FCC Test Report

FCC ID	:	**UDX-600109010**
Equipment	:	**Wi-Fi 6 Indoor Access Point**
Brand Name	:	**CISCO**
Model Name	:	**MR44-HW**
Applicant	:	**Cisco Systems, Inc. 170 West Tasman Drive San Jose, CA 95134 USA**
Manufacturer	:	**Cisco Systems, Inc. 170 West Tasman Drive San Jose, CA 95134 USA**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Apr. 04, 2020, and testing was started from Apr. 04, 2020 and completed on Jun. 08, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
FR041301AL	01	Initial issue of report	Jun. 18, 2020
FR041301AL	02	Modify brand name. This report is the latest version replacing for the report issued on Jun. 18, 2020	Jul. 03, 2020

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	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:
None

Reviewed by: Sam Tsai

Report Producer: Jenny Yang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

Note:
- Bluetooth LE uses a GFSK (1Mbps) modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Number (P/N)	Antenna Type	Connector	Antenna Gain (dBi)			Remark
						2.4GHz	5GHz	BLE	
1	1	SENAO	ANT X-Ray 5G1 MET 26.8*18.6*7.9_1.37LL BLACK ASSEM	PIFA	I-Pex	-	5.5	-	Radio 1
2	2	SENAO	ANT X-Ray 5G2 MET 26.8*18.6*7.9_1.37LL YELLOW ASSEM	PIFA	I-Pex	-	5.9	-	Radio 1
3	3	SENAO	ANT X-Ray 5G3 MET 21*10*5_1.37LL BROWN ASSEM	PIFA	I-Pex	-	5.6	-	Radio 1
4	4	SENAO	ANT X-Ray 5G4 MET 21*10*5_1.37LL RED ASSEM	PIFA	I-Pex	-	5.4	-	Radio 1
5	1	SENAO	ANT X-Ray 2G1 MET 45.5*31.0*8.0_1.37LL GRAY ASSEM	PIFA	I-Pex	5.0	-	-	Radio 2
6	2	SENAO	ANT X-Ray 2G2 MET 45.5*31.0*8.0_1.37LL BLUE ASSEM	PIFA	I-Pex	4.9	-	-	Radio 2
7	1	SENAO	ANT X-Ray Scan PCB 35*10*0.4_1.37LL WHITE ASSEM	PCB	I-Pex	5.4	6.2	-	Radio 3
8	1	SENAO	ANT X-Ray ble PCB 38*6.5*0.4_1.37LL ORANGE ASSEM	PCB	I-Pex	-	-	5	Radio 4

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (1TX/1RX)

Only Ant.7 (port 1) can be used as transmitting/receiving antenna.

For IEEE 802.11 b/g/n/ac/ax mode (2TX/2RX)

Ant.5 (Port 1) and Ant.6 (port 2) could transmit/receive simultaneously.

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Only Ant.8 (port 1) can be used as transmitting/receiving antenna.

For 5GHz function:

For IEEE 802.11 a/n/ac mode (1TX/1RX)

Only Ant.7 (port 1) can be used as transmitting/receiving antenna.

For IEEE 802.11 a/n/ac/ax mode (4TX/4RX)

Ant.1 (Port 1) and Ant.2 (port 2) and Ant.3 (port 3) and Ant.4 (port 4) could transmit/receive simultaneously.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From Adapter / PoE			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point
Type of EUT				
☒	Stand-alone			
☐	Combined (EUT where the radio part is fully integrated within another device)			
	Combined Equipment - Brand Name / Model No.:	…		
☐	Plug-in radio (EUT intended for a variety of host systems)			
	Host System - Brand Name / Model No.:	…		
☐	Other:			

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.205	6.88	128.125u	10k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

1.2 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB 558074 D01 v05r02
- KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location			
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			
☐	Wen Shan	ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
		TEL : 886-3-318-0787	FAX : 886-3-318-0287
Test site Designation No. TW1097 with FCC.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward Wang	21.8~23.4°C / 58~ 61%	12/May/2020
RF Conducted	TH06-HY	Raven Chien	22.4~23.5°C / 58~67%	08/Apr/2020~ 15/May/2020
Radiated	03CH02-HY	Streak Liao	21.6~25.2°C / 54.1~ 56.2%	04/Apr/2020~ 08/Jun/2020

1.4 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)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	120V

2.2 Test Channel Mode

Test Software	CMD

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	170
2440MHz	200
2480MHz	130

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	PoE mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	PoE mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT		V	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Radio1 WLAN 5G+ Radio2 WLAN 2.4G+ Radio3 WLAN 2.4G+ Bluetooth
2	Radio1 WLAN 5G+ Radio2 WLAN 2.4G+ Radio3 WLAN 5G+ Bluetooth
Refer to Sporton Test Report No.: FA041301 for Co-location RF Exposure Evaluation.	

2.4 Accessories

Accessories				
Mounting bracket	Brand Name	TIMSON	Model Name	BRACKET MOUNT CRADLE

Reminder: Regarding to more detail and other information, please refer to user manual.

2.5 Support Equipment

Support Equipment – AC Conduction					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	PoE	CISCO	BRACKET MOUNT CRADI	-	Note 1
2	AC Power Cable	Power sync	PW-GPC180-3	-	-
3	RJ-45 cable	Power Sync	CAT-6E-01	-	-
4	RJ-45 cable	Power Sync	CAT-6E-10	-	-
5	PoE for Beamforming	CISCO	BRACKET MOUNT CRADI	-	Note 1/ Remote
6	AC Power Cable for Beamforming	Power sync	PW-GPC180-3	-	Remote
7	Notebook for Beamforming	DELL	PP13S	-	Remote
8	LAN Cable for Beamforming	Power Sync	CAT-6E-01	-	Remote
9	Adapter for NB for Beamforming	DELL	AA90PM111	-	Remote
10	AC Power Cable for NB for Beamforming	Power sync	PW-GPC180-3	-	Remote

Note 1: Support equipment No. 1, 5 were provided by customer.

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	PoE	CISCO	MA-INJ-4	-	Note 1
4	Notebook for Beamforming	DELL	E5410	-	-
5	Adapter for NB for Beamforming	DELL	HA65NM130	-	-
6	PoE for Beamforming	PHIHONG	POEA33U-1ATE	-	Note 1

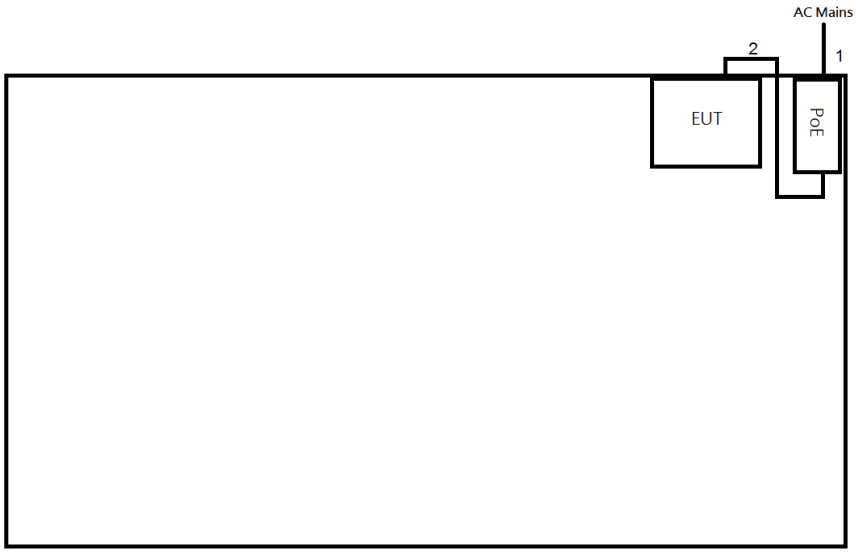
Note 1: Support equipment No. 3, 6 were provided by customer.

Support Equipment – Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	RJ45 Cable	Power Sync	CAT-6E-10	-	-
2	PoE	PHIHONG	POEA33U-1ATE	-	Note 1/ Remote
3	AC Power Cable	-	-	-	Note 1/ Remote
4	Notebook	DELL	PP13S	-	Remote
5	Adapter for NB	DELL	AA90PM111	-	Remote
6	LAN Cable	Power Sync	CAT-6E-01	-	Remote

Note 1: Support equipment No. 2, 3 were provided by customer.

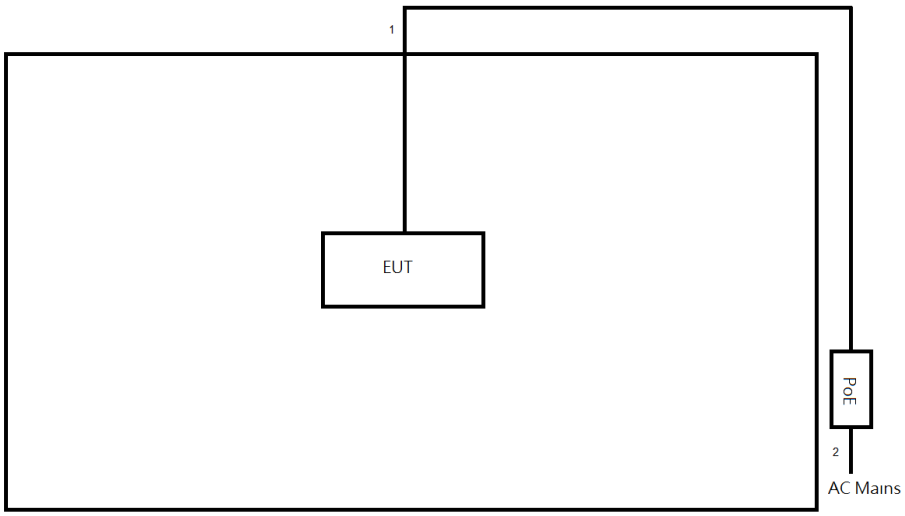
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	RJ-45 Cable	No	1.0	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	RJ45 Cable	No	10.0	-
2	AC Power Cable	No	1.8	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

