

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Product Name:	IDZ Ltd. 18F, No. 216 Kuang Fu N. Rd, Taipei 105, Taiwan Charging cradle
Brand Name:	Chilisin
Model No.:	BTWH00505201TXA012
Model Difference:	N/A
Report Number:	E2/2021/30030
FCC ID:	2AZO7000000000IDZ1C
Issue Date:	May 5, 2021
Date of Test:	March 10, 2021 \sim April 29, 2021
Date of EUT Received:	March 10, 2021

Jay Lin Approved By

Jay Lin / Asst. Supervisor

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15C.

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	Revision History					
Report Number	port Number Revision Description Issue Date Revised By					
E2/2021/30030	00	Original.	May 5, 2021	Susan Lin		

Note:

1 · Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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GENERAL INFORMATION 1

1.1 Product Description

Product Name:	Charging cradle			
Brand Name:	Chilisin			
Model No.:	BTWH00505201TXA012			
Model Difference:	N/A			
Hardware Version:	TX4004001A3			
Software Version:	1202_Watch_test01.bin			
EUT Series No.:	PJ213047016			
Power Supply:	5Vdc from USB Cable			

1.2 RF Specification

Technology:	Wireless Power Transfer			
Operating Frequency:	205KHz			
FCC Transmit Power:	<68.58 dBuV/m at 3m.			
Number of Channels:	1			
Antenna Type:	Coil Antenna			

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1.3 Test Methodology

FCC Part 15, Supbpart C

ANSI C63.10:2013

1.4 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
		SAC 1		
		SAC 3		
		Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1		
	Industrial Park, Wuku District, New	Conducted 2	TW0027	
	Taipei City, Taiwan.	Conducted 3		
		Conducted 4		TW3702
		Conducted 5	-	
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction A	TW0028	
(TAF code 3702)		SAC C		
$(1AI \ COUE \ 5102)$		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
	labydan City, Talwan 555	Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		
Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.				

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1.5 Special Accessories

There is no special accessory used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 9kHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for radiated emissions, measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.3.3 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber,

the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2.4 Configuration of Tested System

Fig. 2-1 Conduction & Radiated Emission test set up configuration

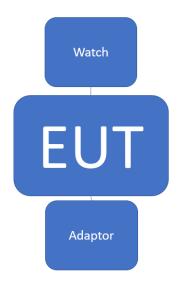


Table 2-1 Equipment Used in Tested System

ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WPC Test Software	N/A	N/A	N/A	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.209	Radiated Emission Limits, general requirement	Compliant
§15.215 (c)	20 dB OCCUPIED BANDWIDTH	Compliant
§15.203	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

The EUT stay in continuous transmitting mode. The frequency is the default channel to test, where it is the only manipulative channel as this application supports.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode), the worst case position was reported.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.34 dB
Frequency Stability	+/- 1.54 Hz
20 dB OCCUPIED BANDWIDTH	+/- 1.54 Hz
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 1%

Radiated Spurious Emission Measurement Uncertainty					
	+/-	2.64	dB	9kHz~30MHz: +-2.3dB	
Polorization: Vortical	+/-	4.93	dB	30MHz - 1000MHz: +/- 3.37dB	
Polarization: Vertical	+/-	4.81	dB	1GHz - 18GHz: +/- 4.04dB	
	+/-	4.52	dB	18GHz - 40GHz: +/- 4.04dB	
Polarization: Horizontal	+/-	2.64	dB	9kHz~30MHz: +-2.3dB	
	+/-	4.45	dB	30MHz - 1000MHz: +/- 4.22dB	
	+/-	4.81	dB	1GHz - 18GHz: +/- 4.08dB	
	+/-	4.52	dB	18GHz - 40GHz: +/- 4.08dB	

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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CONDUCTED EMISSIONS TEST 6

6.1 Limitation

According to section 15.207(a) Conducted Emission Limits as following.

Frequency range	Limits dB (uV)			
MHz	Quasi-peak Average			
0.15 to 0.50	66 to 56	56 to 46		
0.50 to 5	56 46			
5 to 30	60 50			
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.				

