



## 7.8. Conducted Spurious Emissions Measurement

#### 7.8.1.Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

#### 7.8.2.Test Procedure Used

ANSI C63.10-2013 - Section 7.8.8

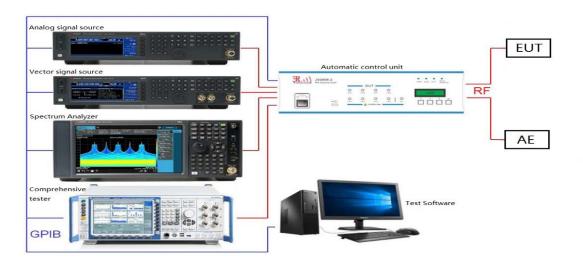
#### 7.8.3.Test Setting

- Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
- 2. RBW = 100 KHz
- 3. VBW ≥ RBW
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize
- 8. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

Report No.: S202312118689E12



# 7.8.4.Test Setup





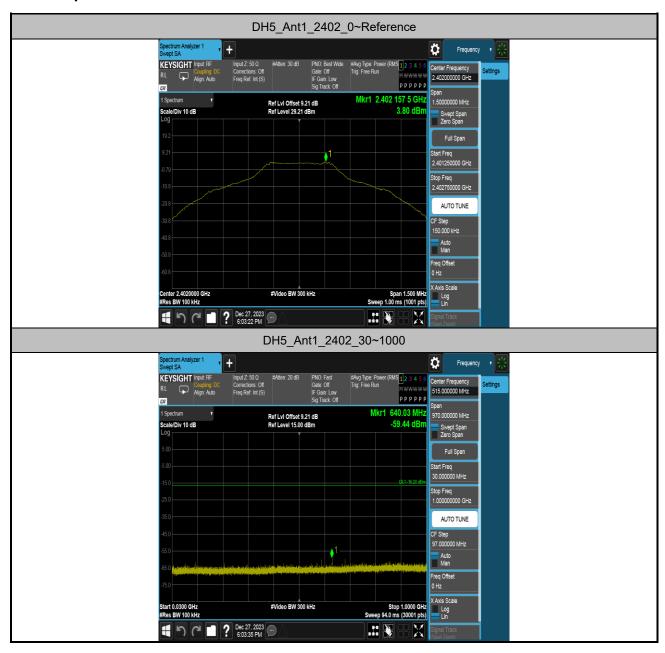
## 7.8.5.Test Result

To d Marila	Antenna	Channel	Freq Range	Ref Level	Result	Limit	Man Bat
Test Mode			[MHz]	[dBm]	[dBm]	[dBm]	Verdict
			Reference	3.80	3.80		PASS
		2402	30~1000	3.80	-59.44	≤-16.2	PASS
			1000~26500	3.80	-52.42	≤-16.2	PASS
			Reference	4.26	4.26		PASS
DH5	Ant1	2441	30~1000	4.26	-59.08	≤-15.74	PASS
			1000~26500	4.26	-52.58	≤-15.74	PASS
			Reference	4.03	4.03		PASS
		2480	30~1000	4.03	-58.93	≤-15.97	PASS
			1000~26500	4.03	-52.35	≤-15.97	PASS
	Ant1	2402	Reference	2.30	2.30		PASS
			30~1000	2.30	-59.69	≤-17.7	PASS
			1000~26500	2.30	-52.61	≤-17.7	PASS
		2441	Reference	2.94	2.94		PASS
2DH5			30~1000	2.94	-58.45	≤-17.06	PASS
			1000~26500	2.94	-52.08	≤-17.06	PASS
			Reference	2.67	2.67		PASS
			30~1000	2.67	-49.44	≤-17.33	PASS
			1000~26500	2.67	-52.42	≤-17.33	PASS
			Reference	2.21	2.21		PASS
		2402	30~1000	2.21	-58.33	≤-17.79	PASS
			1000~26500	2.21	-52.12	≤-17.79	PASS
	Ant1	2441 2480	Reference	3.00	3.00		PASS
3DH5			30~1000	3.00	-32.49	≤-17	PASS
			1000~26500	3.00	-52.66	≤-17	PASS
			Reference	2.65	2.65		PASS
			30~1000	2.65	-60.18	≤-17.35	PASS
			1000~26500	2.65	-35.3	≤-17.35	PASS

