

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	: OT-202-RWD-026
AGR No.	: A202A-006
Applicant	: AMOSENSE
Address	: 56 Naruteo-ro, Seocho-gu, SEOUL, South Korea
Manufacturer	: AMOSENSE
Address	: 56 Naruteo-ro, Seocho-gu, SEOUL, South Korea
Type of Equipment	: ATOZ
FCC ID.	: 2AS9T-SB52SW2
Model Name	: SB52-SW
Multiple Model Name	: N/A
Serial number	: N/A
Total page of Report	: 50 pages (including this page)
Date of Incoming	: February 03, 2020
Date of issue	: February 13, 2020

SUMMARY

The equipment complies with the regulation; *FCC PART 15 SUBPART C Section 15.247* This test report only contains the result of a single test of the sample supplied for the examination. It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by:

Tae-Ho, Kim / Senior Manager ONETECH Corp.

Approved by: Ki-Hong, Nam / General Manager

ONETECH Corp.

EMC-003 (Rev.2)



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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-202-RWD-026	February 13, 2020	Initial Release	All



1. VERIFICATION OF COMPLIANCE

Applicant	: AMOSENSE	
Address	: 56 Naruteo-ro, Seocho-gu, SE	OUL, South Korea
Manufacturer	: AMOSENSE	
Address	: 56 Naruteo-ro, Seocho-gu, SE	OUL, South Korea
Factory	: AMO VINA CO,,LTD	
Address	: Lot CN12, Khai Quang industr	rial Park, Khai Quang Ward, Vinh Yen City, Vinh Phuc Province, Vietnam
Contact Person	: UIHAN JEONG / Research Er	ngineer
Telephone No.	: +82-010-4948-5676	
FCC ID	: 2AS9T-SB52SW2	
Model Name	: SB52-SW	
Brand Name	:-	
Serial Number	: N/A	
Date	: February 13, 2020	
EQUIPMENT	CLASS	DTS – DIGITAL TRNSMISSION SYSTEM

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	ATOZ
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT	
AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED	FCC PART 15 SUBPART C Section 15.247
UNDER FCC RULES PART(S)	558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve	
Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si,

Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) - Registration No. R-4112/ C-14617/ G-10666 / T-1842

IC (Industry Canada) - Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) - Designation No. KR0013



3. GENERAL INFORMATION

3.1 Product Description

The AMOSENSE, Model SB52-SW (referred to as the EUT in this report) is an ATOZ, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	ATOZ	
Temperature Range	-20 °C ~ 60 °C	
	NFC	13.56 MHz
OPERATING	Sig Fox	902.137 5 MHz ~ 904.662 5 MHz
FREQUENCY	Bluetooth LE	2 402 MHz ~ 2 480 MHz
	WLAN 2.4 GHz	2 412 MHz ~ 2 462 MHz (802.11b/g/n(HT20))
	NFC	ASK
	Sig Fox	DBPSK
MODULATION	Bluetooth LE	GFSK
TYPE		802.11b: DSSS Modulation (DBPSK/DQPSK/CCK)
	WLAN 2.4 GHz	802.11g/n(HT20): OFDM Modulation (BPSK/QPSK/16QAM/64QAM)
	NFC	39.11 dBµV/m at 3 m
	Sig Fox	21.59 dBm
RF OUTPUT	Bluetooth LE	-1.37 dBm
POWER'		-1.17 dBm(802.11b)
	WLAN 2.4 GHz	-3.02 dBm(802.11g)
		-3.25 dBm(802.11n_HT20)
		NFC: FPCB Antenna
ANTENNA TYPE		Sig Fox: Chip Antenna
ANTENNA TIFE		Bluetooth LE: Chip Antenna
		WLAN 2.4 GHz: Chip Antenna
ANTENNA GAIN		Sig Fox: 1.66 dBi
		Bluetooth LE / WLAN 2.4 GHz: 2.36 dBi
List of each Osc. or c	rystal	26 MHz, 32 MHz, 50 MHz
Freq.(Freq. >= 1 MH	z)	20 14112, 52 14112, 50 14112



3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None



5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	AMOSENSE	ATOZ Rev2.0 / N/A	N/A
Sub Board	AMOSENSE	N/A	N/A
DC Battery	N/A	UFX303055 / N/A	N/A
Speaker	N/A	N/A	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
SB52-SW	AMOSENSE	ATOZ(EUT)	-
N/A	N/A	Jig Board	EUT
ACR1251U	Advanced Card Systems Ltd.	Card Reader	EUT
G6-1121TU	НР	Notebook PC	-
PPP009C	LIE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	AC Adapter	-

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 2 402 MHz, 2 440 MHz, and 2 480 MHz to get a maximum emission levels from the EUT. The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is "XZ" axis, but the worst data was recorded in this report.



-. Duty Cycle

Mode	Tx On Time	Tx Off Time	Duty Cycle	Correction Factor
Mode	[ms]	[ms]	[%]	[dB]
Bluetooth LE	0.388	0.240	61.78	2.09

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

-. Test Plot

0 dBm D1 D2 M1[1] -2.11 dE -10 dBm -20 dBm -20 dBm -20 dBm -20 dBm -30 dBm -40 dBm -20 dBm -20 dBm	20 dB 🖷 SWT 2 ms	ms • VBW 10 MHz D2[1]	0.19 dB 628.00 µs
1Pk View 0 dBm 1		D2[1]	
D2[1] 0.19 0 dBmM1 D1 D2 -10 dBm 130.00 -20 dBm -10 -30 dBm -10 -40 dBm -10 -70 dBm -10	D1		
0 dBm D1 D2 M1[1] -2.11 dE -10 dBm 1 130.00 130.00 -20 dBm -20 dBm -2.11 dE 130.00 -30 dBm -2.01 dE -2.01 dE -2.01 dE -30 dBm -2.01 dE -2.01 dE -2.01 dE -30 dBm -2.01 dE -2.01 dE -2.01 dE -40 dBm -2.01 dE -2.01 dE -2.01 dE -70 dBm -2.01 dE -2.01 dE -2.01 dE	D1		
0 dBm 01 02 M1[1] -2.11 dE -10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -20 dBm -20 dBm -20 dBm -20 dBm -30 dBm -20 dBm -20 dBm -20 dBm -40 dBm -20 dBm -20 dBm -20 dBm -70 dBm -20 dBm -20 dBm -20 dBm		D2 M1[1]	
-10 dBm -20 dBm -30 dBm -40 dBm -70 dBm -70 dBm	A		
-10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm		▲ ····▲	130.00 µs
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-30 dBm -40 dBm -40 dBm -60 dBm -70 dBm			
-40 dBm -40 dBm -60 dBm -70 dBm			
-40 dBm -40 dBm -60 dBm -70 dBm			
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-60 dBm			
-60 dBm			
-60 dBm	կեսավորտալեր	հան/ իթակերելուան։	ությունով կերությունը
-70 dBm			
-80 dBm			
-80 dBm			
	Hz	1001 pts	200.0 µs/
Marker			
Type Ref Trc X-value Y-value Function Function Result	f Trc X-value		Function Result
	4 405.5		
	1 130.0 µs	> U.10 UD	
	1 130.0 μs 11 1 388.0 μs		
Bluetooth LE	1 130.0 μs 11 1 388.0 μs		



5.4 Configuration of Test System

Line Conducted Test:	The EUT was tested in a Charging & Transmitting mode. The EUT was connected to
	USB and the Power of USB was Connected to DC Adaptor. All supporting equipments
	were connected to another LISN. Preliminary Power line Conducted Emission test was
	performed by using the procedure in ANSI C63.10: 2013 to determine the worse
	operating conditions.
Radiated Emission Test:	Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10:
	2013 to determine the worse operating conditions. Final radiated emission tests were
	conducted at 3 meter Semi Anechoic Chamber.
	The turntable was rotated through 360 degrees and the EUT was tested by positioned
	three orthogonal planes to obtain the highest reading on the field strength meter. Once
	maximum reading was determined, the search antenna was raised and lowered in both
	vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is Chip Antenna on the main board in the EUT, so no consideration of replacement by the user.



6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Charging & Transmitting Mode	Х

6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	Х



7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
-	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.



