# RF TEST REPORT



#### Report No.: Q181023S005-FCC-R4

Supersede Report No.: N/A Applicant TP-LINK Technologies Co., Ltd. **Product Name** C5 Plus smartphone Model No. **TP7031C** Serial No. TP7031CXYZZ **Test Standard** FCC Part 15.247, ANSI C63.10: 2013 Test Date Nov. 06 to Nov. 20, 2018 Issue Date Nov. 22, 2018 Pass Test Result Fail V Equipment complied with the specification Equipment did not comply with the specification David Huang ion Annon **Aaron Liang David Huang Test Engineer** Checked By This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only

Issued by:

### SIEMIC (SHENZHEN-CHINA) LABORATORIES

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## Laboratories Introduction

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In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

#### Accreditations for Conformity Assessment



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## 1. Report Revision History

Report No.	Report Version	Description	Issue Date
Q181023S005-FCC-R4	NONE	Original	Nov. 22, 2018

## 2. Customer information

Applicant Name	TP-LINK Technologies Co., Ltd.
Applicant Add	Building 24-1F/3F/4F/5F, 28-1F/2F/3F/4F Science and Technology Park, Shennan
	Road, Nanshan District, Shenzhen City, Guangdong Province, P.R. China
Manufacturer	TP-LINK Technologies Co.,Ltd
Manufacturer Add	Building 24-1F/3F/4F/5F, 28-1F/2F/3F/4F Science and Technology Park, Shennan
	Road, Nanshan District, Shenzhen City, Guangdong Province, P.R. China



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## 3. Test site information

Test Lab A:

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES	
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park	
Lab Address	South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China	
	518108	
FCC Test Site No.	535293	
IC Test Site No.	4842E-1	
Test Software	Radiated Emission Program-To Shenzhen v2.0	
Test Lab B:		
Lab performing tests	SIEMIC (Nanjing-China) Laboratories	
Lab Address	2-1 Longcang Avenue Yuhua Economic and	
	Technology Development Park, Nanjing, China	
FCC Test Site No.	694825	
IC Test Site No.	4842B-1	
Test Software	EZ_EMC(ver.lcp-03A1)	

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.



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4. Equipment under Test (EUT) Information		
Description of EUT:	C5 Plus smartphone	
Main Model:	TP7031C	
	TP7031CXYZZ	
	(Model Difference	
	Description of Model Name Differentiation:	
Serial Model:	X=2 , indicates Grey ; X=4 , indicates Gold ; X=7 , indicates Blue ; X=8 , indicates Red ;	
	Y=0, indicates the memory is 512MB RAM + 8GB Flash; Y=1, indicates the memory is 1GB RAM + 8GB Flash; Y=2, indicates the memory is 1GB RAM + 16GB Flash; Z=' A' to ' Z', ZZ indicates different regions or customers. All models are same with electrical parameters and internal circuit structure.)	
Date EUT received:	Nov. 05, 2018	
Test Date(s):	Nov. 06 to Nov. 20, 2018	
Equipment Category :	DTS	
Antenna Gain:	BLE: -0.5dBi	
Antenna Type:	PIFA antenna	
Type of Modulation:	BLE: GFSK	
RF Operating Frequency (ies):	BLE: 2402-2480 MHz	
Max. Output Power:	6.060dBm	



Number of Channels:

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Port:	Please refer to the user's manual
Trade Name :	neffos
Input Power:	Adapter : Model: A8-501000 Input: AC100-240V~50/60Hz,0.2A Max Output: DC 5.0V, 1.0A Battery : Model: NBL-40A2150 Spec: 3.8V, 2150mAh from Li-ion Limited charge voltage: 4.35V Rating:3.8V/2150mAh/8.17Wh
FCC ID:	TE7C5PLUSV1

