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Report Template Version: V05 Report Template Revision Date: 2021-11-03

Test Report

Report No.:	CQASZ20211202179E
Applicant:	Plastimold Products, Inc
Address of Applicant:	250 N Congress Ave, Delray Beach, FL 33445
Equipment Under Test (E	UT):
EUT Name:	SonicCast Transmitter
Model No.:	RFA1
Test Model No.:	RFA1
Brand Name:	N/A
FCC ID:	2A26F-RFA1
Standards:	47 CFR Part 15, Subpart C
Date of Receipt:	2021-12-15
Date of Test:	2021-12-15 to 2022-01-17
Date of Issue:	2022-01-25
Test Result:	PASS*

*In the configuration tested, the EUT complied with the standards specified above

Tested By:	lewis zhou	TESTING
	(Lewis Zhou)	and terms terms
Reviewed By:	Rook Huanz	「「「「「「」」」を
	(Rock Huang)	
Approved By:	Jansi	APPROVED
	(Jack Ai)	

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20211202179E	Rev.01	Initial report	2022-01-25



2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS



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6.3 EUT CONSTRUCTIONAL DETAILS	6.2 CONDUCTED EMISSION TEST SETUP	
	6.3 EUT CONSTRUCTIONAL DETAILS	



4 General Information

4.1 Client Information

Applicant:	Plastimold Products, Inc	
Address of Applicant:	250 N Congress Ave, Delray Beach, FL 33445	
Manufacturer:	Plastimold Products, Inc	
Address of Manufacturer:	250 N Congress Ave, Delray Beach, FL 33445	
Factory:	Plastimold Products, Inc	
Address of Factory:	250 N Congress Ave, Delray Beach, FL 33445	

4.2 General Description of EUT

EUT Name:	SonicCast Transmitter	
Model No.:	RFA1	
Test Model No.:	RFA1	
Trade Mark:	N/A	
Software Version:	1.4	
Hardware Version:	1.2	
Frequency Range:	2406MHz~2474MHz	
Modulation Type:	GFSK	
Number of Channels:	3	
Sample Type:	Mobile Portable Fix Location	
Test Software of EUT:	uCon Configuration(manufacturer declare)	
Antenna Type:	PCB Antenna	
Antenna Gain:	3.3 dBi	
Power Supply:	DC 5V for adapter	



Operation Frequency each of channel					
Channel Frequency Channel Frequency Channel Frequency					
1	2406MHz	2	2438MHz	3	2474MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH1)	2406MHz
The Middle channel(CH2)	2438MHz
The Highest channel(CH3)	2474MHz



4.3 Test Environment and Mode

Operating Environment:	Operating Environment:		
Temperature: 26 °C			
Humidity: 59% RH			
Atmospheric Pressure: 1009mbar			
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.		

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
Adapter	MI	/	/	CQA



4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	5.12dB	(1)
Radiated Emission	Above 1GHz	4.60dB	(1)
Conducted Disturbance	0.15~30MHz	3.34dB	(1)

Hereafter the best measurement capability for **CQA** laboratory is reported:

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.



4.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2021/9/10	2022/9/9
Spectrum analyzer	R&S	FSU26	CQA-038	2021/9/10	2022/9/9
Preamplifier	MITEQ	AMF-6D-02001800-29- 20P	CQA-036	2021/9/10	2022/9/9
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2021/9/10	2022/9/9
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2021/9/10	2022/9/9
Antenna Connector	CQA	RFC-01	CQA-080	2021/9/10	2022/9/9
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2021/9/10	2022/9/9
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2021/9/10	2022/9/9

Note:

The temporary antenna connector is soldered on the pcb board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
responsible party shall be u antenna that uses a unique	be designed to ensure that no antenna other than that furnished by the sed with the device. The use of a permanently attached antenna or of an coupling to the intentional radiator, the manufacturer may design the unit an be replaced by the user, but the use of a standard antenna jack or bited
EUT Antenna:	RANSHI TTER FULL REVI-4
The antenna is PCB antenna	a. The best case gain of the antenna is 3.3dBi.



