

### **RADIATED EMISSION ABOVE 1GHZ**

EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	53.16	0.08	53.24	74	-20.76	peak 💿
4804.000	47.18	0.08	47.26	54	-6.74	AVG
7206.000	47.65	2.21	49.86	74	-24.14	peak
7206.000	44.47	2.21	46.68	54	-7.32	AVG
NOY I	<u> </u>				20	
emark:			8			C.V
actor = Anter	na Factor + Cable	e Loss – Pre-	amplifier.	®		

EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	52.94	0.08	53.02	74	-20.98	peak
4804.000	46.34	0.08	46.42	54	-7.58	AVG
7206.000	47.22	2.21	49.43	74	-24.57	peak
7206.000	42.51	2.21	44.72	54	-9.28	AVG
0		<u> </u>				í C
emark:				C	8	

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



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EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	52.64	0.14	52.78	74	-21.22	peak
4882.000	45.38	0.14	45.52	54	-8.48	AVG
7323.000	46.28	2.36	48.64	74	-25.36	peak
7323.000	41.09	2.36	43.45	54	-10.55	AVG
0			9		6	
emark:	- 6	8			- 6	®
actor = Anter	nna Factor + Cable	Loss – Pre-	amplifier.			- 6

			4
EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	) /alua Tura
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
4882.000	50.92	0.14	51.06	74	-22.94	peak
4882.000	44.87	0.14	45.01	54	-8.99	AVG
7323.000	45.53	2.36	47.89	74	-26.11	peak
7323.000	40.12	2.36	42.48	54	-11.52	AVG
		100	0			

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



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EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	51.62	0.22	51.84	74	-22.16	peak
4960.000	44.57	0.22	44.79	54	-9.21	AVG
7440.000	45.79	2.64	48.43	74	-25.57	peak
7440.000	39.41	2.64	42.05	54	-11.95	AVG
0			9 20	0	8	
emark:	- 6	0		<u> </u>	- 6	3
actor = Anter	nna Factor + Cable	Loss – Pre-	amplifier.			- 6

EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4960.000	49.89	0.22	50.11	74	-23.89	peak
4960.000	44.05	0.22	44.27	54	-9.73	AVG
7440.000	44.67	2.64	47.31	74	-26.69	peak
7440.000	38.39	2.64	41.03	54	-12.97	AVG
		- G	8			
				0		

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

# **RESULT: PASS**

**Note:** Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report. Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

All test modes had been tested. Sim 8DPSK modulation +FM low channel is the worst case and recorded in the report.



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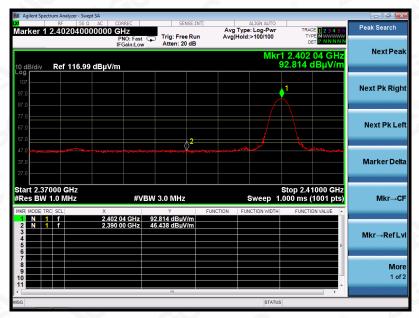
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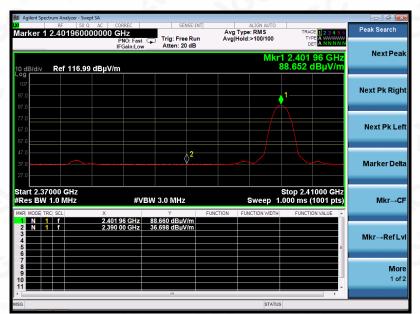
EUT	FM Transmitter	Model Name BH269A	
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

PK



AV



**RESULT: PASS** 



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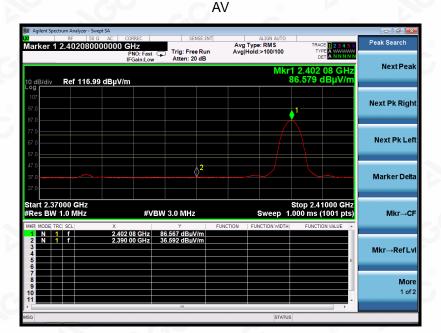


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EUT	FM Transmitter	Model Name BH269A			
Temperature	25°C	Relative Humidity	55.4%		
Pressure	960hPa	Test Voltage	Normal Voltage		
Test Mode	Mode 7	Antenna	Vertical		

ΡK

Peak Search arker 1 2.401920000000 GHz Avg Type: Log-Pwi Avg|Hold:>100/100 Trig: Free Run Atten: 20 dB Next Pea Ref 116.99 dBµV/m Next Pk Righ Next Pk Left Marker Delta Start 2.37000 GHz #Res BW 1.0 MHz Stop 2.41000 GHz 1.000 ms (1001 pts) #VBW 3.0 MHz Sweep Mkr→C 2.401 92 GHz 2.390 00 GHz 90.656 dBµ 46.012 dBµ Mkr→RefLv More 1 of 2