BLE: 40CH



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## 5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result	
§15.203	Antenna Requirement	Compliance	
§15.247 (a)(2)	DTS (6 dB) CHANNEL BANDWIDTH	Compliance	
§15.247(b)(3)	Conducted Maximum Output Power	Compliance	
§15.247(e)	Power Spectral Density	Compliance	
§15.247(d)	Band-Edge & Unwanted Emissions into Restricted	Compliance	
	Frequency Bands		
§15.207 (a),	AC Power Line Conducted Emissions	Compliance	
§15.205, §15.209,	Radiated Emissions & Unwanted Emissions	Compliance	
§15.247(d)	into Restricted Frequency Bands	Compliance	

#### **Measurement Uncertainty**

Emissions			
Test Item	Description	Uncertainty	
Band-Edge & Unwanted			
Emissions into Restricted	Confidence level of approximately 95% (in the case		
Radiated Emissions &	where distributions are normal), with a coverage	+5.6dB/-4.5dB	
Unwanted Emissions	factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)		
into Restricted Frequency			
Bands			
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### 6. Measurements, Examination And Derived Results

#### 6.1 Antenna Requirement

#### **Applicable Standard**

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.

b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### Antenna Connector Construction

The EUT has 2 antennas:

A permanently attached PIFA antenna for Bluetooth/BLE/WIF/GPS, the gain is -0.5dBi for Bluetooth/BLE, the gain is -0.5dBi for WIFI, the gain is -0.5dBi for GPS.

A permanently attached PIFA antenna for GSM/PCS/UMTS, the gain is 0dBi for GSM850, 0dBi for PCS1900, 0dBi for UMTS-FDD Band V, -0.5dBi for UMTS-FDD Band II.

#### The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.



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## 6.2 DTS (6 dB) Channel Bandwidth

Temperature	22 °C
Relative Humidity	54%
Atmospheric Pressure	1021mbar
Test date :	Nov. 21, 2018
Tested By :	Aaron Liang

Spec	Item	Requirement	Applicable	
§ 15.247(a)(2)	a)	a) 6dB BW≥ 500kHz;		
RSS Gen(4.6.1)	b)	99% BW: For FCC reference only; required by IC.		
Test Setup		Spectrum Analyzer EUT		
	55807	4 D01 DTS MEAS Guidance v03r03, 8.1 DTS bandwidth		
	6dB E	mission bandwidth measurement procedure		
	-	Set RBW = 30 kHz.		
	-	Set the video bandwidth (VBW) $\geq$ 3 RBW.		
	- Detector = Peak.			
Toot Droooduro	- Trace mode = max hold.			
Test Procedure	- Sweep = auto couple.			
	- Allow the trace to stabilize.			
	Measure the maximum width of the emission that is constrained by the			
	frequencies associated with the two outermost amplitude points (upper and			
	lo	ower frequencies) that are attenuated by 6 dB relative to the n	naximum	
	le	evel measured in the fundamental emission.		
Remark				
Result	Pa	ss Fail		
Test Data Yes		N/A		
Test Plot Yes	(See b	elow)		



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#### 6dB Bandwidth measurement result

#### Test Data

СН	Frequency (MHz)	6dB Bandwidth (kHz)	99% Occupied Bandwidth (MHz)
Low	2402	664.975	1.0657
Mid	2440	664.408	1.0658
High	2480	666.096	1.0643

#### **Test Plots**





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## 6.3 Maximum Output Power

Temperature	22 °C
Relative Humidity	54%
Atmospheric Pressure	1021mbar
Test date :	Nov. 21, 2018
Tested By :	Aaron Liang

### Requirement(s):

Spec	Item	Requirement	Applicable	
	a)	FHSS in 2400-2483.5MHz with $\geq$ 75 channels: $\leq$ 1 Watt		
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt		
§15.247(b)	c)	For all other FHSS in the 2400-2483.5MHz band: $\leq 0.125$		
(3) RSS210		Watt.		
(A8.4)	d)	FHSS in 902-928MHz with $\geq$ 50 channels: $\leq$ 1 Watt		
(, (011)	e)	FHSS in 902-928MHz with $\geq 25 \& <50$ channels: $\leq 0.25$	Ī	
		Watt		
	f)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt	Y	
Test Setup				
		Spectrum Analyzer EUT		
	558074	D01 DTS MEAS Guidance v03r03, 9.1.2 Integrated band power meth	nod	
	Maximum output power measurement procedure			
	a) Set th	ne RBW ≥ DTS bandwidth.		
	b) Set V	$BW \ge 3 \times RBW.$		
Test	c) Set s	ban ≥ 3 x RBW		
Procedure	d) Swee	p time = auto couple.		
	e) Detec	ctor = peak.		
	f) Trace	mode = max hold.		
	g) Allow trace to fully stabilize.			
	h) Use p	beak marker function to determine the peak amplitude level.		
Remark				
Result	Pas	s Fail		