5.2 Conducted Emissions

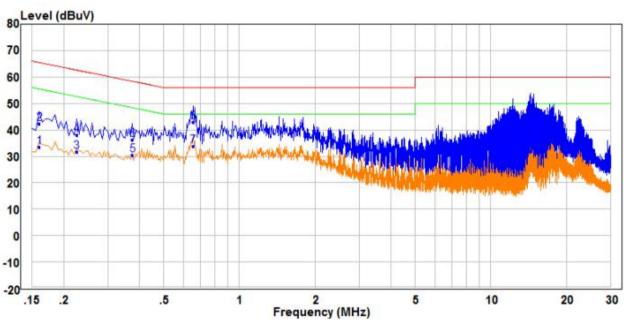
Test Requirement:	47 CFR Part 15C Section 15.2	207					
Test Method:	ANSI C63.10: 2013						
Test Frequency Range:	150kHz to 30MHz						
Limit:	Frequency range (MHz)	Limit (d Quasi-peak	IBuV) Average				
	0.15-0.5	66 to 56*	56 to 46*				
	0.5-5	56	46				
	5-306050* Decreases with the logarithm of the frequency.						
Test Procedure:	 The mains terminal disturbance voltage test was conducted in a shift room. The EUT was connected to AC power source through a LISN 1 Impedance Stabilization Network) which provides a 50Ω/50µH - linear impedance. The power cables of all other units of the EUT 						
	connected to a second reference plane in the s measured. A multiple soc power cables to a single exceeded.	ame way as the LIS ket outlet strip was u	N 1 for the unit being sed to connect multiple				
	3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.						
	4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.						
	5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.						
Test Setup:	Shielding Room	AE	Test Receiver				



Test Mode:	Charge +Transmitting mode.
Test Results:	Pass

Measurement Data:

Live line:



			Read			Limit	Over		
		Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	-	MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.160	23.89	9.68	33.57	55.46	-21.89	Average	Line
2		0.160	32.67	9,68	42.35	65.46	-23.11	QP	Line
3		0.225	22.11	9.58	31.69	52.63	-20.94	Average	Line
4		0.225	28.61	9.58	38.19	62.63	-24.44	QP	Line
5		0.375	20.81	9.58	30.39	48.39	-18.00	Average	Line
6		0.375	26.53	9.58	36.11	58.39	-22.28	QP	Line
7	PP	0.655	23.94	9.86	33.80	46.00	-12.20	Average	Line
8	QP	0.655	33.03	9.86	42.89	56.00	-13.11	QP	Line
9		12.285	17.59	9.82	27.41	50.00	-22.59	Average	Line
10		12.285	32.88	9.82	42.70	60.00	-17.30	QP	Line
11		14.445	22.30	9.75	32.05	50.00	-17.95	Average	Line
12		14.445	34.41	9.75	44.16	60.00	-15.84	QP	Line

Remark:

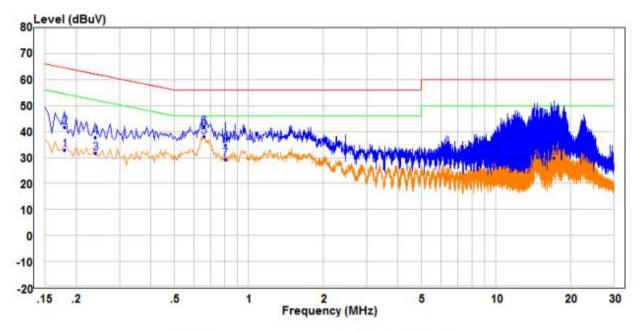
1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.



Neutral line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	_	MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.180	23.27	9.64	32.91	54.49	-21.58	Average	Neutral
2		0.180	32.00	9.64	41.64	64.49	-22.85	QP	Neutral
3		0.240	21.99	9.55	31.54	52.10	-20.56	Average	Neutral
4		0.240	28.30	9.55	37.85	62.10	-24.25	QP	Neutral
5	PP	0.660	28.26	9.86	38.12	46.00	-7.88	Average	Neutral
6	QP	0.660	31.76	9.86	41.62	56.00	-14.38	QP	Neutral
7		0.805	19.54	9.83	29.37	46.00	-16.63	Average	Neutral
8		0.805	24.97	9.83	34.80	56.00	-21.20	QP	Neutral
9		14.695	20.44	9.74	30.18	50.00	-19.82	Average	Neutral
10		14.695	31.61	9.74	41.35	60.00	-18.65	QP	Neutral
11		17.145	20.09	9.78	29.87	50.00	-20.13	Average	Neutral
12		17.145	31.48	9.78	41.26	60.00	-18.74	QP	Neutral