**RESULT: PASS** 



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Mor 1 of:

EUT	FM Transmitter	Model Name	BH269A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal
		PK	

Peak Search arker 1 2.480000000000 GHz Avg Type: Log-Pwi Avg|Hold:>100/100 Trig: Free Run Next Pea Ref 116.99 dBµV/m Next Pk Righ Next Pk Lef Marker Delta Start 2.47500 GHz #Res BW 1.0 MHz Stop 2.50000 GHz 1.000 ms (1001 pts) #VBW 3.0 MHz Sweep Mkr→C 2.480 000 GHz 2.483 500 GHz 93.866 dBµ 47.288 dBµ Mkr→RefLv



larker 1 2.48005000000	CHZ PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB	Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Peak Search
0 dB/div Ref 116.99 dBµV	/m		Mkr1	2.480 050 GHz 89.652 dBµV/m	NextPeak
• g 107 97.0					Next Pk Right
77.0 67.0 57.0					Next Pk Left
47.0	2 2				Marker Delta
tart 2.47500 GHz Res BW 1.0 MHz			Sweep 1	Stop 2.50000 GHz 1.000 ms (1001 pts)	Mkr→CF
1         N         1         f         2.480           2         N         1         f         2.483           3         3           4         5           6         6	0 050 GHz 89. 8 500 GHz 38.	649 dBµV/m 398 dBµV/m		E E	Mkr→RefLvl
7 8 9 10 11					More 1 of 2
5G		-11	STATU	s	

**RESULT: PASS** 



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EUT	FM Transmitter	Model Name BH269A		
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	Mode 9	Antenna	Vertical	

Peak Search arker 1 2.480000000000 GHz Avg Type: Log-Pwi Avg|Hold:>100/100 Trig: Free Run NextPe Ref 116.99 dBµV/m Next Pk Righ Next Pk Lef Marker Delta Start 2.47500 GHz #Res BW 1.0 MHz Stop 2.50000 GHz 1.000 ms (1001 pts) #VBW 3.0 MHz Sweep Mkr→C 2.480 000 GHz 91.790 dBµ\ 2.483 500 GHz 47.161 dBµ\ Mkr→RefLv Mor 1 of 2



#### **RESULT: PASS**

**Note**: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F. All test modes had been pre-tested. Sim 8DPSK modulation +FM low channel is the worst case and recorded in the report.



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PK



# **11. NUMBER OF HOPPING FREQUENCY**

### **11.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

3. VBW  $\geq$  RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

### **11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

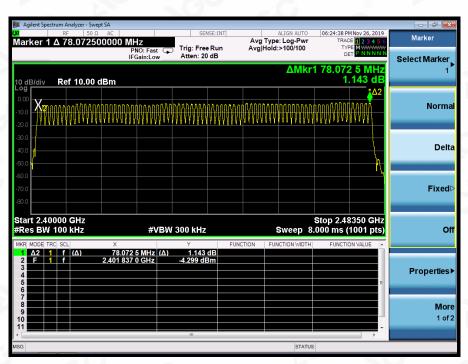
Same as described in section 8.2

### **11.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6

### **11.4. LIMITS AND MEASUREMENT RESULT**

TOTAL NO. OF	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
HOPPING CHANNEL	>=15	79	PASS



# TEST PLOT FOR NO. OF TOTAL CHANNELS

Note: The GFSK modulation is the worst case and recorded in the report.



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# 12. TIME OF OCCUPANCY (DWELL TIME)

### **12.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Zero span, centered on a hopping channel.

2. RBW shall be  $\leq$  channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.

3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.

4. Detector function: Peak. Trace: Max hold.

5. Use the marker-delta function to determine the transmit time per hop.

6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer)  $\times$  (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