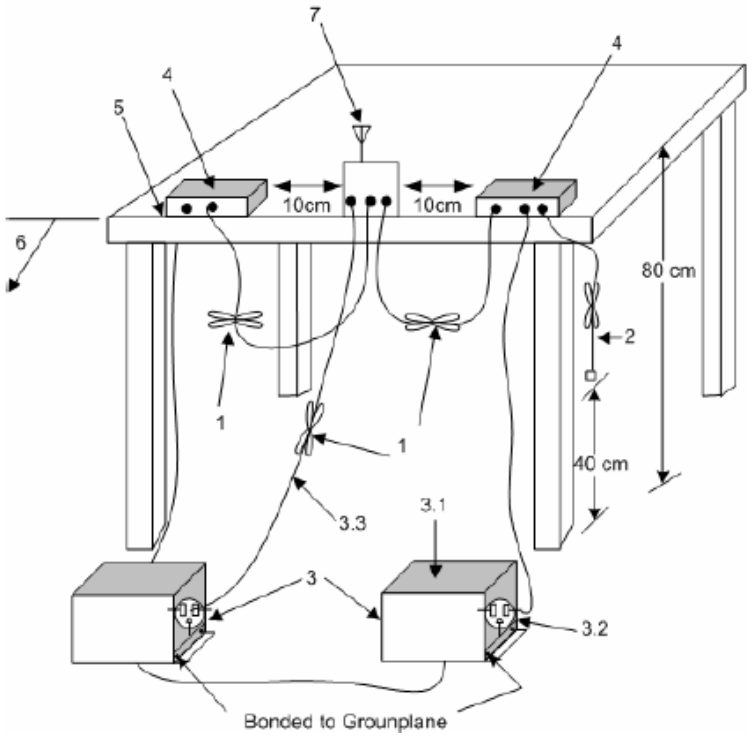
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

3.2.2 Measuring Instruments

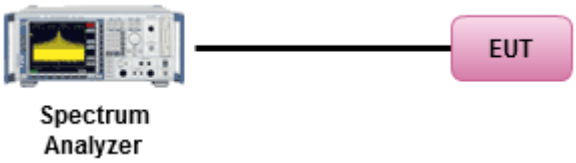
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
e.i.r.p. Power Limit:		
▪ 2400-2483.5 MHz Band		
	▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)	
	▪ Point-to-point systems (P2P): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}])$ dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Overlap beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Aggregate power on all beams: $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.		

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
	☐ Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
	☐ Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
▪ Maximum Average Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
	☒ Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD)≤8 dBm/3kHz

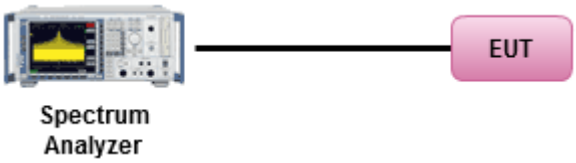
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

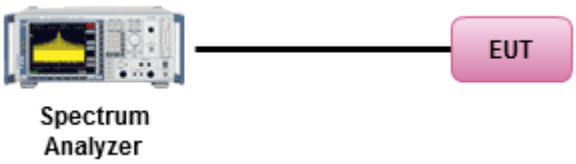
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands


3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

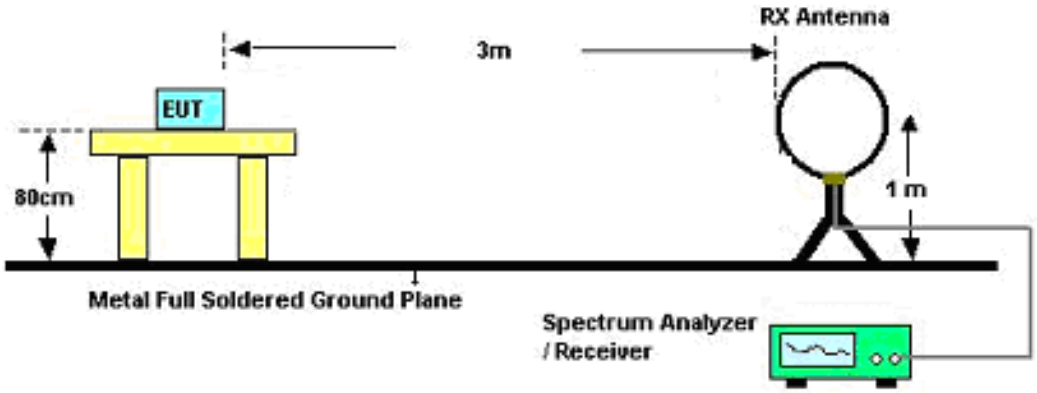
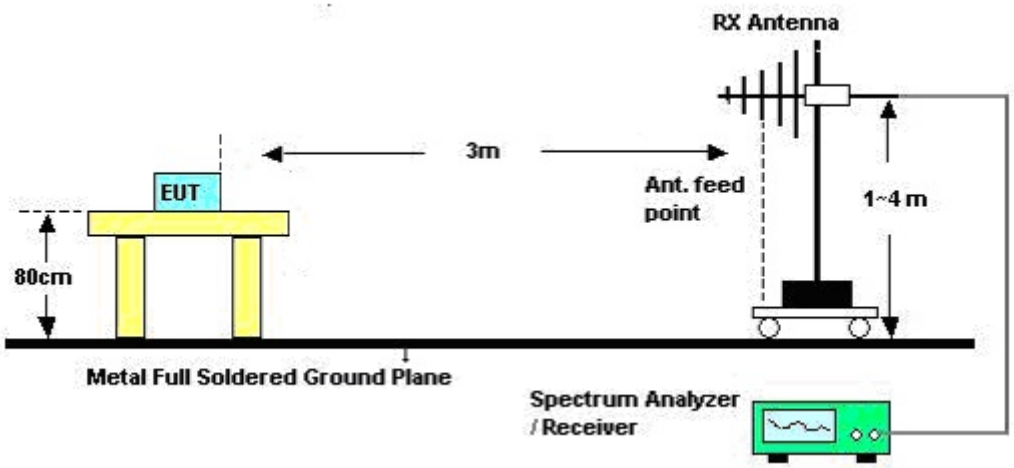
3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

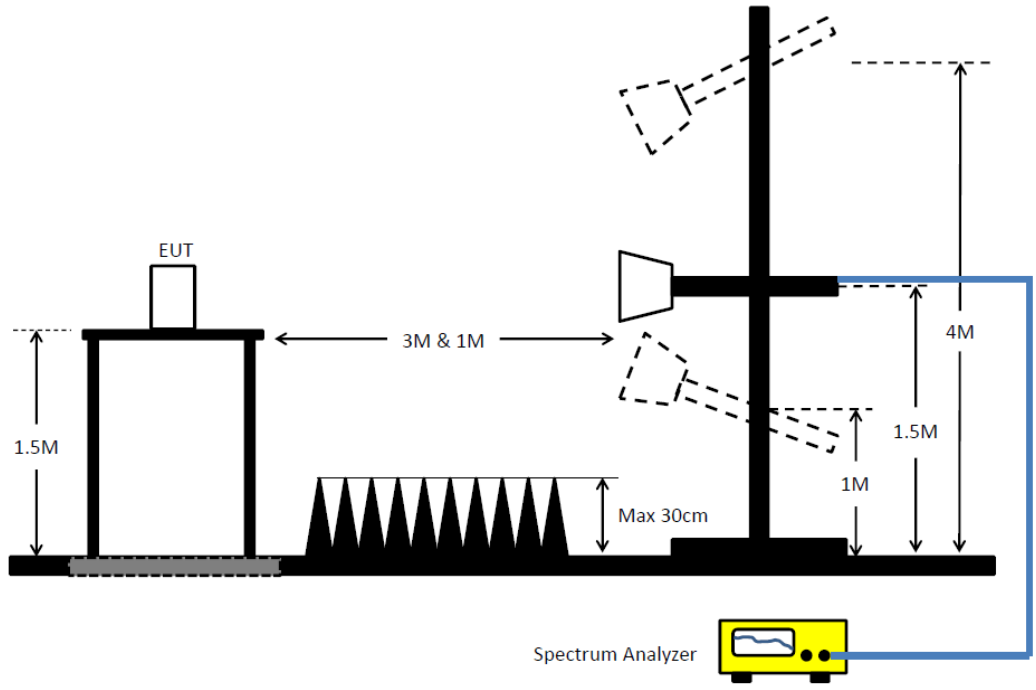
3.6.3 Test Procedures

Test Method	
▪	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
▪	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
▪	For the transmitter unwanted emissions shall be measured using following options below:
	▪ Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪	For the transmitter band-edge emissions shall be measured using following options below:
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
▪	Use the following spectrum analyzer settings:
	▪ Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	▪ Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.
▪	KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.
	▪ Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	▪ Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

3.6.4 Test Setup

Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~1GHz


Above 1GHz



3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2020	08/Apr/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	04/Nov/2019	05/Nov/2020
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	12/Sep/2019	11/Sep/2020
AC POWER	APC	AFC-11005G	F310050055	47Hz ~ 63Hz 5 ~ 300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	24/Sep/2019	23/Sep/2020

NCR: Non-Calibration Require

Instrument for Conducted Test

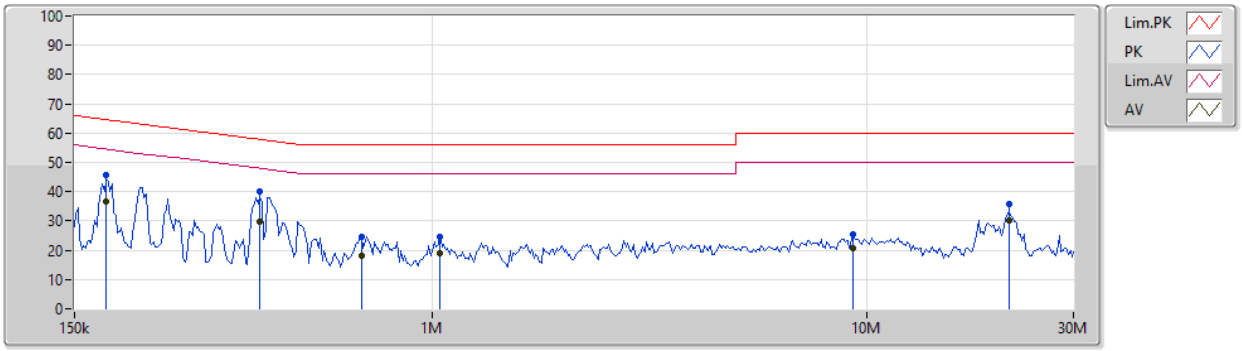
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101029	10kHz ~ 40GHz	01/Oct/2019	30/Sep/2020
Pulse Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	18/Mar/2020	17/Mar/2021
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	18/Mar/2020	17/Mar/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz ~ 40GHz	12/Nov/2018	10/Nov/2020

