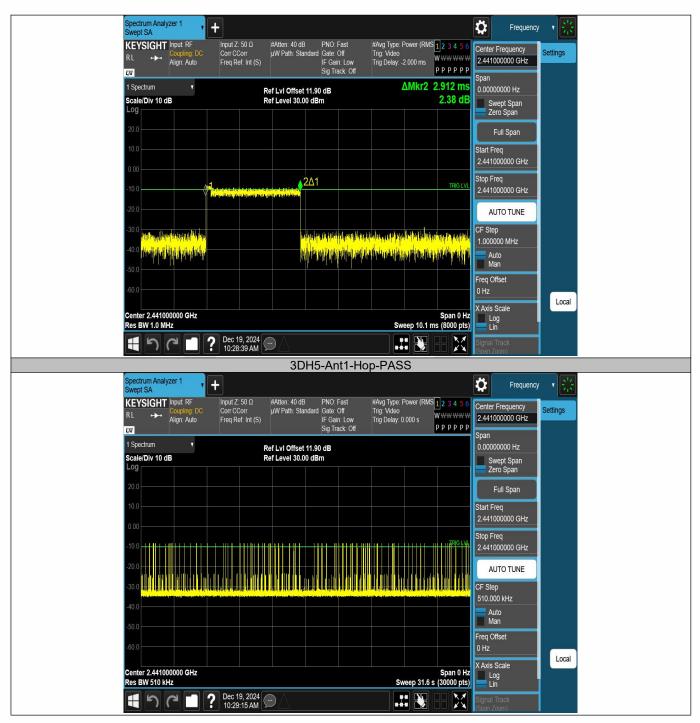




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9.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER

9.5.1 **Applicable Standard**

According to FCC Part 15.247(b)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02 According to IC RSS-247.5.4 and RSS-Gen 6.12

9.5.2 **Conformance Limit**

The max For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.5.3 **Test Configuration**

Test according to clause 7.1 radio frequency test setup 1

9.5.4 **Test Procedure**

As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.

Use the following spectrum analyzer settings:

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel (about 8MHz)

Set RBW > the 20 dB bandwidth of the emission being measured (about 3MHz)

Set VBW ≥ RBW

Set Sweep = auto

Set Detector function = peak

Set Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission to determine the peak amplitude level.

Test Results

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

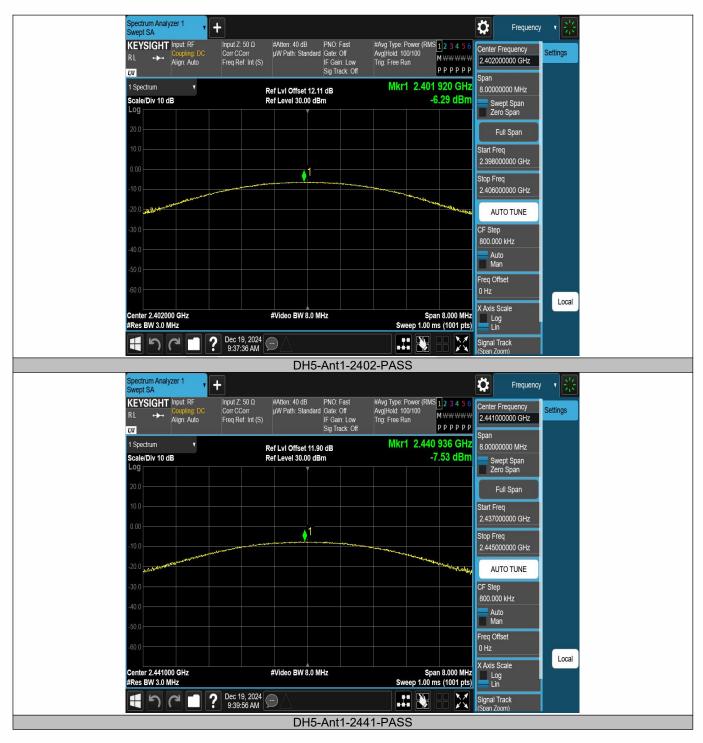
Note: N/A

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	-6.29	≤20.97	PASS
DH5	Ant1	2441	-7.53	≤20.97	PASS
DH5	Ant1	2480	-7.54	≤20.97	PASS
2DH5	Ant1	2402	-6.32	≤20.97	PASS
2DH5	Ant1	2441	-7.76	≤20.97	PASS
2DH5	Ant1	2480	-7.60	≤20.97	PASS
3DH5	Ant1	2402	-6.31	≤20.97	PASS
3DH5	Ant1	2441	-7.50	≤20.97	PASS
3DH5	Ant1	2480	-8.33	≤20.97	PASS

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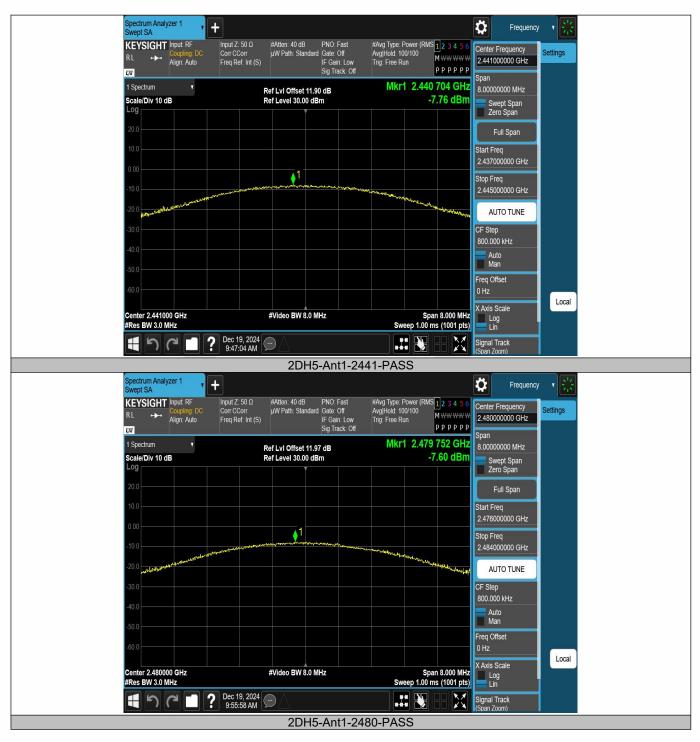






