



# FCC SDoC REPORT

## Canada ISED ICES-003 TEST REPORT

Test Report No. : T190411L01-F  
 Applicant : Quanta Computer Inc.  
 Address : No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377,  
 Taiwan (R.O.C.)  
 Manufacturer : Quanta Computer Inc.  
 Address : No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377,  
 Taiwan (R.O.C.)

### Equipment Under Test (EUT) :

Product Name : Notebook Computer  
 Brand Name : HP  
 Model No. : HSN-Q20C  
 Added Model(s) : N/A  
 Standards : FCC Part 15, Subpart B, Class B  
 Canada ICES-003 Issue 6(June 2016), Class B  
 Date of Receipt : Apr. 22, 2019  
 Date of Test : Apr. 22 ~ 25, 2019  
 Date of Issue : Jun. 10, 2019

<b>Test Result :</b>	<b>PASS</b>
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In the configuration tested, the EUT complied with the standards specified above.

### Remarks :

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronics & Communication Laboratory or testing done by SGS Taiwan Electronics & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronics & Communication Laboratory in writing.

Tested By:

Date:

Jun. 10, 2019

Frank Lin (Engineer)

Approved By:

Date:

Jun. 10, 2019

Hex Chiang (Supervisor)



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## Revision History

Report Number	Revision	Description	Issue Date
T190411L01-F	Rev.00	Initial creation of document	Jun. 10, 2019

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# Contents

<b>1. GENERAL INFORMATION</b> .....	<b>4</b>
1.1 APPLICANT & MANUFACTURER INFORMATION.....	4
1.2 GENERAL DESCRIPTION OF EUT.....	4
1.3 DETAILS OF EUT.....	5
1.4 THE WORST CASE OF THE EUT.....	8
1.5 DESCRIPTION OF SUPPORT UNITS.....	9
1.6 OPERATION PROCEDURE.....	10
1.7 MODIFICATION LIST.....	10
1.8 TEST SET-UP CONFIGURATION.....	11
1.9 ACCESSORIES CABLE LIST.....	11
1.10 MEASUREMENT PROCEDURE.....	12
1.11 STANDARDS APPLICABLE FOR TESTING.....	12
1.12 SUMMARY OF RESULTS.....	12
<b>2. EMISSION</b> .....	<b>13</b>
2.1 TEST RESULTS.....	13
2.2 FREQUENCY RANGE.....	13
2.3 LIMITS OF CONDUCTED AND RADIATED EMISSION.....	14
2.3.1 LIMITS OF CONDUCTED EMISSION.....	14
2.3.2 LIMITS OF RADIATED EMISSIONS.....	14
2.4. TEST OF CONDUCTED EMISSION.....	16
2.4.1 TEST EQUIPMENTS.....	16
2.4.2 OPERATING ENVIRONMENT.....	17
2.4.3 MEASUREMENT LEVEL CALCULATION.....	17
2.4.4 MEASUREMENT DATA:.....	18
2.5 TEST OF RADIATED EMISSION.....	20
2.5.1 TEST EQUIPMENTS.....	20
2.5.2 OPERATING ENVIRONMENT.....	22
2.5.3 MEASUREMENT LEVEL CALCULATION.....	22
2.5.4 MEASUREMENT DATA.....	23
<b>3. PHOTOGRAPHS OF TEST</b> .....	<b>27</b>
<b>4. PHOTOGRAPHS OF PRODUCT</b> .....	<b>30</b>

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# 1. General Information

## 1.1 Applicant & Manufacturer Information

Applicant : Quanta Computer Inc.  
Address : No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377,  
Taiwan (R.O.C.)  
Manufacturer : Quanta Computer Inc.  
Address : No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377,  
Taiwan (R.O.C.)

## 1.2 General Description of EUT

Product Name : Notebook Computer  
Brand Name : HP  
Model No. : HSN-Q20C  
Added Model(s) : N/A  
Model Difference : N/A

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### 1.3 Details of EUT

Power Supply	AC 100 ~ 240V	
Highest operate description	1.9GHz	
Adapter	Artesyn (hp)	TPN-TA02
	Chicony (hp)	TPN-CA10
		TPN-CA06
	Lite-On (hp)	TPN-LA12
AcBel (hp)	TPN-AA03	
Adapter Power Rating	For TPN-TA02, TPN-CA10, TPN-LA12 I/P: 100-240Vac, 1.6A, 50/60Hz O/P: 5Vdc, 3A / 9Vdc, 3A / 12Vdc, 5A / 15Vdc, 4.33A / 20Vdc, 3.25A	
	For TPN-CA06, TPN-AA03 I/P: 100-240Vac, 1.7A, 50/60Hz O/P: 5Vdc, 3A / 9Vdc, 3A / 12Vdc, 5A / 15Vdc, 4.33A / 20Vdc, 3.25A	
AC Power Cord Type	Unshielded, 3 Prong 1.8m (Detachable) to Power Adapter	
DC Power Cable Type	Shielded, 1.8m (Non-Detachable)	
Memory	DDR4 2133 (8GB / 16GB)	
Main Board	Quanta	Y0PA
CPU	Intel	i5-8265U (1.6GHz)
		i5-8365U (1.6GHz)
		i7-8565U (1.8GHz)
		i7-8665U (1.9GHz)
13.3" LCD Panel	AUO	B133HAN05.2
		B133ZAN02.2
	BOE	NV133FHM
	INX	N133HCE-G62
N133DCE-G61		
Touch Screen	GIS	9AN13315-001
		9AN13316-001
	TPK	T08ALO13319HA
		T08ALO13319HB

