

# **RF Exposure Report**

Report No.: SA170614C22C

FCC ID: K7SF8M747V2

Test Model: F8M741

Series Model: F8M747V2

Received Date: Mar. 21, 2018

Test Date: Mar. 29 ~ Apr. 20, 2018

**Issued Date:** Apr. 23, 2018

Applicant: Belkin International., Inc

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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R.O.C.

FCC Registration /

Designation Number: 198487 / TW2021





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## **Release Control Record**

Issue No.	Description	Date Issued
SA170614C22C	Original release	Apr. 23, 2018

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Report No.: SA170614C22C Reference No.: 180321C10



### 1 Certificate of Conformity

Product: Wireless Charging Pad

Brand: belkin

Test Model: F8M741

Series Model: F8M747V2

Sample Status: Engineering sample

Applicant: Belkin International., Inc

**Test Date:** Mar. 29 ~ Apr. 20, 2018

**Standards:** FCC Part 1 (Section 1.1307(b), 1.1310)

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by: Apr. 23, 2018

Annie Chang / Senior Specialist

Rex Lai / Associate Technical Manager



#### 2 General Information

## 2.1 General Description of EUT

Product	Wireless Charging Pad
Brand	belkin
Test Model	F8M741
Series Model	F8M747V2
Model Difference	Refer to note as below
Sample Status	Engineering sample
Power Supply Rating	5Vdc (adapter)
Modulation Type	FSK
Operating Frequency	115-148kHz
Antenna Type	Coil antenna
Field Strength	97.01dBuV/m
Dimensions	15.205cm <sup>2</sup> (diameter = 44.0mm)
Accessory Device	Wall charger
Data Cable Supplied	2m shielded USB cable without core
Maximum Power Output from the Charging Coil	Max Power Should be 5W

#### Note:

1. The EUT is a wireless inductive charging coil for charging Phone.

2. All models are listed as below. The model: F8M741 was selected as a representative one and therefore only its test data was recorded in this report.

Brand Model		Difference
belkin	F8M741	Wireless Charging Pad + Wall Charger + USB cable
belkin	F8M747V2	Wireless Charging Pad + USB cable

3. Model: F8M741 includes following device.

Item	Brand	Model	Specification
Wall charger	Ten Pao International Inc.	C012CDI 10500200	Input: 100-240Vac, 0.4A, 50/60Hz
	Ten Fao international inc.	3012000000200	Output: 5Vdc, 2000mA

- 4. The EUT was pre-tested with the following modes:
- Charging Mode (Powered from Adapter)
- Charging Mode (Powered from Notebook)
- The worst emission level was found when the EUT tested under **Charging Mode (Powered from Adapter)**, therefore, only its test data was recorded in this report.



#### 3 RF Exposure

### 3.1 Description of Support Units

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.

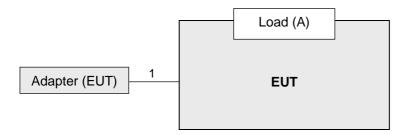
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Load	NA	NA	NA	NA	Provided by manufacturer
B.	iPhone X	Apple	A1901	NA	BCG-E3175A	Provided by manufacturer

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	2	Υ	0	Supplied by client

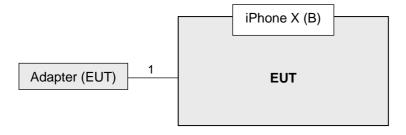
Note: The core(s) is(are) originally attached to the cable(s)

## 3.1.1 Configuration of System Under Test

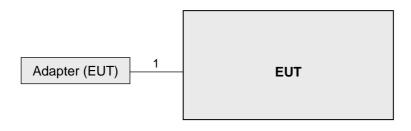
Charging Mode with Load



Charging Mode with iPhone



Standby Mode

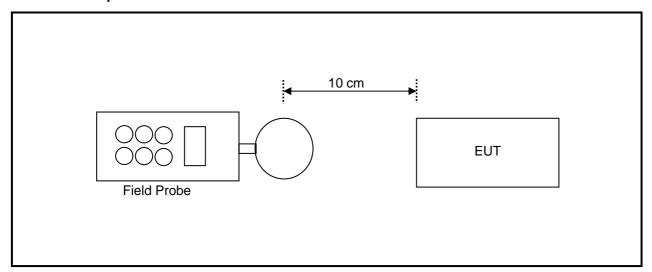


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## 3.2 Test Setup



Note: Measurements should be made from all sides and the top of the primary/client pair, with the 10 cm measured from the center of the probe(s) to the edge of the device.

