FCC 47 CFR PART 15 SUBPART B TEST REPORT

FOR

SATA Flash Drive

Model : SX240-297
Trade Name: Apacer

Issued to

Apacer Technology Inc.

1F., No.32, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan (R.O.C)

Issued by

WH Technology Corp.

Xizhi Office and Lab	**7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan, (R.O.C.)**
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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	Nov. 05, 2019	Initial Issue	ALL	Maggie

1. GENERAL INFORMATION

Applicant	:	**Apacer Technology Inc.**
Address	:	**1F., No.32, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan (R.O.C)**
Manufacturer	:	**Apacer Technology Inc.**
Address	:	**1F., No.32, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan (R.O.C)**
EUT	:	**SATA Flash Drive**
Model Name	:	**SX240-297**
Model Differences	:	**N/A**
Receipt Date	:	**Oct. 23, 2019**
Final Test Date	:	**Nov. 05, 2019**

Is herewith confirmed to comply with the requirements set out in the FCC Rules and Regulations described below and the measurement procedures were according to ANSI C63.4-2014. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC 47 CFR Part 15 Subpart B

Tested By:

Nov. 05, 2019
(Date)

Bing/Engineer

Reviewed by:

Nov. 05, 2019
(Date)

Bell/Manager

FCC Designation Number:
TW1083

1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	:	SATA Flash Drive
Model Number	:	SX240-297
Receipt Date	:	10/23/2019
EUT Power Rating	:	☐ AC 220V/50Hz ☐ DC 12V ☑ DC 5V from PC ☐ DC 12V from Adaptor AC 230V/50Hz
EUT highest operating frequency	:	Above 108MHz
EUT Covered	:	N/A
I/O Port of EUT	:	N/A

1.2 SUMMARY OF TEST RESULT

Test Result measurement is not including uncertainty.

Emission				
Test Standard	**Test Item**	**Limit**	**Test Result**	**Remark**
FCC 47 CFR Part 15 Subpart B	Conducted emission	Class B	PASS	
	Radiated emission Below 1 GHz	Class B	PASS	
	Radiated emission Above 1 GHz	Class B	PASS	**NOTE (2)**

NOTE:

1) "N/A" denotes test is not applicable in this Test Report.
2) If the EUT's highest operating frequency does not exceed 108 MHz, the test will not be performed.

1.3 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

☒ **C01:** 7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan, (R.O.C.)

☐ **C02:** No. 67-22, Baoxin St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.

Conducted emission at telecommunication ports Test:

☐ **C01:** 7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan, (R.O.C.)

☐ **C02:** No. 67-22, Baoxin St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

☒ **OS01:** No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

☐ **CB02:** No. 67-22, Baoxin St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

☒ **OS01:** No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

☐ **CB02:** No. 67-22, Baoxin St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

The immunity test:

No. 67-22, Baoxin St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

1.4 TEST METHODOLOGY

EUT SYSTEM OPERATION

1. All peripherals connect EUT and power on.

2. An executive program, “Ping.exe” was executed to transmit and receive data to the remote workstation through LAN.

3. An executive program, “TFGEN.exe” was executed to transmit and receive data to the Sever through LAN. During the disturbances at telecommunication port test, the condition of LAN utilization in excess of 10%.

DESCRIPITON OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Test Mode	Description
Mode 1	All system

Conducted emission test	
Final Test Mode	Description
Mode 1	All system

Radiated emission test	
Final Test Mode	Description
Mode 1	All system

1.5 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in APPENDIX 1 for the actual connections between EUT and support equipment.

Support Equipment

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Data Cable	Power Cord
1.	PC	D19M	CYY7Y A00 DC4	R33002	DELL	N/A	Unshielded 1.8m
2.	Monitor	UZ2315Hf	CN-0NJ1C5-72872-473-AF2SREVA02	R43002	DELL	Shielded 1.8m	Unshielded 1.8m
3.	Printer	D4360	N/A	R33001	HP	Shielded 1.8m / USB	Unshielded 1.8m
4	USB 3.0	32G	AUC350-32G-CGD	D33A23	ADATA	Shielded 1m / USB	N/A
5	Mouse	MS116p	CN-04DWDN-73826-5CM-0120	R41108	DELL	Shielded 1.8m / USB	N/A
6	Keyboard	KB216p	CN-005TW2-71581-5AF-01I3-A01	D41108	DELL	Shielded 1.8m / USB	N/A

Note:

(1) The support equipment was authorized by Declaration of conformity (DOC).

(2) All the above equipment/cable were placed in worse case position to maximize emission signals during emission test.

(3) Grounding was established in accordance with the manufacturer's requirement and conditions for the intended use.

1.6 FEATURES OF EUT:

Please refer to user manual or product specification.

2. INSTRUMENT AND CALIBRATION

2.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

2.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Conducted emission				
Instrument	Manufacturer	Model No.	Serial No.	Cali Due Date
EMI Test Receiver	R&S	ESHS10	830223/008	2020/06/09
Spectrum Analyzer	R&S	FSP3	833387/010	2019/12/05
Two-Line V-Network	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2020/08/04
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2020/10/17
Test Cable	N/A	N/A	EMI-3	2020/10/10
Measurement Software	AUDIX	e3	V6.101222a	N/A
Radiated emission Below 1GHz				
Instrument	Manufacturer	Model No.	Serial No.	Cali Due Date
Bilog antenna	ETC	MCTD2786B	BLB16M04004/JB-5-004	2020/06/29
LOOP Antenna	EMCO	6507	146361	2019/12/13
Pre-amplifier	EMCI	EMC9135	980334	2020/06/10
Cable	EMCI	N male on end of both sides (EMI4)	30m	2019/12/06
Receiver	R&S	ESVS30	826006/002	2019/12/06
Spectrum Analyzer	R&S	FSP7	830180/006	2020/04/16
Measurement Software	AUDIX	e3	V6.101222a	N/A
Radiated emission Above 1GHz				
Instrument	Manufacturer	Model No.	Serial No.	Cali Due Date
Horn antenna	ETC	MCTD 1209	DRH15N02009	2019/12/13

Pre-amplifier	EMCI	EMC051845	980108	2019/12/06
RF CABLE	SUCOFLEX	104PEA	27348/4PEA	2020/06/10
RF CABLE	HARBOUR INDUSTRIES	LL142MI(7M)	N/A	2020/08/09
Spectrum Analyzer	ADVANTEST	R3182	150900201	2020/01/17
Measurement Software	AUDIX	e3	V6.101222a	N/A

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

2.3 TEST PERFORMED

Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver which resolution bandwidth is set at 9 kHz.

