

TEST REPORT

Application No.: KSCR2601000248AT
FCC ID: M82-UTK3000RC
Applicant: Advantech Co.,Ltd.
Address of Applicant: No.1,Alley 20,Lane 26,Rueiguang Road, NeiHu District, Taipei 114, Taiwan, China
Manufacturer: Advantech Co.,Ltd.
Address of Manufacturer: No.1,Alley 20,Lane 26,Rueiguang Road, NeiHu District, Taipei 114, Taiwan, China
Factory: 1.Advantech Technology(CHINA) Co.,Ltd
2.BEIJING YAN HUA XING YE ELECTRONIC SCIENCE & TECHNOLOGY CO.,LTD
3.Advantech Corp.
4.ADVANTECH EUROPE B.V.
5.ADVANTECH CO.,LTD.
Address of Factory: 1.600 Han-Pu Rd Yushan Town Kunshan Jiangsu 215316 CHINA
2.7,6Th St, Shang Di Zone, Haidian District, Beijing 100085, China
3. 380 Fairview Way, Milpitas CA 95035. USA
4. Science Park Eindhoven 5708 Ekkersrijt 5692 ER Son, The Netherlands
5. No.27-3, Wende Rd.,Guishan Dist.,Taoyuan City 333, Taiwan
Equipment Under Test (EUT):
EUT Name: Self-sevice terminal
Model No.: UTK-3000;UTK-3XXXXXXXXXXXXXXXXX;
UTK3XXXXXXXXXXXXXXXXX
(X=0-9, A-Z, a-z, "." or blank, indicating different sales regions, the change of X does not affect the safety performance and EMC performance of the product.)
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
♣
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2026-01-27
Date of Test: 2026-05-10 to 2026-05-30
Date of Issue: 2026-08-12

Test Result:
Pass*

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

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



Revision Record			
Version	Description	Date	Remark
00	Original	2026-08-12	/

Authorized for issue by:			
Tested By		Eric Liu	
		Eric_Liu/Project Engineer	
Approved By		Terry Hou	
		Terry Hou /Reviewer	

2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2020+Cor 1-2023 Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10-2020+Cor 1-2023 Section 6.10.5 & 7.8.8	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10-2020+Cor 1-2023 Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10-2020+Cor 1-2023 Section 6.6 & 7.8.8	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Model No.: UTK-3000;UTK-3XXXXXXXXXXXXXXXXXX;
 UTK3XXXXXXXXXXXXXXXXXX
 (X=0-9, A-Z, a-z, "." or blank, indicating different sales regions,
 the change of X does not affect the safety performance and
 EMC performance of the product.)

Only the model UTK-3000 was tested.

Note1: There are series models mentioned in this report, and they are identical in electrical and electronic characters. Only the model UTK-3000 was tested since their differences were the model number and whether there is a camera and LED do not affect the RF performance.

Note2: This host product using a certified module (FCC ID: 2AATL-6252C-PUB). The host integrator declares that they have followed the integration instructions provided by the module manufacturer and ensures that the end product complies with the FCC requirements by a technical evaluation to include the FCC Rules and KDB Publication 996369. In this report, the testing is performed with the host product configured in typical operational modes to check the spurious emissions for compliance with all the applicable rules, other test data please refer to original module test report No.

A2208103-C01-R07.

Note3: Conducted output power and tested in agreement with the original project, so it is a direct reference to the original project data. This report evaluates Conducted Emissions at AC Power Line (150kHz-30MHz), Radiated Emissions which fall in the restricted bands and Radiated Spurious Emissions, other test data please refer to original project data.

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4 General Information

4.1 Details of E.U.T.

Test Voltage:	Pre-test AC 120V/50-60Hz&AC 240V/50-60Hz then choose the AC 120V/60Hz as worst case
Power supply:	Host Adapter: FSP120-AHAN3 Input: 100-240V~ 50/60Hz 2.0A Output: 12.0V 10.0A 120.0W Printer Adapter: AP152G-240200 Input: 100-240V~ 50/60Hz 2.0A Max Output: 24.0V 2.0A 48.0W
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	Dipole Antenna
Antenna Gain:	2.28dBi (Provided by the manufacturer)

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	Conduction emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
5	RF conducted power	$\pm 0.75\text{dB}$
6	RF power density	$\pm 2.84\text{dB}$
7	Conducted Spurious emissions	$\pm 0.75\text{dB}$
8	RF Radiated power	$\pm 1.56\text{dB}$ (9KHz-30MHz)
		$\pm 4.80\text{dB}$ (30MHz-1GHz)
		$\pm 4.80\text{dB}$ (1GHz-18GHz)
		$\pm 4.80\text{dB}$ (18GHz-40GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1\%$
12	Time	$\pm 3\%$
Remark: The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		

4.4 Test Location

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Test Lab:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu)
Pilot Free Trade Zone

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA).

• FCC (Designation Number: CN1172)

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No:1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

Test Lab:

• A2LA (Certificate No. 6336.01)

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA).

• FCC (Designation Number: CN1312)

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized as an accredited testing laboratory. Test Firm Registration Number: 717327

• ISED (CAB Identifier: CN0120)

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 27594



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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	2026/1/14	2027/1/13
2	LISN	R&S	ENV216	SUWI-01-19-03	2026/4/22	2027/4/21
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	2026/4/22	2027/4/21
4	Test Software	Tonscend	JS32-CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
5	Test Cable	Tonscend	NA	SUWI-01-03-04	2026/4/22	2027/4/21
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2023/6/3	2026/6/2
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2026/1/14	2027/1/13
3	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	2025/11/21	2026/11/20
4	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2026/1/14	2027/1/13
5	Signal Generator	ROHDE&SCHWARZ	SMW100A	SUWI-01-18-01	2026/1/14	2027/1/13
6	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	2025/9/10	2027/9/9
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2025/5/7	2027/5/6
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2025/5/7	2027/5/6
9	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2025/5/7	2027/5/6
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2026/1/14	2027/1/13
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2026/1/14	2027/1/13
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2026/1/14	2027/1/13
13	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	2025/11/21	2026/11/20
14	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2025/8/25	2026/8/24
15	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	2025/8/26	2026/8/25
16	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	2025/11/21	2026/11/20
17	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	2026/1/14	2027/1/13
18	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2026/1/14	2027/1/13
19	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2026/2/11	2027/2/10
20	Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-06	NCR	NCR
21	RF Control unit	Tonscend	JS0806-1	SUWI-02-20-01	NCR	NCR
22	RF Cables	Tonscend	NA	SUWI-01-03-02	2026/1/15	2027/1/14

6 Radio Spectrum Matter Test Results

6.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10-2020+Cor 1-2023 Section 6.2

Measurement Distance: 3M

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz		

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C

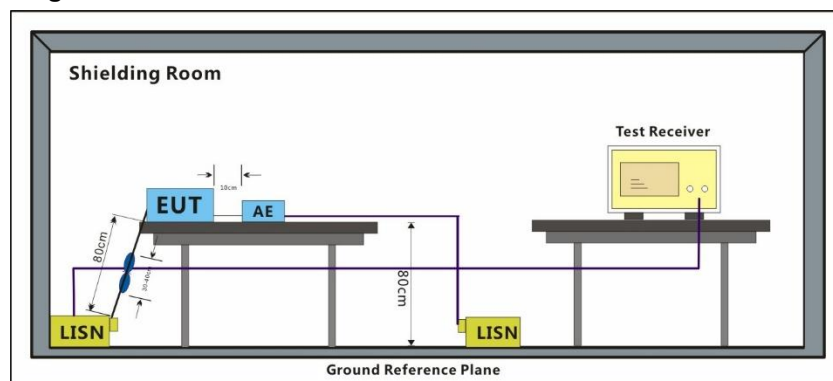
Humidity: 50.2 % RH

Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, Pi/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

