TEST REPORT On behalf of

Signify (China) Investment Co., Ltd

Product Name: Miscellaneous Controls

Model No.: SC1500/05, SC1500/10, SC1500/15

FCC ID: 2AGBW-SC1500

Prepared For: Signify (China) Investment Co., Ltd Building no.9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233, China

Prepared By: Audix Technology (Shanghai) Co., Ltd. 3F and 4F, 34Bldg, 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China

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File No.:C1D1911021Report No.:ACI-F19371Date of Test:2019.12.18-25Date of Report:2019.12.28

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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FCC ID: 2AGBW-SC1500

TEST REPORT

Applicant	:	Signify (China) Investment Co., Ltd				
EUT Description	:	Miscellaneous Controls				
		(A) Model No.	:	Refer to Sec.2.1		
		(B) Power Supply	:	12-20.5V; 25mA		
		(C) Test Voltage	:	DC16V		

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10-2013

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

Date of Test :	2019.12.18-25	Date of Report :	2019.12.28
Producer :	JAREY LU / Supervisor		
Reviewer :	Byron U.L BYRON WU/ Deputy Assistant	Manager	
Audix Technology (Shang	on behalf of hai) Co., Ltd.		
Signatory :	Front s		
Authorized Signature(s) B	RON KWO/Assistant General	Manager	

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item Test Standard		Results	Meets Limit			
	EMISSION					
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.207			
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.209(a) 15.205(a)(c)			
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(2)			
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(b)(3)			
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)			
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)			
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(e)			
N/A is an abbreviation	N/A is an abbreviation for Not Applicable.					

2 GENERAL INFORMATION

2.1	Description of Equipment Under Test				
	Description	:	Miscellaneous Controls		
	Type of EUT	:	☑ Production □ Pre-product □ Pro-type		
	Model Number	:	SC1500/05, SC1500/10, SC1500/15		
	Note	:	SC1500/05, SC1500/10, SC1500/15 are identical with each other, except the color of the front cover is different. /05 is white, /10 is grey and /15 is black.		
	Tested Model	:	SC1500/05		
	Radio Tech	:	Bluetooth v4.2 BLE Zigbee		
	Channel Freq.	:	BLE: 2402MHz-2480MHz; Zigbee: 2405MHz-2480MHz.		
	Modulation	:	BLE: GFSK Zigbee: OQPSK		
	Antenna Info.	:	Antenna Type: PCB Antenna Antenna Gain: 2.35 dBi The Antenna is permanently attached to the intentional radiator that is comply with 15.203 requirement.		
	Test Mode	:	The EUT was set at continuous TX during all the test in the report		
	Applicant	:	Signify (China) Investment Co., Ltd Building no.9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233, China		
	Manufacturer	:	same as Applicant		
	Factory	:	Fideltronik Poland Sp.z.o.o. UL. Beniowskiego 1 34-200, Sucha Beskidzka Poland Postcode/Zip Code: 34-200		

2.2 EUT Specifications Assessed in Current Report

Mode	Modulation	Data Rate(Mbps)	
BLE	GFSK	1	

Channel List						
Channel No. Frequency (MHz) Channel No. Frequency (MHz)						
00	2402	20	2442			
01	2404	21	2444			
02	2406	22	2446			
		•••				
		•••				
17	2436	37	2476			
18	2438	38	2478			
19	2440	39	2480			

2.3 Test Information

The test software "Philips MultiOne" was used to control EUT work in TX mode, and select test channel.

Modulation	data rate (Mbps)	Test Channel		Frequency (MHz)
	1	Low:	00	2402
BLE		Middle:	20	2442
		High:	39	2480

2.4 Supported equipment

Model Name	:	LED Electronic Driver
Model Number	:	XI040C119V054VPT1

2.5 Description of Test Facility

Name of Firm	: Audix Technology (Shanghai) Co., Lt	d.
Site Location	: 3F and 4F, 34Bldg, 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China.	
Accredited by NVLAP, Lab Code	: 200371-0	
FCC Designation Number	: CN5027	
Test Firm Registration Number	: 954668	

3 CONDUCTED EMISSION TEST

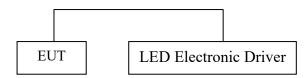
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

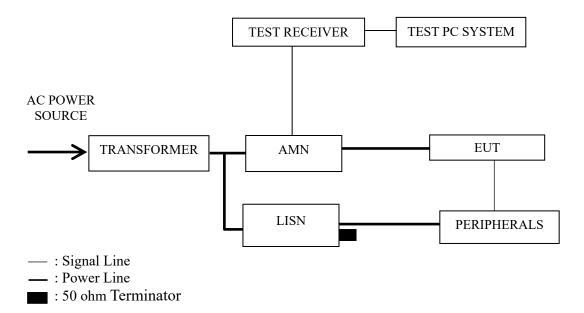
Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2019	Apr 26, 2020
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 24, 2019	Jun 23, 2020
3.	Software	Audix	E3	6.2009-1-15		

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



3.2.2 Conducted Disturbance Test Setup



3.3 Conducted Emission Limits (§15.207)

Frequency Range	Limits c	lB(µV)					
(MHz)	Quasi-peak	Average					
0.15 ~ 0.5	66~56	56~46					
0.5 ~ 5	56	46					
$5 \sim 30$	60	50					

NOTE 1 – The lower limit shall apply at the transition frequencies.

NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Turn the EUT on the test mode, and then test.

3.6 Test Procedures

The EUT was placed upon a non-metallic table, which is 0.8 m above the horizontal conducting ground plane and 0.4 m from a vertical reference plane. The EUT was connected to the power mains through an Artificial Mains Network (AMN) to provide a 50 Ω coupling impedance for the measuring equipment. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission according to FCC Part 15 Subpart C and ANSI C63.10: 2013 requirements during conducted disturbance test.

The I.F. bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

Test with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. (According to KDB 174176 D01 Line Conducted FAQ)

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Worst case emission:

No	. Operation	Modulation	Channel	Frequency (MHz)	Data Page
1.	Normal	BLE			P11

NOTE 1 – Level = Read Level + AMN Factor + Cable Loss

NOTE 2 - "QP" means "Quasi-Peak" values

NOTE 3 – The emission levels which not reported are too low against the official limit.

FCC ID: 2AGBW-SC1500

Worst case emission

EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Normal	Date of Test :	2019.12.25

Polarization	Frequency (MHz)	Meter Reading dB (µV)	AMN Factor (dB/m)	Cable Loss (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	0.22319	29.13	10.43	0.04	39.6	62.7	23.1	QP
	0.22319	27.41	10.43	0.04	37.88	52.7	14.82	Average
	0.54934	21.45	10.33	0.04	31.82	56	24.18	QP
	0.54934	19.35	10.33	0.04	29.72	46	16.28	Average
	0.73519	14.92	10.32	0.05	25.29	56	30.71	QP
Line	0.73519	6.93	10.32	0.05	17.3	46	28.7	Average
Line	1.716	9.5	10.3	0.06	19.86	56	36.14	QP
	1.716	6.35	10.3	0.06	16.71	46	29.29	Average
	12.988	23.31	10.26	0.07	33.64	60	26.36	QP
	12.988	18.14	10.26	0.07	28.47	50	21.53	Average
	28.152	20.25	10.32	0.09	30.66	60	29.34	QP
	28.152	13.43	10.32	0.09	23.84	50	26.16	Average
	0.22797	22.21	10.42	0.04	32.67	62.52	29.85	QP
	0.22797	20.42	10.42	0.04	30.88	52.52	21.64	Average
	0.55226	19.85	10.32	0.04	30.21	56	25.79	QP
	0.55226	14.59	10.32	0.04	24.95	46	21.05	Average
	0.73819	18.81	10.32	0.05	29.18	56	26.82	QP
Neutral	0.73819	8.38	10.32	0.05	18.75	46	27.25	Average
Ineutral	1.1	12.05	10.32	0.05	22.42	56	33.58	QP
	1.1	5.21	10.32	0.05	15.58	46	30.42	Average
	12.784	22.1	10.3	0.07	32.47	60	27.53	QP
	12.784	17.61	10.3	0.07	27.98	50	22.02	Average
	28.603	18.93	10.34	0.09	29.36	60	30.64	QP
	28.603	12.46	10.34	0.09	22.89	50	27.11	Average

4 RADIATED EMISSION TEST

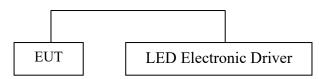
4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

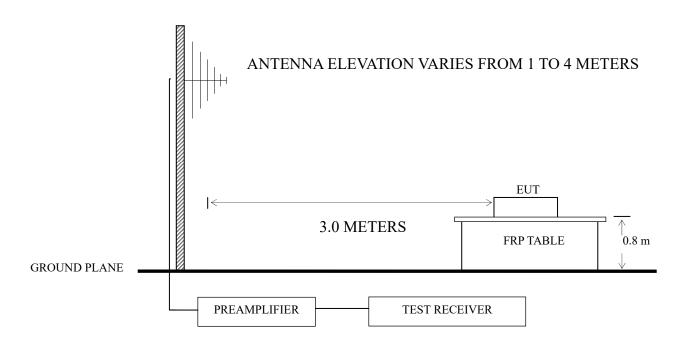
Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2019	Apr 26, 2020
2.	Preamplifier	HP	8449B	3008A00864	Mar 8, 2019	Mar 7, 2020
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020
4.	Test Receiver	R&S	ESCI	101303	May 07, 2019	May 06, 2020
5.	Bi-log Antenna	Schwarz beck	VULB 9168	708	Jul 20, 2019	Jul 19, 2020
6.	Horn Antenna	EMCO	3115	9607-4878	Jun 02, 2019	Jun 01, 2020
7.	Horn Antenna	EMCO	3116	00062643	Sep 08, 2019	Sep 07, 2020
8.	Software	Audix	E3	SET00200 9912M295-2		