Radiated emissions were invested over the frequency range from 30 MHz to 1000 MHz using a receiver which resolution bandwidth is set at 120 kHz. Radiated measurement was performed at distance that from an antenna to EUT is 10 meters.

2.4 APPENDIX

Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

The measurements are performed in a WH lab test room; The EUT was placed on non-conductive1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50 ohm/50 uH) vs. Frequency Characteristic in accordance with the standard. Powers to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, was measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

Appendix B: Test Procedure for Radiated Emissions

Preliminary Measurements in 743 Semi Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°C. The antenna height is 1m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Open Site or 1166 Semi Anechoic Chamber

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipments are set up on the turntable. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4-meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading is recorded with the quasi-peak detector with 120 kHz bandwidth. For frequency between 30 MHz and 1000 MHz, the reading is recorded with peak detector or quasi-peak detector.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

Appendix C: Warning Labels

Label Requirements

A Class B digital device subject to certification by the FCC shall carry a warning label which includes the following statement:

*** * * W A R N I N G * * ***

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Appendix D: Warning Statement

Statement Requirements

The operator's manual for a Class A digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communications Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

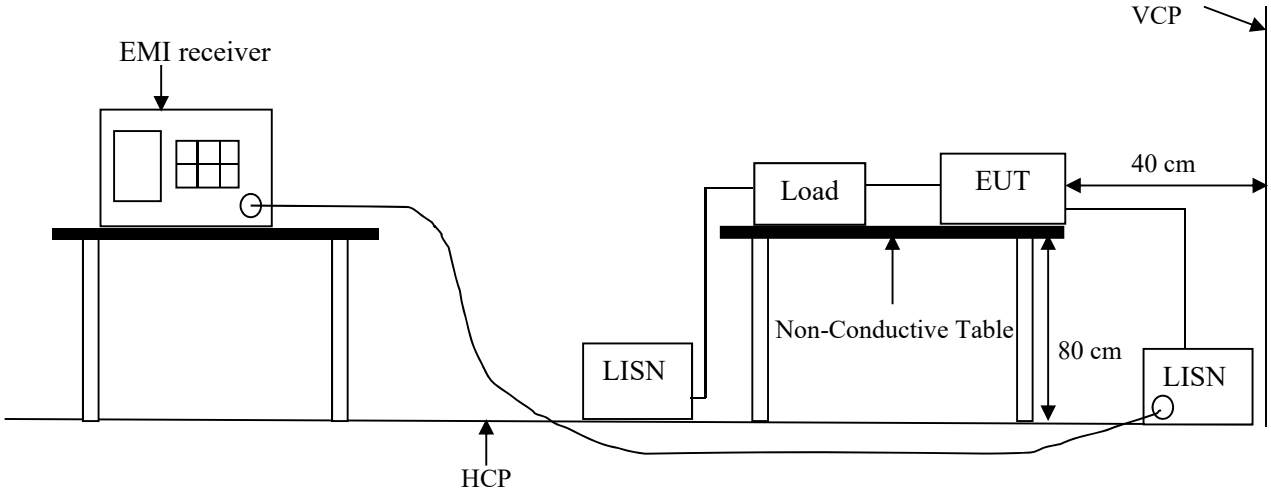
* * * * * * * * * *

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

3. CONDUCTED EMISSION MEASUREMENT

3.1 TEST SET-UP



3.2 LIMIT

Frequency range (MHz)	CLASS A		CLASS B	
	QP (dBμV)	Average (dBμV)	QP (dBμV)	Average (dBμV)
0.15 – 0.5	79	66	66 - 56	56 - 46
0.5 – 5.0	73	60	56	46
5.0 – 30	73	60	60	50

NOTE:

1) In the above table, the tighter limit applies at the band edges.
2) The test result calculated as following:
   Level Value = Reading Level + Factor
   Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
   Over Limit Value = Level Value – Limit Value

3.3 TEST PROCEDURE

Please refer to

Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

Note:

1. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).

2. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only Peak or QP Mode was measured, but AVG Mode didn't perform.

3.4 TEST SPECIFICATION

According to ANSI C63.4-2014 Section 5.2, 7.1, 7.2 and FCC Part 15 Subpart B Class B.