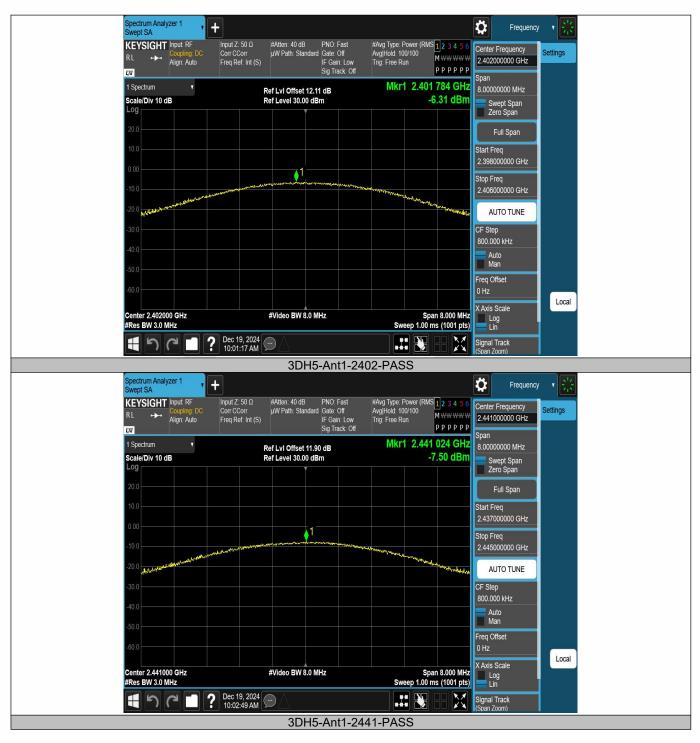




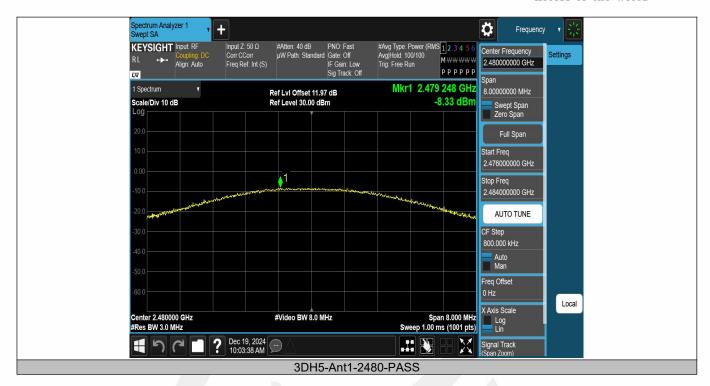














9.6 CONDUCTED SUPRIOUS EMISSION

9.6.1 **Applicable Standard**

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02 According to IC RSS-247 5.5

9.6.2 **Conformance Limit**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

9.6.3 **Test Configuration**

Test according to clause 7.1 radio frequency test setup 1

9.6.4 **Test Procedure**

The transmitter output (antenna port) was connected to the spectrum analyzer

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DSS channel center frequency.

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.

Set the RBW = 100 kHz. Set the VBW \ge 3 x RBW.

Set Detector = peak. Set Sweep time = auto couple.

Set Trace mode = max hold. Allow trace to fully stabilize.

Use the peak marker function to determine the maximum Maximum conduceted level.

Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

Band-edge measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW \geq 1% of the span=100kHz Set VBW \geq 3 x RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

Emission level measurement

Use the following spectrum analyzer settings:

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. (30MHz to 25GHz). Set RBW = 100 kHz Set VBW ≥ RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.



9.6.5 Test Results

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Note: N/A

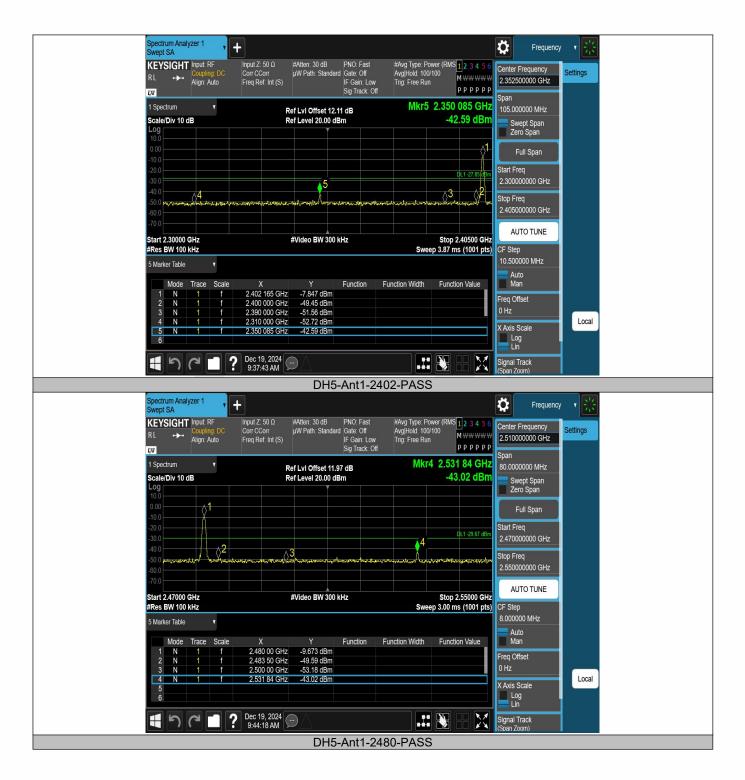
All the antenna and modes mode have been tested, and the worst result recorded was report as below:

Band edge measurements

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-7.85	-42.59	≤-27.85	PASS
DH5	Ant1	High	2480	-9.67	-43.02	≤-29.67	PASS
DH5	Ant1	Low	Hop_2402	-8.07	-42.66	≤-28.07	PASS
DH5	Ant1	High	Hop_2480	-9.53	-40.96	≤-29.53	PASS

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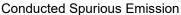


pectrum Analyzer 1 wept SA Ö + Frequency #Atten: 30 dB PNO: Fast µW Path: Standard Gate: Off IF Gain: Low Sig Track: Off #Avg Type: Power (RMS 1 2 3 4 5 (Input Z: 50 Ω Corr CCorr KEYSIGHT Input: RF Center Frequency Avg|Hold: 1000/1000 Trig: Free Run Settings Align: Auto MWWWW Freq Ref: Int (S) 2.352500000 GHz рррррр L)(I Span Mkr5 2.388 095 GHz 1 Spectrum 105.000000 MHz V Ref LvI Offset 11.87 dB Ref Level 20.00 dBm Scale/Div 10 dB -42.66 dBm Swept Span Zero Span Full Span Start Freq DL1 -28.07 c 2.30000000 GHz <u>⊃___2</u> ₩₩₩₩ ()4 Stop Freq 2.405000000 GHz AUTO TUNE Start 2.30000 GHz #Video BW 300 kHz Stop 2.40500 GHz #Res BW 100 kHz Sweep 3.87 ms (1001 pts) CF Step 10.500000 MHz 5 Marker Table ۲ Auto Man Trace Scale Х Function Function Width Function Value Mode 2.402 900 GHz 2.400 000 GHz 2.390 000 GHz 2.310 000 GHz -8.074 dBm -44.64 dBm -44.53 dBm 1 2 3 NNN Freq Offset -49.69 dBm Local X Axis Scale N 2.388 095 GHz -42.66 dBm Log Lin モッペー? Dec 19, 2024 💬 X Signal Track Span Zoor DH5-Ant1-Hop 2402-PASS Spectrum Analyzer 1 Swept SA + Ö Frequency #Atten: 30 dB PNO: Fast µW Path: Standard Gate: Off IF Gain: Low Sig Track: Off Input Z: 50 Ω #Avg Type: Power (RMS 1 2 3 4 5 Avg|Hold: 1000/1000 Trig: Free Run KEYSIGHT Input: RF Center Frequency Settings Align: Auto 2.510000000 GHz Freq Ref: Int (S) рррррр DA Span 1 Spectrum Mkr4 2.528 88 GHz ۲ Ref LvI Offset 11.94 dB 80.000000 MHz -40.96 dBm Scale/Div 10 dB Ref Level 20.00 dBm Swept Span Zero Span Full Span Start Freq YYYYYYYYY DL1 -29.53 dE ₹4 2.470000000 GHz 2 A Transportation of the second seco Stop Freq 2.550000000 GHz AUTO TUNE #Video BW 300 kHz Stop 2.55000 GHz Sweep 3.00 ms (1001 pts) CF Step Start 2.47000 GHz #Res BW 100 kHz . 8.000000 MHz 5 Marker Table Auto Man Function Function Width Function Value Trace Scale Mode -9.532 dBm -49.55 dBm -45.06 dBm 2.472 00 GHz NNN Freg Offset 2.483 50 GHz 2.500 00 GHz Local -40.96 dBr Ν 2.528 88 GHz X Axis Scale Log Lin X Signal Track (Span Zoom) DH5-Ant1-Hop 2480-PASS

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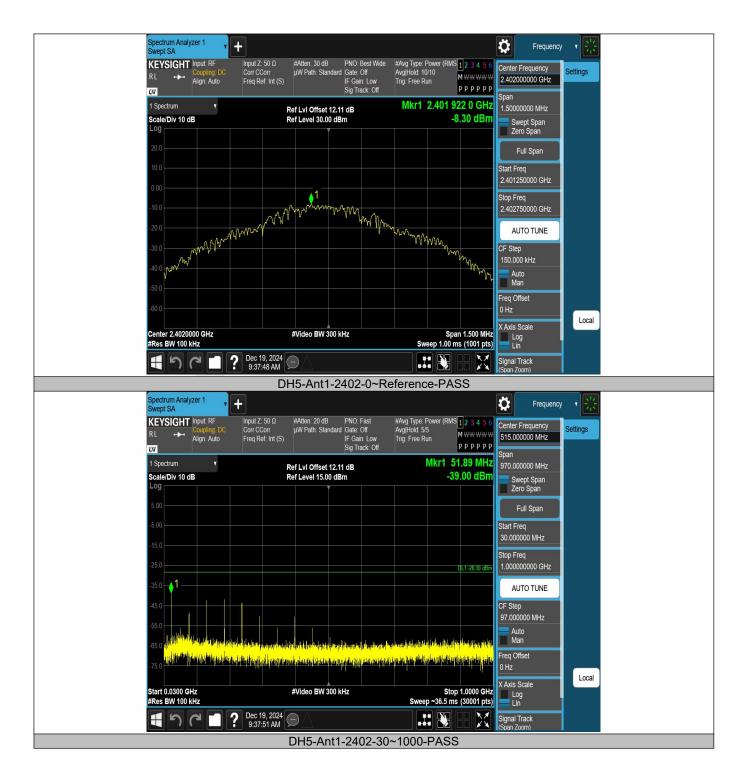
RefLevel Result FreqRange Limit TestMode Antenna Frequency[MHz] Verdict [MHz] [dBm] [dBm] [dBm] DH5 Ant1 2402 0~Reference -8.30 -8.30 PASS ---DH5 Ant1 2402 30~1000 -8.30 -39 ≤-28.3 PASS DH5 Ant1 2402 1000~26500 -8.30 -46.89 ≤-28.3 PASS DH5 Ant1 2441 0~Reference -9.31 -9.31 PASS DH5 2441 30~1000 ≤-29.31 PASS Ant1 -9.31 -39.15 DH5 Ant1 2441 1000~26500 -9.31 -46.99 ≤-29.31 PASS DH5 Ant1 2480 0~Reference -9.84 -9.84 PASS ---DH5 Ant1 2480 30~1000 -9.84 -39.31 ≤-29.84 PASS DH5 Ant1 2480 1000~26500 -9.84 -48.23 ≤-29.84 PASS