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Test Data	✓ Yes
Test Plot	Yes (See below)

□<sub>N/A</sub>

□ <sub>N/A</sub>

Output Power measurement result

Test Data

Туре	СН	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Result
Output power	Low	2402	5.666	30	Pass
	Mid	2440	6.060	30	Pass
	High	2480	5.831	30	Pass

**Test Plots** 





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## 6.4 Power Spectral Density

Temperature	22 °C
Relative Humidity	54%
Atmospheric Pressure	1021mbar
Test date :	Nov. 21, 2018
Tested By :	Aaron Liang

Spec	Item	Requirement	Applicable			
		The power spectral density conducted from the intentional radiator to the antenna shall not be greater				
§15.247(e)	a)	than 8 dBm in any 3 kHz band during any time	•			
		interval of continuous transmission.				
Test Setup						
		Spectrum Analyzer EUT				
	558074	D01 DTS MEAS Guidance v03r03, 10.2 power spectral density met	thod			
	power s	pectral density measurement procedure				
	-	- a) Set analyzer center frequency to DTS channel center frequency.				
	- b) Set the span to 1.5 times the DTS bandwidth.					
	- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .					
Test	- d) Set the VBW $\geq$ 3 × RBW.					
Procedure	- e) Detector = peak.					
	- f) Sweep time = auto couple.					
	- g) Trace mode = max hold.					
	-	h) Allow trace to fully stabilize.				
	-	I) Use the peak marker function to determine the maximum amplitud	de ievel within			
		i) If measured value exceeds limit reduce PBW (no less than 3 kHz	x) and repeat			
Domark			.) and repeat.			
Remark		-				
Result	🎽 Pas	s Fail				
_		_				
Test Data	Yes	N/A				
Test Plot	/es (See	below)				



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#### Power Spectral Density measurement result

#### Test Data

Туре	СН	Freq (MHz)	Reading (dBm)	Factor (dB)	Result (dBm)	Limit (dBm)	Result
PSD	Low	2402	-3.857	-5.23	-9.087	8	Pass
	Mid	2440	-3.573	-5.23	-8.803	8	Pass
	High	2480	-3.788	-5.23	-9.018	8	Pass

Note: factor=10log(3/10)=-5.23

#### **Test Plots**





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## 6.5 Band-Edge & Unwanted Emissions into Restricted Frequency Bands

Temperature	22℃
Relative Humidity	51%
Atmospheric Pressure	1009mbar
Test date :	Nov. 09, 2018
Tested By :	Aaron Liang

#### Requirement(s):

Spec	Item	Requirement	Applicable					
§15.247(d)	a)	<ul> <li>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</li> <li>a) 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.</li> </ul>						
Test Setup	Ant. Tower L-4m Variable 0.8/1.5m Ground Plane Test Receiver							
Test Procedure	Radiate	<ul> <li>Radiated Method Only</li> <li>1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.</li> <li>2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.</li> </ul>						