### 3.3 Test Instruments

Description	Brand	Model No.	Frequency Range	Calibrated Date	Calibrated Until
Broadband Field Meter	NARDA	NBM-550	•	Jan.12,2017	Jan.11,2019
Magnetic Field Meter	NARDA	ELT-400	1 – 400kHz	Jan.10,2017	Jan.9,2019
Magnetic Probe	NARDA	HF-3061	300kHz – 30MHz	Jan.4,2017	Jan.3,2019
Magnetic Probe	NARDA	HF-0191	27 – 1000MHz	Jan.4,2017	Jan.3,2019
Broadband Field Meter	NARDA	NBM-550	-	Jan.12,2017	Jan.11,2019
Electric Field Meter	COMBINOVA	EFM 200	5Hz – 400kHz	Dec. 6, 2017	Dec. 5, 2019
E-Field Probe	NARDA	EF-0391	100kHz – 3GHz	Jan.5,2017	Jan.4,2019
E-Field Probe	NARDA	EF-6091	100MHz - 60GHz	Jan.5,2017	Jan.4,2019

**NOTE:** 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Chia Pau RF Chamber



#### **Limits for Maximum Permissible Exposure (MPE)**

§ 1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency(RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)		
(A) Limits for Occupational/Controlled Exposures						
0.3–3.0	614	1.63	*(100)	6		
3.0-30	1842/f	4.89/f	*(900/f2)	6		
30-300	61.4	0.163	1.0	6		
300-1500			f/300	6		
1500-100,000			5	6		
(B) Limits	for General Populati	on/Uncontrolled Exp	oosure			
0.3–1.34	614	1.63	*(100)	30		
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30		
30–300	27.5	0.073	0.2	30		
300-1500			f/1500	30		
1500-100,000			1.0	30		

f = frequency in MHz

T = frequency in MHz

\* = Plane-wave equivalent power density

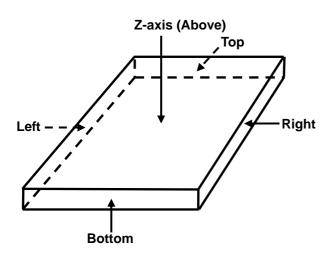
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

### 680106 D01 RF Exposure Wireless Charging Apps v02

Aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.

#### 3.5 **Test Point Description**



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### 4 Calculation Result Of Maximum Conducted Power

Charging Mode with Load 10% Charge

E-Field Measurement (10cm)							
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)		
Max E-field (V/m)	1.42	0.89	0.97	2.01	2.17		
Limit (V/m)	614	614	614	614	614		
Margin (V/m)	-612.58	-613.11	-613.03	-611.99	-611.83		
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8		
70 % Margin (V/m)	-428.806	-429.177	-429.121	-428.393	-428.281		

H-Field Measurement (10cm)							
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)		
Max H-field (uT)	0.263	0.285	0.274	0.362	0.81		
Max H-field (A/m)	0.2104	0.228	0.2192	0.2896	0.648		
Limit (A/m)	1.63	1.63	1.63	1.63	1.63		
Margin (A/m)	-1.4196	-1.402	-1.4108	-1.3404	-0.982		
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141		
70 % Margin (A/m)	-0.99372	-0.9814	-0.98756	-0.93828	-0.6874		



Charging Mode with Load 50% Charge

E-Field Measurement (10cm)							
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)		
Max E-field (V/m)	1.41	0.99	1.01	2.15	2.69		
Limit (V/m)	614	614	614	614	614		
Margin (V/m)	-612.59	-613.01	-612.99	-611.85	-611.31		
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8		
70 % Margin (V/m)	-428.813	-429.107	-429.093	-428.295	-427.917		

