

Prüfbericht-Nr.: <i>Test Report No.:</i>	50176780 001	Auftrags-Nr.: <i>Order No.:</i>	114079598	Seite 1 von 51 <i>Page 1 of 51</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	09-Jul-2018	
Auftraggeber: <i>Client:</i>	Microchip Technology Inc. 2355 West Chandler Blvd. Chandler, Arizona 85224-6199, United States.			
Prüfgegenstand: <i>Test item:</i>	SAMR30 IEEE 802.15.4 Sub-1GHz Module			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	ATSAMR30M18A			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C / IC RSS-247 Test report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247 RSS-247 (02-2017)			
Wareneingangsdatum: <i>Date of receipt:</i>	09-Jul-2018			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000772362-001, 009, 012 A000826357-002			
Prüfzeitraum: <i>Testing period:</i>	19-Jul-2018 – 24-Oct-2018			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Laboratory Taipei			
Prüflaboratorium: <i>Testing laboratory:</i>	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
Report Date / tested by:		kontrolliert von / reviewed by:		
30-Nov-2018 Jack Chang/Project Manager		30-Nov-2018 Ryan W.T. Chen/Project Manager		
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
<p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p>				
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: *Passed*

5.1.2 PEAK OUTPUT POWER

RESULT: *Passed*

5.1.3 6dB BANDWIDTH AND 99% BANDWIDTH

RESULT: *Passed*

5.1.4 POWER DENSITY

RESULT: *Passed*

5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100kHz BANDWIDTH

RESULT: *Passed*

5.1.6 SPURIOUS EMISSION

RESULT: *Passed*

5.1.7 MAINS CONDUCTED EMISSIONS

RESULT: *Passed*

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: *Passed*

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1. General Remarks

1.1 Complementary Materials

The following attachments are integral parts of this test report:

Appendix P: Photo Documentation
(File Name: 50176780 001 APPENDIXP)

Appendix D: Test Result of Radiated Emissions
(File Name: 50176780 001 APPENDIXD)

Test Specifications

The following standards were applied.

Table 1: Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.247
FCC 47CFR Part 2: Subpart J Section 2.1091
RSS-247 Issue 2 (Feb 2017)
RSS-102 Issue 5
RSS-Gen, Issue 5, April 2018
ANSI C63.10:2013
KDB558074 D01 DTS Meas Guidance v05
KDB447498 D01 General RF Exposure Guidance v06

2. Test Sites

2.1 Test Facilities

TUV Rheinland Taiwan Ltd.
Taipei Office

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC RegistrationNo.: 340738
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2016-Jul-1st to 2019-Jun-30th



Testing Laboratory
0759

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manu-facturer	Type	S/N	Last Calibration	Next Calibration
Test Software	Farad	EZ_EMC	Ver. TUV3A1	N/A	N/A
EMI Test Receiver	R&S	ESR 7	101062	2017/09/25	2018/10/31
Spectrum Analyzer	R&S	FSV 40	100921	2018/05/02	2019/05/02
EXA Signal Analyzer	KEYSIGHT	N9010A	MY52221334	2018/02/05	2019/02/05
Preamplifier (30MHz -1GHz)	HP	8447D	2944A06641	2017/12/26	2018/12/26
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2018/01/18	2019/01/18
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	60558	2017/11/21	2018/11/21
Bilog Antenna	TESEQ	CBL6111D	29804	2018/07/02	2019/07/02
Horn Antenna	ETS-Lindgren	3117	00138160	2018/06/01	2019/06/01
Horn Antenna (18GHz~40GHz)	COM-POWER	AH-840	101029	2017/11/28	2018/11/28
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/21	2019/06/21
EMI Test Receiver	R&S	ESR 7	101549	2017/11/10	2018/11/10
Temp. & Humid. Chamber	Giant Force	GCT-099-40-S	MAF0103-007	2017/03/09	2019/03/09
LISN (1 phase)	R&S	ENV216	101243	2018/06/18	2019/06/18
LISN	R&S	ENV216	101262	2018/06/22	2019/06/22
Spectrum Analyzer	Agilent	N9010A	MY53470241	2018/06/04	2019/06/04
Test Software	Agilent	300328 testsystem	V1.9.1	N/A	N/A
Power sensor	Agilent	U2021XA	MY54020001	2018/03/31	2018/11/09

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
RF power, conducted	$\pm 1.5 \text{ dB}$
Adjacent channel power	$\pm 3 \text{ dB}$
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6 \text{ dB}$
Radiated emission of receiver, valid up to 26 GHz	$\pm 6 \text{ dB}$
Temperature	$\pm 2 \text{ }^{\circ}\text{C}$
Humidity	$\pm 10 \text{ \%}$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a SAMR30 IEEE 802.15.4 Sub-1GHz Module. The Module has RF Shield. The Antenna is not part of the module, The RF output of the module is routed to either an SMA connector or a chip antenna located on the host board.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	SAMR30 IEEE 802.15.4 Sub-1GHz Module
Type Designation	ATSAMR30M18A
FCC ID	2ADHKR30M
Canada ID	20266-R30M
Canada HVIN	ATSAMR30M18A

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequencies	906 MHz ~ 924 MHz
Channel Spacing	2MHz
Number of Channels	10
Operation Voltage	1.8-3.6 V. EVB is supplied with 5V via USB, this is regulated to 3.3V and supplied to DUT
Modulation	BPSK-ALT-40, OQPSK-SIN-250, OQPSK-SIN-1000-SCR-ON
Antenna gain	Chip antenna(0900AT43A0070): 2dBi External antenna(ANT-916-CW-QW-SMA): 1.8dBi External antenna(W1910): 1.0 dBi

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiving
- C. Standby
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- | | |
|-------------------------|-------------------|
| - Photo Document | - Circuit Diagram |
| - Technical Description | - Block Diagram |
| - Rating Label | |

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: The module is mounted on an Evaluation Board provided by the manufacturer. The EVB is provided with an USB interface which makes it possible to control the module through the test software installed on a notebook computer.

This software(Performance analyzer) was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:

Conducted: A000772362-009

Radiation(Chip Antenna): A000772362-012

Radiation(External Antenna ANT-916-CW-QW-SMA): A000772362-009

Radiation(External Antenna W1910): A000772362-001

Conducted(Spot check): A000826357-002

Radiation with External Antenna(Spot check): A000826357-002

The changes between original sample and modified sample(spot check) are
ATSAMR30M18A Module:

1. Opening in the shield can around the RF-out trace of SAMR30 module has been increased from 0.15mm to 0.5mm.

SAMR30 Module XPRO(Host board):

2. Series termination resistors of value 100 ohm have been added(on the host board) to six digital lines, namely module pins 3, 4, 6, 17, 19 and 20.
3. An 0R jumper footprint for debug purposes

Full test was applied on all test modes, but only worst case is shown

BPSK-ALT-40 mode:

Channel Low (906MHz), Channel Mid (914MHz) and Channel High (924MHz) with 40kbps data rate were chosen for full testing and Channel Mid (914MHz) with 40kbps data rate for spot check testing.

OQPSK-SIN-250 mode:

Channel Low (906MHz), Channel Mid (914MHz) and Channel High (924MHz) with 250kbps data rate were chosen for full testing.

OQPSK-SIN-1000-SCR-ON mode:

Channel Low (906MHz), Channel Mid (914MHz) and Channel High (924MHz) with 1Mbps data rate were chosen for full testing.

For A000826357-002(Spot check sample), only spot checks for Radiated emission and maximum peak conducted output power measurement is done at the worst case BPSK-40, Tx @914 MHz

For A000772362-001(External Antenna W1910), only spot checks for Radiated emission measurement is done at the worst case CW mode, Tx and Rx @914 MHz

Test Software	Atmel Studio 7(Performance analyzer)
Power setting	11

4.3 Auxiliary Equipment

The product has been tested together with the following additional accessories:

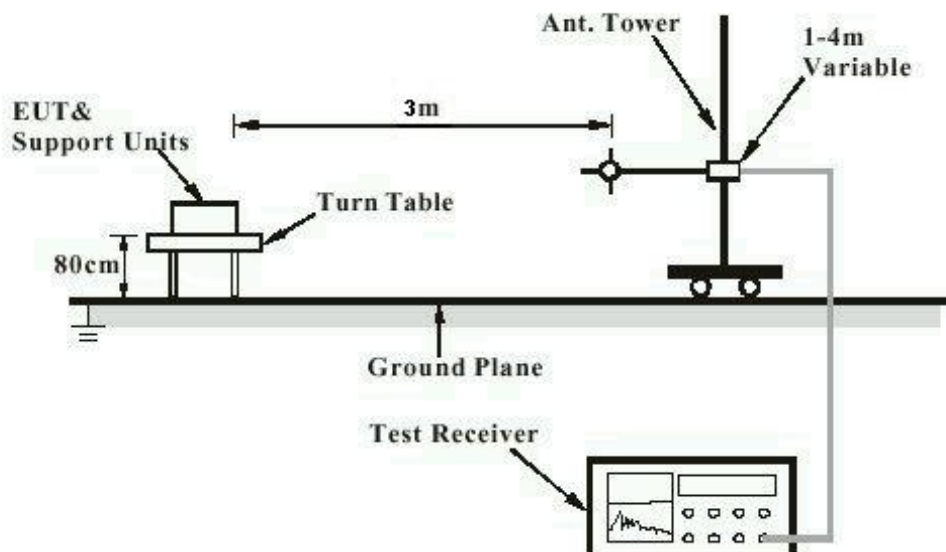
Description	Manufacturer	Model No.	Serial No.
Notebook(EMC-06)	Lenovo	TP00048A	PB-0F8B2