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SSD	Hynix	HFM256GDJTNG-8310A (256GB)
		HFM512GDJTNG-8310A (512GB)
	Intel	SSDPEKNW512G8H (512GB)
		HBRPEKNX0202AH (512GB)
	Kingston	RBU-SNS8350DES3/128GP (128GB)
	Lite-On	CV8-8E128-HP (128GB)
	Micron	MTFDDAV256TBN-1AR15ABHA (256GB)
	Samsung	MZNLN128HAHQ-000H1 (128GB)
		MZVLB256HAHQ-000H1 (256GB)
		MZNLN256HAJQ-000H7 (256GB)
		MZVLB512HAJQ-000H1 (512GB)
		MZVLB512HAJQ-000H7 (512GB)
		MZVLB1T0HALR-000H1 (1TB)
		MZVLB2T0HMLB-000H1 (2TB)
	SanDisk	SD9SN8W-128G-1006 (128GB)
		SD9TN8W-256G-1006 (256GB)
	Toshiba	KXG60ZNV256G (256GB)
		KBG30ZMV256G (256GB)
		KXG60ZNV512G (512GB)
		KBG30ZMV512G (512GB)
		KXG5AZNV512G (512GB)
		KXG60ZNV1T02 (1TB)
		KXG50PNV2T04 (2TB)
	Western Digital	SDAPNTW-256G-1006 (256GB)
		SDAPNUW-256G-1006 (256GB)
		SDAPNTW-512G-1006 (512GB)
		SDAPNUW-512G-1006 (512GB)
SDAQNTW-512G-1006 (512GB)		
SDAPNTW-1T00-1006 (1TB)		
Camera	Chicony	CKFIF1421004330LH
	TFC	YHRU-A

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Wireless LAN	Intel	AX200D2WL
Wireless WAN	Fibocom	L850-GL
		L860-GL
Battery	Dynapack	HSTNN-DB8L
	SDI	HSTNN-UB7L
NFC Module	WNC	XRAV-1
Fingerprinter Module	Synaptics (SYC)	FM-03439-101
Touch Pen	Wacom	Moonracer 2.0

### Pre-test Mode

Mode	Main Board	CPU	Memory	13.3" LCD Panel	Touch Screen	SSD	Camera	Wireless LAN	Wireless WAN	Battery	NFC Module	Fingerprinter Module	Touch Pen	HP HDMI to DVI (Support Unit)	HP Thunderbolt Dock 120W G2 (Hook) HP USB-C Dock G4 (Mockingjay 3.0) HP USB-C Mini Dock (Rosita) HP USB-C/A Universal Dock G2 (Adicora-D) HP HDMI to DVI HP USB-C to RJ45 Adapter FD (Support Unit)	AC Adapter
1	Quanta Y0PA	Intel i5-8265U (1.6GHz)	DDR4 2133 8GB	AUO B133HA N05.2	GIS 9AN13315-001	Hynix HFM256GJTG-8310A (256GB)	Chicony CKFIF1421 004330LH	Intel AX200D2WL	Fibocom L850-GL	Dynapack HSTNN-DB8L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	HP V7W66AA	HP HSN-IX01	Artesyn (hp) TPN-TA02
2	Quanta Y0PA	Intel i5-8365U (1.6GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Hynix HFM512GJTG-8310A (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSTNH-U601	Chicony (hp) TPN-CA10
3	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	BOE NV133F HM	TPK T08ALO133 19HA	Intel SSDPEKNW512G8H (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Chicony (hp) TPN-CA06
4	Quanta Y0PA	Intel i7-8665U (1.9GHz)	DDR4 2133 16GB	INX N133HC E-G62	TPK T08ALO133 19HB	Intel HBRPEKNX02 02AH (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSN-IX02	Lite-On (hp) TPN-LA12
5	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	INX N133DC E-G61	GIS 9AN13316-001	Kingston RBU-SNS8350DES3 /128GP (128GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP F5A28AA#xxx	AcBel (hp) TPN-AA03
6	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Lite-On CV8-8E128-HP (128GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	N/A	Artesyn (hp) TPN-TA02
7	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Micron MTFDDAV256 TBN-1AR15ABHA (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
8	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLN128HA HQ-000H1 (128GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
9	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLB256HA HQ-000H1 (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
10	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLN256HA JQ-000H7 (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
11	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLB512HAJ Q-000H1 (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
12	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLB512HAJ Q-000H7 (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
13	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLB1T0HA LR-000H1 (1TB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
14	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Samsung MZVLB2T0HM LB-000H1 (2TB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02

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Mode	Main Board	CPU	Memory	13.3" LCD Panel	Touch Screen	SSD	Camera	Wireless LAN	Wireless WAN	Battery	NFC Module	Fingerprinter Module	Touch Pen	HP HDMI to DVI (Support Unit)	HP Thunderbolt Dock 120W G2 (Hook) HP USB-C Dock G4 (Mockingjay 3.0) HP USB-C Mini Dock (Rosita) HP USB-C/A Universal Dock G2 (Adicora-D) HP HDMI to DVI HP USB-C to RJ45 Adapter FD (Support Unit)	AC Adapter
15	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	SanDisk SD9SN8W-128G-1006 (128GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
16	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	SanDisk SD9TN8W-256G-1006 (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
17	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KXG60ZNV256G (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
19	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KBG30ZMV256G (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
20	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KXG60ZNV512G (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
21	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KBG30ZMV512G (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
22	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KXG5AZNV512G (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
23	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KXG60ZNV1T02 (1TB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
24	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Toshiba KXG50PNV2T04 (2TB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
25	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Western Digital SDAPNTW-256G-1006 (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
26	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Western Digital SDAPNUW-256G-1006 (256GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
27	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Western Digital SDAPNTW-512G-1006 (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
28	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Western Digital SDAPNUW-512G-1006 (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02
29	Quanta Y0PA	Intel i7-8565U (1.8GHz)	DDR4 2133 16GB	AUO B133ZA N02.2	GIS 9AN13316-001	Western Digital SDAQNTW-512G-1006 (512GB)	TFC YHRU-A	Intel AX200D2WL	Fibocom L860-GL	SDI HSTNN-UB7L	WNC XRAV-1	Synaptics (SYC) FM-03439-101	Wacom Moonracer 2.0	N/A	HP HSA-Q001PR	Artesyn (hp) TPN-TA02