6.1.3 Test Setup Diagram



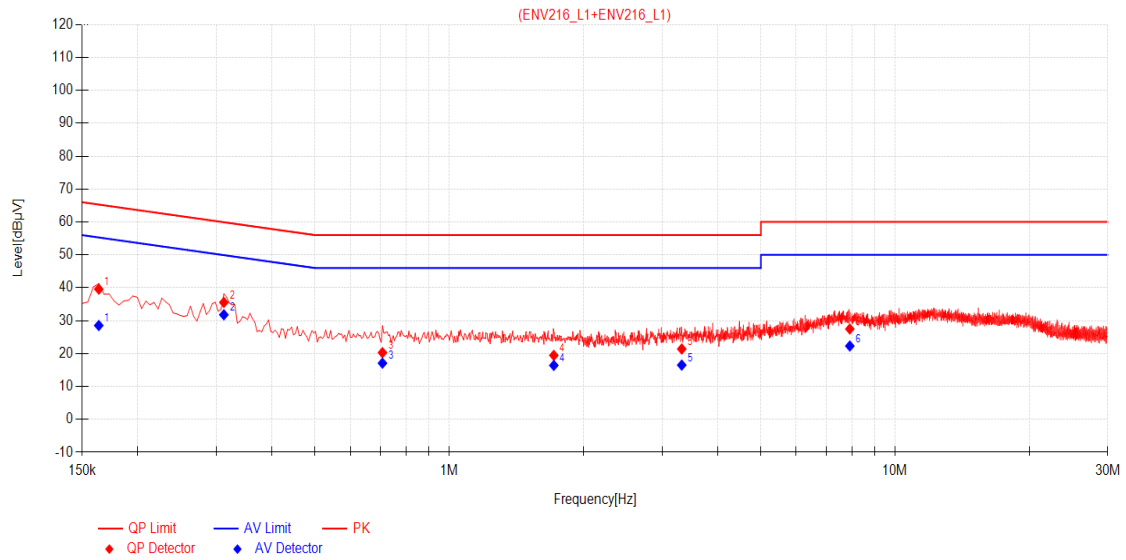
6.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



Test Mode: 01; Line: Live line



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBuV]	QP Value [dBuV]	QP Limit [dBuV]	QP Margin [dB]	AV Reading [dBuV]	AV Value [dBuV]	AV Limit [dBuV]	AV Margin [dB]	Verdict
1	0.1635	9.95	29.64	39.59	65.28	25.69	18.58	28.53	55.28	26.75	PASS
2	0.3120	9.97	25.59	35.56	59.92	24.36	21.82	31.79	49.92	18.13	PASS
3	0.7080	9.94	10.35	20.29	56.00	35.71	7.15	17.09	46.00	28.91	PASS
4	1.7160	9.92	9.54	19.46	56.00	36.54	6.49	16.41	46.00	29.59	PASS
5	3.3225	10.39	11.02	21.41	56.00	34.59	6.12	16.51	46.00	29.49	PASS
6	7.9170	10.35	17.13	27.48	60.00	32.52	11.95	22.30	50.00	27.70	PASS

6.2 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10-2020+Cor 1-2023 Section 6.10.5 & 7.8.8

Measurement Distance: 3M

Limit:

Frequency(MHz)	Field strength(microvolts/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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C

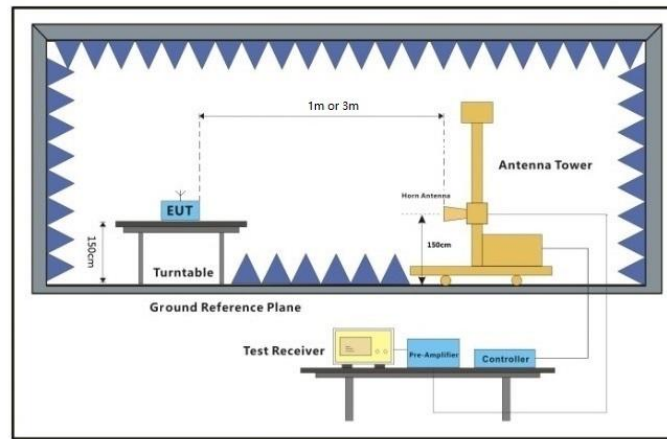
Humidity: 50.2 % RH

Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, Pi/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

6.2.3 Test Setup Diagram



Above 1GHz

6.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

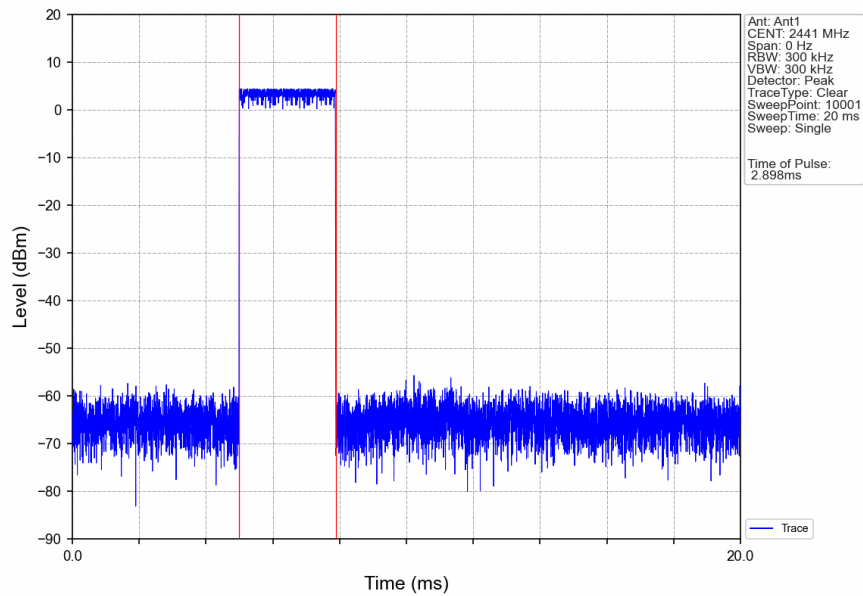
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.

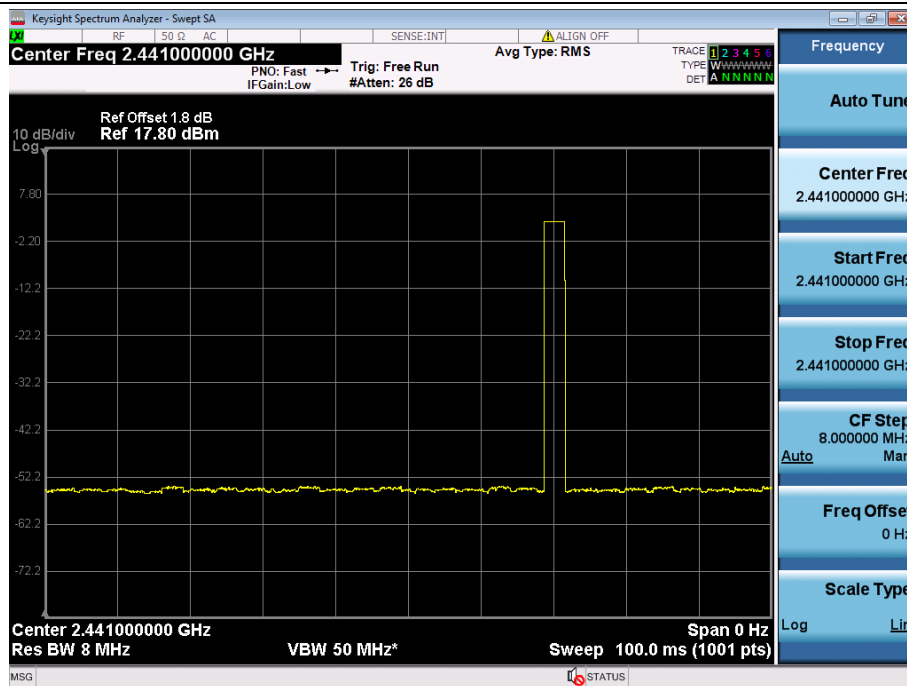
Remark 4: For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