4.2 Block Diagram of Test Setup

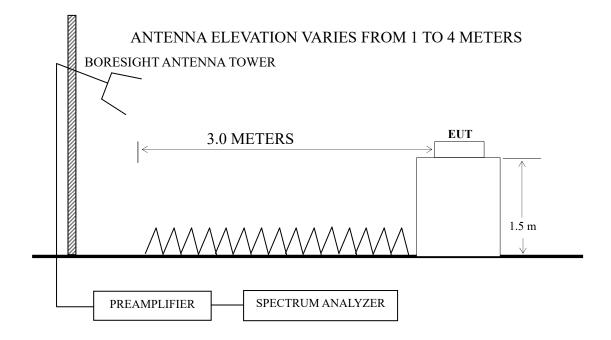
4.2.1 EUT & Peripherals



4.2.2 Below 1GHz



4.2.3 Above 1GHz



4.3 Radiated Emission Limit (§15.209]

Frequency	Distance	Field strength limits (μ V/m)					
(MHz)	(m)	(µV/m)	dB(µV/m)				
$30 \sim 88$	3	100	40.0				
88 ~ 216	3	150	43.5				
216 ~ 960	3	200	46.0				
Above 960	3	500	54.0				
NOTE 2 - Th NOTE 3 - Dis ins sys	e tighter limit appli stance refers to the trument antenna an stem.	V/m) = 20 log Emission es at the band edges. distance in meters betwe d the closed point of any	en the measuring part of the device or				
	NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.						
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT							

4.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

4.5 Operating Condition of EUT

- 4.5.1 Setup the EUT as shown in Sec. 4.2.
- 4.5.2 Turn on the power of all equipment.
- 4.5.3 Turn the EUT on the test mode, and then test.

4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent N9010A.

The frequency range from 30 MHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1G (Worst case emission)

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	BLE	00	2402 MHz	P16
2.	Receiving	BLE	39	2480 MHz	P17

Frequency range: above 1G

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	BLE	00	2402 MHz	P18
2.	Transmitting	BLE	20	2442 MHz	P18
3.	Transmitting	BLE	39	2480 MHz	P19
4.	Receiving	BLE	39	2480 MHz	P20

Restricted bands:

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	BLE	Cabinet l	Emission	P21

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

- NOTE 2 "QP" means "Quasi-Peak" values
- NOTE $3-0^{\circ}$ was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.
- NOTE 4 The emission levels which not reported are too low against the official limit.
- NOTE 5 The emission levels recorded below is data of EUT configured in Lying direction, for Lying direction was the maximum emission direction during the test. The data of Side & Standing direction are too low against the official limit to be reported.
- NOTE 6 All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.
 For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
- NOTE 7 The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

Worst case emission < 1GHz

EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2019.12.22

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	41.64	35.88	17.78	0.75	27.61	26.8	40	13.2	QP
	56.19	36.03	18.33	0.85	27.6	27.61	40	12.39	QP
Horizontal	128.94	41.12	18.05	1.28	27.38	33.07	43.5	10.43	QP
Horizontal	138.64	41.35	19.27	1.33	27.31	34.64	43.5	8.86	QP
	278.32	28.23	19.38	1.89	26.84	22.66	46	23.34	QP
	853.53	25.06	28.3	3.16	27.67	28.85	46	17.15	QP
	41.277	35.7	17.96	0.75	27.61	26.8	40	13.2	QP
	55.805	35.86	18.5	0.85	27.6	27.61	40	12.39	QP
Vertical	128.56	41.13	18.05	1.27	27.38	33.07	43.5	10.43	QP
Vertical	139.36	38.67	19.49	1.33	27.31	32.18	43.5	11.32	QP
	307.83	26.08	20.64	1.99	26.87	21.84	46	24.16	QP
	801.79	25.74	28.11	3.09	27.9	29.04	46	16.96	QP

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EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Receiving	Date of Test :	2019.12.22

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	56.19	29.4	18.33	0.85	27.6	20.98	40	19.02	QP
	120.21	37	17.5	1.23	27.44	28.29	43.5	15.21	QP
Horizontal	140.58	41.55	19.63	1.34	27.3	35.22	43.5	8.28	QP
Horizontai	282.2	26.79	19.48	1.9	26.83	21.34	46	24.66	QP
	569.32	24.33	24.9	2.63	28	23.86	46	22.14	QP
	943.74	24.07	29.57	3.29	27.41	29.52	46	16.48	QP
	47.46	35.95	17.64	0.79	27.6	26.78	40	13.22	QP
	56.19	35.08	18.33	0.85	27.6	26.66	40	13.34	QP
Vertical	127	41.44	17.73	1.27	27.39	33.05	43.5	10.45	QP
vertical	140.58	41.55	19.63	1.34	27.3	35.22	43.5	8.28	QP
	301.6	26.21	20.26	1.96	26.82	21.61	46	24.39	QP
	843.83	24.65	28.3	3.14	27.73	28.36	46	17.64	QP

Radiated Emission > 1GHz

EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2019.12.22

CH00 (2402MHz)

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1801	45.19	27.27	4.55	37.12	39.89	74	34.11	Peak
	3826	42.55	32.29	6.69	36.52	45.01	74	28.99	Peak
Horizontal	5032	42.32	33.45	7.73	36.5	47	74	27	Peak
Horizontal	6427	41	35.34	9.23	36.91	48.66	74	25.34	Peak
	7651	40.82	36.16	10	37.04	49.94	74	24.06	Peak
	8830	40.05	36.68	10.41	35.53	51.61	74	22.39	Peak
	1837	45.15	27.41	4.6	37.1	40.06	74	33.94	Peak
	3952	42.25	32.64	6.84	36.5	45.23	74	28.77	Peak
Vertical	5482	41.13	34.18	8.26	36.55	47.02	74	26.98	Peak
vertical	7003	40.86	35.8	9.76	37.3	49.12	74	24.88	Peak
	7975	41.73	36.29	10.12	36.91	51.23	74	22.77	Peak
	9199	39.75	36.93	10.65	35.26	52.07	74	21.93	Peak