### 1.4 The worst case of the EUT

EUT will be carried out in the worst case as follows:

Worst Case	
CE	Mode 7 (3840 x 2160Resolution)
RE	Mode 7 (3840 x 2160Resolution)

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## 1.5 Description of Support Units

Mode 7:

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
LCD Monitor	DELL	U2713HMt	CN-0C34G2-74445-1AP-034L
LCD Monitor	DELL	UP3214Q	CN-09637J-74445-3A7-206P
Earphone	SENIC	ST-908	N/A
Mouse	DELL	MS111-L	CN-0HRG26-44751-21U-05YA
HDD	WD	WDBPGC5005ABK-PESN	WXD1E849K9YF
HDD	WD	WDBPGC5006	WX21E54RD
Notebook PC (Remote)	DELL	INSPIRON 640m	CN-0MG532-70166-75G-03AP
Wireless AP (Remote)	D-Link	DIR-868L	R3X81D7000137
HP USB-C Mini Dock (Rosita)	HP	HSA-Q001PR	N/A
Universal Radio Communication Tester (Remote)	R & S	CMW 500	N/A
GPS simulator (Remote)	IFR	GPS-101	N/A

## Support Equipment Used in Tested Cable

Mode 7:

Cable Type	Core	Length	Shielding/Non-shielding
LAN Cable (1)	N/A	10m	Non-shielding
Type-C Cable (2)	N/A	0.1m	Shielding
DC Cable (3)	N/A	1.8m	Shielding
HDMI Cable (4)	N/A	1.8m	Shielding
VGA Cable (5)	N/A	1.8m	Shielding
USB HDD Cable (6)	N/A	0.5m	Shielding
USB Mouse Cable (7)	N/A	1.8m	Shielding
Earphone Cable (8)	N/A	1.8m	Non-shielding
HDMI Cable (9)	N/A	1.8m	Shielding

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## 1.6 Operation Procedure

Mode 7:

1. Turn on the power of all equipment.
2. The EUT communicates with Notebook PC by Bluetooth radio.
3. The EUT communicates with Wireless AP by WIFI radio.
4. The EUT read(s)/write(s) disk through Win EMC test software.
5. The EUT displays H pattern through Win EMC test software.
6. Executed AMCAP2 software to turn-on the CCD.
7. The EUT transfers data to another Notebook PC via LAN Port.
8. Setup the condition for test mode, and begin the test.

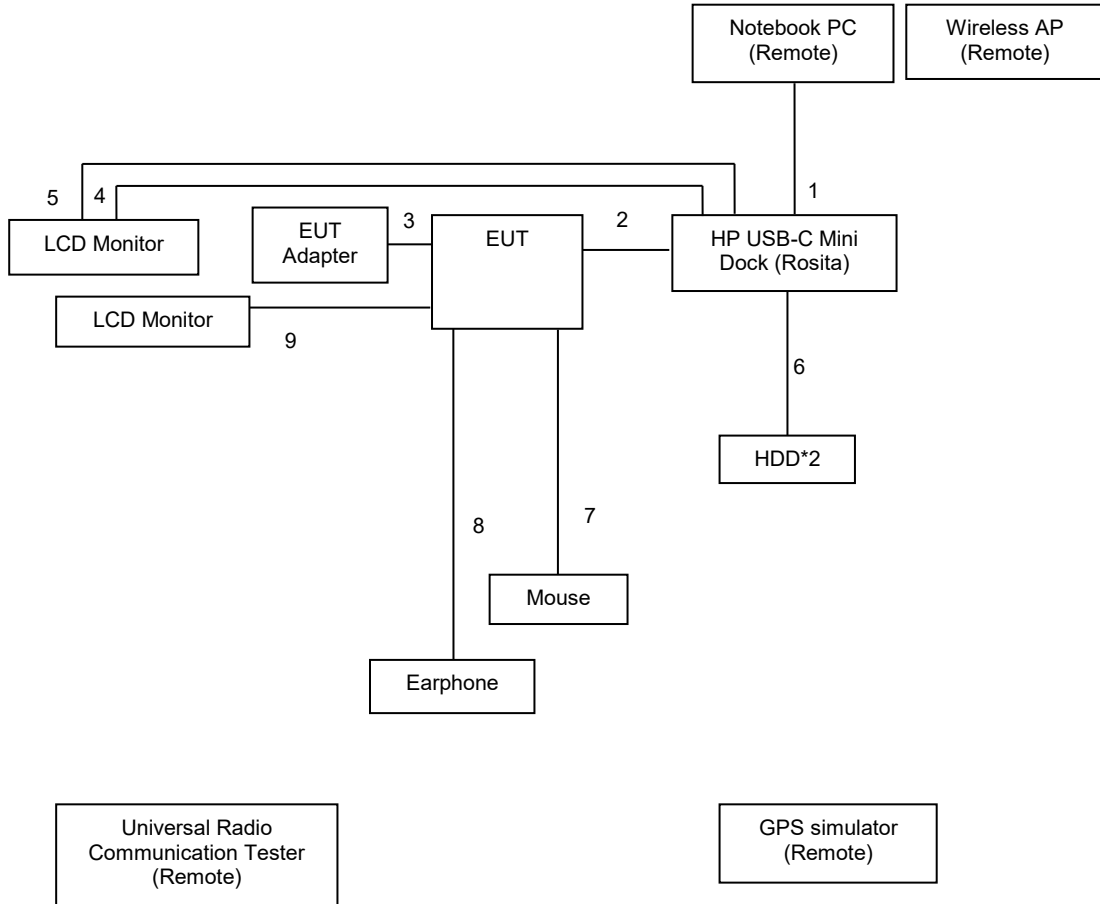
## 1.7 Modification List

No modification was made by SGS Taiwan Electronics & Communication Laboratory.

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### 1.8 Test Set-Up Configuration

Mode 7



### 1.9 Accessories Cable List

See clause 1.3 of this report

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### 1.10 Measurement Procedure

Conducted Emission Testing was performed according to ANSI C63.4:2014 in a shielded room with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded room wall.