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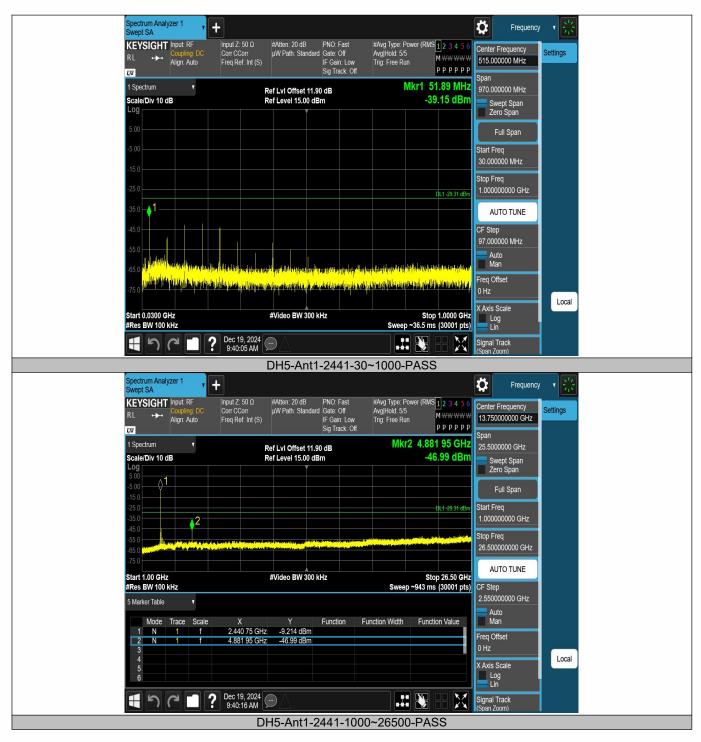


pectrum Analyzer 1 wept SA Ö + Frequency #Atten: 20 dB PNO: Fast µW Path: Standard Gate: Off IF Gain: Low Sig Track: Off #Avg Type: Power (RMS 1 2 3 4 5 (Input Z: 50 Ω Corr CCorr KEYSIGHT Input: RF Center Frequency Avg|Hold: 5/5 Trig: Free Run Settings Align: Auto MWWWW Freq Ref: Int (S) 13.750000000 GHz рррррр L)(I Span Mkr2 4.803 75 GHz 1 Spectrum 25.5000000 GHz V Ref LvI Offset 12.11 dB Ref Level 15.00 dBm Scale/Div 10 dB -46.89 dBm Swept Span Zero Span Full Span Start Freq L1-28.30 dE 1.00000000 GHz 12 Stop Freq 26.50000000 GHz AUTO TUNE Start 1.00 GHz #Video BW 300 kHz Stop 26.50 GHz #Res BW 100 kHz Sweep ~943 ms (30001 pts) CF Step 2.550000000 GHz 5 Marker Table ۲ Auto Man Mode Trace Scale Function Function Width Function Value 2.401 65 GHz -8 086 dBm N -req Offset 4.803 75 GHz -46.89 dBm Local X Axis Scale Log Lin € つ C I ? Dec 19, 2024 💬 X Signal Track (Span Zoom) DH5-Ant1-2402-1000~26500-PASS Spectrum Analyzer 1 Swept SA + Ö Frequency #Atten: 30 dB PNO: Best Wide #Avg Type: Power (RMS 1 2 3 4 5 . µW Path: Standard Gate: Off Avg|Hold: 10/10 IF Gain: Low Trig: Free Run P P P P P Input Z: 50 Ω KEYSIGHT Input: RF Center Frequency Settings Corr C Align: Auto Freq Ref: Int (S) 2.441000000 GHz рррррр DA ban 1 Spectrum Mkr1 2.440 937 0 GHz Ref LvI Offset 11.90 dB 1.5000000 MHz -9.31 dBm Scale/Div 10 dB Ref Level 30.00 dBm Swept Span Zero Span .og Full Span Start Freq 2.440250000 GHz ♦1 Stop Freq MMMMMMMMM 2.441750000 GHz Marin mmmmmmm AUTO TUNE CF Step . 150.000 kHz Auto Man Freq Offset Local X Axis Scale enter 2.4410000 GHz #Video BW 300 kHz Span 1.500 MHz Log Lin #Res BW 100 kHz Sweep 1.00 ms (1001 pts) う C² C² Pict 19, 2024 のの \mathbb{X} Signal Track (Span Zoom) DH5-Ant1-2441-0~Reference-PASS

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pectrum Analyzer 1 wept SA Ö + Frequency #Atten: 30 dB PNO: Best Wide #Avg Type: Power (RMS 1 2 3 4 5 6 µW Path: Slandard Gate. Off Avg[Hold: 10/10 IF Gain: Low Trig: Free Run Sig Track: Off P P P P Input Z: 50 Ω Corr CCorr KEYSIGHT Input: RF Center Frequency Settings Align: Auto Freq Ref: Int (S) 2.480000000 GHz рррррр L)(I Span Mkr1 2.480 004 5 GHz 1 Spectrum 1.50000000 MHz Ref LvI Offset 11.97 dB Ref Level 30.00 dBm Scale/Div 10 dB -9.84 dBm Swept Span Zero Span .00 Full Span Start Freq 2.479250000 GHz my Man My Many Many Stop Freq 2.480750000 GHz 1 WWW www.www AUTO TUNE CF Step 150.000 kHz Auto Man Freq Offset Local X Axis Scale Span 1.500 MHz Sweep 1.00 ms (1001 pts) Center 2.4800000 GHz #Res BW 100 kHz #Video BW 300 kHz Log Lin Dec 19, 2024 9:44:23 AM \mathbb{X} 4 h C 1 Signal Track an Zoo DH5-Ant1-2480-0~Reference-PASS Spectrum Analyzer 1 Swept SA + Ö Frequency #Atten: 20 dB PNO: Fast µW Path: Standard Gate: Off IF Gain: Low Sig Track: Off Input Z: 50 Ω #Avg Type: Power (RMS 1 2 3 4 5 Avg|Hold: 5/5 Trig: Free Run KEYSIGHT Input: RF Center Frequency Settings ++ Align: Auto Freq Ref: Int (S) 515.000000 MHz рррррр DA Span 1 Spectrum Mkr1 51.89 MHz Ref LvI Offset 11.97 dB 970.000000 MHz -39.31 dBm Scale/Div 10 dB Ref Level 15.00 dBm Swept Span Zero Span .og Full Span Start Freq 30.000000 MHz Stop Freq 1.000000000 GHz DL1 -29.84 dB AUTO TUNE CF Step . 97.000000 MHz Auto Man Freq Offset A the local data was a second second second shpal) li ta have parted by the stift of a state of the state of the part of the part of the state of the state of the st Local X Axis Scale tart 0.0300 GHz #Video BW 300 kHz Stop 1.0000 GHz Log Lin #Res BW 100 kHz Sweep ~36.5 ms (30001 pts) う C² C² Pict 19, 2024 の X Signal Track (Span Zoom) DH5-Ant1-2480-30~1000-PASS

