

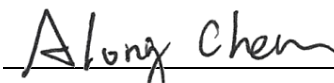
FCC C2PC Test Report

FCC ID : P27-XIONESCM2
Equipment : XiOne-SC (B)
Model No. : SCXIxxBEIxCO; SCXIxxBEI
(Refer to item 1.1.1 for more details.)
Brand Name : Comcast Xfinity; Cox; Shaw
(Refer to item 1.1.1 for more details.)
Applicant : Sercomm Corporation
Address : 8F, No. 3-1, YuanQu St., NanKang, Taipei 115,
Taiwan. R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : May 06, 2022
Tested Date : May 18 ~ May 20, 2022

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager

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Appendix A. Unwanted Emissions into Restricted Frequency Bands

Appendix B. AC Power Line Conducted Emissions

Release Record

Report No.	Version	Description	Issued Date
FR161001-05	Rev. 01	Initial issue	Jun. 08, 2022

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 5.505MHz 50.99 (Margin -9.01dB) - QP	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 422.31MHz 40.45 (Margin -5.55dB) - PK	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

This is a Class II Permissive Change report (C2PC).

This report is issued as a supplementary report to original report no. FR161001-04. The modifications are listed as follows:

- Adding 2nd source (non-RF components) listed in part list document.

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Comcast Xfinity; Cox; Shaw	SCXIxxBEIxCO; SCXIxxBEI	XiOne-SC (B)	Where "x" may be any alphanumeric for External Body Color.
<ul style="list-style-type: none"> ✦ All models are electrically identical, different model names are for marketing purpose. ✦ The above models, model SCXI11BEI was selected as a representative one for the final test and only its data was recorded in this report. 			

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Mode	Ch. Frequency (MHz)	Channel Number	Data Rate
2425~2475	RF4CE	2425~2475	15-25 [3]	250kbps
Note 1: RF4CE uses 16-QQPSK modulation.				

1.1.3 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	Printing	No	0.02	---

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5.0Vdc from AC adapter
-------------------	------------------------

1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: LEADER Model: ML08-7050150-A1 I/P: 100-120V~ 50/60Hz, 0.25A O/P: 5.0Vdc, 1.5A Power Line: 1.8m non-shielded without core
2	AC adapter	Brand: NetBit Model: NBC08A050150HU I/P: 100-120V~ 50/60Hz, 0.2A O/P: 5.0Vdc, 1.5A Power Line: 1.81m non-shielded without core
3	AC adapter	Brand: AcBel Model: WAK010 I/P: 100-120V~ 60Hz, 0.25A O/P: 5.0Vdc, 1.5A Power Line: 1.78m non-shielded without core