CH20 (2442MHz)

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1837	44.89	27.41	4.6	37.1	39.8	74	34.2	Peak
	3835	43.08	32.32	6.69	36.51	45.58	74	28.42	Peak
Horizontal	5599	40.46	34.36	8.44	36.56	46.7	74	27.3	Peak
Horizontai	6814	40.53	35.66	9.58	37.18	48.59	74	25.41	Peak
	8002	41.04	36.3	10.12	36.9	50.56	74	23.44	Peak
	9037	40.12	36.83	10.55	35.29	52.21	74	21.79	Peak
	1900	43.81	27.69	4.66	37.06	39.1	74	34.9	Peak
	3628	42.71	31.71	6.53	36.53	44.42	74	29.58	Peak
Vartical	5086	41.66	33.55	7.82	36.51	46.52	74	27.48	Peak
Vertical	6391	40.49	35.31	9.23	36.88	48.15	74	25.85	Peak
	7696	40.74	36.18	10	37.02	49.9	74	24.1	Peak
	8830	40.24	36.68	10.41	35.53	51.8	74	22.2	Peak

CH39 (2480MHz)

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	1810	44.38	27.3	4.57	37.12	39.13	74	34.87	Peak
	3826	43.44	32.29	6.69	36.52	45.9	74	28.1	Peak
Horizontal	4960	42.89	33.34	7.67	36.5	47.4	74	26.6	Peak
Horizontal	5932	41.05	34.89	8.7	36.59	48.05	74	25.95	Peak
	7237	40.99	35.95	9.84	37.2	49.58	74	24.42	Peak
	8434	41	36.39	10.28	36.17	51.5	74	22.5	Peak
	1810	44.22	27.3	4.57	37.12	38.97	74	35.03	Peak
	3817	42.32	32.26	6.69	36.52	44.75	74	29.25	Peak
Vertical	5500	40.27	34.2	8.26	36.55	46.18	74	27.82	Peak
vertical	6787	40.73	35.64	9.58	37.15	48.8	74	25.2	Peak
	7957	40.8	36.29	10.12	36.92	50.29	74	23.71	Peak
	9217	40.18	36.93	10.65	35.25	52.51	74	21.49	Peak

EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Receiving	Date of Test :	2019.12.22

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	2548	43.73	29.66	5.4	36.76	42.03	74	31.97	Peak
	3718	42.43	31.97	6.58	36.53	44.45	74	29.55	Peak
Horizontal	5374	40.89	34.01	8.17	36.54	46.53	74	27.47	Peak
Horizontai	6436	39.97	35.34	9.23	36.91	47.63	74	26.37	Peak
	7759	40.35	36.21	10.04	37	49.6	74	24.4	Peak
	8974	41.16	36.78	10.45	35.3	53.09	74	20.91	Peak
	2548	43.76	29.66	5.4	36.76	42.06	74	31.94	Peak
	3718	43.55	31.97	6.58	36.53	45.57	74	28.43	Peak
Vertical	4906	41.14	33.27	7.62	36.5	45.53	74	28.47	Peak
vertical	6526	39.02	35.42	9.32	36.97	46.79	74	27.21	Peak
	7993	40.74	36.3	10.12	36.91	50.25	74	23.75	Peak
	9298	39.62	36.97	10.65	35.24	52	74	22	Peak

FCC ID: 2AGBW-SC1500

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Emissions in restricted frequency bands:

EUT	:	Miscellaneous Controls	Temperature :	22°C
Model No.	:	SC1500/05	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2019.12.22

Polarization	Frequency (MHz)	Meter Reading dB (µV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark
	2345.7	44.61	29.17	5.21	36.84	42.15	74	31.85	Peak
	2345.7	32.42	29.17	5.21	36.84	29.96	54	24.04	Average
	2385.8	44.81	29.29	5.25	36.83	42.52	74	31.48	Peak
Horizontal	2385.8	30.45	29.29	5.25	36.83	28.16	54	25.84	Average
Horizontai	2484.3	52.68	29.56	5.36	36.79	50.81	74	23.19	Peak
	2484.3	38.38	29.56	5.36	36.79	36.51	54	17.49	Average
	2491.3	45.13	29.58	5.36	36.78	43.29	74	30.71	Peak
	2491.3	31.41	29.58	5.36	36.78	29.57	54	24.43	Average
	2327.3	44.88	29.11	5.17	36.85	42.31	74	31.69	Peak
	2327.3	32.23	29.11	5.17	36.85	29.66	54	24.34	Average
	2384.2	44.27	29.29	5.25	36.83	41.98	74	32.02	Peak
Vertical	2384.2	31.52	29.29	5.25	36.83	29.23	54	24.77	Average
vertical	2484.3	47.43	29.56	5.36	36.79	45.56	74	28.44	Peak
	2484.3	32.15	29.56	5.36	36.79	30.28	54	23.72	Average
	2491.9	44.36	29.58	5.36	36.78	42.52	74	31.48	Peak
	2491.9	30.04	29.58	5.36	36.78	28.2	54	25.8	Average

5 6 dB BANDWIDTH MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020

5.2 Block Diagram of Test Setup

Spectrum Analyzer <u>EUT</u> LED Electronic Driver
--

5.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

5.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, $VBW \ge 3 \times RBW$.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure "Option 2" was used).

5.6 Test Results

PASSED.

