FCC Test Report

Product Name	:	ML865C1-NA
Trade Name	:	Telit
Model No.	:	ML865C1-NA
FCC ID	:	RI7ML865C1NA

Applicant	:	Telit communications Spa
Address	:	Via Stazione di Prosecco 5/B
		34010 Sgonico
		Trieste-Italy

Date of Receipt	:	Aug. 09, 2018
Issued Date	:	Sep. 28, 2018
Report No.	:	1880135R-HPUSP40V00
Report Version	:	V1.0

Testing Laboratory
3024

Test Report Certification

Issued Date : Sep. 28, 2018
Report No. : 1880135R-HPUSP40V00

Product Name	:	ML865C1-NA
Applicant	:	Telit communications Spa
Address	:	Via Stazione di Prosecco 5/B 34010 Sgonico Trieste-Italy
Manufacturer	:	TELIT WIRELESS SOLUTIONS CO., LTD
Trade name	:	Telit
Model No.	:	ML865C1-NA
FCC ID	:	RI7ML865C1NA
EUT Voltage	:	DC 3.8V
Testing Voltage	:	DC 3.8V
Applicable Standard	:	FCC CFR Title 47 Part 24 Subpart E FCC CFR Title 47 Part 27 Subpart L, Subpart M, Subpart F ANSI/TIA-603 KDB 971168 D01 Power Meas License Digital Systems v03
Test Lab	:	Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C. TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result	:	Complied

Documented By :

(Carol Tsai / Senior Engineering Adm. Specialist)

Tested By :

(Andy Tsai / Senior Engineer)

Approved By :

(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1880135R-HPUSP40V00	V1.0	Initial issue of report	Sep. 28, 2018

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1. General Information

1.1. EUT Description

Product Name	ML865C1-NA
Trade Name	Telit
Model No.	ML865C1-NA
Uplink Frequency Range (MHz)	Band 2: 1850~1910 Band 4: 1710~1755 Band 12: 699~716 Band 13: 777~787
Downlink Frequency Range (MHz)	Band 2: 1930~1990 Band 4: 2110~2115 Band 12: 729~746 Band 13: 746~756
Modulation	QPSK/16QAM
HW	0.0
SW	M0B.150003

Accessories Information	
Antenna	1 PCS

Antenna Information	
Model No.	ATEL-CAB; T-AT305
Antenna Type	1/4 l Antenna
Antenna Gain	2.14 dBi

Note:

1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. We have pre-scanned the RF output power on all mode. According to the results, the worst case was selected from RF output power to test other test item

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: LTE_CAT. M1_Band 2
Mode 2: LTE_CAT. M1_Band 4
Mode 3: LTE_CAT. M1_Band 12
Mode 4: LTE_CAT. M1_Band 13

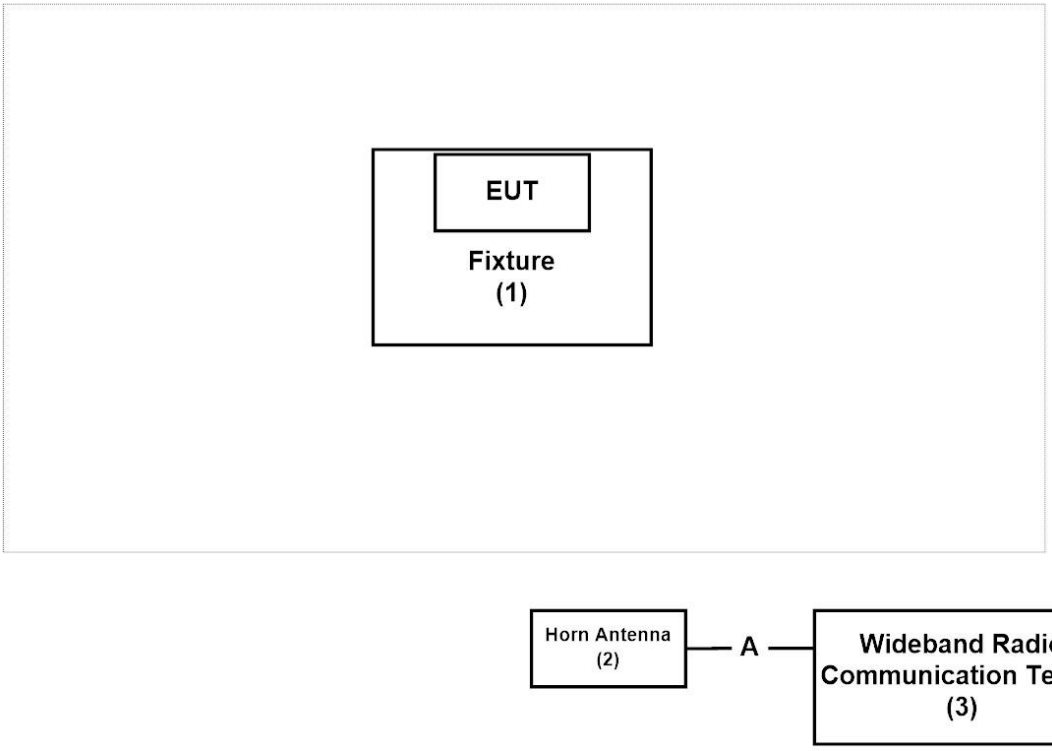
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Fixture	Telit	LE922A6-E2	N/A	DoC	--
2	Horn Antenna	Schwarzbeck	BBHA 9120D	639	DoC	--
3	Wideband Radio Communication Tester	R&S	CMW500	150246	DoC	--

1.4. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	RF Cable	Shielded, 2m

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	The EUT will continue receive the signal from CatM1 function.
4	Repeat the above procedure (3)

2. Technical Test

2.1. Summary of Test Result

Band2

Uplink: 1850-1910MHz

Downlink: 1930-1990MHz

LTE Band2					
FCC Part 24 Subpart E					
Industry Canada RSS-133, issue6, Industry Canada RSS-GEN					
Test item	FCC Reference section	FCC Limit	IC Reference section	IC Limit	Result
RF Output Power	§2.1033 §2.1046 §24.232	<2 Watts	§6.4	<2 Watts	Pass
Occupied Bandwidth	§2.1049	N/A	RSS-GEN §4.2	N/A	Pass
Peak-to-average power ratio	§24.232	<13 dB	§6.4	<13 dB	Pass
Spurious Emissions	§2.1053 §24.238	<-13dBm	§6.5	<-13dBm	Pass
Spurious Emissions at Antenna Terminals	§27.238	<-13dBm	§6.5	<-13dBm	Pass
Frequency Stability	§2.1055 §24.235	<±2.5 ppm	§6.3	<±2.5 ppm	Pass

Band 4

Uplink: 1710-1755MHz

Downlink: 2100-2155MHz

LTE Band4					
FCC Part 27 Subpart L					
Industry Canada RSS-139, issue3, Industry Canada RSS-GEN					
Test item	FCC Reference section	FCC Limit	IC Reference section	IC Limit	Result
RF Output Power	§2.1033 §2.1046 §27.50	<1 Watt	§6.5	<1 Watt	Pass
Occupied Bandwidth	§2.1049	N/A	RSS-GEN §4.2	N/A	Pass
Peak-to-average power ratio	§27.50	<13 dB	§6.5	<13 dB	Pass
Spurious Emissions	§2.1053 §27.53	<-13dBm	§6.6	<-13dBm	Pass
Spurious Emissions at Antenna Terminals	§27.53	<-13dBm	§6.6	<-13dBm	Pass
Frequency Stability	§2.1055 §27.54	<2.5 ppm	§6.4	Within the frequency range	Pass

Band12

Uplink: 699-716MHz

Downlink: 729-746MHz

LTE Band12					
FCC Part 27 Subpart F					
Industry Canada RSS-130, issue1, Industry Canada RSS-GEN					
Test item	FCC Reference section	FCC Limit	IC Reference section	IC Limit	Result
RF Output Power	§2.1033 §2.1046 §27.50	<3 Watts ERP	§4.4	<5 Watts E.I.R.P for portable equipment or for indoor fixed subscriber equipment	Pass
Occupied Bandwidth	§2.1049	N/A	§4.2	N/A	Pass
Peak-to-average power ratio	§27.50	<13 dB	§4.4	<13 dB	Pass
Spurious Emissions	§2.1053 §27.53	<-13dBm	§4.6	<-13dBm The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.	Pass
Spurious Emissions at Antenna Terminals	§27.53	<-13dBm	§4.6	<-13dBm	Pass
Frequency Stability	§2.1055 §27.54	<±2.5 ppm	§4.3	Within the frequency range	Pass

Band13

Uplink: 777-787MHz

Downlink: 746-756MHz

LTE Band 13					
FCC Part 27 Subpart F					
Industry Canada RSS-130, issue1, Industry Canada RSS-GEN					
Test item	FCC Reference section	FCC Limit	IC Reference section	IC Limit	Result
RF Output Power	§2.1055 §27.54	<3 Watts ERP	§4.3	<5 Watts	Pass
Occupied Bandwidth	§2.1033 §2.1046 §27.50	N/A	§4.4	N/A	Pass
Peak-to-average power ratio	§2.1049	<-13 dB	RSS-GEN §4.2	<-13 dB	Pass
Spurious Emissions	§27.50	<-13dBm	§4.4	<-13dBm	Pass
Spurious Emissions at Antenna Terminals	§2.1053 §27.53	<-13dBm	§4.6	<-13dBm	Pass
Frequency Stability	§27.53	<±2.5 ppm	§4.6	Within the frequency range	Pass

2.2. Test Environment

Items	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	15-35	23	2 & 3
Humidity (%RH)	25-75	52	
Barometric pressure (mbar)	860-1060	950-1000	

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA	**:**	**FCC Registration Number: TW3024**
Canada	**:**	**IC Registration Number: 22397-1 / 22397-2 / 22397-3**

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : http://www.dekra.com.tw/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

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2.3. List of Test Equipment

RF Output Power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2018/01/02	2019/01/01
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Occupied Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Peak To Average Ratio / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Conducted Band Edge Emissions / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Spurious Emission / CB4-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04
Bilog Antenna	Teseq	CBL6112D	23191	2018/06/26	2019/06/25
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2018/06/01	2019/05/31
Horn Antenna	Schwarzbeck	BBHA 9170	202	2018/01/31	2019/01/30
Pre-Amplifier	Dekra	AP-025C	201801236	2018/02/26	2019/02/25
Pre-Amplifier	EMCI	EMC11830I	980366	2018/01/08	2019/01/07
Pre-Amplifier	Dekra	AP-400C	201801231	2017/12/13	2018/12/12
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Spurious Emissions at Antenna Terminals / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Frequency Stability Under Temperature & Voltage Variations / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

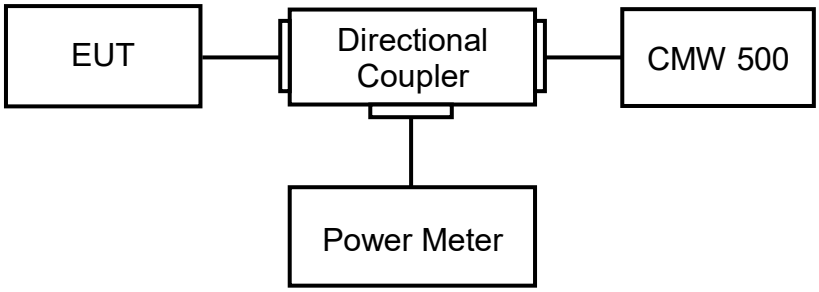
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.4. Uncertainty

Test Item	Uncertainty
RF Output Power	± 1.27 dB
Occupied Bandwidth	± 10 Hz
Peak To Average Ratio	not exceed 13 dB
Spurious Emissions	± 1.27 dB for Conducted Measurement ± 3.2 dB for Radiated Measurement
Spurious Emissions at Antenna Terminals	± 3.2 dB
Frequency Stability	± 10 Hz

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

a) The RF output of the transmitter was connected to base station simulator.
b) The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement..
c) Set EUT at maximum average power by base station simulator.
d) Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Effective Isotropic Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi)
Effective Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi) - 2.15dB

3.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.2.4
ANSI C63.26: 2015 Sub-clause 5.2.4.2

3.4. Test Result

Product	ML865C1-NA		
Test Item	RF Output Power		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/26	Test Site	SR10-H

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 1.4MHz	1850.7	QPSK	1	0	23.40	0.358	2
			6	0	21.44	0.228	2
		16-QAM	1	0	22.62	0.299	2
			1	5	22.64	0.301	2
			5	0	21.45	0.229	2
			5	1	21.43	0.228	2
	1880	QPSK	1	0	23.23	0.344	2
			6	0	21.18	0.215	2
		16-QAM	1	0	22.46	0.288	2
			1	5	22.44	0.287	2
			5	0	21.19	0.215	2
			5	1	21.09	0.210	2
	1909.3	QPSK	1	0	23.46	0.363	2
			6	0	21.41	0.226	2
		16-QAM	1	0	22.73	0.307	2
			1	5	22.71	0.305	2
			5	0	21.61	0.237	2
			5	1	21.47	0.230	2

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 3MHz	1851.5	QPSK	1	0	23.57	0.372	2
			6	0	21.44	0.228	2
		16-QAM	1	0	22.72	0.306	2
			1	5	22.73	0.307	2
			5	0	21.60	0.237	2
			5	1	21.59	0.236	2
	1880	QPSK	1	0	23.18	0.340	2
			6	0	21.21	0.216	2
		16-QAM	1	0	22.41	0.285	2
			1	5	22.43	0.286	2
			5	0	21.31	0.221	2
			5	1	21.27	0.219	2
	1908.5	QPSK	1	0	23.55	0.371	2
			6	0	21.49	0.231	2
		16-QAM	1	0	22.74	0.308	2
			1	5	22.76	0.309	2
			5	0	21.55	0.234	2
			5	1	21.63	0.238	2

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 5MHz	1852.5	QPSK	1	0	23.54	0.370	2
			6	0	22.58	0.296	2
		16-QAM	1	0	23.09	0.333	2
			1	5	23.08	0.333	2
			5	0	21.62	0.238	2
			5	1	21.66	0.240	2
	1880	QPSK	1	0	23.27	0.348	2
			6	0	22.35	0.281	2
		16-QAM	1	0	22.85	0.316	2
			1	5	22.83	0.314	2
			5	0	21.53	0.233	2
			5	1	21.46	0.229	2
	1907.5	QPSK	1	0	23.66	0.380	2
			6	0	22.63	0.300	2
		16-QAM	1	0	23.02	0.328	2
			1	5	23.08	0.333	2
			5	0	21.68	0.241	2
			5	1	21.64	0.239	2

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 10MHz	1855	QPSK	1	0	23.54	0.370	2
			6	0	22.56	0.295	2
		16-QAM	1	0	23.01	0.327	2
			1	5	23.08	0.333	2
			5	0	22.51	0.292	2
			5	1	22.56	0.295	2
	1880	QPSK	1	0	23.35	0.354	2
			6	0	22.35	0.281	2
		16-QAM	1	0	23.05	0.330	2
			1	5	23.07	0.332	2
			5	0	22.26	0.275	2
			5	1	22.25	0.275	2
	1905	QPSK	1	0	23.49	0.366	2
			6	0	22.64	0.301	2
		16-QAM	1	0	23.05	0.330	2
			1	5	23.03	0.329	2
			5	0	22.51	0.292	2
			5	1	22.61	0.299	2

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 15MHz	1857.5	QPSK	1	0	23.47	0.364	2
			6	0	22.60	0.298	2
		16-QAM	1	0	23.06	0.331	2
			1	5	23.08	0.333	2
			5	0	22.48	0.290	2
			5	1	22.42	0.286	2
	1880	QPSK	1	0	23.31	0.351	2
			6	0	22.41	0.285	2
		16-QAM	1	0	23.05	0.330	2
			1	5	23.04	0.330	2
			5	0	22.15	0.269	2
			5	1	22.11	0.266	2
	1902.5	QPSK	1	0	23.64	0.378	2
			6	0	22.68	0.303	2
		16-QAM	1	0	23.05	0.330	2
			1	5	23.06	0.331	2
			5	0	22.62	0.299	2
			5	1	22.49	0.290	2

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 2 20MHz	1860	QPSK	1	0	23.54	0.370	2
			6	0	22.49	0.290	2
		16-QAM	1	0	23.02	0.328	2
			1	5	23.05	0.330	2
			5	0	22.49	0.290	2
			5	1	22.46	0.288	2
	1880	QPSK	1	0	23.45	0.362	2
			6	0	22.36	0.282	2
		16-QAM	1	0	23.08	0.333	2
			1	5	23.05	0.330	2
			5	0	22.29	0.277	2
			5	1	22.31	0.279	2
	1900	QPSK	1	0	23.60	0.375	2
			6	0	22.62	0.299	2
		16-QAM	1	0	23.02	0.328	2
			1	5	23.09	0.333	2
			5	0	22.57	0.296	2
			5	1	22.56	0.295	2

Product	ML865C1-NA		
Test Item	RF Output Power		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/26	Test Site	SR10-H

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 1.4MHz	1710.7	QPSK	1	0	23.76	0.389	1
			6	0	21.88	0.252	1
		16-QAM	1	0	22.76	0.309	1
			1	5	22.73	0.307	1
			5	0	21.93	0.255	1
			5	1	21.94	0.256	1
	1732.5	QPSK	1	0	23.59	0.374	1
			6	0	21.71	0.243	1
		16-QAM	1	0	22.96	0.324	1
			1	5	22.98	0.325	1
			5	0	21.68	0.241	1
			5	1	21.61	0.237	1
	1754.3	QPSK	1	0	23.65	0.379	1
			6	0	21.64	0.239	1
		16-QAM	1	0	22.91	0.320	1
			1	5	22.94	0.322	1
			5	0	21.53	0.233	1
			5	1	21.62	0.238	1

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 3MHz	1711.5	QPSK	1	0	23.94	0.406	1
			6	0	21.84	0.250	1
		16-QAM	1	0	23.09	0.333	1
			1	5	23.11	0.335	1
			5	0	22.09	0.265	1
			5	1	22.00	0.259	1
	1732.5	QPSK	1	0	23.43	0.361	1
			6	0	21.51	0.232	1
		16-QAM	1	0	22.72	0.306	1
			1	5	22.78	0.310	1
			5	0	21.68	0.241	1
			5	1	21.64	0.239	1
	1753.5	QPSK	1	0	23.75	0.388	1
			6	0	21.68	0.241	1
		16-QAM	1	0	22.97	0.324	1
			1	5	23.04	0.330	1
			5	0	21.82	0.249	1
			5	1	21.79	0.247	1

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 5MHz	1712.5	QPSK	1	0	23.88	0.400	1
			6	0	22.88	0.318	1
		16-QAM	1	0	23.07	0.332	1
			1	5	23.14	0.337	1
			5	0	22.07	0.264	1
			5	1	22.04	0.262	1
	1732.5	QPSK	1	0	23.41	0.359	1
			6	0	22.42	0.286	1
		16-QAM	1	0	23.10	0.334	1
			1	5	23.08	0.333	1
			5	0	21.48	0.230	1
			5	1	21.47	0.230	1
	1752.5	QPSK	1	0	23.78	0.391	1
			6	0	22.71	0.305	1
		16-QAM	1	0	23.08	0.333	1
			1	5	23.01	0.327	1
			5	0	21.77	0.246	1
			5	1	21.79	0.247	1

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 10MHz	1715	QPSK	1	0	23.73	0.386	1
			6	0	22.78	0.310	1
		16-QAM	1	0	23.02	0.328	1
			1	5	23.08	0.333	1
			5	0	22.81	0.313	1
			5	1	22.85	0.316	1
	1732.5	QPSK	1	0	23.20	0.342	1
			6	0	22.31	0.279	1
		16-QAM	1	0	23.11	0.335	1
			1	5	23.09	0.333	1
			5	0	22.30	0.278	1
			5	1	22.31	0.279	1
	1750	QPSK	1	0	23.38	0.356	1
			6	0	22.51	0.292	1
		16-QAM	1	0	23.01	0.327	1
			1	5	23.02	0.328	1
			5	0	22.54	0.294	1
			5	1	22.49	0.290	1

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 15MHz	1717.5	QPSK	1	0	23.77	0.390	1
			6	0	22.80	0.312	1
		16-QAM	1	0	23.06	0.331	1
			1	5	23.05	0.330	1
			5	0	22.81	0.313	1
			5	1	22.78	0.310	1
	1732.5	QPSK	1	0	23.46	0.363	1
			6	0	22.48	0.290	1
		16-QAM	1	0	23.05	0.330	1
			1	5	23.06	0.331	1
			5	0	22.22	0.273	1
			5	1	22.23	0.274	1
	1747.5	QPSK	1	0	23.24	0.345	1
			6	0	23.31	0.351	1
		16-QAM	1	0	23.30	0.350	1
			1	5	23.33	0.352	1
			5	0	23.25	0.346	1
			5	1	23.24	0.345	1

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 20MHz	1720	QPSK	1	0	23.74	0.387	1
			6	0	22.79	0.311	1
		16-QAM	1	0	23.08	0.333	1
			1	5	23.09	0.333	1
			5	0	22.75	0.308	1
			5	1	22.74	0.308	1
	1732.5	QPSK	1	0	23.39	0.357	1
			6	0	22.41	0.285	1
		16-QAM	1	0	23.07	0.332	1
			1	5	23.04	0.330	1
			5	0	22.25	0.275	1
			5	1	22.29	0.277	1
	1745	QPSK	1	0	23.33	0.352	1
			6	0	22.21	0.272	1
		16-QAM	1	0	23.01	0.327	1
			1	5	23.04	0.330	1
			5	0	22.12	0.267	1
			5	1	22.14	0.268	1

Product	ML865C1-NA		
Test Item	RF Output Power		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/26	Test Site	SR10-H

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 1.4MHz	699.7	QPSK	1	0	23.63	0.230	3
			6	0	21.58	0.144	3
		16-QAM	1	0	22.79	0.190	3
			1	5	22.84	0.192	3
			5	0	21.38	0.137	3
			5	1	21.41	0.138	3
	707.5	QPSK	1	0	23.42	0.219	3
			6	0	21.31	0.135	3
		16-QAM	1	0	22.69	0.185	3
			1	5	22.61	0.182	3
			5	0	21.13	0.129	3
			5	1	21.30	0.135	3
	715.3	QPSK	1	0	23.51	0.224	3
			6	0	21.42	0.138	3
		16-QAM	1	0	22.66	0.184	3
			1	5	22.71	0.186	3
			5	0	21.29	0.134	3
			5	1	21.28	0.134	3

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 3MHz	700.5	QPSK	1	0	23.77	0.238	3
			6	0	21.48	0.140	3
		16-QAM	1	0	22.86	0.193	3
			1	5	22.71	0.186	3
			5	0	21.68	0.147	3
			5	1	21.69	0.147	3
	707.5	QPSK	1	0	23.58	0.228	3
			6	0	21.50	0.141	3
		16-QAM	1	0	22.66	0.184	3
			1	5	22.64	0.183	3
			5	0	21.50	0.141	3
			5	1	21.46	0.140	3
	714.5	QPSK	1	0	23.31	0.214	3
			6	0	21.43	0.139	3
		16-QAM	1	0	22.16	0.164	3
			1	5	22.17	0.164	3
			5	0	21.65	0.146	3
			5	1	21.51	0.141	3

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 5MHz	701.5	QPSK	1	0	23.73	0.236	3
			6	0	22.56	0.180	3
		16-QAM	1	0	23.06	0.202	3
			1	5	23.05	0.201	3
			5	0	21.46	0.140	3
			5	1	21.48	0.140	3
	707.5	QPSK	1	0	23.71	0.234	3
			6	0	22.69	0.185	3
		16-QAM	1	0	23.01	0.200	3
			1	5	23.04	0.201	3
			5	0	21.67	0.147	3
			5	1	21.66	0.146	3
	713.5	QPSK	1	0	23.70	0.234	3
			6	0	22.48	0.177	3
		16-QAM	1	0	23.09	0.203	3
			1	5	23.08	0.203	3
			5	0	21.59	0.144	3
			5	1	21.58	0.144	3

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 10MHz	704	QPSK	1	0	23.72	0.235	3
			6	0	22.62	0.182	3
		16-QAM	1	0	23.05	0.201	3
			1	5	23.08	0.203	3
			5	0	22.74	0.187	3
			5	1	22.72	0.187	3
	707.5	QPSK	1	0	23.53	0.225	3
			6	0	22.72	0.187	3
		16-QAM	1	0	23.02	0.200	3
			1	5	23.03	0.200	3
			5	0	22.59	0.181	3
			5	1	22.71	0.186	3
	711	QPSK	1	0	23.65	0.231	3
			6	0	22.58	0.181	3
		16-QAM	1	0	23.08	0.203	3
			1	5	23.04	0.201	3
			5	0	22.65	0.184	3
			5	1	22.68	0.185	3

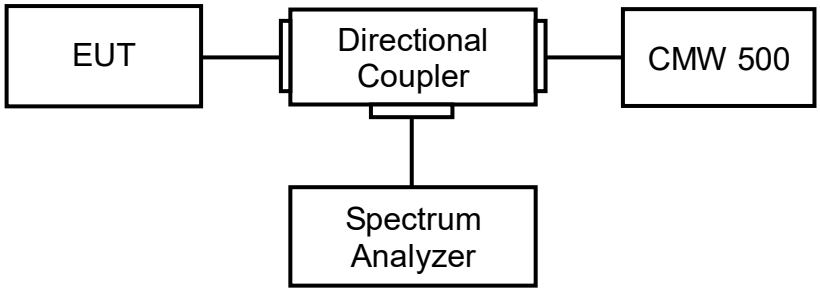
Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 13 5MHz	779.5	QPSK	1	0	23.83	0.241	3
			6	0	22.78	0.189	3
		16-QAM	1	0	23.03	0.200	3
			1	5	23.01	0.200	3
			5	0	21.82	0.152	3
			5	1	21.80	0.151	3
	782	QPSK	1	0	23.56	0.226	3
			6	0	22.62	0.182	3
		16-QAM	1	0	23.07	0.202	3
			1	5	23.11	0.204	3
			5	0	21.71	0.148	3
			5	1	21.81	0.151	3
	784.5	QPSK	1	0	23.78	0.238	3
			6	0	22.76	0.188	3
		16-QAM	1	0	23.18	0.207	3
			1	5	23.23	0.210	3
			5	0	21.82	0.152	3
			5	1	21.74	0.149	3

Product	ML865C1-NA		
Test Item	RF Output Power		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/26	Test Site	SR10-H

Band	Freq. (MHz)	Modulation	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 13 10MHz	782	QPSK	1	0	23.68	0.233	3
			6	0	22.58	0.181	3
		16-QAM	1	0	23.09	0.203	3
			1	5	23.04	0.201	3
			5	0	22.68	0.185	3
			5	1	22.66	0.184	3

4. Occupied Bandwidth

4.1. Test Setup



4.2. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 26 dB bandwidth and 99% occupied bandwidth of the low & middle & high channel for the highest RF powers were measured.

4.3. Test Method

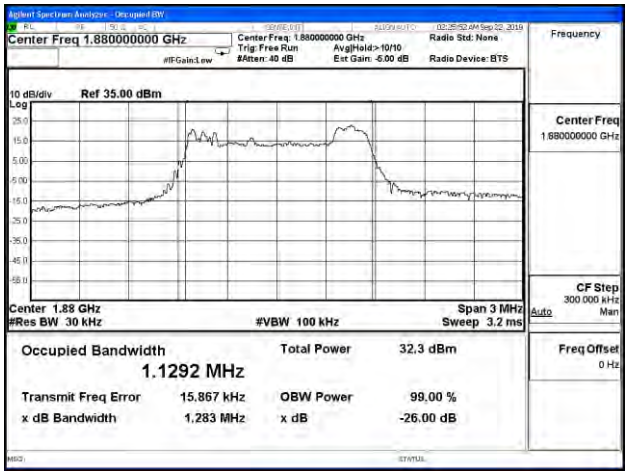
KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause4.2 & 4.3
ANSI C63.26: 2015 Sub-clause 5.4.3 & 5.4.4

4.4. Test Result

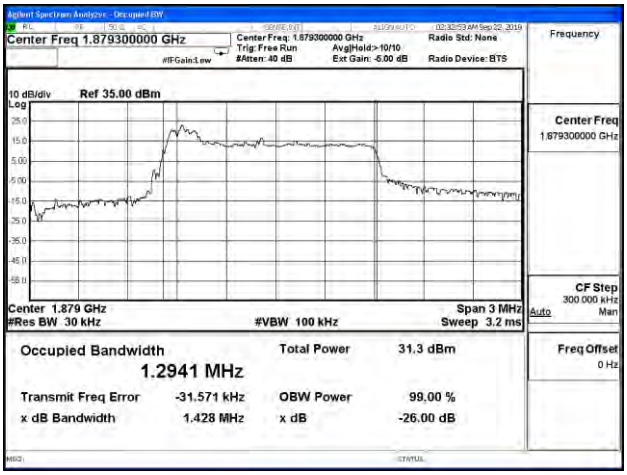
Product	ML865C1-NA		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/22	Test Site	SR10-H

Channel	Freq. (MHz)	BW (MHz)	Modulation	RB No.	RB offset	Measure Level (MHz)		Limit (MHz)
						99% BW	26dB BW	
18900	1880	1.4M	QPSK	6	0	1.129	1.283	NA
			16QAM	5	1	0.938	1.056	NA
		3M	QPSK	6	0	1.294	1.428	NA
			16QAM	5	1	1.291	1.484	NA
		5M	QPSK	6	0	1.111	1.664	NA
			16QAM	5	1	0.959	1.526	NA
		10M	QPSK	6	0	1.137	1.485	NA
			16QAM	5	1	0.977	1.680	NA
		15M	QPSK	6	0	1.128	1.739	NA
			16QAM	5	1	0.991	1.556	NA
		20M	QPSK	6	0	1.142	1.773	NA
			16QAM	5	1	0.971	1.731	NA

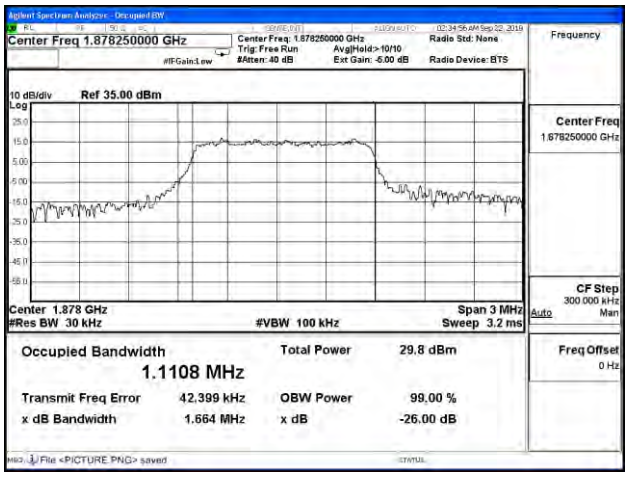
Cat M1_Band2_1.4M_CH18900_QPSK_6RB0



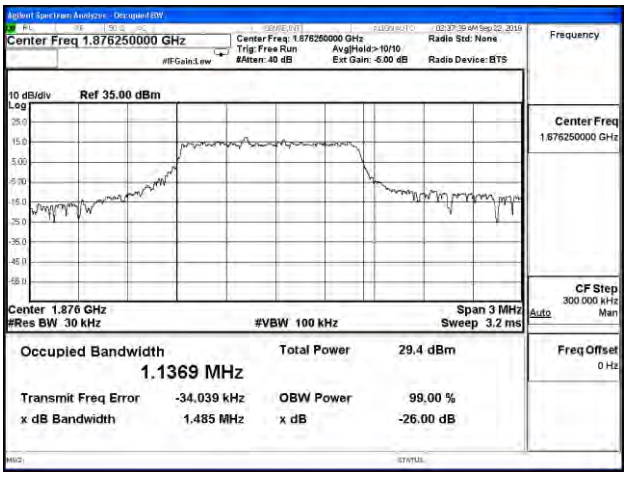
Cat M1_Band2_3M_CH18900_QPSK_6RB0



Cat M1_Band2_5M_CH18900_QPSK_6RB0



Cat M1_Band2_10M_CH18900_QPSK_6RB0



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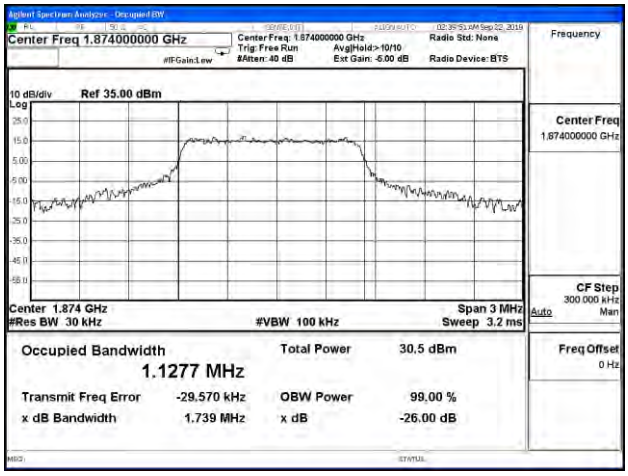
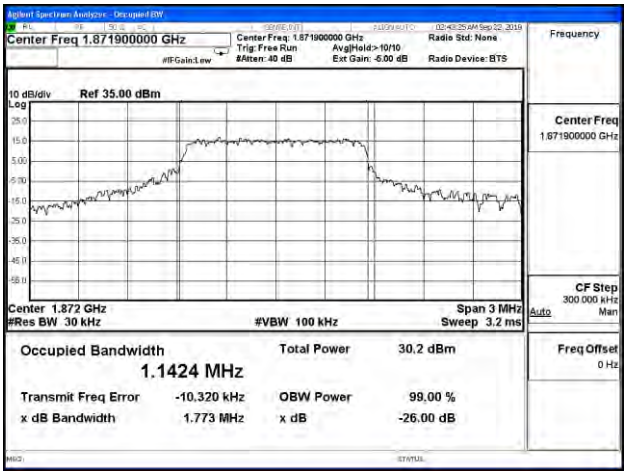
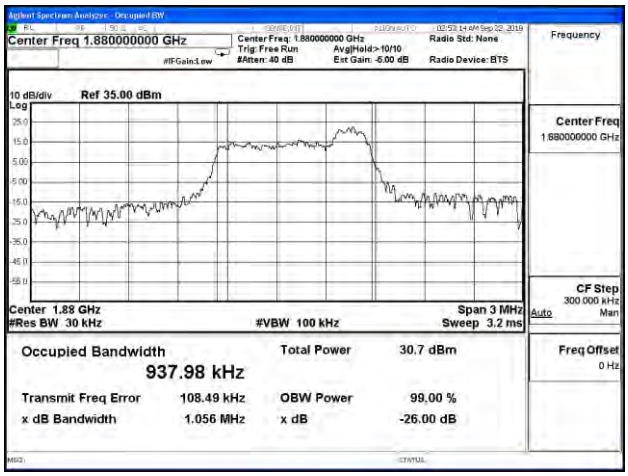


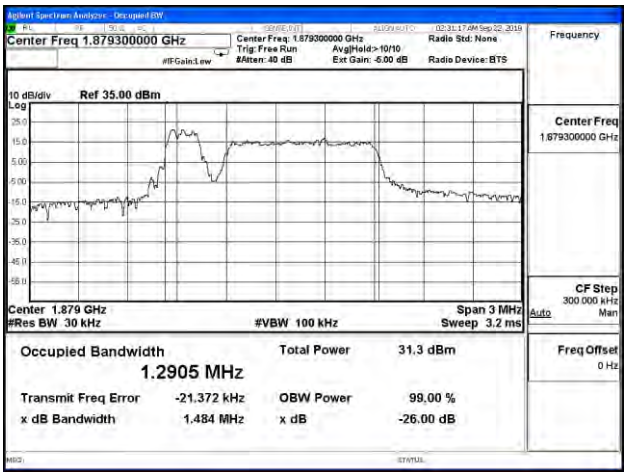
Cat M1_Band2_20M_CH18900_QPSK_6RB0



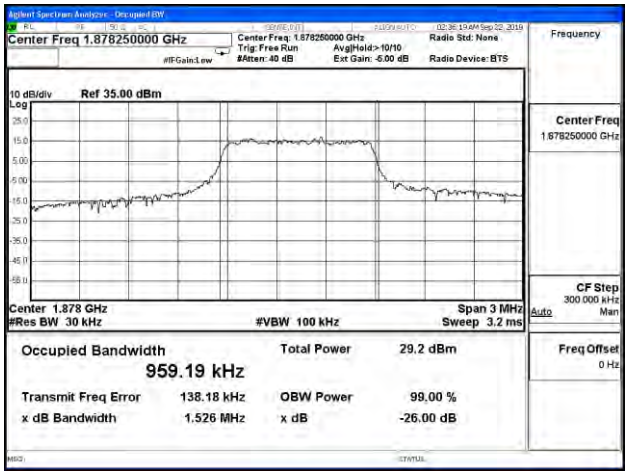
Cat M1_Band2_1.4M_CH18900_16QAM_5RB1



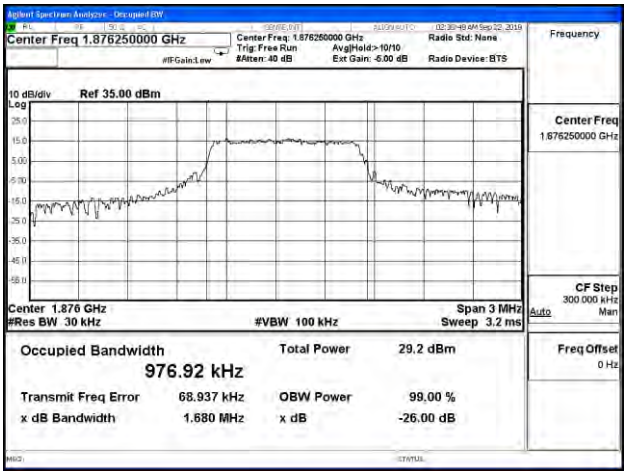
Cat M1_Band2_3M_CH18900_16QAM_5RB1



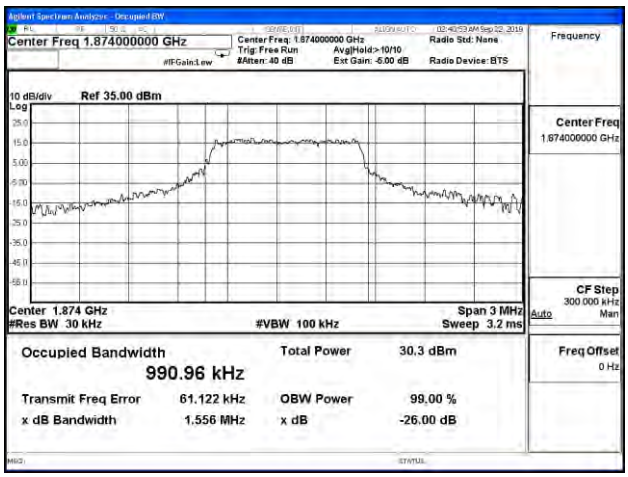
Cat M1_Band2_5M_CH18900_16QAM_5RB1



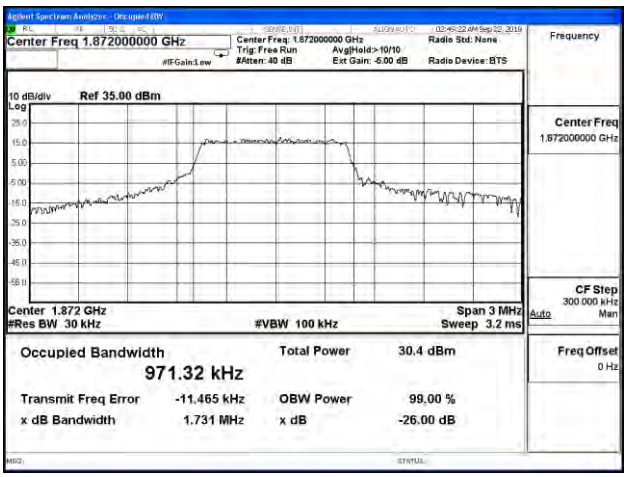
Cat M1_Band2_10M_CH18900_16QAM_5RB1



Cat M1_Band2_15M_CH18900_16QAM_5RB1



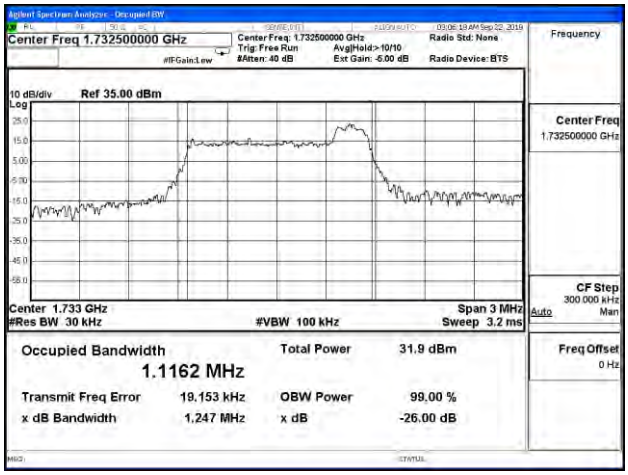
Cat M1_Band2_20M_CH18900_16QAM_5RB1



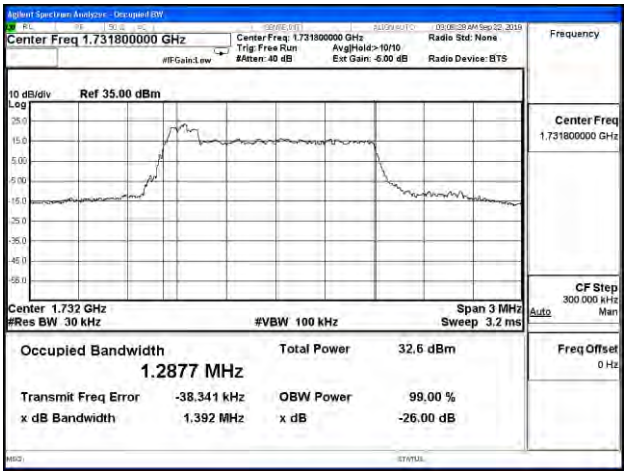
Product	ML865C1-NA		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/22	Test Site	SR10-H