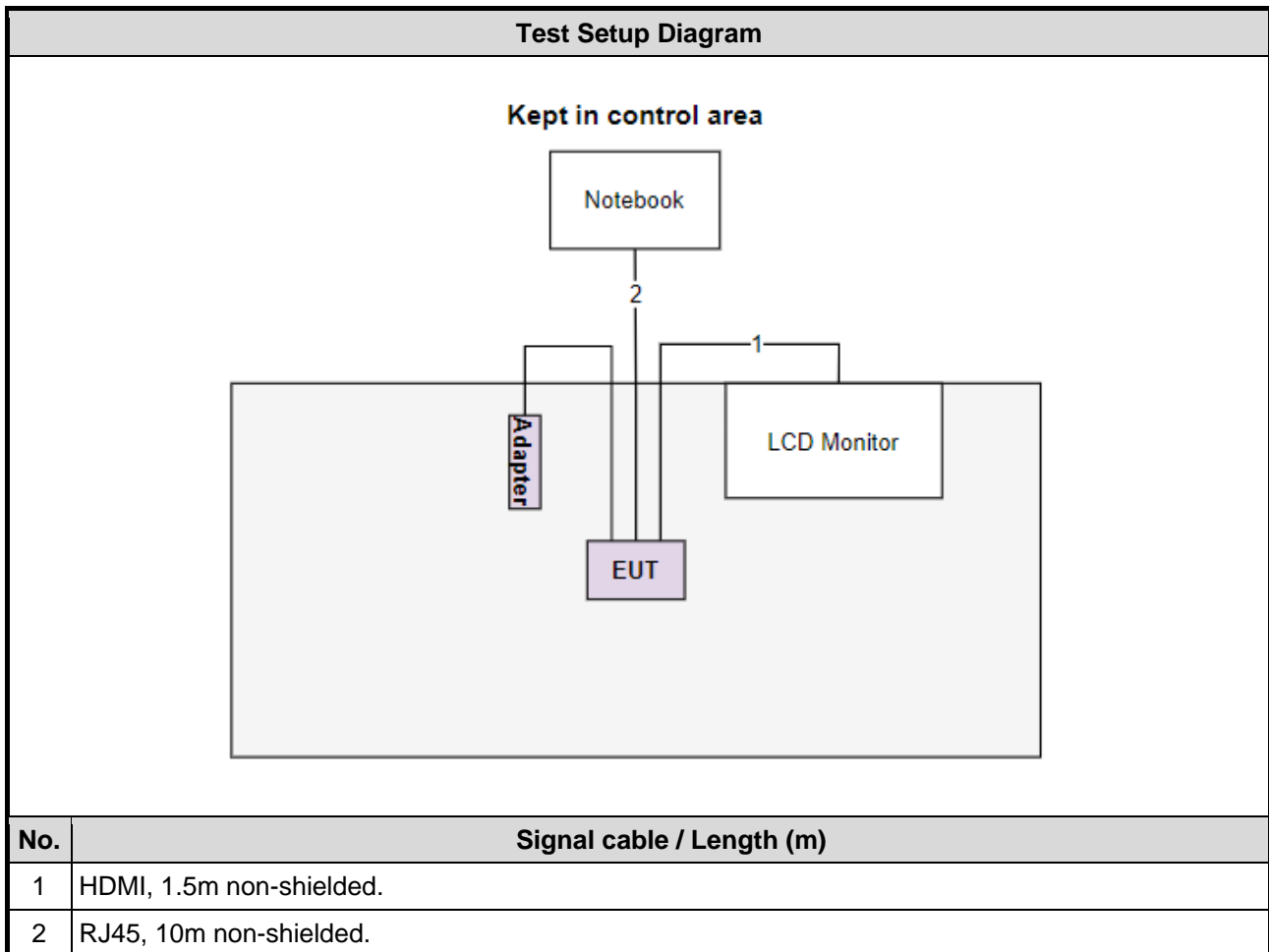
1.1.6 Channel List

Channel No.	Frequency (MHz)
15	2425
20	2450
25	2475

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	LCD Monitor	ASUS	MX27UCS	---	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	May 20, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 16, 2022	Feb. 15, 2023
LISN	R&S	ENV216	101579	Apr. 21, 2022	Apr. 20, 2023
LISN (Support Unit)	SCHWARZBECK	NSLK 8127	8127667	Jan .07, 2022	Jan .06, 2023
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 19, 2021	Oct. 18, 2022
50 ohm terminal (Support Unit)	NA	50	04	May 25, 2021	May 24, 2022
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	May 18, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 15, 2022	Mar. 14, 2023
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 08, 2021	Nov. 07, 2022
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jun. 30, 2021	Jun. 29, 2022
Preamplifier	EMC	EMC02325	980225	Jun. 29, 2021	Jun. 28, 2022
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 05, 2021	Oct. 04, 2022
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 05, 2021	Oct. 04, 2022
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 05, 2021	Oct. 04, 2022
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 05, 2021	Oct. 04, 2022
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247

ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
AC conducted emission	±2.92 dB
Unwanted Emission ≤ 1GHz	±3.41 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emission	16-OQPSK	2425	250kbps	---
Unwanted Emissions ≤ 1GHz	16-OQPSK	2425	250kbps	---

NOTE:

- Three adapters (LEADER, NetBit & AcBel) had been covered during the pretest and found that **LEADER** adapter was the worst case and was selected for final testing.

