

Test Report

Product: 10.1 Inch Outdoor Intercom System

Trade Mark:  **ASSURED**
SYSTEMS

Model Number: ASL-101ODCTPC-PCAP-V3.1

FCC ID: 2BL59ASL101ODC

Prepared for

Assured Systems (UK) Ltd
Unit A5, Douglas Park, Opal Way, Stone Business Park, Stone, Staffs, ST15
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Prepared by

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TEST RESULT CERTIFICATION

Applicant's Name..... : Assured Systems (UK) Ltd
Address : Unit A5, Douglas Park, Opal Way, Stone Business Park, Stone,
Staffs, ST15 0YJ, UK
Manufacturer's Name : Assured Systems (UK) Ltd
Address : Unit A5, Douglas Park, Opal Way, Stone Business Park, Stone,
Staffs, ST15 0YJ, UK

Product description

Product name : 10.1 Inch Outdoor Intercom System
Model Number : ASL-1010DCTPC-PCAP-V3.1
Standards : FCC Part 15.247
IEEE/ANSI C63.10-2020
Test procedure..... : KDB 558074 D01 15.247 Meas Guidance v05r02
662911 D03 MIMO Antenna Gain Measurement v01

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test

Date (s) of performance of tests..... : Oct. 22, 2024~ Nov. 07, 2024
Test Result..... : **Pass**

Testing Engineer :

Zoe Su

(Z o e S u)

Technical Manager :

Ming Liu

(M i n g L i u)

Authorized Signatory :

Leo Su

(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	10.1 Inch Outdoor Intercom System
Model name:	ASL-101ODCTPC-PCAP-V3.1
Series Model:	N/A
Different of series model:	N/A
Operation frequency:	802.11b/g/n20: 2412~2462 MHz 802.11n40: 2422~2452 MHz
Modulation type:	IEEE 802.11b: DSSS (DBPSK, DQPSK, CCK) IEEE 802.11g/n (HT20/HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)
Bit Rate of transmitter:	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n(20MHz) use 800 ns GI: 65.0/58.5/52.0/39.0/26.0/19.5/13.0/6.5 Mbps (MCS0~MCS7) 802.11n(40MHz) use 800 ns GI: 13.5/27/40.5/54/81/108/121.5/135Mbps
Antenna type:	ANT A/B: PCB Antenna
Antenna gain:	ANT A: 1.27 dBi ANT B: 1.27 dBi MIMO: 4.28 dBi
Max. output power:	ANT A: 17.3 dBm ANT B: 17.68 dBm
Hardware version:	C381S-IM-AA
Software version:	V1.0
Battery:	N/A
Power supply:	Input: 12V $\pm$ 5A Output: 5V $\pm$ 0.2A
Adapter information:	INPUT: 100V-240V~ 50/60Hz, 1.5A MAX OUTPUT: 12V $\pm$ 5A

1.2 Test Mode

Channel List for 802.11b/g/n (20)

Channel	Channel	Frequency (MHz)
Low	01	2412
Middle	06	2437
High	11	2462

Channel List for 802.11n (40)

Channel	Channel	Frequency (MHz)
Low	03	2422
Middle	06	2437
High	09	2452

1.3 Operation Channel list

Channel List for 802.11b/g/n (20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	\	\

Channel List for 802.11n (40)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437	\	\

1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Power setting configuration parameters

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

Test software Version		DRTU	
Mode	802.11b/g	802.11n20	802.11n40
Parameters	Default	Default	Default
RF cable			
Description	Connector	Length	Supplied by
Antenna Cable	SMA	10cm	Applicant

Note: Disclaimer: the loss of RF cable is too small and can be ignored.

1.6 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Notebook	BDR-WDH	A3RQPM242 0004454	HONR

Note: The laptop is used to assist the RF test. In order to prevent the laptop from causing unnecessary impact on the test, the laptop will be removed from the test environment after the EUT successfully transmits at a fixed frequency using the laptop.

2 Summary of Test Result

No.	Standard Section	Test Item	Result	Remark
1	15.203	Antenna Requirement	Pass	
2	15.247 (b)	Peak Output Power	Pass	
3	15.207	Conducted Emission	Pass	
4	15.247 (d) & 15.209	Radiated Spurious Emission	Pass	
5	15.247 (e)	Power Spectral Density	Pass	
6	15.247 (a)(2)	6dB Bandwidth	Pass	
7	558074 D01 15.247 Meas Guidance v05r02 Chapter 6	Duty Cycle	Pass	
8	15.205	Band Edge Emission	Pass	
9	15.247(d)	Spurious RF Conducted Emissions	Pass	

3 Test Facilities and Accreditations

3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

3.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.

In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(9kHz-30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Occupied Bandwidth	$\pm 3\%$	
Temperature	± 1 degree	
Humidity	± 5 %	

3.4 Test Software

Software name	Manufacturer	Model	Version
Conducted Emission test Software	Farad	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission test Software	Farad	EZ-EMC	FA-03A2
RF Test System	MWRF	MTS 8310	2.0.0.0

4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2024-05-18	2026-05-17
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2024-05-18	2026-05-17
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 91270	01193	2024-05-18	2026-05-17
4	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2024-05-17	2025-05-16
5	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2024-05-17	2025-05-16
6	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2024-05-17	2025-05-16
7	HB-E009	POSITINAL COTROLLE R	Noyetec	N/A	N/A	/	/
8	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
9	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2024-05-21	2025-05-20
10	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-245	2024-05-18	2026-05-17
11	HB-E076	Preamplifier	Hewlett Packard	8447D	1937A02278	2024-05-17	2025-05-16
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2024-05-17	2025-05-16
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2024-05-17	2025-05-16
3	HB-E016	ZN23201	Noyetec	ZN23201	N/A	2024-05-21	2025-05-20
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2024-05-17	2025-05-16
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	N/A	2024-05-17	2025-05-16
RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaio Signal	Agilent	N5181A	MY47070421	2024-05-17	2025-05-16

		Generator					
2	HB-E042	WIDEBAND RADIO COMMUNICA TION TESTER	R&S	CMW500	132108	2024-05-17	2025-05-16
3	HB-E043	MXG Anaio g Signal Generator	Agilent	N5182A	US46240335	2024-05-17	2025-05-16
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2024-05-17	2025-05-16
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	2024-08-19	2025-08-18
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	2024-08-19	2025-08-18

Note: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

Note2: The instrument RF Control Box, numbered HB-E045, contains power meter.

5 Test Item And Results

5.1 Antenna Requirement

5.1.1 Standard Requirement

15.203 requirement: For intentional device, according to 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

5.1.2 Test Result

The EUT antenna is WLAN Antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

5.2 Conducted Emission

5.2.1 Limits

Limits – Class B		
Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Note:

- the tighter limit applies at the band edges.
- the limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

5.2.2 Test Procedures

a) EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

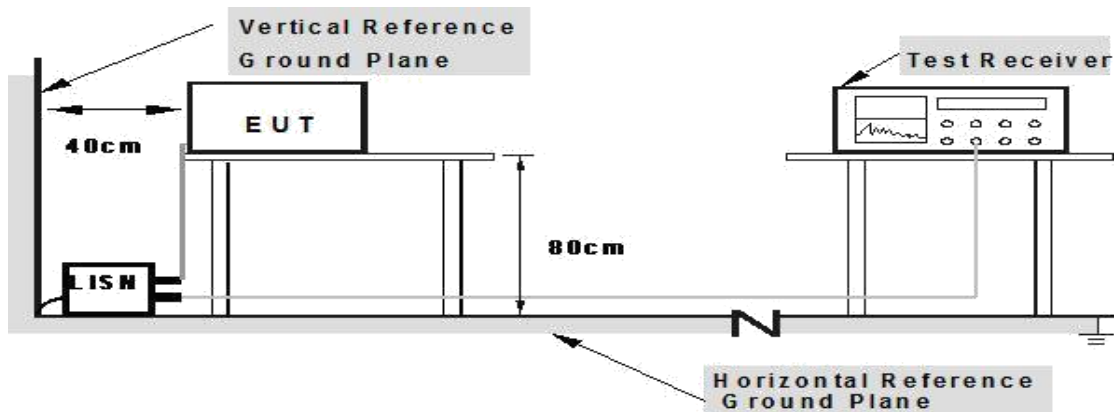
b) The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from nearest part of EUT chassis.

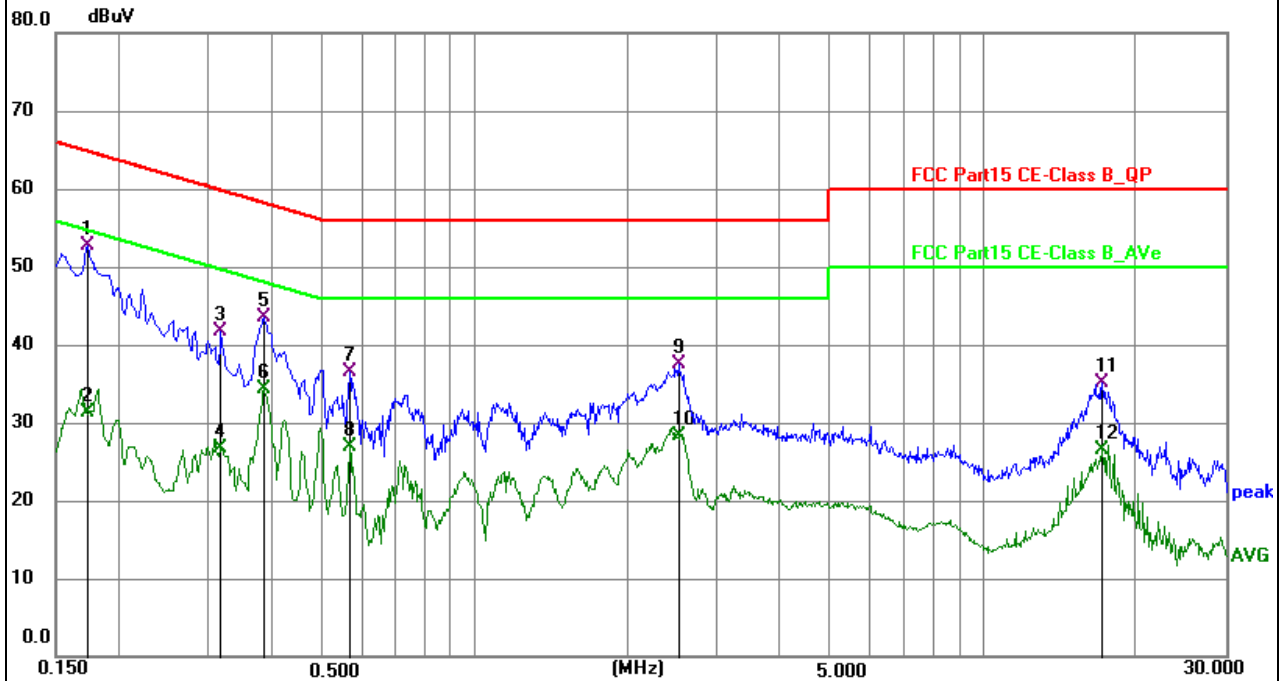
- g) For the actual test configuration, please refer to the related Item – photographs of the test setup.

