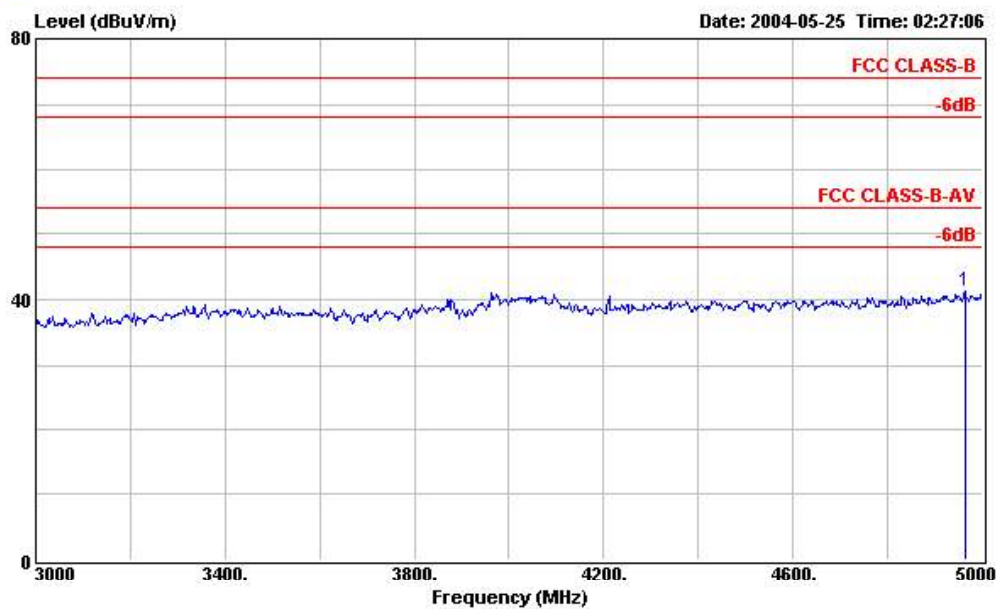
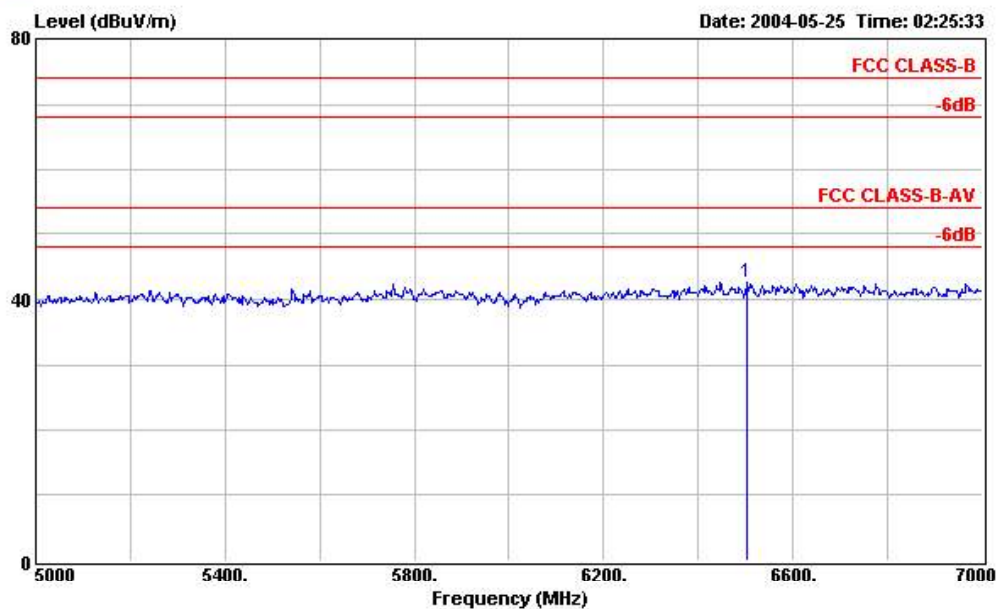