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

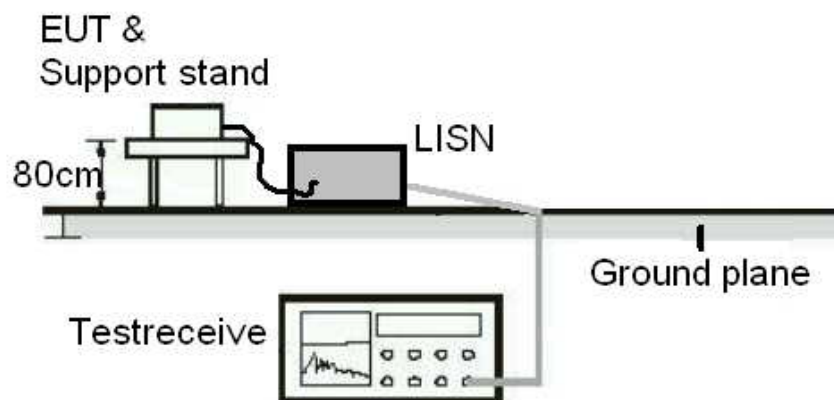
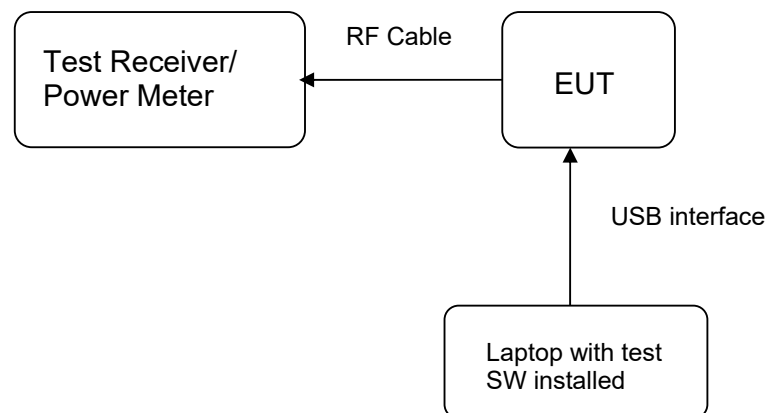


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Test standard	:	LP0002(2018): 3.10.1.3 FCC Part 15.247(b)(4), Part 15.203 and RSS- Gen 8.3
Limit	:	the use of antennas with directional gains that do not exceed 6dBi

According to the manufacturer declaration, the EUT has a chip antenna with peak gain of 2.0 dBi and an external antenna with peak gain of 1.8dBi. The chip antenna is mounted on the board. The external antenna is connected through a SMA connector and only the antenna tested and approved is allowed for use by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Maximum peak conducted output power**RESULT:****Passed**

Test standard	:	LP0002(2018): 3.10.1.2 FCC Part 15.247(b)(3), RSS-247 5.4(4)
Basic standard	:	ANSI C63.10:2013, KDB558074
Limit	:	1 Watt
Kind of test site	:	Shielded room/Conducted room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A
Ambient temperature	:	18-25 °C
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103kPa

Table 6: Test result of Peak Output Power (40kbps,BPSK)

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	906.0	8.69	0.00740	1
Middle Channel	914.0	8.45	0.00700	1
High Channel	924.0	8.06	0.00640	1

Table 7: Test result of Peak Output Power (250kbps,O-QPSK)

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	906.0	7.32	0.00540	1
Middle Channel	914.0	7.11	0.00514	1
High Channel	924.0	6.72	0.00470	1

Table 8: Test result of Peak Output Power (1Mbps,O-QPSK)

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	906.0	7.32	0.00540	1
Middle Channel	914.0	7.10	0.00513	1
High Channel	924.0	6.71	0.00469	1

Table 9: Test result of Peak Output Power (40kbps,BPSK), Spot check

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Middle Channel	914.0	8.36	0.00685	1

5.1.3 6dB Bandwidth and 99% Bandwidth**RESULT:****Passed**

Test standard : LP0002(2018): 3.10.1.5
FCC Part 15.247(a)(2), RSS-247 5.2(1)
Basic standard : ANSI C63.10:2013, KDB558074
Kind of test site : Shielded room/Conducted room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A

Ambient temperature : 18-25°C
Relative humidity : 50-65%
Atmospheric pressure : 100-103kPa

Table 10: Test result of 6dB Bandwidth (40kbps,BPSK)

Channel	Channel Frequency (MHz)	6dB Bandwidth (KHz)	Limit (KHz)	Result
Low Channel	906.0	676.3	500	Pass
Mid Channel	914.0	675.8	500	Pass
High Channel	924.0	676.1	500	Pass

Table 11: Test result of 6dB Bandwidth (250kbps,O-QPSK)

Channel	Channel Frequency (MHz)	6dB Bandwidth (KHz)	Limit (KHz)	Result
Low Channel	906.0	830.3	500	Pass
Mid Channel	914.0	820.9	500	Pass
High Channel	924.0	810.2	500	Pass

Table 12: Test result of 6dB Bandwidth (1Mbps,O-QPSK)

Channel	Channel Frequency (MHz)	6dB Bandwidth (KHz)	Limit (KHz)	Result
Low Channel	906.0	741.3	500	Pass
Mid Channel	914.0	744.7	500	Pass
High Channel	924.0	737.8	500	Pass

Table 13: Test result of 99% Bandwidth (40kbps,BPSK)

Channel	Channel Frequency (MHz)	99% Bandwidth (KHz)
Low Channel	906.0	802.33
Mid Channel	914.0	792.51
High Channel	924.0	788.12

Table 14: Test result of 99% Bandwidth (250kbps,O-QPSK)

Channel	Channel Frequency (MHz)	99% Bandwidth (KHz)
Low Channel	906.0	1433.4
Mid Channel	914.0	1392.5
High Channel	924.0	1415.9

Table 15: Test result of 99% Bandwidth (1Mbps,O-QPSK)

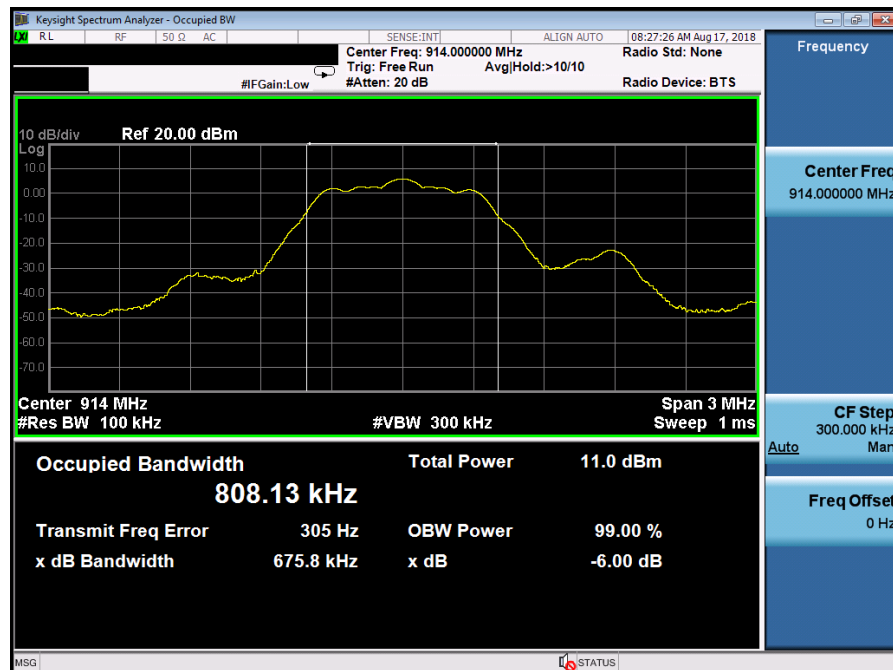
Channel	Channel Frequency (MHz)	99% Bandwidth (KHz)
Low Channel	906.0	1428.6
Mid Channel	914.0	1394.5
High Channel	924.0	1432.5

Test Plot of 6dB Bandwidth (40kbps,BPSK)

