Report No.: STR210706002001E



ilac-MR/

ACCREDITED



EUT:		5G Smart	Phone	N	lodel No.:		GQ5	5002		
Temperatu	ıre:	<b>20</b> ℃		R	elative Humic	dity:	48%	%		
Test Mode	:	Mode2/Mo	ode3/Mode	4 Т	Test By: Mukzi Lee					
All the mod	lulation r	nodes hav	e been tes	ted, and	the worst res	ult was	repo	ort as belo	ow:	
Frequency	Read Level	Cable loss	Antenna Factor	Pream Factor	Emission Level	Limit	s	Margin	Remark	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµV/	′m)	(dB)		
4804	70.35	5.21	35.59	44.30	66.85	74.00	C	-7.15	Pk	Vertical
4804	46.44	5.21	35.59	44.30	42.94	54.00	0	-11.06	AV	Vertical
7206	69.56	6.48	36.27	44.60	67.71	74.00	0	-6.29	Pk	Vertical
7206	45.19	6.48	36.27	44.60	43.34	54.00	0	-10.66	AV	Vertical
4804	70.15	5.21	35.55	44.30	66.61	74.00	0	-7.39	Pk	Horizontal
4804	50.2	5.21	35.55	44.30	46.66	54.00		-7.34	AV	Horizontal
7206	68.31	6.48	36.27	44.52	66.54	74.00	C	-7.46	Pk	Horizontal
7206	49.2	6.48	36.27	44.52	47.43	54.00	0	-6.57	AV	Horizontal
			Mid Chan	nel (244	1 MHz)(GFSK)-	-Above 2	1G			
4882	69.94	5.21	35.66	44.20	66.61	74.00	C	-7.39	Pk	Vertical
4882	45.44	5.21	35.66	44.20	42.11	54.00	0	-11.89	AV	Vertical
7323	69.41	7.10	36.50	44.43	68.58	74.00	0	-5.42	Pk	Vertical
7323	46.68	7.10	36.50	44.43	45.85	54.00	0	-8.15	AV	Vertical
4882	69.16	5.21	35.66	44.20	65.83	74.00	C	-8.17	Pk	Horizontal
4882	46.01	5.21	35.66	44.20	42.68	54.00	0	-11.32	AV	Horizontal
7323	70.12	7.10	36.50	44.43	69.29	74.00	0	-4.71	Pk	Horizontal
7323	50.16	7.10	36.50	44.43	49.33	54.00	C	-4.67	AV	Horizontal
			High Char	nel (248	0 MHz)(GFSK)	Above	1G			
4960	68.36	5.21	35.52	44.21	64.88	74.00	0	-9.12	Pk	Vertical
4960	47.23	5.21	35.52	44.21	43.75	54.00	D	-10.25	AV	Vertical
7440	69.49	7.10	36.53	44.60	68.52	74.00	D	-5.48	Pk	Vertical
7440	49.12	7.10	36.53	44.60	48.15	54.00	D	-5.85	AV	Vertical
4960	68	5.21	35.52	44.21	64.52	74.00	C	-9.48	Pk	Horizontal
4960	45.62	5.21	35.52	44.21	42.14	54.00	D	-11.86	AV	Horizontal
7440	68.47	7.10	36.53	44.60	67.50	74.00	C	-6.50	Pk	Horizontal
7440	47.7	7.10	36.53	44.60	46.73	54.00	C	-7.27	ΔV	Horizonta

Note:

(1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor (2)All other emissions more than 20dB below the limit.