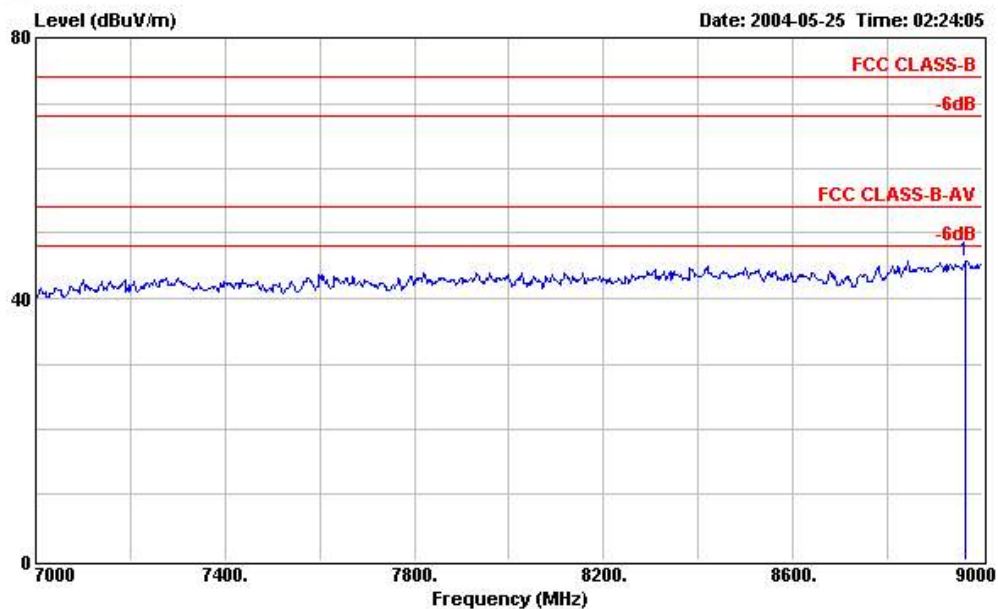
Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
 EUT :
 Power : 120V/60Hz
 Model :
 Memo : BT TX CH78 2480MHz

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line							
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 4964.000	41.37	-32.63	74.00	48.12	33.35	2.46	42.56	Peak	---	---



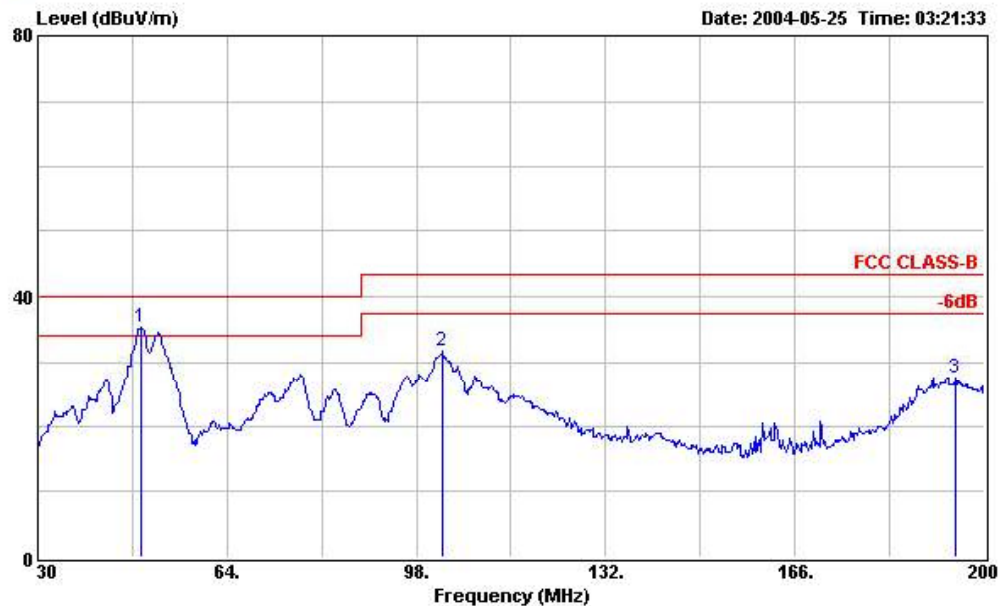
Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
 EUT :
 Power : 120W/60Hz
 Model :
 Memo : BT TX CH78 2480MHz

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	6502.000	42.69	-31.31	74.00	48.74	34.30	2.94	43.29	Peak	---	---



