Test Report
Model : YY-R445

Tested Standard
EN 55022: 2010
Results from Preliminary Scan in 743 Anechoic Chamber

Tested by Jones, William

Date: Jun. 10, 2015

Approved by Cathy Hsu

Date: June 18b. , 2015

1. Introduction

The purpose of this evaluation is to present the results of the EMC Emissions tests on the Yeong Yang chassis. The testing was carried out by Yeong Yang at Matrix Test Laboratory located at 2F, 146, Jianyi Road, Chung Ho District, New Taipei City 235, Taiwan.

2. References

Radiation Test (as per EN 55022:2010)

3. Equipment Under Test (EUT)

3.1 EUT Test Item

Yeong Yang YY-R44500 Chassis

3.2 EUT Configuration

Item	Supplier	Model/Part Number
Chassis	Yeong Yang	YY-R445
Power Supply	Delta	ZIPPY HG2-6400P
Chassis Fans	Top Fan	DF121225BM DF128025BH
Processor	Intel	Core i5 3570; 3.4GHz / Socket 1155
Chipset	Intel	Z77
Motherboard	Gigabyte	GA-Z77M-D3H
Memory	Transcend	DDR3 1600 8GB , Quantity: 1
Hard Drive	WD	2TB WD2002FAEX
DVD-RW	none	
FPIO	GD	USB 3.0

3.3 Support Equipment by 743 Anechoic Chamber

Item	Supplier	Model/Part Number/PID
Keyboard	Logitech	K200 / 820-003185 / SY209UK
Mouse	Logitech	K200 / 810-002181 / HS208HA
Monitor	Dell	E1709WC/Q40G17N-700-23AXY
USB 2.0 PEN DRIVE	HP	V218G
USB 3.0 PEN DRIVE	A-DATA	C103 16GB
Earphone + Microphone	CJ	CJ323

3.4 EUT Comments

EUT tested with, Intel i5 3570 Processors with active heat sink and fan. An I/O shield was supplied with motherboard and used in this chassis.

3.5 Software

The program used to exercise the EUT was the EMC test software PassMark BurnInTest 6.0.1 were running under Microsoft Windows 8 x64 Edition. Video resolution was set at 1024x768.*The EMC test software version is designed to exercise the various EUT components in a manner similar to typical use.*

