DEKRA Certification, Inc.
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United States of America

DEKRA

ACCREDITED
Test Lab
Cert 2764.01

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No:
2370ERM.004

Test report

REFERENCE STANDARD:
USA FCC Part 27
CANADA ISED RSS-199

Identification of item tested	Module
Trademark	Continental Automotive Systems, Inc.
Model and /or type reference	WT50NA02
Other identification of the product	FCC ID: LHJ-WT50NA02 IC: 2807E-WT50NA02
Features	Module supporting LTE, WCDMA and GSM Cellular Technologies
Manufacturer	Continental Automotive Systems, Inc. 21440 W. Lake Cook Rd, Deer Park, IL 60010, U.S.A.
Test method requested, standard	USA FCC Part 27 10-1-18 Edition CANADA IC RSS-199 Issue 3, Dec. 2016. Measurement Guidance 971168 D01 v02r02 for certification of Licensed Digital Transmitters. ANSI C63.26 – 2015.
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: 2019.07.22 21:41:07 -04'00'
Date of issue	06-25-2019
Report template No	FDT08_21

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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
30-180	3.82	dB
180-1000	2.61	dB
1000-18000	2.92	dB
18000-40000	2.15	dB

Data provided by the client

Module supporting LTE, WCDMA and GSM Cellular Technologies.

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 Nº	Description	Model	Serial Nº	Date of reception
2370.07	CAT 11 Module Designation NA	WT50NA02	015433000004487	5/21/2019
2370.03	Antenna_LTE dipole	SPDA24700/2700	-	5/08/2019
2370.04	Antenna_LTE dipole	SPDA24700/2700	-	5/08/2019
2370.05	Power cable	-	-	5/08/2019

1. Sample S/01 was used for the following test(s):

   All conducted and radiated tests indicated in appendix A.

Test sample description

Ports…… :	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	No Data Provided		☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
Supplementary information to the ports…… :	No Data Provided					
Rated power supply .....:	Voltage and Frequency	Reference poles				
		L1	L2	L3	N	PE
	☐ AC: 230Vac / 50Hz.	☐	☐	☐	☐	☐
	☐ AC:	☐	☐	☐	☐	☐
	☒ DC:13.4 V					
	☐ DC:					
Rated Power .....:	No Data Provided					
Clock frequencies .....:	No Data Provided					
Other parameters.....:	No Data Provided					
Software version .....:	OTP_2.48					
Hardware version.....:	P3					
Dimensions in cm (L x W x D) ....:	No Data Provided					
Mounting position.....:	☐ Table top equipment					
	☐ Wall/Ceiling mounted equipment					
	☐ Floor standing equipment					
	☐ Hand-held equipment					
	☐ Other:					
Modules/parts .....:	Module/parts of test item	Type	Manufacturer			
	No Data provided					

Accessories (not part of the test item) .....:	Description	Type	Manufacturer
Documents as provided by the applicant.....:	Description	File name	Issue date
	Equipment declaration data	FDT30_15_Declaration_Equipment_Data_Continental_WT50NA02_signed	2019-06-17

Copy of marking plate:

Identification of the client

Continental Automotive Systems, Inc.
21440 W. Lake Cook Rd, Deer Park, IL 60010, U.S.A.

Testing period and place

Test Location	DEKRA Certification, Inc.
Date (start)	05-22-2019
Date (finish)	06-06-2019

Document history

Report number	Date	Description
2370ERM.004	06-25-2019	First release

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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, Koji Nishimoto, and Poojita Bhattu.

Testing verdicts

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

Summary

FCC PART 27 /IC RSS-199 PARAGRAPH					
Report Section	**FCC Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
A.1	§2.1046 and §27.50	RSS-199 Clause 4.4	RF Output power	P	N/A
A.2	§2.1047 and §27.50	RSS-199 Clause 4.1	Modulation characteristics	P	N/A
A.3	§2.1055 and § 27.54	RSS-199 Clause 4.3	Frequency stability	P	N/A
A.4	§ 2.1049	RSS-199 Clause 4.2	Occupied Bandwidth	P	N/A
A.5	§2.1051 and §27.53	RSS-199 Clause 4.5	Spurious emissions at antenna terminals	P	N/A
A.6	§27.53	RSS-199 Clause 4.5	Spurious emissions at antenna terminals at Block edges	P	N/A
A.7	§2.1053 and §27.53	RSS-199 Clause 4.5	Radiated emissions	P	N/A
Supplementary information and remarks: N/A					

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1039	Signal analyzer Rohde & Schwarz FSV40	2018/10	2020/10
1149	Wideband Radio Communication Tester Rohde & Schwarz CMW 500	2018/07	2020/07
1041	EMI Test Receiver Rohde & Schwarz ESR 7	2017/04	2019/08
101	Climatic chamber Espec	2019/10	2020/10

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber Frankonia SAC 3 plus “L”	N/A	N/A
1064	BiconicalLog antenna ETS LINDGREN 3142E	2017/03	2020/03
1057	Double-ridge Waveguide Horn antenna 1-18 GHz	2017/03	2020/03
1056	Double-ridge Waveguide Horn antenna 18-40 GHz	2016/12	2019/12
1012	Spectrum analyzer Rohde & Schwarz ESR26	2018/09	2020/09
1039	Spectrum analyzer Rohde & Schwarz FSV40	2018/10	2020/10
1015,1017, 1019, 1020	Rohde & Schwarz EMC32 software	N/A	N/A

Appendix A: Test Results for LTE

FCC Part 27/ IC RSS-199

Appendix A Content

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PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	QPSK, QAM
Maximum RF Output Power	23 dBm
Operation mode:	
- Operating Frequency Range	LTE Band 4: 1710 – 1755MHz LTE Band 7: 2500 – 2570MHz LTE Band 12: 699 – 716MHz LTE Band 13: 777 – 787MHz LTE Band 66: 1710 – 1780MHz
- Nominal Channel Bandwidth	LTE Band 4: 1.4 / 3 / 5/ 10/ 15/ 20 MHz LTE Band 7: 5 / 10 / 15 / 20 MHz LTE Band 12: 1.4 / 3 / 5 / 10 MHz LTE Band 13: 5 / 10 MHz LTE Band 66: 1.4 / 3 / 5/ 10/ 15/ 20 MHz
Extreme operating conditions	
- Temperature range	T_{nom} = +15 to + 35 T_{min} = -30 T_{max} = +50
Antenna type	External Antenna.
Antenna gain	2 dBi
Nominal Voltage	
- Supply Voltage	12 Vdc
- Type of power source	DC voltage from power supply.

DESCRIPTION OF TEST CONDITIONS

The worst case was found when positioned as the table below. Following channel(s) was (were selected for the final test as listed below:

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#01
LTE Band 4</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 12 Vdc
<u>Test Frequencies for Conducted tests:</u>
<u>1.4 MHz Bandwidth</u>:
-Lowest Channel: 19957(1710.7 MHz)
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 20393(1754.3 MHz)

<u>3 MHz Bandwidth</u>:
-Lowest Channel: 19965(1711.5 MHz)
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 20375(1752.5 MHz)

<u>5 MHz Bandwidth</u>:
-Lowest Channel: 19975(1712.5 MHz
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 19175(1907.5 MHz)
<u>10 MHz Bandwidth</u>:
-Lowest Channel: 20000(1715 MHz)
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 20350(1750 MHz)

<u>15 MHz Bandwidth</u>:
-Lowest Channel: 20025(1717.5 MHz)
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 20325(1747.5 MHz)

<u>20 MHz Bandwidth</u>:
-Lowest Channel: 20050(1720 MHz)
-Middle Channel: 20175(1732.5 MHz)
-Highest Channel: 20300(1745 MHz)

<u>Test Frequencies for Radiated tests:</u>
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Mode</th></tr>
<tr><td>1710 to 1755 MHz</td><td>1717.5 MHz
1732.5 MHz
1747.5 MHz</td><td>15 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#02
LTE Band 7</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 12 Vdc

<u>Test Frequencies for Conducted tests:</u>
<u>5 MHz Bandwidth</u>:
-Lowest Channel: 20775 (2502.5 MHZ)
-Middle Channel: 21100 (2535.0 MHz)
-Highest Channel: 21425 (2567.5 MHz)
<u>10 MHz Bandwidth</u>:
-Lowest Channel: 20800 (2505.0 MHZ)
-Middle Channel: 21100 (2535.0 MHz)
-Highest Channel: 21400 (2565.0 MHz)
<u>15 MHz Bandwidth</u>:
-Lowest Channel: 20825 (2507.5 MHZ)
-Middle Channel: 21100 (2535.0 MHz)
-Highest Channel: 21375 (2562.5 MHz)
<u>20 MHz Bandwidth</u>:
-Lowest Channel: 20850 (2510.0 MHZ)
-Middle Channel: 21100 (2535.0 MHz)
-Highest Channel:21350 (2560.0 MHz)

<u>Test Frequencies for Radiated tests:</u>
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Mode</th></tr>
<tr><td>2570 to 2610 MHz</td><td>2510 MHz
2535 MHz
2560 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#03
LTE Band 12</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 12 Vdc

<u>Test Frequencies for Conducted tests:</u>
<u>1.4 MHz Bandwidth</u>:
-Lowest Channel: 23017(699.7 MHZ)
-Middle Channel: 23095(707.5 MHz)
-Highest Channel: 23173(715.3 MHz)
<u>3 MHz Bandwidth</u>:
-Lowest Channel: 23025(700.5 MHZ)
-Middle Channel: 23095(707.5 MHz)
-Highest Channel: 23165(714.5 MHz)
<u>5 MHz Bandwidth</u>:
-Lowest Channel: 23035(701.5 MHZ)
-Middle Channel: 23095(707.5 MHz)
-Highest Channel: 23155(713.5 MHz)
<u>10 MHz Bandwidth</u>:
-Lowest Channel: 23060(704 MHZ)
-Middle Channel: 23095(707.5 MHz)
-Highest Channel: 23130(711 MHz)

<u>Test Frequencies for Radiated tests:</u>
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Mode</th></tr>
<tr><td>699 to 710 MHz</td><td>701.5 MHz
707.5 MHz
713.5 MHz</td><td>5 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#04
LTE Band 13</td><td>
<u>Power supply (V):</u>
$V_{nominal}$ = 12 Vdc

<u>Test Frequencies for Conducted tests:</u>
<u>5 MHz Bandwidth</u>:
-Lowest Channel: 23205 (779.5 MHZ)
-Middle Channel: 23230 (782.0 MHz)
-Highest Channel: 23255 (784.5 MHz)

<u>10 MHz Bandwidth</u>:
-Middle Channel: 23230 (782.0 MHz)

<u>Test Frequencies for Radiated tests:</u>
<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Mode</th></tr>
<tr><td>2570 to 2610 MHz</td><td>779.5 MHz
782 MHz
784.5 MHz</td><td>5 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.
</td></tr>
</table>

<table>
<tr><th>TEST CONDITIONS</th><th>DESCRIPTION</th></tr>
<tr><td>TC#05

LTE Band 66</td><td>
<u>Power supply (V):</u>

$V_{nominal}$ = 12 Vdc

<u>Test Frequencies for Conducted tests:</u>

<u>1.4 MHz Bandwidth</u>:
-Lowest Channel: 131979(1710.7 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132665(1779.3 MHz)

<u>3 MHz Bandwidth</u>:
-Lowest Channel: 131987(1711.5 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132657(1778.5 MHz)

<u>5 MHz Bandwidth</u>:
-Lowest Channel: 131997(1712.5 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132647(1777.5 MHz)

<u>10 MHz Bandwidth</u>:
-Lowest Channel: 132022(1715 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132622(1775 MHz)

<u>15 MHz Bandwidth</u>:
-Lowest Channel: 132047(1717.5 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132597(1772.5 MHz)

<u>20 MHz Bandwidth</u>:
-Lowest Channel: 132072(1720 MHz)
-Middle Channel: 132422(1755 MHz)
-Highest Channel: 132572(1770 MHz)

<u>Test Frequencies for Radiated tests:</u>

<table>
<tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th><th>Mode</th></tr>
<tr><td>1850 to 1915 MHz</td><td>1717.5 MHz
1755 MHz
1772.5 MHz</td><td>15 MHz</td><td>QPSK</td><td>1 RB</td></tr>
</table>
</td></tr>
</table>

TEST A.1: RF OUTPUT POWER

LIMITS:	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC §2.1046 and §27.50 / RSS-199 Clause 4.4

LIMITS

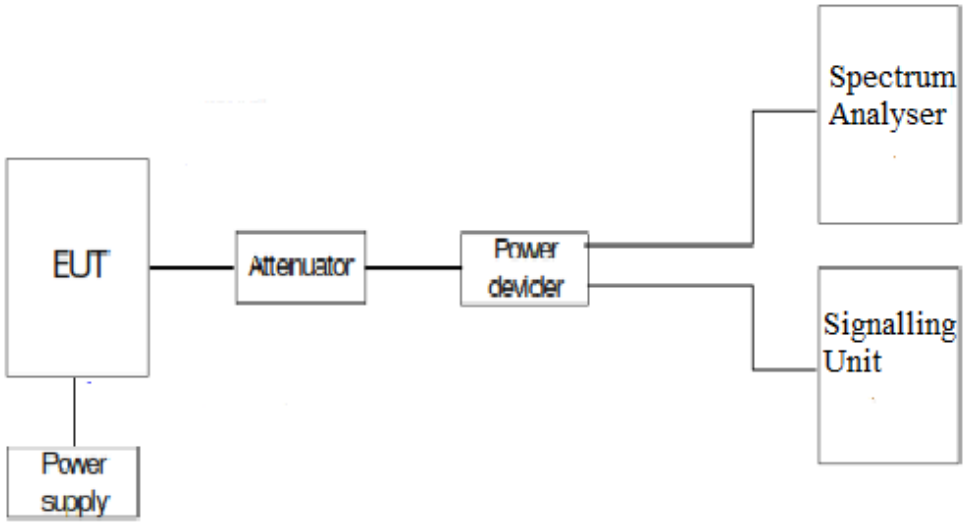
Fixed. mobile. and portable (hand-held) stations operating in the band are limited to 1-watt EIRP (30 dBm). Fixed stations operating in the band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.
The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

RSS-199 Clause 6.5

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed two watts.