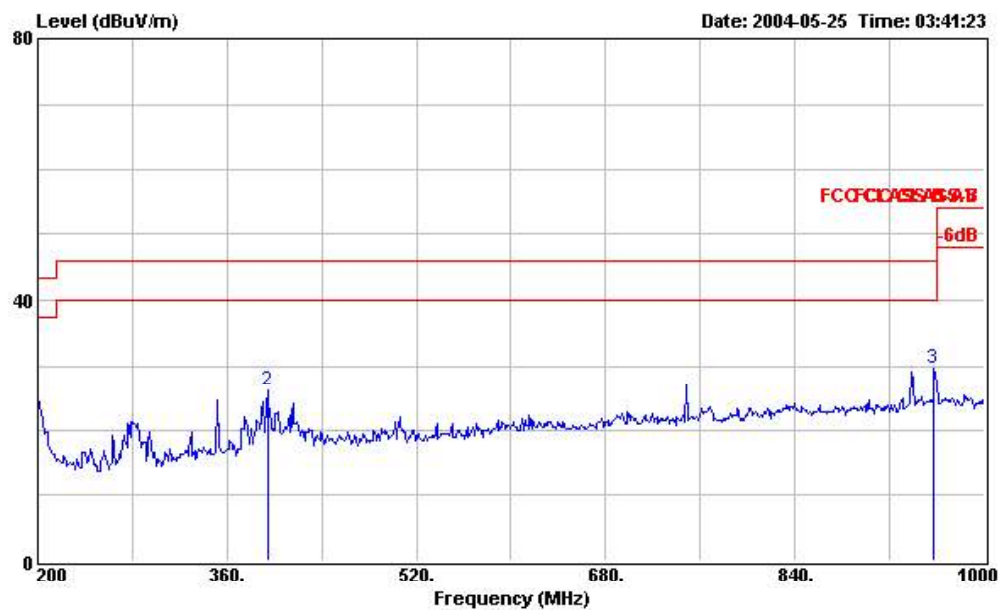
Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT :
Power : 120V/60Hz
Model :
Memo : BT TX CH78 2480MHz

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line							
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 8966.000	45.68	-28.32	74.00	45.25	38.09	3.27	40.93	Peak	---	---



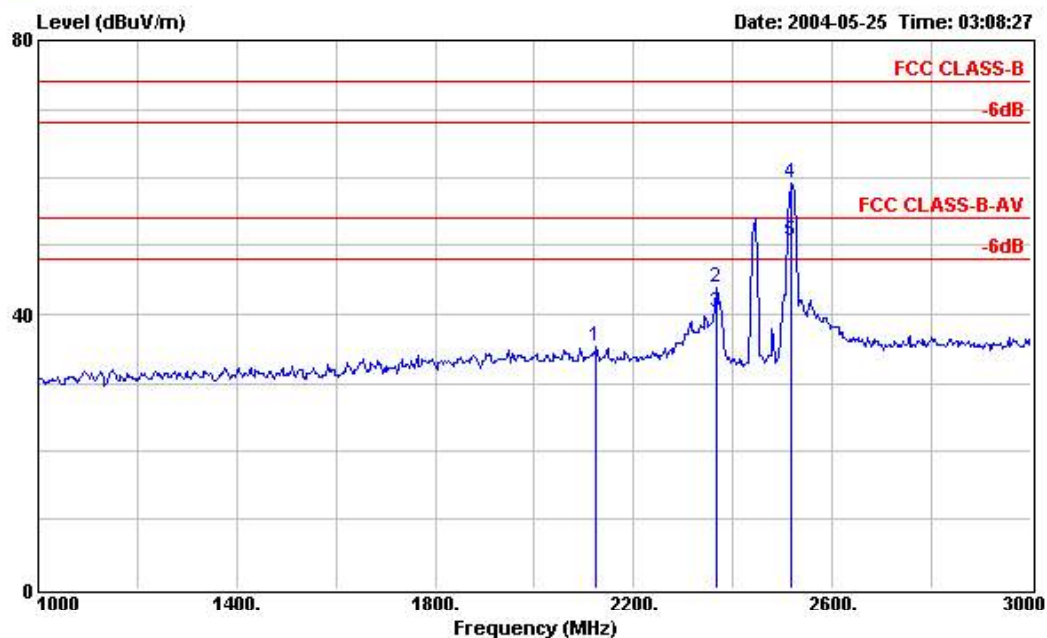
Site : 03CH03-HY
 Condition : FCC CLASS-B 3m BIC-9124--301 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	48.700	35.29	-4.71	40.00	51.90	10.22	1.17	28.00	Peak	---	---
2	102.590	31.61	-11.89	43.50	47.73	9.96	1.81	27.89	Peak	---	---
3	194.900	27.64	-15.86	43.50	38.16	14.68	2.51	27.71	Peak	---	---