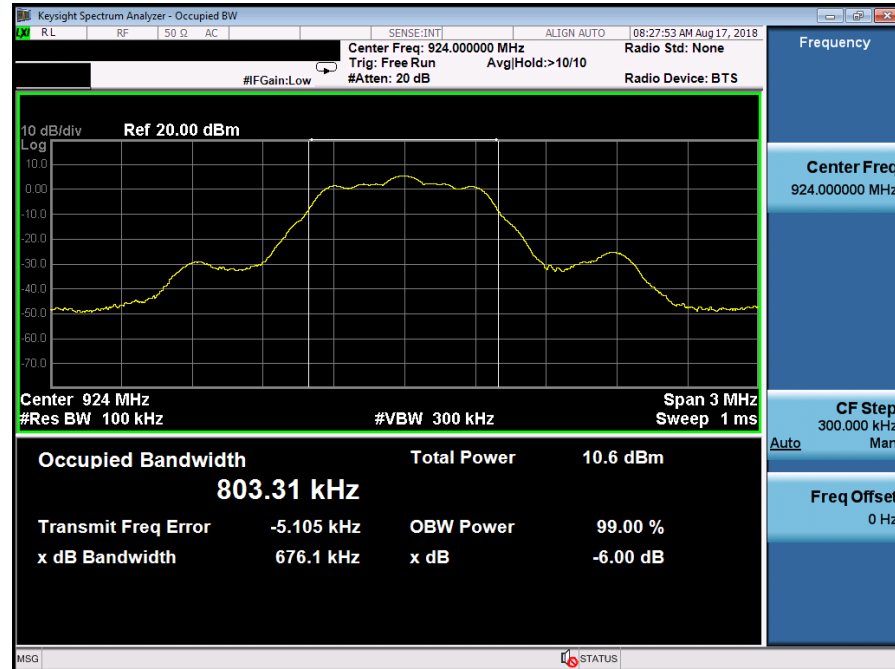
Low Channel



Middle Channel

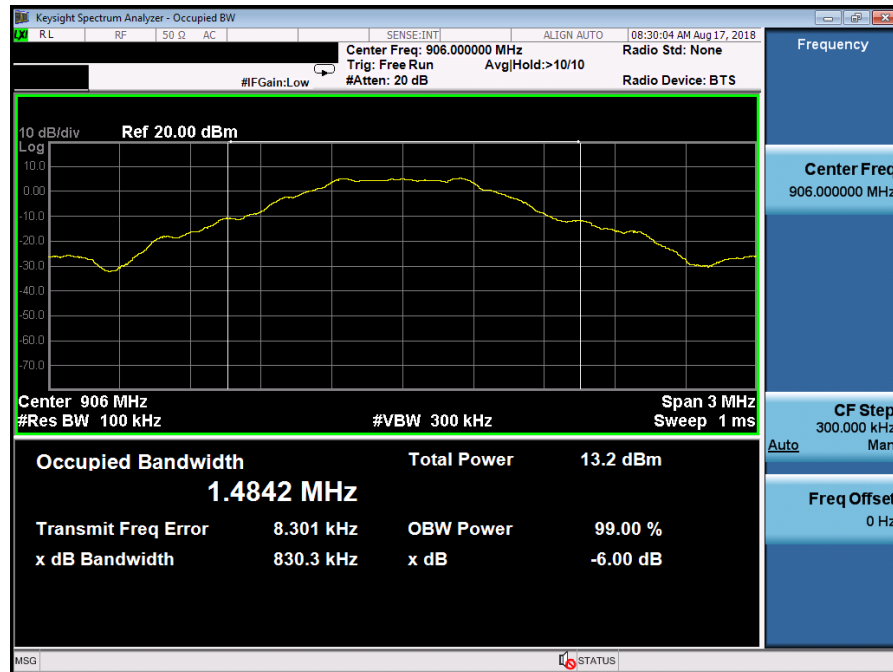


High Channel



Test Plot of 6dB Bandwidth (250kbps,O-QPSK)

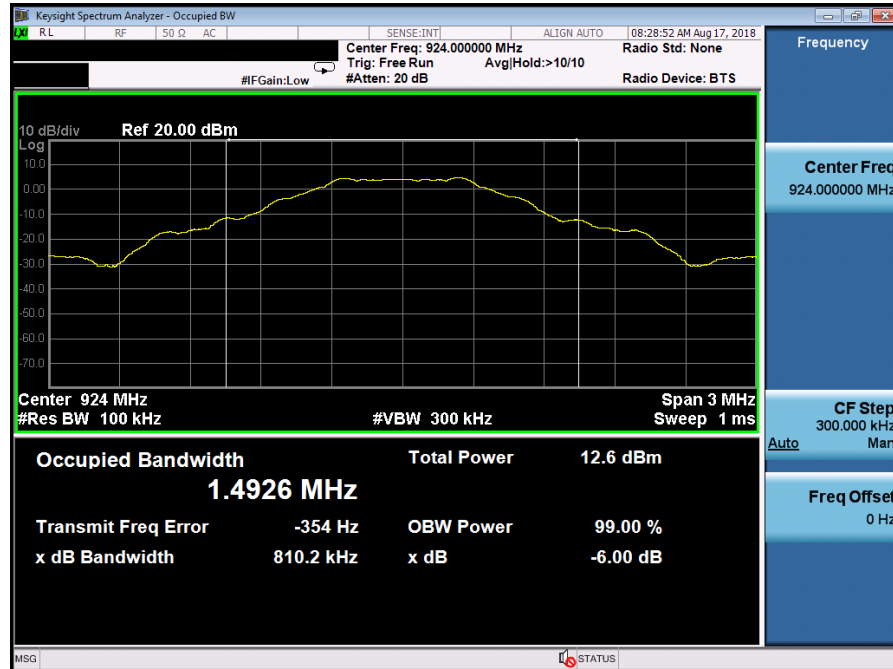
Low Channel



Middle Channel



High Channel

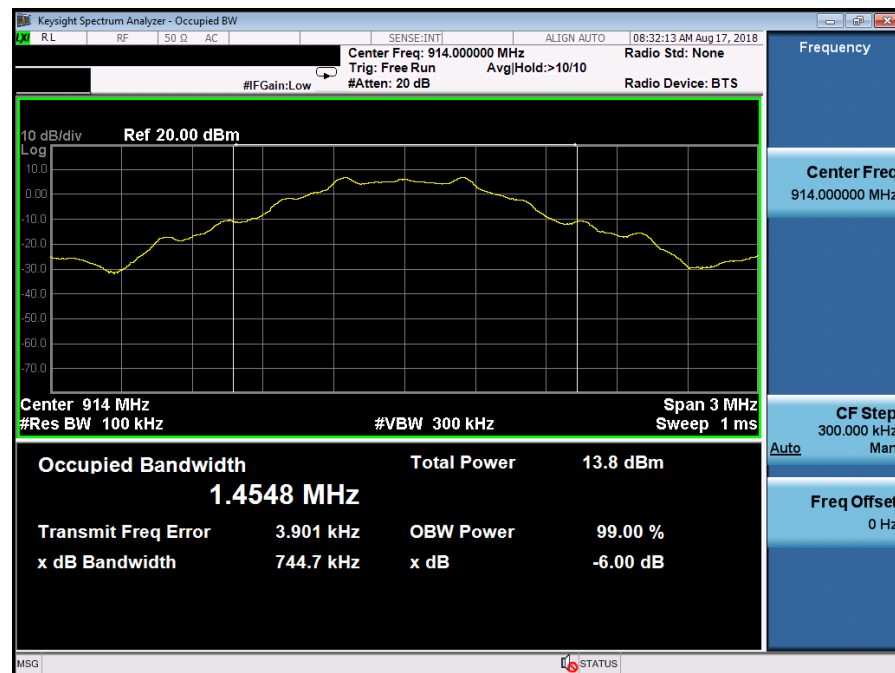


Test Plot of 6dB Bandwidth (1Mbps,O-QPSK)

