

Japan Test Report

Equipment : 802.11 b/g/n WLAN, Bluetooth & BLE Module
w/Integrated MCU

Model No. : Sterling™ – EWB

Brand Name : Laird Connectivity

Applicant : Laird Connectivity

Address : W66N220 Commerce Court, Cedarburg,
Wisconsin 53012, USA

Standard : Article 2 Paragraph 1 Item 19

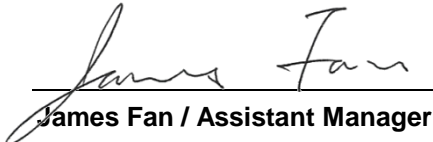
Received Date : Mar. 14, 2019

Tested Date : Apr. 23, 2019

Measurement was conducted by the following test method:
the test method of Ordinance Concerning Technical Regulations Conformity Certification
etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and
Communication notification in Annex “43” of Article 88, Paragraph 1 and ARIB STD-T66.

We, International Certification Corp., would like to declare that the tested sample has been
evaluated and in compliance with the requirement of the above standards. The test results
contained in this report refer exclusively to the product. It may be duplicated completely for
legal use with the approval of the applicant. It shall not be reproduced except in full without
the written approval of our laboratory.

Reviewed by:


James Fan / Assistant Manager

Approved by:


Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
JR931402AE	Rev. 01	Initial issue	Jul. 10, 2019

Summary of Test Results

Ref. Std. Clause	Description	Result
3.2(2)(3)	Antenna Power	Pass
3.2(4)	Frequency Tolerance	Pass
3.2(6)	Transmitter Spurious Emission	Pass
3.2(7)	Occupied Bandwidth	Pass
3.3(1)	Receiver Emission	Pass
3.4.1	Interference prevention function	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Laird Connectivity	Sterling™ – EWB	802.11 b/g/n WLAN, Bluetooth & BLE Module w/Integrated MCU	With Printed PCB Antenna
			With Connector Type Antenna

1.1.2 Specification of the Equipment under Test (EUT)

Power Type	3.3Vdc from host
Type(s) of Modulation / Technology	GFSK = 1Mbps
Frequency Range (MHz)	2402 ~ 2480 MHz
Total Channel Number	40
HW Version	R3.0
SW Version	R1.0

1.1.3 Accessories

N/A

1.1.4 Antenna Details

Ant. No.	Brand	Model	Laird Part Number	Type	Connector	Gain (dBi)	Remark
1	ACX	AT3216-A2R4PAA	AT3216-A2R4PAA	Chip	N/A	1.5	Printed PCB Antenna
2	Laird	001 -0001	001 -0001	Dipole	R-SMA	2	Connector Type Antenna
3	Laird	001-0014	001-0014	FlexPIFA	U.FL	2	Connector Type Antenna
4	Laird	001-0015	001-0015	FlexNotch	U.FL	2	Connector Type Antenna
5	Laird	001-0030	001-0030	PIFA	UFL	2	Connector Type Antenna
6	Laird	NanoBlue	EBL2400A1-10MH4L	PCB Dipole	UFL	2	Connector Type Antenna

Note: Please refer to antenna report for more details about antenna pattern and other information.

1.1.5 Antenna Power

Operating Mode	Rated Power (mW)	Measured Conducted Power (mW)	Radiated Power (mW)
LE	3.50	3.404	5.395

1.1.6 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

1.1.7 Test Tool and Power Index

Test Tool
cybluetool

Power Index			
Modulation Mode	Test Frequency (MHz)		
	2402	2440	2480
GFSK/1Mbps	default	default	default

1.1.8 Protection Method for High Frequency and Modulation Section

Protected Method	Description
Shielded case	RF and Modulation components are covered with shielding case and this shielding case is soldered

1.2 Test Equipment and Calibration Data

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101486	Jan. 08, 2019	Jan. 07, 2020
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note 1: Calibration Interval of instruments listed above is one year. Note 2: Above instruments are calibrated by Electronics Testing Center					

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Article 2 Paragraph 1 Item 19

1.4 Deviation from Test Standard and Measurement Procedure

None

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.139 Hz
Conducted power	±0.808 dB
Frequency error	±1×10 ⁻⁹
TX Conducted emission	±2.680 dB
RX Conducted emission	±3.034 dB

2 Test Configuration

2.1 Testing Location and Conditions

Test Site	Site Category	Ambient Condition	Tested By
TH01-WS	OVEN Room	22°C / 63%	Jack Li

2.2 Supporting Units

N/A

2.3 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)
Antenna Power Frequency Tolerance Occupied Bandwidth Transmitter Spurious Emission Interference prevention function Receiver Spurious Emissions	BT LE	2402 / 2440 / 2480

3 Transmitter Test Results

3.1 Antenna Power

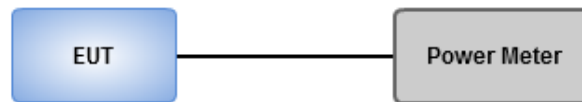
3.1.1 Limit of Antenna Power

Mode	Limit	Tolerance
1) FH, FH+DS, FH+OFDM	3 mW / MHz	+20 % , -80 %
2) OFDM(Narrow- bandwidht), DS	10 mW / MHz	
3) Other than 1) & 2)	10mW	
4) OFDM (Wide-band)	5 mW / MHz	

3.1.2 Test Procedures

Measure the total power by Power Meter

3.1.3 Test Setup



3.1.4 Test Result of Maximum Transmit Power

Reference Documents	Test Mode
Appendix A1, A2	BT-LE

3.2 Frequency Tolerance

3.2.1 Limit of Frequency Tolerance

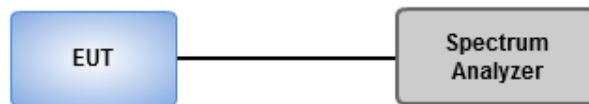
Frequency tolerance shall be +/- 50ppm.

3.2.2 Test Procedures

1. Set Span = 150kHz, RBW = 1kHz, VBW = 30kHz, Sweep time = Auto, detector = Peak.
2. Use Peak search function to find the max peak value and record this value (RF).
3. Calculate frequency tolerance by below formula
$$FT(ppm) = \{ (RF) - (MF) / (MF) \} \times 1000000$$

(FT: Frequency Tolerance, RF: Reading Frequency, MF: Measurement Frequency.)

3.2.3 Test Setup



3.2.4 Test Result of Frequency Tolerance

Reference Documents	Test Mode
Appendix B	BT-LE

3.3 Occupied Bandwidth

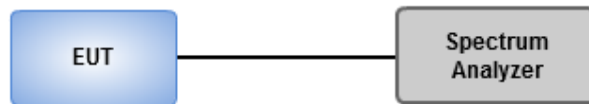
3.3.1 Limit of Occupied Bandwidth

Mode	Limit (MHz)
FH	83.5
FH+DS	83.5
FH+OFDM	83.5
OFDM(Narrow- bandwidth), DS	26
Others	26
OFDM (Wide-band)	38

3.3.2 Test Procedures

1. Set Span = 40MHz, RBW = VBW = 300kHz, detector = Peak, Sweep time = Auto.
2. Enable OBW function of spectrum analyzer to measure OBW and capture test plot.

3.3.3 Test Setup



3.3.4 Test Result of Occupied Bandwidth

Reference Documents	Test Mode
Appendix C	BT-LE

3.4 Transmitter Spurious Emissions

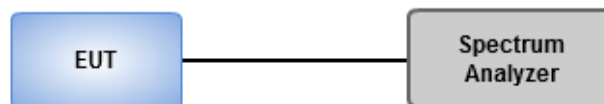
3.4.1 Limit of Transmitter Spurious Emissions

Item	Limits
Tx Spurious Emission	$\leq 2.5 \mu\text{W}$ ($2387\text{MHz} > f$; $2496.5\text{MHz} < f$).
	$\leq 25 \mu\text{W}$. ($2387\text{MHz} \leq f < 2400\text{MHz}$) and ($2483.5\text{MHz} < f \leq 2496.5\text{MHz}$).

3.4.2 Test Procedures

1. Set EUT to transmit at rated power and channel to perform test.
2. Set RBW = VBW = 1MHz, Detector type = Peak, Sweep time = Auto.
3. Following above setting of spectrum analyzer to measure spurious emission of 30~12500 MHz.

3.4.3 Test Setup



3.4.4 Test Result of Transmitter Spurious Emissions

Reference Documents	Test Mode
Appendix D	BT-LE

3.5 Interference Prevention Function

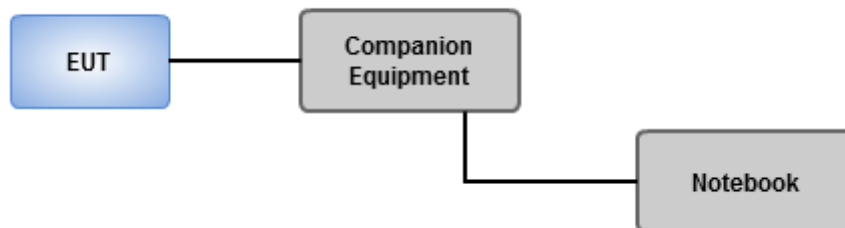
3.5.1 Limit of Interference Prevention Function

Limits
The identification code shall be 48 bits long

3.5.2 Test Procedures

1. Set EUT under operating mode and link up with companion equipment
2. Check communication status between EUT and companion equipment is normal
3. Confirm the MAC address of EUT

3.5.3 Test Setup



3.5.4 Test Result of Interference Prevention Function

Reference Documents	Test Mode
Appendix E	BT-LE

4 Receiver Test Results

4.1 Receiver Spurious Emissions

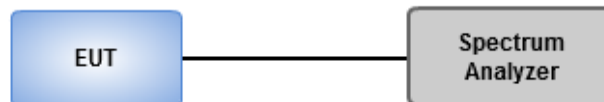
4.1.1 Limit of Receiver Spurious Emissions

Item	Limits
Rx Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$).
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$).