Page Number: 60 of 109



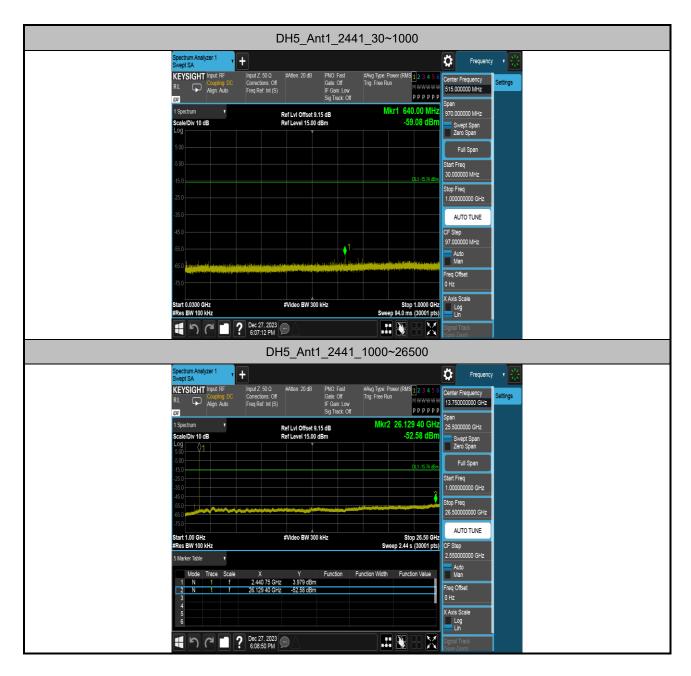
# **Test Graphs**



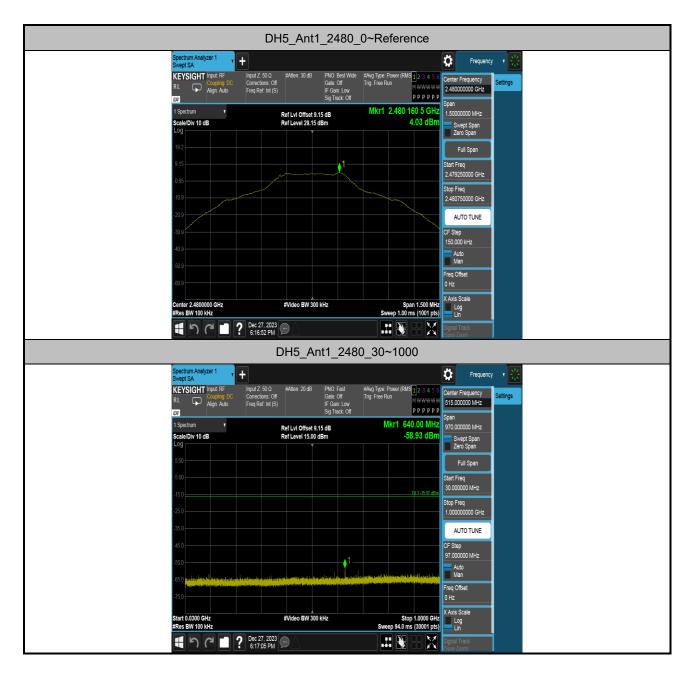




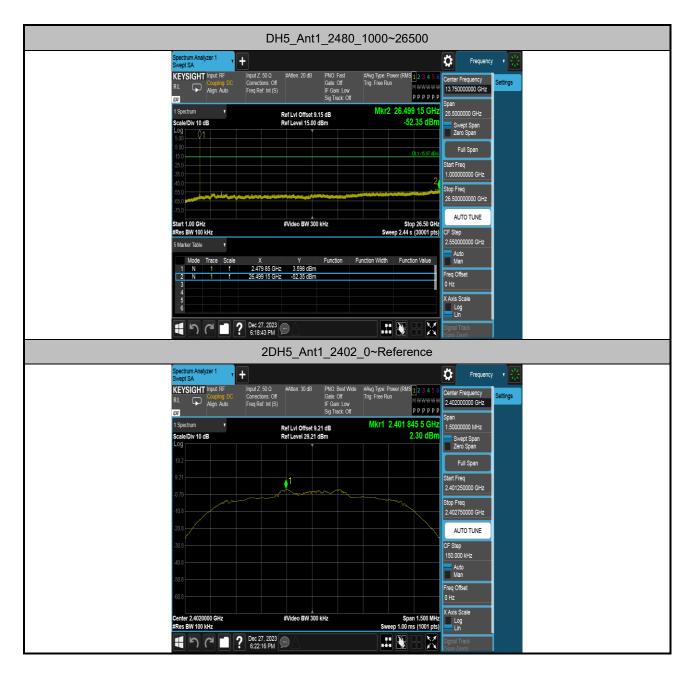




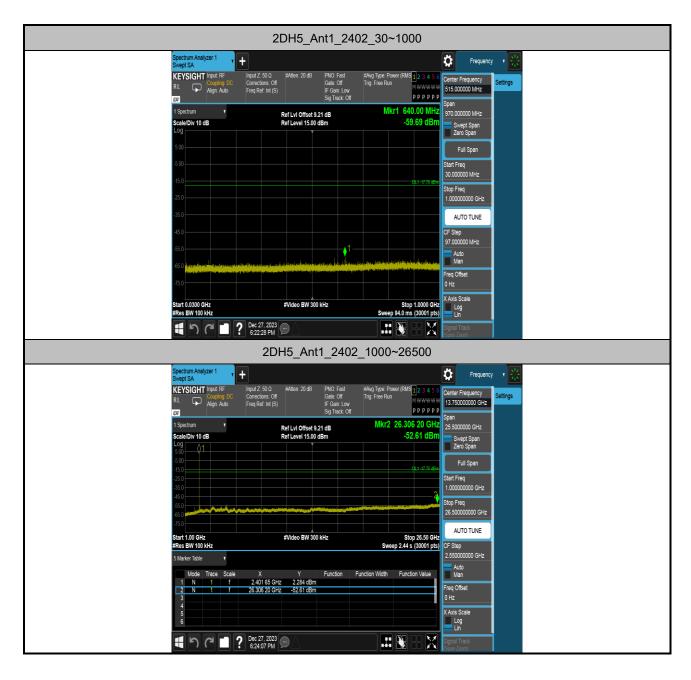




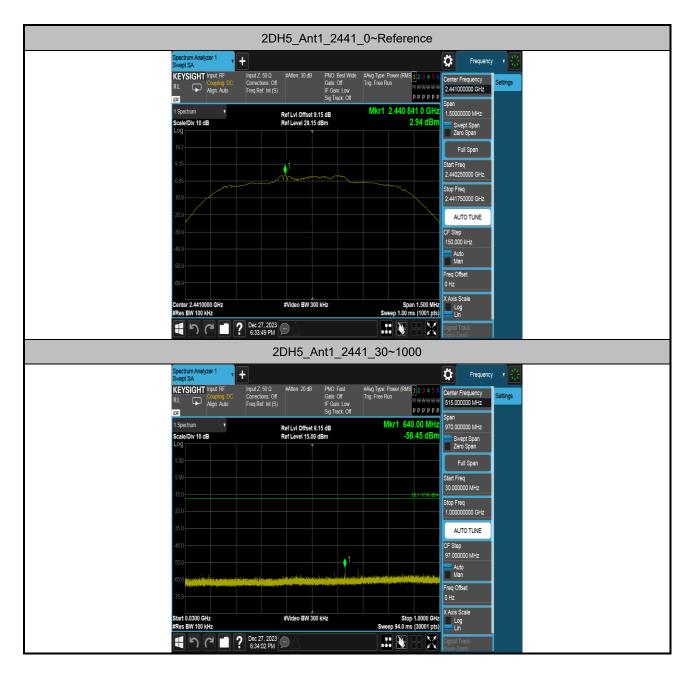








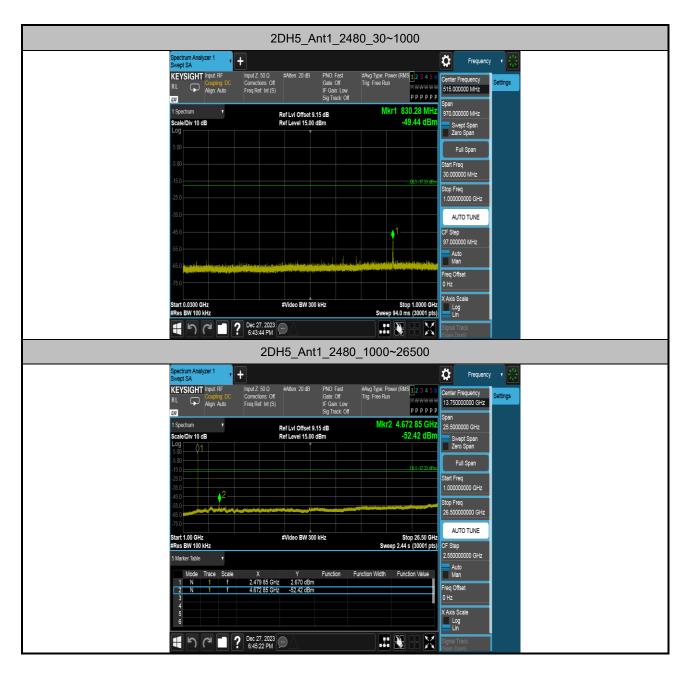












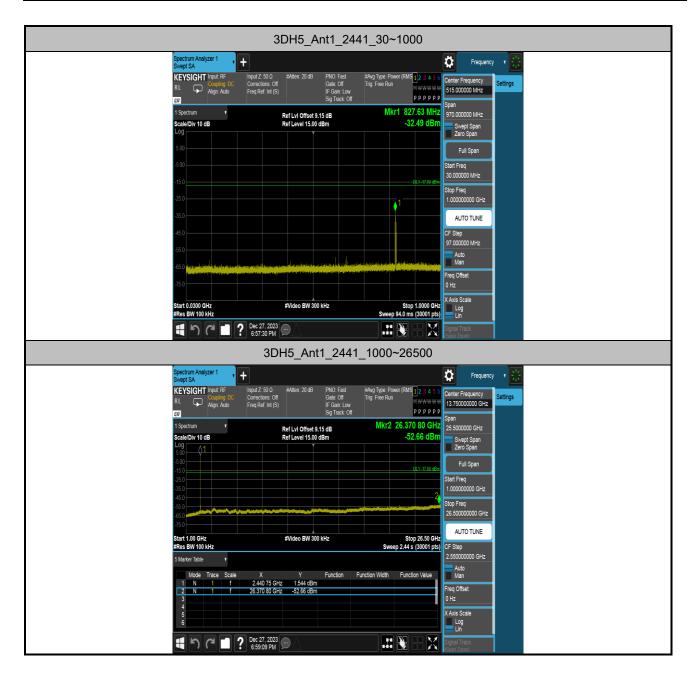




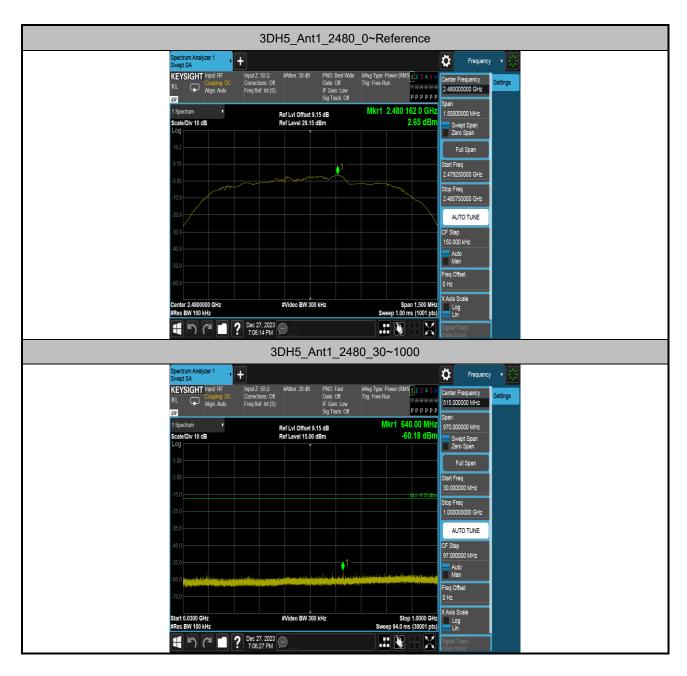