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Spectrum Analyzer 1 Swept SA	+		Frequency	▼
KEYSIGHT Input: RF RL Image: Coupling: DC Align: Auto Align: Auto	Input Z: 50 Ω #Atten: 20 dB PNO: Fast Corr CCorr μW Path: Standard Gate: Off Freq Ref: Int (S) IF Gain: Loo		13.750000000 GHz	Settings
1,01	Sig Track: C	Off PPPPP	Span	
1 Spectrum v	Ref LvI Offset 11.97 dB	Mkr2 4.960 15 GHz	25.5000000 GHz	ĺ
Scale/Div 10 dB	Ref Level 15.00 dBm	-48.23 dBm	Swept Span	
Log			Zero Span	
-5.00 1			Full Span	
-25.0		DL1-29.84 dBn	Start Freq	
-35.0			1.000000000 GHz	
-45.0			Stop Freq	
-55.0	a para mandara a dinata di situ dan mandari kan dari kan mana mana di sami dan kana dan kana dan kana dan kana Mana dan mana mana mana mana mana mana ma		26.50000000 GHz	
-75.0				
	#Video BW 300 kHz	04-m 20 50 014	AUTO TUNE	
Start 1.00 GHz #Res BW 100 kHz	#VIGEO BW 300 KHZ	Stop 26.50 GH Sweep ~943 ms (30001 pts		
5 Marker Table v			2.550000000 GHz	
			Auto	
Mode Trace Scale		Function Width Function Value	Man Man	
1 N 1 f	2.479 85 GHz -10.03 dBm 4.960 15 GHz -48.23 dBm		Freq Offset	
3 1 1	4.500 T3 GHZ -46.25 UDII		0 Hz	
4			X Axis Scale	Local
5				
			Log Lin	
1 500	Pec 19, 2024 9:44:37 AM		Signal Track (Span Zoom)	
	DH5-Ant1-2480-1	000-26500 BASS		

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9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d), 15.205, 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02 According to IC RSS-Gen and RSS-247

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part15.205, Restricted bands								
MHz	MHz	MHz	GHz					
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15					
10.495-0.505	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	.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	123-138	2200-2300	14.47-14.5					
8.291-8.294	294 149.9-150.05 2310-		15.35-16.2					
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4					
8.37625-8.38675	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	(2)					
13.36-13.41								

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	estricted Frequency(MHz) Field Strength (µV/m)		Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	38-216 150 4		3
216-960	200	46	3
Above 960 500		54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

```
Span = wide enough to fully capture the emission being measured
```

RBW = 1 MHz

 $VBW \ge RBW$

Sweep = auto

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 E-mail: project@emtek.com.cn



Detector function = peak Trace = max hold For Below 1GHz: The EUT was placed on a turn table which is 0.8m above ground plane. Maximum procedure was performed on the highest emissions to ensure EUT compliance. Span = wide enough to fully capture the emission being measured RBW = 100 kHz for $VBW \ge RBW$ Sweep = auto Detector function = peak Trace = max hold For Below 30MHz: The EUT was placed on a turn table which is 0.8m above ground plane. Maximum procedure was performed on the highest emissions to ensure EUT compliance. Span = wide enough to fully capture the emission being measured RBW = 9kHz $VBW \ge RBW$ Sweep = auto Detector function = peak Trace = max hold For Below 150KHz: The EUT was placed on a turn table which is 0.8m above ground plane. Maximum procedure was performed on the highest emissions to ensure EUT compliance. Span = wide enough to fully capture the emission being measured RBW = 200Hz $VBW \ge RBW$ Sweep = auto Detector function = peak Trace = max hold Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT,

measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

9.7.5 **Test Results**

Spurious Emission below 30MHz (9KHz to 30MHz)

Temperature:	22° C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Freq.	Ant.Pol.		ssion BuV/m)	Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK È	AÝ	PK	AV	PK	AV

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =40log(Specific distance/ test distance)(dB); Limit line=Specific limits(dBuV) + distance extrapolation factor



Spurious Emission Above 1GHz (1GHz to 25GHz)

All the antenna(Antenna 1) and modes(GFSK, π /4-DQPSK, 8DPSK) mode have been tested, and the worst(Antenna 1, GFSK) result recorded was report as below:

Test mode:	GFS	K	Freque	ency:	cy: Channel 0: 2402MHz			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)		
	H/V	PK	AV	PK	AV	PK	AV	
10298.02	V	57.44	44.31	74.00	54.00	-16.56	-9.69	
11166.09	V	57.62	44.75	74.00	54.00	-16.38	-9.25	
11923.29	V	57.60	44.81	74.00	54.00	-16.40	-9.19	
14329.51	Н	57.29	43.92	74.00	54.00	-16.71	-10.08	
15510.50	Н	57.38	44.25	74.00	54.00	-16.62	-9.75	
17206.40	Н	57.78	44.74	74.00	54.00	-16.22	-9.26	

