



RADIO TEST REPORT FCC ID: 2AOWK-3289

Product: Mobile Phone Trade Mark: ulefone Model No.: GQ3289 Note 20 Pro, Note 20 Ultra, Family Model: Note 20, Note 20E, Note 20S, Note 20 Lite, Note 20s, Note 20s Pro Report No.: S24082304507001 Issue Date: Oct. 08, 2024

Prepared for

Shenzhen Gotron Electronic CO., LTD.

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Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's name:	Shenzhen Gotron Electronic CO.,LTD.
Address:	7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China
Manufacturer's Name::	Shenzhen Gotron Electronic CO.,LTD.
Address:	7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China
Product description	
Product name:	Mobile Phone
Model and/or type reference:	GQ3289
Family Model:	Note 20 Pro, Note 20 Ultra, Note 20, Note 20E, Note 20S, Note 20 Lite, Note 20s, Note 20s Pro
Sample number	S240823045005
Date of Test	Aug. 23, 2024 ~ Oct. 08, 2024

Measurement Procedure Used:

APPLICABLE STANDARDS

STANDARD/ TEST PROCEDURE	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C ANSI C63.10-2013	Complied

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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The test results of this report relate only to the tested sample identified in this report.

Prepared By: Joe Yan Reviewed By: Aaron Cheng Approved Approved Alex L Alex Li (Project Engineer) (Supervisor) (Manager)





FCC Part15 (15.247), Subpart C			
Standard Section	Test Item	Verdict	Remark
15.207	Conducted Emission	PASS	
15.209 (a) 15.205 (a)	Radiated Spurious Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.247 (d)	Band Edge Emission	PASS	
15.247 (d)	Spurious RF Conducted Emission	PASS	
15.203	Antenna Requirement	PASS	

Remark:

 "N/A" denotes test is not applicable in this Test Report.
 All test items were verified and recorded according to the standards and without any deviation during the test.





3 FACILITIES AND ACCREDITATIONS

3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at 1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District, Shenzhen, Guangdong, China The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description	
CNAS-Lab.	: The Certificate Registration Number is L5516.
IC-Registration	The Certificate Registration Number is 9270A.
	CAB identifier:CN0074
FCC- Accredited	Test Firm Registration Number: 463705.
	Designation Number: CN1184
A2LA-Lab.	The Certificate Registration Number is 4298.01
	This laboratory is accredited in accordance with the recognized
	International Standard ISO/IEC 17025:2005 General requirements for
	the competence of testing and calibration laboratories.
	This accreditation demonstrates technical competence for a defined
	scope and the operation of a laboratory quality management system
	(refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm	: Shenzhen NTEK Testing Technology Co., Ltd.
Site Location	: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang
	Street, Bao'an District, Shenzhen 518126 P.R. China.

3.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y\pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty	
1	Conducted Emission Test	±2.80dB	
2	RF power, conducted	±0.16dB	
3	Spurious emissions, conducted	±0.21dB	
4	All emissions, radiated(30MHz~1GHz)	±2.64dB	
5	All emissions, radiated(1GHz~6GHz)	±2.40dB	
6	All emissions, radiated(>6GHz)	±2.52dB	
7	Temperature	±0.5°C	
8	Humidity	±2%	
9	All emissions, radiated(9KHz~30MHz)	±6dB	





4 GENERAL DESCRIPTION OF EUT

Product Feature and Specification		
Equipment	Mobile Phone	
Trade Mark	ulefone	
FCC ID	2AOWK-3289	
Model No.	GQ3289	
Family Model	Note 20 Pro, Note 20 Ultra, Note 20, Note 20E, Note 20S, Note 20 Lite, Note 20s, Note 20s Pro	
Model Difference	All models are the same circuit and RF module, except for model names.	
Operating Frequency	2402MHz~2480MHz	
Modulation	GFSK, π/4-DQPSK, 8-DPSK	
Number of Channels	79 Channels	
Antenna Type	PIFA Antenna	
Antenna Gain	1.01 dBi	
Adapter	Model: HJ-FC038K7-US Input: 100-240V~ 50/60Hz 0.6A Output: 5.0V3.0A 15.0W OR 9.0V2.0A 18.0W OR 12.0V1.5A 18.0W	
Battery	DC 3.87V, 6000mAh, 23.22Wh	
Power supply	DC 3.87V from battery or DC 5V/9V/12V from adapter	
HW Version	S682A_V1	
SW Version	N/A	

Note 1: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.

Note 2: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.





 Revision History				
Report No.	Version	Description	Issued Date	
S24082304507001	Rev.01	Initial issue of report	Oct. 08, 2024	





5 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps for GFSK modulation; 2Mbps for π /4-DQPSK modulation; 3Mbps for 8-DPSK modulation) were used for all test.

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement -X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

Carrier Frequency and Channel list:

Channel	Frequency(MHz)
0	2402
1	2403
39	2441
40	2442
77	2479
78	2480

Note: fc=2402MHz+k×1MHz k=0 to 78

The following summary table is showing all test modes to demonstrate in compliance with the standard.

For AC Conducted Emission	
Final Test Mode	Description
Mode 1	normal link mode

Note: AC power line Conducted Emission was tested under maximum output power.

For Radiated Test Cases		
Final Test Mode	Description	
Mode 1	normal link mode	
Mode 2	CH00(2402MHz)	
Mode 3	CH39(2441MHz)	
Mode 4	CH78(2480MHz)	

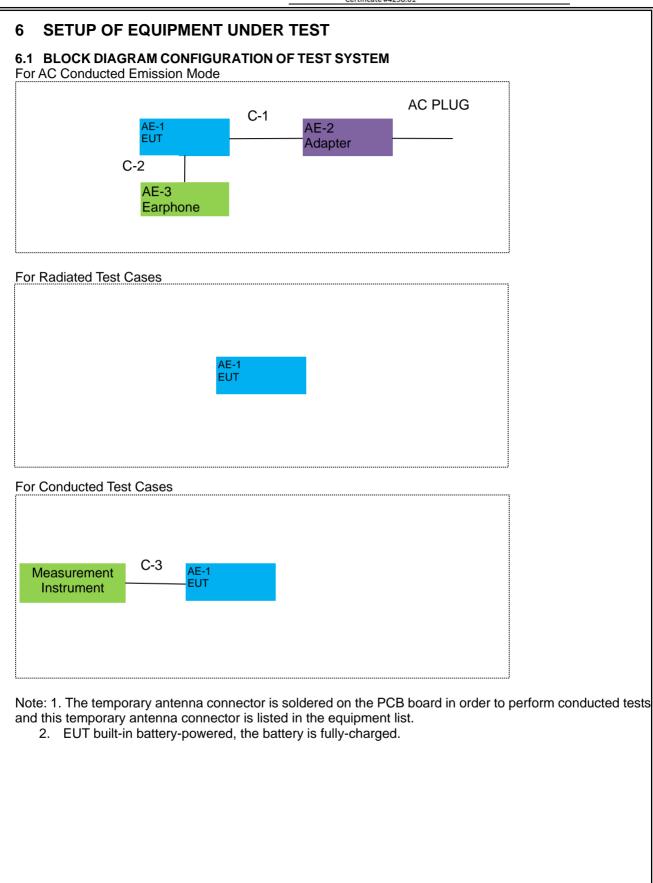
Note: For radiated test cases, the worst mode data rate 3Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.