5.2.3 Test Setup



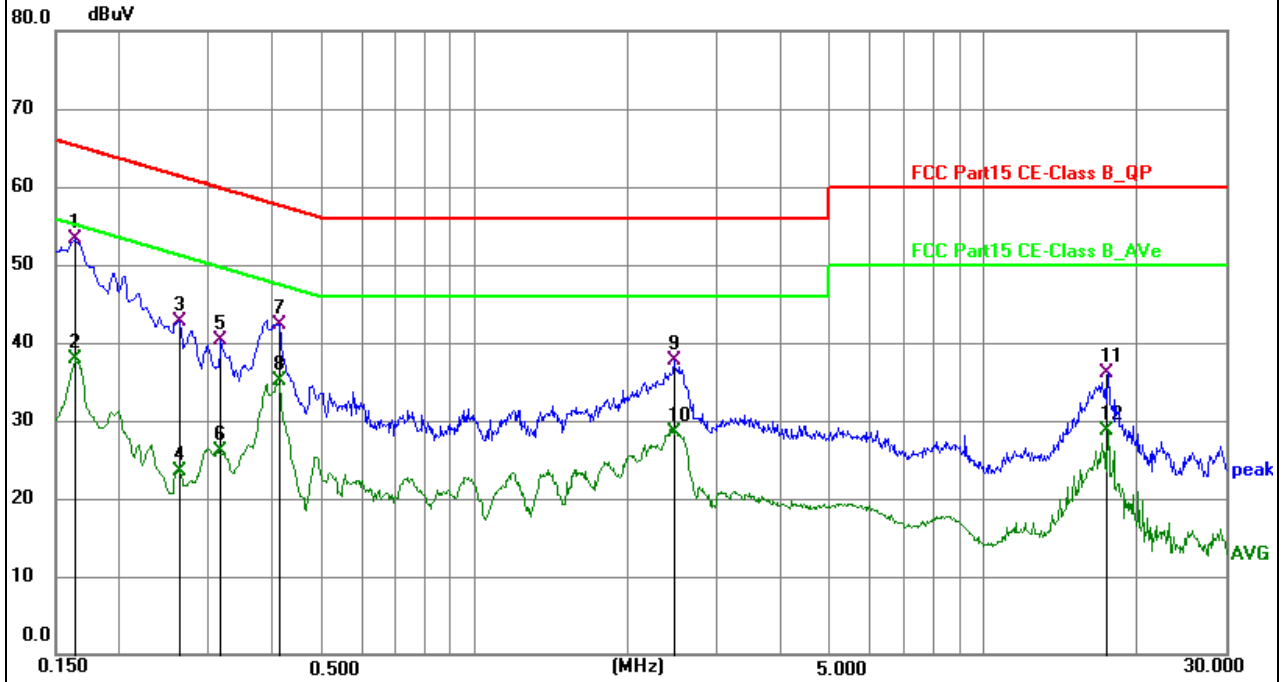
5.2.4 Test Result

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Test Mode:	TX Mode	Phase:	L
Test Voltage:	DC 12V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.172300	42.14	10.47	52.61	64.85	-12.24	QP
2	0.172300	20.76	10.47	31.23	54.85	-23.62	AVG
3	0.316500	31.13	10.48	41.61	59.80	-18.19	QP
4	0.316500	16.13	10.48	26.61	49.80	-23.19	AVG
5	0.384000	33.08	10.48	43.56	58.19	-14.63	QP
6	0.384000	23.88	10.48	34.36	48.19	-13.83	AVG
7	0.568500	25.93	10.51	36.44	56.00	-19.56	QP
8	0.568500	16.32	10.51	26.83	46.00	-19.17	AVG
9	2.525900	26.92	10.51	37.43	56.00	-18.57	QP
10	2.525900	17.85	10.51	28.36	46.00	-17.64	AVG
11	17.182500	23.17	11.92	35.09	60.00	-24.91	QP
12	17.182500	14.50	11.92	26.42	50.00	-23.58	AVG

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Test Mode:	TX Mode	Phase:	N
Test Voltage:	DC 12V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.163500	42.77	10.48	53.25	65.28	-12.03	QP
2	0.163500	27.46	10.48	37.94	55.28	-17.34	AVG
3	0.262500	32.27	10.50	42.77	61.35	-18.58	QP
4	0.262500	13.07	10.50	23.57	51.35	-27.78	AVG
5	0.316500	29.81	10.48	40.29	59.80	-19.51	QP
6	0.316500	15.55	10.48	26.03	49.80	-23.77	AVG
7	0.410700	31.84	10.44	42.28	57.63	-15.35	QP
8	0.410700	24.57	10.44	35.01	47.63	-12.62	AVG
9	2.467400	27.38	10.39	37.77	56.00	-18.23	QP
10	2.467400	18.21	10.39	28.60	46.00	-17.40	AVG
11	17.627900	24.22	11.98	36.20	60.00	-23.80	QP
12	17.627900	16.69	11.98	28.67	50.00	-21.33	AVG

5.3 Radiated Emission

5.3.1 Limits

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

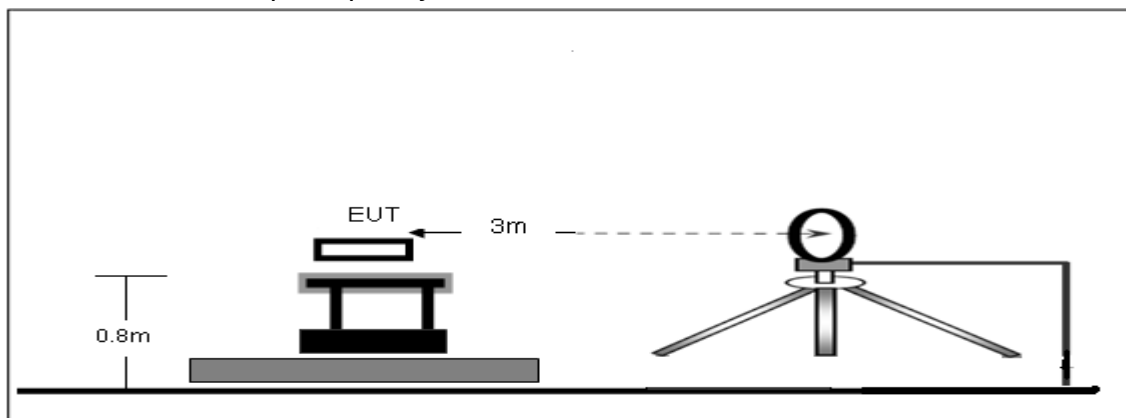
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.3.2 Test Procedures

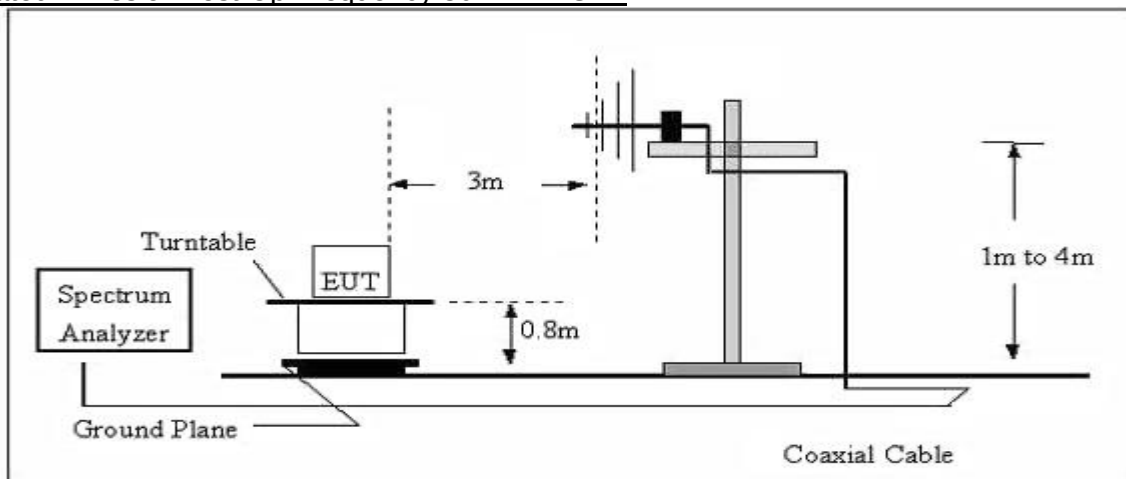
- The radiated emission tests were performed in the 3 meters.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.
- If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.
- For the actual test configuration, please refer to the related item – EUT test photos.

5.3.3 Test Setup

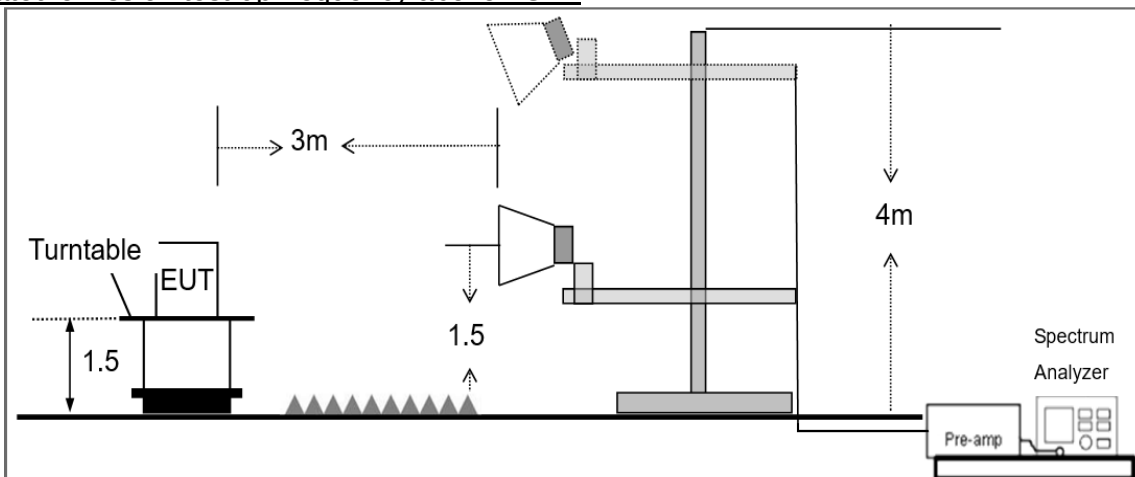
Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.3.4 Test Result

Below 30MHz

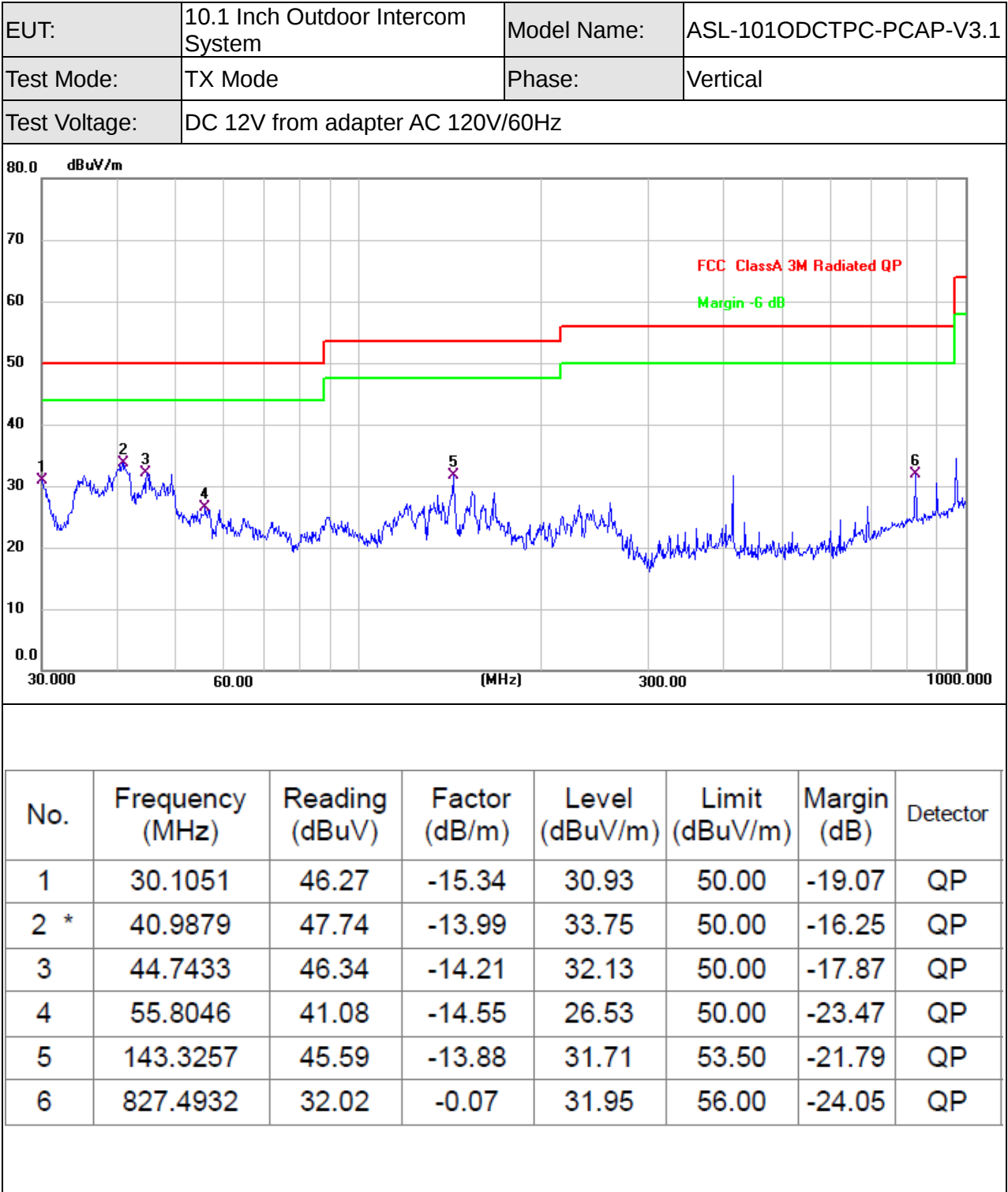
EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PC AP-V3.1
Pressure:	1010 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	TX	Polarization:	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