The peak-to-average power ratio (PAPR) of the transmission shall not exceed 13 dB.

TEST SETUP:



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 4)
TEST RESULTS:	PASS

LTE QPSK AND 16QAM MODULATION. Bandwidth = 1.4 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.41	2.0	24.41	5.07
Middle	22.37	2.0	24.37	5.07
Highest	22.4	2.0	24.4	5.36

LTE QPSK AND 16QAM MODULATION. Bandwidth = 3 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.4	2.0	24.4	5.04
Middle	22.37	2.0	24.37	5.07
Highest	22.42	2.0	24.42	5.30

LTE QPSK AND 16QAM MODULATION. Bandwidth = 5 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.51	2.0	24.51	5.10
Middle	22.44	2.0	24.44	4.81
Highest	22.45	2.0	24.45	5.25

LTE QPSK AND 16QAM MODULATION. Bandwidth = 10 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.48	2.0	24.48	5.16
Middle	22.45	2.0	24.45	4.84
Highest	22.47	2.0	24.47	5.22

LTE QPSK AND 16QAM MODULATION. Bandwidth = 15 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.52	2.0	24.52	5.04
Middle	22.51	2.0	24.51	4.75
Highest	22.59	2.0	24.59	4.99

LTE QPSK AND 16QAM MODULATION. Bandwidth = 20 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.59	2.0	24.59	5.01
Middle	22.55	2.0	24.55	5.04
Highest	22.52	2.0	24.52	4.99
Measurement uncertainty (dB)			<±0.95	

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
1.4	Lowest (19957 (1710.7 MHz))	QPSK	1	0	22.33	4.32
			1	5	22.38	
			3	0	22.37	
			3	2	22.41	
			6	0	21.39	
		16-QAM	1	0	21.75	5.07
			1	5	21.74	
			3	0	21.48	
			3	2	21.49	
			6	0	20.41	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.3	4.23
			1	5	22.31	
			3	0	22.33	
			3	2	22.37	
			6	0	21.33	
		16-QAM	1	0	21.39	5.07
			1	5	21.47	
			3	0	21.42	
			3	2	21.46	
			6	0	20.37	
	Highest (20393 (1754.3 MHz))	QPSK	1	0	22.36	4.52
			1	5	22.39	
			3	0	22.35	
			3	2	22.4	
			6	0	21.35	
		16-QAM	1	0	21.6	5.36
			1	5	21.47	
			3	0	21.41	
			3	2	21.49	
			6	0	20.41	

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
3	Lowest (19965 (1711.5 MHz))	QPSK	1	0	22.4	4.20
			1	14	22.37	
			8	0	21.48	
			8	7	21.45	
			15	0	21.48	
		16-QAM	1	0	21.61	5.04
			1	14	21.6	
			8	0	20.57	
			8	7	20.56	
			15	0	20.48	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.37	4.06
			1	14	22.34	
			8	0	21.36	
			8	7	21.41	
			15	0	21.39	
		16-QAM	1	0	21.62	5.07
			1	14	21.5	
			8	0	20.47	
			8	7	20.46	
			15	0	20.37	
	Highest (20385 (1753.5 MHz))	QPSK	1	0	22.42	4.46
			1	14	22.4	
			8	0	21.39	
			8	7	21.45	
			15	0	21.42	
		16-QAM	1	0	21.66	5.30
			1	14	21.67	
			8	0	20.48	
			8	7	20.48	
			15	0	20.45	

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
5	Lowest (19975 (1712.5 MHz))	QPSK	1	0	22.51	4.17
			1	12	22.44	
			1	24	22.47	
			12	0	21.49	
			12	11	21.48	
			25	0	21.49	
		16-QAM	1	0	21.67	5.10
			1	12	21.56	
			1	24	21.53	
			12	0	20.48	
			12	11	20.56	
			25	0	20.52	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.43	4.06
			1	12	22.37	
			1	24	22.44	
			12	0	21.42	
			12	11	21.4	
			25	0	21.42	
		16-QAM	1	0	21.55	4.81
			1	12	21.46	
			1	24	21.53	
			12	0	20.4	
			12	11	20.44	
			25	0	20.42	
	Highest (20375 (1752.5 MHz))	QPSK	1	0	22.43	4.38
			1	12	22.43	
			1	24	22.45	
			12	0	21.43	
			12	11	21.42	
			25	0	21.42	
		16-QAM	1	0	21.64	5.25
			1	12	21.67	
			1	24	21.7	
			12	0	20.47	
			12	11	20.45	
			25	0	20.47	

TEST RESULTS (Cont):	

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PAPR (dB)
10	Lowest (20000 (1715 MHz))	QPSK	1	0	22.47	4.14
			1	24	22.4	
			1	49	22.48	
			25	0	21.51	
			25	24	21.53	
			50	0	21.51	
		16-QAM	1	0	21.69	5.16
			1	24	21.65	
			1	49	21.57	
			25	0	20.56	
			25	24	20.55	
			50	0	20.53	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.45	4.09
			1	24	22.38	
			1	49	22.44	
			25	0	21.46	
			25	24	21.43	
			50	0	21.44	
		16-QAM	1	0	21.52	4.84
			1	24	21.62	
			1	49	21.63	
			25	0	20.45	
			25	24	20.48	
			50	0	20.47	
	Highest (20350 (1750 MHz))	QPSK	1	0	22.47	4.17
			1	24	22.4	
			1	49	22.46	
			25	0	21.42	
			25	24	21.47	
			50	0	21.44	
		16-QAM	1	0	21.49	5.22
			1	24	21.58	
			1	49	21.61	
			25	0	20.45	
			25	24	20.44	
			50	0	20.47	

TEST RESULTS (Cont):

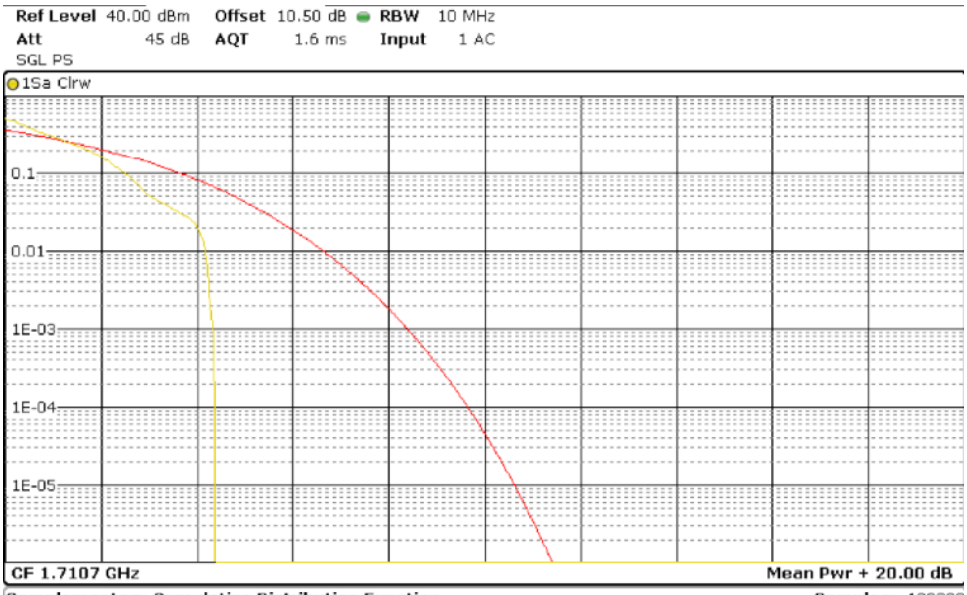
BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PAPR (dB)
15	Lowest (20025 (1717.5 MHz))	QPSK	1	0	22.52	4.12
			1	37	22.38	
			1	74	22.44	
			36	0	21.53	
			36	37	21.42	
			75	0	21.54	
		16-QAM	1	0	21.7	5.04
			1	37	21.7	
			1	74	21.74	
			36	0	20.55	
			36	37	20.41	
			75	0	20.58	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.51	4.00
			1	37	22.4	
			1	74	22.5	
			36	0	21.44	
			36	37	21.45	
			75	0	21.46	
		16-QAM	1	0	21.66	4.75
			1	37	21.53	
			1	74	21.69	
			36	0	20.5	
			36	37	20.51	
			75	0	20.44	
	Highest (20325 (1747.5 MHz))	QPSK	1	0	22.59	4.03
			1	37	22.35	
			1	74	22.53	
			36	0	21.46	
			36	37	21.43	
			75	0	21.43	
		16-QAM	1	0	21.82	4.99
			1	37	21.61	
			1	74	21.68	
			36	0	20.43	
			36	37	20.46	
			75	0	20.48	

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PAPR (dB)
20	Lowest (20050 (1720 MHz))	QPSK	1	0	22.59	4.12
			1	49	22.38	
			1	99	22.41	
			50	0	21.59	
			50	49	21.41	
			100	0	21.56	
		16-QAM	1	0	21.72	5.01
			1	49	21.66	
			1	99	21.6	
			50	0	20.62	
			50	49	20.43	
			100	0	20.55	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.47	4.14
			1	49	22.37	
			1	99	22.55	
			50	0	21.46	
			50	49	21.49	
			100	0	21.45	
		16-QAM	1	0	21.66	5.04
			1	49	21.53	
			1	99	21.76	
			50	0	20.51	
			50	49	20.47	
			100	0	20.49	
	Highest (20300 (1745 MHz))	QPSK	1	0	22.48	4.00
			1	49	22.38	
			1	99	22.52	
			50	0	21.54	
			50	49	21.49	
			100	0	21.45	
		16-QAM	1	0	21.78	4.99
			1	49	21.55	
			1	99	21.71	
			50	0	20.53	
			50	49	20.47	
			100	0	20.47	

TEST RESULTS (Cont):	

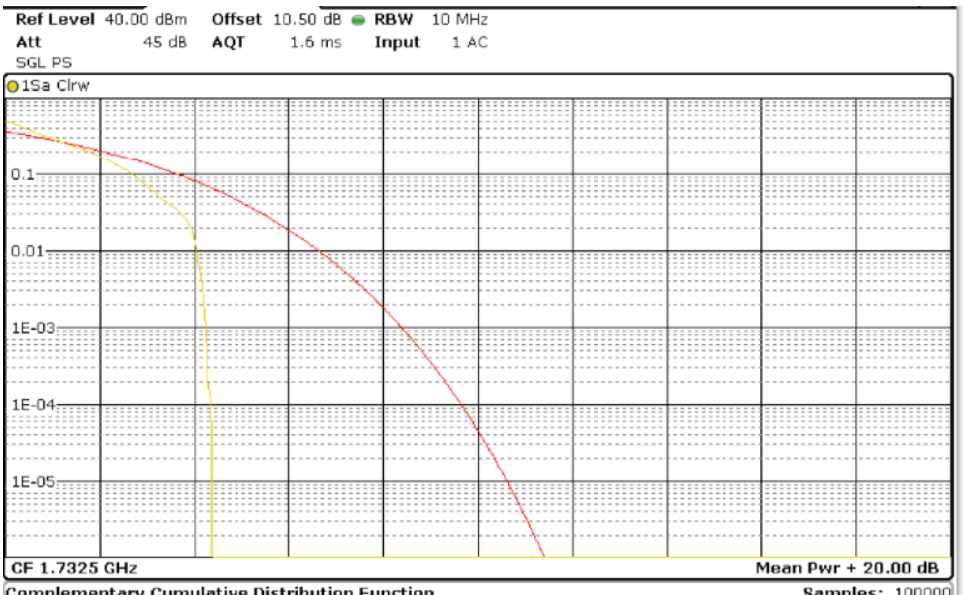
PAPR
Bandwidth = 1.4 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel



Complementary Cumulative Distribution Function — Samples: 100000

	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	32.56 dBm	36.91 dBm	4.35 dB	2.49 dB	4.14 dB	4.32 dB	4.38 dB

Middle channel

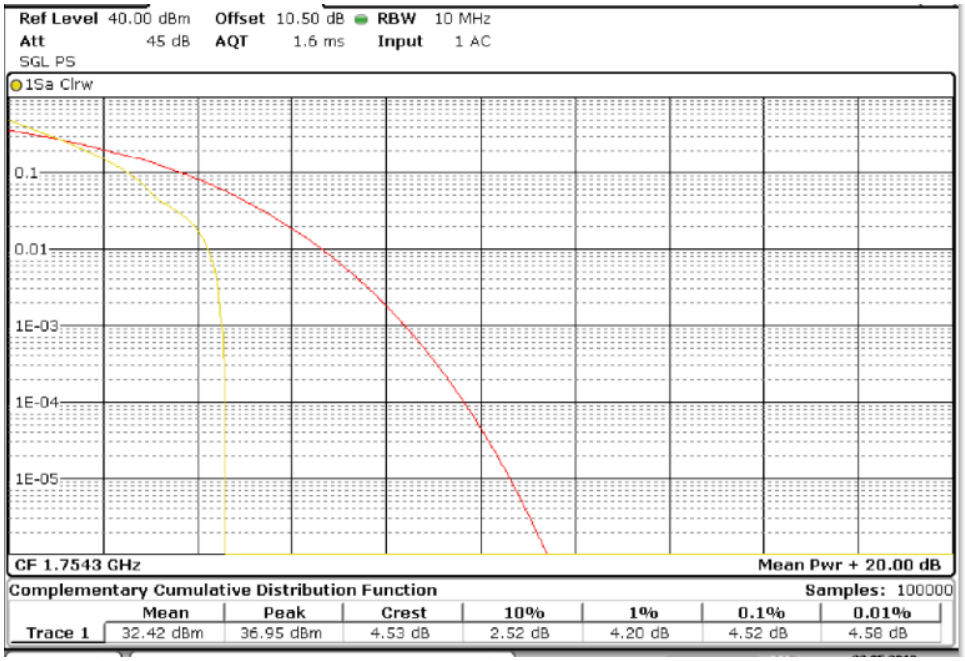


Complementary Cumulative Distribution Function — Samples: 100000

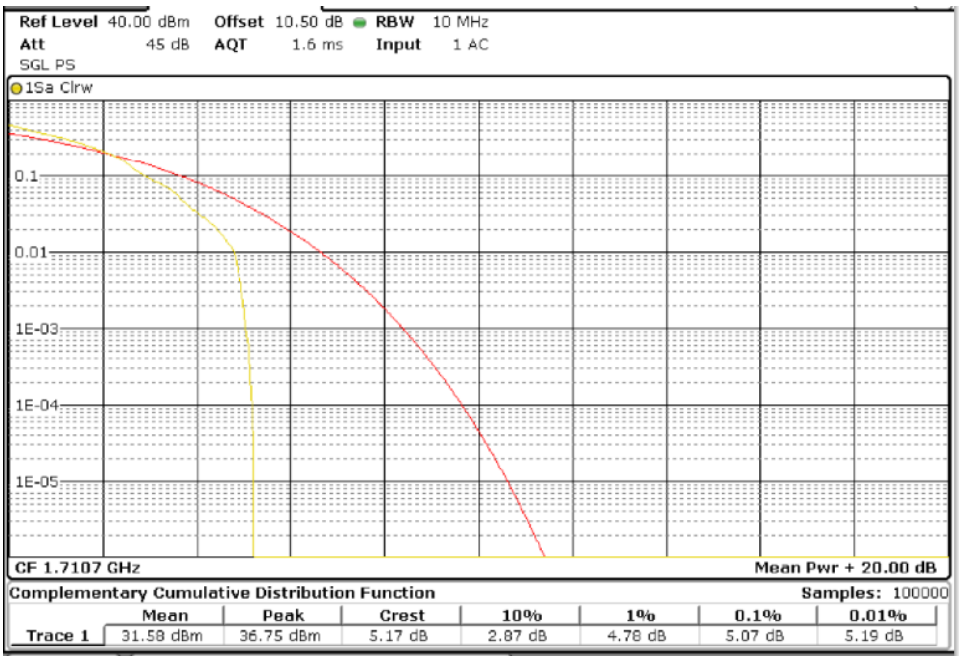
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	32.29 dBm	36.60 dBm	4.31 dB	2.70 dB	4.06 dB	4.23 dB	4.32 dB

TEST RESULTS (Cont):	

Highest channel

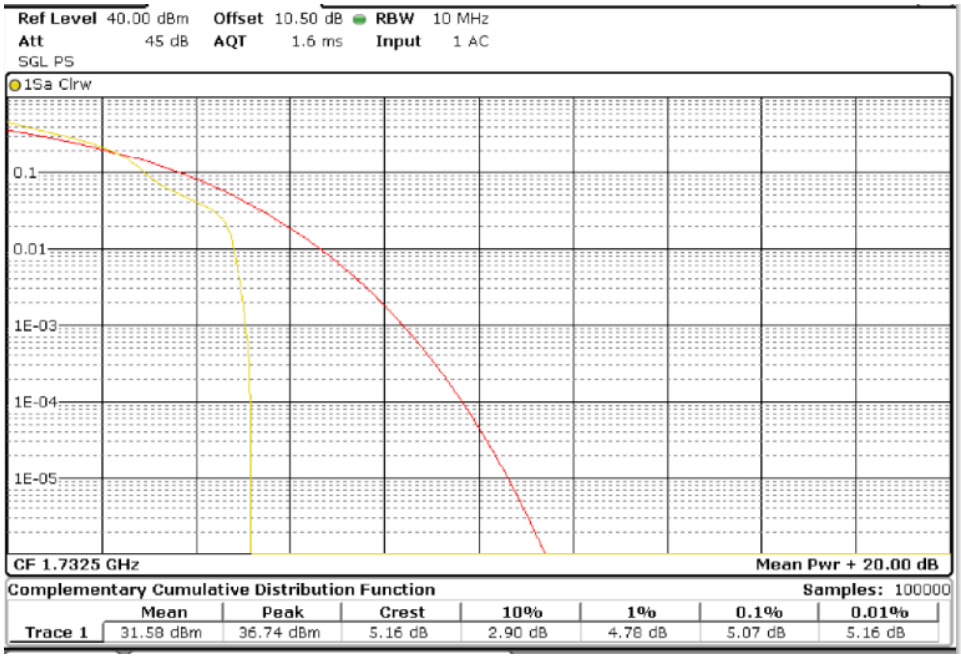


PAPR
Bandwidth = 1.4 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

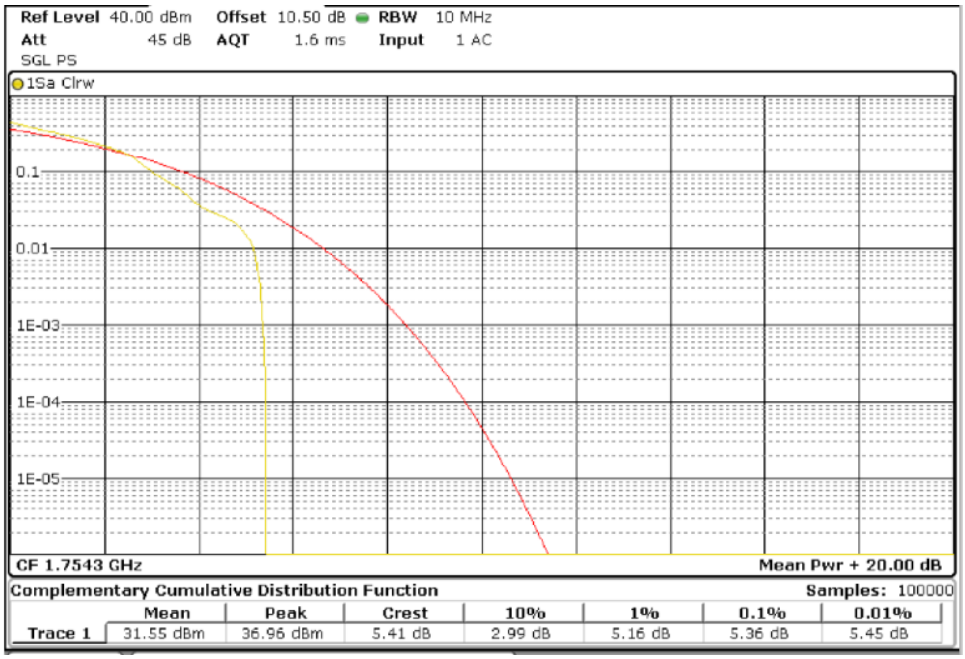


TEST RESULTS (Cont):	

Middle channel

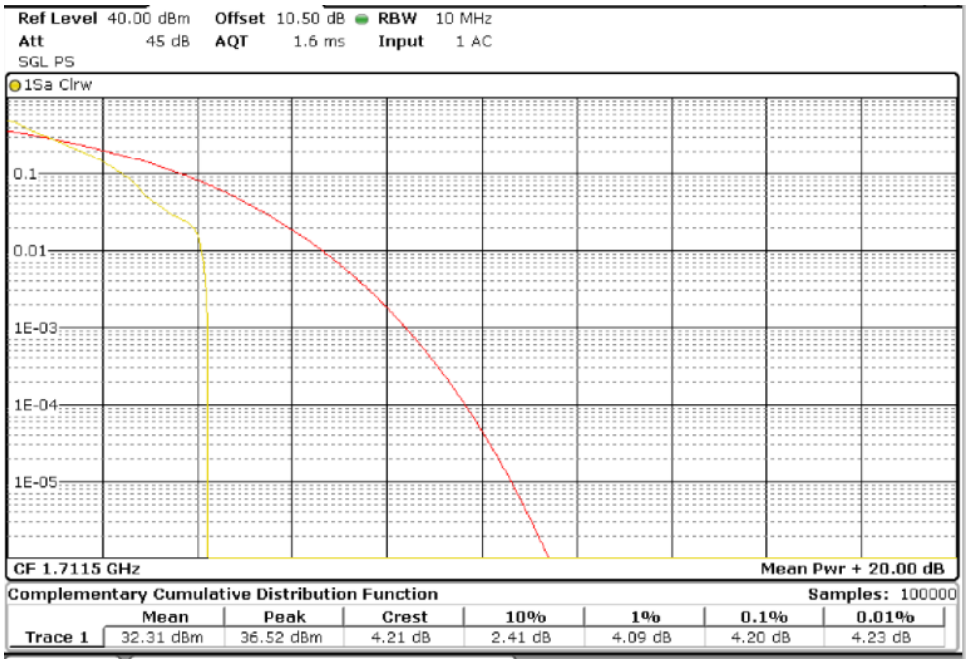


Highest channel

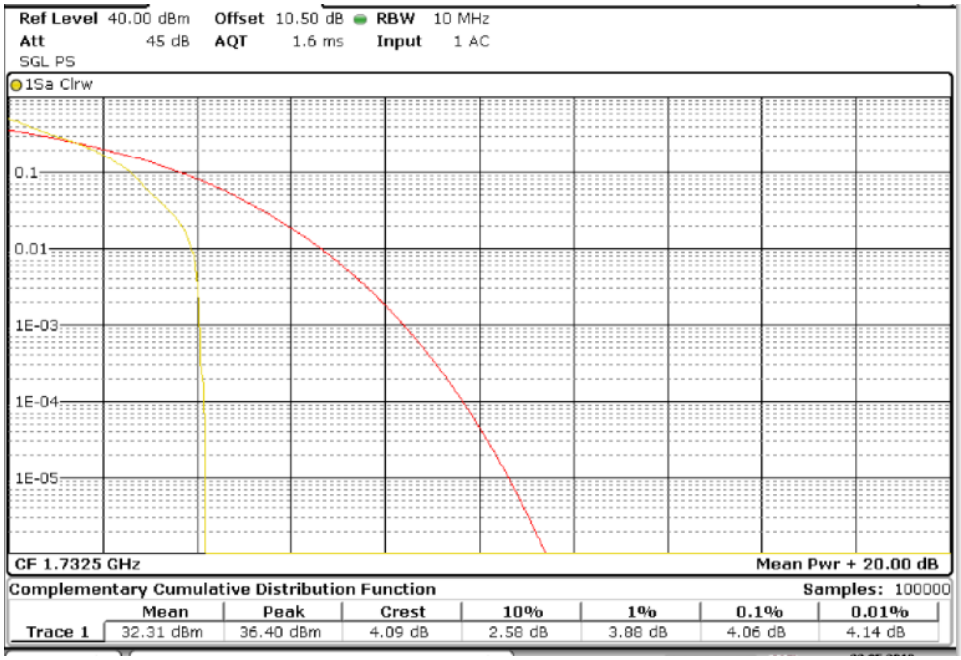


TEST RESULTS (Cont):	