Radiated Emission Testing was performed according to ANSI C63.4:2014 at the 3/10m semi-anechoic chamber. The EUT was placed on a 0.8m high table along with the peripherals. The turn table was placed 10m distance from the antenna. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for production of maximum emission.

The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Maximum emission levels are then reported.

### 1.11 Standards Applicable for Testing

Tests to be carried out under FCC Part 15, Subpart B/CISPR 22

Test Standards	Status
FCC Part 15, Subpart B/ CISPR 22	Applicable
Deviation from Standard	No deviation

### 1.12 Summary of Results

Standard	Test Type	Highest Emission			
		Result	Phase/Pol.	Frequency(MHz)	Margin(dB)
FCC Part 15 Subpart B Class B	Conducted Emission	PASS	Line	0.1660	-16.22 (QP)
			Neutral	0.1500	-15.11 (QP)
Canada ICES-003 Issue 6 (June 2016),Class B	Radiated Emission	PASS	Ver.	801.0790	-5.36 (QP)

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## 2. EMISSION

### 2.1 Test Results

	Results
Conducted Emission	Pass
Radiated Emission	Pass

### 2.2 Frequency Range

#### FCC Part 15, Subpart B:

Conducted Emission : 150 kHz - 30 MHz

Radiated Emission : See below table

Highest frequency generated or Upper frequency of measurement  
used in the device or on which the range (MHz)  
device operates or tunes (MHz)

Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

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## 2.3 Limits of Conducted and Radiated Emission

### 2.3.1 Limits of Conducted Emission

#### FCC Part 15, Subpart B/CISPR 22:

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi - peak	Average	Quasi - peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 to 0.50 MHz.

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected there to, shall not exceed the level of field strengths specified above.

### 2.3.2 Limits of Radiated Emissions

#### FCC Part 15, Subpart B Limit:

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30~88	39	40
88~216	43.5	43.5
216~960	46.44	46
Above 960	49.54	54

- Detector Function : Peak , Average

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000-18000	79.3	59.3	73.9	53.9

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**CISPR 22 Limit:**

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 10m)	
	dBuV/m		dBuV/m	
30-230	40		30	
230-1000	47		37	

NOTE 1 The lower limit shall apply at the transition frequency.

NOTE 2 Additional provisions may be required for cases where interference occurs.

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Average	Peak	Average	Peak
1~3	56	76	50	70
3~6	60	80	54	74

NOTE The lower limit applies at the transition frequency.

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## 2.4. Test of Conducted Emission

### 2.4.1 Test Equipments

SGS Conducted Emission Conducted Room No.B EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	101073	07/17/2018	07/16/2019
LISN	R&S	ENV216	101054	05/02/2018	05/01/2019
LISN	Schwarzbeck	NSLK8128	5012	04/18/2019	04/17/2020
Software	CCS-3A1-CE				
Compliance Certification Services Inc. (Wugu Laboratory)					
No.139, Wugong Rd., Wugu Dist., New Taipei City 24886, Taiwan (R.O.C.)					
Measurement Uncertainty of Conducted Emission					
Expanded uncertainty (K=2) of conducted emission is 2.96 dB					
Expanded uncertainty (K=2) of ISN conducted emission is 3.07 dB					

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## 2.4.2 Operating Environment

Temperature : 24 degree C

Humidity : 50 %RH

Atmospheric Pressure : 992 mBar

## 2.4.3 Measurement Level Calculation

Factor = LISN insertion loss + Cable loss + Pulse Limiter Insertion Loss

Measurement Level = Reading Level + Factor

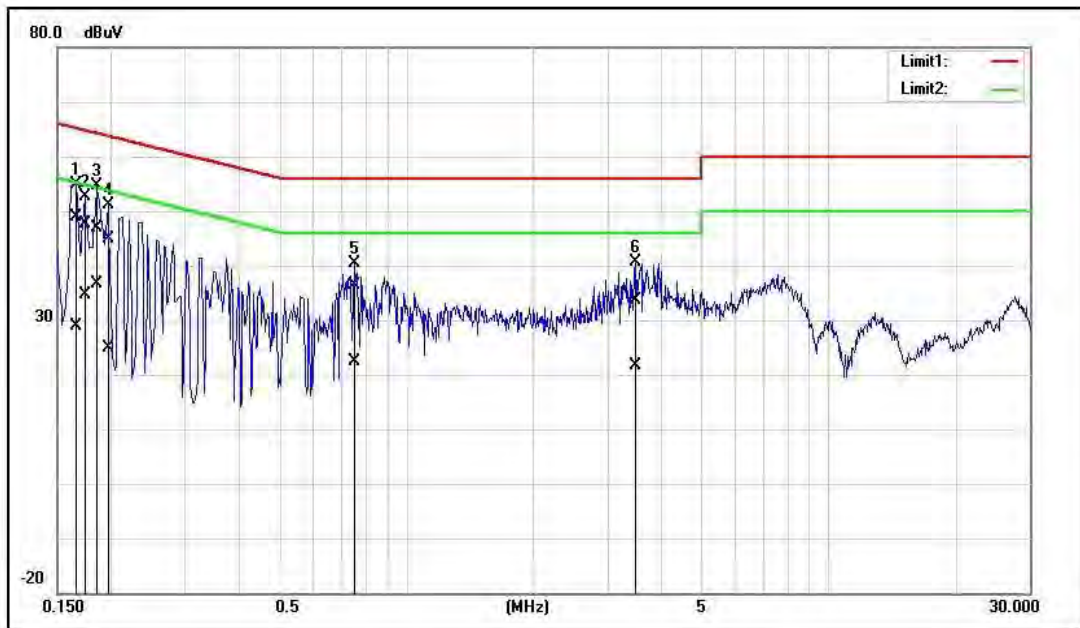
Over (Margin) = Measurement Level – Limit

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2.4.4 Measurement Data:

Model No.: HSN-Q20C  
Mode\_7\_L

Test site:	IOM Conduction	Date:	2019/4/22
Standard:	FCC Part 15 B Class B(QP)	Time:	17:42:36
Test item:	Conduction test	Temp.(°C)/Hum.(%):	24(°C)/50%
Mode:	7	Test Voltage:	AC 120V/60Hz
Description:			

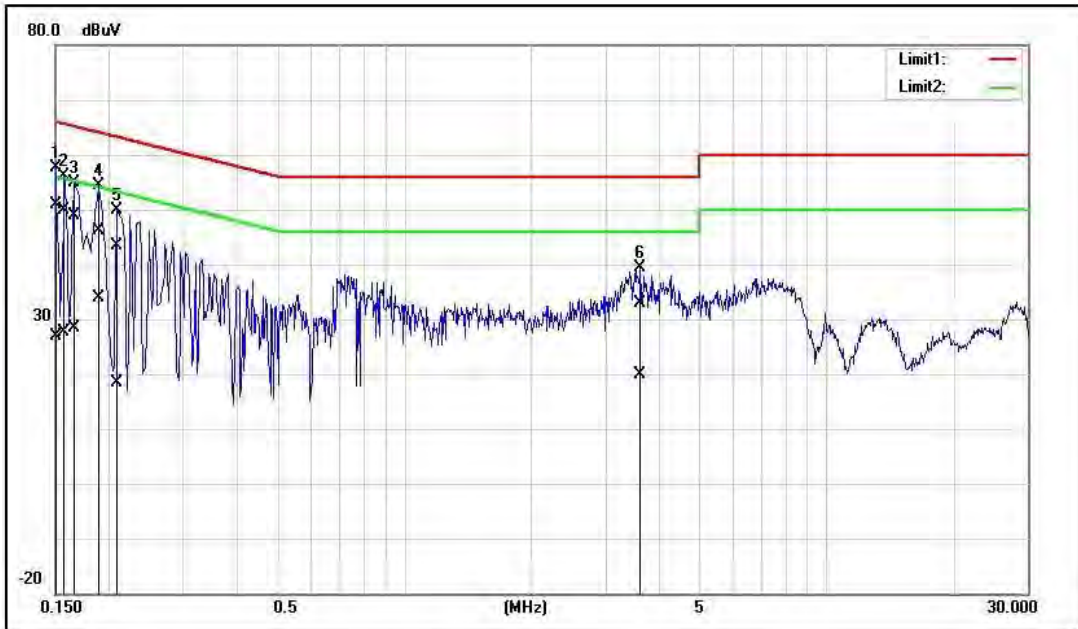


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1660	39.17	19.18	9.76	48.93	28.94	65.15	55.16	-16.22	-26.22	Pass
2	0.1740	37.99	24.82	9.75	47.74	34.57	64.76	54.77	-17.02	-20.20	Pass
3	0.1860	37.06	26.90	9.76	46.82	36.66	64.21	54.21	-17.39	-17.55	Pass
4	0.1980	35.24	15.08	9.76	45.00	24.84	63.69	53.69	-18.69	-28.85	Pass
5	0.7539	26.55	12.68	9.78	36.33	22.46	56.00	46.00	-19.67	-23.54	Pass
6	3.5020	23.74	11.76	9.82	33.56	21.58	56.00	46.00	-22.44	-24.42	Pass

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### Mode\_7\_N

Test site:	IOM Conduction	Date:	2019/4/22
Standard:	FCC Part 15 B Class B(QP)	Time:	17:44:29
Test item:	Conduction test	Temp.(°C)/Hum.(%):	24(°C)/50%
Mode:	7	Test Voltage:	AC 120V/60Hz
Description:			



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1500	41.15	17.22	9.73	50.88	26.95	65.99	56.00	-15.11	-29.05	Pass
2	0.1580	40.09	17.94	9.73	49.82	27.67	65.56	55.57	-15.74	-27.90	Pass
3	0.1660	39.05	18.39	9.73	48.78	28.32	65.15	55.16	-16.37	-26.84	Pass
4	0.1900	36.39	24.23	9.73	46.12	33.96	64.03	54.04	-17.91	-20.08	Pass
5	0.2100	33.68	8.74	9.73	43.41	18.47	63.20	53.21	-19.79	-34.74	Pass
6	3.6300	23.06	9.96	9.80	32.86	19.76	56.00	46.00	-23.14	-26.24	Pass

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## 2.5 Test of Radiated Emission

### 2.5.1 Test Equipments

#### Below 1GHz

SGS Radiated_Below_1GHz 10m EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	TESEQ	CBL 6112D	31674	03/06/2019	03/05/2020
Bilog Antenna	TESEQ	CBL 6112D	31675	03/22/2019	03/21/2020
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	330029	05/02/2018	05/01/2019
Coaxial Cable	Huber+Suhner	104PEA	33948/4PEA	05/02/2018	05/01/2019
Coaxial Cable	Huber+Suhner	104PEA	33949/4PEA	05/02/2018	05/01/2019
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	24813	05/02/2018	05/01/2019
EMI Test Receiver	R&S	ESCI	100961	07/04/2018	07/03/2019
EMI Test Receiver	R&S	ESCI	100962	07/10/2018	07/09/2019
Pre-Amplifier	HP	8447D	2944A07754	05/02/2018	05/01/2019
Pre-Amplifier	HP	8447D	2944A08150	05/02/2018	05/01/2019
AC POWER SOURCE	APE	AFC-130	991259	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Antenna Tower	Sunol Sciences	TLT2	031010-5	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	031010-1	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				
Compliance Certification Services Inc. (Wugu Laboratory)					
No.139, Wugong Rd., Wugu Dist., New Taipei City 24886, Taiwan (R.O.C.)					
Measurement Uncertainty of Radiated Emission					
Expanded uncertainty of radiated emission is 4.45 dB. (30MHz ~ 200MHz)					
Expanded uncertainty of radiated emission is 4.80 dB. (200MHz ~ 1000MHz)					