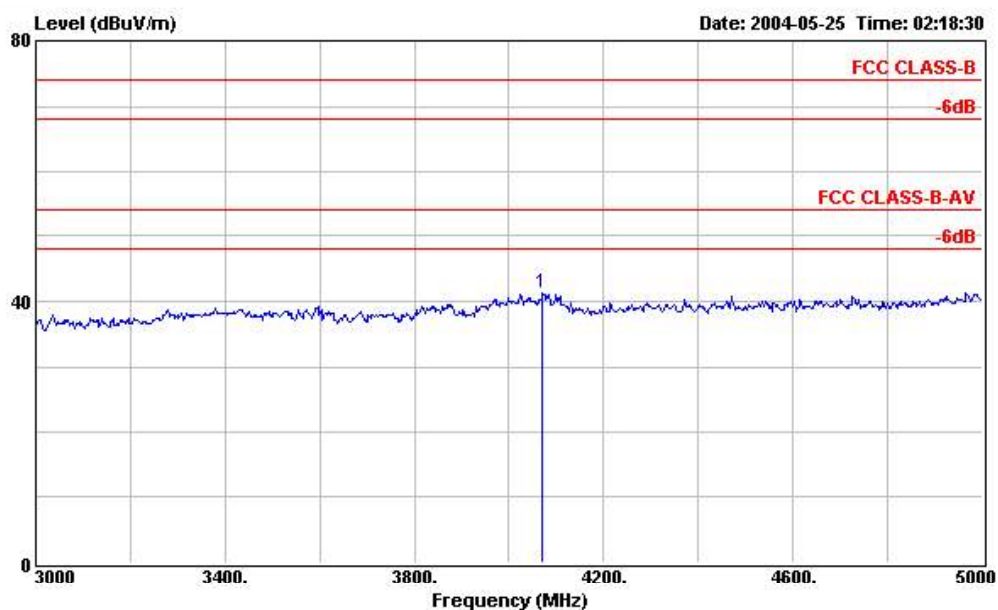
Site : 03CH03-HY
 Condition : FCC CLASS-B 3m LOG-9111-221 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	200.000	24.78	-18.72	43.50	34.52	15.39	2.57	27.70	Peak	---	---
2	394.400	26.20	-19.80	46.00	34.84	15.68	3.45	27.77	Peak	---	---
3	957.600	29.58	-16.42	46.00	30.27	21.90	5.65	28.24	Peak	---	---



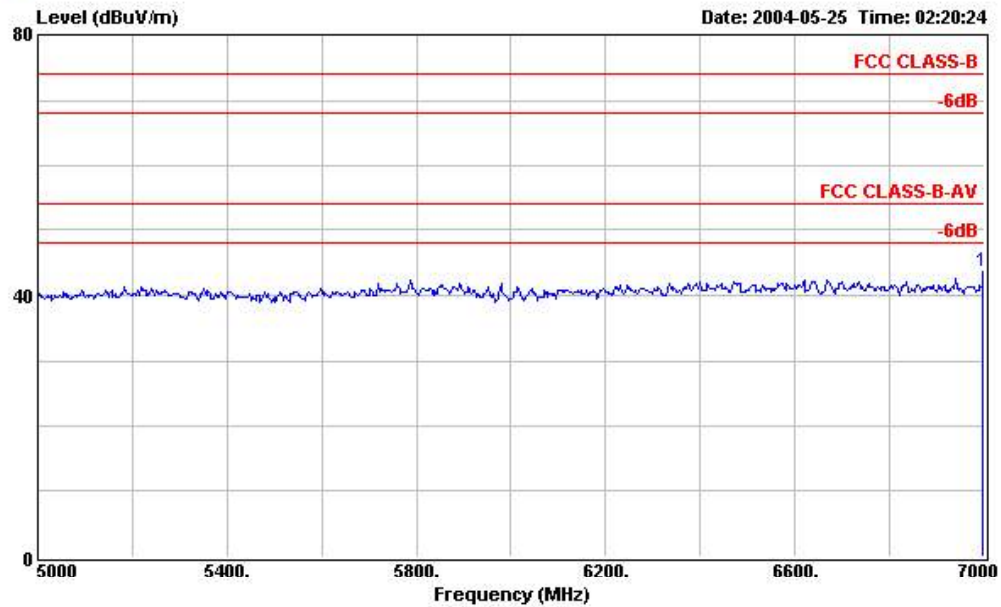
Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2124.000	35.21	-38.79	74.00	46.85	27.66	1.68	40.98	Peak	---	---
2	2366.000	43.88	-30.12	74.00	55.16	28.15	1.70	41.13	Peak	---	---
3	2366.000	40.18	-13.82	54.00	51.46	28.15	1.70	41.13	Average	---	---
4	2518.000	59.16	-14.84	74.00	70.01	28.49	1.86	41.20	Peak	---	---
5	2518.000	50.67	-3.33	54.00	61.52	28.49	1.86	41.20	Average	---	---