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		2 Eirct or	t both DRW/ and V/RW/	of sportrum applyzer to 100 kHz with a
		- J. Filst, se	t frequency span inclu	ding 100kHz bandwidth from band edge, check
		the emissi	on of FLIT if pass ther	ang Tookinz bandwidth norn band euge, check
		a The res	olution bandwidth and	video bandwidth of test receiver/spectrum
		analyzer i	a 120 kHz for Ouasiv P	eak detection at frequency below 1GHz
		h The res	olution bandwidth of te	st receiver/spectrum analyzer is 1MHz and video
		b: The les	uis 3MHz with Peak de	tection for Peak measurement at frequency above
		1GHz		
		c The res	olution bandwidth of te	st receiver/spectrum analyzer is 1MHz and the
		video ban	dwidth is 10Hz with Pe	ak detection for Average Measurement as below
		at frequen	cv above 1GHz	
		- 4 Measur	e the highest amplitude	e appearing on spectral display and set it as a
		reference	level. Plot the graph wi	ith marking the highest point and edge frequency
		- 5. Repeat	above procedures unti	all measured frequencies were complete.
Romark			p	· · · · · · · · · · · · · · · · · · ·
Remark				
Result		Pass	Fail	
Test Data Test Plot	Γ <sub>Υ</sub>	es es (See below)	N/A	



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#### **Test Plots**

#### Band Edge measurement result



Note: Both Horizontal and vertical polarities were investigated.



### 6.6 AC Power Line Conducted Emissions

Temperature	25℃
Relative Humidity	50%
Atmospheric Pressure	1008mbar
Test date :	Nov. 08, 2018
Tested By :	Aaron Liang

#### Requirement(s):

Spec	Item	Requirement Applicable						
47CFR§15. 207, RSS210 (A8.1)	a)	For Low-power radio-fr connected to the public voltage that is conducte frequency or frequencie not exceed the limits in [mu] H/50 ohms line im lower limit applies at th Frequency ranges (MHz) 0.15 ~ 0.5 0.5 ~ 5	K					
		5 ~ 30	60	50				
Test Setup	Vertical Ground Reference Plane EUT UT Blocm UISN Horizontal Ground Reference Plane Note: 1.Support units were connected to second LISN.							
Procedure	<ol> <li>The the</li> <li>The filte</li> <li>The filte</li> </ol>	<ol> <li>Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</li> <li>The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.</li> <li>The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.</li> <li>The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss</li> </ol>						

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	<ul> <li>coaxial cable.</li> <li>4. All other supporting</li> <li>5. The EUT was swith</li> <li>6. A scan was made over the required f</li> <li>7. High peaks, relative selected frequencies setting of 10 kHz.</li> <li>8. Step 7 was then restricted frequences</li> </ul>	g equipment were p ched on and allowe on the NEUTRAL li requency range usi re to the limit line, T es and the necessa	bowered separately from another main supply. d to warm up to its normal operating condition. ne (for AC mains) or Earth line (for DC power) ng an EMI test receiver. he EMI test receiver was then tuned to the ary measurements made with a receiver bandwidth E line (for AC mains) or DC line (for DC power).
Remark			
Result	Pass	Fail	
Test Data	Yes	N/A	
Test Plot 🛛 🕍	Yes (See below)	N/A	



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### Test Mode: Transmitting Mode



Test Data

### Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.1734	29.65	QP	10.03	39.68	64.80	-25.12
2	L1	0.1734	15.68	AVG	10.03	25.71	54.80	-29.09
3	L1	0.5088	30.40	QP	10.03	40.43	56.00	-15.57
4	L1	0.5088	24.72	AVG	10.03	34.75	46.00	-11.25
5	L1	1.0743	26.75	QP	10.03	36.78	56.00	-19.22
6	L1	1.0743	16.36	AVG	10.03	26.39	46.00	-19.61
7	L1	2.6616	25.19	QP	10.05	35.24	56.00	-20.76
8	L1	2.6616	14.22	AVG	10.05	24.27	46.00	-21.73
9	L1	5.1138	18.78	QP	10.08	28.86	60.00	-31.14
10	L1	5.1138	11.14	AVG	10.08	21.22	50.00	-28.78
11	L1	15.7725	12.06	QP	10.24	22.30	60.00	-37.70
12	L1	15.7725	2.36	AVG	10.24	12.60	50.00	-37.40