For Conducted Test Cases	
Final Test Mode	Description
Mode 2	CH00(2402MHz)
Mode 3	CH39(2441MHz)
Mode 4	CH78(2480MHz)
Mode 5	Hopping mode

Note: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.











6.2 SUPPORT EQUIPMENT

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	Mobile Phone	GQ3289	N/A	EUT
AE-2	Adapter	HJ-FC038K7-US	N/A	Peripherals
AE-3	Earphone	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	USB Cable	YES	NO	1.0m
C-2	Earphone Cable	NO	NO	1.2m
C-3	RF Cable	YES	NO	0.1m

Notes:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in [Length] column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".





6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation& Conducted Test equipment

uuluu		corequipment					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibrati on period
1	Spectrum Analyzer	Agilent	E4440A	MY41000130	2024.04.26	2025.04.25	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024.04.25	2025.04.24	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2024.04.25	2025.04.24	1 year
4	Test Receiver	R&S	ESPI7	101318	2024.04.26	2025.04.25	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
7	Horn Antenna	EM	EM-AH-1018 0	2011071402	2024.05.12	2027.05.11	3 year
8	Broadband Horn Antenna	SCHWARZBE CK	BBHA 9170	803	2024.05.12	2027.05.11	3 year
9	Amplifier	EMC	EMC051835 SE	980246	2024.04.25	2025.04.24	1 year
10	Active Loop Antenna	SCHWARZBE CK	FMZB 1519 B	055	2024.05.17	2027.05.16	3 year
11	Power Meter	DARE	RPR3006W	15I00041SN 084	2024.04.25	2025.04.24	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2023.05.06	2026.05.05	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2023.05.06	2026.05.05	3 year
14	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2023.05.06	2026.05.05	3 year
15	Filter	TRILTHIC	2400MHz	29	2024.04.26	2027.04.25	3 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test And this temporary antenna connector is listed within the instrument list





AC Co	AC Conduction Test equipment						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2024.04.26	2025.04.25	1 year
2	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
3	LISN	SCHWARZBE CK	NNLK 8129	8129245	2024.04.25	2025.04.24	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2024.04.26	2027.04.25	3 year
5	Test Cable (9KHz-30MH z)	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
6	Test Cable (9KHz-30MH z)	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
7	Test Cable (9KHz-30MH z)	N/A	C03	N/A	2023.05.06	2026.05.05	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Aux Equipment & Test Cable which is scheduled for calibration every 2 or 3 years.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	1 MWRFtest MTS 8310 2.4GHz/5GHz		2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest
4	4 Farad EZ-EMC_CE		AIT-03A	AC Conducted Test





7 TEST REQUIREMENTS

7.1 CONDUCTED EMISSIONS TEST

7.1.1 Applicable Standard

According to FCC Part 15.207(a)

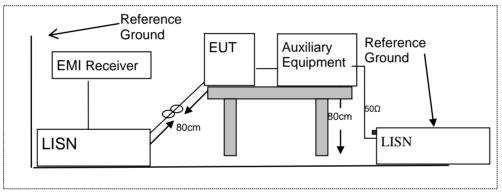
7.1.2 Conformance Limit

	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	

Note: 1. *Decreases with the logarithm of the frequency

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

7.1.3 Test Configuration



7.1.4 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
- 2. The EUT was placed on a table which is 0.8m above ground plane.
- Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable
 may be terminated, if required, using the correct terminating impedance. The overall length shall not
 exceed 1 m.
- 6. LISN at least 80 cm from nearest part of EUT chassis.
- 7. The frequency range from 150KHz to 30MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
- 9. For the actual test configuration, please refer to the related Item -EUT Test Photos.

7.1.5 Test Results

Pass





7.1.6 Test Results

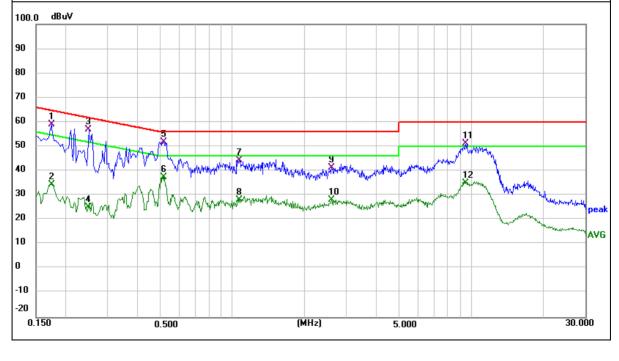
EUT:	Mobile Phone	Model Name :	GQ3289
Temperature:	22 ℃	Relative Humidity:	57%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Demont
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1740	49.14	10.04	59.18	64.77	-5.59	QP
0.1740	24.44	10.04	34.48	54.77	-20.29	AVG
0.2481	46.72	10.20	56.92	61.82	-4.90	QP
0.2481	15.02	10.20	25.22	51.82	-26.60	AVG
0.5140	41.10	10.70	51.80	56.00	-4.20	QP
0.5140	26.81	10.70	37.51	46.00	-8.49	AVG
1.0700	32.47	11.88	44.35	56.00	-11.65	QP
1.0700	16.19	11.88	28.07	46.00	-17.93	AVG
2.6060	31.37	9.86	41.23	56.00	-14.77	QP
2.6060	18.20	9.86	28.06	46.00	-17.94	AVG
9.5219	40.36	10.80	51.16	60.00	-8.84	QP
9.5219	24.35	10.80	35.15	50.00	-14.85	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