All the test results are attached in next pages.

(Test Date: 2019.12.18 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit
	00	2402	657.8	500 kHz
BLE	20	2442	659.0	500 kHz
	39	2480	655.5	500 kHz

CH00 (2402 MHz)

Center Freq 2.402000000 Ref Offset 11.3 dB 10 dB/div Ref 15.00 dBm	#IFGain:Low #Atten	sense:INT r Freq: 2.402000000 GHz Free Run Avg Ho n: 10 dB	Radio St Nd:>10/10	7 PMDec 18, 2019 td: None evice: BTS	Frequency
5.00					Center Freq 2.402000000 GHz
-15.0 -25.0 -45.0				Magan	
-55.0 -75.0					CF Step 300.000 kHz
Center 2.402 GHz #Res BW 100 kHz	#	VBW 300 kHz		pan 3 MHz veep 1 ms	<u>Auto</u> Man
Occupied Bandwidth 1.() 467 MHz	Total Power	11.3 dBm		Freq Offset 0 Hz
Transmit Freq Error x dB Bandwidth	11.670 kHz 657.8 kHz	OBW Power x dB	99.00 % -6.00 dB		
MSG			STATUS		

CH20 (2442 MHz)



CH39 (2480 MHz)

₩ RF 50 Ω DC Center Freq 2.480000000	GHz Center Trig: F	SENSE:INT r Freq: 2.480000000 GHz Free Run Avg Ho n: 10 dB	Radio Id:>10/10	36:09 PM Dec 18, 2019 5 Std: None 5 Device: BTS	Frequency
Ref Offset 11.3 dE 10 dB/div Ref 15.00 dBm Log					
5.00 -5.00					Center Freq 2.480000000 GHz
-15.0					
-35.0 -45.0 -55.0				and the second second	
-65.0					05 860
Center 2.48 GHz #Res BW 100 kHz	#	VBW 300 kHz		Span 3 MHz Sweep 1 ms	CF Step 300.000 kHz <u>Auto</u> Man
Occupied Bandwidth	י 0481 MHz	Total Power	11.4 dBn	n	Freq Offset 0 Hz
Transmit Freq Error	10.184 kHz	OBW Power	99.00 %	6	
x dB Bandwidth	655.5 kHz	x dB	-6.00 di	3	
MSG			STATUS		

6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Ite	em	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020

6.2 Block Diagram of Test Setup

The Same as Section. 5.2.

6.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

6.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- a) RBW \geq DTS Bandwidth.
- b) VBW \geq [3 × RBW].
- c) Span $\geq [3 \times RBW]$.
- d) Sweep time = auto.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

The test procedure is defined in ANSI C63.10-2013 (11.9.1.1 Measurement Procedure " $RBW \ge DTS$ bandwidth" was used).

6.6 Test Results

PASSED.

All the test results are listed below.

(Test Date: 2019.12.18 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit
	00	2402 MHz	4.617	30 dBm
BLE	20	2442 MHz	4.547	30 dBm
	39	2480 MHz	4.695	30 dBm

CH00 (2402 MHz)

LXI	RF 50 Ω DC		SENSE:INT	ALIGN AUTO	03:45:28 PM Dec 18, 2019	
Marker 1	2.401985000000	GHz PNO: Fast	Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW	Peak Search
		IFGain:Low	Atten: 10 dB	-	DET P NNNNN	Next Peak
10 dB/div	Ref Offset 11.3 dB Ref 11.30 dBm			Mkr1	2.401 985 GHz 4.617 dBm	NEXTFEAK
Log	Kei 11.50 dBill		1			
1.30						Next Pk Right
-8.70						Next Pk Left
-18.7						Next PK Left
						5
-28.7						Marker Delta
-38.7						
-48.7						Mkr→CF
-58.7						
-68.7						Mkr→RefLvl
-78.7						
						More
	402000 GHz			0.07	Span 3.000 MHz	1 of 2
#Res BW	1.0 MHz	#VBW	3.0 MHz		1.00 ms (1001 pts)	
MSG				STATUS	5	

CH20 (2442 MHz)

RF 50 Ω DC Marker 1 2.44197300000	D GHZ PNO: Fast IFGain:Low Atten: 10 dB	Avg Type: Log-Pwr TRAC AvglHold:>100/100 TYF	MDec 18, 2019 E 1 2 3 4 5 6 E M WWWWWW T P N N N N N
Ref Offset 11.3 dB 10 dB/div Ref 11.30 dBm	IFGain:Low Attent to up	Mkr1 2.441 9 4.5	73 GHz NextPeak 47 dBm
-og 1.30			Next Pk Righ
8.70			Next Pk Lei
28.7			Marker Delt
-48.7			Mkr→C
68.7			Mkr→RefLv
78.7			Mor
Center 2.442000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Span 3 Sweep 1.00 ms (International Structures	.000 MHz 1001 pts)

CH39 (2480 MHz)

<mark>×</mark> Marker 1	RF 50 Ω DC 2.47998500000		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	03:49:23 PM Dec 18, 2019 TRACE 1 2 3 4 5 6 TYPE MW/W/W/	Peak Search
10 dB/div	Ref Offset 11.3 dB Ref 11.30 dBm	PNO: Fast 😱 IFGain:Low	Atten: 10 dB		2.479 985 GHz 4.695 dBm	Next Peak
1.30			1			Next Pk Right
-8.70						Next Pk Lef
-28.7						Marker Delta
48.7						Mkr→Cf
68.7						Mkr→RefLv
78.7						More
Center 2.4 #Res BW	480000 GHz 1.0 MHz	#VBW	3.0 MHz	Sweep	Span 3.000 MHz 1.00 ms (1001 pts)	1 of 2

7 EMISSION LIMITATIONS MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the emission limitations test :

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020

7.2 Block Diagram of Test Setup

The Same as Section. 5.2.