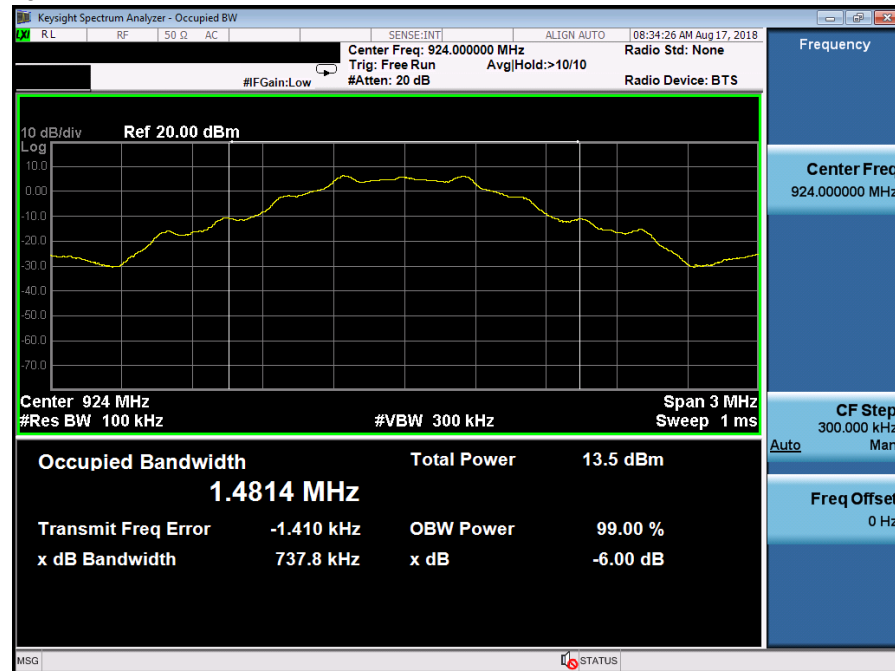
Low Channel



Middle Channel

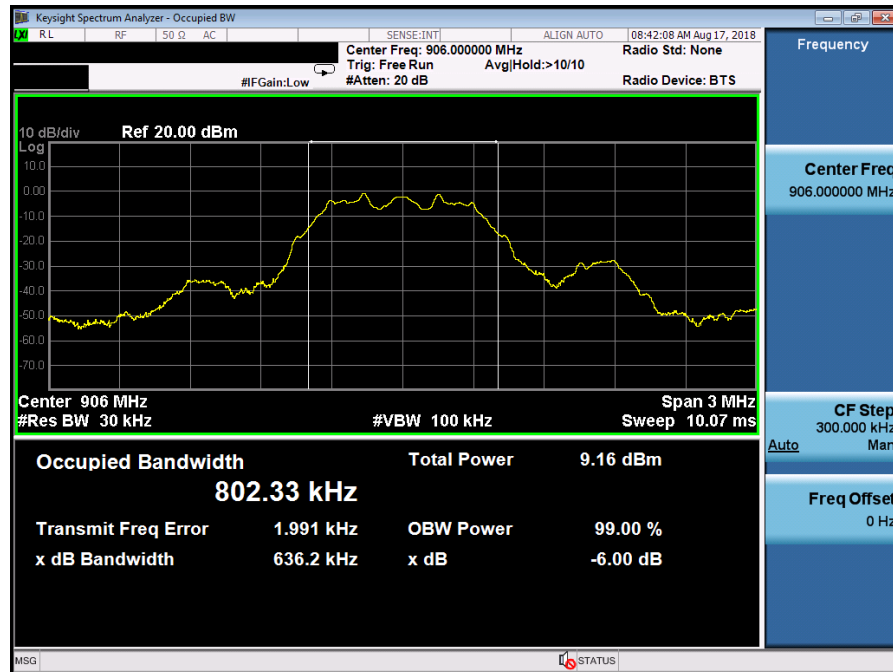


High Channel



Test Plot of 99% Bandwidth (40kbps,BPSK)

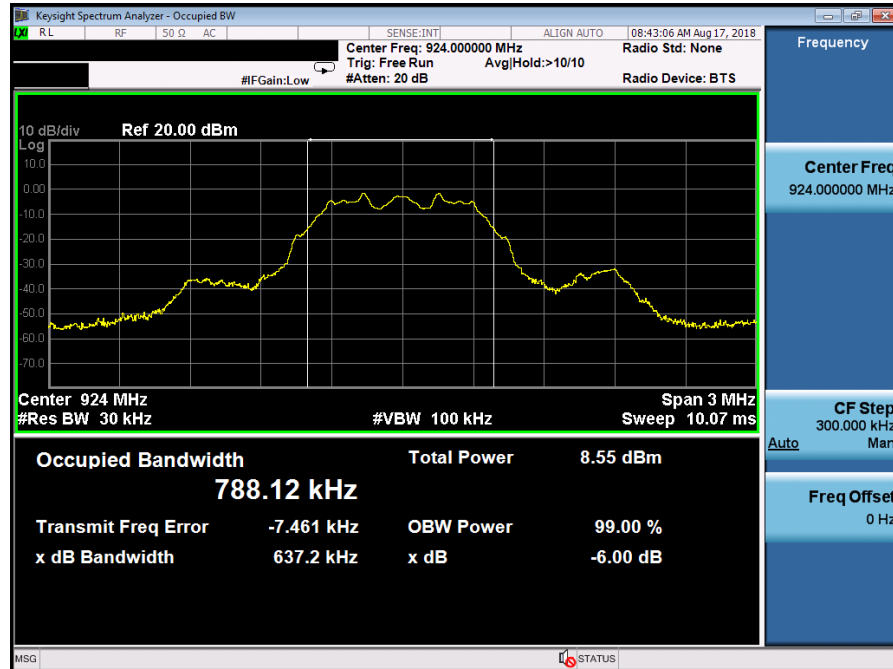
Low Channel



Middle Channel



High Channel



Test Plot of 99% Bandwidth (250kbps,O-QPSK)

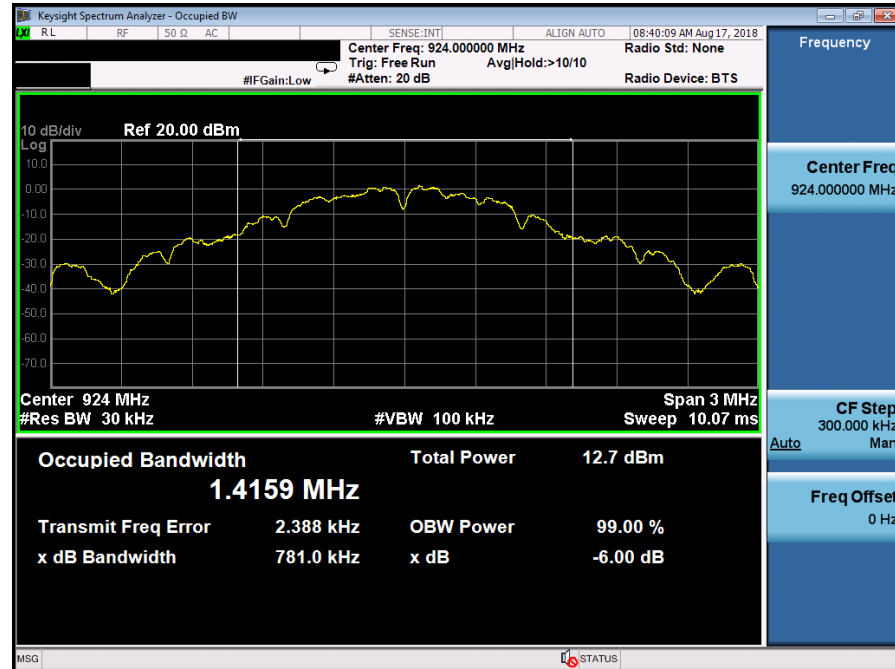
Low Channel



Middle Channel



High Channel

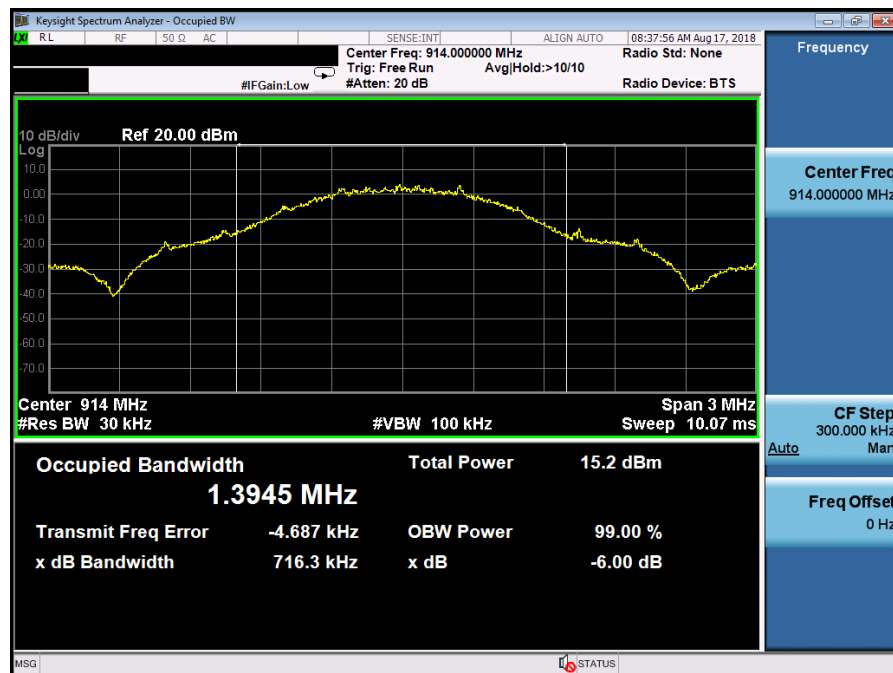


Test Plot of 99% Bandwidth (1Mbps,O-QPSK)

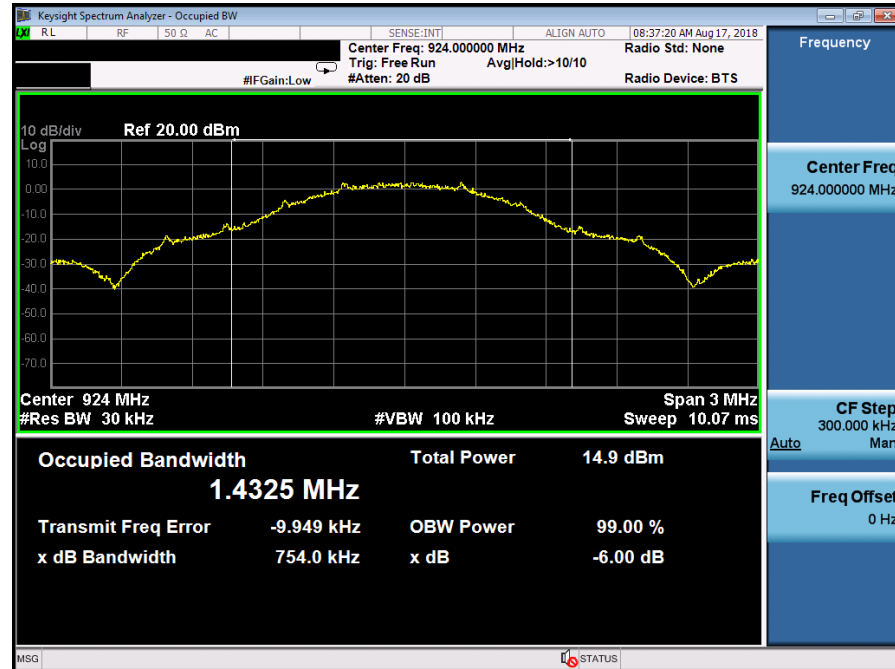
Low Channel



Middle Channel



High Channel



5.1.4 Power Density

RESULT:
Passed

Test standard : LP0002(2018): 3.10.1.6 (2) (B)
 FCC Part 15.247(e) , RSS-247 5.2(2)
 Basic standard : ANSI C63.10:2013, KDB558074
 Kind of test site : Shielded room/Conducted room