4. Test Result (Radiated Emissions)

4.1 Test Setup

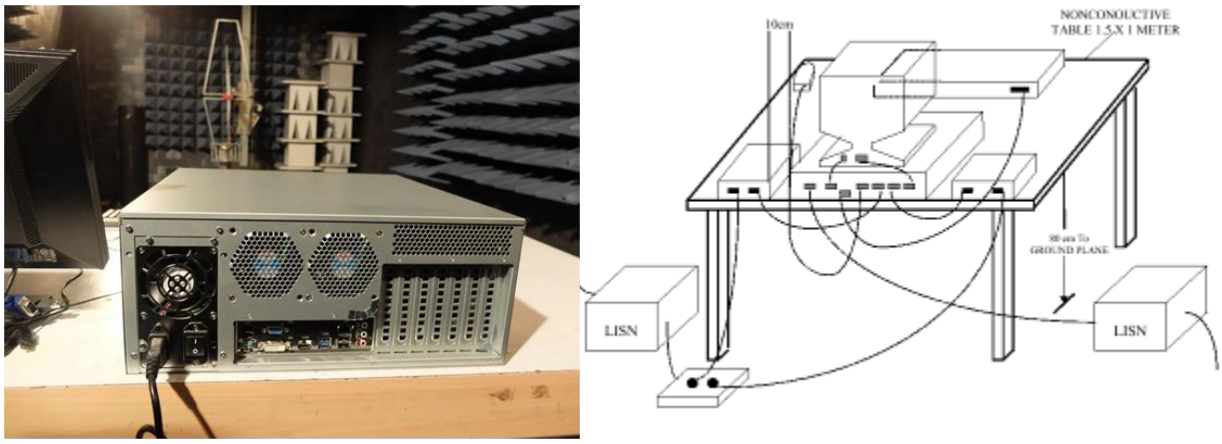


Figure 4.1.1 Generic Test set up for the Yeong Yang YY-3606

4.2 Test Facilities

4.2.1 Radiated Emission Test for 30Mhz ~ 1Ghz

Instrument	Manufacturer	Model	Serial No.	Date of Calibration
Spectrum analyzer	HP	8595E	3829A03763	2013/2/18
Antenna	Frankonia	BTA-H	030001H	2013/2/18
Pre-Amplifier	Advantest	BB525C	N/A	2013/2/18
RF Cable	MIYAZAKI	8D-F8	N/A	2013/2/18
EMI Test Receiver	R&S	ESCI	100615	2013/2/19

4.2.2 Radiated Emission Test for 1Ghz ~ 6Ghz

Instrument	Manufacturer	Model	Serial No.	Date of Calibration
Horn Antenna	Com-power	AH-118	071248	2012/12/28
Pre-Amplifier	Com-power	PAM-118A	443027	2013/1/11
RF Cable	Huber+ Suhner	Sucoflex_104	N/A	2012/12/28
EMI Test Receiver	R&S	ESCI	100615	2013/2/19

4.3 Test Procedure - EUT is tested in 743 Anechoic Chamber as outlined below

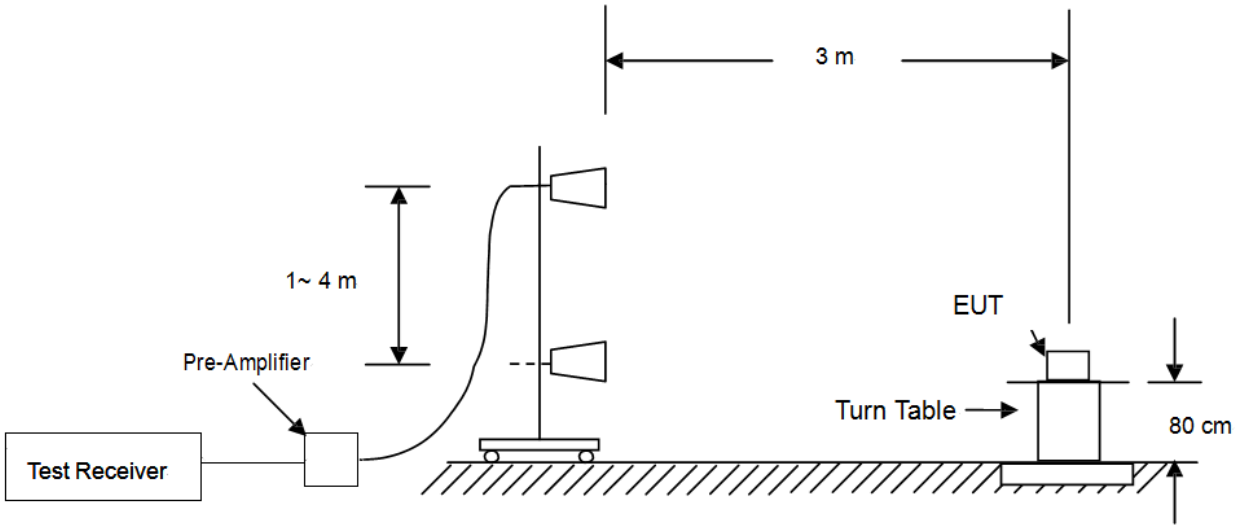


Figure 4.3.1 Generic Test set up at 743 Anechoic Chamber

Environmental Status

Temperature 25℃, Humidity 45% and Barometric Pressure 1010mB

4.3.1 Table-top Equipment

- The EUT was place on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 3m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 4.4.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded

4.4 Test spec

Mode name	Loading	FPIO Model	IO Device Configuration
Mode 1 PC Only	Full	GD	PC Only
Mode 2 Full System Back IO	Full	GD	USB3.0 Device plug in Back IO 2pcs
Mode 3 Full System Front IO	Full	GD	USB3.0 Device plug in Front Panel IO 2pcs