PAPR
Bandwidth = 3 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel

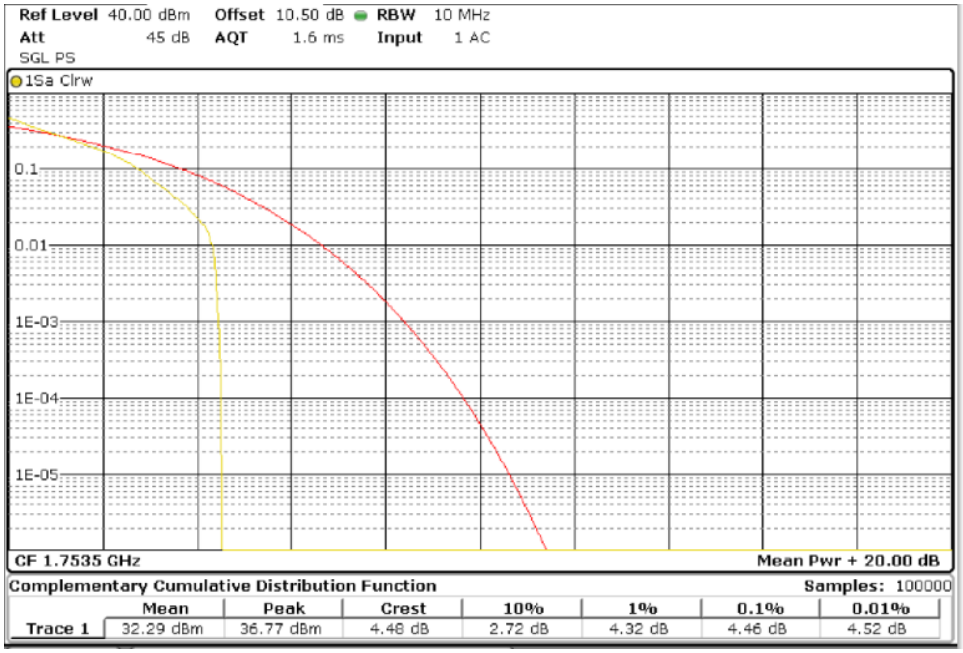


Middle channel

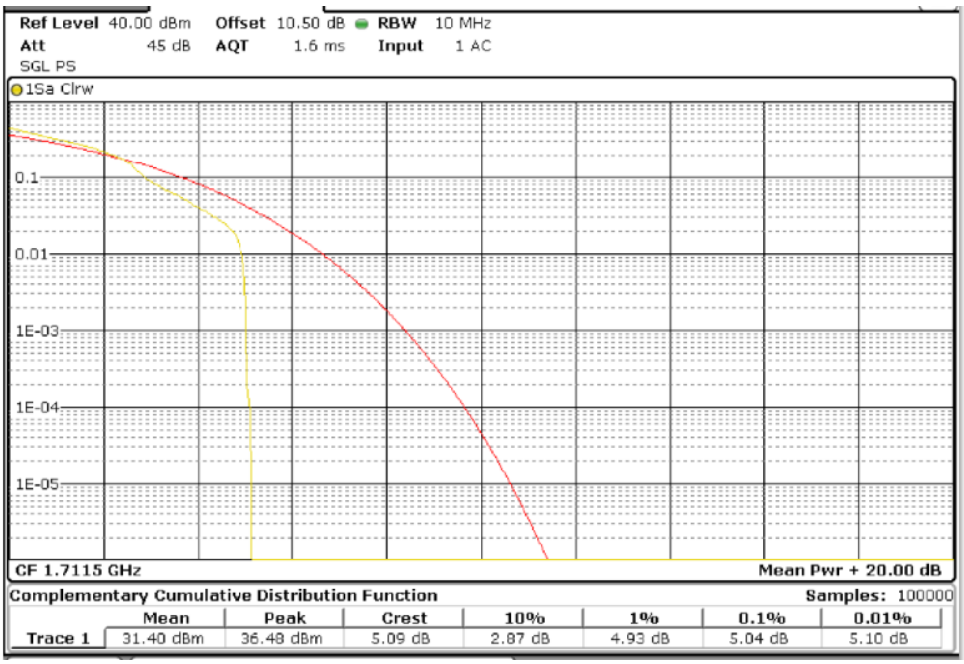


TEST RESULTS (Cont):	

Highest channel

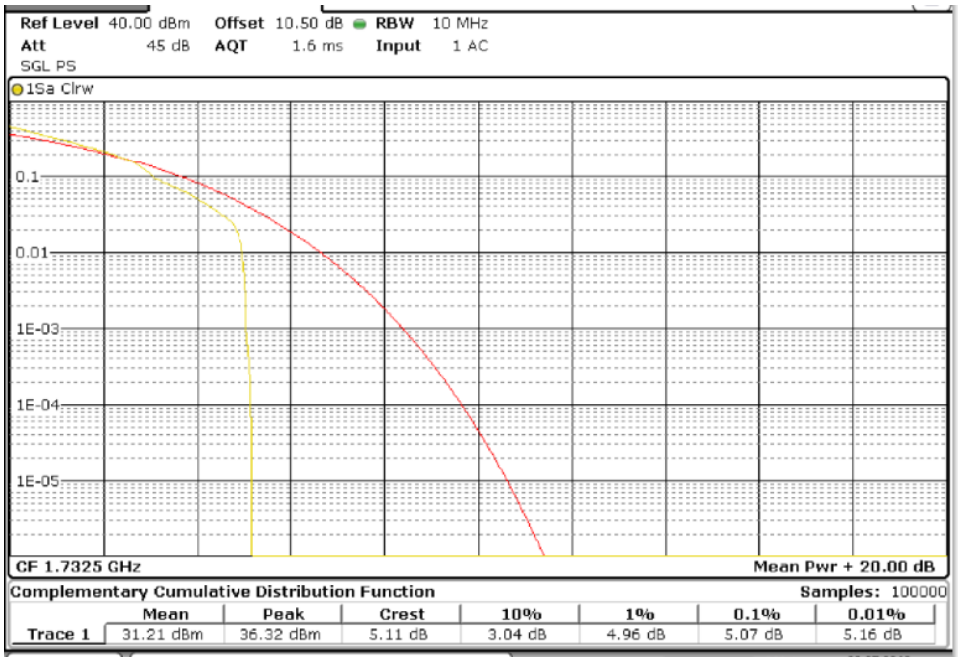


PAPR
Bandwidth = 3 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

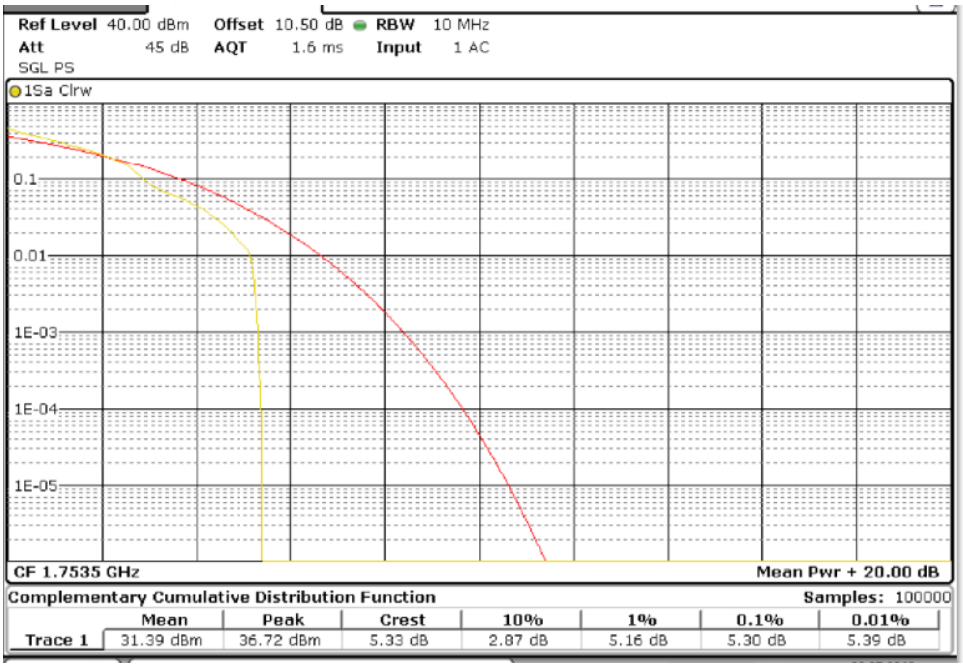


TEST RESULTS (Cont):	

Middle channel

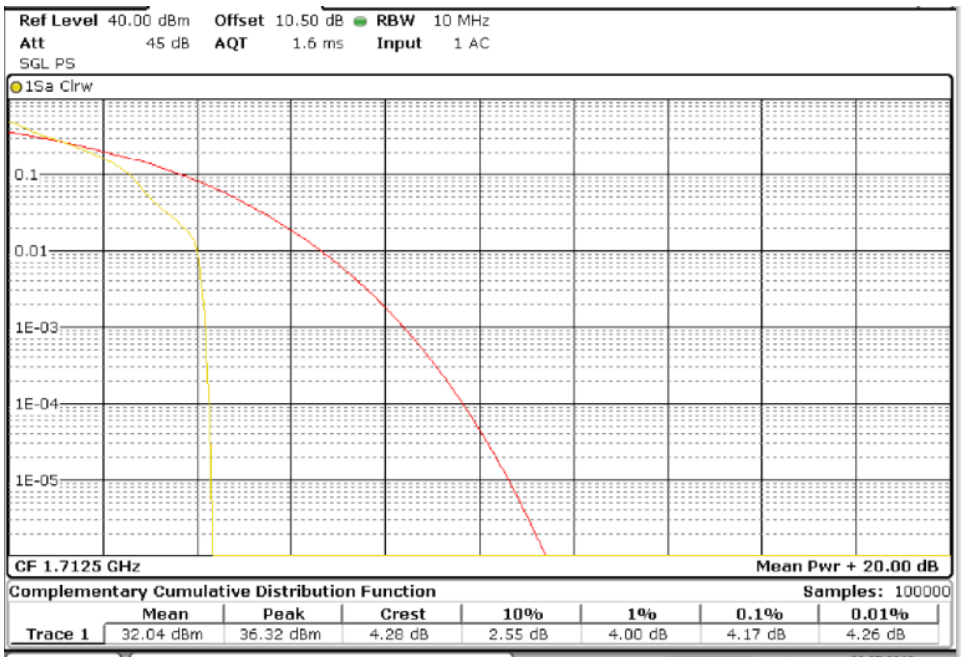


Highest channel

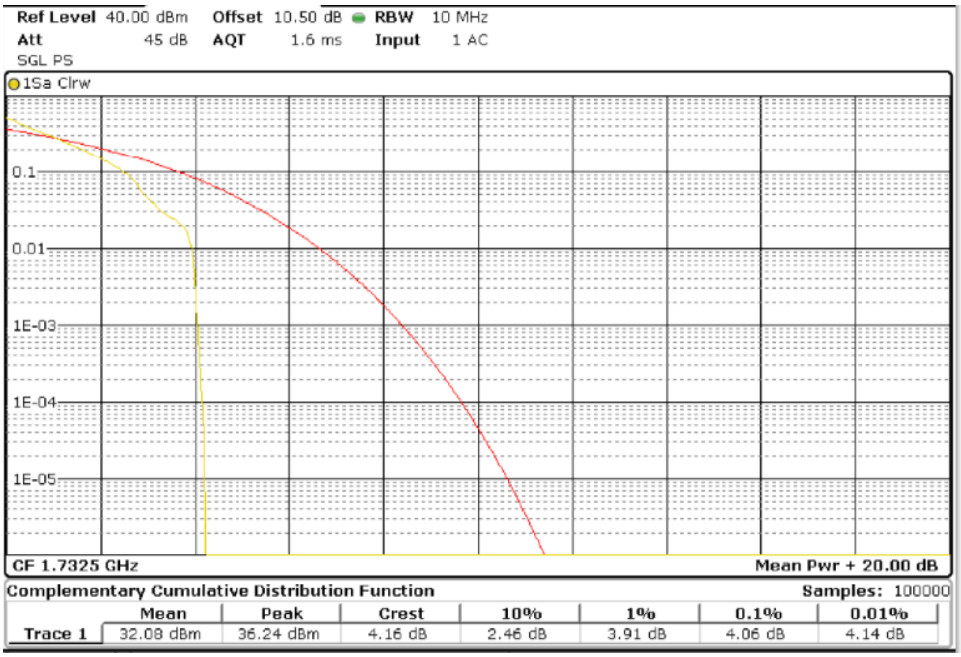


TEST RESULTS (Cont):	