Remark:

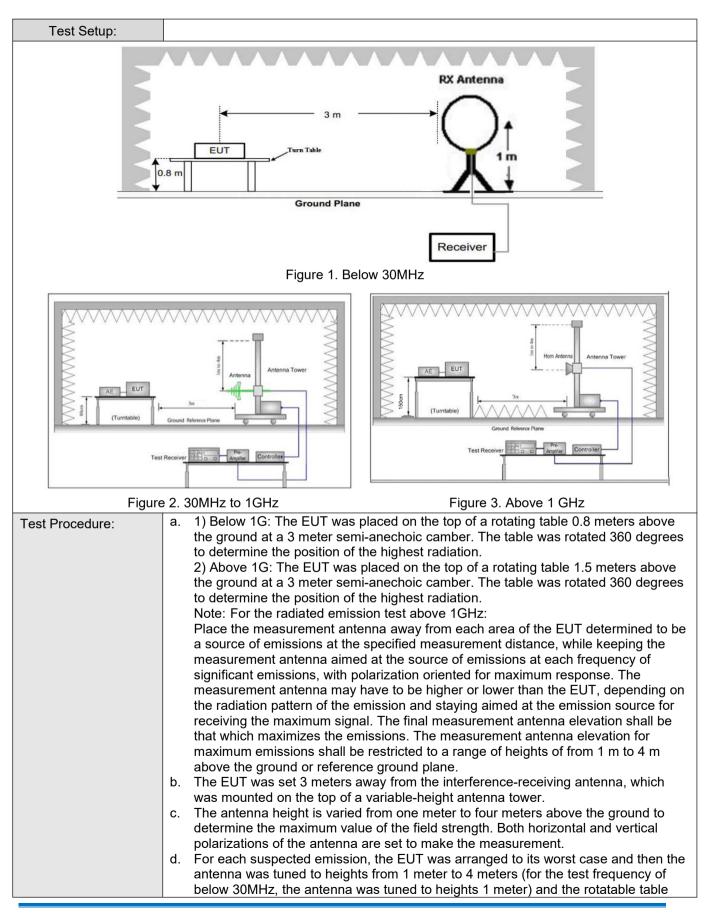
- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



5.3 Radiated Emission

Test Requirement:	47 CFR Part 15C Section	n 15.249 and 15.20	09 and 15.205	5					
Test Method:	ANSI C63.10: 2013								
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)								
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark]			
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak				
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average	-			
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak				
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak				
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average				
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak	1			
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak]			
		Peak	1MHz	3MHz	Peak]			
	Above 1GHz	Peak	1MHz	10Hz	Average]			
	Note: For fundamental f value, RMS detect			5MHz, Peak o	detector is for	r PK			
Limit: (Spurious Emissions	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark		Measurement distance (m)			
and band edge)	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300				
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30				
	1.705MHz-30MHz	30	-	-	30				
	30MHz-88MHz	100	40.0	Quasi-peak	3				
	88MHz-216MHz	150	43.5	Quasi-peak 3					
	216MHz-960MHz	200	46.0	Quasi-peak	3				
	960MHz-1GHz	500	54.0	Quasi-peak	3				
	Above 1GHz	500	54.0	Average	3				
	 Note: 1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. 2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation. 								
Limit:	Frequency	Limit (dBu∨	//m @3m)	Rem	nark	1			
(Field strength of the		94.		Average		1			
fundamental signal)	2400MHz-2483.5MHz	114		Peak		1			