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	29/Aug/2019	28/Aug/2020
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	29/Aug/2019	28/Aug/2020
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	02/Jul/2019	01/Jul/2020
Amplifier	HP	8447D	2944A08033	10kHz~1.3GHz	14/Apr/2020	13/Apr/2021
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	16/Oct/2019	15/Oct/2020
Spectrum Analyzer	Rohde & Schwarz	FSP40	100593	9kHz - 40GHz	27/Feb/2020	26/Feb/2021
EMI Test Receiver	R&S	ESR	102052	9kHz~3.6GHz	29/Apr/2020	28/Apr/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	28/May/2019	27/May/2020
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz~1GHz	25/Mar/2020	24/Mar/2021
RF Cable-high 6m	HUBER+SUHNER	SUCOFLEX104	SN 805193/4	1GHz~40GHz	09/Apr/2019	08/Apr/2020
RF Cable-high 7m	HUBER+SUHNER	SUCOFLEX104	SN 805192/4	1GHz~40GHz	09/Apr/2019	08/Apr/2020
RF Cable-high 6m	HUBER+SUHNER	SUCOFLEX104	SN 805193/4	1GHz~40GHz	08/Apr/2020	07/Apr/2021
RF Cable-high 7m	HUBER+SUHNER	SUCOFLEX104	SN 805192/4	1GHz~40GHz	08/Apr/2020	07/Apr/2021
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	28/Feb/2020	27/Feb/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170339	18GHz~40GHz	14/Apr/2020	13/Apr/2021
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	03/Jun/2019	02/Jun/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	02/Jun/2020	01/Jun/2021
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	05/Aug/2019	04/Aug/2020
Loop Antenna	TESEQ	HLA 6120	31244	9k~30MHz	16/Mar/2020	15/Mar/2021

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	PoE mode; BT LE TX		

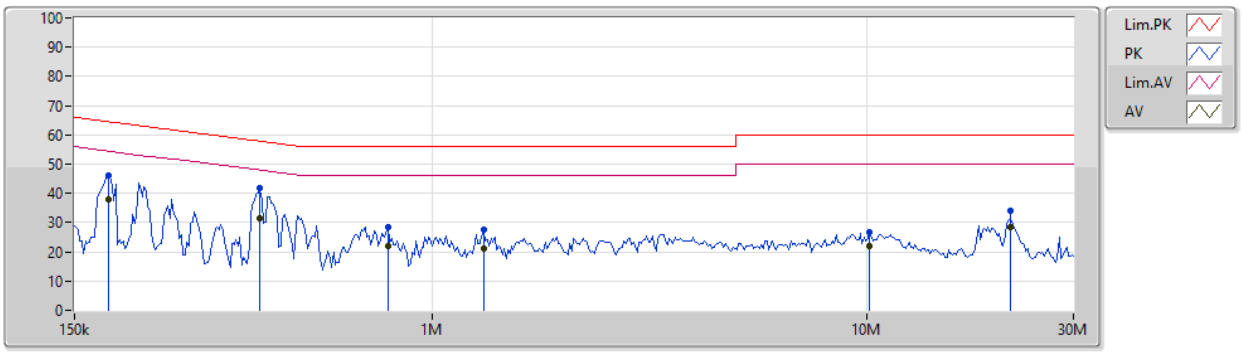
12/05/2020



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	177.646k	45.77	64.59	-18.82	19.62	Neutral	-	26.15	9.64	0.11	9.87
AV	177.646k	36.82	54.59	-17.77	19.62	Neutral	"Worst"	17.20	9.64	0.11	9.87
QP	401.705k	40.04	57.82	-17.78	19.63	Neutral	-	20.41	9.63	0.13	9.87
AV	401.705k	29.90	47.82	-17.92	19.63	Neutral	-	10.27	9.63	0.13	9.87
QP	687.482k	24.41	56.00	-31.59	19.62	Neutral	-	4.79	9.63	0.12	9.87
AV	687.482k	18.22	46.00	-27.78	19.62	Neutral	-	-1.40	9.63	0.12	9.87
QP	1.044M	24.62	56.00	-31.38	19.62	Neutral	-	5.00	9.63	0.11	9.88
AV	1.044M	18.81	46.00	-27.19	19.62	Neutral	-	-0.81	9.63	0.11	9.88
QP	9.321M	25.59	60.00	-34.41	19.84	Neutral	-	5.75	9.70	0.26	9.88
AV	9.321M	20.72	50.00	-29.28	19.84	Neutral	-	0.88	9.70	0.26	9.88
QP	21.288M	35.99	60.00	-24.01	19.97	Neutral	-	16.02	9.71	0.37	9.89
AV	21.288M	30.37	50.00	-19.63	19.97	Neutral	-	10.40	9.71	0.37	9.89

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	PoE mode; BT LE TX		

12/05/2020



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	179.422k	46.02	64.51	-18.49	19.63	Line	-	26.39	9.65	0.11	9.87
AV	179.422k	37.87	54.51	-16.64	19.63	Line	-	18.24	9.65	0.11	9.87
QP	401.705k	41.77	57.82	-16.05	19.64	Line	"Worst"	22.13	9.64	0.13	9.87
AV	401.705k	31.47	47.82	-16.35	19.64	Line	-	11.83	9.64	0.13	9.87
QP	790.243k	28.58	56.00	-27.42	19.63	Line	-	8.95	9.64	0.12	9.87
AV	790.243k	21.83	46.00	-24.17	19.63	Line	-	2.20	9.64	0.12	9.87
QP	1.313M	27.62	56.00	-28.38	19.65	Line	-	7.97	9.64	0.13	9.88
AV	1.313M	21.08	46.00	-24.92	19.65	Line	-	1.43	9.64	0.13	9.88
QP	10.194M	26.70	60.00	-33.30	19.84	Line	-	6.86	9.69	0.27	9.88
AV	10.194M	22.01	50.00	-27.99	19.84	Line	-	2.17	9.69	0.27	9.88
QP	21.501M	33.97	60.00	-26.03	19.89	Line	-	14.08	9.62	0.38	9.89
AV	21.501M	28.29	50.00	-21.71	19.89	Line	-	8.40	9.62	0.38	9.89

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	512.5k	1.007M	1M01F1D	508.75k	1.005M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

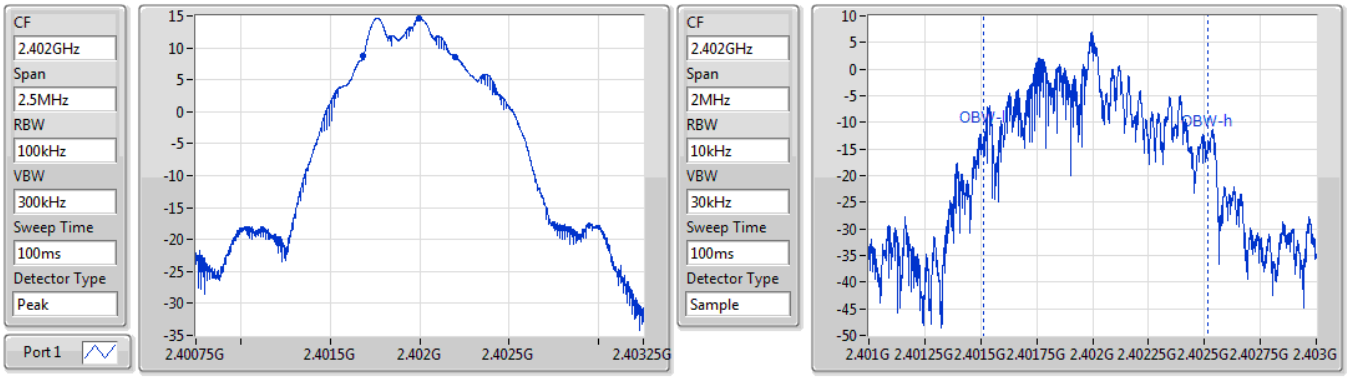
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	512.5k	1.005M
2440MHz_TnomVnom	Pass	500k	508.75k	1.007M
2480MHz_TnomVnom	Pass	500k	508.75k	1.007M

Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

BT-LE(1Mbps) EBW

2402MHz

09/04/2020

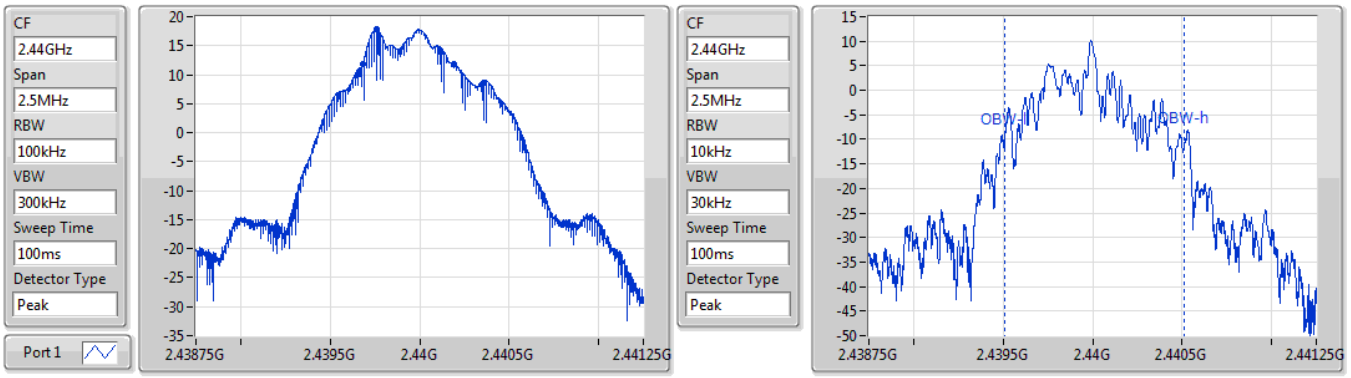


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
512.5k	2.401686G	2.402199G	1.005M	2.401512G	2.402518G	500k	1