Duty Cycle Plots

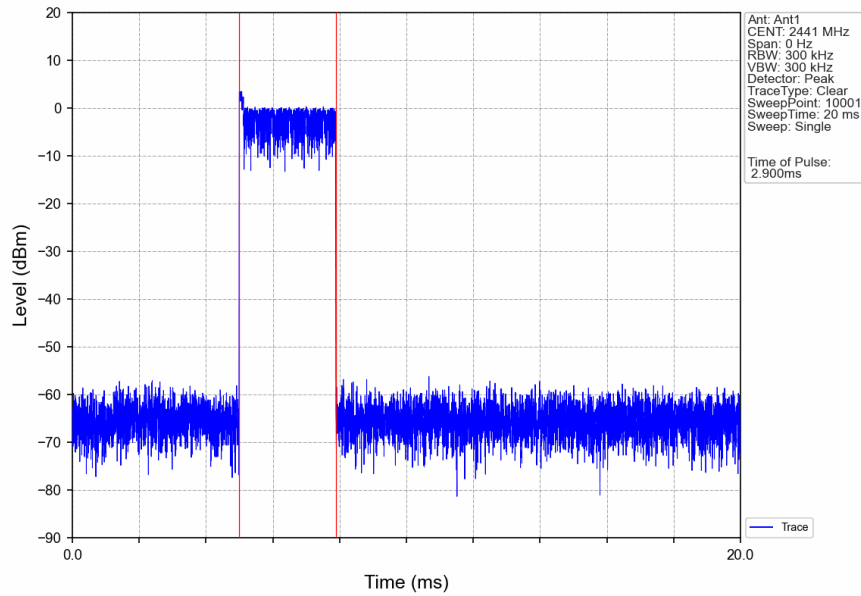
DH5 on time(One Pules)Plot on channel 39



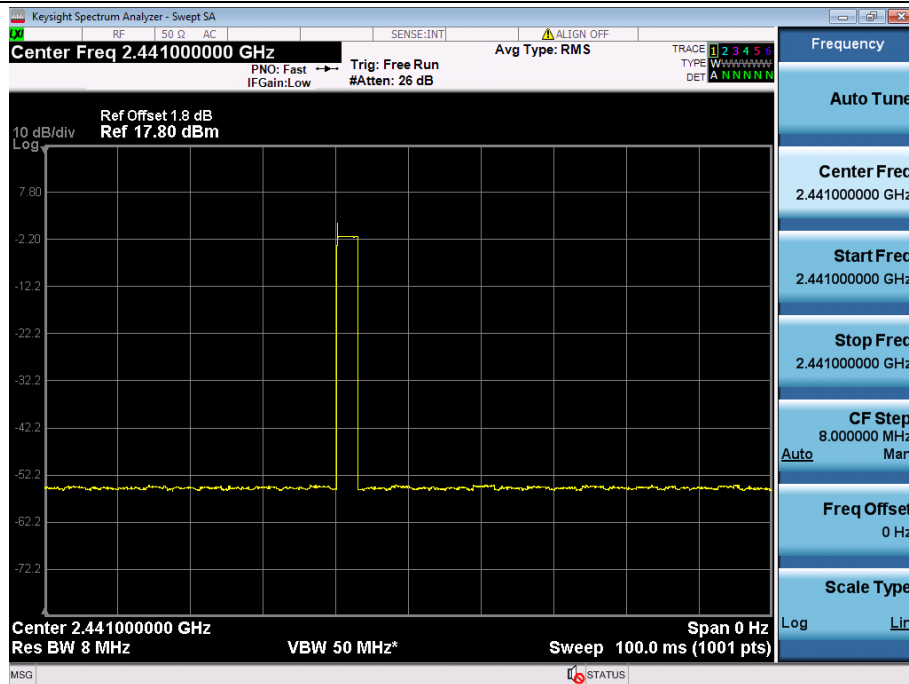
DH5 on time(Count Pulses)Plot on channel 39



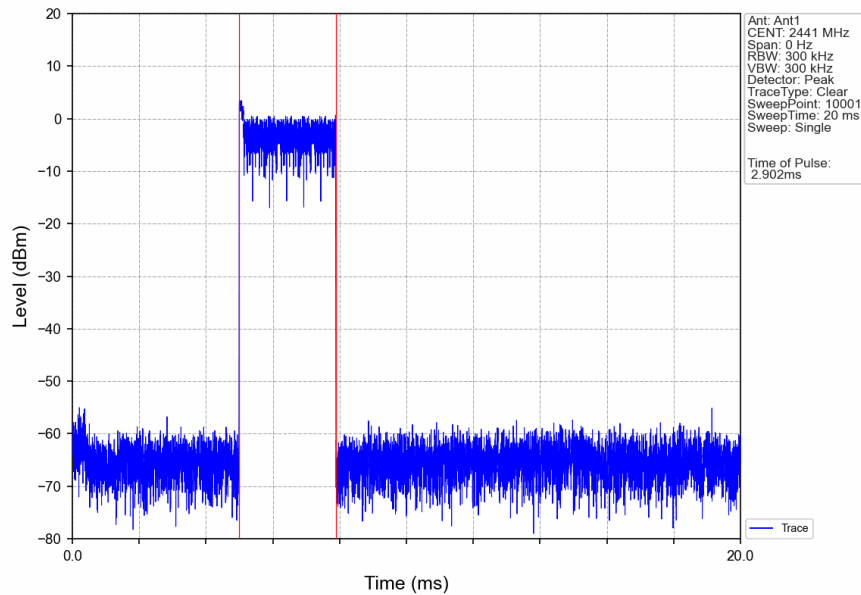
2DH5 on time(One Pules)Plot on channel 39



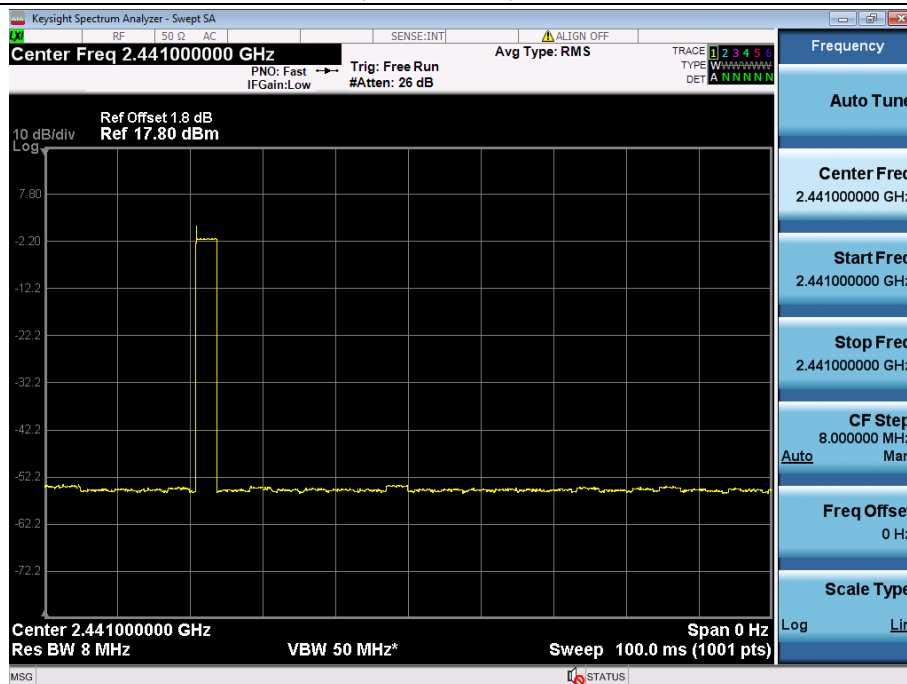
2DH5 on time(Count Pulses)Plot on channel 39