EUT:	5G Smart	Phone		Mo	Model No.:			GQ5002		
emperature:	<b>20</b> ℃			Re	lative Humidi	tv:	48%			
Test Mode:	Mode2/ M	lode4		Те	Test By: Mukzi Lee					
All the modul	lation mod	es have	heen test	ed and	the worst res	ult wa	s ren	ort as he	low:	
Frequency	Meter Reading	Cable Loss	Antenna Factor	Pream Factor	Emission Level	Lim	its	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ\	//m)	(dB)	Туре	
	<u>1</u> Mbr				FSK)-Non-hop	ping	,	( )	,,	
2310.00	68.63	2.97	27.80	43.80	55.60	74	L	-18.40	Pk	Horizonta
2310.00	50.2	2.97	27.80	43.80	37.17	54	Ļ	-16.83	AV	Horizonta
2310.00	68.79	2.97	27.80	43.80	55.76	74	Ļ	-18.24	Pk	Vertical
2310.00	49.35	2.97	27.80	43.80	36.32	54	Ļ	-17.68	AV	Vertical
2390.00	69.86	3.14	27.21	43.80	56.41	74	Ļ	-17.59	Pk	Vertical
2390.00	47.95	3.14	27.21	43.80	34.50	54	Ļ	-19.50	AV	Vertical
2390.00	70.95	3.14	27.21	43.80	57.50	74	Ļ	-16.50	Pk	Horizonta
2390.00	45.38	3.14	27.21	43.80	31.93	54	Ļ	-22.07	AV	Horizonta
2483.50	69.16	3.58	27.70	44.00	56.44	74	L I	-17.56	Pk	Vertical
2483.50	45.68	3.58	27.70	44.00	32.96	54	Ļ	-21.04	AV	Vertical
2483.50	69.19	3.58	27.70	44.00	56.47	74	Ļ	-17.53	Pk	Horizonta
2483.50	46.32	3.58	27.70	44.00	33.60	54	Ļ	-20.40	AV	Horizonta
	1			1Mbps	(GFSK)-hoppir	้าต				
2310.00	70.65	2.97	27.80	43.80	57.62	74	L	-16.38	Pk	Vertical
2310.00	46.1	2.97	27.80	43.80	33.07	54	Ļ	-20.93	AV	Vertical
2310.00	69.11	2.97	27.80	43.80	56.08	74	Ļ	-17.92	Pk	Horizonta
2310.00	45.92	2.97	27.80	43.80	32.89	54	Ļ	-21.11	AV	Horizonta
2390.00	70.86	3.14	27.21	43.80	57.41	74	Ļ	-16.59	Pk	Vertical
2390.00	45.31	3.14	27.21	43.80	31.86	54	Ļ	-22.14	AV	Vertical
2390.00	70.69	3.14	27.21	43.80	57.24	74	ŀ	-16.76	Pk	Horizonta
2390.00	48.69	3.14	27.21	43.80	35.24	54	ŀ	-18.76	AV	Horizonta
2483.50	69.25	3.58	27.70	44.00	56.53	74	L I	-17.47	Pk	Vertical
2483.50	49.41	3.58	27.70	44.00	36.69	54	ŀ	-17.31	AV	Vertical
2483.50	69.52	3.58	27.70	44.00	56.80	74	ŀ	-17.20	Pk	Horizonta
2483.50	46.15	3.58	27.70	44.00	33.43	54	Ļ	-20.57	AV	Horizonta

Note: (1) All other emissions more than 20dB below the limit.