Channel	Freq. (MHz)	BW (MHz)	Modulation	RB No.	RB offset	Measure Level (MHz)		Limit (MHz)
						99% BW	26dB BW	
20175	1732.5	1.4M	QPSK	6	0	1.116	1.247	NA
			16QAM	5	1	1.089	1.261	NA
		3M	QPSK	6	0	1.288	1.392	NA
			16QAM	5	1	1.292	1.465	NA
		5M	QPSK	6	0	1.110	1.381	NA
			16QAM	5	1	0.946	1.350	NA
		10M	QPSK	6	0	1.120	1.627	NA
			16QAM	5	1	0.951	1.496	NA
		15M	QPSK	6	0	1.127	1.895	NA
			16QAM	5	1	0.983	1.662	NA
		20M	QPSK	6	0	1.129	1.768	NA
			16QAM	5	1	0.948	1.399	NA

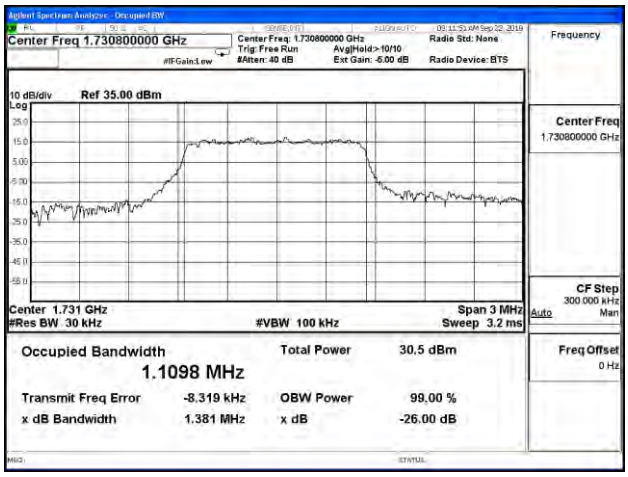
Cat M1_Band4_1.4M_CH20175_QPSK_6RB0



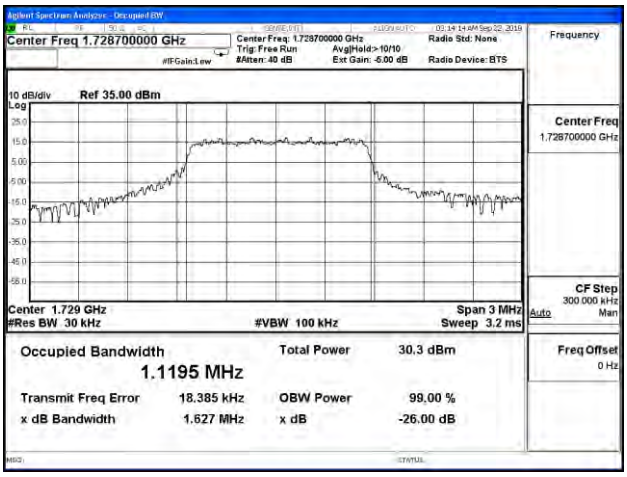
Cat M1_Band4_3M_CH20175_QPSK_6RB0



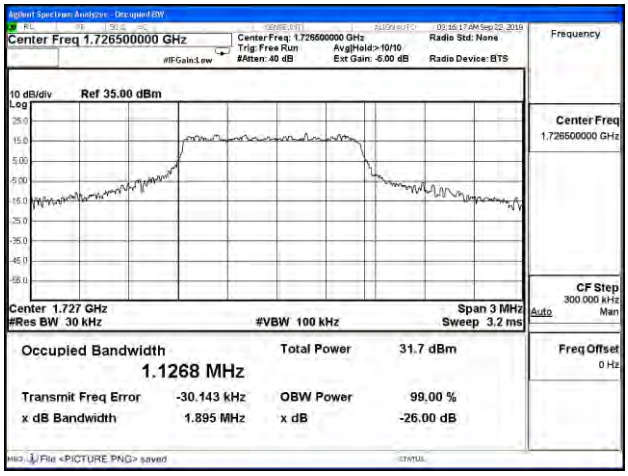
Cat M1_Band4_5M_CH20175_QPSK_6RB0



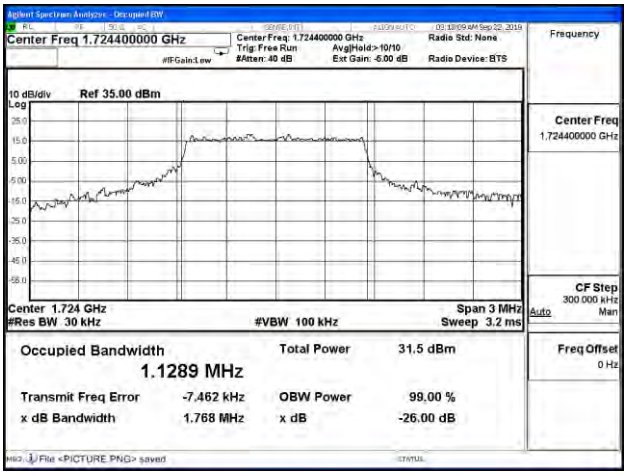
Cat M1_Band4_10M_CH20175_QPSK_6RB0



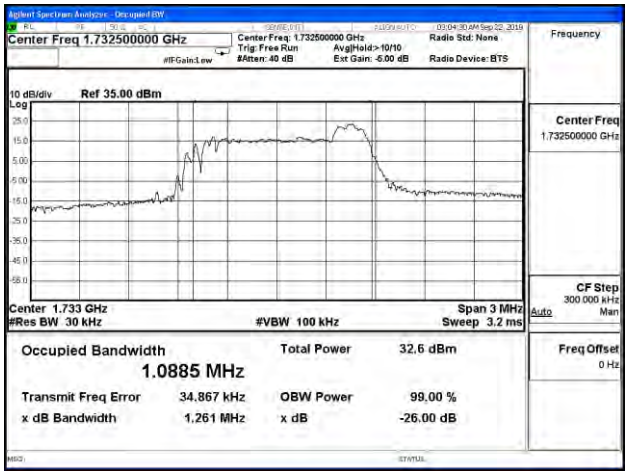
Cat M1_Band4_15M_CH20175_QPSK_6RB0



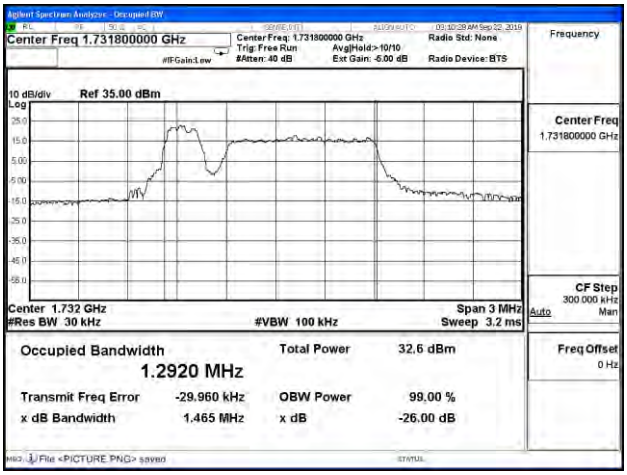
Cat M1_Band4_20M_CH20175_QPSK_6RB0



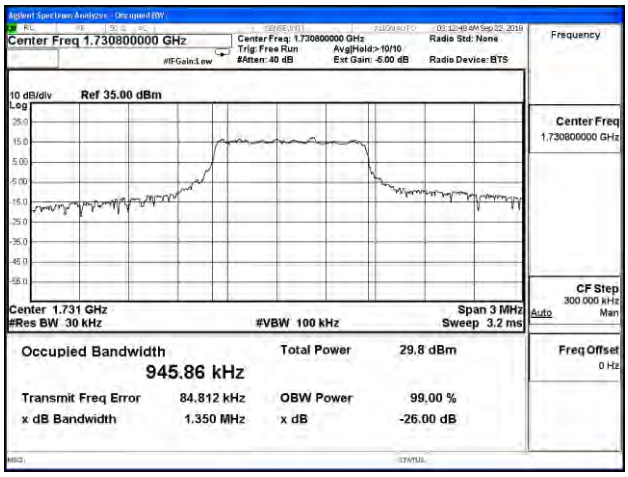
Cat M1_Band4_1.4M_CH20175_16QAM_5RB1



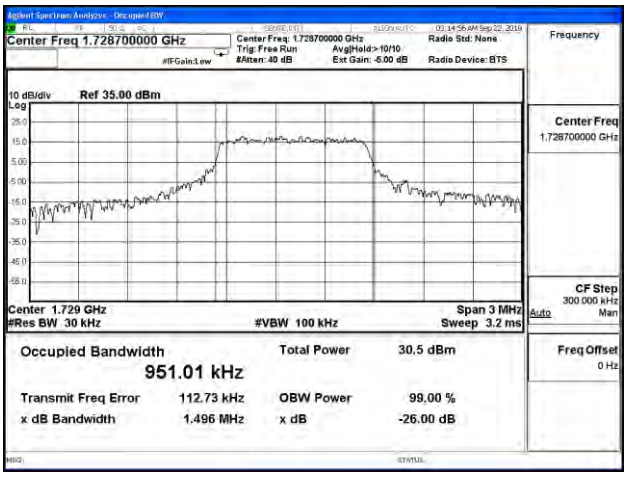
Cat M1_Band4_3M_CH20175_16QAM_5RB1



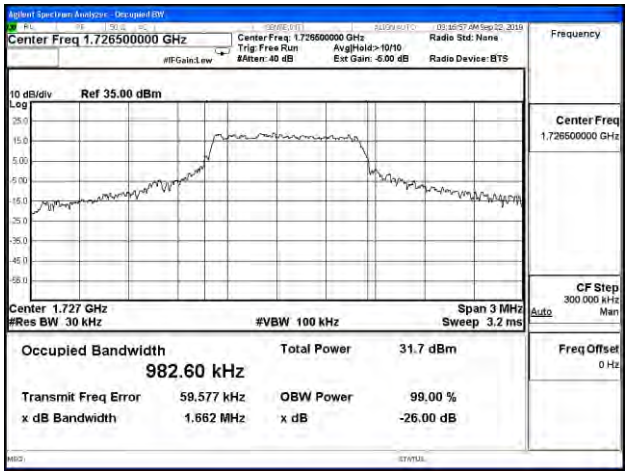
Cat M1_Band4_5M_CH20175_16QAM_5RB1



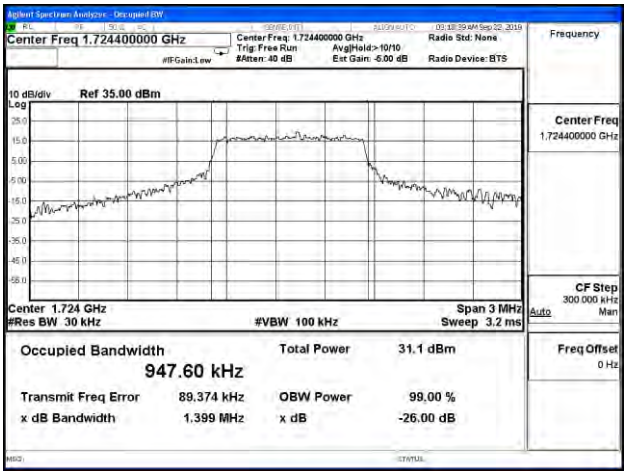
Cat M1_Band4_10M_CH20175_16QAM_5RB1



Cat M1_Band4_15M_CH20175_16QAM_5RB1



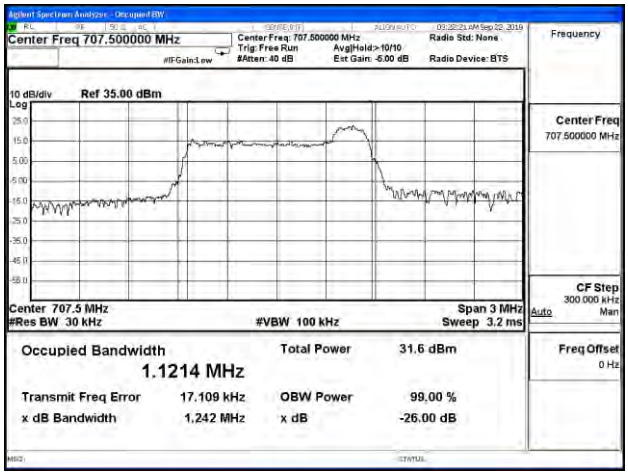
Cat M1_Band4_20M_CH20175_16QAM_5RB1



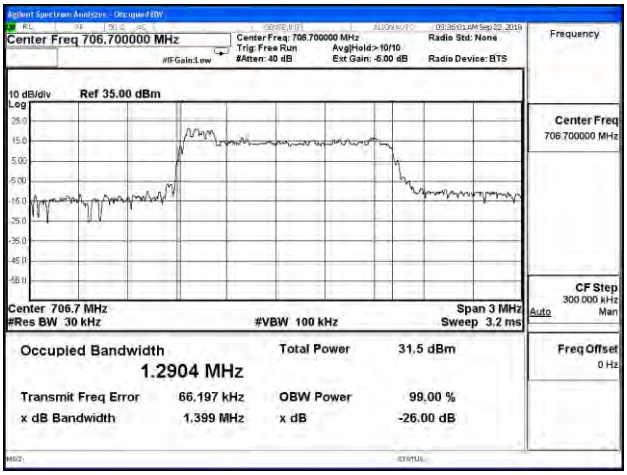
Product	ML865C1-NA		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/22	Test Site	SR10-H

Channel	Freq. (MHz)	BW (MHz)	Modulation	RB No.	RB offset	Measure Level (MHz)		Limit (MHz)
						99% BW	26dB BW	
23095	707.5	1.4M	QPSK	6	0	1.121	1.242	NA
			16QAM	5	1	1.118	1.222	NA
		3M	QPSK	6	0	1.290	1.399	NA
			16QAM	5	1	1.311	1.458	NA
		5M	QPSK	6	0	1.109	1.725	NA
			16QAM	5	1	0.975	1.481	NA
		10M	QPSK	6	0	1.150	2.185	NA
			16QAM	5	1	0.977	1.945	NA

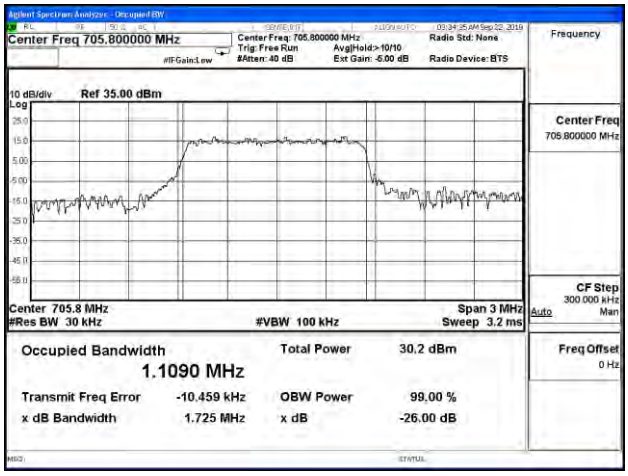
Cat M1_Band12_1.4M_CH23095_QPSK_6RB0



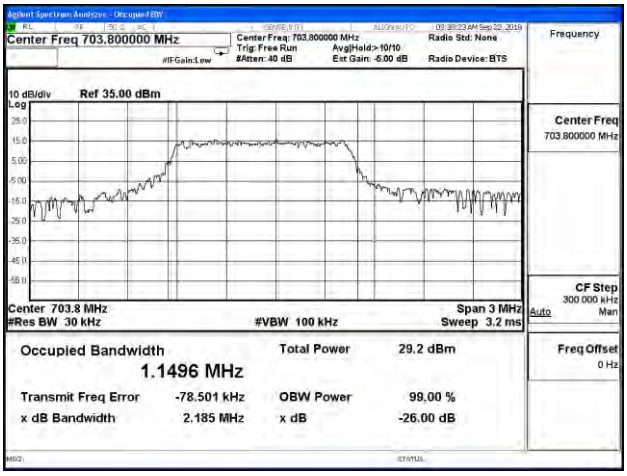
Cat M1_Band12_3M_CH23095_QPSK_6RB0



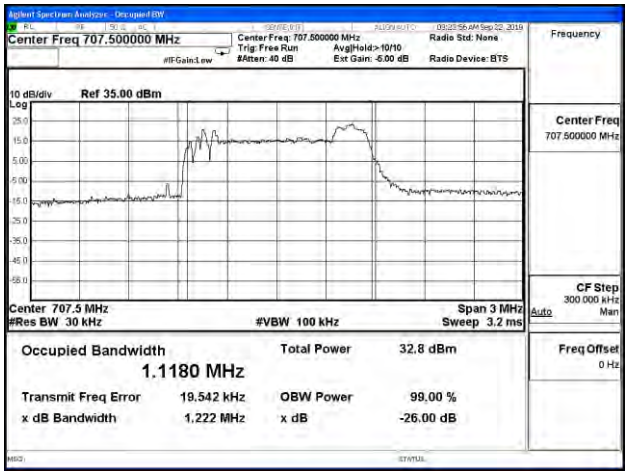
Cat M1_Band12_5M_CH23095_QPSK_6RB0



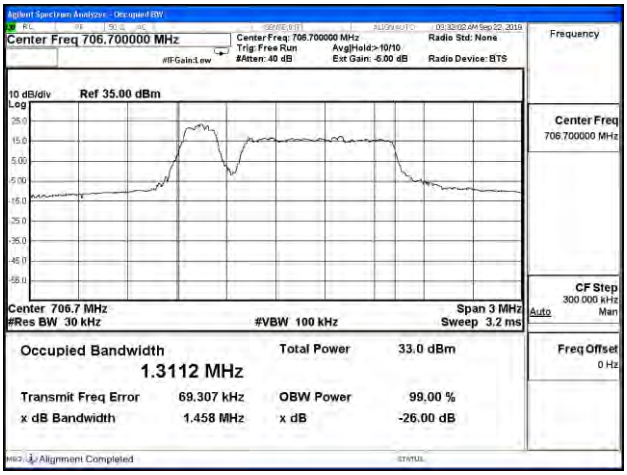
Cat M1_Band12_10M_CH23095_QPSK_6RB0



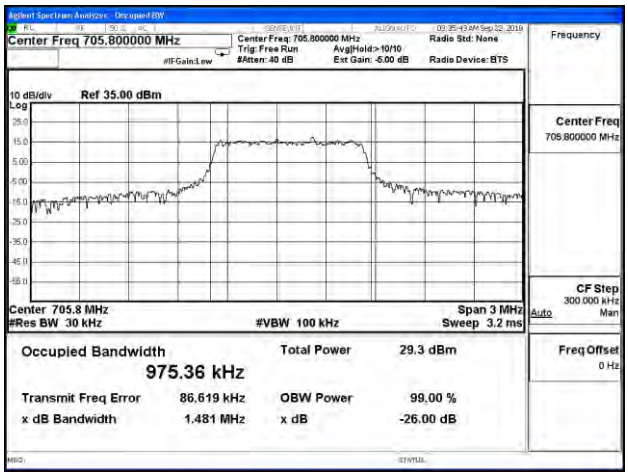
Cat M1_Band12_1.4M_CH23095_16QAM_5RB1



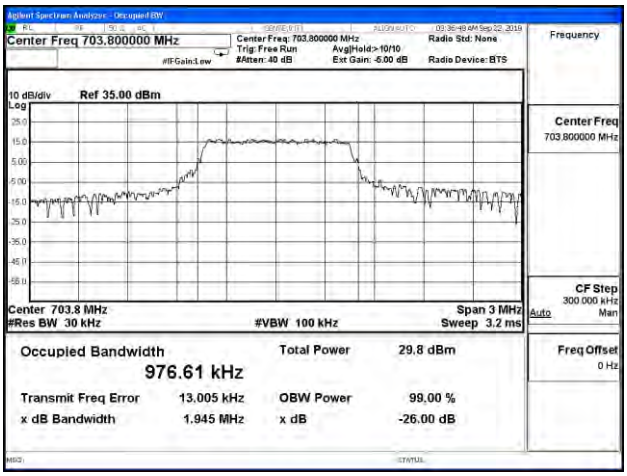
Cat M1_Band12_3M_CH23095_16QAM_5RB1



Cat M1_Band12_5M_CH23095_16QAM_5RB1



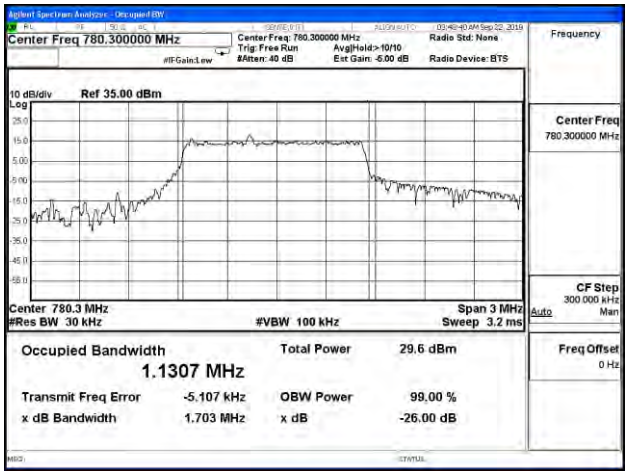
Cat M1_Band12_10M_CH23095_16QAM_5RB1



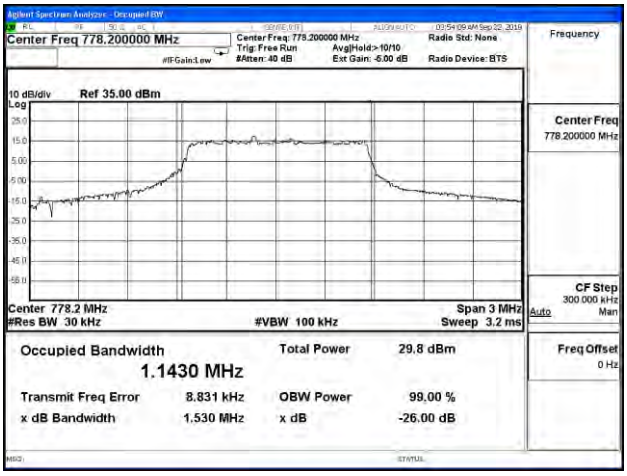
Product	ML865C1-NA		
Test Item	Occupied Bandwidth		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/22	Test Site	SR10-H

Channel	Freq. (MHz)	BW (MHz)	Modulation	RB No.	RB offset	Measure Level (MHz)		Limit (MHz)
						99% BW	26dB BW	
23230	782	5M	QPSK	6	0	1.131	1.703	NA
			16QAM	5	1	0.960	1.718	NA
		10M	QPSK	6	0	1.143	1.530	NA
			16QAM	5	1	0.993	1.477	NA

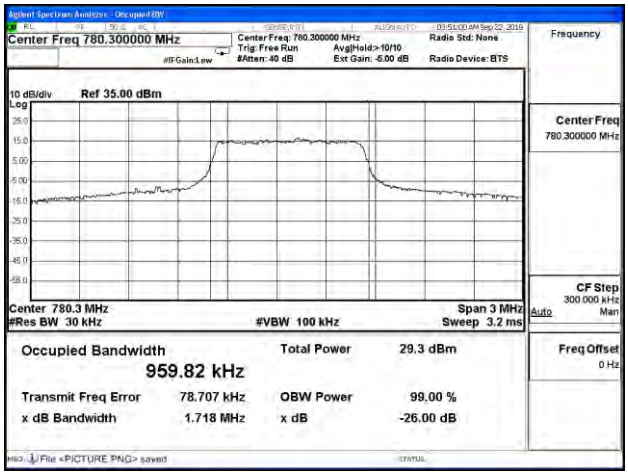
Cat M1_Band13_5M_CH23230_QPSK_6RB0



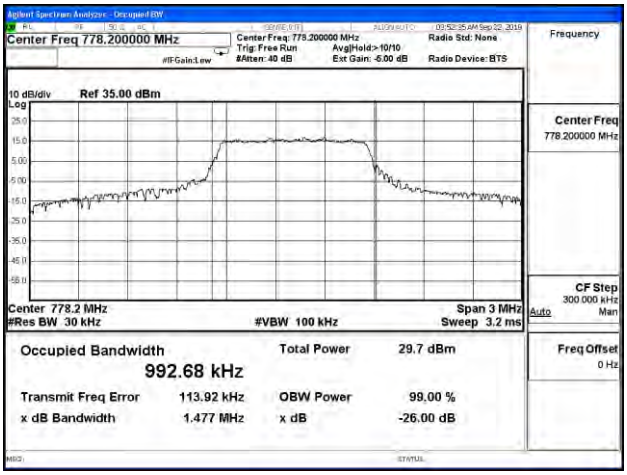
Cat M1_Band13_10M_CH23230_QPSK_6RB0



Cat M1_Band13_5M_CH23230_16QAM_5RB1

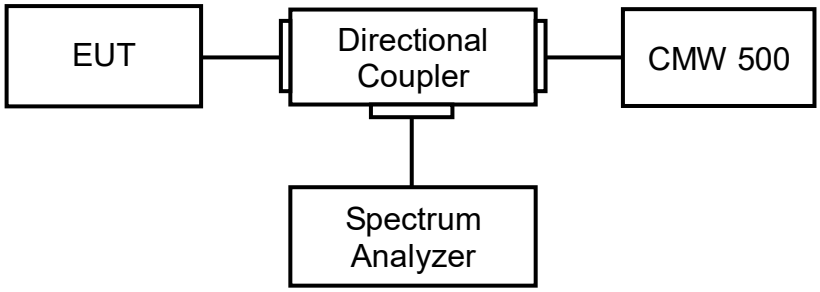


Cat M1_Band13_10M_CH23230_16QAM_5RB1



5. Peak To Average Ratio

5.1. Test Setup



5.2. Test Procedure

1. Set resolution/measurement bandwidth ≥ 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 %.

5.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.7.2
ANSI C63.26: 2015 Sub-clause 5.2.3.4

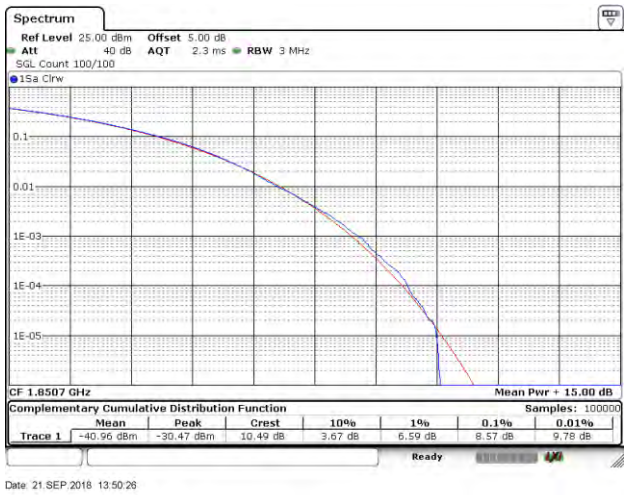
5.4. Limit

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

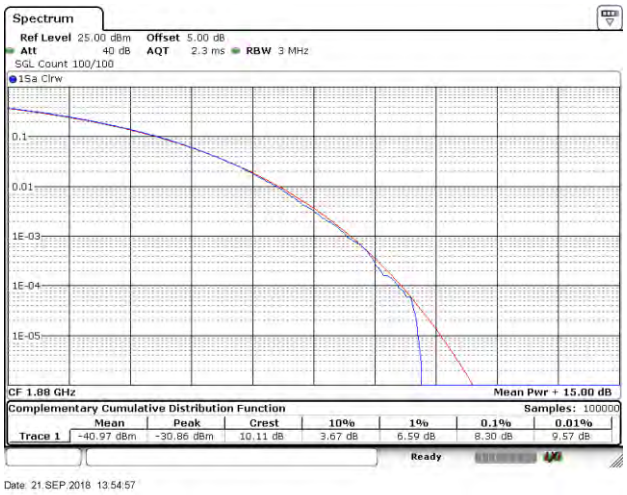
5.5. Test Result

Product	ML865C1-NA		
Test Item	Peak To Average Ratio		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/21	Test Site	SR10-H

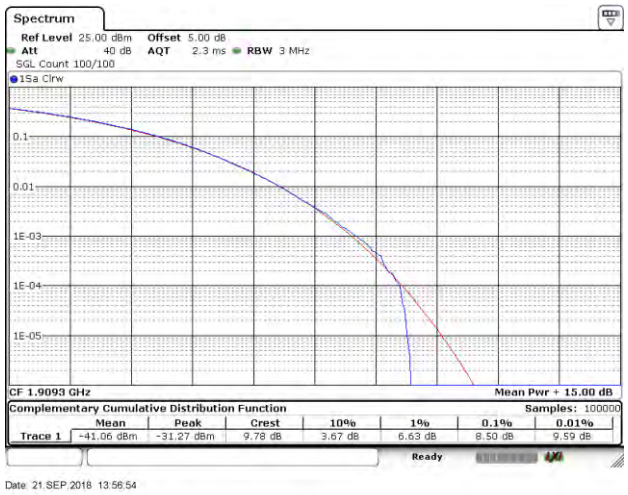
CAT-M1_Band2_CH18607_1.4M_QPSK_1RB0



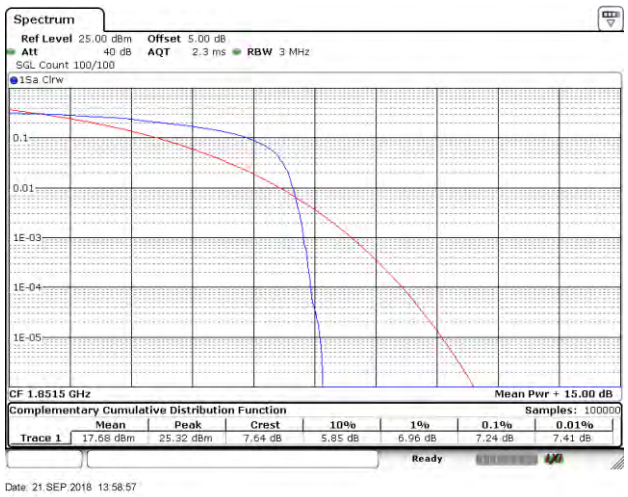
CAT-M1_Band2_CH18900_1.4M_QPSK_1RB0



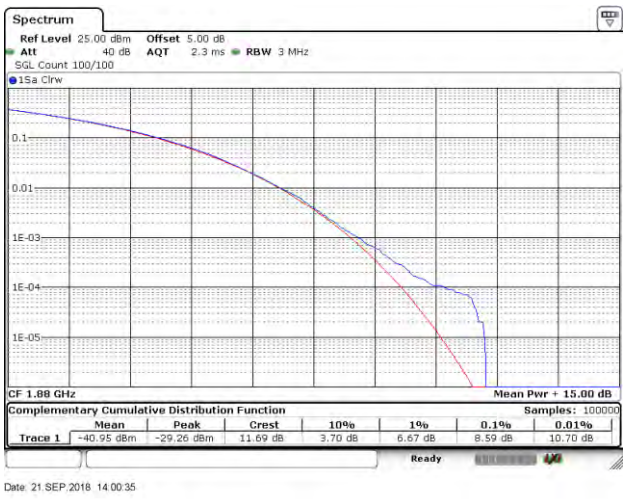
CAT-M1_Band2_CH19193_1.4M_QPSK_1RB0



CAT-M1_Band2_CH18615_3M_QPSK_1RB0

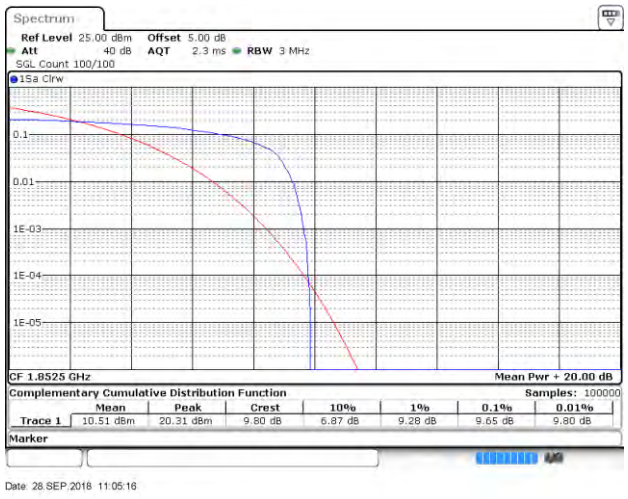


CAT-M1_Band2_CH18900_3M_QPSK_1RB0

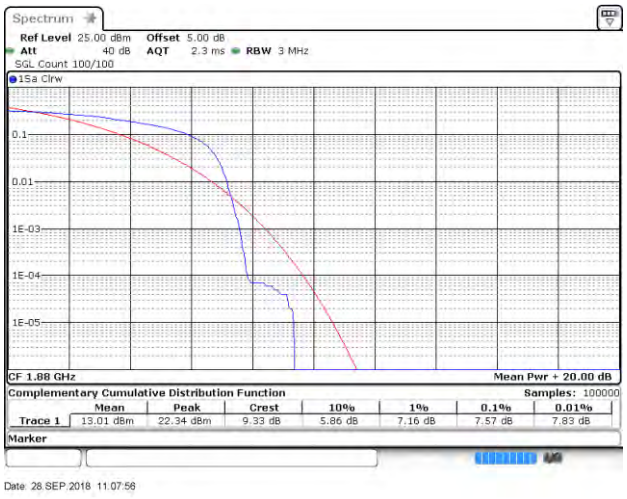


CAT-M1_Band2_CH19185_3M_QPSK_1RB0

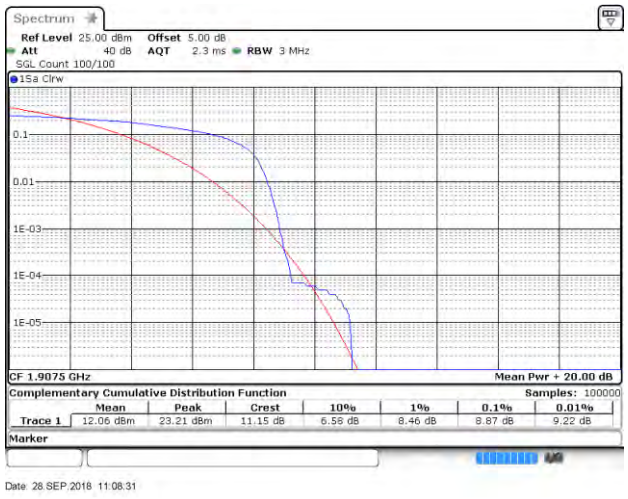
CAT-M1_B2_CH18625_5M_QPSK_1RB0



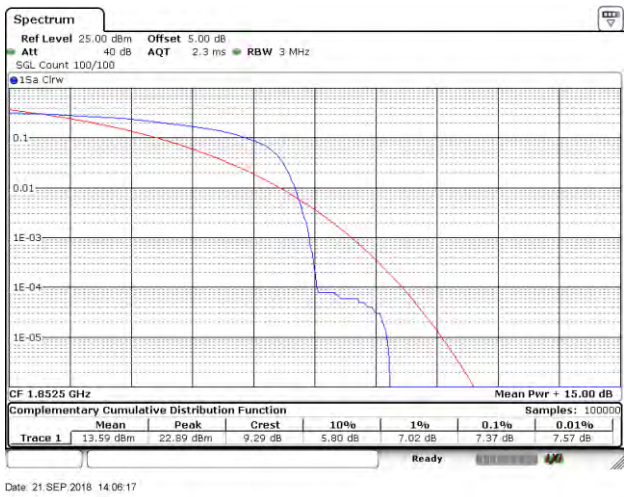
CAT-M1_B2_CH18900_5M_QPSK_1RB0



CAT-M1_B2_CH19175_5M_QPSK_1RB0



CAT-M1_Band2_CH18650_10M_QPSK_1RB0



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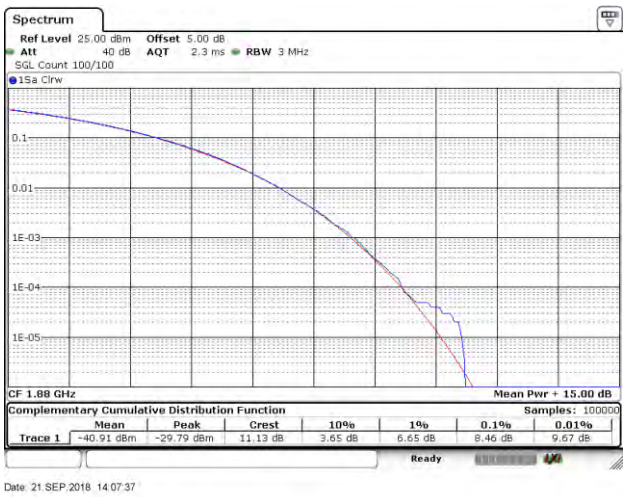
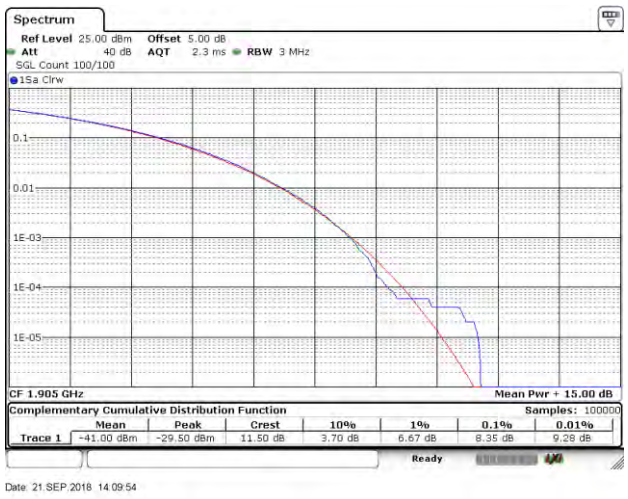
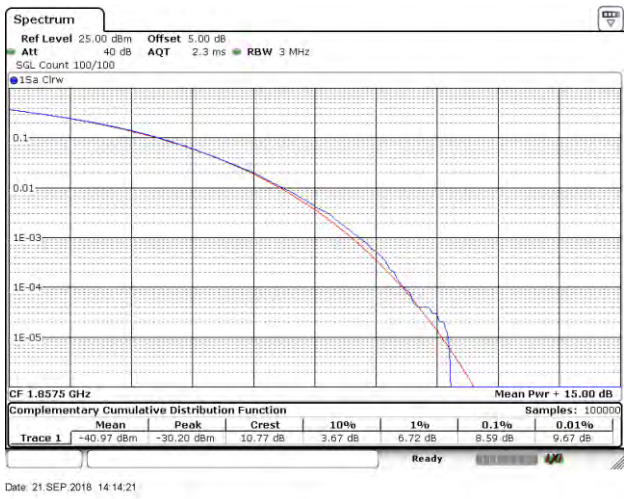