3DH5 on time(One Pules)Plot on channel 39



3DH5 on time(Count Pulses)Plot on channel 39



The process and drawings of RSE-AVG

Ant1							
Test Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.016	0.932	≥ 0.957	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.000	1.285	≥ 0.889	Pass
8DPSK	SISO	HOPP	3DH5	1.000	1.306	≥ 0.881	Pass

Note:

Channel separation correction

DH5: Channel Separation ≥ 1 MHz, Channel separation correction=1

2DH5: Channel Separation ≥ 1 MHz, Channel separation correction=1

3DH5: Channel Separation ≥ 1 MHz, Channel separation correction=1

Overlapping channel correction

DH5: Overlapping channel correction = 0

2DH5: Overlapping channel correction = 1

3DH5: Overlapping channel correction = 1

Test mode	Dwell time per 100 ms	Channel separation correction	Overlapping channel correction	Maximum dwell time
DH5	$1 \times 2.898 = 2.898$	1	0	2.898
2DH5	$1 \times 2.900 = 2.900$	1	1	5.8
3DH5	$1 \times 2.902 = 2.902$	1	1	5.804

Note: Maximum dwell time per 1MHz= Dwell time per 100 ms per Channel*(Channel separation correction+ Overlapping channel correction)

Test Mode	Factor
DH5	-30.76
2DH5	-24.73
3DH5	-24.73

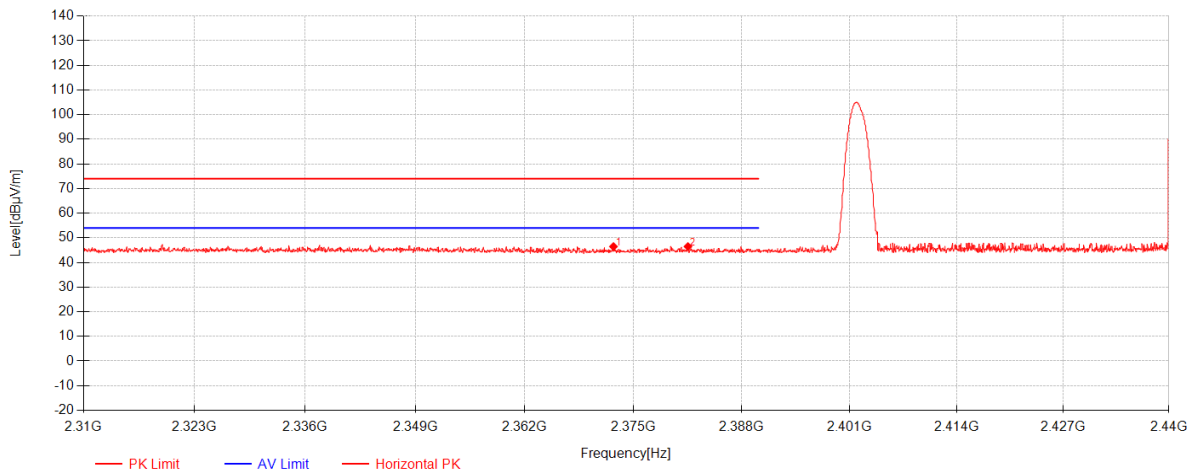
Factor=20*log(Maximum dwell time in 100 ms/100)



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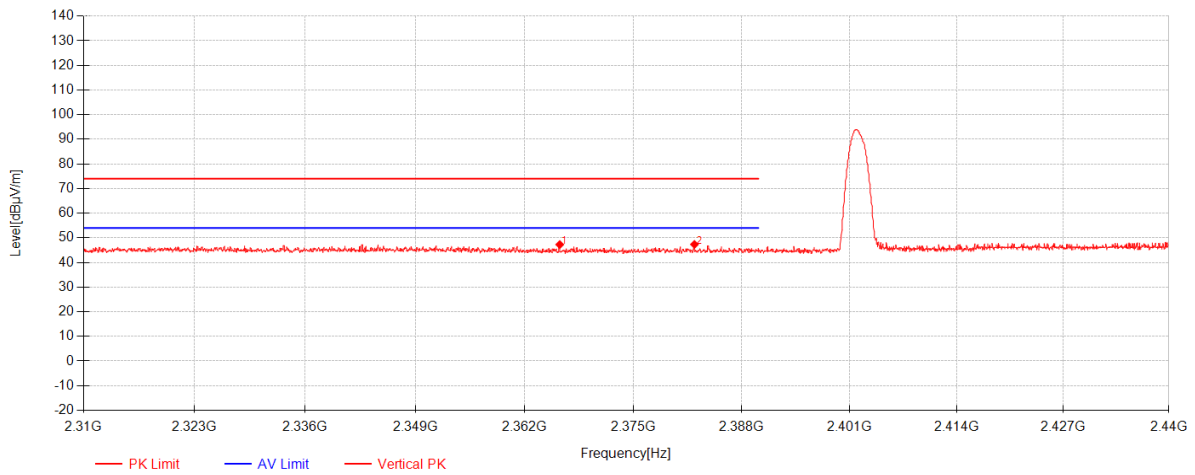
BT_DH5_TX_CH_00_Horizontal_Peak



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2372.5942	42.99	26.97	-23.49	46.47	74.00	27.53	Horizontal
-	-	-	-	-	21.74	54.00	32.26	-
2	2381.5238	42.99	26.99	-23.51	46.47	74.00	27.53	Horizontal
-	-	-	-	-	21.74	54.00	32.26	-