3 Transmitter Test Results

3.1 Unwanted Emissions into Restricted Frequency Bands

3.1.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.1.2 Test Procedures

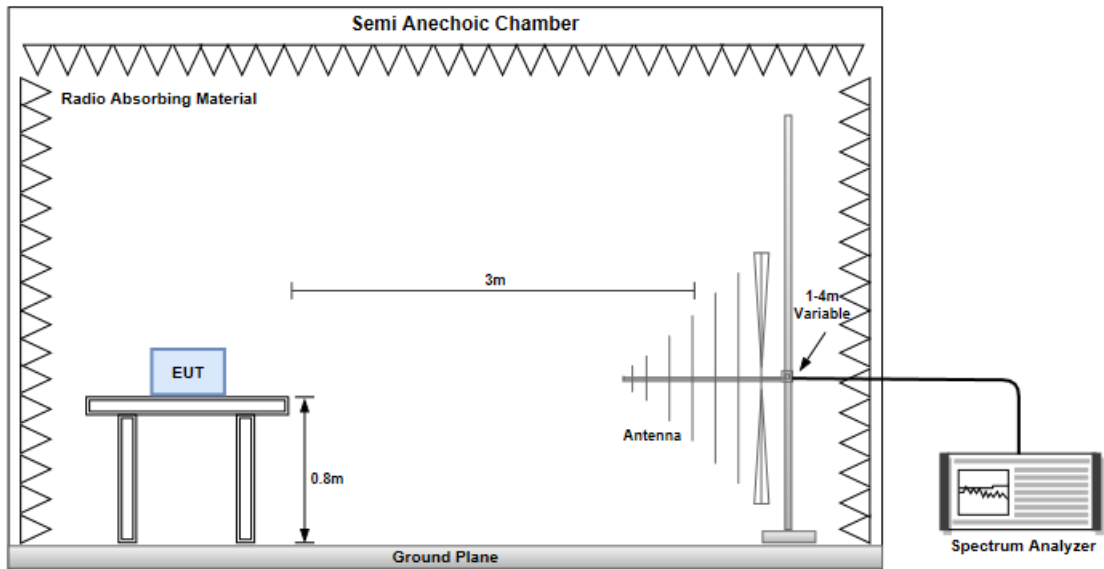
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

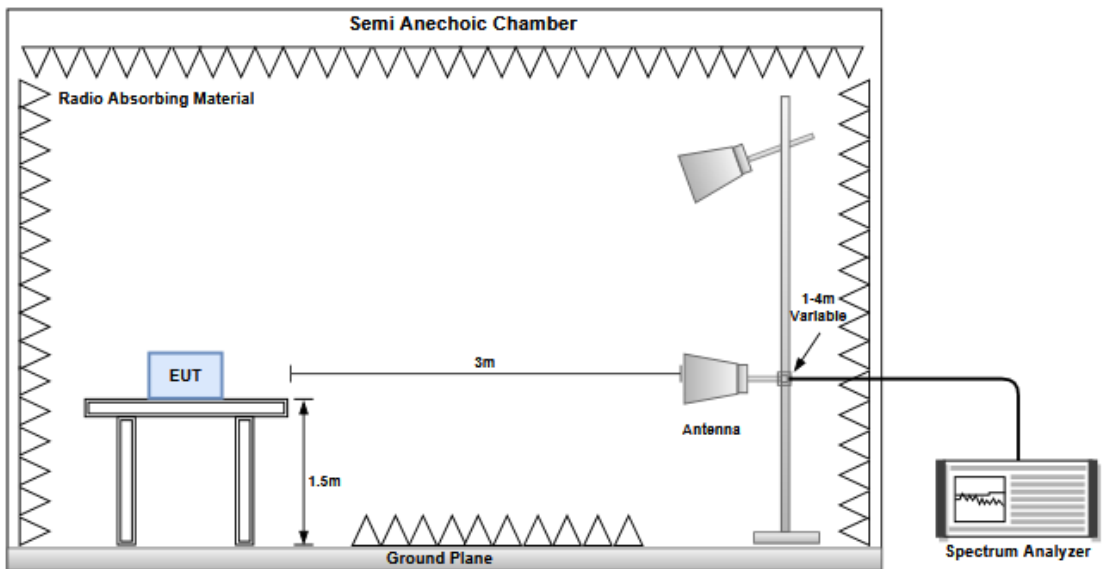
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.1.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.1.4 Test Results

Refer to Appendix A.