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.356	0.302	0.298	0.421	0.789			
Max H-field (A/m)	0.2848	0.2416	0.2384	0.3368	0.6312			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.3452	-1.3884	-1.3916	-1.2932	-0.9988			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-0.94164	-0.97188	-0.97412	-0.90524	-0.69916			



Charging Mode with Load 90% Charge

E-Field Measurement (10cm)								
EUT Side Left Right Top Bottom Z-axis (Al								
Max E-field (V/m)	1.9	1.18	1.3	2.45	2.96			
Limit (V/m)	614	614	614	614	614			
Margin (V/m)	-612.1	-612.82	-612.7	-611.55	-611.04			
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8			
70 % Margin (V/m)	-428.47	-428.974	-428.89	-428.085	-427.728			

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.404	0.338	0.345	0.543	0.913			
Max H-field (A/m)	0.3232	0.2704	0.276	0.4344	0.7304			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.3068	-1.3596	-1.354	-1.1956	-0.8996			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-0.91476	-0.95172	-0.9478	-0.83692	-0.62972			



Charging Mode with Load 3mm airgap 10% Charge

E-Field Measurement (10cm)								
EUT Side Left Right Top Bottom Z-ax								
Max E-field (V/m)	1.62	1.03	1.12	2.21	2.41			
Limit (V/m)	614	614	614	614	614			
Margin (V/m)	-612.38	-612.97	-612.88	-611.79	-611.59			
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8			
70 % Margin (V/m)	-428.666	-429.079	-429.016	-428.253	-428.113			

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.312	0.323	0.296	0.412	0.961			
Max H-field (A/m)	0.2496	0.2584	0.2368	0.3296	0.7688			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.3804	-1.3716	-1.3932	-1.3004	-0.8612			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-0.96628	-0.96012	-0.97524	-0.91028	-0.60284			



Charging Mode with Load 3mm airgap 50% Charge

E-Field Measurement (10cm)							
EUT Side Left Right Top Bottom Z-axis (A							
Max E-field (V/m)	1.62	1.01	1.21	2.29	2.77		
Limit (V/m)	614	614	614	614	614		
Margin (V/m)	-612.38	-612.99	-612.79	-611.71	-611.23		
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8		
70 % Margin (V/m)	-428.666	-429.093	-428.953	-428.197	-427.861		

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.398	0.385	0.341	0.51	0.814			
Max H-field (A/m)	0.3184	0.308	0.2728	0.408	0.6512			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.3116	-1.322	-1.3572	-1.222	-0.9788			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-0.91812	-0.9254	-0.95004	-0.8554	-0.68516			



Charging Mode with Load 3mm airgap 90% Charge

E-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max E-field (V/m)	2.13	1.36	1.58	2.66	3.05			
Limit (V/m)	614	614	614	614	614			
Margin (V/m)	-611.87	-612.64	-612.42	-611.34	-610.95			
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8			
70 % Margin (V/m)	-428.309	-428.848	-428.694	-427.938	-427.665			

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.526	0.485	0.474	0.741	1.263			
Max H-field (A/m)	0.4208	0.388	0.3792	0.5928	1.0104			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.2092	-1.242	-1.2508	-1.0372	-0.6196			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-0.84644	-0.8694	-0.87556	-0.72604	-0.43372			



Charging Mode with iPhone X 10% Charge

E-Field Measurement (10cm)								
EUT Side Left Right Top Bottom Z-axis (A								
Max E-field (V/m)	0.89	0.75	0.72	0.69	1.39			
Limit (V/m)	614	614	614	614	614			
Margin (V/m)	-613.11	-613.25	-613.28	-613.31	-612.61			
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8			
70 % Margin (V/m)	-429.177	-429.275	-429.296	-429.317	-428.827			

H-Field Measurement (10cm)								
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)			
Max H-field (uT)	0.0885	0.087125	0.094125	0.08325	0.093375			
Max H-field (A/m)	0.0708	0.0697	0.0753	0.0666	0.0747			
Limit (A/m)	1.63	1.63	1.63	1.63	1.63			
Margin (A/m)	-1.5592	-1.5603	-1.5547	-1.5634	-1.5553			
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141			
70 % Margin (A/m)	-1.09144	-1.09221	-1.08829	-1.09438	-1.08871			