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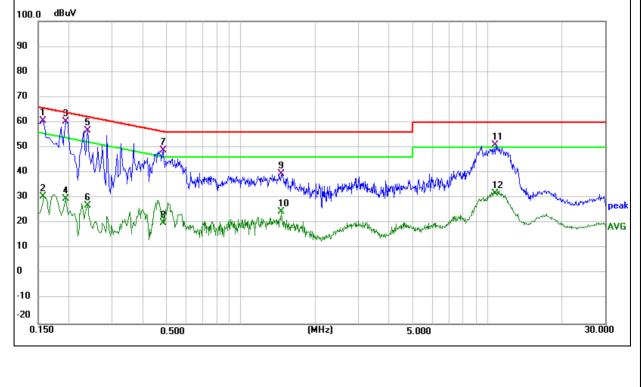
EUT:	Mobile Phone	Model Name :	GQ3289
Temperature:	25 ℃	Relative Humidity:	62%
Pressure:	1010hPa	Phase :	Ν
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

r			T			r 1
Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1580	51.24	9.46	60.70	65.57	-4.87	QP
0.1580	21.06	9.46	30.52	55.57	-25.05	AVG
0.1940	50.87	9.49	60.36	63.86	-3.50	QP
0.1940	20.26	9.49	29.75	53.86	-24.11	AVG
0.2380	47.06	9.59	56.65	62.17	-5.52	QP
0.2380	17.26	9.59	26.85	52.17	-25.32	AVG
0.4820	38.77	9.95	48.72	56.30	-7.58	QP
0.4820	10.01	9.95	19.96	46.30	-26.34	AVG
1.4540	27.72	11.93	39.65	56.00	-16.35	QP
1.4540	12.53	11.93	24.46	46.00	-21.54	AVG
10.7860	51.37	-0.56	50.81	60.00	-9.19	QP
10.7860	32.40	-0.56	31.84	50.00	-18.16	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.







7.2 RADIATED SPURIOUS EMISSION

7.2.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and ANSI C63.10-2013

7.2.2 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					
0.495-0.505	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	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	149.9-150.05	2310-2390	15.35-16.2					
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4					
8.37625-8.38675	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								

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (µV/m)	Field Strength (dBµV/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
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)				
	PEAK	AVERAGE			
Above 1000	74	54			

Remark :1. Emission level in dBuV/m=20 log (uV/m)

Measurement was performed at an antenna to the closed point of EUT distance of meters.
 For Frequency 9kHz~30MHz:

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

For Frequency above 30MHz:

Distance extrapolation factor =20log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.



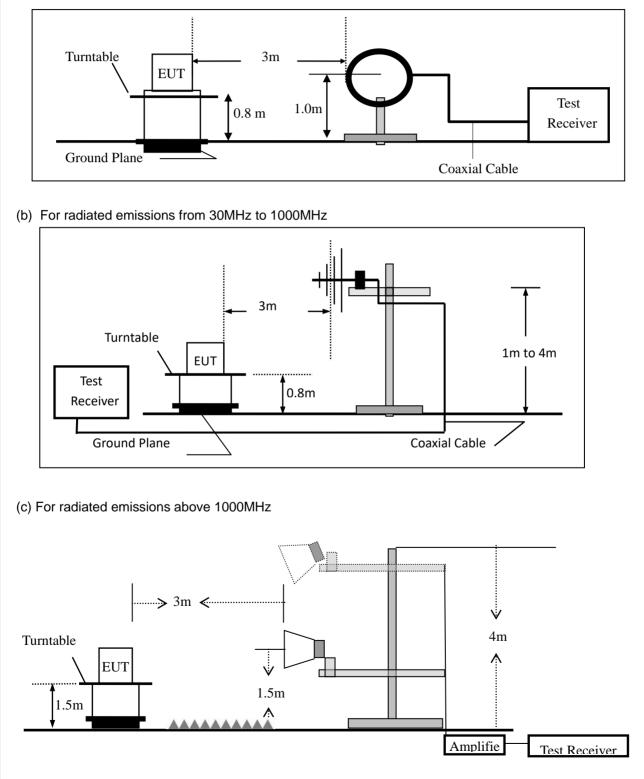


7.2.3 Measuring Instruments

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

7.2.4 Test Configuration

(a) For radiated emissions below 30MHz







7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

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:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1 MHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- e. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- f. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.
 - Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported





During the radiated emission test, the Spectrum Analyzer was set with the following configurations:							
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth				
30 to 1000	QP	120 kHz	300 kHz				
Abaua 4000	Peak	1 MHz	1 MHz				
Above 1000	Average	1 MHz	1 MHz				

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

7.2.6 Test Results

EUT:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Joe Yan

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3	m(dBuV/m)	Over(dB) PK AV		
(MHz)	H/V	PK	AV	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.





Certificate #4298.01 Spurious Emission below 1GHz (30MHz to 1GHz) All the modulation modes have been tested, and the worst result was report as below: EUT: Mobile Phone Model Name : GQ3289 **25°**℃ 55% **Relative Humidity:** Temperature: 1010hPa Test Mode: Mode 4 8-DPSK Pressure: Test Voltage : DC 3.87V Emission Meter Frequency Factor Limits Margin Polar Reading Level Remark (H/V) (MHz) (dBuV) (dB) (dBuV/m) (dBuV/m) (dB) V 31.8430 18.41 16.66 35.07 40.00 -4.93 QP 36.8950 17.60 -7.31 QP V 15.09 32.69 40.00 V QP 51.8430 15.54 19.35 34.89 40.00 -5.11 V 104.5360 10.95 17.85 28.80 43.50 -14.70 QP V 158.1120 16.25 14.72 30.97 43.50 -12.53 QP V 182.5590 17.59 16.20 33.79 43.50 -9.71 QP **Remark:** Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit 80.0 dBu¥/m 70 60 50 40 ţ 3 1. M. 6 30 Mundulin Habid An analyting 20

(MHz)

300.00

10

0.0

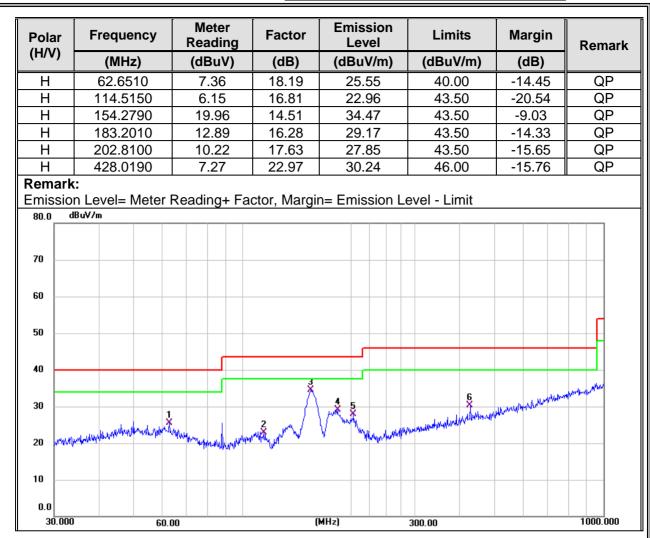
30.000

60.00

1000.000

NTEK 北测[®]