3.2 AC Power Line Conducted Emissions

3.2.1 Limit of AC Power Line Conducted Emissions

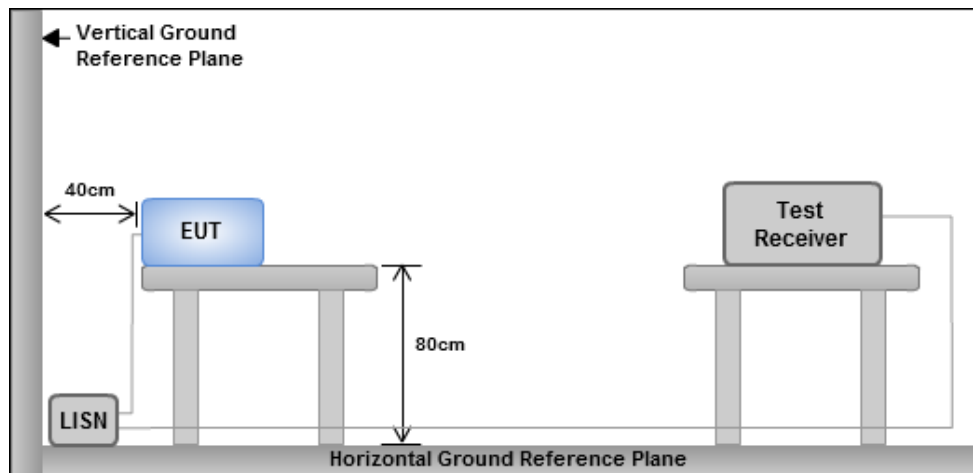
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.2.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

3.2.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.2.4 Test Results

Refer to Appendix B.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 333, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

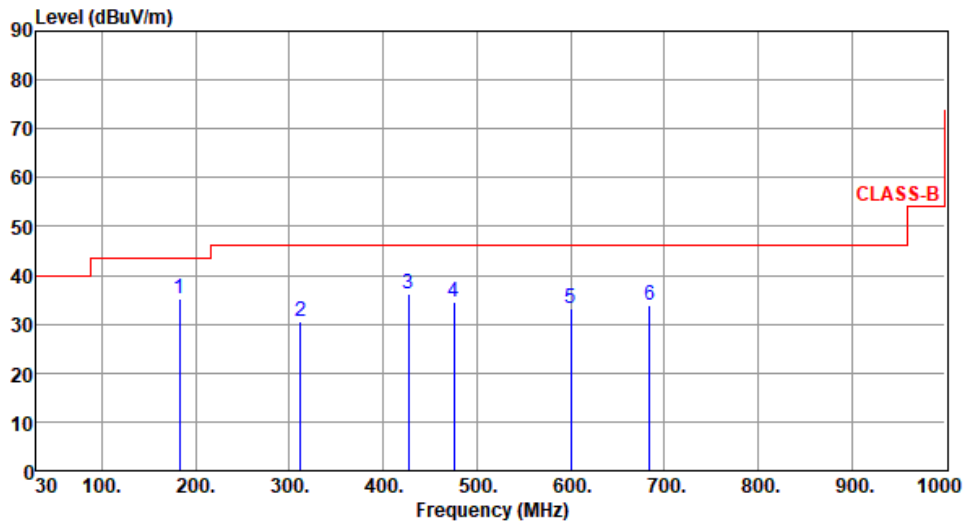
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Unwanted Emissions (Below 1GHz)

Modulation	16-OQPSK	Test Freq. (MHz)	2425
Polarization	Horizontal		

Test By :Brad Wu Temperature(°C):24 Humidity(%):63



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	182.56	35.28	43.50	-8.22	45.75	-10.47	Peak	---	---
2	311.59	30.59	46.00	-15.41	38.34	-7.75	Peak	---	---
3	427.45	36.31	46.00	-9.69	41.22	-4.91	Peak	---	---
4	475.39	34.54	46.00	-11.46	38.39	-3.85	Peak	---	---
5	600.15	33.21	46.00	-12.79	34.22	-1.01	Peak	---	---
6	684.12	33.91	46.00	-12.09	33.91	0.00	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