CAT-M1_Band2_CH19150_10M_QPSK_1RB0



CAT-M1_Band2_CH18675_15M_QPSK_1RB0



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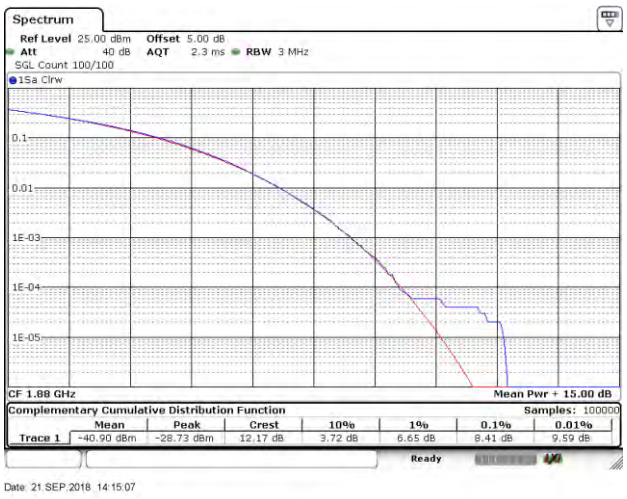
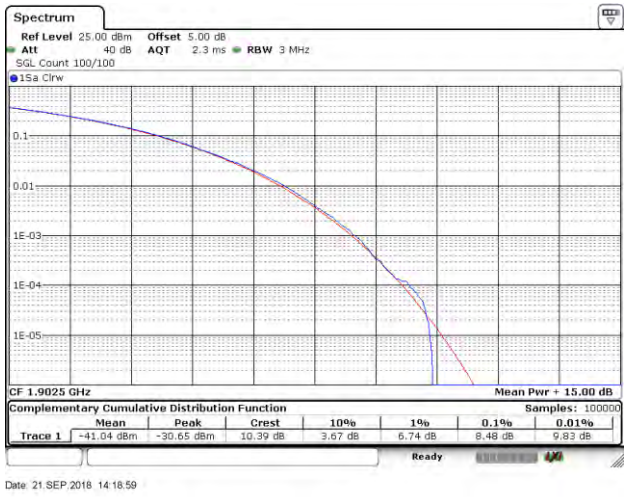
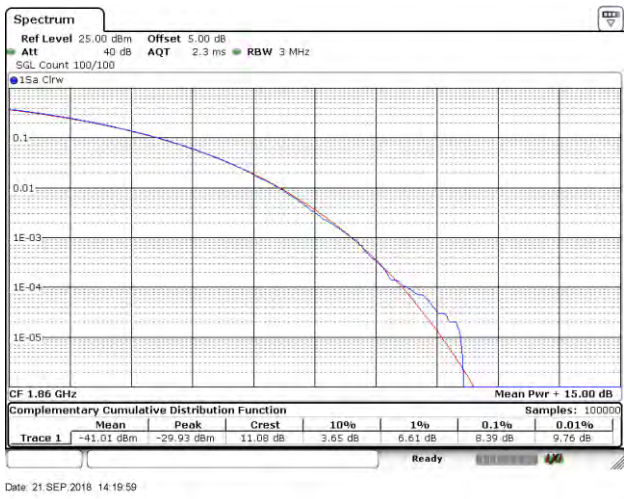


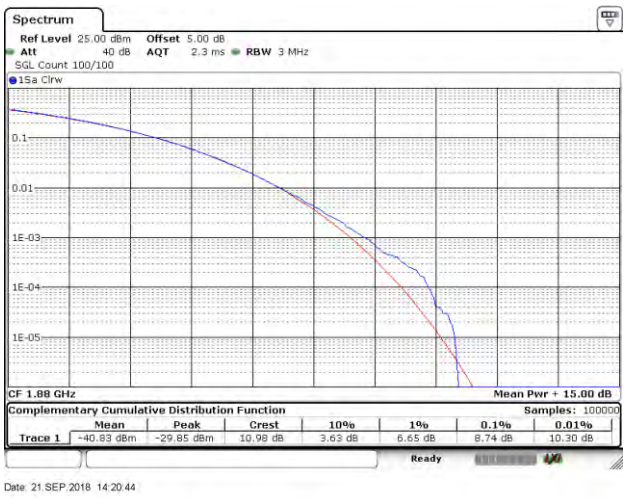
CAT-M1_Band2_CH19125_15M_QPSK_1RB0



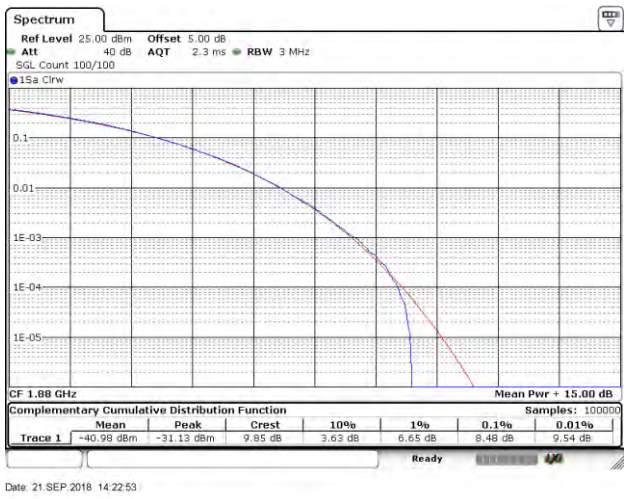
CAT-M1_Band2_CH18700_20M_QPSK_1RB0



CAT-M1_Band2_CH18900_20M_QPSK_1RB0

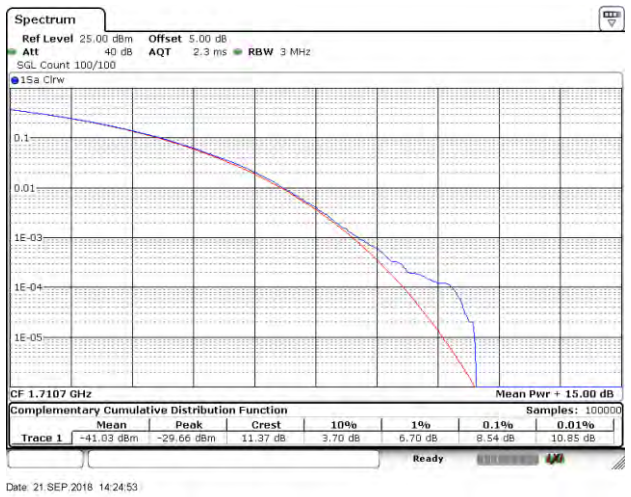


CAT-M1_Band2_CH19100_20M_QPSK_1RB0

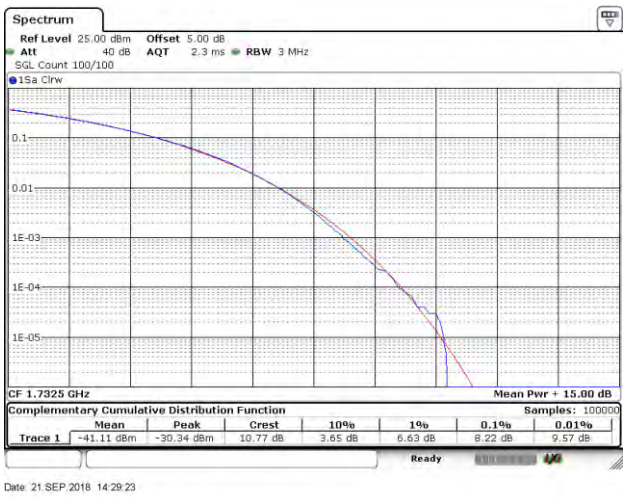


Product	ML865C1-NA		
Test Item	Peak To Average Ratio		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/21	Test Site	SR10-H

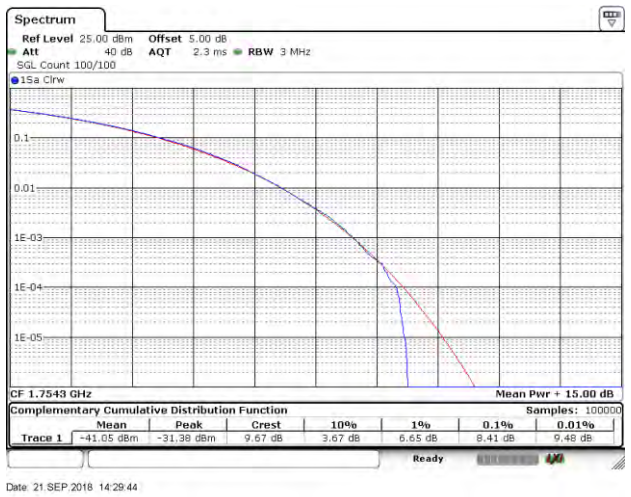
CAT-M1_Band4_CH19957_1.4M_QPSK_1RB0



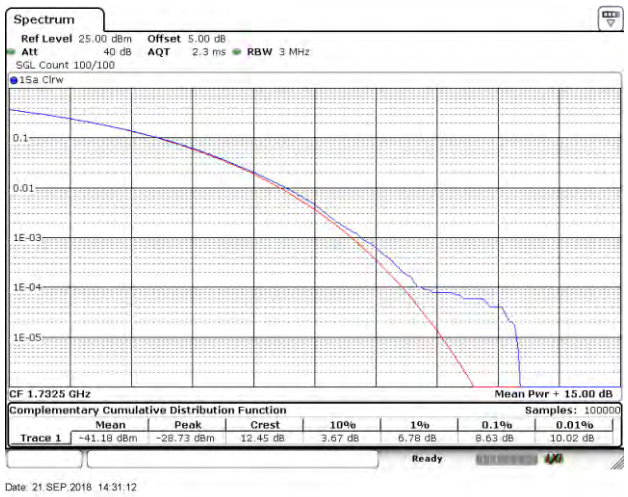
CAT-M1_Band4_CH20175_1.4M_QPSK_1RB0



CAT-M1_Band4_CH20393_1.4M_QPSK_1RB0



CAT-M1_Band4_CH19965_3M_QPSK_1RB0



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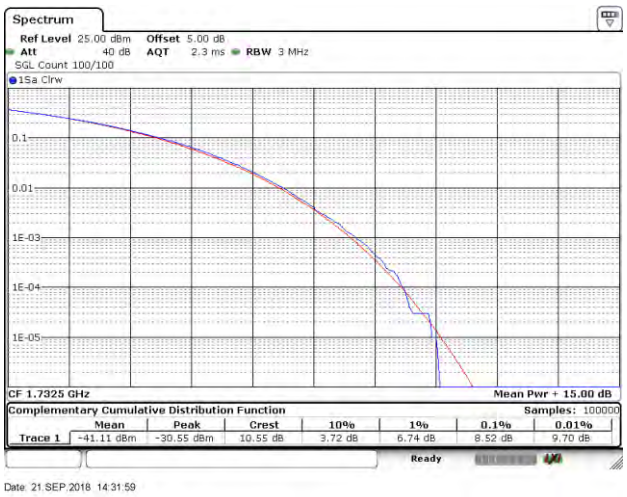

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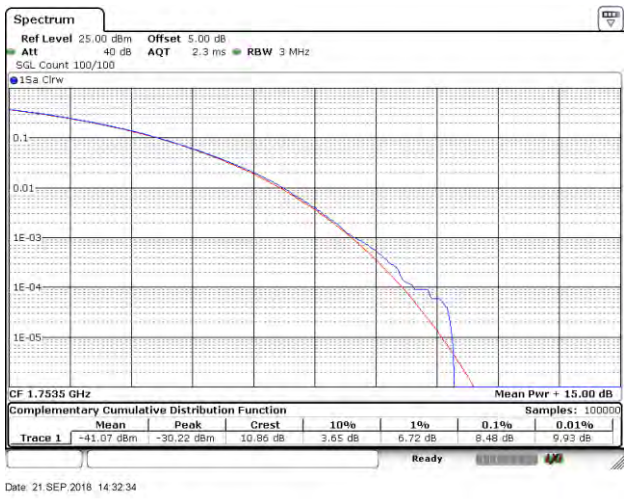
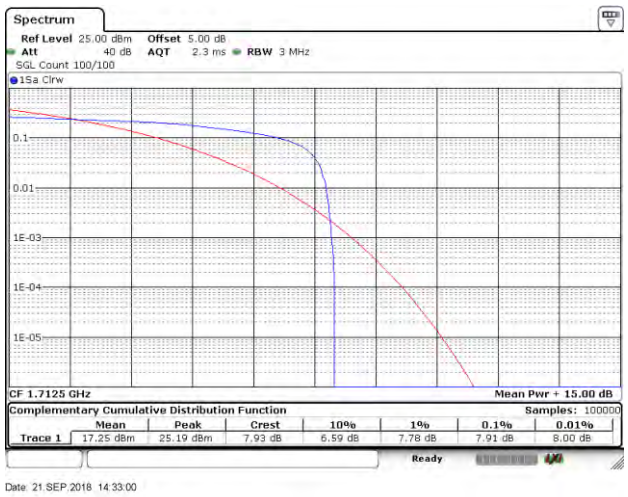


CAT-M1_Band4_CH19975_5M_QPSK_1RB0



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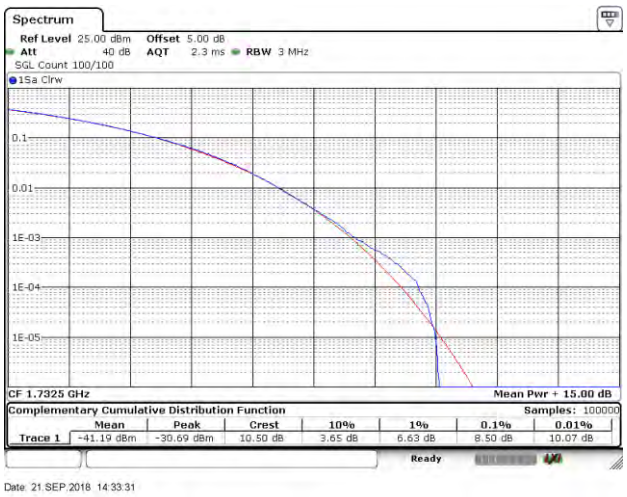

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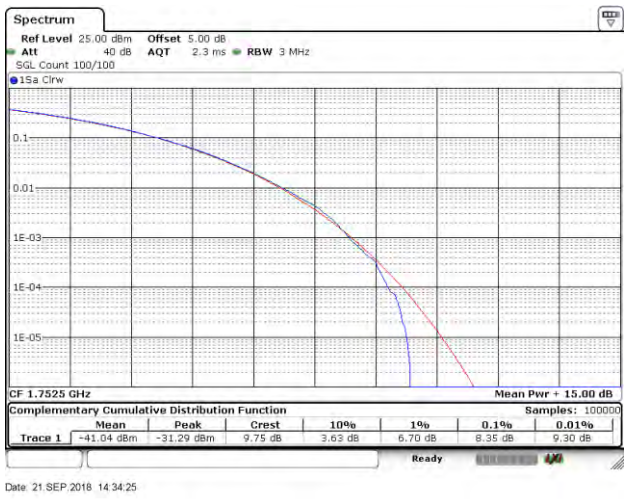
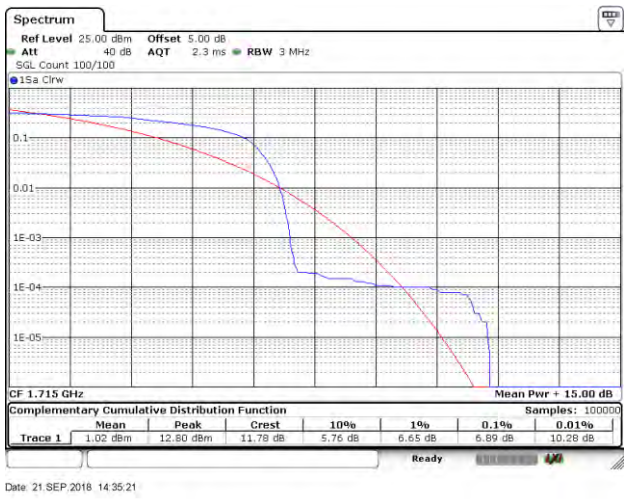
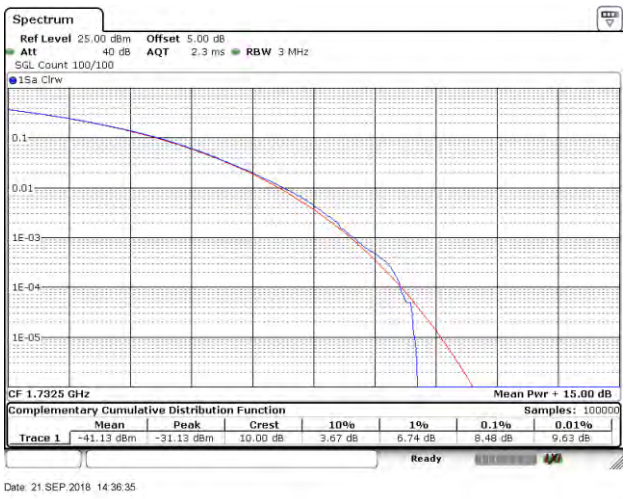


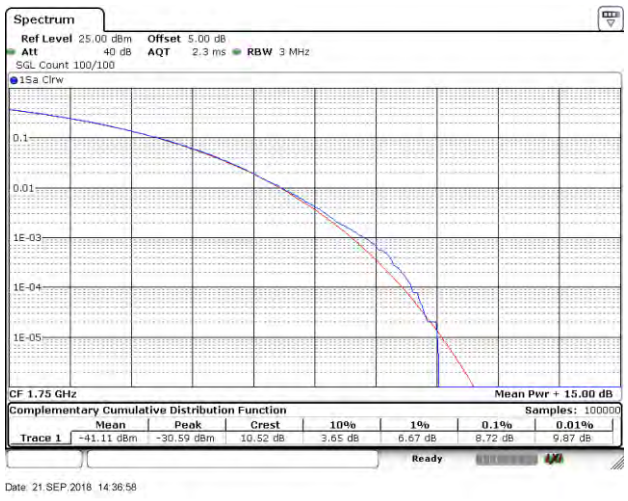
CAT-M1_Band4_CH20000_10M_QPSK_1RB0



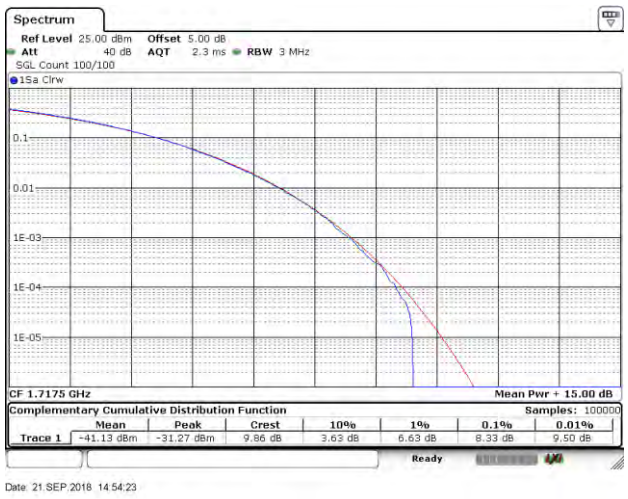
CAT-M1_Band4_CH20175_10M_QPSK_1RB0



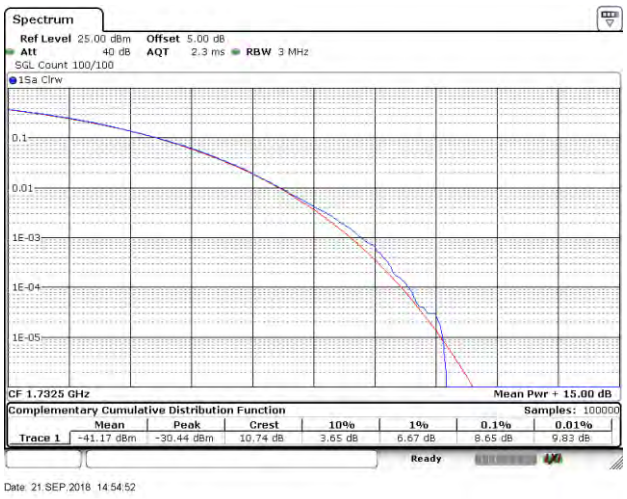
CAT-M1_Band4_CH20350_10M_QPSK_1RB0



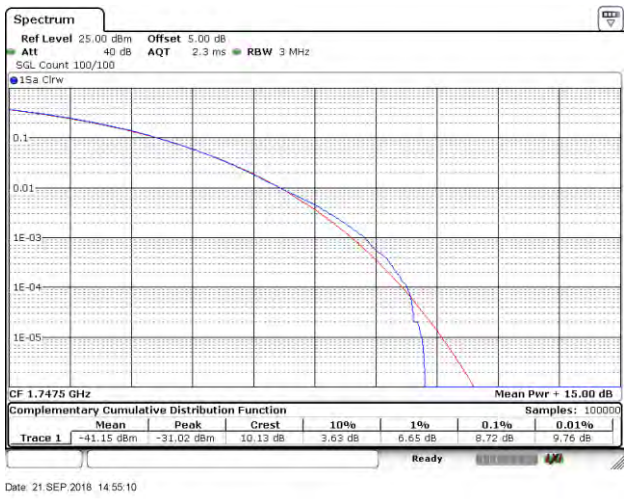
CAT-M1_Band4_CH20025_15M_QPSK_1RB0



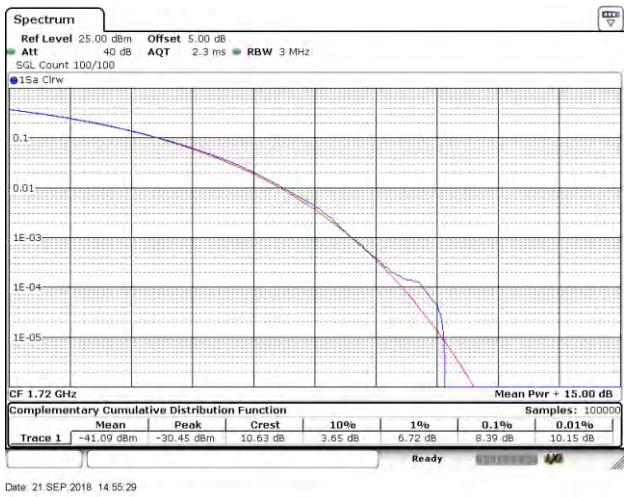
CAT-M1_Band4_CH20175_15M_QPSK_1RB0



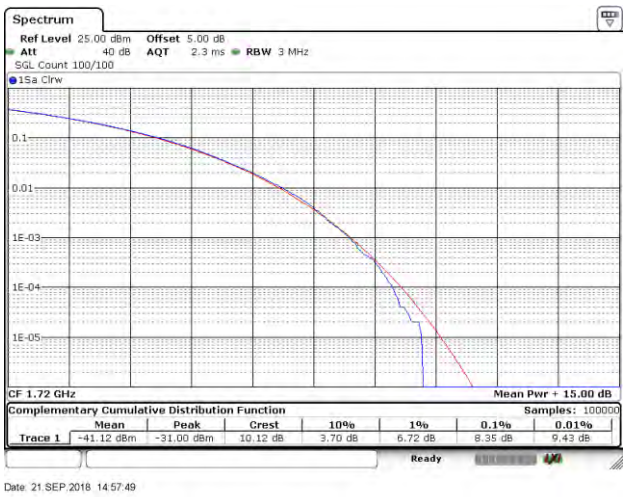
CAT-M1_Band4_CH20325_15M_QPSK_1RB0



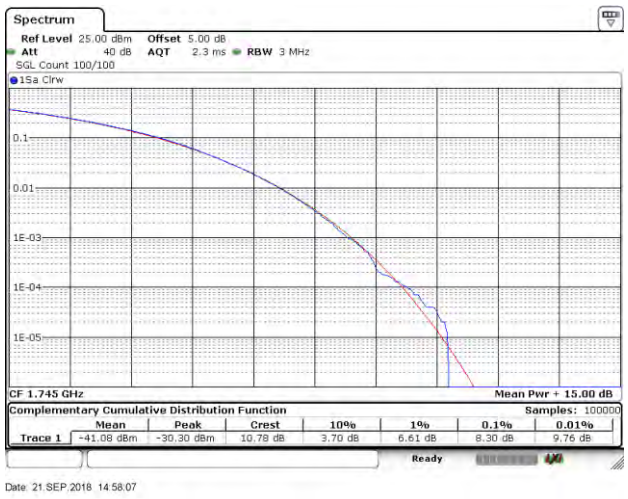
CAT-M1_Band4_CH20050_20M_QPSK_1RB0



CAT-M1_Band4_CH20175_20M_QPSK_1RB0

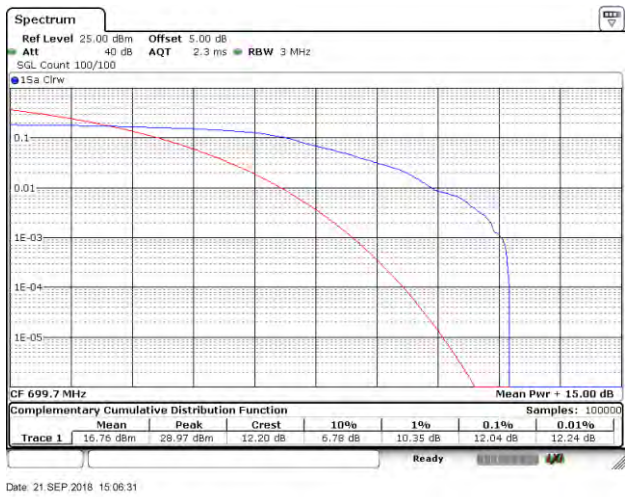


CAT-M1_Band4_CH20300_20M_QPSK_1RB0

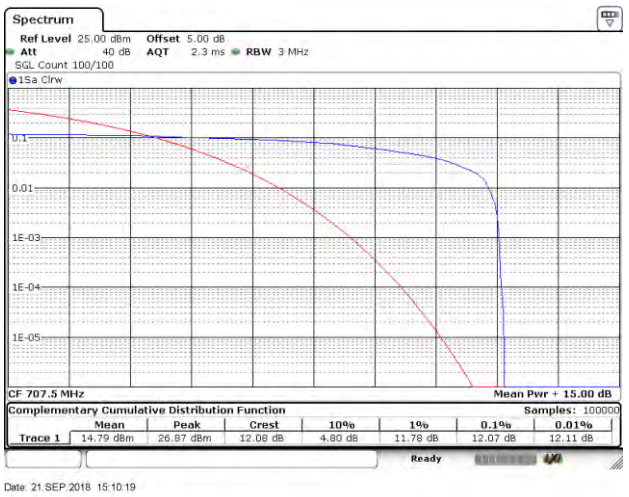


Product	ML865C1-NA		
Test Item	Peak To Average Ratio		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/21	Test Site	SR10-H

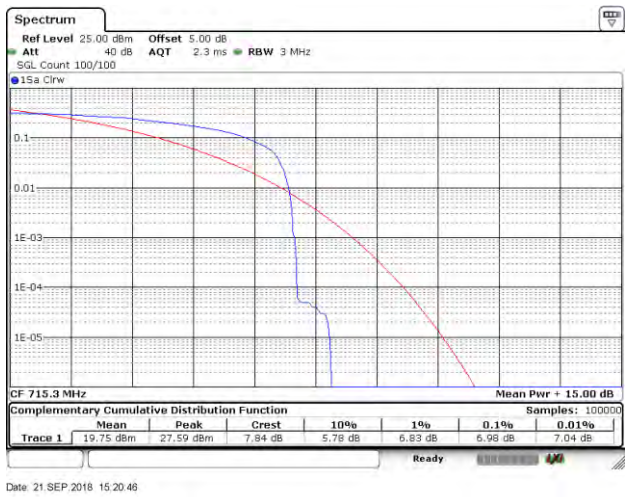
CAT-M1_Band12_CH23017_1.4M_QPSK_1RB0



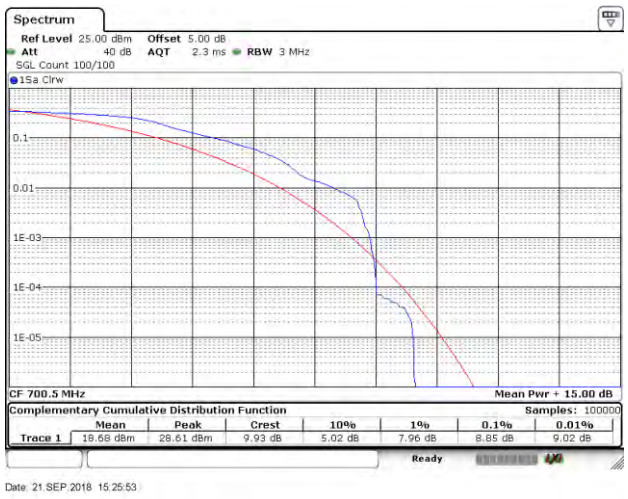
CAT-M1_Band12_CH23095_1.4M_QPSK_1RB0



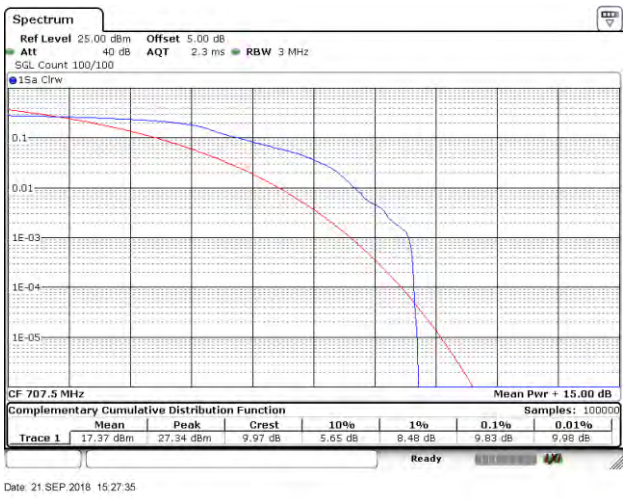
CAT-M1_Band12_CH23173_1.4M_QPSK_1RB0



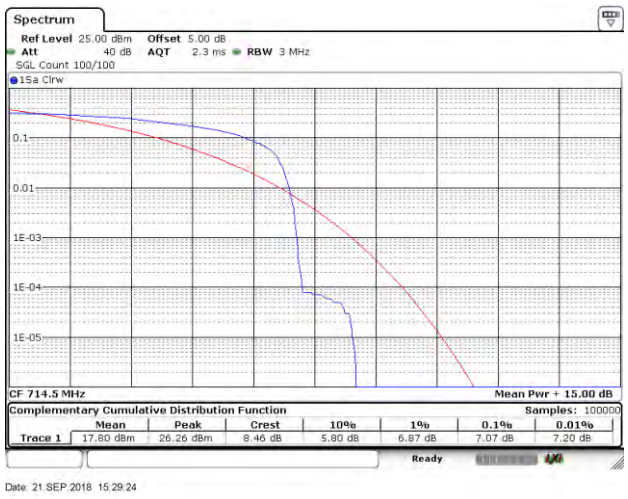
CAT-M1_Band12_CH23025_3M_QPSK_1RB0



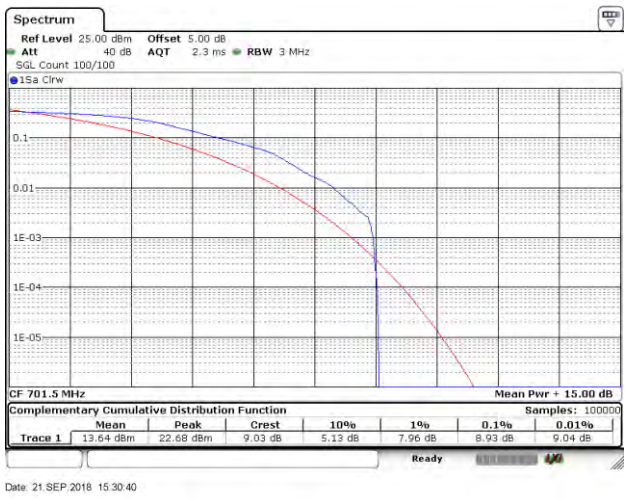
CAT-M1_Band12_CH23095_3M_QPSK_1RB0



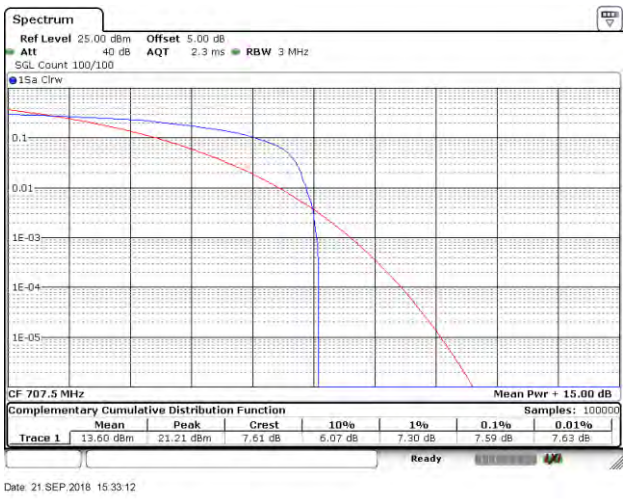
CAT-M1_Band12_CH23165_3M_QPSK_1RB0



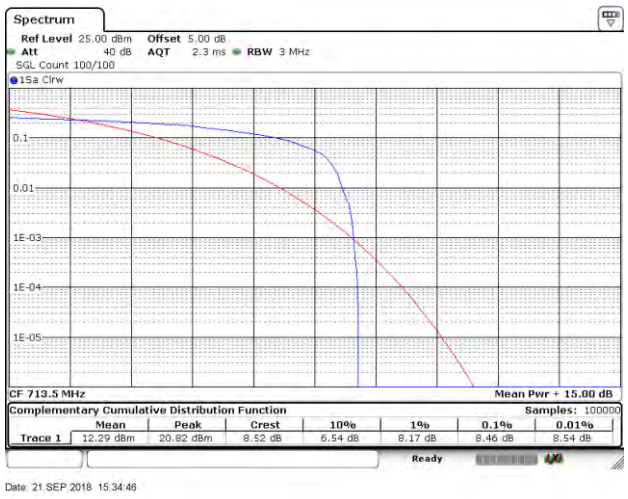
CAT-M1_Band12_CH23035_5M_QPSK_1RB0



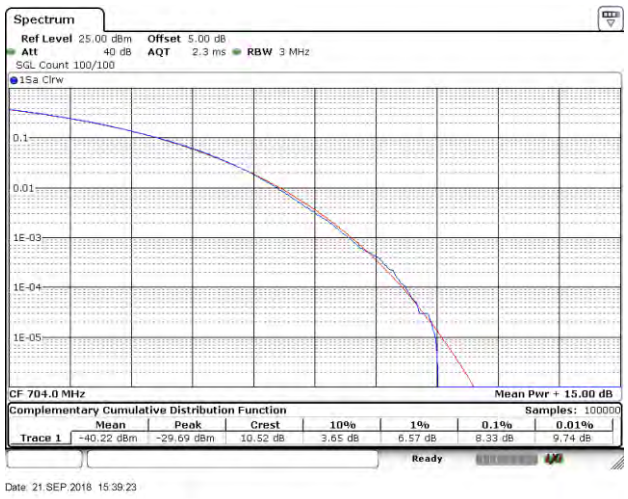
CAT-M1_Band12_CH23095_5M_QPSK_1RB0



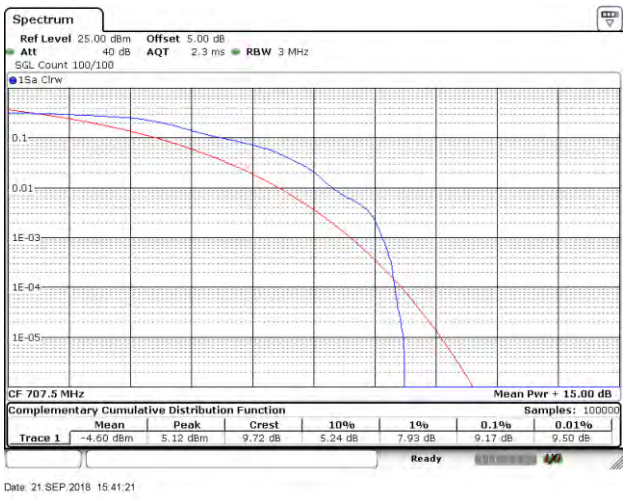
CAT-M1_Band12_CH23155_5M_QPSK_1RB0



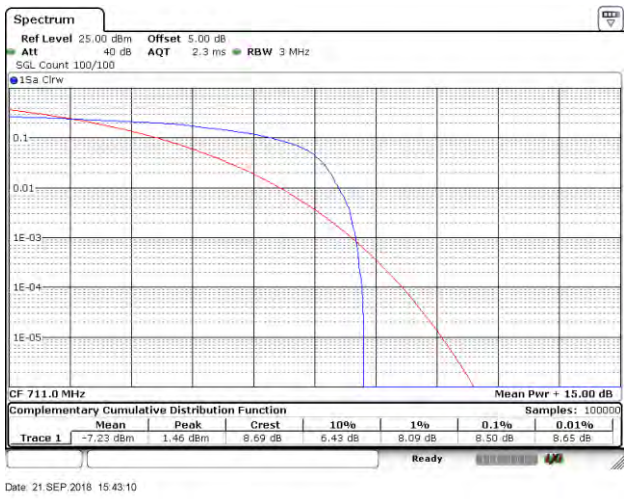
CAT-M1_Band12_CH23060_10M_QPSK_1RB0



CAT-M1_Band12_CH23095_10M_QPSK_1RB0

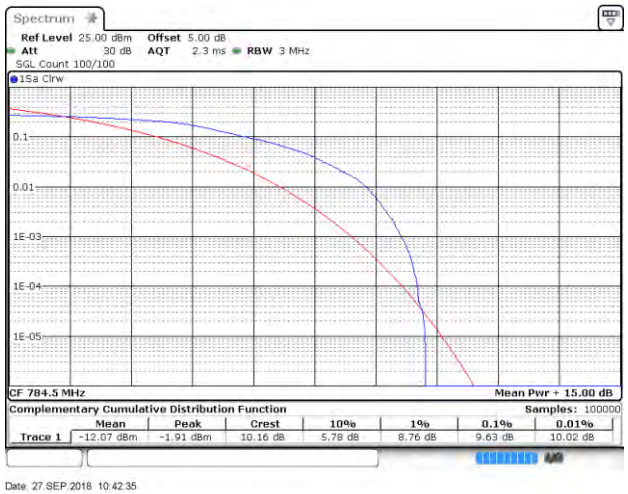


CAT-M1_Band12_CH23130_10M_QPSK_1RB0

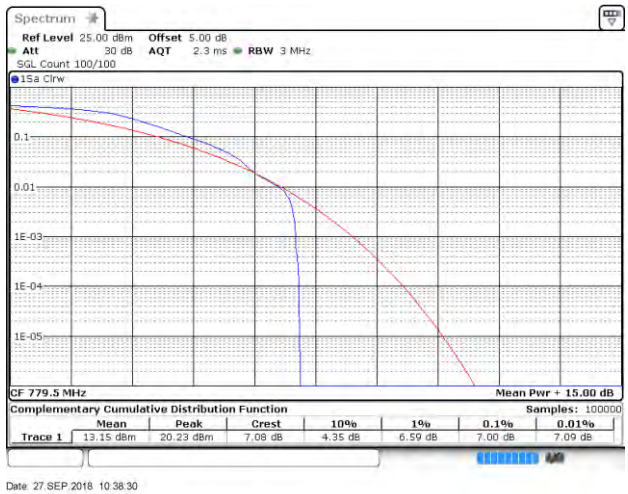


Product	ML865C1-NA		
Test Item	Peak To Average Ratio		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/27	Test Site	SR10-H