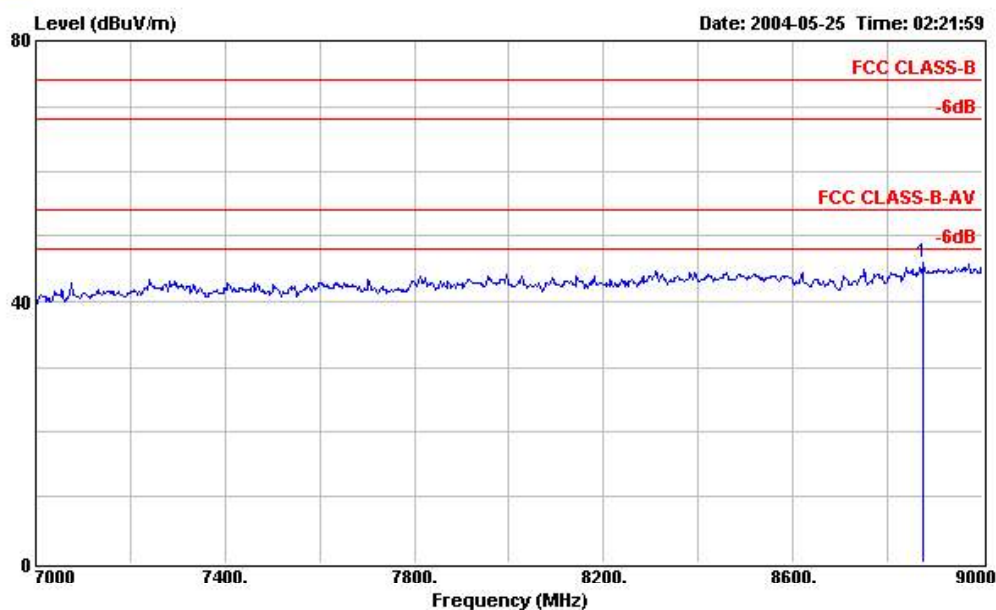
Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT :
Power : 120V/60Hz
Model :
Memo : BT TX CH78 2480MHz

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line							
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 4070.000	41.20	-32.80	74.00	47.64	32.57	2.56	41.57	Peak	---	---



Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	6998.000	43.56	-30.44	74.00	47.99	35.30	3.27	43.00	Peak	---	---