BT-LE(1Mbps) EBW

2440MHz

08/04/2020

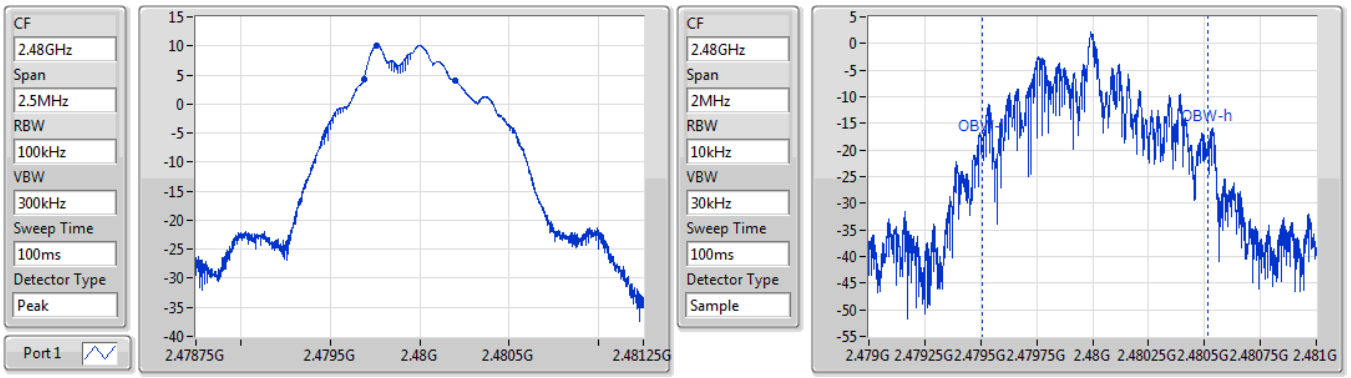


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
508.75k	2.439684G	2.440193G	1.007M	2.439506G	2.440513G	500k	1

BT-LE(1Mbps) **EBW**

2480MHz

09/04/2020



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
508.75k	2.479688G	2.480196G	1.007M	2.479507G	2.480515G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	18.14	0.06516

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	5.00	14.80	30.00
2440MHz_TnomVnom	Pass	5.00	18.14	30.00
2480MHz_TnomVnom	Pass	5.00	10.32	30.00

DG = Directional Gain; **Port X** = Port X output power

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	4.47

RBW=3 kHz.

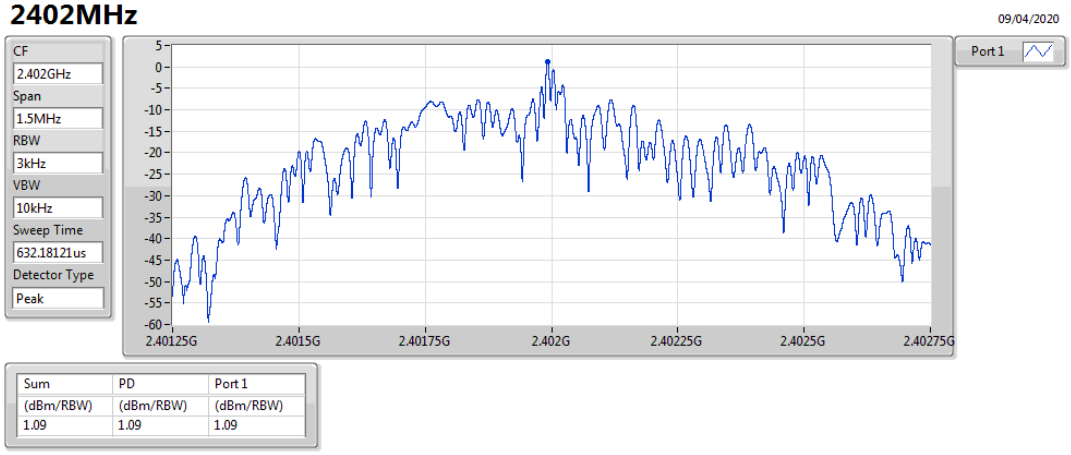
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	5.00	1.09	8.00
2440MHz_TnomVnom	Pass	5.00	4.47	8.00
2480MHz_TnomVnom	Pass	5.00	-3.65	8.00

DG = Directional Gain; RBW=3 kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

BT-LE(1Mbps) **PSD**

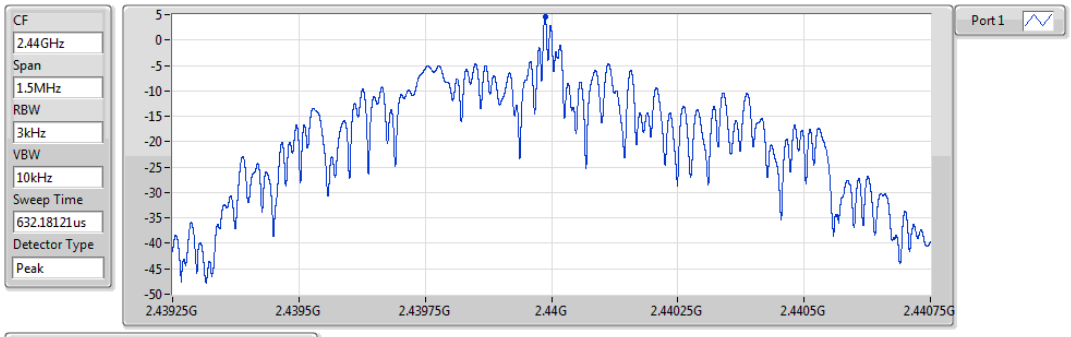
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
1.09	1.09	1.09

BT-LE(1Mbps) **PSD**

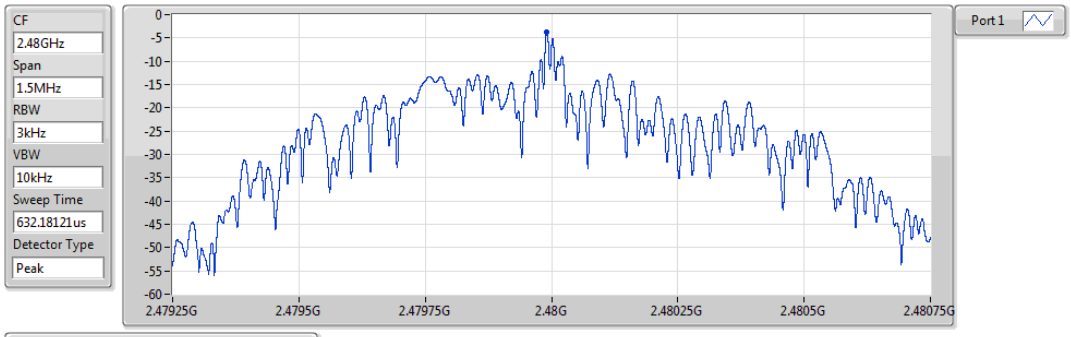
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.47	4.47	4.47

BT-LE(1Mbps) **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.65	-3.65	-3.65

Summary

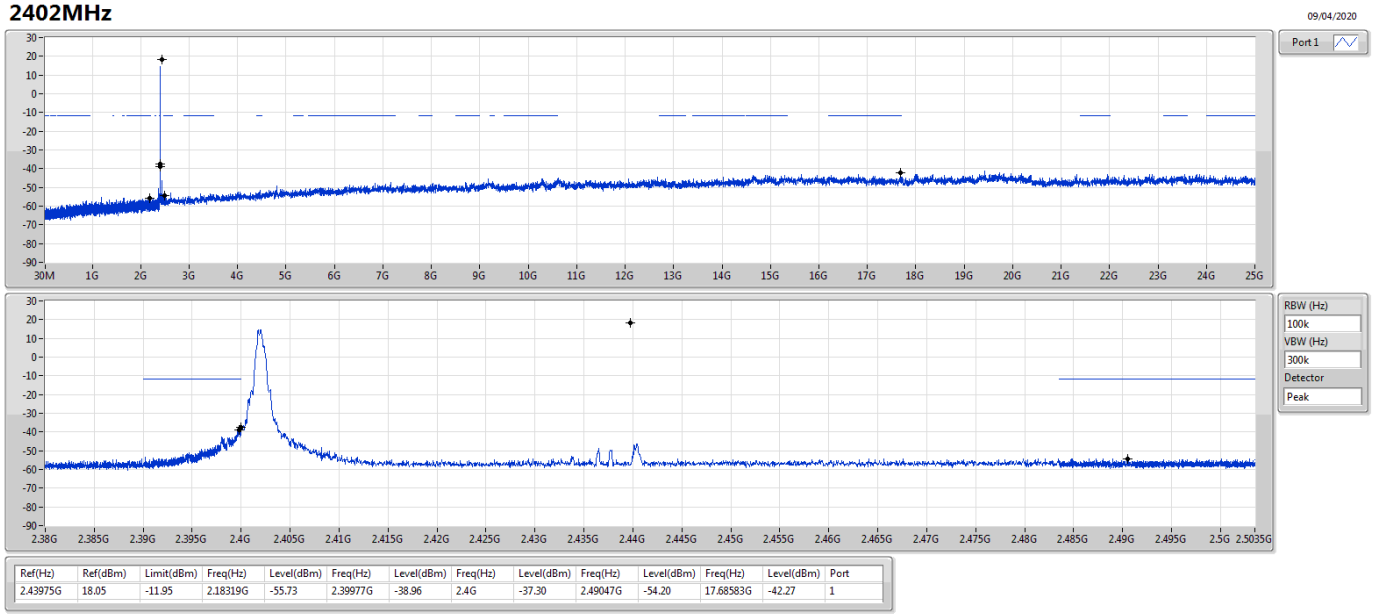
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.43975G	18.05	-11.95	2.18319G	-55.73	2.39977G	-38.96	2.4G	-37.30	2.49047G	-54.20	17.68583G	-42.27	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.43975G	18.05	-11.95	2.18319G	-55.73	2.39977G	-38.96	2.4G	-37.30	2.49047G	-54.20	17.68583G	-42.27	1
2440MHz_TnomVnom	Pass	2.43975G	18.05	-11.95	1.96493G	-55.78	2.39554G	-55.02	2.4835G	-56.59	2.49597G	-53.71	23.44212G	-43.39	1
2480MHz_TnomVnom	Pass	2.43975G	18.05	-11.95	2.1215G	-55.48	2.3962G	-55.42	2.4835G	-49.66	2.48375G	-47.94	17.66614G	-42.53	1