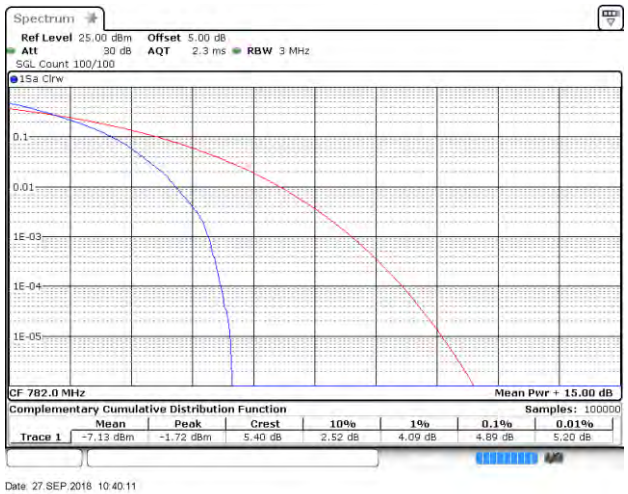
CAT-M1_Band13_CH23255_5M_QPSK_1RB0



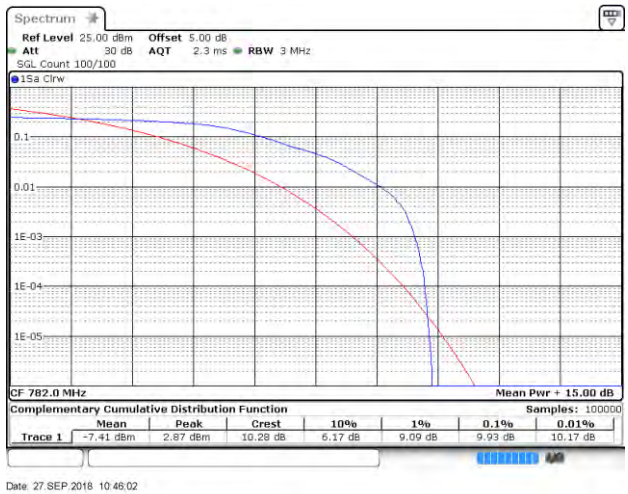
CAT-M1_Band13_CH23205_5M_QPSK_1RB0



CAT-M1_Band13_CH23230_5M_QPSK_1RB0



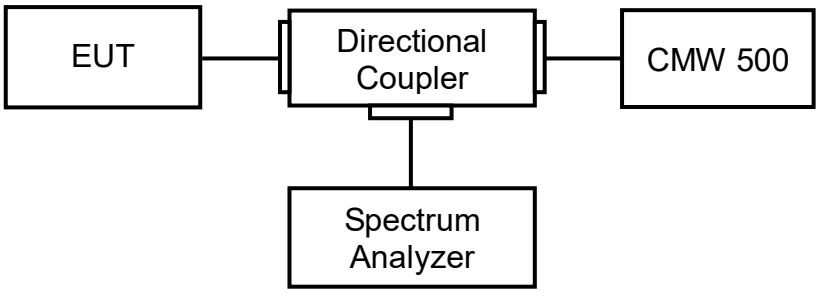
CAT-M1_Band13_CH23230_10M_QPSK_1RB0



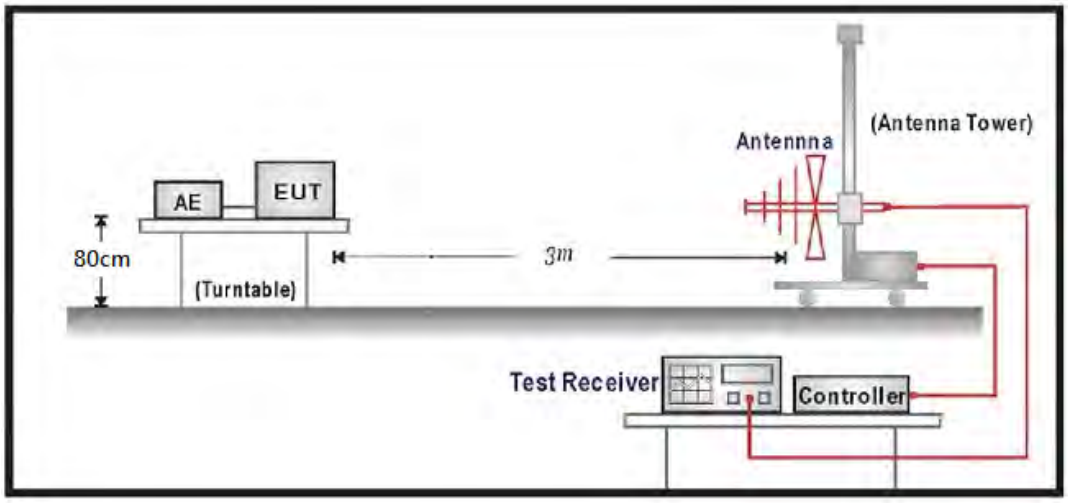
6. Spurious Emissions

6.1. Test Setup

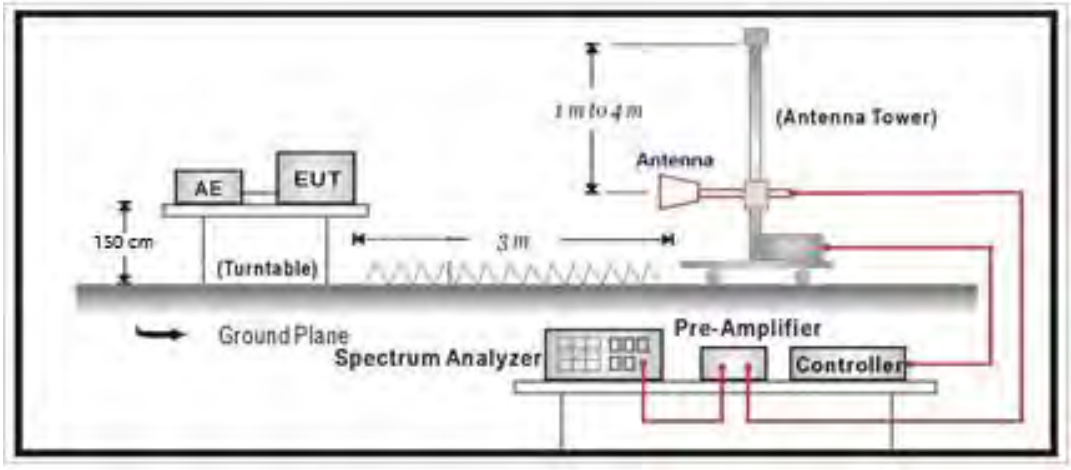
Conducted Spurious Measurement:



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



6.2. Test Procedure

Conducted Spurious Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c) EUT Communicate with CMW500, then select a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.
e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10^{th} harmonic.

Radiated Spurious Measurement:

a) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
b) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
c) The table was rotated 360 degrees to determine the position of the highest spurious emission.
d) The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
e) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
f) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
g) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
h) Taking the record of output power at antenna port
i) Repeat step 7 to step 8 for another polarization.
j) EIRP = SG - Cable loss + Antenna Gain

6.3. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause6.1
ANSI C63.26: 2015 Sub-clause 5.7

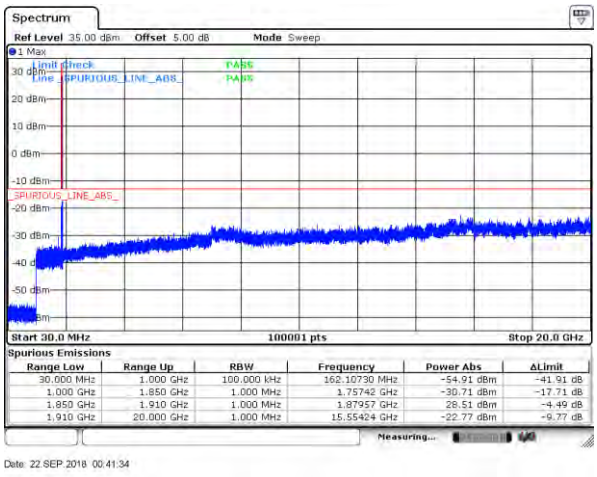
Radiated Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.8
ANSI C63.26: 2015 Sub-clause 5.5.3.2

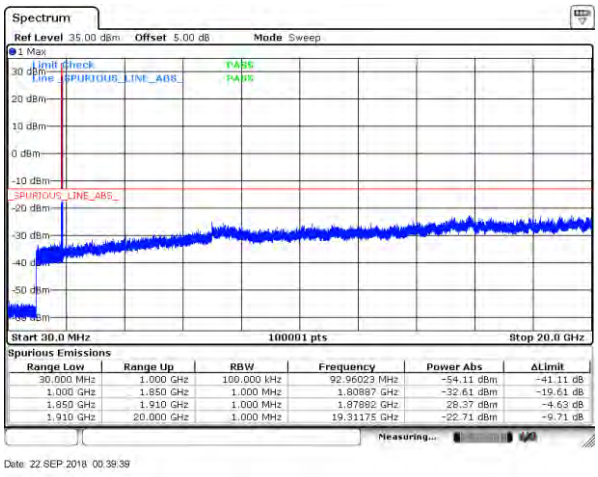
6.4. Test Result

Product	ML865C1-NA		
Test Item	Conducted Spurious Emissions		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/22	Test Site	SR10-H

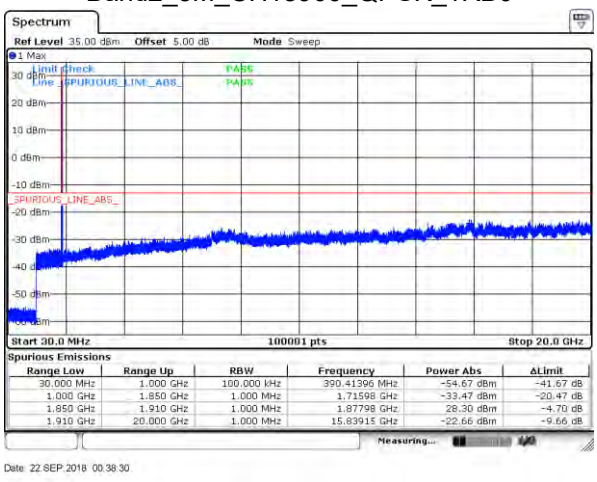
Band2_1.4M_CH18900_QPSK_1RB0



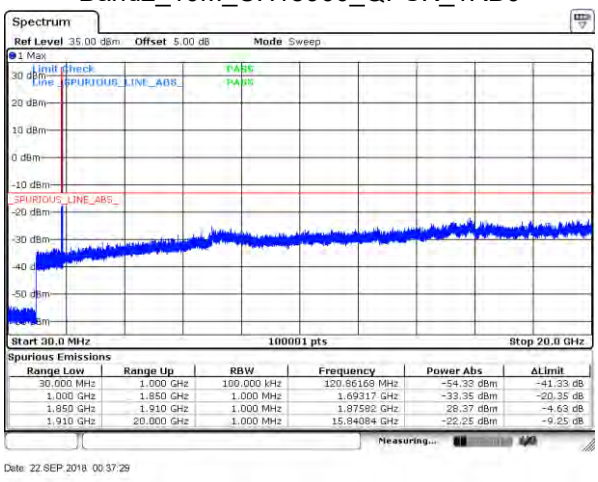
Band2_3M_CH18900_QPSK_1RB0



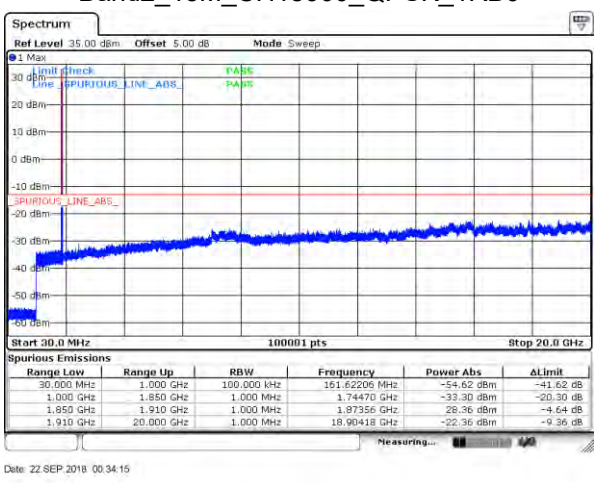
Band2_5M_CH18900_QPSK_1RB0



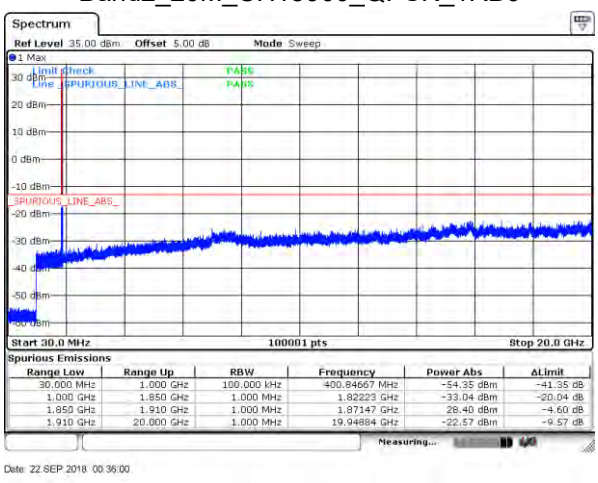
Band2_10M_CH18900_QPSK_1RB0



Band2_15M_CH18900_QPSK_1RB0

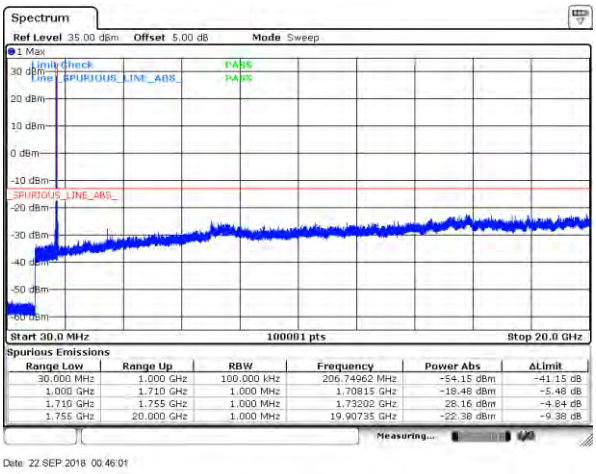


Band2_20M_CH18900_QPSK_1RB0

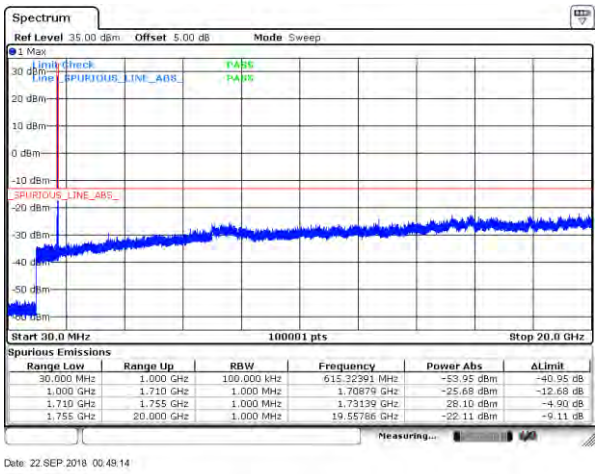


Product	ML865C1-NA		
Test Item	Conducted Spurious Emissions		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/22	Test Site	SR10-H

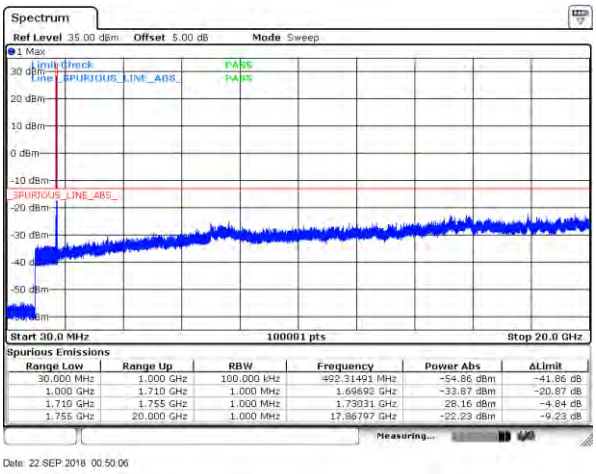
Band4_1.4M_CH20175_QPSK_1RB0



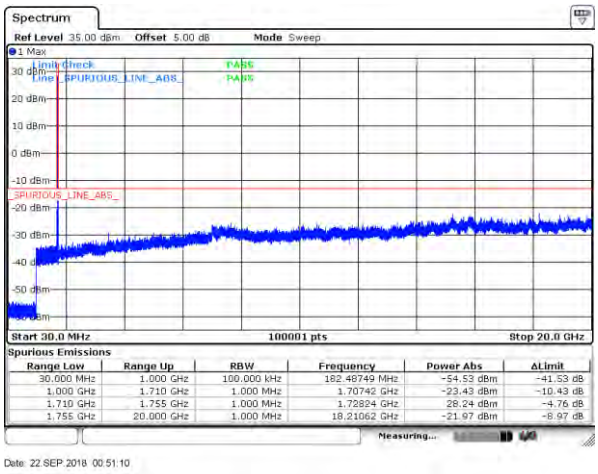
Band4_3M_CH20175_QPSK_1RB0



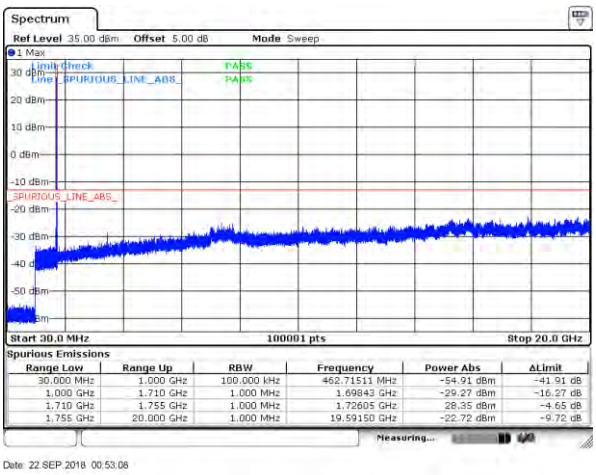
Band4_5M_CH20175_QPSK_1RB0



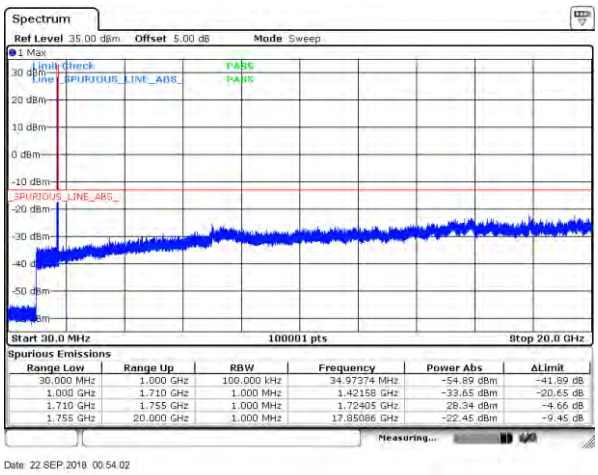
Band4_10M_CH20175_QPSK_1RB0



Band4_15M_CH20175_QPSK_1RB0

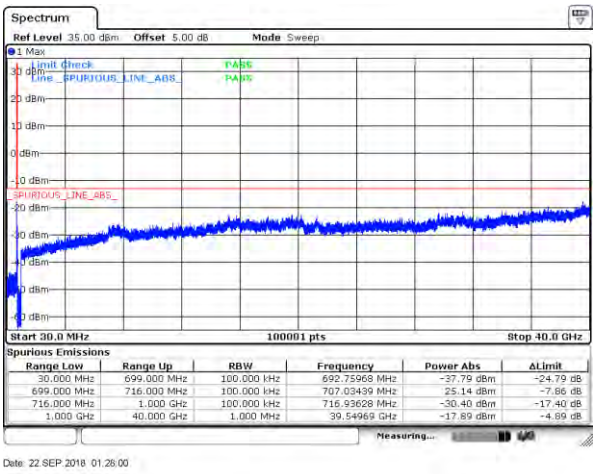


Band4_20M_CH20175_QPSK_1RB0

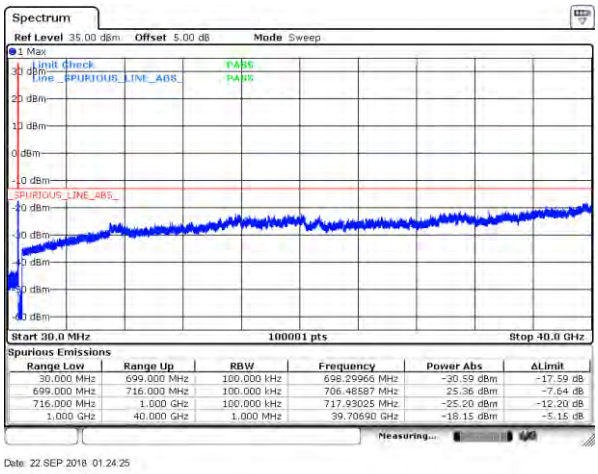


Product	ML865C1-NA		
Test Item	Conducted Spurious Emissions		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/22	Test Site	SR10-H

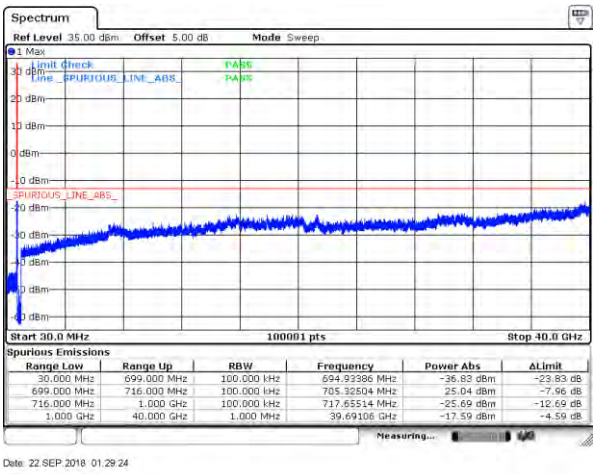
Band12_1.4M_CH23095_QPSK_1RB0



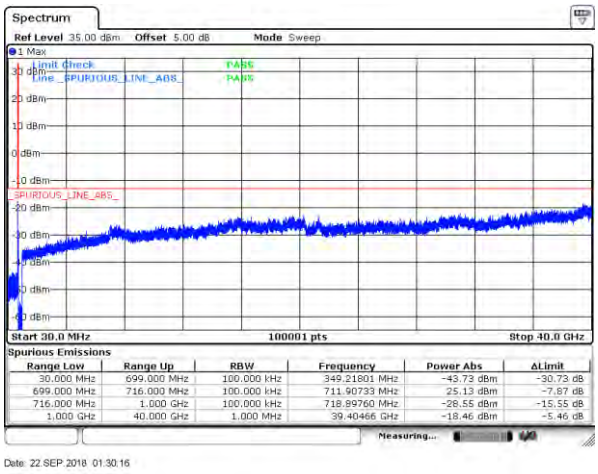
Band12_3M_CH23095_QPSK_1RB0



Band12_5M_CH23095_QPSK_1RB0

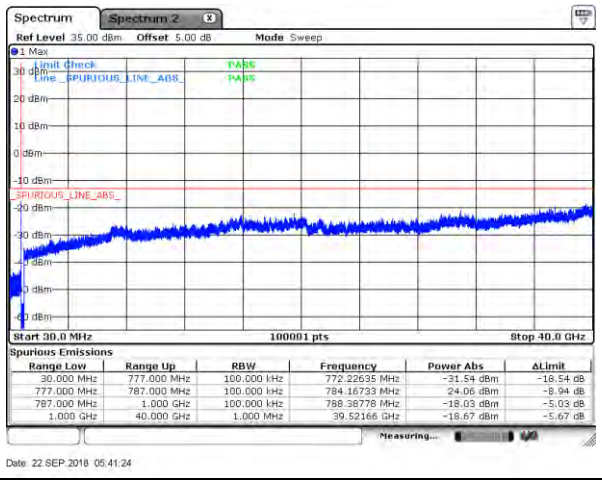


Band12_10M_CH23095_QPSK_1RB0

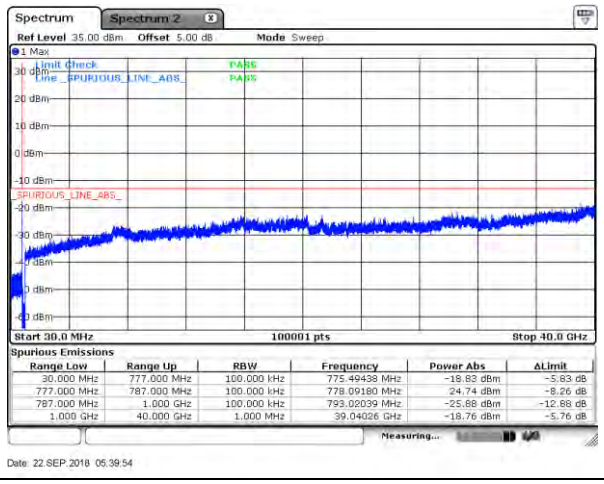


Product	ML865C1-NA		
Test Item	Conducted Spurious Emissions		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/22	Test Site	SR10-H

Band13_5M_CH23230_QPSK_1RB0



Band13_10M_CH23230_QPSK_1RB0



Product	ML865C1-NA		
Test Item	Radiated Spurious Emissions		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/22	Test Site	CB4-H

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
CAT-M1_Band2_1.4M_CH18900_QPSK_1RB0								
3760.00	-62.430	H	-63.907	4.335	11.832	-56.410	-13	-43.410
5640.00	-59.360	H	-57.535	5.235	12.900	-49.870	-13	-36.870
3760.00	-63.630	V	-65.337	4.335	11.832	-57.840	-13	-44.840
5640.00	-50.810	V	-49.725	5.235	12.900	-42.060	-13	-29.060
CAT-M1_Band2_3M_CH18900_QPSK_1RB0								
3760.00	-61.880	H	-63.357	4.335	11.832	-55.860	-13	-42.860
5640.00	-59.170	H	-57.345	5.235	12.900	-49.680	-13	-36.680
3760.00	-63.460	V	-65.167	4.335	11.832	-57.670	-13	-44.670
5640.00	-50.550	V	-49.465	5.235	12.900	-41.800	-13	-28.800
CAT-M1_Band2_5M_CH18900_QPSK_1RB0								
3760.00	-62.100	H	-63.577	4.335	11.832	-56.080	-13	-43.080
5640.00	-59.840	H	-58.015	5.235	12.900	-50.350	-13	-37.350
3760.00	-63.030	V	-64.737	4.335	11.832	-57.240	-13	-44.240
5640.00	-51.250	V	-50.165	5.235	12.900	-42.500	-13	-29.500
CAT-M1_Band2_10M_CH18900_QPSK_1RB0								
3760.00	-62.460	H	-63.937	4.335	11.832	-56.440	-13	-43.440
5640.00	-59.930	H	-58.105	5.235	12.900	-50.440	-13	-37.440
3760.00	-62.540	V	-64.247	4.335	11.832	-56.750	-13	-43.750
5640.00	-51.130	V	-50.045	5.235	12.900	-42.380	-13	-29.380
CAT-M1_Band2_15M_CH18900_QPSK_1RB0								
3760.00	-61.820	H	-63.297	4.335	11.832	-55.800	-13	-42.800
5640.00	-58.980	H	-57.155	5.235	12.900	-49.490	-13	-36.490
3760.00	-62.580	V	-64.287	4.335	11.832	-56.790	-13	-43.790
5640.00	-51.710	V	-50.625	5.235	12.900	-42.960	-13	-29.960
CAT-M1_Band2_20M_CH18900_QPSK_1RB0								
3760.00	-61.380	H	-62.857	4.335	11.832	-55.360	-13	-42.360
5640.00	-59.330	H	-57.505	5.235	12.900	-49.840	-13	-36.840
3760.00	-63.090	V	-64.797	4.335	11.832	-57.300	-13	-44.300
5640.00	-52.110	V	-51.025	5.235	12.900	-43.360	-13	-30.360

Product	ML865C1-NA		
Test Item	Radiated Spurious Emissions		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/22	Test Site	CB4-H

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
CAT-M1_Band4_1.4M_CH20175_QPSK_1RB0								
3465.00	-61.910	H	-63.899	4.090	12.209	-55.780	-13	-42.780
5197.50	-58.610	H	-57.362	5.094	12.356	-50.100	-13	-37.100
3465.00	-61.760	V	-63.979	4.090	12.209	-55.860	-13	-42.860
5197.50	-57.490	V	-56.792	5.094	12.356	-49.530	-13	-36.530
CAT-M1_Band4_3M_CH20175_QPSK_1RB0								
3465.00	-61.680	H	-63.669	4.090	12.209	-55.550	-13	-42.550
5197.50	-58.740	H	-57.492	5.094	12.356	-50.230	-13	-37.230
3465.00	-61.550	V	-63.769	4.090	12.209	-55.650	-13	-42.650
5197.50	-57.780	V	-57.082	5.094	12.356	-49.820	-13	-36.820
CAT-M1_Band4_5M_CH20175_QPSK_1RB0								
3465.00	-61.970	H	-63.959	4.090	12.209	-55.840	-13	-42.840
5197.50	-58.360	H	-57.112	5.094	12.356	-49.850	-13	-36.850
3465.00	-62.120	V	-64.339	4.090	12.209	-56.220	-13	-43.220
5197.50	-57.660	V	-56.962	5.094	12.356	-49.700	-13	-36.700
CAT-M1_Band4_10M_CH20175_QPSK_1RB0								
3465.00	-61.810	H	-63.799	4.090	12.209	-55.680	-13	-42.680
5197.50	-58.230	H	-56.982	5.094	12.356	-49.720	-13	-36.720
3465.00	-61.350	V	-63.569	4.090	12.209	-55.450	-13	-42.450
5197.50	-58.320	V	-57.622	5.094	12.356	-50.360	-13	-37.360
CAT-M1_Band4_15M_CH20175_QPSK_1RB0								
3465.00	-61.430	H	-63.419	4.090	12.209	-55.300	-13	-42.300
5197.50	-58.970	H	-57.722	5.094	12.356	-50.460	-13	-37.460
3465.00	-61.750	V	-63.969	4.090	12.209	-55.850	-13	-42.850
5197.50	-57.660	V	-56.962	5.094	12.356	-49.700	-13	-36.700
CAT-M1_Band4_20M_CH20175_QPSK_1RB0								
3465.00	-61.430	H	-63.419	4.090	12.209	-55.300	-13	-42.300
5197.50	-58.210	H	-56.962	5.094	12.356	-49.700	-13	-36.700
3465.00	-62.230	V	-64.449	4.090	12.209	-56.330	-13	-43.330
5197.50	-57.190	V	-56.492	5.094	12.356	-49.230	-13	-36.230

Product	ML865C1-NA		
Test Item	Radiated Spurious Emissions		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/22	Test Site	CB4-H

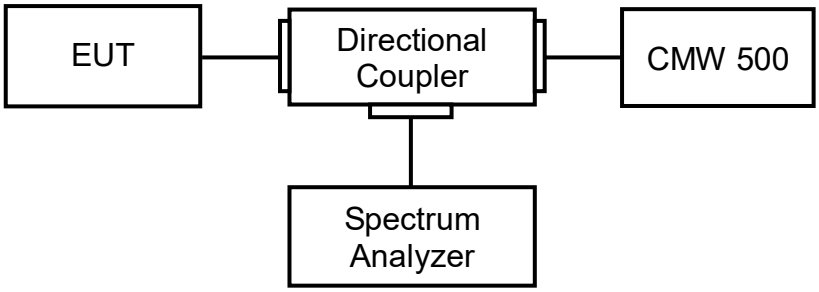
Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
CAT-M1_Band12_1.4M_CH23095_QPSK_1RB0								
1415.00	-57.530	H	-60.647	2.585	7.892	-55.340	-13	-42.340
2122.50	-54.150	H	-58.191	3.195	9.996	-51.390	-13	-38.390
1415.00	-58.000	V	-60.927	2.585	7.892	-55.620	-13	-42.620
2122.50	-54.370	V	-58.431	3.195	9.996	-51.630	-13	-38.630
CAT-M1_Band12_3M_CH23095_QPSK_1RB0								
1415.00	-57.730	H	-60.847	2.585	7.892	-55.540	-13	-42.540
2122.50	-52.420	H	-56.461	3.195	9.996	-49.660	-13	-36.660
1415.00	-57.730	V	-60.657	2.585	7.892	-55.350	-13	-42.350
2122.50	-53.990	V	-58.051	3.195	9.996	-51.250	-13	-38.250
CAT-M1_Band12_5M_CH23095_QPSK_1RB0								
1415.00	-57.820	H	-60.937	2.585	7.892	-55.630	-13	-42.630
2122.50	-54.580	H	-58.621	3.195	9.996	-51.820	-13	-38.820
1415.00	-61.020	V	-63.947	2.585	7.892	-58.640	-13	-45.640
2122.50	-51.980	V	-56.041	3.195	9.996	-49.240	-13	-36.240
CAT-M1_Band12_10M_CH23095_QPSK_1RB0								
1415.00	-59.080	H	-62.197	2.585	7.892	-56.890	-13	-43.890
2122.50	-52.340	H	-56.381	3.195	9.996	-49.580	-13	-36.580
1415.00	-58.500	V	-61.427	2.585	7.892	-56.120	-13	-43.120
2122.50	-52.300	V	-56.361	3.195	9.996	-49.560	-13	-36.560

Product	ML865C1-NA		
Test Item	Radiated Spurious Emissions		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/22	Test Site	CB4-H

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
CAT-M1_Band12_5M_CH23095_QPSK_1RB0								
1564.00	-57.090	H	-60.429	2.713	8.492	-54.650	-13	-41.650
2346.00	-57.830	H	-61.714	3.349	10.354	-54.710	-13	-41.710
1564.00	-58.100	V	-61.419	2.713	8.492	-55.640	-13	-42.640
2346.00	-56.200	V	-60.144	3.349	10.354	-53.140	-13	-40.140
CAT-M1_Band12_10M_CH23095_QPSK_1RB0								
1564.00	-55.730	H	-59.069	2.713	8.492	-53.290	-13	-40.290
2346.00	-56.710	H	-60.594	3.349	10.354	-53.590	-13	-40.590
1564.00	-56.940	V	-60.259	2.713	8.492	-54.480	-13	-41.480
2346.00	-56.390	V	-60.334	3.349	10.354	-53.330	-13	-40.330

7. Spurious Emissions at Antenna Terminals

7.1. Test Setup



7.2. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c) EUT Communicate with CMW500, then select a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.
e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

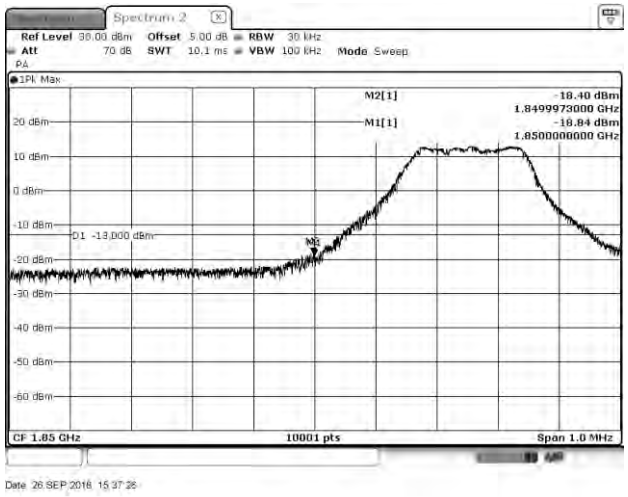
7.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 6.1
ANSI C63.26: 2015 Sub-clause 5.7

7.4. Test Result

Product	ML865C1-NA		
Test Item	Spurious Emissions at Antenna Terminals		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/26	Test Site	SR10-H