Table 1: Conducted emission limits for induction cooking appliances (AC mains terminals)

Frequency range (MHz)	All other appliances Quasi-peak (dBµV)	All other appliances Average (dBµV)
0.009 - 0.05	110	—
0.05 – 0.15	90 to 80	—
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

6.2 EUT Setup

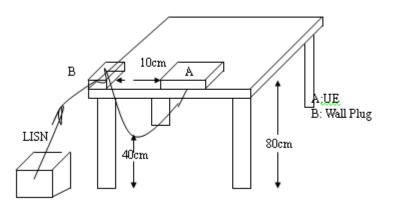
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.

6.5 Measurement Equipment Used:

Radiated Emission Test Site: Conduction A					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	audix	e3	Ver. 6.11- 20180419c	N.C.R	N.C.R
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	03/25/2021	03/24/2022
EMI Test Receiver	R&S	ESCI	101342	04/28/2020	04/27/2021
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB- 250-01	03/27/2021	03/26/2022
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2021	03/26/2022
Adapter	Sony	AC-0400-TW	3504600	N.C.R	N.C.R
USB Cable	MI	SJX10ZM	USB to Type-c	N.C.R	N.C.R

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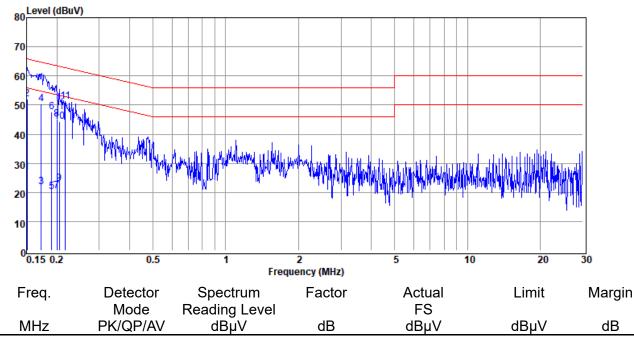
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6.6 Measurement Result:

Report Number	:E2/2021/30030
Test Mode	:WPC
Power	:120V/60Hz
Probe	:L1
Note:	:

Test Site	:Conduction Room C
Test Date	:2021-04-17
Temp./Humi.	:23.4/66
Engineer	:Ashton Chiu



0.15	Average	16.52	10.30	26.82	55.96	-29.14
0.15	QP	41.83	10.30	52.13	65.96	-13.83
0.17	Average	11.45	10.30	21.75	54.82	-33.07
0.17	QP	40.14	10.30	50.44	64.82	-14.38
0.19	Average	9.78	10.30	20.08	54.02	-33.94
0.19	QP	37.44	10.30	47.74	64.02	-16.28
0.20	Average	10.31	10.30	20.61	53.60	-32.99
0.20	QP	34.70	10.30	45.00	63.60	-18.60
0.21	Average	12.60	10.30	22.90	53.40	-30.50
0.21	QP	33.89	10.30	44.19	63.40	-19.21
0.22	Peak	40.82	10.30	51.12	62.92	-11.80

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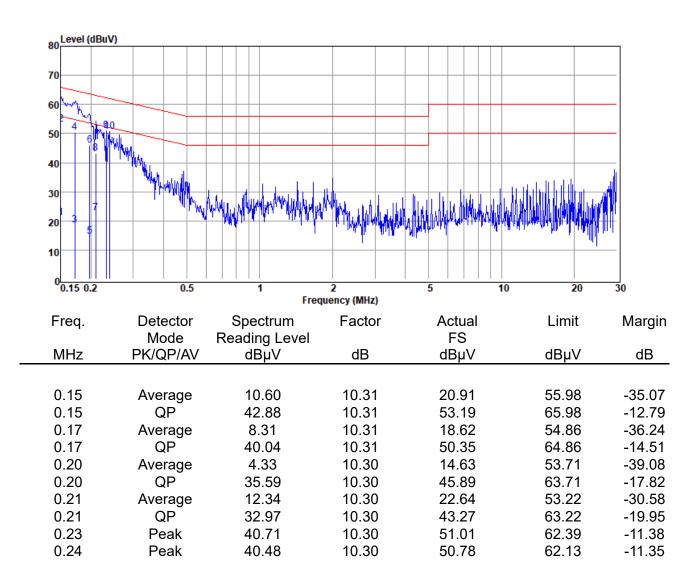
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Report Number	:E2/2021/30030	Test Site	:Conduction Room C
Test Mode	:WPC	Test Date	:2021-04-17
Power	:120V/60Hz	Temp./Humi.	:23.4/66
Probe	:N	Engineer	:Ashton Chiu
Note:	:		