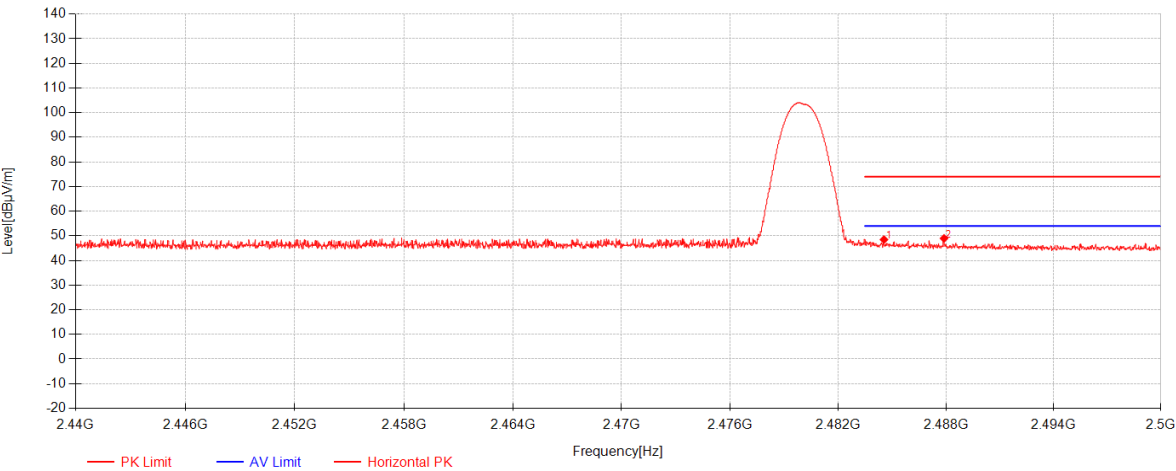


BT_DH5_TX_CH_00_Vertical_Peak



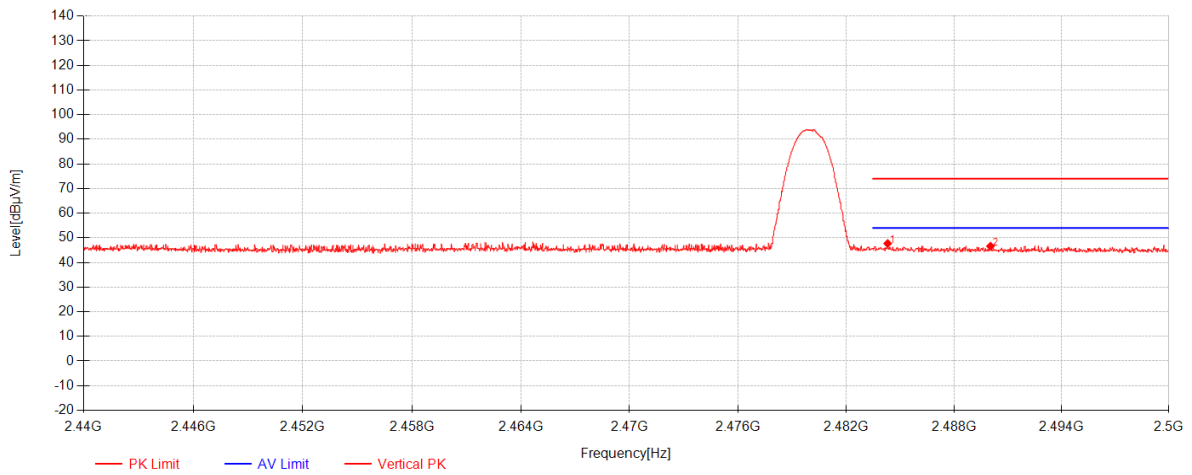
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2366.1787	43.80	26.96	-23.49	47.27	74.00	26.73	Vertical
-	-	-	-	-	22.54	54.00	31.46	-
2	2382.3041	43.84	26.99	-23.51	47.32	74.00	26.68	Vertical
-	-	-	-	-	22.59	54.00	31.41	-

BT_DH5_TX_CH_78_Horizontal_Peak



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.5549	44.48	27.17	-23.17	48.48	74.00	25.52	Horizontal
-	-	-	-	-	23.75	54.00	30.25	-
2	2487.896	44.94	27.18	-23.16	48.96	74.00	25.04	Horizontal
-	-	-	-	-	24.23	54.00	29.77	-

BT_DH5_TX_CH_78_Vertical_Peak



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.3148	43.70	27.17	-23.18	47.70	74.00	26.30	Vertical
-	-	-	-	-	22.97	54.00	31.03	-
2	2490.0367	42.59	27.18	-23.15	46.62	74.00	27.38	Vertical
-	-	-	-	-	21.89	54.00	32.11	-

6.3 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10-2020+Cor 1-2023 Section 6.4,6.5

Measurement Distance: 3M

Limit:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength (dBμV/m@3m)
0.009-0.490	2400/F(kHz)	300	128.5 to 93.8
0.490-1.705	24000/F(kHz)	30	73.8 to 62.9
1.705-30.0	30	30	69.60
30-88	100	3	40.0
88-216	150	3	43.5
216-960	200	3	46.0
960-1000	500	3	54.0

Note : The above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C

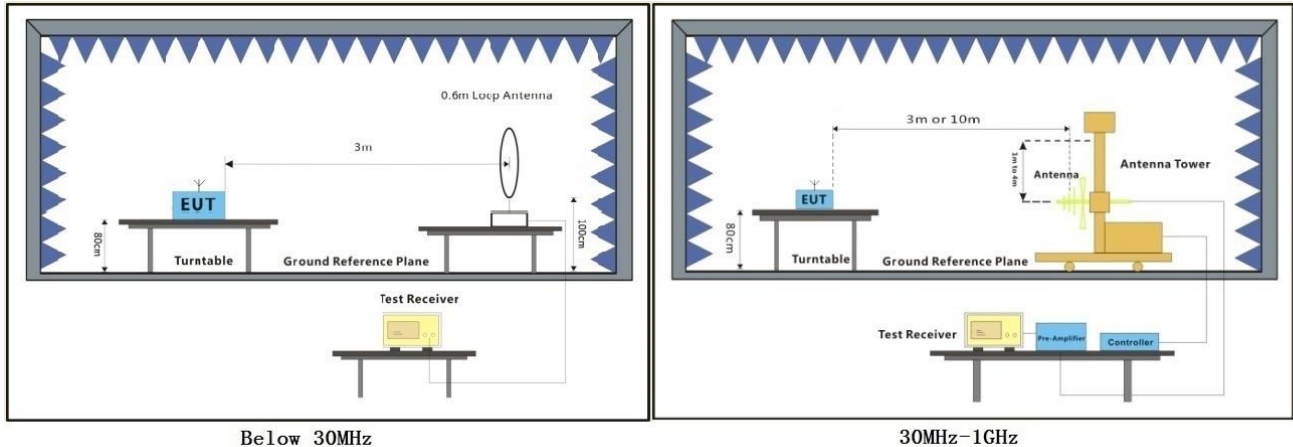
Humidity: 50.2 % RH

Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, Pi/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8m above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3m or 10m away from the interference-receiving antenna, which was mounted on the variable-height antenna tower.
- The antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1m) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark:

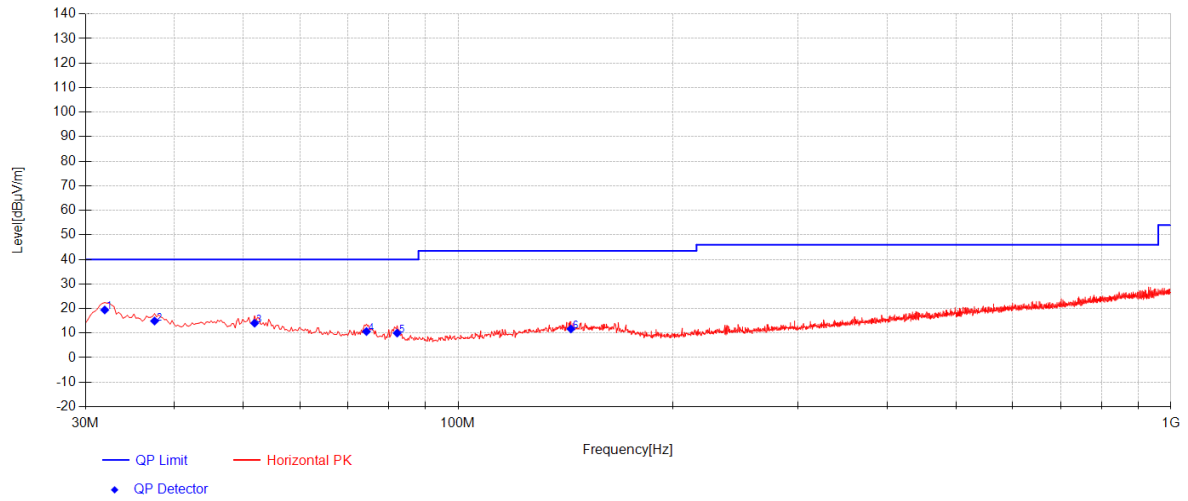
- Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only below points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the worst-case test curve is displayed.