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7.4 Test data

-. Test Date : February 04, 2020 ~ February 07, 2020

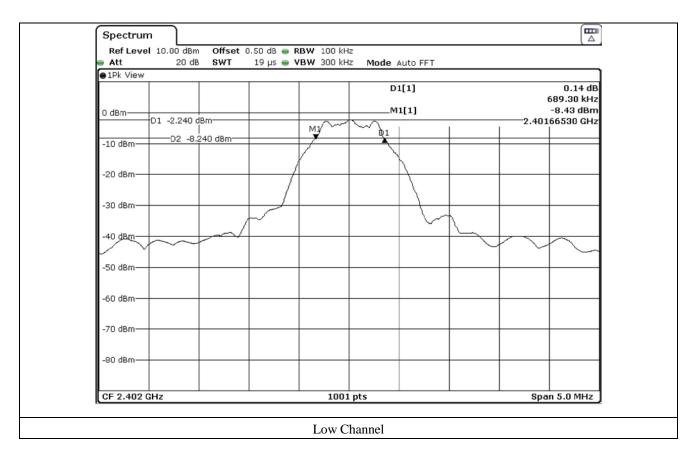
: Pass

-. Test Result

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	689.30	500.00	189.30
Middle	2 440.00	699.30	500.00	199.30
High	2 480.00	694.30	500.00	194.30

Remark. Margin = Measured Value - Limit

Tested by: Hyung-Kwon, Oh / Manager





● Att ●1Pk View	20 de								
					D	1[1]			0.03 dE 599.30 kHz
0 dBm					м	1[1]			-8.45 dBm
o dom	D1 -2.370 (dBm		мı	\sim	1		2.439	66030 GH
-10 dBm-	D2 -8.	370 dBm		7					
				1					
-20 dBm—			- /						
-30 dBm—									
		/	~				N I		
-40 dBm-								\sim	
	1								
-50 dBm—									
60 40-									
-60 dBm—									
-70 dBm—									
, o ubiii-									
-80 dBm—									
CF 2.44 G	<u> </u>			107				0	n 5.0 MHz
GF 2.44 G	T 2								
Spectru	m	0 Offset () 50 dB 👄 🛙	Middle	Channel			эра	
Ref Leve Att	m el 10.00 dBn 20 dE				Channel	Auto FFT			
Ref Leve Att	m el 10.00 dBn 20 dE			Middle	Channel				(III) A
Ref Leve Att	m el 10.00 dBn 20 dE			Middle	Channel	1[1]			0.24 dE
Ref Leve Att	m el 10.00 dBn 20 dł	3 SWT		Middle	Channel				0.24 dE 594.30 kHz -8.86 dBm
Ref Leve Att 1Pk View	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE
Ref Leve Att 1Pk View	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Leva Att 1Pk View 0 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Leve Att 1Pk View 0 dBm-	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att ● 1Pk View 0 dBm -10 dBm -20 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att 1Pk View 0 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att ● 1Pk View 0 dBm -10 dBm -20 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att ● 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Levo Att ● 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Leve Att ● 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Leve Att ● 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm	m el 10.00 dBn 20 df	3 SWT		Middle	Channel	1[1]			0.24 dE 594.30 kHz -8.86 dBm



8. MAXIMUM PEAK OUTPUT POWER

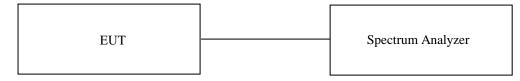
8.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to \geq DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



8.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.



8.4 Test data

-. Test Date : February 04, 2020 ~ February 07, 2020

: Pass

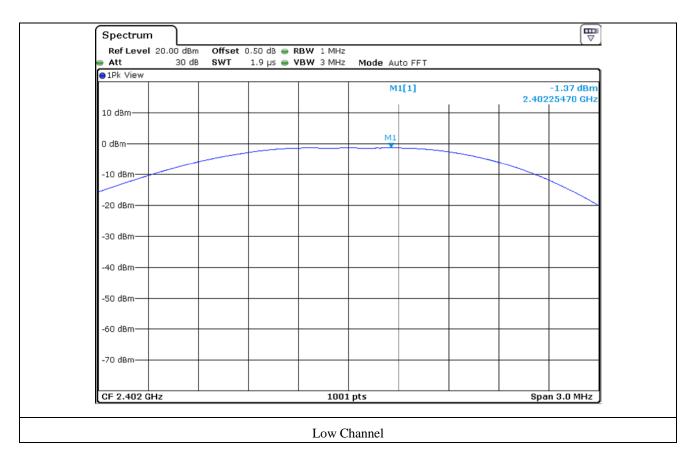
-. Test Result

CHANNEL	FREQUENCY	MEASURED VALUE	LIMIT	MARGIN
CHANNEL	(MHz)	(dBm)	(dBm)	(dB)
LOW	2 402.00	-1.37	30.00	31.37
MIDDLE	2 440.00	-1.73	30.00	31.73
HIGH	2 480.00	-1.69	30.00	31.69

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



Tested by: Hyung-Kwon, Oh / Manager





Spectrum Ref Level		Offset	0.50 dB 👄	RBW 1 MHz					
Att 🗧	30 dB			VBW 3 MHz	Mode Au	to FFT			
●1Pk View									
					M	1[1]		0.440	-1.73 dBn
10 dBm							1	2.440	25470 GH:
10 dBm									
					M1				
0 dBm					V				
-10 dBm									
-20 dBm									
-30 dBm									
00 000									
40 dB~									
-40 dBm									
-50 dBm									
-60 dBm			-	-					
-70 dBm									
CF 2.44 GHz	2			1001	l pts			Spa	n 3.0 MHz
		Offset	0 50 d8 👄	Middle					
Spectrum Ref Level Att				Middle RBW 1 MHz VBW 3 MHz		to FFT			
Ref Level Att	20.00 dBm			RBW 1 MHz	Mode Au				
Ref Level Att	20.00 dBm			RBW 1 MHz	Mode Au	to FFT 1[1]			-1.69 dBn
Ref Level Att 1Pk View	20.00 dBm			RBW 1 MHz	Mode Au		1		
Ref Level Att	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	20.00 dBm			RBW 1 MHz	Mode Au				-1.69 dBn
Ref Level Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	20.00 dBm 30 dB			RBW 1 MHz	Mode Au			2.480	-1.69 dBn



9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth and peak detection was used.



9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

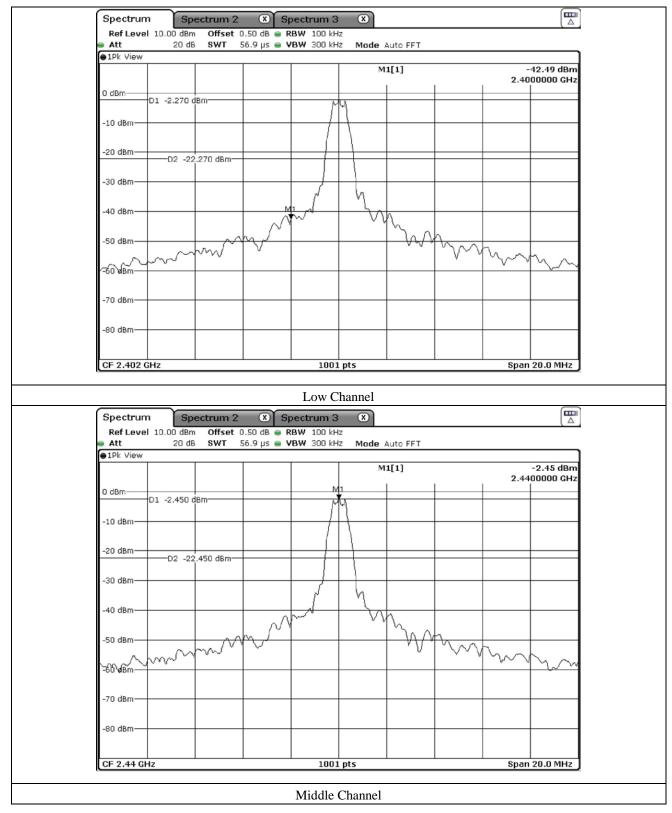
9.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312545	Mar. 18, 2019 (1Y)
■ -	BBV9718	Schwarzbeck	Amplifier	310	Mar. 28, 2019 (1Y)
	SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Mar. 11, 2019 (1Y)
■ -	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 07, 2020 (1Y)

All test equipment used is calibrated on a regular basis.