Test mode: GFSK Frequency: Channel 39: 2441MHz

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
11082.50	V	59.27	46.21	74.00	54.00	-14.73	-7.79
12401.31	V	59.57	46.72	74.00	54.00	-14.43	-7.28
13801.07	V	59.46	46.52	74.00	54.00	-14.54	-7.48
9000.32	Н	57.71	44.93	74.00	54.00	-16.29	-9.07
11044.12	Н	57.51	44.63	74.00	54.00	-16.49	-9.37
15854.99	Н	57.38	44.73	74.00	54.00	-16.62	-9.27

Test mode:	GFS	К	Frequer	Frequency: Channel 7		78: 2480MHz	
Freq.	Ant.Pol.	Emission Lev	el(dBuV/m) Limit 3m		(dBuV/m)	Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
8205.21	V	56.10	43.06	74.00	54.00	-17.90	-10.94
8591.09	V	56.23	43.32	74.00	54.00	-17.77	-10.68
12505.70	V	56.92	44.07	74.00	54.00	-17.08	-9.93
9688.75	Н	56.11	43.29	74.00	54.00	-17.89	-10.71
11868.27	Н	56.76	43.91	74.00	54.00	-17.24	-10.09
15668.21	Н	56.73	44.06	74.00	54.00	-17.27	-9.94

Note:

(1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).

(2) Emission Level= Reading Level+Correct Factor.

(3) Correct Factor= Ant_F + Cab_L - Preamp

(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All the antenna(Antenna 1) and modes(GFSK, π/4-DQPSK, 8DPSK, Hopping) mode have been tested, and the worst(Antenna 1, GFSK, Hopping) result recorded was report as below:

Test mode:	Fest mode: GFSK		cy: Ch	nannel 0: 2402MHz		
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	
2332.160	Н	43.58	74.00	30.81	54.00	
2385.832	V	43.47	74.00	30.38	54.00	

Fest mode: GFSK		Frequenc	cy: Ch	nannel 78: 2480MHz		
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	
2493.365	Н	43.41	74.00	30.57	54.00	
2491.700	V	43.21	74.00	30.30	54.00	

Test mode:	GFSK	Frequenc	су: Но	pping	
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2394.930	Н	45.93	74.00	33.14	54.00
2400.000	Н	46.35	74.00	33.42	54.00
2483.500	Н	47.04	74.00	33.25	54.00
2389.800	V	46.41	74.00	33.54	54.00
2400.000	V	46.82	74.00	34.05	54.00
2483.500	V	46.19	74.00	33.45	54.00

(1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz). Note:

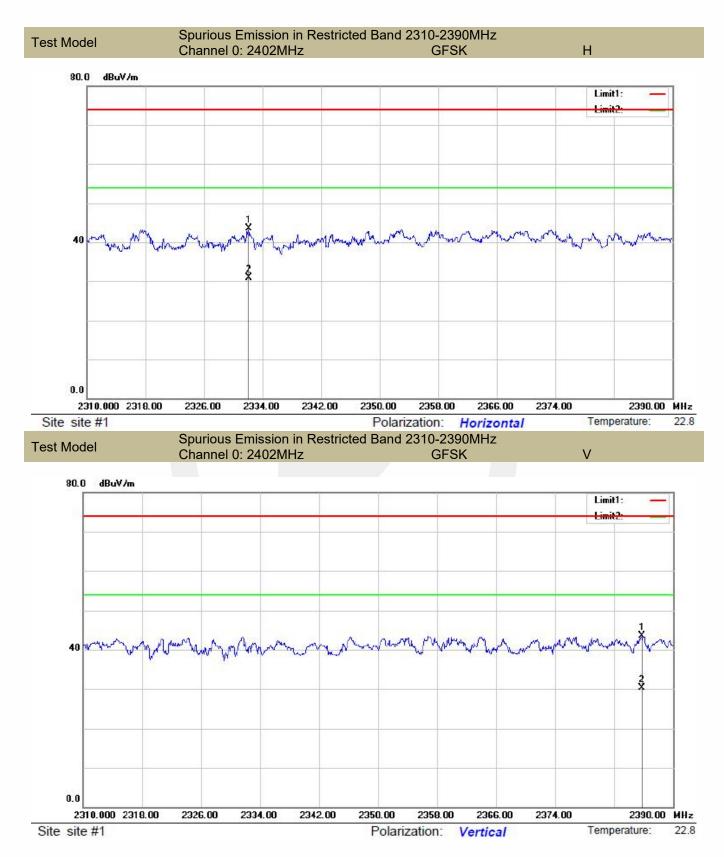
(2) Emission Level= Reading Level+Correct Factor.