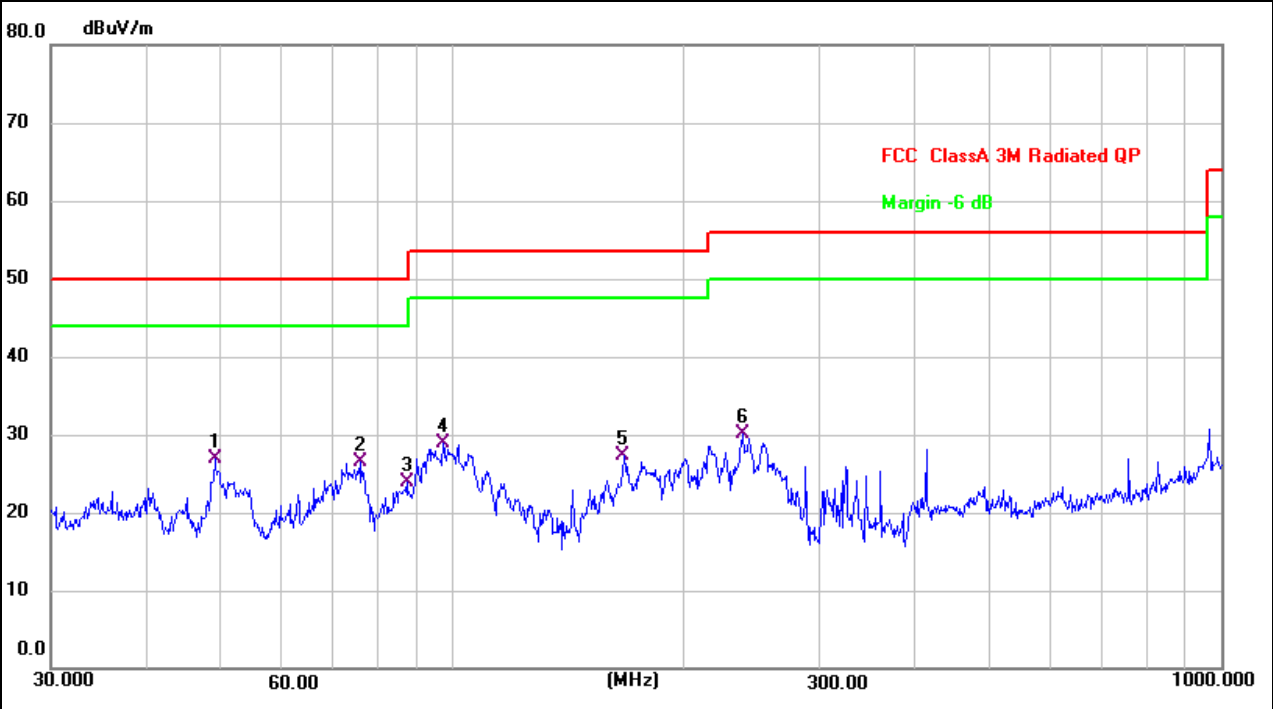
Note:

- For 9kHz-30MHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- Distance extrapolation factor =40 log (specific distance/test distance)(dB);
- Limit line = specific limits (dBuV) + distance extrapolation factor.

Frequency range (30MHz – 1GHz)



EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Test Mode:	TX Mode	Phase:	Horizontal
Test Voltage:	DC 12V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	49.0144	41.11	-14.30	26.81	50.00	-23.19	QP
2	75.7112	43.25	-16.79	26.46	50.00	-23.54	QP
3	87.1115	42.07	-18.21	23.86	50.00	-26.14	QP
4	97.1148	46.64	-17.70	28.94	53.50	-24.56	QP
5	167.2366	40.73	-13.50	27.23	53.50	-26.27	QP
6	238.3101	45.60	-15.44	30.16	56.00	-25.84	QP

Frequency range (1GHz-25GHz)

Frequency (MHz)	Read Level (dBμV)	Cable loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (2412 MHz)(802.11b)--Above 1G									
4824.161	63.28	4.36	32.92	45.53	55.03	74.00	-18.97	Pk	Vertical
4824.161	43.62	4.36	32.92	45.53	35.37	54.00	-18.63	AV	Vertical
7236.396	60.14	5.02	37.63	45.56	57.23	74.00	-16.77	Pk	Vertical
7236.396	41.29	5.02	37.63	45.56	38.38	54.00	-15.62	AV	Vertical
4824.154	62.59	4.36	32.92	45.53	54.34	74.00	-19.66	Pk	Horizontal
4824.154	42.65	4.36	32.92	45.53	34.40	54.00	-19.60	AV	Horizontal
7236.168	63.99	5.02	37.63	45.56	61.08	74.00	-12.92	Pk	Horizontal
7236.168	42.32	5.02	37.63	45.56	39.41	54.00	-14.59	AV	Horizontal
Middle Channel (2437 MHz)(802.11b)--Above 1G									
4874.112	62.50	4.41	33.01	45.76	54.16	74.00	-19.84	Pk	Vertical
4874.112	43.87	4.41	33.01	45.76	35.53	54.00	-18.47	AV	Vertical
7311.247	60.34	5.02	37.68	45.59	57.45	74.00	-16.55	Pk	Vertical
7311.247	41.15	5.02	37.68	45.59	38.26	54.00	-15.74	AV	Vertical
4874.132	62.78	4.41	33.01	45.76	54.44	74.00	-19.56	Pk	Horizontal
4874.132	44.74	4.41	33.01	45.76	36.40	54.00	-17.60	AV	Horizontal
7311.085	61.64	5.02	37.68	45.59	58.75	74.00	-15.25	Pk	Horizontal
7311.085	42.82	5.02	37.68	45.59	39.93	54.00	-14.07	AV	Horizontal
High Channel (2462 MHz)(802.11b)--Above 1G									
4924.169	63.85	4.50	33.26	46.07	55.54	74.00	-18.46	Pk	Vertical
4924.169	43.28	4.50	33.26	46.07	34.97	54.00	-19.03	AV	Vertical
7386.215	61.43	5.02	37.78	45.77	58.46	74.00	-15.54	Pk	Vertical
7386.215	40.30	5.02	37.78	45.77	37.33	54.00	-16.67	AV	Vertical
4924.045	63.60	4.50	33.26	46.07	55.29	74.00	-18.71	Pk	Horizontal
4924.045	44.99	4.50	33.26	46.07	36.68	54.00	-17.32	AV	Horizontal
7386.132	60.92	5.02	37.78	45.77	57.95	74.00	-16.05	Pk	Horizontal
7386.132	43.12	5.02	37.78	45.77	40.15	54.00	-13.85	AV	Horizontal

Note:

1. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
2. All other emissions more than 20dB below the limit.
3. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is 802.11b.

5.3.5 Radiated Band Edge

Frequency (MHz)	Meter Reading (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b									
2310.00	45.93	3.40	27.80	32.41	44.69	74	-29.31	Pk	Horizontal
2310.00	33.42	3.40	27.80	32.41	32.07	54	-21.93	AV	Horizontal
2310.00	44.79	3.40	27.80	32.41	43.44	74	-30.56	Pk	Vertical
2310.00	33.58	3.40	27.80	32.41	32.22	54	-21.78	AV	Vertical
2390.00	45.53	3.45	27.70	32.49	44.10	74	-29.90	Pk	Vertical
2390.00	34.41	3.45	27.70	32.49	33.01	54	-20.99	AV	Vertical
2390.00	46.26	3.45	27.70	32.49	44.79	74	-29.21	Pk	Horizontal
2390.00	34.41	3.45	27.70	32.49	32.99	54	-21.01	AV	Horizontal
2483.50	47.05	3.48	28.53	32.55	46.51	74	-27.49	Pk	Vertical
2483.50	33.90	3.48	28.53	32.55	33.28	54	-20.72	AV	Vertical
2483.50	46.13	3.48	28.53	32.55	45.56	74	-28.44	Pk	Horizontal
2483.50	33.98	3.48	28.53	32.55	33.17	54	-20.83	AV	Horizontal
2500.00	45.34	3.49	29.20	32.66	45.27	74	-28.73	Pk	Vertical
2500.00	33.80	3.49	29.20	32.66	33.73	54	-20.27	AV	Vertical
2500.00	45.32	3.49	29.20	32.66	45.21	74	-28.79	Pk	Horizontal
2500.00	33.74	3.49	29.20	32.66	33.66	54	-20.34	AV	Horizontal
802.11g									
2310.00	46.01	3.40	27.80	32.41	44.69	74	-29.31	Pk	Horizontal
2310.00	33.42	3.40	27.80	32.41	32.07	54	-21.93	AV	Horizontal
2310.00	44.86	3.40	27.80	32.41	43.44	74	-30.56	Pk	Vertical
2310.00	33.69	3.40	27.80	32.41	32.22	54	-21.78	AV	Vertical
2390.00	45.63	3.45	27.70	32.49	44.10	74	-29.90	Pk	Vertical
2390.00	34.54	3.45	27.70	32.49	33.01	54	-20.99	AV	Vertical
2390.00	46.34	3.45	27.70	32.49	44.79	74	-29.21	Pk	Horizontal
2390.00	34.40	3.45	27.70	32.49	32.99	54	-21.01	AV	Horizontal
2483.50	47.29	3.48	28.53	32.55	46.51	74	-27.49	Pk	Vertical
2483.50	33.85	3.48	28.53	32.55	33.28	54	-20.72	AV	Vertical
2483.50	46.34	3.48	28.53	32.55	45.56	74	-28.44	Pk	Horizontal
2483.50	33.98	3.48	28.53	32.55	33.17	54	-20.83	AV	Horizontal
2500.00	45.39	3.49	29.20	32.66	45.27	74	-28.73	Pk	Vertical
2500.00	33.97	3.49	29.20	32.66	33.73	54	-20.27	AV	Vertical
2500.00	45.21	3.49	29.20	32.66	45.21	74	-28.79	Pk	Horizontal
2500.00	33.67	3.49	29.20	32.66	33.66	54	-20.34	AV	Horizontal