Cat M1_Band 2_ 1.4M_CH18607_QPSK_1RB0



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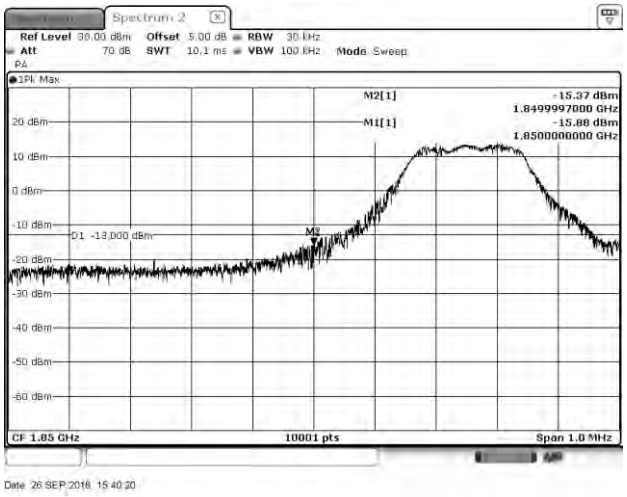
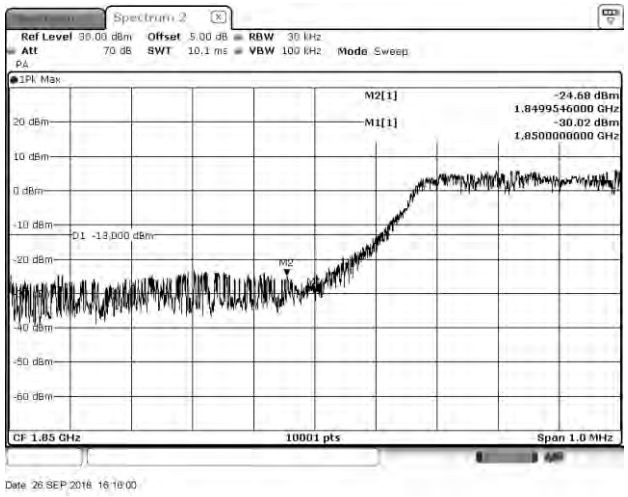
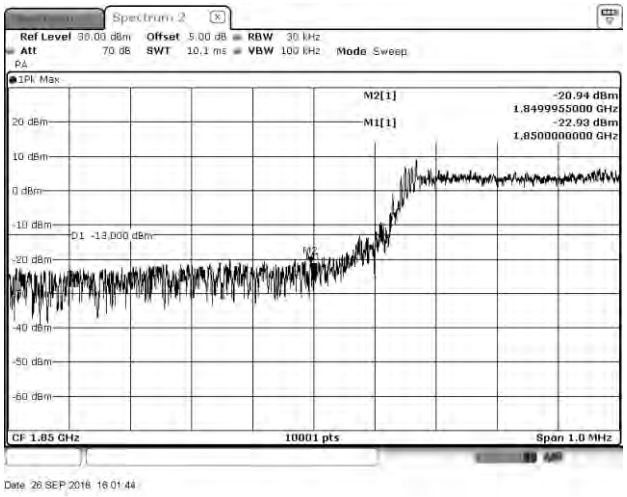


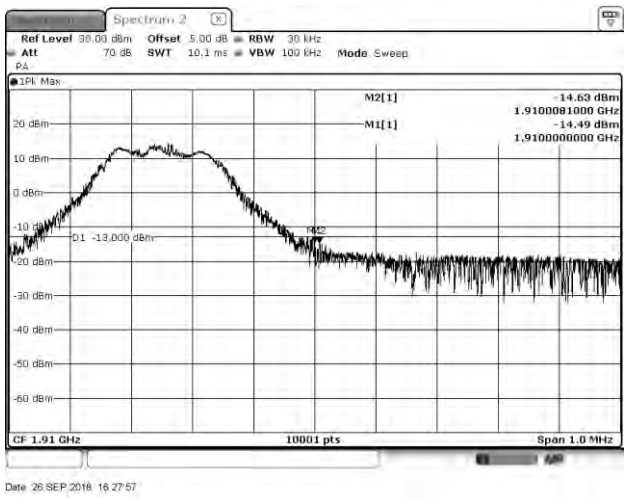
Cat M1_Band 2_ 1.4M_CH18607_QPSK_6RB0



Cat M1_Band 2_ 1.4M_CH18607_16QAM_5RB0



Cat M1_Band 2_ 1.4M_CH19193_QPSK_1RB0



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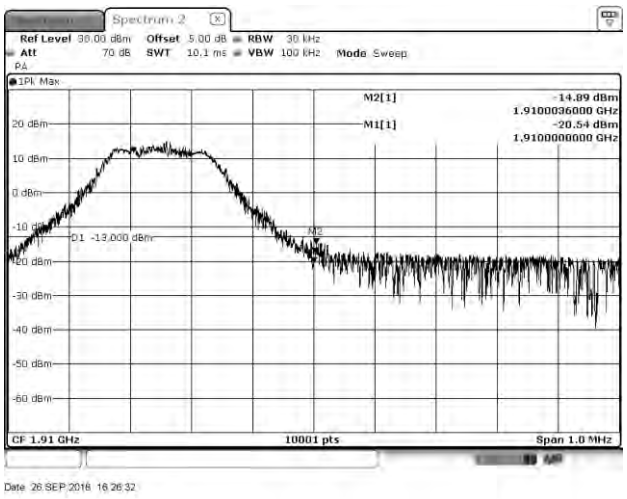
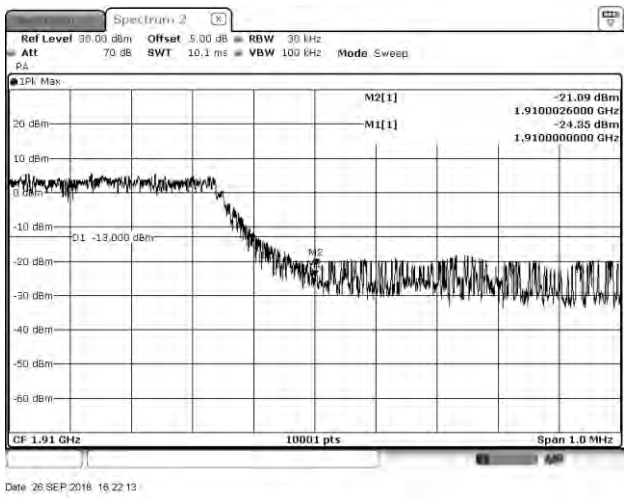
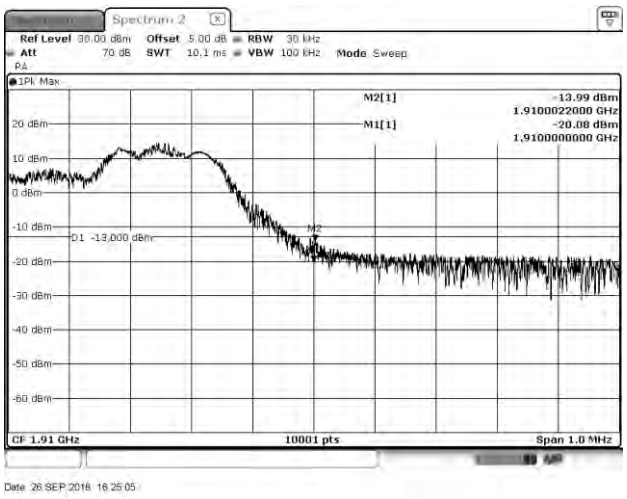


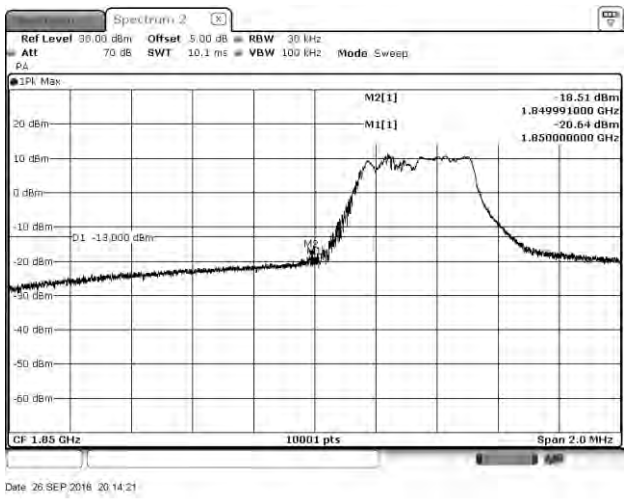
Cat M1_Band 2_ 1.4M_CH19193_QPSK_6RB0



Cat M1_Band 2_ 1.4M_CH19193_16QAM_5RB1



Cat M1_Band 2_ 3M_CH18615_QPSK_1RB0



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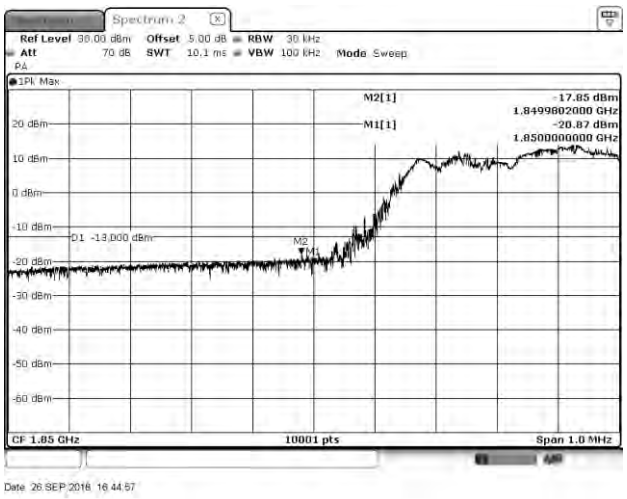
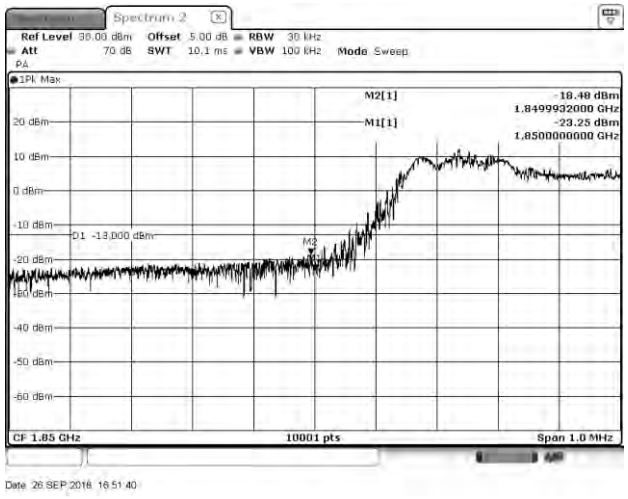
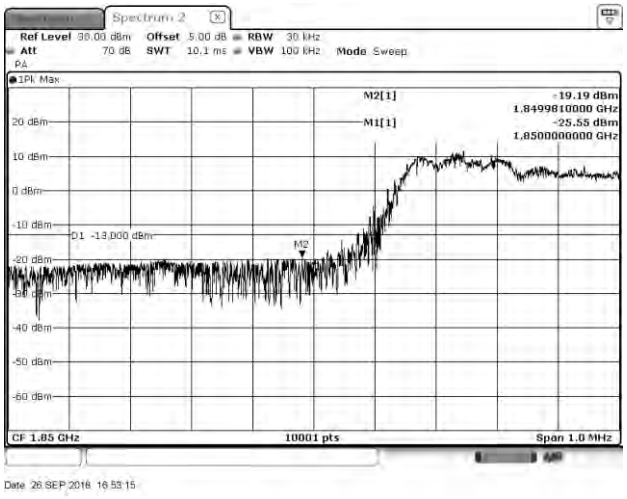


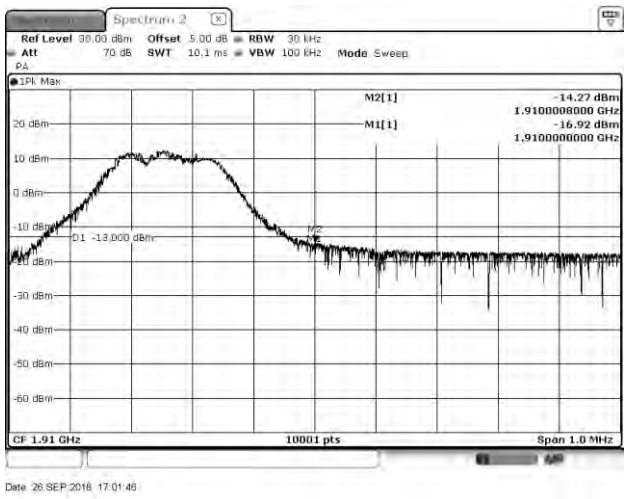
Cat M1_Band 2_ 3M_CH18615_QPSK_6RB0



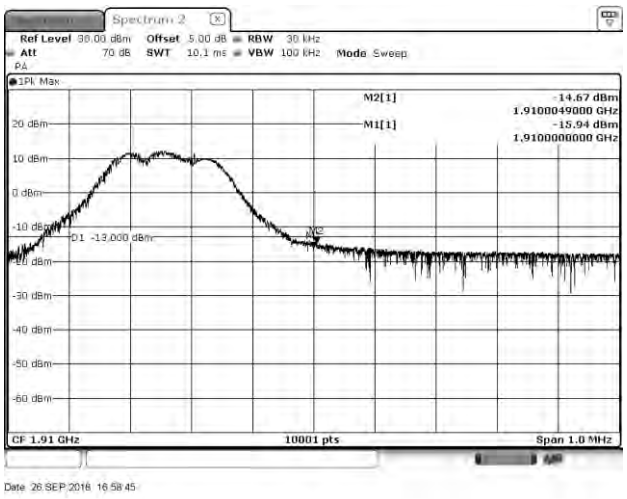
Cat M1_Band 2_ 3M_CH18615_16QAM_5RB0



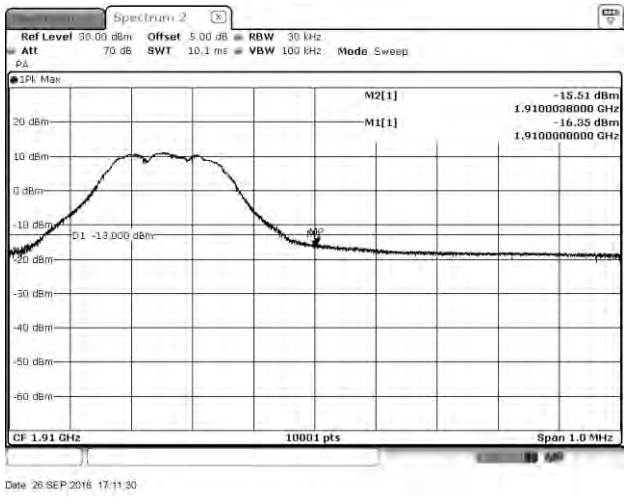
Cat M1_Band 2_ 3M_CH19185_QPSK_1RB0



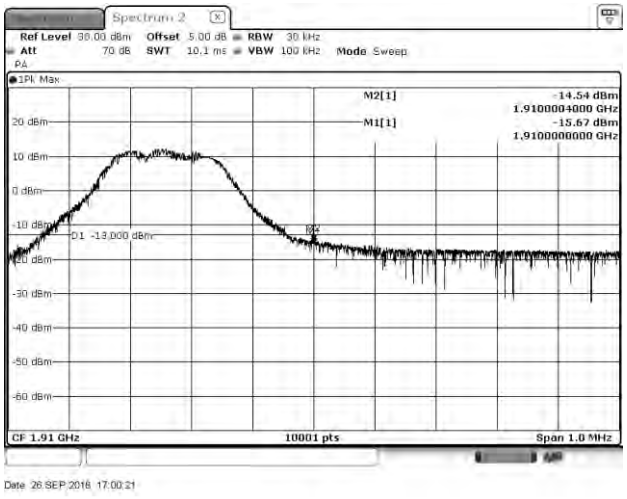
Cat M1_Band 2_ 3M_CH19185_16QAM_1RB5



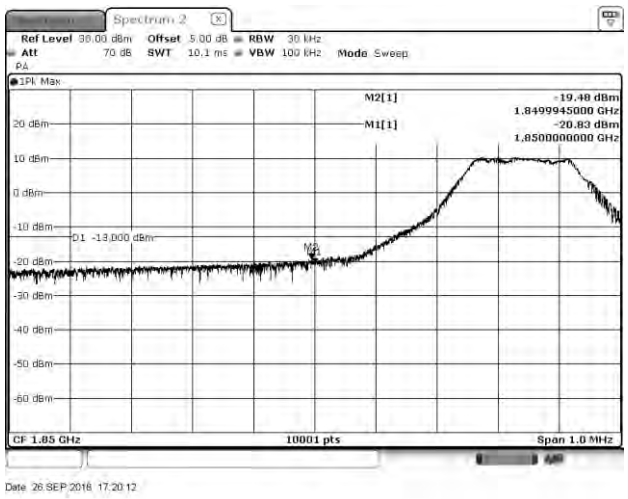
Cat M1_Band 2_ 3M_CH19185_QPSK_6RB0



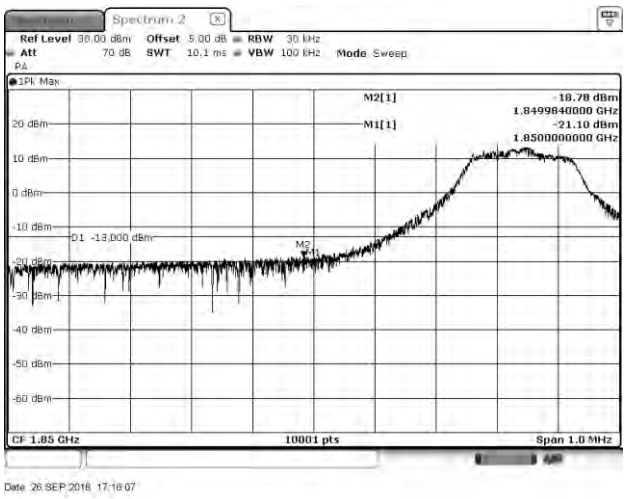
Cat M1_Band 2_ 3M_CH19185_16QAM_5RB1



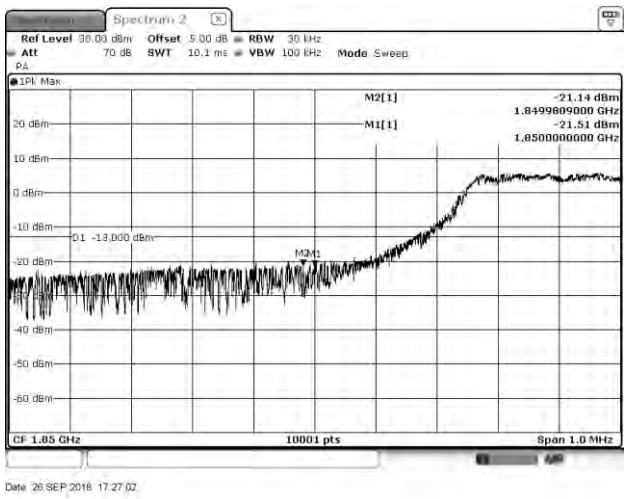
Cat M1_Band 2_ 5M_CH18625_QPSK_1RB0



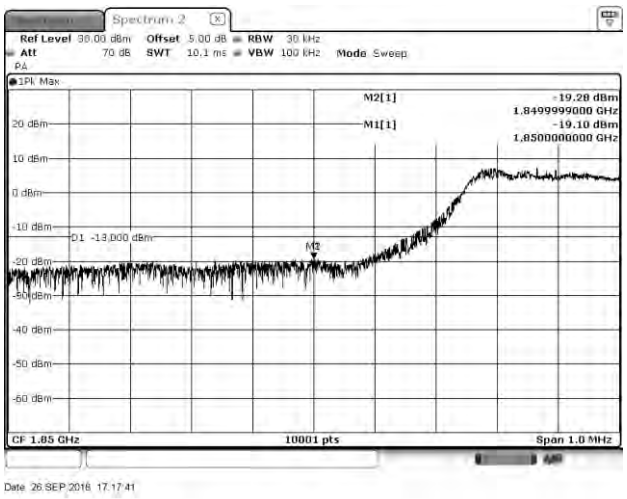
Cat M1_Band 2_ 5M_CH18625_16QAM_1RB0



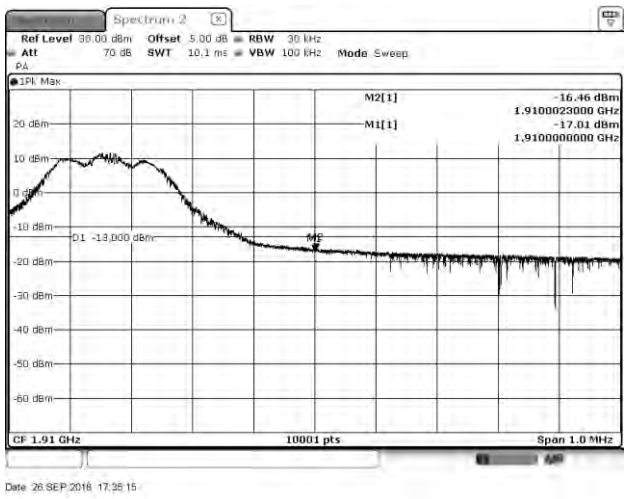
Cat M1_Band 2_ 5M_CH18625_QPSK_6RB0



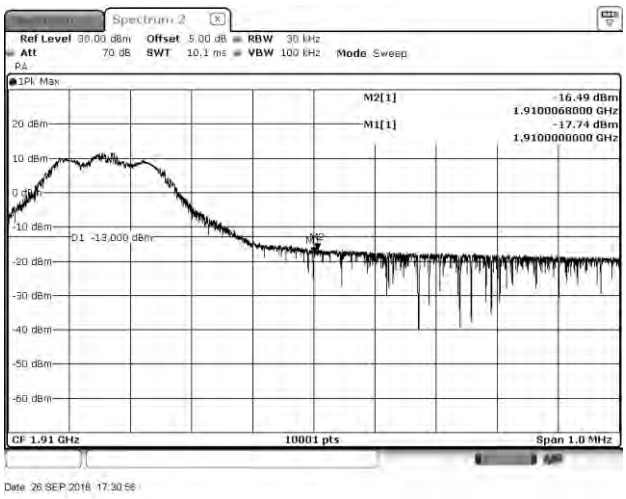
Cat M1_Band 2_ 5M_CH18625_16QAM_5RB0



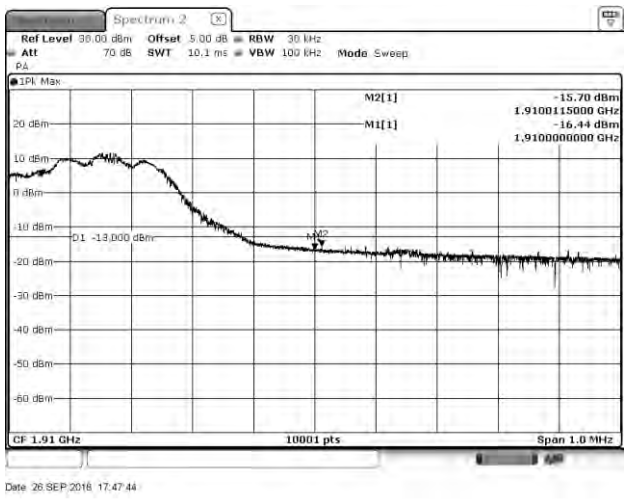
Cat M1_Band 2_ 5M_CH19175_QPSK_1RB0



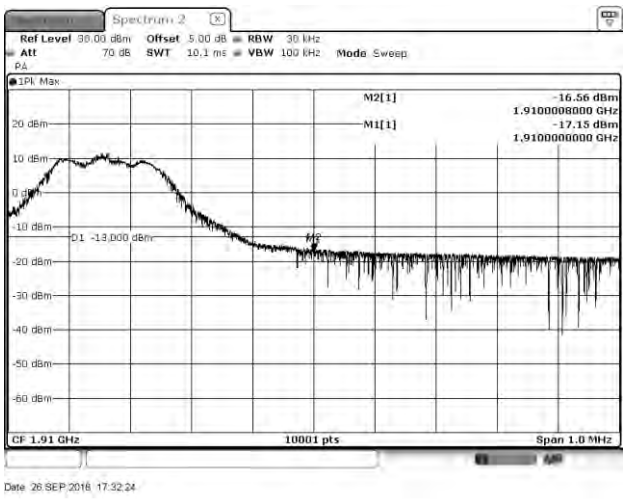
Cat M1_Band 2_ 5M_CH19175_16QAM_1RB5



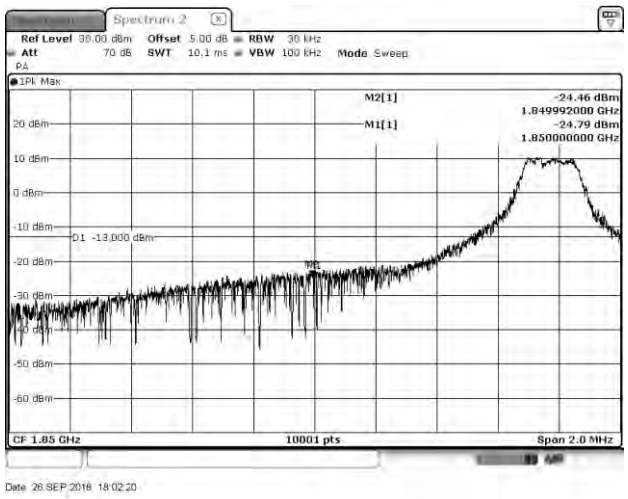
Cat M1_Band 2_ 5M_CH19175_QPSK_6RB0



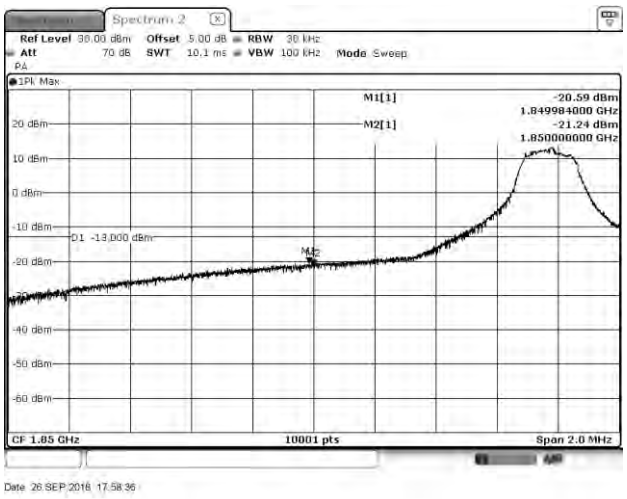
Cat M1_Band 2_ 5M_CH19175_16QAM_5RB1



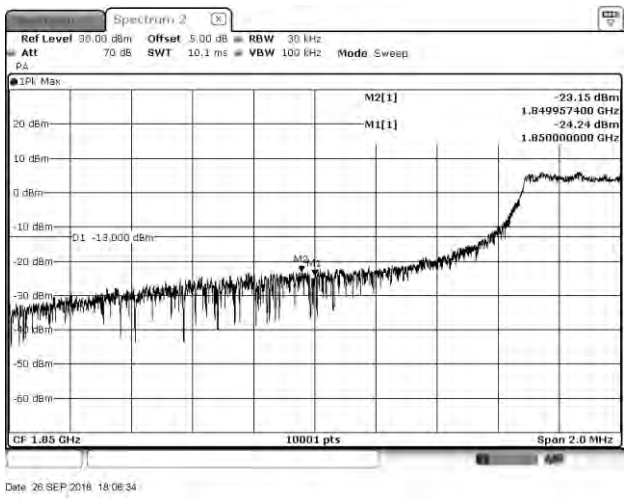
Cat M1_Band 2_ 10M_CH18650_QPSK_1RB0



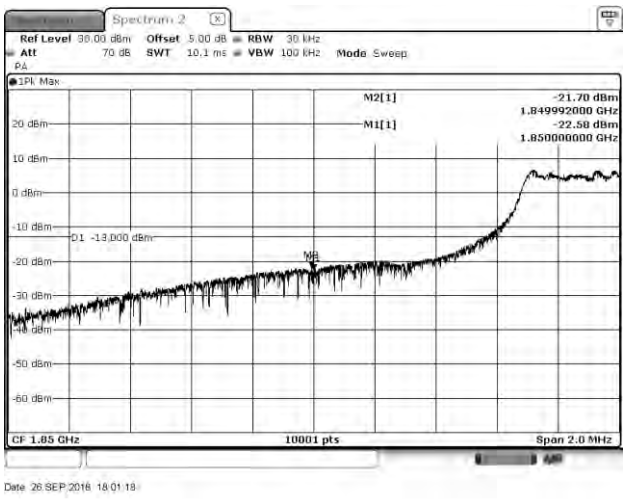
Cat M1_Band 2_ 10M_CH18650_QPSK_1RB0



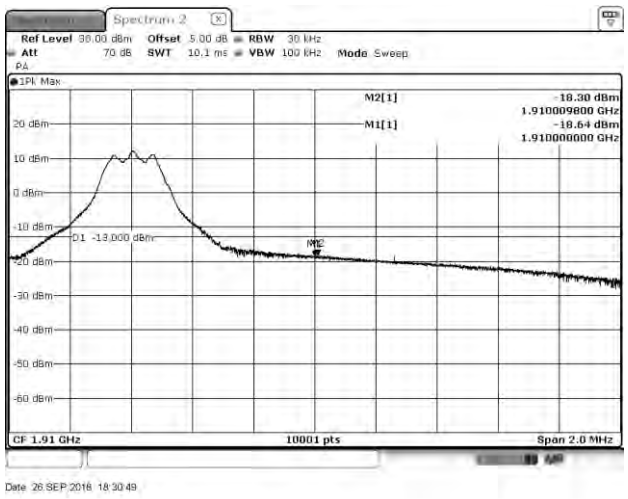
Cat M1_Band 2_ 10M_CH18650_QPSK_6RB0



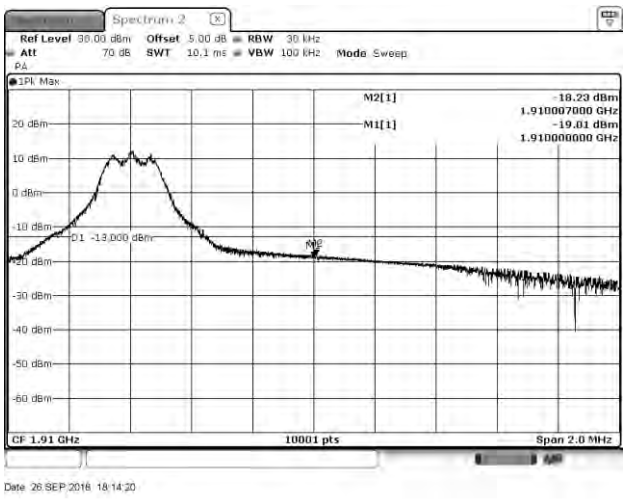
Cat M1_Band 2_ 10M_CH18650_16QAM_5RB0



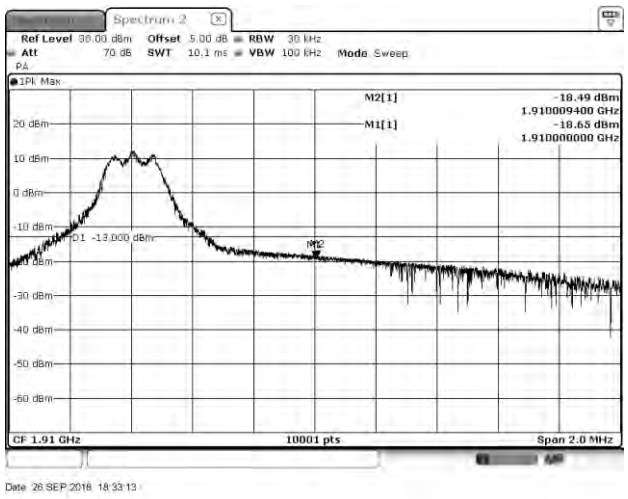
Cat M1_Band 2_ 10M_CH19150_QPSK_1RB0



Cat M1_Band 2_ 10M_CH19150_16QAM_1RB5



Cat M1_Band 2_ 10M_CH19150_QPSK_6RB0



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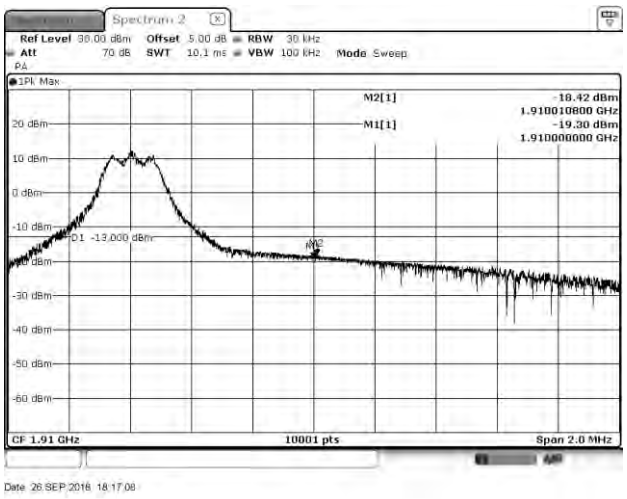

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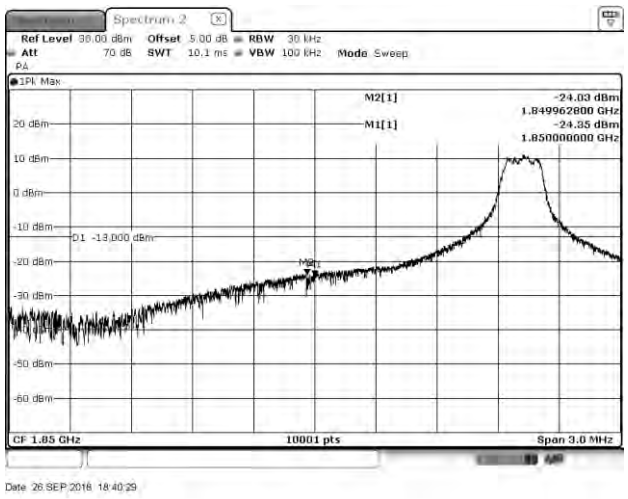

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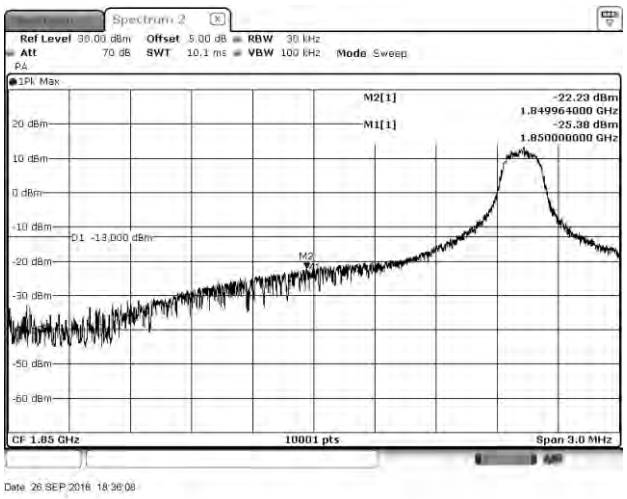

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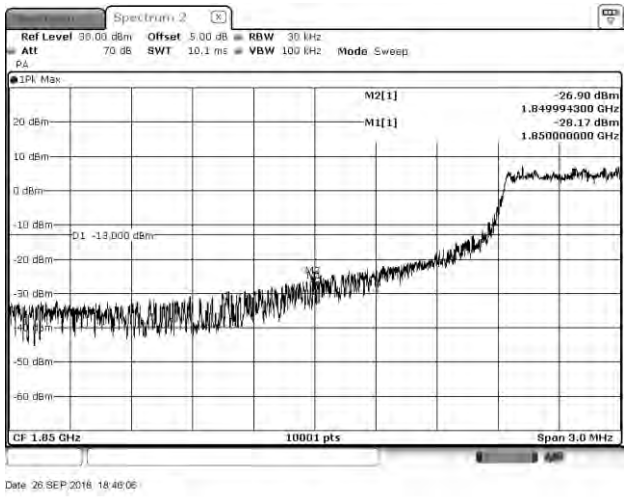

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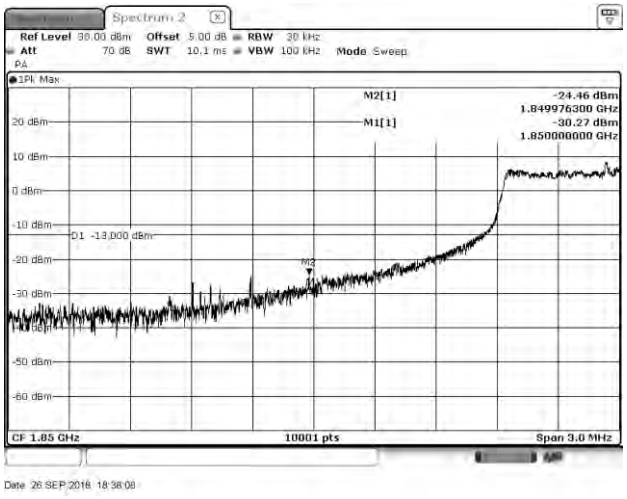

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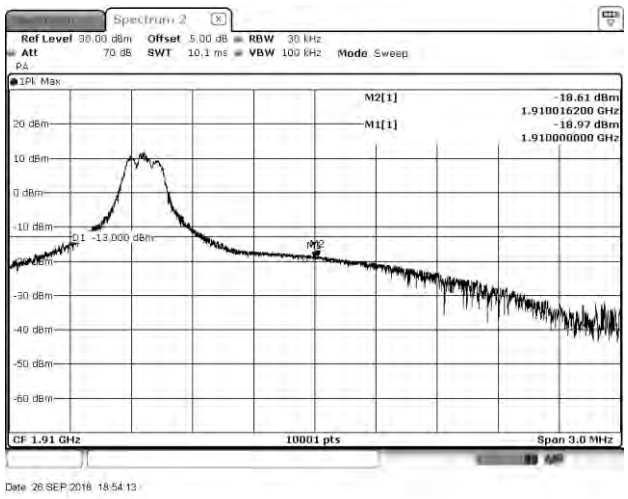

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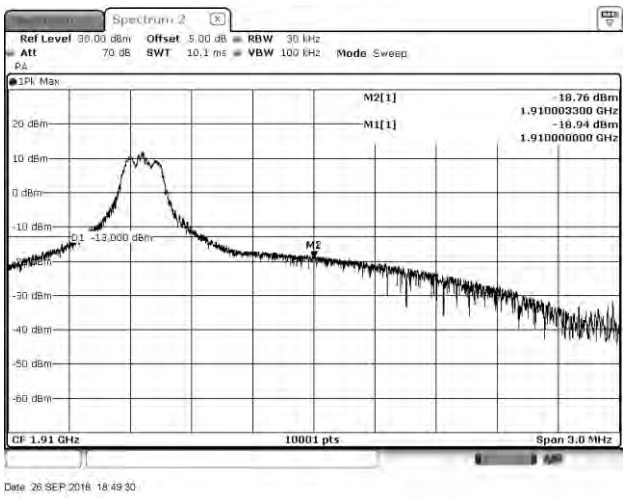

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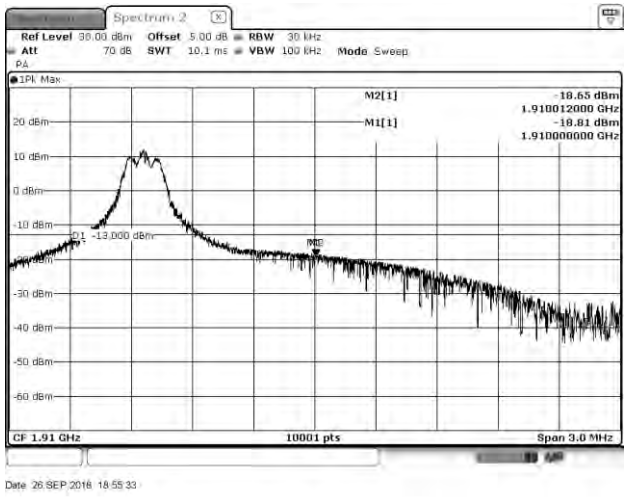