7.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in \$15.205(a), must also comply with the radiated emission limits specified in \$15.209(a) (see \$15.205(c)). (%This test result attaching to Section. 3.7)

7.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to ≥ 1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW \geq [3 × RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.

- b) Set the RBW = 100 kHz.
- c) Set the VBW \geq [3 × RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Scan up through 10th harmonic.

The test procedure is defined in ANSI C63.10-2013 (11.11.2 Reference level measurement and 11.11.3 Emission level measurement was used).

7.6 Test Results **PASSED**.

The test data was attached in the next pages.

(Test Date: 2019.12.18 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Data Page
	00	2402 MHz	P33-34
BLE	20	2442 MHz	P35-36
	39	2480 MHz	P37-38

CH00 (2402 MHz)

Reference level

Peak Search	25:47 PM Dec 18, 2019 TRACE 1 2 3 4 5 6 TYPE M WWWWW	LIGN AUTO		SE:INT	SEI			RF 50 Ω 2.40225200	4 Narker 1
Next Peak	02 252 GHz 4.489 dBm		, rightera		Atten: 10	NO: Wide 😱 Gain:Low	IF 3 dB	Ref Offset 11. Ref 11.30 d	0 dB/div
Next Pk Righ				~	<u> </u>				1.30
Next Pk Lef	-15.51 dBm						/		8.70
Marker Delta									28.7
Mkr→Cl	and the second s							ner et el	48.7
Mkr→RefLv									68.7
Mor 1 of	oan 3.000 MHz							02000 GHz	78.7
	ms (1001 pts)	Sweep '			300 kHz	#VBW			Res BW

Emission level



Marker 1	RF 50 Ω DC 7.205000000000		INSE:INT	Avg Type:	LIGN AUTO	04:52:40 PM Dec 18, 2019 TRACE 1 2 3 4 5 0	Peak Search
10 dB/div	Ref Offset 11.3 dB Ref 11.30 dBm	PNO: Fast Trig: Fre IFGain:Low Atten: 1		Avg Hold:>	>100/100	түре Милин Det P NNNN Akr1 7.205 GHz -52.873 dBm	NextPeak
1.30							Next Pk Right
-8.70						-15.51 dBm	Next Pk Left
-28.7							Marker Delta
-48.7							Mkr→CF
-68.7	ng gali di kana kana kana kana kana kana kana kan	atras water and a state of the	enervis, kortriketuri	helden ligt og nær feset begi	al a thread the local	h dranes i collection and a consistent shed are in	Mkr→RefLvl
Start 5.00 #Res BW		#VBW 300 kH;	2		Sweep	Stop 15.000 GHz 956 ms (2001 pts)	More 1 of 2
MSG					STATUS	5	

Marker 1	RF 50 Ω DC 23.6500000000		SENSE:INT	ALIGN AUTO	04:55:07 PM Dec 18, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Peak Search
10 dB/div	Ref Offset 11.3 dB Ref 11.30 dBm	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hoid:>100/100	kr1 23.650 GHz -59.984 dBm	NextPeak
1.30						Next Pk Righ
18.7					-15.51 dBm	Next Pk Lef
38.7						Marker Delt
48.7					<u></u> 1	Mkr→Cl
68.7	nd a sign of the second of the	helyikethepen disessipetheten iki diri	ran an a	agage of the public of the second	ŔĸĸġĹŔĊĬ ^{ĬĊĸĸĸĸ} ŸŀĊĬĬŔŶŔŢĸĊŀĸĸĸĸġĸĸſĸĸ	Mkr→RefLv
Start 15.0	00 GHz 100 kHz	#VBW	300 kHz	Sweep	Stop 25.000 GHz 956 ms (2001 pts)	More 1 of 2

CH20 (2442 MHz)

Reference level

	00 GHz PNO: Wide G IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Type: Log-Pwi Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Peak Search	
ef Offset 11.3 dB ef 11.30 dBm	IFGam:Low	Atten. To db	Mkr	1 2.442 252 GHz 4.453 dBm	NextPea	
					Next Pk Righ	
				-15.55 dBm	Next Pk Le	
					Marker Del	
				Juner	Mkr→C	
					Mkr→RefL	
000 GHz	#\@\\	(200 kHz		Span 3.000 MHz	Mo 1 of	
	ef 11.30 dBm	ef Offset 11.3 dB ef 11.30 dBm	ef Offset 11.3 dB ef 11.30 dBm	of Offset 11.3 dB ef 11.30 dBm	Mkr1 2.442 252 GHz 4.453 dBm	