802.11n20									
2310.00	45.90	3.40	27.80	32.41	44.69	74	-29.31	Pk	Horizontal
2310.00	33.43	3.40	27.80	32.41	32.22	54	-21.78	AV	Horizontal
2310.00	44.70	3.40	27.80	32.41	43.49	74	-30.51	Pk	Vertical
2310.00	33.65	3.40	27.80	32.41	32.44	54	-21.56	AV	Vertical
2390.00	45.55	3.45	27.70	32.49	44.21	74	-29.79	Pk	Vertical
2390.00	34.41	3.45	27.70	32.49	33.07	54	-20.93	AV	Vertical
2390.00	46.38	3.45	27.70	32.49	45.04	74	-28.96	Pk	Horizontal
2390.00	34.35	3.45	27.70	32.49	33.01	54	-20.99	AV	Horizontal
2483.50	47.20	3.48	28.53	32.55	46.66	74	-27.34	Pk	Vertical
2483.50	33.94	3.48	28.53	32.55	33.40	54	-20.60	AV	Vertical
2483.50	46.13	3.48	28.53	32.55	45.59	74	-28.41	Pk	Horizontal
2483.50	33.73	3.48	28.53	32.55	33.19	54	-20.81	AV	Horizontal
2500.00	45.53	3.49	29.20	32.66	45.56	74	-28.44	Pk	Vertical
2500.00	33.85	3.49	29.20	32.66	33.88	54	-20.12	AV	Vertical
2500.00	45.33	3.49	29.20	32.66	45.36	74	-28.64	Pk	Horizontal
2500.00	33.70	3.49	29.20	32.66	33.73	54	-20.27	AV	Horizontal
802.11n40									
2310.00	46.10	3.40	27.80	32.41	44.89	74	-29.11	Pk	Horizontal
2310.00	33.47	3.40	27.80	32.41	32.26	54	-21.74	AV	Horizontal
2310.00	44.83	3.40	27.80	32.41	43.62	74	-30.38	Pk	Vertical
2310.00	33.46	3.40	27.80	32.41	32.25	54	-21.75	AV	Vertical
2390.00	45.64	3.45	27.70	32.49	44.30	74	-29.70	Pk	Vertical
2390.00	34.36	3.45	27.70	32.49	33.02	54	-20.98	AV	Vertical
2390.00	46.25	3.45	27.70	32.49	44.91	74	-29.09	Pk	Horizontal
2390.00	34.41	3.45	27.70	32.49	33.07	54	-20.93	AV	Horizontal
2483.50	47.11	3.48	28.53	32.55	46.57	74	-27.43	Pk	Vertical
2483.50	34.10	3.48	28.53	32.55	33.56	54	-20.44	AV	Vertical
2483.50	46.31	3.48	28.53	32.55	45.77	74	-28.23	Pk	Horizontal
2483.50	33.77	3.48	28.53	32.55	33.23	54	-20.77	AV	Horizontal
2500.00	45.53	3.49	29.20	32.66	45.56	74	-28.44	Pk	Vertical
2500.00	33.92	3.49	29.20	32.66	33.95	54	-20.05	AV	Vertical
2500.00	45.30	3.49	29.20	32.66	45.33	74	-28.67	Pk	Horizontal
2500.00	33.89	3.49	29.20	32.66	33.92	54	-20.08	AV	Horizontal

Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor.
3. All the modulation modes have been tested, and only the worst results are reflected in the report.

5.3.6 Spurious Emission in Restricted Band 1000MHz-25000MHz

All the modulation modes have been tested, and the worst result was report as below:

Frequency (MHz)	Meter Reading (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
3260	44.24	3.89	30.04	32.85	45.32	74	-28.68	Pk	Vertical
3260	33.46	3.89	30.04	32.85	34.54	54	-19.46	AV	Vertical
3260	44.22	3.89	30.04	32.85	45.30	74	-28.70	Pk	Horizontal
3260	33.28	3.89	30.04	32.85	34.36	54	-19.64	AV	Horizontal
5332	43.10	5.00	34.03	31.00	51.13	74	-22.87	Pk	Vertical
5332	30.50	5.00	34.03	31.00	38.53	54	-15.47	AV	Vertical
5332	43.19	5.00	34.03	31.00	51.22	74	-22.78	Pk	Horizontal
5332	30.47	5.00	34.03	31.00	38.50	54	-15.50	AV	Horizontal
12500	44.60	8.46	39.30	31.30	61.06	74	-12.94	Pk	Vertical
12500	32.65	8.46	39.30	31.30	49.11	54	-4.89	AV	Vertical
12500	44.76	8.46	39.30	31.30	61.22	74	-12.78	Pk	Horizontal
12500	32.53	8.46	39.30	31.30	48.99	54	-5.01	AV	Horizontal

5.4 Peak Output Power

5.4.1 Limit

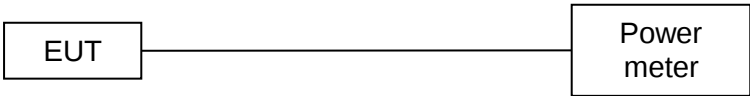
FCC Part15 Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(b)(3)	Peak output power	1 watt or 30dBm	2400-2483.5

5.4.2 Test Procedure

1. PKPM1 Peak power meter measurement

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

5.4.3 Test Setup



5.4.4 Test Results

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCA P-V3.1
Test Mode:	TX Mode /CH01, CH06, CH11	Test Voltage:	DC 12V from adapter AC 120V/60Hz

802.11b

Test Channel	Frequency (MHz)	ANT A Maximum Peak Conducted Output Power(dBm)	ANT B Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.21	17.23	30
CH06	2437	17.30	17.56	30
CH11	2462	17.16	17.52	30

802.11g

Test Channel	Frequency (MHz)	ANT A Maximum Peak Conducted Output Power(dBm)	ANT B Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.19	17.44	30
CH06	2437	17.23	17.80	30
CH11	2462	17.12	17.68	30

802.11n20

Test Channel	Frequency (MHz)	Output Power (ANT A)		Output Power (ANT B)		Total Power (ANT A + ANT B)		Limit (dBm)	
		dBm	mW	dBm	mW	dBm	mW	dBm	mW
CH01	2412	13.91	24.60	14.12	25.82	17.03	50.42	30	1000
CH06	2437	14.21	26.36	14.12	25.82	17.18	52.18		
CH11	2462	14.29	26.85	13.87	24.38	17.1	51.23		

802.11n40

Test Channel	Frequency (MHz)	Output Power (ANT A)		Output Power (ANT B)		Total Power (ANT A + ANT B)		Limit (dBm)	
		dBm	mW	dBm	mW	dBm	mW	dBm	mW
CH01	2422	14.22	26.42	14.18	26.18	17.21	52.60	30	1000
CH06	2437	14.31	26.98	14.26	26.67	17.3	53.65		
CH11	2452	14.33	27.10	14.13	25.88	17.24	52.98		

Note: if transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

The limit should be calculated as below: Limit = 30 dBm - (ANT Gain + 10*Log(N=2))

5.5 Power Spectral Density

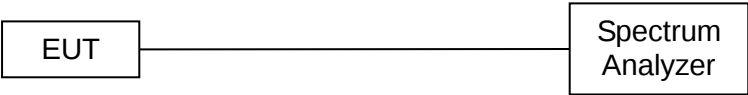
5.5.1 Limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247	Power Spectral Density	8 dBm (in any 3kHz)	2400-2483.5

5.5.2 Test Procedure

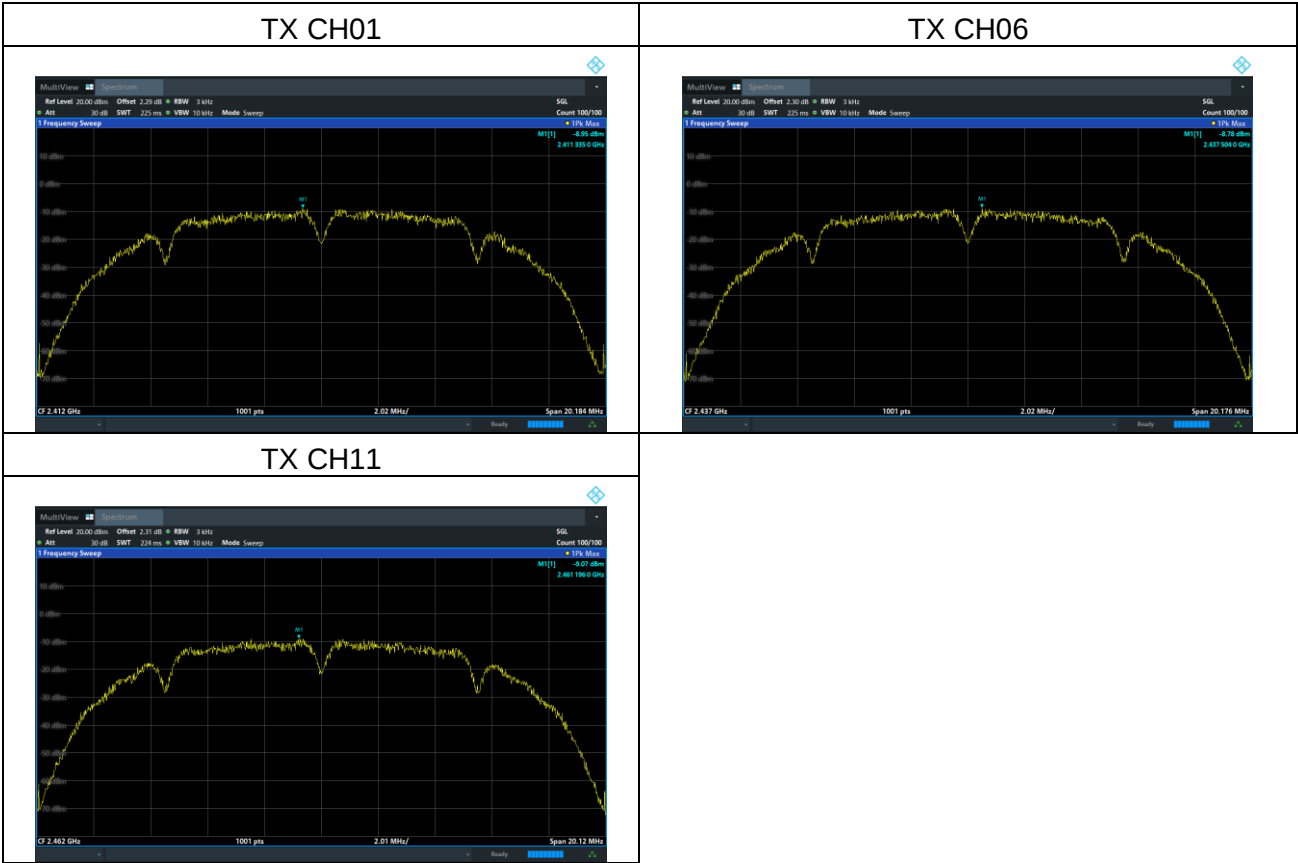
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW $\geq$ 3 kHz.
4. Set the VBW $\geq$ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.5.3 Test Setup