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

3.5 RESULT: PASSED

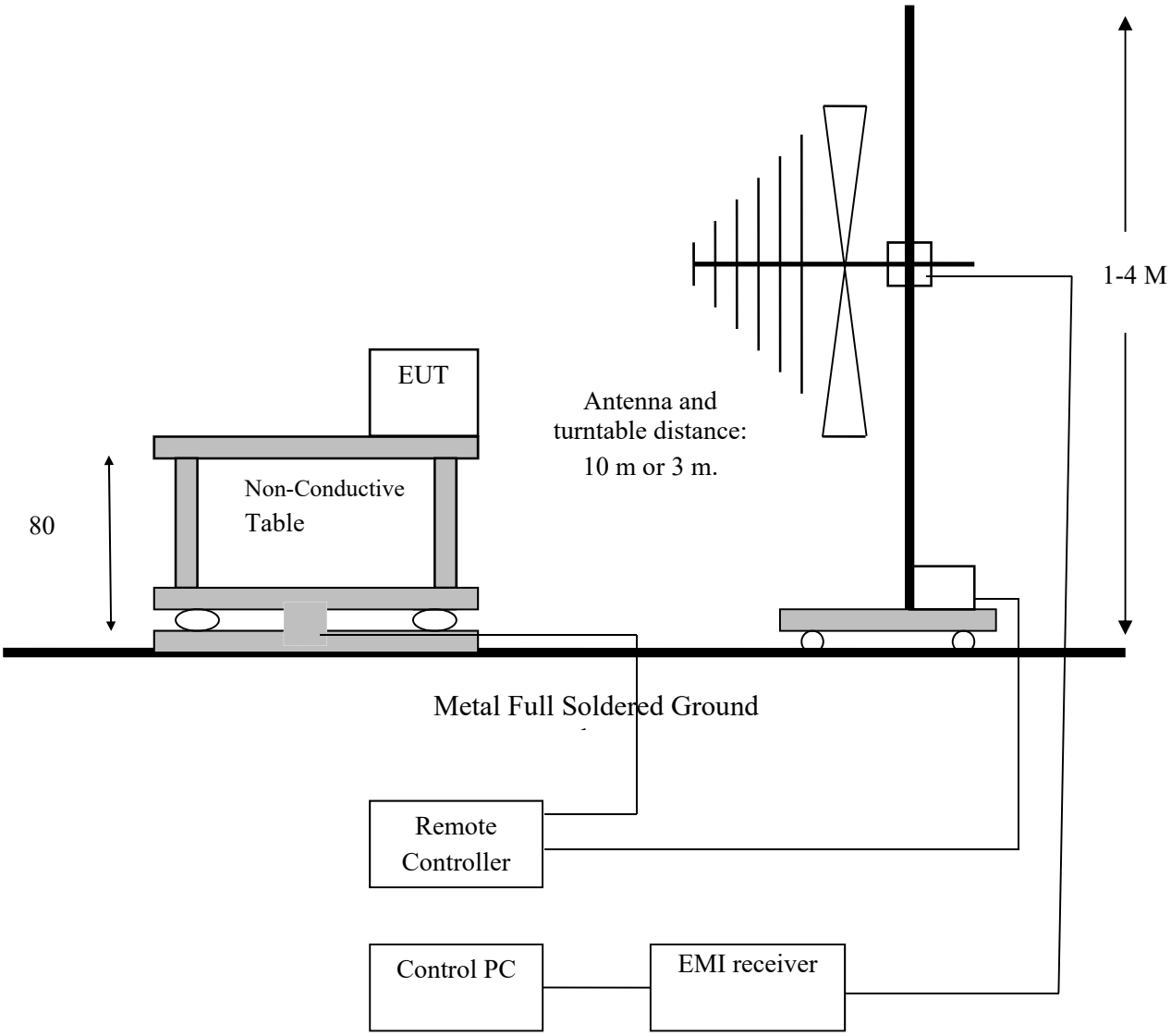
Model Name	SX240-297
Test Voltage	DC 5V
Temperature:	26 ℃
Humidity:	54 % RH

3.6 TEST DATA:

Please refer to APPENDIX 2

4. RADIATED EMISSION MEASUREMENT

4.1 TEST SETUP



4.2 LIMIT

Frequency	Class A at 10m		Class B at 3m	
MHz	Field Strength (μV/m)	Quasi-peak (dBμV/m)	Field Strength (μV/m)	Quasi-peak (dBμV/m)
30 ~ 88	90	39.08	100	40
88 ~ 216	15	43.52	150	43.52
216 ~ 960	210	46.44	200	46.02
960 above	300	49.54	500	53.98

Frequency	Class A at 10m	Class B at 10m
MHz	Quasi-peak (dBμV/m)	Quasi-peak (dBμV/m)
30 ~ 230	40	30
230 ~ 1000	47	37

NOTE:

1) According to FCC 47 CFR Part 15 § 15.109(g) as refer to CISPR 22 Limits and method of measurement.

Frequency range (GHz)	Class A at 3m		Class B at 3m	
	Average (dBμV/m)	Peak (dBμV/m)	Average (dBμV/m)	Peak (dBμV/m)
1 ~ 6	60	80	54	74

NOTE:

1) In the above table, the tighter limit applies at the band edges.
2) The test result calculated as following:
   Level Value = Reading Level + Factor
   Factor = Antenna Factor + Cable Loss – Amplifier Gain (if use)
   Over Limit Value = Level Value – Limit Value

4.3 TEST PROCEDURE

Please refer to
Appendix B: Test Procedure for Radiated Emissions

Note:

(Below 1 GHz)

1. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.

2.All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
(Above 1 GHz)
1.Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW=1 MHz, VBW= 1MHz.
Reading in which marked as AV means measurements by using are Average Mode with instruments setting in RBW=1 MHz, VBW= 10Hz.
2.All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.4 TEST SPECIFICATION

According to ANSI C63.4-2014 Section 5.2, 7.1, 7.2 and FCC Part 15 Subpart B Class B.