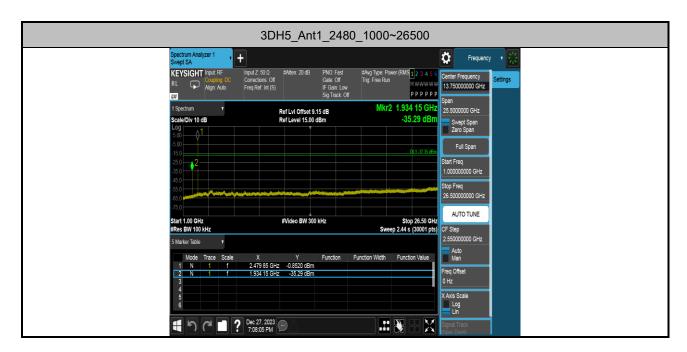














## 7.9. Radiated Spurious Emission Measurement

#### 7.9.1.Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title

47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209						
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]				
0.009 - 0.490	2400/F (kHz)	300				
0.490 - 1.705	24000/F (kHz)	30				
1.705 - 30	30	30				
30 - 88	100	3				
88 - 216	150	3				
216 - 960	200	3				
Above 960	500	3				

### 7.9.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

Page Number: 75 of 109



### 7.9.3.Test Setting

### **Quasi-Peak Measurements below 1GHz**

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. Span was set greater than 1MHz
- 3. RBW = as specified in Table 1
- 4. Detector = CISPR quasi-peak
- 5. Sweep time = auto couple
- 6. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

## Peak Measurements above 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

### Average Measurements above 1GHz (Method VB)

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW; If the EUT is configured to transmit with duty cycle  $\geq$  98%, set VBW = 10 Hz. If the EUT duty cycle is < 98%, set VBW  $\geq$  1/T. T is the minimum transmission duration.
- 4. Detector = Peak
- 5. Sweep time = auto