Charging Mode with iPhone X 50% Charge

E-Field Measurement (10cm)								
EUT Side Left Right Top Bottom Z-axis (A								
Max E-field (V/m)	0.92	0.71	0.61	0.87	1.55			
Limit (V/m)	614	614	614	614	614			
Margin (V/m)	-613.08	-613.29	-613.39	-613.13	-612.45			
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8			
70 % Margin (V/m)	-429.156	-429.303	-429.373	-429.191	-428.715			

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.8925	0.9275	0.985	0.87	0.98125
Max H-field (A/m)	0.0714	0.0742	0.0788	0.0696	0.0785
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5586	-1.5558	-1.5512	-1.5604	-1.5515
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.09102	-1.08906	-1.08584	-1.09228	-1.08605



Charging Mode with iPhone X 90% Charge

E-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max E-field (V/m)	0.9	0.65	0.54	0.91	1.72
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.1	-613.35	-613.46	-613.09	-612.28
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8
70 % Margin (V/m)	-429.17	-429.345	-429.422	-429.163	-428.596

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.096	0.088	0.093	0.086	0.111
Max H-field (A/m)	0.0768	0.0704	0.0744	0.0688	0.0888
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5532	-1.5596	-1.5556	-1.5612	-1.5412
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.08724	-1.09172	-1.08892	-1.09284	-1.07884



Charging Mode with iPhone X 3mm airgap 10% Charge

E-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max E-field (V/m)	0.71	0.62	0.66	0.78	1.36
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.29	-613.38	-613.34	-613.22	-612.64
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8
70 % Margin (V/m)	-429.303	-429.366	-429.338	-429.254	-428.848

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.09675	0.091125	0.0745	0.082875	0.092625
Max H-field (A/m)	0.0774	0.0729	0.0596	0.0663	0.0741
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5526	-1.5571	-1.5704	-1.5637	-1.5559
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.08682	-1.08997	-1.09928	-1.09459	-1.08913



Charging Mode with iPhone X 3mm airgap 50% Charge

E-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max E-field (V/m)	0.67	0.58	0.62	0.74	1.22
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.33	-613.42	-613.38	-613.26	-612.78
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8
70 % Margin (V/m)	-429.331	-429.394	-429.366	-429.282	-428.946

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.08725	0.08975	0.0835	0.087	0.098625
Max H-field (A/m)	0.0698	0.0718	0.0668	0.0696	0.0789
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5602	-1.5582	-1.5632	-1.5604	-1.5511
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.09214	-1.09074	-1.09424	-1.09228	-1.08577



Charging Mode with iPhone X 3mm airgap 90% Charge

E-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max E-field (V/m)	0.88	0.63	0.52	0.87	1.69
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.12	-613.37	-613.48	-613.13	-612.31
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8
70 % Margin (V/m)	-429.184	-429.359	-429.436	-429.191	-428.617

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.096375	0.088125	0.09275	0.08575	0.111125
Max H-field (A/m)	0.0771	0.0705	0.0742	0.0686	0.0889
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5529	-1.5595	-1.5558	-1.5614	-1.5411
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.08703	-1.09165	-1.08906	-1.09298	-1.07877



Standby Mode

E-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max E-field (V/m)	0.92	0.81	0.75	0.76	1.58
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.08	-613.19	-613.25	-613.24	-612.42
70 % Limit (V/m)	429.8	429.8	429.8	429.8	429.8
70 % Margin (V/m)	-429.156	-429.233	-429.275	-429.268	-428.694

H-Field Measurement (10cm)					
EUT Side	Left	Right	Тор	Bottom	Z-axis (Above)
Max H-field (uT)	0.088875	0.090375	0.08875	0.08475	0.091
Max H-field (A/m)	0.0711	0.0723	0.071	0.0678	0.0728
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5589	-1.5577	-1.559	-1.5622	-1.5572
70 % Limit (A/m)	1.141	1.141	1.141	1.141	1.141
70 % Margin (A/m)	-1.09123	-1.09039	-1.0913	-1.09354	-1.09004



5 Photographs of the Test Configuration
Please refer to the attached file (Test Setup Photo).
END
END

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