(3) Correct Factor= Ant_F + Cab_L - Preamp

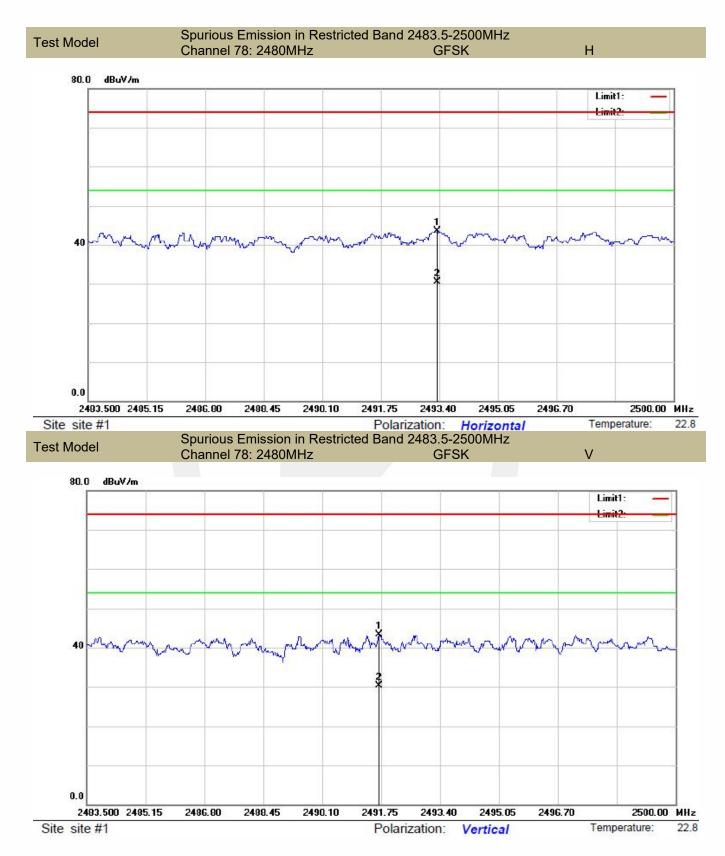
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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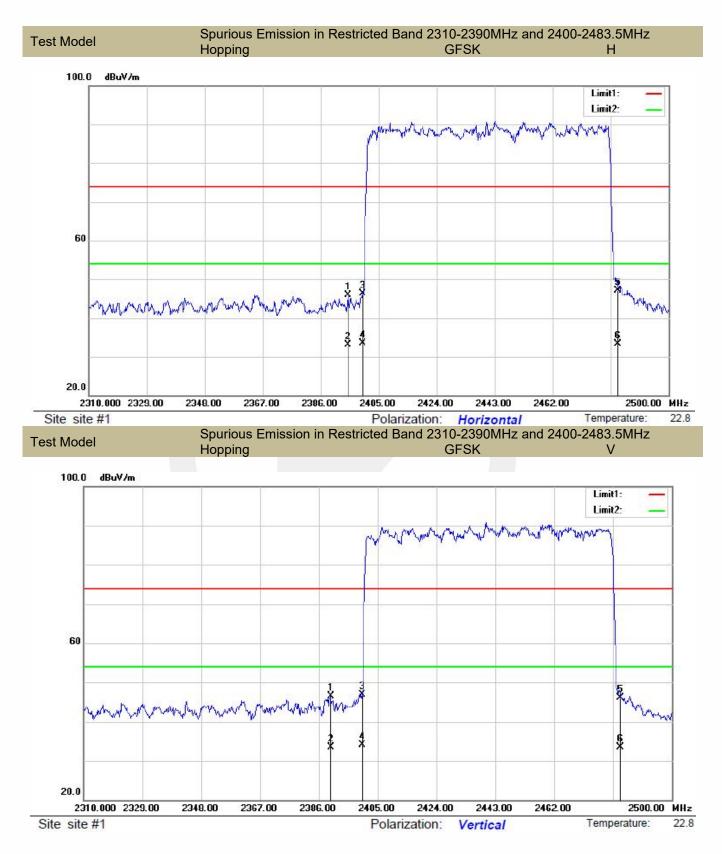








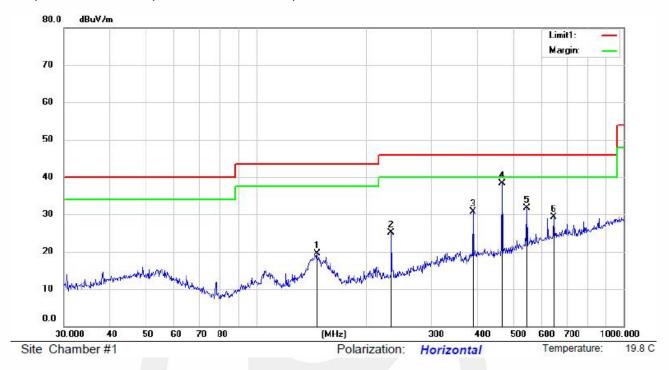






Spurious Emission below 1GHz (30MHz to 1GHz)

All the antenna(Antenna 1) and modes(GFSK, π /4-DQPSK, 8DPSK) mode have been tested, and the worst(Antenna 1, 8DPSK) result recorded was report as below:

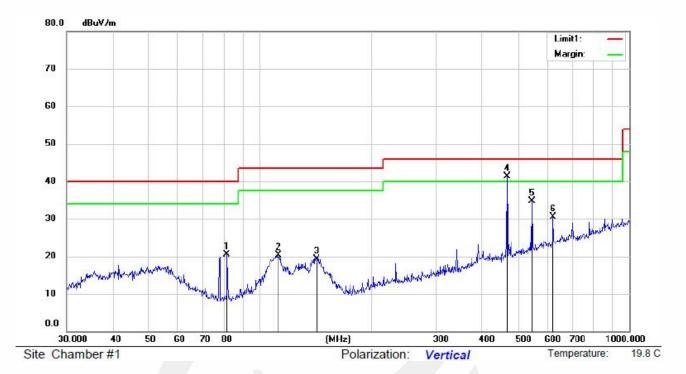


No.	Mk	. Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure- ment	Limit	Over		HI	Degree	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Commen
1		146.3735	40.40	8.43	30.64	1.41	19.60	43.50	-23.90	QP			
2		233.3487	40.86	12.53	30.18	1.99	25.20	46.00	-20.80	QP			
3		389.3550	<mark>41.0</mark> 9	16.02	29.82	3.42	30.71	46.00	-15.29	QP			
4	*	467.2350	48.07	17.21	29.81	2.75	38.22	46.00	-7.78	QP			
5		545.1826	39.66	18.79	29.88	3.09	31.66	46.00	-14.34	QP			
6		645.1195	35.14	20.81	30.02	3.42	29.35	46.00	-16.65	QP			

*:Maximum data x:Over limit I:over margin Operator: Ccyf

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No.	Mk	Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure- ment	Limit	Over		н	Degree	1
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Comment
1		81.4970	41.87	8.11	30.61	1.05	20.42	40.00	-19.58	QP			
2		112.5244	38.91	11.05	30.82	1.17	20.31	43.50	-23.19	QP			
3		142.3243	40.40	8.24	30.67	1.38	19.35	43.50	-24.15	QP			
4	*	467.2350	51.19	17.21	29.81	2.75	41.34	46.00	- <mark>4.66</mark>	QP			
5		545.1826	42.78	18.79	29.88	3.09	34.78	46.00	-11.22	QP			
6		622.8900	36.92	20.41	29.99	3.26	30.60	46.00	-15.40	QP			