Spurious	Spurious Emission Above 1GHz (1GHz to 25GHz)									
EUT:	EUT: Mobile Phone I			Model	,		GQ3	289		
Temperature:	20 ℃	1		Relativ	e Humidity	/:	48%			
Test Mode:	Mode	e2/Mode3	/Mode4	Test By	/:		Joe \	ran		
	All the modulation modes have been tested, and the worst result was report as below:									
Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Lin	nits	Margin	Remark	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ	V/m)	(dB)		
			Low Chann	el (2402 M⊢	lz)(8-DPSK)-	-Above	e 1G			
4804.41	65.54	5.21	35.59	44.30	62.04	74	.00	-11.96	Pk	Vertical
4804.41	44.54	5.21	35.59	44.30	41.04	54	.00	-12.96	AV	Vertical
7206.93	64.64	6.48	36.27	44.60	62.79	74	.00	-11.21	Pk	Vertical
7206.93	42.67	6.48	36.27	44.60	40.82	54	.00	-13.18	AV	Vertical
4804.34	63.29	5.21	35.55	44.30	59.75	74	.00	-14.25	Pk	Horizontal
4804.34	42.58	5.21	35.55	44.30	39.04	54	.00	-14.96	AV	Horizontal
7206.62	66.17	6.48	36.27	44.52	64.40	74	.00	-9.60	Pk	Horizontal
7206.62	42.47	6.48	36.27	44.52	40.70	54	.00	-13.30	AV	Horizontal
		-	Mid Chann	el (2441 MH	z)(8-DPSK)-	-Above	e 1G			
4882.35	68.76	5.21	35.66	44.20	65.43	74	.00	-8.57	Pk	Vertical
4882.35	44.53	5.21	35.66	44.20	41.20	54	.00	-12.80	AV	Vertical
7323.29	64.58	7.10	36.50	44.43	63.75	74	.00	-10.25	Pk	Vertical
7323.29	44.96	7.10	36.50	44.43	44.13	54	.00	-9.87	AV	Vertical
4882.59	63.16	5.21	35.66	44.20	59.83	74	.00	-14.17	Pk	Horizontal
4882.59	44.39	5.21	35.66	44.20	41.06	54	.00	-12.94	AV	Horizontal
7324.01	62.23	7.10	36.50	44.43	61.40	74	.00	-12.60	Pk	Horizontal
7324.01	41.82	7.10	36.50	44.43	40.99	-	.00	-13.01	AV	Horizontal
		1	High Chann	el (2480 MH	z)(8-DPSK)-	- Abov	ve 1G		r	
4959.21	64.56	5.21	35.52	44.21	61.08	74	.00	-12.92	Pk	Vertical
4959.21	44.91	5.21	35.52	44.21	41.43	54	.00	-12.57	AV	Vertical
7439.13	61.97	7.10	36.53	44.60	61.00	74	.00	-13.00	Pk	Vertical
7439.13	44.09	7.10	36.53	44.60	43.12	54	.00	-10.88	AV	Vertical
4960.12	67.17	5.21	35.52	44.21	63.69	74	.00	-10.31	Pk	Horizontal
4960.12	43.71	5.21	35.52	44.21	40.23	54	.00	-13.77	AV	Horizontal
7440.99	61.40	7.10	36.53	44.60	60.43	74	.00	-13.57	Pk	Horizontal
7440.99	41.43	7.10	36.53	44.60	40.46	54	.00	-13.54	AV	Horizontal

Note:

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





– (Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz										
EUT	Mobile Phone Model No.:						GQ	3289			
Tem	perature: 20 °C Relative Humidity:						48%	D			
Test	Mode: M	ode2/ Mo	de4		Test	By:		Joe	Yan		
All t	he modulati	on modes	s have b	oeen teste	d, and th	e worst res	sult wa	as rep	oort as b	elow:	
	Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Limi	its	Margin	Detector	Comment
	(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ∖	//m)	(dB)	Туре	
				3	Mbps(8-DP	SK)-Non-hop	ping				
	2310.00	53.89	2.97	27.80	43.80	40.86	74	ł	-33.14	Pk	Horizontal
	2310.00	45.17	2.97	27.80	43.80	32.14	54	÷	-21.86	AV	Horizontal
	2310.00	54.42	2.97	27.80	43.80	41.39	74	l I	-32.61	Pk	Vertical
	2310.00	42.74	2.97	27.80	43.80	29.71	54	ŀ	-24.29	AV	Vertical
	2390.00	55.81	3.14	27.21	43.80	42.36	74	÷	-31.64	Pk	Vertical
	2390.00	44.59	3.14	27.21	43.80	31.14	54	Ļ	-22.86	AV	Vertical
	2390.00	55.77	3.14	27.21	43.80	42.32	74	÷	-31.68	Pk	Horizontal
	2390.00	44.16	3.14	27.21	43.80	30.71	54	÷	-23.29	AV	Horizontal
	2483.50	52.71	3.58	27.70	44.00	39.99	74	Ļ	-34.01	Pk	Vertical
	2483.50	42.22	3.58	27.70	44.00	29.50	54	Ļ	-24.50	AV	Vertical
	2483.50	53.94	3.58	27.70	44.00	41.22	74	Ļ	-32.78	Pk	Horizontal
	2483.50	43.16	3.58	27.70	44.00	30.44	54	ŀ	-23.56	AV	Horizontal
					3Mbps(8-E	OPSK)-hoppir	ng				
	2310.00	54.34	2.97	27.80	43.80	41.31	74	Ļ	-32.69	Pk	Horizontal
	2310.00	46.16	2.97	27.80	43.80	33.13	54	Ļ	-20.87	AV	Horizontal
	2310.00	55.23	2.97	27.80	43.80	42.20	74	L .	-31.80	Pk	Vertical
	2310.00	42.42	2.97	27.80	43.80	29.39	54	ļ	-24.61	AV	Vertical
	2390.00	55.31	3.14	27.21	43.80	41.86	74	ŀ	-32.14	Pk	Vertical
	2390.00	44.76	3.14	27.21	43.80	31.31	54	ŀ	-22.69	AV	Vertical
	2390.00	56.01	3.14	27.21	43.80	42.56	74	ŀ	-31.44	Pk	Horizontal
	2390.00	43.84	3.14	27.21	43.80	30.39	54	ŀ	-23.61	AV	Horizontal
	2483.50	52.85	3.58	27.70	44.00	40.13	74	ŀ	-33.87	Pk	Vertical
	2483.50	42.06	3.58	27.70	44.00	29.34	54	ŀ	-24.66	AV	Vertical
	2483.50	54.72	3.58	27.70	44.00	42.00	74	ļ	-32.00	Pk	Horizontal
	2483.50	43.13	3.58	27.70	44.00	30.41	54	ŀ	-23.59	AV	Horizontal