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

4.5 RESULT: PASSED

Model Name	SX240-297
Test Voltage	DC 5V
Temperature:	24 ℃
Humidity:	70 % RH

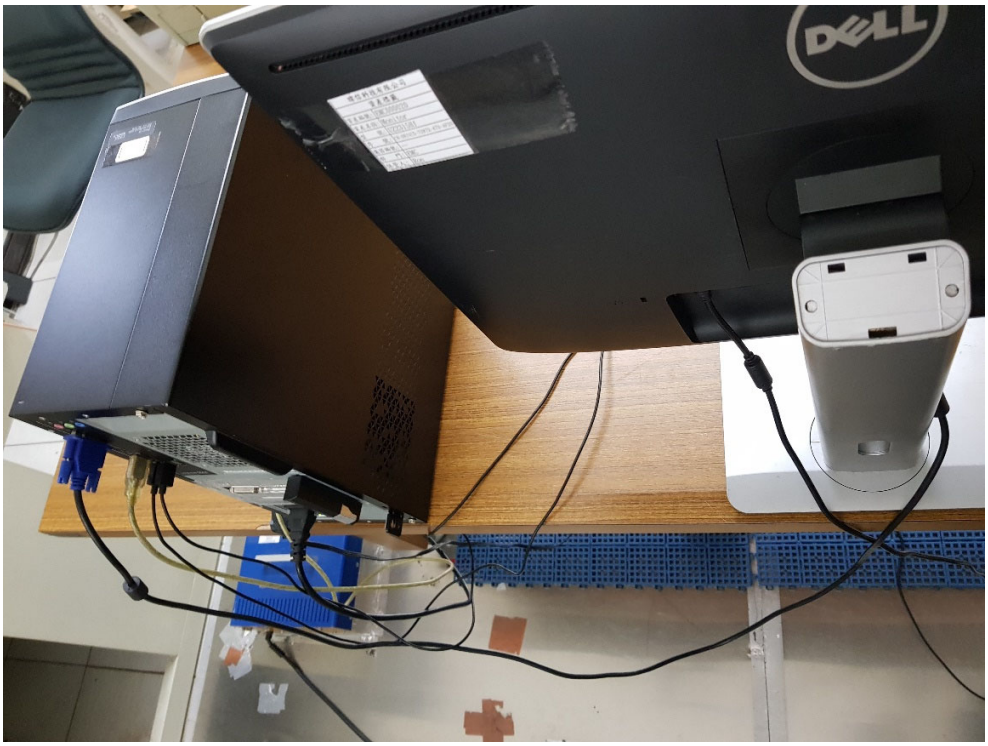
4.6 TEST DATA:

Please refer to APPENDIX 2

5. MEASUREMENT UNCERTAINTY

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	3.54 dB
Radiated Emission	Below 1GHz	Horizontal	2.81 dB
		Vertical	4.01 dB
	Above 1GHz	Horizontal	4.64 dB
		Vertical	5.16 dB