FUT.	5G S	mart Ph	one		Mode	I No ·		GOS	002		
Tomor or other	20.00	martin			Delet			499/			
remperature:	20 0				Relat						
Test Mode:	Mode	e2/ Mode	e4		Test I	est By: Mukzi Lee					
All the modula	ation mode	es have	been teste	ed, a	ind the	e worst res	ult wa	s repo	ort as bel	ow:	
Frequency	Reading Level	Cable Loss	Antenna Factor	Pre Fa	eamp actor	Emission Level	Lir	nits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	dB/m	(0	dB)	(dBµV/m)	(dBµ	ıV/m)	(dB)	Туре	
3260	70.31	4.04	29.57	44	4.70	59.22	7	'4	-14.78	Pk	Vertical
3260	47.98	4.04	29.57	44	4.70	36.89	5	54	-17.11	AV	Vertical
3260	70.89	4.04	29.57	44	4.70	59.80	7	'4	-14.20	Pk	Horizontal
3260	50.75	4.04	29.57	44	4.70	39.66	5	54	-14.34	AV	Horizontal
3332	68.48	4.26	29.87	44	4.40	58.21	7	'4	-15.79	Pk	Vertical
3332	48.35	4.26	29.87	44	4.40	38.08	5	54	-15.92	AV	Vertical
3332	69.15	4.26	29.87	44	4.40	58.88	7	'4	-15.12	Pk	Horizontal
3332	47.4	4.26	29.87	44	4.40	37.13	5	54	-16.87	AV	Horizontal
17797	51.39	10.99	43.95	43	3.50	62.83	7	'4	-11.17	Pk	Vertical
17797	31.23	10.99	43.95	43	3.50	42.67	5	64	-11.33	AV	Vertical
17788	57.74	11.81	43.69	44	4.60	68.64	7	'4	-5.36	Pk	Horizontal
17788	38.42	11.81	43.69	44	4.60	49.32	5	54	-4.68	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.



## 7.3 NUMBER OF HOPPING CHANNEL

#### 7.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) (iii)and ANSI C63.10-2013

#### 7.3.2 Conformance Limit

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

#### 7.3.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.3.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.3.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.3

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = the frequency band of operation

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.

 $VBW \ge RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

#### 7.3.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode 5(1Mbps)	Test By:	Mukzi Lee



## 7.4 HOPPING CHANNEL SEPARATION MEASUREMENT

#### 7.4.1 Applicable Standard

According to FCC Part 15.247(a)(1) and ANSI C63.10-2013

#### 7.4.2 Conformance Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band shall have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

#### 7.4.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.4.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.4.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.2

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Measurement Bandwidth or Channel Separation

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.

VBW ≥ RBW Sweep = auto

Detector function = peak Trace = max hold

#### 7.4.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mukzi Lee

## 7.5 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

#### 7.5.1 Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and ANSI C63.10-2013

#### 7.5.2 Conformance Limit

The average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channels employed.

#### 7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.5.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.4 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel RBW  $\geq$  1MHz VBW  $\geq$  RBW Sweep = as necessary to capture the entire dwell time per hopping channel Detector function = peak Trace = max hold Measure the maximum time duration of one single pulse. Set the EUT for DH5, DH3 and DH1 packet transmitting. Measure the maximum time duration of one single pulse.



#### 7.5.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mukzi Lee

Test data reference attachment.

Note:

A Period Time = (channel number)\*0.4

DH1 Dwell time: Reading \* (1600/2)\*31.6/(channel number) DH3 Dwell time: Reading \* (1600/4)\*31.6/(channel number) DH5 Dwell time: Reading \* (1600/6)\*31.6/(channel number)

For Example:

- 1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to  $(1600 / 6 / 79) \times (0.4 \times 79) = 106.67$  hops.
- 2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s), Hops Over Occupancy Time comes to  $(800 / 6 / 20) \times (0.4 \times 20) = 53.33$  hops.
- 3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time



## 7.6 20DB BANDWIDTH TEST

## 7.6.1 Applicable Standard

According to FCC Part 15.247(a)(1) and ANSI C63.10-2013

#### 7.6.2 Conformance Limit

No limit requirement.

#### 7.6.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.6.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.6.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 6.9.2 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT was operating in controlled its channel. Use the following spectrum analyzer settings: Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW  $\geq$  1% of the 20 dB bandwidth VBW  $\geq$  RBW Sweep = auto Detector function = peak Trace = max hold

#### 7.6.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mukzi Lee



## 7.7 **PEAK OUTPUT POWER**

## 7.7.1 Applicable Standard

According to FCC Part 15.247(b)(1) and ANSI C63.10-2013

## 7.7.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

#### 7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.7.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.5.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

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

 $RBW \ge the 20 dB$  bandwidth of the emission being measured

 $VBW \ge RBW$ 

Sweep = auto

Detector function = peak Trace = max hold

#### 7.7.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mukzi Lee



## 7.8 CONDUCTED BAND EDGE MEASUREMENT

#### 7.8.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2013

#### 7.8.2 Conformance 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 shal 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 power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).