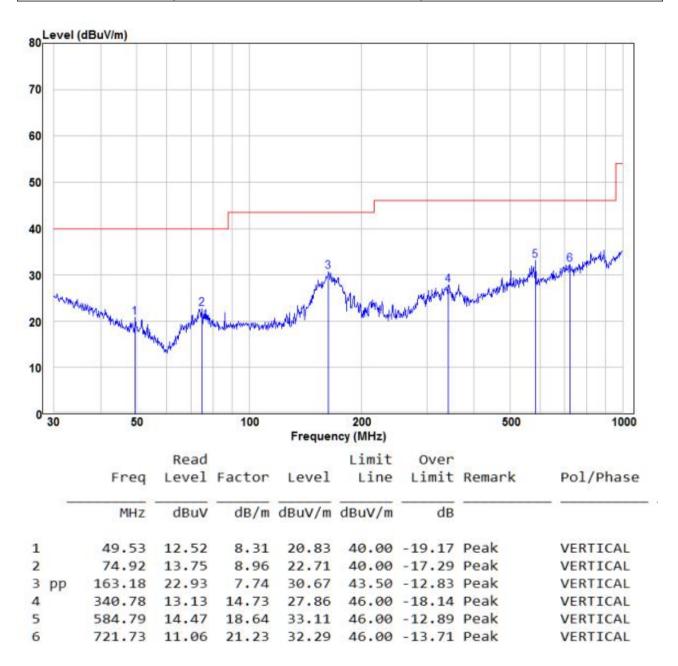


	 was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
	 g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case.
	For below 1GHz part, through pre-scan, the worst case is the lowest channel.
	Only the worst case is recorded in the report.
Test Results:	Pass

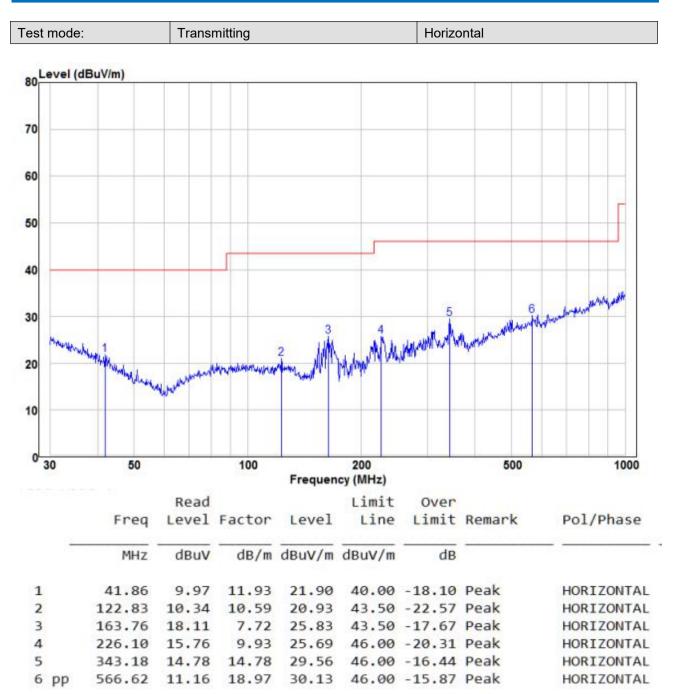


Measurement Data

30MHz~1GHz		
Test mode:	Transmitting	Vertical









Above 1GHz									
Test mode:		Transmitting		Test chann	Test channel:		Lowest		
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V		
2390	61.13	-9.2	51.93	74	-22.07	Peak	н		
2390	44.62	-9.2	35.42	54	-18.58	AVG	н		
2400	45.26	-9.39	35.87	74	-38.13	Peak	н		
2400	46.29	-9.39	36.90	54	-17.10	AVG	н		
2406	99.88	-9.33	90.55	114	-23.45	peak	н		
2406	98.36	-9.33	89.03	94	-4.97	AVG	н		
4812	55.14	-4.28	50.86	74	-23.14	peak	н		
4812	42.99	-4.28	38.71	54	-15.29	AVG	н		
7218	51.61	1.13	52.74	74	-21.26	peak	н		
7218	38.60	1.13	39.73	54	-14.27	AVG	н		
2390	61.14	-9.2	51.94	74	-22.06	peak	V		
2390	45.68	-9.2	36.48	54	-17.52	AVG	v		
2400	61.25	-9.39	51.86	74	-22.14	peak	V		
2400	44.09	-9.39	34.70	54	-19.30	AVG	V		
2406	94.64	-9.33	85.31	114	-28.69	peak	V		
2406	93.44	-9.33	84.11	94	-9.89	AVG	V		
4812	56.92	-4.28	52.64	74	-21.36	peak	v		
4812	42.95	-4.28	38.67	54	-15.33	AVG	V		
7218	51.37	1.13	52.50	74	-21.50	peak	V		
7218	38.04	1.13	39.17	54	-14.83	AVG	v		