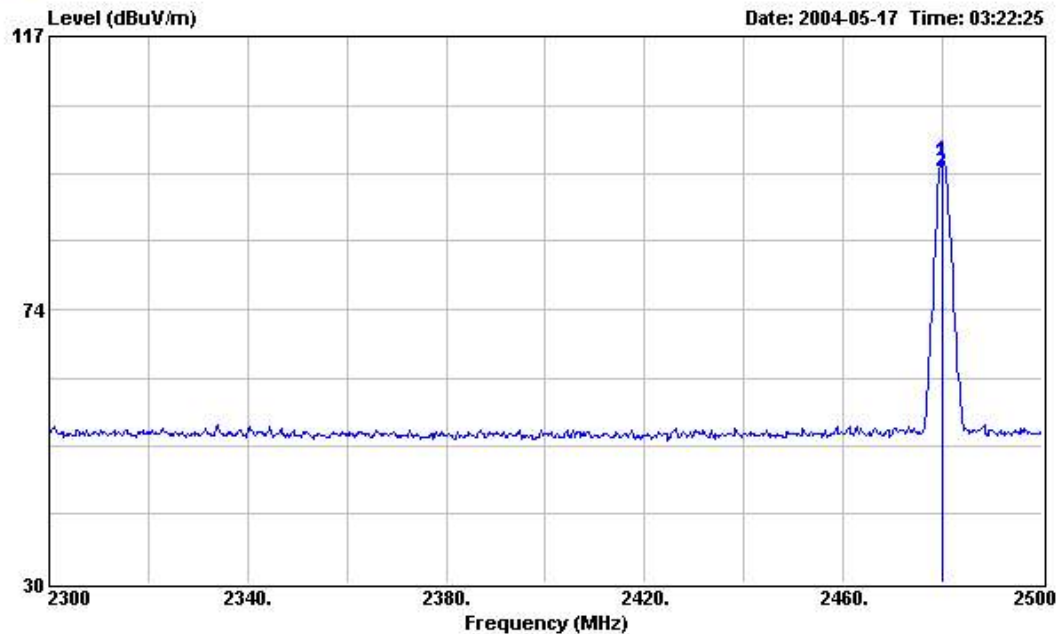
Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT :
Power : 120V/60Hz
Model :
Memo : BT TX CH78 2480MHz

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	8876.000	46.06	-27.94	74.00	45.75	38.05	3.32	41.06	Peak	---	---

Mark:

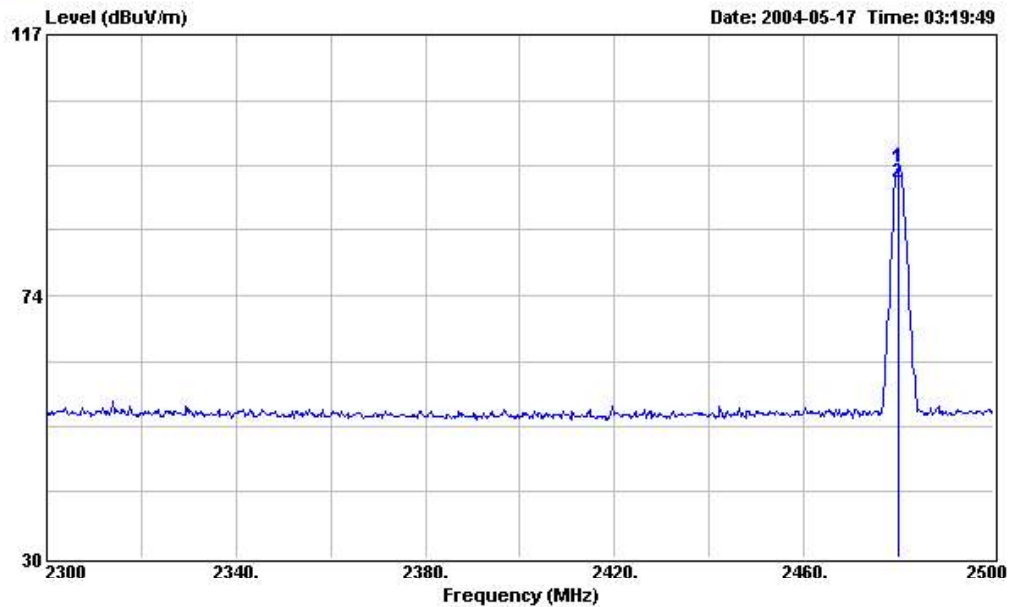
Frequency from 9000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

BT TXCH78 2480 MHz



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 HORIZONTAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