PAPR
Bandwidth = 5 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel

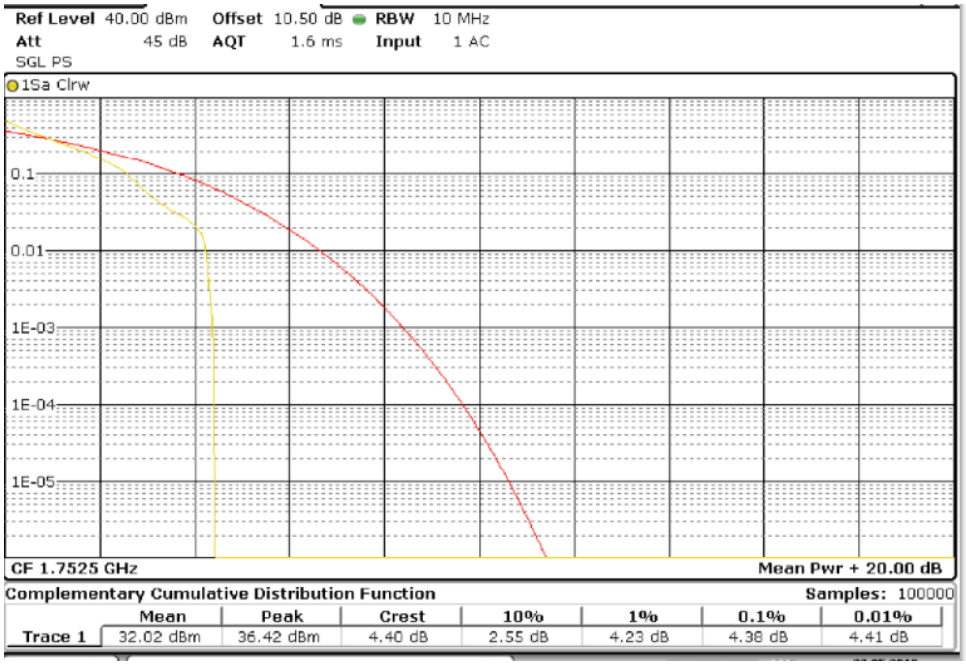


Middle channel

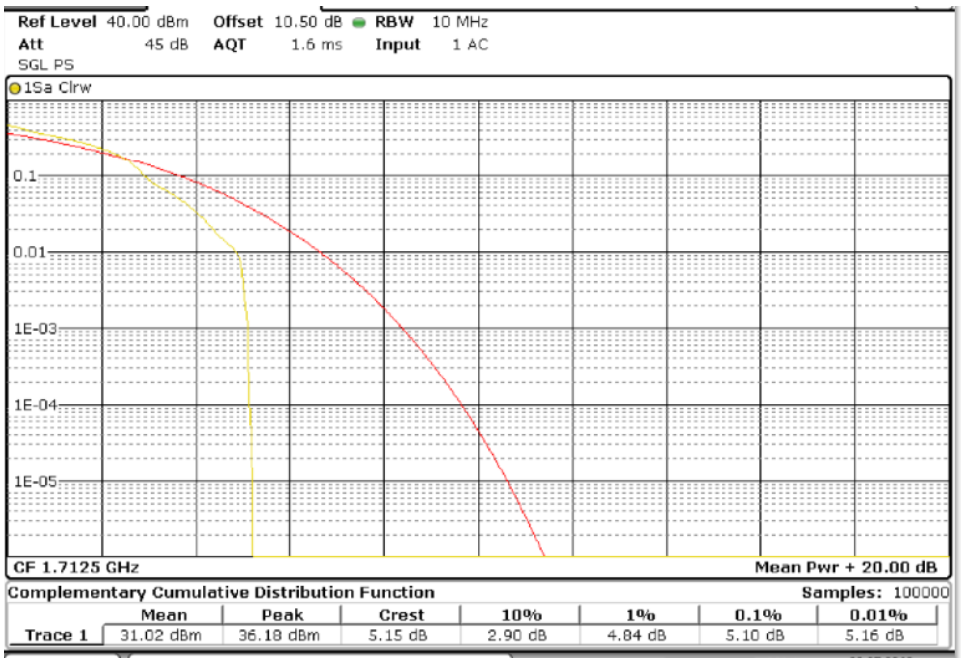


TEST RESULTS (Cont):	

Highest channel

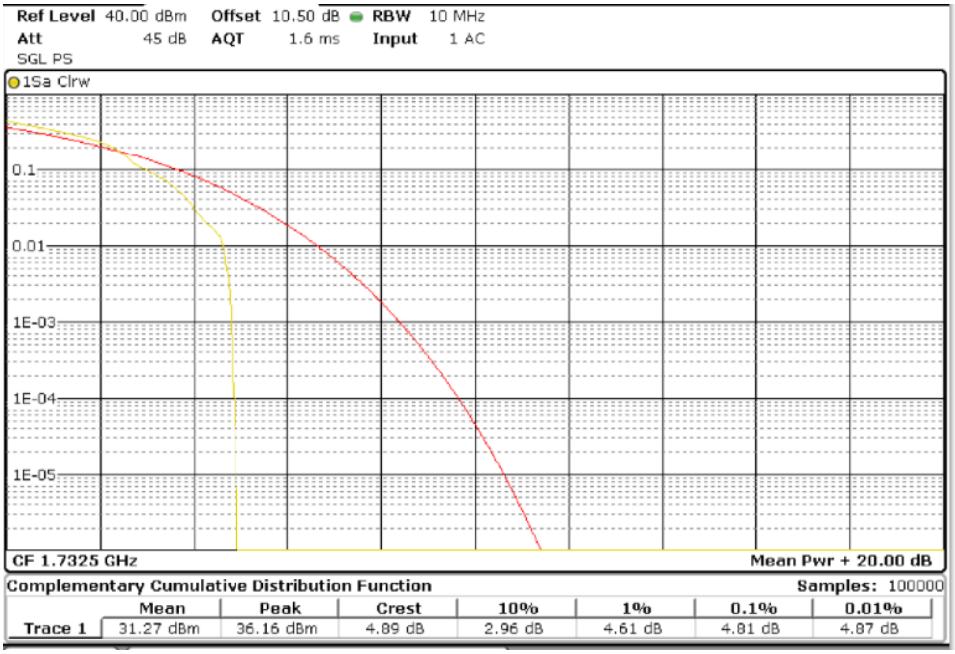


Bandwidth = 5 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

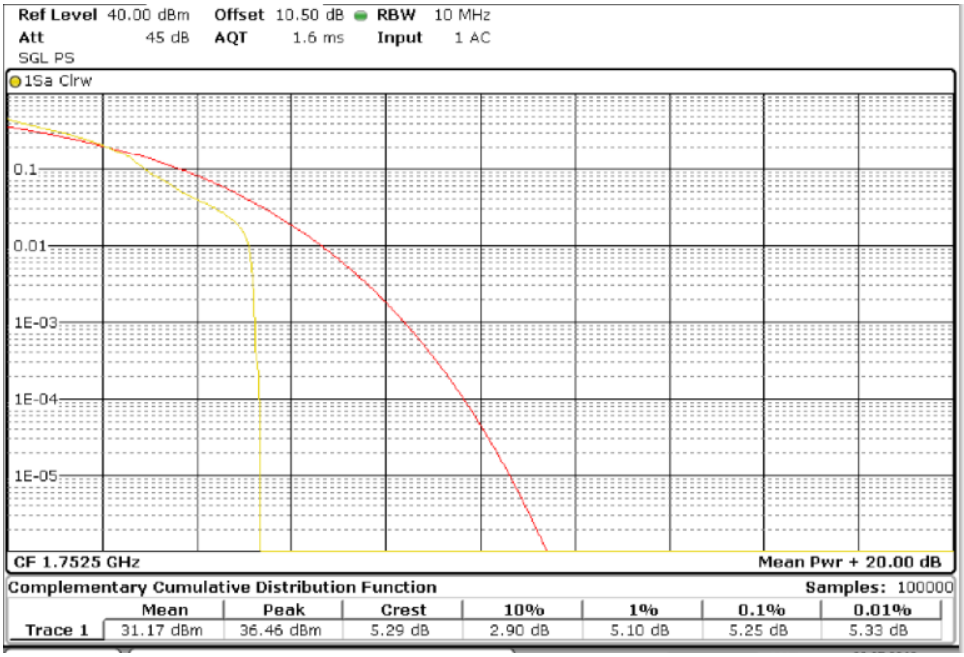


TEST RESULTS (Cont):	

Middle channel

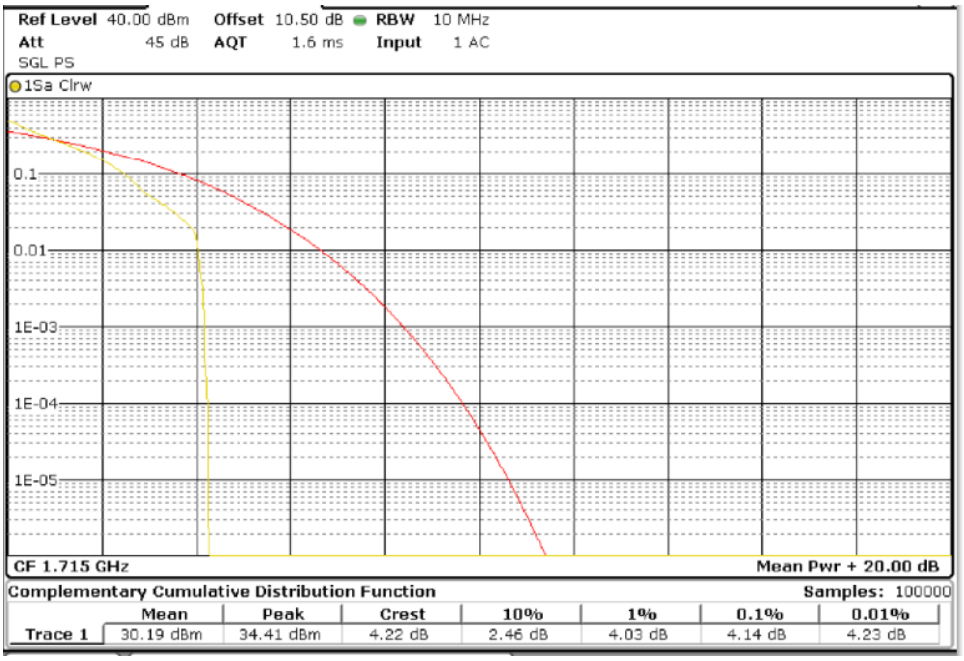


Highest channel

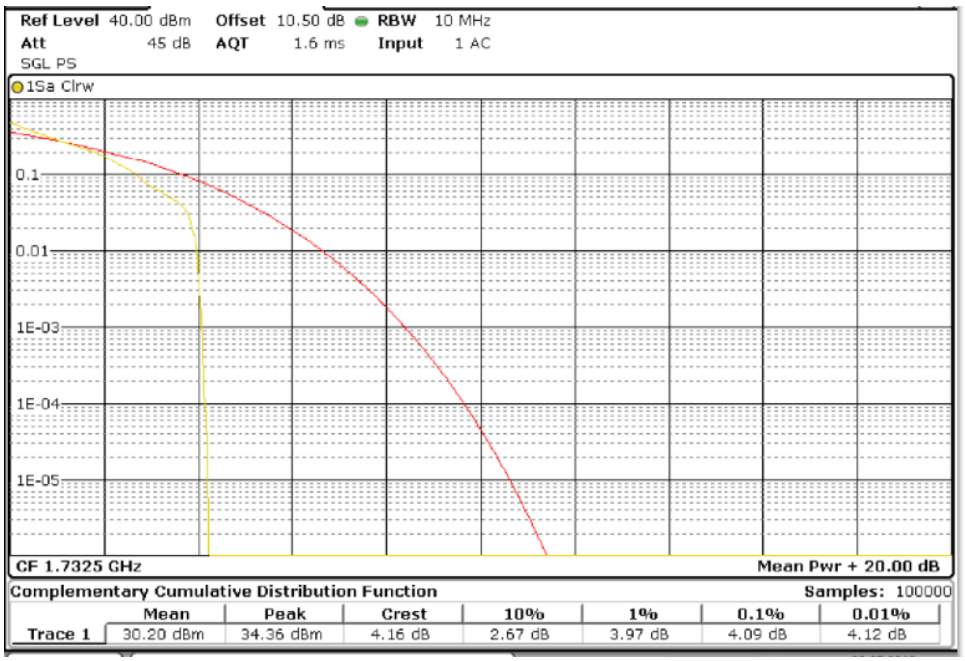


TEST RESULTS (Cont):	