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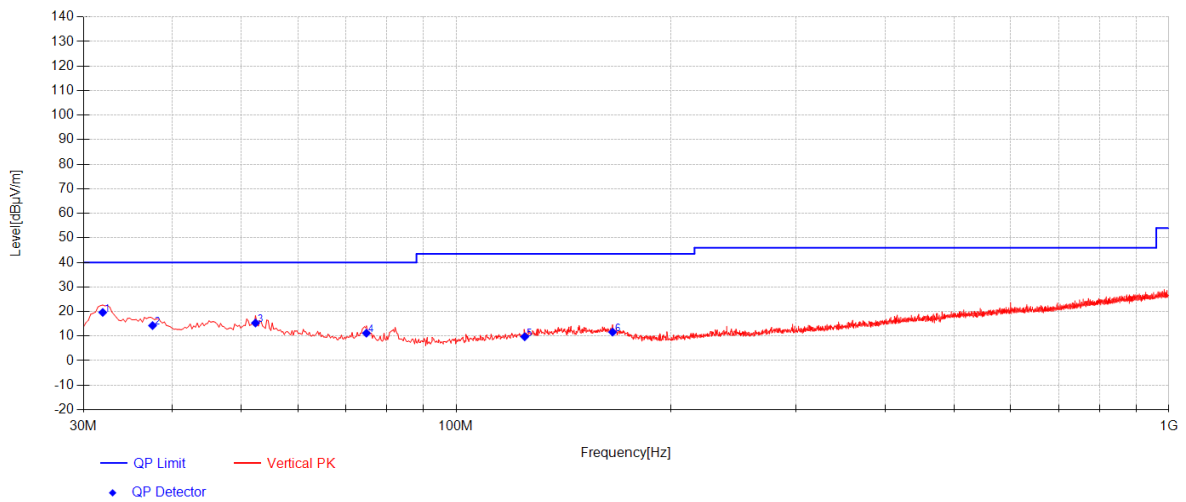
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Test Mode: 01



Final Data List								
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	31.94	49.75	-42.72	12.38	19.41	40.00	20.59	Horizontal
2	37.5175	44.65	-42.70	12.95	14.90	40.00	25.10	Horizontal
3	51.825	43.53	-42.66	13.14	14.01	40.00	25.99	Horizontal
4	74.3775	43.27	-42.42	9.77	10.63	40.00	29.37	Horizontal
5	82.1375	43.35	-42.42	9.04	9.97	40.00	30.03	Horizontal
6	143.975	40.59	-41.58	12.66	11.67	43.50	31.83	Horizontal

Test Mode: 01



Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	31.94	49.96	-42.72	12.38	19.62	40.00	20.38	Vertical
2	37.5175	44.01	-42.70	12.95	14.26	40.00	25.74	Vertical
3	52.31	44.86	-42.65	13.09	15.30	40.00	24.70	Vertical
4	74.8625	43.86	-42.42	9.72	11.16	40.00	28.84	Vertical
5	124.8175	39.95	-41.86	11.61	9.70	43.50	33.80	Vertical
6	165.8	41.11	-41.71	12.20	11.60	43.50	31.90	Vertical

6.4 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10-2020+Cor 1-2023 Section 6.6 & 7.8.8

Measurement Distance: 3M

Limit:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

Note:

At Above 18GHz, measurements may be performed at a distance shorter than that specified in the regulations

Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor+ Aux Factor (if applicable)

The aux factor needs to be added when measurements are performed at a distance other than the limit distance provided.

EX. Above 18GHz, Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(1/3) = -9.54\text{dB}$ (for 1m test distance).

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C

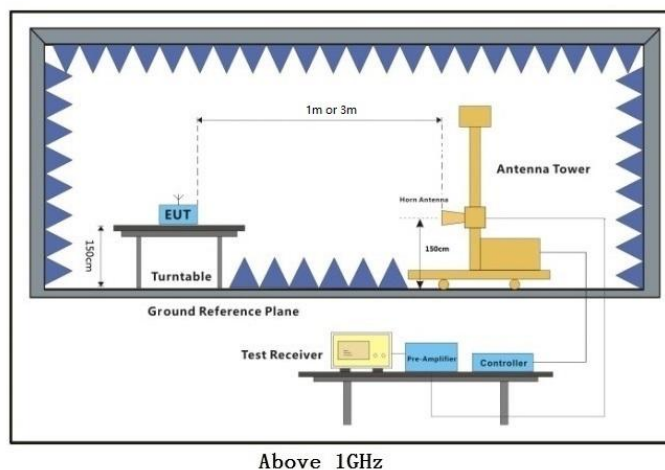
Humidity: 50.2 % RH

Atmospheric Pressure: 1010 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, Pi/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

6.4.3 Test Setup Diagram



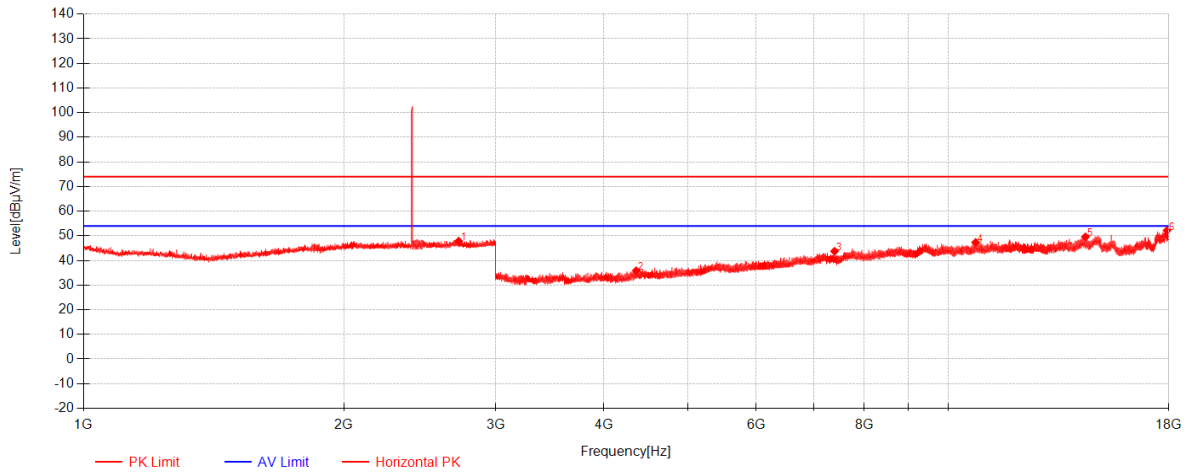
6.4.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5m above the ground at a 3m fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3m away from the interference-receiving antenna from 1GHz to 18GHz, and 1m away from the interference-receiving antenna above 18GHz.
- b. The interference-receiving antenna was mounted on the variable-height antenna tower, with its boresight facing the EUT throughout the test.
- c. The antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1m to 4m and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- g. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- h. Repeat above procedures until all frequencies measured was complete.