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**Above 1GHz**

SGS Radiated_Above_1GHz 10m_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	330029	05/02/2018	05/01/2019
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	329383	05/02/2018	05/01/2019
Horn Antenna	ETS LINDGREN	3116	00026370	12/26/2018	12/25/2019
Horn Antenna	EMCO	3117	00055167	12/24/2018	12/23/2019
Pre-Amplifier	EMCI	EMC051845	980040	05/02/2018	05/01/2019
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	06/21/2018	06/20/2019
Spectrum Analyzer	Agilent	E4446A	MY48250297	08/30/2018	08/29/2019
AC POWER SOURCE	APE	AFC-130	991259	N.C.R	N.C.R
Antenna Tower	Sunol Sciences	TLT2	031010-5	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	031010-1	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				
Compliance Certification Services Inc. (Wugu Laboratory) No.139, Wugong Rd., Wugu Dist., New Taipei City 24886, Taiwan (R.O.C.) Measurement Uncertainty of Radiated Emission Expanded uncertainty of radiated emission is 5.25 dB. (1000MHz ~ 6000MHz) Expanded uncertainty of radiated emission is 5.25 dB. (6000MHz ~ 18000MHz) Expanded uncertainty of radiated emission is 3.93 dB. (18000MHz ~ 26000MHz) Expanded uncertainty of radiated emission is 3.97 dB. (26000MHz ~ 40000MHz)					

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## 2.5.2 Operating Environment

Temperature : 26 degree C

Humidity : 60 %RH

Atmospheric Pressure : 996 mBar

## 2.5.3 Measurement Level Calculation

Correction Factor = Antenna Factor + Cable loss - Amplifier Gain

Measurement Level = Reading Level + Correction Factor

Over (Margin) = Measurement Level – Limit

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## 2.5.4 Measurement Data

### Below 1GHz

Model No.: HSN-Q20C

Mode\_7\_H

Test site:	10M Chamber	Ant.Polar.:	Horizontal
Standard:	FCC Part 15B Class B	Test Distance:	10m
Test item:	Radiation Test	Power:	AC 120V/60Hz
Temp.(°C)/Hum.(%RH):	26(°C)/60%RH	Date:	2019/4/24
Mode:	7	Time:	22:21:14
Description:			



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	32.9100	21.24	-4.54	16.70	30.00	-13.30	399	0	QP
2	171.6200	30.25	-10.72	19.53	30.00	-10.47	366	0	QP
3	296.7070	35.14	-5.65	29.49	37.00	-7.51	398	180	QP
4	801.0700	25.76	1.69	27.45	37.00	-9.55	135	194	QP
5	890.1160	27.80	2.78	30.58	37.00	-6.42	249	0	QP
6	967.9900	18.88	3.76	22.64	37.00	-14.36	399	0	QP

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### Mode\_7\_V

Test site:	10M Chamber	Ant.Polar.:	Vertical
Standard:	FCC Part 15B Class B	Test Distance:	10m
Test item:	Radiation Test	Power:	AC 120V/60Hz
Temp.(°C)/Hum.(%RH):	26(°C)/60%RH	Date:2019/4/24	Time:22:21:16
Mode:	7		
Description:			



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	30.0000	26.53	-2.30	24.23	30.00	-5.77	200	0	QP
2	40.6700	29.66	-8.09	21.57	30.00	-8.43	100	109	QP
3	73.6500	32.79	-13.86	18.93	30.00	-11.07	218	0	QP
4	149.3100	29.95	-8.71	21.24	30.00	-8.76	100	137	QP
5	801.0790	27.73	3.91	31.64	37.00	-5.36	164	0	QP
6	999.0300	19.27	6.65	25.92	37.00	-11.08	100	335	QP

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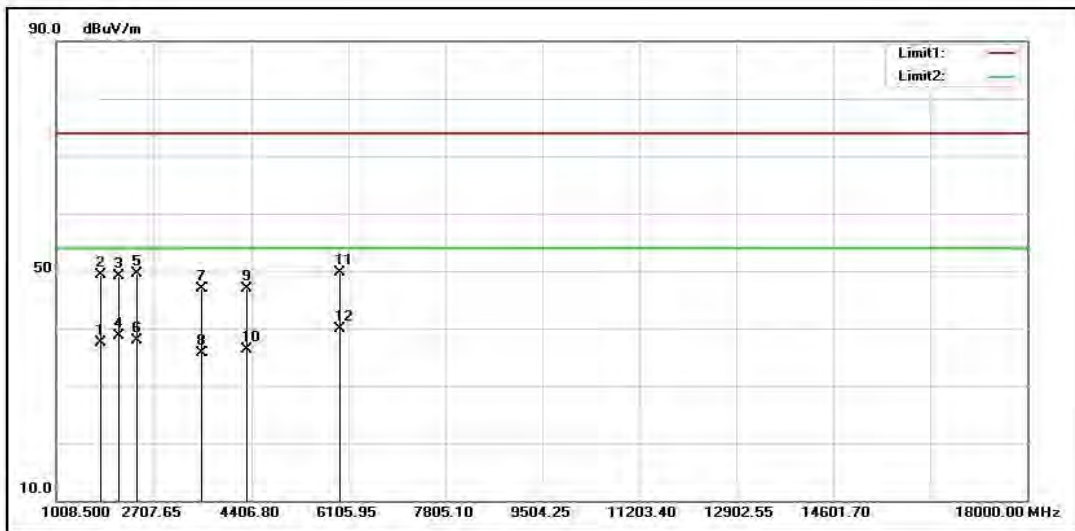


Above 1GHz

Model No.: HSN-Q20C

Mode\_7\_H

Test site:	10M Chamber	Ant.Polar.:	Horizontal
Standard:	FCC Part 15B 3M Class B	Test Distance:	3m
Test item:	Radiation Test	Power:	AC 120V/60Hz
Temp.(°C)/Hum.(%RH):	26(°C)/60%RH	Date:	2019/4/25
Mode:	7	Time:	00:48:33
Description:			