PC Only

Back IO

CLKF FPIO

4.4.1 Limit of conducted power line emission class A

Frequency Range	Measurement Distance	Quasi Peak	Average
0.15~0.5Mhz	3 (M)	76-66 dBuV	66-56 dBuV
0.5~5Mhz	3 (M)	66dBuV	56dBuV
5~30Mhz	3 (M)	70dBuV	60dBuV

4.4.2 Limit of Radiated emission class B

Frequency Range	Measurement Distance	Average Limit dB(uV/m)	Peak Limit dB(uV/m)
30~230Mhz	3 (M)	40	50
230~1000Mhz	3 (M)	47	67
1~3 Ghz	3 (M)	60	80
3~6Ghz	3 (M)	64	84

4.5 Test Results

Preliminary Scan result in 743 Anechoic Chamber, see attachments.

Mode	**EUT**	**Item**	**Result**
Mode1	YY-R445	30M-1G	PASS
		1G-6G	PASS
Mode2	YY-R445	30M-1G	PASS
		1G-6G	PASS
Mode3	YY-R445	30M-1G	PASS
		1G-6G	PASS

4.5.1 Summary

Pass Class A without any modification

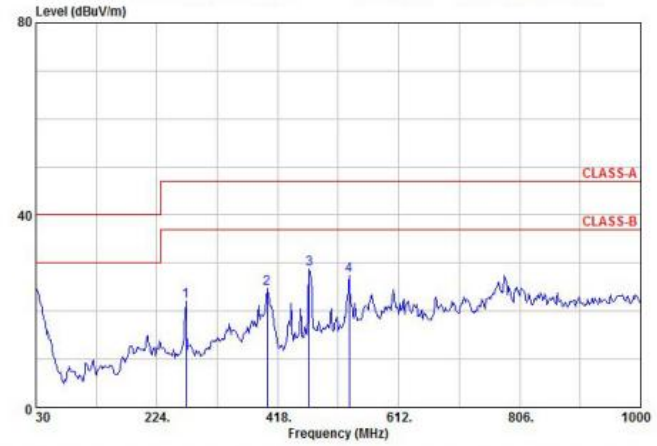
Mode 1.

PC Only 30Mhz-1GHz Pass

```
CONDITION   : CLASS-B
            : HORIZONTAL  FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : PC ONLY FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 2 Date: 2015-06-10

File: C:\chamber\RE DATA\盧商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



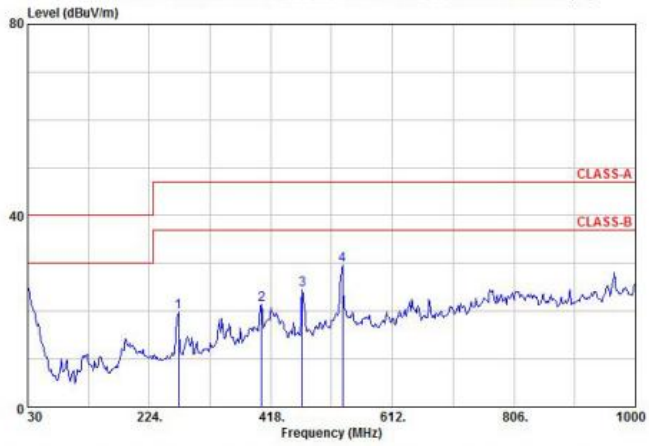
	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	270.560	40.75	-18.80	21.95	37.00	-15.05	---	---	
2	400.540	38.63	-13.97	24.66	37.00	-12.34	---	---	
3 @	468.440	41.50	-12.75	28.75	37.00	-8.25	---	---	
4	532.460	37.93	-10.60	27.33	37.00	-9.67	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

```
CONDITION   : CLASS-B
            : VERTICAL    FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : PC ONLY FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 1 Date: 2015-06-10

File: C:\chamber\RE DATA\盧商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	270.560	38.53	-18.80	19.73	37.00	-17.27	---	---	
2	403.450	35.70	-14.28	21.42	37.00	-15.58	---	---	
3	468.440	37.15	-12.75	24.40	37.00	-12.60	---	---	
4 @	532.460	40.22	-10.60	29.62	37.00	-7.38	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