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





Spurious Emission in Restricted Band 3260MHz-18000MHz										
EUT:	Mobile	Phone		Model	No.:		GQ	3289		
Temperature:	20 ℃			Relativ	/e Humidit	:y:	48%	b		
Test Mode:	Mode	2/ Mode4	ŀ	Test B	sy:		Joe	Yan		
All the modula	tion mode	s have b	een testeo	d, and the	worst res	ult wa	as rep	port as be	elow:	
Frequency	Reading Level	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Lim	nits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ'	V/m)	(dB)	Туре	
3260	63.98	4.04	29.57	44.70	52.89	7	4	-21.11	Pk	Vertical
3260	50.36	4.04	29.57	44.70	39.27	5	4	-14.73	AV	Vertical
3260	59.52	4.04	29.57	44.70	48.43	7.	4	-25.57	Pk	Horizontal
3260	48.44	4.04	29.57	44.70	37.35	5	4	-16.65	AV	Horizontal
3332	62.24	4.26	29.87	44.40	51.97	7.	4	-22.03	Pk	Vertical
3332	48.76	4.26	29.87	44.40	38.49	5	4	-15.51	AV	Vertical
3332	64.26	4.26	29.87	44.40	53.99	7.	4	-20.01	Pk	Horizontal
3332	44.68	4.26	29.87	44.40	34.41	5	4	-19.59	AV	Horizontal
17797	49.79	10.99	43.95	43.50	61.23	7	4	-12.77	Pk	Vertical
17797	37.45	10.99	43.95	43.50	48.89	5	4	-5.11	AV	Vertical
17788	54.32	11.81	43.69	44.60	65.22	7	4	-8.78	Pk	Horizontal
17788	36.31	11.81	43.69	44.60	47.21	5	4	-6.79	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 \geq RBW Sweep = auto Detector function = peak Trace = max hold

7.3.6 Test Results

EUT:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode 5(1Mbps)	Test By:	Joe Yan





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:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Joe Yan





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:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Joe Yan

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:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Joe Yan





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:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Joe Yan





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 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)).

7.8.3 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 = 100KHz

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:	Mobile Phone	Model No.:	GQ3289
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2 /Mode4/ Mode 5	Test By:	GQ3289 48% Joe Yan





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 fundamental 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: 1.01dBi). 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 transmitter be presented with a continuous data (or information) stream. In addition, a system employing short 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 section. (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.





8 TEST RESULTS

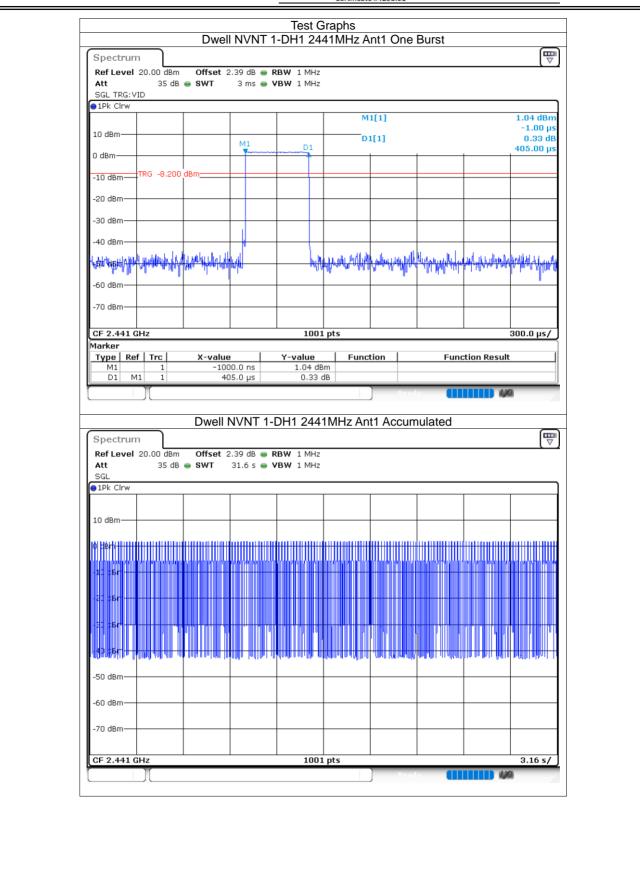
8.1 DWELL TIME

OIL DUELE II									
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.405	77.76	192	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.66	205.84	124	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.912	262.08	90	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.399	77.007	193	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.65	211.2	128	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.904	223.608	77	31600	400	Pass
NVNT	3-DH1	2441	Ant1	0.396	78.012	197	31600	400	Pass
NVNT	3-DH3	2441	Ant1	1.65	207.9	126	31600	400	Pass
NVNT	3-DH5	2441	Ant1	2.904	267.168	92	31600	400	Pass





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Dwell N	VNT 1-DH3 244	1MHz Ant1 One	Burst	
Spectrum				
Ref Level 20.00 dBm Offset 2.39 Att 35 dB SWT 5	dB 👄 RBW 1 MHz ms 👄 VBW 1 MHz			
SGL TRG: VID				
		M1[1]		-10.32 dBm
10 dBm		D1[1]		-5.00 µs 4.39 dB
0 dBm			I I	1.66000 ms
	ารสาวารสาวารสาวาร	D1		
		•		
-20 dBm				
-30 dBm				
-40 dBm				
289,98440 marine half			and white the second	dullaysladdyllayslyr
-60 dBm				
-70 dBm				
-/ G dBill				
CF 2.441 GHz	1001	pts		500.0 µs/
Marker X-value	Y-value	Function	Function Resul	t
M1 1 -5.0 D1 M1 1 1.66				
		Read		0
Durall MV		MHz Ant1 Accun	aulatad	
			nulated	Ē
Spectrum Ref Level 20.00 dBm Offset 2.39	dB 👄 RBW 1 MHz			[▽]
Att 35 dB ● SWT 31.4 SGL	6 s 👄 VBW 1 MHz			
●1Pk Clrw		,		
				7
10 dBm				
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- 1 4€,∦≢π <mark>,</mark>				
- 4 C ## 7 , 6 - 4 - 6 - 7 -				
- 4 C ## 7 , 6 - 4 - 6 - 7 -				3.16 s/
- 4C # BP				3.16 s/
- 4C # BP				3.16 s/
- 4C # BP				3.16 s/
- 4C # BP				3.16 s/
- 4C # BP				3.16 s/