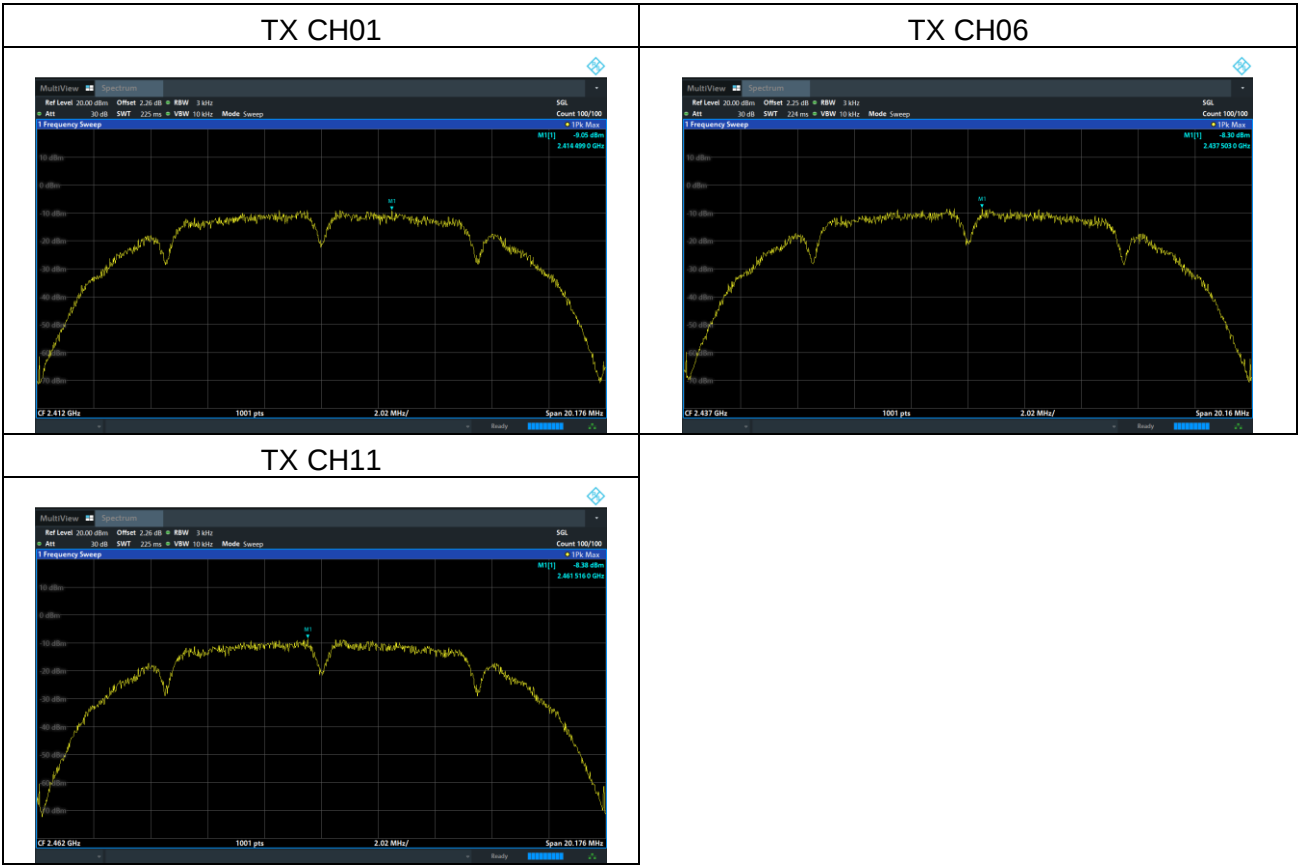


5.5.4 Test Results

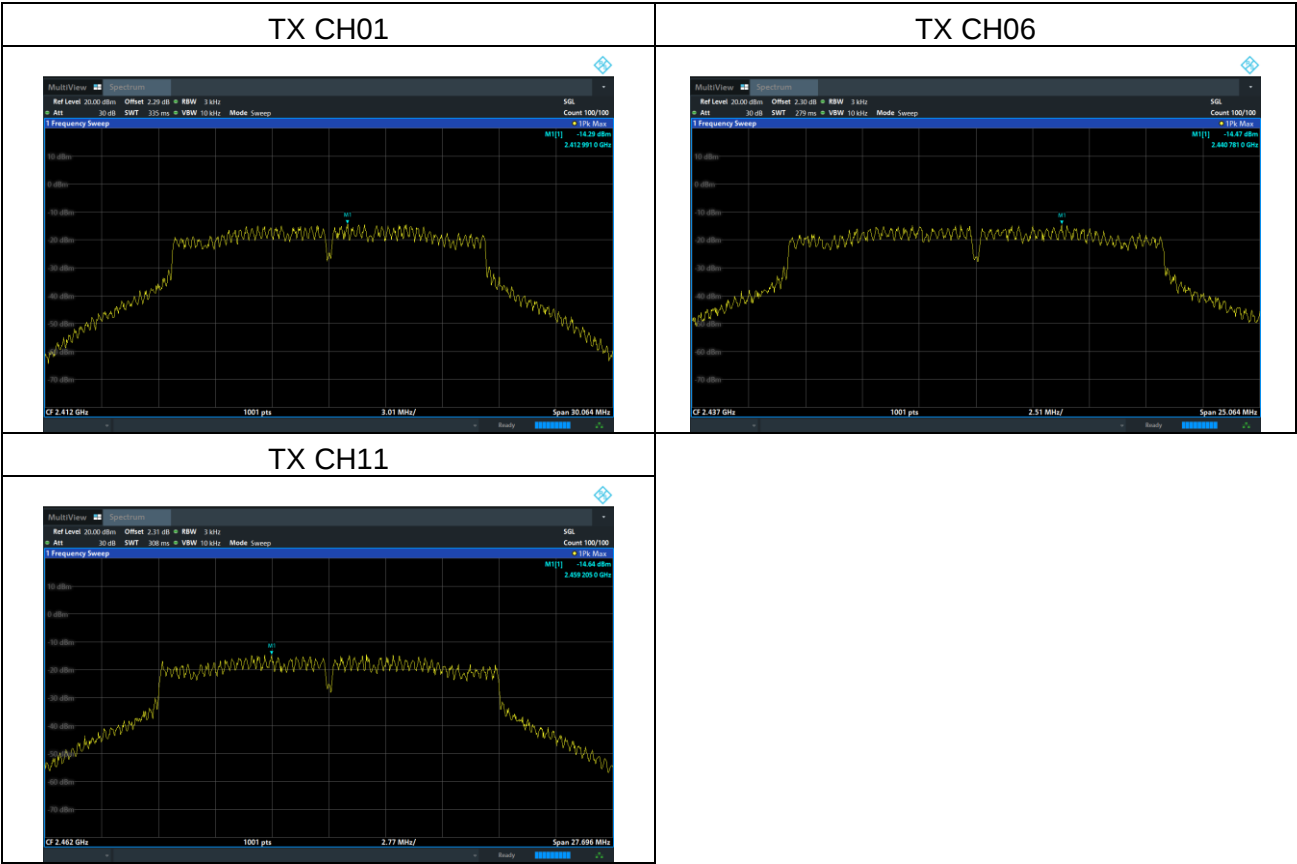
802.11b ANT A				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-8.95	8	Pass
CH06	2437	-8.78	8	Pass
CH11	2462	-9.07	8	Pass



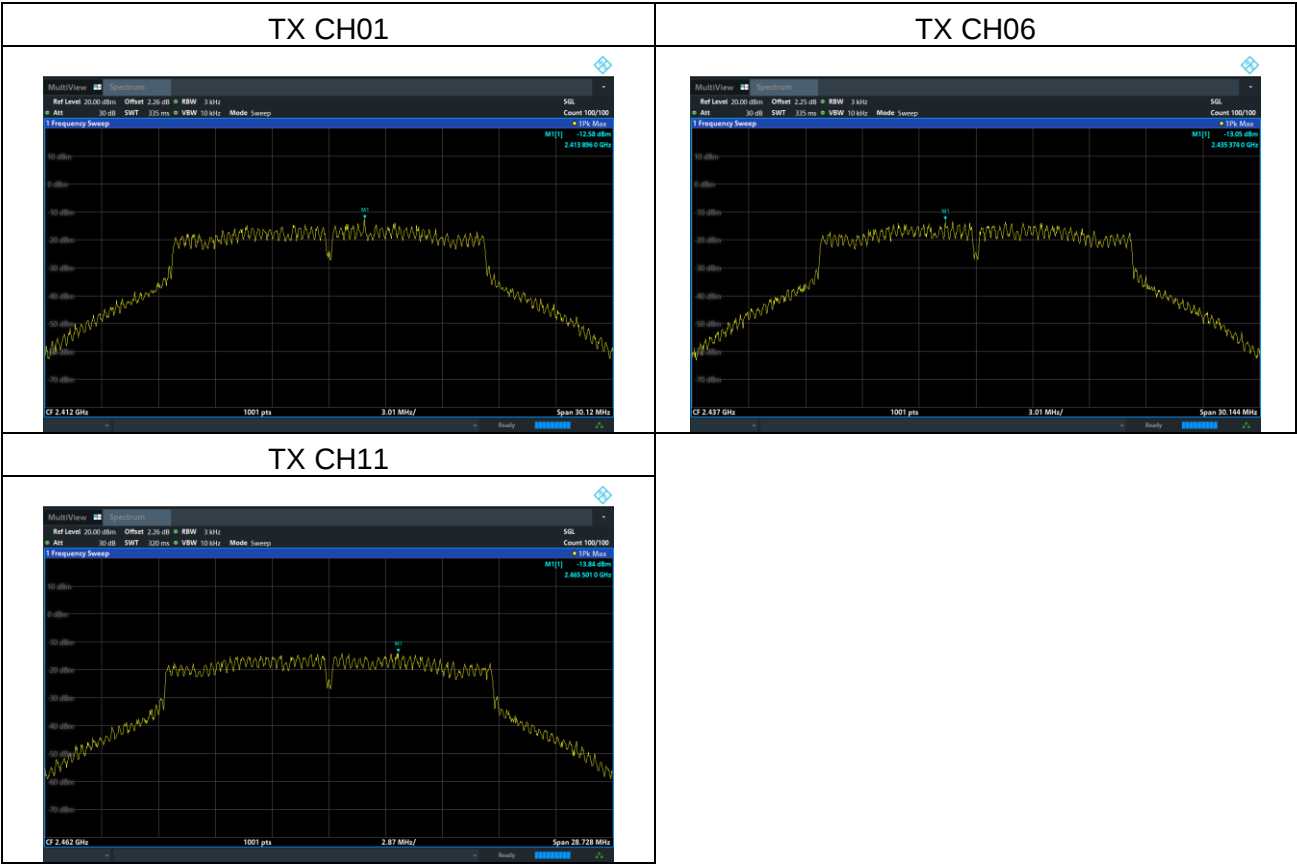
802.11b ANT B				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-9.05	8	Pass
CH06	2437	-8.30	8	Pass
CH11	2462	-8.38	8	Pass



802.11g ANT A				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-14.29	8	Pass
CH06	2437	-14.47	8	Pass
CH11	2462	-14.64	8	Pass



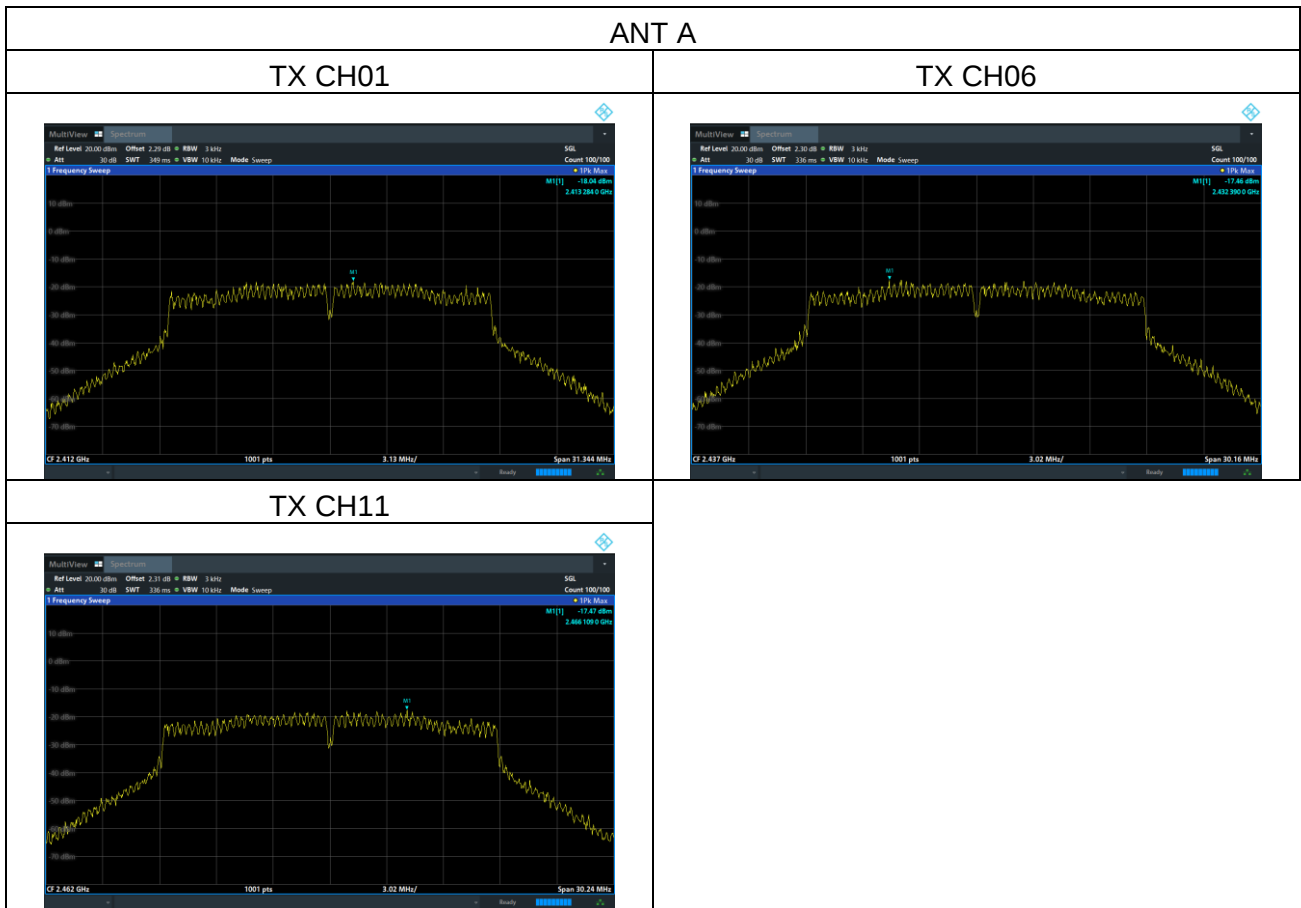
802.11g ANT B				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-12.58	8	Pass
CH06	2437	-13.05	8	Pass
CH11	2462	-13.84	8	Pass