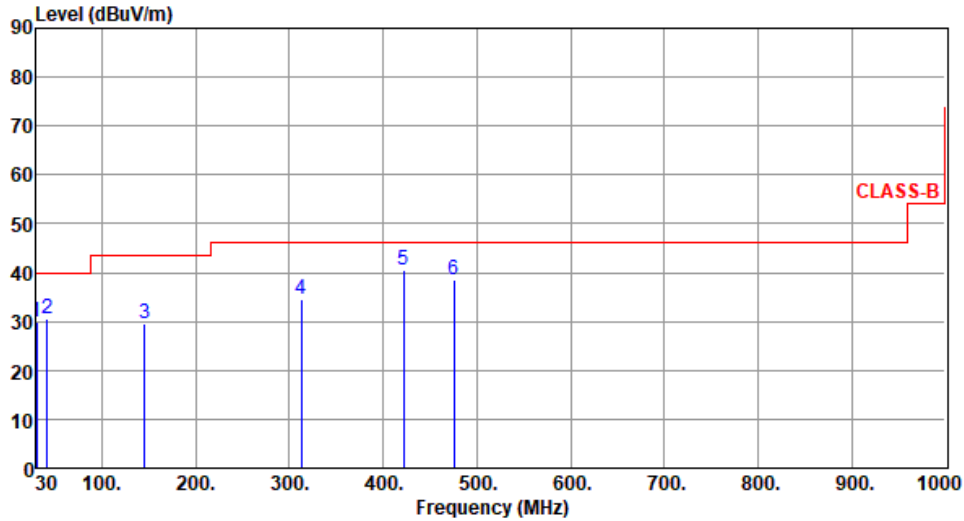
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Modulation	16-OQPSK	Test Freq. (MHz)	2425
Polarization	Vertical		

Test By :Brad Wu Temperature(°C):24 Humidity(%):63



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	30.19	29.94	40.00	-10.06	39.88	-9.94	Peak	---	---
2	41.45	30.58	40.00	-9.42	39.25	-8.67	Peak	---	---
3	145.89	29.64	43.50	-13.86	38.94	-9.30	Peak	---	---
4	312.59	34.61	46.00	-11.39	42.34	-7.73	Peak	---	---
5	422.31	40.45	46.00	-5.55	45.52	-5.07	Peak	---	---
6	475.39	38.59	46.00	-7.41	42.44	-3.85	Peak	---	---

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

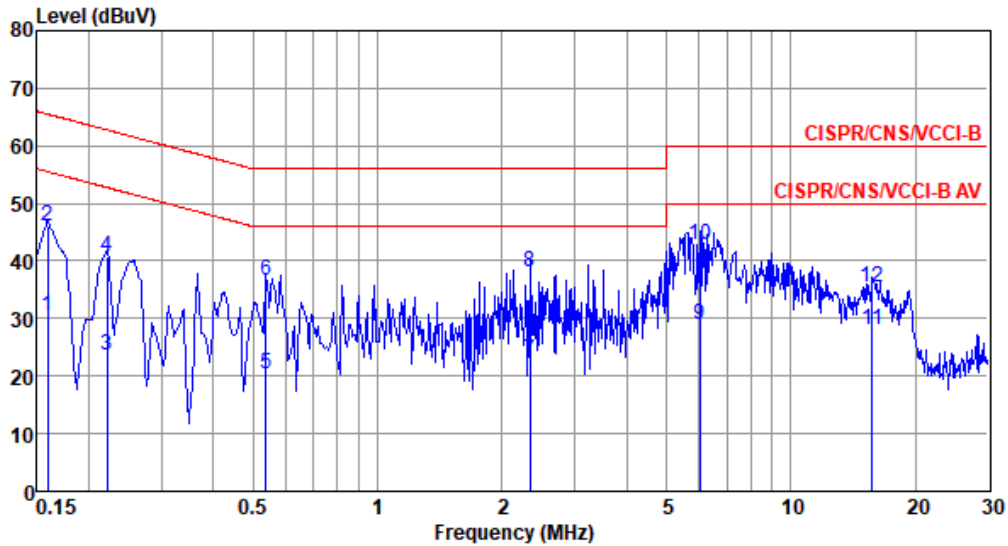
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Modulation Mode	16-QQPSK	Test Freq. (MHz)	2425
Power Phase	Line		