4.1.2 Test Procedures

1. Set EUT under receiving condition to perform test
2. Set RBW = VBW = 100kHz, detector = Peak, Sweep time = Auto for emission measurement below 1GHz.
3. Set RBW = VBW=1MHz, detector = Peak, Sweep time = Auto for emission measurement above 1GHz.

4.1.3 Test Setup



4.1.4 Test Result of Receiver Spurious Emissions

Reference Documents	Test Mode
Appendix F	BT-LE

5 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan,
R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==



Total Power-DTS Result

Appendix A.1

Summary

Mode	Power (dBm)	Power (mW)	EIRP (dBm)	EIRP (mW)
2.4-2.4835GHz	-	-	-	-
BT-LE(1Mbps)	5.32	3.404	7.32	5.395

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power (mW)	Power Lim. (mW)	EIRP (dBm)	EIRP (mW)	EIRP Lim. (mW)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.00	4.84	3.048	10	6.84	4.831	16.368
2402MHz_TnomVmin	Pass	2.00	4.72	2.965	10	6.72	4.699	16.368
2402MHz_TnomVmax	Pass	2.00	4.95	3.126	10	6.95	4.955	16.368
2440MHz_TnomVnom	Pass	2.00	5.29	3.381	10	7.29	5.358	16.368
2440MHz_TnomVmin	Pass	2.00	5.22	3.327	10	7.22	5.272	16.368
2440MHz_TnomVmax	Pass	2.00	5.32	3.404	10	7.32	5.395	16.368
2480MHz_TnomVnom	Pass	2.00	4.98	3.148	10	6.98	4.989	16.368
2480MHz_TnomVmin	Pass	2.00	4.99	3.155	10	6.99	5.000	16.368
2480MHz_TnomVmax	Pass	2.00	5.15	3.273	10	7.15	5.188	16.368



Power Tolerance-DTS Result

Appendix A.2

Summary

Mode	Result	Power (dBm)	Power (mW)	Declare (mW)	Tolerance (%)	Limit+ (%)	Limit- (%)
2.4-2.4835GHz	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	5.32	3.40408	3.50	-2.74	20	-80

Result

Mode	Result	Power (dBm)	Power (mW)	Declare (mW)	Tolerance (%)	Limit+ (%)	Limit- (%)
BT-LE(1Mbps)	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	4.84	3.04789	3.50	-12.92	20	-80
2402MHz_TnomVmin	Pass	4.72	2.96483	3.50	-15.29	20	-80
2402MHz_TnomVmax	Pass	4.95	3.12608	3.50	-10.68	20	-80
2440MHz_TnomVnom	Pass	5.29	3.38065	3.50	-3.41	20	-80
2440MHz_TnomVmin	Pass	5.22	3.32660	3.50	-4.95	20	-80
2440MHz_TnomVmax	Pass	5.32	3.40408	3.50	-2.74	20	-80
2480MHz_TnomVnom	Pass	4.98	3.14775	3.50	-10.06	20	-80
2480MHz_TnomVmin	Pass	4.99	3.15500	3.50	-9.86	20	-80
2480MHz_TnomVmax	Pass	5.15	3.27341	3.50	-6.47	20	-80



Frequency Tolerance-DTS Result

Appendix B

Summary

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
2.4-2.4835GHz	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.48G	2.48001854G	7.477	±50	1	-



Frequency Tolerance-DTS Result

Appendix B

Result

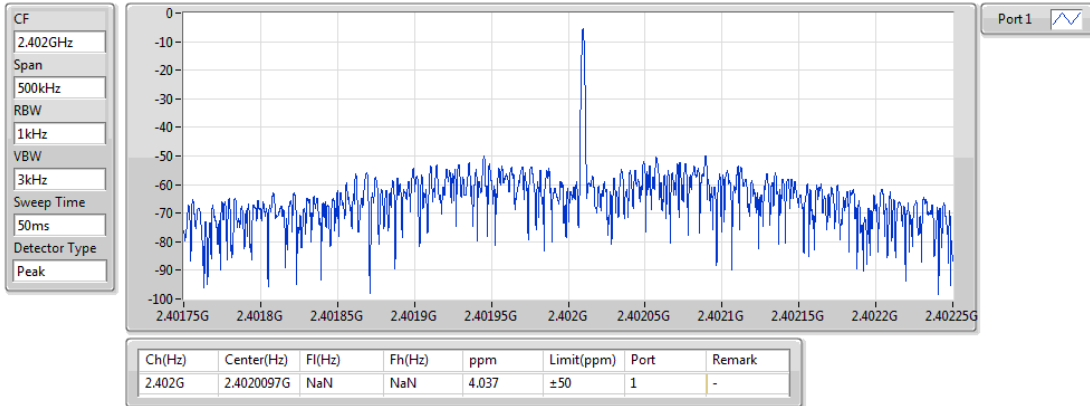
Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
BT-LE(1Mbps)	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.402G	2.4020097G	4.037	±50	1	-
2402MHz_TnomVmin	Pass	2.402G	2.40200967G	4.026	±50	1	-
2402MHz_TnomVmax	Pass	2.402G	2.40200966G	4.02	±50	1	-
2440MHz_TnomVnom	Pass	2.44G	2.44001407G	5.764	±50	1	-
2440MHz_TnomVmin	Pass	2.44G	2.44001408G	5.771	±50	1	-
2440MHz_TnomVmax	Pass	2.44G	2.44001409G	5.774	±50	1	-
2480MHz_TnomVnom	Pass	2.48G	2.48001854G	7.477	±50	1	-
2480MHz_TnomVmin	Pass	2.48G	2.48001846G	7.444	±50	1	-
2480MHz_TnomVmax	Pass	2.48G	2.48001839G	7.414	±50	1	-



BT-LE(1Mbps)

Freq. Stability

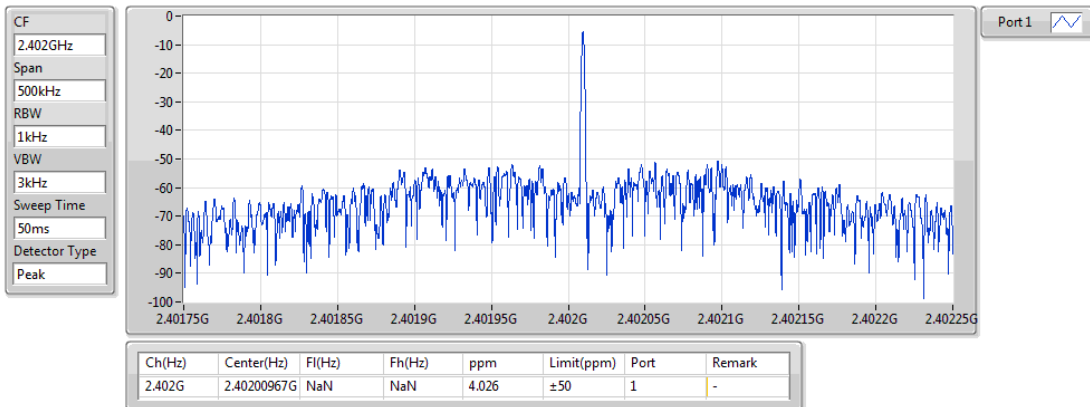
2402MHz_TnomVnom



BT-LE(1Mbps)

Freq. Stability

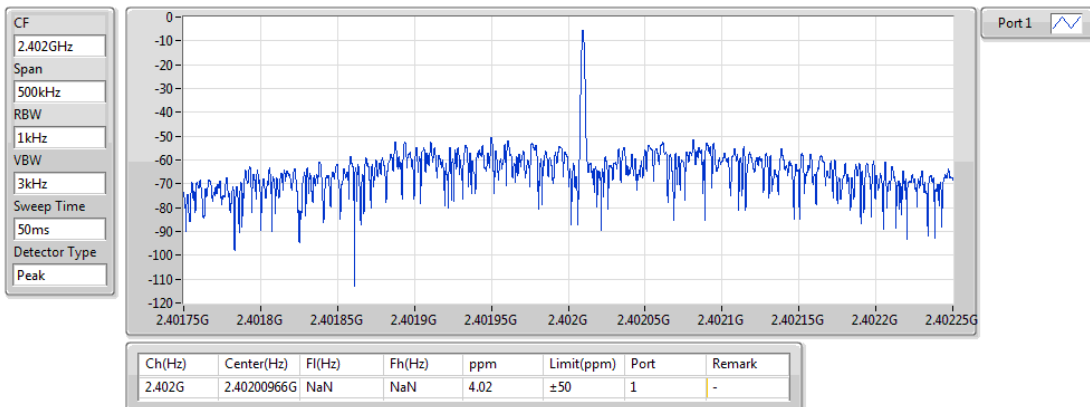
2402MHz_TnomVmin



BT-LE(1Mbps)