9.5 Test data for conducted emission





Spectrum Sp	ectrum 2 🛛 🗶 Sı	ectrum 3	×				
Ref Level 10.00 dBm							
Att 20 dB IPk View	8 SWT 56.9 µs 🖷 V	BW 300 kHz	Mode Auto	o FFT			
THE VIEW			M1[1	.]			50.38 dBm 35000 GHz
0 dBm D1 -2.760 d	10 m						
-10 dBm	38m	M					
10 40.00							
-20 dBm	2.760 dBm						
-30 dBm							
		r	4				
-40 dBm	~	\sim	M	А., М1			
-50 dBm	m				how		
~664Bm~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					V . V	V	$\sim \sim $
-70 dBm							
-80 dBm							
CF 2.48 GHz	1	1001 p	ots		I	Span	20.0 MHz
		High Ch	annel				



Spectrum		ectrum 2		bectrum 3					
Ref Level Att	10.00 dBm 20 dB			(BW 100 kH (BW 300 kH		Auto Sweep			
1Pk View	20 00	541 2		D W 300 Ki	14ioue	Auto Sweep			
_					м	1[1]			55.43 dBm
							I	g	14.60 MHz
0 dBm									1
-10 dBm-									
-20 dBm-	D1 -22.270	dBm							
-30 dBm									
-40 dBm									
-50 dBm			M1						
han her have	محاد للأطحاد	and and the second second	y have you have been and	walthil			dia Line		المكارية
-60,98,4	ALTA AMART BARA	- L.Allesh.davona - AM	A M. C. M. M.		allight of the states of the	hillingiafrankillans	الميالة والمناطقة المنطلة	President provided in the second	yupupuru unity
-70 dBm									
-80 dBm									
Start 30.0	MHz			1001	nts			Sto	p 2.5 GHz
		ectrum 2	X SI	Low C					
Spectrum			.80 dB 👄 R	Low C Dectrum 3 BW 100 kH BW 300 kH	Z X	Auto Sweep			
Spectrum Ref Level	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(\
Spectrum Ref Level	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode	Auto Sweep 1[1]			(∆ 49.76 dBm
Spectrum Ref Level	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(\
Spectrum Ref Level Att 1Pk View	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm	1 Spo 10.00 dBm	Offset 1	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm	1 Sp 10.00 dBm 20 dB	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm	1 Spo 10.00 dBm	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm	1 Sp 10.00 dBm 20 dB	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm	1 Sp 10.00 dBm 20 dB	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm	1 Sp 10.00 dBm 20 dB	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	Z Z Mode				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	1 Sp 10.00 dBm 20 dB	Offset 1 SWT 2	.80 dB 👄 R	ectrum 3 BW 100 kH	X Mode /				(∆ 49.76 dBm
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /				(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		h		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att IPk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		hthereforester		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		hushatajhasha		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		h		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att IPk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /				(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		h.,		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		h_itigh_alla-ML		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm	1 Spo 10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Mode /		hushard		(△ 49.76 dBm 5.2980 GHz
Spectrum Ref Level Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm	10.00 dBm 20 dB D1 -22.270	Offset 1 SWT 2	.80 dB • V	Dectrum 3 BW 100 kH BW 300 kH	X Z Mode M		h	16	(△ 49.76 dBm 5.2980 GHz



Spectrun	n Sp	ectrum 2	× :	Spectrum 3	×				
Ref Leve Att	10.00 dBm 20 dB			RBW 100 kH		Auto Swoon			
1Pk View	20 06	5 3WI 4	24.7 113	4044 300 KF		Auto Sweep			
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0 dBm							I	1	707.30 MHz
o ubili									
-10 dBm									
10 0000									
-20 dBm									
	D1 -22.450	dBm							
-30 dBm									
									1
-40 dBm									
-50 dBm		M1							
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-00 ubiii-					14900 - 000 - 000 - 00	400.00			
-70 dBm									
-80 dBm									
Start 30.0	MHz			1001	pts			Sto	p 2.5 GHz
				Middle	Channel				
Spectrun	n Sp	ectrum 2	8						
Spectrun Ref Leve	10.00 dBm			Middle Spectrum 3 RBW 100 kH	×				
Ref Leve Att		Offset	1.80 dB 👄	Spectrum 3	x	Auto Sweep			
Ref Leve	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A	Auto Sweep 1[1]			50.45 dBm
Ref Leve Att 1Pk View	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A		1		(\
Ref Leve Att	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm-	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm	10.00 dBm	Offset	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	10.00 dBm	9 Offset :	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	9 Offset :	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	9 Offset :	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	9 Offset :	1.80 dB 👄	Spectrum 3 RBW 100 kH	z Mode A				(∆ •50.45 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]	anna lleist agricolaithe		[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]	νηνα Πεεί του αρχαριατίου 		[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	1 10.00 dBm 20 dB	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	Z Mode #	1[1]			[△ 50.45 dBm 5.7230 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm -80 dBm	D1 -22.450	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	X Mode A	1[1]		1.	[Δ
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm	D1 -22.450	dBm	1.80 dB • 240 ms •	Spectrum 3 RBW 100 kH VBW 300 kH	X Mode A	1[1]		1.	[△ 50.45 dBm 5.7230 GHz



Spectrun	n Spe	ectrum 2		pectrum 3					
Ref Leve Att	10.00 dBm 20 dB			RBW 100 kH VBW 300 kH		Auto Sweep			
1Pk View	20 00	UNI 2		TEN SOO KI	iz moue	Auto Sweep			
					M	1[1]			54.45 dBm 07990 GHz
0 dBm								1.	.07990 GHz
-10 dBm									
-20 dBm		10							
	D1 -22.760	dBm							
-30 dBm									
-40 dBm									
-50 dBm				M1					
weeker here here here here	spranturburnet	monuture	hermonelistertit	fermilien lane	المرابية الإصابة المراجع	adament and the distance	anto an anto	hiden al Carbolate	tumorard
-00 0811					- Maillagar day			A WWALL IN	
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-80 dBm									
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Spectrum	n Sn	ectrum 2	85	High C					Ē
Spectrun Ref Leve	-	ectrum 2 Offset 1		Spectrum 3	: X)				
Ref Leve Att	n Spe I 10.00 dBm 20 dB	Offset 1	.80 dB 👄			Auto Sweep			
Ref Leve	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				[Δ
Ref Leve Att	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode	Auto Sweep			49.83 dBm 5.7470 GHz
Ref Leve Att	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	10.00 dBm	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	1 10.00 dBm 20 dB	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm	1 10.00 dBm 20 dB	Offset 1	.80 dB 👄	Spectrum 3 RBW 100 kH	iz Mode				(∆ 49.83 dBm
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K				49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K				49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH	K K K K K K K K K K K K K K K K K K K		h.J.h.v.f.laskorthev		49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K				49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K		hjdurdfilleskorthev		49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -60 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K		h jdy.v h llog kystlavi		49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -60 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K		h du v f Usskertber		49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K				49.83 dBm 5.7470 GHz
Ref Leve Att 1Pk View 1Pk View 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm	D1 -22.760	dBm	80 dB - 240 ms -	Spectrum 3 RBW 100 kH VBW 300 kH	K K K K K K K K K K K K K K K K K K K			1.	49.83 dBm 5.7470 GHz



9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

9.6.1.1 Test data for Bluetooth LE

Test Date	: February 04, 2020 ~ February 07, 2020
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- -. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
 - 1 MHz and RMS Detector for Average Mode
- -. Video bandwidth : 3 MHz for Peak and Average Mode
- -. Measurement distance : 3 m
- -. Duty Cycle : 61.78 %
- -. Result : <u>PASSED</u>

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
		·	Tes	t Data for]	Low Chan	nel			
2 389.24	19.89	Peak	Н			-	56.03	74.00	17.97
2 338.01	7.14	Average	Н			2.09	45.37	54.00	8.63
2 387.24	19.26	Peak	v	26.94	9.20	-	55.40	74.00	18.60
2 338.17	6.74	Average	v			2.09	44.97	54.00	9.03
			Test	t Data for I	High Chan	nel			
2 483.508	28.56	Peak	Н			-	65.52	74.00	8.48
2 483.508	8.44	Average	Н			2.09	47.49	54.00	6.51
2 483.508	26.81	Peak	v	27.47	9.49	-	63.77	74.00	10.23
2 483.508	7.45	Average	v			2.09	46.50	54.00	7.50

Tabulated test data for Restricted Band

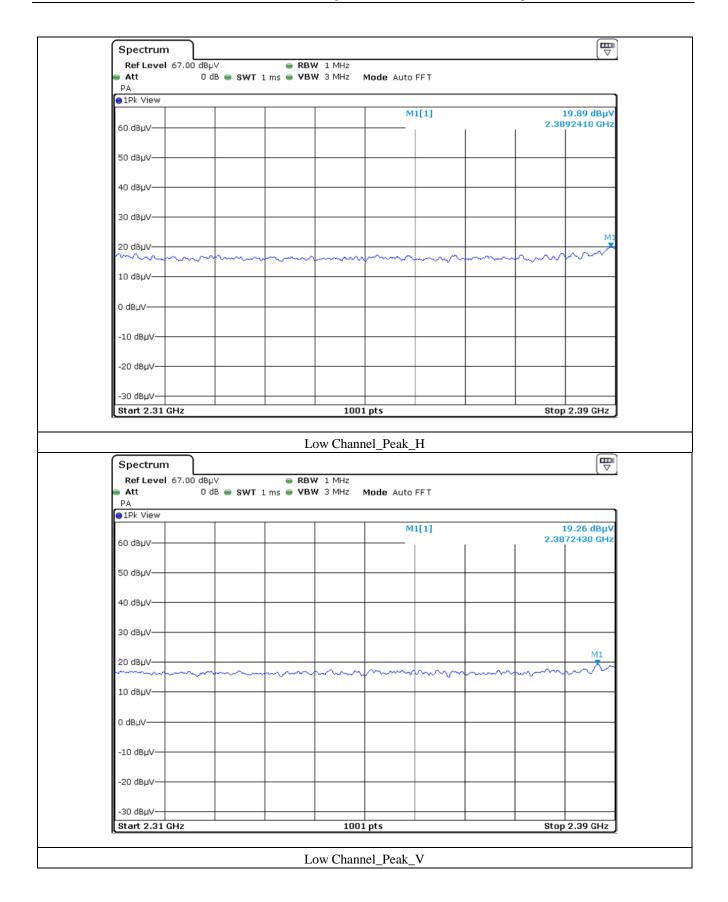
Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB μ V/m) - Total Level (dB μ V/m)