Bandwidth = 10 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel

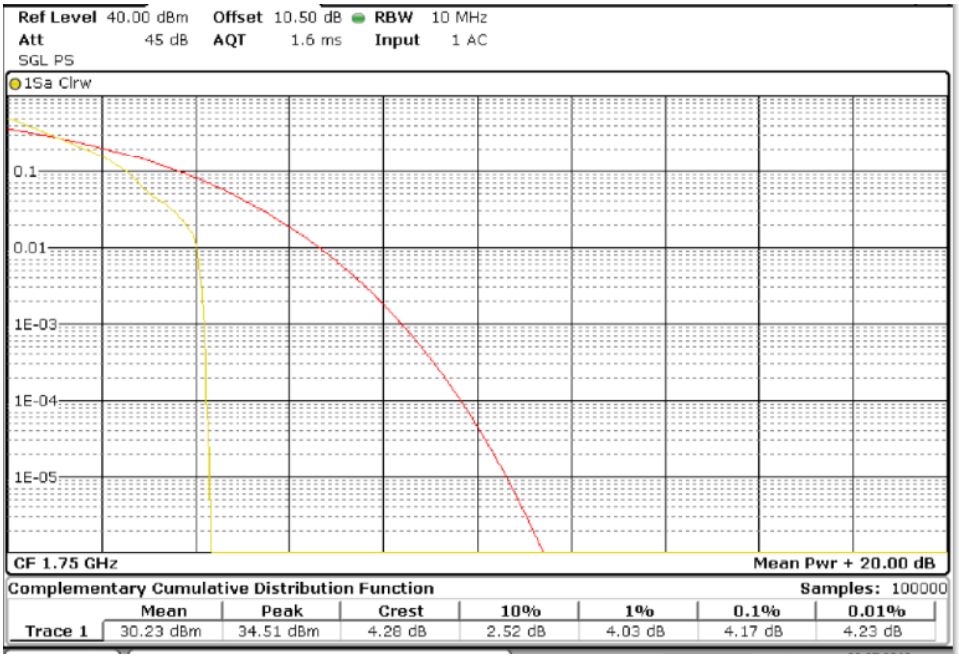


Middle channel

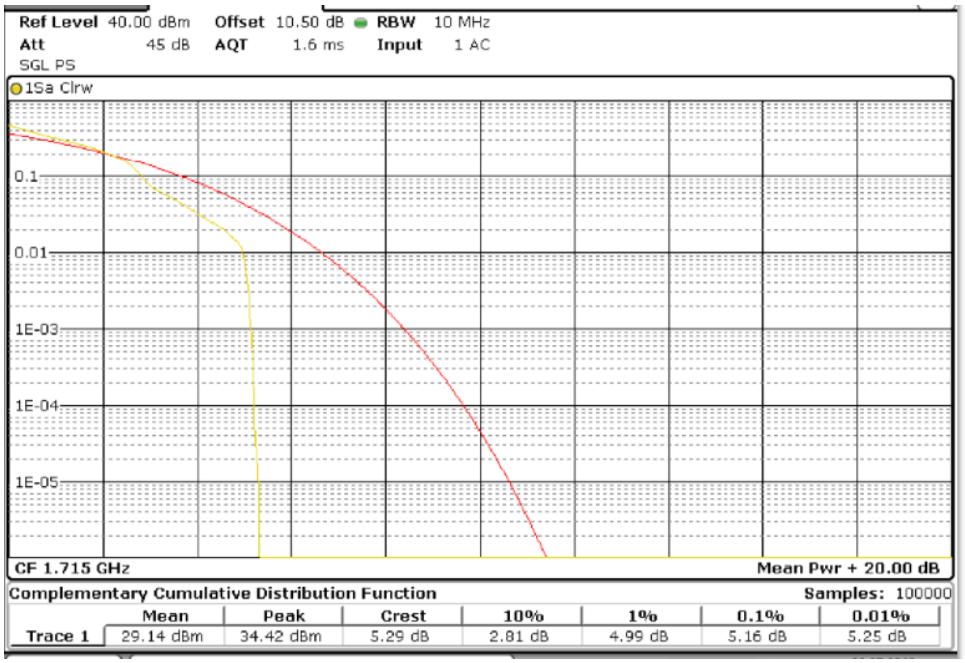


TEST RESULTS (Cont):	

Highest channel

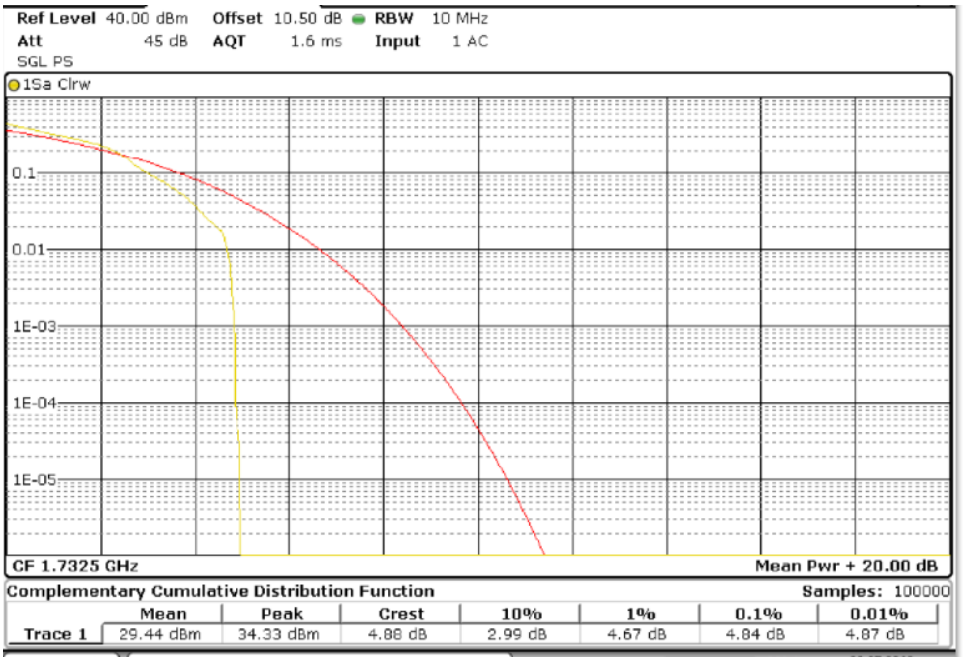


Bandwidth = 10 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

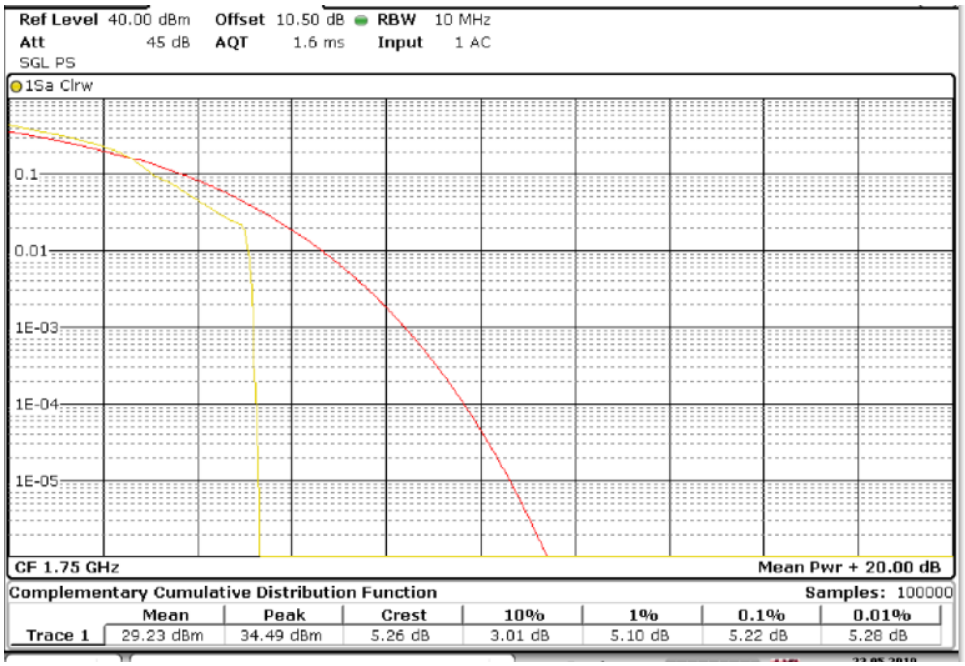


TEST RESULTS (Cont):	

Middle channel

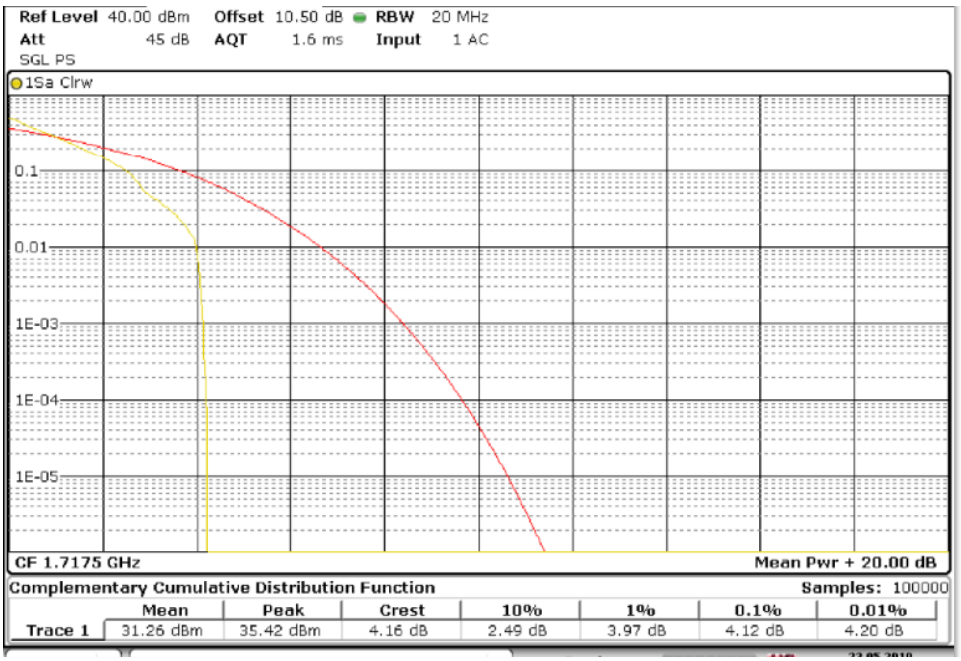


Highest channel

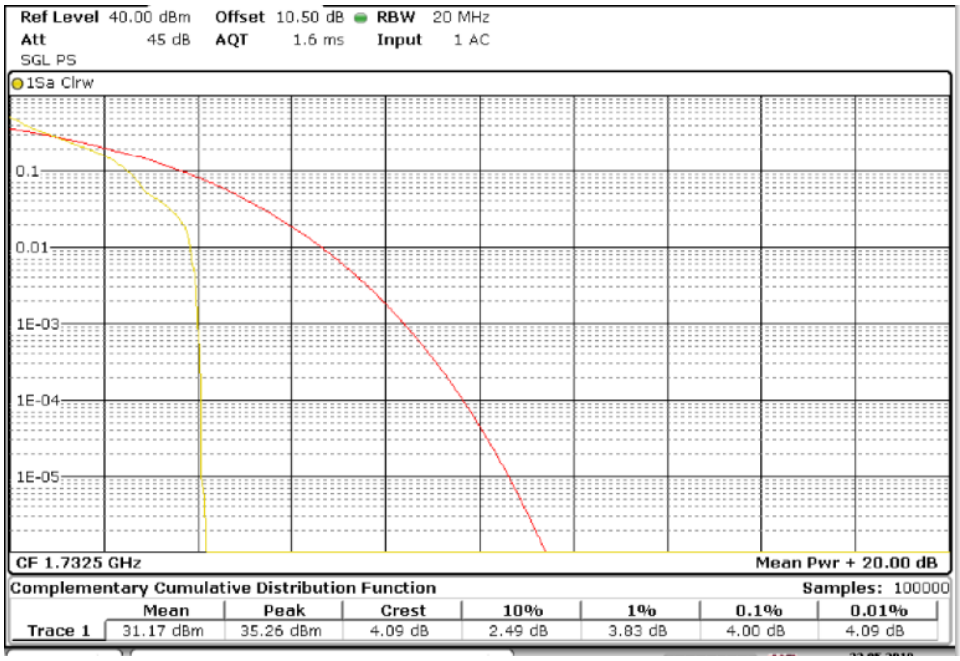


TEST RESULTS (Cont):	