Test setup

Test Channel : Low/ Middle/ High
 Operation Mode : A
 Ambient temperature : 18-25°C
 Relative humidity : 50-65%
 Atmospheric pressure : 100-103kPa

Table 16: Test result of Power Density (40kbps,BPSK)

Channel	Channel Frequency (MHz)	Power Density	Limit
		(dBm)	(dBm)
Low Channel	906.0	-3.76	8
Middle Channel	914.0	-4.42	8
High Channel	924.0	-4.33	8

Table 17: Test result of Power Density (250kbps,O-QPSK)

Channel	Channel Frequency (MHz)	Power Density	Limit
		(dBm)	(dBm)
Low Channel	906.0	-5.32	8
Middle Channel	914.0	-5.68	8
High Channel	924.0	-5.63	8

Table 18: Test result of Power Density (1Mbps,O-QPSK)

Channel	Channel Frequency (MHz)	Power Density	Limit
		(dBm)	(dBm)
Low Channel	906.0	-5.39	8
Middle Channel	914.0	-5.43	8
High Channel	924.0	-5.73	8

Test Plot of Power Density (40kbps,BPSK)

Low Channel



Middle Channel



High Channel

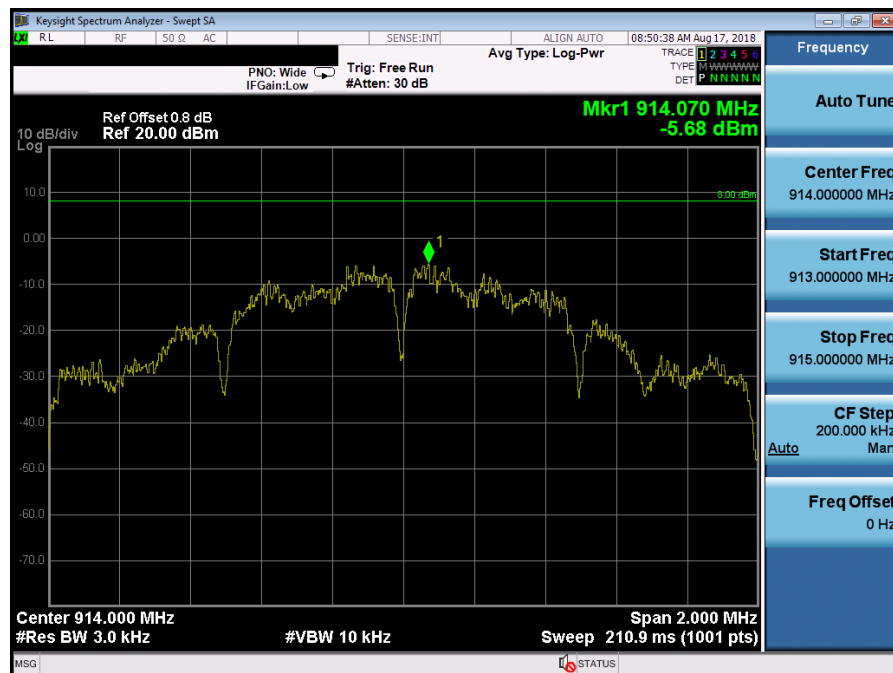


Test Plot of Power Density (250kbps,O-QPSK)

Low Channel



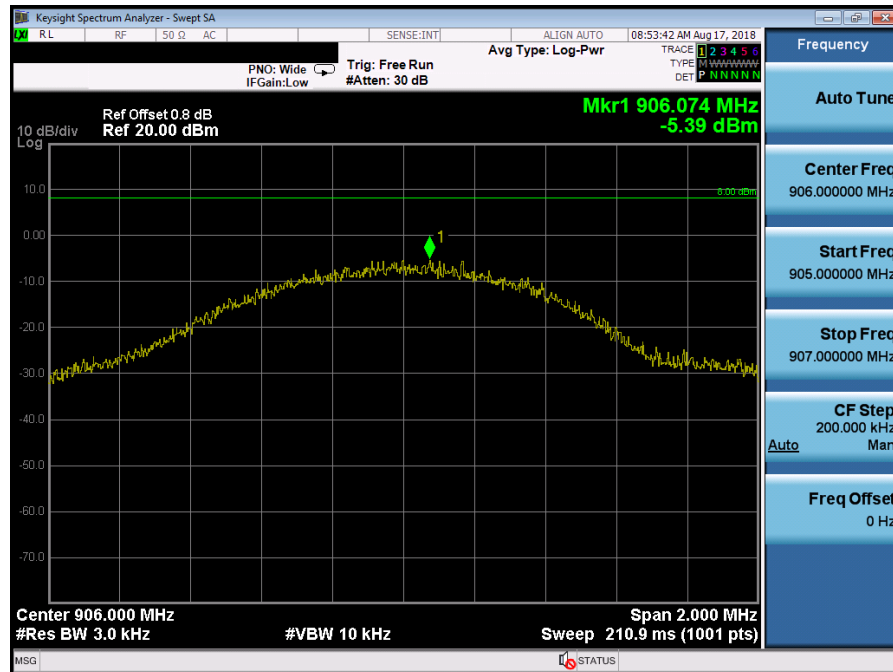
Middle Channel



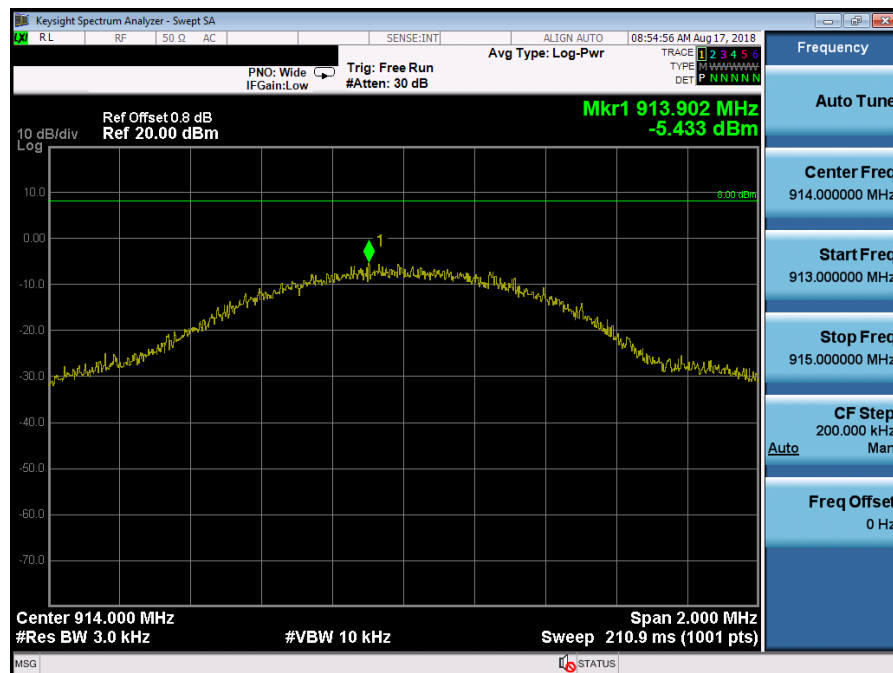


Test Plot of Power Density (1Mbps,O-QPSK)