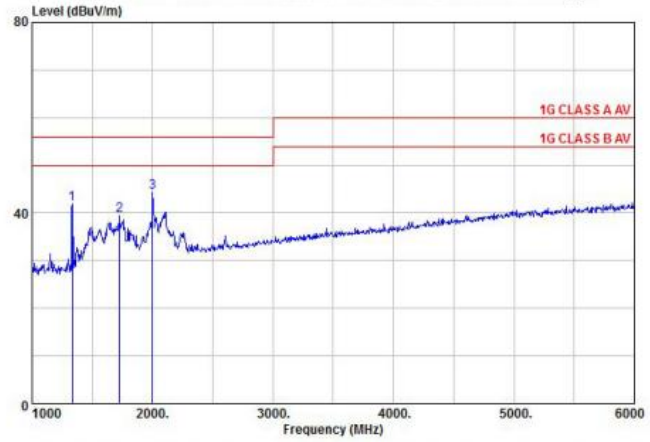
Mode 1.

PC Only 1-6GHz Pass

```
CONDITION   : 1G CLASS B AV
            : HORIZONTAL   1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : PC ONLY FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 1 Date: 2015-06-10

File: C:\chamber\RE DATA\盧商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



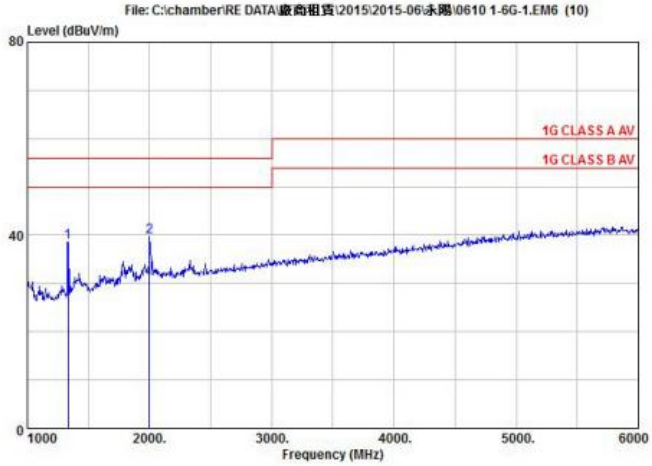
	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	1335.000	53.76	-11.78	41.98	50.00	-8.02	---	---	Average
2	1725.000	49.46	-10.01	39.45	50.00	-10.55	---	---	Average
3	@2000.000	53.12	-8.78	44.34	50.00	-5.66	---	---	Average

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

```
CONDITION   : 1G CLASS B AV
            : VERTICAL   1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : PC ONLY FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 2 Date: 2015-06-10

File: C:\chamber\RE DATA\盧商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	1335.000	50.38	-11.78	38.60	50.00	-11.40	---	---	Average
2	@2000.000	48.39	-8.78	39.61	50.00	-10.39	---	---	Average

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

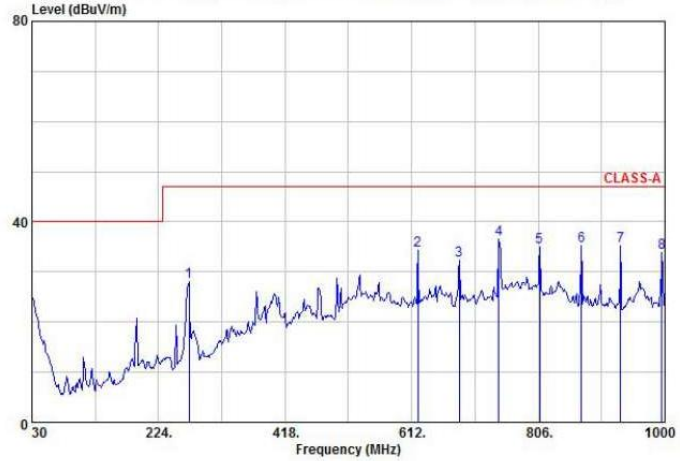
Mode 2.