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#### Test Data

### Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	Ν	0.1734	34.97	QP	10.02	44.99	64.80	-19.81
2	Ν	0.1734	15.51	AVG	10.02	25.53	54.80	-29.27
3	Ν	0.4698	28.09	QP	10.02	38.11	56.52	-18.41
4	Ν	0.4698	17.45	AVG	10.02	27.47	46.52	-19.05
5	Ν	1.4409	23.18	QP	10.03	33.21	56.00	-22.79
6	Ν	1.4409	12.02	AVG	10.03	22.05	46.00	-23.95
7	Ν	3.5811	24.45	QP	10.06	34.51	56.00	-21.49
8	Ν	3.5811	11.68	AVG	10.06	21.74	46.00	-24.26
9	Ν	6.8610	19.64	QP	10.10	29.74	60.00	-30.26
10	Ν	6.8610	6.30	AVG	10.10	16.40	50.00	-33.60
11	Ν	24.0405	23.95	QP	10.32	34.27	60.00	-25.73
12	Ν	24.0405	6.04	AVG	10.32	16.36	50.00	-33.64



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Test Data

### Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.5049	35.26	QP	10.03	45.29	56.00	-10.71
2	L1	0.5049	28.75	AVG	10.03	38.78	46.00	-7.22
3	L1	0.9495	32.51	QP	10.03	42.54	56.00	-13.46
4	L1	0.9495	25.17	AVG	10.03	35.20	46.00	-10.80
5	L1	1.5735	32.45	QP	10.04	42.49	56.00	-13.51
6	L1	1.5735	22.53	AVG	10.04	32.57	46.00	-13.43
7	L1	2.2404	32.89	QP	10.05	42.94	56.00	-13.06
8	L1	2.2404	24.00	AVG	10.05	34.05	46.00	-11.95
9	L1	3.5265	30.25	QP	10.06	40.31	56.00	-15.69
10	L1	3.5265	21.02	AVG	10.06	31.08	46.00	-14.92
11	L1	4.8408	28.99	QP	10.08	39.07	56.00	-16.93
12	L1	4.8408	17.69	AVG	10.08	27.77	46.00	-18.23



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#### Test Data

### Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	Ν	0.3879	36.05	QP	10.02	46.07	58.11	-12.04
2	Ν	0.3879	26.38	AVG	10.02	36.40	48.11	-11.71
3	Ν	0.4971	39.47	QP	10.02	49.49	56.05	-6.56
4	Ν	0.4971	31.38	AVG	10.02	41.40	46.05	-4.65
5	Ν	0.9924	36.62	QP	10.03	46.65	56.00	-9.35
6	Ν	0.9924	27.98	AVG	10.03	38.01	46.00	-7.99
7	Ν	1.4877	35.68	QP	10.03	45.71	56.00	-10.29
8	Ν	1.4877	25.61	AVG	10.03	35.64	46.00	-10.36
9	Ν	2.6460	36.14	QP	10.05	46.19	56.00	-9.81
10	Ν	2.6460	24.77	AVG	10.05	34.82	46.00	-11.18
11	Ν	3.8658	33.49	QP	10.06	43.55	56.00	-12.45
12	Ν	3.8658	20.29	AVG	10.06	30.35	46.00	-15.65



## 6.7 Radiated Emissions & Restricted Band

Temperature	22°C
Relative Humidity	51%
Atmospheric Pressure	1009mbar
Test date :	Nov. 09, 2018
Tested By :	Aaron Liang

#### Requirement(s):

Spec	Item	Requirement	Applicable	
		Except higher limit as specified else emissions from the low-power radio exceed the field strength levels spe the level of any unwanted emission the fundamental emission. The tigh edges		
		Frequency range (MHz)	Field Strength (µV/m)	
	a)	0.009~0.490	2400/F(KHz)	
		0.490~1.705	24000/F(KHz)	
		1.705~30.0	30	
		30 - 88	100	
47CFR§15.		88 – 216	150	
247(d),		216 960	200	
RSS210		Above 960		
(A8.5)	b)	) kHz bandwidth outside the d spectrum or digitally berating, the radio frequency ational radiator shall be at least 0 kHz bandwidth within the I of the desired power, ethod on output power to be al limits specified in § 15.209(a) dB down	V	
	c)	or restricted band, emission must a emission limits specified in 15.209	V	