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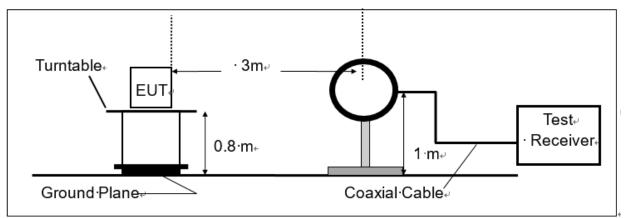
7 RADIATED EMISSION TEST

7.1 Measurement Procedure

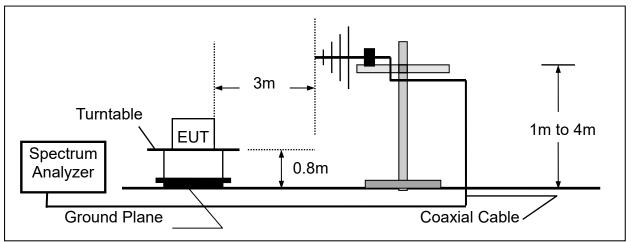
- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



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7.3 Measurement Equipment Used:

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	TESEQ	CBL 6112D	35240	09/08/2020	09/07/2021
Loop Antenna	ETS.LINDGREN	6502	143303	04/28/2020	04/27/2021
Test Software	audix	e3	20923 sgs Ver.9	N.C.R	N.C.R
EMI Test Receiver	R&S	ESU 40	100363	04/29/2020	04/28/2021
Pre-Amplifier	EMC Instruments	EMC330	980096	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/19/2020	11/18/2021
Adapter	Sony	AC-0400- TW	3504600	N.C.R	N.C.R
USB Cable	MI	SJX10ZM	USB to Type- c	N.C.R	N.C.R

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7.4 Applicable Standard

The field strength of any emissions appearing outside of operation frequency shall not exceed the general radiated emission limits in section 15.209 as below.

Frequency (MHz)	Field strength (μV/m)	Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- 1. Emission level in $dB\mu V/m=20 \log (\mu V/m)$
- 2. Distance extrapolation factor = 40 log (required distance/ test distance) (dB)
- 3. 20*log(30uV/m) + 40dB = 69.54 dBuV/m
- 4. The lower limit shall apply at the transition frequencies.
- 5. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.
- 6. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of §15.205.
- 7. The general radiated emission limits in §15.209 apply for the spurious emission generate from UE, except for the fundamental emission where the respective section specifies otherwise.
- Actual FS(dBµV/m) = Spectrum. Reading level(dBµV) + Factor(dB) Factor(dB) = Antenna Factor(dB) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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7.4.1 Frequency range 30 MHz to 1000 MHz

The electric field radiated emissions within 30 – 1000 MHz from the WPT subassembly of WPT source and client devices and WPT systems shall comply with the limits applicable to induction cooking equipment, as set out in ICES-001 table 4.

Table 4: Electric field strength radiated emission limits for induction cookingappliances

Frequency range (MHz)	OATS or SAC* 10 m measurement distance Quasi- peak (dBµV/m)	OATS or SAC* 3 m measurement distance Quasi- peak (dBµV/m)	FAR* 3 m measurement distance Quasi- peak (dBµV/m)
30 – 230	30	40	42 to 35 **
230 – 1000	37	47	42

* OATS = open-area test site, SAC = semi-anechoic chamber, FAR = fully-anechoic room (see CSA CISPR 11:19).

