



RF TEST REPORT

Product Name: DALEN Aladdin

Model Name: X30S, X30H, X30 Pro, X30L, X30 Plus, X30C, X30N, X30,
XE01, XE02, U3, XA3, XC3, XM3

FCC ID: 2BA9P-003

Issued For : Jiangsu Dalen Electronic Co., Ltd.

No.5, Baitan Road, Changshu High-tech Industrial
Development Zone, Jiangsu Province, China

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park,
No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan
District, Shenzhen, Guangdong, China

Report Number: LGT23E023RF04

Sample Received Date: May 18, 2023

Date of Test: May 18, 2023 ~ Jun. 01, 2023

Date of Issue: Jun. 01, 2023

The test report is effective only with both signature and specialized stamp. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report only apply to the tested sample.



TEST REPORT CERTIFICATION

Applicant: Jiangsu Dalen Electronic Co., Ltd.
Address: No.5, Baitan Road, Changshu High-tech Industrial Development Zone, Jiangsu Province, China
Manufacturer: Jiangsu Dalen Electronic Co., Ltd.
Address: No.5, Baitan Road, Changshu High-tech Industrial Development Zone, Jiangsu Province, China
Product Name: DALEN Aladdin
Trademark: DALEN
Model Name: X30S, X30H, X30 Pro, X30L, X30 Plus, X30C, X30N, X30, XE01, XE02, U3, XA3, XC3, XM3
Sample Status: Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15.407, Subpart E ANSI C63.10-2013	PASS

Prepared by:

Zane Shan

Zane Shan
Engineer

Approved by:

Vita Li

Vita Li
Technical Director





Table of Contents

Page

1 . SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2 . GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF THE EUT	8
2.2 DESCRIPTION OF TEST MODES	11
2.3 TEST SOFTWARE AND POWER LEVEL	12
2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	12
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	13
3 . EMC EMISSION TEST	14
3.1 CONDUCTED EMISSION MEASUREMENT	14
3.2 RADIATED EMISSION AND (BANDEGE) MEASUREMENT	18
4. POWER SPECTRAL DENSITY TEST	40
4.1 LIMIT	40
4.2 TEST PROCEDURE	40
4.3 DEVIATION FROM STANDARD	40
4.4 TEST SETUP	41
4.5 EUT OPERATION CONDITIONS	41
4.6 TEST RESULTS	41
5. BANDWIDTH MEASUREMENT	42
5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT	42
5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT	43
5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT	44
6. MAXIMUM CONDUCTED OUTPUT POWER	45
6.1 LIMIT	45
6.2 TEST PROCEDURE	45
6.3 DEVIATION FROM STANDARD	45
6.4 TEST SETUP	45
6.5 EUT OPERATION CONDITIONS	45
6.6 TEST RESULTS	45
7. AUTOMATICALLY DISCONTINUE TRANSMISSION	46
7.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	46
7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	46
8. ANTENNA REQUIREMENT	47



Table of Contents	Page
8.1 STANDARD REQUIREMENT	47
8.2 EUT ANTENNA	47
APPENDIX I:TEST RESULTS	48
DUTY CYCLE	48
MAXIMUM CONDUCTED OUTPUT POWER	76
-26DB BANDWIDTH	79
OCCUPIED CHANNEL BANDWIDTH	101
MAXIMUM POWER SPECTRAL DENSITY LEVEL	123
APPENDIX II:PHOTOS OF TEST SETUP	159



Revision History

Rev.	Issue Date	Contents
00	Jun. 01, 2023	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Part 15.407, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
15.407 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/15.205/15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2013.



1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate:	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.39\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 5.10\text{dB}$
6	All emissions, radiated >6G	$\pm 5.48\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.79\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.80\text{dB}$

Note:

1. The measurement uncertainty is not included in the test result.



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	DALEN Aladdin	
Trademark:	DALEN	
Model Name:	X30S	
Series Model:	X30H, X30 Pro, X30L, X30 Plus, X30C, X30N, X30, XE01, XE02, U3, XA3, XC3, XM3	
Model Difference:	All models are similar in electrical and mechanical construction. X30S, X30L, X30 Plus, X30C, X30N, X30, XE01, XE02, U3, XA3, XC3 and XM3 are totally same except projector memory versions or model names for different market purpose. X30 pro and X30H are identical to the X30S except for the extra gold ring.	
Product Description:	The EUT is a DALEN Aladdin	
	Operation Frequency:	IEEE 802.11a/n(HT20)/ac(VHT20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80): 5.210GHz
		IEEE 802.11a/n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz
		IEEE 802.11a/n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz
		Modulation Type: 802.11a(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11ac (OFDM): BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
	Antenna Designation:	Please refer to the Note 3.
		Antenna Gain(dBi) 2.84
More details of EUT technical specification, please refer to the User Manual.		
Test Channel:	Please refer to the Note 2.	
Power Input:	AC 100~240V 50/60Hz 1A	
Hardware Version:	V 1.0	
Software Version:	V 1.0	
Connecting I/O Port(s):	Please refer to the Note 1.	

Note

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.



2.

Operation Frequency of channel			
5.180GHz-5.240GHz		5.260GHz-5.320GHz	
Channel	Frequency	Channel	Frequency
36	5180	52	5260
38	5190	54	5270
40	5200	56	5280
42	5210	58	5290
44	5220	60	5300
46	5230	62	5310
48	5240	64	5320
5.500GHz-5.720GHz			
Channel	Frequency		
100	5500		
102	5510		
104	5520		
108	5540		
110	5550		
112	5560		
116	5580		
118	5590		
120	5600		
124	5620		
126	5630		
128	5640		
132	5660		
134	5670		
136	5680		
140	5700		
142	5710		
144	5720		

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:

Carrier Frequency Channel

Channel List for 802.11a/n/ac(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	52	5260	100	5500	-	-
40	5200	60	5300	116	5580	-	-
48	5240	64	5320	140	5700	-	-

Channel List for 802.11n/ac(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	54	5270	102	5510	-	-
46	5230	62	5310	110	5550	-	-
159	5795	-	-	-	-	-	-



Channel List for 802.11ac(80MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	58	5290	106	5530	-	-
155	5775	-	-	-	-	-	-

3.

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
1	DALEN	X30S	FPC	N/A	2.84	WLAN Ant

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11a HT20 CH52&CH60&CH64	6 Mbps
Mode 3	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 4	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 5	TX IEEE 802.11ac VHT20 CH36&CH40&CH48	NSS1 MCS0
Mode 6	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 7	TX IEEE 802.11ac VHT20 CH52&CH60&CH64	NSS1 MCS0
Mode 8	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 9	TX IEEE 802.11ac VHT20 CH149&CH157&CH165	NSS1 MCS0
Mode 10	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 11	TX IEEE 802.11ac VHT40 CH38&CH46	NSS1 MCS0
Mode 12	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 13	TX IEEE 802.11ac VHT40 CH54 &CH62	NSS1 MCS0
Mode 14	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 15	TX IEEE 802.11ac VHT40 CH151&CH159	NSS1 MCS0
Mode 16	TX IEEE 802.11ac VHT80 CH42	NSS1 MCS0
Mode 17	TX IEEE 802.11ac VHT80 CH58	NSS1 MCS0
Mode 18	TX IEEE 802.11ac VHT80 CH155	NSS1 MCS0

- Note: (1) The measurements are performed at the highest, middle, lowest available channels.
 (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
 (3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.
 (4) The battery is fully-charged during the radited and RF conducted test.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 19: TX Mode



2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test software Version	Test program: 5G WIFI B1	
SecureCRT_6.5.0.380	Mode Or Modulation type	Power setting
	a	14
	n20	14
	n40	14
	ac80	14
Test software Version	Test program: 5G WIFI B2	
SecureCRT_6.5.0.380	Mode Or Modulation type	Power setting
	a	14
	n20	14
	n40	14
	ac80	14
Test software Version	Test program: 5G WIFI B3	
SecureCRT_6.5.0.380	Mode Or Modulation type	Power setting
	a	14
	n20	14
	n40	14
	ac80	14

2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
remote control	N/A	N/A	N/A	N/A

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	HUAWEI	HKF-16	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
LISN	COM-POWER	LI-115	02032	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8121	00847	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8122	00160	2023.04.07	2024.04.06
ISN	FCC	T4-02	91317	2022.06.08	2023.06.07
ISN	SCHWARZBECK	NTFM 8158	00303	2023.04.07	2024.04.06
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

Radiated Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
Active loop Antenna	ETS	6502	00049544	2022.06.02	2025.06.01
Spectrum Analyzer	Keysight	N9010B	MY60242508	2023.04.10	2024.04.09
Bilog Antenna	SCHAFFNER	CBL6112B	2705	2022.06.05	2025.06.04
Horn Antenna	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01
Pre-amplifier(9kHz-1GHz)	EMtrace	RP01A	02017	2023.04.07	2024.04.06
Pre-amplifier(1-26.5G)	Agilent	8449B	3008A4722	2023.04.07	2024.04.06
Wireless Communications Test Set	R&S	CMW 500	137737	2023.04.13	2024.04.12
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

Conducted Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
Signal Analyzer	Keysight	N9010B	MY60242508	2023.04.10	2024.04.09
Wireless Communications Test Set	R&S	CMW 500	137737	2023.04.13	2024.04.12
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2023.04.07	2024.04.06
RF Automatic Test system	MW	MW100-RFCB	MW220324LG-33	2023.04.13	2024.04.12
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2023.05.10	2024.05.09
Attenuator	eastsheep	90db	N.A	2023.04.10	2024.04.09
Testing Software	MTS8200_V2.0.0.0_MW				



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

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



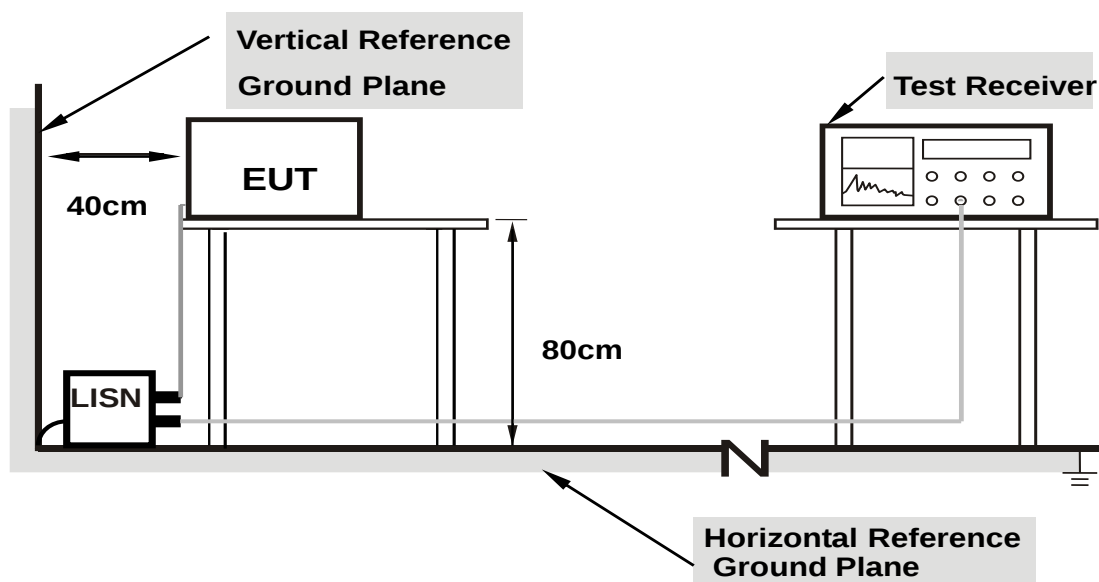
3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 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 the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