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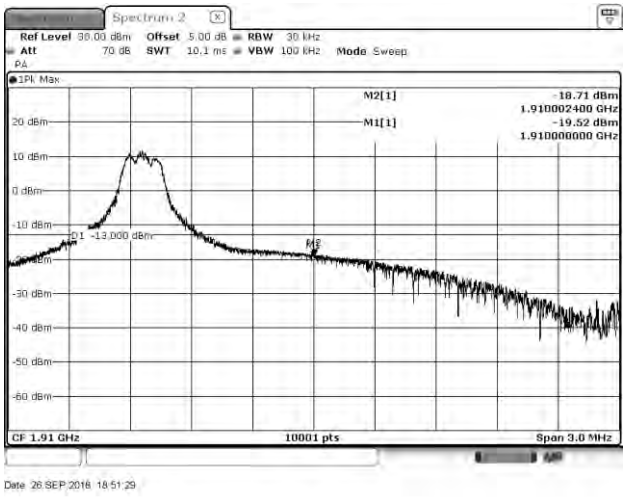

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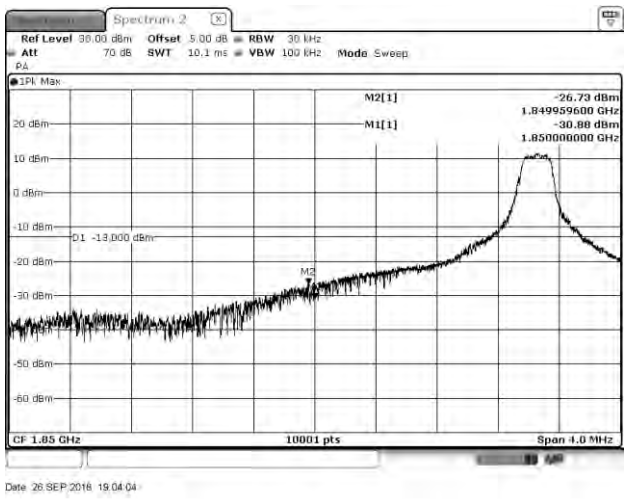

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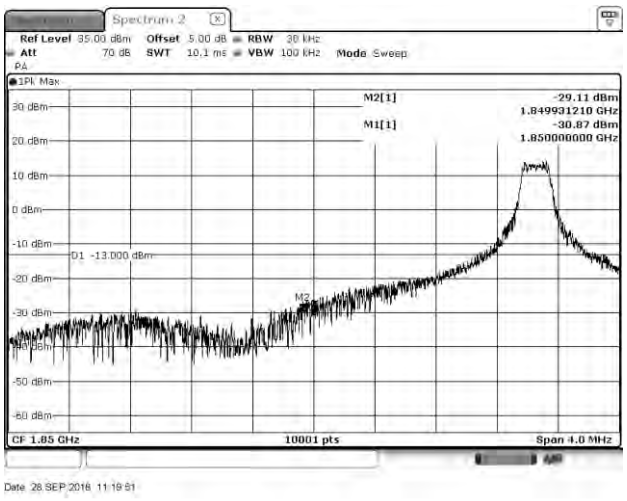

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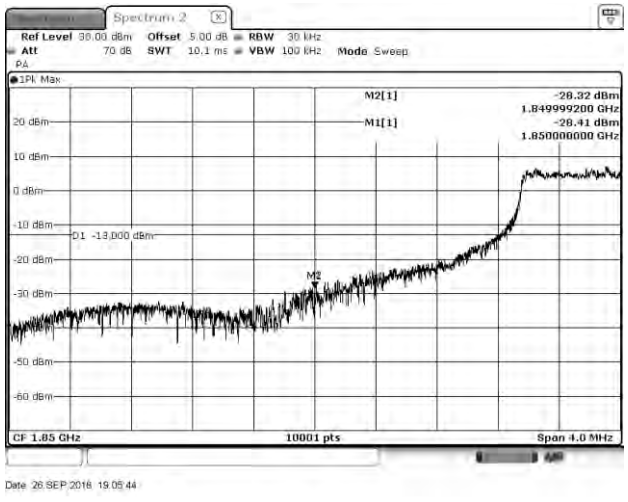

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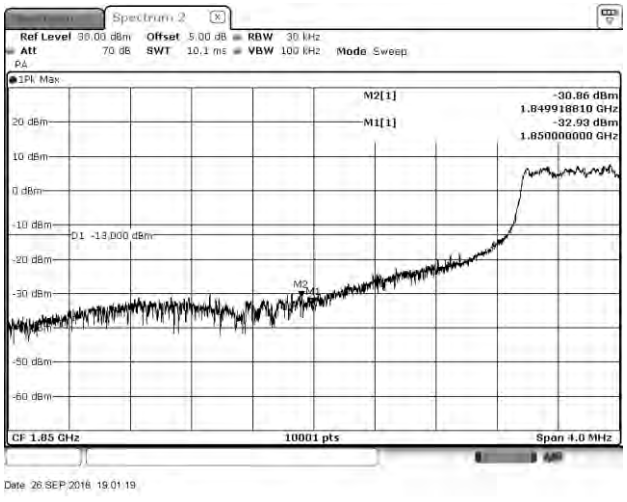

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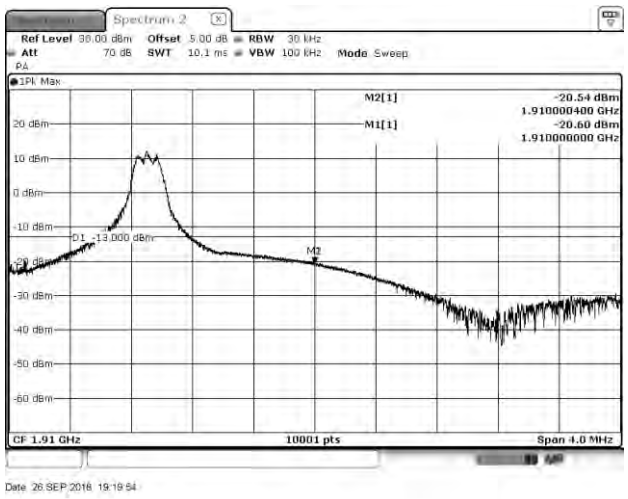

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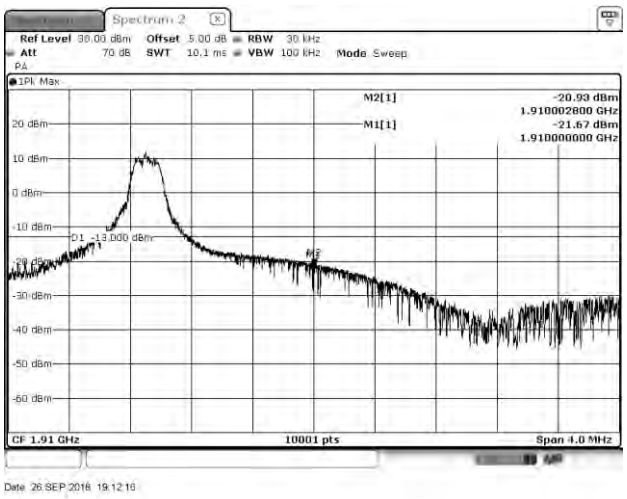

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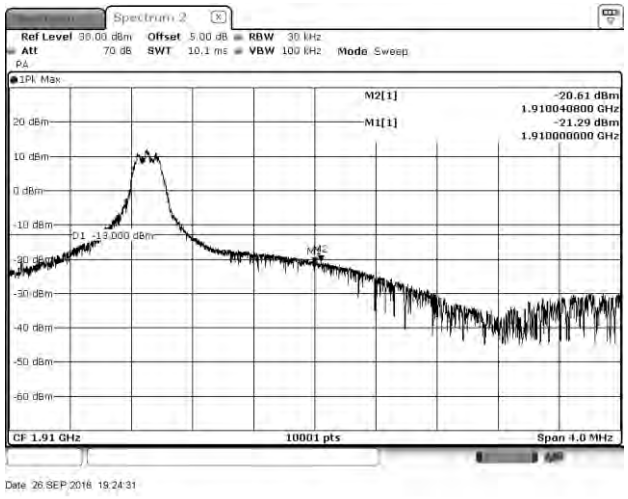

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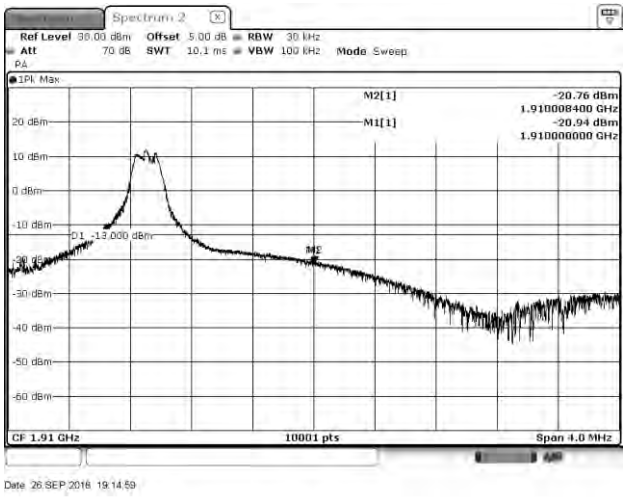
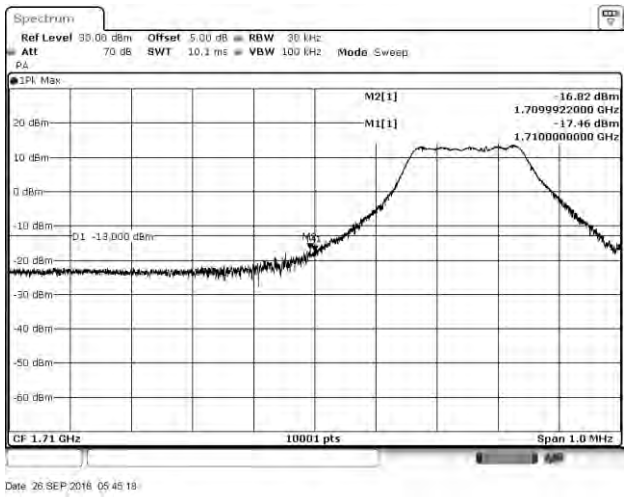


Product	ML865C1-NA		
Test Item	Spurious Emissions at Antenna Terminals		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/26	Test Site	SR10-H

Cat M1_Band 4_ 1.4M_CH19957_QPSK_1RB0



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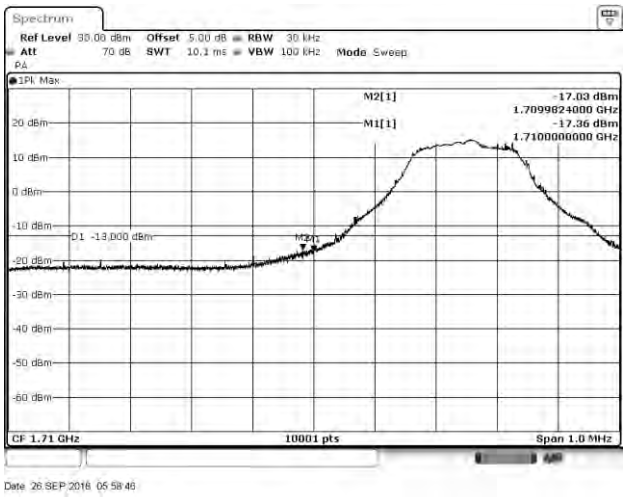

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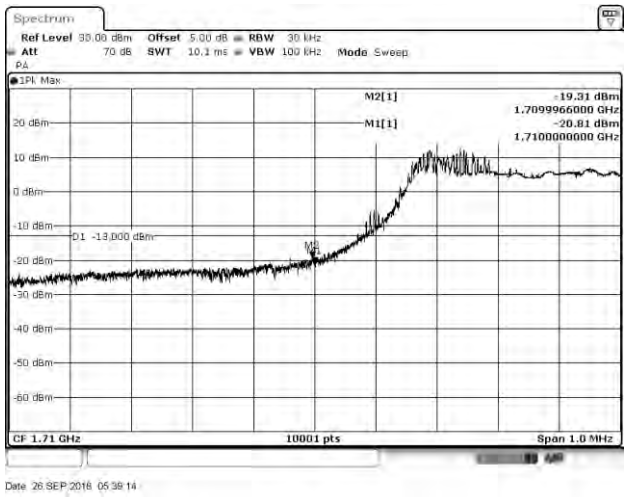

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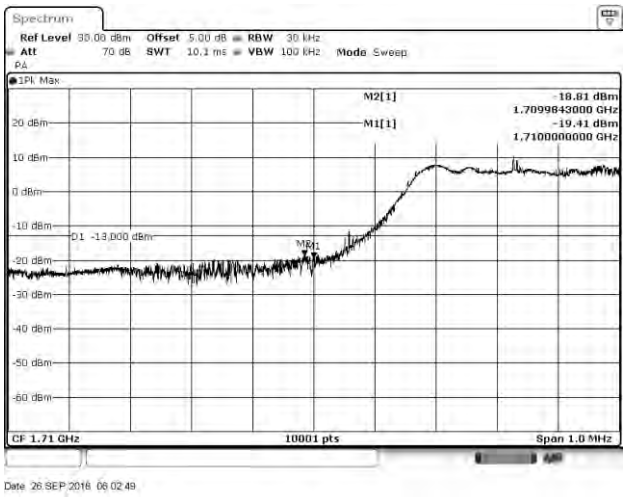

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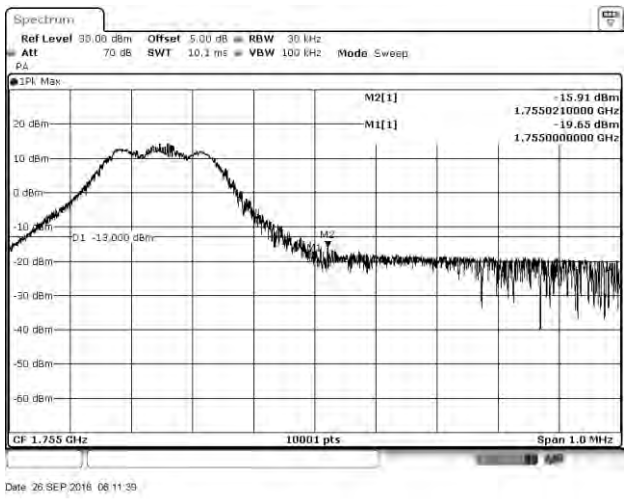

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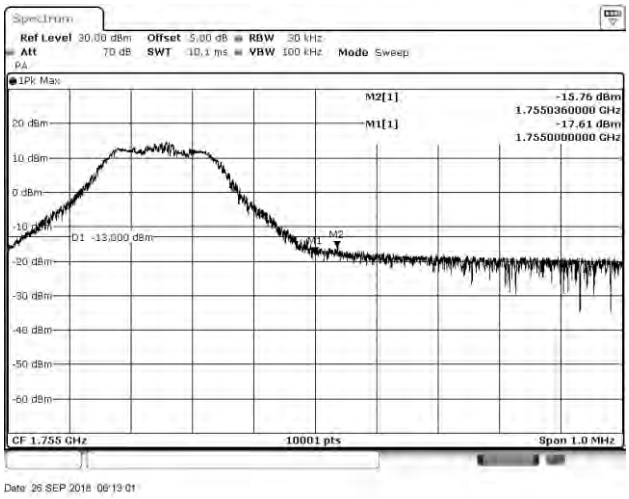

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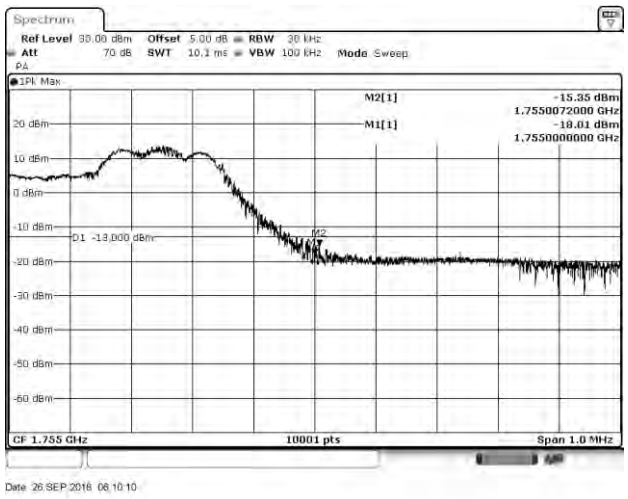

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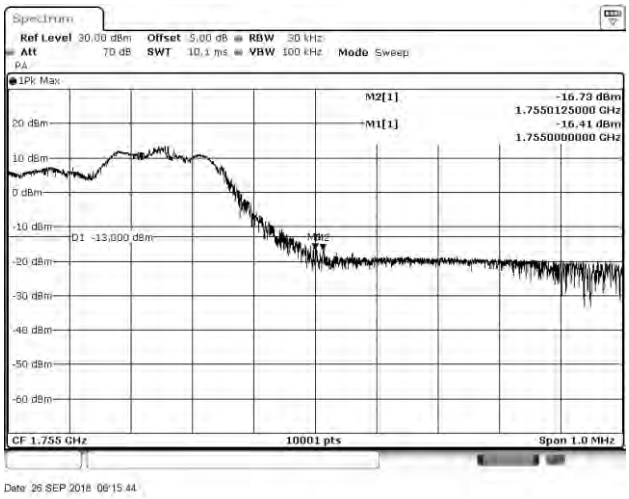

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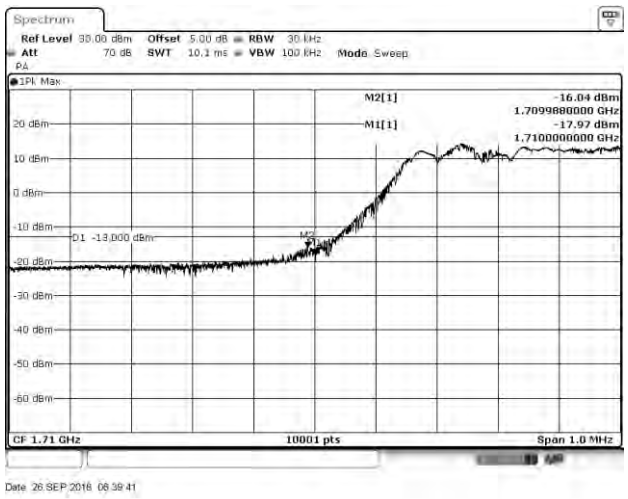

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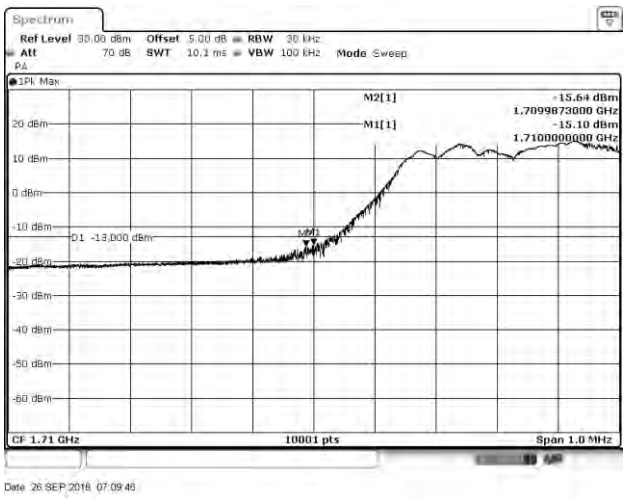

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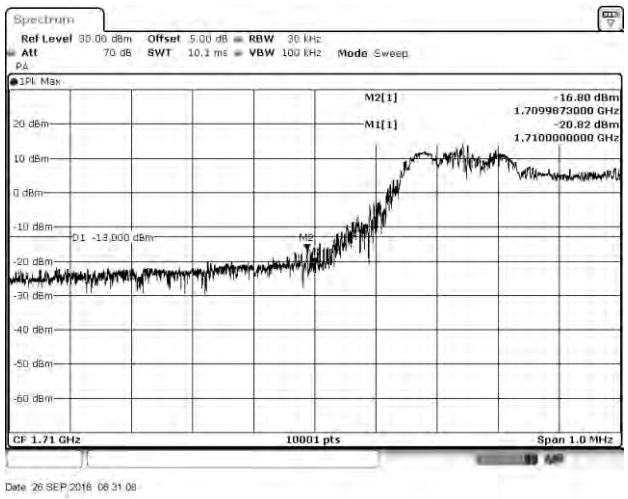

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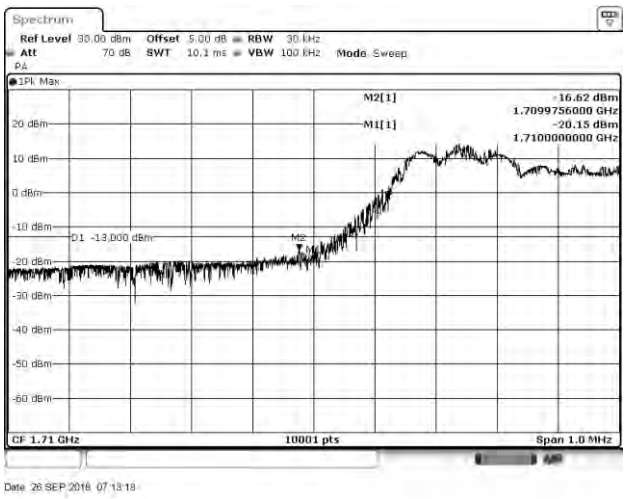
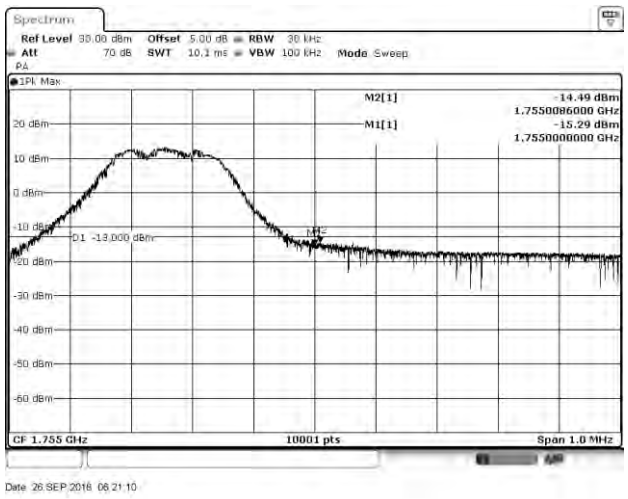


Cat M1_Band 4_ 3M_CH20385_QPSK_1RB0



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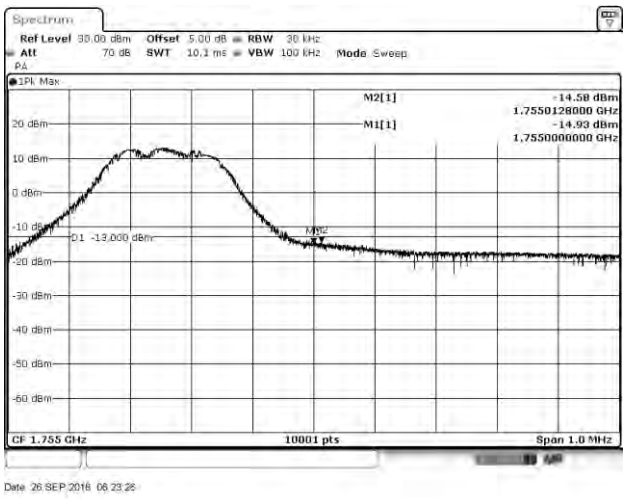
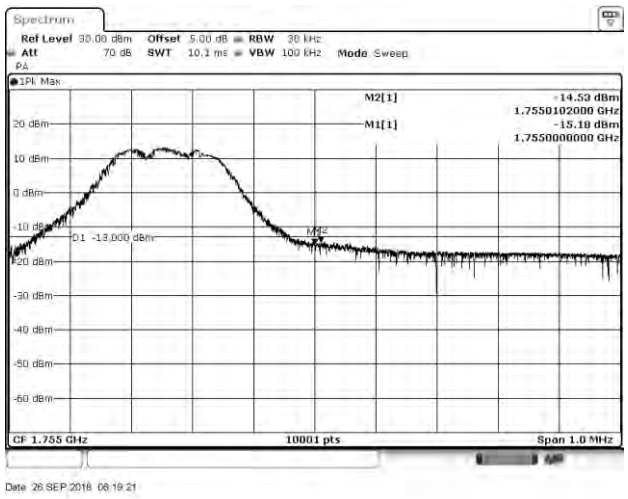
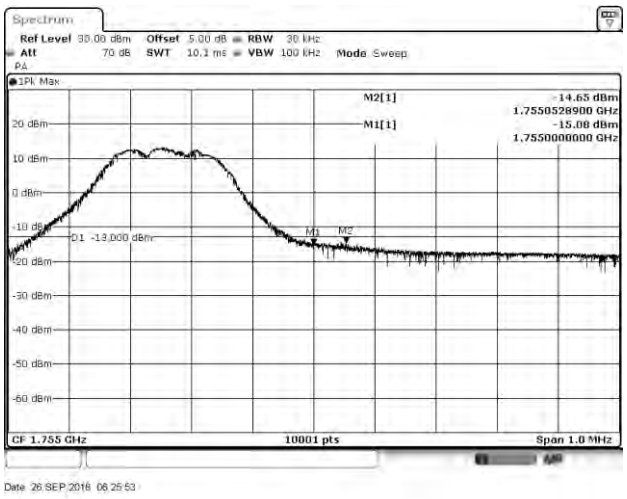


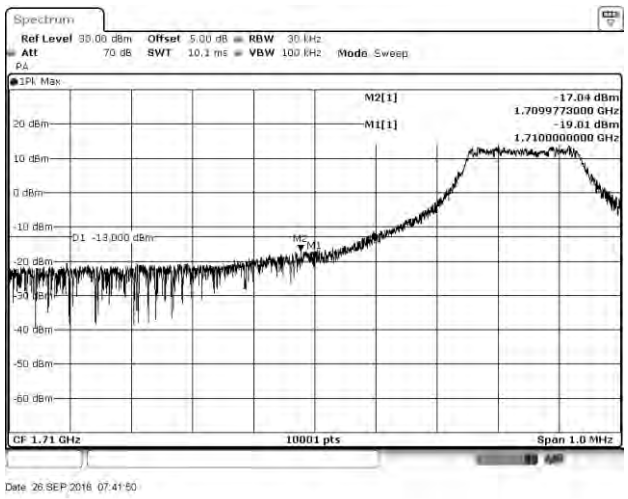
Cat M1_Band 4_ 3M_CH20385_QPSK_6RB0



Cat M1_Band 4_ 3M_CH20385_16QAM_5RB1



Cat M1_Band 4_ 5M_CH19975_QPSK_1RB0



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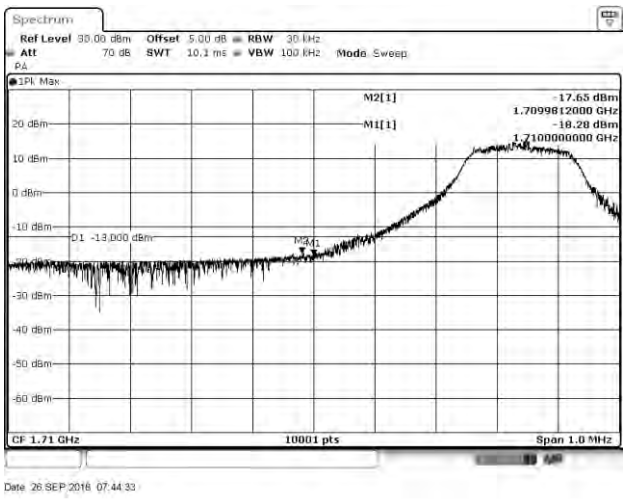
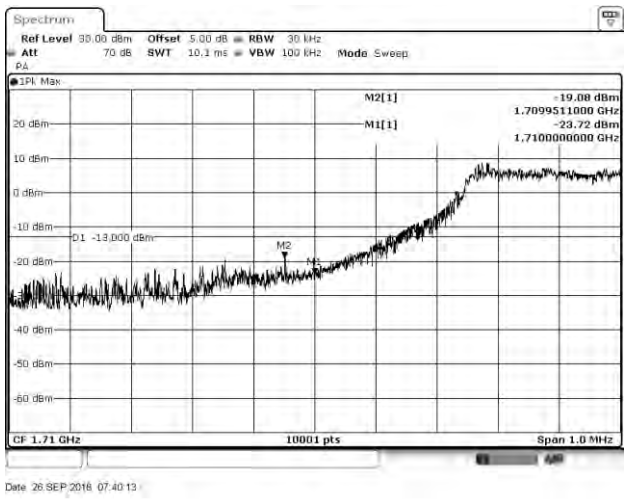


Cat M1_Band 4_ 5M_CH19975_QPSK_6RB0



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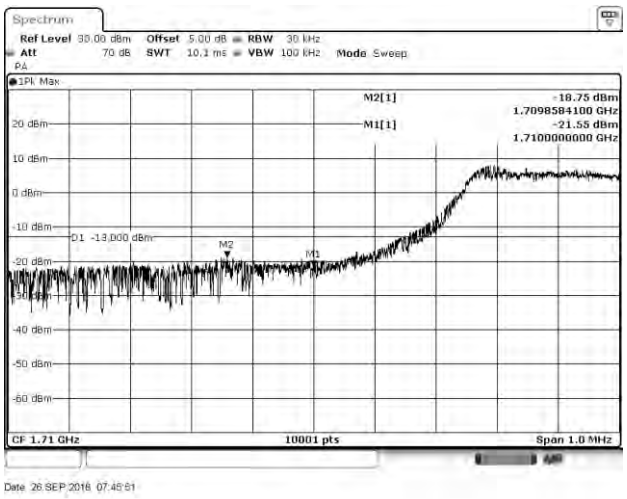

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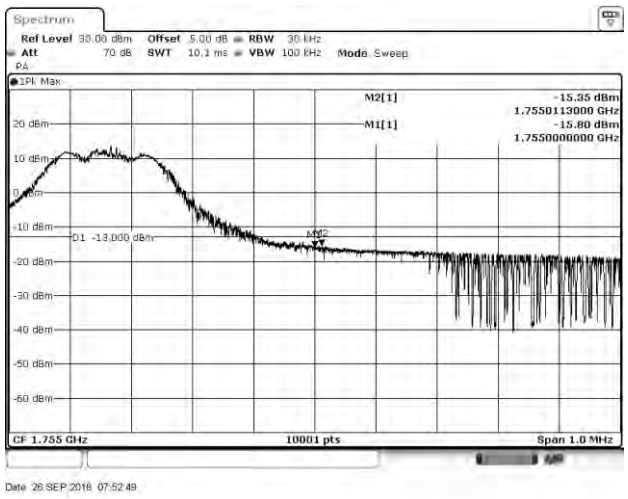	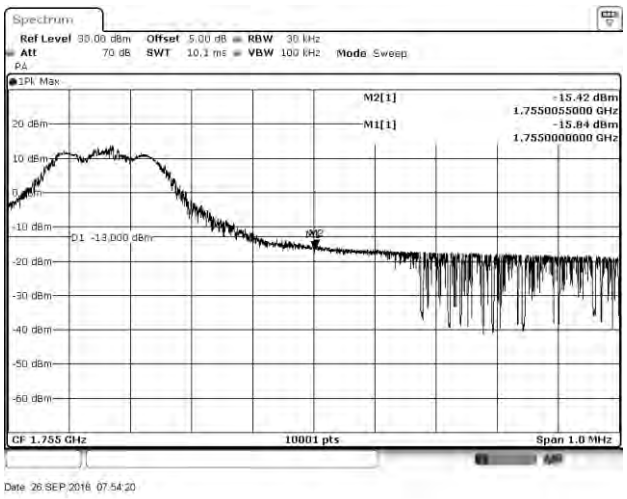
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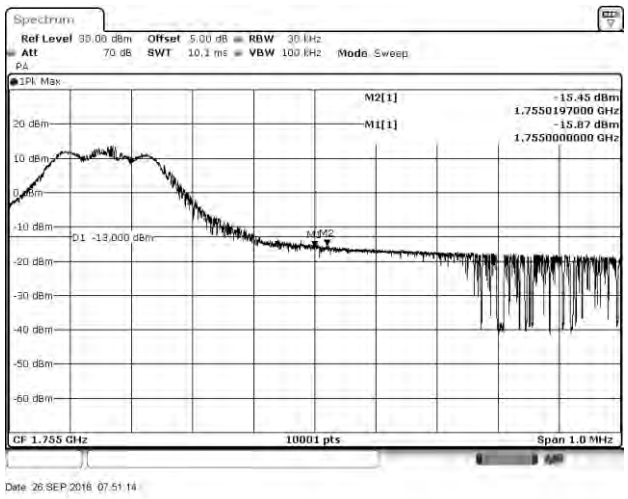
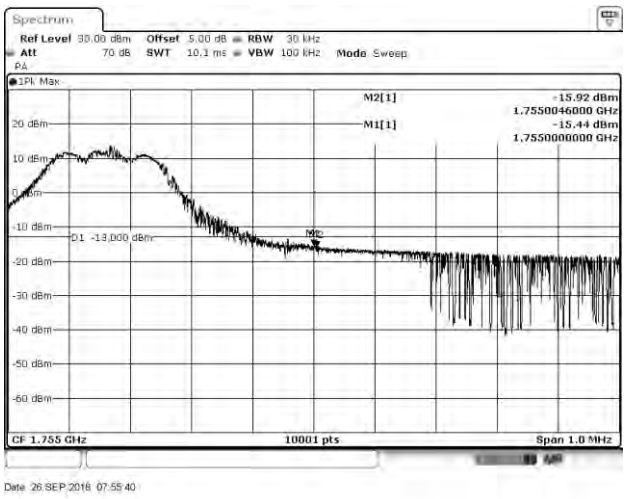
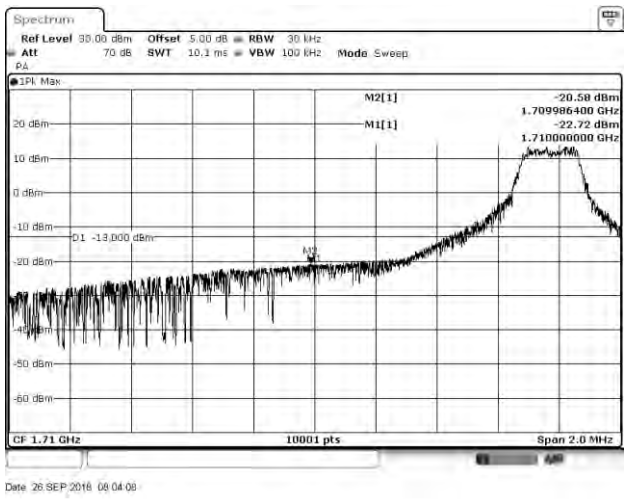
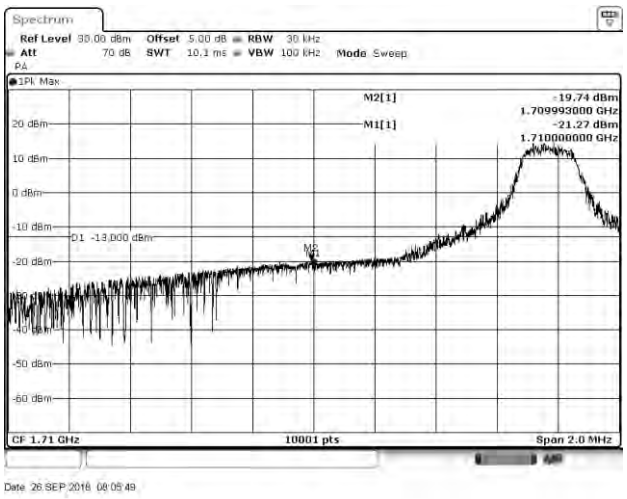
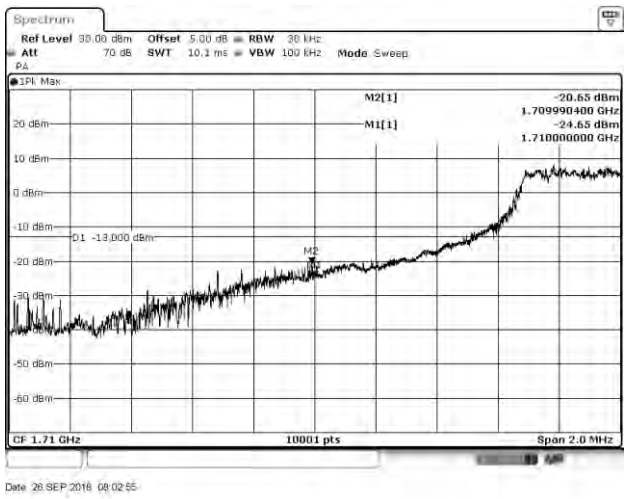
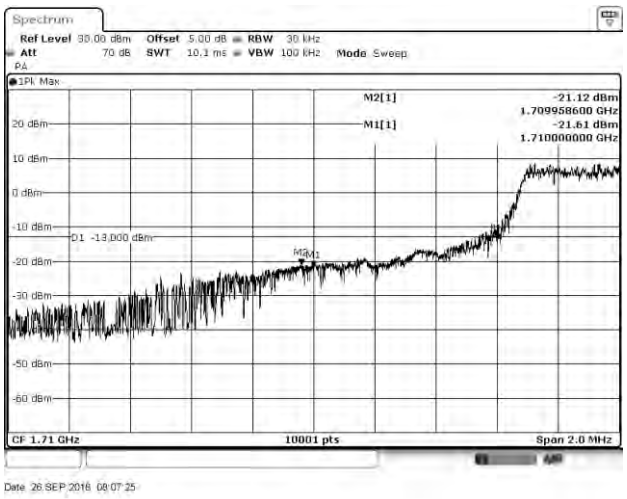
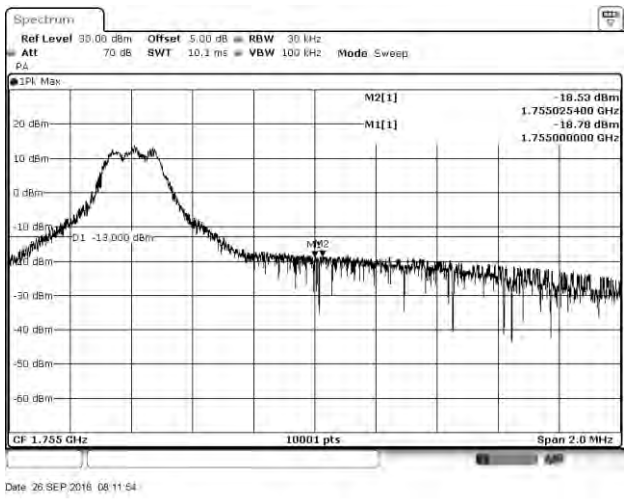
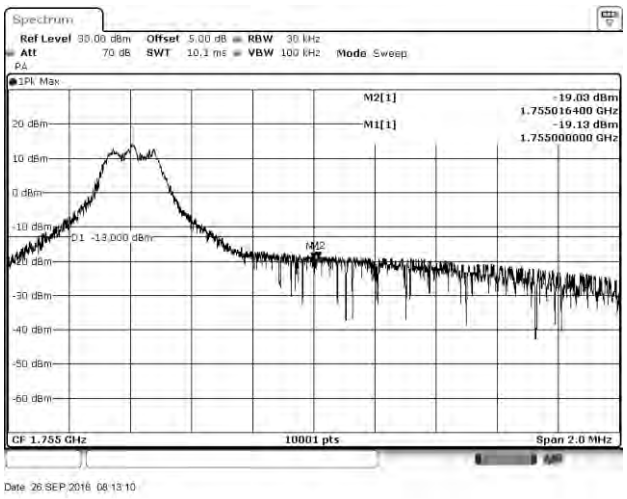
	