Test mode:	Test mode:		Transmitting		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V	
2438	97.49	-9.37	88.12	114	-25.88	peak	н	
2438	95.69	-9.37	86.32	94	-7.68	AVG	н	
4876	55.56	-4.14	51.42	74	-22.58	peak	Н	
4876	40.71	-4.14	36.57	54	-17.43	AVG	Н	
7314	53.28	0.56	53.84	74	-20.16	peak	Н	
7314	37.54	0.56	38.10	54	-15.90	AVG	н	
2438	94.92	-9.36	85.56	114	-28.44	peak	V	
2438	93.17	-9.36	83.81	94	-10.19	AVG	V	
4876	57.42	-4.14	53.28	74	-20.72	peak	V	
4876	41.10	-4.14	36.96	54	-17.04	AVG	V	
7314	53.59	0.56	54.15	74	-19.85	peak	V	
7314	37.88	0.56	38.44	54	-15.56	AVG	V	



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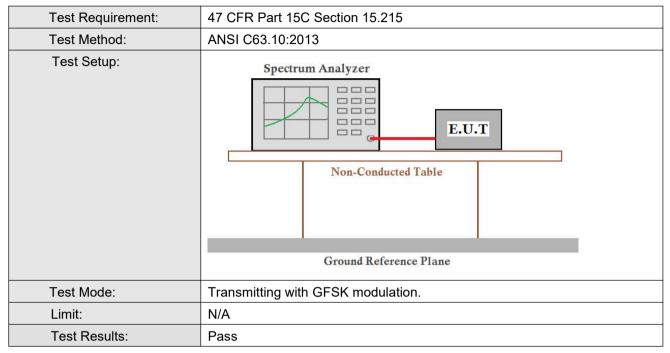
Test mode:		Transmitting		Test channel:		Highest	
_	N.A		F usia sia n				Ant. Pol.
Frequenc y	Meter Reading	Factor	Emission Level	Limits	Over	Detector	7 414. 1 01.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2474	99.15	-9.23	89.92	114	-24.08	peak	н
2474	96.84	-9.23	87.61	94	-6.39	AVG	н
2483.5	60.43	-9.29	51.14	74	-22.86	Peak	н
2483.5	42.79	-9.29	33.50	54	-20.50	AVG	Н
4948	55.08	-4.03	51.05	74	-22.95	peak	Н
4948	40.71	-4.03	36.68	54	-17.32	AVG	Н
7422	51.11	1.68	52.79	74	-21.21	peak	Н
7422	37.22	1.68	38.90	54	-15.10	AVG	Н
2474	96.55	-9.23	87.32	114	-26.68	peak	V
2474	95.51	-9.23	86.28	94	-7.72	AVG	V
2483.5	62.45	-9.29	53.16	74	-20.84	peak	V
2483.5	43.19	-9.29	33.90	54	-20.10	AVG	V
4948	57.66	-4.03	53.63	74	-20.37	peak	V
4948	41.08	-4.03	37.05	54	-16.95	AVG	V
7422	53.60	1.68	55.28	74	-18.72	peak	V
7422	35.91	1.68	37.59	54	-16.41	AVG	V

Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



5.4 20dB Bandwidth



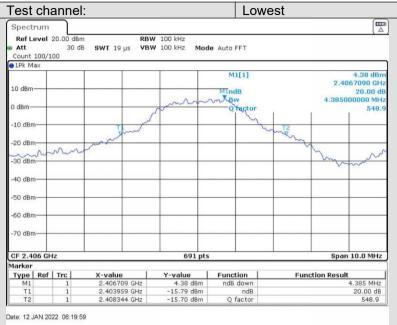
Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	4.385	Pass
Middle	4.385	Pass
Highest	4.356	Pass



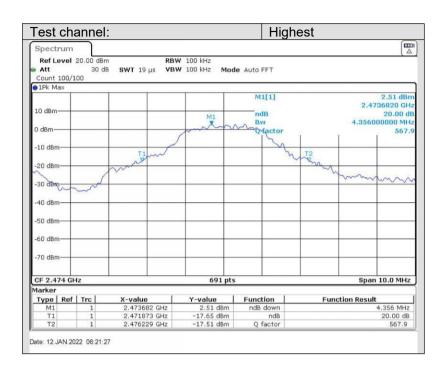
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Test plot as follows:



