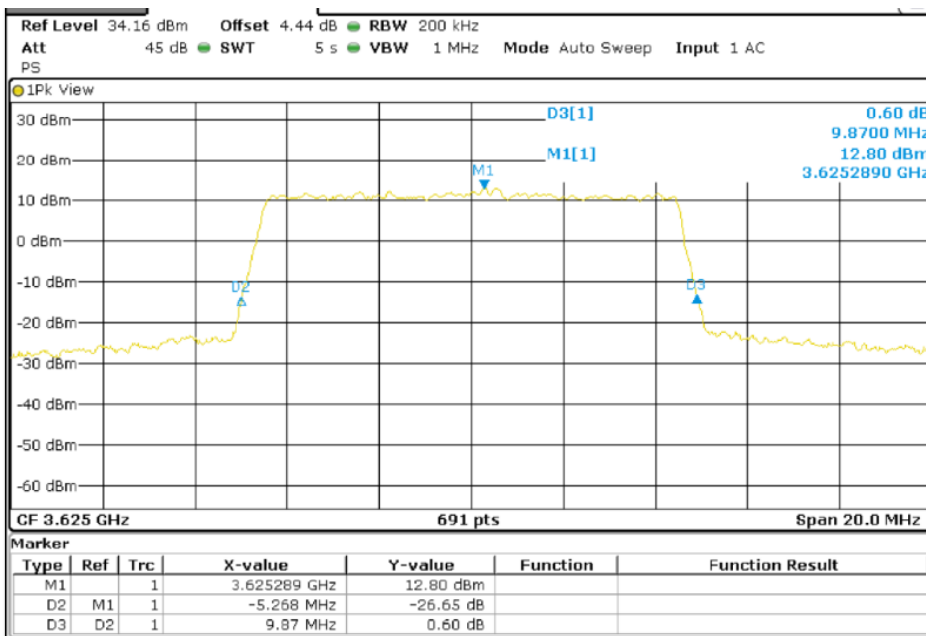


TEST RESULTS (Cont.):