APPENDIX 1
PHOTOS OF TEST CONFIGURATION
Conducted Emission Test Setup



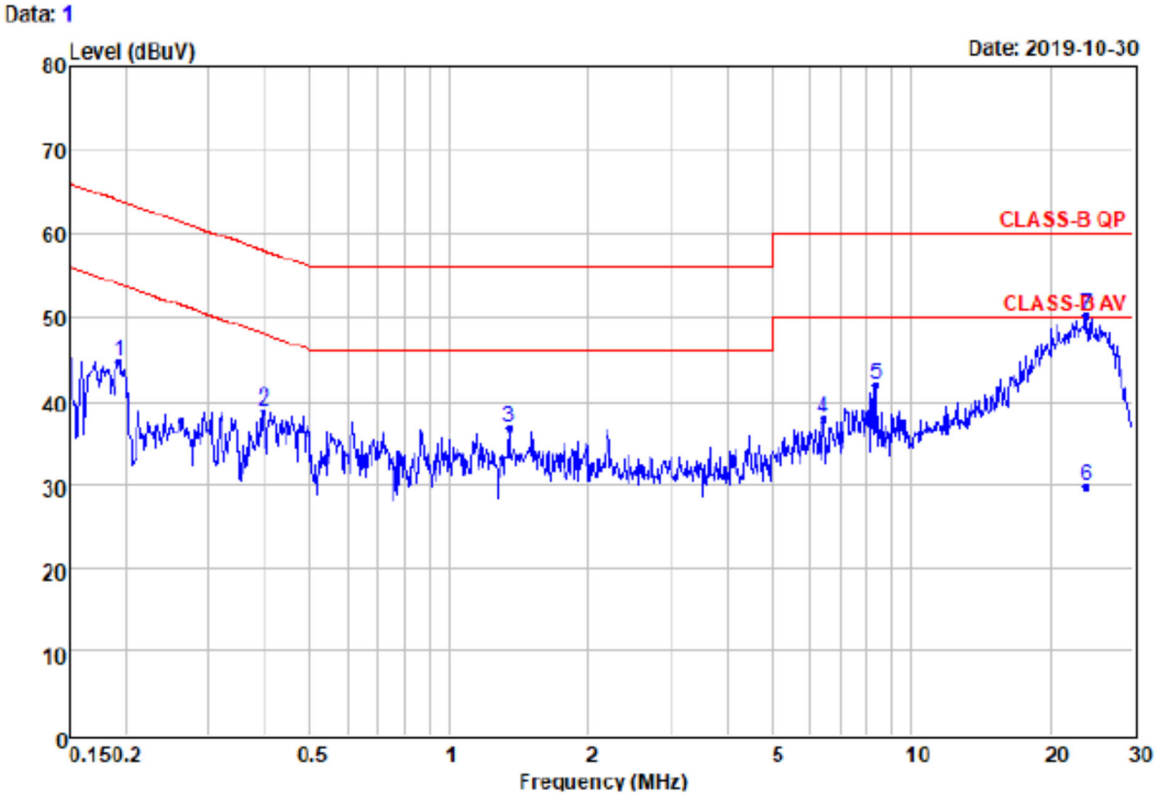
Radiated Emission Test Setup

APPENDIX 2

TEST DATA

Test Data – Conducted Emission

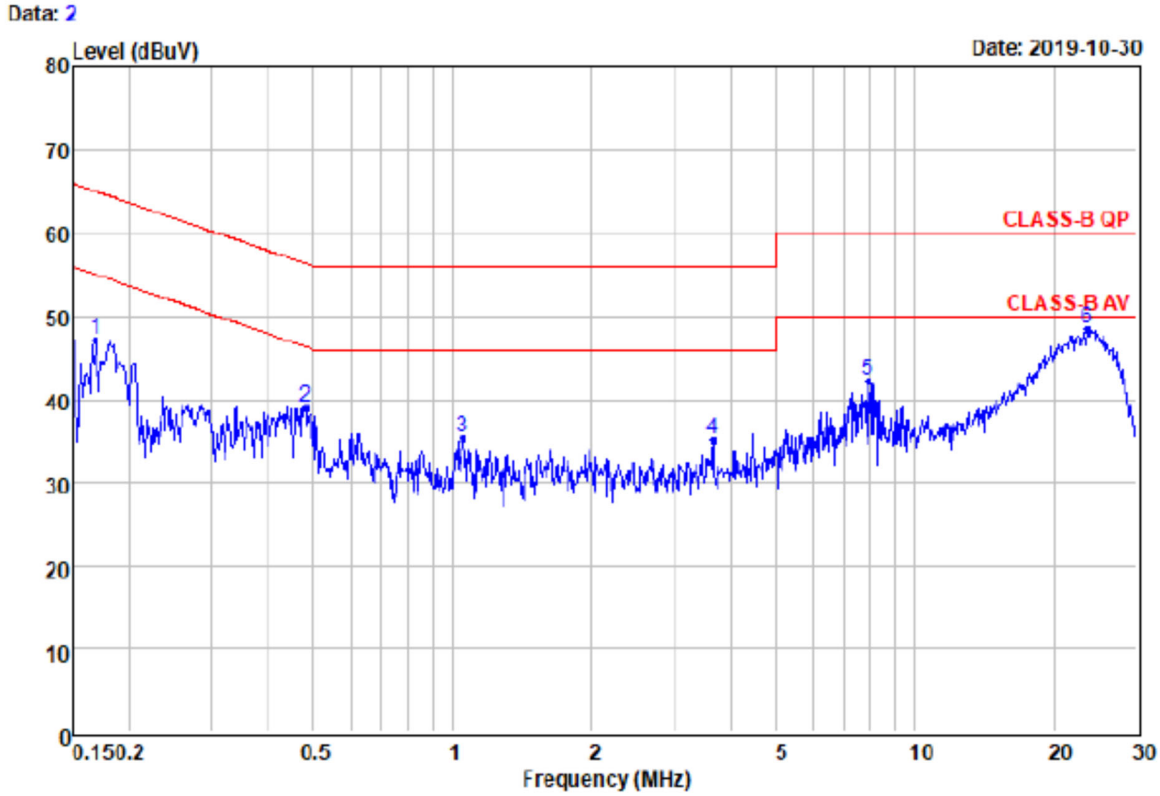
Phase: L



Remarks : Factor=Insertion loss+Cable loss

	Freq	Read Level	Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	
1	0.19	34.46	44.53	10.07	-19.40	63.93	Peak
2	0.40	28.84	38.92	10.08	-19.03	57.95	Peak
3	1.34	26.73	36.86	10.13	-19.14	56.00	Peak
4	6.42	27.61	37.90	10.29	-22.10	60.00	Peak
5	8.37	31.49	41.83	10.34	-18.17	60.00	Peak
6	23.89	19.20	29.85	10.65	-20.15	50.00	Average
7 @	23.89	39.59	50.24	10.65	-9.76	60.00	Peak