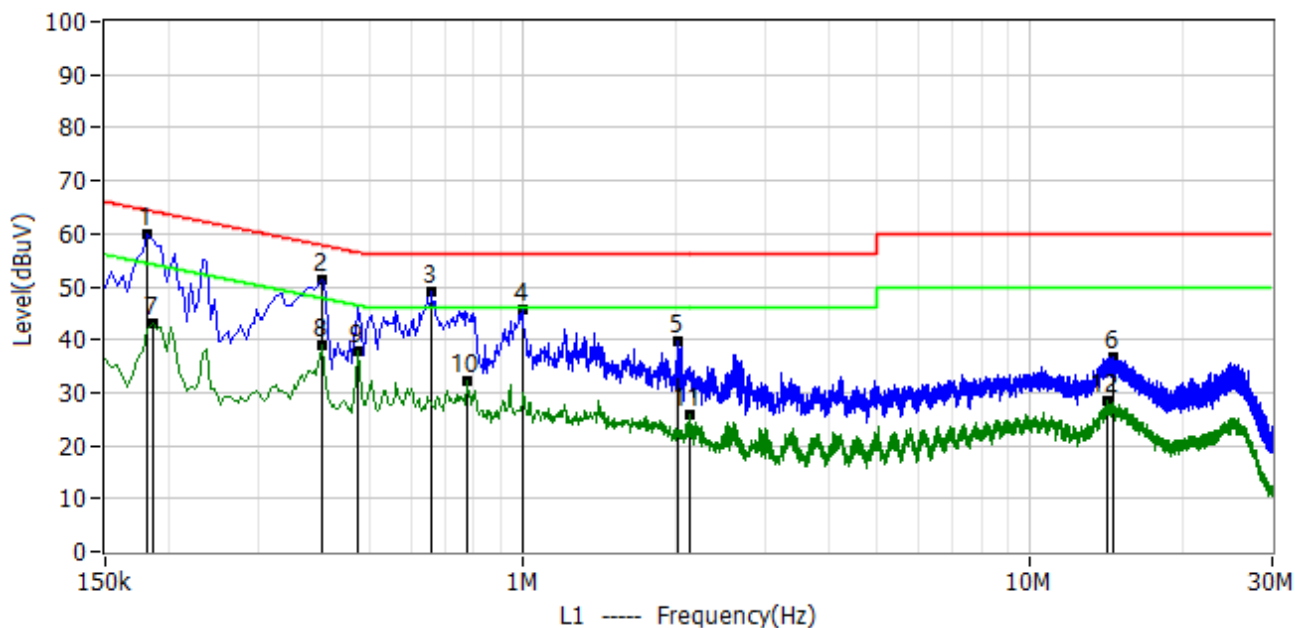
3.1.5 EUT OPERATING CONDITIONS

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.



3.1.6 TEST RESULTS

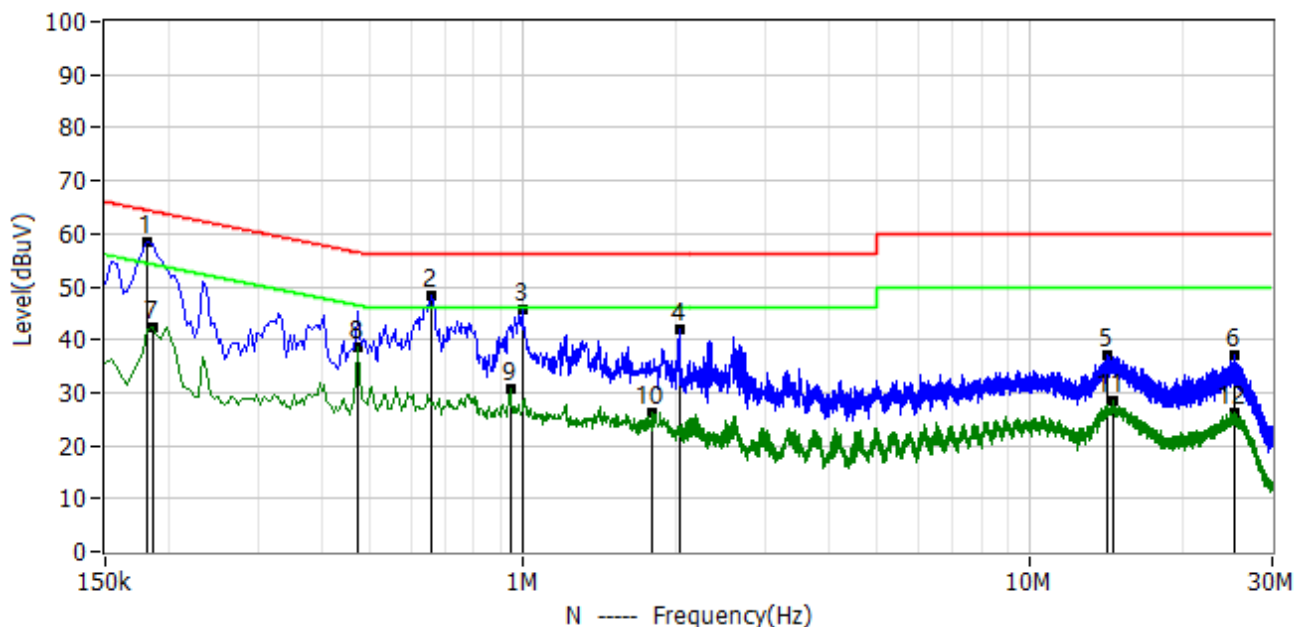
Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 25.5°C
M/N: X30S	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-15
Test Mode: 5G Wi-Fi TX	
Note:	



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	182.000kHz	49.37	10.59	59.96	64.39	-4.44	QP	L1
2*	402.000kHz	40.67	10.58	51.25	57.81	-6.56	QP	L1
3*	662.000kHz	38.35	10.58	48.93	56.00	-7.07	QP	L1
4*	998.000kHz	35.19	10.59	45.78	56.00	-10.22	QP	L1
5*	2.018MHz	29.12	10.75	39.87	56.00	-16.13	QP	L1
6*	14.546MHz	25.65	11.06	36.71	60.00	-23.29	QP	L1
7*	186.000kHz	32.57	10.59	43.16	54.21	-11.05	AV	L1
8*	402.000kHz	28.25	10.58	38.83	47.81	-8.98	AV	L1
9*	474.000kHz	27.41	10.58	37.99	46.44	-8.45	AV	L1
10*	778.000kHz	21.66	10.58	32.24	46.00	-13.76	AV	L1
11*	2.122MHz	15.03	10.75	25.78	46.00	-20.22	AV	L1
12*	14.206MHz	17.40	11.04	28.44	50.00	-21.56	AV	L1



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 25.5°C
M/N: X30S	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-15
Test Mode: 5G Wi-Fi TX	
Note:	



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	182.000kHz	47.81	10.59	58.40	64.39	-5.99	QP	N
2*	662.000kHz	37.68	10.58	48.26	56.00	-7.74	QP	N
3*	998.000kHz	35.00	10.59	45.59	56.00	-10.41	QP	N
4*	2.030MHz	31.25	10.75	42.00	56.00	-14.00	QP	N
5*	14.166MHz	25.88	11.08	36.96	60.00	-23.04	QP	N
6*	25.242MHz	25.47	11.43	36.90	60.00	-23.10	QP	N
7*	186.000kHz	31.81	10.59	42.40	54.21	-11.81	AV	N
8*	474.000kHz	28.08	10.58	38.66	46.44	-7.79	AV	N
9*	942.000kHz	20.03	10.58	30.61	46.00	-15.39	AV	N
10*	1.798MHz	15.59	10.72	26.31	46.00	-19.69	AV	N
11*	14.550MHz	17.18	11.11	28.29	50.00	-21.71	AV	N
12*	25.246MHz	14.76	11.43	26.19	50.00	-23.81	AV	N



3.2 RADIATED EMISSION AND (BANDEGE) MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.407(b)7&15.205/209(a), then the limit in the table below has to be followed.

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	68.2	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15E.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.



LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note: dBuV/m(at 3M) = EIRP(dBm) + 95.3.

Peak Limit = -27dBm/MHz + 95.3 = 68.3 dBuV/m.

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



3.2.2 TEST PROCEDURE

- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

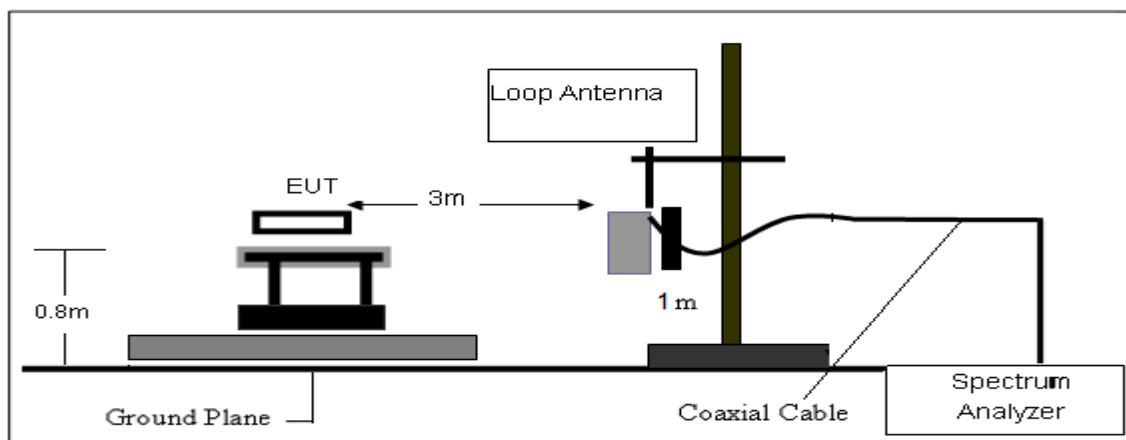
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.2 DEVIATION FROM TEST STANDARD