Freq. Stability

2402MHz_TnomVmax





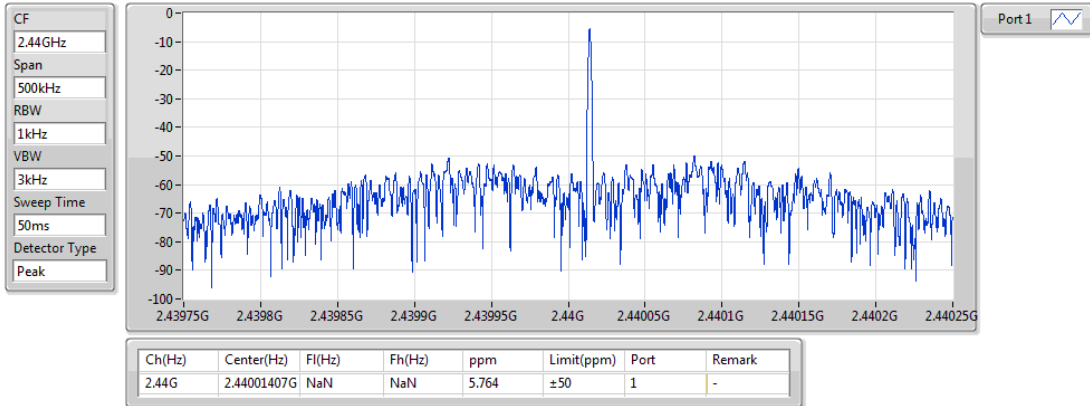
Frequency Tolerance-DTS Result

Appendix B

BT-LE(1Mbps)

Freq. Stability

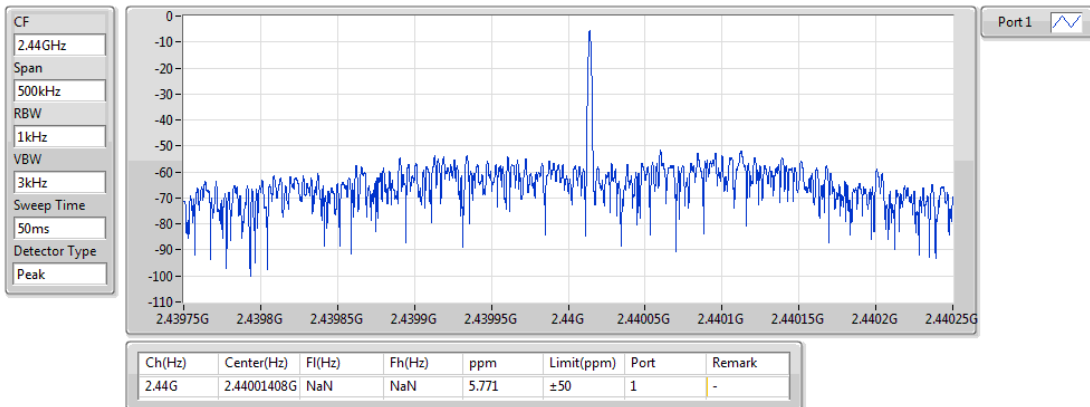
2440MHz_TnomVnom



BT-LE(1Mbps)

Freq. Stability

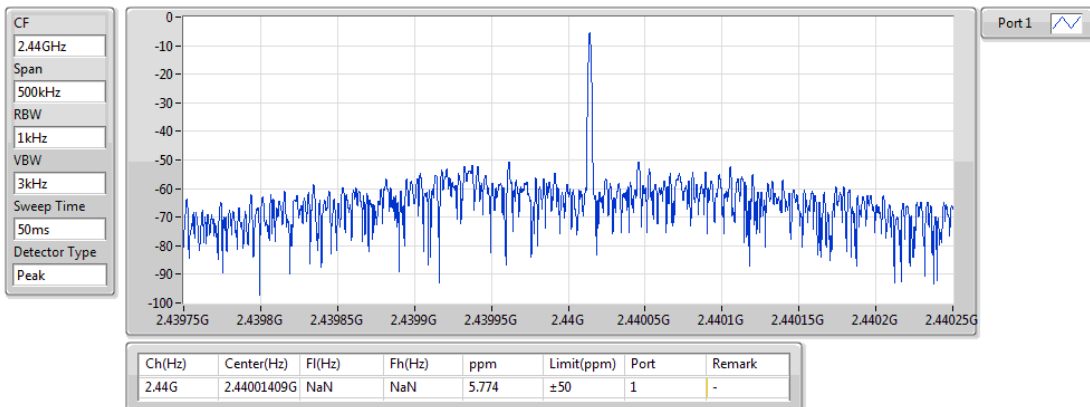
2440MHz_TnomVmin



BT-LE(1Mbps)

Freq. Stability

2440MHz_TnomVmax

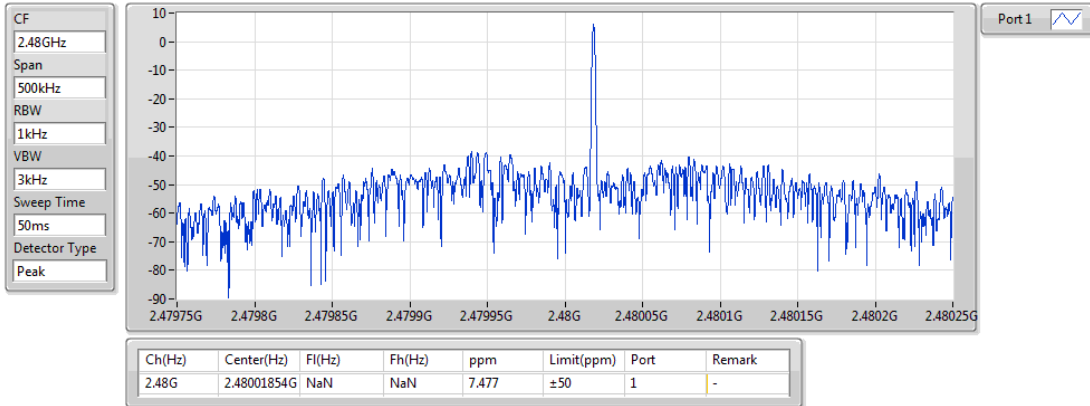




BT-LE(1Mbps)

Freq. Stability

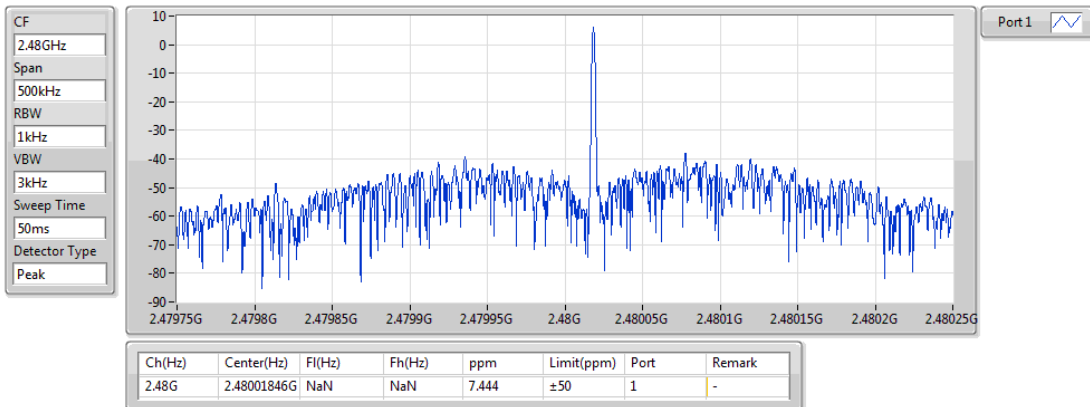
2480MHz_TnomVnom



BT-LE(1Mbps)

Freq. Stability

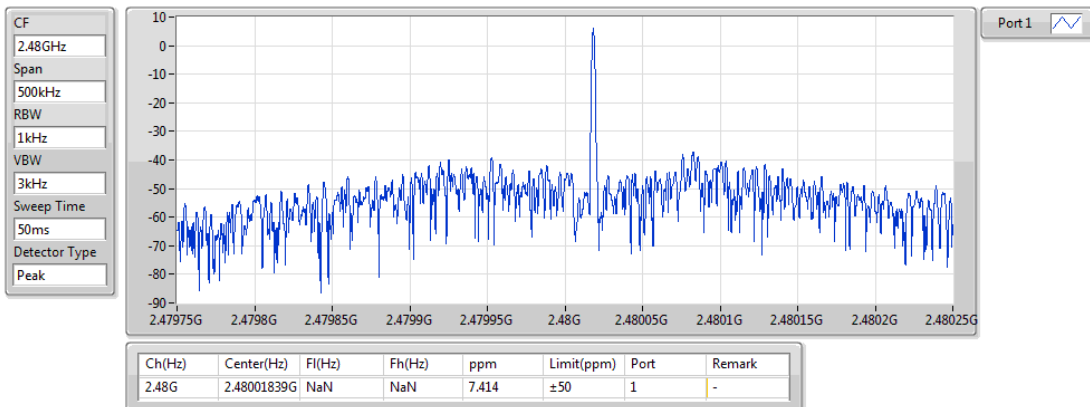
2480MHz_TnomVmin



BT-LE(1Mbps)

Freq. Stability

2480MHz_TnomVmax





Occupied Bandwidth-DTS Result

Appendix C

Summary

Mode	Max-OBW (Hz)	ITU-Code	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-
BT-LE(1Mbps)	1.294M	1M29F1D	1.289M

Max-OBW = Maximum 99% occupied bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	P1-OBW (Hz)
BT-LE(1Mbps)	-	-	-
2402MHz_TnomVnom	Pass	26M	1.294M
2402MHz_TnomVmin	Pass	26M	1.291M
2402MHz_TnomVmax	Pass	26M	1.292M
2440MHz_TnomVnom	Pass	26M	1.294M
2440MHz_TnomVmin	Pass	26M	1.294M
2440MHz_TnomVmax	Pass	26M	1.293M
2480MHz_TnomVnom	Pass	26M	1.292M
2480MHz_TnomVmin	Pass	26M	1.289M
2480MHz_TnomVmax	Pass	26M	1.292M

P1-OBW = Port 1 99% occupied bandwidth;