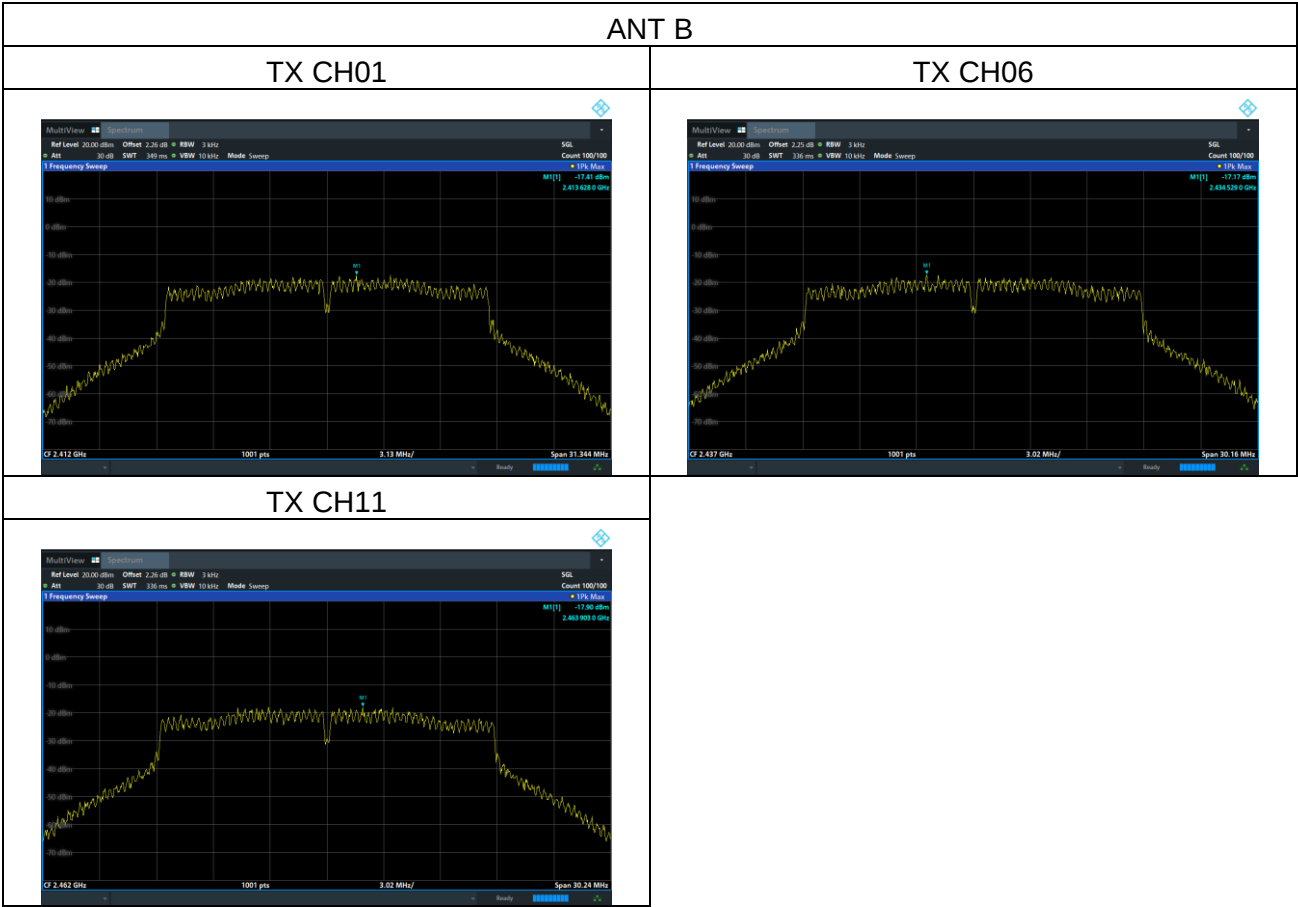


802.11n20						
Test Channel	Frequency (MHz)	Power Density of ANT A (dBm/3kHz)	Power Density of ANT B (dBm/3kHz)	Total Power Density of (ANT A + B) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-18.04	-17.41	-14.70	8	Pass
CH06	2437	-17.46	-17.17	-14.30	8	Pass
CH11	2462	-17.47	-17.90	-14.67	8	Pass

Note: if transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced. (The MIMO antenna gain is 4.28dBi, so it is not required.)

The limit should be calculated as below: Limit = 8 dBm/3kHz - (ANT Gain + 10*Log(N=2) - 6dBi)

