

FCC - TEST REPORT

Report Number	:	60.792.17.012.01R01	Date of Issue	: July	4, 2017	
Model	:	HG02430				
Product Type	:	Motorized Panorama T	ripod Head			
Applicant	:	Lidl US Trading, LLC				
Address	:	3500 S. Clark Street Arlington, Virginia, 22202				
Production Facility	:	Fujian Youtong Industries Co.,Ltd				
Address	:	Building 7 No. 70 Rujiang East Road, Mawei, Fuzhou, China				
Test Result	:	■Positive	□Negative			
Total pages including	:	43		-		

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Appendices



1 Table of Contents

1 Table of Contents	2
2 Description of Equipment Under Test	3
3 Summary of Test Standards	4
4 Details about the Test Laboratory	5
4.1 Test Equipment Site List	6
4.2 Measurement System Uncertainty	7
5 Summary of Test Results	8
6 General Remarks	9
7 Emission Test Results	10
7.1 Spurious Radiated Emission	10
7.2 20dB & 99% Bandwidth	16
7.3 Peak Output Power	19
7.4 Spurious Emissions at Antenna Terminals	22
7.5 100kHz Bandwidth of band edges	25
7.6 Minimum. Number of Hopping Frequencies	29
7.7 Minimum Hopping Channel Carrier Frequency Separation	30
7.8 Average Channel Occupancy Time	31
7.9 Antenna Requirement	32
8 Appendix A - Photographs of EUT	33
9 Appendix B - Setup Photographs of EUT	42
10 Appendix C - General Product Information	43



2 Description of Equipment Under Test

Description of the Equipment Under Test

Product: Motorized Panorama Tripod Head

Model no.: HG02430

FCC ID: 2AJ9O-HG243

Rating: 1) 3.7VDC (1 x 3.7VDC Rechargeable battery)

2) 5.0VDC (USB port)

Frequency: 2402MHz-2480MHz

Antenna gain: 0 dBi

Number of operated channel: 79

Modulation: GFSK

Report Number: 60.792.17.012.01R01



3 Summary of Test Standards

Test Standards

FCC Part 15 Subpart C 10-1-16 Edition

Federal Communications Commission, PART 15 — Radio Frequency Devices,

Subpart C — Unintentional Radiators



4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.

3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Building 12&13 Zhiheng Wisdomland Business Park,

Nantou Checkpoint Road 2, Shenzhen 518052, P.R.China FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 2
FCC Title 47 Part 15.247(a)(1) 20dB & 99% Bandwidth	Site 2
FCC Title 47 Part 15.247(b) Peak Output Power	Site 2
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 2
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 2
FCC Title 47 Part 15.247(a)(1) Minimum Number of Hopping Frequencies	Site 2
FCC Title 47 Part 15.247(a)(1) Minimum Hopping Channel Carrier Frequency	Site 2
Separation	
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	Site 2
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 2



4.1 Test Equipment Site List

Radiated emission Test - Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	15-July-17
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	15-July-17
Horn Antenna	Rohde & Schwarz	HF907	102294	15-July-17
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	15-July-17
3m Semi-anechoic chamber	TDK	9X6X6		29-May-19

20dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Min. No. of Hopping Frequencies, Min. Hopping Channel Carrier Frequency Separation and Average Time of Occupancy - Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	15-July-17
Signal Analyzer	Rohde & Schwarz	FSV40	101030	15-July-17
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	15-July-17
RF Switch Module	Rohde & Schwarz	OSP120/OSP- B157	101226/100851	15-July-17



4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty				
Items	Extended Uncertainty			
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB			
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;			
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;			
Uncertainty for Conducted RF test	2.04dB			

Report Number: 60.792.17.012.01R01



5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Te	st Resi	ılt
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	10-15			
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	16-18			
FCC Title 47 Part 15.247(b) Peak Output Power	19-21			
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	22-24	\boxtimes		
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	25-28			
FCC Title 47 Part 15.247(a)(1) Min. No. of Hopping Frequencies	29			
FCC Title 47 Part 15.247(a)(1) Min. of Hopping Channel Carrier Frequency Separation	30	\boxtimes		
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	31			
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	32	\boxtimes		



