

TEST REPORT

APPLICANT : Hot Pepper, Inc.

PRODUCT NAME: 4G Feature Phone

MODEL NAME : HPP-LF2

BRAND NAME: Hot Pepper

FCC ID : 2APD4-A90L

STANDARD(S) : 47 CFR Part 15 Subpart E

RECEIPT DATE : 2019-08-09

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Change History					
Version Date Reason for change					
1.0 2020-01-09		First edition			



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Hot Pepper, Inc.	
Applicant Address:	Applicant Address: 5151 California Ave., Suite 100, Irvine 92617, USA	
Manufacturer:	Hot Pepper, Inc.	
Manufacturer Address:	5151 California Ave., Suite 100, Irvine 92617, USA	

1.2. Companion Equipment(Master) Description

Product Name:	Router
Manufacturer:	Cisco
FCC ID:	LDK102091
Serial No:	FGL1848X9S5
Antenna Gain:	2.1 dBi

1.3. Equipment Under Test (EUT) Description

Product Name:	4G Feature Phone			
Serial No:	(N/A, marked #1 by test site)			
Hardware Version:	A90L_MAINBOARD_P1			
Software Version:	HPP-LF2-V1.0.3-19	90809		
Modulation Type:	OFDM			
Modulation Mode:	802.11a, 11n(HT20	802.11a, 11n(HT20),11n(HT40),802.11ac(HT20),		
Wodulation Wode.	802.11ac(HT40)			
Operating Frequency Range:	5.180 GHz- 5.240 GHz; 5.260 GHz -5.320 GHz ;			
Operating Frequency Kange.	5.745GHz- 5.825GHz			
Channel Number:	Refer to 1.3			
Antenna Type:	PIFA Antenna			
Antenna Gain:	5.1G:-0.8 dBi,5.2G:-0.8dBi;5.8G:-0.9dBi			
Accessory Information	Battery			
Accessory Information:	Manufacturer:	Shenzhen HUATIANTONG		



Kehu-Morlab Test Laboratory

REPORT No.: XM19070036W08

	TECHNOLOGY CO.LTD
Brand Name:	Hot Pepper
Model No.:	HPP-LF2
Serial No.:	(N/A, marked #1 by test site)
Capacity:	1700mAh
Rated Voltage:	3.80V
Charge Limit:	4.35V
AC Adapter	
Manufacturer:	Shenzhen Tianyin Electronics Co.,Ltd.
Brand Name:	Hot Pepper
Model No.:	TPA-46B050100UU
Serial No.:	(N/A, marked #1 by test site)
Rated Input:	100-240V ~ 50/60Hz 0.2A
Rated Output:	5V=1.0A

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Tel: +86-592-5612050



1.4. The channel number and frequency of EUT

Frequency Range: 5180MHz-5240MHz					
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
20MHz	36	5180	40	5200	
ZUIVITZ	44	5220	48	5240	
40MHz	38	5190	46	5230	
Frequency Rang	e: 5260MHz-53	20MHz			
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
20MHz	52	5260	56	5280	
2017112	60	5300	64	5320	
40MHz	54	5270	62	5310	
Frequency Rang	Frequency Range: 5745-5825MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
	149	5745	153	5765	
20MHz	157	5785	161	5805	
	165	5825	/	/	
40MHz	151	5775	159	5795	



1.5. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (U-NII band) for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15 (5-1-14 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	15.407(h)	TPC and DFS	Oct 10, 2019	Lai Huihuang	PASS

- **Note 1:** The DFS section for U-NII band is applicable to this report, the other test items are documented in a separate report.
- **Note 2:** These RF tests were performed according to the method of measurements prescribed in KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.
- **Note 3:** Test results demonstrating an associated client link is established with the master on a same test frequency operating in the same band and operation modes.
- **Note 4:** Two client devices can't communicate directly with each other while maintaining an association with a master, the client device also can't operates on a frequency band while "listening" to a master.

1.6. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106



2.47 CFR Part 15E Requirements

2.1. Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)

2.1.1. Requirement

According to FCC section 15.407(h), (1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.1

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.2



Tables 1 and 2 shown below summarize the information contained in sections 5.1.1 and 5.1.2.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

	Operational Mode			
Requirement	Master	Client Without Radar	Client With Radar	
		Detection	Detection	
Non-Occupancy Period	Yes	Not required	Yes	
DFS Detection Threshold	Yes	Not required	Yes	
Channel Availability Check Time	Yes	Not required	Not required	
U-NII Detection Bandwidth	Yes	Not required	Yes	

Table 2: Applicability of DFS requirements during normal operation

Doguiroment	Operational Mode		
Requirement	Master	Client Without Radar Detection	
DFS Detection Threshold	Yes	Not required	
Channel Closing Transmission Time	Yes	Yes	
Channel Move Time	Yes	Yes	
U-NII Detection Bandwidth	Yes	Not required	

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection	
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required	
Channel Move Time and Channel	Test using widest BW mode	Test using the widest BW	
Closing Transmission Time	available	mode available for the link	
All other tests	Any single BW mode	Not required	

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

Master Devices

- a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 5350 MHz and 5470 5725 MHz bands. DFS is not required in the 5150 5250 MHz or 5725 5825 MHz bands.
- b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for specified time duration (Channel Availability Check Time) to ensure that there is no radar



system operating on the Channel, using DFS described under subsection a) above.