PAPR
Bandwidth = 15 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel

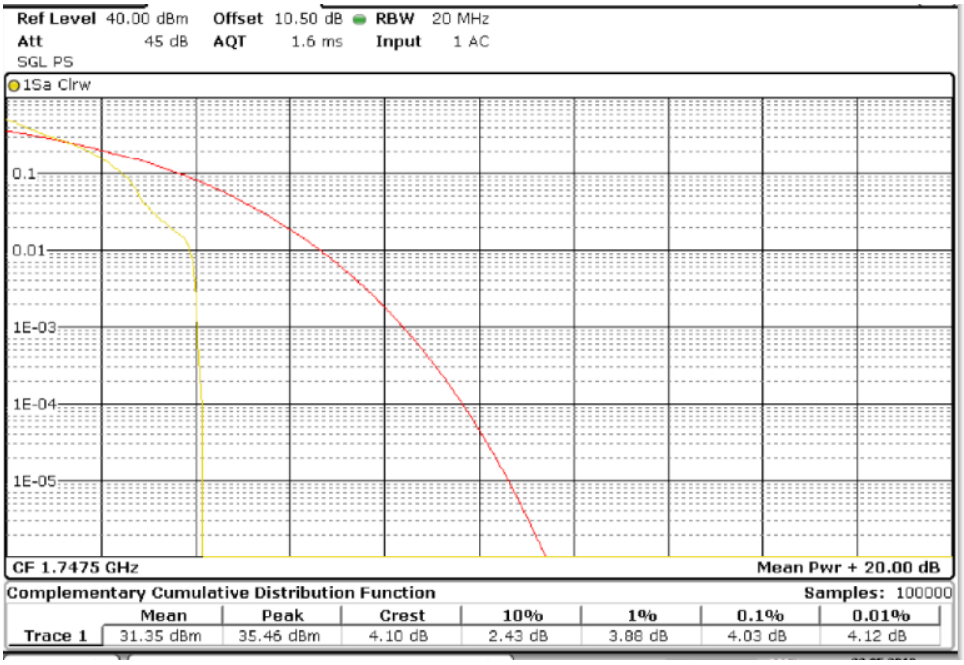


Middle channel

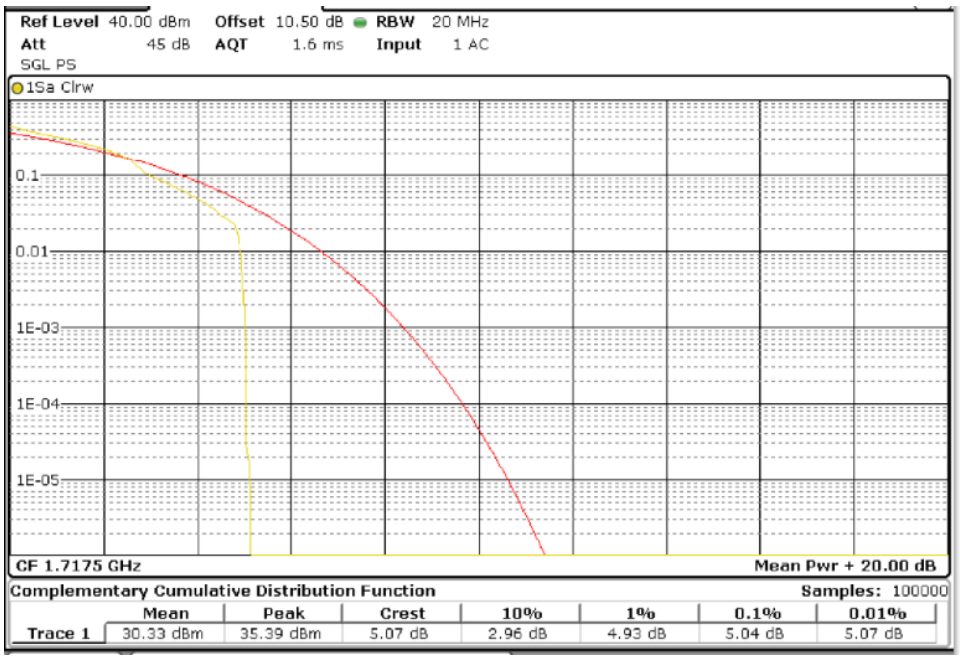


TEST RESULTS (Cont):	

Highest channel

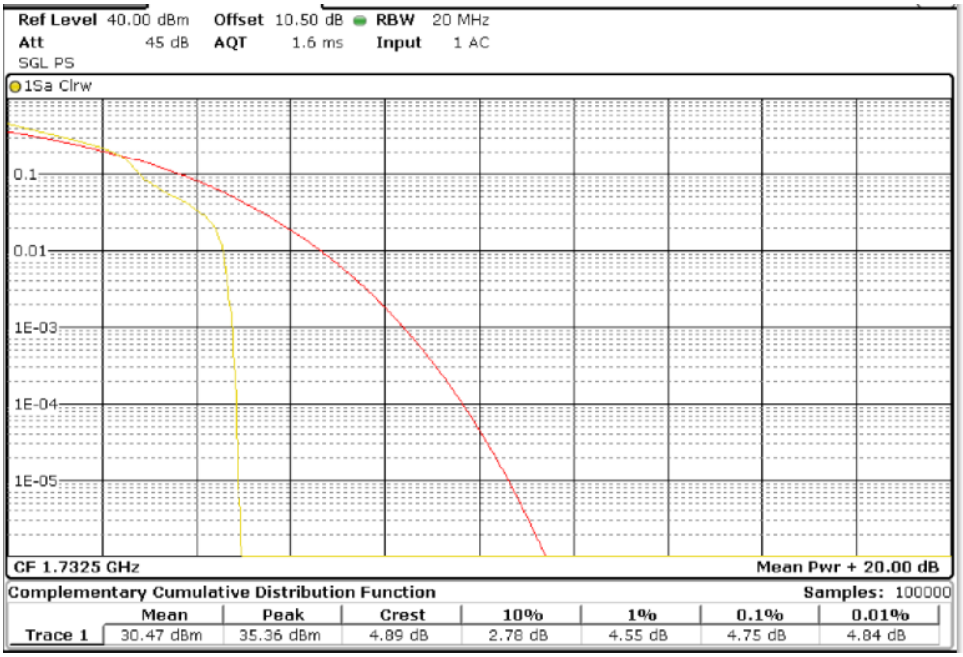


Bandwidth = 15 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

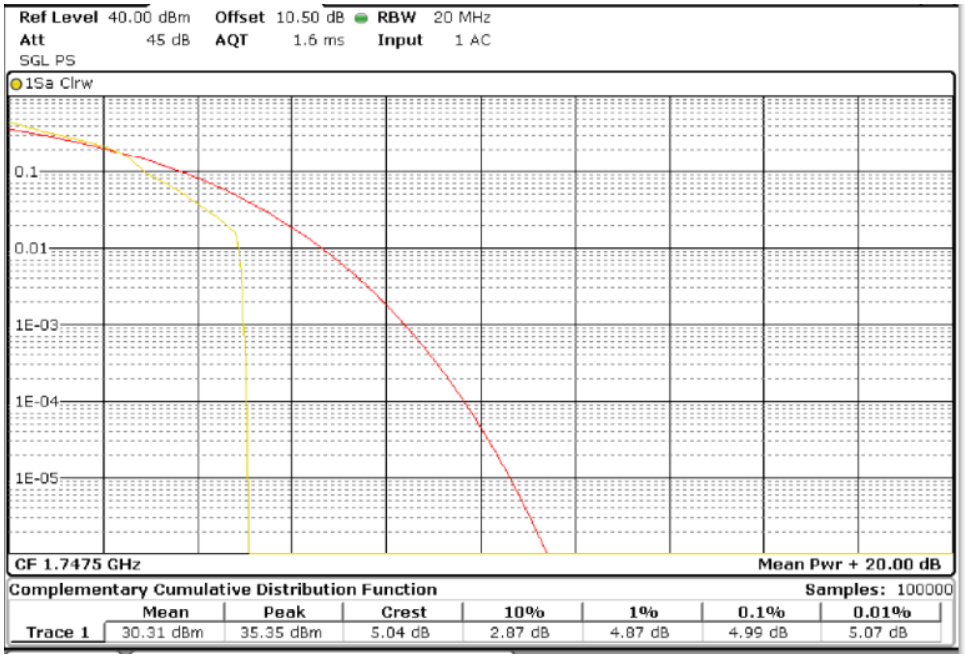


TEST RESULTS (Cont):	

Middle channel

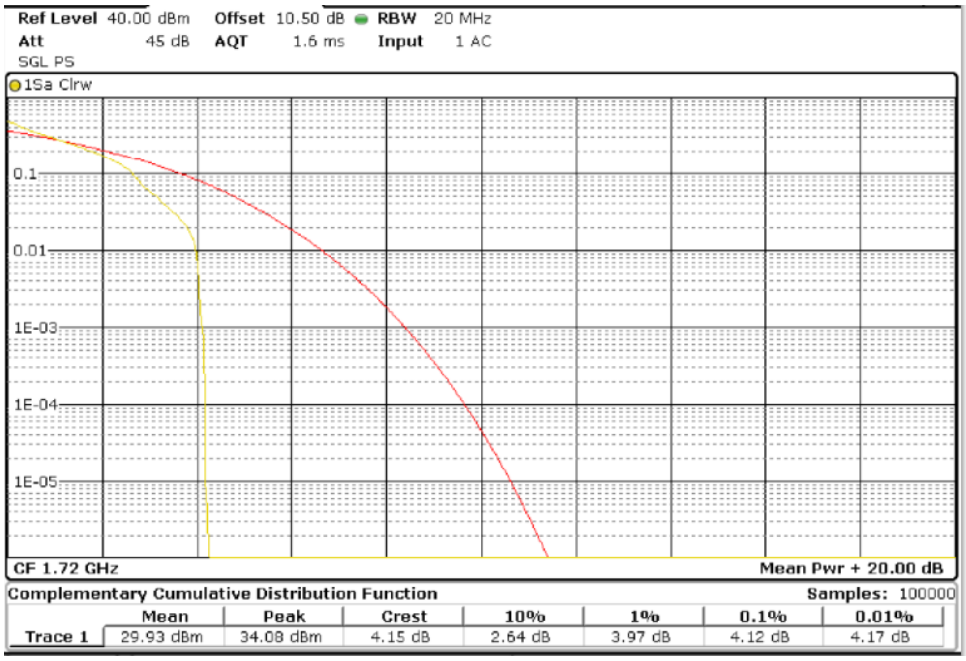


Highest channel

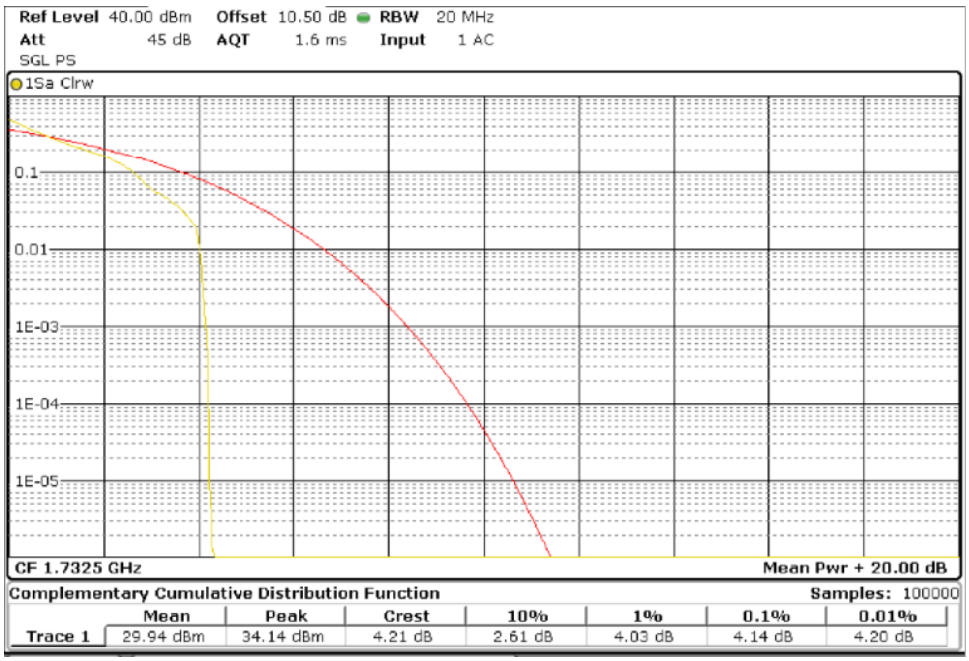


TEST RESULTS (Cont):	