Page Number: 76 of 109



- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

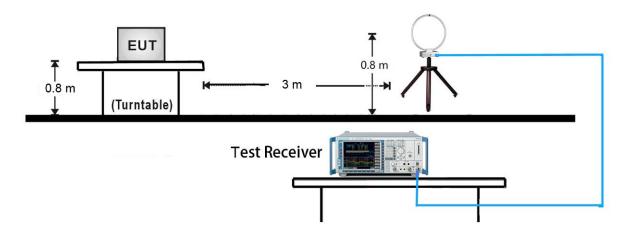
Page Number: 77 of 109

Report No.: S202312118689E12

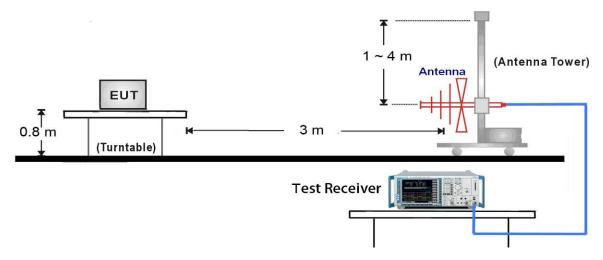


# 7.9.4.Test Setup

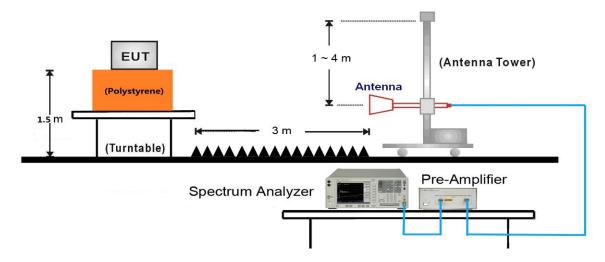
# 9kHz ~ 30MHz Test Setup:



## 30MHz ~ 1GHz Test Setup:



# 1GHz ~ 26.5GHz Test Setup:





## 7.9.5.Test Result

Test Mode:	DH5	Test Date:	2023-12-27			
Test Channel:	00	Test Engineer:	Chuang Li			
Remark:	Average measurement was not performed if peak level lower than average limit.					
	Other frequency was 20dB below limit line within 1-18GHz, there is not show in the					
	report.					
	This is the worst case of Radiated Emission for 1-18GHz.					

Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
4010.0000	42.26	5.15	74.00	31.74	Peak	Horizontal
4995.0000	43.08	7.62	74.00	30.92	Peak	Horizontal
6855.0000	47.88	13.92	74.00	26.12	Peak	Horizontal
8975.0000	52.94	15.77	74.00	21.06	Peak	Horizontal
3870.0000	40.46	4.70	74.00	33.54	Peak	Vertical
4830.0000	43.67	7.10	74.00	30.33	Peak	Vertical
6120.0000	47.17	11.19	74.00	26.83	Peak	Vertical
7840.0000	51.68	15.13	74.00	22.32	Peak	Vertical

Page Number: 79 of 109



Test Mode:	DH5	Test Date:	2023-12-27			
Test Channel:	39	Test Engineer:	Chuang Li			
Remark:	Average measurement was not performed if peak level lower than average limit.					
	Other frequency was 20dB below limit line within 1-18GHz, there is not show in the					
	report.					
	This is the worst case of Radiated Emission for 1-18GHz.					

Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
3810.0000	40.58	4.50	74.00	33.42	Peak	Horizontal
4805.0000	43.87	7.11	74.00	30.13	Peak	Horizontal
6435.0000	46.87	12.20	74.00	27.13	Peak	Horizontal
7960.0000	51.36	15.58	74.00	22.64	Peak	Horizontal
3810.0000	41.64	4.50	74.00	32.36	Peak	Vertical
4890.0000	43.71	7.27	74.00	30.29	Peak	Vertical
6230.0000	47.06	11.44	74.00	26.94	Peak	Vertical
7945.0000	51.95	15.59	74.00	22.05	Peak	Vertical



Test Mode:	DH5	Test Date:	2023-12-27		
Test Channel:	78	Test Engineer:	Chuang Li		
Remark:	Average measurement was not performed if peak level lower than average limit.				
	Other frequency was 20dB below limit line within 1-18GHz, there is not show in the				
	report.				
	This is the worst case of Radiated Emission for 1-18GHz.				

Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
3875.0000	41.45	4.70	74.00	32.55	Peak	Horizontal
5010.0000	44.16	7.64	74.00	29.84	Peak	Horizontal
6635.0000	46.59	13.00	74.00	27.41	Peak	Horizontal
8895.0000	52.07	15.95	74.00	21.93	Peak	Horizontal
3790.0000	41.26	4.41	74.00	32.74	Peak	Vertical
4740.0000	44.09	6.97	74.00	29.91	Peak	Vertical
6790.0000	48.78	13.33	74.00	25.22	Peak	Vertical
7965.0000	52.31	15.54	74.00	21.69	Peak	Vertical