Emission level



<mark>LXI</mark>	RF 50 Ω DC		SENSE:INT	ALIGN AUTO	04:20:38 PM Dec 18, 2019 TRACE 1 2 3 4 5 6	Peak Search
Marker 1	7.32500000000	PNO: Fast	rig: Free Run Atten: 10 dB	Avg Hold:>100/100		
10 dB/div Log	Ref Offset 11.3 dB Ref 11.30 dBm			1	/kr1 7.325 GHz -53.474 dBm	Next Peak
1.30						Next Pk Right
-8.70					-15.55 dBm	Next Pk Left
-28.7						Marker Delta
-48.7	• ¹					Mkr→CF
	An Josef and the state of the s	and and a second se	ningallandalarya, firstandar with the ca	hhajoditentationalista	and the second from the second second	Mkr→RefLv
-78.7 Start 5.00					Stop 15.000 GHz	More 1 of 2
#Res BW ^{MSG}	100 KHZ	#VBW 31	JU KHZ	Sweep	956 ms (2001 pts)	

Peak Search	04:23:10 PM Dec 18, 2019 TRACE 1 2 3 4 5 6	ALIGN AUTO	SE:INT	SEN	GHz		RF 50 Ω	ker 1 2	<mark>x</mark> Marl
Next Peak	kr1 23.620 GHz -59.599 dBm	Hold:>100/100		Trig: Free Atten: 10	PNO: Fast 🕞 FGain:Low	1 11 3 dB	tef Offset 11. tef 11.30 d		10 dE Log r
Next Pk Righ									- og 1.30 -
Next Pk Lei	-15.55 dBm					1			8.70 - •18.7 -
Marker Delt									28.7 38.7
Mkr→C									48.7 - 58.7 -
Mkr→RefL	nangganlari ^{di na} nanatinjan si kan sinjadi	રંકુની હુમ્પ્રે પંચ પ્લાપ્ત અન્ય તું કુન્ન પૈલી પૈલી પ્લેલ	andriken er an der	related in the stand in the stand is a grant of the stand in the stand is a grant of the stand is a grant of the	مىلىمىلىرى تەلىكى تەلىكى تىلىكى تىلىكى تىلىكى تىلىلىكى تىلىپىلىرى تەلىكى تىلىپىلىرى تەلىكى تىلىپىلىرى تەلىكى تى تەلىكى تەلىكى	h. beleviterine and	intertanting that the second	elineligitania	68.7
Mon 1 of	Stop 25.000 GHz 956 ms (2001 pts)	Sweep		300 kHz	#VBW			t 15.00 s BW 1	Stari
		STATUS							ISG

CH39 (2480 MHz)

Reference level

Peak Search	03:52:37 PM Dec 18, 2019 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P N N N N N	LIGN AUTO Log-Pwr >100/100	Avg Ty Avg Hol			HZ NO: Wide Gain:Low	00000 G	RF 50 Ω 2.48024900	larker 1
Next Pea	2.480 249 GHz 4.658 dBm	Mkr1					3 dB	Ref Offset 11. Ref 11.30 d	0 dB/div
Next Pk Rigi				~	<u> </u>				1.30
Next Pk Le	-15.34 dBm								18.7
Marker Del								a dealer and a second	38.7
Mkr→C	hyper								m A 18.7
Mkr→RefL									i8.7
Mo 1 of	Span 3.000 MHz				200 141-			80000 GHz	
	.00 ms (1001 pts)	Sweep '			300 kHz	#VBW		l00 kHz	Res BW

Emission level



L <mark>XI</mark>	RF 50 Ω DC		SENSE:INT	ALIGN AUTO	03:59:41 PM Dec 18, 2019 TRACE 1 2 3 4 5 6	Peak Search
Marker 1	7.4400000000	PNO: Fast IFGain:Low	Trig: Free Run Atten: 10 dB	Avg Hold:>100/100		
10 dB/div Log	Ref Offset 11.3 dB Ref 11.30 dBm			1	Mkr1 7.440 GHz -58.418 dBm	NextPeak
1.30						Next Pk Right
-8.70					-15.34 dBm	Next Pk Left
-28.7						Marker Delta
-48.7		1				Mkr→CF
-68.7	way with the fast of the providence of the sec	مارومودنارند. ما ^{رو} موردا <mark>ارار</mark> ماروم	unite and the second second	anniner, aller ag de la de	an de se and the second se	Mkr→RefLvl
-78.7 Start 5.00 #Res BW		#VBM	300 kHz	Swaan	Stop 15.000 GHz 956 ms (2001 pts)	More 1 of 2
MSG				SWEEP		

Peak Search	04:02:56 PMDec 18, 2019 TRACE 1 2 3 4 5 6	ALIGN AUTO		SENS		2 DC		
Next Peak	cr1 23.605 GHz -59.359 dBm	NO: Fast Trig: Free Run Avg Hold:>100/100 TVPE Minimum Gain:Low Atten: 10 dB DET PINN Mkr1 23.605 G			P IF	3.605000 Ref Offset 11 Ref 11.30 0	dB/div	
Next Pk Rig								
Next Pk Le	-15.34 dBm							7
Marker De								7
Mkr→C								7 7
Mkr→RefL	dinerf ^{an An} bientinetinetinetinetinetinetinetinetinet	in de se die	Reduction States in a state of the	pedendd yndig a dirwyan	al an	an a	nerenteen er en	7
Мо 1 оf	Stop 25.000 GHz 956 ms (2001 pts)	Sweep		300 kHz	#VBW			art 15.00 es BW 7
	330 ms (2001 pts)	STATUS		300 KH2	#VDVV		00 KH2	

8 BAND EDGES MEASUREMENT

8.1 Test Equipment

The following test equipment was used during the band edges measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020

8.2 Block Diagram of Test Setup

The Same as section. 5.2.