Remark:

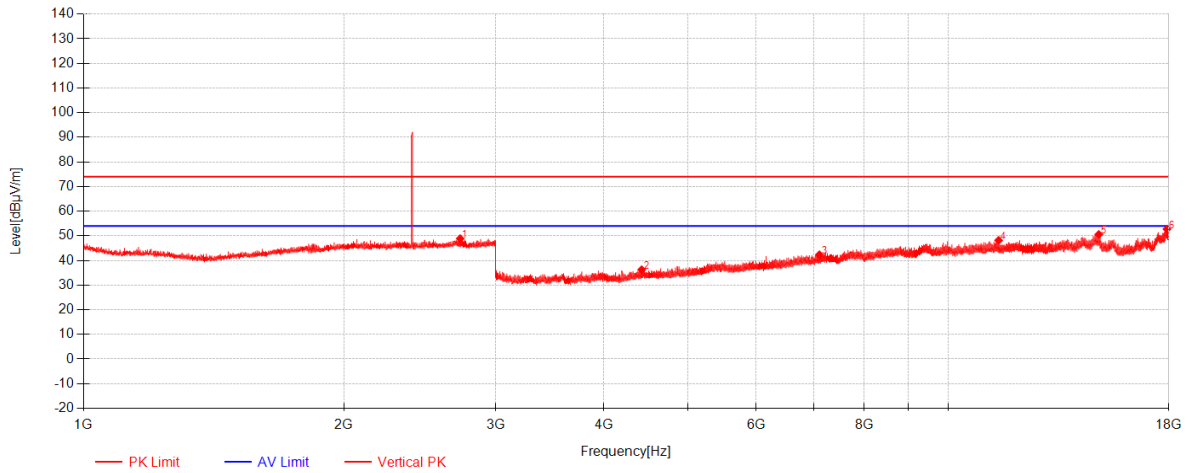
1. Scan from 1GHz to 10th harmonic of the highest frequency or 40 GHz, whichever is lower.
2. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
3. Scan for the frequency above 18GHz, the disturbance above 18GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
4. For devices with multiple operating modes, measurements on the middle channel is used to determine the worst-case mode(s). Only the worst-case mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum) is recorded in the test report.

BT_DH5_TX_CH_00_Horizontal



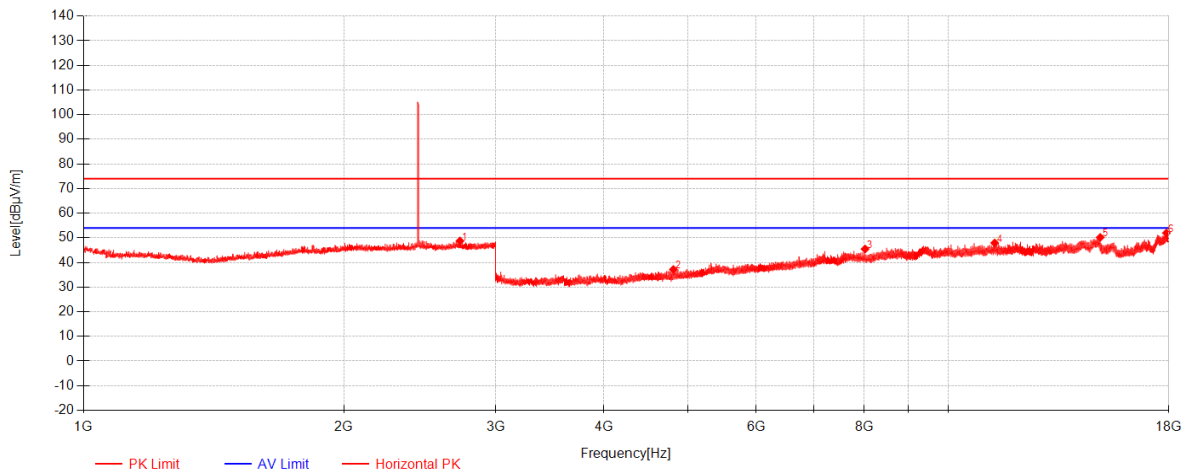
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2716	43.28	27.59	-23.01	47.86	74.00	26.14	Horizontal
-	-	-	-	-	23.13	54.00	30.87	-
2	4357.875	53.94	29.87	-47.97	35.84	74.00	38.16	Horizontal
-	-	-	-	-	11.11	54.00	42.89	-
3	7389.375	53.70	36.20	-46.17	43.73	74.00	30.27	Horizontal
-	-	-	-	-	19.00	54.00	35.00	-
4	10759.125	48.83	39.33	-40.84	47.32	74.00	26.68	Horizontal
-	-	-	-	-	22.59	54.00	31.41	-
5	14410.125	47.90	40.26	-38.58	49.58	74.00	24.42	Horizontal
-	-	-	-	-	24.85	54.00	29.15	-
6	17905.125	46.11	44.23	-38.19	52.15	74.00	21.85	Horizontal
-	-	-	-	-	27.42	54.00	26.58	-

BT_DH5_TX_CH_00_Vertical



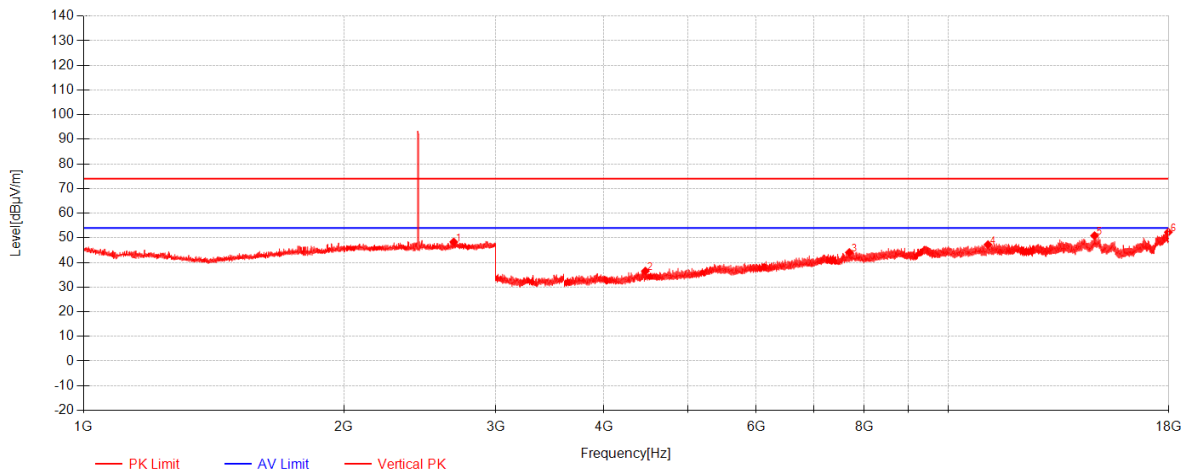
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2727.3333	44.32	27.61	-23.05	48.88	74.00	25.12	Vertical
-	-	-	-	-	24.15	54.00	29.85	-
2	4422	54.35	29.98	-48.08	36.24	74.00	37.76	Vertical
-	-	-	-	-	11.51	54.00	42.49	-
3	7098	52.50	35.68	-45.85	42.33	74.00	31.67	Vertical
-	-	-	-	-	17.60	54.00	36.40	-
4	11438.625	48.79	39.46	-40.07	48.17	74.00	25.83	Vertical
-	-	-	-	-	23.44	54.00	30.56	-
5	14932.875	47.91	40.21	-37.58	50.54	74.00	23.46	Vertical
-	-	-	-	-	25.81	54.00	28.19	-
6	17904.375	46.67	44.23	-38.18	52.71	74.00	21.29	Vertical
-	-	-	-	-	27.98	54.00	26.02	-