Spectrum Image: Spectrum Ref Level 200 dbm Offset 2:39 db = RBW 1 MH2 30. TB2: VD Image: Spectrum 10 dbm Image: Spectrum 11 dbm Image: Spectrum 12 dbm Image: Spectrum <th>C n a atmus</th> <th></th> <th>Dwell</th> <th>INVNI 1</th> <th>-DH5 244</th> <th>41MHz A</th> <th>nt1 One</th> <th>Burst</th> <th></th> <th></th>	C n a atmus		Dwell	INVNI 1	-DH5 244	41MHz A	nt1 One	Burst		
Att 35 db SWT 9 ms VBW 1 MH2 SOL TRG/VD IIII 0.00000000000000000000000000000000000			Offset 2	2.39 dB 👄 R	BW 1 MHz					\ ₹
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10 dBm 01[1]		/ID								
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Marker Y-value Y-value Function Function Result D1 1 0.0 s -7.73 dbm -7.74 dbm	CF 2.441	 GHz			1001	pts				800.0 μs/
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Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated Spectrum Image: Comparison of the second seco			X-value				tion	Fund	ction Result	
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-50 dBm -60 dBm -70	Ref Level Att SGL 1Pk Clrw 10 dBm 0 dBm 10 cB = -20 cB =	20.00 dBm 35 dB	• SWT	31.6 s • V	'BW 1 MHz					
-60 dBm	Ref Level Att SGL ● 1Pk Clrw 10 dBm D dBm • 10 cB ⁻ • 20 cB ⁻ • 30 cB ⁻	20.00 dBm 35 dB	• SWT	31.6 5 • • •	'BW 1 MHz	i i An Mi				
-70 dBm	Ref Level Att SGL 1Pk Clrw 10 dBm 10 dBm 10 cB 20 cB 30 cB 30 cB 30 cB 10 cB	20.00 dBm 35 dB	• SWT	31.6 5 • • •	'BW 1 MHz					
CF 2.441 GHz 1001 pts 3.16 s/	Ref Level Att SGL 1Pk Clrw 10 dBm 10 dBm 10 cB 20 cB 30 cB 30 cB 30 cB 10 cB	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MHz					
CF 2.441 GHz 1001 pts 3.16 s/	Ref Level Att SGL 1Pk Clrw 10 dBm D dBm 20 cB 30 cB -30 cB -50 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MHz					
	Ref Level Att SGL 1Pk Clrw 10 dBm D dBm 20 cB 20 cB 30 cB -50 dBm -60 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MHz					
	Ref Level Att SGL 1Pk Clrw 10 dBm D dBm 20 cB 20 cB 30 cB -50 dBm -60 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MHz					
	Ref Level Att SGL 1Pk Clrw 10 dBm b dBm 10 dBm 20 cB = -30 cB = -30 cB = -50 dBm -50 dBm -60 dBm -70 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MH2					
	Ref Level Att SGL 1Pk Clrw 10 dBm b dBm 10 dBm 20 cB = -30 cB = -30 cB = -50 dBm -50 dBm -60 dBm -70 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MH2					3.16 s/
	Ref Level Att SGL 1Pk Clrw 10 dBm b dBm 10 dBm 20 cB = -30 cB = -30 cB = -50 dBm -50 dBm -60 dBm -70 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MH2					3.16 s/
	Ref Level Att SGL 1Pk Clrw 10 dBm b dBm 10 cB = -20 cB = -30 cB = -30 cB = -40 cB = -50 dBm -50 dBm -70 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MH2					3.16 s/
	Ref Level Att SGL 1Pk Clrw 10 dBm b dBm 10 cB = -20 cB = -30 cB = -30 cB = -40 cB = -50 dBm -50 dBm -70 dBm	20.00 dBm 35 dB	• SWT	31.6 5 • •	'BW 1 MH2					3.16 s/





Spectrum	Dwell NVNT 2	2-DH1 2441MF	iz Ant'i One	Burst		
Ref Level 20.00 dBm	Offset 2.39 dB 👄 F	RBW 1 MHz				[v]
Att 35 dB SGL TRG: VID	😑 SWT 3 ms 👄 V	/BW 1 MHz				
●1Pk Clrw	1 1					10.00 40
10 dBm			M1[1]		-	10.82 dBm -19.00 µs
			D1[1]			0.88 dB 399.00 µs
0 dBm	M1-mmAm	here all 1				
-10 dBm 100 -8.000						
-20 dBm						
-30 dBm						
-40 dBm						
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-60 dBm			• • • • • • • • • • • • • • • • • • • •	· · · · ·		
-70 dBm						
CF 2.441 GHz Marker		1001 pts				300.0 µs/
Type Ref Trc	X-value	Y-value -10.82 dBm	unction	Fund	tion Result	
M1 1 D1 M1 1	-19.0 µs 399.0 µs	-10.82 dBm 0.88 dB				
			Rea			
	Dwell NVNT 2-	DH1 2441MH;	Ant1 Accur	nulated		
Spectrum						
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-50 dBm		1001 pts				3.16 s/
-50 dBm		1001 pts	Rea			
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-50 dBm		1001 pts	Pea			