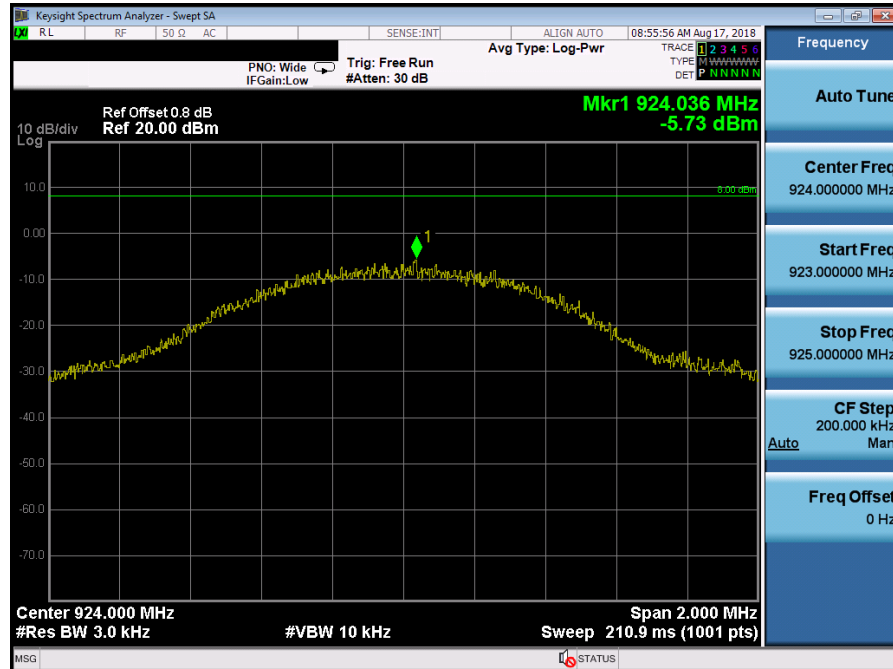
Low Channel



Middle Channel



High Channel



**5.1.5 Conducted spurious emissions and Frequency Band Edge
measured in 100kHz Bandwidth****RESULT:****Passed**

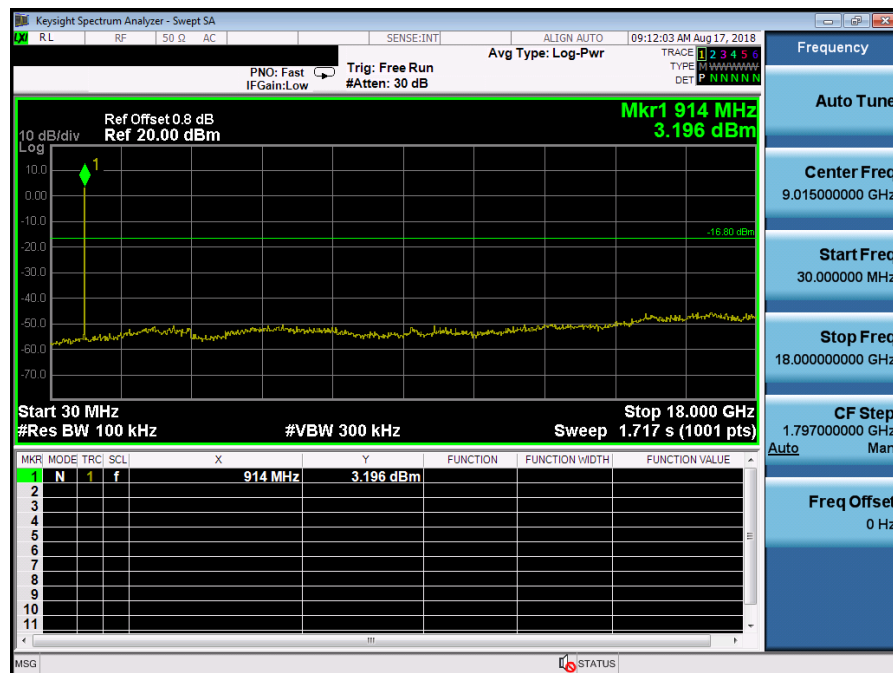
Test standard	:	LP0002(2018): 3.10.1.5 FCC part 15.247(d), RSS-247 5.5
Basic standard	:	ANSI C63.10:2013, KDB558074
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power)
Kind of test site	:	Shielded room/Conducted room

Test setup

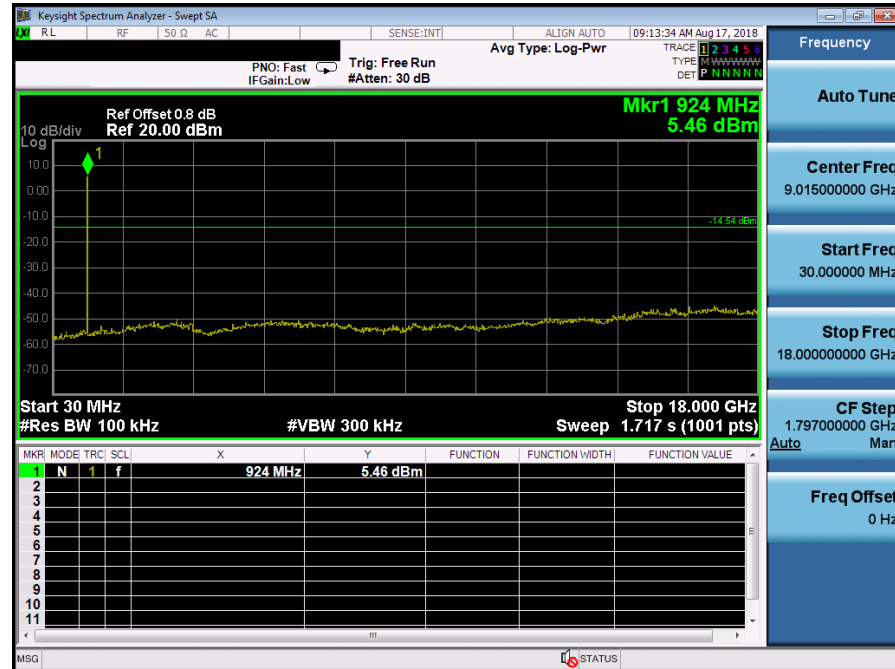
Test Channel	:	Low/ Mid/ High for spurious, Low/ High for Band Edge
Operation mode	:	A
Ambient temperature	:	18-25°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103kPa

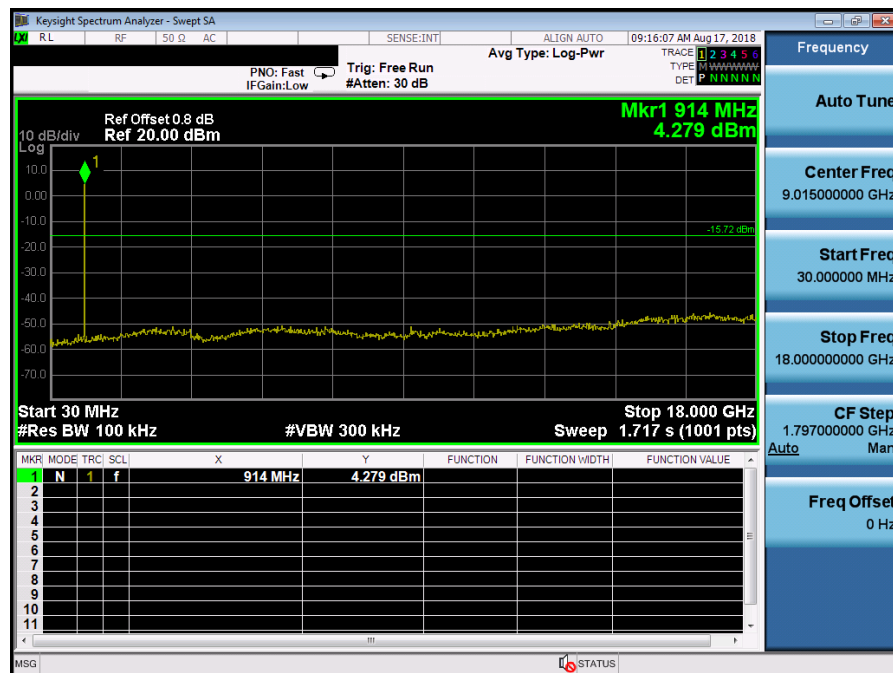
All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.

Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

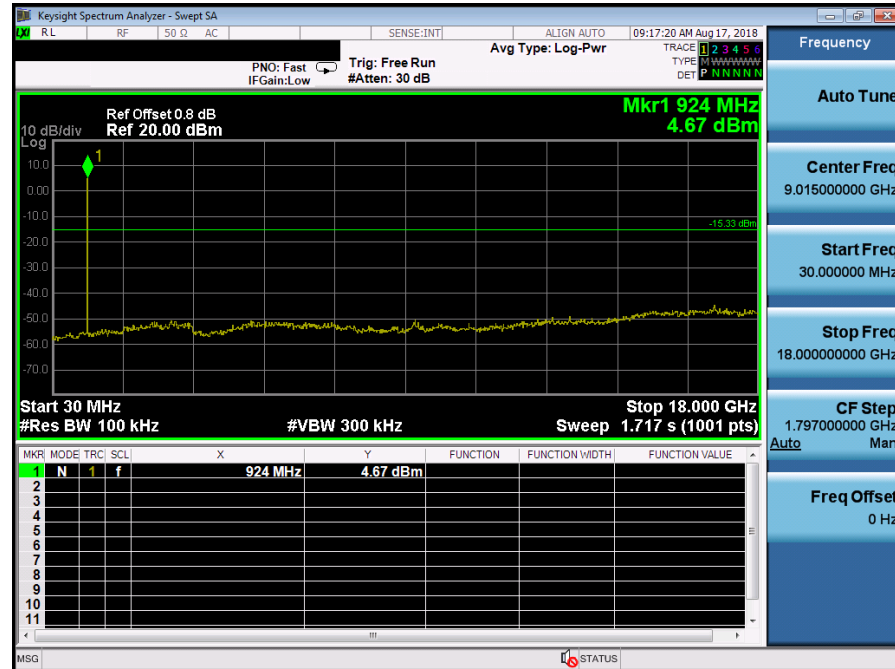


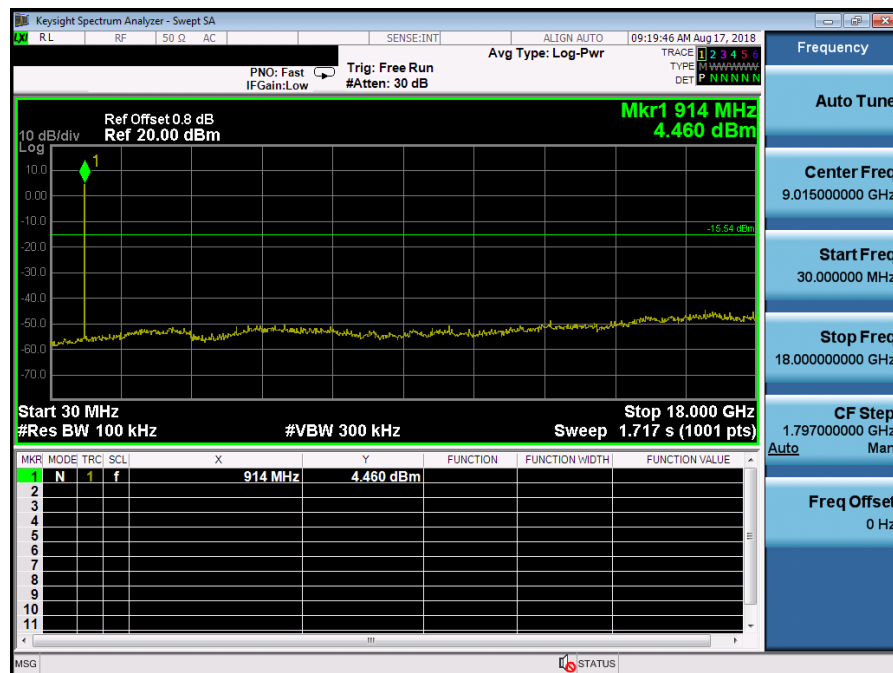
High Channel

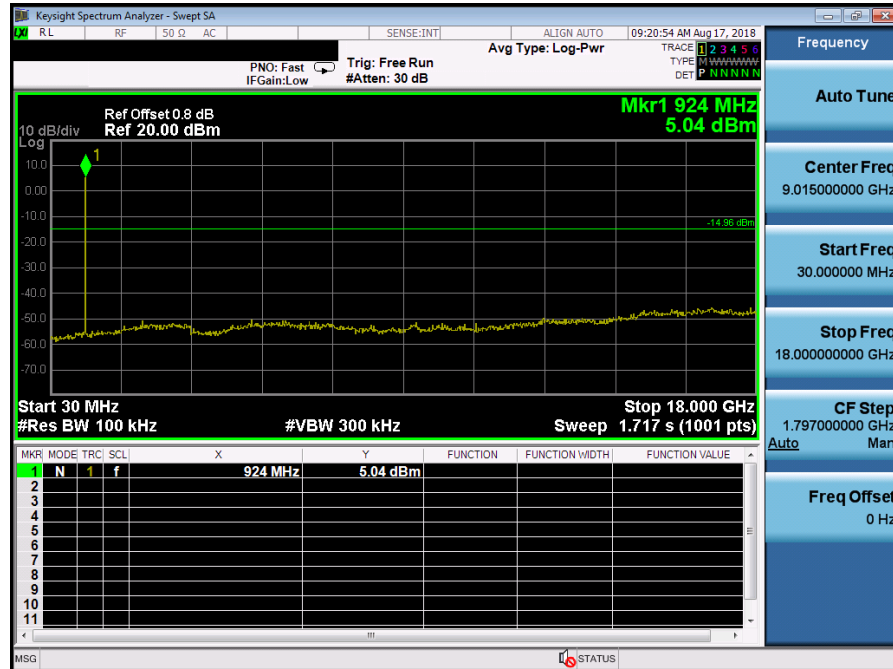




High Channel

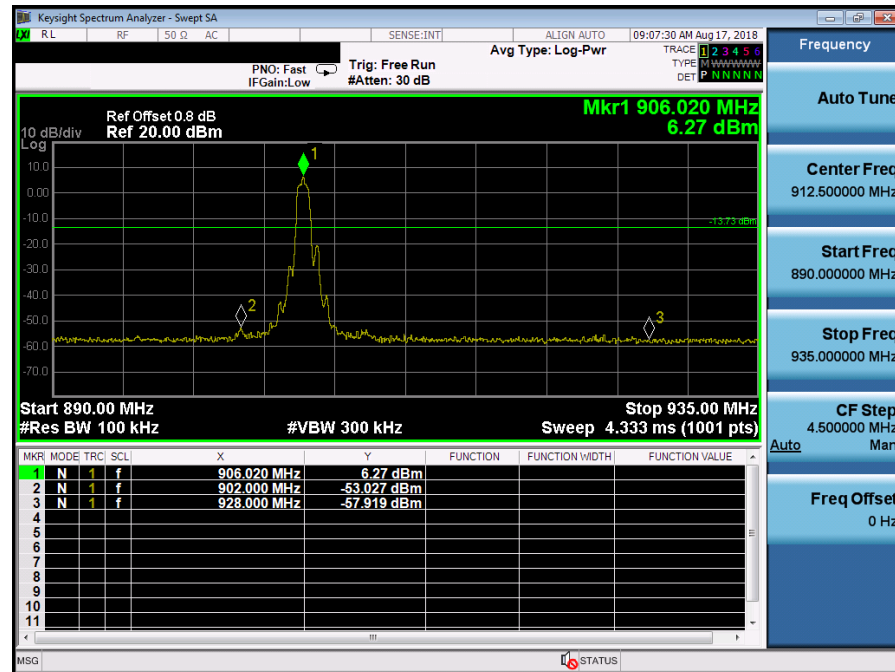




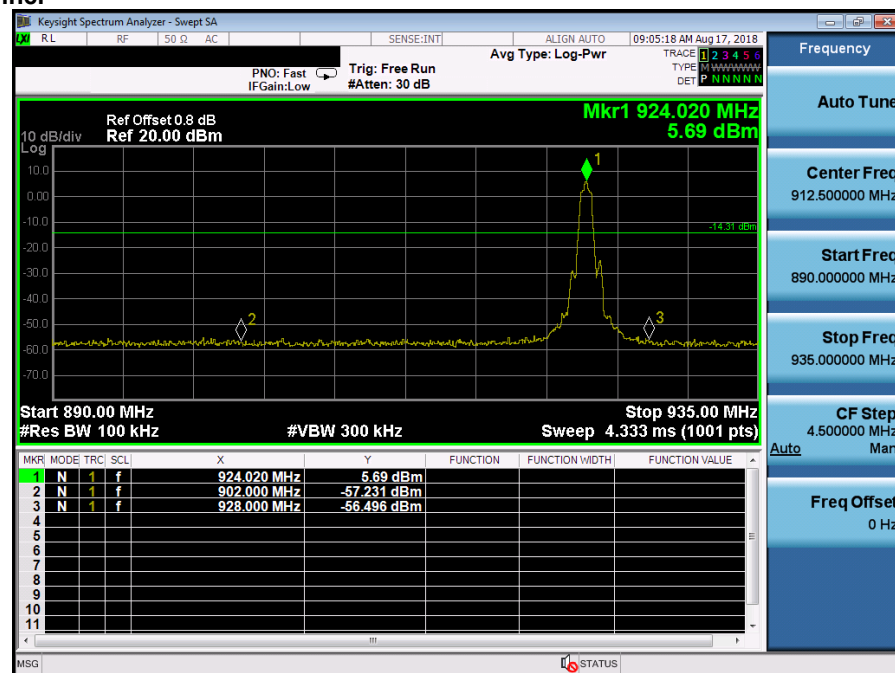


Test Plot 100kHz RBW of Band Edge (40kbps,BPSK)