BT-LE(1Mbps) **CSE NdB**

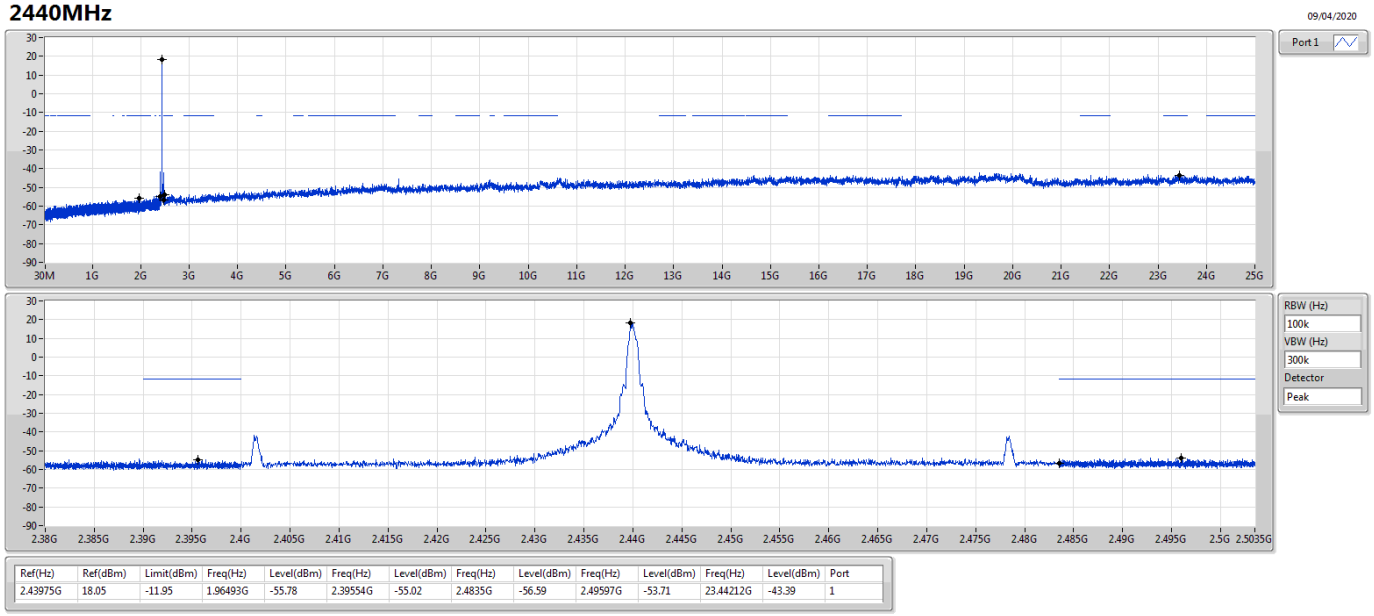
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	18.05	-11.95	2.18319G	-55.73	2.39977G	-38.96	2.4G	-37.30	2.49047G	-54.20	17.68583G	-42.27	1

BT-LE(1Mbps) **CSE NdB**

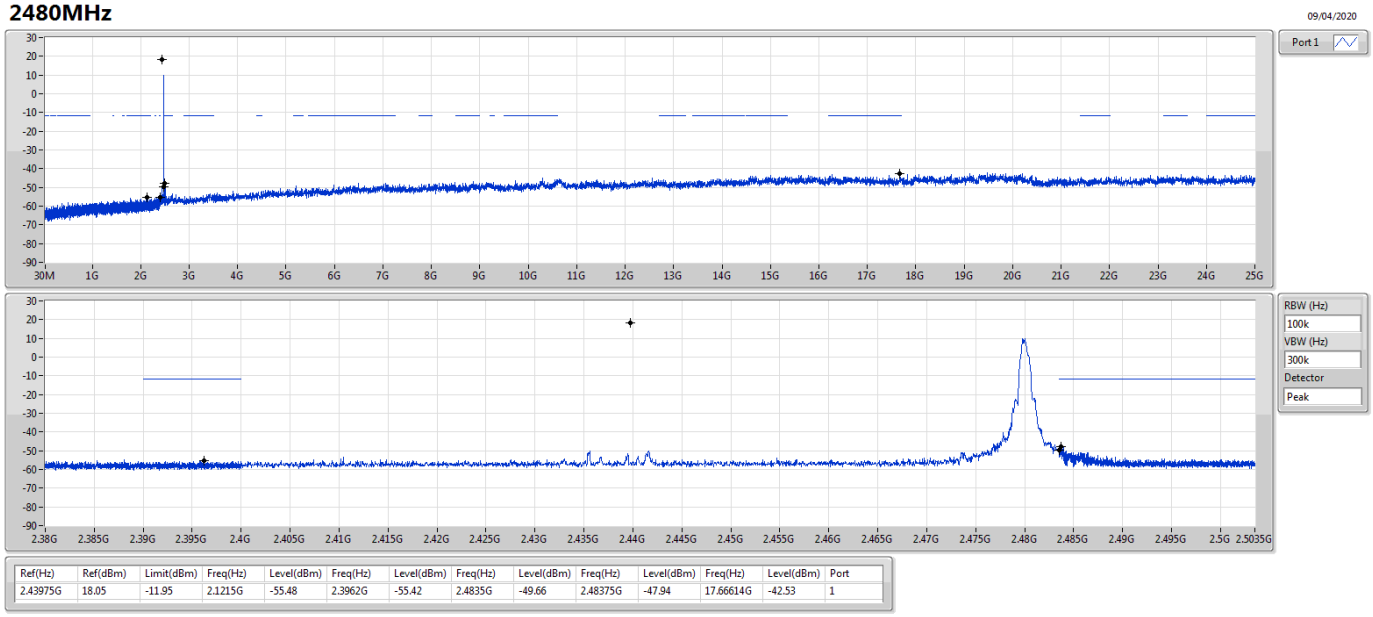
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	18.05	-11.95	1.96493G	-55.78	2.39554G	-55.02	2.4835G	-56.59	2.49597G	-53.71	23.44212G	-43.39	1

BT-LE(1Mbps) **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	18.05	-11.95	2.1215G	-55.48	2.3962G	-55.42	2.4835G	-49.66	2.48375G	-47.94	17.66614G	-42.53	1

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	45.52M	31.73	40.00	-8.27	3	Vertical	360	1.00	-

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	45.52M	31.73	40.00	-8.27	3	Vertical	360	1.00	-
2440MHz	Pass	PK	99.84M	25.39	43.50	-18.11	3	Vertical	360	1.00	-
2440MHz	Pass	PK	198.78M	33.03	43.50	-10.47	3	Vertical	360	1.00	-
2440MHz	Pass	PK	790.48M	31.53	46.00	-14.47	3	Vertical	360	1.00	-
2440MHz	Pass	PK	912.7M	33.31	46.00	-12.69	3	Vertical	360	1.00	-
2440MHz	Pass	PK	924.34M	33.65	46.00	-12.35	3	Vertical	360	1.00	-
2440MHz	Pass	PK	31.94M	27.70	40.00	-12.30	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	101.78M	27.03	43.50	-16.47	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	206.54M	32.64	43.50	-10.86	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	472.32M	35.38	46.00	-10.62	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	796.3M	34.68	46.00	-11.32	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	945.68M	33.30	46.00	-12.70	3	Horizontal	0	1.00	-

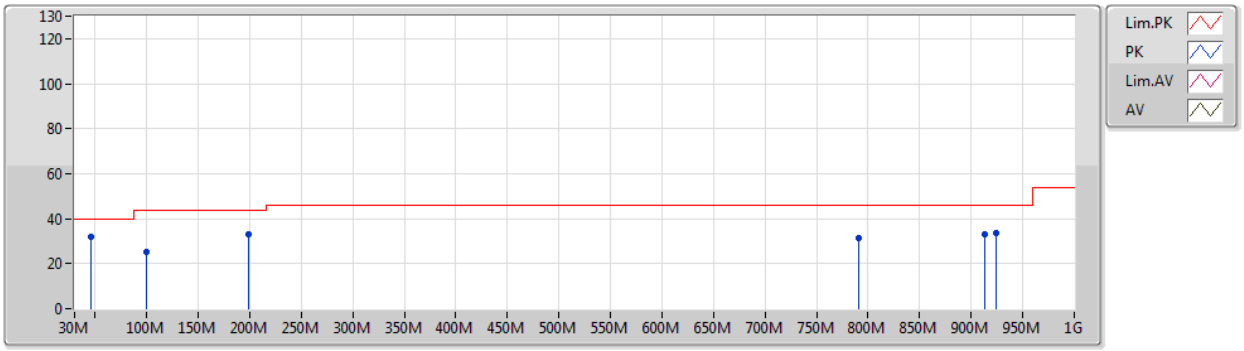
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_PoE

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	45.52M	31.73	40.00	-8.27	-11.63	3	Vertical	360	1.00	-	43.36	15.06	0.99	27.68
PK	99.84M	25.39	43.50	-18.11	-10.43	3	Vertical	360	1.00	-	35.82	15.85	1.48	27.76
PK	198.78M	33.03	43.50	-10.47	-10.86	3	Vertical	360	1.00	-	43.89	14.40	2.13	27.39
PK	790.48M	31.53	46.00	-14.47	1.25	3	Vertical	360	1.00	-	30.28	24.94	4.50	28.19
PK	912.7M	33.31	46.00	-12.69	2.72	3	Vertical	360	1.00	-	30.59	25.56	4.83	27.67
PK	924.34M	33.65	46.00	-12.35	2.92	3	Vertical	360	1.00	-	30.73	25.71	4.86	27.65

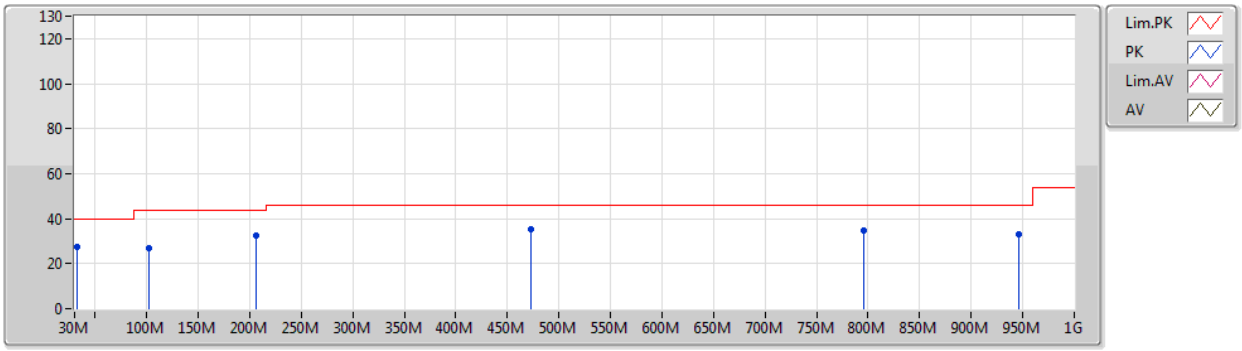
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_PoE