Cat M1_Band 4_ 10M_CH20000_QPSK_1RB0	Cat M1_Band 4_ 10M_CH20000_16QAM_1RB0
	
Cat M1_Band 4_ 10M_CH20000_QPSK_6RB0	Cat M1_Band 4_ 10M_CH20000_16QAM_5RB0
	

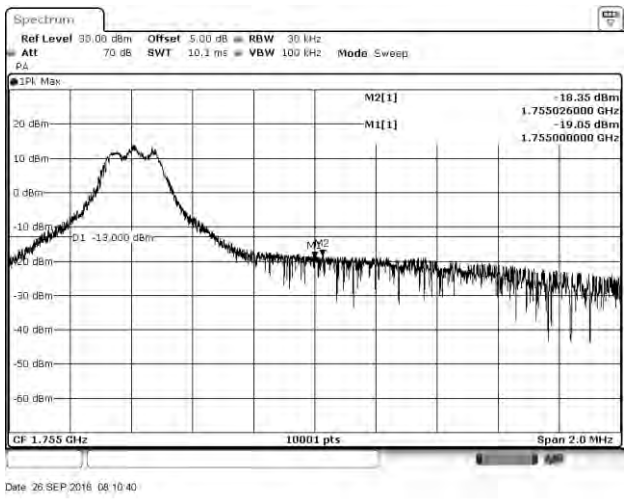
Cat M1_Band 4_ 10M_CH20350_QPSK_1RB0



Cat M1_Band 4_ 10M_CH20350_16QAM_1RB5



Cat M1_Band 4_ 10M_CH20350_QPSK_6RB0



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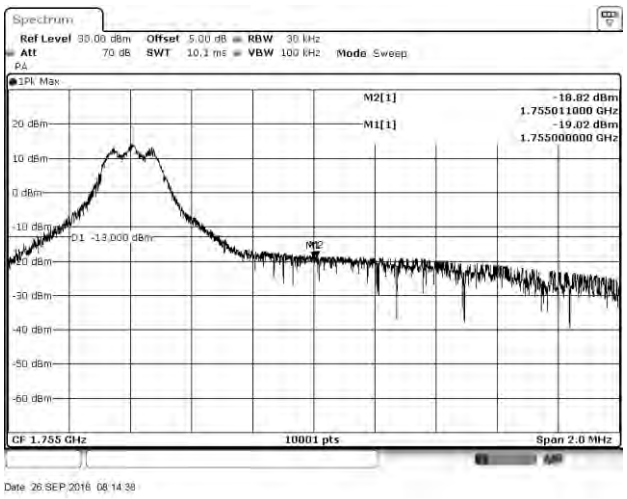
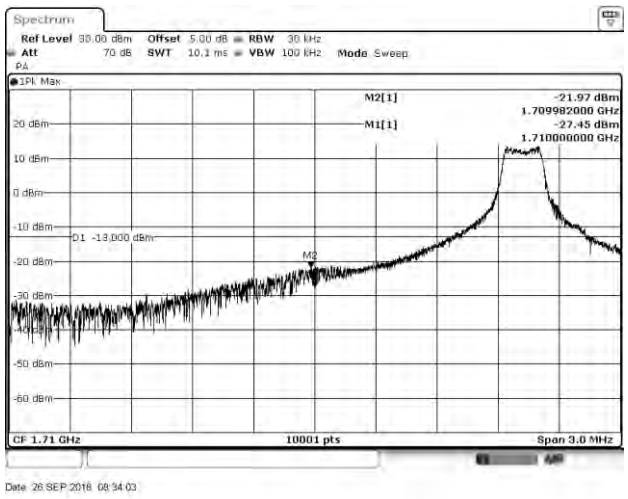
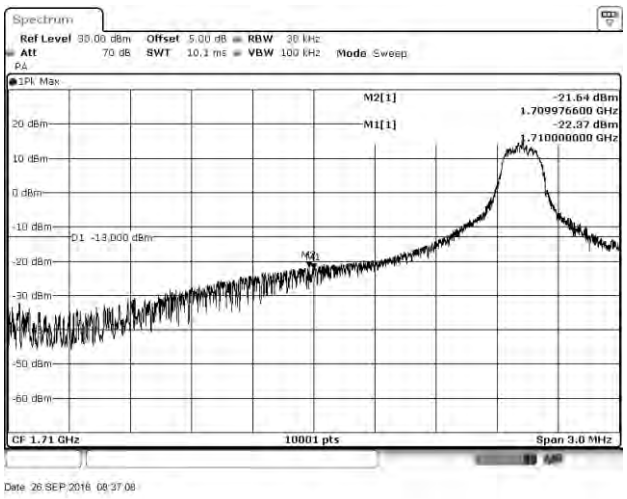


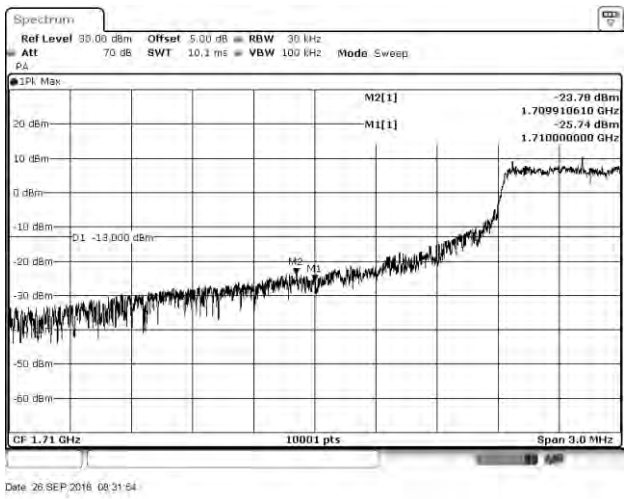
Cat M1_Band 4_ 15M_CH20025_QPSK_1RB0



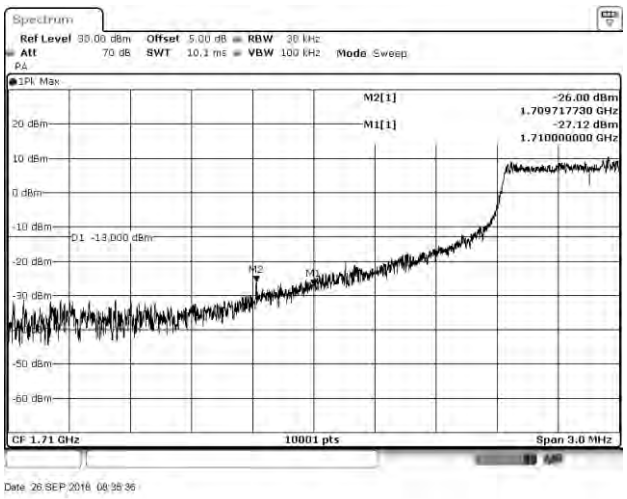
Cat M1_Band 4_ 15M_CH20025_16QAM_1RB0



Cat M1_Band 4_ 5M_CH20025_QPSK_6RB0



Cat M1_Band 4_ 15M_CH20025_16QAM_5RB0



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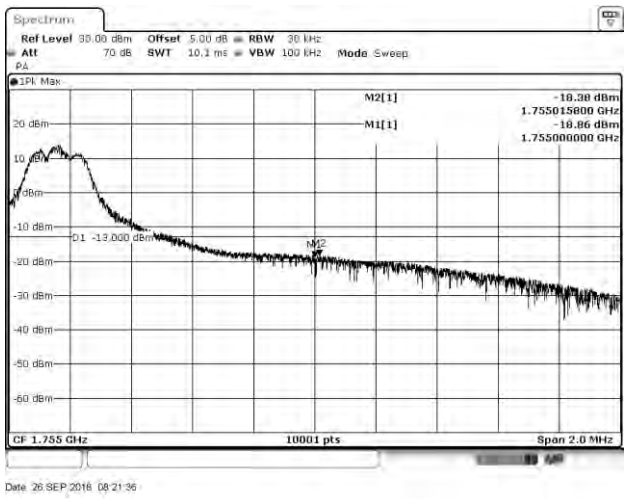

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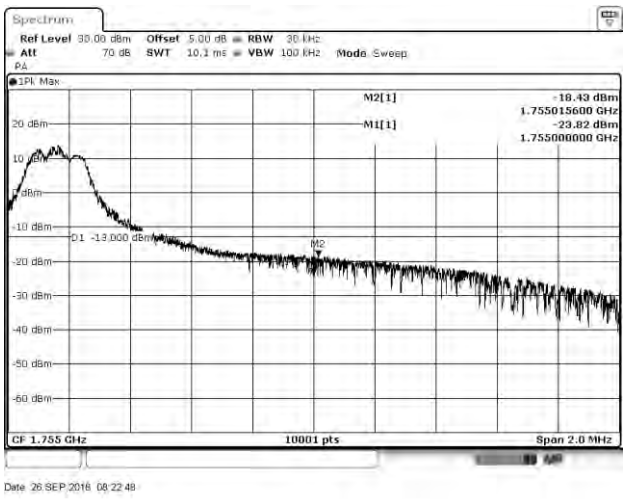
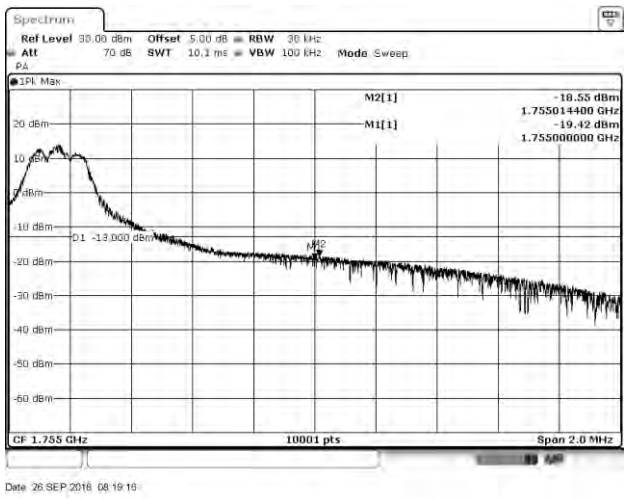
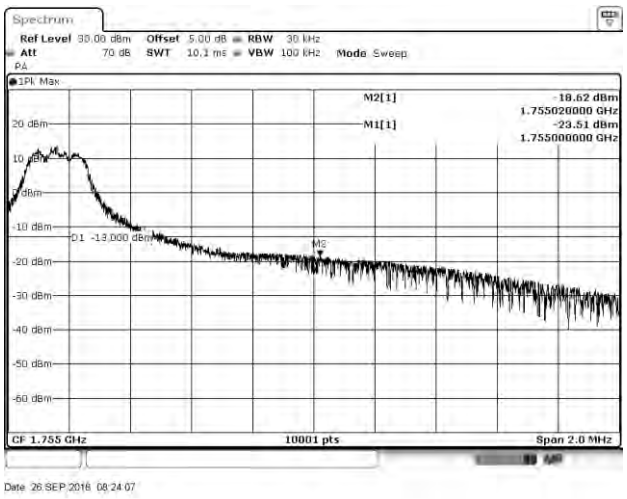
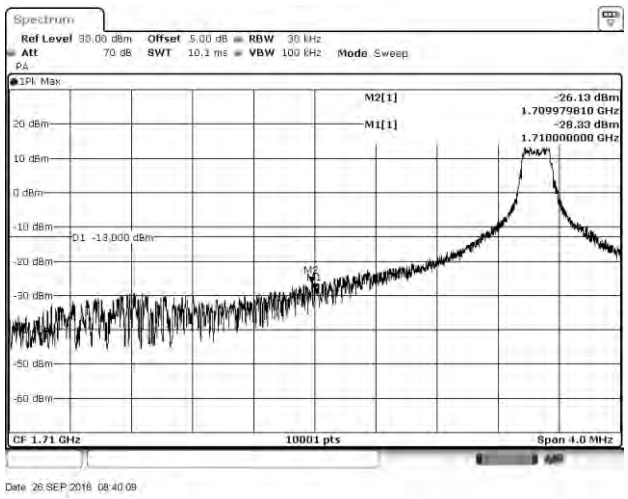
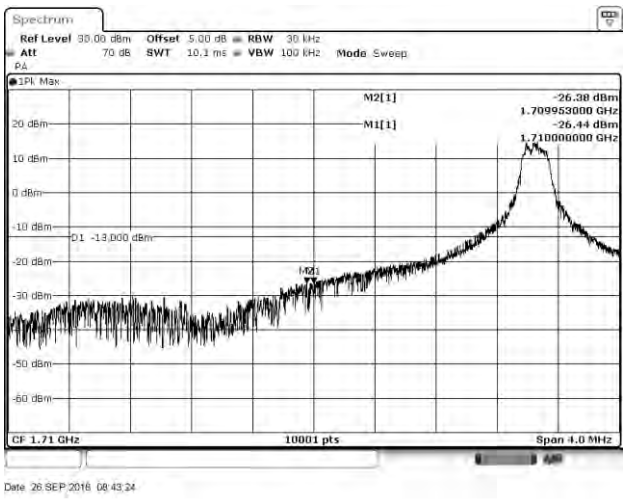
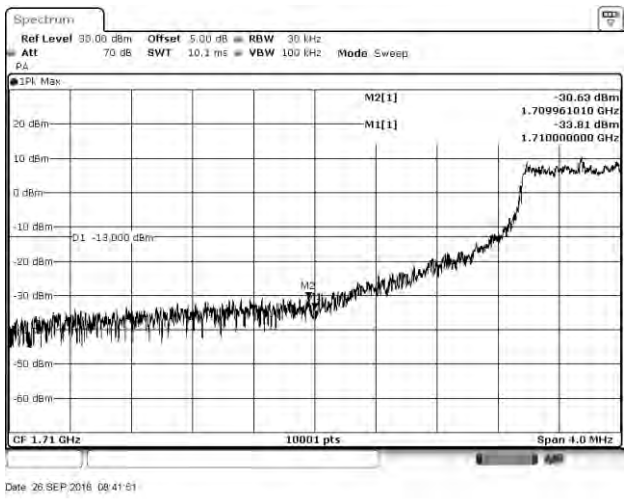
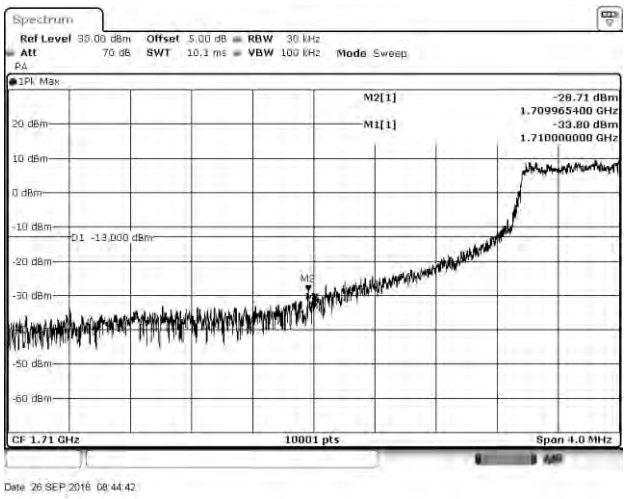


Cat M1_Band 4_ 15M_CH20325_QPSK_6RB0

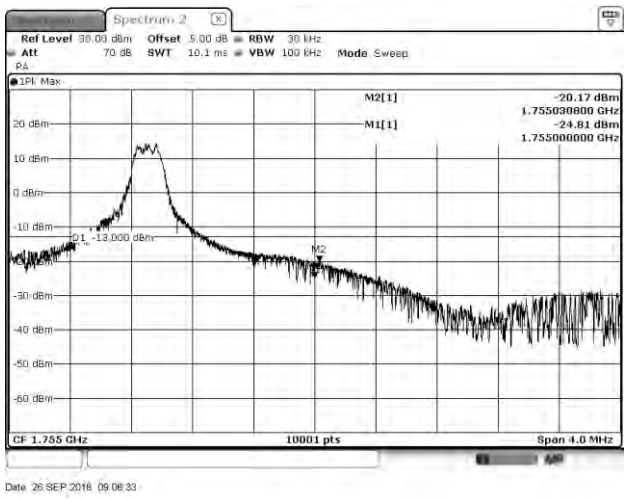


Cat M1_Band 4_ 15M_CH20325_16QAM_5RB1

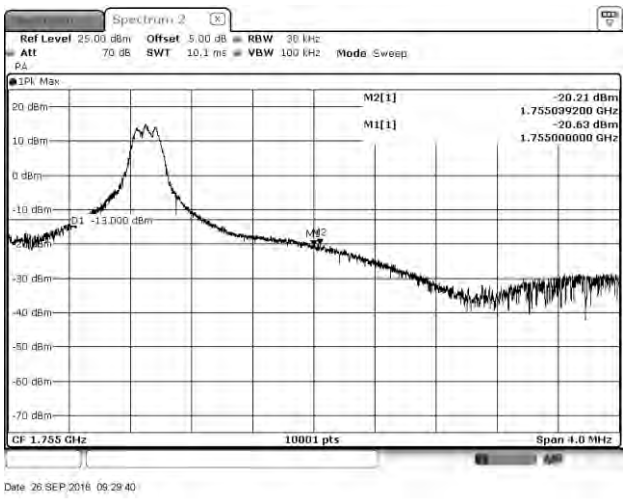


Cat M1_Band 4_ 20M_CH20025_QPSK_1RB0	Cat M1_Band 4_ 20M_CH20050_16QAM_1RB0
	
Cat M1_Band 4_ 20M_CH20050_QPSK_6RB0	Cat M1_Band 4_ 20M_CH20050_16QAM_5RB0
	

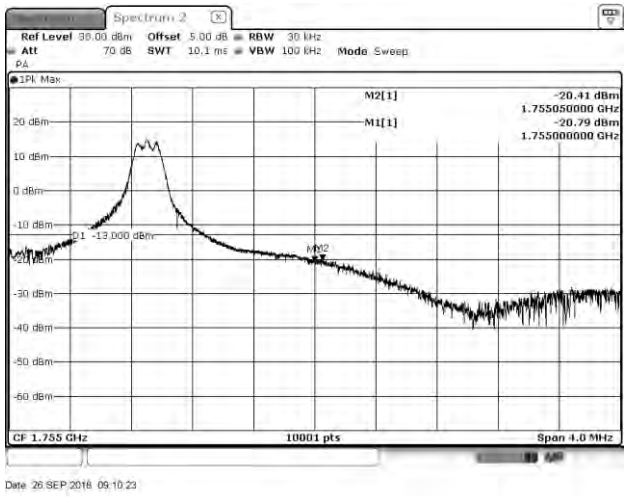
Cat M1_Band 4_ 20M_CH20300_QPSK_1RB0



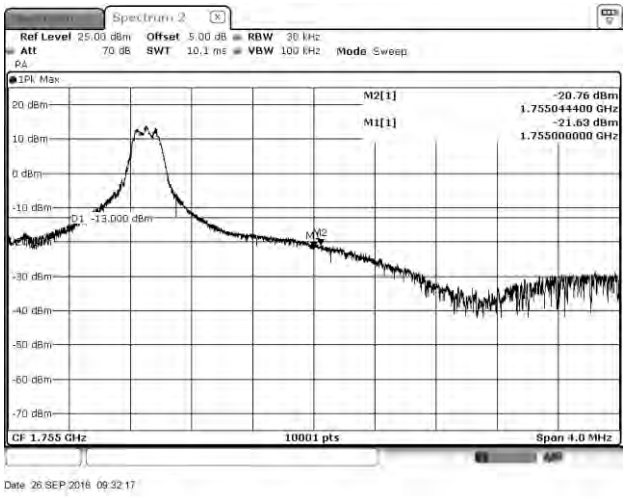
Cat M1_Band 4_ 20M_CH20300_16QAM_1RB5



Cat M1_Band 4_ 20M_CH20300_QPSK_6RB0

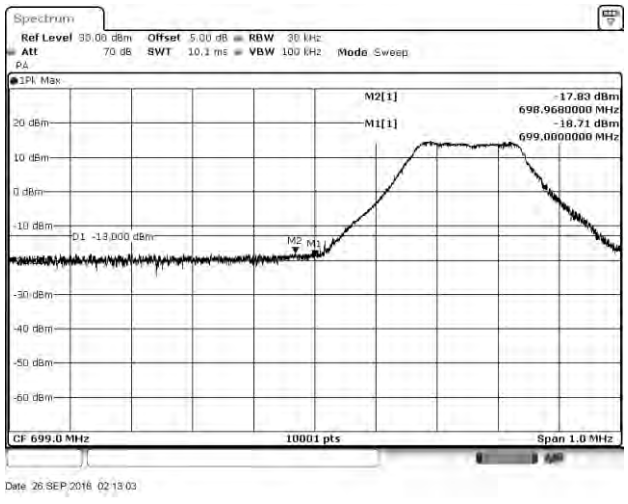


Cat M1_Band 4_ 20M_CH20300_16QAM_5RB1

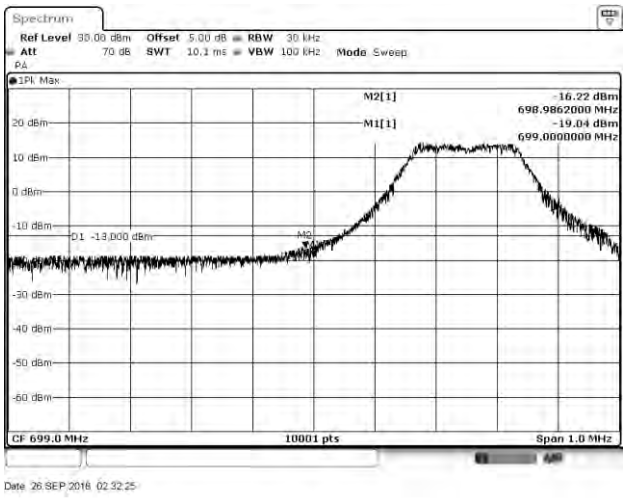


Product	ML865C1-NA		
Test Item	Spurious Emissions at Antenna Terminals		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/26	Test Site	SR10-H

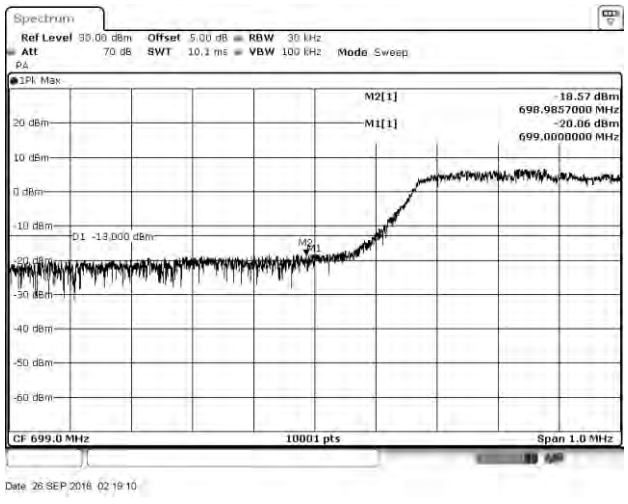
Cat M1_Band 12_ 1.4M_CH23017_QPSK_1RB0



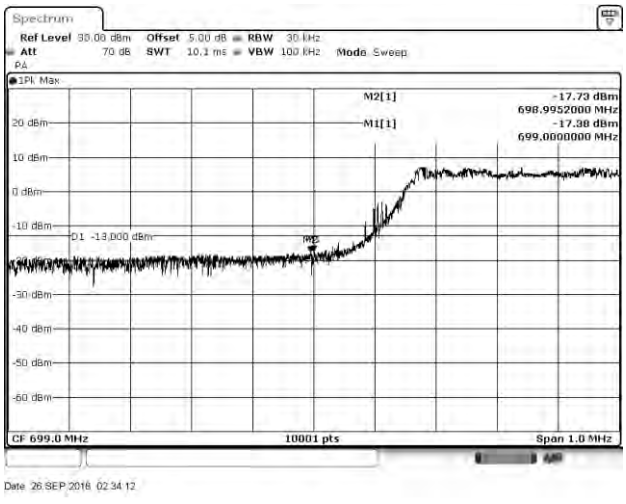
Cat M1_Band 12_ 1.4M_CH23017_16QAM_1RB0

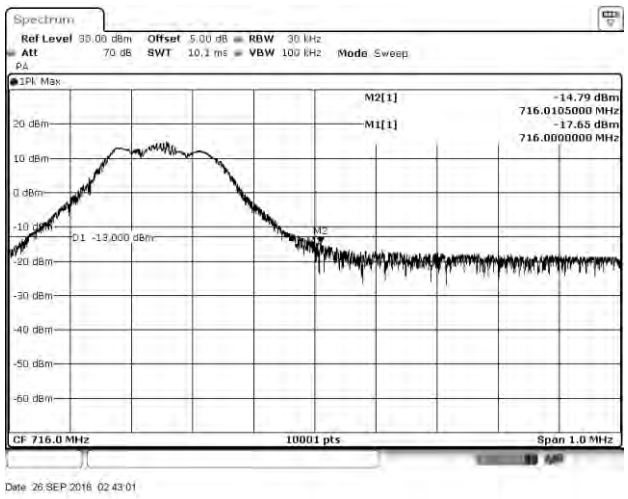
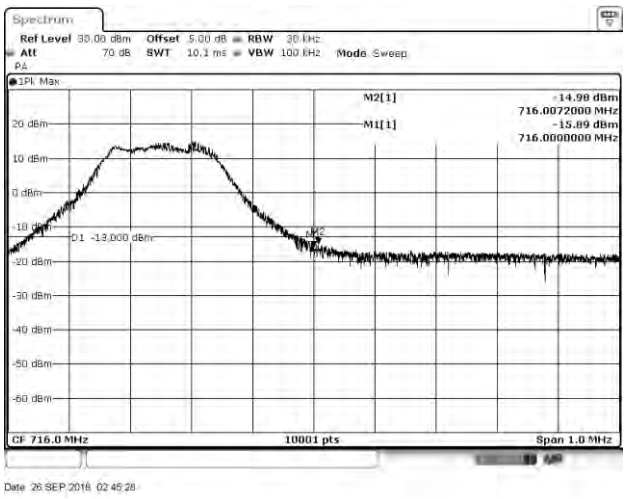
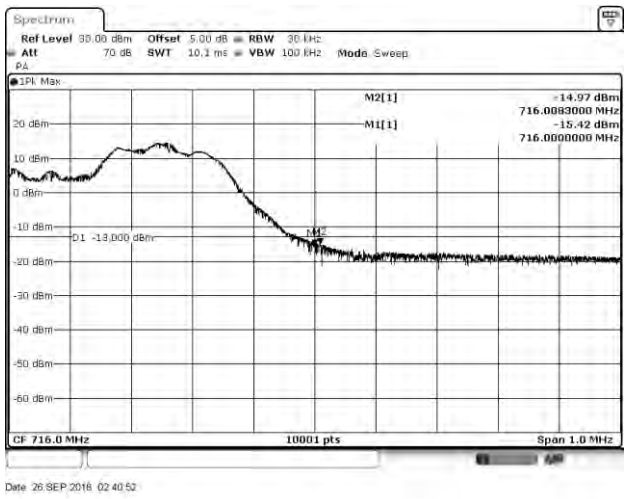
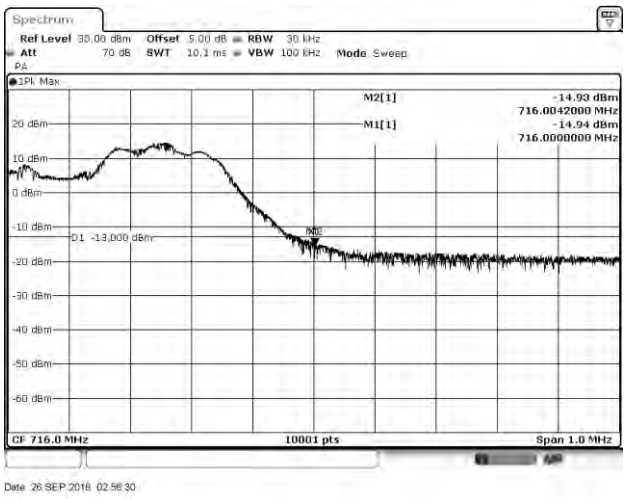


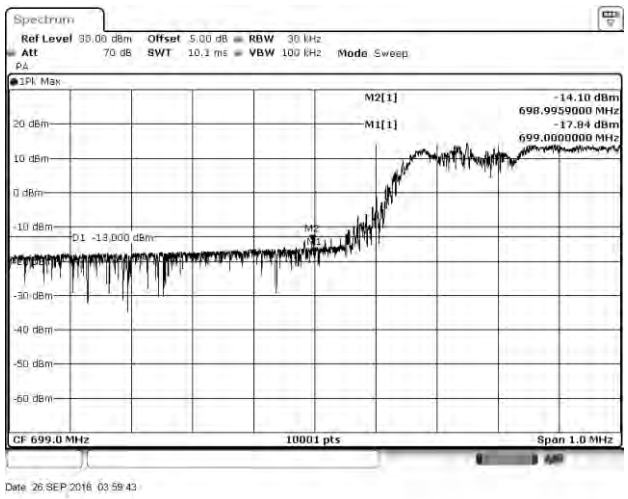
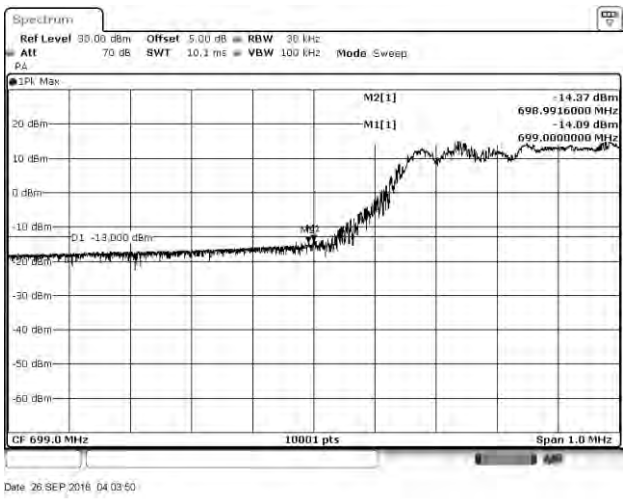
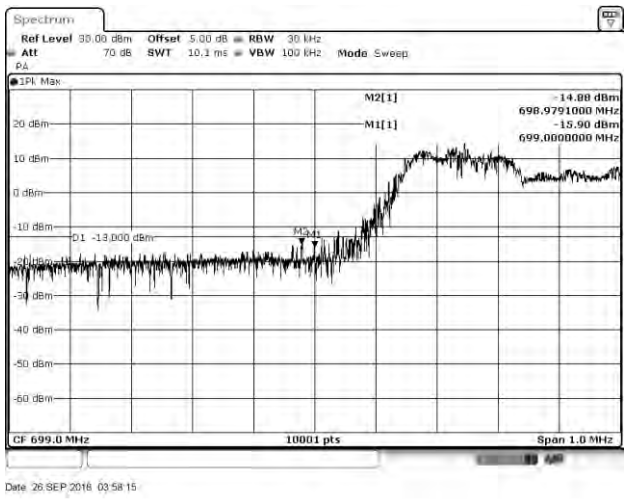
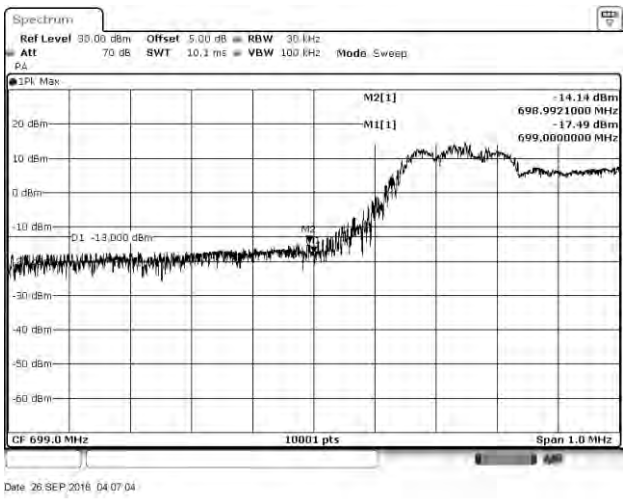
Cat M1_Band 12_ 1.4M_CH23017_QPSK_6RB0

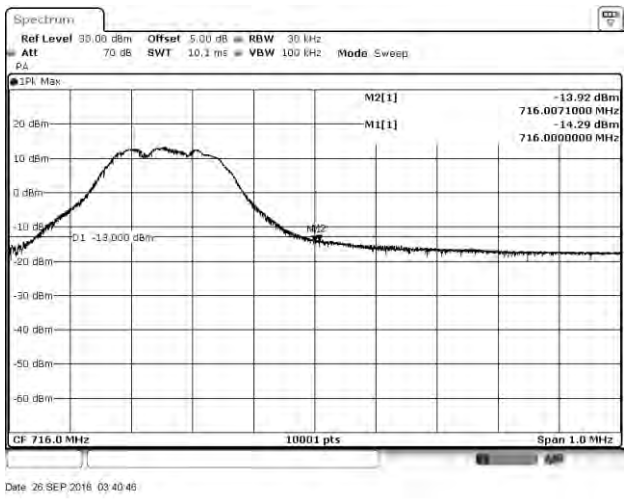
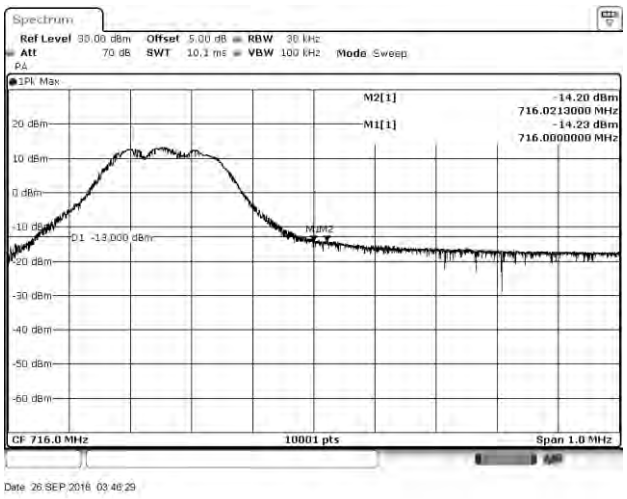
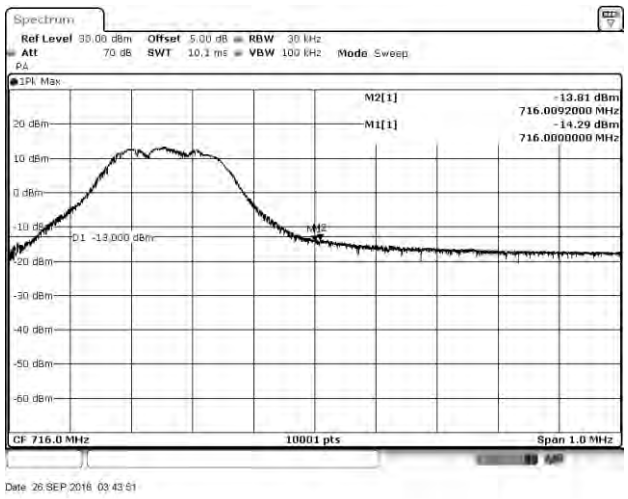
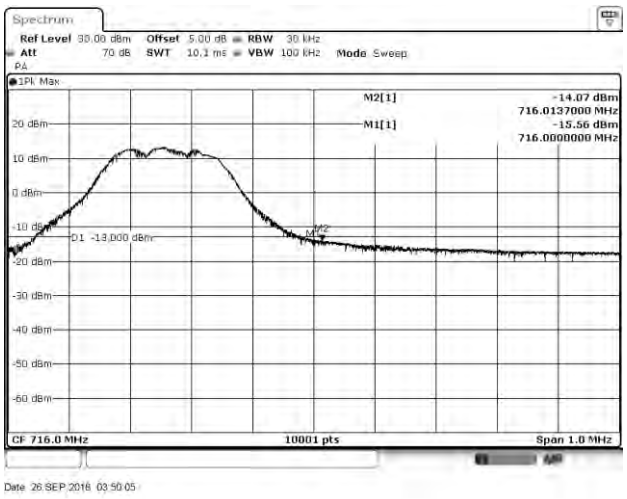


Cat M1_Band 12_ 1.4M_CH23017_16QAM_5RB0

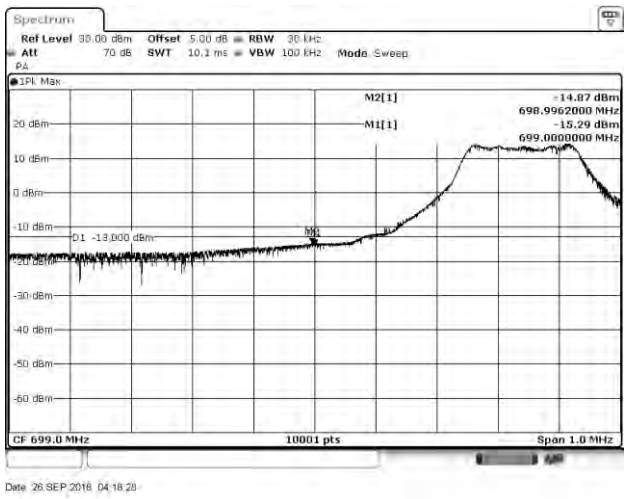


Cat M1_Band 12_ 1.4M_CH23173_QPSK_1RB0	Cat M1_Band 12_ 1.4M_CH23173_16QAM_1RB5
	
Cat M1_Band 12_ 1.4M_CH23173_QPSK_6RB0	Cat M1_Band 12_ 1.4M_CH23173_16QAM_5RB1
	

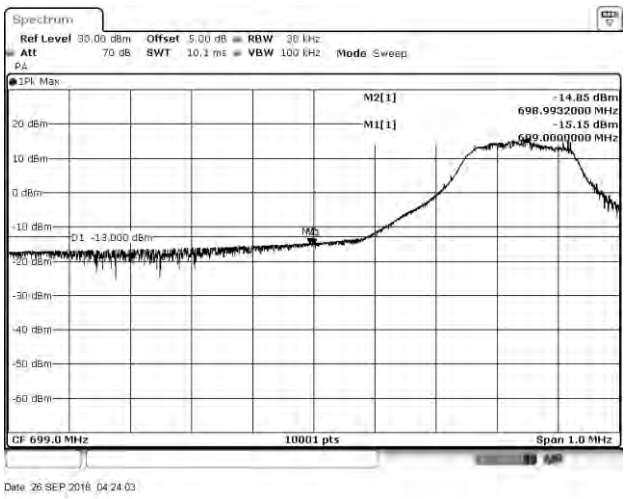
Cat M1_Band 12_ 3M_CH23025_QPSK_1RB0	Cat M1_Band 12_ 3M_CH23025_16QAM_1RB0
	