CHAN Kwong Ngai

EMC Test Engineer

6 General	Remarks	
Remarks		
NIL		
SUMMARY:		
- All tests accordin	ng to the regulations cited on page 5 were	
■ - Performe	ed	
□ - Not Perfo	formed	
- The Equipment U	Under Test	
■ - Fulfills th	the general approval requirements.	
□ - Does no	ot fulfill the general approval requirements.	
Sample Received	d Date: March 21, 2017	
Testing Start Date	e: March 22, 2017	
Testing End Date:	e: June 9, 2017	
- TÜV SÜD HONG I	KONG LTD	
Reviewed by:	TI'V 5	

Alex CHAN

EMC Project Engineer



Test Result

□ Passed

Not Passed

Peak

Average

7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)

43.94

33.84

Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal

Comment: 3.7VDC

9612.187

9612.187

Remark: 9kHz to 25GHz

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
119.994	25.04	43.5	-18.46	Quasi Peak
191.990	32.75	43.5	-10.75	Quasi Peak
215.970	38.99	43.5	-4.51	Quasi Peak
240.005	40.94	46.0	-5.06	Quasi Peak
264.039	41.15	46.0	-4.85	Quasi Peak
863.499	31.76	46.0	-14.24	Quasi Peak
1258.750	33.82	74.0	-40.18	Peak
1258.750	24.55	54.0	-29.45	Average
1783.812	31.32	74.0	-42.68	Peak
1783.812	23.84	54.0	-30.16	Average
4828.593	35.65	74.0	-38.35	Peak
4828.593	26.28	54.0	-27.72	Average

74.0

54.0

-30.06

-20.16



EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)

Test Spe

Commei

Remark:

ndition: pecification:	HG02430 Operated, TX Mode FCC15.205, 15.209 & 1	,	Test Result ☐ Passed ☐ Not Passed	
ent: C:	3.7VDC 9kHz to 25GHz			

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
43.472	19.33	40.0	-20.67	Quasi Peak
60.339	17.68	40.0	-22.32	Quasi Peak
216.024	30.86	46.0	-15.14	Quasi Peak
240.005	36.82	46.0	-9.18	Quasi Peak
263.985	36.51	46.0	-9.49	Quasi Peak
285.337	25.68	46.0	-20.32	Quasi Peak
1594.125	38.10	74.0	-35.90	Peak
1594.125	28.54	54.0	-25.46	Average
2275.187	37.58	74.0	-36.42	Peak
2275.187	29.25	54.0	-24.75	Average
5968.125	37.18	74.0	-36.82	Peak
5968.125	28.22	54.0	-25.78	Average
9612.187	45.64	74.0	-28.36	Peak
9612.187	36.83	54.0	-17.17	Average



EUT: HG02430

Op Condition: Operated, TX Mode (2441MHz)

Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal

Comment: 3.7VDC

Remark: 9kHz to 25GHz

Test Result
□ Passed
■ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
120.015	25.08	43.5	-18.42	Quasi Peak
190.885	32.71	43.5	-10.79	Quasi Peak
215.788	39.03	43.5	-4.47	Quasi Peak
240.010	40.92	46.0	-5.08	Quasi Peak
264.095	41.80	46.0	-4.20	Quasi Peak
863.501	31.93	46.0	-14.07	Quasi Peak
1267.375	33.96	74.0	-40.04	Peak
1267.375	24.62	54.0	-29.38	Average
1595.125	31.62	74.0	-42.38	Peak
1595.125	22.19	54.0	-31.81	Average
6128.906	37.51	74.0	-40.04	Peak
6128.906	28.46	54.0	-29.38	Average
9767.812	49.33	74.0	-24.67	Peak
9767.812	40.07	54.0	-13.93	Average



EUT: HG02430

Op Condition: Operated, TX Mode (2441MHz)

Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical

Comment: 3.7VDC

Remark: 9kHz to 25GHz

Test Result	
□ Passed	
☐ Not Passed	

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
43.475	20.01	40.0	-19.99	Quasi Peak
60.342	16.94	40.0	-23.06	Quasi Peak
216.028	31.07	46.0	-14.93	Quasi Peak
240.001	36.91	46.0	-9.09	Quasi Peak
263.992	36.66	46.0	-9.34	Quasi Peak
285.341	25.76	46.0	-20.24	Quasi Peak
1098.062	33.95	74.0	-40.05	Peak
1098.062	33.95	54.0	-20.05	Average
1596.000	33.13	74.0	-40.87	Peak
1596.000	23.95	54.0	-30.05	Average
7000.781	39.24	74.0	-34.76	Peak
7000.781	29.86	54.0	-24.14	Average
9767.812	45.67	74.0	-28.33	Peak
9767.812	35.92	54.0	-18.08	Average



EUT: HG02430

Op Condition: Operated TX Mode (2480MHz)

Test Spec

Comment

Remark:

dition:	HG02430 Operated, TX Mode (2480MHz)	Test Result ☐ Passed ☐ Not Beared
ecification: nt: :	FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal 3.7VDC 9kHz to 25GHz	☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBμV/m	dBµV/m	dB	
120.005	25.07	43.5	-18.43	Quasi Peak
191.225	32.69	43.5	-10.81	Quasi Peak
215.983	38.96	43.5	-4.54	Quasi Peak
240.001	40.98	46.0	-5.02	Quasi Peak
264.044	40.25	46.0	-5.75	Quasi Peak
863.507	31.88	46.0	-14.12	Quasi Peak
1267.687	35.05	74.0	-38.95	Peak
1267.687	26.19	54.0	-27.81	Average
1761.125	30.42	74.0	-43.58	Peak
1761.125	21.44	54.0	-32.56	Average
7015.781	39.60	74.0	-38.95	Peak
7015.781	30.77	54.0	-27.81	Average
9923.906	47.68	74.0	-26.32	Peak
9923.906	38.81	54.0	-15.19	Average



China

Spurious Radiated Emission

EUT: HG02430

Op Condition: Operated, TX Mode (2480MHz)

Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical

Comment: 3.7VDC

Remark: 9kHz to 25GHz

	Test Result
	□ Passed
	Not Passed
•	

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
43.478	19.52	40.0	-20.48	Quasi Peak
60.346	17.51	40.0	-22.49	Quasi Peak
216.033	30.92	46.0	-15.08	Quasi Peak
239.994	36.97	46.0	-9.03	Quasi Peak
263.990	36.59	46.0	-9.41	Quasi Peak
285.347	25.83	46.0	-20.17	Quasi Peak
1595.687	35.15	74.0	-38.85	Peak
1595.687	26.70	54.0	-27.30	Average
2577.187	33.86	74.0	-40.14	Peak
2577.187	24.93	54.0	-29.07	Average
6000.000	38.91	74.0	-35.09	Peak
6000.000	30.08	54.0	-23.92	Average
9923.906	45.11	74.0	-28.89	Peak
9923.906	36.89	54.0	-17.11	Average

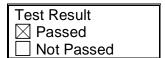


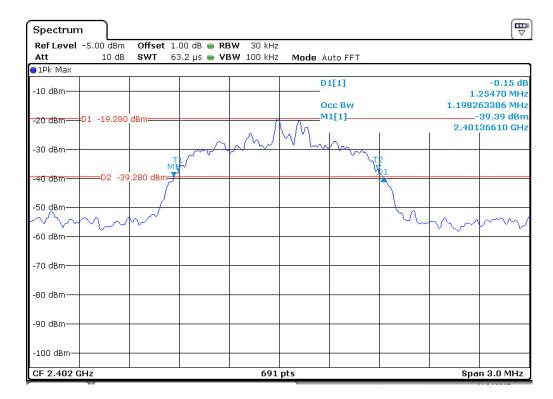
7.2 20dB & 99% Bandwidth

EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)

Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth





20dB bandwidth	99% bandwidth
1254.700 kHz	1198.263 kHz

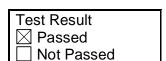


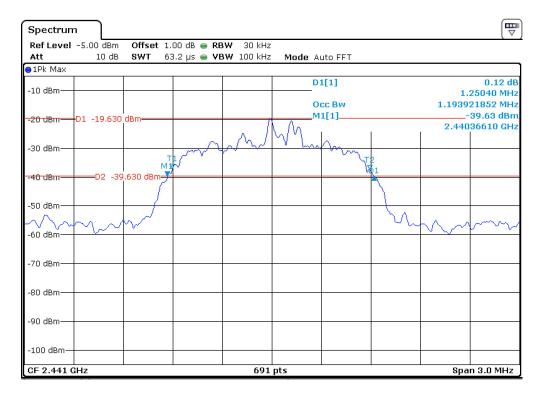
20dB & 99% Bandwidth

EUT: HG02430

Op Condition: Operated, TX Mode (2441MHz)

Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth





20dB bandwidth	99% bandwidth
1250.400 kHz	1193.921 kHz



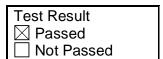
China

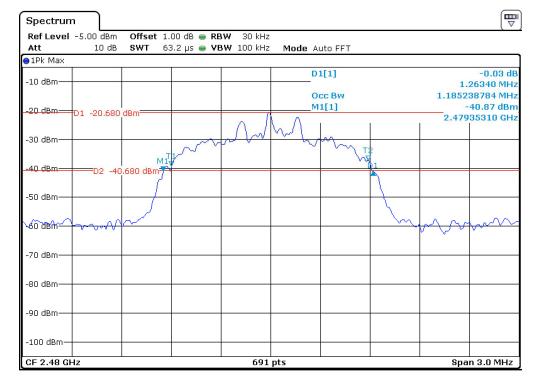
20dB & 99% Bandwidth

EUT: HG02430

Op Condition: Operated, TX Mode (2480MHz)

Test Specification: FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth





20dB bandwidth	99% bandwidth
1263.400 kHz	1185.238 kHz



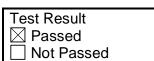
7.3 Peak Output Power

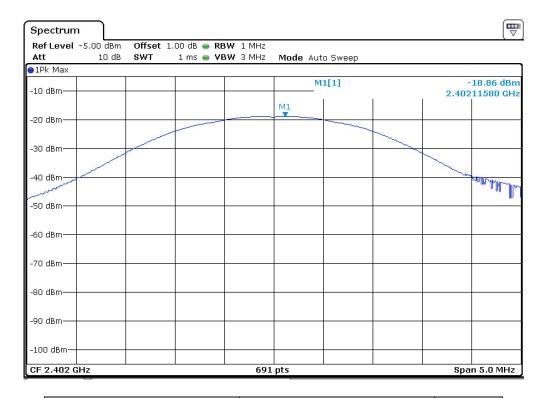
EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)

Test Specification: FCC15.247(b)

Comment: 3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB





Conducted Output Power	Conducted Output Power	Limit
(dBm)	(mW)	(mW)
-18.86	0.013	125.0



China

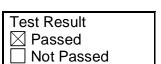
Peak Output Power

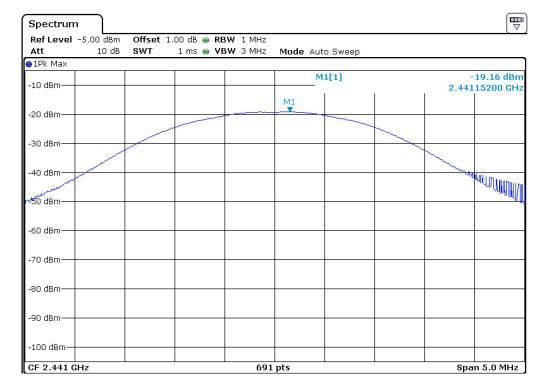
EUT: HG02430

Op Condition: Operated, TX Mode (2441MHz)