** The limit level in dBµV/m decreases linearly with the logarithm of frequency.

Note:

- 1. The more stringent limit applies at the transition frequency.
- 2. Measurements are demonstrated in SAC with distance at 3m.
- Actual FS(dBµV/m) = Spectrum. Reading level(dBµV) + Factor(dB) Factor(dB) = Antenna Factor(dB) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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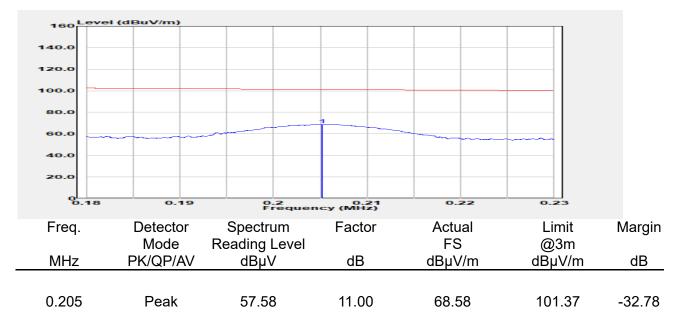
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7.5 Test Result

7.5.1 Field Strength of Fundamental Emission

7.5.2 Below 30	MHZ test result		
Report Number	:E2/2021/30030	Test Site	:966 Chamber C
Operation Mode	:WPC	Test Date	:2021-04-16
Test Frequency	:205 KHz	Temp./Humi.	:23.3/58
Test Mode	:Main	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Ashton Chiu



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Report Number	:E2/2021/30030	Test Site	:966 Chamber C
Operation Mode	:WPC	Test Date	:2021-04-16
Test Frequency	:205 KHz	Temp./Humi.	:23.3/58
Test Mode	:Main	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Ashton Chiu
160 Level (d	BuV/m)		
140.0			
120.0			
100.0			
80.0			
60.0			~~~~
40.0			
20.0			
0			

0.18	0.19	0.2 Frequen	0.21 cy (MHz)	0.22	0.23	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
0.205	Peak	57.29	11.00	68.29	101.37	-33.08

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Report Number Operation Mode Test Frequency	:E2/2021/30030 :WPC :205 KHz		Tes	t Site t Date np./Humi.	:966 Chamber C :2021-04-16 :23.3/58
Test Mode	:Tx		Ant	enna Pol.	:Vertical
EUT Pol	:H Plane		Eng	jineer	:Ashton Chiu
160	BuV/m)				
140.0					
120.0					
100.0					
80.0					
60.0 1					
40.0				34	5 6
20.0		2			
0.009	6.007	12.005	18.004	24.002	2 30

0.005	0.007	Frequen	cy (MHz)	24.002	50	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	-
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
0.410	Peak	38.48	11.24	49.72	95.35	-45.62
13.995	Peak	14.17	11.30	25.47	69.54	-44.07
21.349	Peak	18.97	10.64	29.61	69.54	-39.93
21.781	Peak	20.52	10.54	31.06	69.54	-38.48
26.491	Peak	21.83	9.60	31.43	69.54	-38.11
27.741	Peak	18.05	9.39	27.43	69.54	-42.11

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100.0

60.0 40.0 20.0

Freq.

MHz

0.410

13.947

23.031

23.415

26.540

26.924

8.009

6.007

Detector

Mode

PK/QP/AV

Peak

Peak

Peak

Peak

Peak

Peak

30

Limit

@3m

dBµV/m

95.35

69.54

69.54

69.54

69.54

69.54

Margin

dB

-40.90

-40.19

-35.59

-30.78

-35.49

-36.75

24.002

Actual

FS

dBµV/m

54.45

29.35

33.95

38.76

34.05

32.79

Report Number	:E2/2021/30030	Test Site	:966 Chamber C
Operation Mode	:WPC	Test Date	:2021-04-16
Test Frequency	:205 KHz	Temp./Humi.	:23.3/58
Test Mode	:Tx	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Ashton Chiu
160 Level (d	lBuV/m)		
140.0			
120.0			

12.005 18.004 Frequency (MHz)

Factor

dB

11.24

11.30

10.27

10.19

9.59

9.53

Spectrum

Reading Level

dBµV

43.20

18.05

23.68

28.57

24.45

23.26

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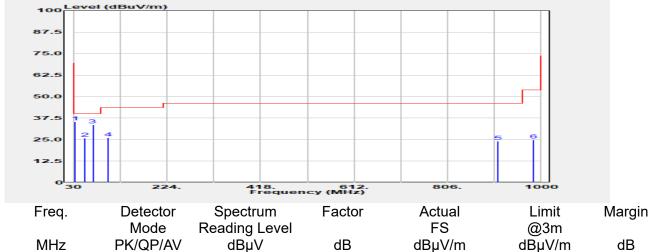
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7.5.3 FCC Above 30MHz test result

Report Number	:E2/2021/30030
Operation Mode	:WPC
Test Frequency	:205 KHz
Test Mode	:Tx
EUT Pol	:H Plane

Test Site	:966 Chamber C
Test Date	:2021-04-16
Temp./Humi.	:23.1/60
Antenna Pol.	:Vertical
Engineer	:Ashton Chiu



_						a = a + / · · ·	
	34.663	Peak	44.15	-8.86	35.29	40.00	-4.71
	53.317	QP	48.10	-22.16	25.94	40.00	-14.06
	70.417	Peak	56.23	-22.52	33.70	40.00	-6.30
	101.506	Peak	45.63	-19.52	26.11	43.50	-17.39
	909.840	Peak	29.96	-5.97	24.00	46.00	-22.00
	984.455	Peak	30.02	-5.18	24.84	54.00	-29.16

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56.426

104.615

213.430

563.189

852.324

992.228

Peak

Peak

Peak

Peak

Peak

Peak

Margin

dB

-14.87

-21.68 -22.60

-22.92

-20.96

-29.17

40.00

43.50

43.50

46.00

46.00

54.00

Report Number Operation Mode Test Frequency Test Mode EUT Pol	:E2/2021/3 :WPC :205 KHz :Tx :H Plane	30030		Test Site Test Date Temp./Humi. Antenna Pol. Engineer	:966 Chamber C :2021-04-16 :23.1/60 :Horizontal :Ashton Chiu
100 Level (d 87.5 75.0 62.5 50.0 37.5 25.0 12.5 0 30	BuV/m)	418. Frequen	4 612. cy (MHz)	806.	
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m

-23.67

-18.81

-19.61

-8.97

-6.28

-4.82

25.13

21.82

20.90

23.08

25.04

24.83

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48.81

40.63

40.51

32.05

31.32

29.65

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8 20 dB OCCUPIED BANDWIDTH MEASUREMENT

8.1 Standard Applicable:

§2.1049 & §15.215 (c)

8.2 Limit:

None

8.3 Test Set-up

Refer to section 6.2 in this report

8.4 Measurement Procedure

20dB bandwidth

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.

20dB Bandwidth 496 Hz

- 2. 20dB Bandwidth the resolution bandwidth of 200 Hz and the video bandwidth of 1 kHz were used.
- 3. Measured the spectrum width with power higher than 20dB below carrier.

8.5 Measurement Equipment Used:

Refer to section 8.3 in this report

8.6 Measurement Result

-20dB Bandwidth

Keysight Spectrum Analyzer - Occup R L RF 50 Ω	DC		SENSE:INT Freg: 205.315 kHz	ALIGN AUTO	04:52:24 PM Apr 29, 202 Radio Std: None	1 <u></u> F	requency
	⊶ #IFGain:Low		ree Run Av	g Hold: 10/10	Radio Device: BTS	_	
Ref Offset 10 0 dB/div Ref 0.00 d og		·					
0.0						-11 -	Center Fre
0.0							205.315 kł
0.0	/			<u>\</u>			
0.0				\sim			
0.0							
0.0							
D.0						4	
enter 205.3 kHz Res BW 200 Hz		#\	/BW 1 kHz		Span 2 kH Sweep FF		CF Ste
Occupied Bandw	vidth		Total Powe	er -13.9	dBm	Auto	Ma
	423	Hz					Freq Offs
Transmit Freq Error		7 Hz	OBW Powe	er 99	.00 %		0
x dB Bandwidth	490	6 Hz	x dB	-20.	00 dB		
3				STATU	2		

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9 ANTENNA REQUIREMENT

9.1 Standard Applicable:

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

9.2 Antenna Connected Construction:

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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