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	31.94M	27.70	40.00	-12.30	-4.66	3	Horizontal	0	1.00	-	32.36	22.23	0.80	27.69
PK	101.78M	27.03	43.50	-16.47	-10.01	3	Horizontal	0	1.00	-	37.04	16.26	1.49	27.76
PK	206.54M	32.64	43.50	-10.86	-10.88	3	Horizontal	0	1.00	-	43.52	14.31	2.17	27.36
PK	472.32M	35.38	46.00	-10.62	-2.35	3	Horizontal	0	1.00	-	37.73	22.61	3.39	28.35
PK	796.3M	34.68	46.00	-11.32	1.21	3	Horizontal	0	1.00	-	33.47	24.85	4.52	28.16
PK	945.68M	33.30	46.00	-12.70	3.19	3	Horizontal	0	1.00	-	30.11	25.90	4.91	27.62

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	53.28	54.00	-0.72	3	Horizontal	342	1.49	-

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3636G	49.65	54.00	-4.35	3	Vertical	13	1.52	-
2402MHz	Pass	AV	2.402G	105.31	Inf	-Inf	3	Vertical	13	1.52	-
2402MHz	Pass	PK	2.3588G	60.10	74.00	-13.90	3	Vertical	13	1.52	-
2402MHz	Pass	PK	2.4018G	106.24	Inf	-Inf	3	Vertical	13	1.52	-
2402MHz	Pass	AV	2.3634G	53.11	54.00	-0.89	3	Horizontal	343	1.50	-
2402MHz	Pass	AV	2.402G	111.84	Inf	-Inf	3	Horizontal	343	1.50	-
2402MHz	Pass	PK	2.3632G	60.84	74.00	-13.16	3	Horizontal	343	1.50	-
2402MHz	Pass	PK	2.4018G	112.79	Inf	-Inf	3	Horizontal	343	1.50	-
2402MHz	Pass	AV	4.80004G	36.76	54.00	-17.24	3	Vertical	161	1.41	-
2402MHz	Pass	PK	4.8001G	45.94	74.00	-28.06	3	Vertical	161	1.41	-
2402MHz	Pass	AV	4.79992G	36.30	54.00	-17.70	3	Horizontal	345	1.50	-
2402MHz	Pass	PK	4.80052G	45.62	74.00	-28.38	3	Horizontal	345	1.50	-
2440MHz	Pass	AV	2.342G	51.86	54.00	-2.14	3	Vertical	16	1.08	-
2440MHz	Pass	AV	2.44G	110.20	Inf	-Inf	3	Vertical	16	1.08	-
2440MHz	Pass	AV	2.4992G	52.15	54.00	-1.85	3	Vertical	16	1.08	-
2440MHz	Pass	PK	2.3772G	60.65	74.00	-13.35	3	Vertical	16	1.08	-
2440MHz	Pass	PK	2.44G	110.76	Inf	-Inf	3	Vertical	16	1.08	-
2440MHz	Pass	PK	2.4848G	61.42	74.00	-12.58	3	Vertical	16	1.08	-
2440MHz	Pass	AV	2.3536G	51.60	54.00	-2.40	3	Horizontal	334	1.48	-
2440MHz	Pass	AV	2.44G	118.22	Inf	-Inf	3	Horizontal	334	1.48	-
2440MHz	Pass	AV	2.4992G	52.15	54.00	-1.85	3	Horizontal	334	1.48	-
2440MHz	Pass	PK	2.344G	61.28	74.00	-12.72	3	Horizontal	334	1.48	-
2440MHz	Pass	PK	2.44G	118.78	Inf	-Inf	3	Horizontal	334	1.48	-
2440MHz	Pass	PK	2.4968G	61.41	74.00	-12.59	3	Horizontal	334	1.48	-
2440MHz	Pass	AV	4.87994G	38.64	54.00	-15.36	3	Vertical	169	2.95	-
2440MHz	Pass	AV	7.31922G	50.62	54.00	-3.38	3	Vertical	124	2.82	-
2440MHz	Pass	PK	4.87934G	46.02	74.00	-27.98	3	Vertical	169	2.95	-
2440MHz	Pass	PK	7.32G	55.88	74.00	-18.12	3	Vertical	124	2.82	-
2440MHz	Pass	AV	4.87988G	37.33	54.00	-16.67	3	Horizontal	82	1.48	-
2440MHz	Pass	AV	7.31922G	52.82	54.00	-1.18	3	Horizontal	316	1.27	-
2440MHz	Pass	PK	4.88042G	45.92	74.00	-28.08	3	Horizontal	82	1.48	-
2440MHz	Pass	PK	7.31928G	57.21	74.00	-16.79	3	Horizontal	316	1.27	-
2480MHz	Pass	AV	2.48G	96.02	Inf	-Inf	3	Vertical	24	1.46	-
2480MHz	Pass	AV	2.4932G	50.22	54.00	-3.78	3	Vertical	24	1.46	-
2480MHz	Pass	PK	2.4798G	96.98	Inf	-Inf	3	Vertical	24	1.46	-
2480MHz	Pass	PK	2.4956G	60.04	74.00	-13.96	3	Vertical	24	1.46	-
2480MHz	Pass	AV	2.48G	106.17	Inf	-Inf	3	Horizontal	342	1.49	-
2480MHz	Pass	AV	2.4835G	53.28	54.00	-0.72	3	Horizontal	342	1.49	-
2480MHz	Pass	PK	2.48G	107.09	Inf	-Inf	3	Horizontal	342	1.49	-
2480MHz	Pass	PK	2.4835G	62.00	74.00	-12.00	3	Horizontal	342	1.49	-
2480MHz	Pass	AV	4.95952G	38.26	54.00	-15.74	3	Vertical	6	1.47	-
2480MHz	Pass	AV	7.43908G	43.26	54.00	-10.74	3	Vertical	323	2.83	-
2480MHz	Pass	PK	4.95994G	47.13	74.00	-26.87	3	Vertical	6	1.47	-
2480MHz	Pass	PK	7.44016G	51.44	74.00	-22.56	3	Vertical	323	2.83	-
2480MHz	Pass	AV	4.96G	39.70	54.00	-14.30	3	Horizontal	1	2.44	-
2480MHz	Pass	AV	7.43988G	44.94	54.00	-9.06	3	Horizontal	315	2.13	-
2480MHz	Pass	PK	4.96006G	46.73	74.00	-27.27	3	Horizontal	1	2.44	-

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	7.43922G	51.63	74.00	-22.37	3	Horizontal	315	2.13	-

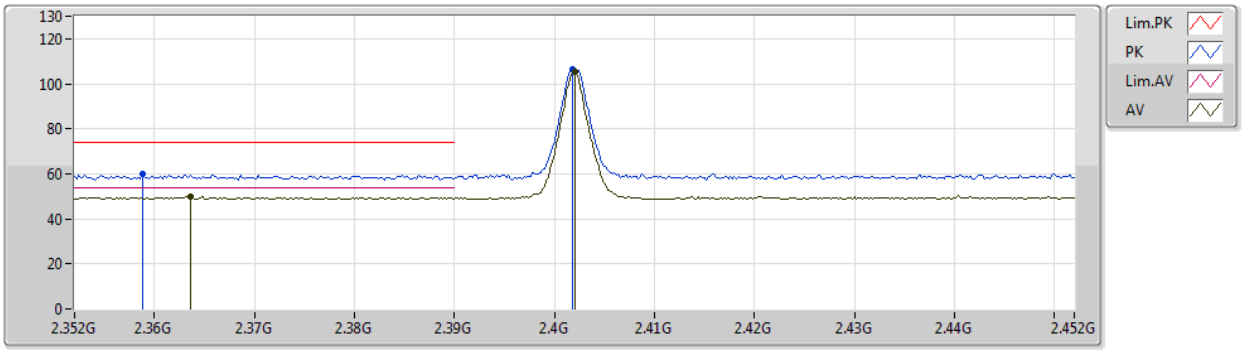
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2402MHz_TX

08/06/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3636G	49.65	54.00	-4.35	35.56	3	Vertical	13	1.52	-	14.09	29.63	5.93	-
AV	2.402G	105.31	Inf	-Inf	35.67	3	Vertical	13	1.52	-	69.64	29.71	5.96	-
PK	2.3588G	60.10	74.00	-13.90	35.55	3	Vertical	13	1.52	-	24.55	29.62	5.93	-
PK	2.4018G	106.24	Inf	-Inf	35.67	3	Vertical	13	1.52	-	70.57	29.71	5.96	-

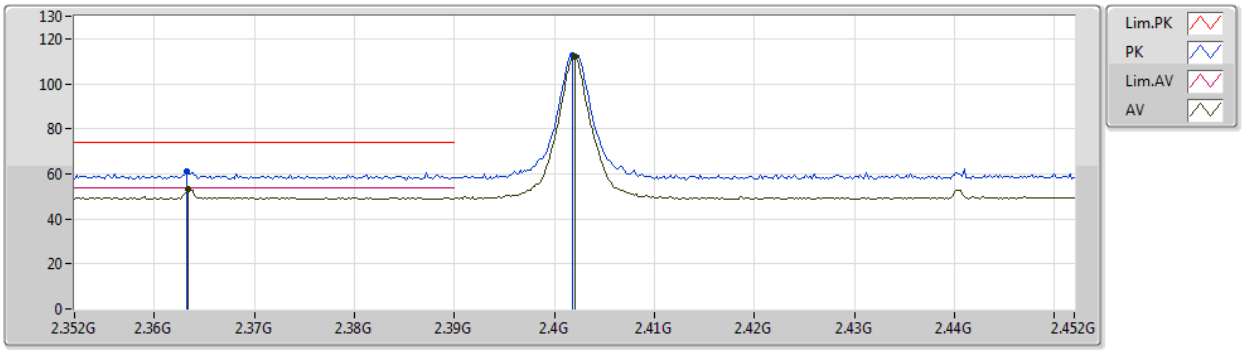
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2402MHz_TX