Test Specification: FCC15.247(b)

Comment: 3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB





Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
-19.16	0.012	125.0



hina

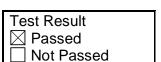
Peak Output Power

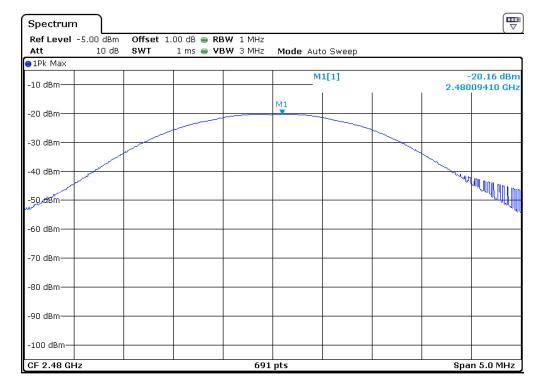
EUT: HG02430

Op Condition: Operated, TX Mode (2480MHz)

Test Specification: FCC15.247(b)

Comment: 3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB





Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
-20.16	0.010	125.0



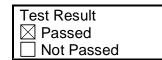
Chi

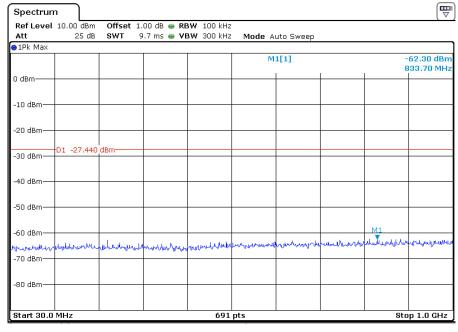
7.4 Spurious Emissions at Antenna Terminals

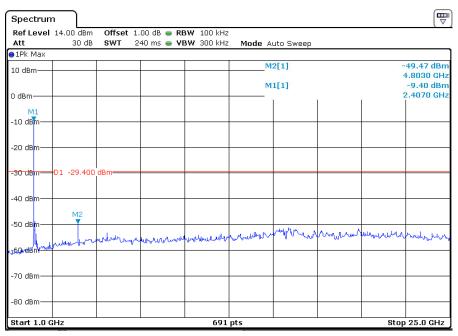
EUT: HG02430 Op Condition: Operated, TX Mode (2402MHz)

Test Specification: FCC2.1051 & 15.247(d)

Comment: 3.7VDC







Limit: 20dB below the highest level of the desired power in the passband



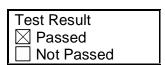
Spurious Emissions at Antenna Terminals

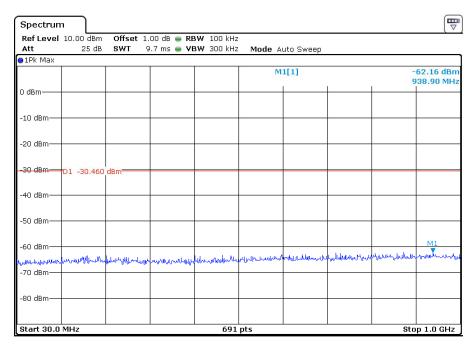
EUT: HG02430

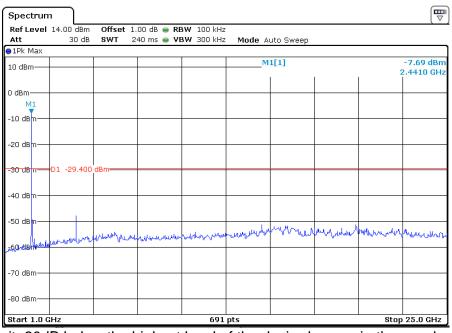
Op Condition: Operated, TX Mode (2441MHz)

Test Specification: FCC2.1051 & 15.247(d)