# 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

# 12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

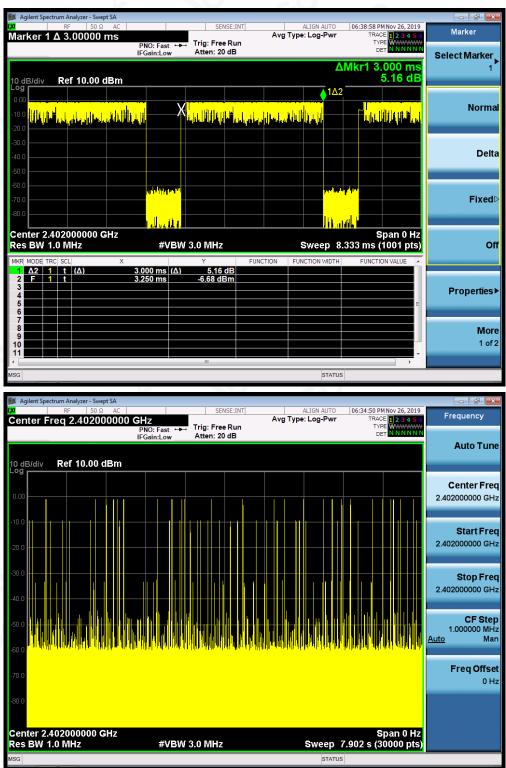
# **12.4. LIMITS AND MEASUREMENT RESULT**

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)
Low	3.000	25*4	300.000	400
Middle	3.000	29*4	348.000	400
High	3.000	26*4	312.000	400

Note: The 8DPSK modulation is the worst case and recorded in the report.



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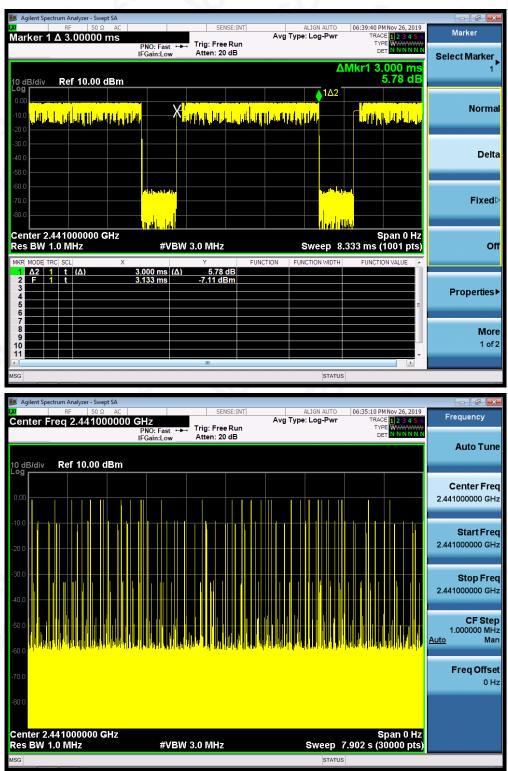


# TEST PLOT OF LOW CHANNEL



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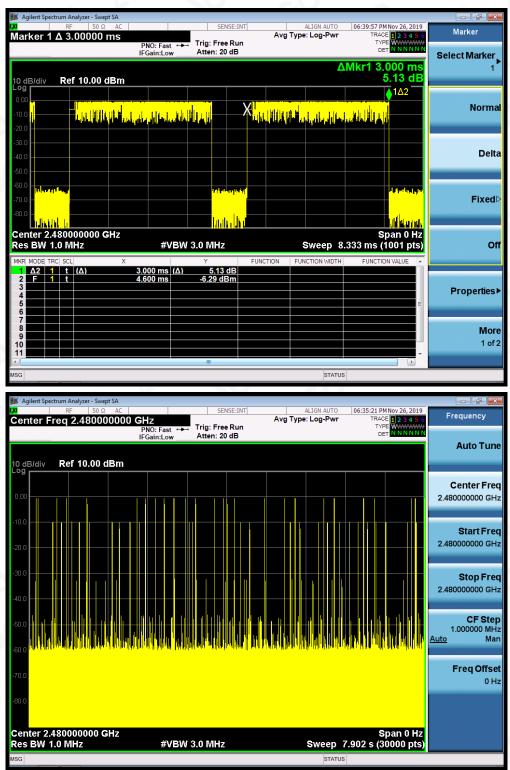
### TEST PLOT OF MIDDLE CHANNEL



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### TEST PLOT OF HIGH CHANNEL



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# **13. FREQUENCY SEPARATION**

### **13.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Wide enough to capture the peaks of two adjacent channels.

2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

3. Video (or average) bandwidth (VBW)  $\geq$  RBW.

4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### **13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

Same as described in section 6.2

### 13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.3

### **13.4. LIMITS AND MEASUREMENT RESULT**

CHANNEL	CHANNEL SEPARATION KHz	LIMIT (KHz)	RESULT
CH01-CH02	995	>=25 KHz or 2/3 20 dB BW	PASS



# TEST PLOT FOR FREQUENCY SEPARATION

Note: The 8DPSK modulation is the worst case and recorded in the report.