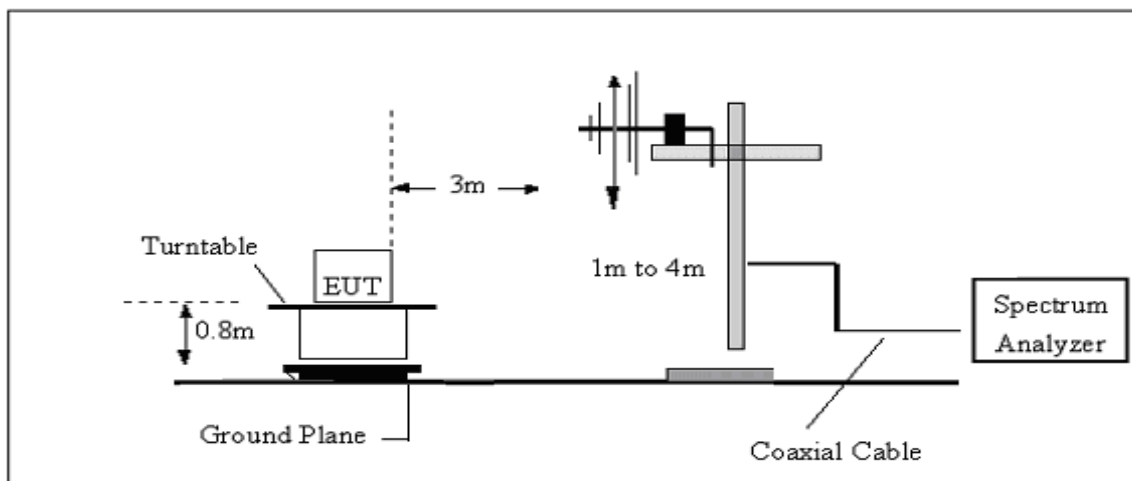
No deviation

3.2.3 TEST SETUP

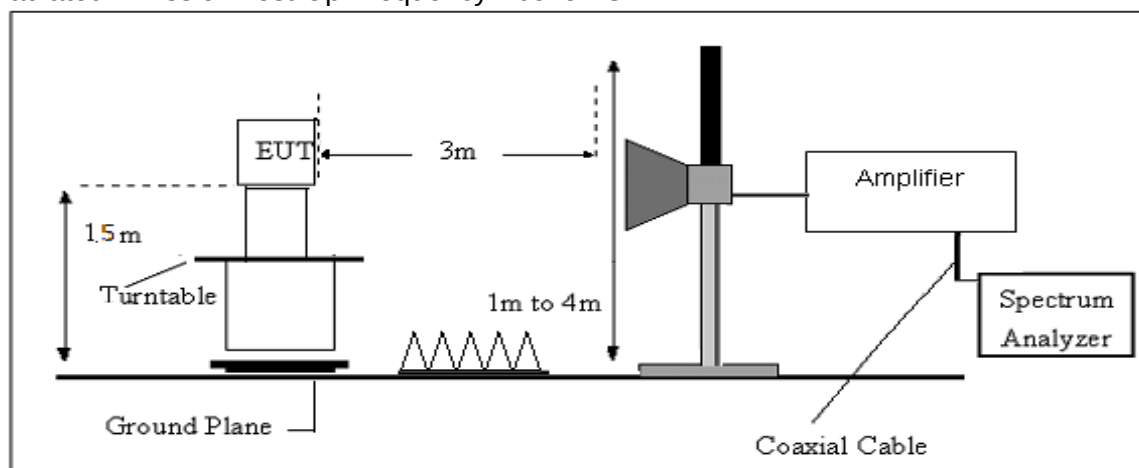
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz





3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



3.2.6 TEST RESULTS

Results of Radiated Emissions (9 KHz~30MHz)

No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Remark
1*	-	-	-	-	-	-	-	See Note

Note:

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

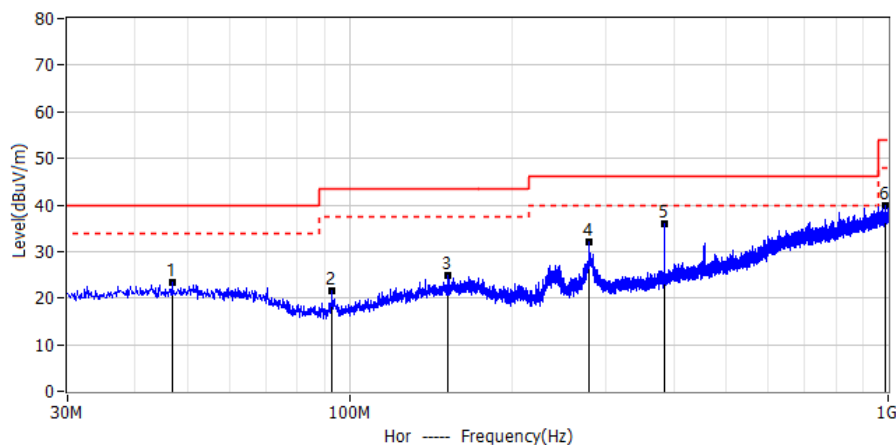
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

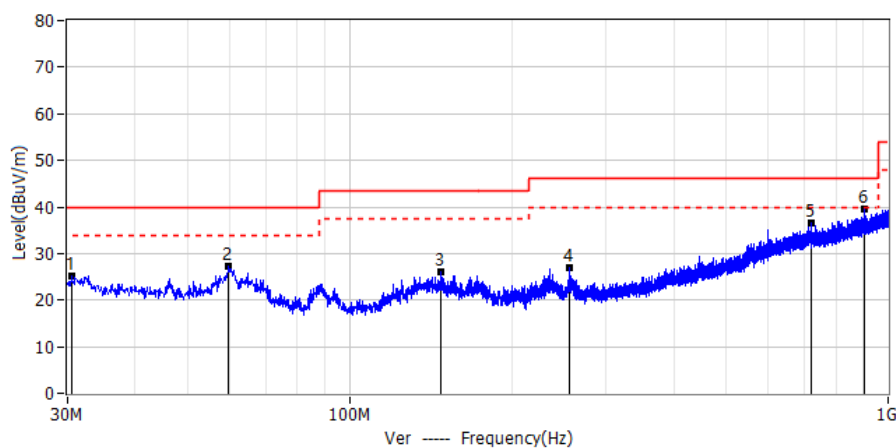


Results of Radiated Emissions (30MHz~1000MHz)

Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.9°C
M/N: X30S	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-15
Test Mode: 5G Wi-Fi TX	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	46.854MHz	4.01	19.27	23.28	40.00	-16.72	PK	Hor
2*	92.686MHz	6.24	15.21	21.45	43.50	-22.05	PK	Hor
3*	152.220MHz	4.83	19.96	24.79	43.50	-18.71	PK	Hor
4*	278.805MHz	12.48	19.50	31.98	46.00	-14.02	PK	Hor
5*	383.929MHz	13.68	22.35	36.03	46.00	-9.97	PK	Hor
6*	990.664MHz	5.44	34.53	39.97	54.00	-14.03	PK	Hor

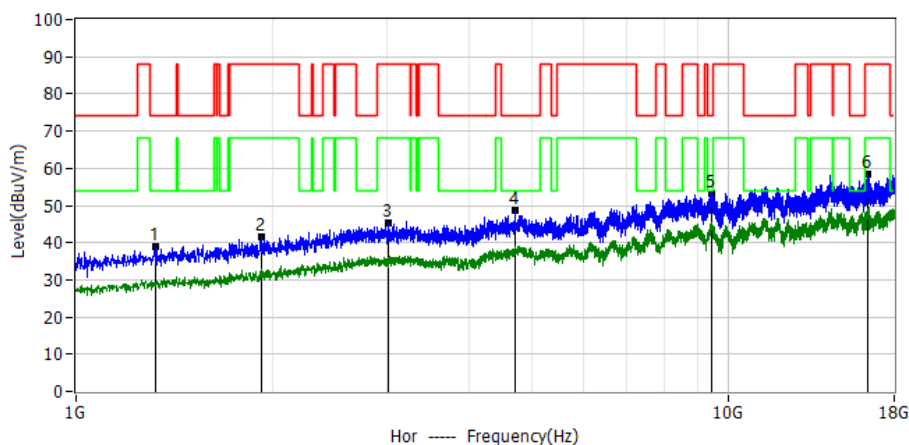


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	30.485MHz	6.86	18.23	25.09	40.00	-14.91	PK	Ver
2*	59.585MHz	8.70	18.67	27.37	40.00	-12.63	PK	Ver
3*	148.098MHz	6.11	19.81	25.92	43.50	-17.58	PK	Ver
4*	255.525MHz	8.42	18.49	26.91	46.00	-19.09	PK	Ver
5*	720.398MHz	6.52	30.02	36.54	46.00	-9.46	PK	Ver
6*	902.636MHz	6.28	33.25	39.53	46.00	-6.47	PK	Ver

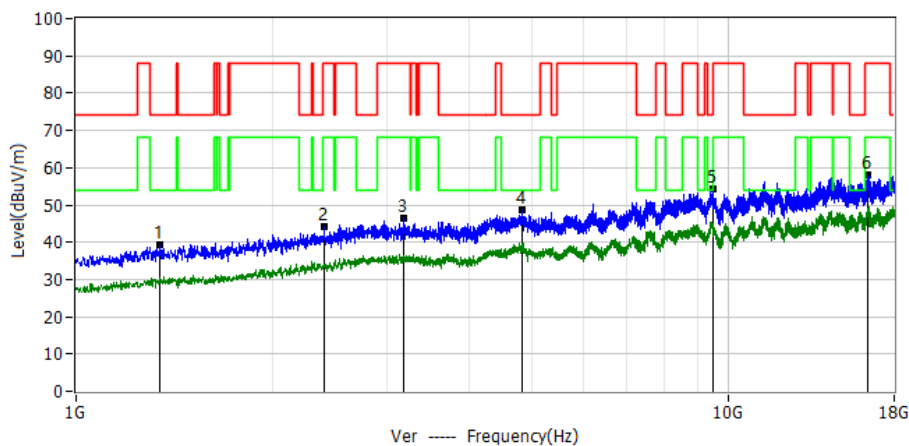


3.2.7 TEST RESULTS(Above 1GHz)

Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5180	
Note:	



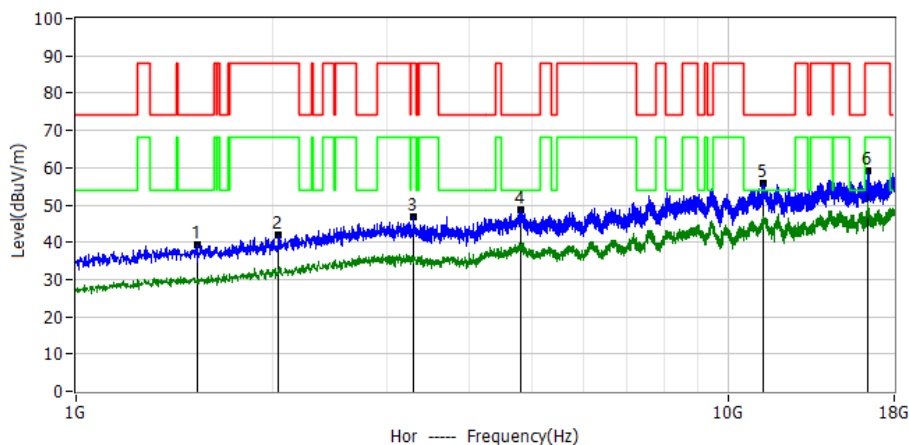
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.327GHz	60.85	-21.96	38.89	74.00	-35.11	PK	Hor
2*	1.929GHz	58.70	-16.95	41.75	88.20	-46.45	PK	Hor
3*	3.017GHz	53.85	-8.35	45.50	88.20	-42.70	PK	Hor
4*	4.706GHz	54.77	-5.91	48.86	74.00	-25.14	PK	Hor
5*	9.434GHz	54.47	-1.17	53.30	74.00	-20.70	PK	Hor
6*	16.362GHz	51.57	6.82	58.39	88.20	-29.81	PK	Hor