Comment: 3.7VDC







Limit: 20dB below the highest level of the desired power in the passband



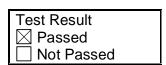
Spurious Emissions at Antenna Terminals

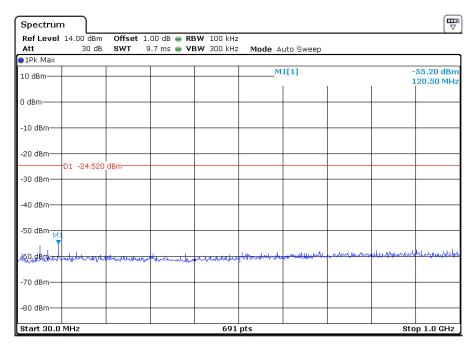
EUT: HG02430

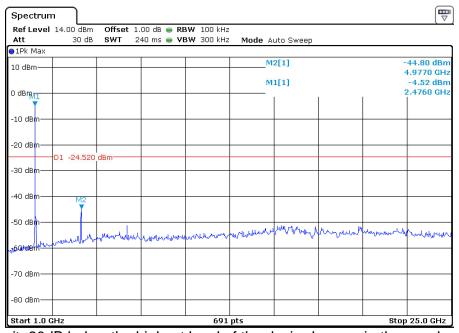
Op Condition: Operated, TX Mode (2480MHz)

Test Specification: FCC2.1051 & 15.247(d)

Comment: 3.7VDC







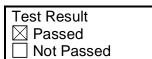
Limit: 20dB below the highest level of the desired power in the passband

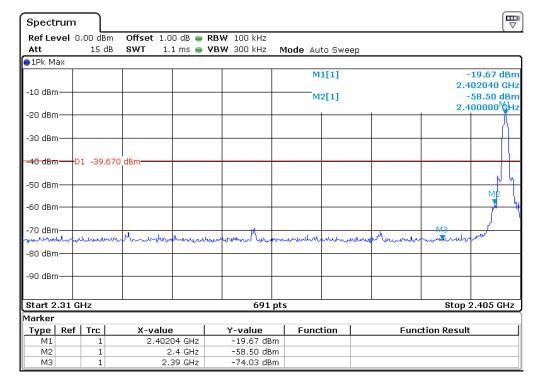


7.5 100kHz Bandwidth of band edges

EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(d), Conducted





Band edges	Limit
38.83 dB	> 20dB

Report Number: 60.792.17.012.01R01



hina

Test Result

□ Passed

Not Passed

100kHz Bandwidth of band edges

EUT: HG02430

Op Condition: Operated, TX Mode (2402MHz)

Test Specification: FCC15.247(d), Radiated

Frequency	Result	Limit	Margin	Detector
MHz	dBμV/m	dBµV/m	dB	
2390.000	21.02	74	-52.98	Peak
2390.000	18.51	54	-35.49	Average

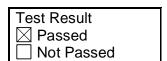


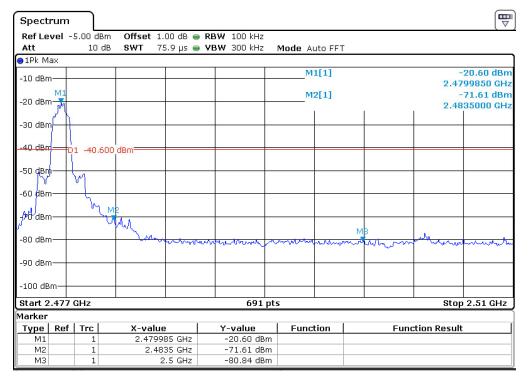
China

100kHz Bandwidth of band edges

EUT: HG02430

Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(d), Conducted





Band edges	Limit
51.01 dB	> 20dB

Report Number: 60.792.17.012.01R01



China

Test Result

□ Passed

Not Passed

100kHz Bandwidth of band edges

EUT: HG02430

Op Condition: Operated, TX Mode (2480MHz)