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1			
SIF		Test Report No.	Q181023S005-FCC-R4
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	The resolution bandwidth is frequency ab 5. Steps 2 and points were	n bandwidth of test reco 10Hz with Peak detecti ove 1GHz. I 3 were repeated for th measured.	eiver/spectrum analyzer is 1MHz and the video on for Average Measurement as below at e next frequency point, until all selected frequency
Remark			
Result	Pass	Fail	
Test Data	Yes	N/A	
Test Plot	Yes (See below)	□ <sub>N/A</sub>	

### **Test Result:**

Test Mode: Transmitting Mode	
------------------------------	--

#### Frequency range: 9KHz - 30MHz

Freq.	Detection	Factor	Reading	Result	Limit@3m	Margin
(MHz)	value	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
						>20
						>20

#### Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

Limit line = specific limits(dBuv) + distance extrapolation factor.



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### Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	ee ( )
1	Н	408.9460	25.39	15.88	21.99	2.03	21.31	46.00	-24.69	100	173
2	Н	312.1794	28.44	13.86	22.26	1.85	21.89	46.00	-24.11	100	252
3	Н	156.4578	25.25	12.60	22.29	1.37	16.93	43.50	-26.57	100	6
4	Н	120.6991	24.56	13.85	22.36	1.16	17.21	43.50	-26.29	100	90
5	Н	102.3597	26.86	10.81	22.32	1.13	16.48	43.50	-27.02	100	282
6	Н	85.2981	29.31	7.81	22.37	1.06	15.81	40.00	-24.19	100	256



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#### 30MHz -1GHz



### Test Data

### Vertical Polarity Plot @3m

Ν	P/	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr
0.	L					(10)			(10)	(	ee
		(MHZ)	(abuv/m)	(aB/m)	(aB)	(aB)	(aBuv/m)	(aBuv/m)	(ab)	(cm)	
1	V	651.9417	32.10	19.67	21.47	2.63	32.93	46.00	-13.07	100	172
2	V	207.8501	27.68	11.99	22.37	1.57	18.87	43.50	-24.63	100	55
3	V	125.0066	27.35	13.57	22.37	1.18	19.73	43.50	-23.77	100	235
4	v	88.0329	33.67	7.92	22.34	1.00	20.25	43.50	-23.25	100	217
5	V	54.6429	38.57	7.89	22.39	0.78	24.85	40.00	-15.15	100	314
6	v	41.5670	33.21	12.87	22.28	0.78	24.58	40.00	-15.42	100	106



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Above 1GHz

Test Mode:

Transmitting Mode

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4804	45.83	AV	V	33.39	7.22	48.46	37.98	54	-16.02
4804	42.38	AV	Н	33.39	7.22	48.46	34.53	54	-19.47
4804	68.54	PK	V	33.39	7.22	48.46	60.69	74	-13.31
4804	65.86	PK	Н	33.39	7.22	48.46	58.01	74	-15.99
10010	39.1	AV	V	39.21	9.12	47.44	39.99	54	-14.01
10010	39.5	AV	Н	39.21	9.12	47.44	40.39	54	-13.61
10010	60.82	PK	V	39.21	9.12	47.44	61.71	74	-12.29
10010	59.82	PK	Н	39.21	9.12	47.44	60.71	74	-13.29

### Low Channel (2402 MHz)

#### Middle Channel (2440 MHz)

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4880	48.54	AV	V	33.62	7.53	48.36	41.33	54	-12.67
4880	47.9	AV	Н	33.62	7.53	48.36	40.69	54	-13.31
4880	66	PK	V	33.62	7.53	48.36	58.79	74	-15.21
4880	63.75	PK	Н	33.62	7.53	48.36	56.54	74	-17.46
10918	40.31	AV	V	39.88	9.79	46.24	43.74	54	-10.26
10918	39.55	AV	Н	39.88	9.79	46.24	42.98	54	-11.02
10918	60.37	PK	V	39.88	9.79	46.24	63.8	74	-10.2
10918	60.56	PK	Н	39.88	9.79	46.24	63.99	74	-10.01