08/06/2020

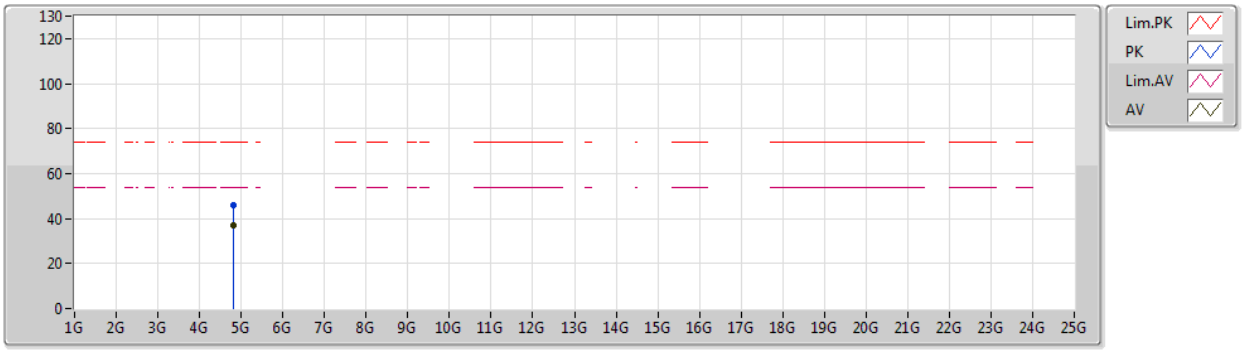


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3634G	53.11	54.00	-0.89	35.56	3	Horizontal	343	1.50	-	17.55	29.63	5.93	-
AV	2.402G	111.84	Inf	-Inf	35.67	3	Horizontal	343	1.50	-	76.17	29.71	5.96	-
PK	2.3632G	60.84	74.00	-13.16	35.56	3	Horizontal	343	1.50	-	25.28	29.63	5.93	-
PK	2.4018G	112.79	Inf	-Inf	35.67	3	Horizontal	343	1.50	-	77.12	29.71	5.96	-

BT-LE(1Mbps)

2402MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80004G	36.76	54.00	-17.24	5.68	3	Vertical	161	1.41	-	31.08	31.34	8.25	33.91
PK	4.8001G	45.94	74.00	-28.06	5.68	3	Vertical	161	1.41	-	40.26	31.34	8.25	33.91

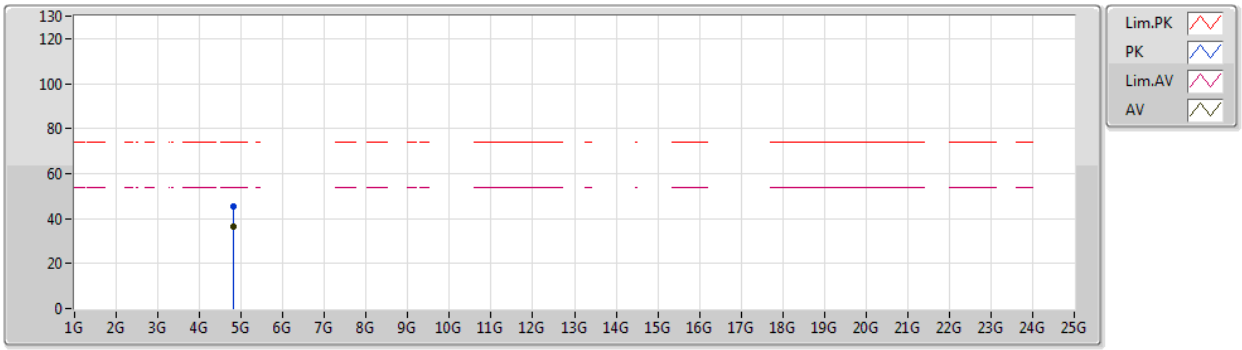
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2402MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.79992G	36.30	54.00	-17.70	5.68	3	Horizontal	345	1.50	-	30.62	31.34	8.25	33.91
PK	4.80052G	45.62	74.00	-28.38	5.68	3	Horizontal	345	1.50	-	39.94	31.34	8.25	33.91

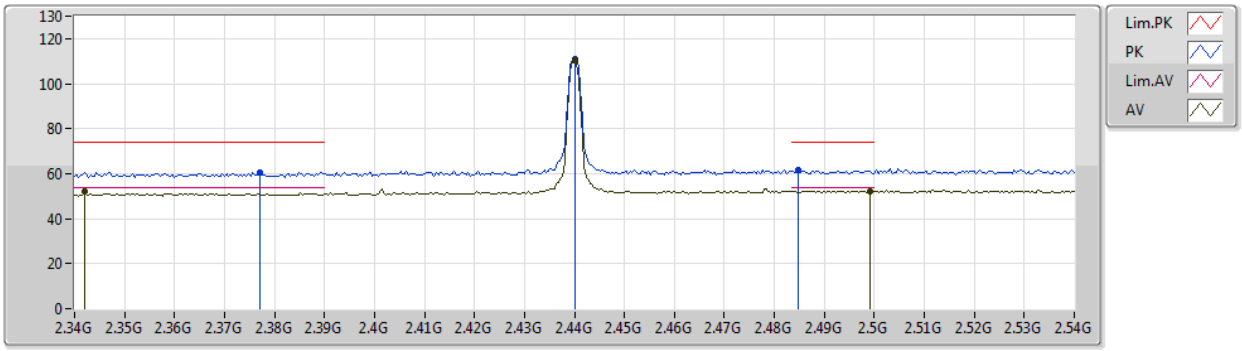
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.342G	51.86	54.00	-2.14	33.15	3	Vertical	16	1.08	-	18.71	27.23	5.92	-
AV	2.44G	110.20	Inf	-Inf	33.53	3	Vertical	16	1.08	-	76.67	27.52	6.01	-
AV	2.4992G	52.15	54.00	-1.85	33.78	3	Vertical	16	1.08	-	18.37	27.70	6.08	-
PK	2.3772G	60.65	74.00	-13.35	33.27	3	Vertical	16	1.08	-	27.38	27.33	5.94	-
PK	2.44G	110.76	Inf	-Inf	33.53	3	Vertical	16	1.08	-	77.23	27.52	6.01	-
PK	2.4848G	61.42	74.00	-12.58	33.71	3	Vertical	16	1.08	-	27.71	27.65	6.06	-

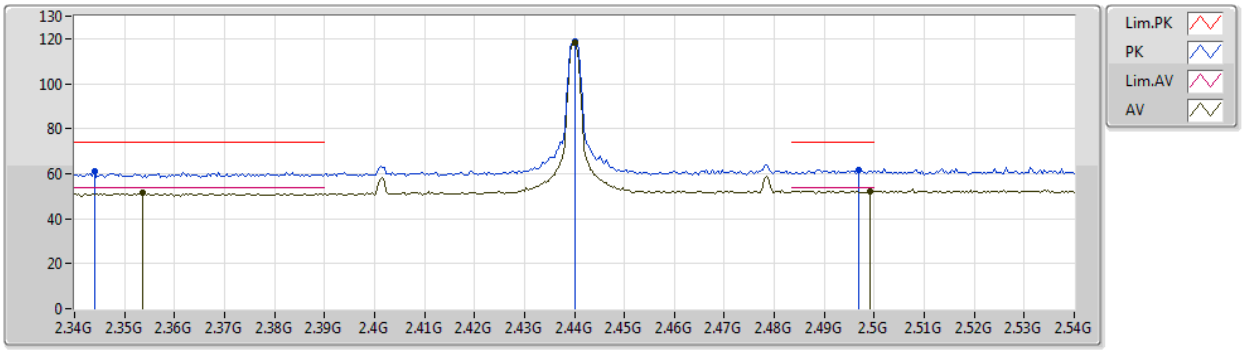
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3536G	51.60	54.00	-2.40	33.19	3	Horizontal	334	1.48	-	18.41	27.26	5.93	-
AV	2.44G	118.22	Inf	-Inf	33.53	3	Horizontal	334	1.48	-	84.69	27.52	6.01	-
AV	2.4992G	52.15	54.00	-1.85	33.78	3	Horizontal	334	1.48	-	18.37	27.70	6.08	-
PK	2.344G	61.28	74.00	-12.72	33.15	3	Horizontal	334	1.48	-	28.13	27.23	5.92	-
PK	2.44G	118.78	Inf	-Inf	33.53	3	Horizontal	334	1.48	-	85.25	27.52	6.01	-
PK	2.4968G	61.41	74.00	-12.59	33.77	3	Horizontal	334	1.48	-	27.64	27.69	6.08	-

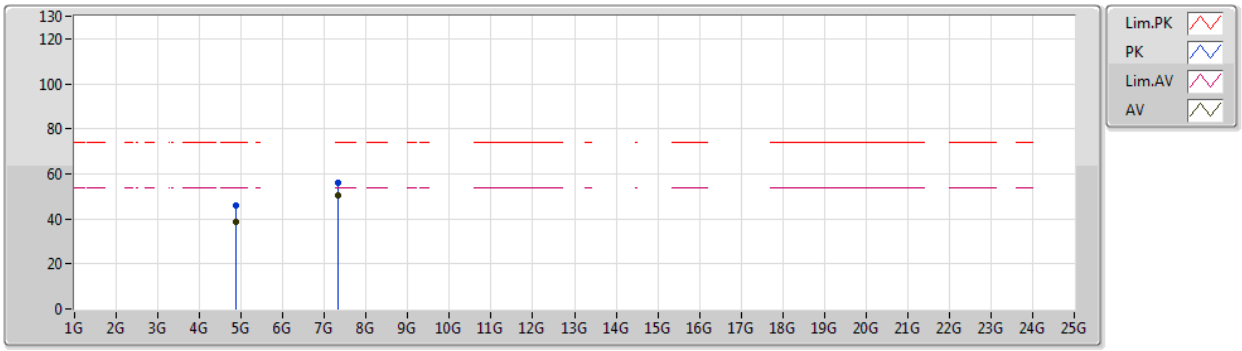
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87994G	38.64	54.00	-15.36	5.91	3	Vertical	169	2.95	-	32.73	31.48	8.30	33.87
AV	7.31922G	50.62	54.00	-3.38	11.95	3	Vertical	124	2.82	-	38.67	36.03	10.03	34.11
PK	4.87934G	46.02	74.00	-27.98	5.91	3	Vertical	169	2.95	-	40.11	31.48	8.30	33.87
PK	7.32G	55.88	74.00	-18.12	11.95	3	Vertical	124	2.82	-	43.93	36.03	10.03	34.11