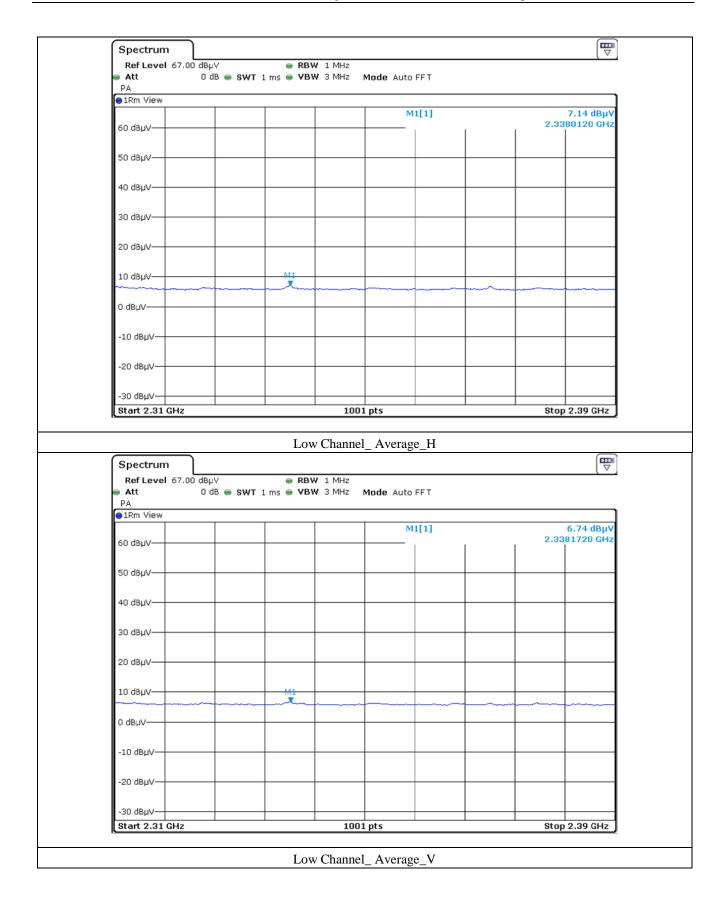
Total Level = Reading + Antenna Factor + Cable Loss + Correction Factor

Tested by: Hyung-Kwon, Oh / Manager

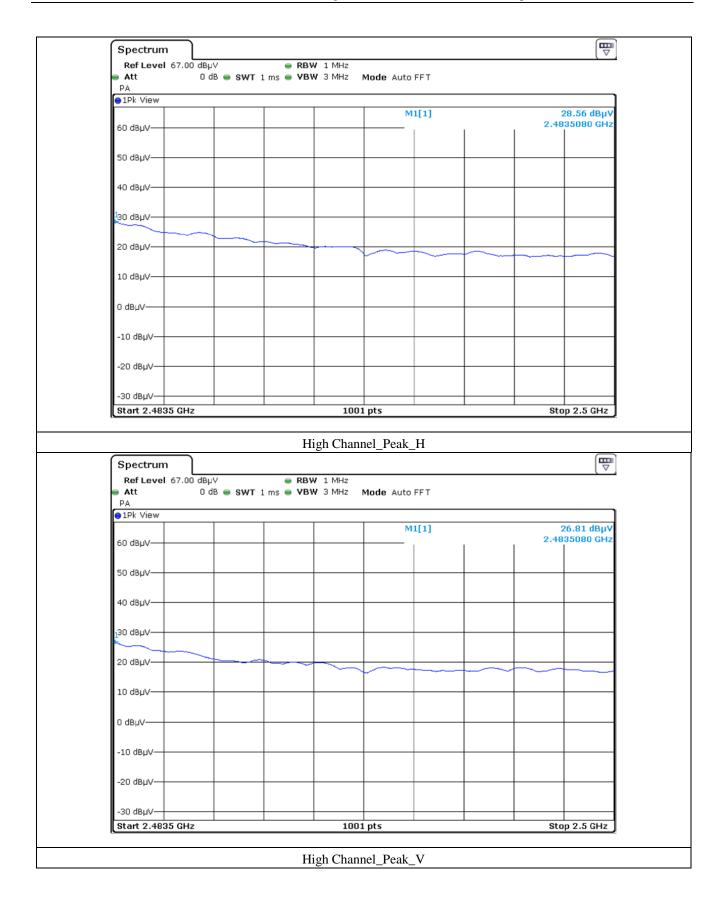














	57.00 dBµ∖	/	🖷 R	BW 1 MHz					
Att PA	0 dE	s 👄 SML	1 ms 👄 ۷	BW 3 MHz	Mode Au	ito FFT			
●1Rm View									
						M1[1]			8.44 dBµ\
60 dBµV						- ,		2.48	35080 GH
50 dBµV									
00 00000									
40 dBµV									
40 UBpV									
0.0 10.11									
30 dBµV									
20 dBµV									
10 dBµV					-		-		
			<u> </u>		+		-		
0 dBµV			-	_	-				
-10 dBµV					_				
-20 dBµV									
Lo depr									
-30 dBµV									
Start 2.4835	CHIP			100	1 pts				p 2.5 GHz
				igh Chann	el_Aver	age_H			
Spectrum Ref Level 6 Att	57.00 dBµV 0 dE	s e swt	e R	igh Chann BW 1 MHz BW 3 MHz					
Ref Level 6 Att PA	57.00 dBμ\ 0 dE	s e swt	e R	BW 1 MHz					
Ref Level 6 Att PA	67.00 dBµ\ 0 dE	s ⊜ swt	e R	BW 1 MHz		ito FFT			,
Ref Level 6 Att PA 1Rm View	67.00 dBμ\ 0 dE	s swt	e R	BW 1 MHz				2.48	(▼ 7.45 dBµ\ 35080 GH:
Ref Level 6 Att PA 1Rm View	57.00 dBµV 0 dE	g ● SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV	57.00 dBμ\ 0 dE	swT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV	0 dBµV 0 dE	s swt	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV	57.00 dBμV 0 dE	s swt	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV	0 dBμV 0 dE	s ● SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	0 dBμV 0 dE		e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV			e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	57.00 dBµ\ 0 dE	8 ● SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ●1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	17.00 dBµv 0 dE	s swt	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV	17.00 dBµv 0 dE	S SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 110 dBµV	17.00 dBµv 0 dE	S SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 110 dBµV -10 dBµV		S SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 110 dBµV 0 dBµV		S SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV		S SWT	e R	BW 1 MHz		ito FFT		2.48	7.45 dBµ\
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 110 dBµV -10 dBµV		S SWT	e R	BW 1 MHz BW 3 MHz		ito FFT			7.45 dBµ\



9.6.1.2 Test data for Bluetooth LE Edge

Test Date	: February 04, 2020 ~ February 07, 2020	
. Test Dute	. Teordary 04, 2020 - Teordary 07, 2020	

Resolution bandwidth	: 1 MHz and Peak Detector for Peak Mode
	1 MHz and RMS Detector for Average Mode

-. Video bandwidth : 3 MHz for Peak and Average Mode

: PASSED

- -. Measurement distance : 3 m
- -. Duty Cycle : 61.78 %
- -. Result

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
			Tes	t Data for]	Low Chan	nel			
2 389.08	20.24	Peak	Н			-	56.38	74.00	17.62
2 386.02	5.62	Average	Н			2.09	43.85	54.00	10.15
2 389.84	19.45	Peak	v	26.94	9.20	-	55.59	74.00	18.41
2 385.94	5.41	Average	v			2.09	43.64	54.00	10.36
			Tes	t Data for l	High Chan	nel			
2 483.50	28.46	Peak	Н			-	65.42	74.00	8.58
2 483.50	7.46	Average	Н			2.09	46.51	54.00	7.49
2 483.50	26.37	Peak	V	27.47	9.49	-	63.33	74.00	10.67
2 483.50	6.86	Average	v			2.09	45.91	54.00	8.09