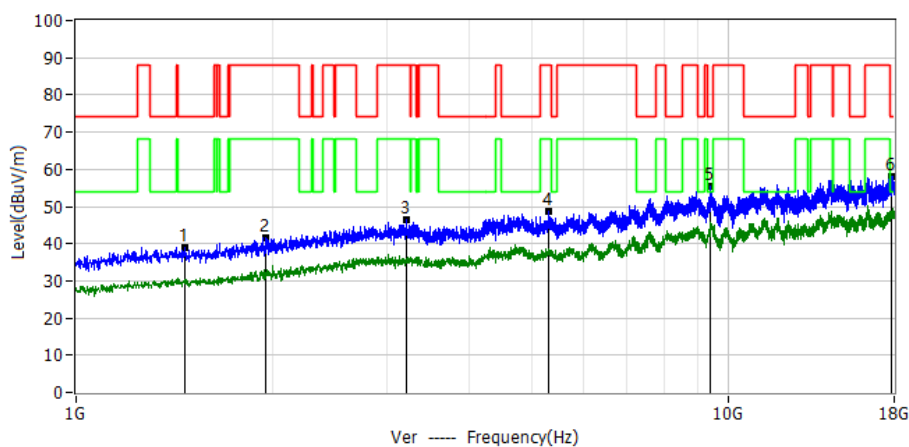
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.344GHz	61.31	-21.82	39.49	74.00	-34.51	PK	Ver
2*	2.400GHz	56.07	-12.03	44.04	88.20	-44.16	PK	Ver
3*	3.187GHz	54.79	-8.40	46.39	88.20	-41.81	PK	Ver
4*	4.844GHz	54.55	-6.02	48.53	74.00	-25.47	PK	Ver
5*	9.479GHz	55.39	-1.17	54.22	74.00	-19.78	PK	Ver
6*	16.415GHz	51.09	6.91	58.00	88.20	-30.20	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5200	
Note:	



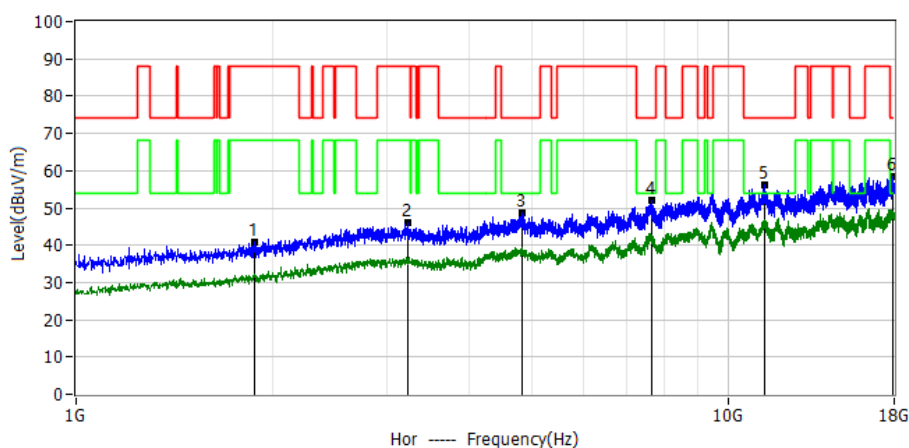
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.536GHz	59.88	-20.60	39.28	74.00	-34.72	PK	Hor
2*	2.046GHz	57.64	-15.75	41.89	88.20	-46.31	PK	Hor
3*	3.299GHz	55.25	-8.44	46.81	88.20	-41.39	PK	Hor
4*	4.817GHz	54.51	-6.00	48.51	74.00	-25.49	PK	Hor
5*	11.321GHz	53.91	1.82	55.73	74.00	-18.27	PK	Hor
6*	16.364GHz	52.33	6.83	59.16	88.20	-29.04	PK	Hor



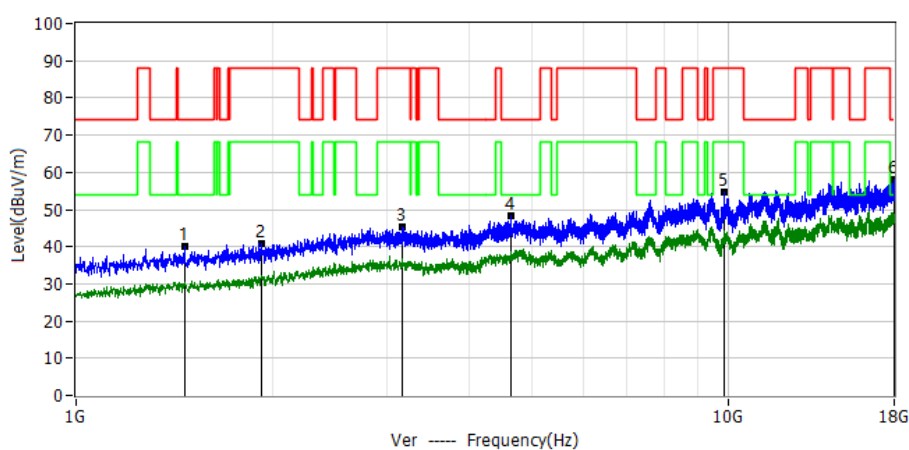
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.465GHz	60.02	-21.03	38.99	74.00	-35.01	PK	Ver
2*	1.954GHz	58.36	-16.69	41.67	88.20	-46.53	PK	Ver
3*	3.210GHz	54.99	-8.41	46.58	88.20	-41.62	PK	Ver
4*	5.310GHz	55.97	-7.13	48.84	88.20	-39.36	PK	Ver
5*	9.415GHz	56.63	-1.17	55.46	74.00	-18.54	PK	Ver
6*	17.798GHz	49.81	8.38	58.19	74.00	-15.81	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5240	
Note:	



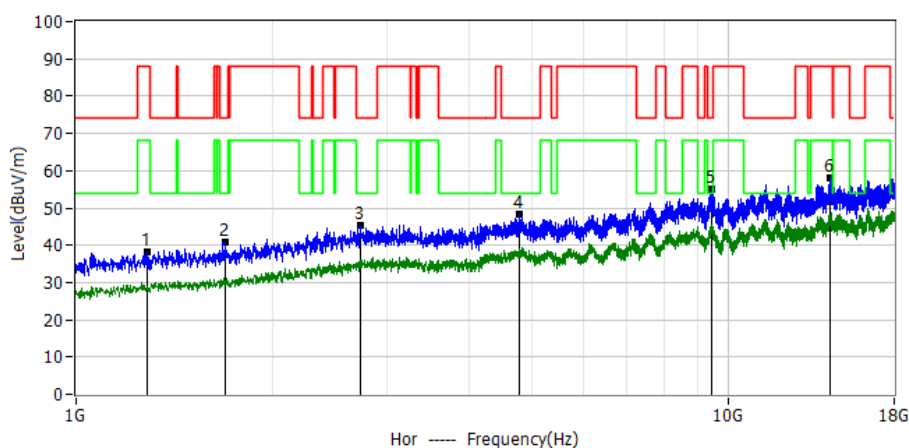
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.882GHz	58.16	-17.43	40.73	88.20	-47.47	PK	Hor
2*	3.229GHz	54.67	-8.42	46.25	88.20	-41.95	PK	Hor
3*	4.836GHz	54.81	-6.01	48.80	74.00	-25.20	PK	Hor
4*	7.647GHz	56.20	-4.21	51.99	74.00	-22.01	PK	Hor
5*	11.359GHz	54.40	1.84	56.24	74.00	-17.76	PK	Hor
6*	17.938GHz	49.76	8.48	58.24	74.00	-15.76	PK	Hor



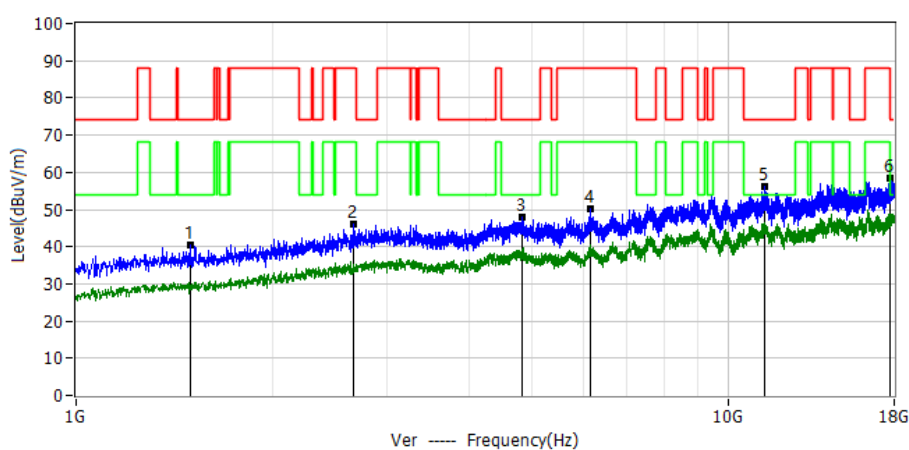
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.465GHz	61.06	-21.03	40.03	74.00	-33.97	PK	Ver
2*	1.922GHz	57.85	-17.02	40.83	88.20	-47.37	PK	Ver
3*	3.165GHz	53.69	-8.39	45.30	88.20	-42.90	PK	Ver
4*	4.649GHz	54.09	-5.87	48.22	74.00	-25.78	PK	Ver
5*	9.891GHz	55.74	-1.18	54.56	88.20	-33.64	PK	Ver
6*	17.981GHz	49.68	8.51	58.19	74.00	-15.81	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5260	
Note:	



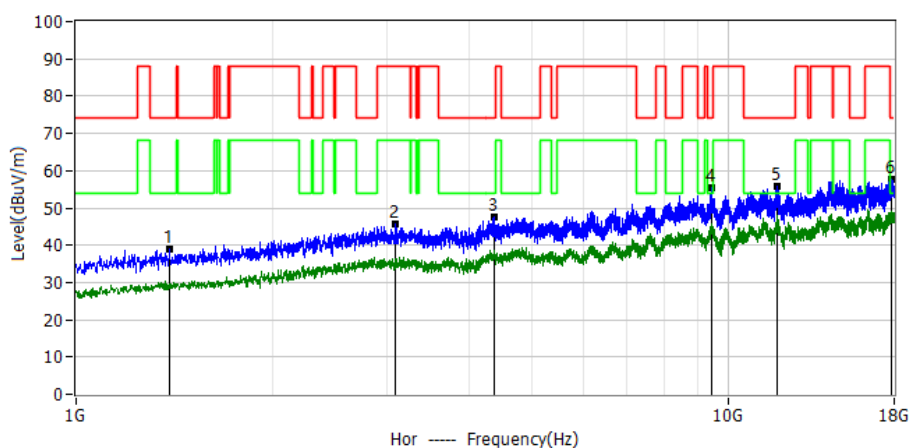
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.283GHz	60.47	-22.31	38.16	88.20	-50.04	PK	Hor
2*	1.691GHz	60.05	-19.31	40.74	74.00	-33.26	PK	Hor
3*	2.728GHz	55.10	-9.78	45.32	74.00	-28.68	PK	Hor
4*	4.787GHz	54.46	-5.98	48.48	74.00	-25.52	PK	Hor
5*	9.449GHz	56.28	-1.17	55.11	74.00	-18.89	PK	Hor
6*	14.368GHz	52.09	5.90	57.99	88.20	-30.21	PK	Hor