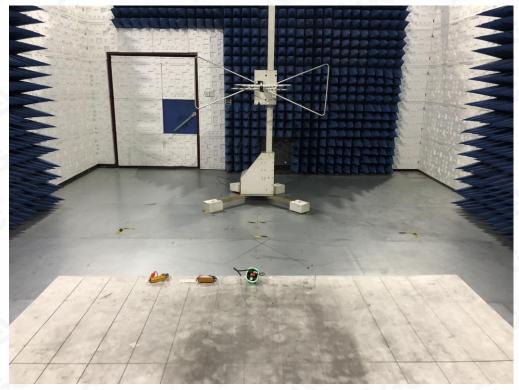
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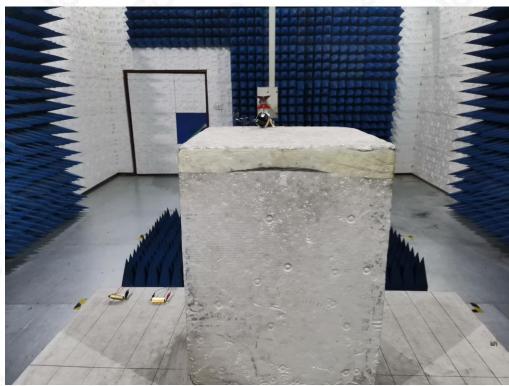


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# APPENDIX A: PHOTOGRAPHS OF TEST SETUP RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ



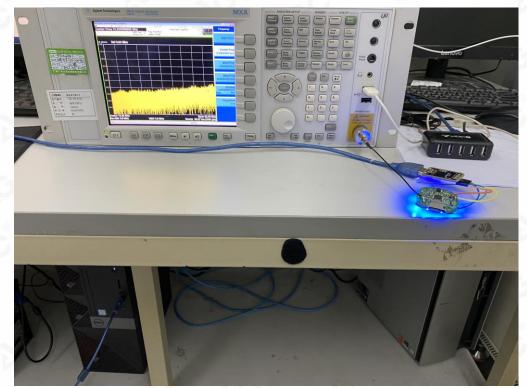


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### CONDUCTED TEST SETUP





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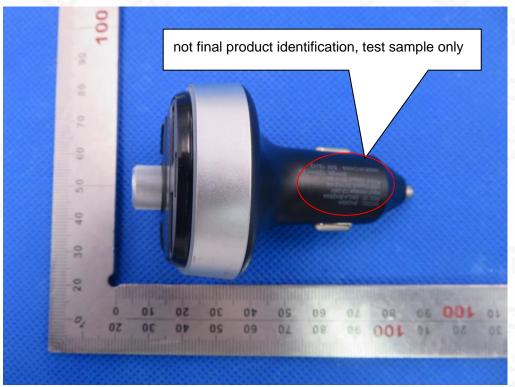


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# APPENDIX B: PHOTOGRAPHS OF EUT TOP VIEW OF EUT

#### BOTTOM VIEW OF EUT





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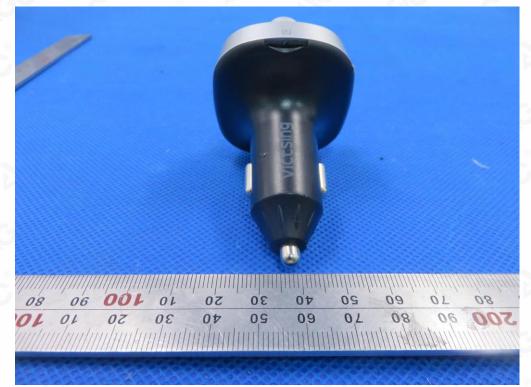


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### FRONT VIEW OF EUT



BACK VIEW OF EUT





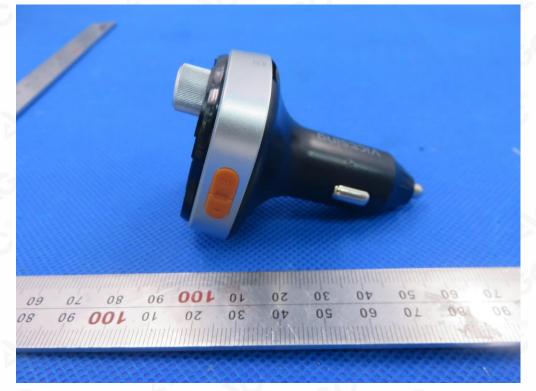
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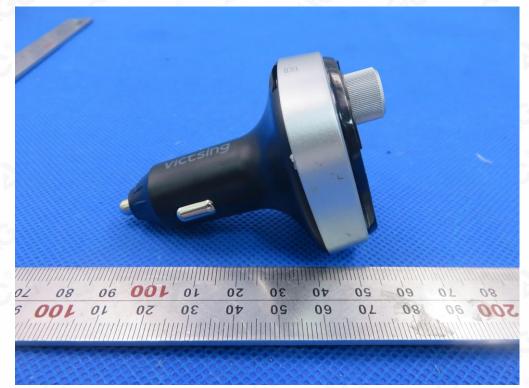