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB μ V/m) - Total Level (dB μ V/m)

Total Level = Reading + Antenna Factor + Cable Loss + Correction Factor

Tested by: Hyung-Kwon, Oh / Manager



	7.00 dBµ∨	👄 RBW 1 MHz				
Att	0 dB 👄 SWT 1 i	ms 👄 VBW 3 MHz	Mode Auto FFT			
PA						
●1Pk View		1	M1[1]			20.24 dBµV
60 d9:44			mi[1]		2.389	07840 GHz
60 dBµV				1		
50 dBµV						
40 dBµV						
30 dBµV						
					M1	
20 dBµV					M1	
10 dBµV						
10 0004						
0.40.44						1
0 dBµV						
-10 dBµV						
						1
-20 dBµV						
-30 dBµV						
Start 2.385 GI	Hz	11	001 pts		Ston	2.39 GHz
Ref Level 67	7.00 dBµ∨	👄 RBW 1 MHz				
Att 🛛	7.00 dBµ∨ 0 dB ⊜ SWT 1 m	● RBW 1 MHz ms ● VBW 3 MHz	Mode Auto FFT			
Ref Level 67	7.00 dBµ∀ 0 dB ⊖ SWT 1 r	● RBW 1 MHz ms ● VBW 3 MHz	Mode Auto FFT			
RefLevel 67 Att PA	7.00 dBµ∨ 0 dB ● SWT 1 r	● RBW 1 MHz ms ● VBW 3 MHz	Mode Auto FFT		1	19.45 dBµV
RefLevel 67 Att PA	7.00 dBµ∨ 0 dB ● SWT 1 m	● RBW 1 MHz ms ● VBW 3 MHz	Mode Auto FFT		2.389	
Ref Level 67 Att PA 1Pk View	7.00 dBµ∨ 0 dB ● SWT 1 1	● RBW 1 MHz ms ● VBW 3 MHz	Mode Auto FFT		1 2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View	7.00 dBµ∨ 0 dB ● SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 60 dBµV	7.00 dBµ∨ 0 dB ● SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 50 dBµV	7.00 dBµ∨ 0 dB ● SWT 1 n	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 60 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 1Pk View 60 dBµV 50 dBµV 40 dBµV 40 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 50 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		2.389	19.45 dBµV
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 1Pk View 60 dBµV 50 dBµV 40 dBµV 40 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	19.45 dBµV 84270 GH2
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT		1 2.389	.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT			.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV	7.00 dBµV 0 dB • SWT 1 1	RBW 1 MHz ms VBW 3 MHz	Mode Auto FFT			.9.45 dBµV 84270 GHz M1
Ref Level 67 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV		ms • VBW 3 MHz	Mode Auto FFT			.9.45 dBµV 84270 GHz M1



Ker Lever o	7.00 dBµ∨	👄 RBW 🔅	L MHz			
PA	0 dB 😑 SW	/T 1 ms 👄 VBW 3	3 MHz Mode /	Auto FFT		
●1Rm View						
				M1[1]		5.62 dBµV
60 dBµV					2.3	8601650 GHz
50 dBµV						
50 UBµV						
40 dBµV						
30 dBµV						
20 dBµV						
10 dBµV	M1					
0 dBµV						
-10 dBµV						
10 0000						
-20 db 4/						
-20 dBµV						
-30 dBµV						
Start 2.385 (iHz		1001 pts		St	op 2.39 GHz
Spectrum Ref Level 6	7.00 dBµ∨	e RBW 1				
Ref Level 6 Att	7.00 dBµV 0 dB ● SW		L MHz			
Ref Level 6	7.00 dBµ∨ 0 dB ● SW	e RBW 1	L MHz			
Ref Level 6 Att PA	7.00 dB _µ V 0 dB — SW	e RBW 1	L MHz			5.41 dBµV
Ref Level 6 Att PA	7.00 dB _µ V 0 dB ● SW	e RBW 1	L MHz	Auto FF T	2.38	
Ref Level 6 Att PA 1Rm View	7.00 dB _µ V 0 dB ● SW	e RBW 1	L MHz	Auto FF T	2.30	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View	7.00 dBµV 0 dB • sw	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV	7.00 dBµV 0 dB • sw	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV	7.00 dBµV 0 dB • sw	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 1Rm View 60 dBµV 50 dBµV 40 dBµV 40 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 1Rm View 60 dBµV 50 dBµV 40 dBµV 40 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµV 0 dB • SW	e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ●1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ●1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV		e RBW 1	L MHz	Auto FF T	2.3	5.41 dBµV
Ref Level 6 Att PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV	0 dB • SW	e RBW 1	L MHz	Auto FF T		5.41 dBµV



KELEVEL U	7.00 dBµV	e Ri	BW 1 MHz				
🕨 Att	0 dB 👄 SV	VT 1 ms 👄 VI		lode Auto FFT			
PA 91Pk View							
JIFK VIEW				M1[1]		2	8.46 dBµV
60 dBµV							50250 GHz
50 db. 44							
50 dBµV							
40 dBµV		_					
.							
30_dBµV							
20 dBµV							
10 dBµV							
10 dbpv							
0 dBµV							
-10 dBµV							
-20 dBµV							
-30 dBµV					_		
Start 2.4835	GHz		1001	pts		Stop 2.	4885 GHz
			High Chann	el Peak H			
Spectrum		1	High Chann	el_Peak_H			Ē
Spectrum				el_Peak_H			
	7.00 dBµV 0 dB ⊜ S ¥	e R	3W 1 MHz				
RefLevel 6 Att PA	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	el_Peak_H			
RefLevel 6 Att	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT			
Ref Level 6 Att PA 1Pk View	7.00 dBµ∨ 0 dB ● S ₩	e R	3W 1 MHz			2 483	6.37 dBµV
RefLevel 6 Att PA	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		22.483	
Ref Level 6 Att PA 1Pk View 60 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2 2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		2.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV	7.00 dBµ∨ 0 dB ● SV	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 0 dBµV -10 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 10 dBµV -10 dBµV -20 dBµV	7.00 dBµV 0 dB • sv	e R	3W 1 MHz	lode Auto FFT		22.483	6.37 dBµV
Ref Level 6 Att PA ● 1Pk View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 0 dBµV -10 dBµV		e R	3W 1 MHz	Iode Auto FFT		2.483	6.37 dBµV



	7.00 dBµ∨	👄 RBW 🗈	L MHz			
Att	O dB 👄 SWT	1 ms 👄 VBW 3	MHz Mode	Auto FFT		
PA 1Dm Minut						
1Rm View						T IC ID I
				M1[1]	2.49	7.46 dBµ\ 350250 GH:
60 dBµV						
50 dBµV						
40 dBµV						
30 dBµV						
30 dbpv						
20 dBµV					1	
10 dBµV		+				-
		+				+
о авил						
-10 dBµV						
-10 0000						
-20 dBµV		+ +				
-30 dBµV						
Start 2.4835	GHz		1001 pts		Stop	2.4885 GHz
Spectrum Ref Level 6	7.00 dBµ∨	e RBW 1	Channel_Ave			
Ref Level 6 Att	7.00 dBµ∨ 0 dB ● SWT		L MHz			
Ref Level 6	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz			
RefLevel 6 Att PA	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T		
Ref Level 6 Att PA 1Rm View	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz		2.48	(▼ 6.86 dBµ\ 350250 GH;
Ref Level 6 Att PA 1Rm View	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA IRm View 60 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA IRm View 60 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' Att PA 1Rm View 60 dBµV 50 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA IRm View 60 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' Att PA 1Rm View 60 dBµV 50 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' Att PA IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6" Att PA 1Rm View 60 dBµV 50 dBµV 40 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' Att PA ●1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµ∨ 0 dB ● SWT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' Att PA ●1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA ● 1Rm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV 0 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV	7.00 dBµV 0 dB • swT	e RBW 1	L MHz	Auto FF T	2.48	6.86 dBµ\
Ref Level 6' PA PA IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV		e RBW 1	I MHz Mode /	Auto FF T		6.86 dBµ\ 350250 GH:
Ref Level 6' PA IRm View 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV		e RBW 1	L MHz	Auto FF T		6.86 dBµ\



-. Result

9.6.2 Spurious & Harmonic Radiated Emission

: PASSED

: February 04, 2020 ~ February 07, 2020
: 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
: 3 MHz for Peak and Average Mode
: 1 GHz ~ 26.5 GHz
: 3 m
: 61.78 %