#### 7.8.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.8.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.8.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.6.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

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

- RBW = 100 KHz
- VBW = 300KHz

Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.

Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

Repeat above procedures until all measured frequencies were complete.

#### 7.8.6 Test Results

EUT:	5G Smart Phone	Model No.:	GQ5002
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2 /Mode4/ Mode 5	Test By:	Mukzi Lee



## 7.9 SPURIOUS RF CONDUCTED EMISSION

## 7.9.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2013.

## 7.9.2 Conformance 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 power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).

#### 7.9.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

## 7.9.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.9.5 Test Procedure

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.

- b) Set the RBW = 100 kHz.
- c) Set the VBW  $\geq$  [3 × RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level. Then the limit shall be attenuated by at least 20 dB relative to the maximum

amplitude level in 100 kHz.

## 7.9.6 Test Results

Remark: The measurement frequency range is from 30MHzHz to the 10th harmonic of the fundamenta frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.



## 7.10 ANTENNA APPLICATION

## 7.10.1 Antenna Requirement

15.203 requirement: For intentional device, according to 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.

#### 7.10.2 Result

The EUT antenna is permanent attached PIFA antenna (Gain: 0.3dBi). It comply with the standard requirement.



#### 7.11 FREQUENCY HOPPING SYSTEM (FHSS) EQUIPMENT REQUIREMENTS 7.11.1 Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. (g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this sectior (h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

## 7.11.2 Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule. This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock. Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with an bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for FCC Part 15.247 rule.

## 7.11.3 EUT Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below: Channel: 08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45 etc.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.



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## 8 TEST RESULTS

## 8.1 DWELL TIME

Condition	Mode	Frequency	Pulse Time	Total Dwell	Period Time	Limit	Vordict			
Condition	NIUUE	(MHz)	(ms)	Time (ms)	(ms)	(ms)	veruici			
NVNT	1-DH1	2441	0.366	117.12	31600	400	Pass			
NVNT	1-DH3	2441	1.625	260	31600	400	Pass			
NVNT	1-DH5	2441	2.872	306.347	31600	400	Pass			
NVNT	2-DH1	2441	0.375	120	31600	400	Pass			
NVNT	2-DH3	2441	1.63	260.8	31600	400	Pass			
NVNT	2-DH5	2441	2.872	306.347	31600	400	Pass			
NVNT	3-DH1	2441	0.378	120.96	31600	400	Pass			
NVNT	3-DH3	2441	1.63	260.8	31600	400	Pass			
NVNT	3-DH5	2441	2.872	306.347	31600	400	Pass			





