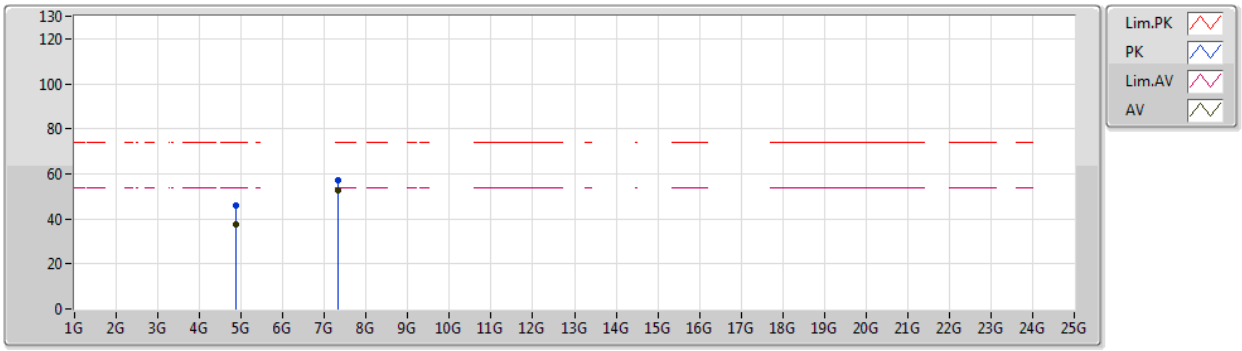
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2440MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87988G	37.33	54.00	-16.67	5.91	3	Horizontal	82	1.48	-	31.42	31.48	8.30	33.87
AV	7.31922G	52.82	54.00	-1.18	11.95	3	Horizontal	316	1.27	-	40.87	36.03	10.03	34.11
PK	4.88042G	45.92	74.00	-28.08	5.91	3	Horizontal	82	1.48	-	40.01	31.48	8.30	33.87
PK	7.31928G	57.21	74.00	-16.79	11.95	3	Horizontal	316	1.27	-	45.26	36.03	10.03	34.11

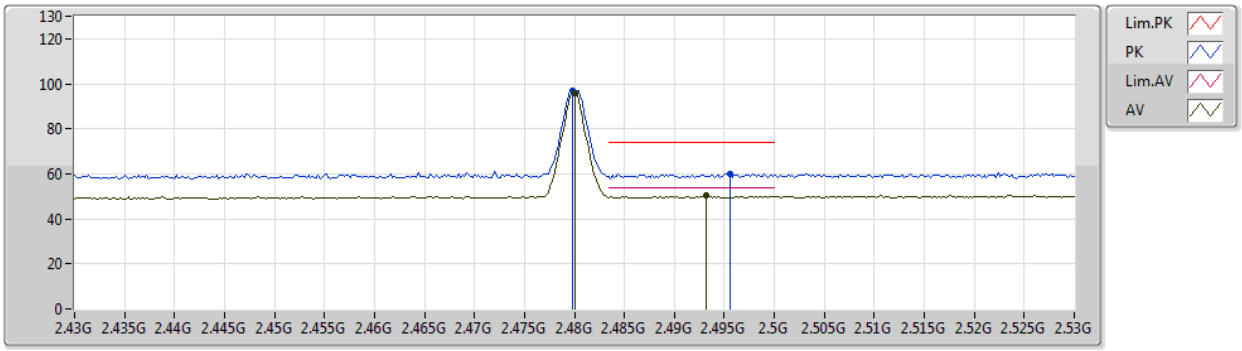
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2480MHz_TX

08/06/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	96.02	Inf	-Inf	36.16	3	Vertical	24	1.46	-	59.86	30.10	6.06	-
AV	2.4932G	50.22	54.00	-3.78	36.24	3	Vertical	24	1.46	-	13.98	30.17	6.07	-
PK	2.4798G	96.98	Inf	-Inf	36.16	3	Vertical	24	1.46	-	60.82	30.10	6.06	-
PK	2.4956G	60.04	74.00	-13.96	36.25	3	Vertical	24	1.46	-	23.79	30.18	6.07	-

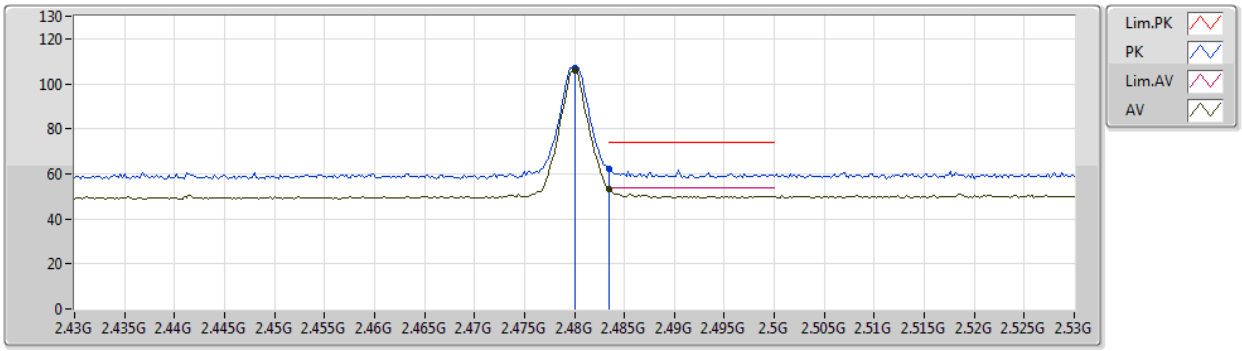
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2480MHz_TX

08/06/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	106.17	Inf	-Inf	36.16	3	Horizontal	342	1.49	-	70.01	30.10	6.06	-
AV	2.4835G	53.28	54.00	-0.72	36.18	3	Horizontal	342	1.49	-	17.10	30.12	6.06	-
PK	2.48G	107.09	Inf	-Inf	36.16	3	Horizontal	342	1.49	-	70.93	30.10	6.06	-
PK	2.4835G	62.00	74.00	-12.00	36.18	3	Horizontal	342	1.49	-	25.82	30.12	6.06	-

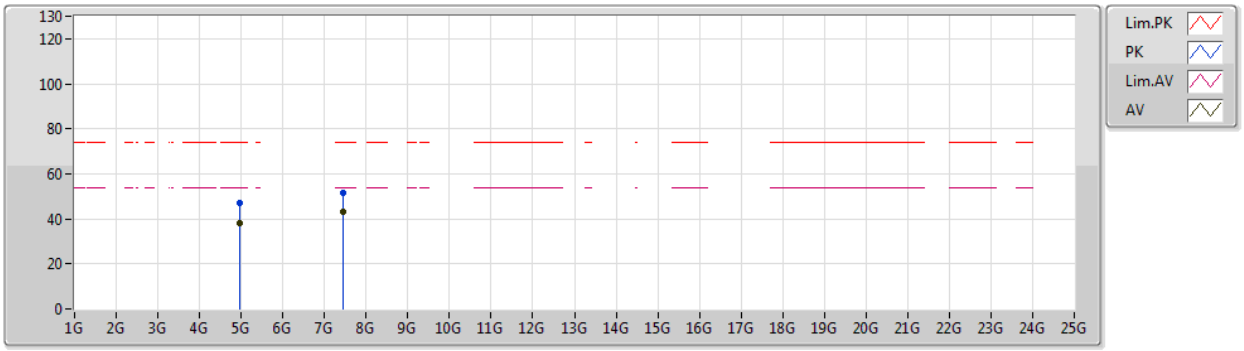
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2480MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95952G	38.26	54.00	-15.74	6.16	3	Vertical	6	1.47	-	32.10	31.63	8.35	33.82
AV	7.43908G	43.26	54.00	-10.74	12.33	3	Vertical	323	2.83	-	30.93	36.34	10.10	34.11
PK	4.95994G	47.13	74.00	-26.87	6.16	3	Vertical	6	1.47	-	40.97	31.63	8.35	33.82
PK	7.44016G	51.44	74.00	-22.56	12.33	3	Vertical	323	2.83	-	39.11	36.34	10.10	34.11

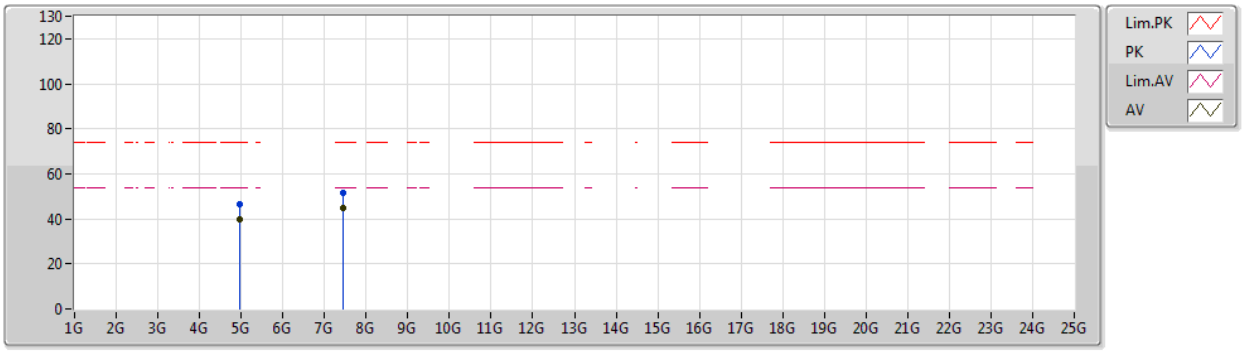
Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301

BT-LE(1Mbps)

2480MHz_TX

09/04/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.96G	39.70	54.00	-14.30	6.16	3	Horizontal	1	2.44	-	33.54	31.63	8.35	33.82
AV	7.43988G	44.94	54.00	-9.06	12.33	3	Horizontal	315	2.13	-	32.61	36.34	10.10	34.11
PK	4.96006G	46.73	74.00	-27.27	6.16	3	Horizontal	1	2.44	-	40.57	31.63	8.35	33.82
PK	7.43922G	51.63	74.00	-22.37	12.33	3	Horizontal	315	2.13	-	39.30	36.34	10.10	34.11

Remark :

Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor) 041301