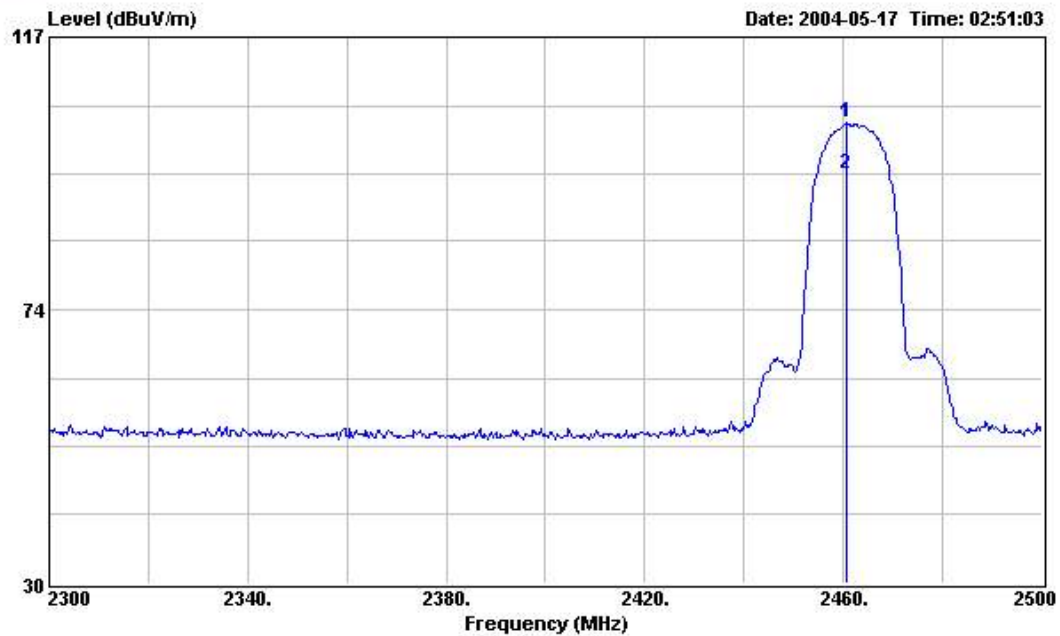
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2479.800	97.16	-----	-----	66.99	28.38	1.79	0.00	Peak	---	---
2	2479.800	95.42	-----	-----	65.25	28.38	1.79	0.00	Average	---	---



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : BT TX CH78 2480MHz

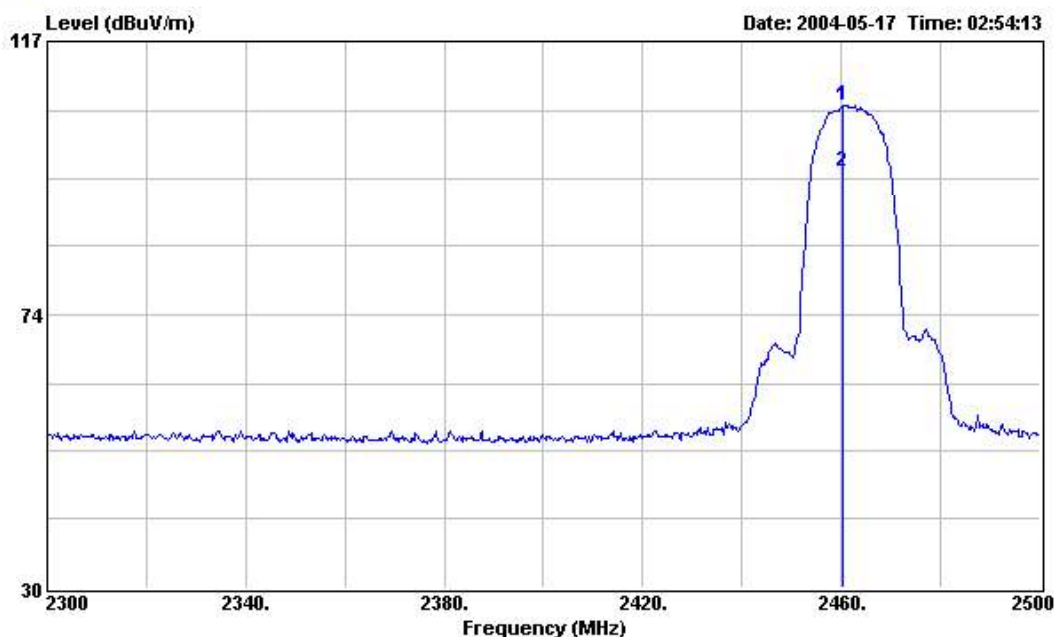
	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2479.800	94.89	-----	-----	64.72	28.38	1.79	0.00	Peak	---	---
2	2479.800	92.37	-----	-----	62.20	28.38	1.79	0.00	Average	---	---