Full System Back IO 30Mhz-1Ghz Pass

```
CONDITION   : CLASS-A
            : HORIZONTAL   FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 4 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	270.560	46.86	-18.80	28.06	47.00	-18.94	---	---	
2	621.700	43.29	-8.86	34.43	47.00	-12.57	---	---	
3	684.750	39.70	-7.33	32.37	47.00	-14.63	---	---	
4 @	745.860	42.91	-6.45	36.46	47.00	-10.54	---	---	
5	807.940	40.46	-5.41	35.05	47.00	-11.95	---	---	
6	871.960	39.45	-4.29	35.16	47.00	-11.84	---	---	
7	932.100	39.02	-3.87	35.15	47.00	-11.85	---	---	
8	995.150	37.22	-3.31	33.91	47.00	-13.09	---	---	

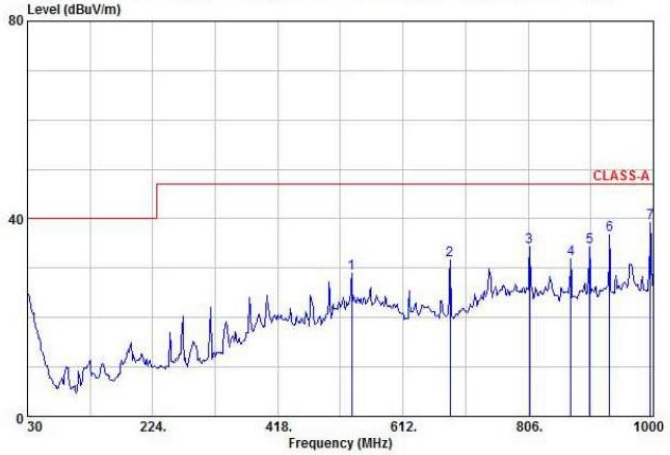
C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

```
CONDITION   : CLASS-A
            : VERTICAL     FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 3 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	532.460	39.51	-10.60	28.91	47.00	-18.09	---	---	
2	684.750	39.01	-7.33	31.68	47.00	-15.32	---	---	
3	807.940	39.82	-5.41	34.41	47.00	-12.59	---	---	
4	871.960	36.14	-4.29	31.85	47.00	-15.15	---	---	
5	901.060	38.42	-4.04	34.38	47.00	-12.62	---	---	
6	932.100	40.72	-3.87	36.85	47.00	-10.15	---	---	
7 @	995.150	42.47	-3.31	39.16	47.00	-7.84	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

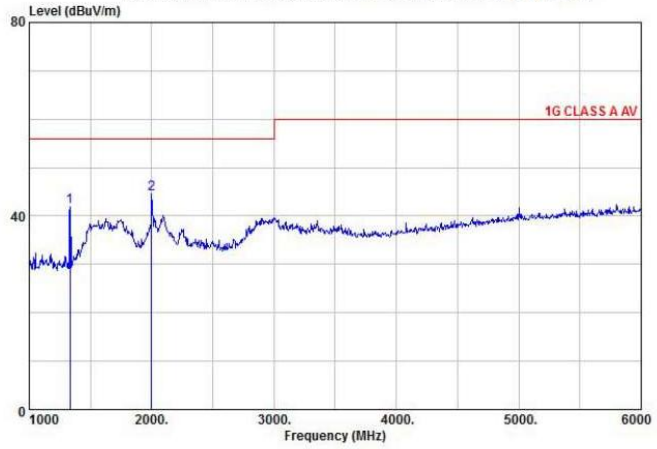
Mode 2.