Size TRG/VID     In the first of the first o	Ref Level         27.78 dBm         Of           Att         40 dB         8 N	fset 7.78 dB — RBW 1 M VT 8 ms — VRW 1 M	IHz IHz		<u> </u>	
B a b k Clw       -3.19 dbm         20 dbm       0111       -3.9 dbm         20 dbm       0111       2.87200 ms         0 dbm       0100 ms       0111       2.87200 ms         20 dbm       000 ms       0111       2.87200 ms         20 dbm       000 ms       0100 ms       0100 ms       0100 ms         20 dbm       000 ms       0100 ms       800.0 ps/       0100 ms         20 dbm       000 ms       0100 pts       800.0 ps/       0100 ms       0100 ms         20 dbm       000 pts       400 ms       1000 pts       800.0 ps/         20 dbm       1000 pts       8000.0 ps/       0100 pts       800.0 ps/         20 dbm       1000 pts       900.0 ps/       01111       2.002 ms         20 dbm       00 ms       01111       2.002 ms       0.000 ms         20 dbm       00 ms       01111       2.002 ms       0.000 ms         20 dbm       00 ms       01111       2.002 ms       0.000 ms						
20 dBm       0111       -0.42 dB         10 dBm       0111       -0.42 dB         0 dBm       0111       -0.42 dB         0 dBm       0111       -0.42 dB         -10 dBm       0111       -0.42 dB         -10 dBm       0111       -0.42 dB         -10 dBm       0111       -0.42 dB         -20 dBm       0111       -0.42 dB         -10 dBm       0111       -0.42 dB         -20 dBm       0111       -0.42 dB         -20 dBm       0111       -0.42 dB         -30 dBm       0111       -0.42 dB         -30 dBm       0111       -0.42 dB         -50 dBm       0111       -0.42 dB         -50 dBm       0111       -0.42 dB         -50 dBm       0111       2.072 ms         -70 dBm       Offset 7.78 dB       RBW 1 M42         Att       40 dB       SWT         -50 dBm       0111       -0.42 dB         -10 dBm       0111       -1.82 dB         -10 dBm       0111       <	●1Pk Clrw		M1[1]		-2.10 dBm	
10 dbm       D1[1]       -0.42 db         0 dbm       41       2.97200 ms         0 dbm       41       2.97200 ms         10 dbm       10 dbm       10 dbm         20 dbm       10 dbm       10 dbm         30 dbm       10 dbm       10 dbm         30 dbm       10 dbm       10 dbm         30 dbm       10 dbm       10 dbm         50 dbm       10 dbm       10 dbm         50 dbm       10 dbm       10 dbm         50 dbm       10 dbm       10 dbm         60 dbm       10 dbm       10 dbm         70 dbm       11 dbm       10 dbm         70 dbm       11 dbm       10 dbm         70 dbm       0ffset 7.78 dbm       10 dbm         70 dbm       11 dbm       2.00 gbm         10 dbm       11 dbm       2.00 g	20 dBm		MILI		16.00 µs	
10 dBm 41 0 dBm 41 10 dBm 41 41 41 41 41 41 41 41 41 41			D1[1]		-0.42 dB	
0 dBm M1 A1 A2	10 dBm				2.07200 ms	
10 dbm       100 lbm	0 dBm M1	and duling and distance and distance and	. <u></u>			
Control         Control <t< td=""><td>-10 dBm</td><td>Anna</td><td>· 🛧</td><td></td><td></td></t<>	-10 dBm	Anna	· 🛧			
20 dbm         TRG         -20.020 dbm						
-30 dBm						
Ly well with         Ly well with a structure of the struct	-30 dBm				12	
-50 dBm       -60 dBm	12 1 Tradition March		An entropy of the particular of the second s	a have the property of the second	upprostaptic	
50 dBm       -50 dBm       -60 dBm       -1.62 dB	Westernet Teleford and		The second se	1	· · · · ·	
-60 dBm -70 dBm -70 dBm -70 dBm M1 1 1 1 16.0 μs -7.19 dBm M1 1 2.872 ms -0.42 dB DUwell NVNT 3-DH1 2441MHz Duwell NVNT 3-DH1 2441MHz Spectrum Ref Level 27.78 dBm 0 dBm 20 dBm -10 dBm -	-50 dBm					