- c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.
- f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period. 3
- g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above. Client Devices
- a) A Client Device will not transmit before having received appropriate control signals from a Master Device.
- b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.
- c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.
- d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.
- e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

DFS Detection Thresholds

Table 3 below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)	
EIRP ≥ 200 milliwatt	-64 dBm	
EIRP < 200 milliwatt and	-62 dBm	



power spectral density < 10 dBm/MHz	
EIRP < 200 milliwatt that do not meet the power spectral	-64 dBm
density requirement	-04 QBIII

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

Response Requirements

Table 4 provides the response requirements for Master and Client Devices incorporating DFS.

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
	See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds
	over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power
	bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

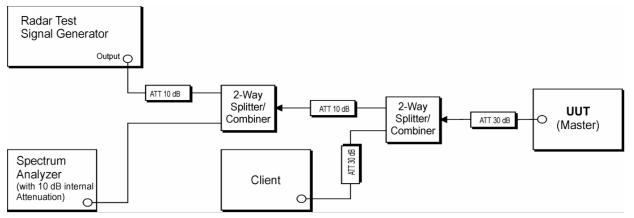
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

2.1.2. Test Description

According to Section 7.2 of KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

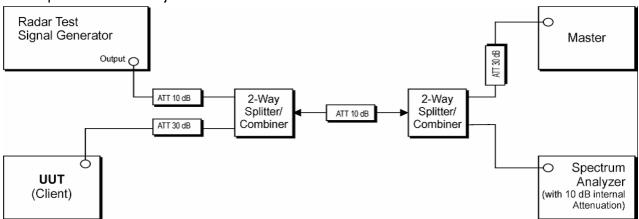
1. Setup for Master with injection at the Master





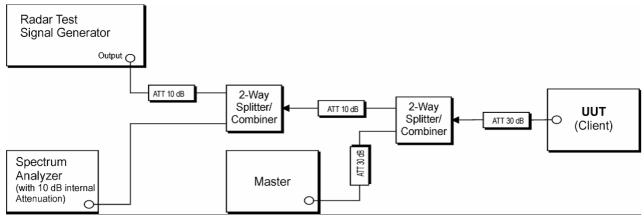
(Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master)

2. Setup for Client with injection at the Master



(Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master)

3. Setup for Client with injection at the Client



(Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client)

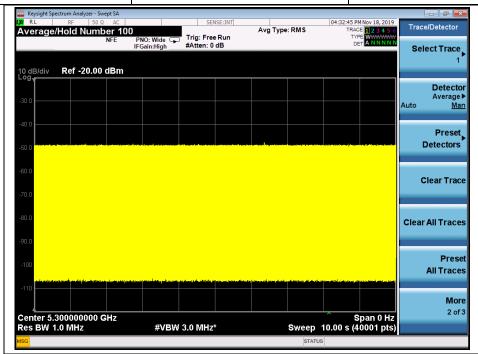




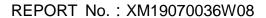
2.1.3. Test Result

a. Test sequence and Channel loading between Master and Client

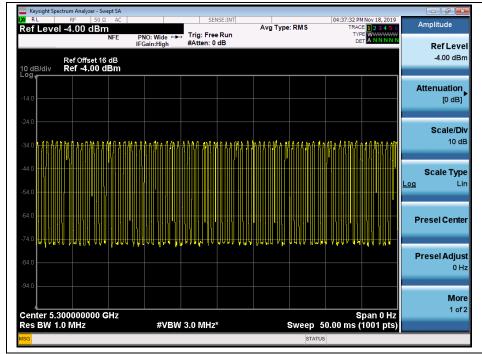
Test Channel	Frequency(MHz)	Payload	
60	5300	40.35%	



(Test sequence)

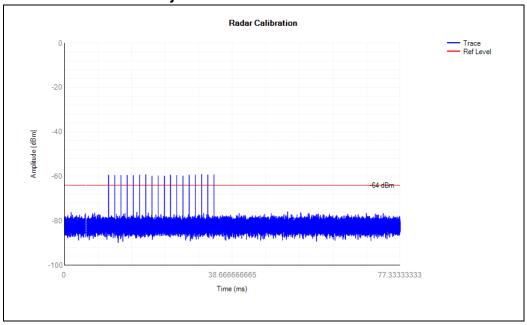






(Payload)

b. Radar Test Waveforms are injected into the Master:



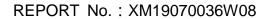
(Type 0)