Cat M1_Band 12_ 3M_CH23025_QPSK_6RB0	Cat M1_Band 12_ 3M_CH23025_16QAM_5RB0
	

Cat M1_Band 12_ 3M_CH23165_QPSK_1RB0	Cat M1_Band 12_ 3M_CH23165_16QAM_1RB5
	
Cat M1_Band 12_ 3M_CH23165_QPSK_6RB0	Cat M1_Band 12_ 3M_CH23165_16QAM_5RB1
	

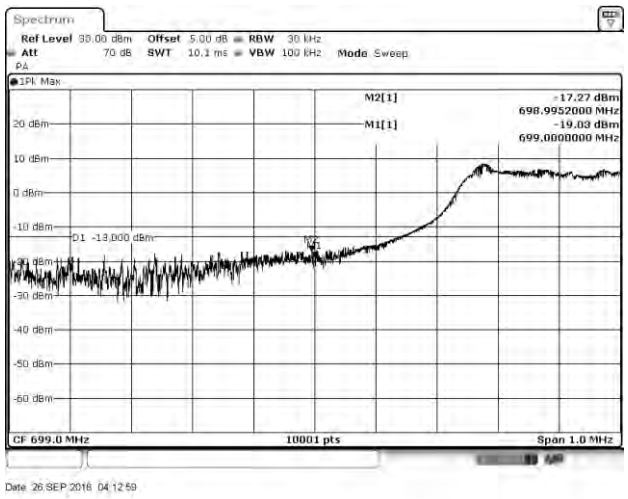
Cat M1_Band 12_ 5M_CH23035_QPSK_1RB0



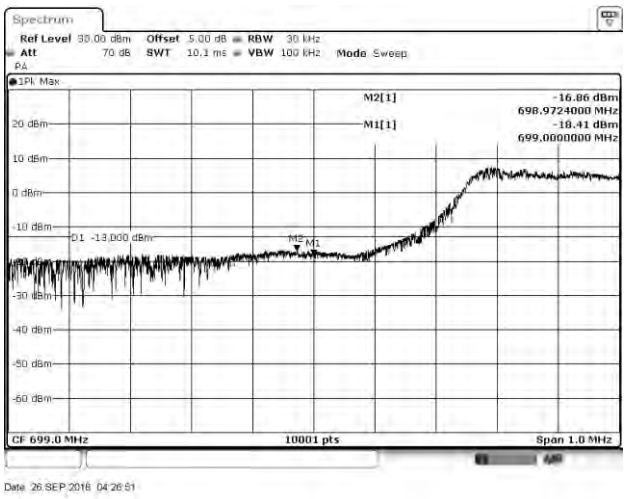
Cat M1_Band 12_ 5M_CH23035_16QAM_1RB0

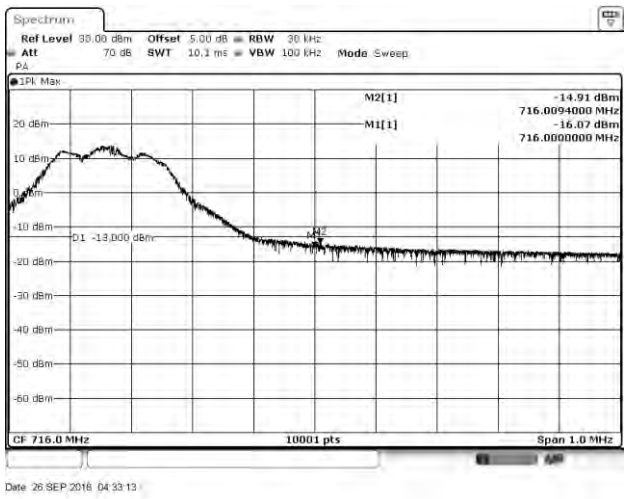
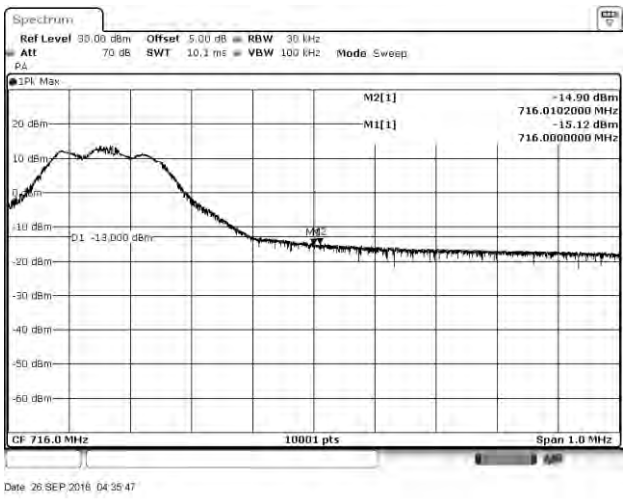
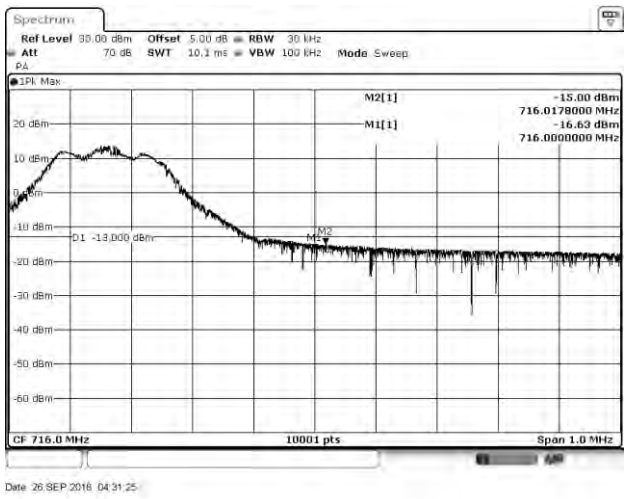
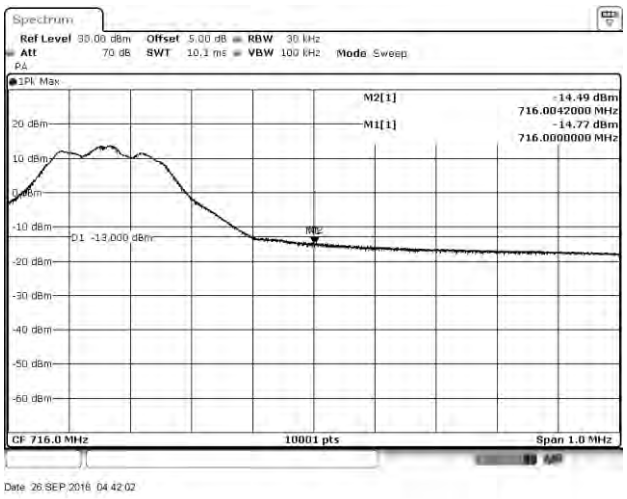


Cat M1_Band 12_ 5M_CH23035_QPSK_6RB0

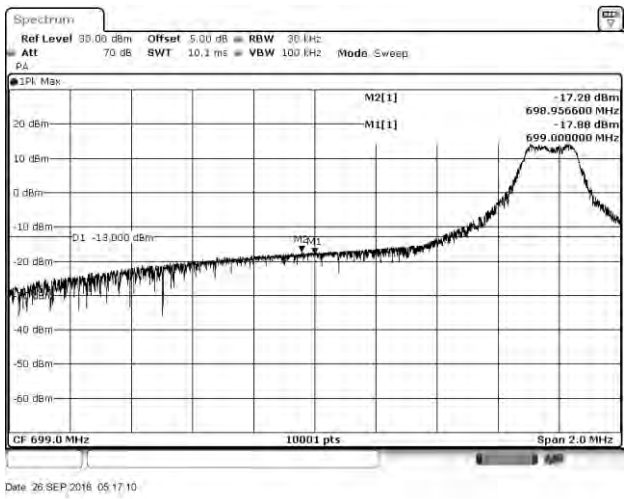


Cat M1_Band 12_ 5M_CH23035_16QAM_5RB0

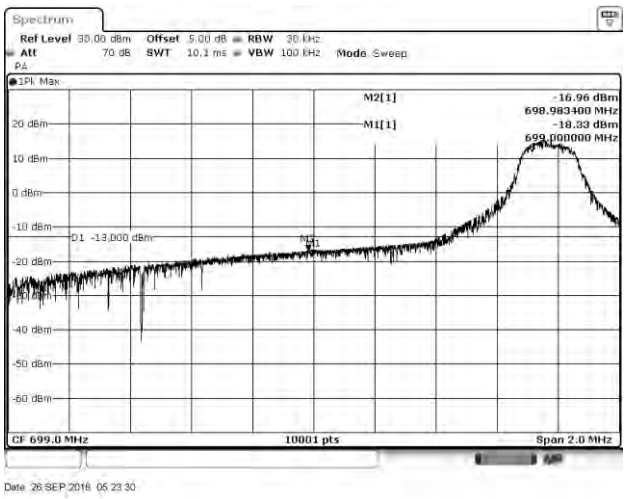


Cat M1_Band 12_ 5M_CH23155_QPSK_1RB0	Cat M1_Band 12_ 5M_CH23155_16QAM_1RB5
	
Cat M1_Band 12_ 5M_CH23155_QPSK_6RB0	Cat M1_Band 12_ 5M_CH23155_16QAM_5RB1
	

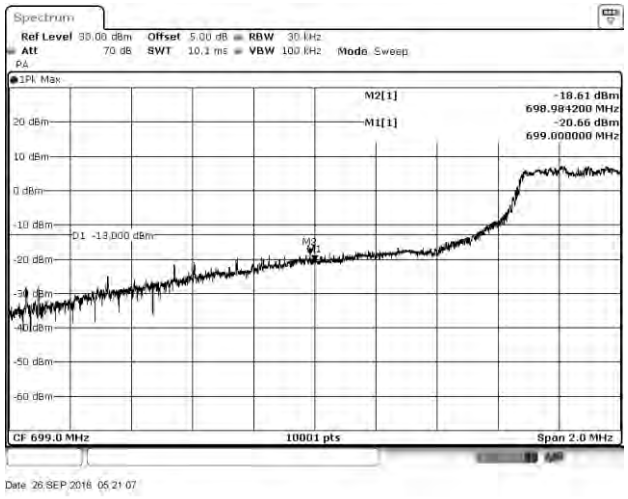
Cat M1_Band 12_ 10M_CH23060_QPSK_1RB0



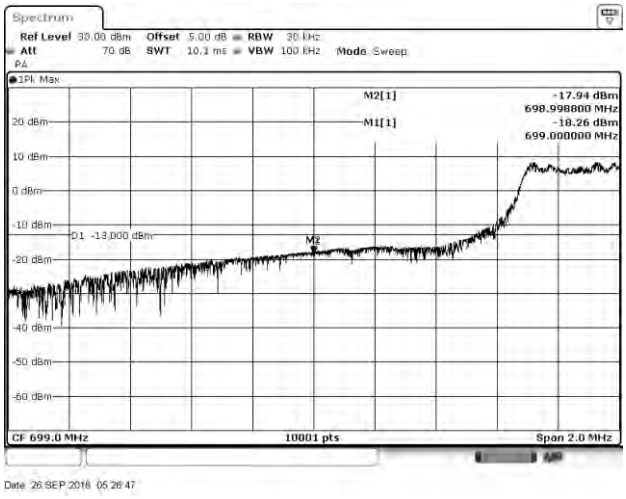
Cat M1_Band 12_ 10M_CH23060_16QAM_1RB0



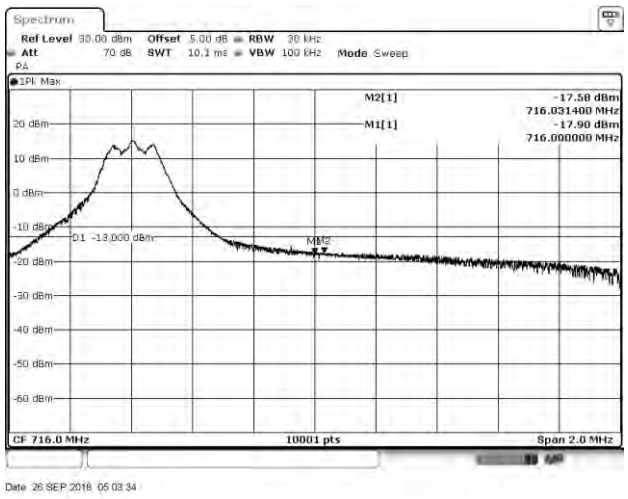
Cat M1_Band 12_ 10M_CH23060_QPSK_6RB0



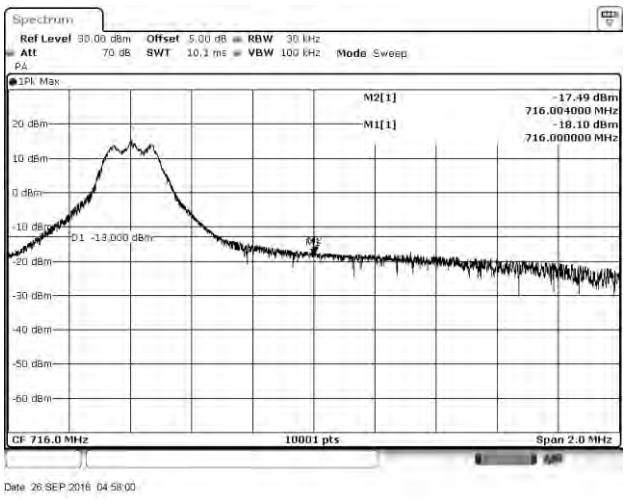
Cat M1_Band 12_ 10M_CH23060_16QAM_5RB0



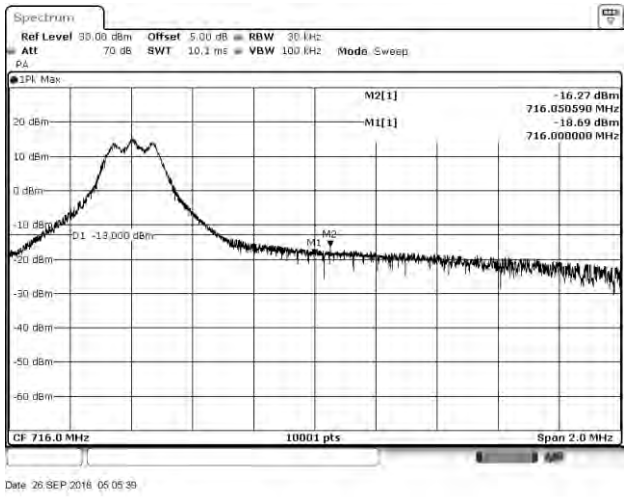
Cat M1_Band 12_ 10M_CH23130_QPSK_1RB0



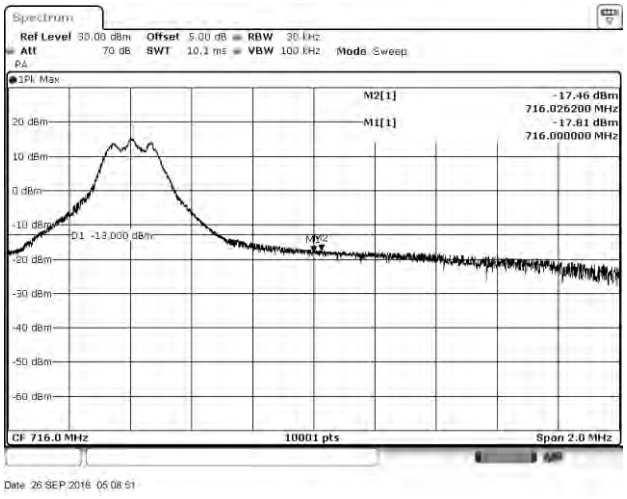
Cat M1_Band 12_ 10M_CH23130_16QAM_1RB5



Cat M1_Band 12_ 10M_CH23130_QPSK_6RB0

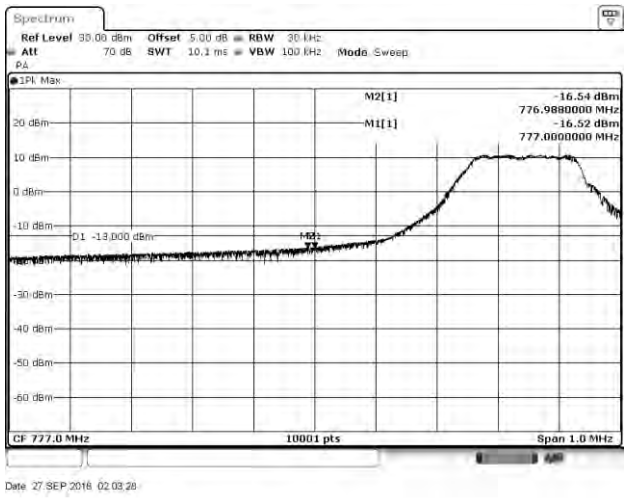


Cat M1_Band 12_ 10M_CH23130_16QAM_5RB1

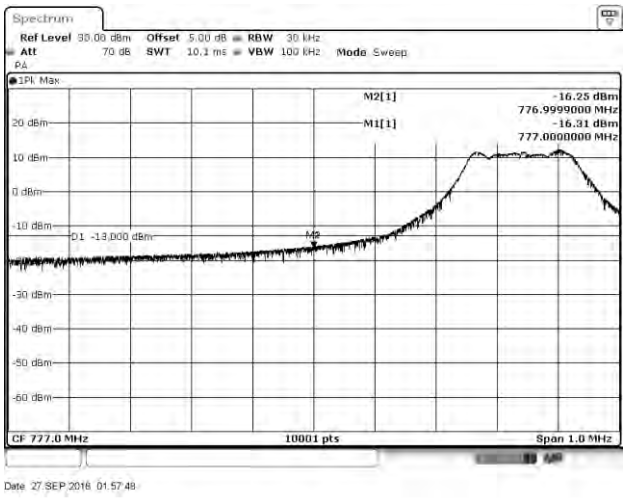


Product	ML865C1-NA		
Test Item	Spurious Emissions at Antenna Terminals		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/27	Test Site	SR10-H

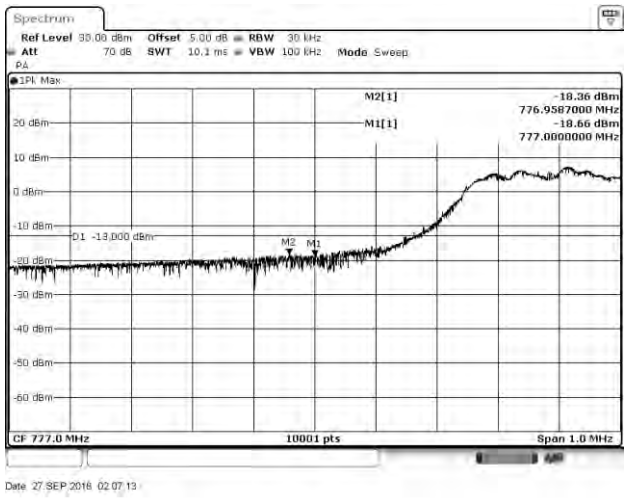
Cat M1_Band 13_ 5M_CH23205_QPSK_1RB0



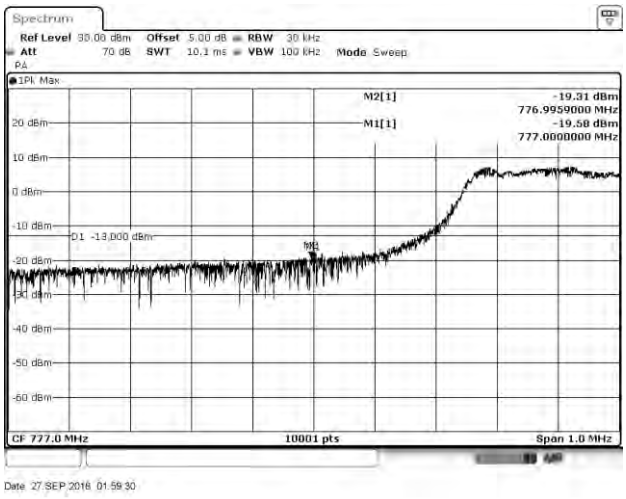
Cat M1_Band 13_ 5M_CH23205_16QAM_1RB0



Cat M1_Band 13_ 5M_CH23205_QPSK_6RB0



Cat M1_Band 13_ 5M_CH23205_16QAM_5RB0



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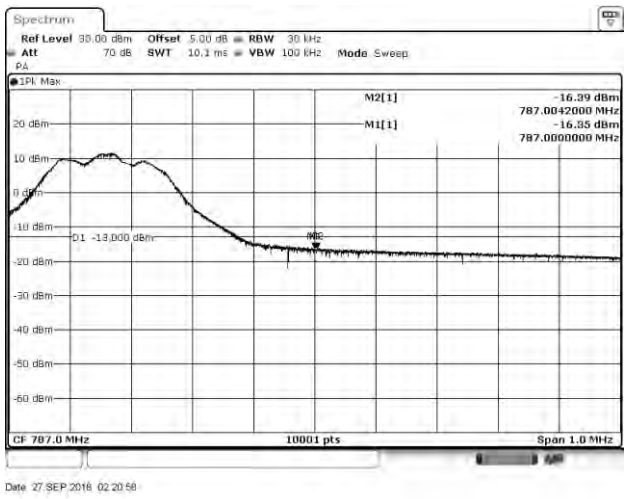
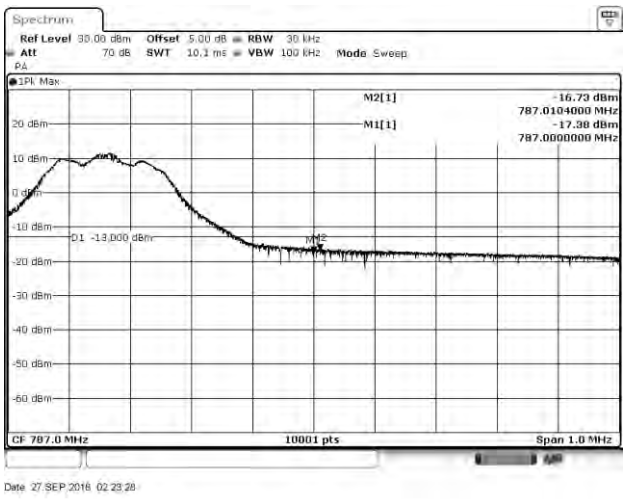
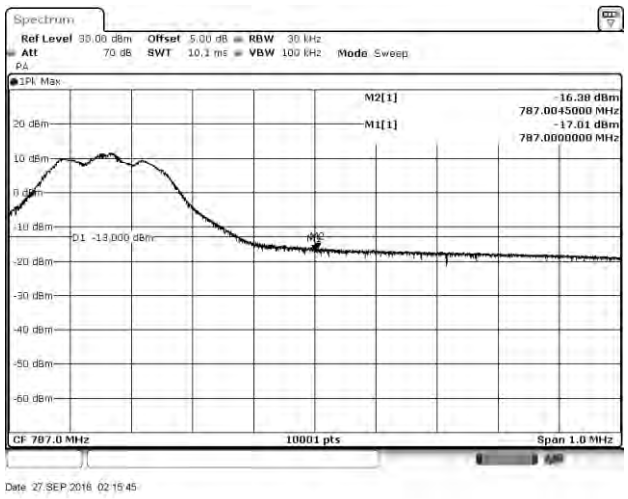
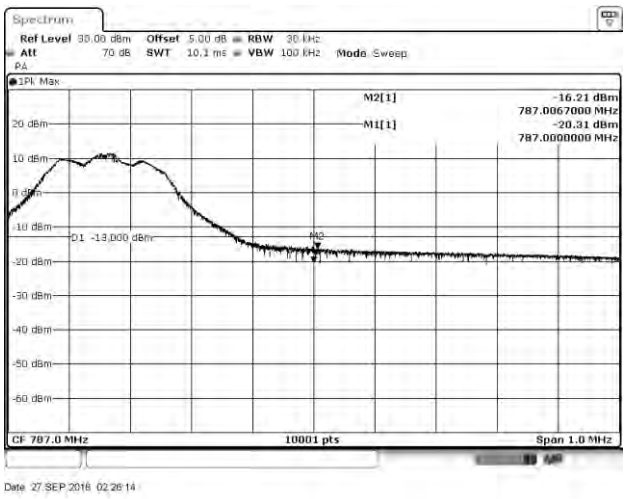
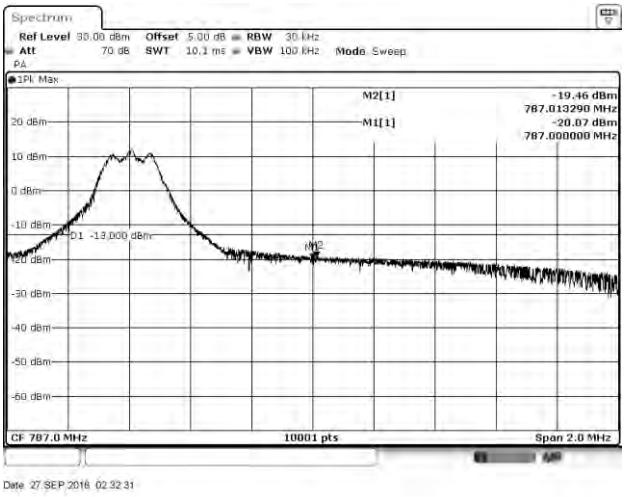
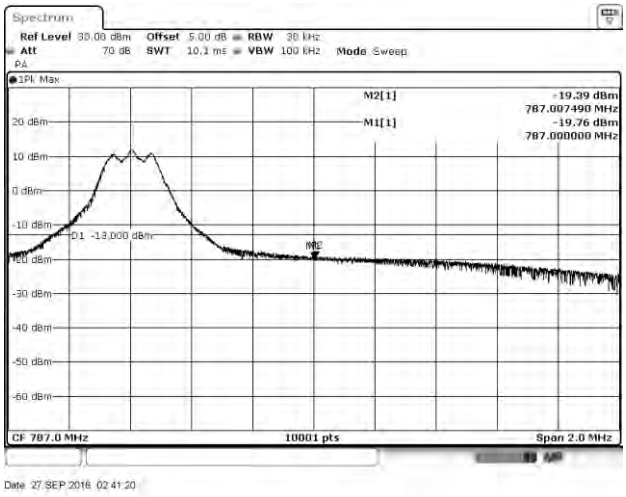
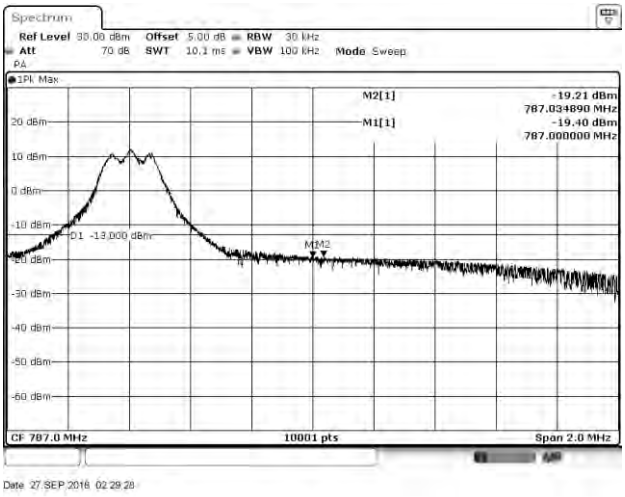
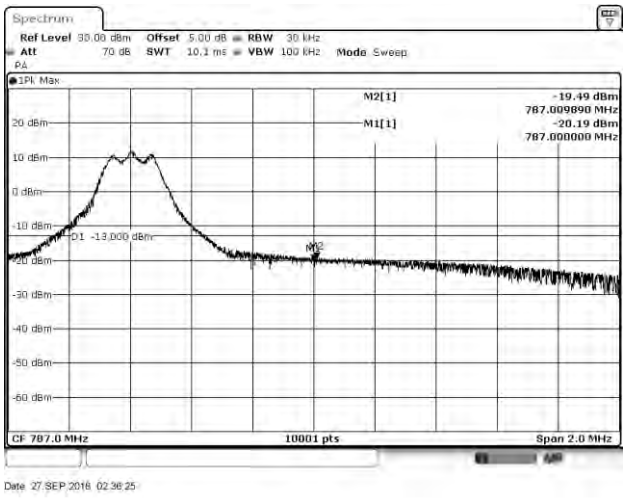
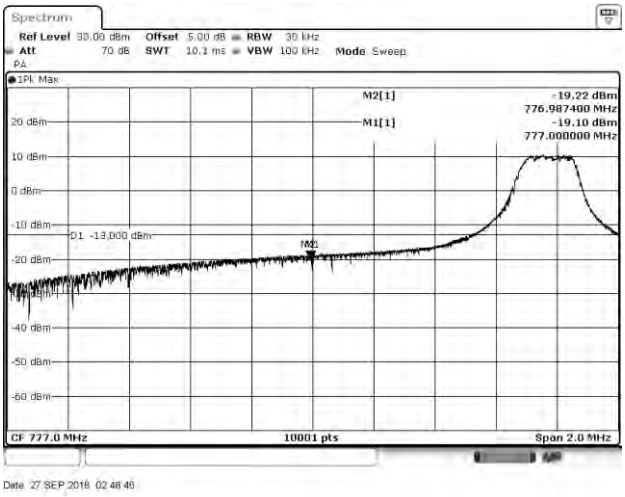
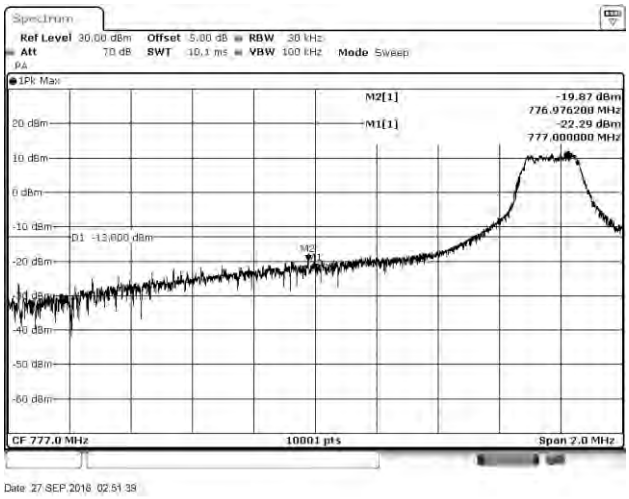
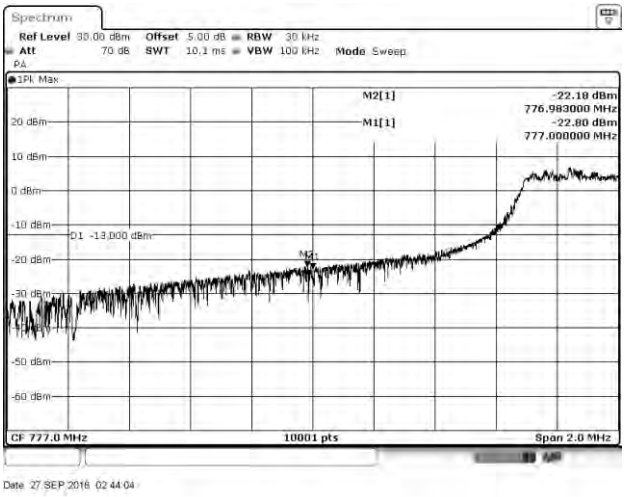
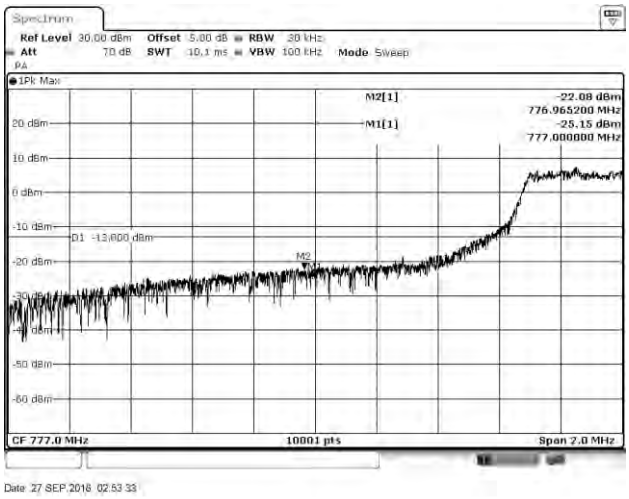
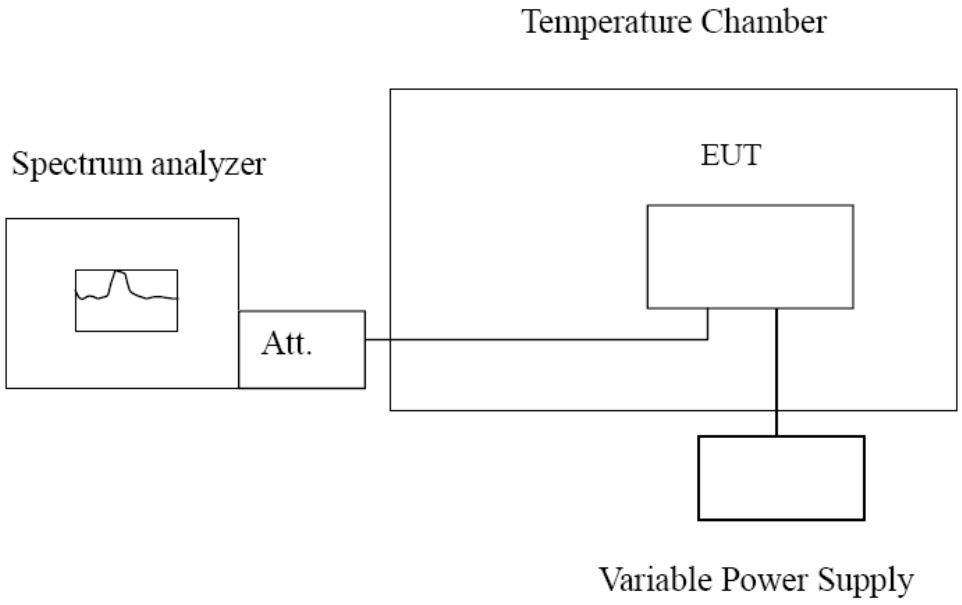
	
Cat M1_Band 13_ 5M_CH23255_QPSK_6RB0	Cat M1_Band 13_ 5M_CH23255_16QAM_5RB1
	

Cat M1_Band 13_ 0M_CH23230_QPSK_1RB0_high	Cat M1_Band 13_ 10M_CH23230_16QAM_1RB5__high
	
Cat M1_Band 13_ 10M_CH23230_QPSK_6RB0_high	Cat M1_Band 13_ 10M_CH23230_16QAM_5RB1__high
	

Cat M1_Band 13_ 10M_CH23230_QPSK_1RB0 _low	Cat M1_Band 13_ 10M_CH23230_16QAM_1RB0 _low
	
Cat M1_Band 13_ 10M_CH23230_QPSK_6RB0 _low	Cat M1_Band 13_ 10M_CH23230_16QAM_5RB0 _low
	

8. Frequency Stability

8.1. Test Setup



8.2. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

8.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 9
ANSI C63.26: 2015 Sub-clause 5.6

8.4. Test Result

Product	ML865C1-NA		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE_CAT. M1_Band 2		
Date of Test	2018/09/26	Test Site	SR10-H

CAT M1 Band 2-QPSK_1860MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-22	0.0121
3.8	3	-0.0014
3.4	12	-0.0062

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-7	0.0040
-20	-27	0.0148
-10	-16	0.0089
0	-3	0.0019
10	3	-0.0014
20	-11	0.0062
30	-3	0.0019
40	-10	0.0056
50	-13	0.0072

CAT M1 Band 2-QPSK_1880MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	4	-0.0020
3.8	-14	0.0076
3.4	-26	0.0140

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	7	-0.0036
-20	1	-0.0004
-10	-15	0.0081
0	-1	0.0007
10	-3	0.0018
20	-10	0.0055
30	2	-0.0009
40	-27	0.0145
50	2	-0.0009

CAT M1 Band 2-QPSK_1900MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-27	0.0140
3.8	-16	0.0082
3.4	-20	0.0103

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-20	0.0103
-20	1	-0.0007
-10	13	-0.0071
0	18	-0.0097
10	-25	0.0129
20	-7	0.0035
30	-10	0.0050
40	14	-0.0076
50	6	-0.0034

Product	ML865C1-NA		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 2: LTE_CAT. M1_Band 4		
Date of Test	2018/09/26	Test Site	SR10-H

CAT M1 Band 4-QPSK_1720MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-4	0.0026
3.8	11	-0.0061
3.4	-19	0.0113

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	4	-0.0021
-20	-31	0.0183
-10	-12	0.0072
0	-29	0.0171
10	-3	0.0020
20	-11	0.0067
30	2	-0.0009
40	-17	0.0102
50	-30	0.0177

CAT M1 Band 4-QPSK_1732.5MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	14	-0.0079
3.8	-12	0.0071
3.4	-25	0.0146

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-10	0.0060
-20	12	-0.0067
-10	13	-0.0073
0	12	-0.0067
10	0	0.0002
20	-10	0.0060
30	-12	0.0071
40	-4	0.0025
50	-8	0.0048
50	13	-0.0077

CAT M1 Band 4-QPSK_1745MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	11	-0.0065
3.8	6	-0.0037
3.4	-5	0.0026

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-1	0.0003
-20	9	-0.0054
-10	17	-0.0100
0	-22	0.0124
10	-20	0.0112
20	-7	0.0038
30	13	-0.0077
40	-1	0.0003
50	13	-0.0077

Product	ML865C1-NA		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 3: LTE_CAT. M1_Band 12		
Date of Test	2018/09/26	Test Site	SR10-H

CAT M1 Band 12-QPSK_704MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-7	0.0106
3.8	2	-0.0022
3.4	-20	0.0291

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-15	0.0220
-20	-18	0.0262
-10	-6	0.0092
0	3	-0.0036
10	-21	0.0305
20	-11	0.0163
30	-21	0.0305
40	5	-0.0064
50	-7	0.0106

CAT M1 Band 12-QPSK_707.5MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	10	-0.0137
3.8	-3	0.0047
3.4	-20	0.0287

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	3	-0.0038
-20	-26	0.0372
-10	-16	0.0231
0	-8	0.0118
10	-26	0.0372
20	-10	0.0146
30	-20	0.0287
40	-14	0.0202
50	-28	0.0400

CAT M1 Band 12-QPSK_711MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-1	0.0008
3.8	-9	0.0121
3.4	17	-0.0245

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-10	0.0135
-20	-8	0.0107
-10	-11	0.0149
0	-9	0.0121
10	-23	0.0318
20	-7	0.0093
30	16	-0.0231
40	11	-0.0161
50	-17	0.0233

Product	ML865C1-NA		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 4: LTE_CAT. M1_Band 13		
Date of Test	2018/09/26	Test Site	SR10-H

CAT M1 Band 13-QPSK_779.5MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	12	-0.0148
3.8	-31	0.0404
3.4	-27	0.0352

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	3	-0.0033
-20	-1	0.0019
-10	-31	0.0404
0	11	-0.0135
10	-15	0.0198
20	-11	0.0147
30	9	-0.0109
40	-21	0.0275
50	-14	0.0186

CAT M1 Band 13-QPSK_782MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-12	0.0158
3.8	-6	0.0081
3.4	8	-0.0098

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-10	0.0132
-20	-12	0.0158
-10	13	-0.0162
0	-4	0.0055
10	11	-0.0137
20	-10	0.0132
30	-2	0.0030
40	-14	0.0183
50	4	-0.0047

CAT M1 Band 13-QPSK_784.5MHz

Voltage

Voltage (VAC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	6	-0.0082
3.8	-21	0.0262
3.4	-16	0.0199

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-30	-3	0.0033
-20	-25	0.0313
-10	-26	0.0326
0	11	-0.0146
10	-12	0.0148
20	-7	0.0084
30	6	-0.0082
40	16	-0.0209
50	-3	0.0033