Middle Channel (3625 MHz) QPSK

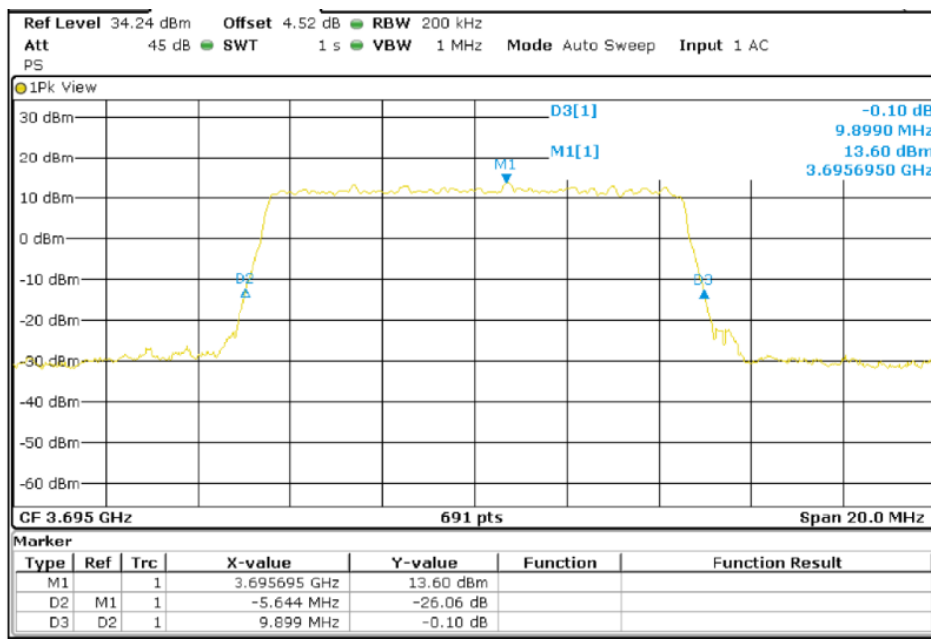


Middle Channel (3625 MHz) 16QAM

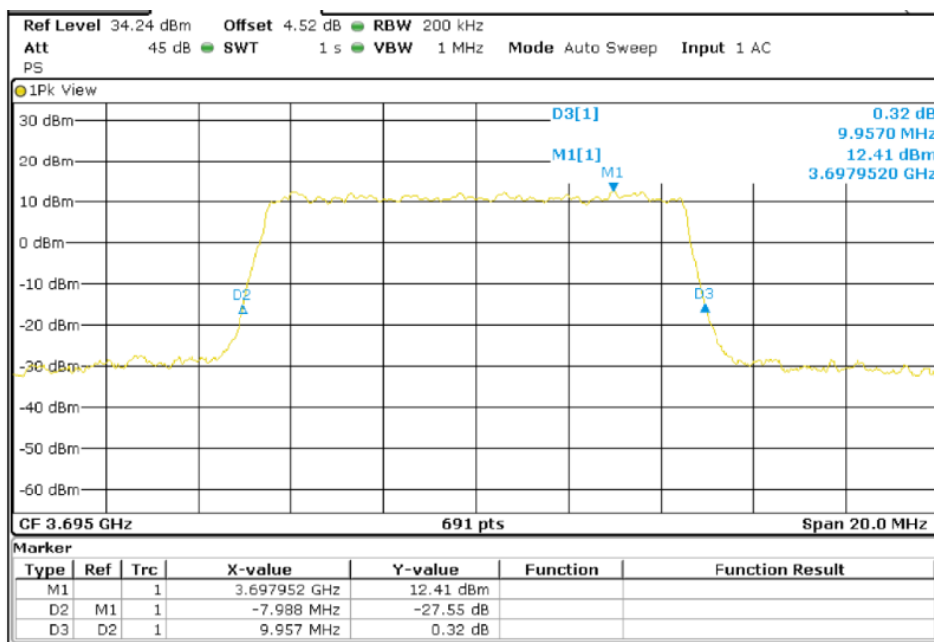


TEST RESULTS (Cont.):

High Channel (3695 MHz) QPSK



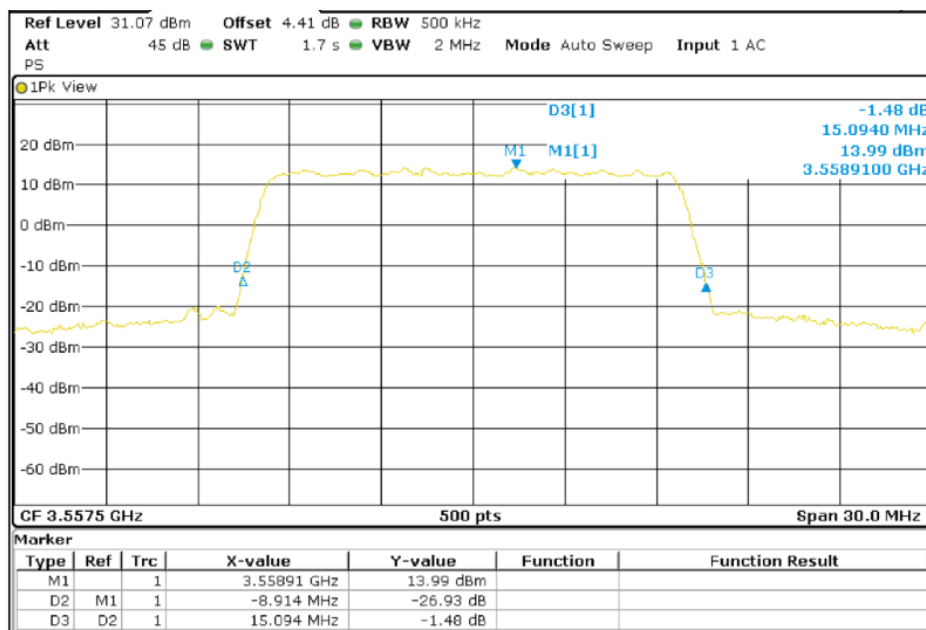
High Channel (3695 MHz) 16QAM



TEST RESULTS (Cont.):

15 MHz BW

Lowest Channel (3557.5 MHz) QPSK



Lowest Channel (3557.5 MHz) 16QAM