Test channel:				Mid	Middle		
Spectrum							
Ref Level	20.00 dBn	n RB	W 100 kHz				
Att	30 di	B SWT 19 µs VE	W 100 kHz Mod	e Auto FFT			
Count 100/1	00						
1Pk Max							
				M1[1]		3.18 dBr	
						2,4387240 GH	
10 dBm				MINdB		20.00 d	
				BW		4.385000000 MH	
0 dBm			hundry	Qfactor		556.	
			4	12	1		
-10 dBm		T1		2	TO		
		T1 Serand			white .		
-20 dBm		m			why		
na.n.	m				~	4	
-30 dBm					-		
-40 dBm		-				-	
-50 dBm		-	_		_		
0.00000000							
-60 dBm					_		
-70 dBm							
CF 2.438 GH	łz		691 pts			Span 10.0 MHz	
Marker							
	Trc	X-value	Y-value	Function	Fun	ction Result	
M1	1	2.438724 GHz	3.18 dBm	ndB down	4.385 MHz		
T1	1	2.435887 GHz	-16.69 dBm	ndB	20.00 dB		
T2	1	2.440272 GHz	-16.91 dBm	Q factor	556.2		







6 Photographs

6.1 Radiated Emission Test Setup

9kHz~30MHz









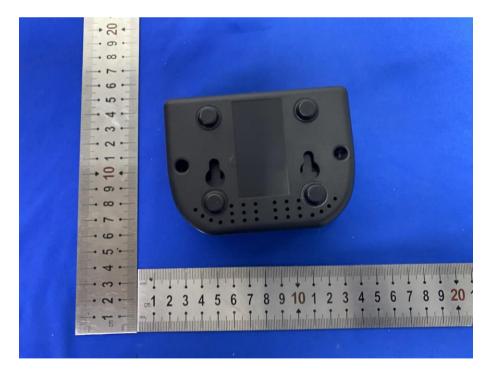
6.2 Conducted Emission Test Setup



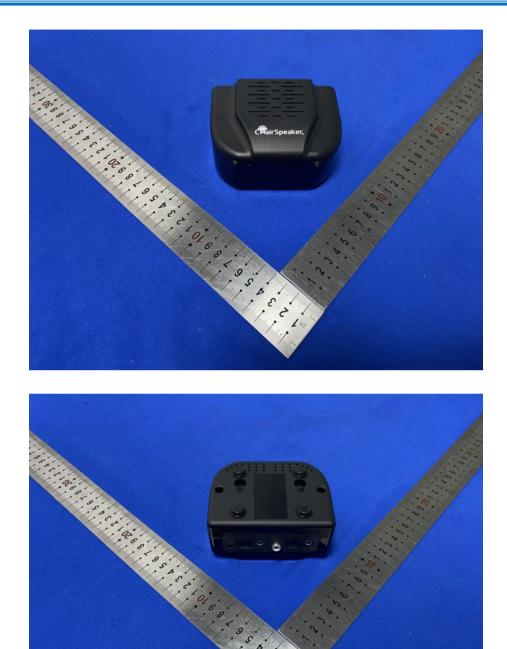


6.3 EUT Constructional Details



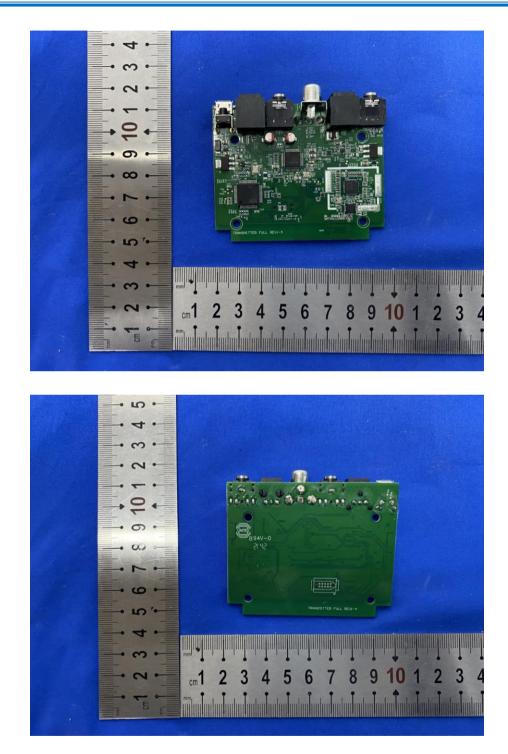








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*** END OF REPORT ***