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)	
Test Data for Low Channel										
	15.26	Peak	Н			-	54.41	74.00	19.59	
	3.17	Average	Н			2.09	44.41	54.00	9.59	
4 804.00	15.39	Peak	V 28.84	10.31	-	54.54	74.00	19.46		
	3.46	Average	V			2.09	44.70	54.00	9.30	
Test Data for Middle Channel										
4 880.00	14.89	Peak	Н	28.01	10.43	-	53.33	74.00	20.67	
	3.35	Average	Н			2.09	43.88	54.00	10.12	
	15.15	Peak	V			-	53.59	74.00	20.41	
	3.82	Average	V			2.09	44.35	54.00	9.65	
Test Data for High Channel										
	15.21	Peak	Н	29.15	10.81	-	55.17	74.00	18.83	
4 960.00	3.49	Average	Н			2.09	45.54	54.00	8.46	
	16.20	Peak	V			_	56.16	74.00	17.84	
	3.79	Average	v			2.09	45.84	54.00	8.16	

Tabulated test data for Restricted Band

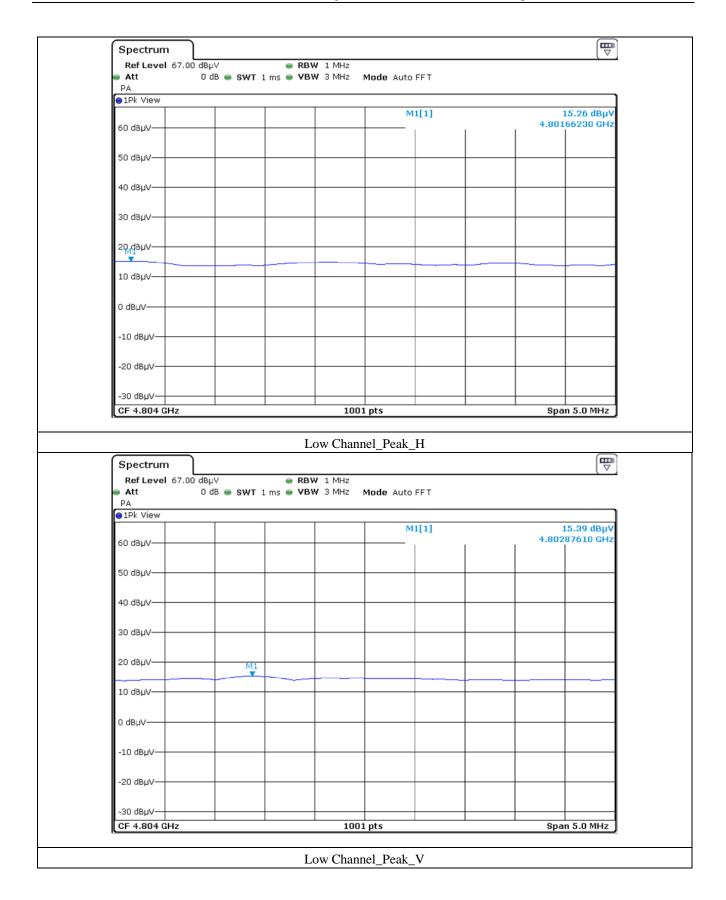
Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB μ V/m) - Total Level (dB μ V/m)

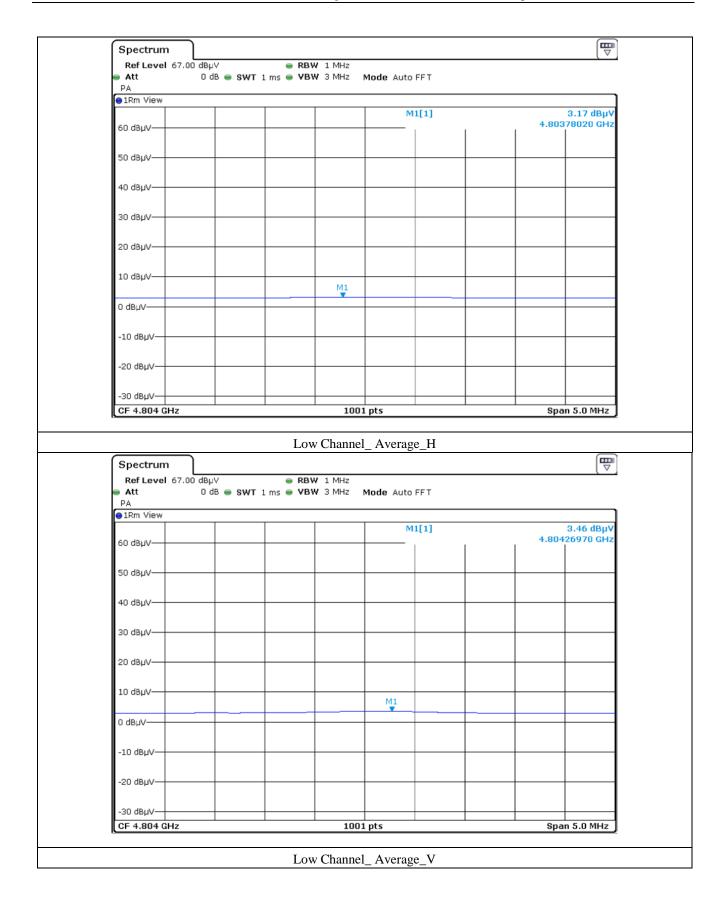
Total Level = Reading + Antenna Factor + Cable Loss + Correction Factor