8.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

8.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

8.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. Set RBW of Test Receiver to 100kHz and VBW to 300kHz with suitable frequency span including 100kHz bandwidth from band edge.

The test procedure is defined in ANSI C63.10-2013 (11.11.3 Emission level measurement was used).

8.6 Test Results

PASSED.

All the test results are attached in next pages.

(Test Date: 2019.12.19 Temperature: 23°C Humidity: 51 %)

Modulation	Location	Channel	Frequency (MHz)	Delta Marker (dB)	Result
BLE	Below Band Edge	00	2402	68.033	More than 20 dB below the highest
BLE	Upper Band Edge	39	2480	58.455	level of the desired power

CH00 2402MHz (Below Edge 2390 MHz)

		2 DC		SENSE		ALIGN AUTO		MDec 19, 2019	Parls Orent
rker 2	Δ 38.7000		HZ PNO: Fast Gain:Low	Trig: Free R	un Av	vg Type: Log-Pw vg Hold:>100/100	TYP	E 1 2 3 4 5 6 E M WWWWW T P N N N N N	Peak Search
dB/div	Ref Offset 11 Ref 11.30	1.3 dB	Gameen				ΔMkr2 38 68	8.7 MHz .033 dB	Next Pe
g 30								2Δ3	
0									Next Pk Rig
7									
7					68 				Next Pk L
7							1 1		
.7 .7 -land		نورار ^س ر ومدر و او ا	mandrane	لومامعينا المالي معاوم موال إسراك	X3	مد المدينة المدينة من مساور الم	had a for the second of the	May.	Marker De
7									
	000 GHz 100 kHz		#\(B)(V 300 kHz		Swoor	Stop 2.47 9.60 ms (1000 GHz	
		X	#VDV	Y JOU KHZ	FUNCTION				Mkr→
N 1	f		0 GHz .7 MHz (Δ)	-66.967 dBm 68.033 dB					
	f	2.363	6 GHz	-63.790 dBm					Mkr→RefL
									Mo
									1 0

CH39 2480MHz (Upper Edge 2483.5 MHz)



9 POWER SPECTRAL DENSITY MEASUREMENT

9.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jan 05, 2019	Jan 05, 2020

9.2 Block Diagram of Test Setup

The Same as section 5.2.

9.3 Specification Limits (§15.247(e))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band.

9.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

9.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to 3 kHz \leq RBW \leq 100 kHz.
- d) Set the VBW \geq [3 × RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

The test procedure is defined in ANSI C63.10-2013 (11.10.2 Measurement Procedure "Method PKPSD (peak PSD)" was used).

9.6 Test Results

PASSED.

All the test results are attached in next pages.

(Test Date: 2019.12.18 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit
	00	2402	4.489	8 dBm
BLE	20	2442	4.453	8 dBm
	39	2480	4.658	8 dBm

CH00 2402 MHz



CH20 2442 MHz



CH39 2480 MHz

Peak Search	2:37 PM Dec 18, 2019 TRACE 1 2 3 4 5 5 TYPE M WWWW DET P N N N N N	Log-Pwr	Avg Type Avg Hold			HZ NO: Wide ⊂ Gain:Low	00000 GI	RF 50 Ω 2.48024900	<mark>x</mark> Marker 1
Next Peak	0 249 GHz 4.658 dBm	Mkr1 2.			Atten. It	Gain:Low	3 dB	Ref Offset 11. Ref 11.30 c	10 dB/div
Next Pk Righ				~~_^	<u> </u>				1.30
Next Pk Lef	-15.34 dBm						/		-8.70
Marker Delta	Land Market							herdrand and a second	-28.7
Mkr→CF	Mulpular								-48.7
Mkr→RefLv			10						-68.7
More 1 of 2	an 3.000 MHz							00000 GHz	
	ns (1001 pts)	Sweep 1.0 STATUS			300 kHz	#VBW		UU KHZ	#Res BW ^{MSG}

10 DEVIATION TO TEST SPECIFICATIONS

None.

11 MEASUREMENT UNCERTAINTY LIST

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2. The uncertainties value is not used in determining the PASS/FAIL results.

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted Emission	9kHz~150kHz	±3.8dB
No.1 Shielded Room	150kHz~30MHz	±3.4dB
Conducted Emission No.3 Shielded Room	150kHz~30MHz	±3.4dB
Radiated Emission	30MHz~200MHz, Horizontal	±4.5dB
	30MHz~200MHz, Vertical	±4.5dB
	200MHz~1000MHz, Horizontal	±4.6dB
	200MHz~1000MHz, Vertical	±5.7dB
	1GHz~6GHz	±6.0dB
	6GHz~18GHz	±5.7dB
Output Power Test	50MHz~18GHz	0.77dB
Power Density Test	9kHz~6GHz	1.08dB
RF Frequency Test	9kHz~40GHz	$6*10^{-4}$
Bandwidth Test	9kHz~6GHz	$1.5*10^{-3}$
RF Radiated Power Test	30MHz~1000MHz	3.06dB
Conducted Output Power Test	50MHz~18GHz	0.83dB
AC Voltage(<10kHz) Test	120V~230V	0.04%
DC Power Test	0V~30V	0.4%
Temperature	-40°C∼+100°C	0.52°C
Humidity	30%~95%	2.6%