Test Specification: FCC15.247(d), Radiated

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
2483.500	23.62	74	-50.38	Peak
2483.500	20.24	54	-33.76	Average

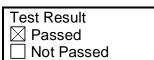


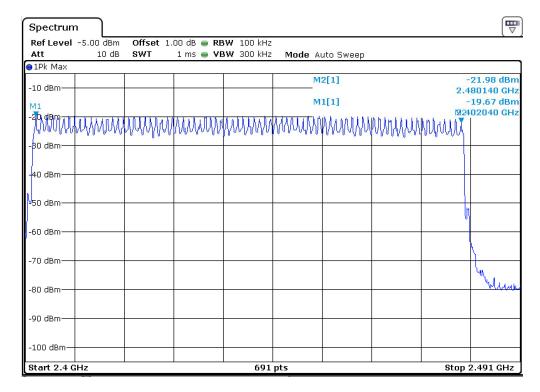
7.6 Minimum. Number of Hopping Frequencies

EUT: HG02430

Op Condition: Operated, TX Mode (2402-2480MHz)

Test Specification: FCC15.247(a)(1)





Hopping Channels	Limit
79	≥ 15



China

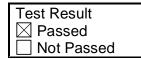
7.7 Minimum Hopping Channel Carrier Frequency Separation

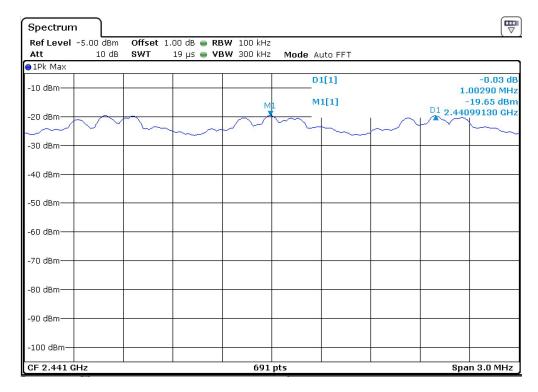
EUT: HG02430

Op Condition: Operated, TX Mode (2402-2480MHz)

Test Specification: FCC15.247(a)(1)

Comment: 3.7VDC





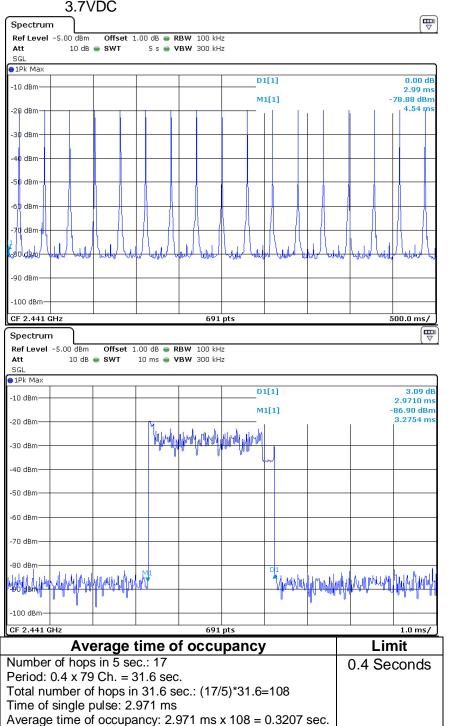
Chanel Separation	Limit
1002.90 kHz	853.867 kHz

Limit: 2/3 of 20dB bandwidth of hopping channel



7.8 Average Channel Occupancy Time

EUT:	HG02430	Test Result
Op Condition:		□ Passed
Test Specification:	FCC15.247(a)(1)	☐ Not Passed



Report Number: 60.792.17.012.01R01



China

7.9 Antenna Requirement

EUT: HG02430

Op Condition: Operated, TX Mode Test Specification: FCC15.203 & 15.247(b)

Comment: 3.7VDC

Test Result	
□ Passed	
☐ Not Passed	

Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antenna used in this product is PCB antenna, and the maximum gain of this antenna is 0.0 dBi.