70 dBm       1001 pts       800.0 µs/         GF 2.441 GHz       1001 pts       800.0 µs/         Marker       1       16.0 µs       -3.19 dBm       Function         Type Ref Trc       X-value       Y-value       Function       Function Result         D1       M1       1       2.872 ms       -0.42 dB       Porto         Dwell NVNT 3-DH1 2441MHz         Spectrum         Ref Level 27.78 dB       RBW 1 MHz         Att       40 dB       SWT       3 ms       VBW 1 MHz         Solution offset 7.78 dB       RBW 1 MHz         Odd Bm       2.00 µs         0.03 dBm       2.00 µs         Odd Bm       <	-60 dBm					
CF 2.441 GHz       1001 pts       1001 pts       800.0 µs/         Marker       Trc       X-value       Function       Function Result         M1       1       16.0 µs       -3.19 dbm       Function Result       1001 pts         D1       M1       1       2.872 ms       -0.42 dB       Ports       1001 pts         Dwell NVNT 3-DH1 2441MHz         Spectrum         Ref Level 27.78 dB< RBW 1 MHz	<td>-70 dBm</td> <td></td> <td></td> <td></td> <td></td>	-70 dBm				
Marker           Type         Ref         Trc         X-value         Y-value         Function         Function           D1         1         1         16.0 µs         -3.19 dbm         Function         Function Result           D1         M1         1         2.872 ms         -0.42 db         Function         Function Result           Dwell NVNT 3-DH1 2441MHz           Spectrum           Ref Level 27.78 db         RBW 1 MHz           SGL TRG:VID         SWT         3 ms         YBW 1         YBW         SUB         SUB <td>CF 2.441 GHz</td> <td>1</td> <td>001 pts</td> <td>1</td> <td>800.0 µs/</td>	CF 2.441 GHz	1	001 pts	1	800.0 µs/	
Mi         1 <th1< th="">         1         <th1< th=""> <th1< th=""></th1<></th1<></th1<>	Marker	value   v_uslu	e Function	Function Peculi		
01       M1       1       2.872 ms       -0.42 dB         Dwell NVNT 3-DH1 2441MHz         Dwell NVNT 3-DH1 2441MHz         Ref Level 27.78 dBm       Offset 7.78 dB       RBW 1 MHz         Att       40 dB       SWT       3 ms       VBW 1 MHz         SGL TRG: VID         0.03 dBm         0.03 dBm         0.03 dBm         0.020 dBm         -0.020 dBm         -0.020 dBm         -0.020 dBm         -0 dBm      <	M1 1	16.0 µs -3.19	9 dBm	T unction Result		
Production of the second seco	D1 M1 1	2.872 ms -0.4	42 dB			
1Pk Clrw       M1[1]       0.03 dBm         20 dBm       D1[1]       -1.82 dB         10 dBm       M1       378.00 µs         0 dBm       M1       378.00 µs         -10 dBm       TRG       -10.020 dBm         -20 dBm       -10.020 dBm       -10.020 dBm         -30 dBm       -10.020 dBm       -10.020 dBm         -20 dBm       -10.020 dBm       -10.020 dBm         -50 dBm       -10.020 dBm       -10.020 dBm         -70 dBm       -10.020 dBm       -10.020 dBm         -70 dBm       -10.020 dBm       -10.020 dBm         -70 dBm       -10.020 dBm       -1.020 µs         -70 dBm       -1.020 µs       0.03 dBm         -70 dBm       -1.020 µs       -1.020 µs         -10 M1       1       378.0 µs <t< th=""><th>Spectrum Ref Level 27.78 dBm Of</th><th><b>Dwell NVNT</b> fset 7.78 dB <b>e RBW</b> 1 M</th><th>3-DH1 2441MH:</th><th>Z</th><th></th></t<>	Spectrum Ref Level 27.78 dBm Of	<b>Dwell NVNT</b> fset 7.78 dB <b>e RBW</b> 1 M	3-DH1 2441MH:	Z		
20 dBm     M1[1]     0.03 dBm       2.00 µs     2.00 µs       10 dBm     01[1]     -1.82 dB       0 dBm     M1     0       -10 dBm     TRG     -10.020 dBm       -20 dBm     -10       -30 dBm     -10       -20 dBm     -100       -20 dBm     -1.82 dB	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG: VID         SU         SU	Dwell NVNT           fset         7.78 dB         • RBW         1 M           vr         3 ms         • vBw         1 M	3-DH1 2441MH:	Z		