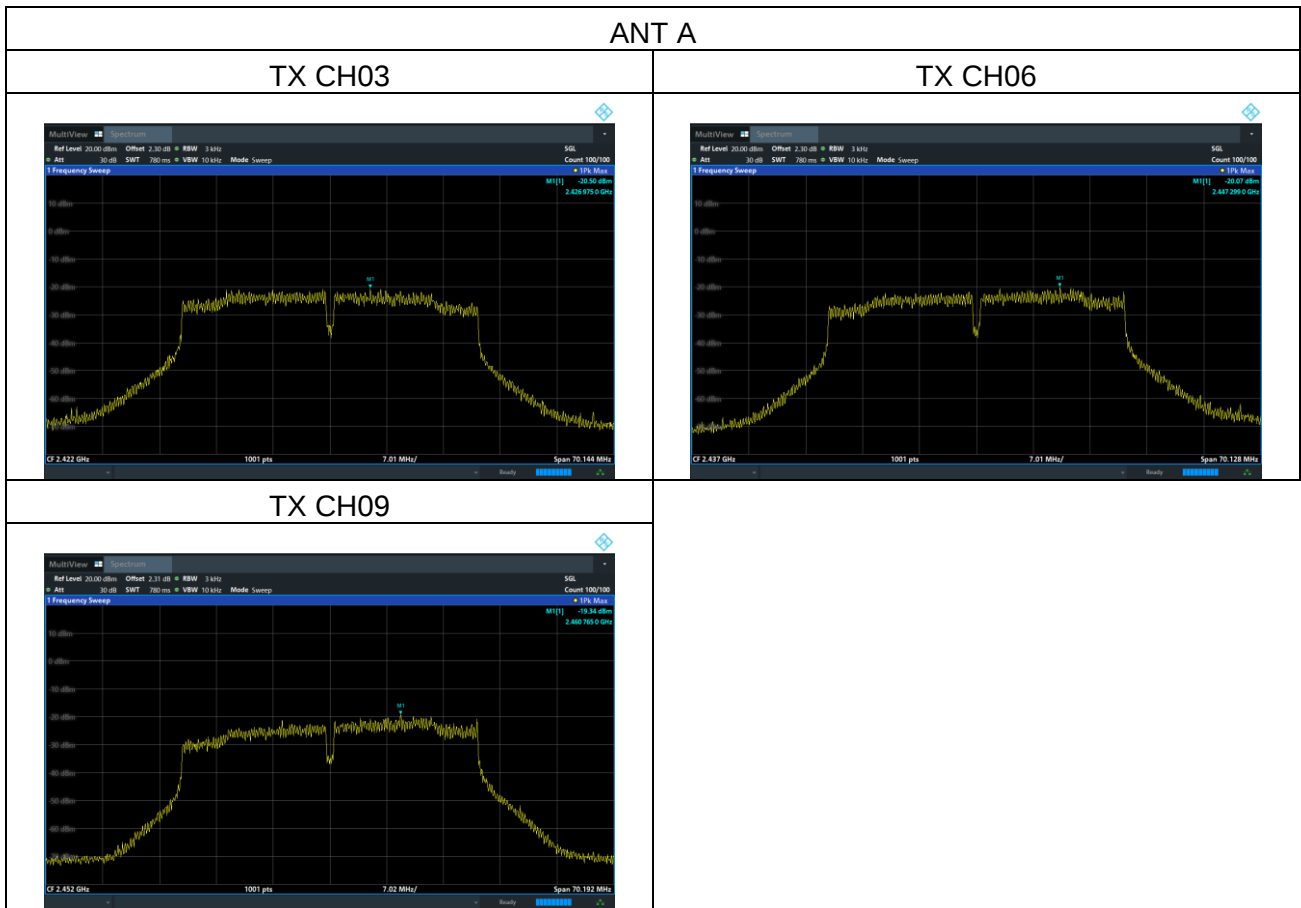


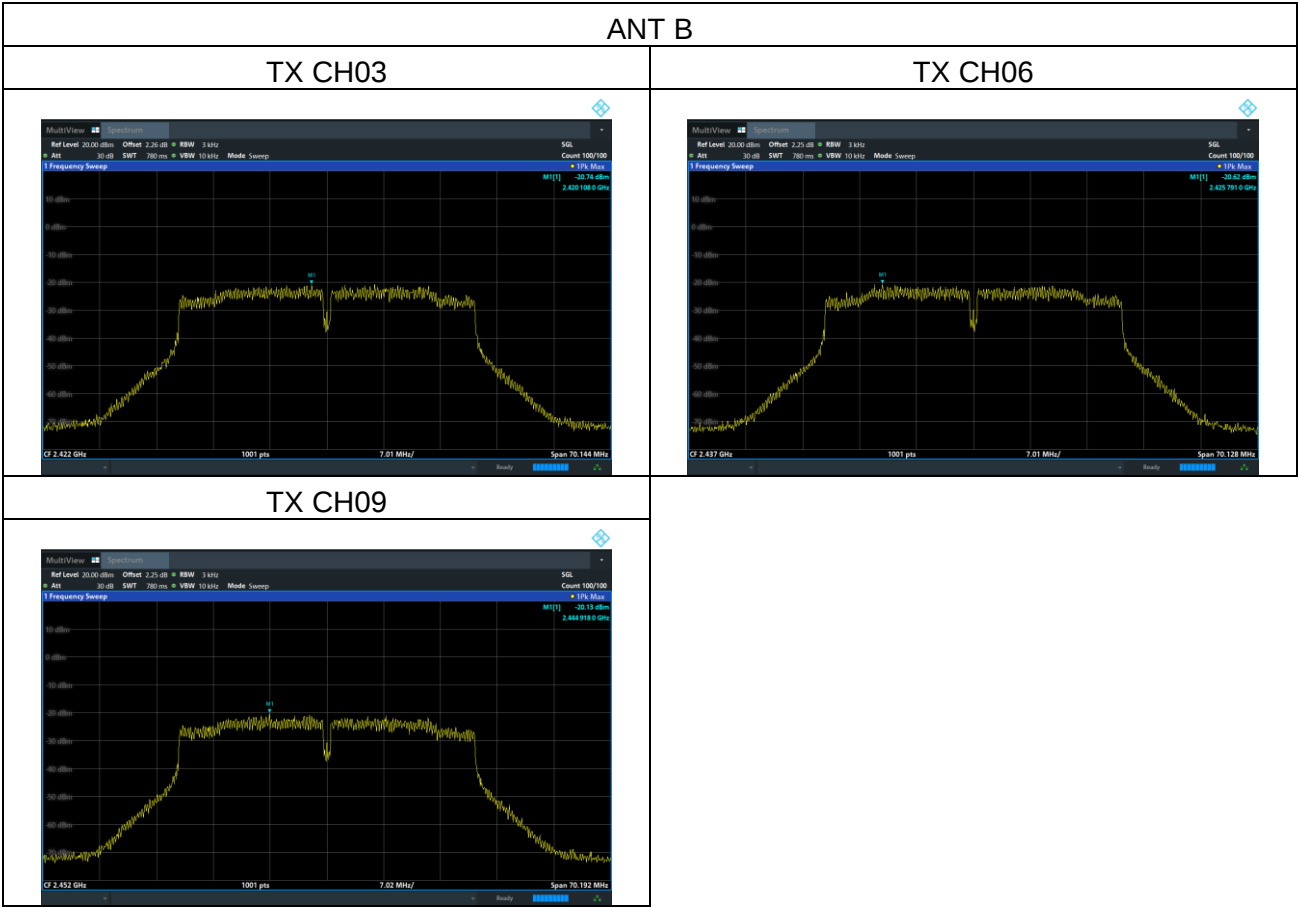


802.11n40						
Test Channel	Frequency (MHz)	Power Density of ANT A (dBm/3kHz)	Power Density of ANT B (dBm/3kHz)	Total Power Density of (ANT A + B) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH03	2422	-20.50	-20.74	-17.61	8	Pass
CH06	2437	-20.07	-20.62	-17.33	8	Pass
CH09	2452	-19.34	-20.13	-16.71	8	Pass

Note: if transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced. (The MIMO antenna gain is 4.28dBi, so it is not required.)

The limit should be calculated as below: Limit = 8 dBm/3kHz - (ANT Gain + 10*Log(N=2) - 6dBi)





5.6 6dB Bandwidth

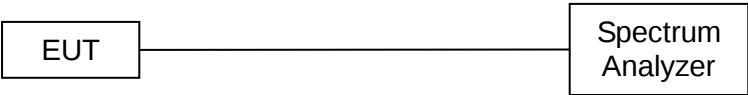
5.6.1 Limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	$\geq 500\text{kHz}$ (6dB bandwidth)	2400-2483.5

5.6.2 Test Procedure

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.6.3 Test Setup

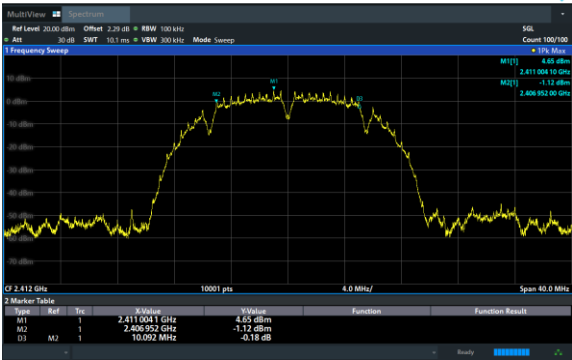
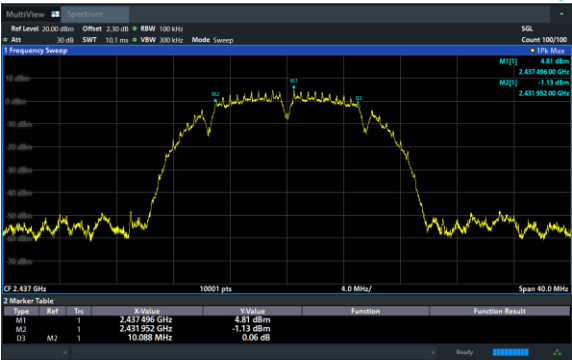
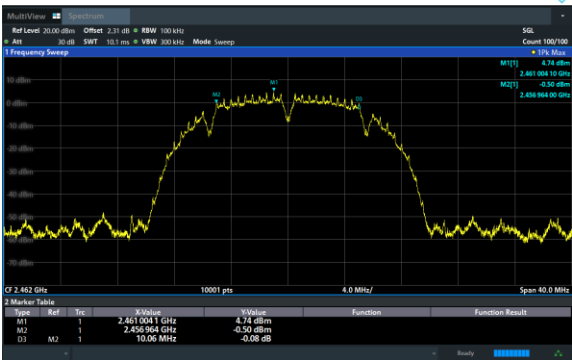


5.6.4 Test Results

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT A TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	10.092	500	Pass
CH06	2437	10.088	500	Pass
CH11	2462	10.06	500	Pass

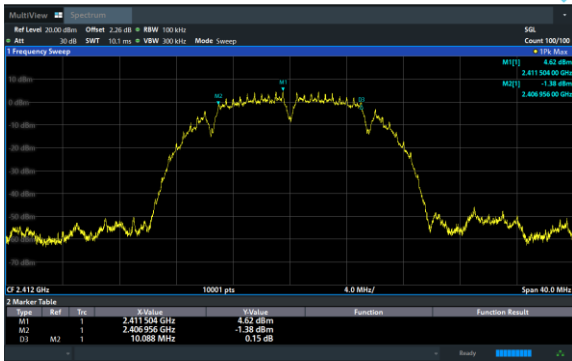
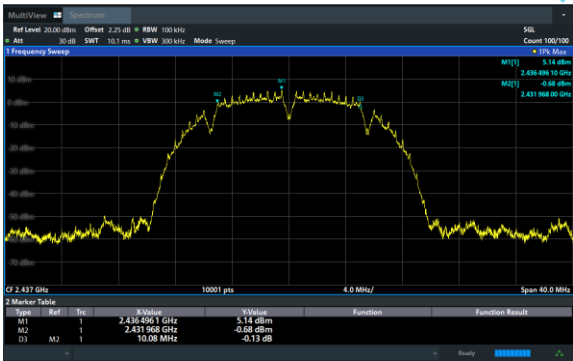
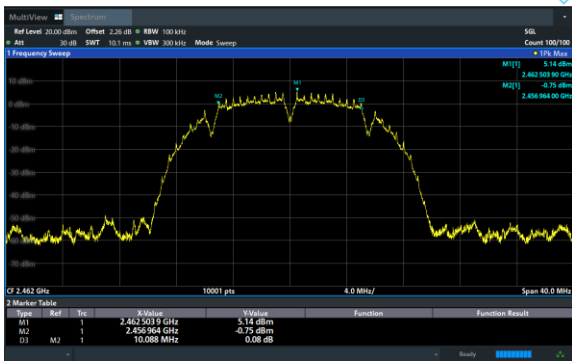
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT B TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	10.088	500	Pass
CH06	2437	10.08	500	Pass
CH11	2462	10.088	500	Pass

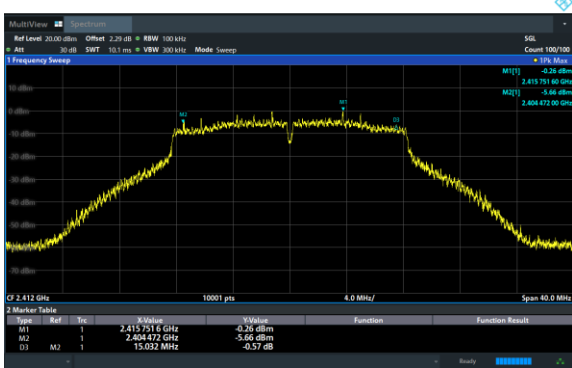
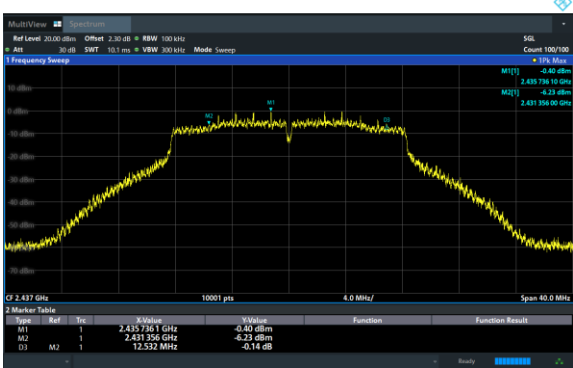
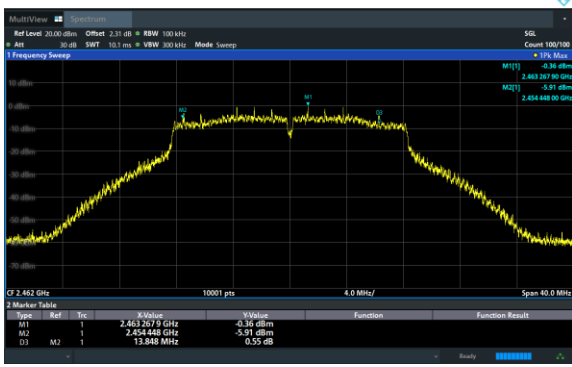
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT A TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	15.032	500	Pass
CH06	2437	12.532	500	Pass
CH11	2462	13.848	500	Pass

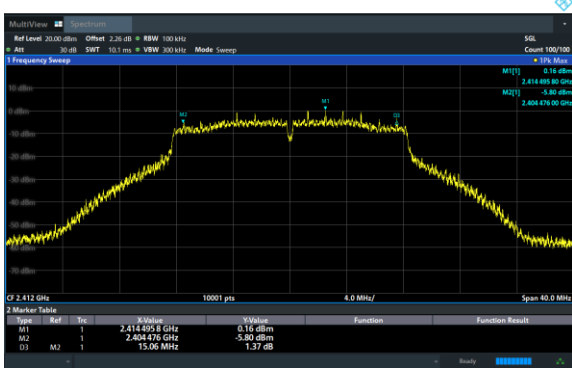
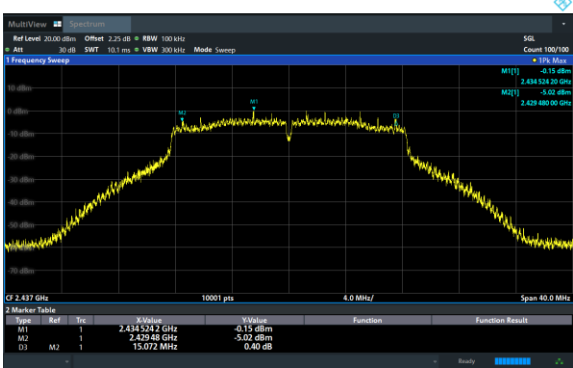
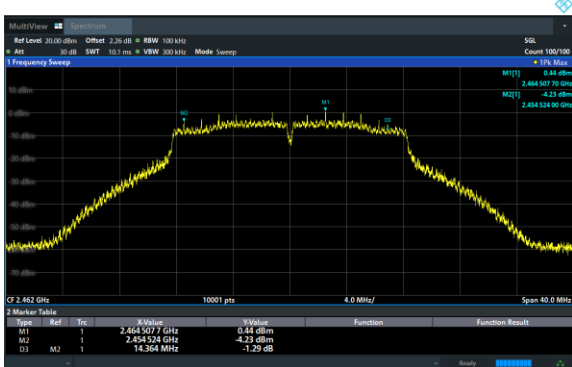
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT B TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	15.06	500	Pass
CH06	2437	15.072	500	Pass
CH11	2462	14.364	500	Pass

