

3.4.5 DEVIATION FROM TEST STANDARD No deviation.

3.4.6 TEST RESULTS



3.5 CHANNEL BANDWIDTH

3.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dBbandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.5.4 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.



3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 TEST RESULTS



3.6 HOPPING CHANNEL SEPARATION

3.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.6.4 TEST PROCEDURES

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
- 3. By using the MaxHold function record the separation of two adjacent channels.
- 4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
- 5. Repeat above procedures until all frequencies measured were complete.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.



3.6.6 TEST RESULTS

Please Refer to Appendix Of this test report.

3.7 MAXIMUM OUTPUT POWER

3.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 125mW.

3.7.2 TEST SETUP



3.7.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.7.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.



3.7.5 DEVIATION FROM TEST STANDARD No deviation.

3.7.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



3.7.7 TEST RESULTS

3.7.7.1 MAXIMUM PEAK OUTPUT POWER



3.7.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.



3.8 OUT OF BAND MEASUREMENT

3.8.1 LIMITS OF OUT OF BAND MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

3.8.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Spectrum Analyzer was set RBW to 100 kHz and VBW to 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. Detector = PEAK and Trace mode = Max Hold. The band edges was measured and recorded.

3.8.4 DEVIATION FROM TEST STANDARD

No deviation.

3.8.5 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.8.6 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



6 Appendix :BT 20DB EMISSION BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	0.858	2401.556	2402.414		
DH5	Ant1	2441	0.909	2440.562	2441.471		
	2480	0.843	2479.559	2480.402			
		2402	1.290	2401.361	2402.651		
2DH5	Ant1	2441	1.311	2440.340	2441.651		
		2480	1.314	2479.337	2480.651		
		2402	1.308	2401.343	2402.651		
3DH5	Ant1	2441	1.311	2440.343	2441.654		
		2480	1.305	2479.346	2480.651		



TEST GRAPHS



Huarui 7Layers High Technology
(Suzhou) Co., LtdTower N, Innovation Center, 88 Zhuyi Road, High-tech District,
Suzhou City, Anhui ProvinceTel: +86(0557) 368 1008



















OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	0.76006	2401.6230	2402.3831		
DH5	Ant1	2441	0.78628	2440.6059	2441.3922		
		2480	0.76305	2479.6153	2480.3784		
		2402	1.1919	2401.4021	2402.5940		
2DH5	Ant1	2441	1.1752	2440.4091	2441.5843		
		2480	1.1820	2479.4042	2480.5862		
		2402	1.1946	2401.4006	2402.5952		
3DH5	Ant1	2441	1.1727	2440.4145	2441.5872		
		2480	1.2037	2479.3923	2480.5960		



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(Suzhou) Co., LtdTower N, Innovation Center, 88 Zhuyi Road, High-tech District,
Suzhou City, Anhui ProvinceTel: +86(0557) 368 1008



















MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT

TestMode	Antenna	Frequency [MHz]	Average power [dBm]	Peak Power [dBm]	Peak power [mw]	Conducted Limit [dBm]	EIRP [dBm]	EIRP [mw]	EIRP Limit [dBm]	Verdict	Power Setting
		2402	11.73	11.98	15.78	≤20.97	12.11	16.26	≤36.00	PASS	Defult
DH5	DH5 Ant1	2441	11.63	11.84	15.28	≤20.97	11.97	15.74	≤36.00	PASS	Defult
	2480	10.68	11.18	13.12	≤20.97	11.31	13.52	≤36.00	PASS	Defult	
		2402	8.74	11.29	13.46	≤20.97	11.42	13.87	≤36.00	PASS	Defult
2DH5	Ant1	2441	8.55	11.08	12.82	≤20.97	11.21	13.21	≤36.00	PASS	Defult
		2480	8.54	10.95	12.45	≤20.97	11.08	12.82	≤36.00	PASS	Defult
		2402	8.82	11.28	13.43	≤20.97	11.41	13.84	≤36.00	PASS	Defult
3DH5	Ant1	2441	8.57	11.11	12.91	≤20.97	11.24	13.30	≤36.00	PASS	Defult
		2480	8.55	10.96	12.47	≤20.97	11.09	12.85	≤36.00	PASS	Defult
Note:EIRP=Peak Power+Gain											