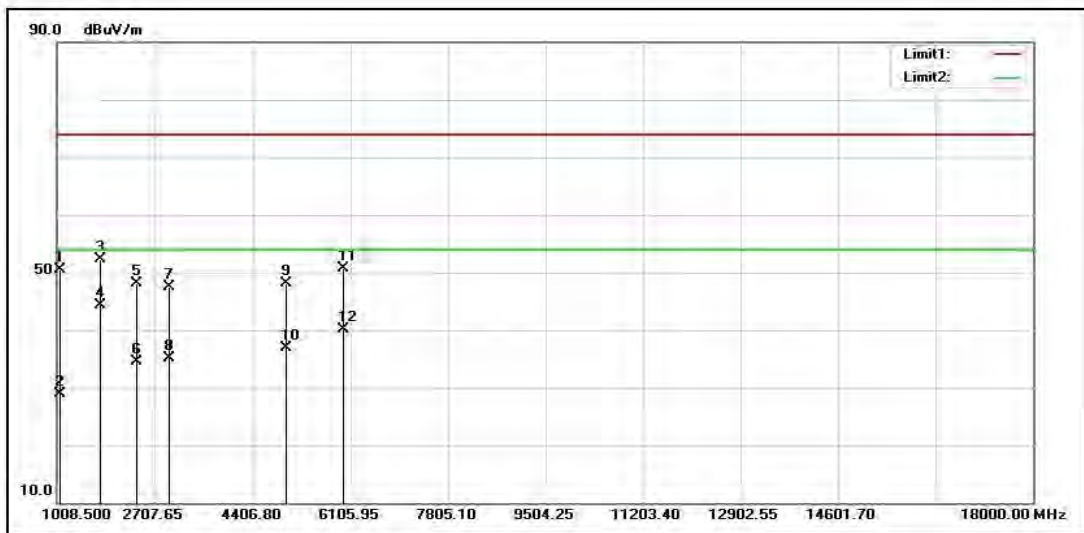


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1779.750	54.57	-17.06	37.51	54.00	-16.49	200	196	AVG
2	1782.000	66.29	-17.04	49.25	74.00	-24.75	200	196	peak
3	2088.000	63.77	-14.75	49.02	74.00	-24.98	200	113	peak
4	2088.000	53.45	-14.75	38.70	54.00	-15.30	200	113	AVG
5	2419.500	63.80	-14.21	49.59	74.00	-24.41	200	83	peak
6	2419.500	52.15	-14.21	37.94	54.00	-16.06	200	83	AVG
7	3558.500	58.48	-11.60	46.88	74.00	-27.12	172	0	peak
8	3558.500	47.30	-11.60	35.70	54.00	-18.30	172	0	AVG
9	4315.000	56.52	-9.70	46.82	74.00	-27.18	200	7	peak
10	4315.000	45.97	-9.70	36.27	54.00	-17.73	200	7	AVG
11	5955.500	55.19	-5.42	49.77	74.00	-24.23	200	0	peak
12	5955.500	45.37	-5.42	39.95	54.00	-14.05	200	0	AVG

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### Mode\_7\_V

Test site:	10M Chamber	Ant.Polar.:	Vertical
Standard:	FCC Part 15B 3M Class B	Test Distance:	3m
Test item:	Radiation Test	Power:	AC 120V/60Hz
Temp.(°C)/Hum.(%RH):	26(°C)/60%RH	Date:2019/4/25	Time:00:35:25
Mode:	7		
Description:			



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1051.000	70.40	-19.83	50.57	74.00	-23.43	100	246	peak
2	1051.000	48.73	-19.83	28.90	54.00	-25.10	100	246	AVG
3	1756.500	69.61	-17.28	52.33	74.00	-21.67	149	0	peak
4	1756.950	61.50	-17.27	44.23	54.00	-9.77	150	0	AVG
5	2402.500	62.37	-14.24	48.13	74.00	-25.87	200	76	peak
6	2402.500	48.72	-14.24	34.48	54.00	-19.52	200	76	AVG
7	2963.500	60.22	-12.73	47.49	74.00	-26.51	100	0	peak
8	2963.500	47.89	-12.73	35.16	54.00	-18.84	100	0	AVG
9	4978.000	56.84	-8.68	48.16	74.00	-25.84	200	220	peak
10	4978.000	45.52	-8.68	36.84	54.00	-17.16	200	220	AVG
11	5964.000	55.99	-5.35	50.64	74.00	-23.36	200	60	peak
12	5964.000	45.43	-5.35	40.08	54.00	-13.92	200	60	AVG

**The frequency band during 18GHz till 26.5 GHz that was not reported was verified with no extra obvious finding except ambient signals.**