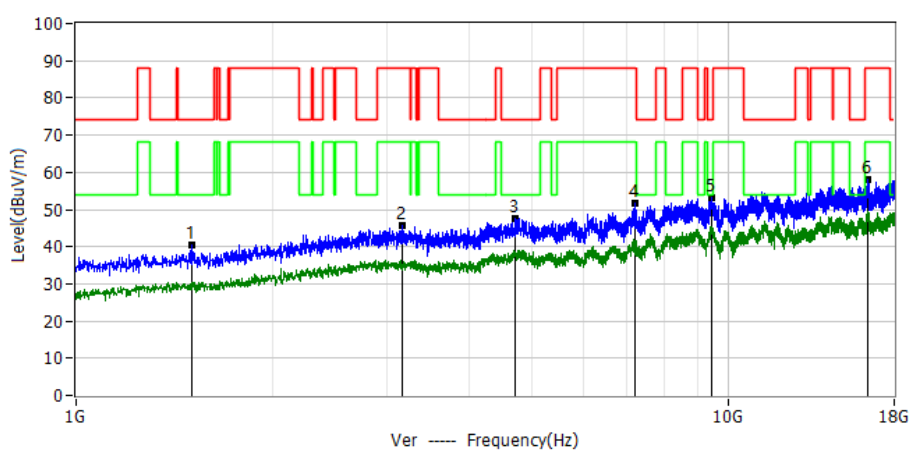
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.497GHz	61.17	-20.85	40.32	74.00	-33.68	PK	Ver
2*	2.660GHz	56.17	-10.14	46.03	88.20	-42.17	PK	Ver
3*	4.844GHz	53.94	-6.02	47.92	74.00	-26.08	PK	Ver
4*	6.143GHz	57.51	-7.26	50.25	88.20	-37.95	PK	Ver
5*	11.393GHz	54.14	1.86	56.00	74.00	-18.00	PK	Ver
6*	17.779GHz	50.03	8.37	58.40	74.00	-15.60	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5300	
Note:	



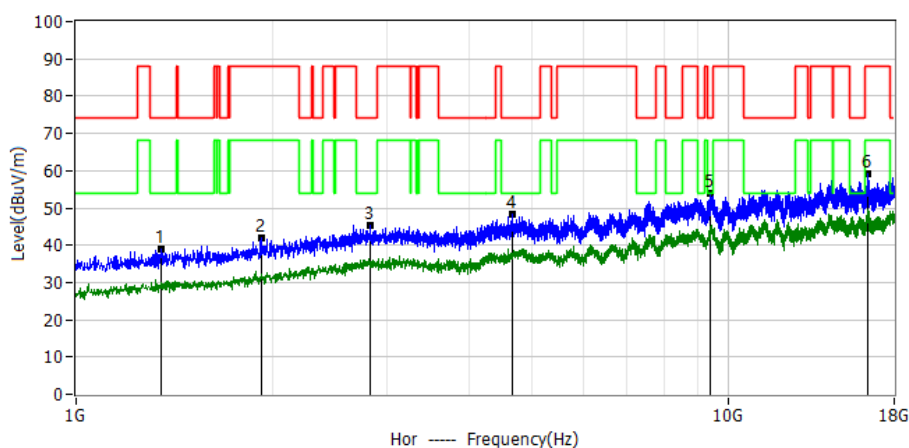
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.391GHz	60.29	-21.45	38.84	74.00	-35.16	PK	Hor
2*	3.089GHz	53.89	-8.37	45.52	88.20	-42.68	PK	Hor
3*	4.377GHz	53.89	-6.28	47.61	74.00	-26.39	PK	Hor
4*	9.428GHz	56.73	-1.17	55.56	74.00	-18.44	PK	Hor
5*	11.925GHz	53.59	2.18	55.77	74.00	-18.23	PK	Hor
6*	17.785GHz	49.13	8.37	57.50	74.00	-16.50	PK	Hor



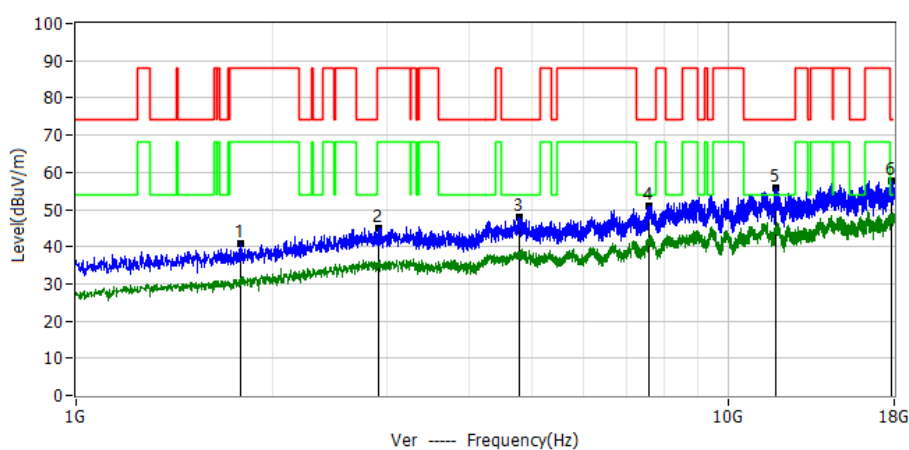
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.508GHz	61.32	-20.79	40.53	74.00	-33.47	PK	Ver
2*	3.172GHz	53.97	-8.40	45.57	88.20	-42.63	PK	Ver
3*	4.723GHz	53.60	-5.93	47.67	74.00	-26.33	PK	Ver
4*	7.186GHz	56.82	-5.17	51.65	88.20	-36.55	PK	Ver
5*	9.455GHz	54.52	-1.17	53.35	74.00	-20.65	PK	Ver
6*	16.370GHz	51.21	6.84	58.05	88.20	-30.15	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5320	
Note:	



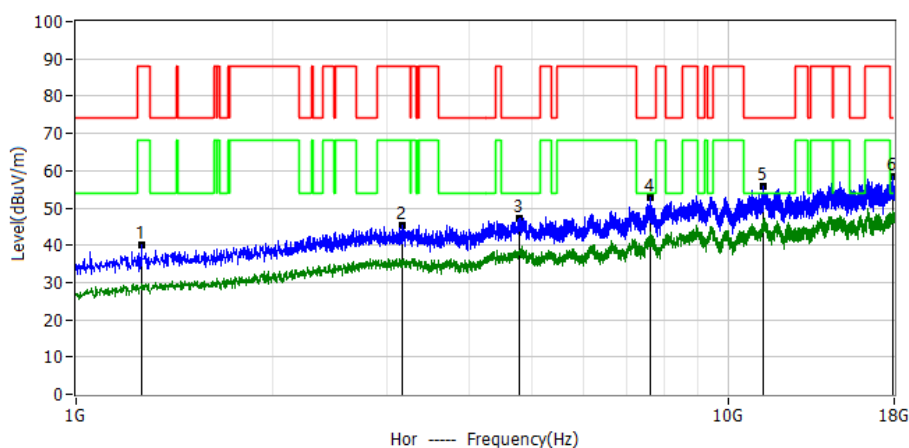
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.3485GHz	60.72	-21.79	38.93	74.00	-35.07	PK	Hor
2*	1.9222GHz	58.96	-17.02	41.94	88.20	-46.26	PK	Hor
3*	2.8317GHz	54.59	-9.23	45.36	74.00	-28.64	PK	Hor
4*	4.6592GHz	54.11	-5.88	48.23	74.00	-25.77	PK	Hor
5*	9.4150GHz	55.14	-1.17	53.97	74.00	-20.03	PK	Hor
6*	16.3786GHz	52.35	6.85	59.20	88.20	-29.00	PK	Hor



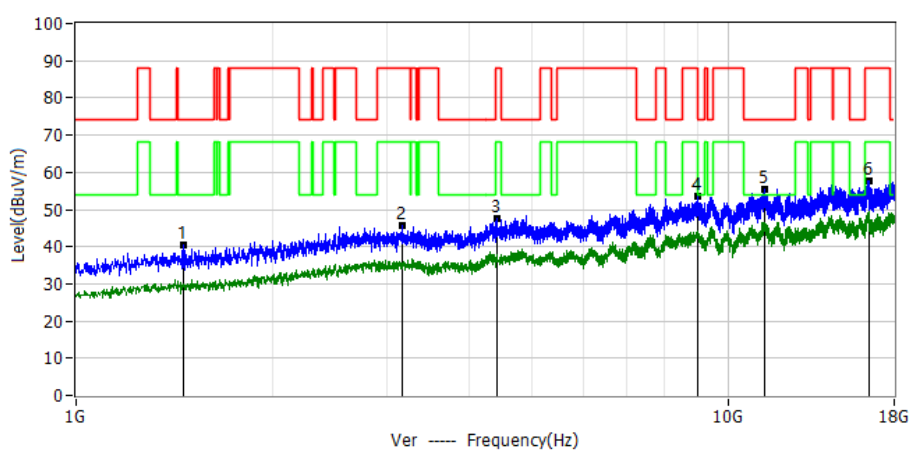
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.784GHz	59.30	-18.41	40.89	88.20	-47.31	PK	Ver
2*	2.910GHz	53.80	-8.81	44.99	88.20	-43.21	PK	Ver
3*	4.793GHz	53.86	-5.98	47.88	74.00	-26.12	PK	Ver
4*	7.577GHz	55.17	-4.25	50.92	74.00	-23.08	PK	Ver
5*	11.861GHz	53.69	2.14	55.83	74.00	-18.17	PK	Ver
6*	17.847GHz	49.32	8.41	57.73	74.00	-16.27	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5500	
Note:	