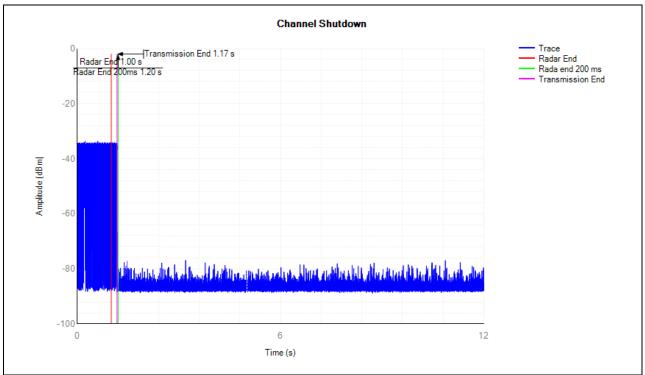
c. EUT is a Client Device Without Radar Detection :

Channel &		Operational Mode	Test	Limit	Verdict
Bandwidth	Requirement	Client Without	Result		
Bandwidth		Radar Detection	Result		
802.11 a	Channel Move Time	Yes	0.17s	<10s	PASS
5300MHz	Channel Closing	Yes	152.7ms	<200+60ms	PASS
5500WIF12	Transmission Time	162	132.71115	\200 + 001115	PASS
802.11	Channel Move Time	Yes	0.23s	<10s	PASS
ac(VHT40)	Channel Closing	Yes	207.3ms	<200+60ms	PASS
5310MHz	Transmission Time	res	207.31118	\200+00IIIS	rass

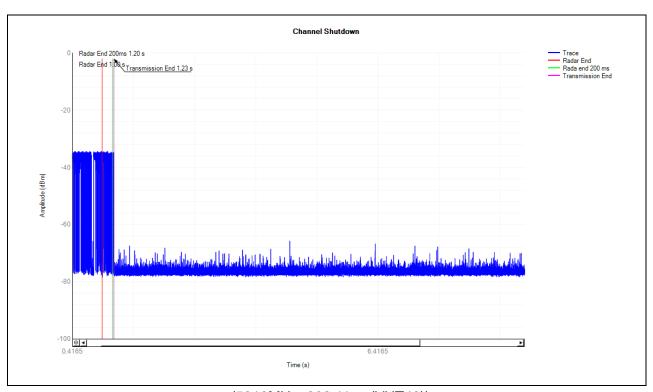
Test Plots







(5300MHz, 802.11a)



(5310MHz, 802.11ac (VHT40))

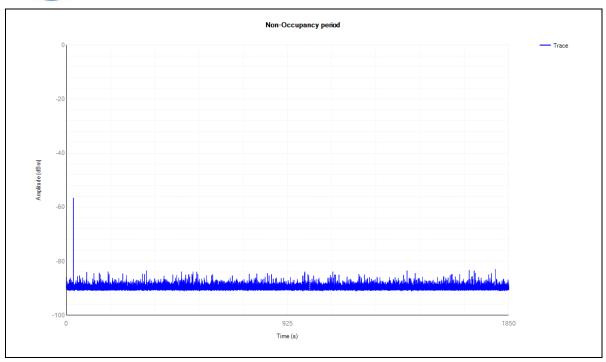


d. Verification of Non-occupancy time

The sweep time is 1.86ks(31min) which is able to meet the requirements of Non-occupancy time.

Channel & Bandwidth	Test Result	Limit	Verdict
802.11 a 5280MHz	31min	≥30min	PASS





(Non-occupancy time, 5280MHz, 802.11a)



Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Bandwidth	±5%
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Kehu-Morlab Test Laboratory	
Laboratory Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free	
	Trade Zone (Fujian) P.R. China	
Telephone:	+86 592 5612050	
Facsimile:	+86 592 5612095	

2. Identification of the Responsible Testing Location

Name:	Kehu-Morlab Test Laboratory
Addes	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free
Address:	Trade Zone (Fujian) P.R. China

3. Accreditation Certificate

Accredited Testing	The FCC designation number is CN1249.
Laboratory:	(Kehu-Morlab Test Laboratory)

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
adjustable	(NI/A)	0~70dB	Centron	N/A	N/A
attenuator	(N/A.)	0~70ub	Microwave	IN/A	IN/A
EXA Signal	MY57150136	N9030A	A gilont	2019.1.5	2020.1.4
Analzyer	W1137 130 130	N9030A	Agilent	2019.1.5	2020.1.4
MXG Vector Signal	MY47272140	E4438C	kovojaht	2019.1.4	2020.1.3
Generator	101147272140	E4436C	keysight	2019.1.4	2020.1.3
RF cable	DE04	N1/A	Maylak	N1/A	NI/A
(30MHz-26GHz)	RF01	N/A	Morlab	N/A	N/A
Coaxial cable	RF02	N/A	Morlab	N/A	N/A
SMA connector	RF03	N/A	Xingbo	N/A	N/A

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