Phase: N

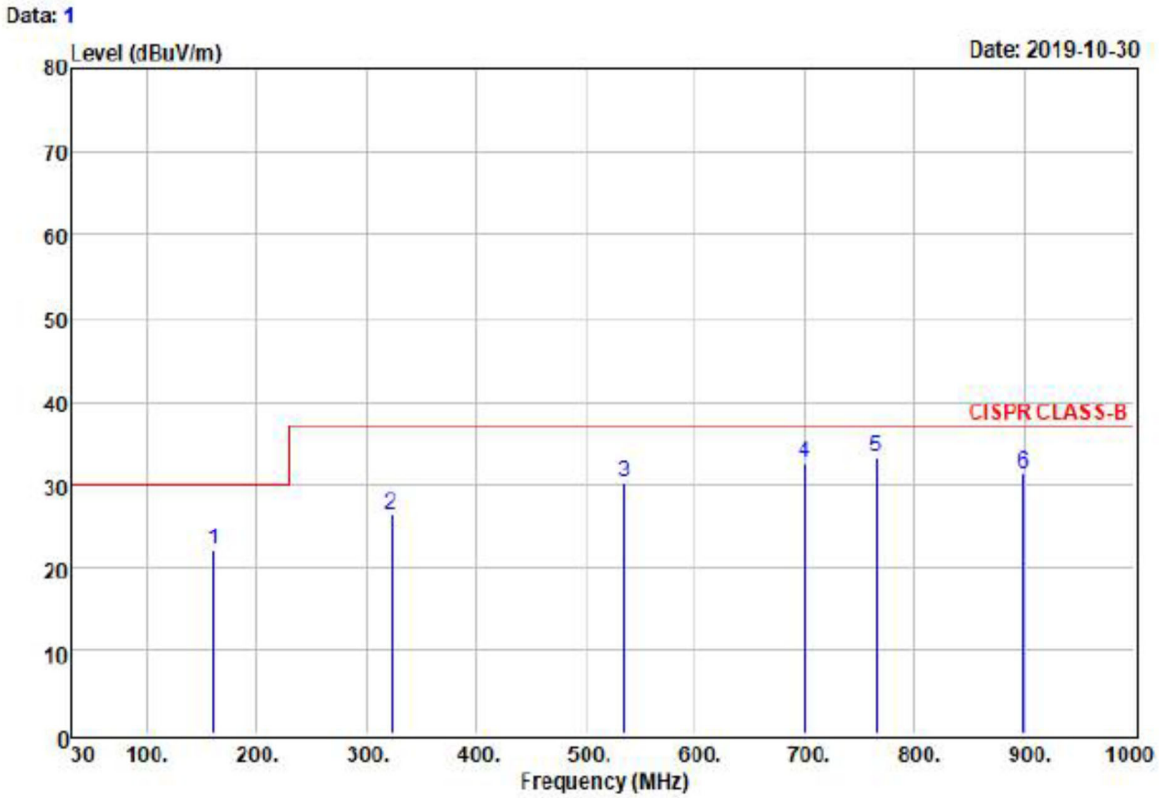


Remarks : Factor=Insertion loss+Cable loss

	Freq	Read Level	Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	
1	0.17	37.09	47.15	10.06	-17.88	65.03	Peak
2	0.48	29.02	39.09	10.07	-17.27	56.36	Peak
3	1.05	25.36	35.46	10.10	-20.54	56.00	Peak
4	3.64	24.91	35.11	10.20	-20.89	56.00	Peak
5	7.89	31.97	42.27	10.30	-17.73	60.00	Peak
6 @	23.51	37.83	48.41	10.58	-11.59	60.00	Peak

Test Data – Radiated Emission-Below 1GHz

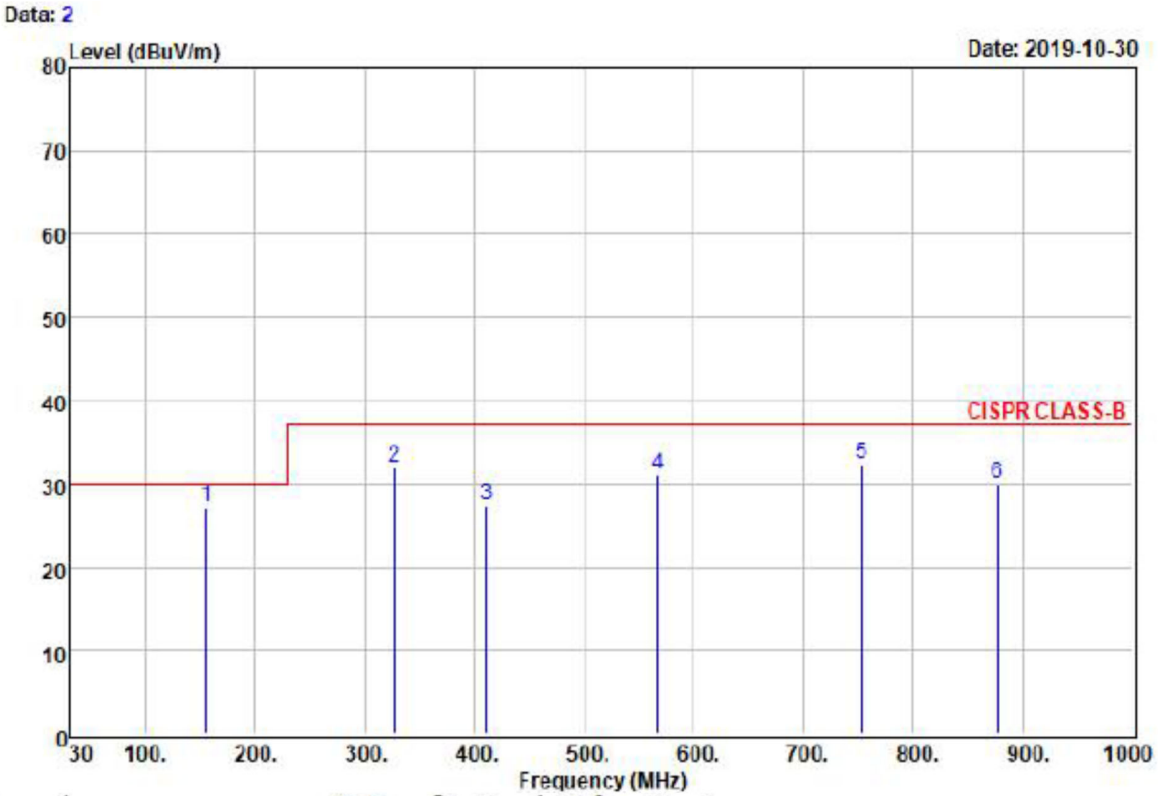
Polarization: Horizontal



Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Level	Read Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	
1	160.30	22.18	39.09	-16.91	-7.82	30.00	QP
2	322.40	26.39	39.28	-12.89	-10.61	37.00	QP
3	534.60	30.19	38.84	-8.65	-6.81	37.00	QP
4	700.40	32.55	39.45	-6.90	-4.45	37.00	QP
5 @	765.40	33.21	39.22	-6.01	-3.79	37.00	QP
6	899.30	31.33	34.94	-3.61	-5.67	37.00	QP