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### 3. Photographs of Test

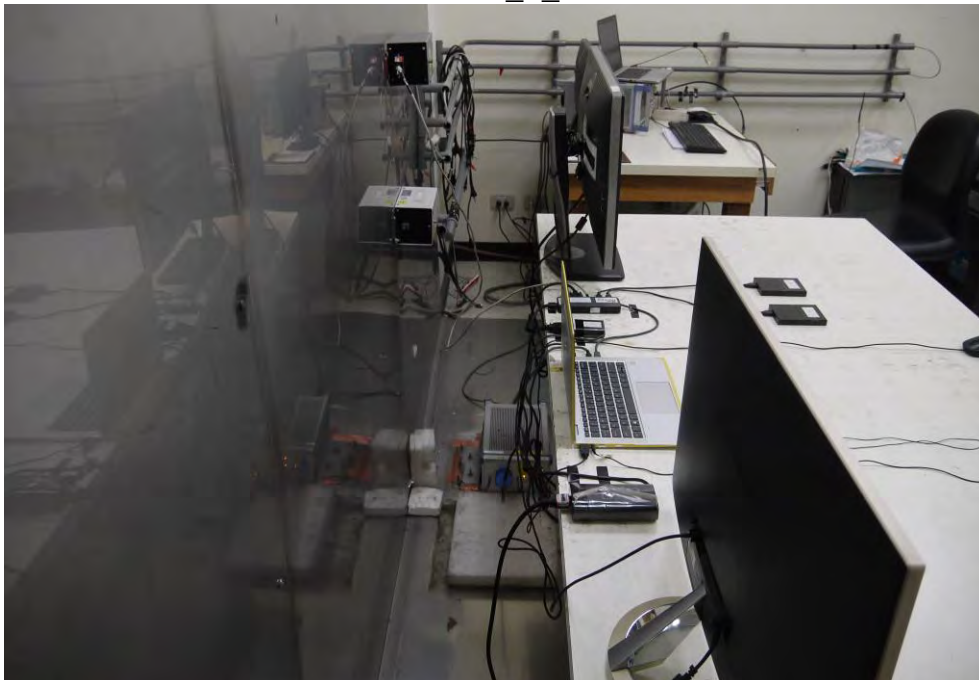
CE Testing Set-up

Model No.: HSN-Q20C

Mode 7\_+



Mode 7\_-



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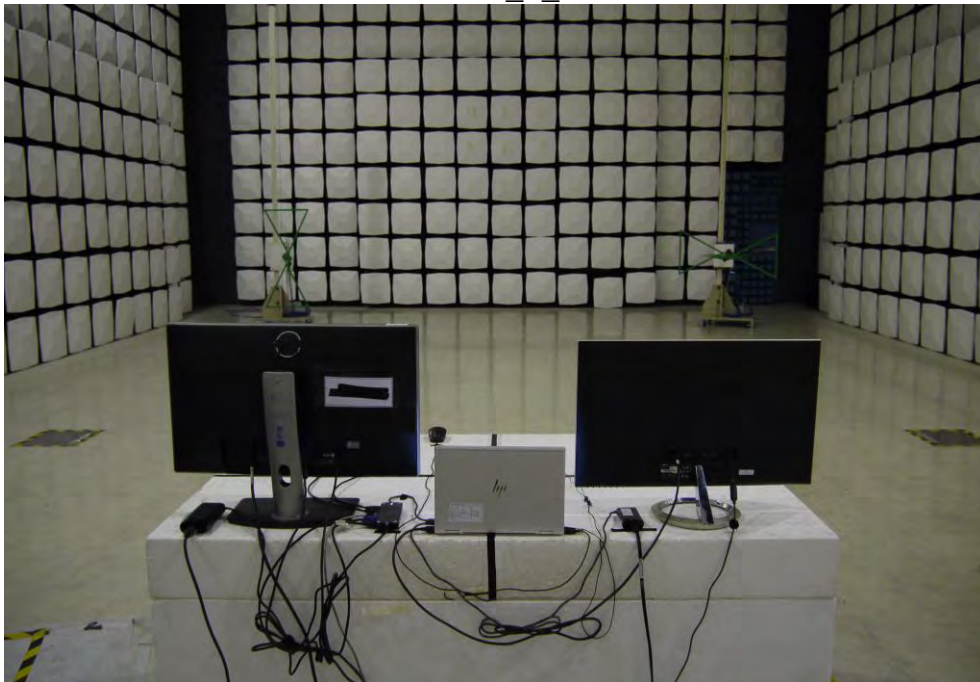
**RE Testing Set-up  
Below 1GHz**

**Model No.: HSN-Q20C**

**Mode\_7\_+**



**Mode\_7\_-**



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Above 1GHz

Model No.: HSN-Q20C

Mode\_7\_+



Mode\_7\_-



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# 4. Photographs of Product

Exterior

Model No.: HSN-Q20C



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Adapter Model No.: TPN-TA02



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Adapter Model No.: TPN-CA10

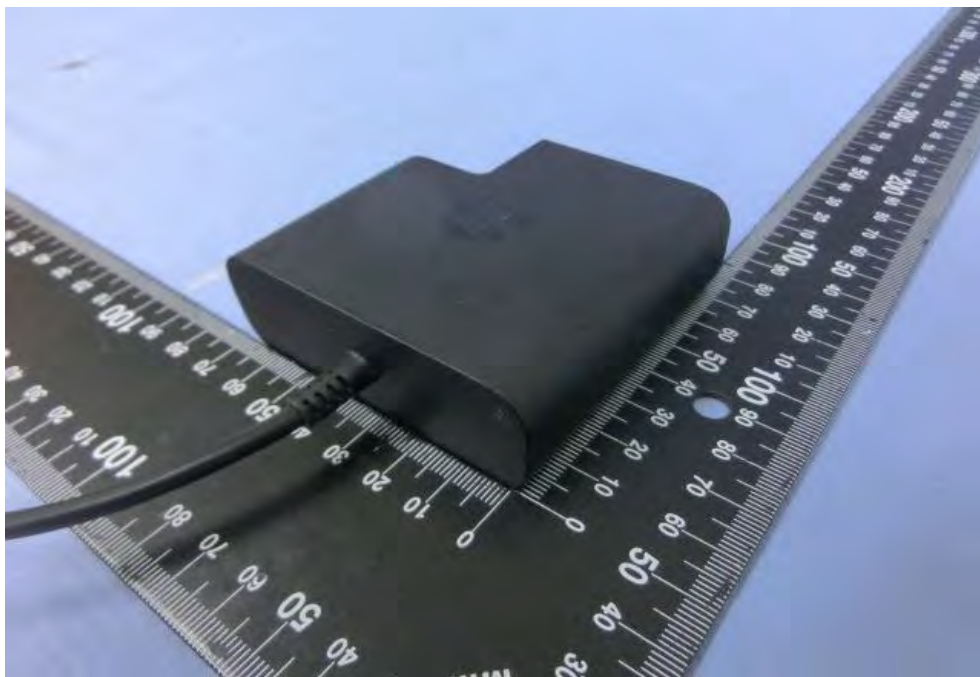


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Adapter Model No.: TPN-CA06



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Adapter Model No.: TPN-LA12



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Adapter Model No.: TPN-AA03



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