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### LEFT VIEW OF EUT



**RIGHT VIEW OF EUT** 





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# VIEW OF EUT(PORT)-1



# VIEW OF EUT(PORT)-2





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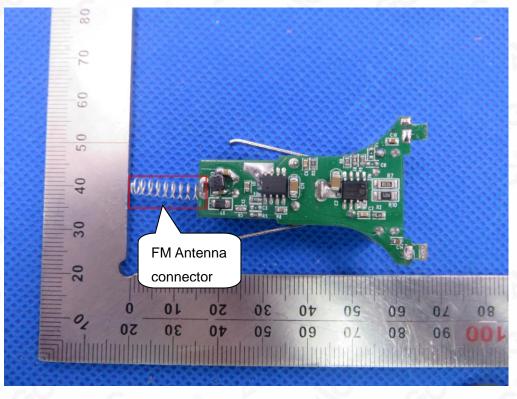


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### **OPEN VIEW OF EUT**



**INTERNAL VIEW OF EUT-1** 





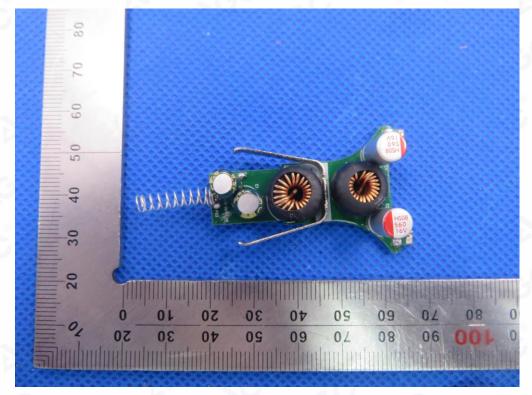
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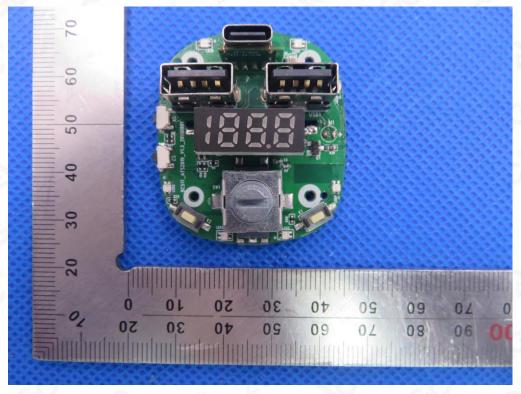


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#### **INTERNAL VIEW OF EUT-2**



**INTERNAL VIEW OF EUT-3** 





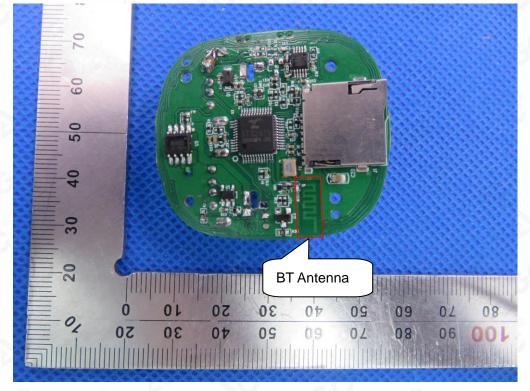
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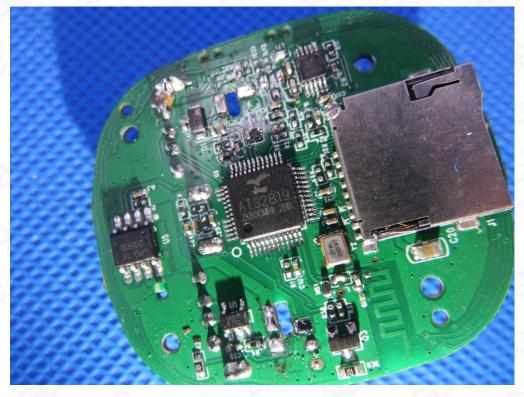


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#### **INTERNAL VIEW OF EUT-4**



**INTERNAL VIEW OF EUT-5** 



# ----END OF REPORT----



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