	Offset 2.39 dB SWT 5 ms	• VBW 1 MHz					
SGL TRG: VID							
10 d0m			М	1[1]		0.0	1.04 dBm 00000000 s
10 dBm	1	Autor descriptions	D:	L[1]		:	-0.48 dB L.65000 ms
0 dBm		olymood a second of the second second	- A				
-10 dBm TRG -8.000	dBm						
-20 dBm							
-30 dBm							
-40 dBm							
has a share when the state of t			http://ht	hipetra and the		Juquik Apple Public	
-60 dBm							
-70 dBm							
CF 2.441 GHz Marker		1001	. pts				500.0 μs/
Type Ref Trc	X-value 0.0 s	Y-value 1.04 dB	Func	tion	Fund	tion Result	:
D1 M1 1	1.65 ms	-0.48 (
				Read			
	Dwell NVNT	2-DH3 244	1MHz An	t1 Accun	nulated		
Spectrum							₽
RefLevel 20.00 dBm Att 35 dB	Offset 2.39 dB SWT 31.6 s	RBW 1 MHz					
SGL	- oni - 31.0 S						
⊖1Pk Clrw							
10 dBm							
10 dBm							
0 #8m							
0 18m							
ol itém 							
0 #8m C #8m							
lo ±8m							
loj 18m C 28m							
lo dem							
lo Hém							
lo dém							3.16 s/
lo dem - 10 dem - 20 dem - 30 dem - 50 dem - 70 dem							3.16 s/





Ref Level Att SGL TRG: V	35 dB	Offset 2 SWT	2.39 dB 👄 I 8 ms 👄 V	RBW 1 MH VBW 1 MH					
• 1Pk Clrw		1				1111			10.04 dBm
10 dBm						1[1]			-13.94 dBm -152.00 μs
0 dBm						1[1]		:	4.41 dB 2.90400 ms
	ыы.м. TRG -7.900	dBm www.	Humannhuhyahluha	WAR WAR					
				4					
-20 dBm									
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husbijasmilini				UP	helpethological and a state	loadnieddid	Men alalikulini	frallingh saith	maulhterodelaus
-60 dBm									
-70 dBm									
CF 2.441 G	Hz			100)1 pts				800.0 µs/
Marker Type Ref	f Tre	X-value	, 1	Y-value		tion	Fue	tion Result	
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		2,				Read	v (11		0
		Dwall					ulated		1721
Spectrum		Dweir	NVINI Z-	DH0 244	41MHz Ar	ILT ACCUIT	luiated		
Ref Level	20.00 dBm		2.39 dB 😑 I						[~
Att SGL	35 dB	SWT	31.6 s 👄 🕻	VBW 1 MH	Z				
●1Pk Clrw									
10 dBm									
10 0.011									
D dBm		da dhail ta abh bha							
D dBm									
·10 dB n									
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-10 dB n -20 dB n -30 dB									
·10 d8 n ·20 d8 n ·30 d8 - ¹									
-10 dB n -20 dB n -30 dB -50 dBm									
.10 dB n 20 dB n .33 dB .53 dB									
10 dB n 20 dB n 30 dB , fD dB , fD dB									
-10 dB n 20 dB n -50 dB 1 -50 dB n -60 dB n -70 dB n									
-10 dB n -20 dB n -30 dB -50 dBm									3.16 s/





Spectrun		Dwel	I NVNT 3	-DH1 24	41MHz A	nt1 One	Burst		
opecului	n								
Ref Level Att	20.00 dBm	Offset 2 SWT	2.39 dB 👄 R	BW 1 MHz BW 1 MHz					
SGL TRG:V		- 3WI	3 ms 👅 🖣						
⊖1Pk Clrw		1			M	1[1]			-11.34 dBm
10 dBm									-139.00 µs
					D	1[1]			1.23 dB 396.00 μs
0 dBm			for Lemistic						
-10 dBm	TRG -7.800	dBm Ma	way buy any the	1 1 1 1 1					
-20 dBm			14.						
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nife all a subsection of the s	Henry Charles	WWWWWW		<u>A</u> UMARIA	Maland Mar	LINN NUM	ul <mark>tilongabili</mark>	un han a	ally a hard and
-60 dBm									
-70 dBm									
CF 2.441 (Marker	3Hz			1001	l pts				300.0 µs/
Type Re		X-value		Y-value	Func	tion	Fund	tion Resul	t[
M1 D1 M	1 /1 1		39.0 µs 96.0 µs	-11.34 dB 1.23 (
						Read	y 🛄		0
		Dwall	NVNT 3-I			+1 A a a um	wlated		
C		Dweiri	NVINI 3-I			LT ACCUIT	luialeu		Ē
Spectrun Ref Level	'' 20.00 dBm	Offset 2	2.39 dB 👄 R	BW 1 MHz					(∇)
Att			31.6 s 👄 🎙						
SGL 1Pk Clrw									
1	1								
10 dBm									
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0 (5 201									
0 c 2m -10 c6 -20 c6 -30 c6 -50 dBm									
0 c 2m -10 c6 -20 c6 -30 c6 -50 dBm									
0 d 3m - 10 d 6 - 20 d 6 									
0 c 2m									3.16 s/
0 d 3m - 10 d 6 - 20 d 6 									3.16 s/
0 d 3m - 10 d 6 - 20 d 6 									3.16 s/
0 d 3m - 10 d 6 - 20 d 6 									3.16 s/
0 d 3m - 10 d 6 - 20 d 6 									3.16 s/
0 d 3m - 10 d 6 - 20 d 6 									3.16 s/
l c sr 20 c c 30 c c 40 c c 									3.16 s/