Bandwidth = 20 MHz. Modulation QPSK. RB Size: 1. RB Offset: 0.
Lowest channel

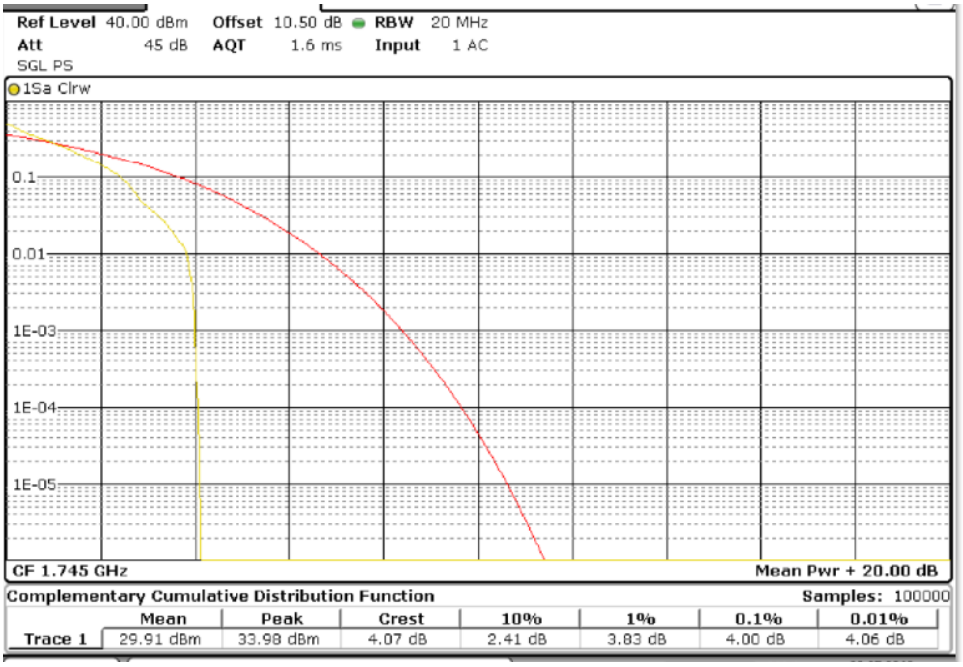


Middle channel

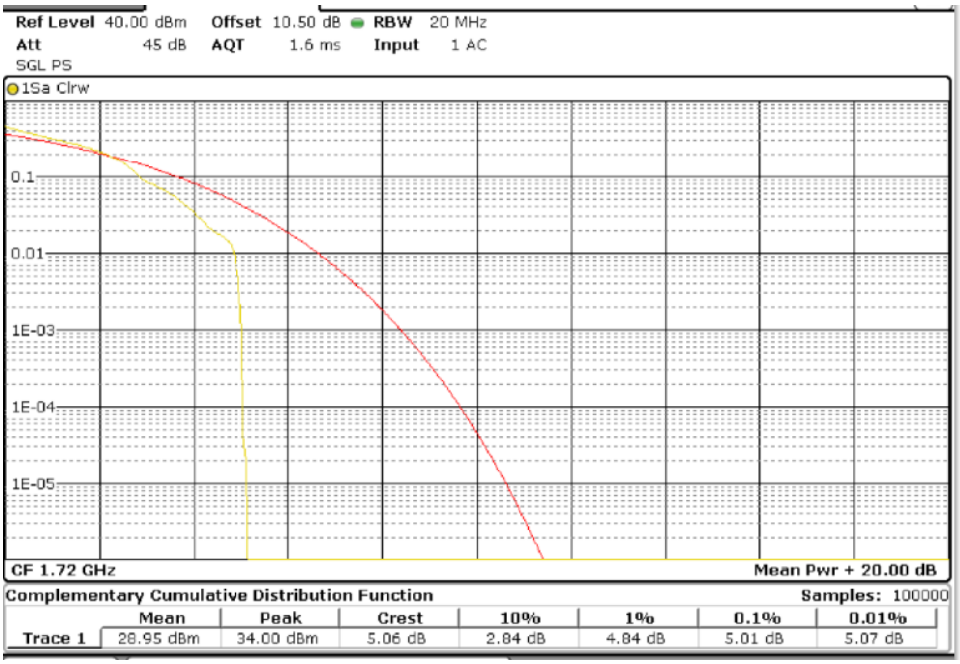


TEST RESULTS (Cont):	

Highest channel

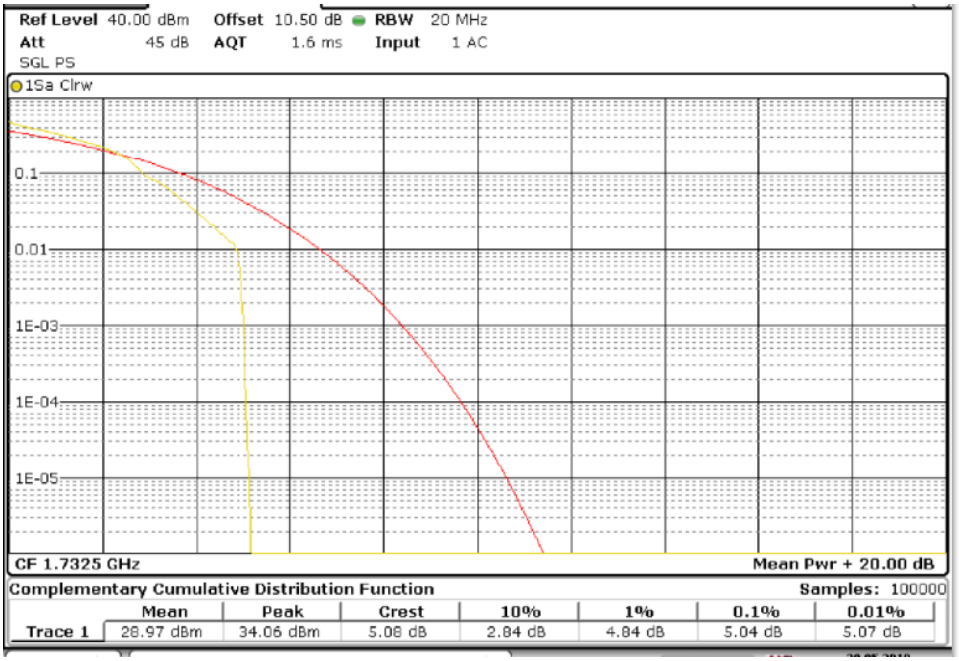


Bandwidth = 20 MHz. Modulation 16QAM. RB Size: 1. RB Offset: 0.
Lowest channel

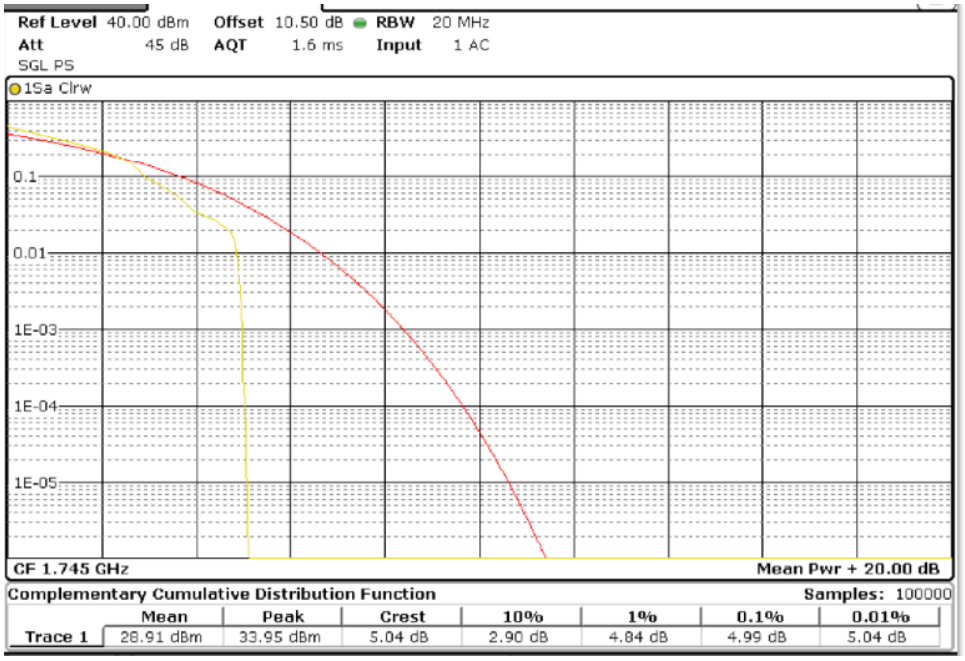


TEST RESULTS (Cont):	

Middle channel



Highest channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 7)
TEST RESULTS:	PASS

LTE QPSK AND 16QAM MODULATION. Bandwidth = 5 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.22	2.0	24.22	5.28
Middle	22.17	2.0	24.17	5.33
Highest	21.97	2.0	23.97	5.22

LTE QPSK AND 16QAM MODULATION. Bandwidth = 10 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.25	2.0	24.25	5.13
Middle	22.21	2.0	24.21	5.19
Highest	22.10	2.0	24.10	5.25

LTE QPSK AND 16QAM MODULATION. Bandwidth = 15 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.28	2.0	24.28	5.13
Middle	22.24	2.0	24.24	5.13
Highest	22.16	2.0	24.16	5.16

LTE QPSK AND 16QAM MODULATION. Bandwidth = 20 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)	PAPR (dB)
Lowest	22.30	2.0	24.30	5.10
Middle	22.28	2.0	24.28	5.07
Highest	22.19	2.0	24.19	5.13
Measurement uncertainty (dB)			<±0.95	

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
5	Lowest (20775 (2502.5 MHz))	QPSK	1	0	22.22	4.41
			1	12	22.21	
			1	24	22.18	
			12	0	21.26	
			12	11	21.24	
			25	0	21.23	
		16-QAM	1	0	21.45	5.28
			1	12	21.32	
			1	24	21.28	
			12	0	20.27	
			12	11	20.25	
			25	0	20.25	
	Middle (21100 (2535 MHz))	QPSK	1	0	22.17	4.43
			1	12	22.11	
			1	24	22.03	
			12	0	21.17	
			12	11	21.14	
			25	0	21.1	
		16-QAM	1	0	21.27	5.33
			1	12	21.31	
			1	24	21.26	
			12	0	20.18	
			12	11	20.18	
			25	0	20.16	
	Highest (24125 (2567.5 MHz))	QPSK	1	0	21.97	4.38
			1	12	21.95	
			1	24	21.96	
			12	0	21.05	
			12	11	20.99	
			25	0	21.01	
		16-QAM	1	0	21.28	5.22
			1	12	21.38	
			1	24	21.27	
			12	0	20.05	
			12	11	20.05	
			25	0	20.05	

TEST RESULTS (Cont):	

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PAPR (dB)
10	Lowest (20800 (2505 MHz))	QPSK	1	0	22.25	4.35
			1	24	22.16	
			1	49	22.12	
			25	0	21.27	
			25	24	21.19	
			50	0	21.26	
		16-QAM	1	0	21.51	5.13
			1	24	21.41	
			1	49	21.43	
			25	0	20.29	
			25	24	20.27	
			50	0	20.26	
	Middle (21100 (2535 MHz))	QPSK	1	0	22.21	4.32
			1	24	22.1	
			1	49	22.1	
			25	0	21.14	
			25	24	21.11	
			50	0	21.16	
		16-QAM	1	0	21.46	5.19
			1	24	21.24	
			1	49	21.31	
			25	0	20.15	
			25	24	20.12	
			50	0	20.15	
	Highest (21400 (2565 MHz))	QPSK	1	0	22.1	4.43
			1	24	22.04	
			1	49	22.03	
			25	0	21.04	
			25	24	21.03	
			50	0	21.07	
		16-QAM	1	0	21.38	5.25
			1	24	21.2	
			1	49	21.14	
			25	0	20.1	
			25	24	20.06	
			50	0	20.09	