BT_DH5_TX_CH_39_Horizontal



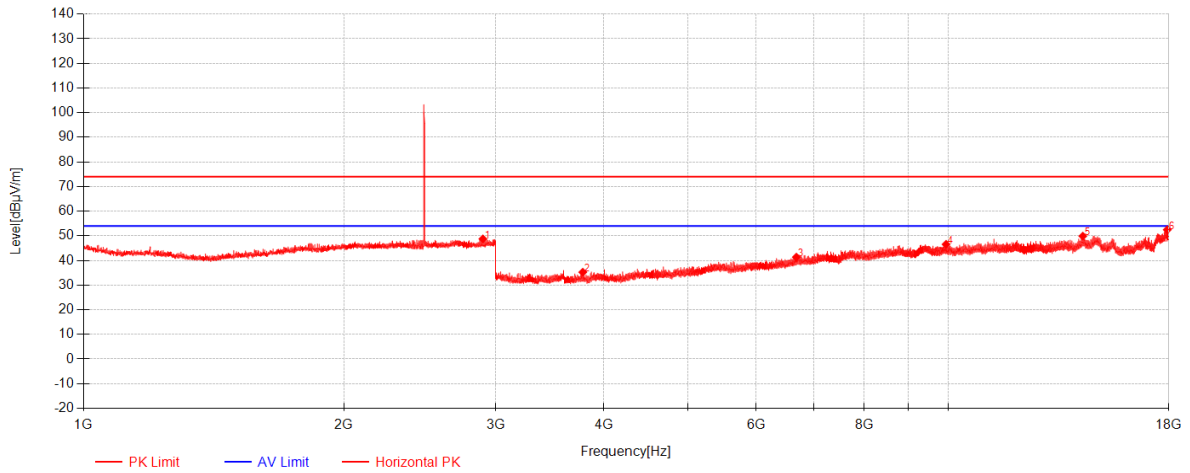
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2726	44.18	27.61	-23.04	48.74	74.00	25.26	Horizontal
-	-	-	-	-	24.01	54.00	29.99	-
2	4810.875	54.38	30.78	-48.01	37.15	74.00	36.85	Horizontal
-	-	-	-	-	12.42	54.00	41.58	-
3	8015.625	53.51	36.32	-44.38	45.45	74.00	28.55	Horizontal
-	-	-	-	-	20.72	54.00	33.28	-
4	11319	48.85	39.47	-40.39	47.93	74.00	26.07	Horizontal
-	-	-	-	-	23.20	54.00	30.80	-
5	14992.125	47.92	40.20	-37.95	50.17	74.00	23.83	Horizontal
-	-	-	-	-	25.44	54.00	28.56	-
6	17879.25	46.05	44.08	-38.16	51.97	74.00	22.03	Horizontal
-	-	-	-	-	27.24	54.00	26.76	-

BT_DH5_TX_CH_39_Vertical



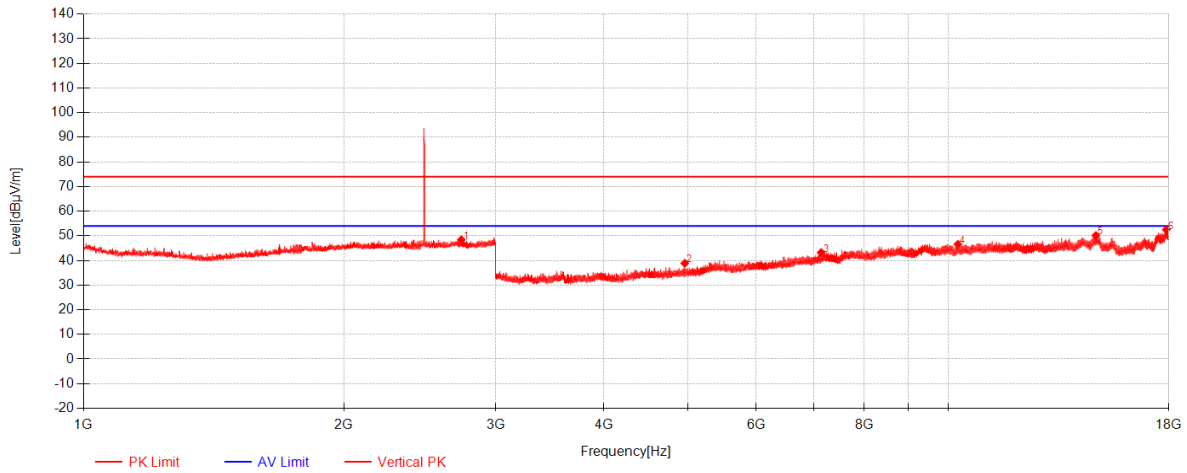
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2681.3333	43.90	27.53	-23.09	48.33	74.00	25.67	Vertical
-	-	-	-	-	23.60	54.00	30.40	-
2	4465.125	54.48	30.04	-48.03	36.50	74.00	37.50	Vertical
-	-	-	-	-	11.77	54.00	42.23	-
3	7686.375	52.82	36.36	-45.12	44.06	74.00	29.94	Vertical
-	-	-	-	-	19.33	54.00	34.67	-
4	11117.625	48.11	39.49	-40.36	47.24	74.00	26.76	Vertical
-	-	-	-	-	22.51	54.00	31.49	-
5	14767.125	47.43	40.22	-36.79	50.86	74.00	23.14	Vertical
-	-	-	-	-	26.13	54.00	27.87	-
6	17976	46.37	44.66	-38.72	52.31	74.00	21.69	Vertical
-	-	-	-	-	27.58	54.00	26.42	-

BT_DH5_TX_CH_78_Horizontal



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2897.3333	43.82	27.92	-23.00	48.74	74.00	25.26	Horizontal
-	-	-	-	-	24.01	54.00	29.99	-
2	3780	54.53	28.95	-48.25	35.23	74.00	38.77	Horizontal
-	-	-	-	-	10.50	54.00	43.50	-
3	6675.375	53.04	34.98	-46.67	41.35	74.00	32.65	Horizontal
-	-	-	-	-	16.62	54.00	37.38	-
4	9943.5	49.77	38.72	-41.93	46.56	74.00	27.44	Horizontal
-	-	-	-	-	21.83	54.00	32.17	-
5	14311.875	48.05	40.27	-38.44	49.88	74.00	24.12	Horizontal
-	-	-	-	-	25.15	54.00	28.85	-
6	17920.125	46.44	44.32	-38.30	52.46	74.00	21.54	Horizontal
-	-	-	-	-	27.73	54.00	26.27	-

BT_DH5_TX_CH_78_Vertical



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2735.6667	43.86	27.62	-23.07	48.41	74.00	25.59	Vertical
-	-	-	-	-	23.68	54.00	30.32	-
2	4959.75	55.79	31.11	-48.02	38.88	74.00	35.12	Vertical
-	-	-	-	-	14.15	54.00	39.85	-
3	7131.75	53.47	35.74	-45.95	43.26	74.00	30.74	Vertical
-	-	-	-	-	18.53	54.00	35.47	-
4	10261.875	49.11	38.98	-41.53	46.57	74.00	27.43	Vertical
-	-	-	-	-	21.84	54.00	32.16	-
5	14818.125	46.88	40.22	-36.94	50.15	74.00	23.85	Vertical
-	-	-	-	-	25.42	54.00	28.58	-
6	17872.875	46.60	44.04	-38.16	52.48	74.00	21.52	Vertical
-	-	-	-	-	27.75	54.00	26.25	-



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7 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2601000248AT

8 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for KSCR2601000248AT

- End of the Report -