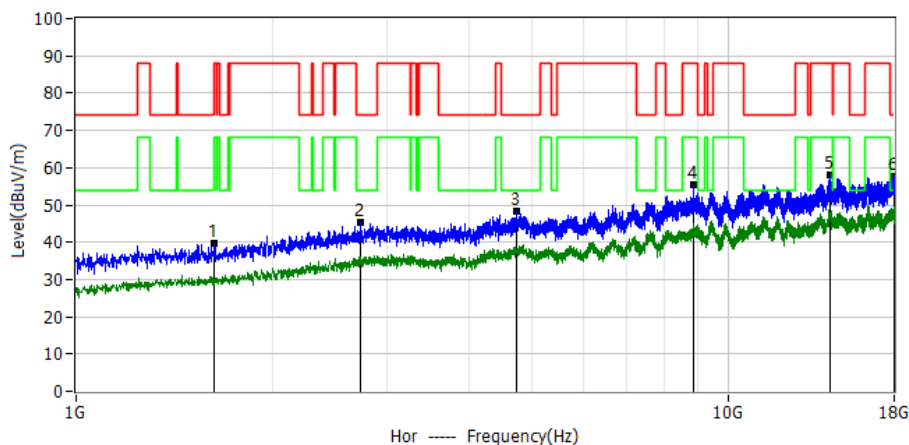
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.2614GHz	62.37	-22.48	39.89	88.20	-48.31	PK	Hor
2*	3.1611GHz	53.80	-8.39	45.41	88.20	-42.79	PK	Hor
3*	4.7931GHz	53.24	-5.98	47.26	74.00	-26.74	PK	Hor
4*	7.5981GHz	56.88	-4.24	52.64	74.00	-21.36	PK	Hor
5*	11.3551GHz	53.96	1.84	55.80	74.00	-18.20	PK	Hor
6*	17.9235GHz	49.88	8.47	58.35	74.00	-15.65	PK	Hor



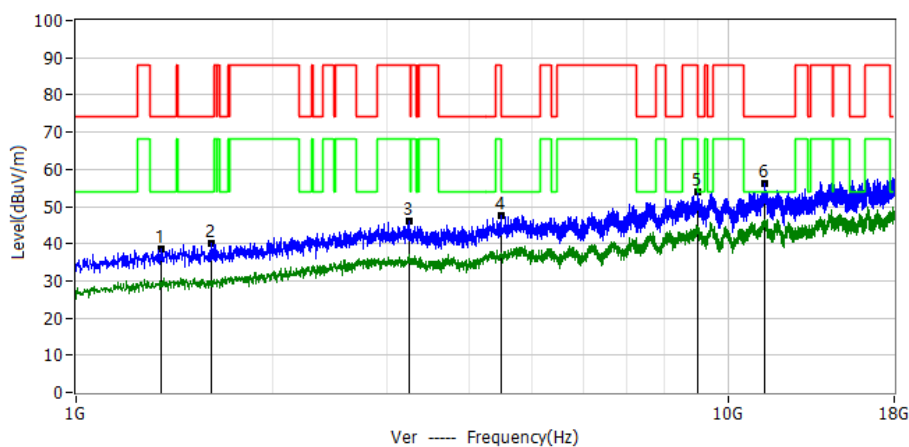
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.459GHz	61.40	-21.06	40.34	74.00	-33.66	PK	Ver
2*	3.161GHz	53.90	-8.39	45.51	88.20	-42.69	PK	Ver
3*	4.430GHz	53.73	-6.05	47.68	88.20	-40.52	PK	Ver
4*	8.990GHz	54.83	-1.20	53.63	88.20	-34.57	PK	Ver
5*	11.374GHz	53.46	1.85	55.31	74.00	-18.69	PK	Ver
6*	16.472GHz	50.82	7.00	57.82	88.20	-30.38	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5580	
Note:	



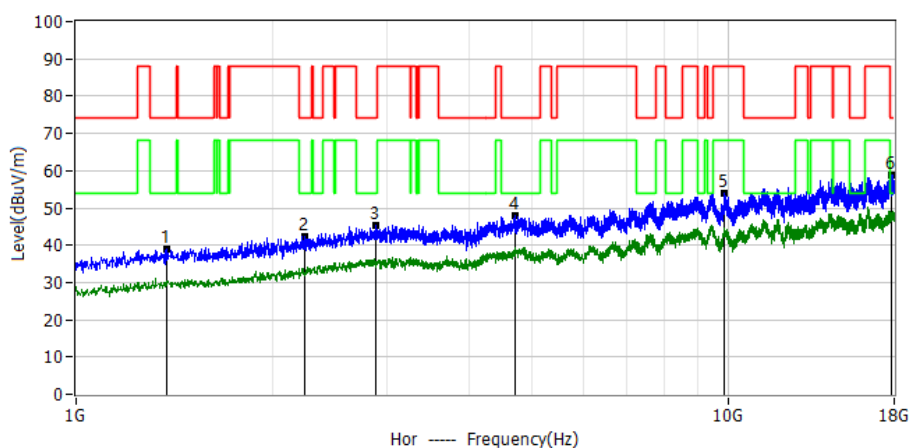
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.627GHz	59.53	-19.92	39.61	88.20	-48.59	PK	Hor
2*	2.732GHz	55.06	-9.76	45.30	74.00	-28.70	PK	Hor
3*	4.749GHz	54.15	-5.95	48.20	74.00	-25.80	PK	Hor
4*	8.869GHz	56.93	-1.54	55.39	88.20	-32.81	PK	Hor
5*	14.317GHz	51.99	5.90	57.89	88.20	-30.31	PK	Hor
6*	17.994GHz	49.02	8.52	57.54	74.00	-16.46	PK	Hor



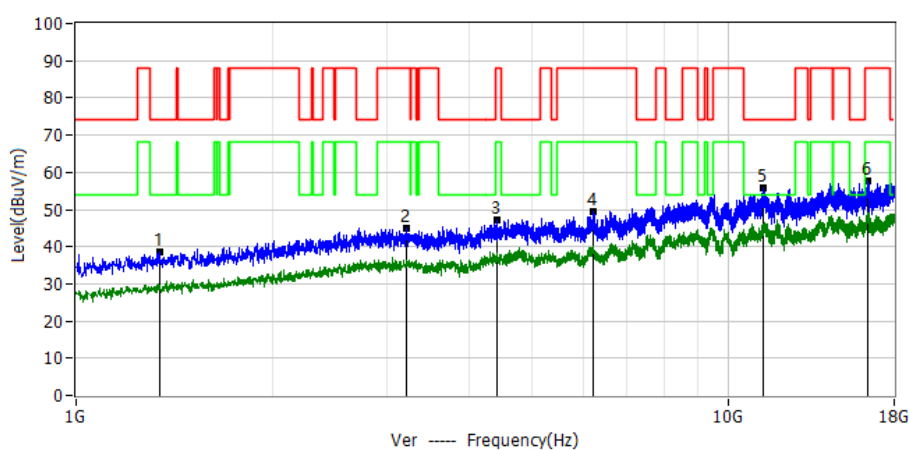
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.349GHz	60.46	-21.79	38.67	74.00	-35.33	PK	Ver
2*	1.610GHz	60.01	-20.08	39.93	74.00	-34.07	PK	Ver
3*	3.246GHz	54.31	-8.42	45.89	88.20	-42.31	PK	Ver
4*	4.498GHz	53.27	-5.76	47.51	88.20	-40.69	PK	Ver
5*	8.984GHz	55.04	-1.22	53.82	88.20	-34.38	PK	Ver
6*	11.379GHz	54.36	1.85	56.21	74.00	-17.79	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5700	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.374GHz	60.40	-21.59	38.81	74.00	-35.19	PK	Hor
2*	2.247GHz	56.11	-13.64	42.47	74.00	-31.53	PK	Hor
3*	2.876GHz	54.26	-8.99	45.27	74.00	-28.73	PK	Hor
4*	4.723GHz	53.82	-5.93	47.89	74.00	-26.11	PK	Hor
5*	9.885GHz	55.13	-1.18	53.95	88.20	-34.25	PK	Hor
6*	17.792GHz	50.44	8.37	58.81	74.00	-15.19	PK	Hor



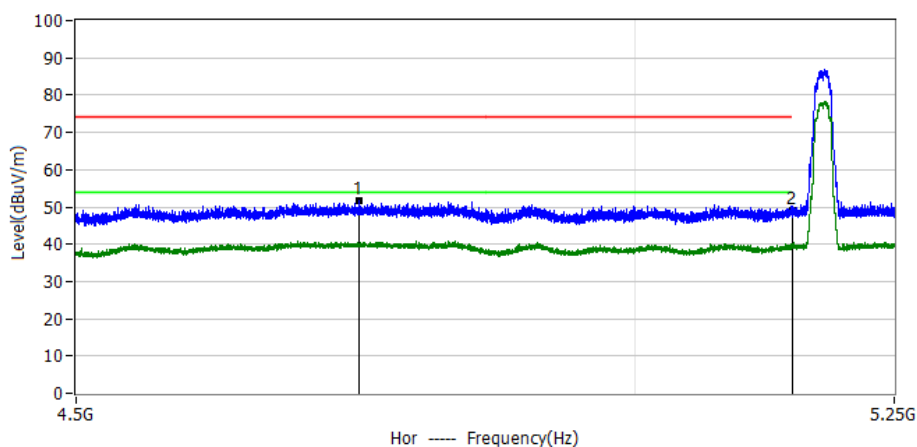
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.342GHz	60.46	-21.84	38.62	74.00	-35.38	PK	Ver
2*	3.212GHz	53.31	-8.41	44.90	88.20	-43.30	PK	Ver
3*	4.423GHz	53.31	-6.08	47.23	88.20	-40.97	PK	Ver
4*	6.219GHz	56.57	-7.11	49.46	88.20	-38.74	PK	Ver
5*	11.347GHz	54.07	1.83	55.90	74.00	-18.10	PK	Ver
6*	16.366GHz	50.90	6.83	57.73	88.20	-30.47	PK	Ver

Note: The 18-40GHz emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

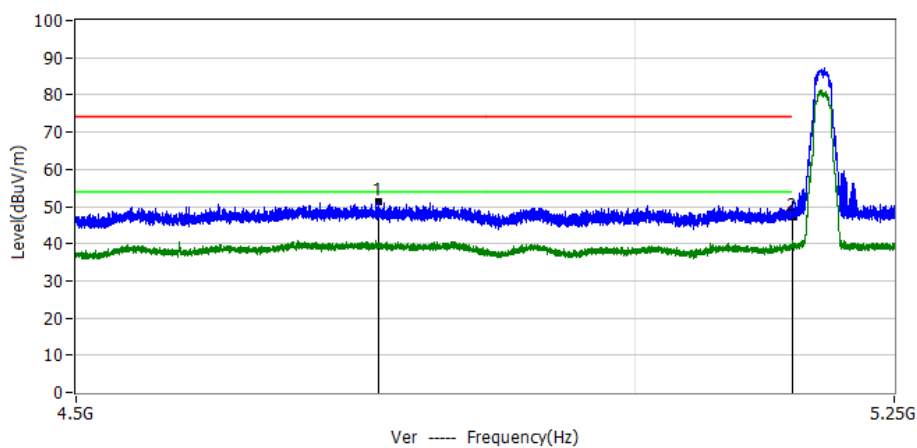


3.2.7 TEST RESULTS(Band edge Requirements)

Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5180	
Note:	