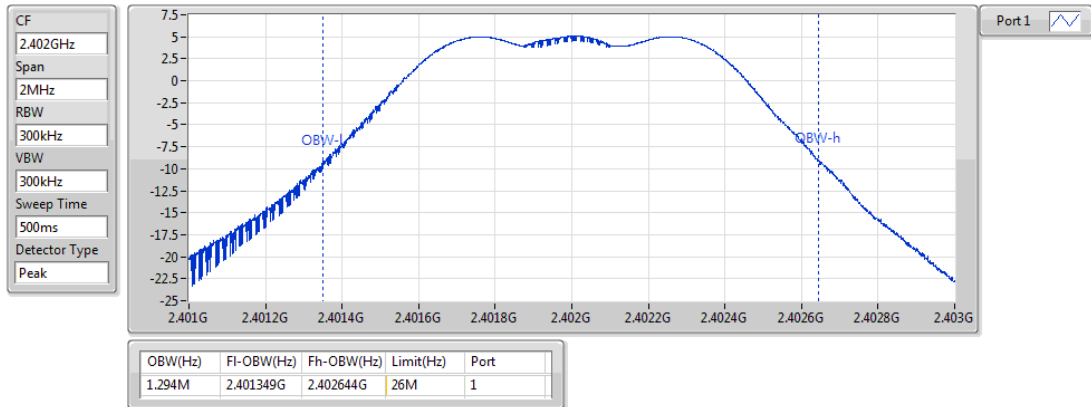
Occupied Bandwidth-DTS Result

Appendix C

BT-LE(1Mbps)

OBW

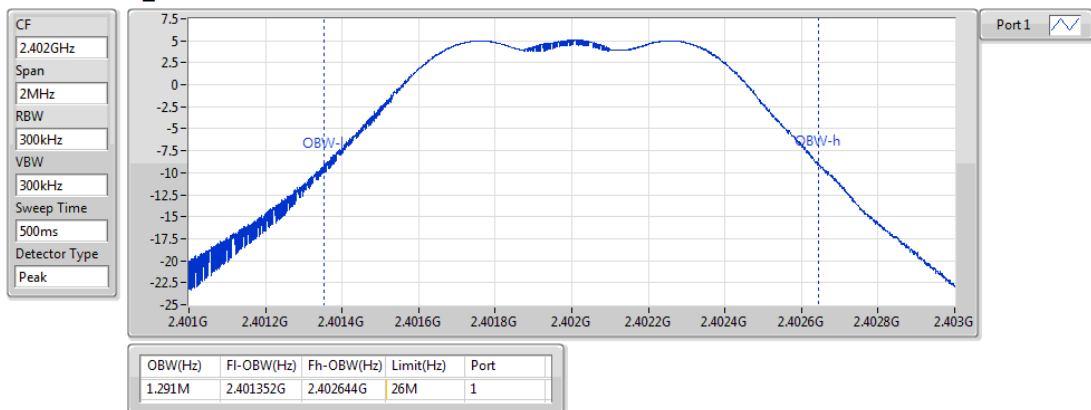
2402MHz_TnomVnom



BT-LE(1Mbps)

OBW

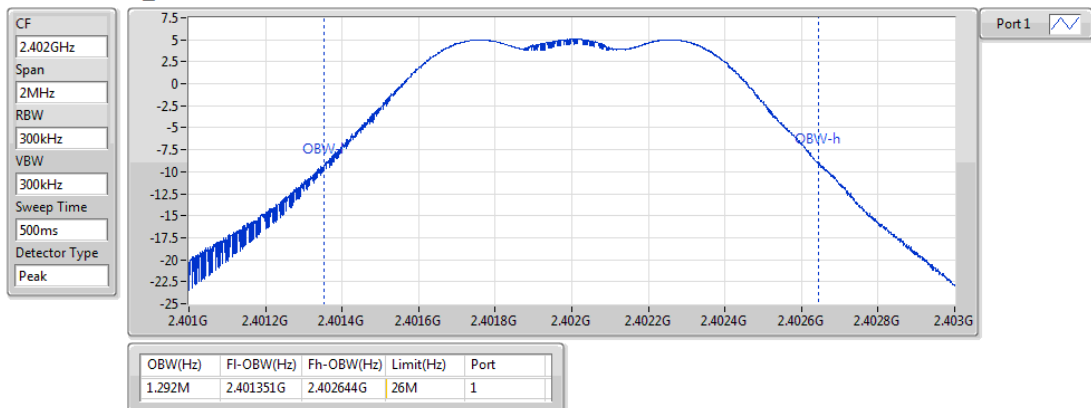
2402MHz_TnomVmin



BT-LE(1Mbps)

OBW

2402MHz_TnomVmax

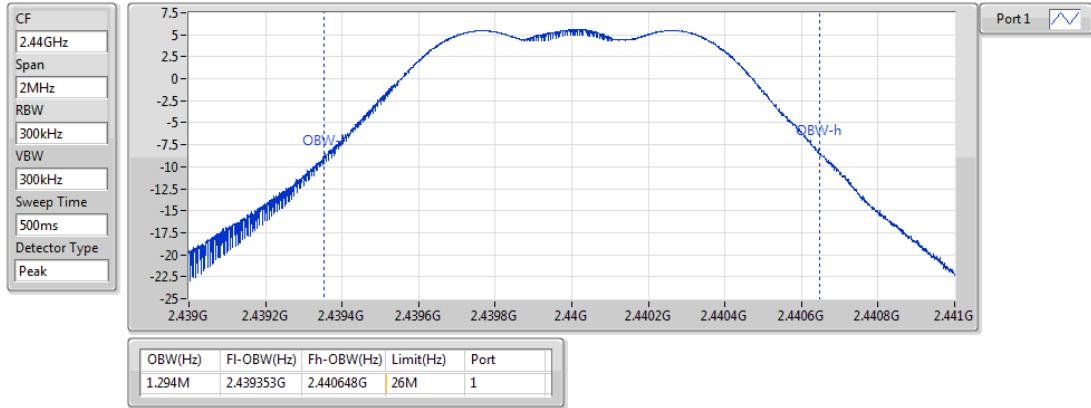




BT-LE(1Mbps)

OBW

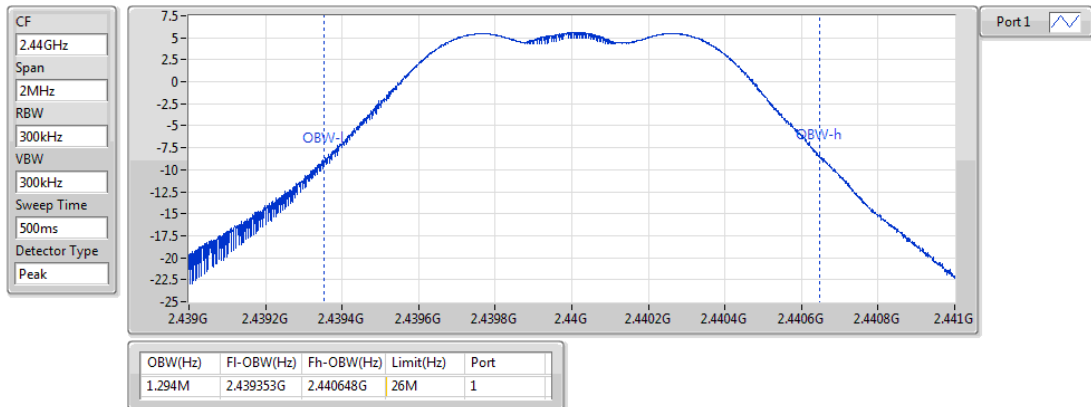
2440MHz_TnomVnom



BT-LE(1Mbps)

OBW

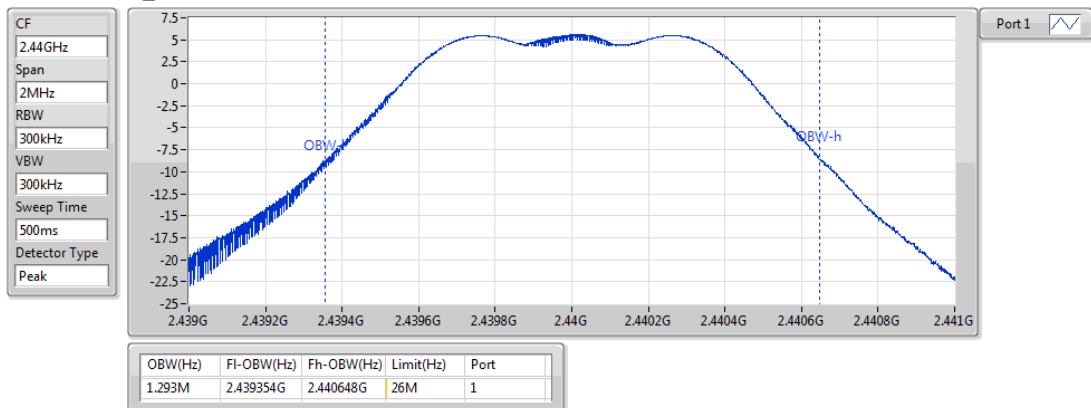
2440MHz_TnomVmin



BT-LE(1Mbps)