Polarization: Vertical

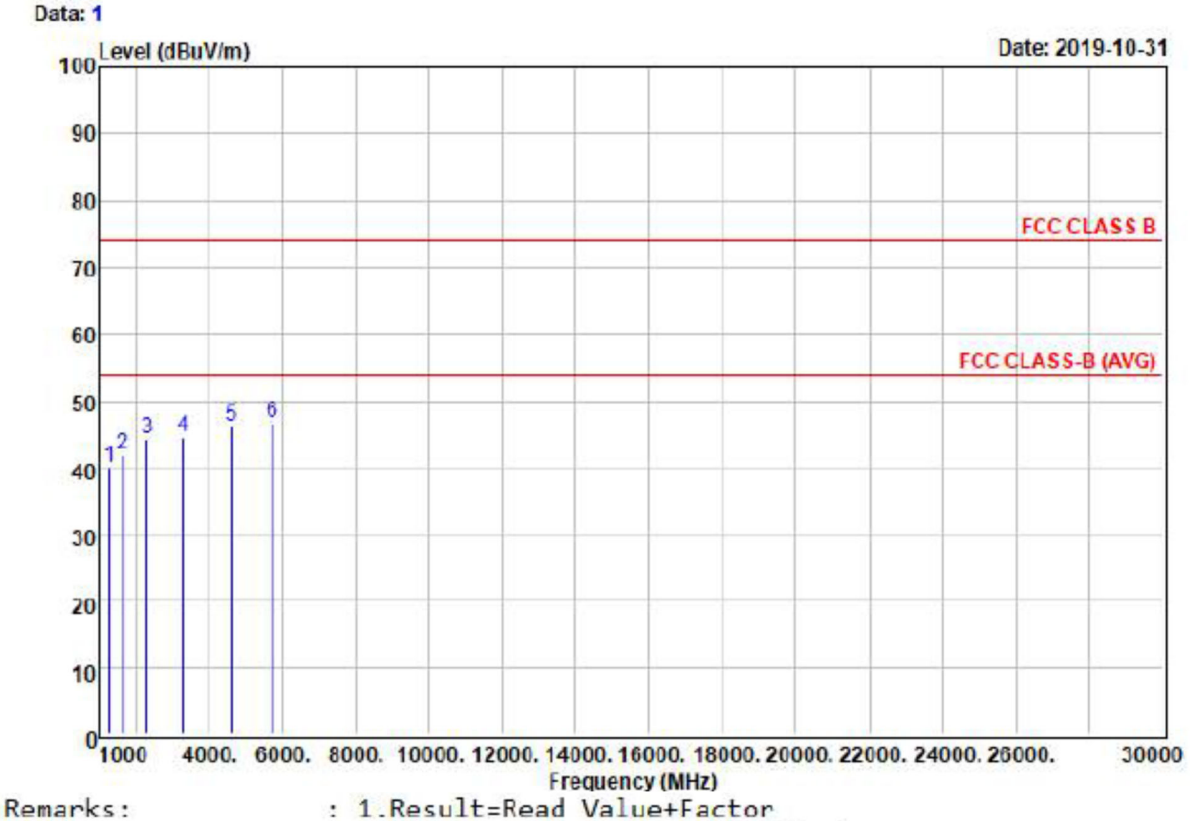


Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Level	Read Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	
1 @	155.60	27.26	43.45	-16.19	-2.74	30.00	QP
2	327.60	31.97	44.63	-12.66	-5.03	37.00	QP
3	411.20	27.43	37.90	-10.47	-9.57	37.00	QP
4	567.50	31.13	40.14	-9.01	-5.87	37.00	QP
5	753.20	32.46	38.65	-6.19	-4.54	37.00	QP
6	877.50	30.03	33.78	-3.75	-6.97	37.00	QP

Test Data – Radiated Emission-1GHz-30GHz

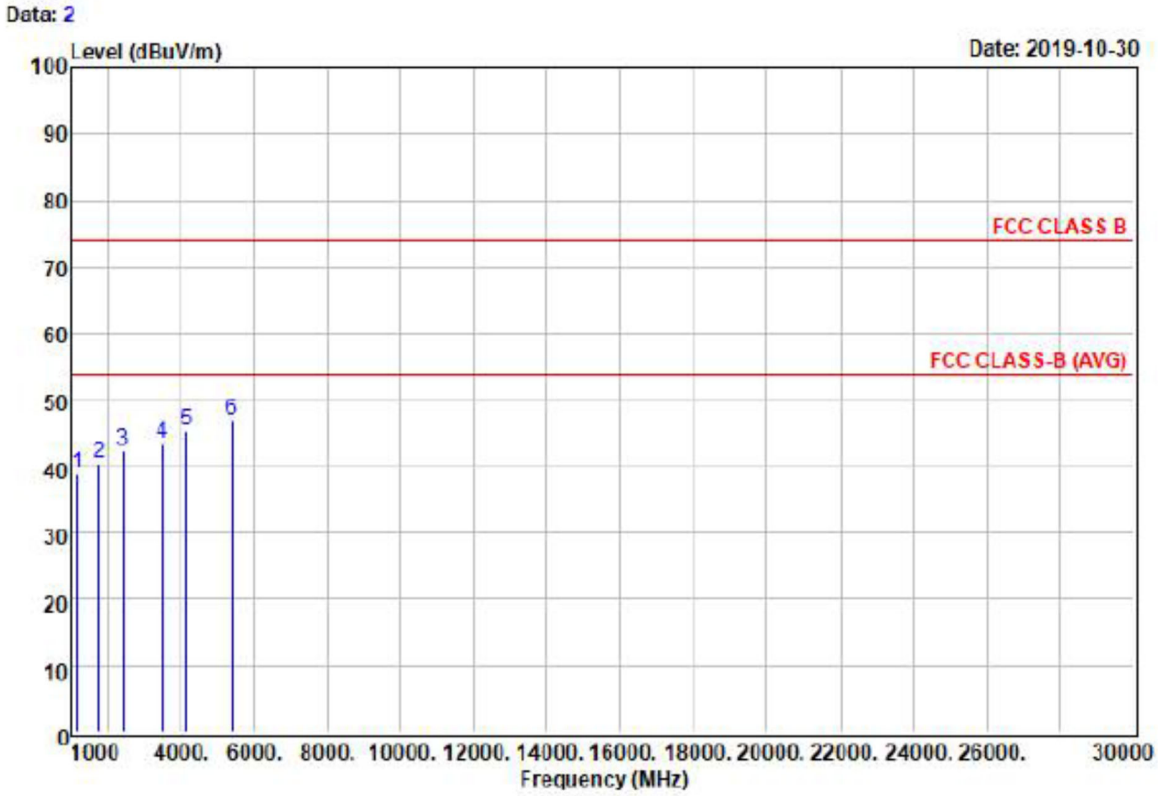
Polarization: Horizontal



Remarks: : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Level	Read Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	
1	1299.00	39.88	59.15	-19.27	-34.12	74.00	Peak
2	1674.00	41.88	60.37	-18.49	-32.12	74.00	Peak
3	2323.00	44.35	59.30	-14.95	-29.65	74.00	Peak
4	3297.00	44.55	54.94	-10.39	-29.45	74.00	Peak
5	4629.00	45.99	54.71	-8.72	-28.01	74.00	Peak
6 @	5724.00	46.56	52.50	-5.94	-27.44	74.00	Peak