Test by : Joe Liao Temperature: 21°C Humidity: 63%



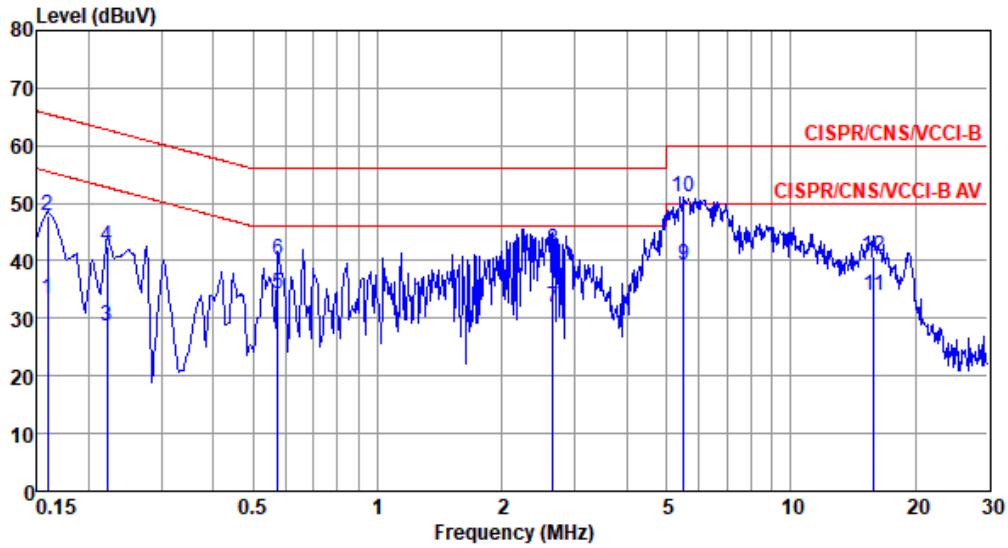
	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	30.29	55.52	-25.23	20.33	9.68	0.08	0.20	Average
2	0.159	46.08	65.52	-19.44	36.12	9.68	0.08	0.20	QP
3	0.222	23.75	52.74	-28.99	13.75	9.68	0.08	0.24	Average
4	0.222	40.74	62.74	-22.00	30.74	9.68	0.08	0.24	QP
5	0.538	20.38	46.00	-25.62	10.24	9.67	0.11	0.36	Average
6	0.538	36.64	56.00	-19.36	26.50	9.67	0.11	0.36	QP
7	2.334	22.73	46.00	-23.27	12.44	9.69	0.20	0.40	Average
8	2.334	38.19	56.00	-17.81	27.90	9.69	0.20	0.40	QP
9	6.024	29.07	50.00	-20.93	18.60	9.72	0.32	0.43	Average
10*	6.024	42.93	60.00	-17.07	32.46	9.72	0.32	0.43	QP
11	15.718	28.14	50.00	-21.86	17.30	9.73	0.57	0.54	Average
12	15.718	35.52	60.00	-24.48	24.68	9.73	0.57	0.54	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).



Modulation Mode	16-QQPSK	Test Freq. (MHz)	2425
Power Phase	Neutral		

Test by : Joe Liao Temperature: 21°C Humidity: 63%



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	33.37	55.52	-22.15	23.52	9.61	0.08	0.16	Average
2	0.159	47.93	65.52	-17.59	38.08	9.61	0.08	0.16	QP
3	0.222	28.77	52.74	-23.97	18.90	9.61	0.08	0.18	Average
4	0.222	42.56	62.74	-20.18	32.69	9.61	0.08	0.18	QP
5	0.573	34.33	46.00	-11.67	24.38	9.61	0.11	0.23	Average
6	0.573	40.07	56.00	-15.93	30.12	9.61	0.11	0.23	QP
7	2.650	31.75	46.00	-14.25	21.61	9.63	0.20	0.31	Average
8	2.650	41.93	56.00	-14.07	31.79	9.63	0.20	0.31	QP
9	5.505	39.26	50.00	-10.74	28.97	9.66	0.29	0.34	Average
10*	5.505	50.99	60.00	-9.01	40.70	9.66	0.29	0.34	QP
11	15.885	34.04	50.00	-15.96	23.23	9.76	0.58	0.47	Average
12	15.885	40.69	60.00	-19.31	29.88	9.76	0.58	0.47	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).
 Note 2: Over Limit (dB) = Level (dBUV) - Limit Line (dBUV).