OBW

2440MHz_TnomVmax

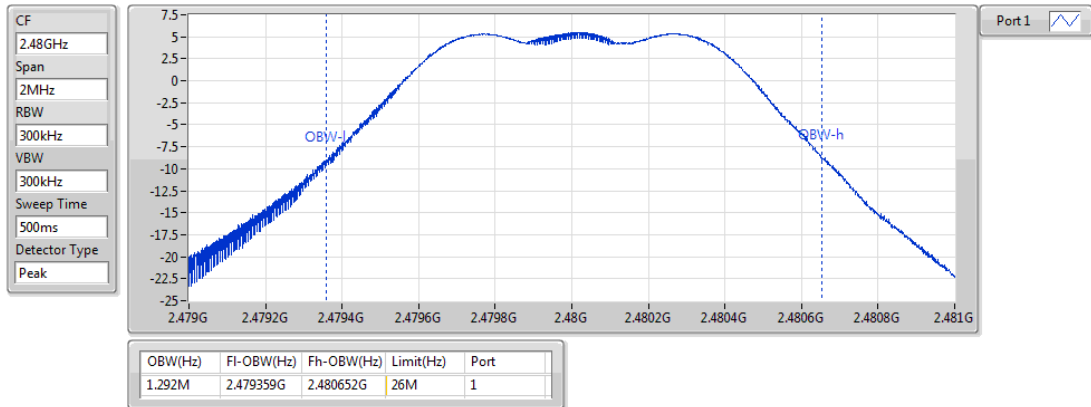




BT-LE(1Mbps)

OBW

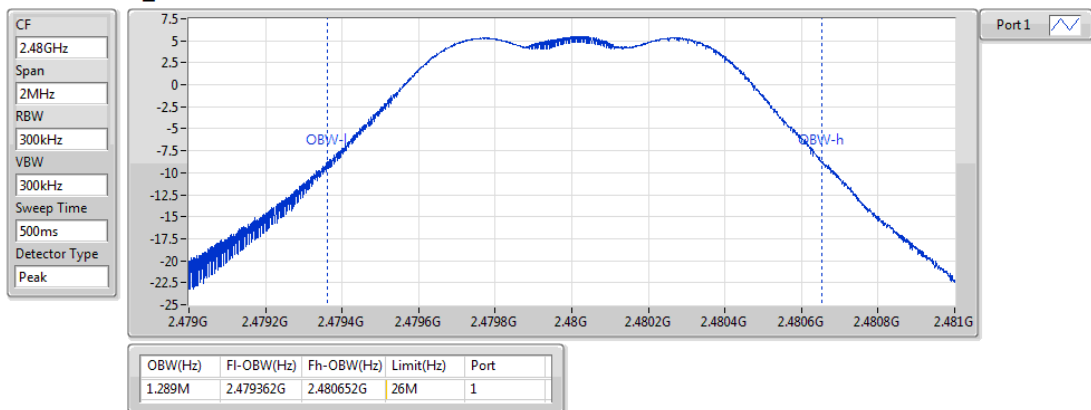
2480MHz_TnomVnom



BT-LE(1Mbps)

OBW

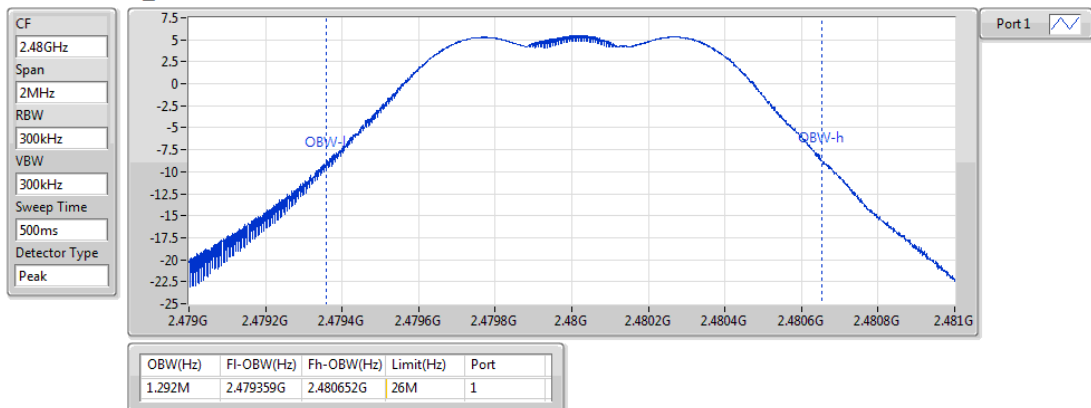
2480MHz_TnomVmin



BT-LE(1Mbps)

OBW

2480MHz_TnomVmax





CSE-TX Unwanted Emission Strength-DTS Result

Appendix D

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	Freq (Hz)	Psum (dBm)	Psum (uW/MHz)	Limit (dBm)	Limit (uW/MHz)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.387G	2.4G	1M	2.39997G	-32.21	0.60117	-16.02	25

**CSE-TX Unwanted Emission Strength-DTS Result****Appendix D****Result**

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	Freq (Hz)	Psum (dBm)	Psum (uW/MHz)	Limit (dBm)	Limit (uW/MHz)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	30M	2.387G	1M	2.32808G	-53.28	0.0047	-26.02	2.5
2402MHz_TnomVnom	Pass	2.387G	2.4G	1M	2.39997G	-32.21	0.60117	-16.02	25
2402MHz_TnomVnom	Pass	2.4835G	2.4965G	1M	2.48696G	-53.56	0.00441	-16.02	25
2402MHz_TnomVnom	Pass	2.4965G	12.5G	1M	10.52431G	-42.92	0.05105	-26.02	2.5
2402MHz_TnomVmin	Pass	30M	2.387G	1M	2.26797G	-53.47	0.0045	-26.02	2.5
2402MHz_TnomVmin	Pass	2.387G	2.4G	1M	2.39997G	-33.99	0.39902	-16.02	25
2402MHz_TnomVmin	Pass	2.4835G	2.4965G	1M	2.48662G	-53.49	0.00448	-16.02	25
2402MHz_TnomVmin	Pass	2.4965G	12.5G	1M	12.48249G	-42.86	0.05176	-26.02	2.5
2402MHz_TnomVmax	Pass	30M	2.387G	1M	2.36579G	-53.41	0.00456	-26.02	2.5
2402MHz_TnomVmax	Pass	2.387G	2.4G	1M	2.39995G	-33.19	0.47973	-16.02	25
2402MHz_TnomVmax	Pass	2.4835G	2.4965G	1M	2.49177G	-53.52	0.00445	-16.02	25
2402MHz_TnomVmax	Pass	2.4965G	12.5G	1M	12.495G	-42.54	0.05572	-26.02	2.5
2440MHz_TnomVnom	Pass	30M	2.387G	1M	1.46423G	-52.97	0.00505	-26.02	2.5
2440MHz_TnomVnom	Pass	2.387G	2.4G	1M	2.39698G	-54.16	0.00384	-16.02	25
2440MHz_TnomVnom	Pass	2.4835G	2.4965G	1M	2.48657G	-53.57	0.0044	-16.02	25
2440MHz_TnomVnom	Pass	2.4965G	12.5G	1M	12.49625G	-42.62	0.0547	-26.02	2.5
2440MHz_TnomVmin	Pass	30M	2.387G	1M	889.13M	-53.62	0.00435	-26.02	2.5
2440MHz_TnomVmin	Pass	2.387G	2.4G	1M	2.39477G	-54.19	0.00381	-16.02	25
2440MHz_TnomVmin	Pass	2.4835G	2.4965G	1M	2.48982G	-53.64	0.00433	-16.02	25
2440MHz_TnomVmin	Pass	2.4965G	12.5G	1M	10.51806G	-42.51	0.0561	-26.02	2.5
2440MHz_TnomVmax	Pass	30M	2.387G	1M	2.32808G	-53.35	0.00462	-26.02	2.5
2440MHz_TnomVmax	Pass	2.387G	2.4G	1M	2.39522G	-54.18	0.00382	-16.02	25
2440MHz_TnomVmax	Pass	2.4835G	2.4965G	1M	2.4888G	-53.59	0.00438	-16.02	25
2440MHz_TnomVmax	Pass	2.4965G	12.5G	1M	12.46999G	-42.55	0.05559	-26.02	2.5
2480MHz_TnomVnom	Pass	30M	2.387G	1M	2.34575G	-53.58	0.00439	-26.02	2.5
2480MHz_TnomVnom	Pass	2.387G	2.4G	1M	2.39672G	-54.21	0.00379	-16.02	25
2480MHz_TnomVnom	Pass	2.4835G	2.4965G	1M	2.4836G	-52.50	0.00562	-16.02	25
2480MHz_TnomVnom	Pass	2.4965G	12.5G	1M	10.53056G	-42.71	0.05358	-26.02	2.5
2480MHz_TnomVmin	Pass	30M	2.387G	1M	2.31511G	-53.50	0.00447	-26.02	2.5
2480MHz_TnomVmin	Pass	2.387G	2.4G	1M	2.39064G	-54.17	0.00383	-16.02	25
2480MHz_TnomVmin	Pass	2.4835G	2.4965G	1M	2.48353G	-52.47	0.00566	-16.02	25
2480MHz_TnomVmin	Pass	2.4965G	12.5G	1M	12.47749G	-42.73	0.05333	-26.02	2.5
2480MHz_TnomVmax	Pass	30M	2.387G	1M	2.29272G	-53.67	0.0043	-26.02	2.5

**CSE-TX Unwanted Emission Strength-DTS Result**

Appendix D

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	Freq (Hz)	Psum (dBm)	Psum (uW/MHz)	Limit (dBm)	Limit (uW/MHz)
2480MHz_TnomVmax	Pass	2.387G	2.4G	1M	2.39249G	-54.16	0.00384	-16.02	25
2480MHz_TnomVmax	Pass	2.4835G	2.4965G	1M	2.48355G	-52.37	0.00579	-16.02	25
2480MHz_TnomVmax	Pass	2.4965G	12.5G	1M	12.49125G	-42.65	0.05433	-26.02	2.5