D1[1]     -1.82 dB       10 dBm     M1       0 dBm     M1       -10 dBm     TRG       -20 dBm     -10       -30 dBm     -10       -50 dBm     -10       -50 dBm     -10       -70 dBm     -1001 pts       -70 dBm     -1001 pts       -70 dBm     -1001 pts       -101 pt     -1.82 dB	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG:VID           1Pk Clrw	Dwell NVNT fset 7.78 dB • RBw 1 M vT 3 ms • vBw 1 M	3-DH1 2441MH:	Z		
10 dBm     M1	Spectrum Ref Level 27.78 dBm Of Att 40 dB SV SGL TRG:VID 1Pk Cirw 20 dBm	Dwell NVNT fset 7.78 dB • RBw 1 M vT 3 ms • VBW 1 M	3-DH1 2441MH:	Z	□.03 dBm 2.00 us	
0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -60 dBm -60 dBm -60 dBm -60 dBm -10 d	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG: VID         91Pk Clrw         91000000000000000000000000000000000000	Dwell NVNT	3-DH1 2441MH:	Z	0.03 dBm 2.00 μs -1.82 dB	
-10 dBm       TRG       -10.020 dBm       Image: the second se	Spectrum Ref Level 27.78 dBm Of Att 40 dB SV SGL TRG: VID 1Pk Clrw 20 dBm 10 dBm	Dwell NVNT	3-DH1 2441MH:	z	(⊥) 0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
-20 dBm -30 dBm -30 dBm -50 dBm -50 dBm -50 dBm -60 dBm -60 dBm -70 dBm -7	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         5V           SGL         TRG: VID         10 dBm         10 dBm           10 dBm         0 dBm         10 dBm         10 dBm	Dwell NVNT	3-DH1 2441MH:	z	0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
-20 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -60 dBm -60 dBm -60 dBm -70	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         10 dBm           10 dBm         0 dBm         0 dBm	Dwell NVNT	3-DH1 2441MH:	z	0.03 dBm 2.00 μs -1.82 dB 378.00 μs	
-30 dBm -50 dBm -50 dBm -60 dBm -60 dBm -60 dBm -60 dBm -60 dBm -70 dBm -7	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         9 1Pk Clrw           20 dBm         10 dBm         10 dBm           10 dBm         710 dBm         10.020 dBm	Dwell NVNT	3-DH1 2441MH:	Z	0.03 dBm 2.00 μs -1.82 dB 378.00 μs	
Image: state	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         IV           1Pk Clrw         20 dBm         IV           10 dBm         0 dBm         IV           -10 dBm         TRG         -10.020 dBm           -20 dBm         IV         IV	Dwell NVNT	3-DH1 2441MH:	Z	( 	
Image: Constraint of the second of	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB • SV           SGL TRG: VID         •1Pk           •1Pk Clrw         20 dBm           10 dBm         0           •10 dBm         0           •20 dBm         -10.020 dBm           •30 dBm         -30 dBm	Dwell NVNT	3-DH1 2441MH:	Z	0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
-50 dBm -60 dBm -70	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         91Pk Cirw           20 dBm         10 dBm         10 dBm           10 dBm         70 dBm         70 dBm           -10 dBm         TRG         -10.020 dBm           -30 dBm         -30 dBm         -30 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
-60 dBm	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         91Pk Cirw           20 dBm         0         0           10 dBm         0         0           -10 dBm         TRG         -10.020 dBm           -20 dBm         -30 dBm         -10.020 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
-70 dBm         1001 pts         300.0 μs/           CF 2.441 GHz         1001 pts         300.0 μs/           Aarker         101 nts         0.03 dBm           M1         1         2.0 μs           D1         M1         378.0 μs	Spectrum           Ref Level         27.78 dBm         Of           Att         40 dB         SV           SGL         TRG: VID         91Pk Clrw           20 dBm         10 dBm         10 dBm           10 dBm         10 dBm         10 dBm           -20 dBm         -30 dBm         -30 dBm           -50 dBm         -50 dBm         -50 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