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Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4960	49.26	AV	V	33.89	7.86	48.31	42.7	54	-11.3
4960	48.15	AV	Н	33.89	7.86	48.31	41.59	54	-12.41
4960	65.67	PK	V	33.89	7.86	48.31	59.11	74	-14.89
4960	68.59	PK	Н	33.89	7.86	48.31	62.03	74	-11.97
17866	24.51	AV	V	42.31	19.68	45.26	41.24	54	-12.76
17866	21.45	AV	н	42.31	19.68	45.26	38.18	54	-15.82
17866	44.39	PK	V	42.31	19.68	45.26	61.12	74	-12.88
17866	46.85	PK	Н	42.31	19.68	45.26	63.58	74	-10.42

#### High Channel (2480 MHz)

#### Note:

1, The testing has been conformed to 10\*2480MHz=24,800MHz

2, All other emissions more than 30 dB below the limit

3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.



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## Annex A. TEST INSTRUMENT

The product was tested in accordance with the following specifications. All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.203	Antonna Paquiromont	Please refer
		to 17021127-FCC-R1
§15.247(a)(1)	Channel Separation	Please refer
		to 17021127-FCC-R1
§15.247(a)(1)	20 dB Bandwidth	Please refer
		to 17021127-FCC-R1
§15.247(b)(1)	Pools Output Dower	Please refer
		to 17021127-FCC-R1
§15.247(a)(1)(iii)		Please refer
		to 17021127-FCC-R1
§15.247(a)(1)(iii)	Time of Occurrency (Dwall Time)	Please refer
	Time of Occupancy (Dweir Time)	to 17021127-FCC-R1
§15.247(d)	Pand Edge & Destricted Pand	Please refer
		to 17021127-FCC-R1
§15.207(a)	AC Line Conducted Emissions	Please refer
	AC Line Conducted Emissions	to 17021127-FCC-R1
§15.205, §15.209, §15.247(d)	Dedicted Emissions & Destricted Dead	Please refer
		to 17021127-FCC-R1



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## Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

#### Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for AC Line Conducted Emissions





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Block Configuration Diagram for Radiated Emissions (Below 1GHz).





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### Block Configuration Diagram for Radiated Emissions (Above 1GHz).





### Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

#### Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No	
Dongguan Aohai Power	Adapter	A8-501000	N/A	
Technology Co.,Ltd.	•			
Dong guan Tenji Technology	Farabana	TJ101891E	N/A	
Industrial Co., Ltd.	Laiphone			

#### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	1m	N/A



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## Annex C. User Manual / Block Diagram / Schematics / Partlist/ DECLARATION OF SIMILARITY

#### TP-LINK TECHNOLOGIES CO., LTD. Building 24 (floors 1 3.4.5) and 28 (floors 1

Building 24 (floors 1,3,4,5) and 28 (floors 1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

Product Change Description

We, TP-LINK TECHNOLOGIES CO., LTD. ,declare on our sole responsibility that the product,

[TP7031CXYZZ]

is the variant of the initial certified product,

[TP7031C]

Except the following changes on the latest MODEL: [TP7031CXYZZ]

Series Name TP7031CXYZZ Model Difference Description of Model Name Differentiation: X=2, indicates Grey; X=4, indicates Gold; X=7, indicates Blue; X=8, indicates Red; Y=0, indicates the memory is 512MB RAM + 8GB Flash; Y=1, indicates the memory is 1GB RAM + 8GB Flash; Y=2, indicates the memory is 1GB RAM + 16GB Flash; Z='A' to 'Z', ZZ indicates different regions or customers. All models are same with electrical parameters and internal circuit structure.

#### HARDWARE MODIFICATION:

Power Amplifier changes: NO Antenna changes: NO PCB Layout changes: NO LCD changes: NO Speaker changes: NO Camera changes: NO Vibrator changes: NO FM changes: NO Other changes: NO

#### **MECHANICAL MODIFICATIONS:**

Use new metal front/back cover or keypad: NO Mechanical shell changes: NO Other changes detailed: NO

Signature:

Name: Huang Jing Designation: Regulatory Compliance Manager Date: 2018-11-29