8 Appendix A - Photographs of EUT









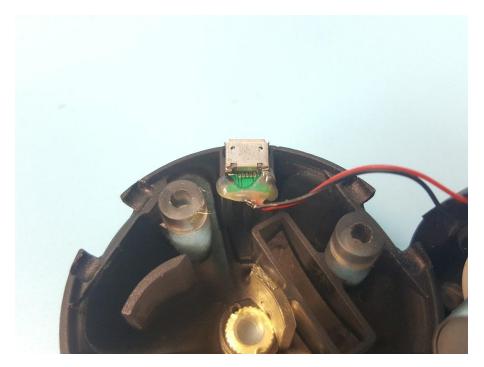






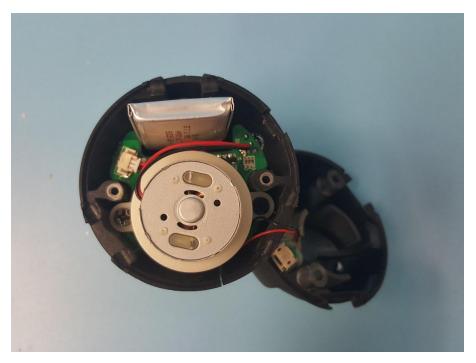












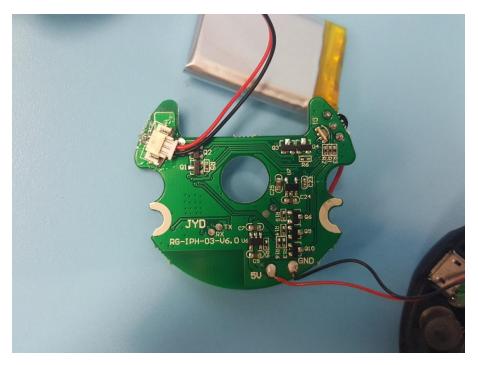






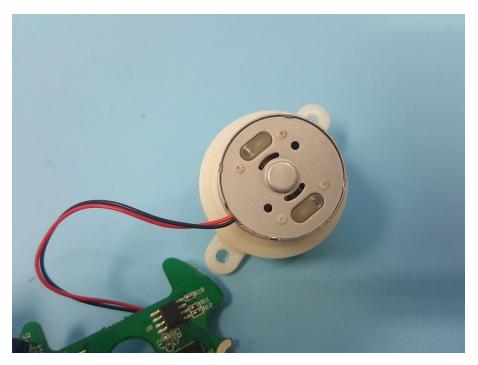




















9 Appendix B - Setup Photographs of EUT



20dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals,

100kHz Bandwidth of band edges, Min. No. of Hopping Frequencies,
Min. Hopping Channel Carrier Frequency Separation, Average Time of Occupancy





10 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as

Step a)

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] $\cdot [\sqrt{f(GHz)}] \le 3.0$ for 1-g SAR

>> The fundamental frequency of the EUT is 2402-2480MHz, the test separation distance is ≤ 50mm. (Manufacturer specified the separation distance is: 5mm)

Step a)

- >> Numeric threshold (2402MHz), mW / 5mm * $\sqrt{2.402}$ GHz ≤ 3.0 Numeric threshold (2402MHz) ≤ 9.678 mW
- >> Numeric threshold (2441MHz), mW / 5mm * $\sqrt{2.441}$ GHz ≤ 3.0 Numeric threshold (2441MHz) ≤ 9.601 mW
- >> Numeric threshold (2480MHz), mW / 5mm * $\sqrt{2.480}$ GHz ≤ 3.0 Numeric threshold (2480MHz) ≤ 9.525 mW
- >> The power of EUT measured (2402MHz) is: -18.86dBm = 0.013mW
 The power of EUT measured (2441MHz) is: -19.16dBm = 0.012mW
 The power of EUT measured (2480MHz) is: -20.16dBm = 0.010mW
 Which is smaller than the Numeric threshold.
 Therefore, the device is exempt from stand-alone SAR test requirements.