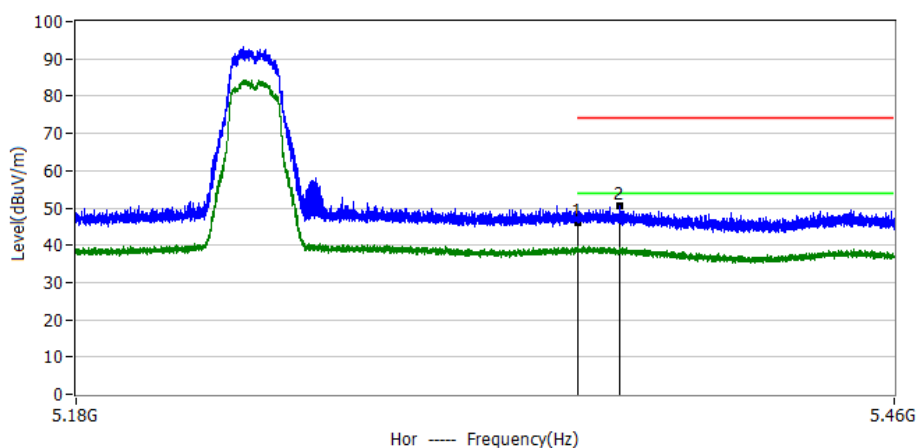
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.7469GHz	57.49	-5.95	51.54	74.00	-22.46	PK	Hor
2*	5.1500GHz	55.82	-6.62	49.20	74.00	-24.80	PK	Hor



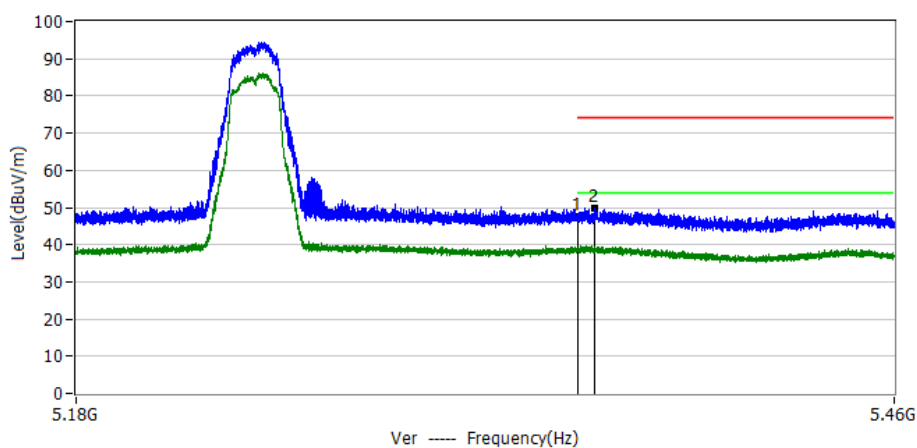
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.7636GHz	57.12	-5.96	51.16	74.00	-22.84	PK	Ver
2*	5.1500GHz	53.92	-6.62	47.30	74.00	-26.70	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5240	
Note:	



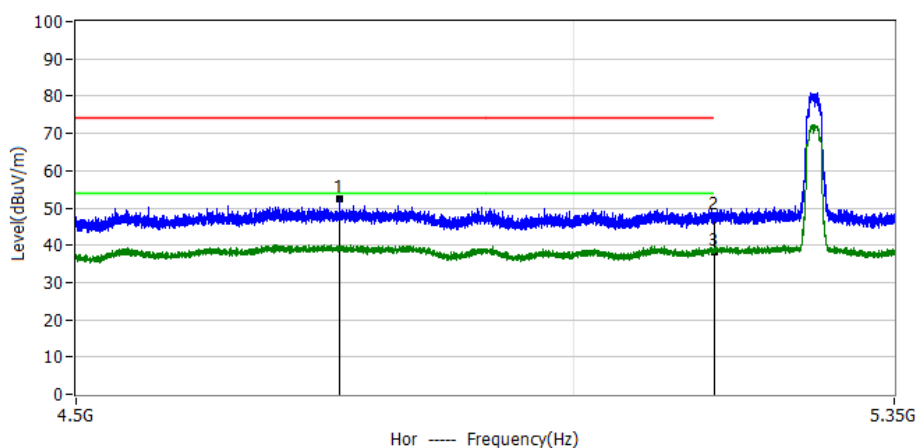
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3500GHz	53.46	-7.26	46.20	74.00	-27.80	PK	Hor
2*	5.3643GHz	57.73	-7.31	50.42	74.00	-23.58	PK	Hor



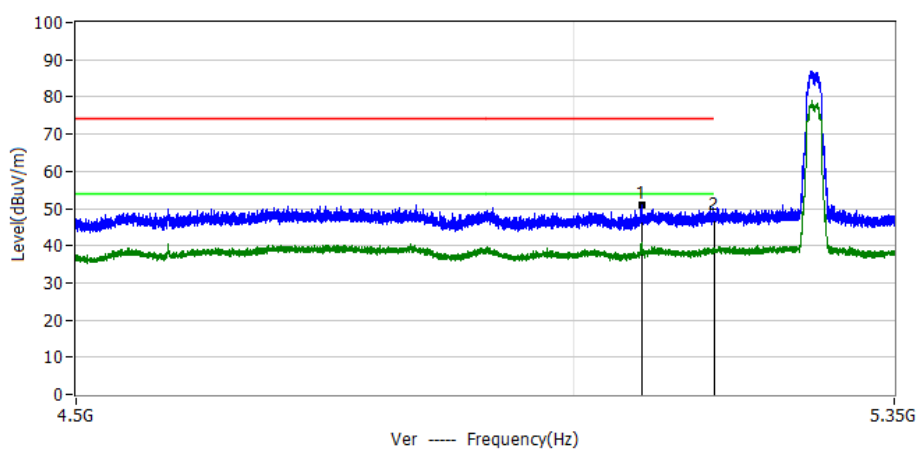
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3500GHz	54.86	-7.26	47.60	74.00	-26.40	PK	Ver
2*	5.3555GHz	56.93	-7.28	49.65	74.00	-24.35	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5260	
Note:	



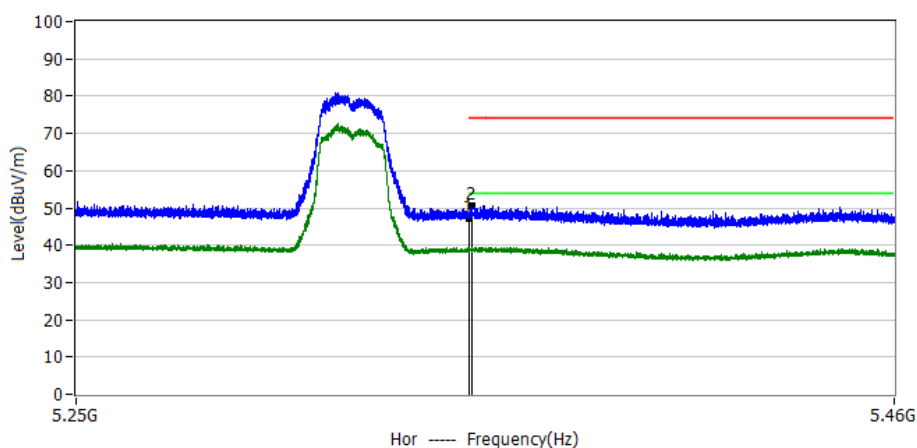
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.7572GHz	58.53	-5.95	52.58	74.00	-21.42	PK	Hor
2*	5.1500GHz	54.42	-6.62	47.80	74.00	-26.20	PK	Hor
3*	5.1500GHz	44.92	-6.62	38.30	54.00	-15.70	AV	Hor



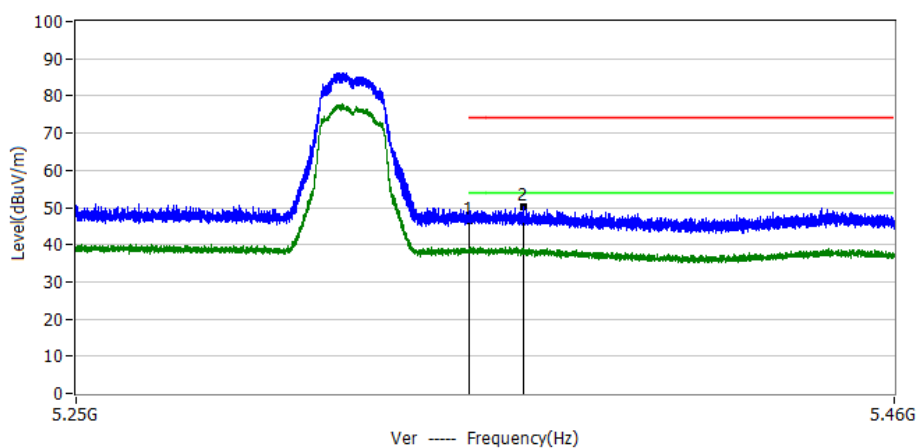
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.0714GHz	57.33	-6.37	50.96	74.00	-23.04	PK	Ver
2*	5.1500GHz	54.62	-6.62	48.00	74.00	-26.00	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5320	
Note:	



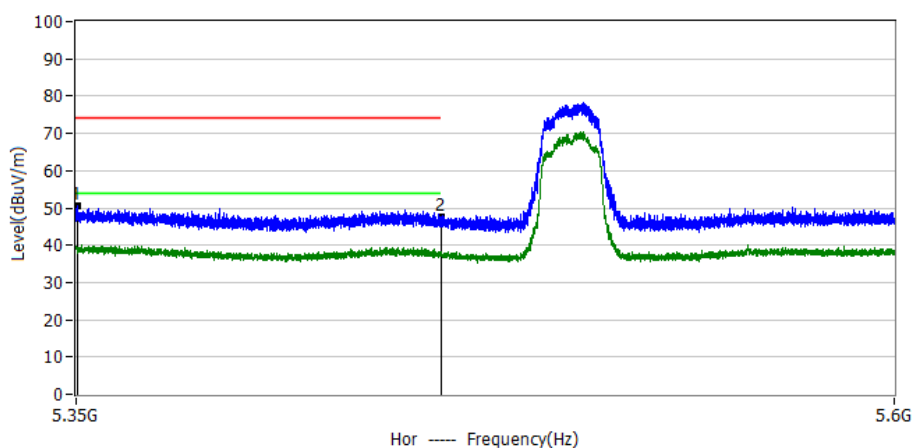
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3500GHz	54.46	-7.26	47.20	74.00	-26.80	PK	Hor
2*	5.3505GHz	57.98	-7.26	50.72	74.00	-23.28	PK	Hor



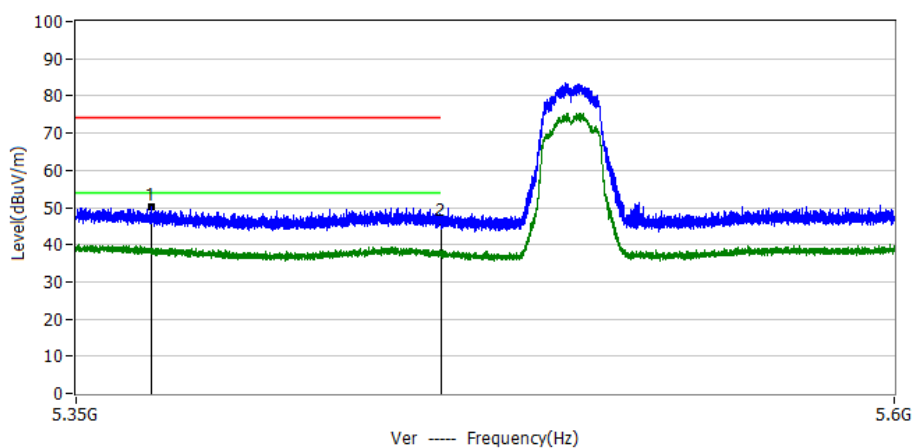
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3500GHz	53.76	-7.26	46.50	74.00	-27.50	PK	Ver
2*	5.3638GHz	57.41	-7.30	50.11	74.00	-23.89	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5500	
Note:	