Tested by: Hyung-Kwon, Oh / Manager

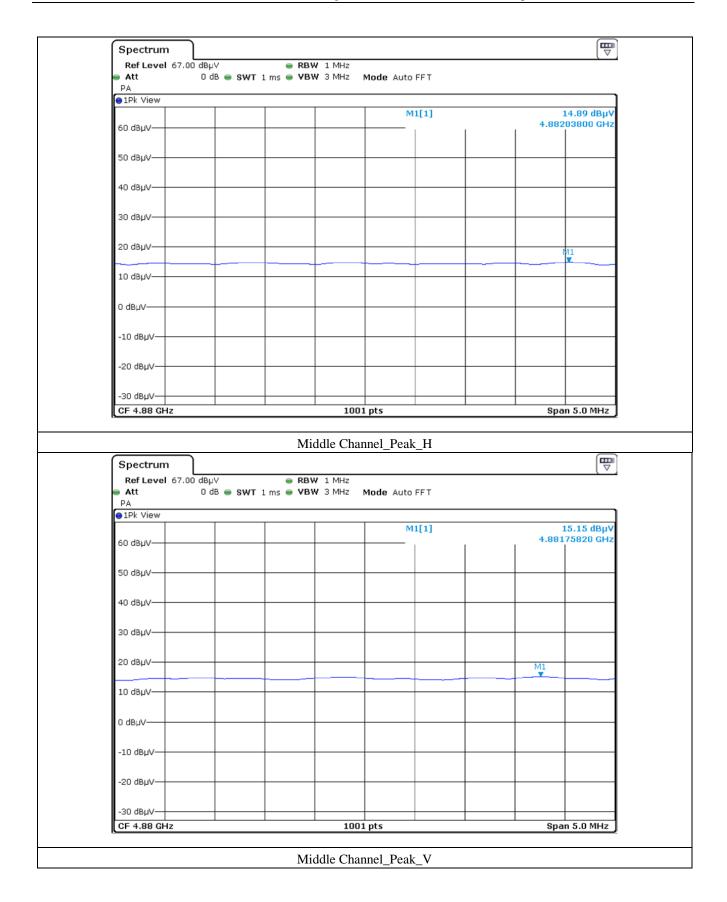




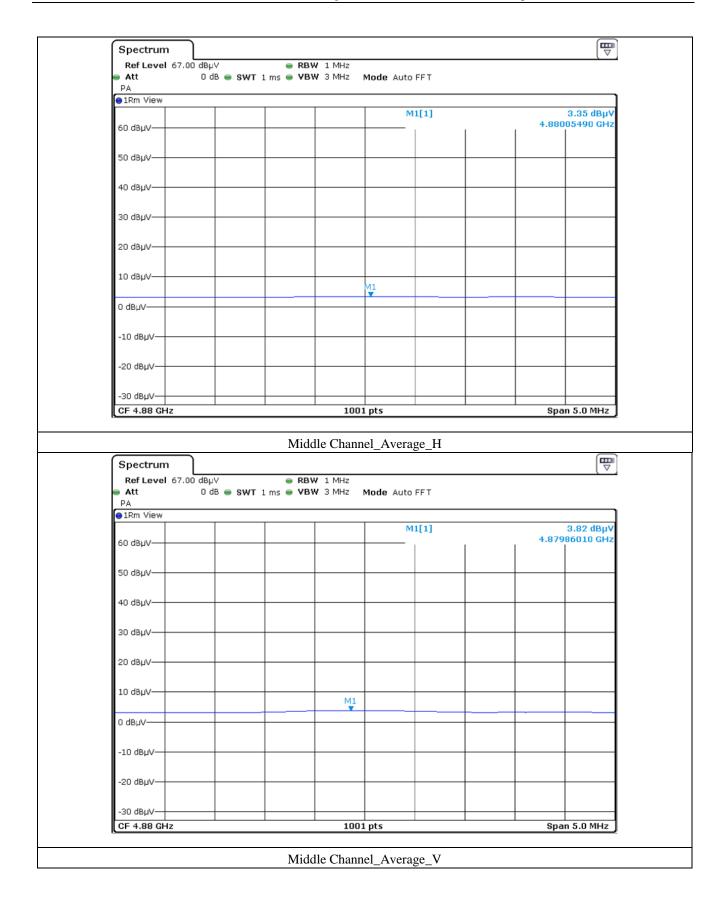




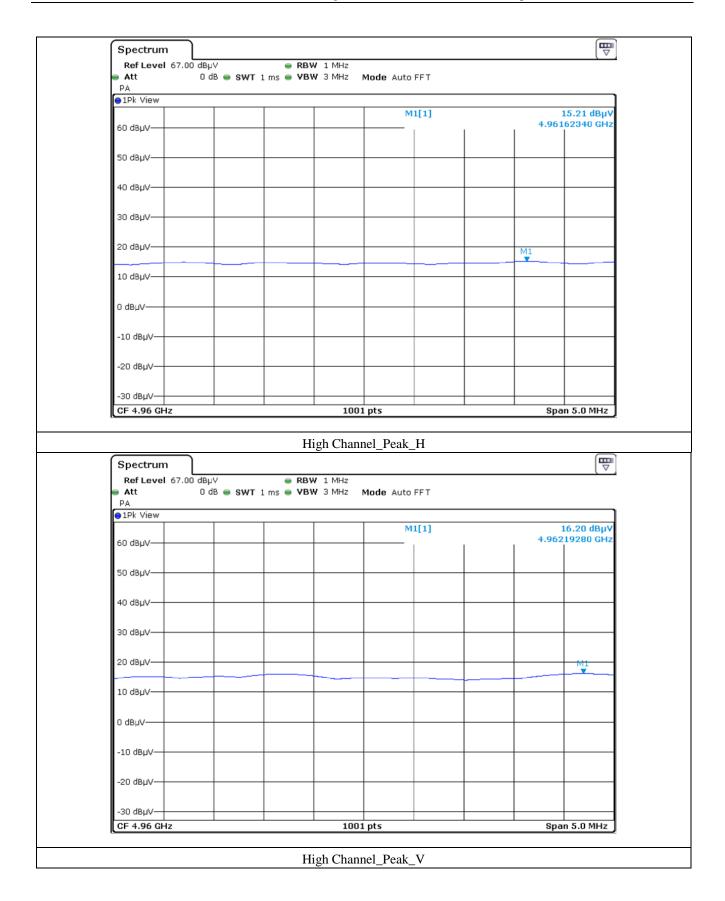




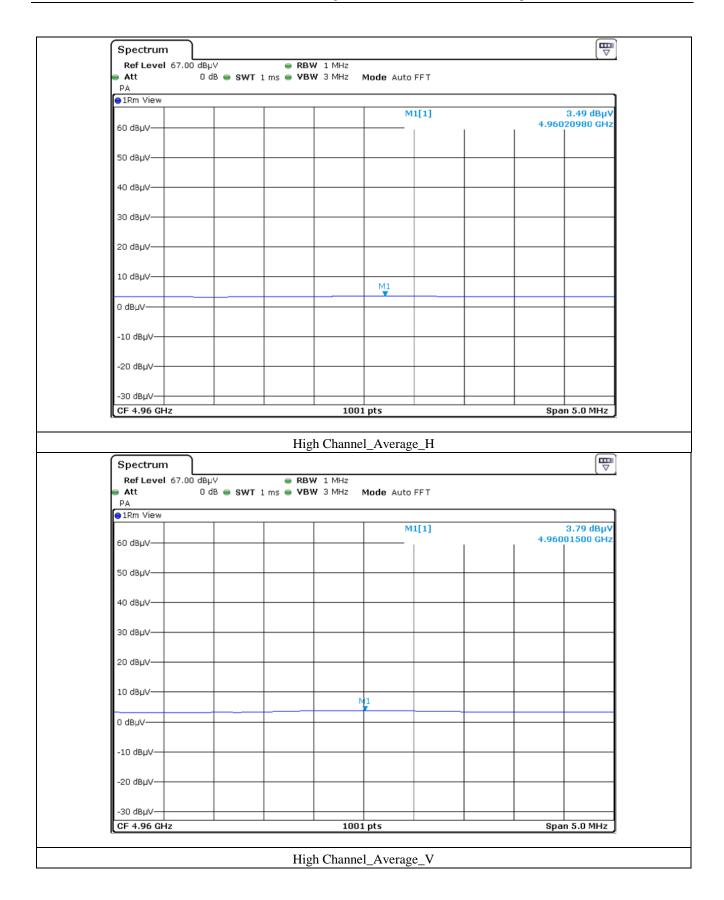














10. PEAK POWER SPECTRAL DENSITY

10.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to 3 kHz \leq RBW \leq 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.	
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)	

All test equipment used is calibrated on a regular basis.



10.4 Test data

-. Test Date : February 04, 2020 ~ February 07, 2020

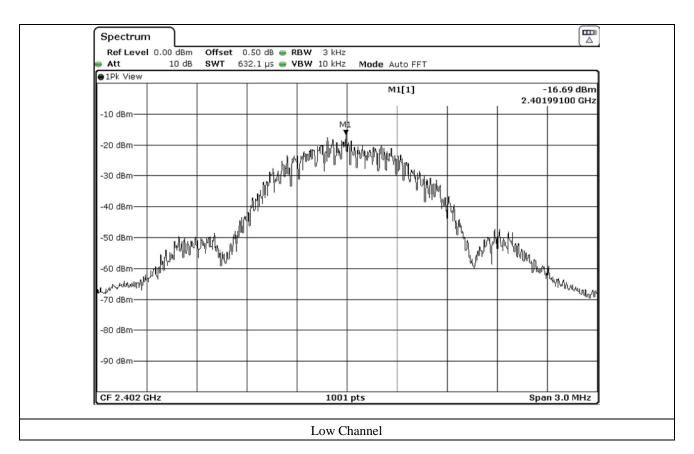
-. Test Result

: Pass -. Operating Condition : Continuous transmitting mode

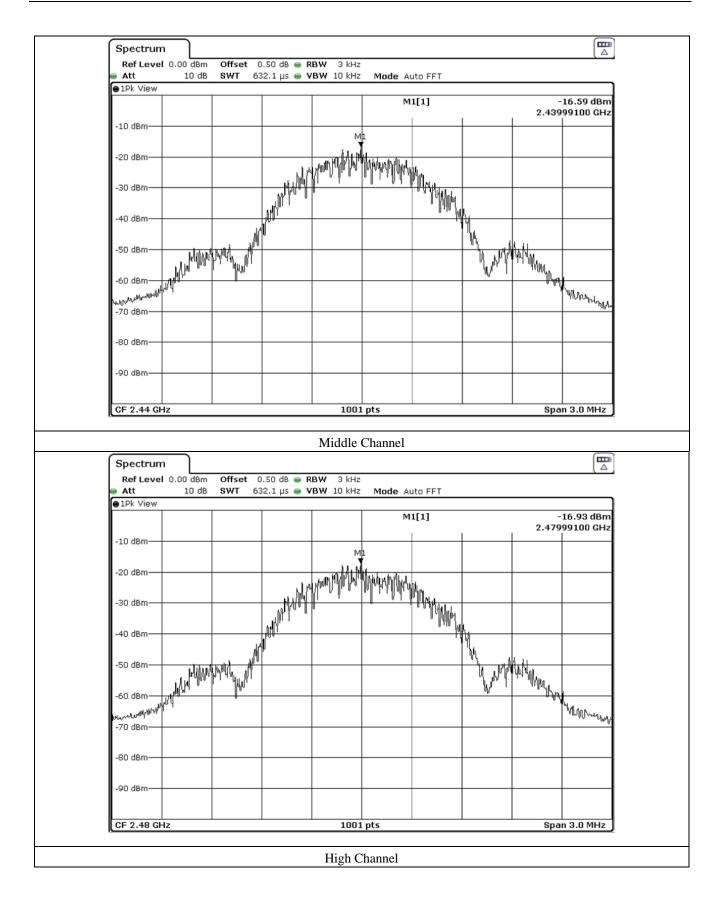
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-16.69	8.00	24.69
Middle	2 440.00	-16.59	8.00	24.59
High	2 480.00	-16.93	8.00	24.93

Remark. Margin = Limit – Measured value

Tested by: Hyung-Kwon, Oh / Manager









11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312545	Mar. 18, 2019 (1Y)
■ -	BBV9718	Schwarzbeck	Amplifier	310	Mar. 28, 2019 (1Y)
	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 07, 2020 (1Y)

All test equipment used is calibrated on a regular basis.