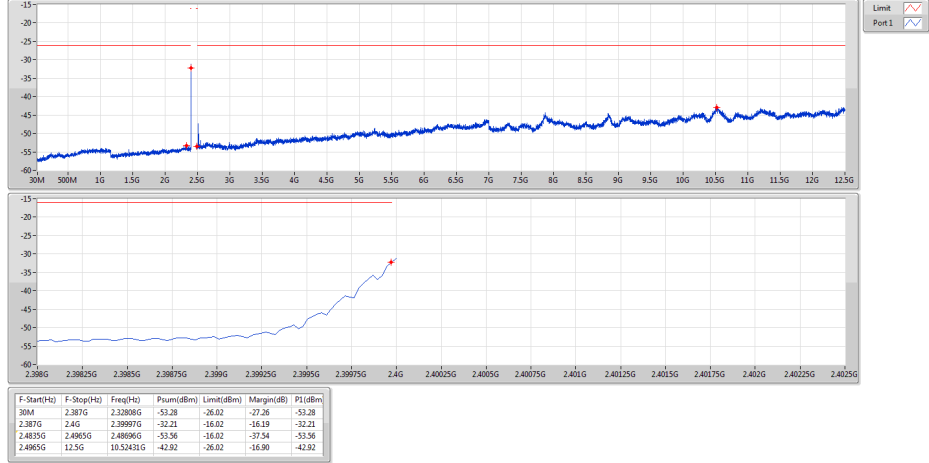
CSE-TX Unwanted Emission Strength-DTS Result

Appendix D

BT-LE(1Mbps)

CSE-TX-DTS

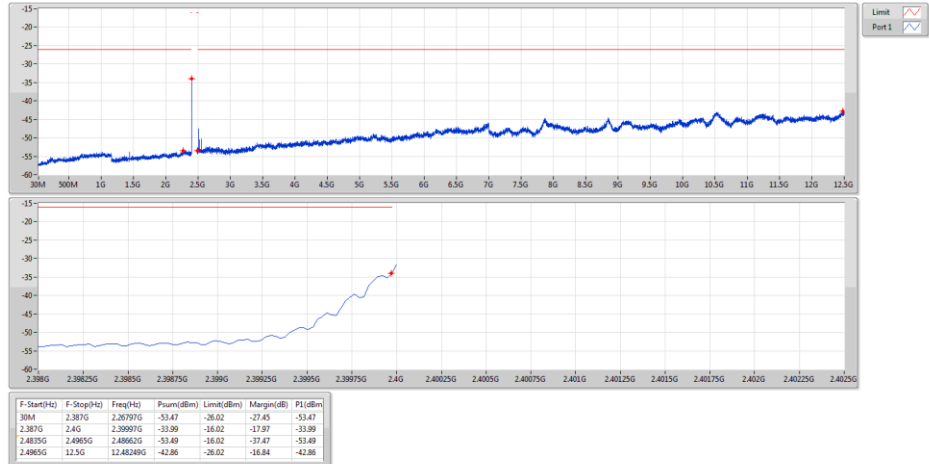
2402MHz_TnomVnom



BT-LE(1Mbps)

CSE-TX-DTS

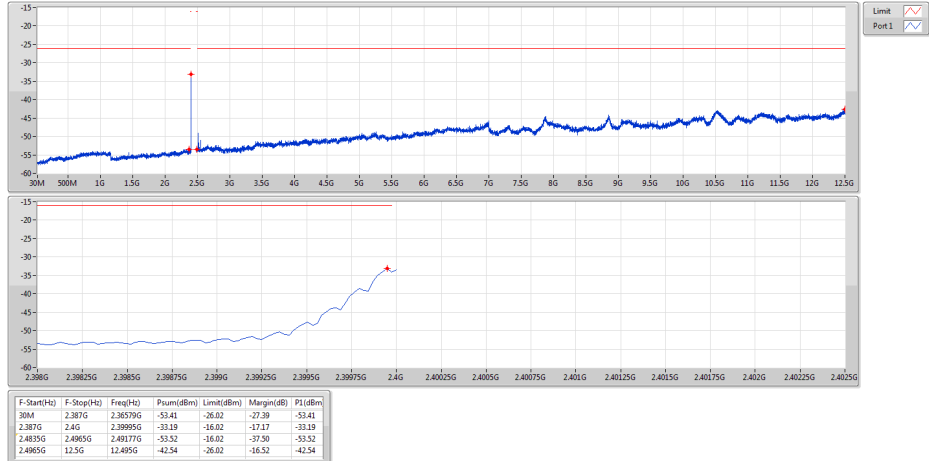
2402MHz_TnomVmin



BT-LE(1Mbps)

CSE-TX-DTS

2402MHz_TnomVmax





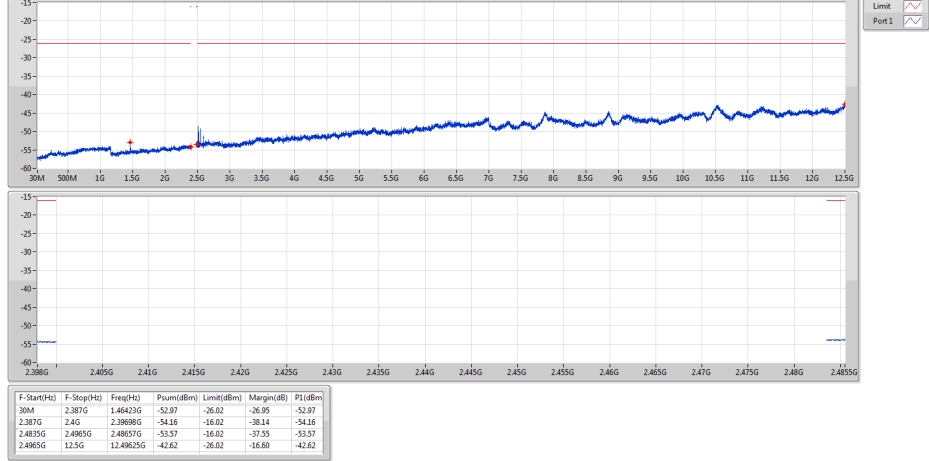
CSE-TX Unwanted Emission Strength-DTS Result

Appendix D

BT-LE(1Mbps)

CSE-TX-DTS

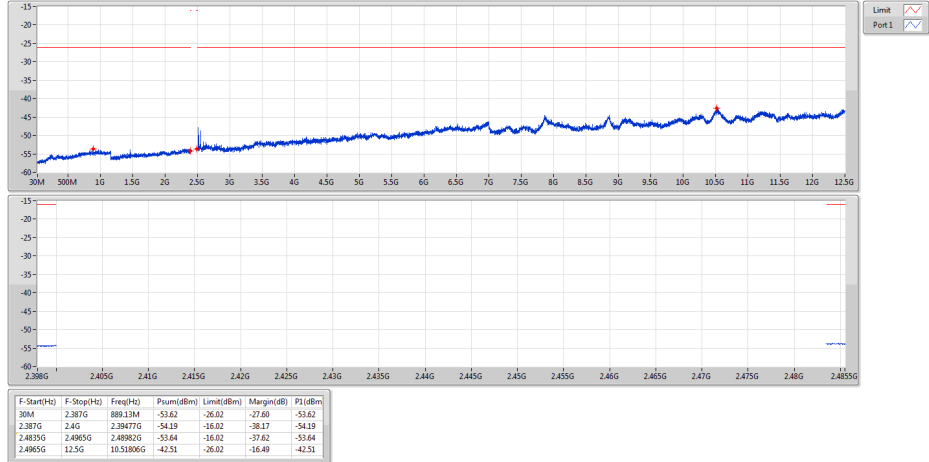
2440MHz_TnomVnom



BT-LE(1Mbps)

CSE-TX-DTS

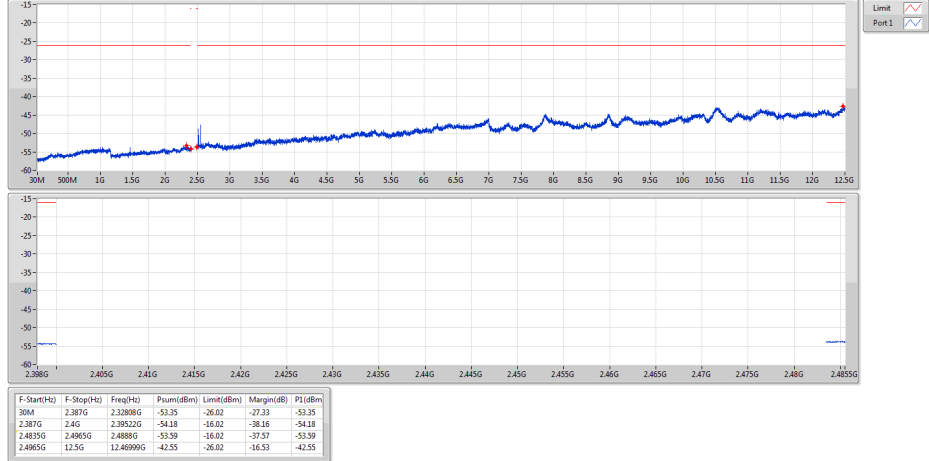
2440MHz_TnomVmin



BT-LE(1Mbps)