Low Channel

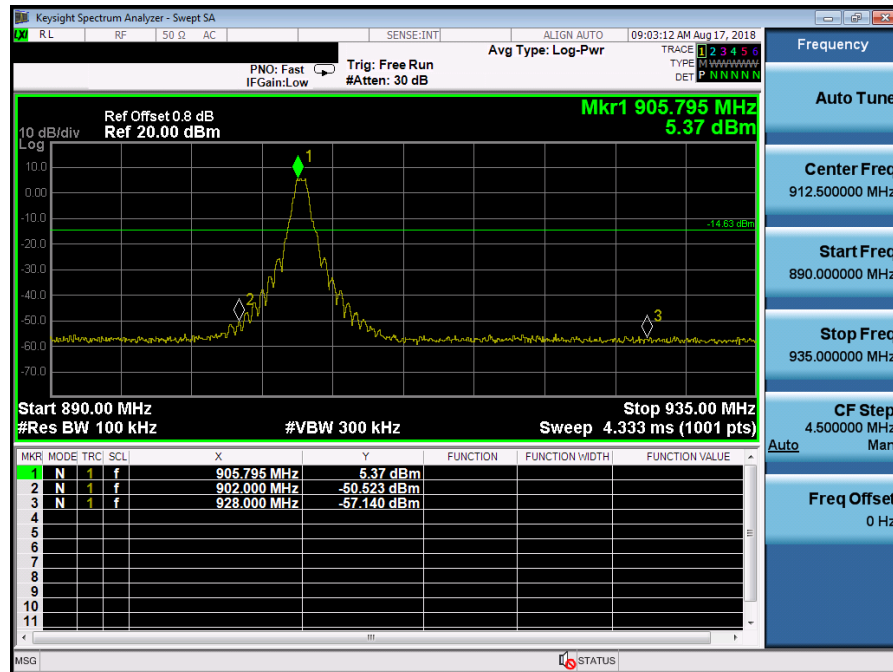


High Channel

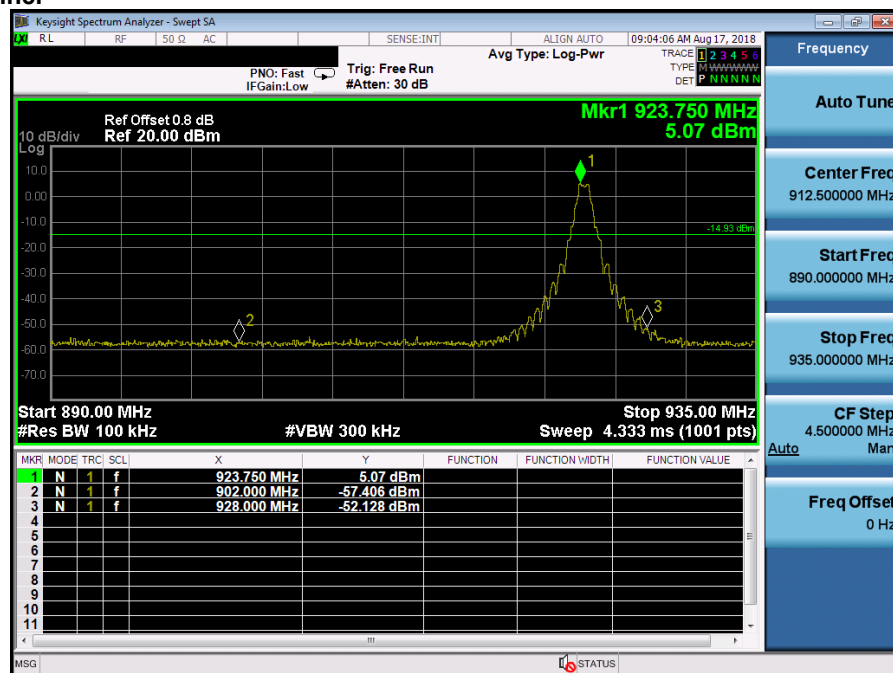


Test Plot 100kHz RBW of Band Edge (250kbps,O-QPSK)

Low Channel

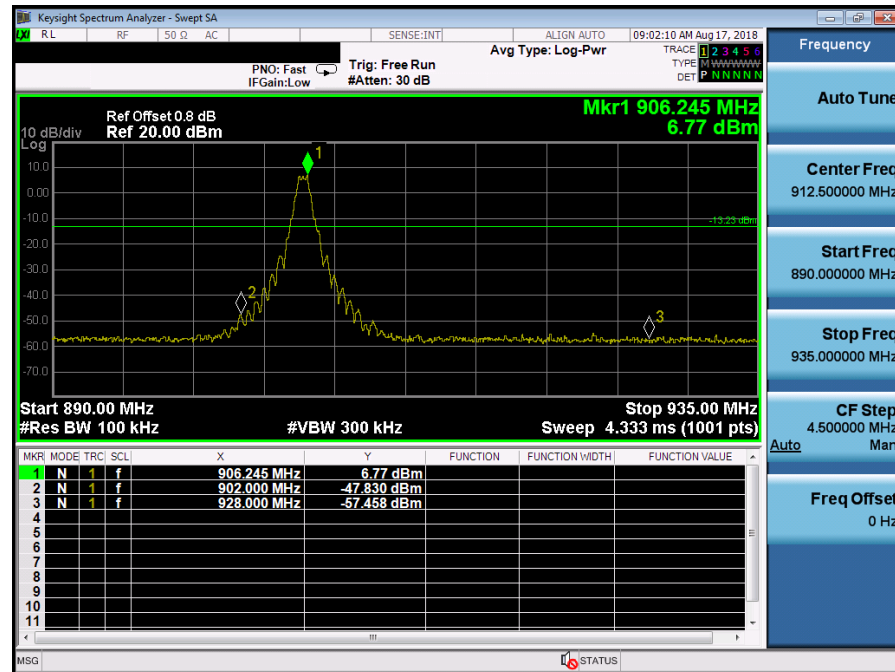


High Channel

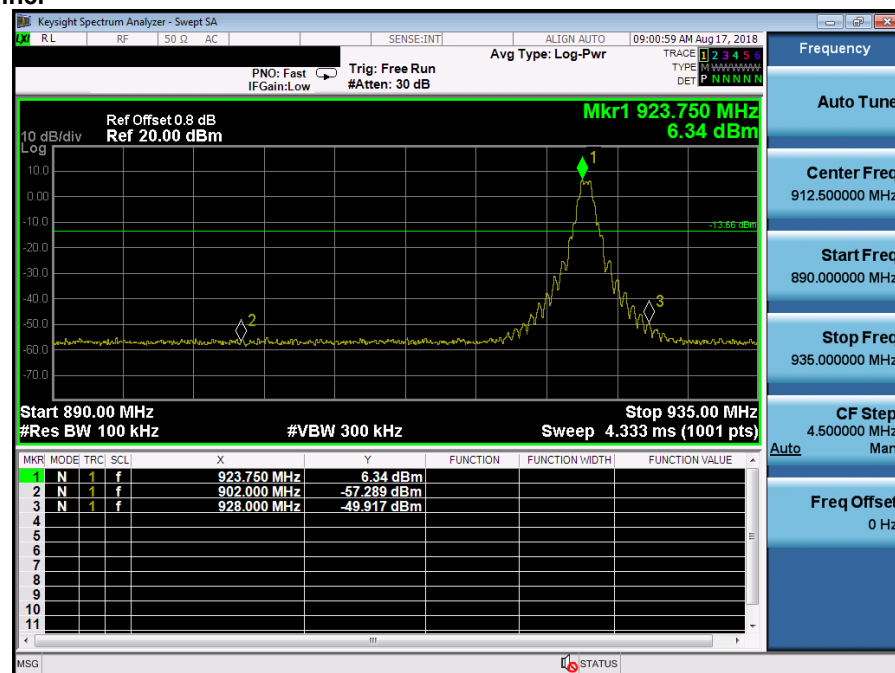


Test Plot 100kHz RBW of Band Edge (1Mbps,O-QPSK)

Low Channel



High Channel



5.1.6 Spurious Emission

RESULT:**Passed**

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-247 5.5 and RSS-Gen Issue 5 8.9 LP0002(2018): 3.10.1.5
Basic standard	:	ANSI C63.10:2013
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i5, 8.10 (Table 7), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i5, 8.9 (Table 5 and 6). Radiated emissions which fall in the restricted bands, as defined in LP0002(2018): 2.7 , must comply with the radiated emission limits specified in LP0002(2018): 2.8 Emission radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in FCC15.247(d) and RSS-247 i2, 5.5 Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2018): 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A, B

For details refer to Appendix D.

The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

Mains Emissions

5.1.7 Mains Conducted Emissions**RESULT:****Passed**

Test standard : FCC Part 15.207
FCC Part 15.107
RSS-Gen Issue 5: 8.8
LP0002(2018): 2.3

Limits : Mains Conducted emissions as defined in
above standards

Kind of test site : Shielded Room

Test setup

Test Channel : Middle
Operation mode : A

Remark: For details refer to Appendix D.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Passed**

Test standard : FCC KDB Publication 447498 D01 v06
47CFR 1.1310
47CFR 2.1091
RSS-102 issue 5, Table 1

FCC:

Therefore the maximum output power of the transmitter is $7.4\text{mW} < 16\text{mW}$ (Distance: 5 mm), hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile Portable RF Exposure.

Canada:**External antenna(ANT-916-CW-QW-SMA)**

Maximum conducted peak power: 7.4 mW
Antenna Gain: 1.8 dbi
Maximum EIRP available 11.2 mW

Since maximum output power of the transmitter is $11.2\text{mW} < 16\text{mW}$ (distance $\leq 5\text{ mm}$), hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102

External antenna(W1910)

Maximum conducted peak power: 7.4 mW
Antenna Gain: 1.0 dbi
Maximum EIRP available 9.3 mW

Since maximum output power of the transmitter is $9.3\text{mW} < 16\text{mW}$ (distance $\leq 5\text{ mm}$), hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102

Chip antenna

Maximum conducted peak power: 7.4 mW
Antenna Gain: 2 dbi
Maximum EIRP available 11.7 mW

Since maximum output power of the transmitter is $11.7\text{mW} < 16\text{mW}$ (distance $\leq 5\text{ mm}$), hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102

---End---