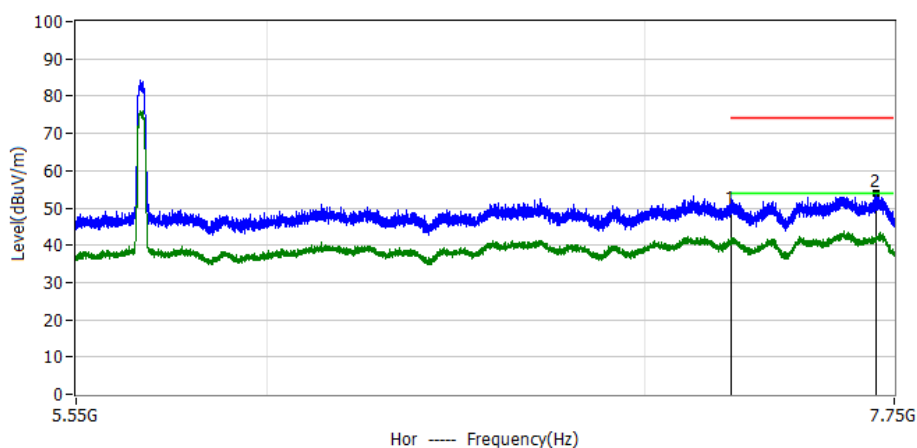
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3504GHz	57.99	-7.26	50.73	74.00	-23.27	PK	Hor
2*	5.4600GHz	55.31	-7.61	47.70	74.00	-26.30	PK	Hor



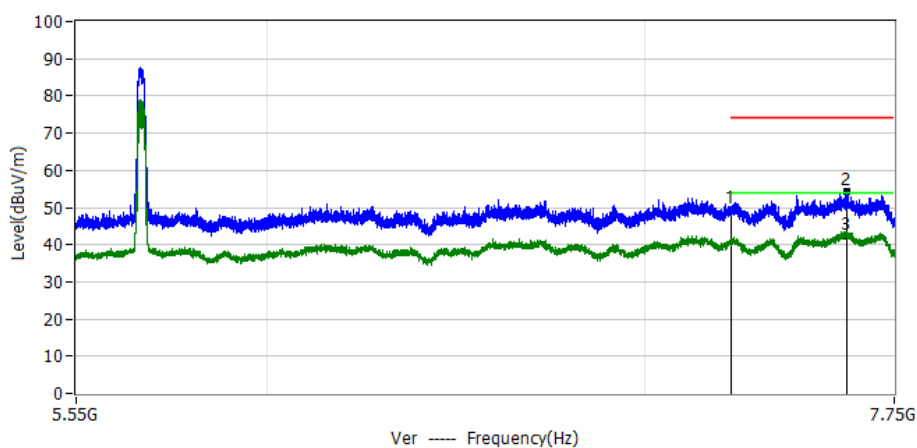
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5.3725GHz	57.49	-7.33	50.16	74.00	-23.84	PK	Ver
2*	5.4600GHz	53.51	-7.61	45.90	74.00	-28.10	PK	Ver



Project: LGT23E023	Test Engineer: Dylan.shi
EUT: DALEN Aladdin	Temperature: 27.8°C
M/N: X30S	Humidity: 57%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-05-21
Test Mode: 802.11a 5700	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	7.2500GHz	54.59	-4.99	49.60	74.00	-24.40	PK	Hor
2*	7.6928GHz	58.09	-4.18	53.91	74.00	-20.09	PK	Hor



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	7.2500GHz	54.29	-4.99	49.30	74.00	-24.70	PK	Ver
2*	7.6023GHz	58.37	-4.23	54.14	74.00	-19.86	PK	Ver
3*	7.6023GHz	46.53	-4.23	42.30	54.00	-11.70	AV	Ver



4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHz}$ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.



4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

For the measurement records, refer to the appendix I.



5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW $\geq$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

For the measurement records · refer to the appendix I.



5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth.

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.2.5 TEST RESULTS

For the measurement records, refer to the appendix I.



5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth.

5.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
 - a) Set RBW = 100 kHz.
 - b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Sweep = auto couple.
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.3.5 TEST RESULTS

For the measurement records , refer to the appendix I.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz, If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Peak Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or $11 \text{ dBm} + 10 \log (26 \text{ dB emission bandwidth})$	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

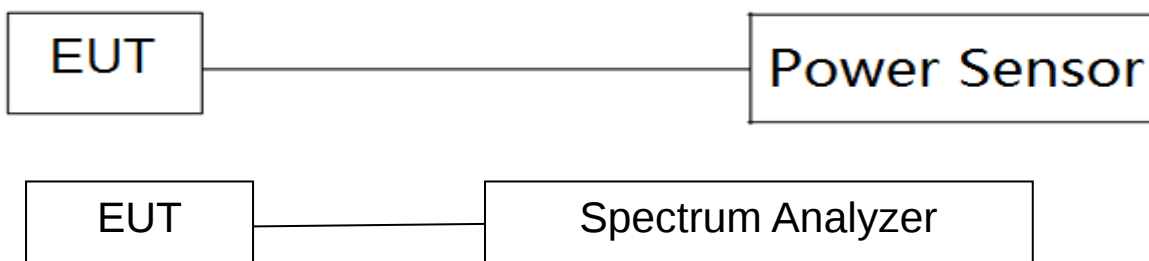
6.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

For the measurement records · refer to the appendix I.



7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

Part 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.

8.2 EUT ANTENNA

The EUT antenna is FPC Antenna. It comply with the standard requirement.



APPENDIX I:TEST RESULTS

Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	Ant1	93.51	0.29	0.72
NVNT	a	5200	Ant1	93.44	0.29	0.72
NVNT	a	5240	Ant1	93.51	0.29	0.72
NVNT	a	5260	Ant1	93.51	0.29	0.72
NVNT	a	5300	Ant1	93.51	0.29	0.72
NVNT	a	5320	Ant1	93.51	0.29	0.72
NVNT	a	5500	Ant1	93.51	0.29	0.72
NVNT	a	5580	Ant1	93.44	0.29	0.72
NVNT	a	5700	Ant1	93.51	0.29	0.72
NVNT	a	5180	Ant2	93.44	0.29	0.72
NVNT	a	5200	Ant2	93.44	0.29	0.72
NVNT	a	5240	Ant2	93.44	0.29	0.72
NVNT	a	5260	Ant2	93.51	0.29	0.72
NVNT	a	5300	Ant2	93.51	0.29	0.72
NVNT	a	5320	Ant2	93.44	0.29	0.72
NVNT	a	5500	Ant2	93.51	0.29	0.72
NVNT	a	5580	Ant2	93.44	0.29	0.72
NVNT	a	5700	Ant2	93.44	0.29	0.72
NVNT	n20	5180	Ant1	63.12	2	6.02
NVNT	n20	5200	Ant1	63.12	2	6.02
NVNT	n20	5240	Ant1	63.12	2	6.02
NVNT	n20	5260	Ant1	63.12	2	6.02
NVNT	n20	5300	Ant1	63	2.01	6.02
NVNT	n20	5320	Ant1	63.12	2	6.02
NVNT	n20	5500	Ant1	63.12	2	6.02
NVNT	n20	5580	Ant1	63.05	2	6.04
NVNT	n20	5700	Ant1	63.05	2	6.04
NVNT	n20	5180	Ant2	62.74	2.02	6.06
NVNT	n20	5200	Ant2	62.74	2.02	6.06
NVNT	n20	5240	Ant2	62.74	2.02	6.06
NVNT	n20	5260	Ant2	62.74	2.02	6.06
NVNT	n20	5300	Ant2	62.74	2.02	6.06
NVNT	n20	5320	Ant2	62.74	2.02	6.06
NVNT	n20	5500	Ant2	62.74	2.02	6.06
NVNT	n20	5580	Ant2	62.74	2.02	6.06
NVNT	n20	5700	Ant2	62.74	2.02	6.06
NVNT	n20	5180	Sum	62.74	2.02	6.06
NVNT	n20	5200	Sum	62.74	2.02	6.06
NVNT	n20	5240	Sum	62.86	2.02	6.06
NVNT	n20	5260	Sum	62.93	2.01	6.04
NVNT	n20	5300	Sum	62.93	2.01	6.04
NVNT	n20	5320	Sum	62.88	2.01	6.02
NVNT	n20	5500	Sum	62.93	2.01	6.04
NVNT	n20	5580	Sum	62.81	2.02	6.04
NVNT	n20	5700	Sum	63	2.01	6.02
NVNT	n40	5190	Ant1	51.51	2.88	9.76
NVNT	n40	5230	Ant1	51.51	2.88	9.76
NVNT	n40	5270	Ant1	51.51	2.88	9.76
NVNT	n40	5310	Ant1	51.76	2.86	9.71



NVNT	n40	5510	Ant1	51.51	2.88	9.76
NVNT	n40	5550	Ant1	51.76	2.86	9.71
NVNT	n40	5670	Ant1	51.76	2.86	9.71
NVNT	n40	5190	Ant2	51.51	2.88	9.76
NVNT	n40	5230	Ant2	51.51	2.88	9.76
NVNT	n40	5270	Ant2	51.63	2.87	9.71
NVNT	n40	5310	Ant2	51.63	2.87	9.71
NVNT	n40	5510	Ant2	51.51	2.88	9.76
NVNT	n40	5550	Ant2	51.51	2.88	9.76
NVNT	n40	5670	Ant2	51.51	2.88	9.76
NVNT	n40	5190	Sum	51.63	2.87	9.71
NVNT	n40	5230	Sum	51.76	2.86	9.71
NVNT	n40	5270	Sum	51.76	2.86	9.71
NVNT	n40	5310	Sum	51.76	2.86	9.71
NVNT	n40	5510	Sum	51.51	2.88	9.76
NVNT	n40	5550	Sum	51.64	2.87	9.76
NVNT	n40	5670	Sum	51.63	2.87	9.71
NVNT	ac80	5210	Ant1	40.98	3.87	14.93
NVNT	ac80	5290	Ant1	40.98	3.87	14.93
NVNT	ac80	5530	Ant1	40.98	3.87	14.93
NVNT	ac80	5610	Ant1	40.98	3.87	14.93
NVNT	ac80	5210	Ant2	40.98	3.87	14.93
NVNT	ac80	5290	Ant2	41.1	3.86	14.93
NVNT	ac80	5530	Ant2	40.8	3.89	15.04
NVNT	ac80	5610	Ant2	40.8	3.89	15.04
NVNT	ac80	5210	Sum	40.98	3.87	14.93
NVNT	ac80	5290	Sum	40.98	3.87	14.93
NVNT	ac80	5530	Sum	40.98	3.87	14.93
NVNT	ac80	5610	Sum	41.1	3.86	14.93