10 dsm -0.0.0 gs 0 dsm 01[1] 0.000 ms 10 dsm 10.500 ms 20 dsm 10.500 ms 30 dsm 10.500 ms 40 dsm 10.500 ms 40 dsm 10.500 ms 50 dsm 10.500 ms 70 dsm 10.57 dsm 70 dsm 11.55 ms 70 dsm 0 dsm 70 dsm 0 dsm 70 dsm 0 dsm 71 dt 11.1 1.65 ms 70 dsm 11.55 ms 70 dsm 0 dsm 70 dsm 11.55 ms 70 dsm 11.55 ms <						M	1[1]			10.67 dBm
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-30 dBm -40 dBm -40 dBm -50 dBm -70 dBm -	-10 dBm—	TRG -7.400) dBm ^{////////////////////////////////////}	weiterhautha	And a frank not	1				
40 dBm	-20 dBm—									
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-60 dBm -70 dBm -70 dBm -70 dBm 500.0 µs/ Arker Type Ref Trc X-value Y-value Function Function Result 11 1.65 ms -70.00 dBm Function Result 11 1.65 ms D1 M1 1 1.65 ms -0.00 dB -70.00 dBm Function Result 11 1.65 ms Function Result 10 11 1.65 ms Dwell NVNT 3-DH3 2441MHz Ant1 Accumulated Image: Ref Level 20.00 dBm Offset 2.39 dB • RBW 1 MHz Image: Ref Level 20.00 dBm Image: Ref Level 20.00 d	-50 dBm-	uldu Manadera				d.Marthalahalaha	d high duands	Labellinia	Mahalaharan	MUNUMPUM
CF 2.441 CHz 1001 pts 500.0 µs/ Marker Type [Ref Trc X-value Y-value Function Function Result M1 1 -145.0 µs -10.67 dBm - - - D1 M1 1 -145.0 µs -10.67 dBm - - - D1 M1 1 -145.0 µs -0.00 dB -	-60 dBm	վի ութվերու էր				Ոստ	որ անդրդներություն Դուստեսություն	adah Ohod Alba ang	վերեւավի ավ	ألمي يرتقما الترقيم
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M1 1 -145.0 µs -10.67 dBm D1 M1 1 1.65 ms -0.00 dB Dwell NVNT 3-DH3 2441MHz Ant1 Accumulated Sectrum Ref Level 20.00 dBm Offset 2.39 dB RBW 1 MHz Att 30 dB SWT 31.6 s VBW 3 MHz SGL 0 IPk Cirw I		f Trc	X-value		Y-value	Funct	tion	Fund	tion Result	
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Att 30 dB SWT 31.6 s VBW 3 MHz SGL IPk Clrw IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			Dwell 1	NVNT 3-	DH3 2441	MHz An	t1 Accum	ulated		
SGL IPk Clrw 10 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm	Spectrur	n	Dwell	NVNT 3-	DH3 2441	MHz An	t1 Accum	nulated		
10 dBm	Ref Leve	l 20.00 dBr	n Offset	2.39 dB 👄	RBW 1 MHz		t1 Accum	nulated		
0 dem	Ref Leve Att SGL	l 20.00 dBr	n Offset	2.39 dB 👄	RBW 1 MHz		t1 Accum	nulated		
-10 dBr -20 dBr -30 dBr -30 dBr -50 dBm -50 dBm -70 dB	Ref Leve Att SGL	l 20.00 dBr	n Offset	2.39 dB 👄	RBW 1 MHz		t1 Accum	nulated		
20 cBr	Ref Leve Att SGL 1Pk Clrw	l 20.00 dBr	n Offset	2.39 dB 👄	RBW 1 MHz		t1 Accum	nulated		
-30 dGr	Ref Leve Att SGL 9 1Pk Clrw 10 dBm-	1 20.00 dBn 30 dl	n Offset B e SWT	2.39 dB 🖷 31.6 s 🖷	RBW 1 MHz VBW 3 MHz					(The second seco
-30 dGr	Ref Leve Att SGL 1Pk Clrw 10 dBm	1 20.00 dBn 30 dl	n Offset B e SWT	2.39 dB 🖷 31.6 s 🖷	RBW 1 MHz VBW 3 MHz					
-Cl dBr -50 dBm -60 dBm -70 dBm CF 2.441 GHz 1001 pts 3.16 s/	Ref Leve Att SGL 1Pk Clrw 10 dBm -10 cBr -10 cBr	1 20.00 dBn 30 dl	n Offset B e SWT	2.39 dB 🖷 31.6 s 🖷	RBW 1 MHz VBW 3 MHz					
-60 dBm -70 dBm CF 2.441 GHz 1001 pts 3.16 s/	Ref Leve Att SGL 1Pk Clrw 10 dBm 0 dBm -10 cBr -20 cBr	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
-60 dBm -70 dBm CF 2.441 GHz 1001 pts 3.16 s/	Ref Leve Att SGL 1Pk Clrw 10 dBm 0 dBm -10 cBr -20 cBr	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
-60 dBm -70 dBm CF 2.441 GHz 1001 pts 3.16 s/	Ref Leve Att SGL 1Pk Clrw 10 dBm 0 dBm -10 cBr -20 cBr	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
-70 dBm	Ref Leve Att SGL ● 1Pk Clrw 10 dBm -10 dBm -10 cBr -30 cBr -40 cBr -40 cBr -10 cBr	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
CF 2.441 GHz 1001 pts 3.16 s/	Ref Leve Att SGL 1Pk Clrw 10 dBm -10 dBm -10 cBr -20 cBr -30 cBr 	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
	Ref Leve Att SGL 1Pk Clrw 10 dBm -10 dBm -10 cBr -20 cBr -30 cBr 	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
	Ref Leve Att SGL ■ 1Pk Clrw 10 dBm -10 dBm -10 cBr -20 cBr -20 cBr -30 cBr -50 dBm -60 dBm	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz YBW 3 MHz					
	Ref Leve Att SGL ■ 1Pk Clrw 10 dBm -10 dBm -10 cBr -20 cBr -40 cBr -50 dBm -50 dBm -70 dBm	1 20.00 dBr 30 dl	n Offset B SWT	2.39 dB • 31.6 s •	RBW 1 MHz yBW 3 MHz					





Spectrur Ref Level	n 20.00 dBm	Offset 2	2.39 dB 👄 F	RBW 1 MHz					
Att SGL TRG:\	35 dB	● SWT		/BW 1 MHz					
●1Pk Clrw	/10								
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-10 dBm—	TRG -7.600	dBm-	Introduction and the	4					
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-30 dBm									
-40 dBm									
Mare a survey	P.			hely	hamphyrau	walk wilderlik	NANIMALAAN	mulannakhltahu	Marth Martin
									
-60 dBm									
-70 dBm—									
CF 2.441	GHz			100	l pts				800.0 µs/
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		2,1		0.00		Read	y U		0
		D "				4.4			111
		Dwell	NVNI 3-I	DH5 244	1MHz An	t1 Accum	ulated		
Spectrur Ref Level	'' 20.00 dBm	Offset 2	2.39 dB 👄 F	RBW 1 MHz					
Att SGL	35 dB	● SWT	31.6 s 👄 🕻	/BW 1 MHz					
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- C - C									
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-50 dBm— -60 dBm— -70 dBm—									3.16 s/
-50 dBm— -60 dBm— -70 dBm—									3.16 s/
-50 dBm— -60 dBm— -70 dBm—									3.16 s/





8.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	2.26	21	Pass
NVNT	1-DH5	2441	Ant1	1.98	21	Pass
NVNT	1-DH5	2480	Ant1	2.95	21	Pass
NVNT	2-DH5	2402	Ant1	2.78	21	Pass
NVNT	2-DH5	2441	Ant1	2.94	21	Pass
NVNT	2-DH5	2480	Ant1	3.47	21	Pass
NVNT	3-DH5	2402	Ant1	2.93	21	Pass
NVNT	3-DH5	2441	Ant1	3.08	21	Pass
NVNT	3-DH5	2480	Ant1	3.6	21	Pass