CARRIER FREQUENCY SEPARATION

TEST RESULT

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Нор	0.988	≥0.909	PASS
2DH5	Ant1	Нор	1.156	≥0.876	PASS
3DH5	Ant1	Нор	1.136	≥0.874	PASS



TEST GRAPHS



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Suzhou City, Anhui ProvinceTel: +86(0557) 368 1008







TIME OF OCCUPANCY

TEST RESULT

TestMode	Antenna	Frequency[MHz]	BurstWidth	TotalHops	Result[s]	Limit[s]	Verdict
			[ms]	[Num]			
DH1	Ant1	Нор	0.377	320	0.121	≤0.4	PASS
DH3	Ant1	Нор	1.633	160	0.261	≤0.4	PASS
DH5	Ant1	Нор	2.880	106.67	0.307	≤0.4	PASS
2DH1	Ant1	Нор	0.384	320	0.123	≤0.4	PASS
2DH3	Ant1	Нор	1.635	160	0.262	≤0.4	PASS
2DH5	Ant1	Нор	2.883	106.67	0.308	≤0.4	PASS
3DH1	Ant1	Нор	0.385	320	0.123	≤0.4	PASS
3DH3	Ant1	Нор	1.635	160	0.262	≤0.4	PASS
3DH5	Ant1	Нор	2.887	106.67	0.308	≤0.4	PASS

NOTE: TotalHops =[1600/(Send and receive Number*79)]*0.4*79;

Send and receive Number : DH1/2DH1/3DH1=2; DH3/2DH3/3DH3=4; DH5/2DH5/3DH5=6



TEST GRAPHS



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(Suzhou) Co., LtdTower N, Innovation Center, 88 Zhuyi Road, High-tech District,
Suzhou City, Anhui ProvinceTel: +86(0557) 368 1008







Keysight Spectrum Analyzer - Swept SA L RF 50 Ω AC	SENSE:INT	ALIGN AUTO 10:01:34 AM Nov 1	8, 2023 Frequency	
Center Freq 2.441000000 GH	Trig Delay-2.000 ms #Avg	Type: RMS TRACE	3456 Frequency	
IF	Sain:Low #Atten: 40 dB	DET P P	Auto Tune	
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			Scale Type	
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() RL RF 50Ω AC Contor From 2 444000000 CH	SENSE:INT	ALIGN AUTO 09:58:05 AM Nov 1 Type: RMS TRACE	8, 2023 Frequency	
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			IRIG LVL	
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0.00			2.441000000 GHz	
+10.0			Stop Freq	
-20.0			2.441000000 GHz	
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		1.1		
	3DH1_Ant1_	Hop		



Keysight Spectrum Analyzer - Swept SA	SENSE:INT ALIGN AUTO	0 10:04:10 AM Nov 18, 2023		
Center Freq 2.441000000 GHz	Trig Delay-2.000 ms #Avg Type: RMS Trig: Video	TRACE 1 2 3 4 5 6 TYPE WWW.FMMM	Frequency	
IFGain:Low	#Atten: 40 dB		Auto Tupe	
Ref Offset 11.22 dB		ΔMKr2 385.0 μs 10.24 dB		
Log				
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2Δ1		TRIGLYL	44100000 3112	
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-10.0			Stop Freq	
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			Scale Type	
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Res BW 1.0 MHz #VB	N 3.0 MHz Sweep	10.13 ms (8000 pts)		
MSG	[<mark> </mark> ₀sta	TUS		
	3DH3 Ant1 Hop			
Keysight Spectrum Analyzer - Swept SA	SENSE:INT ALIGN AUTO	0 10:04:40 AM Nov 18, 2023		
Center Freq 2.441000000 GHz	Trig Delay-2.000 ms #Avg Type: RMS Trig: Video	TRACE 1 2 3 4 5 6 TYPE WWWWWWW	Frequency	
IFGain:Low	#Atten: 40 dB		Auto Tune	
Ref Offset 11.22 dB		ΔMkr2 1.635 ms 5.28 dB	Auto Func	
Log				
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