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11.4 Test data

11.4.1 Te		ta for 30									-		22 0 G
Humidity I			: <u>46 %</u>								Temp	erature:	<u>23 °C</u>
Limits app	ly to				PART 1	<u>5, SUB</u>	PART C, S	SECTION	15.247				
Result			: PASS	ED									
EUT			: ATO	Z				D	ate: Febru	ary 04, 20	20 ~ Febr	uary 07	, 2020
Detector			: CISP	R Quasi-I	Peak (6	dB Ban	dwidth: 12	0 kHz)					
70	[dBu	IV/m]	<<		<>>					RIZONTAL	/×VEF	RTICAL	
60													
50													
40					· · · · · · · · · · · · · · · · · · ·								
30	\sim					m.t	1 4						
20	Ť			M	A	A M	when the	mander	1 PK 1	M. M. M.	Walder		
10			m			Vv	And the second sec		Madd Walay 194	CONFERNMENT			
0													
	30		50	70	100		200) 3	800	500	700 Frequenc	960 y[MHz]	
	No.	FREQ	READING QP	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE		
		[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]		
	H	orizontal -											
	1 2 3 4 5 6	159.980 239.520 320.030 399.570 424.791 480.081	42.4 46.6 40.8 37.7 40.1 41.9	12.6 10.6 14.2 16.4 16.8 17.5	1.6 1.9 2.2 2.4 2.4 2.6	32.6 32.6 32.7 32.7 32.7 32.9	24.0 26.5 24.5 23.8 26.6 29.1	43.5 46.0 46.0 46.0 46.0 46.0	19.5 19.5 21.5 22.2 19.4 16.9	100 100 100 100 100 100	193 0 225 0 0 0		
	V	ertical											
	7 8 9 10 11 12	31.940 48.430 119.240 130.880 196.840 327.790	46.6 47.7 42.2 50.7 41.1 39.9	10.9 10.0 10.8 10.8 12.7 14.4	0.8 0.9 1.4 1.4 1.8 2.2	32.6 32.7 32.7 32.7 32.6 32.7	25.7 25.9 21.7 30.2 23.0 23.8	40.0 40.0 43.5 43.5 43.5 43.5 46.0	14.3 14.1 21.8 13.3 20.5 22.2	100 100 100 100 100 100	244 300 359 195 283 345		
											R	1	



Tested by: Hyung-Kwon, Oh / Manager



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11.4.2 Test data for Below 30 MHz

-. Test Date : February 04, 2020 ~ February 07, 2020

-. Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)

- -. Frequency range : 9 kHz ~ 30 MHz
- -. Measurement distance : 3 m
- -. Operating mode : Transmitting mode

Frequency	Reading	Ant. Pol.	Ant.	Angle	Ant. Factor	Cable	Emission	Limits	Margin
(MHz)	(dBµV)	(H/V)	Height (m)	(°)	(dB/m)	Loss	Level(dBµV/m)	(dBµV/m)	(dB)
			It was not o	observed a	any emissions	from the l	EUT.		

11.4.3 Test data for above 1 GHz

- -. Test Date : February 04, 2020 ~ February 07, 2020
- -. Resolution bandwidth 21 MHz for Peak and Average Mode
- -. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- -. Frequency range : 1 GHz ~ 26.5 GHz
- -. Measurement distance : 3 m

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Emission Level(dBµV/m)	Limits (dBµV/m)	Margin (dB)

It was not observed any emissions from the EUT.

Tested by: Hyung-Kwon, Oh / Manager



12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature	:	23 °C
Relative humidity	:	46 % R.H.

12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Oct. 22, 2019 (1Y)
□ -	ESU	Rohde & Schwarz	Test Receiver	100261	Mar. 28, 2019 (1Y)
□ -	NSLK8128	Schwarzbeck	AMN	8128-216	Mar. 20, 2019 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 19, 2019 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Mar. 19, 2019 (1Y)
-	3825/2	EMCO	AMN	9109-1867	Mar. 27, 2019 (1Y)

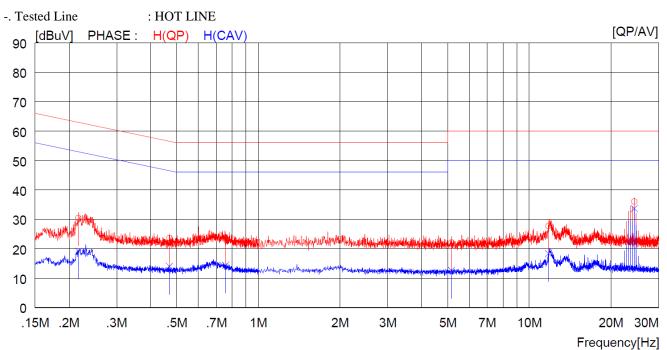
All test equipment used is calibrated on a regular basis.



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12.4 Test data

- -. Test Date : February 04, 2020 ~ February 07, 2020
- -. Resolution bandwidth : 9 kHz
- -. Frequency range : 0.15 MHz ~ 30 MHz

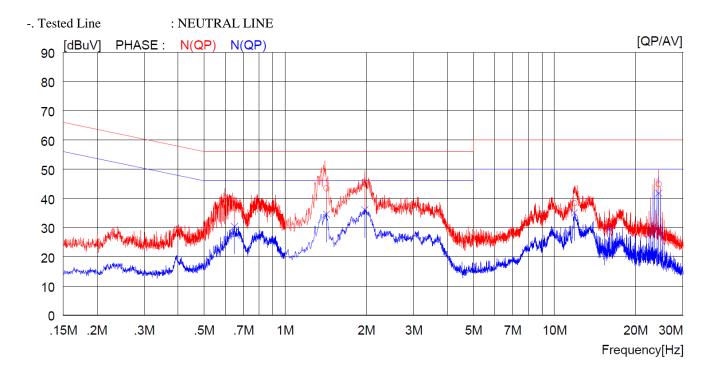


N	O FREQ	READ QP	ING (AV	C.FACTOR	RES OP	ULT AV	LIM QP	IIT AV	MAH QP	RGIN AV	PHASE
	[MHz]	[d̃BuV]	[dBuV]	[dB]	[d̃BuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]]
1	0.21700	20.4		10.1	30.5		62.9		32.4		H(QP)
2	0.47000	13.5		10.1	23.6		56.5		32.9		H(QP)
3	0.75600	13.6		10.1	23.7		56.0		32.3		H(QP)
L	5.16000	12.1		10.1	22.2		60.0		37.8		H(QP)
5	11.77000	17.4		10.3	27.7		60.0		32.3		H(QP)
6	24.39000	25.6		10.4	36.0		60.0		24.0		H(QP)
7	0.21700		9.1	10.1		19.2		52.9		33.7	H(CAV)
8	0.47000		3.9	10.1		14.0		46.5		32.5	H(CAV)
9	0.75600		4.3	10.1		14.4		46.0		31.6	H(CAV)
10	5.16000		2.6	10.1		12.7		50.0		37.3	H(CAV)
11	11.77000		8.0	10.3		18.3		50.0		31.7	H(CAV)
12	24.39000		23.3	10.4		33.7		50.0		16.3	H(CAV)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



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NC	FREQ	READII OP	NG AV	C.FACTOR	RES OP	ULT AV	LIM OP	IT AV	MAF OP	RGIN AV	PHASE
	[MHz]	[dBuV][[dB]	[dBuV]		[dBuV]		~	[dBuV]	
1	0.64800	26.6 -		10.1	36.7		56.0		19.3		N(QP)
2	1.42400	33.3 -		10.1	43.4		56.0		12.6		N(QP)
3	1.97600	35.5 -		10.1	45.6		56.0		10.4		N(QP)
4	11.86000	28.0 -		10.3	38.3		60.0		21.7		N(QP)
5	15.98000	21.1 -		10.4	31.5		60.0		28.5		N(QP)
6	24.39000	34.5 -		10.4	44.9		60.0		15.2		N(QP)
7	0.64800	2	20.3	10.1		30.4		46.0		15.6	N(CAV)
8	1.42400	2	24.5	10.1		34.6		46.0		11.4	N(CAV)
9	1.97600	2	26.0	10.1		36.1		46.0		9.9	N(CAV)
10	11.86000	2	24.8	10.3		35.1		50.0		14.9	N(CAV)
11	15.98000	1	19.2	10.4		29.6		50.0		20.4	N(CAV)
12	24.39000	3	31.4	10.4		41.8		50.0		8.2	N (CAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: Hyung-Kwon, Oh / Manager