CSE-TX-DTS

2440MHz_TnomVmax





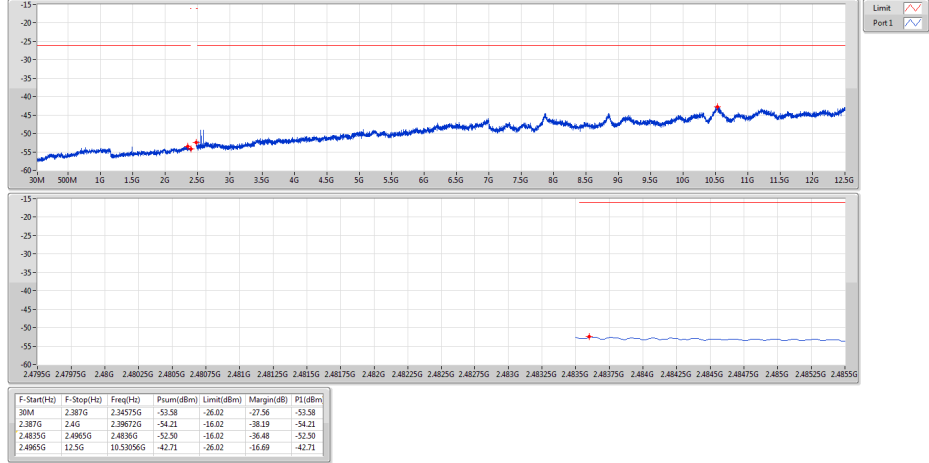
CSE-TX Unwanted Emission Strength-DTS Result

Appendix D

BT-LE(1Mbps)

CSE-TX-DTS

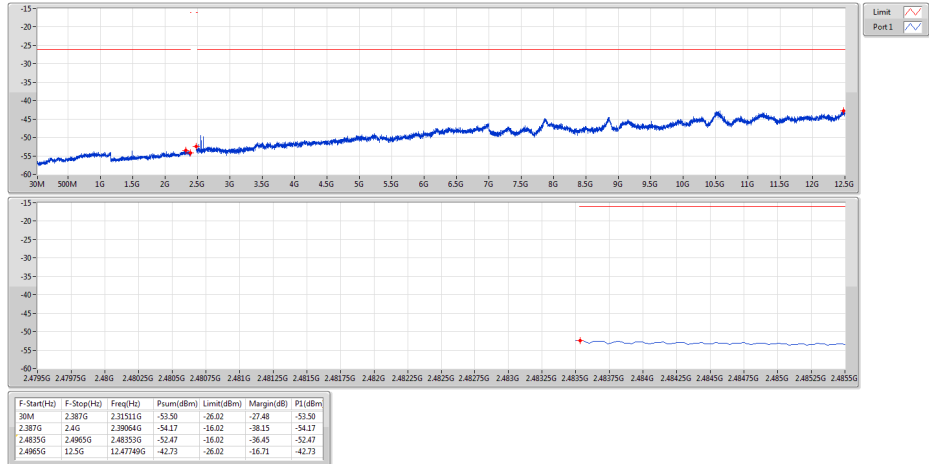
2480MHz_TnomVnom



BT-LE(1Mbps)

CSE-TX-DTS

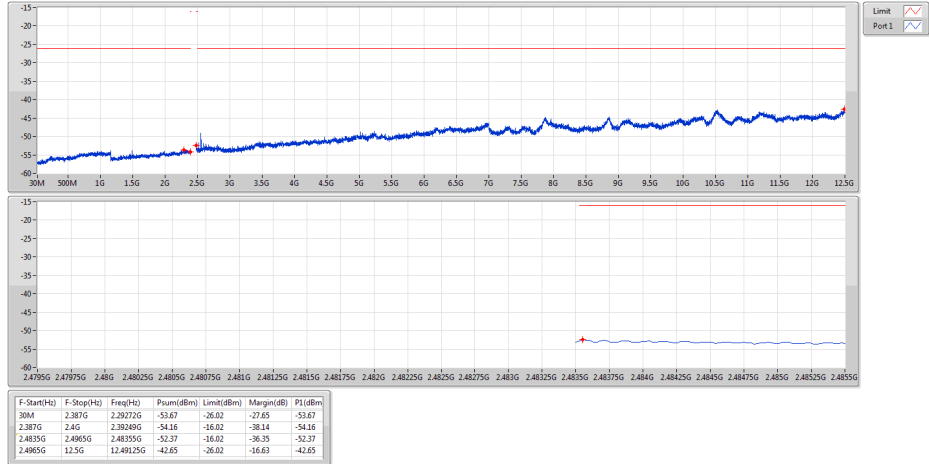
2480MHz_TnomVmin



BT-LE(1Mbps)

CSE-TX-DTS

2480MHz_TnomVmax





Interference Prevention Function-DTSResult

Appendix E

Summary

Mode	Result	ID Length	ID Limit	Function
2.4-2.4835GHz	-	-	-	-
BT-LE(1Mbps)	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good



Interference Prevention Function-DTSResult

Appendix E

Result

Mode	Result	ID Length	ID Limit	Function
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2402MHz_TnomVmin	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2402MHz_TnomVmax	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2440MHz_TnomVnom	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2440MHz_TnomVmin	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2440MHz_TnomVmax	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2480MHz_TnomVnom	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2480MHz_TnomVmin	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good
2480MHz_TnomVmax	Pass	AA:AA:AA:AA:AA:AA	48 bits	Good

**CSE-RX Secondary Radiated Emissions-DTS Result**

Appendix F

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	Freq (Hz)	Psum (dBm)	Psum (nW/MHz)	Limit (dBm)	Limit (nW/MHz)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	1G	12.5G	1M	10.50475G	-76.09	0.0246	-46.99	20

**CSE-RX Secondary Radiated Emissions-DTS Result****Appendix F****Result**

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	Freq (Hz)	Psum (dBm)	Psum (nW/MHz)	Limit (dBm)	Limit (nW/MHz)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	30M	1G	100k	952.96M	-93.97	0.0004	-53.98	4
2402MHz_TnomVnom	Pass	1G	12.5G	1M	10.52631G	-76.53	0.02223	-46.99	20
2402MHz_TnomVmin	Pass	30M	1G	100k	959.75M	-94.49	0.00036	-53.98	4
2402MHz_TnomVmin	Pass	1G	12.5G	1M	10.53494G	-76.36	0.02312	-46.99	20
2402MHz_TnomVmax	Pass	30M	1G	100k	874.39M	-96.30	0.00023	-53.98	4
2402MHz_TnomVmax	Pass	1G	12.5G	1M	10.53206G	-76.47	0.02254	-46.99	20
2440MHz_TnomVnom	Pass	30M	1G	100k	958.78M	-93.53	0.00044	-53.98	4
2440MHz_TnomVnom	Pass	1G	12.5G	1M	10.50475G	-76.09	0.0246	-46.99	20
2440MHz_TnomVmin	Pass	30M	1G	100k	939.38M	-94.92	0.00032	-53.98	4
2440MHz_TnomVmin	Pass	1G	12.5G	1M	10.54644G	-76.49	0.02244	-46.99	20
2440MHz_TnomVmax	Pass	30M	1G	100k	958.78M	-93.64	0.00043	-53.98	4
2440MHz_TnomVmax	Pass	1G	12.5G	1M	10.52056G	-76.51	0.02234	-46.99	20
2480MHz_TnomVnom	Pass	30M	1G	100k	958.78M	-94.63	0.00034	-53.98	4
2480MHz_TnomVnom	Pass	1G	12.5G	1M	12.49569G	-76.10	0.02455	-46.99	20
2480MHz_TnomVmin	Pass	30M	1G	100k	959.75M	-94.07	0.00039	-53.98	4
2480MHz_TnomVmin	Pass	1G	12.5G	1M	10.50763G	-76.29	0.0235	-46.99	20
2480MHz_TnomVmax	Pass	30M	1G	100k	958.78M	-93.52	0.00044	-53.98	4
2480MHz_TnomVmax	Pass	1G	12.5G	1M	12.49138G	-76.31	0.02339	-46.99	20



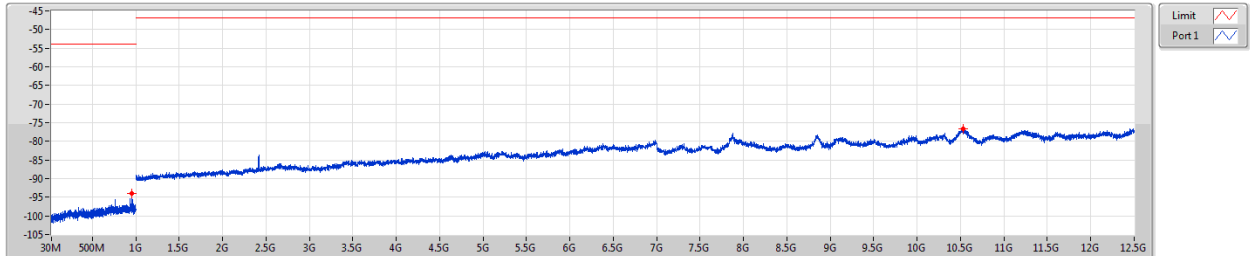
CSE-RX Secondary Radiated Emissions-DTS Result

Appendix F

BT-LE(1Mbps)

CSE-RX-DTS

2402MHz_TnomVnom

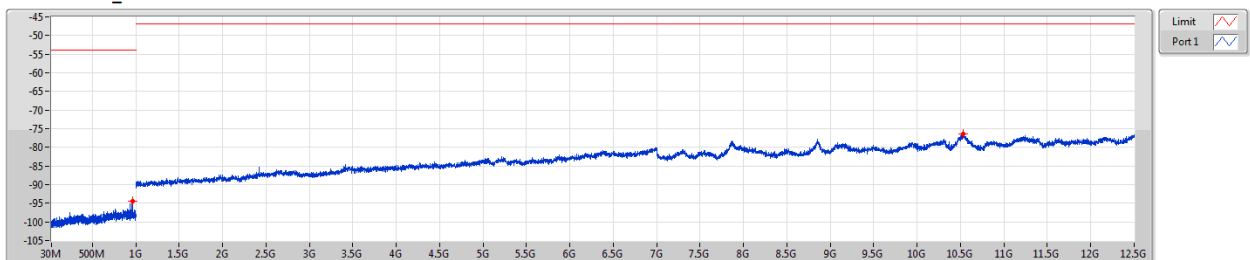


F-Start(Hz)	F-Stop(Hz)	Freq(Hz)	Psum(dBm)	Limit(dBm)	Margin(dB)	P1(dBm)
30M	1G	952.96M	-93.97	-53.98	-39.99	-93.97
1G	12.5G	10.52631G	-76.53	-46.99	-29.54	-76.53