WLAN TX CH11 2462MHz



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 HORIZONTAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : WLAN TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2460.600	103.33	-----	-----	73.19	28.35	1.79	0.00	Peak	---	---
2	2460.600	95.24	-----	-----	65.10	28.35	1.79	0.00	Average	---	---



Site : 03CH03-HY
 Condition : 3m HORN-ANT-6741 VERTICAL
 EUT
 Power : 120V/60Hz
 Model
 Memo : WLAN TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2460.400	106.87	-----	-----	76.75	28.34	1.78	0.00	Peak	---	---
2	2460.400	96.51	-----	-----	66.39	28.34	1.78	0.00	Average	---	---

FCC TEST REPORT

Report No. :F451503

■ Field strength of fundamental and harmonics

Test Item	Frequency	Antenna	Cable	Reading	Preamp	Limits	Emission	Margin	Detect	
	Polarity	Factor	Loss		Factor					
	(MHz)	(dB/m)	(dB)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode	
Bluetooth	2479.800	H	28.38	1.79	66.99	0.00	-	97.16	-	Peak
	2479.800	V	28.38	1.79	64.72	0.00	-	94.89	-	AV
	4960.000	V/H	-	-	-	-	-	-	-	AV/Peak
	7440.000	V/H	-	-	-	-	-	-	-	AV/Peak
	9920.000	V/H	-	-	-	-	-	-	-	AV/Peak
	12400.000	V/H	-	-	-	-	-	-	-	AV/Peak
	14880.000	V/H	-	-	-	-	-	-	-	AV/Peak
	17360.000	V/H	-	-	-	-	-	-	-	AV/Peak
	19840.000	V/H	-	-	-	-	-	-	-	AV/Peak
	22320.000	V/H	-	-	-	-	-	-	-	AV/Peak
	24800.000	V/H	-	-	-	-	-	-	-	AV/Peak
WLAN	2460.600	H	28.35	1.79	73.19	0.00	-	103.33	-	Peak
	2460.400	V	28.34	1.78	76.75	0.00	-	106.87	-	AV
	4924.000	V/H	-	-	-	-	-	-	-	AV/Peak
	7386.000	V/H	-	-	-	-	-	-	-	AV/Peak
	9848.000	V/H	-	-	-	-	-	-	-	AV/Peak
	12310.000	V/H	-	-	-	-	-	-	-	AV/Peak
	14772.000	V/H	-	-	-	-	-	-	-	AV/Peak
	17234.000	V/H	-	-	-	-	-	-	-	AV/Peak
	19696.000	V/H	-	-	-	-	-	-	-	AV/Peak
	22158.000	V/H	-	-	-	-	-	-	-	AV/Peak
	24620.000	V/H	-	-	-	-	-	-	-	AV/Peak

Remark:

1. The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : 

Jay

SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

FCC ID : NM8BALI

Page No. : 128 of 132

Issued Date : May 25, 2004

8. Antenna Requirements

8.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

8.2 Antenna Connected Construction

The antennas used in this product are PIFA with SMT switch connector and SMT chip antenna without connector.

9. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 23, 2003	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 24, 2003	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 24, 2003	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	COM-POWER	3115	6741	1GHz – 18GHz	Apr. 08, 2004	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 02, 2003	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.

※ Calibration Interval of Horn Antenna, BBHA9170, is three years.

10. Uncertainty Measurement

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch Receiver VSWR Γ_1 = LISN VSWR Γ_2 = Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.26		

$$U = \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.2 \text{ for 10m test distance}$$

$$U = \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.7 \text{ for 3m test distance}$$

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.15	Normal(k=2)	0.08
Antenna factor calibration	1.12	Normal(k=2)	0.56
Cable loss calibration	0.12	Normal(k=2)	0.06
Pre Amplifier Gain calibration	0.13	Normal(k=2)	0.07
RCV/SPA specification	2.5	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1	Rectangular	0.29
Site imperfection	2.1	Rectangular	1.21
Mismatch Receiver VSWR Γ_1 = 0.20 Antenna VSWR Γ_2 = 0.23 Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	1.58		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	3.16		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	± 0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	± 1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	± 0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U = 2U_c(y)$	4.72				

$$U = \sqrt{\{(0.3/2)^2 + (2^2 + 1.5^2 + 0.2^2)/3 + (0.2)^2/2\}} = 1.66$$