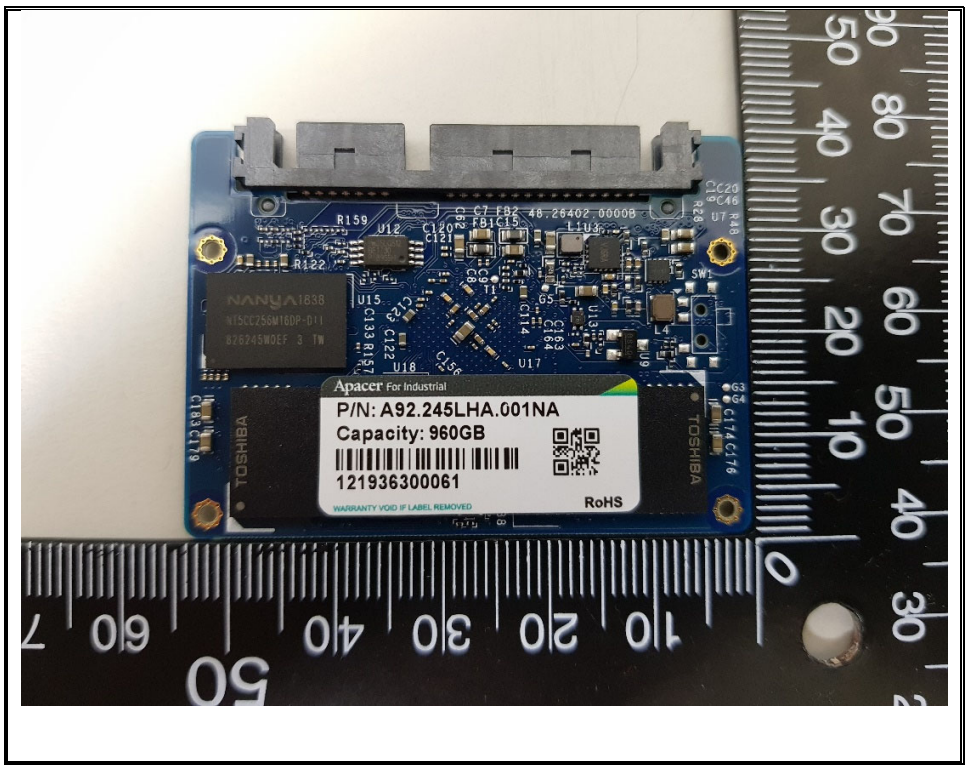
Polarization: Vertical

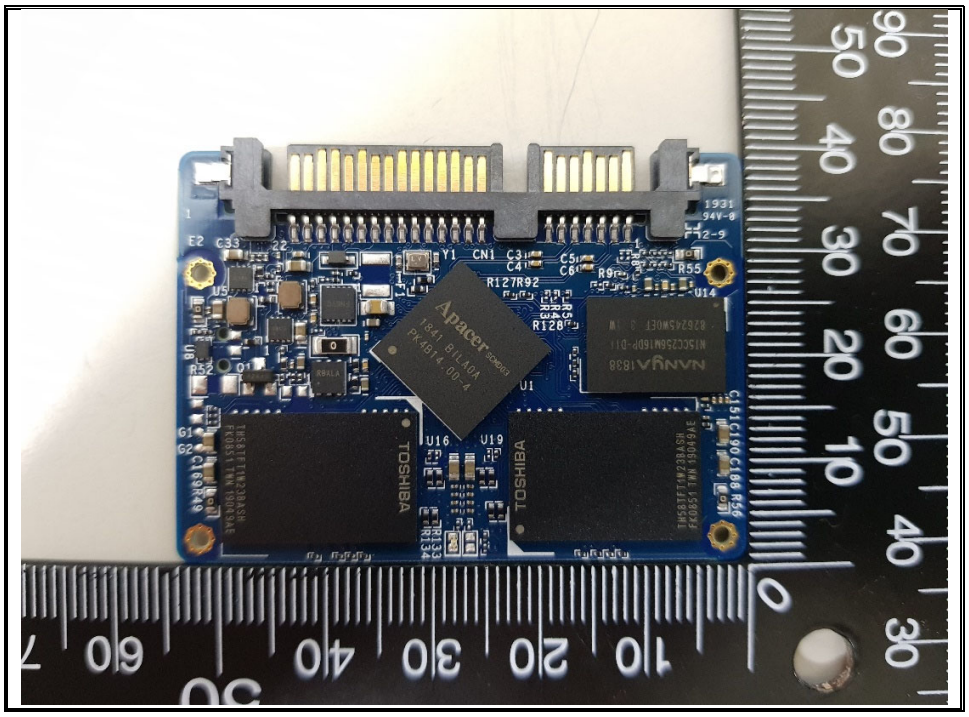


Remarks: : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Level	Read Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	
1	1200.00	39.00	59.46	-20.46	-35.00	74.00	Peak
2	1800.00	40.55	58.47	-17.92	-33.45	74.00	Peak
3	2440.00	42.23	56.85	-14.62	-31.77	74.00	Peak
4	3527.00	43.56	54.82	-11.26	-30.44	74.00	Peak
5	4177.00	45.24	55.80	-10.56	-28.76	74.00	Peak
6 @	5423.00	46.85	54.24	-7.39	-27.15	74.00	Peak

PHOTS OF EUT


Apacer For Industrial
P/N: A92.245LHA.001NA
Capacity: 960GB
121936300061
RoHS
WARRANTY VOID IF LABEL REMOVED
TOSHIBA
TOSHIBA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