*:Maximum data x:Over limit I:over margin Operator: Ccyf

Remark:

1. Measurement (dBµV/m) = Antenna Factor(dB) - Amp Factor(dB) + Cable Loss(dB) + Reading(dBµV/m)

2. Over (dB) = Measurement (dBµV/m) - Limit (dBµV/m)

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9.8 CONDUCTED EMISSION TEST

9.8.1 **Applicable Standard**

According to FCC Part 15.207 According to IC RSS-Gen 8.8

9.8.2 **Conformance Limit**

Conducted Emission Limit							
Frequency(MHz) Quasi-peak Average							
0.15-0.5	66-56	56-46					
0.5-5.0	56	46					
5.0-30.0 60 50							
Nates 4. The law on limit shall apply at i	he transition from to be						

Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

9.8.3 **Test Configuration**

Test according to clause 7.3 conducted emission test setup

9.8.4 **Test Procedure**

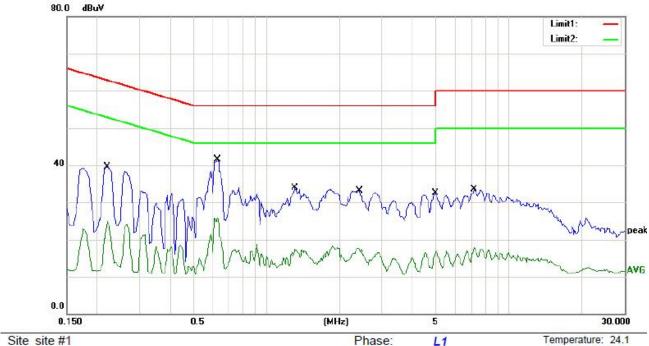
The EUT was placed on a table which is 0.8m above ground plane. Maximum procedure was performed on the highest emissions to ensure EUT compliance. Repeat above procedures until all frequency measured were complete.

9.8.5 **Test Results**

Pass

The AC120V &240V voltage have been tested, and the worst result recorded was report as below:





Site	SHE	# 1
~	0110	

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2200	39.60	0.00	39.60	62.82	-23.22	QP	
2		0.2200	24.87	0.00	24.87	52.82	-27.95	AVG	
3	*	0.6300	41.44	0.00	41.44	56.00	-14.56	QP	
4		0.6300	25.78	0.00	25.78	46.00	-20.22	AVG	
5		1.3100	33.90	0.00	33.90	56.00	-22.10	QP	
6		1.3100	17.59	0.00	17.59	46.00	-28.41	AVG	
7		2.4200	33.15	0.00	33.15	56.00	-22.85	QP	
8		2.4200	17.77	0.00	17.77	46.00	-28.23	AVG	
9		4.9700	32.46	0.00	32.46	56.00	-23.54	QP	
10		4.9700	16.95	0.00	16.95	46.00	-29.05	AVG	
11		7.1900	33.42	0.00	33.42	60.00	-26.58	QP	
12		7.1900	17.93	0.00	17.93	50.00	-32.07	AVG	

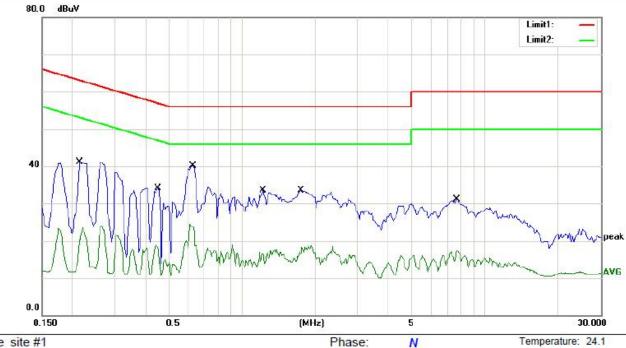
*:Maximum data

x:Over limit I:over margin Comment: Factor build in receiver.

Operator: Jian

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0.1		11.4
Site	CITO	111
One	SILC	$\pi 1$

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.2162	41.13	0.00	41. <mark>1</mark> 3	62.96	-21.83	QP	
2	0.2162	23.48	0.00	23.48	52.96	-29.48	AVG	
3	0.4500	34.17	0.00	34.17	56.88	-22.71	QP	
4	0.4500	18.88	0.00	18.88	46.88	-28.00	AVG	
5 *	0.6300	40.03	0.00	40.03	56.00	-15.97	QP	
6	0.6300	24.57	0.00	24.57	<u>46</u> .00	-21.43	AVG	
7	1.2200	33.51	0.00	33.51	56.00	-22.49	QP	
8	1.2200	16.88	0.00	16.88	46.00	-29.12	AVG	
9	1.7500	33.42	0.00	33.42	56.00	- <mark>22.58</mark>	QP	
10	1.7500	18.71	0.00	18.71	46.00	-27.29	AVG	
11	7.6800	31.18	0.00	31.18	60.00	-28.82	QP	
12	7.6800	17.33	0.00	17.33	50.00	-32.67	AVG	

*:Maximum data

x:Over limit I:over margin Comment: Factor build in receiver.

Operator: Jian

Remark:

1. Measurement (dBµV) = AMN Factor (dB) + Cable Loss (dB) + Reading (dBµV)

2. Over (dB) = Measurement (dB μ V) - Limit (dB μ V)

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9.9 ANTENNA APPLICATION

9.9.1 **Antenna Requirement**

Standard	Requirement
FCC CRF Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
FCC 47 CFR Part 15.247 (b)	If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
RSS-Gen Section 6.8	The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.
RSS-247 Section 5.4	If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

9.9.2 Result

PASS.

- Note: \checkmark Antenna use a permanently attached antenna which is not replaceable.
 - Not using a standard antenna jack or electrical connector for antenna replacement
 - The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached document Internal Photos to show the antenna connector.



Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	١	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

Detail of factor for radiated emission

*** End of Report ***

 余美市信測科技有限公司

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