BT-LE(1Mbps)

CSE-RX-DTS

2402MHz_TnomVmin

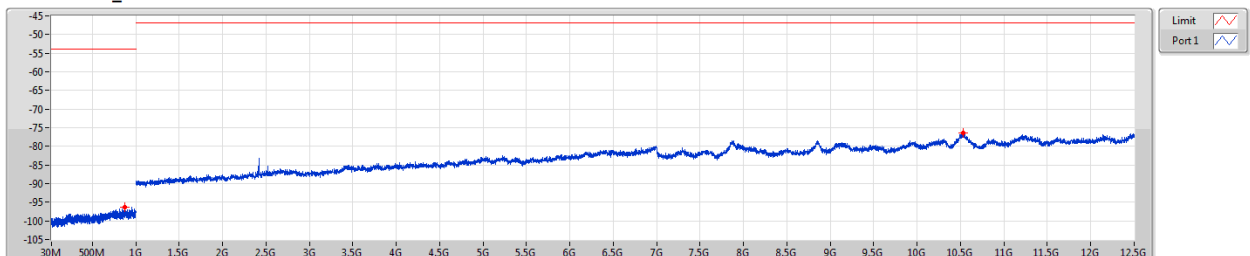


F-Start(Hz)	F-Stop(Hz)	Freq(Hz)	Psum(dBm)	Limit(dBm)	Margin(dB)	P1(dBm)
30M	1G	959.75M	-94.49	-53.98	-40.51	-94.49
1G	12.5G	10.53494G	-76.36	-46.99	-29.37	-76.36

BT-LE(1Mbps)

CSE-RX-DTS

2402MHz_TnomVmax



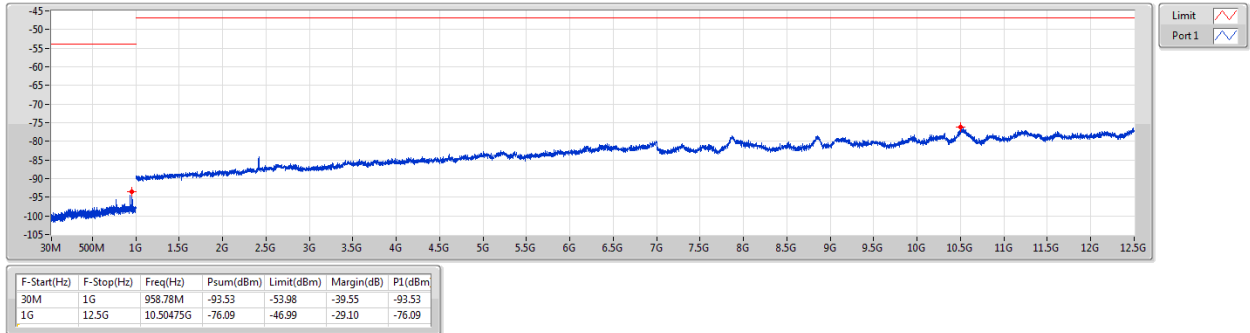
F-Start(Hz)	F-Stop(Hz)	Freq(Hz)	Psum(dBm)	Limit(dBm)	Margin(dB)	P1(dBm)
30M	1G	874.39M	-96.30	-53.98	-42.32	-96.30
1G	12.5G	10.53206G	-76.47	-46.99	-29.48	-76.47



BT-LE(1Mbps)

CSE-RX-DTS

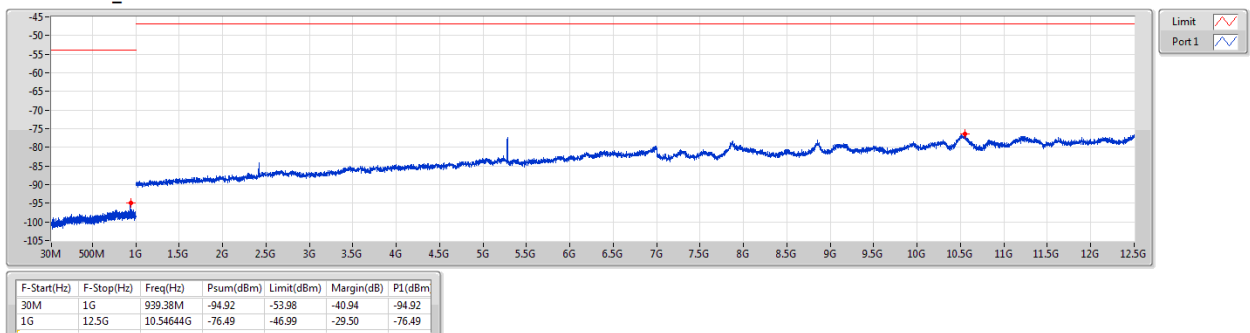
2440MHz_TnomVnom



BT-LE(1Mbps)

CSE-RX-DTS

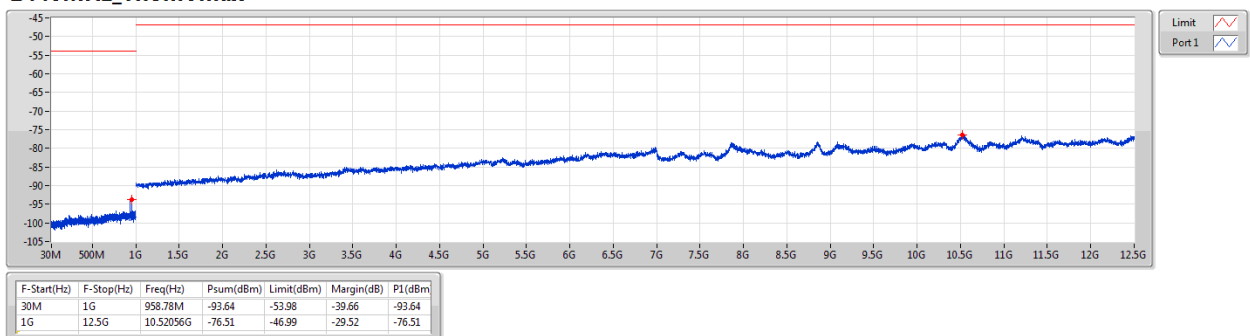
2440MHz_TnomVmin



BT-LE(1Mbps)

CSE-RX-DTS

2440MHz_TnomVmax

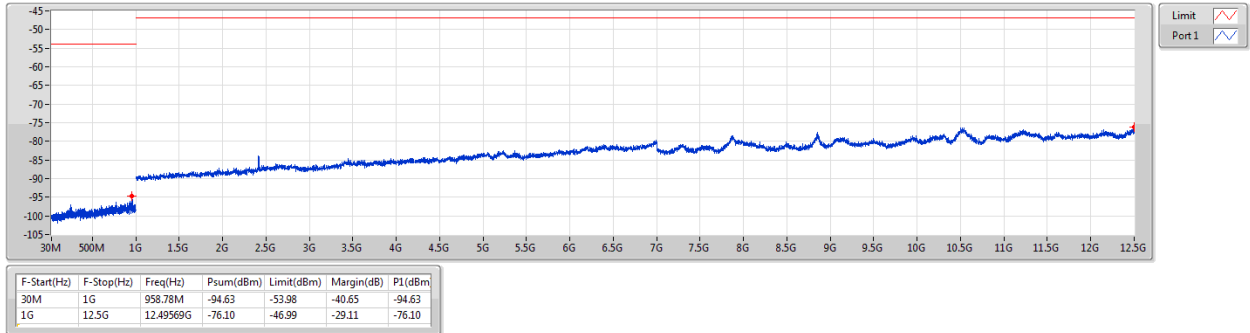




BT-LE(1Mbps)

CSE-RX-DTS

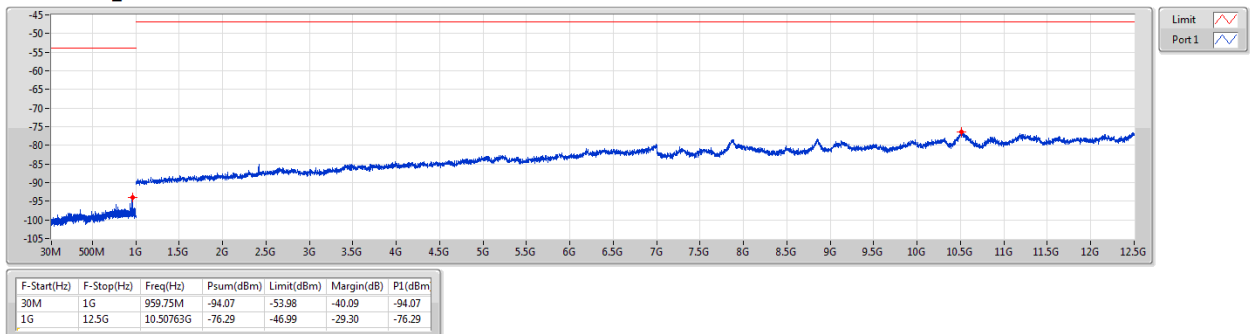
2480MHz_TnomVnom



BT-LE(1Mbps)

CSE-RX-DTS

2480MHz_TnomVmin



BT-LE(1Mbps)

CSE-RX-DTS

2480MHz_TnomVmax