Full System Back IO 1Ghz-6Ghz Pass

```
CONDITION   : 1G CLASS A AV
            : HORIZONTAL  1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 4 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	1335.000	53.71	-11.78	41.93	56.00	-14.07	---	---	Average
2	@2000.000	53.35	-8.78	44.57	56.00	-11.43	---	---	Average

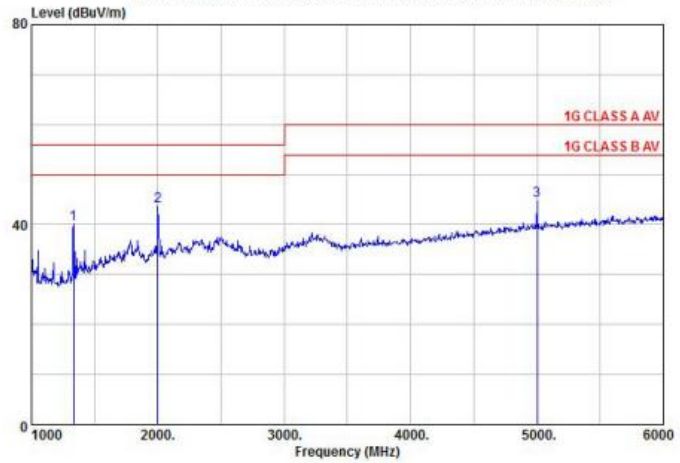
C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

```
CONDITION   : 1G CLASS B AV
            : VERTICAL  1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 3 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	1335.000	51.85	-11.78	40.07	50.00	-9.93	---	---	Average
2	@2000.000	52.53	-8.78	43.75	50.00	-6.25	---	---	Average
3	5000.000	43.45	1.30	44.75	54.00	-9.25	---	---	Average

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

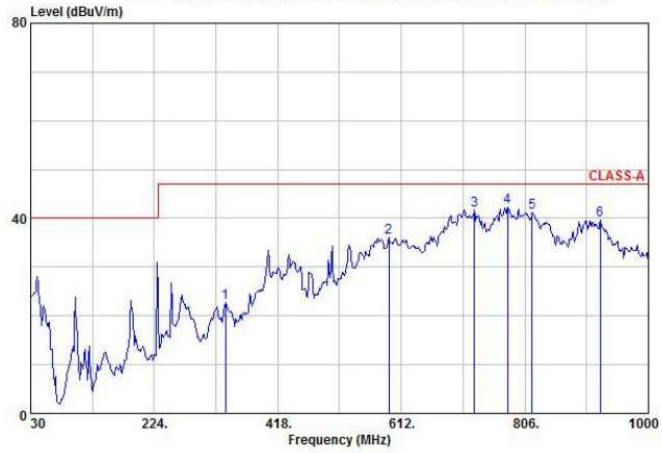
Mode 3.

Full System Front IO 30Mhz-1Ghz Pass

```
CONDITION   : CLASS-A
            : HORIZONTAL  FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : FPIO-USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 8 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	335.550	39.61	-16.93	22.68	47.00	-24.32	---	---	
2	592.600	47.36	-11.21	36.15	47.00	-10.85	---	---	
3	726.460	49.45	-7.78	41.67	47.00	-5.33	---	---	
4 @	778.840	49.36	-7.07	42.29	47.00	-4.71	---	---	
5	817.640	47.27	-6.03	41.24	47.00	-5.76	---	---	
6	924.340	43.64	-4.07	39.57	47.00	-7.43	---	---	

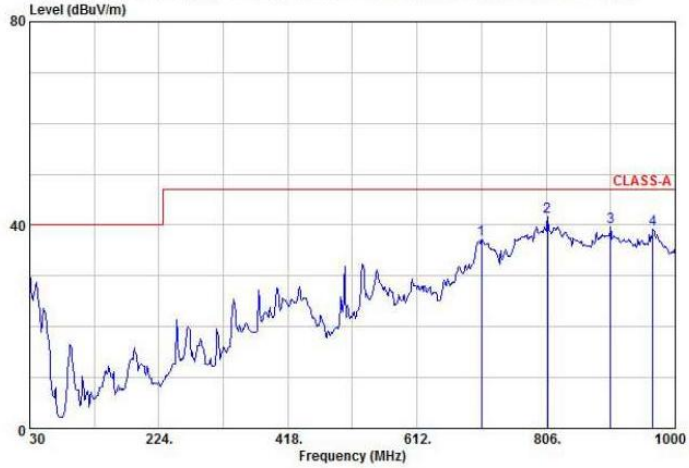
C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