CF 2.441 GHz         1001 pts         300.0 µs/           Marker           Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.0 µs         0.03 dBm	Spectrum         Of           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG: VID         10 HR           1Pk Clrw         20 dBm         10 dBm           10 dBm         10 dBm         10 dBm           -20 dBm         -30 dBm         -50 dBm           -50 dBm         -50 dBm         -50 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
Marker         Your State         Your State         Your State         Function         Function Result           M1         1         2.0 µs         0.03 dBm </td <td>Spectrum         Of           Ref Level 27.78 dBm         0f           Att         40 dB         SV           SGL TRG: VID         10 dBm         10           10 dBm         0         0           10 dBm         70 dBm         10           -10 dBm         TRG         -10.020 dBm           -20 dBm         -30 dBm         -50 dBm           -50 dBm         -60 dBm         -70 dBm</td> <td>Dwell NVNT</td> <td>3-DH1 2441MH:</td> <td></td> <td>0.03 dBm 2.00 µs -1.82 dB 378.00 µs</td>	Spectrum         Of           Ref Level 27.78 dBm         0f           Att         40 dB         SV           SGL TRG: VID         10 dBm         10           10 dBm         0         0           10 dBm         70 dBm         10           -10 dBm         TRG         -10.020 dBm           -20 dBm         -30 dBm         -50 dBm           -50 dBm         -60 dBm         -70 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
M1         1         2.0 μs         0.03 dBm           D1         M1         378.0 μs         -1.82 dB	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG:VID         10 dBm         SV           10 dBm         0         0           10 dBm         0         0           -10 dBm         70 dBm         10           -20 dBm         -10.020 dBm         -50 dBm           -50 dBm         -60 dBm         -70 dBm           -70 dBm         CF 2.441 GHz         -50 dBm	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG: VID         10 dBm         SV           10 dBm         0         0           10 dBm         0         0           -10 dBm         TRG         -10.020 dBm           -20 dBm         -         0           -30 dBm         -         -           -50 dBm         -         -           -60 dBm         -         -           -70 dBm         -         CF 2.441 GHz           Marker         Trype   Ref   Trc           ×	Dwell NVNT	3-DH1 2441MH:		0.03 dBm 2.00 µs -1.82 dB 378.00 µs	
	Spectrum           Ref Level 27.78 dBm         Of           Att         40 dB         SV           SGL TRG: VID         1Pk Cirw         20 dBm           10 dBm         0         0           10 dBm         0         0           -10 dBm         TRG         -10.020 dBm           -20 dBm         -30 dBm         -50 dBm           -50 dBm         -60 dBm         -70 dBm           -70 dBm         CF 2.441 GHz           Marker         Type         Ref           Type         Ref         Trc         X	Dwell NVNT	3-DH1 2441MH:	Z	0.03 dBm 2.00 µs -1.82 dB 378.00 µs	









## 8.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant 1	6.271	30	Pass
NVNT	1-DH5	2441	Ant 1	5.977	30	Pass
NVNT	1-DH5	2480	Ant 1	4.395	30	Pass
NVNT	2-DH5	2402	Ant 1	5.684	21	Pass
NVNT	2-DH5	2441	Ant 1	5.63	21	Pass
NVNT	2-DH5	2480	Ant 1	4.253	21	Pass
NVNT	3-DH5	2402	Ant 1	5.471	21	Pass
NVNT	3-DH5	2441	Ant 1	5.202	21	Pass
NVNT	3-DH5	2480	Ant 1	3.525	21	Pass

#### Power NVNT 1-DH5 2402MHz Ant1