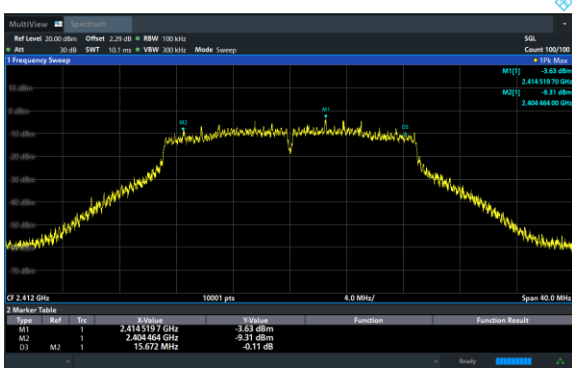
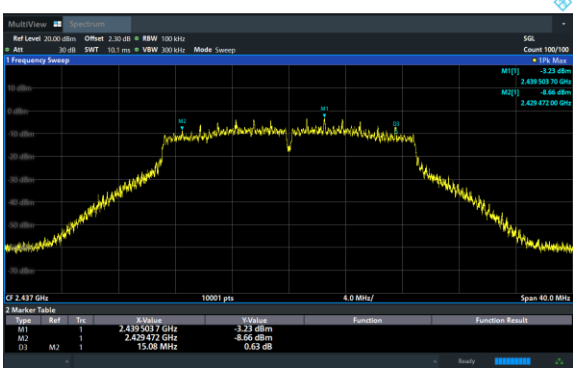
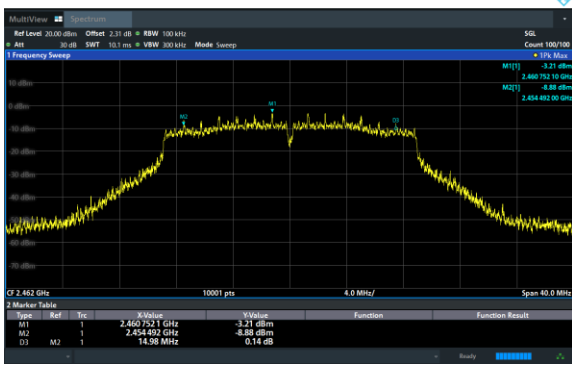
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT A TX n20 Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	15.672	500	Pass
CH06	2437	15.08	500	Pass
CH11	2462	14.98	500	Pass

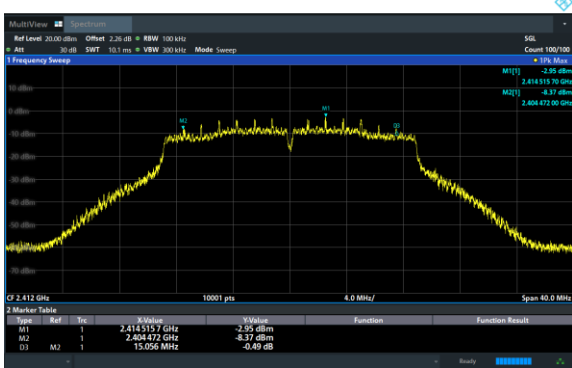
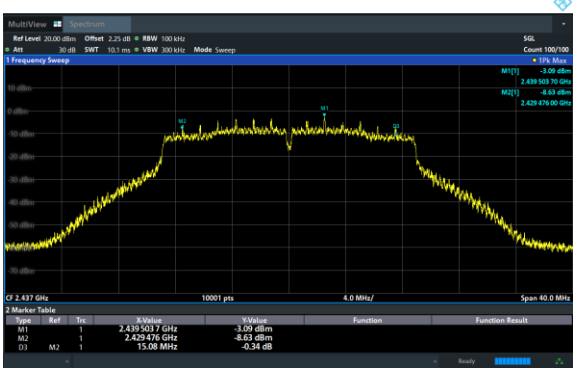
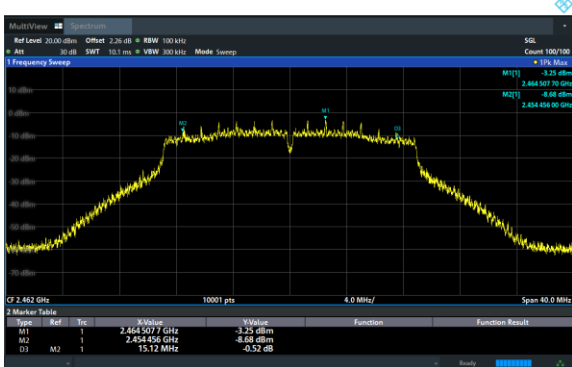
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT B TX n20 Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	15.056	500	Pass
CH06	2437	15.08	500	Pass
CH11	2462	15.12	500	Pass

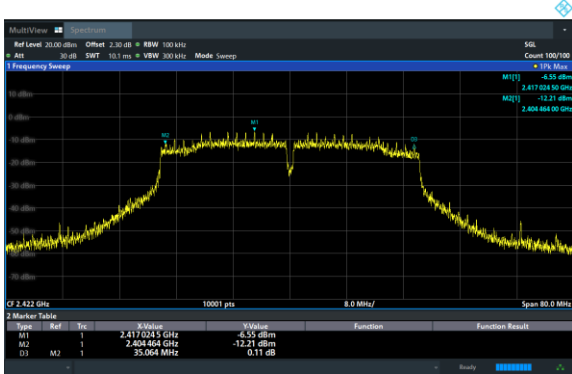
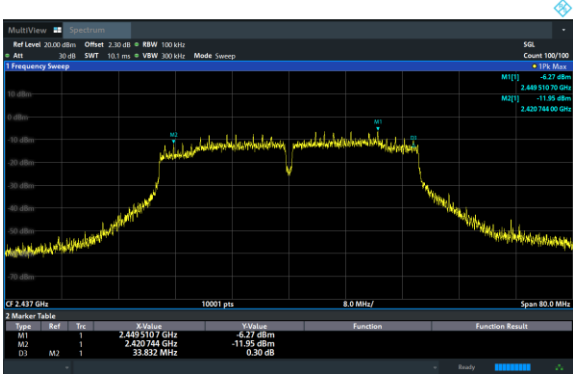
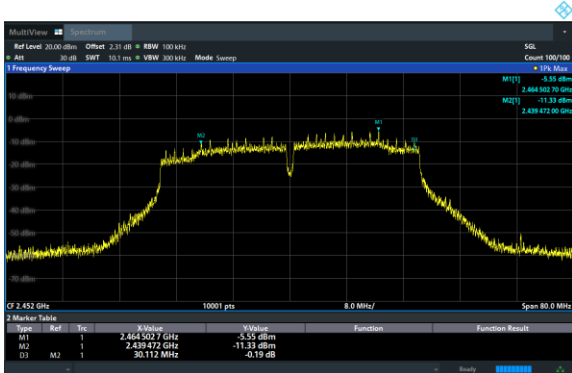
Test plots

TX CH 01 	TX CH 06 
TX CH 11 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT A TX n40 Mode /CH03, CH06, CH09		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH03	2422	35.064	500	Pass
CH06	2437	33.832	500	Pass
CH09	2452	30.112	500	Pass

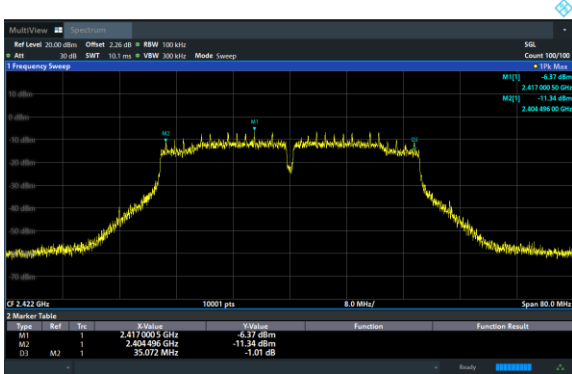
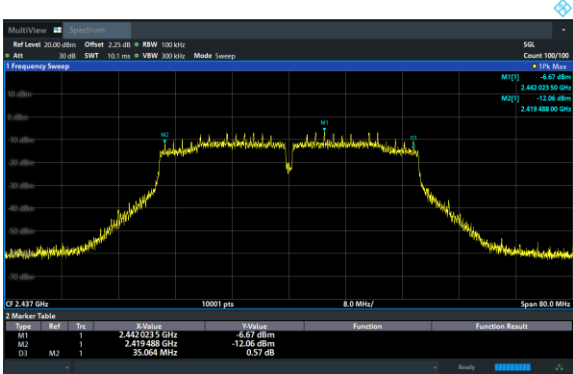
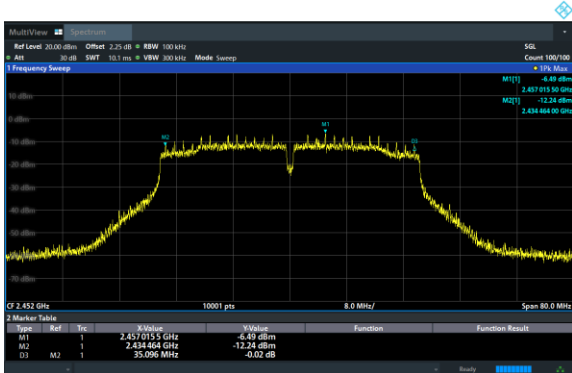
Test plots

TX CH 03 	TX CH 06 
TX CH 09 	/

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCAP-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	ANT B TX n40 Mode /CH03, CH06, CH09		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH03	2422	35.072	500	Pass
CH06	2437	35.064	500	Pass
CH09	2452	35.096	500	Pass

Test plots

TX CH 03 	TX CH 06 
TX CH 09 	/

5.7 Duty Cycle

5.7.1 Limit

No limit requirement.

5.7.2 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value. Set $VBW \geq RBW$. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, 6.0(b) in KDB 558074 D01 DTS Meas Guidance v05r02.

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if $T \leq 6.25$ microseconds. ($50/6.25 = 8$)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are $> 50/T$.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Zero Span

RBW = 10MHz (the largest available value)

VBW = 10MHz ($\geq$ RBW)

Number of points in Sweep > 100

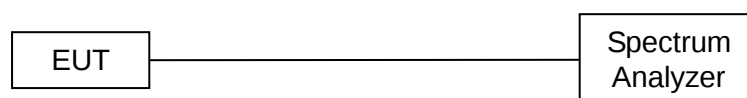
Detector function = peak

Trace = Clear write

Measure Total and Ton

Calculate Duty Cycle = $Ton / Total$

5.7.3 Test Setup



5.7.4 Test Results

EUT:	10.1 Inch Outdoor Intercom System	Model Name:	ASL-101ODCTPC-PCA P-V3.1
Pressure:	1012 hPa	Test Voltage:	DC 12V from adapter AC 120V/60Hz
Test Mode:	TX b/g/n(20/40)		

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant A	96.99	0.13	0.08
NVNT	b	2437	Ant A	96.99	0.13	0.08
NVNT	b	2462	Ant A	96.98	0.13	0.08
NVNT	b	2412	Ant B	98.96	0	0.08
NVNT	b	2437	Ant B	98.96	0	0.08
NVNT	b	2462	Ant B	98.94	0	0.08
NVNT	g	2412	Ant A	97.9	0.09	0.49
NVNT	g	2437	Ant A	97.9	0.09	0.49
NVNT	g	2462	Ant A	97.9	0.09	0.49
NVNT	g	2412	Ant B	97.99	0.09	0.49
NVNT	g	2437	Ant B	97.9	0.09	0.49
NVNT	g	2462	Ant B	97.9	0.09	0.49
NVNT	n20	2412	Sum	94.94	0.23	1.02
NVNT	n20	2437	Sum	94.94	0.23	1.02
NVNT	n20	2462	Sum	94.94	0.23	1.02
NVNT	n40	2422	Sum	90.48	0.43	2.02
NVNT	n40	2437	Sum	90.44	0.44	2.03
NVNT	n40	2452	Sum	90.44	0.44	2.03