Part List

MODEL: BRAVO/BRAVO-SC						
Item	BOM.Ref Des	function	main source		Sercomm suggested substitute	
			Manufacturer	MPN	Manufacturer	MPN
1	FB5000,FB5015	BEAD	Murata	FERRITE BEAD BLM15PX601SN1D	INPAQ	MHC1005P601ZBPA90E4
2	FB5018	BEAD	Murata	FERRITE BEAD BLM15AX102SN1D	CHILISIN	PBY100505T-102Y-N
3	D4600,D4601,D4602,D8401	TVS	BENCENT	DIODE TVS ARRAY BV-FK05U4CA	MCC	ESD PROTECTOR ESDSLC0524F-TP
4	D4603, D4604, D8403, D8404	TVS	BENCENT	DIODE TVS BV-FA05UCA	MCC	CSPULC5V0LB(CSP1006-2)
5	L8002	RF LL	CHILISIN	INDUCTOR CLH1005T-6N8J-S	SUNLORD	SDCL1005C6N8JTDF
6	L8000	RF LL	Murata	INDUCTOR LQG15HN6N2S02D	SUNLORD	INDUCTOR SDCL1005C6N2STDF
7	L8001	RF LL	Murata	INDUCTOR LQG15HN5N6S02D	SUNLORD	INDUCTOR SDCL1005C5N6STDF
8	L8007	RF LL	Murata	INDUCTOR LQP03TN3N9B02D	SUNLORD	SDCL0603Q3N9BT02B03
9	L6013	RF LL	Murata	INDUCTOR LQP03TN1N1B02D	SUNLORD	SDCL0603Q1N1BT02B03
10	L6048	RF LL	Murata	INDUCTOR LQP03TN1N3B02D	SUNLORD	SDCL0603Q1N3BT02B03
11	L6010,L6012	RF LL	Murata	INDUCTOR LQP03TN3N2B02D	SUNLORD	SDCL0603Q3N2BT02B03
12	L8006	RF LL	TDK	INDUCTOR MLG0603P1N5BTZ10	SUNLORD	INDUCTOR SDCL0603Q1N5BT02B03
13	L7000,L7001	RF LL	Murata	INDUCTOR LQP03TN3N0B02D	SUNLORD	SDCL0603Q3N0BT02B03

Part List

14	L6001	RF LL	Murata	INDUCTOR LQP03TN8N2H02D	SUNLORD	SDCL0603Q8N2HT02B03
15	L7008,L8005	RF LL	CHILISIN	INDUCTOR CLH1005T-22NJ-S	SUNLORD	SDCL1005C22NJTDF
16	L7002	RF LL	Murata	INDUCTOR LQP03TN2N7B02D	SUNLORD	INDUCTOR SDCL0603Q2N7BT02B03
17	F7000	RF Filter	TDK	RF FILTER(LP) DEA162690LT-5014A5	Walsin	RFLPF1606A13T
18	L4600,L4601,L4602,L4603	common chock	Murata	COMMON CHOKE NFG0QHB542HS2D	TDK	TCM0605T-080-2P-T201
19	J1	CONN	LIYANG	JACK DC PWR LYDC000147	SHENZHEN UNIT ELECTRONICS	805-02200-000
20	J8400	CONN	LIYANG	CONN RJ45 LYWK045131	SHENZHEN UNIT ELECTRONICS	845-63060-000
21	FB5003, FB5004, FB5005, FB5006	BEAD	Murata	FERRITE BEAD BLM03AX121SN1D	SUNLORD	FERRITE BEAD PZ0603D121-R45TF
22	FB402	BEAD	CHILISIN	FERRITE BEAD 1.5A 0402	TAI-TECH	FERRITE BEAD HCB1005KF-121T15
23	FB5001, FB5002, FB5016, FB5017	BEAD	Murata	FERRITE BEAD BLM15PD121SN1D	TAI-TECH	FERRITE BEAD HCB1005KF-121T15
24	L8003	RF LL	CHILISIN	INDUCTOR BSCH001005053N6SCS	SUNLORD	INDUCTOR SDCL1005C3N6STDF
25	C8004,C8011	RF CAP	Murata	CAP CHIP GJM0335C1E100JB01D	WALSIN	RF03N100J500CT
26	J6001	RF CONN	Murata	CONN RF MM8030-2610RJ3	ECT	CONN RF 818011998
27	SK6000	RF CONN	Foxconn	CONN RF KK23011-32-7H	ECT	CONN RF 818000368
28	U6000,U6002	RF SWITCH	RICHWAVE	RF CHIP RTC6603SP	KCT	KCT2821L
29	C8413	CAP	Walsin	CAP CHIP 1808B102K202CT	YAGEO	CC1808KKX7RDBB102
30	U7000	RF SWITCH	RICHWAVE	RF CHIP RTC6617SP	MAXSCEND	MXD8730