```
CONDITION   : CLASS-A
            : VERTICAL    FRANKONIA_BTA-H
            : RBW:120 KHz VBW:300 KHz SWT:-1  sec
EUT         : YY-R445
Mode        : FPIO-USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 7 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 30-1G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	709.000	45.55	-8.34	37.21	47.00	-9.79	---	---	
2 @	807.940	47.93	-6.32	41.61	47.00	-5.39	---	---	
3	903.000	44.04	-4.38	39.66	47.00	-7.34	---	---	
4	966.050	42.63	-3.51	39.12	47.00	-7.88	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

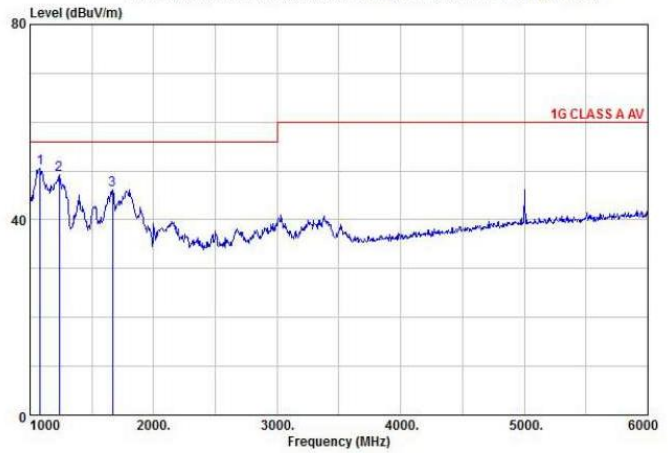
Mode 3

Full System Front IO 1Ghz-6Ghz Pass

```
CONDITION   : 1G CLASS A AV
            : HORIZONTAL  1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : FPIO-USB 3.0 + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 8 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@1080.000	63.48	-12.94	50.54	56.00	-5.46	---	---	Average
2	1235.000	61.43	-12.25	49.18	56.00	-6.82	---	---	Average
3	1670.000	56.41	-10.32	46.09	56.00	-9.91	---	---	Average

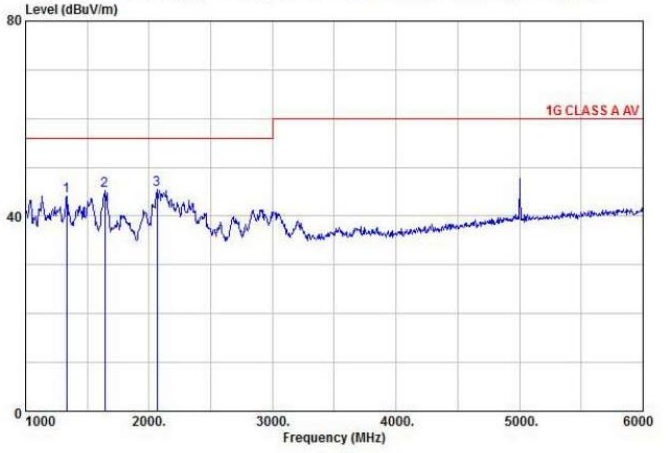
C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

```
CONDITION   : 1G CLASS A AV
            : VERTICAL    1-18G
            : RBW:1000KHz VBW:1000KHz SWT:-1  sec
EUT         : YY-R445
Mode        : FPIO-USB 3.0+b + FULL SYSTEM
Remark      :
Engineer    : KIDD
```

Data: 10 Date: 2015-06-10

File: C:\chamber\RE DATA\廠商租賃\2015\2015-06\永陽\0610 1-6G-1.EM6 (10)



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	1335.000	55.80	-11.78	44.02	56.00	-11.98	---	---	Average
2	1640.000	55.69	-10.39	45.30	56.00	-10.70	---	---	Average
3	@2065.000	54.03	-8.58	45.45	56.00	-10.55	---	---	Average

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit