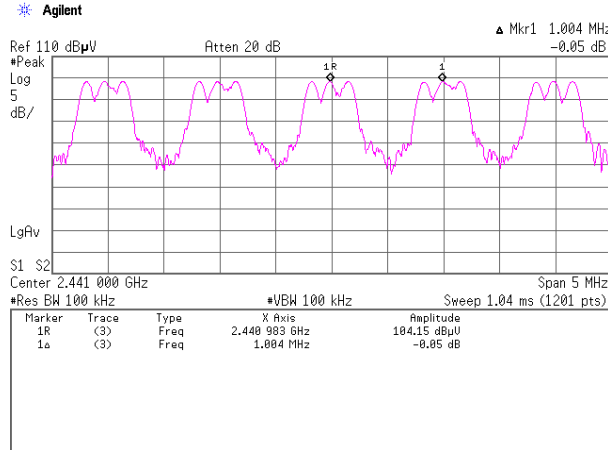


**Channel Separation (Regulation: FCC 15.247(a)(1))**

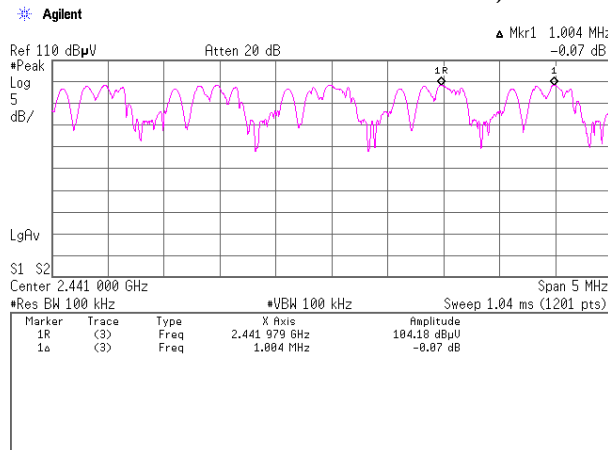
UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
 Date: 2009/09/08  
 Temp: 23 deg. C.  
 Humid: 50 %  
 Engineer: Akira Sato  
 Test mode: Transmitting

**Limit:  $\geq 25\text{kHz}$  or  $2/3 * 20\text{dB Bandwidth}$  (Power: No greater than 125mW)**

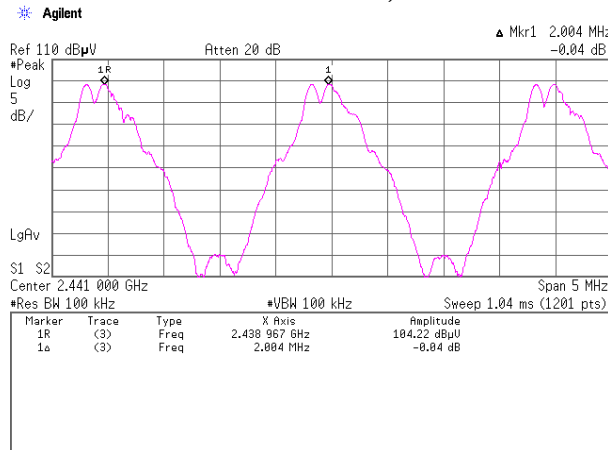
**1. Hopping, DH5: 1.004MHz ( $2/3 * 20\text{dB Bandwidth}$ :  $2/3 * 782.5\text{kHz} = 521.7\text{kHz}$ )**



**2. Hopping, 3DH5: 1.004MHz ( $2/3 * 20\text{dB Bandwidth}$ :  $2/3 * 1.2225\text{MHz} = 815.0\text{kHz}$ )**



**3. Inquiry: 2.004MHz ( $2/3 * 20\text{dB Bandwidth}$ :  $2/3 * 815.0\text{kHz} = 543.3\text{kHz}$ )**



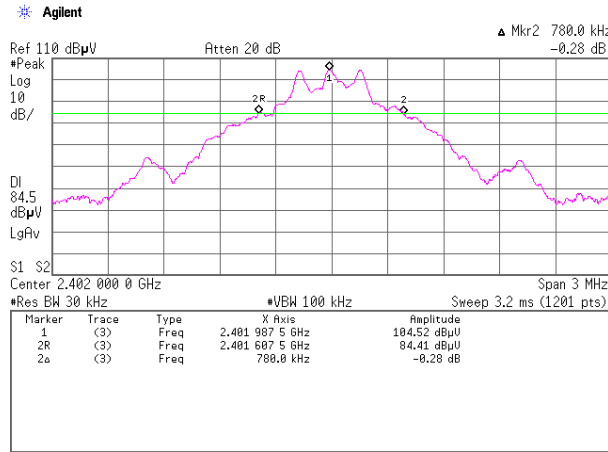
**20dB Bandwidth (Regulation: FCC 15.247(a)(1))**

UL Japan, Inc. Yamakita EMC lab.  
 Date:  
 Temp./Humid.:  
 Engineer:  
 Test mode:

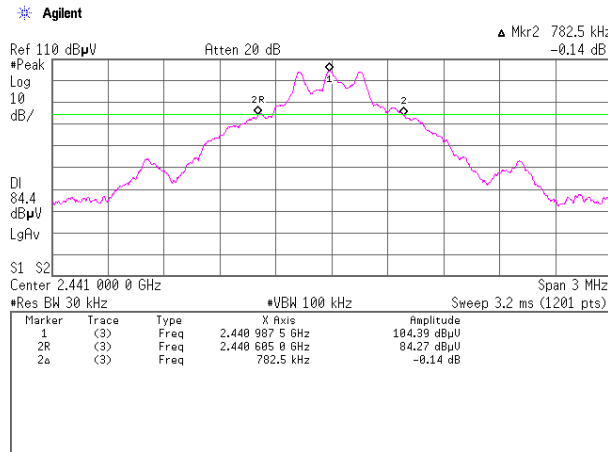
No.4 shielded room  
 2009/09/08  
 23 deg. C. / 50 %  
 Akira Sato  
 Transmitting

[Hopping off, DHS]

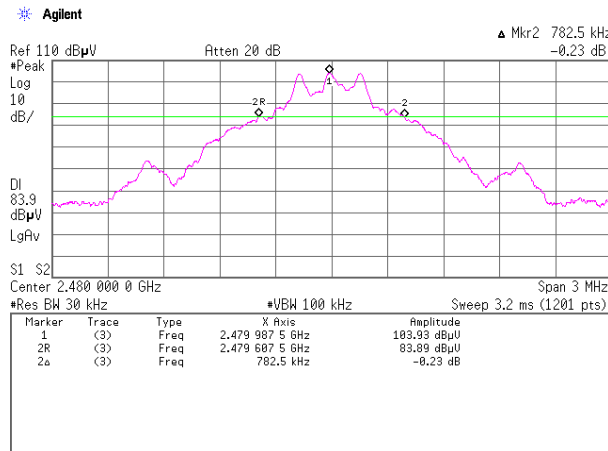
1. ch : 2402MHz/20dB Bandwidth: 780.0kHz



2. ch : 2441MHz/20dB Bandwidth: 782.5kHz

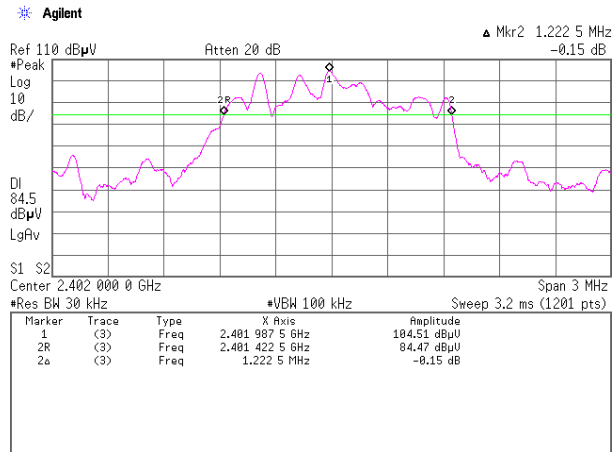


3. ch : 2480MHz/20dB Bandwidth: 782.5kHz

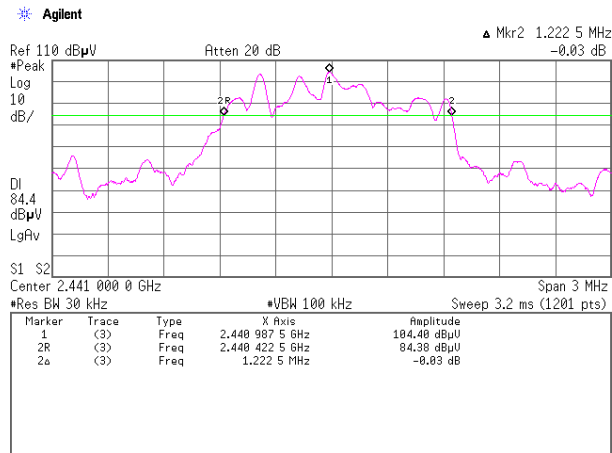


[Hopping off, 3DH5]

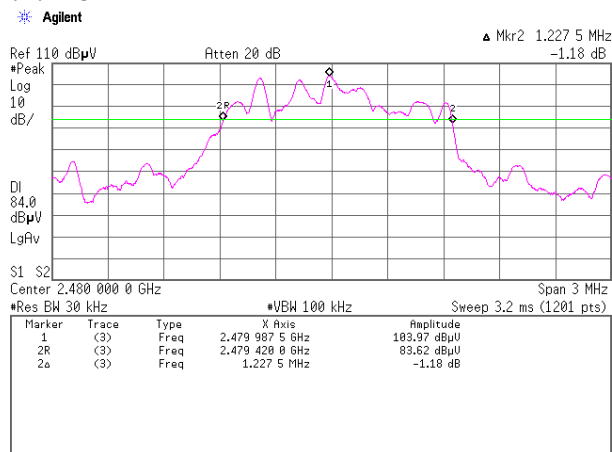
4. ch : 2402MHz/20dB Bandwidth: 1.2225MHz



5. ch : 2441MHz/20dB Bandwidth: 1.2225MHz



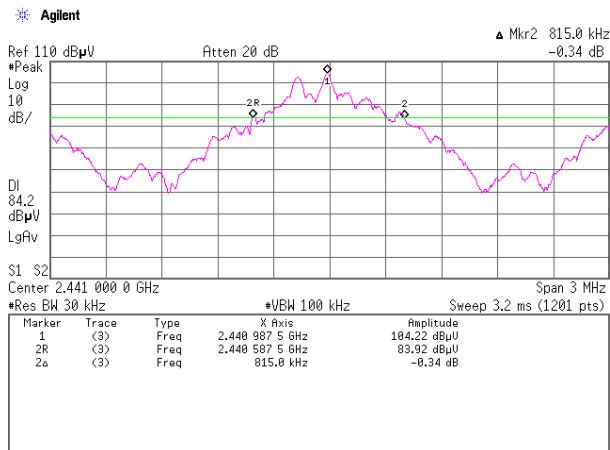
6. ch : 2480MHz/20dB Bandwidth: 1.2275MHz



Revised date : December 24, 2009

[Inquiry]

7. Inquiry/20dB Bandwidth: 815.0kHz

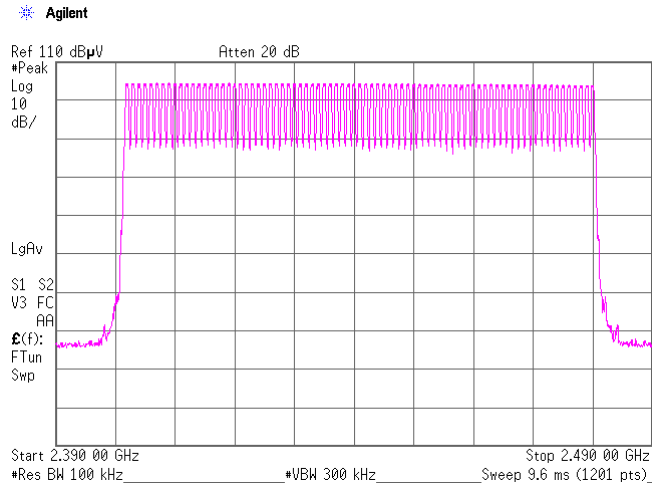


**Channel Utilization (Regulation: FCC 15.247(a)(1)(iii))**

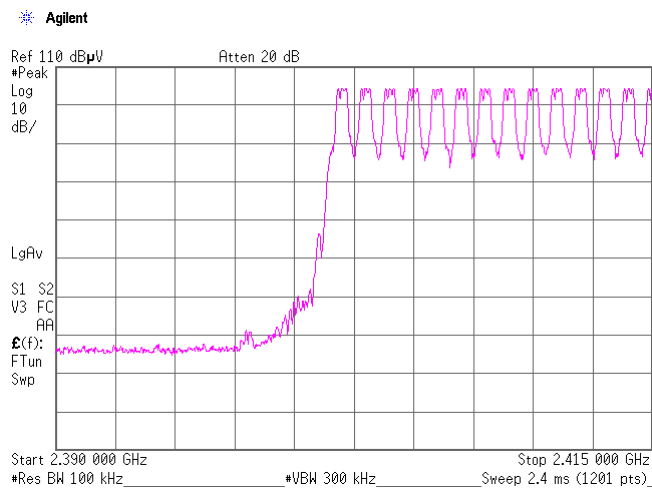
UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
 Date: 2009/09/08  
 Temp./Humid.: 23 deg. C. / 50 %  
 Engineer: Akira Sato  
 Test mode: Transmitting

**Hopping, DH5: 79ch**

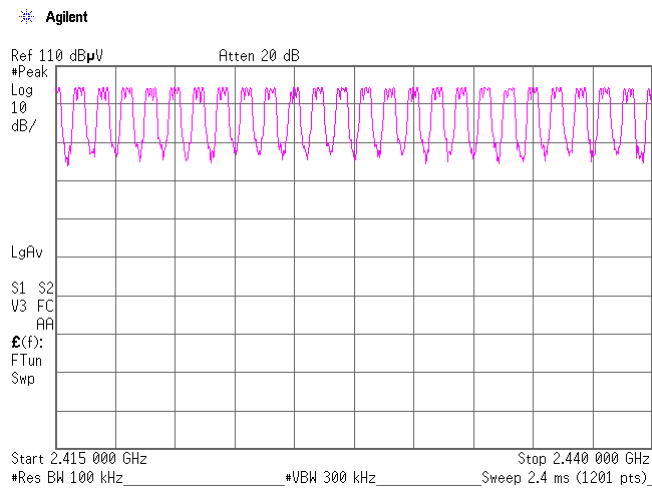
1.



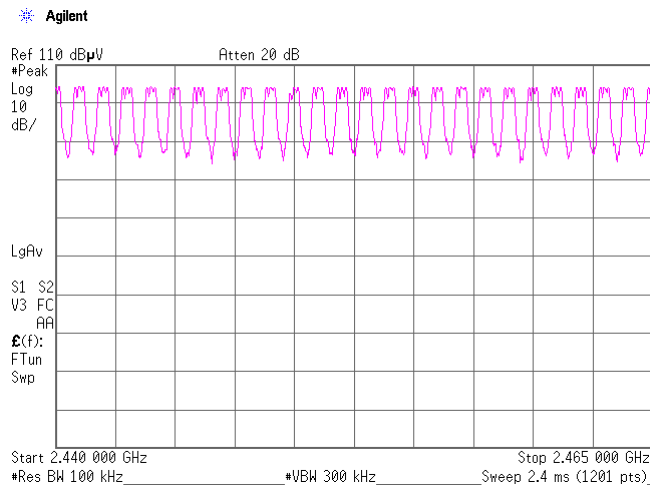
2.



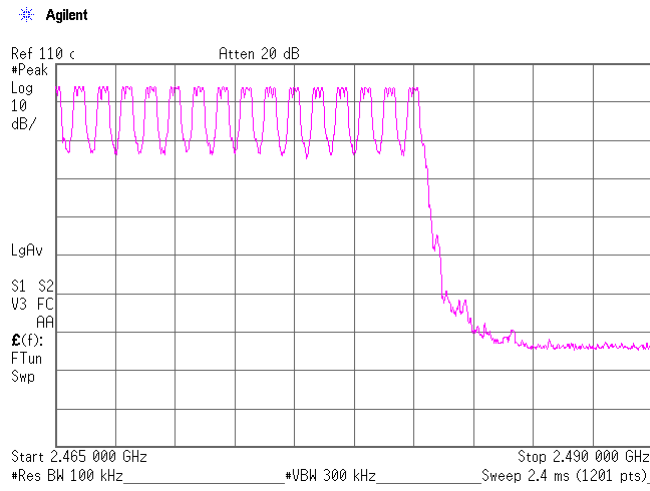
3.



4.

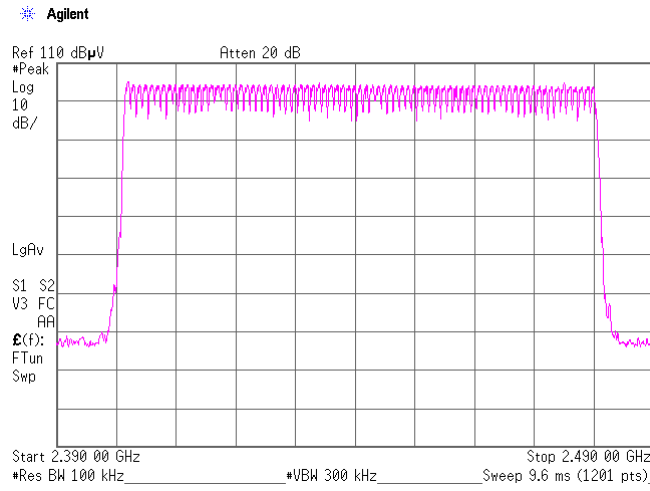


5.

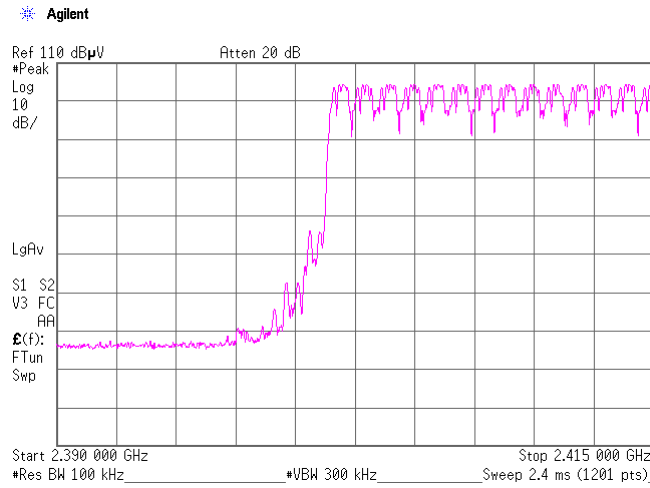


**Hopping, 3DHS: 79ch**

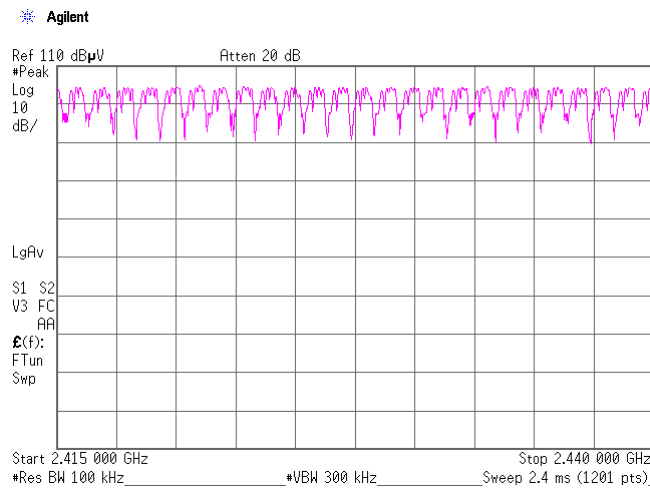
1.



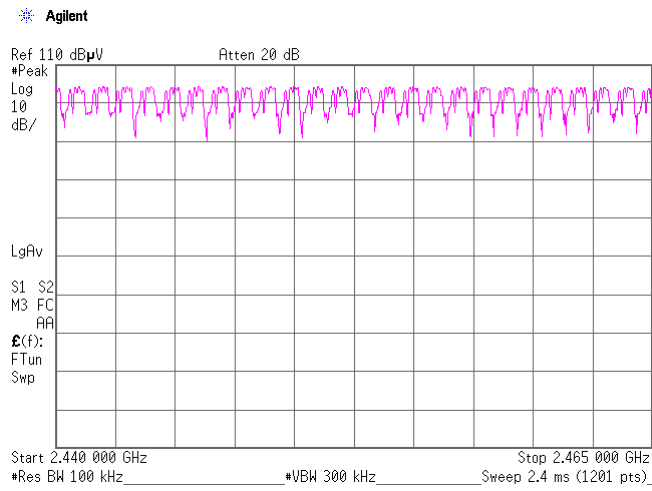
2.



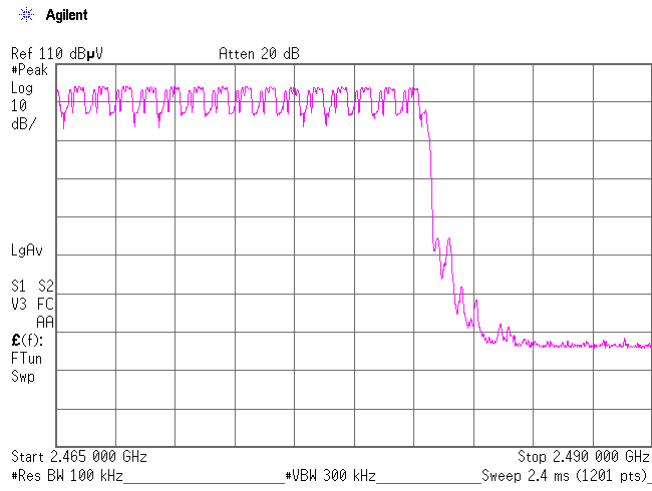
3.



4.



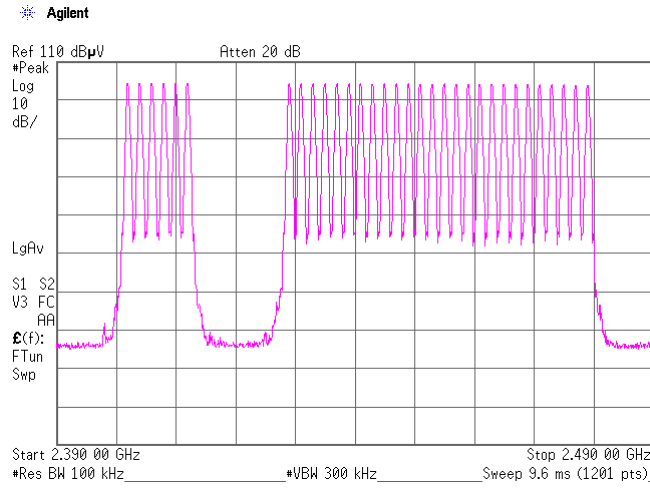
5.





UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
Date: 2009/09/08  
Temp./Humid.: 23 deg. C. / 50 %  
Engineer: Akira Sato  
Test mode: Transmitting (Inquiry)

1. Inquiry: 32ch



Company: Alpine Electronics, Inc.  
Kind of Equipment: Bluetooth Module  
Serial No.: No.6

Report No.:  
Model No.:  
Power:

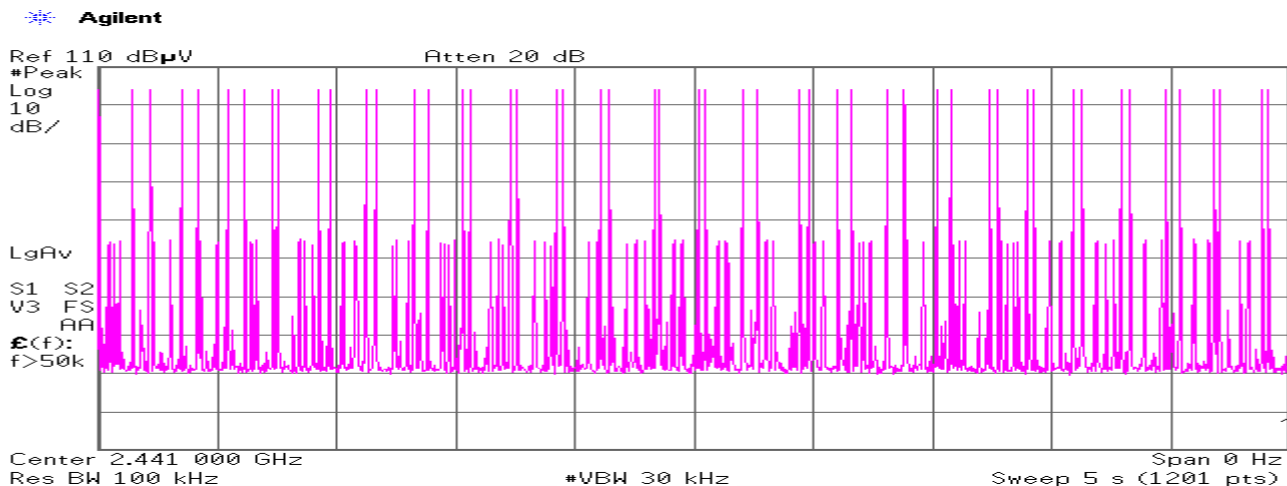
29LE0246-YK-01-B  
IAM2.1 BT PWB US  
DC 12.0V

### Dwell Time (Regulation: FCC 15.247(a)(1)(iii))

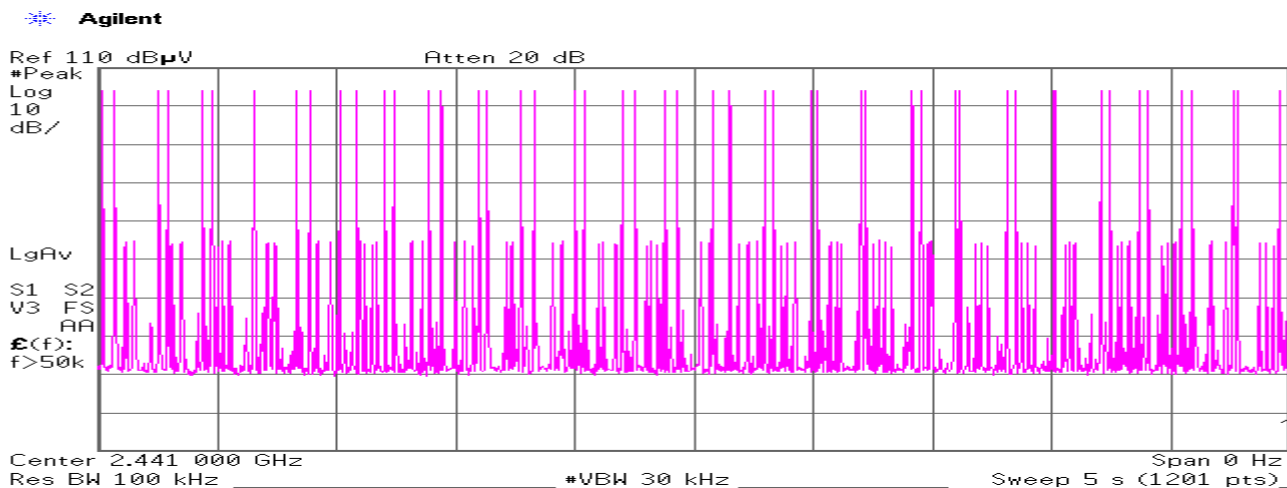
UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
Date: 2009/09/08  
Temp/Humid.: 23 deg. C./ 50 %  
Engineer: Akira Sato  
Test mode: Transmitting

#### Hopping (DH1):

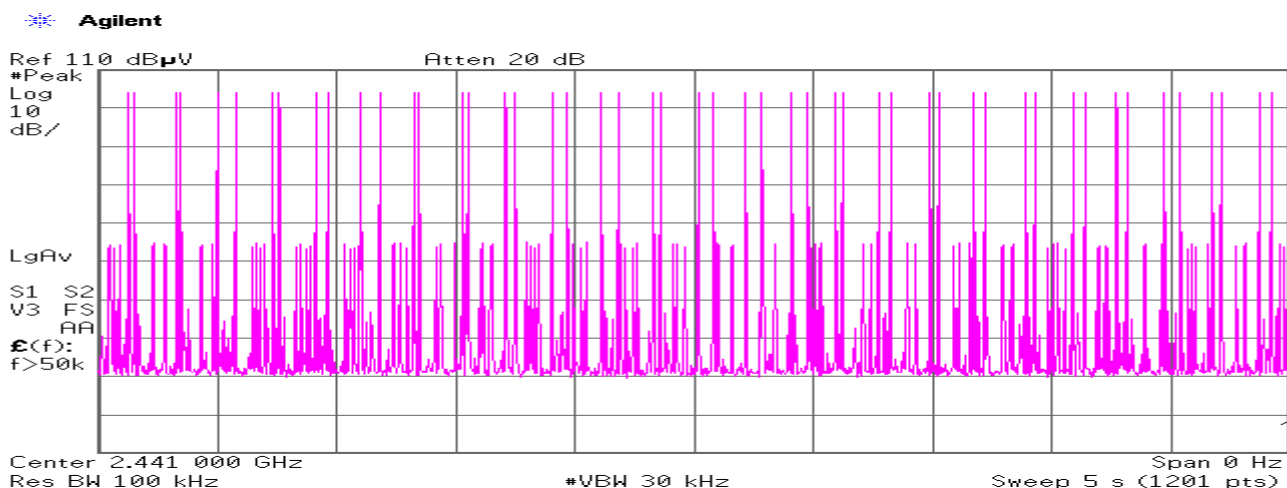
##### Count 1



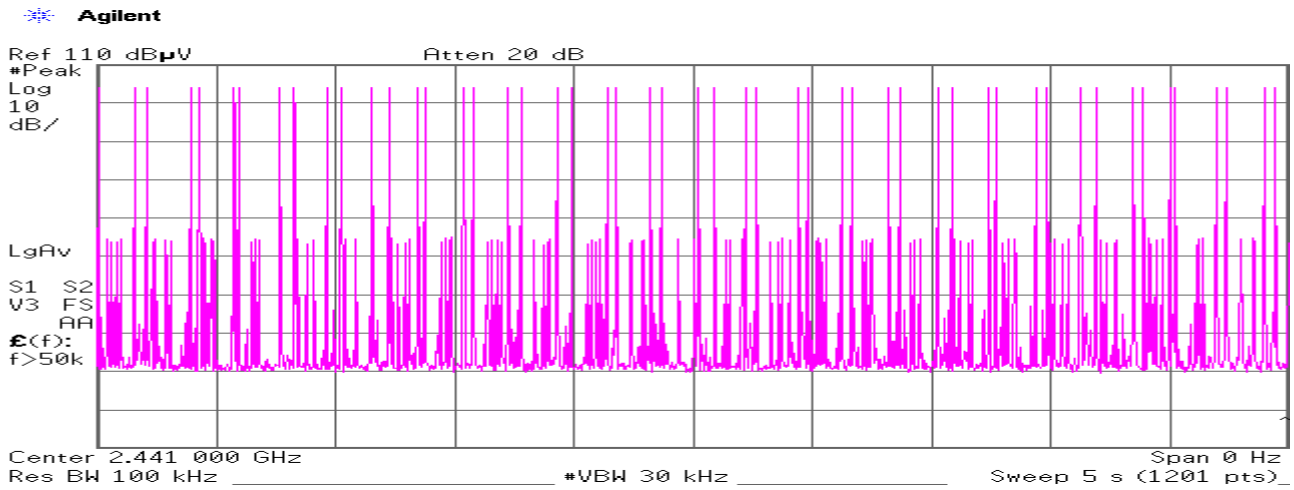
##### Count 2



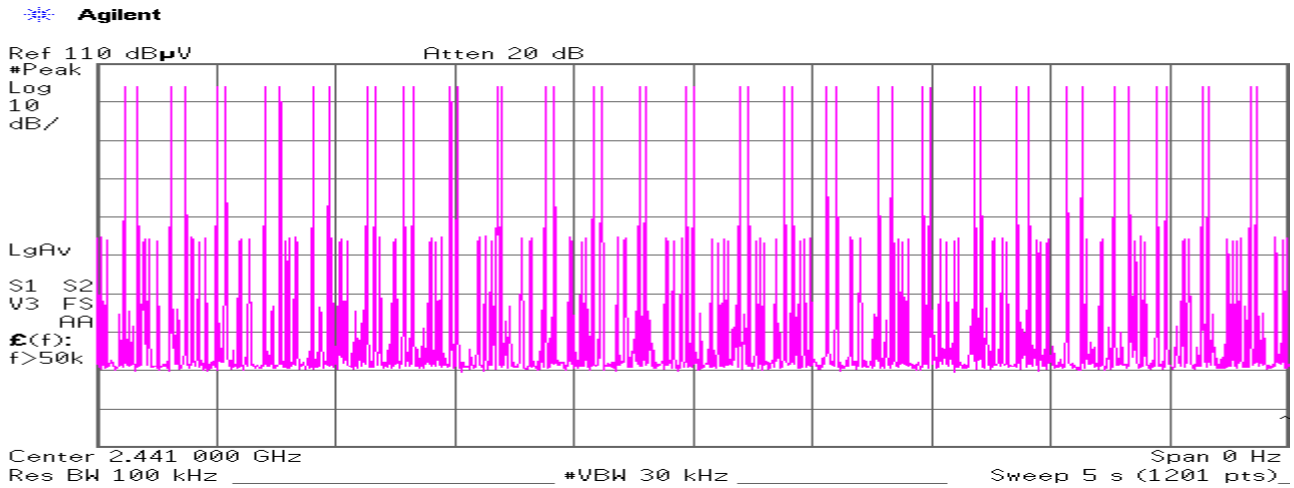
##### Count 3



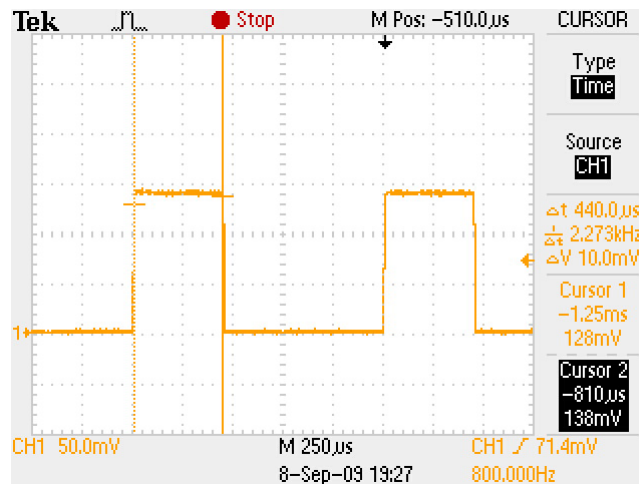
**Count 4**



**Count 5**



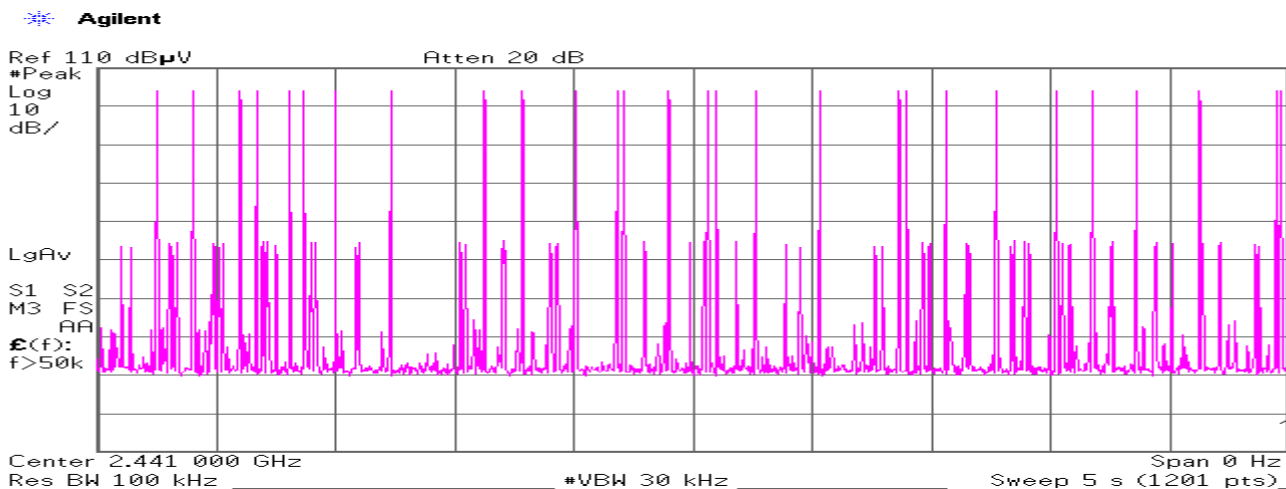
**Duty cycle(Hopping DH1)**



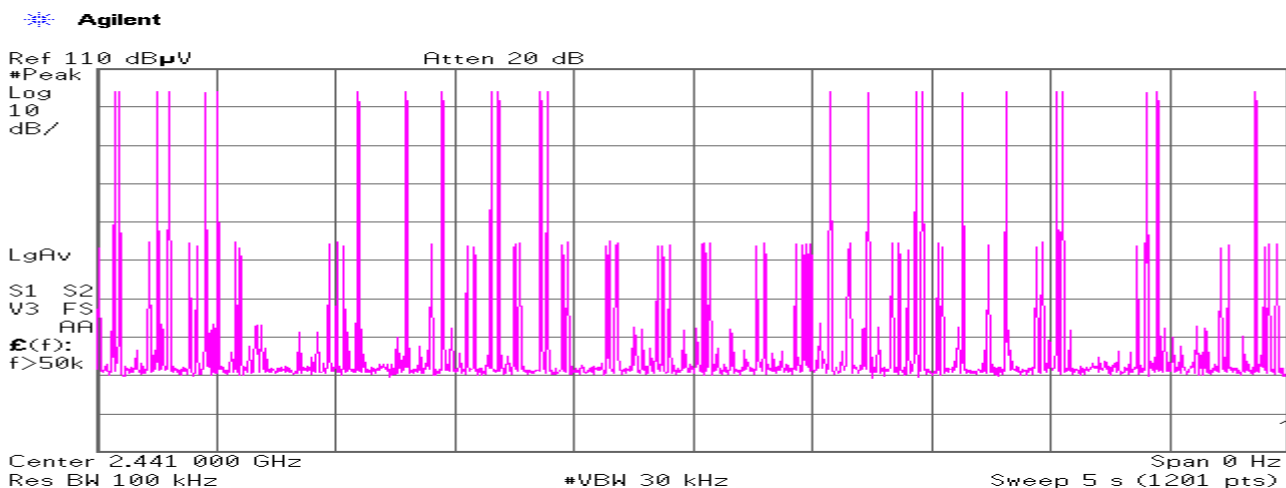
Average times of rising in 5 sec. of sweep = (51+ 49 + 50 + 51 + 50) / 5 = 50.2  
 Average times of rising in 1 sec. = 50.2 / 5s = 10.04  
 Average times of rising in 0.4x = 0.4 \* 79ch \* 10.04 = 317.26  
 Dwell time = 317.26\* 0.44 = 139.59 [ms]  
 Limit : Dwell Time < 0.4[s]

**Hopping (DH3):**

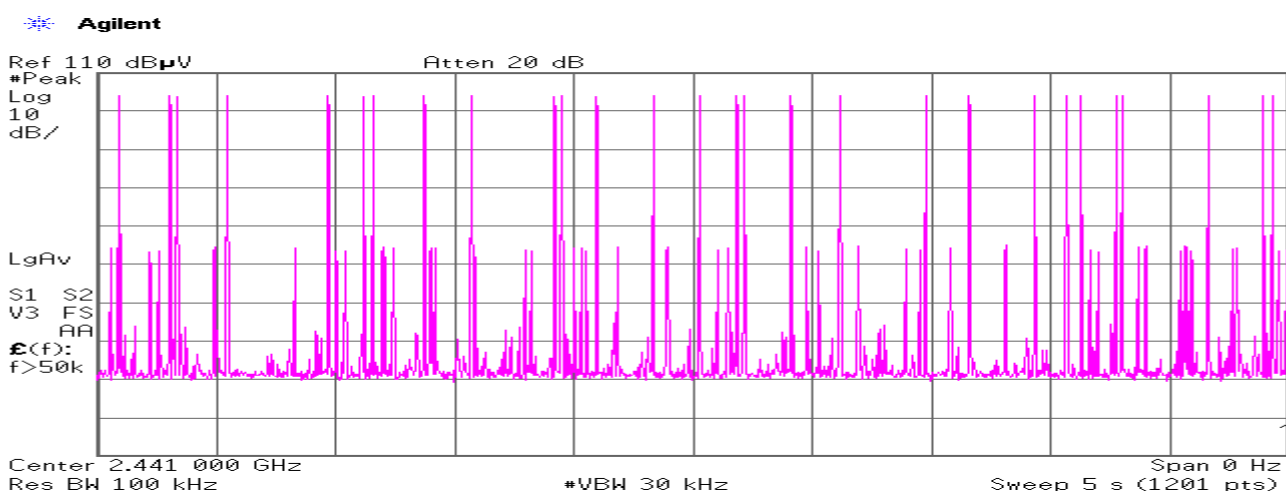
**Count 1**



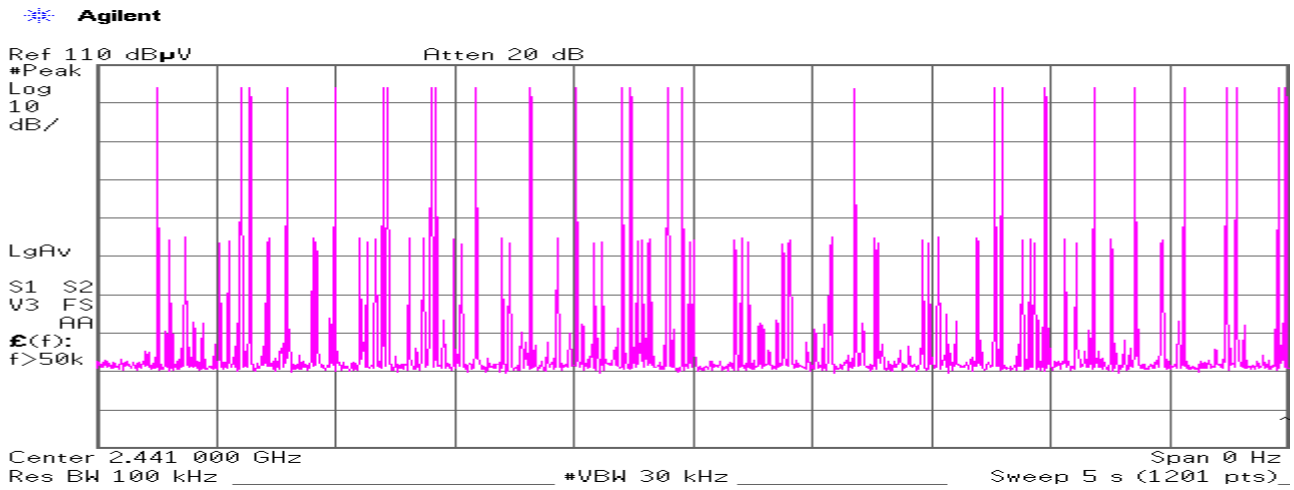
**Count 2**



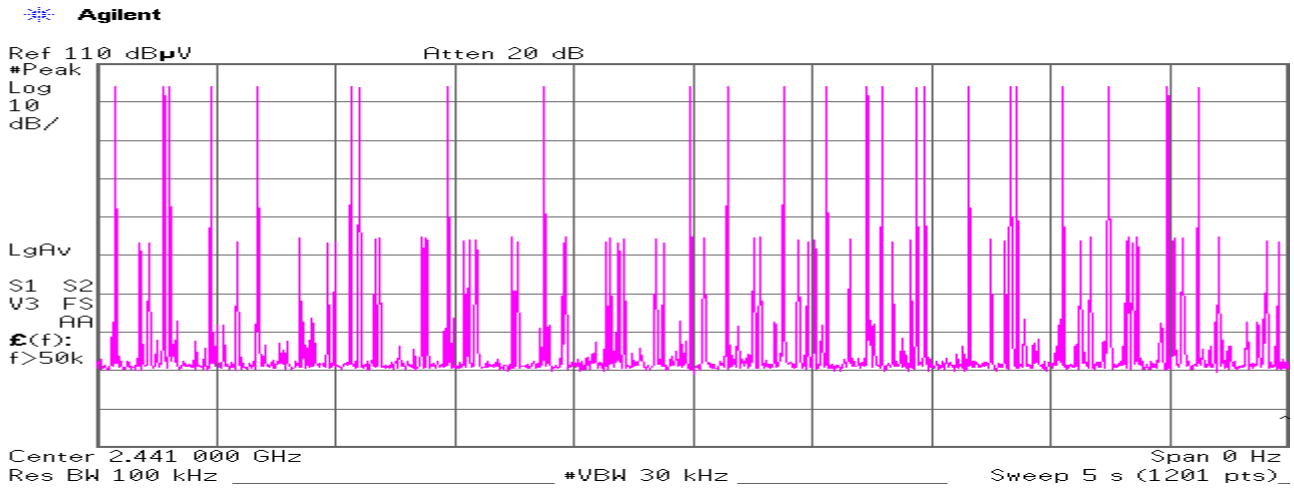
**Count 3**



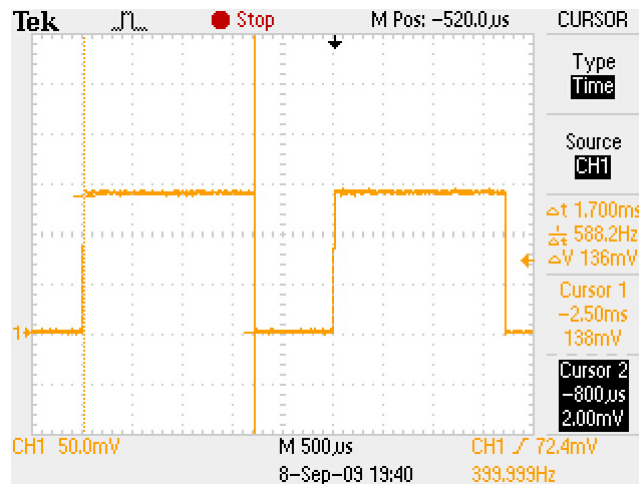
**Count 4**



**Count 5**



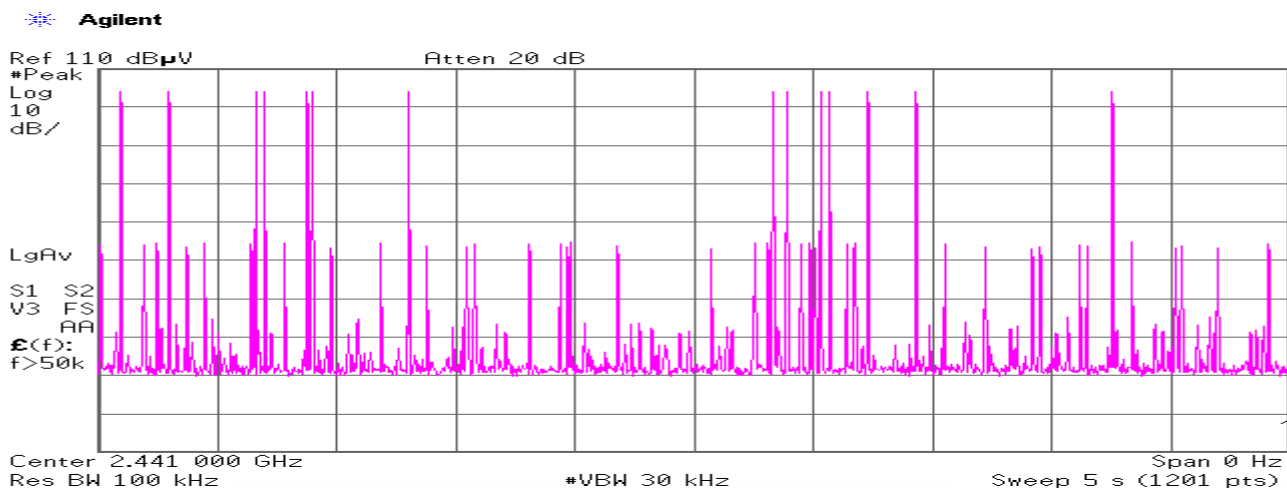
**Duty cycle(Hopping DH3)**



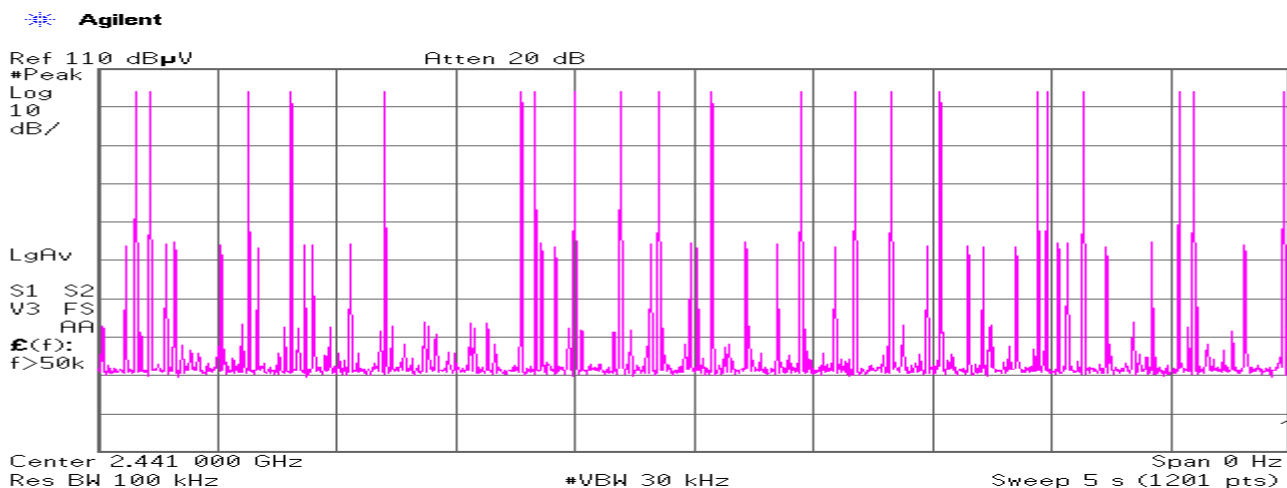
Average times of rising in 5 sec. of sweep =  $(28 + 24 + 28 + 27 + 24) / 5 = 26.2$   
 Average times of rising in 1 sec. =  $26.2 / 5s = 5.24$   
 Average times of rising in 0.4x =  $0.4 * 79ch * 5.24 = 165.58$   
 Dwell time =  $165.58 * 1.70 = 281.49 [ms]$   
 Limit : Dwell Time < 0.4[s]

**Hopping (DHS):**

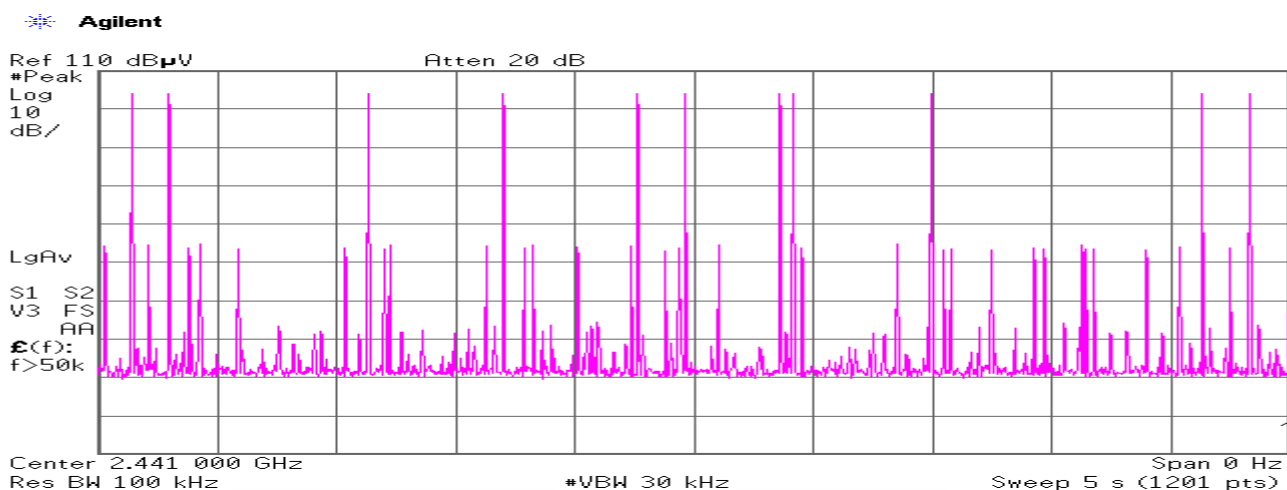
**Count 1**



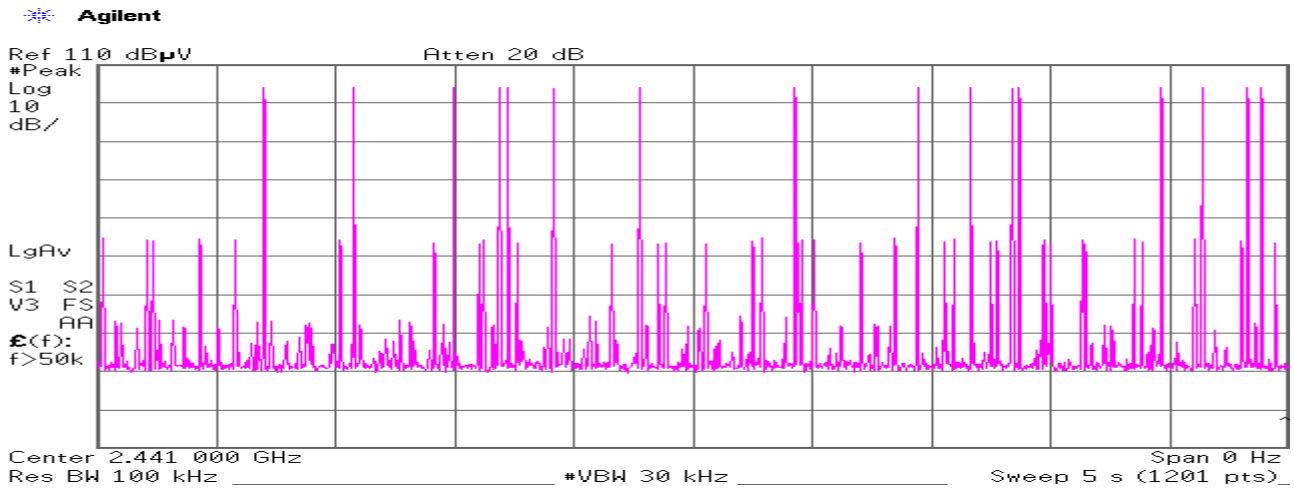
**Count 2**



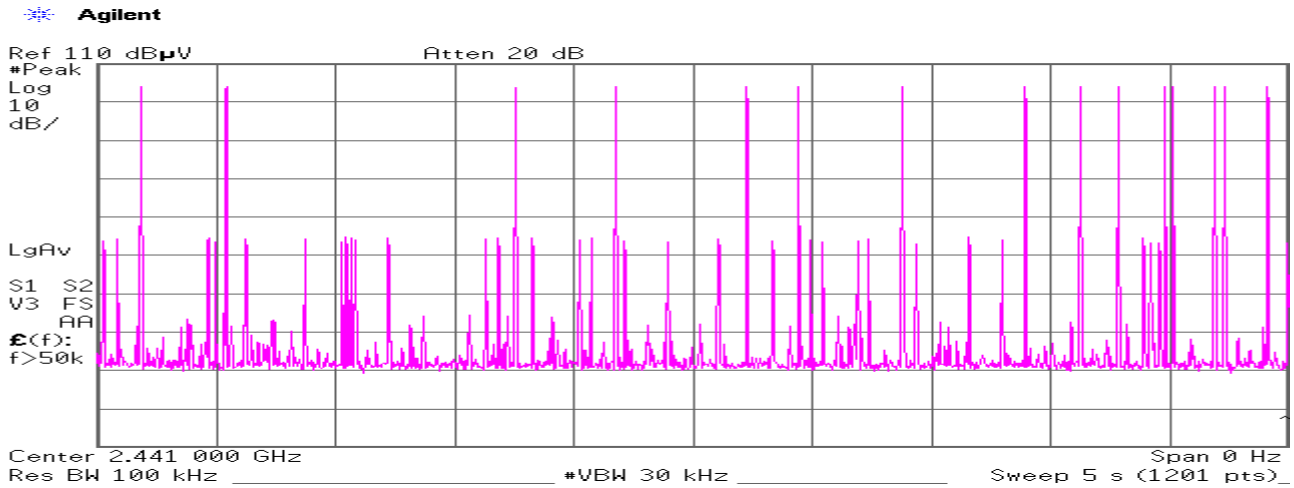
**Count 3**



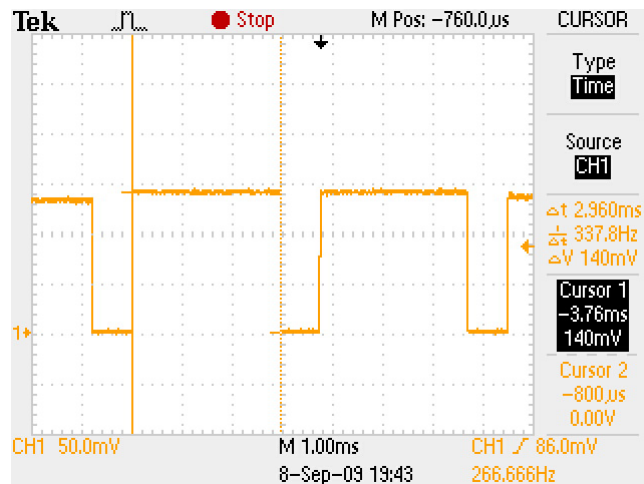
**Count 4**



**Count 5**



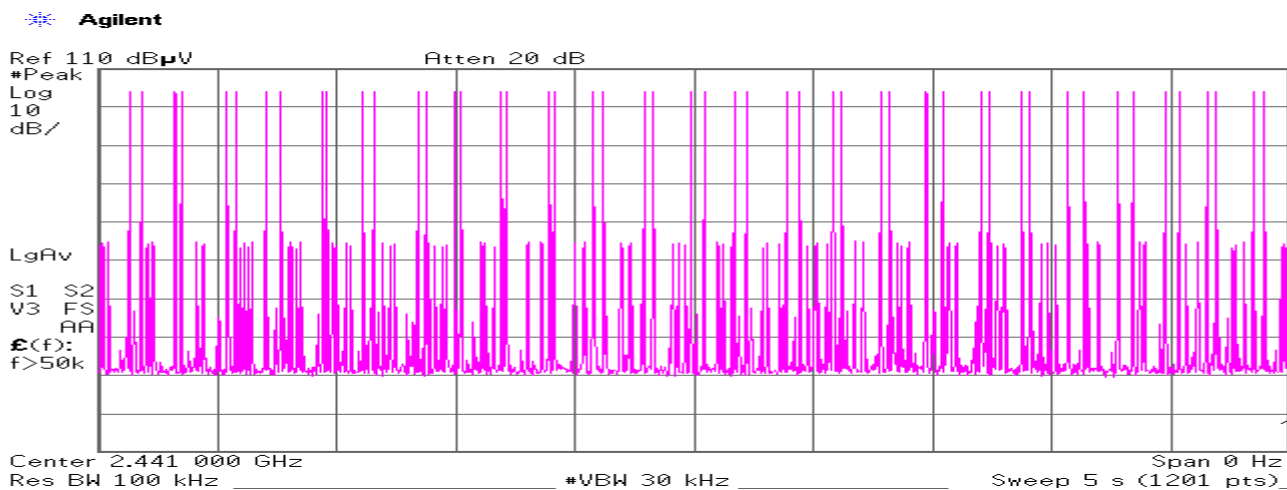
**Duty cycle(Hopping DH5)**



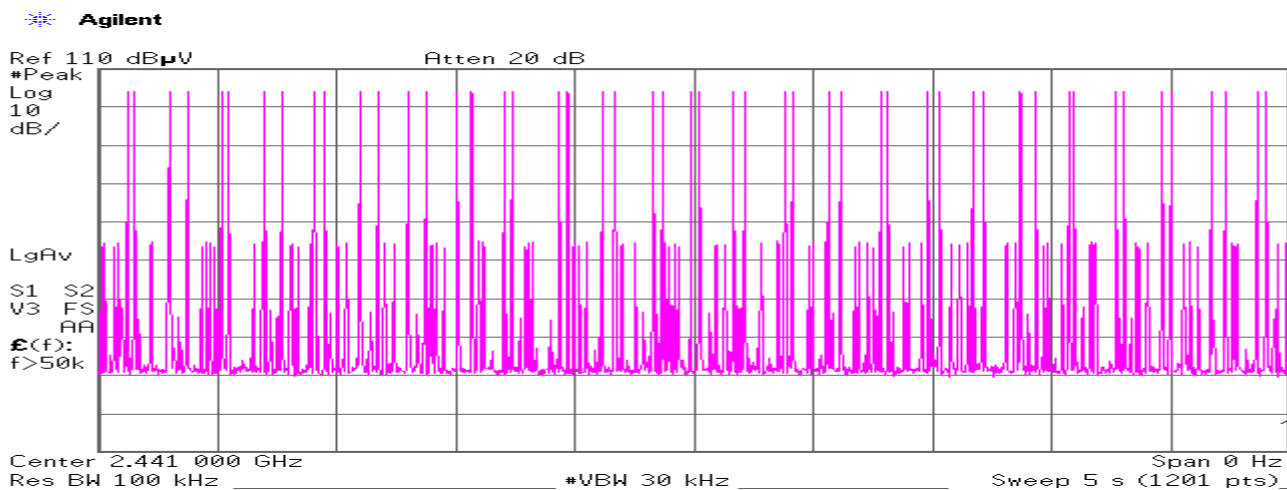
Average times of rising in 5 sec. of sweep =  $(14 + 21 + 11 + 16 + 15) / 5 = 15.4$   
 Average times of rising in 1 sec. =  $15.4 / 5s = 3.08$   
 Average times of rising in 0.4x =  $0.4 * 79ch * 3.08 = 97.33$   
 Dwell time =  $97.33 * 2.96 = 288.10 [ms]$   
 Limit : Dwell Time < 0.4[s]

**Hopping (3DH1):**

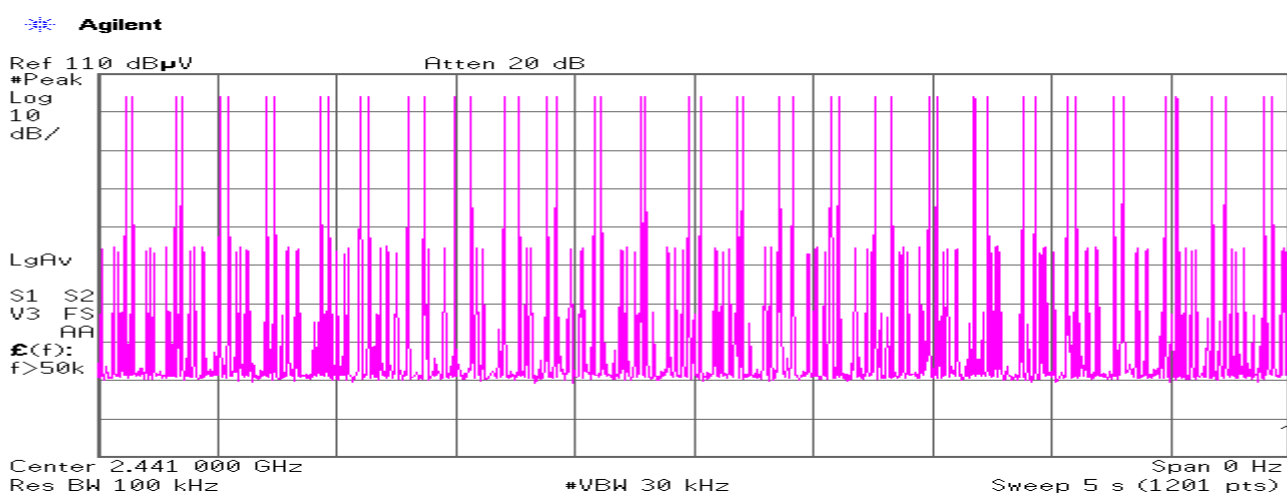
**Count 1**



**Count 2**

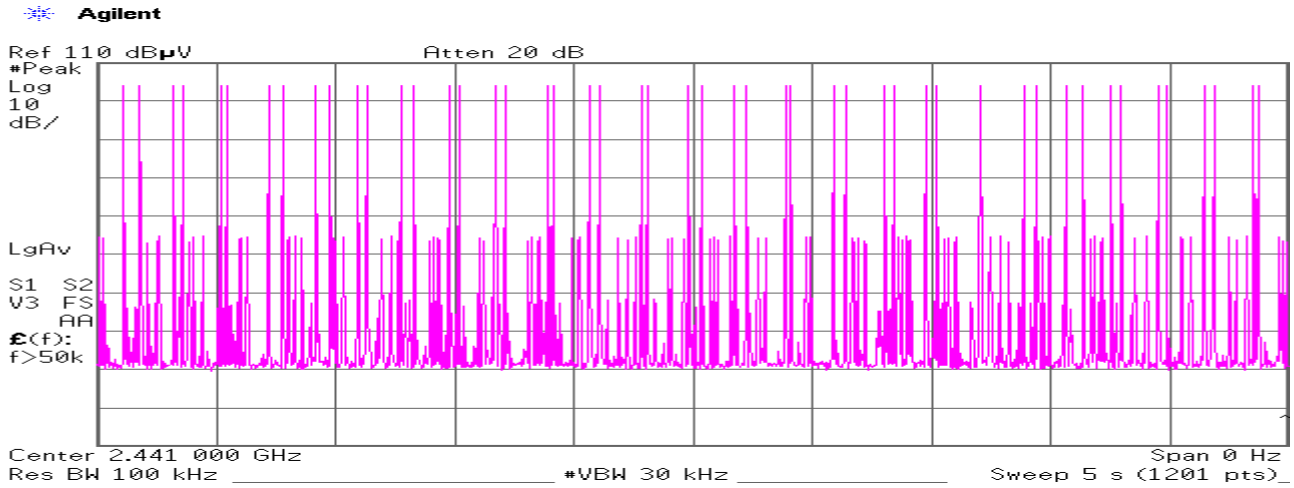


**Count 3**

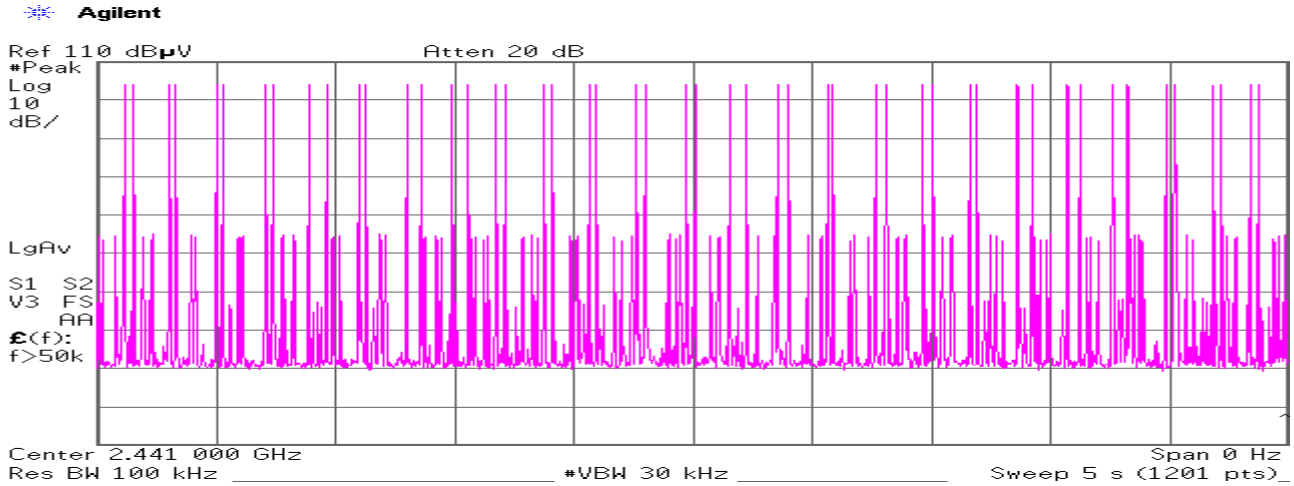




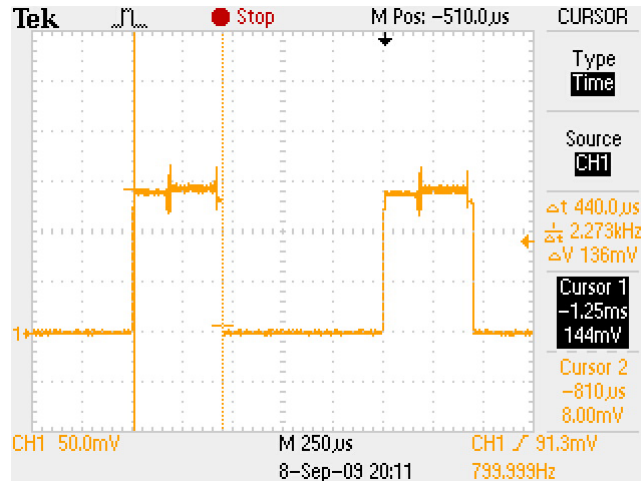
**Count 4**



**Count 5**



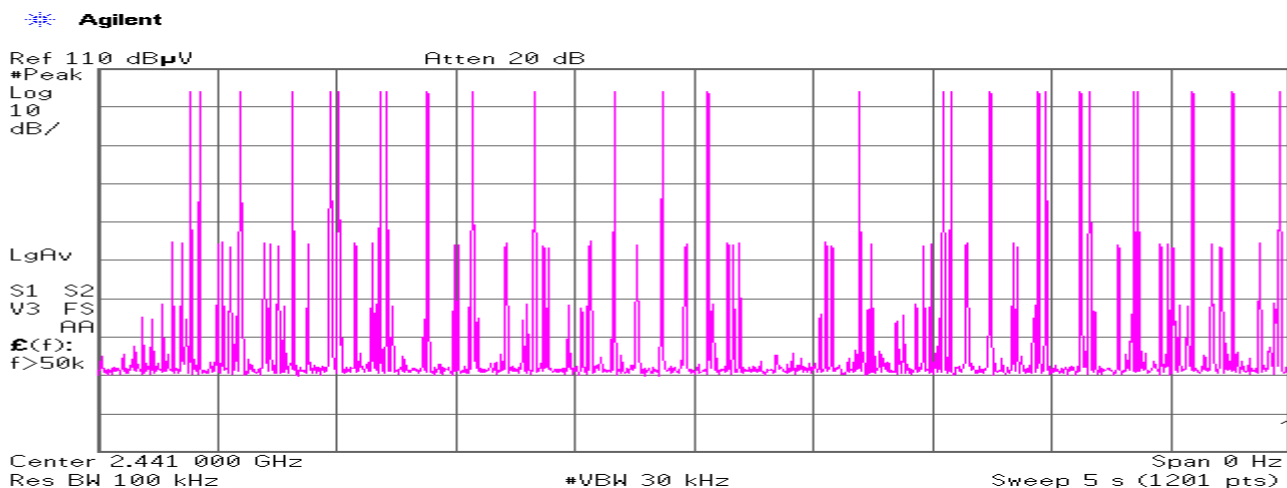
**Duty cycle(Hopping 3DH1)**



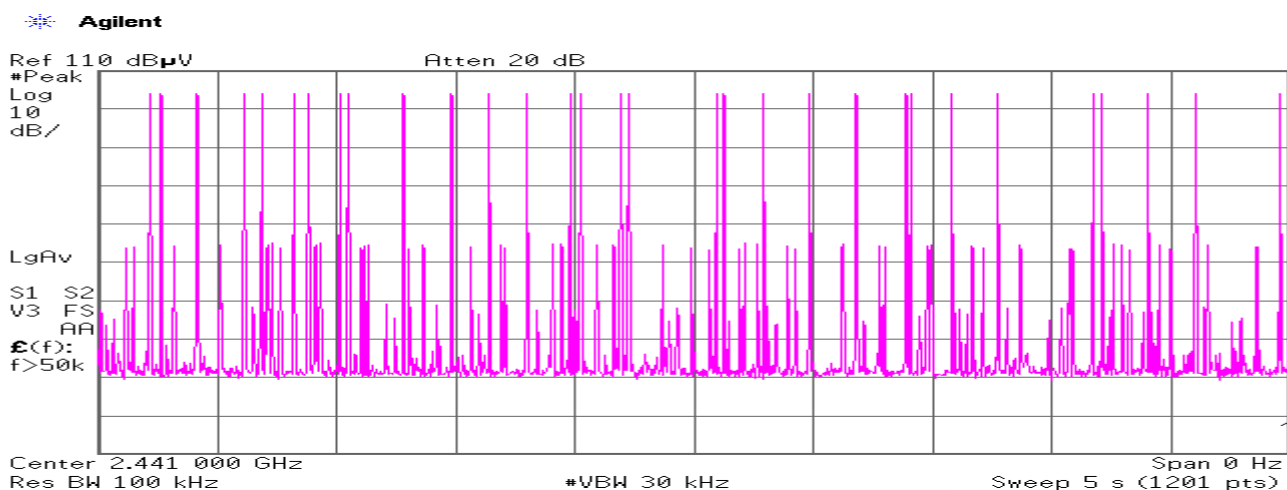
Average times of rising in 5 sec. of sweep = (50 + 50 + 50 + 49 + 50) / 5 = 49.80  
 Average times of rising in 1 sec. = 49.8/ 5s = 9.96  
 Average times of rising in 0.4x = 0.4 \* 79ch \* 9.96 = 314.74  
 Dwell time = 314.74 \* 0.44 = 138.49 [ms]  
 Limit : Dwell Time < 0.4[s]

**Hopping (3DH3):**

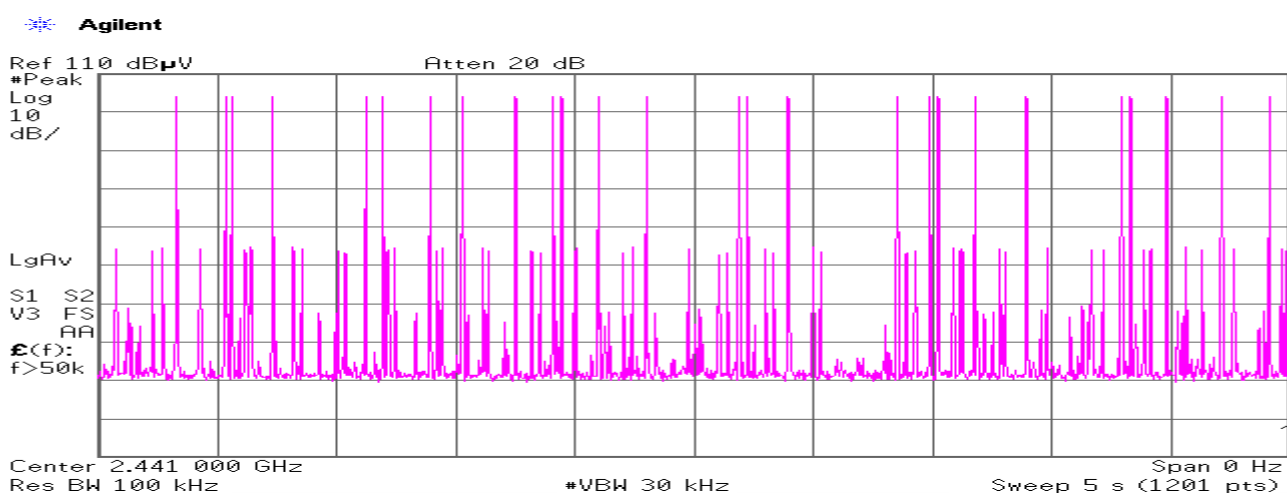
**Count 1**



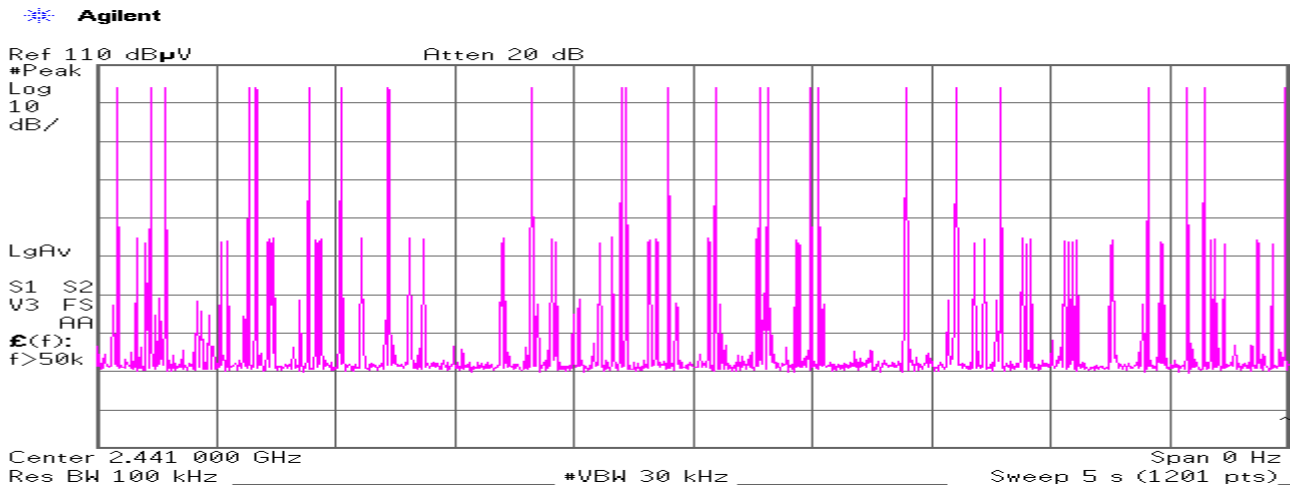
**Count 2**



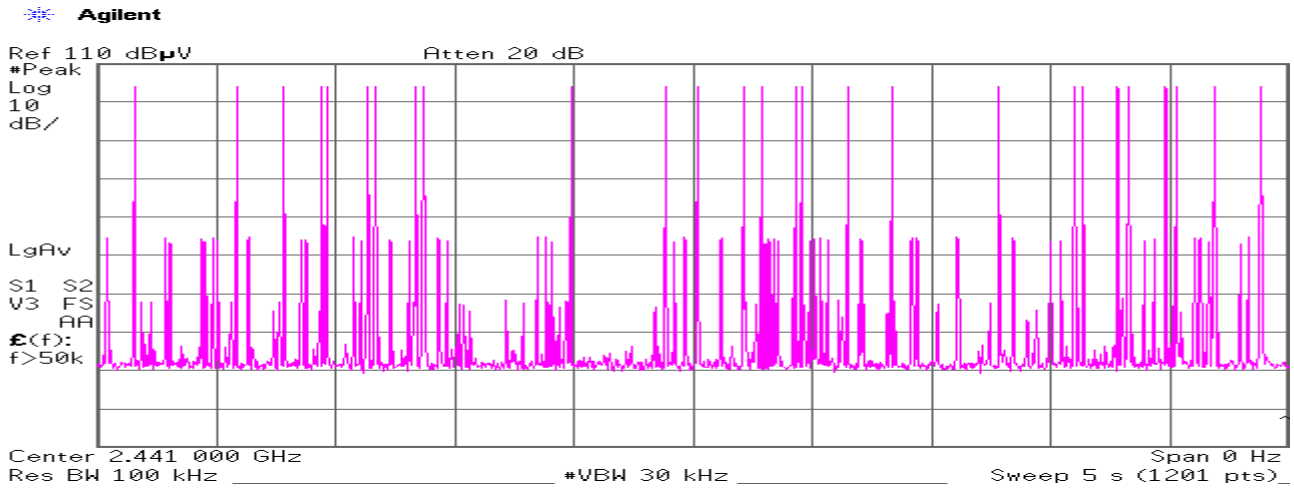
**Count 3**



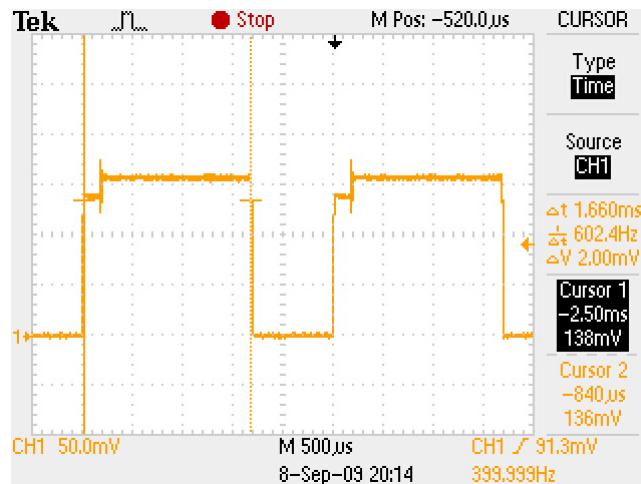
**Count 4**



**Count 5**



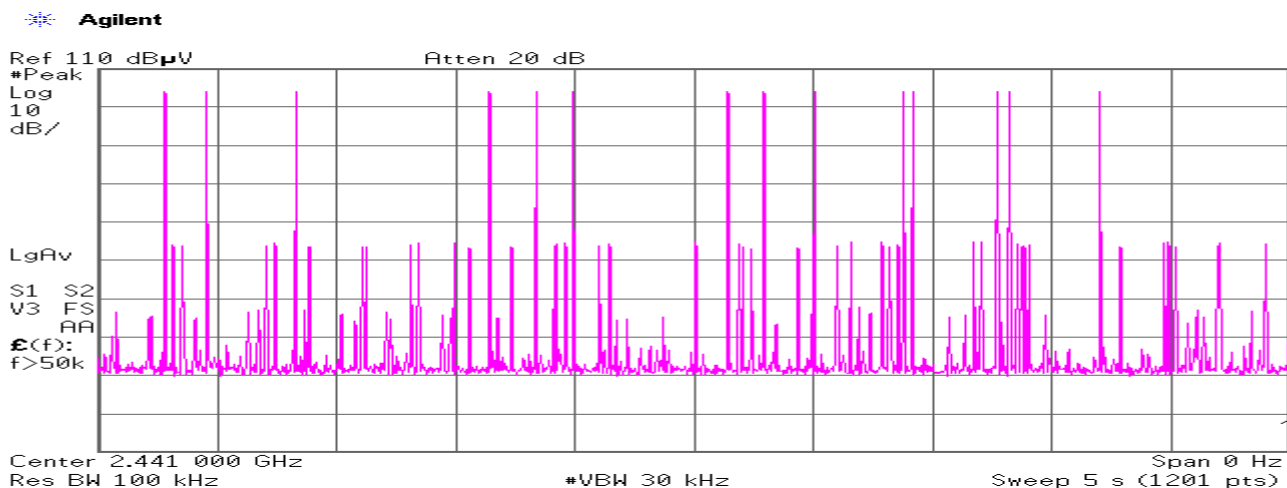
**Duty cycle(Hopping 3DH3)**



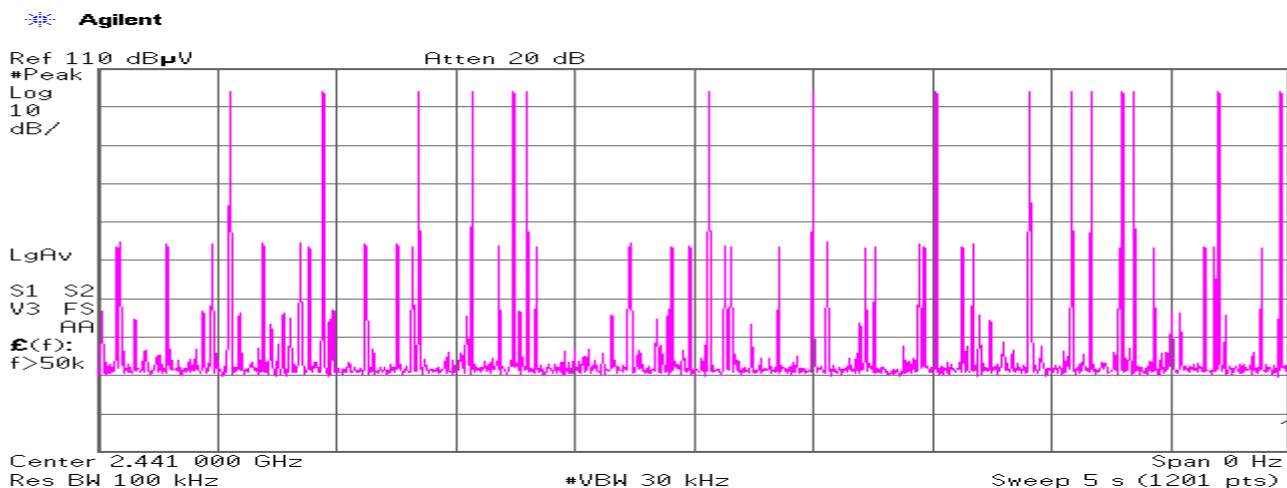
Average times of rising in 5 sec. of sweep =  $(27 + 31 + 26 + 24 + 27) / 5 = 27.0$   
 Average times of rising in 1 sec. =  $27.0 / 5s = 5.40$   
 Average times of rising in 0.4x =  $0.4 * 79ch * 5.40 = 170.64$   
 Dwell time =  $170.64 * 1.66 = 283.26 [ms]$   
 Limit : Dwell Time < 0.4[s]

**Hopping (3DH5):**

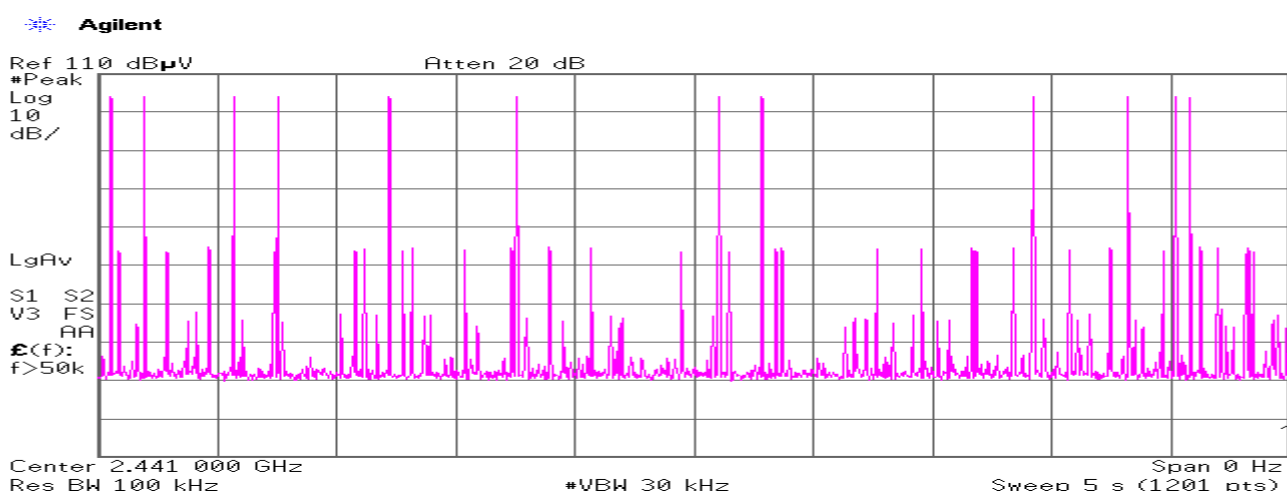
**Count 1**



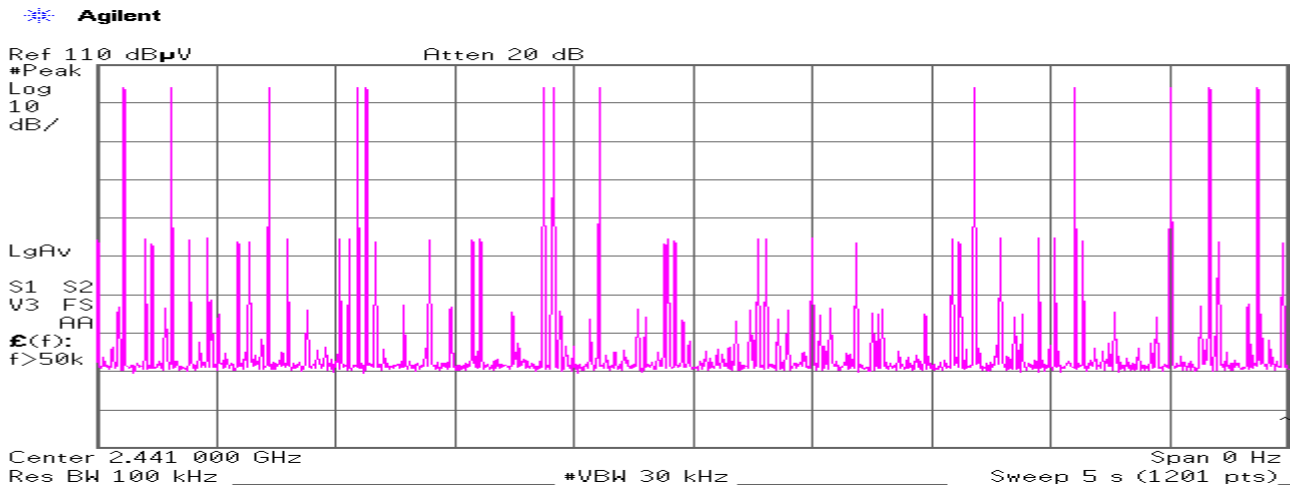
**Count 2**



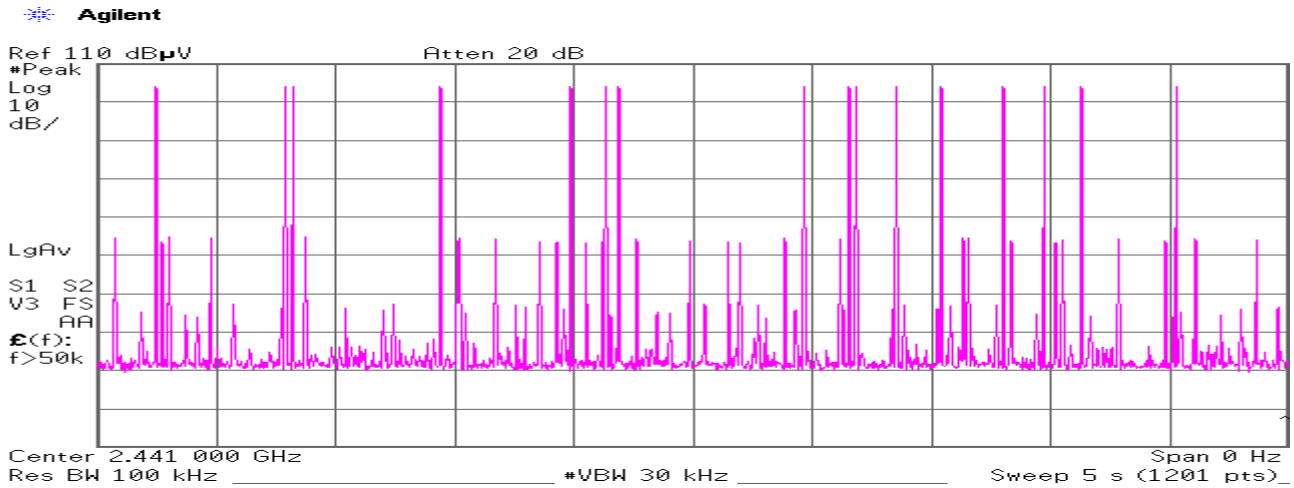
**Count 3**



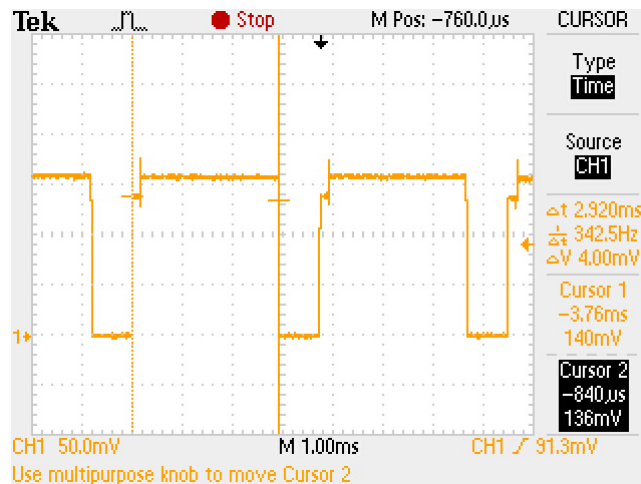
**Count 4**



**Count 5**



**Duty cycle(Hopping 3DH5)**



Average times of rising in 5 sec. of sweep =  $(14 + 16 + 12 + 13 + 16) / 5 = 14.2$   
 Average times of rising in 1 sec. =  $14.2 / 5s = 2.84$   
 Average times of rising in 0.4x =  $0.4 * 79ch * 2.84 = 89.74$   
 Dwell time =  $89.74 * 2.92 = 262.04 [ms]$   
 Limit : Dwell Time < 0.4[s]

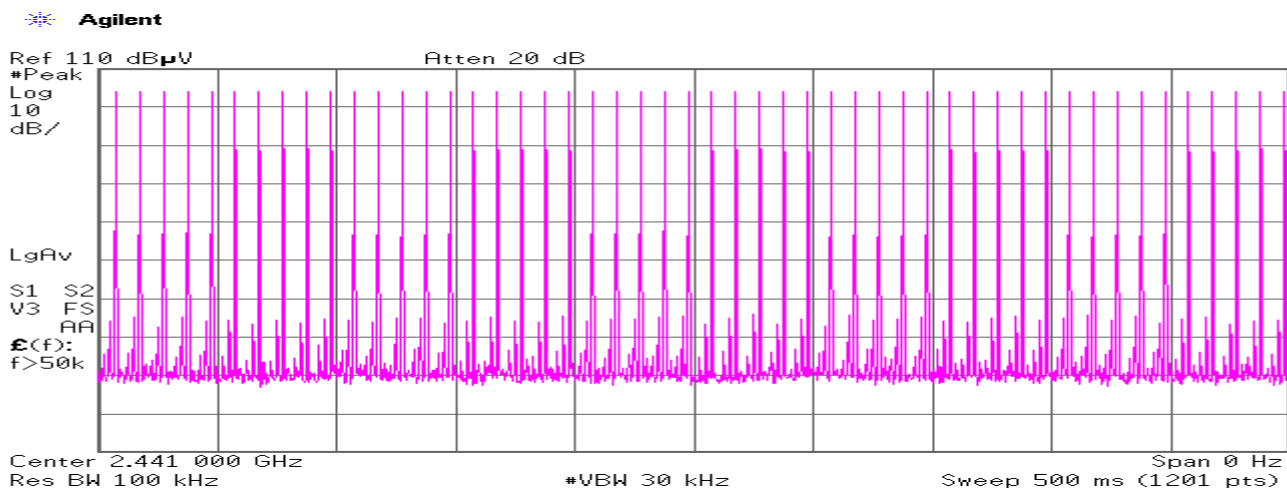
Company: Alpine Electronics, Inc.  
Kind of Equipment: Bluetooth Module  
Serial No.: No.6

Report No.:  
Model No.:  
Power:

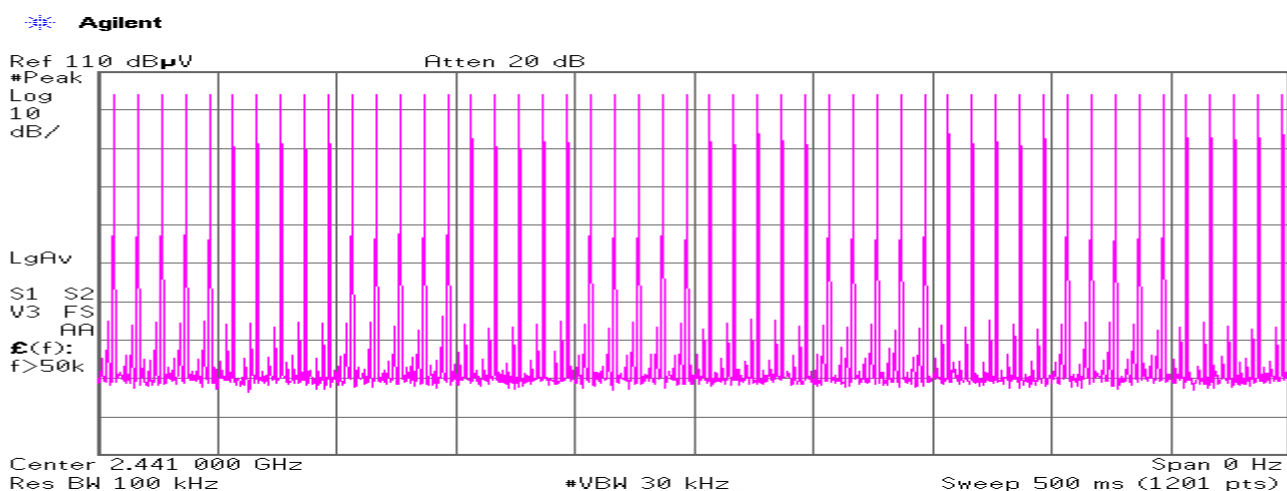
29LE0246-YK-01-B  
IAM2.1 BT PWB US  
DC 12.0V

UL Japan, Inc. Yamakita EMC lab. 4 shielded room  
Date: 2009/09/08  
Temp./Humid.: 23 deg. C. / 50 %  
Engineer: Akira Sato  
Test mode: Transmitting (Inquiry)

**Inquiry:**  
**Count 1**



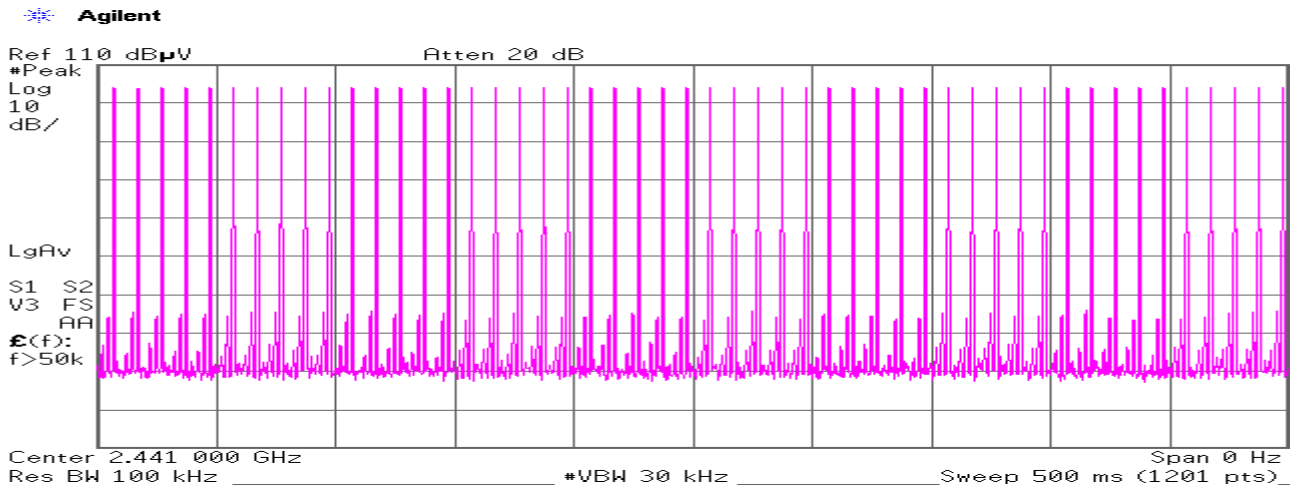
**Count 2**



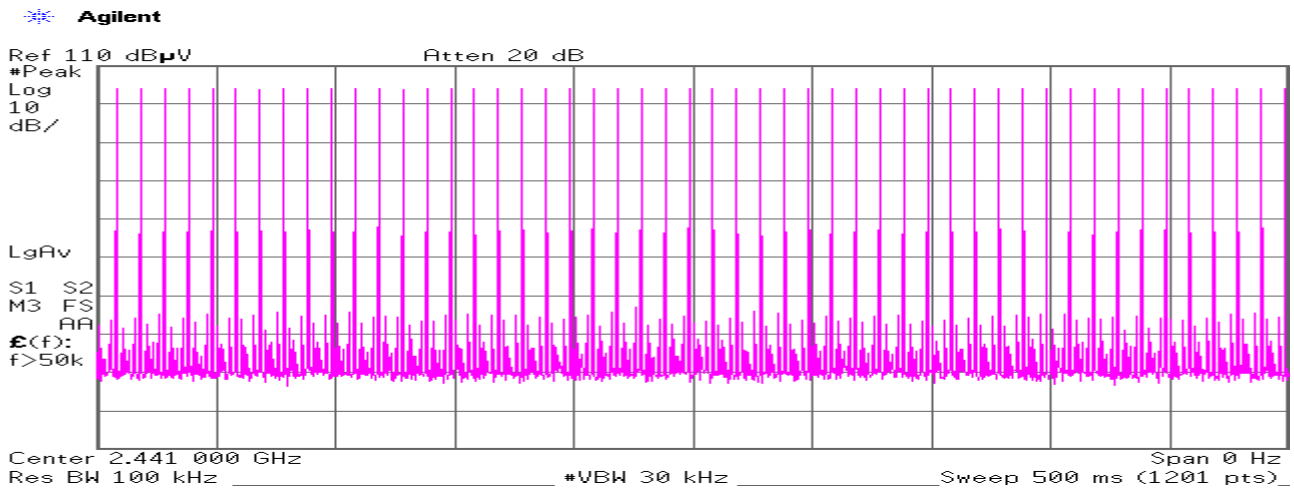
**Count 3**



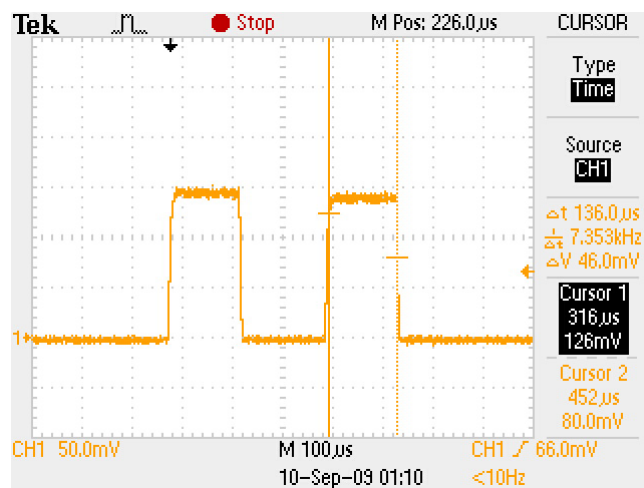
**Count 4**



**Count 5**



**Duty cycle(Inquiry)**



Average times of rising in 0.5 sec. of sweep =  $(50 + 50 + 50 + 50 + 50) / 5 = 50.0$   
 Average times of rising in 1 sec. =  $50.0 / 0.5s = 100.0$   
 Average times of rising in 0.4x =  $0.4 * 32ch * 100.0 = 1280.0$   
 Dwell time =  $1280.0 * 0.136 = 174.08 [ms]$   
 Limit : Dwell Time < 0.4[s]

## Maximum Peak Conducted Output Power (Regulation: FCC 15.247(b)(1))

UL Japan, Inc Yamakita EMC lab.  
 No.4 Shielded Room

DATE: 2009/9/9  
 TEMP./HUMID.: 22deg.C/64%  
 TEST MODE: Transmitting

ENGINEER: Akira Sato

### DH5

CH	FREQ [GHz]	P/M Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit (125mW) [dBm]	MARGIN [dB]
Low	2402.00	-2.26	0.84	-1.42	20.96	22.38
Mid	2441.00	-2.37	0.84	-1.53	20.96	22.49
High	2480.00	-3.09	0.84	-2.25	20.96	23.21
Inquiry	-	-2.19	0.84	-1.35	20.96	22.31

Limit: 125mW=20.96dBm

P/M: Power Meter

CABLE LOSS:KCC-D22

### 2DH5

CH	FREQ [GHz]	P/M Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit (125mW) [dBm]	MARGIN [dB]
Low	2402.00	-0.42	0.84	0.42	20.96	20.54
Mid	2441.00	-0.55	0.84	0.29	20.96	20.67
High	2480.00	-1.29	0.84	-0.45	20.96	21.41

Limit: 125mW=20.96dBm

P/M: Power Meter

CABLE LOSS:KCC-D22

### 3DH5

CH	FREQ [GHz]	P/M Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit (125mW) [dBm]	MARGIN [dB]
Low	2402.00	-0.40	0.84	0.44	20.96	20.52
Mid	2441.00	-0.54	0.84	0.30	20.96	20.66
High	2480.00	-1.29	0.84	-0.45	20.96	21.41

Limit: 125mW=20.96dBm

P/M: Power Meter

CABLE LOSS:KCC-D22

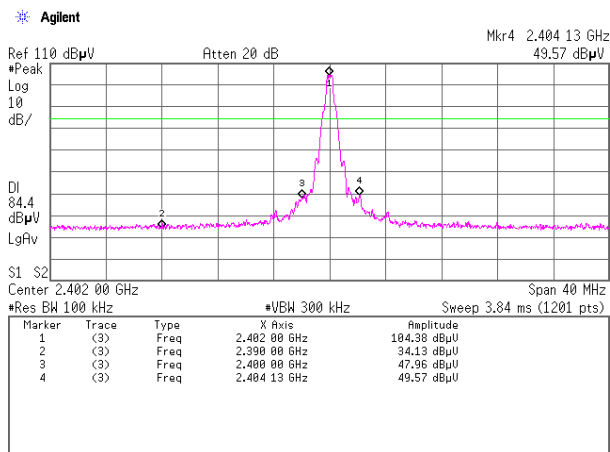


### Out of Band Emission (Antenna Terminal Conducted) (Regulation: FCC 15.247(d))

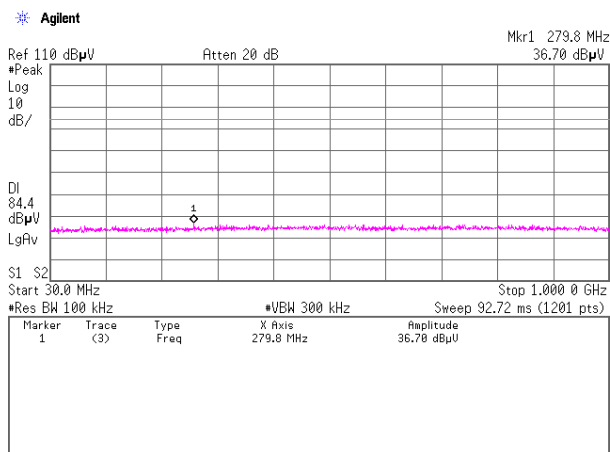
UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
 Date: 2009/09/09  
 Temp: 22 deg. C.  
 Humid: 64 %  
 Engineer: Akira Sato  
 Test mode: Transmitting

[Transmitting DHS]  
 Ch:2402MHz

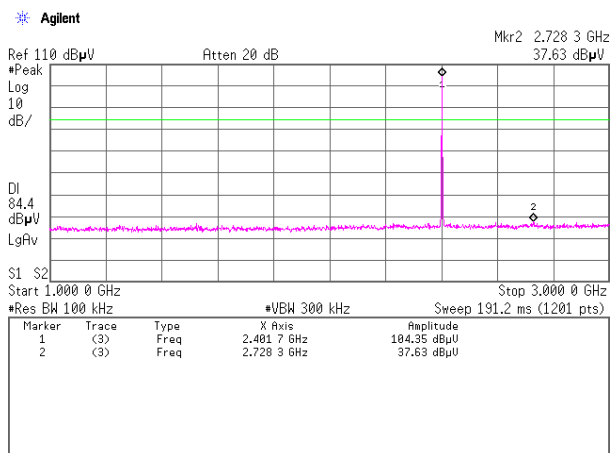
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2.

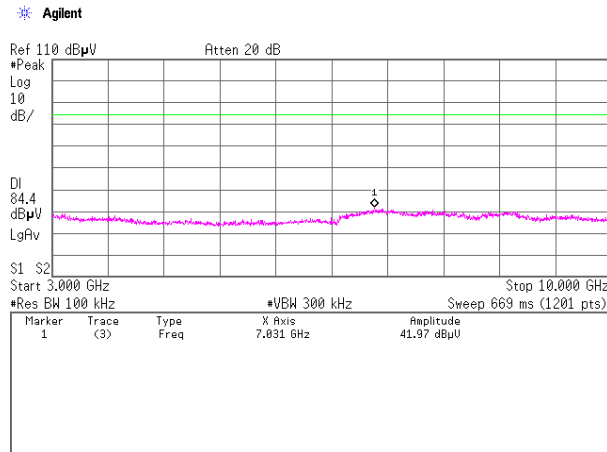


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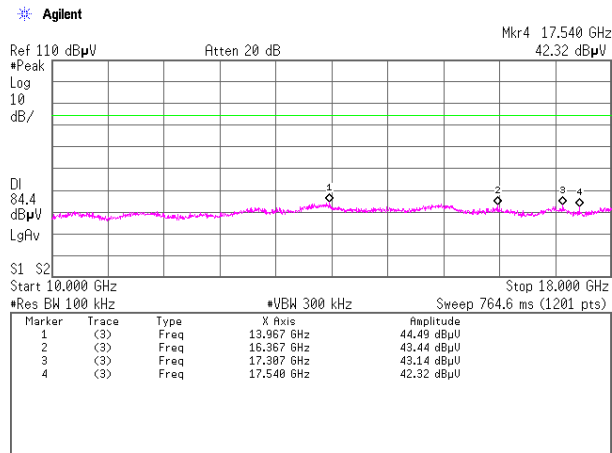


[Transmitting DH5]  
Ch:2402MHz

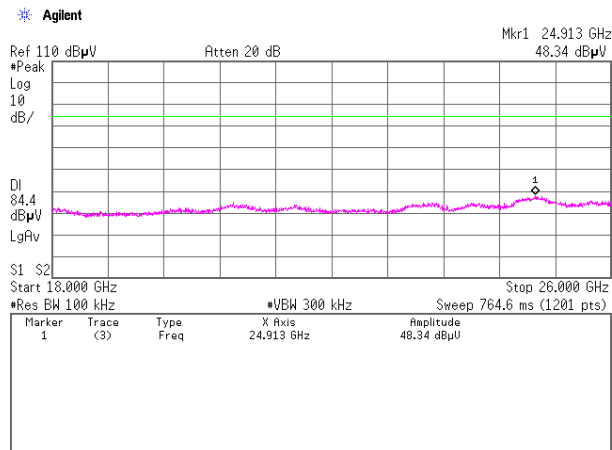
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5.

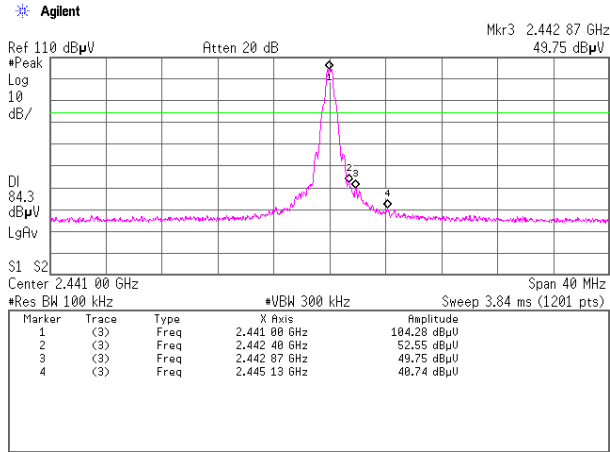


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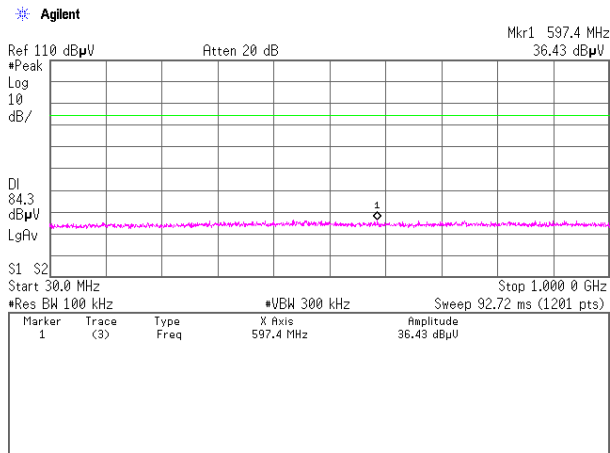


[Transmitting DH5]  
Ch:2441MHz

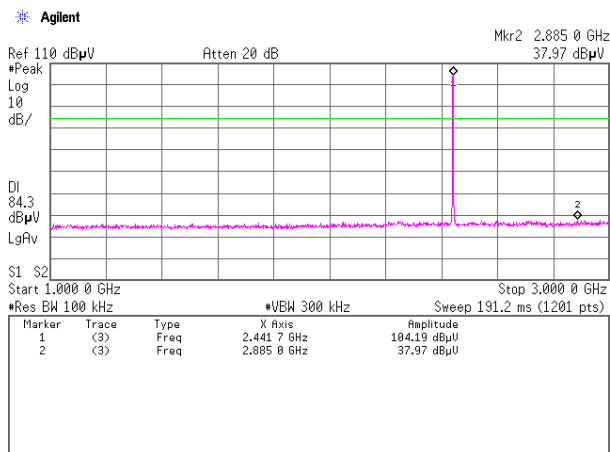
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2.

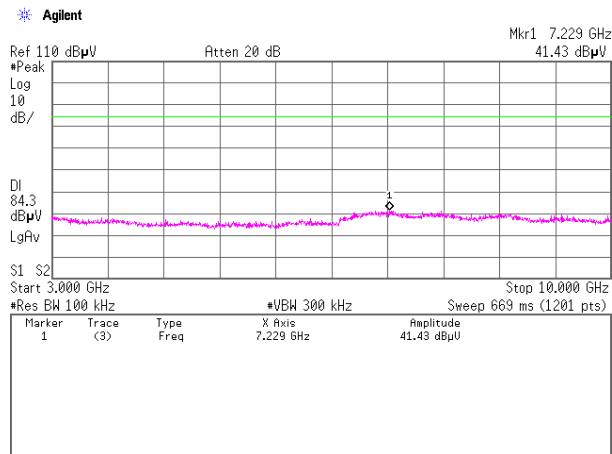


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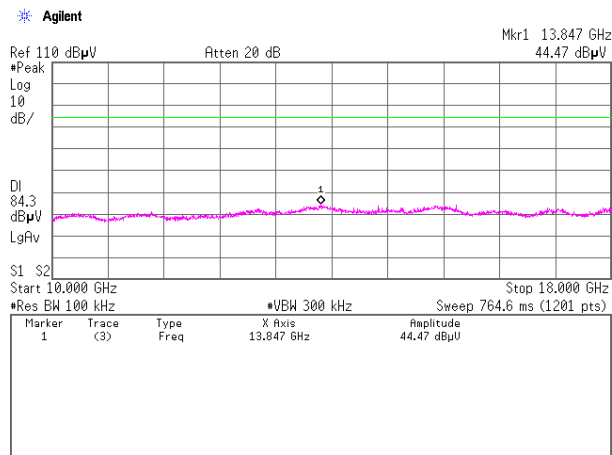


[Transmitting DH5]  
Ch:2441MHz

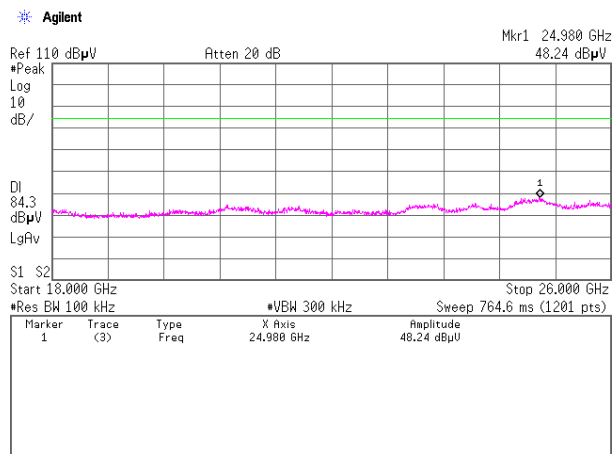
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5.

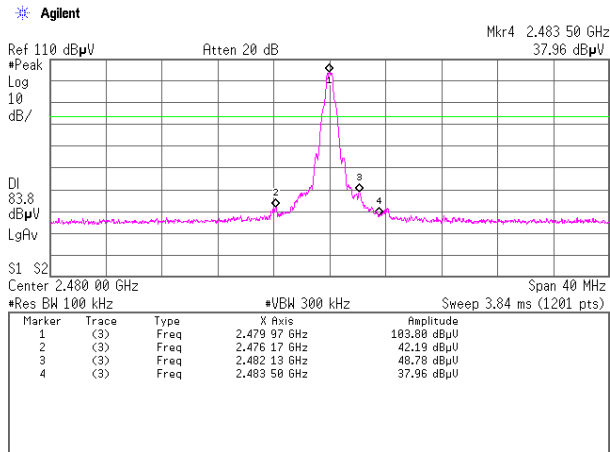


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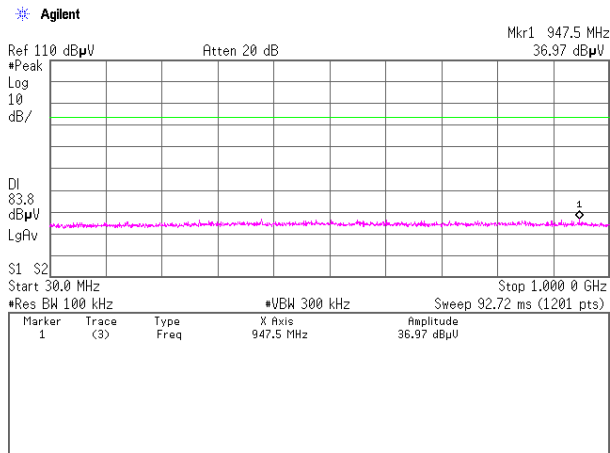


[Transmitting DH5]  
Ch:2480MHz

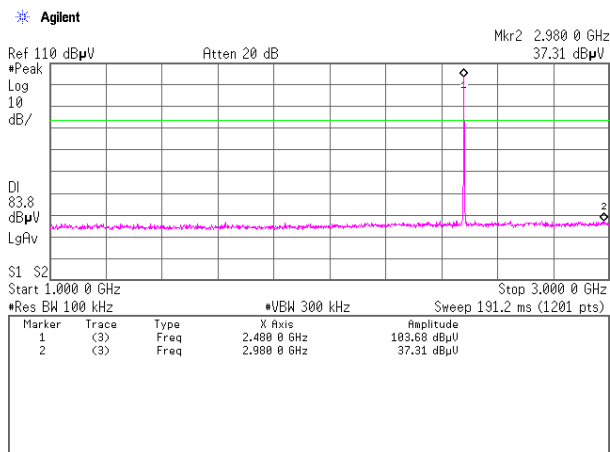
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2.

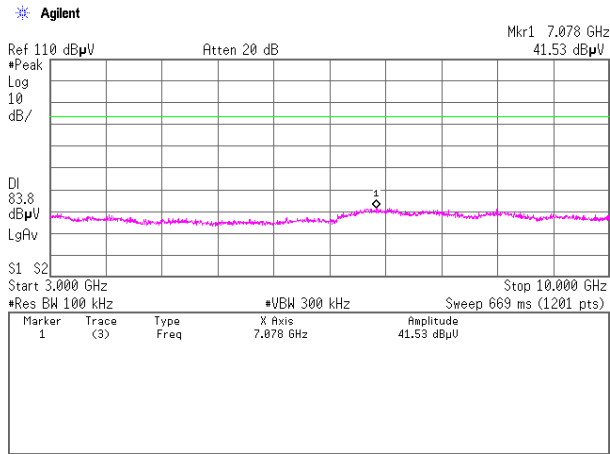


3.

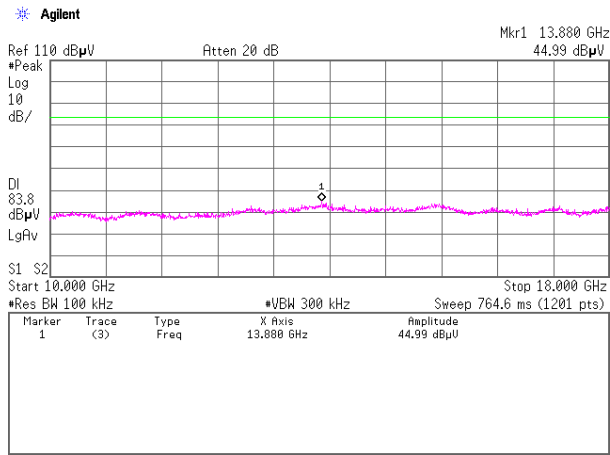


[Transmitting DH5]  
Ch:2480MHz

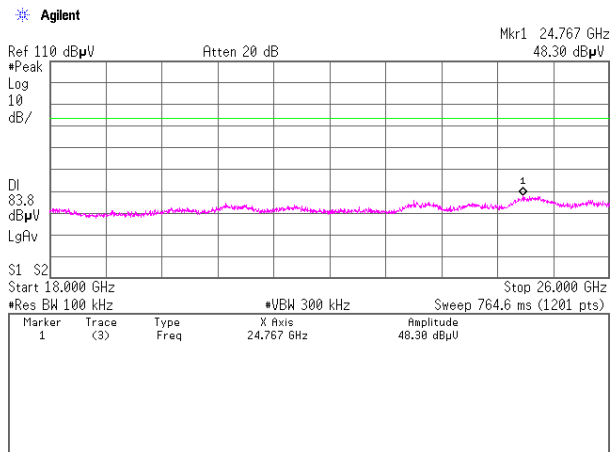
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5.

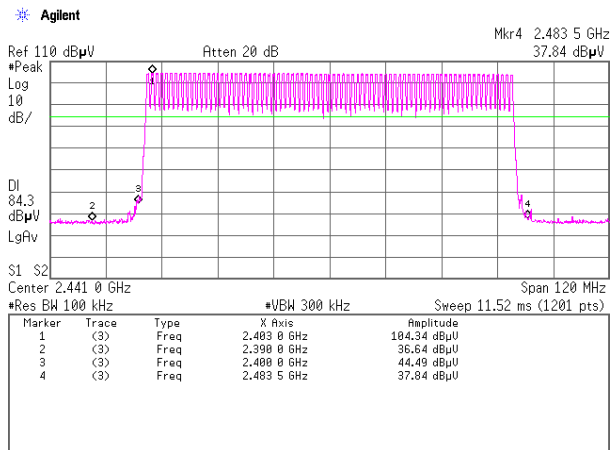


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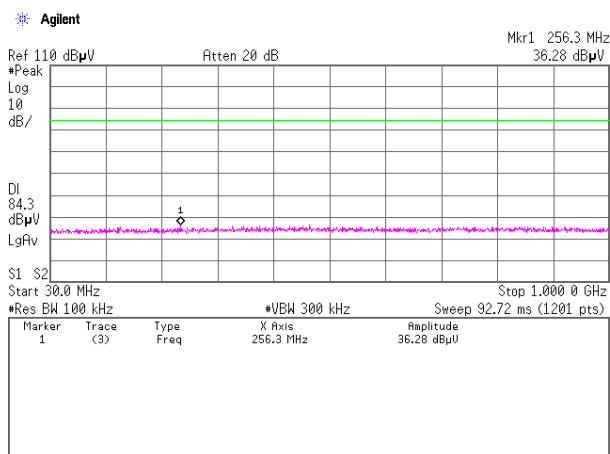


**[Transmitting DH5]  
Hopping**

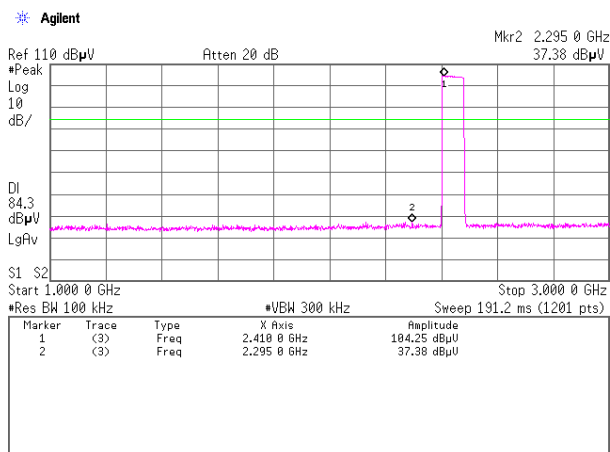
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2.

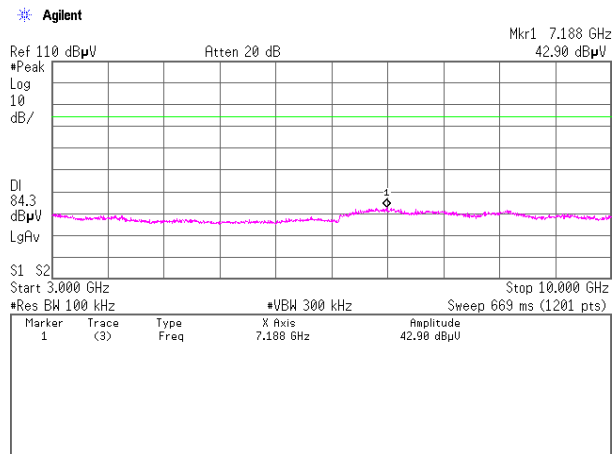


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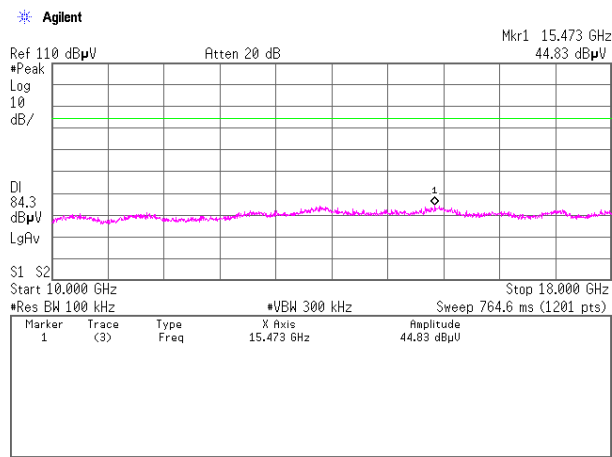


[Transmitting DH5]  
Hopping

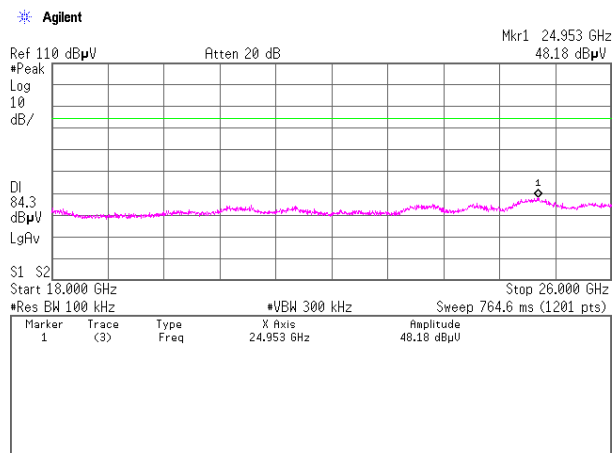
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5.



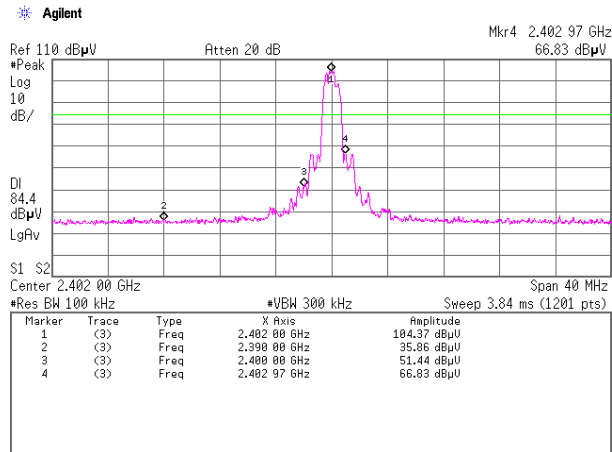
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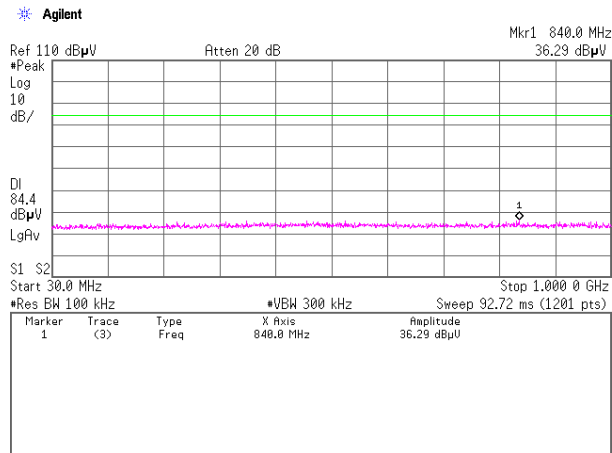


[Transmitting 3DH5]  
 Ch:2402MHz

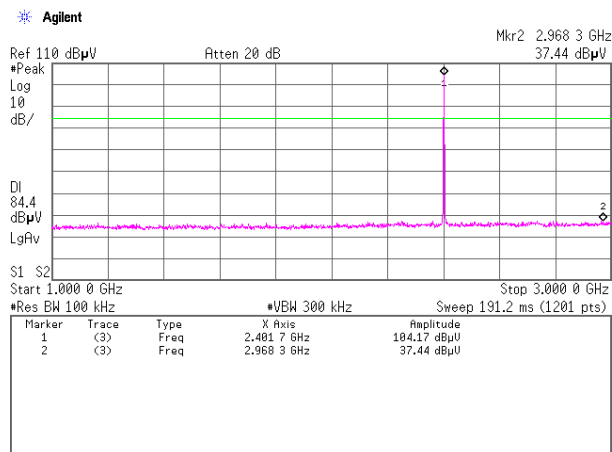
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2.

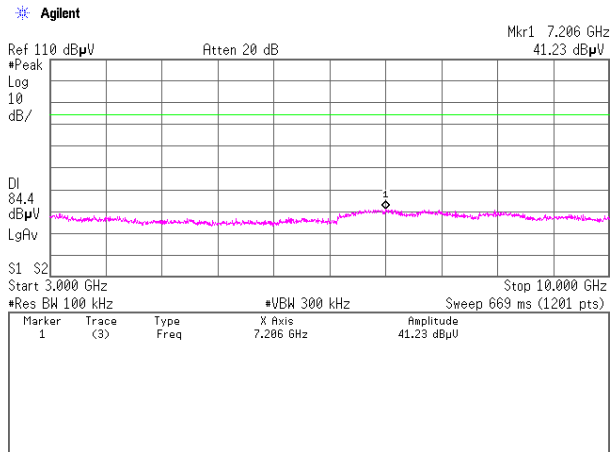


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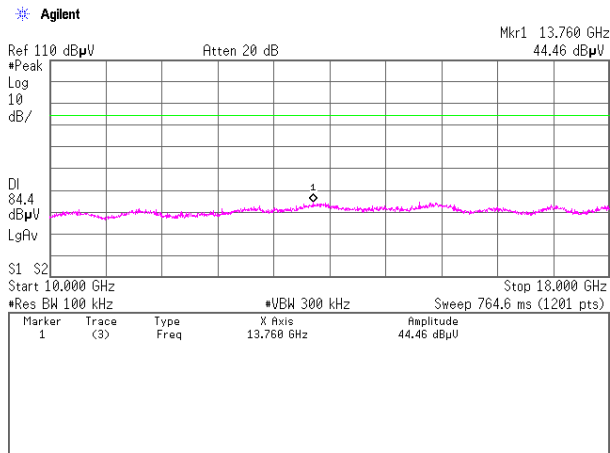


[Transmitting 3DH5]  
Ch:2402MHz

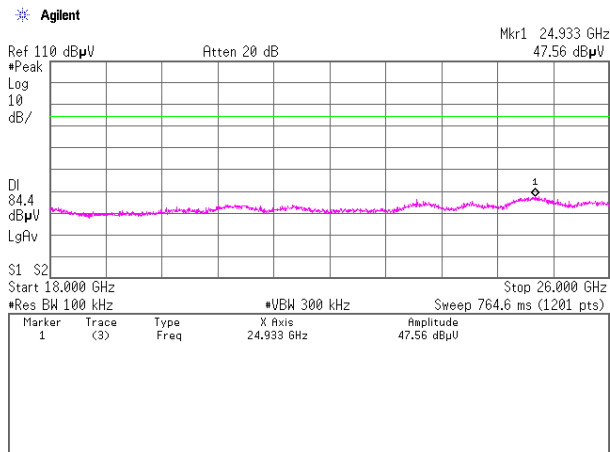
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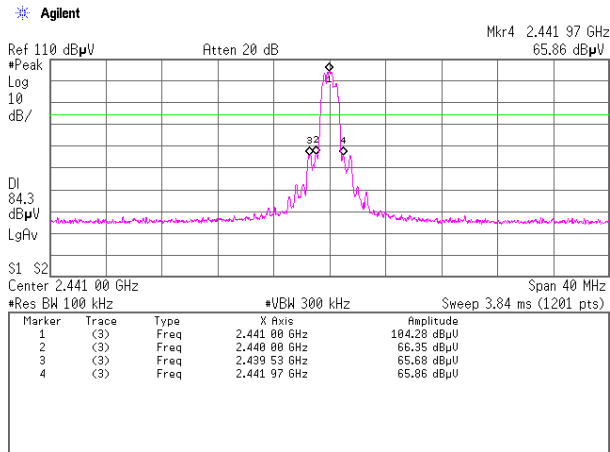


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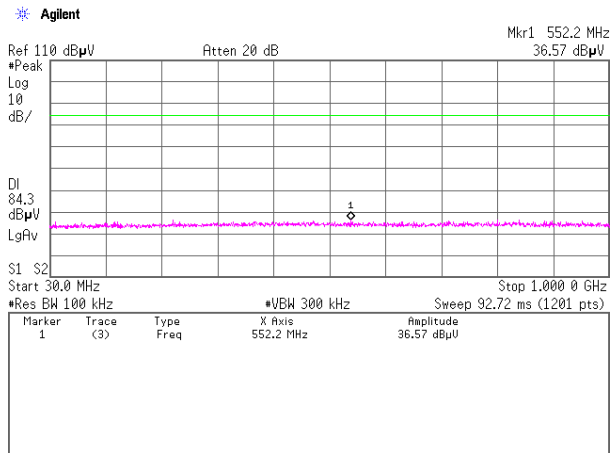


[Transmitting 3DH5]  
Ch:2441MHz

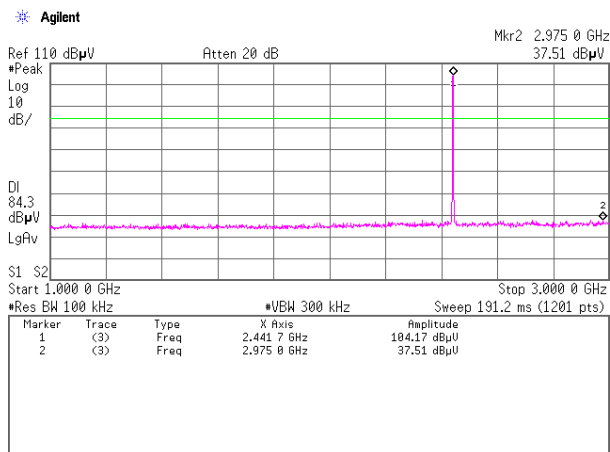
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2.

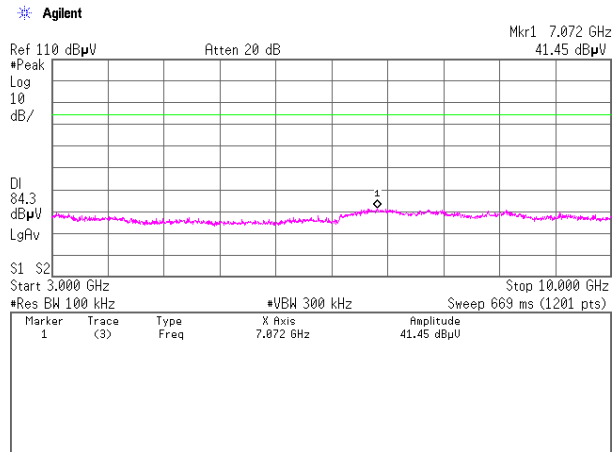


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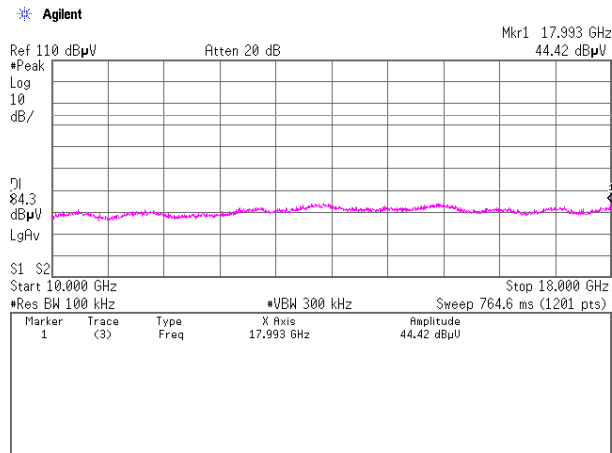


[Transmitting 3DH5]  
 Ch:2441MHz

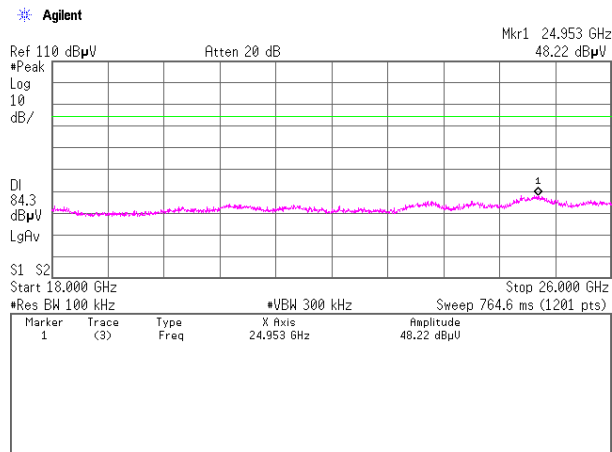
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5.

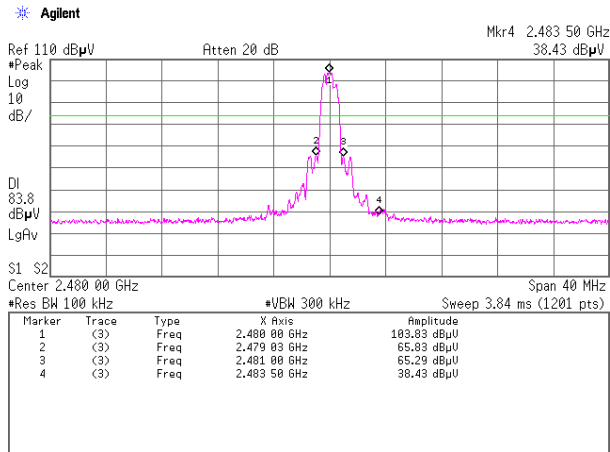


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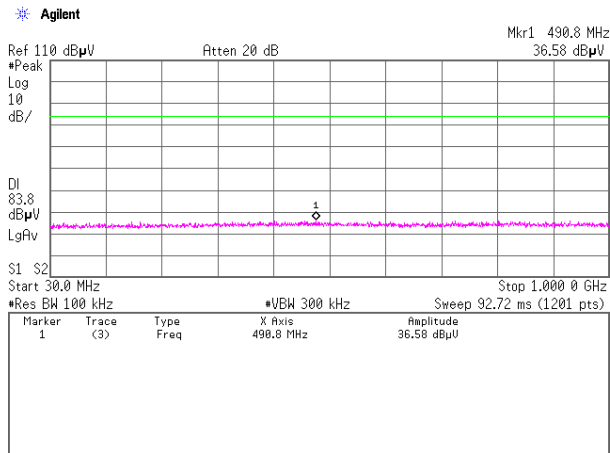


[Transmitting 3DH5]  
Ch:2480MHz

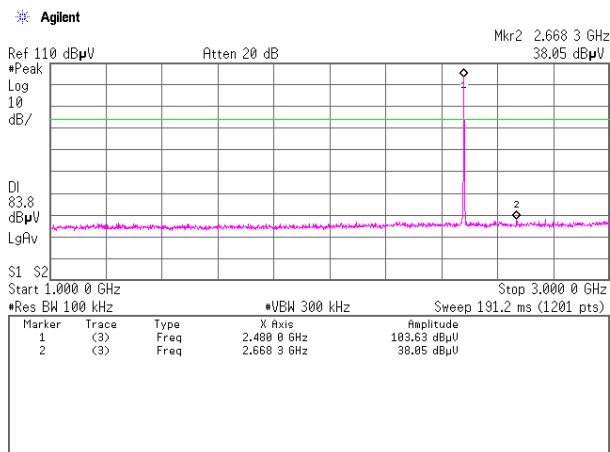
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2.

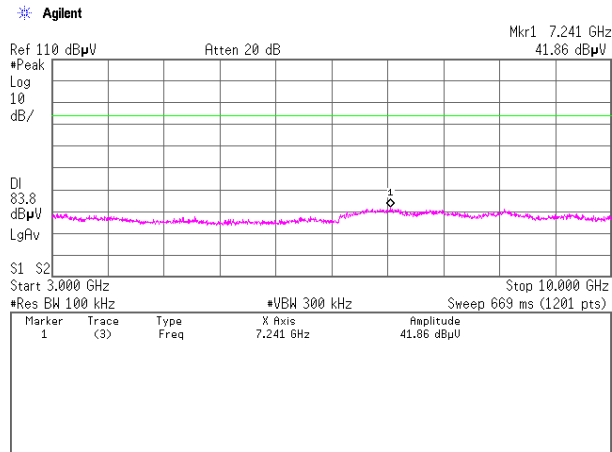


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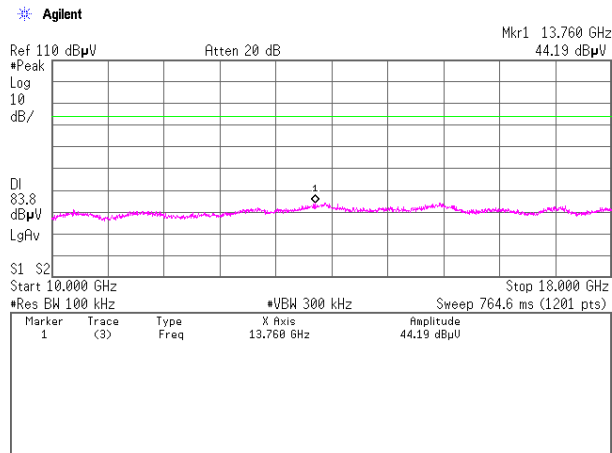


[Transmitting 3DH5]  
Ch:2480MHz

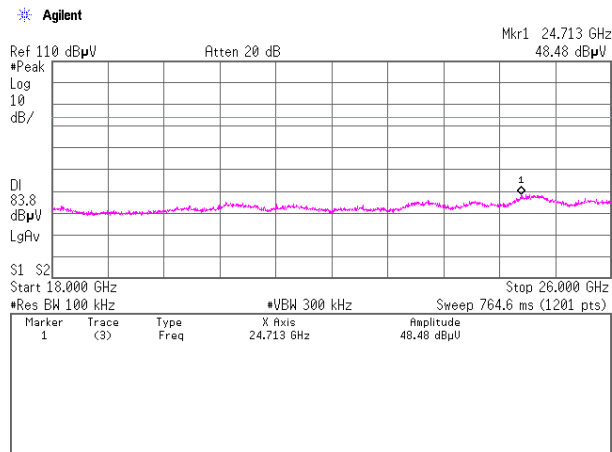
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5.

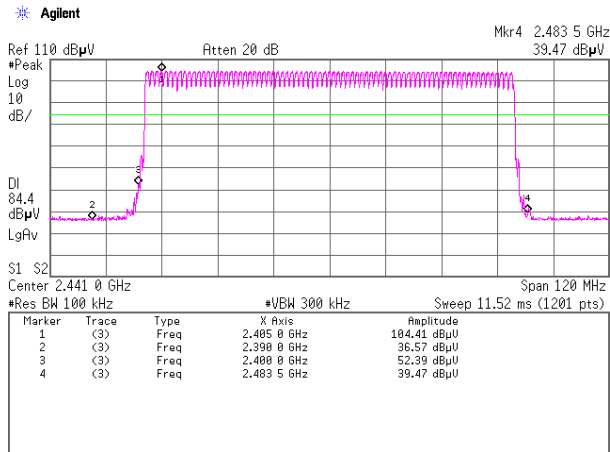


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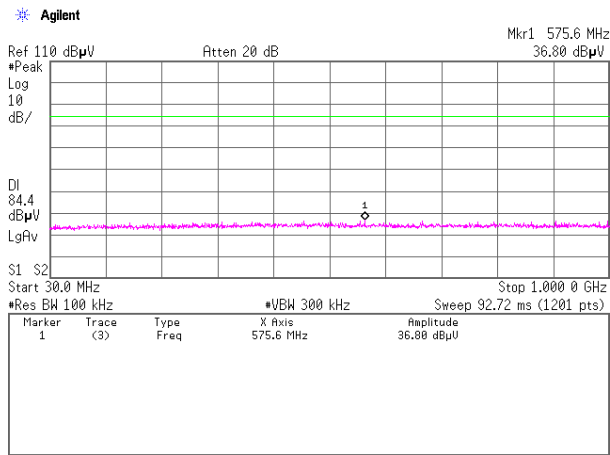


[Transmitting 3DH5]  
Hopping

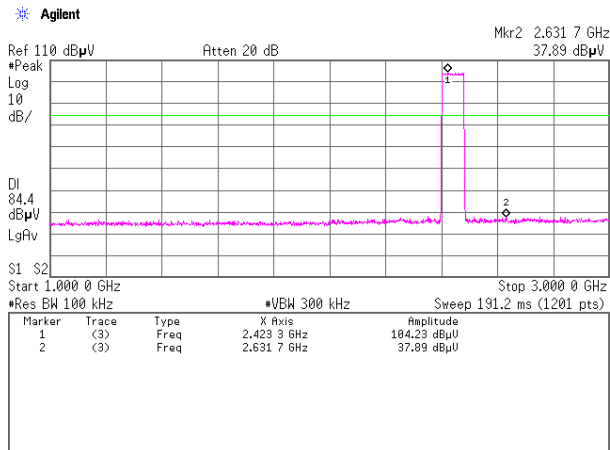
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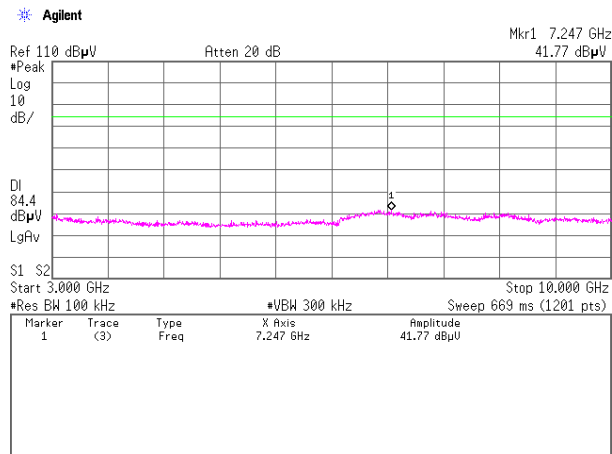


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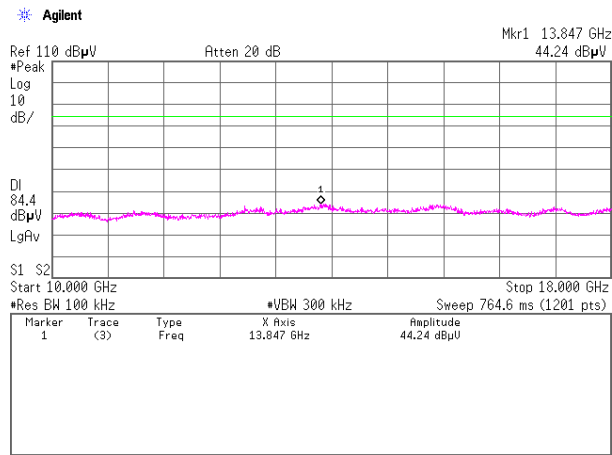


[Transmitting 3DH5]  
Hopping

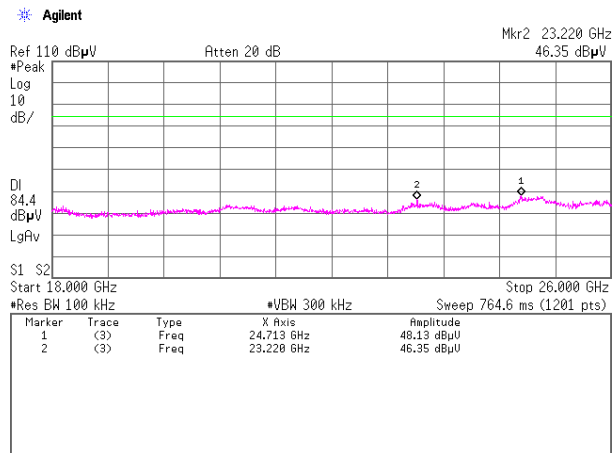
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5.



6.





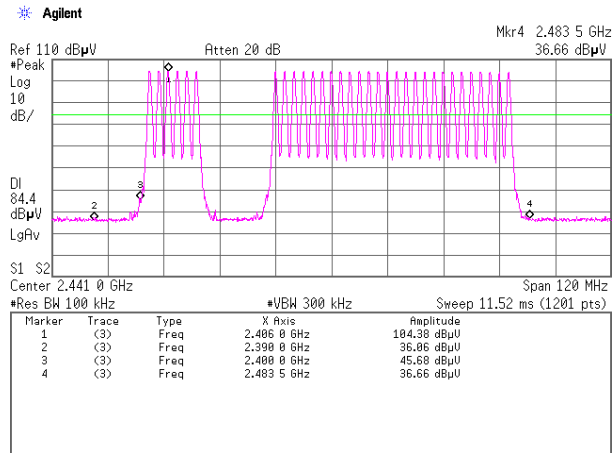
UL Japan, Inc. Yamakita EMC lab.  
 Date:  
 Temp./Humid.:  
 Engineer:  
 Test mode:

No.4 shielded room  
 2009/09/09  
 22 deg. C. / 64 %  
 Akira Sato  
 Transmitting (Inquiry)

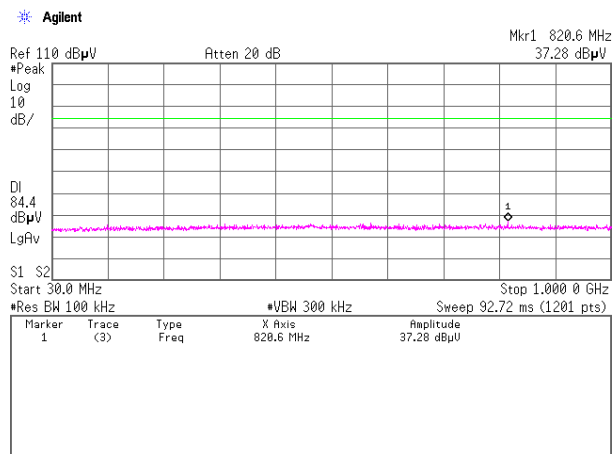
[Transmitting]

Inquiry

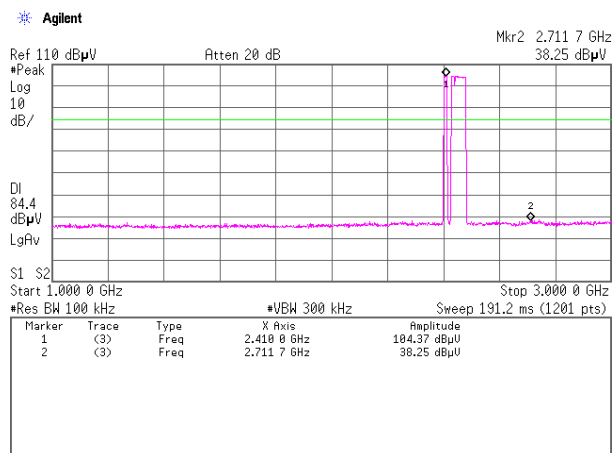
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2.

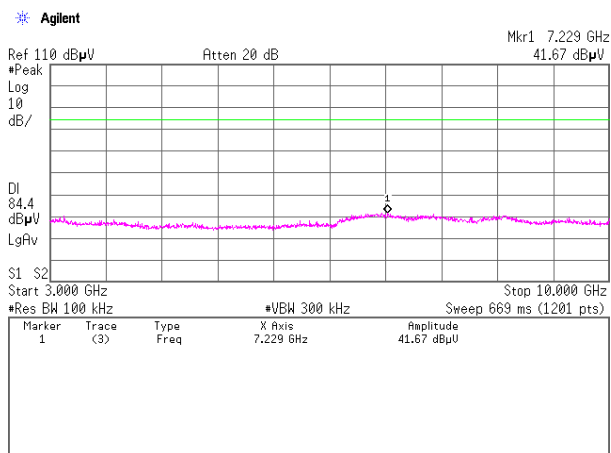


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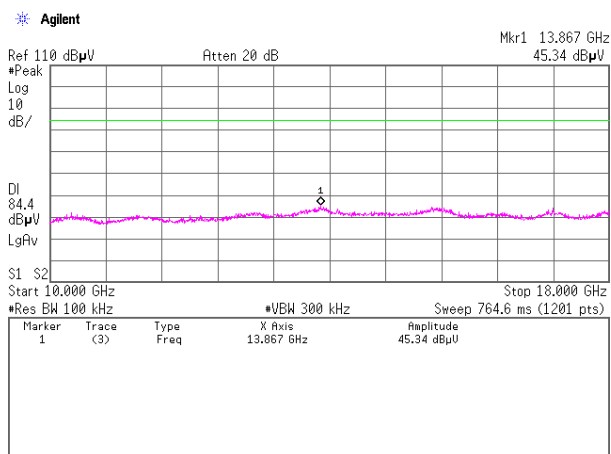


[Transmitting]  
Inquiry

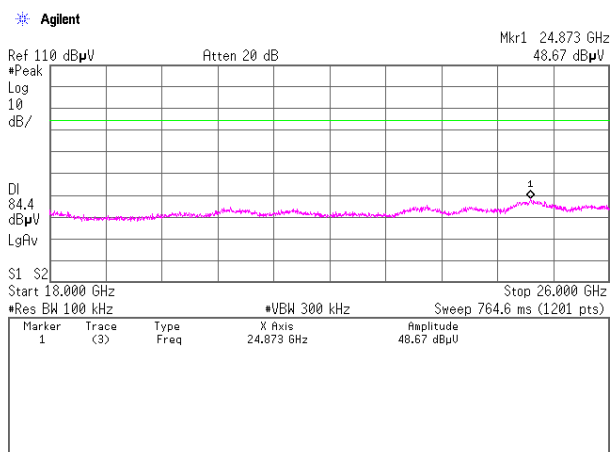
4.



5.



6.



# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.63	BB	38.5	34.7	16.2	28.1	4.6	6.1	37.3	33.5	46.0	8.7	12.5
2.	614.40	BB	42.6	42.0	19.6	29.2	6.2	6.1	45.3	44.7	46.0	0.7	1.3
3.	737.26	BB	33.0	33.1	21.1	29.2	6.9	6.1	37.9	38.0	46.0	8.1	8.0
4.	860.15	BB	30.8	33.8	22.1	28.9	7.5	6.1	37.6	40.6	46.0	8.4	5.4

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.63	BB	38.3	35.8	16.2	28.1	4.6	6.1	37.1	34.6	46.0	8.9	11.4
2.	614.40	BB	38.1	40.1	19.6	29.2	6.2	6.1	40.8	42.8	46.0	5.2	3.2
3.	737.26	BB	33.5	33.5	21.1	29.2	6.9	6.1	38.4	38.4	46.0	7.6	7.6
4.	860.15	BB	31.4	32.5	22.1	28.9	7.5	6.1	38.2	39.3	46.0	7.8	6.7

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.64	BB	39.1	35.2	16.2	28.1	4.6	6.1	37.9	34.0	46.0	8.1	12.0
2.	614.39	BB	38.0	40.3	19.6	29.2	6.2	6.1	40.7	43.0	46.0	5.3	3.0
3.	737.28	BB	33.0	33.1	21.1	29.2	6.9	6.1	37.9	38.0	46.0	8.1	8.0
4.	860.14	BB	30.8	30.5	22.1	28.9	7.5	6.1	37.6	37.3	46.0	8.4	8.7

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.69	BB	52.3	59.6	24.6	37.7	4.6	0.0	43.8	51.1	74.0	30.2	22.9
2.	2390.00	BB	43.0	42.5	28.0	36.5	7.2	0.0	41.7	41.2	74.0	32.3	32.8
3.	2400.00	BB	55.6	54.9	28.0	36.5	7.2	0.0	54.3	53.6	74.0	19.7	20.4
4.	4804.00	BB	42.2	43.0	32.2	36.2	8.4	0.0	46.6	47.4	74.0	27.4	26.6
5.	7206.00	BB	40.0	40.7	36.6	36.2	9.0	0.0	49.4	50.1	74.0	24.6	23.9
6.	9608.00	BB	41.7	41.9	38.8	36.3	10.0	0.0	54.2	54.4	74.0	19.8	19.6
7.	12010.00	BB	42.0	42.6	38.7	35.6	10.7	0.0	55.8	56.4	74.0	18.2	17.6

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(AV Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.69	BB	38.2	42.1	24.6	37.7	4.6	0.0	29.7	33.6	54.0	24.3	20.4
2.	2390.00	BB	32.1	32.2	28.0	36.5	7.2	0.0	30.8	30.9	54.0	23.2	23.1
3.	2400.00	BB	49.8	48.5	28.0	36.5	7.2	0.0	48.5	47.2	54.0	5.5	6.8
4.	4804.00	BB	32.9	33.9	32.2	36.2	8.4	0.0	37.3	38.3	54.0	16.7	15.7
5.	7206.00	BB	29.7	30.4	36.6	36.2	9.0	0.0	39.1	39.8	54.0	14.9	14.2
6.	9608.00	BB	31.0	31.2	38.8	36.3	10.0	0.0	43.5	43.7	54.0	10.5	10.3
7.	12010.00	BB	32.1	32.2	38.7	35.6	10.7	0.0	45.9	46.0	54.0	8.1	8.0

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)

■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	1086.70	BB	57.1	60.6	24.6	37.7	4.6	0.0	48.6	52.1	74.0	25.4	21.9	
2.	4882.00	BB	41.1	43.1	32.2	36.1	8.4	0.0	45.6	47.6	74.0	28.4	26.4	
3.	7323.00	BB	40.7	41.5	36.9	36.3	9.0	0.0	50.3	51.1	74.0	23.7	22.9	
4.	9764.00	BB	40.8	41.5	38.9	36.2	10.1	0.0	53.6	54.3	74.0	20.4	19.7	
5.	12205.00	BB	43.2	43.1	39.0	35.2	10.7	0.0	57.7	57.6	74.0	16.3	16.4	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) / KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)



# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209 (AV Detection) 1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB μ V/m]	VER	HOR [dB]	VER
1.	1086.70	BB	38.5	43.4	24.6	37.7	4.6	0.0	30.0	34.9	54.0	24.0	19.1	
2.	4882.00	BB	31.5	32.1	32.2	36.1	8.4	0.0	36.0	36.6	54.0	18.0	17.4	
3.	7323.00	BB	30.6	30.7	36.9	36.3	9.0	0.0	40.2	40.3	54.0	13.8	13.7	
4.	9764.00	BB	30.5	30.7	38.9	36.2	10.1	0.0	43.3	43.5	54.0	10.7	10.5	
5.	12205.00	BB	32.2	32.4	39.0	35.2	10.7	0.0	46.7	46.9	54.0	7.3	7.1	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) / KHA-04 (18-26GHz)

■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.86	BB	56.4	60.5	24.6	37.7	4.6	0.0	47.9	52.0	74.0	26.1	22.0
2.	2483.50	BB	42.9	44.1	28.0	36.5	7.3	0.0	41.7	42.9	74.0	32.3	31.1
3.	4960.00	BB	41.0	42.0	32.3	36.1	8.5	0.0	45.7	46.7	74.0	28.3	27.3
4.	7440.00	BB	41.5	41.1	37.2	36.3	9.0	0.0	51.4	51.0	74.0	22.6	23.0
5.	9920.00	BB	41.1	41.1	39.1	36.2	10.1	0.0	54.1	54.1	74.0	19.9	19.9
6.	12400.00	BB	42.9	42.4	39.3	34.9	10.7	0.0	58.0	57.5	74.0	16.0	16.5

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(AV Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	1086.86	BB	39.1	41.4	24.6	37.7	4.6	0.0	30.6	32.9	54.0	23.4	21.1	
2.	2483.50	BB	36.6	37.6	28.0	36.5	7.3	0.0	35.4	36.4	54.0	18.6	17.6	
3.	4960.00	BB	31.5	31.9	32.3	36.1	8.5	0.0	36.2	36.6	54.0	17.8	17.4	
4.	7440.00	BB	30.8	30.7	37.2	36.3	9.0	0.0	40.7	40.6	54.0	13.3	13.4	
5.	9920.00	BB	30.3	30.5	39.1	36.2	10.1	0.0	43.3	43.5	54.0	10.7	10.5	
6.	12400.00	BB	32.2	32.1	39.3	34.9	10.7	0.0	47.3	47.2	54.0	6.7	6.8	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz 3DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.65	BB	37.8	35.2	16.2	28.1	4.6	6.1	36.6	34.0	46.0	9.4	12.0
2.	614.39	BB	38.4	40.5	19.6	29.2	6.2	6.1	41.1	43.2	46.0	4.9	2.8
3.	737.28	BB	33.2	33.4	21.1	29.2	6.9	6.1	38.1	38.3	46.0	7.9	7.7
4.	860.15	BB	31.3	32.1	22.1	28.9	7.5	6.1	38.1	38.9	46.0	7.9	7.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz 3DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.63	BB	38.0	35.1	16.2	28.1	4.6	6.1	36.8	33.9	46.0	9.2	12.1
2.	614.40	BB	38.2	40.8	19.6	29.2	6.2	6.1	40.9	43.5	46.0	5.1	2.5
3.	737.26	BB	32.8	33.0	21.1	29.2	6.9	6.1	37.7	37.9	46.0	8.3	8.1
4.	860.15	BB	31.3	29.5	22.1	28.9	7.5	6.1	38.1	36.3	46.0	7.9	9.7

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz 3DH5)  
 Remarks : Hor:Ant X, Mod Y/Ver:Ant X, Mod Y  
 Date : 9/8/2009  
 Test Distance : 3 m  
 Temperature : 22 °C  
 Humidity : 61 %  
 Limit : FCC Part15C § 15.209

Engineer : Minoru Nakatake

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	368.63	BB	37.7	34.4	16.2	28.1	4.6	6.1	36.5	33.2	46.0	9.5	12.8
2.	614.40	BB	37.9	40.8	19.6	29.2	6.2	6.1	40.6	43.5	46.0	5.4	2.5
3.	737.26	BB	32.7	33.3	21.1	29.2	6.9	6.1	37.6	38.2	46.0	8.4	7.8
4.	860.15	BB	32.4	32.3	22.1	28.9	7.5	6.1	39.2	39.1	46.0	6.8	6.9

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz  
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.90	BB	56.6	60.5	24.6	37.7	4.6	0.0	48.1	52.0	74.0	25.9	22.0
2.	2390.00	BB	41.9	42.4	28.0	36.5	7.2	0.0	40.6	41.1	74.0	33.4	32.9
3.	2400.00	BB	55.5	55.4	28.0	36.5	7.2	0.0	54.2	54.1	74.0	19.8	19.9
4.	4804.00	BB	42.0	42.2	32.2	36.2	8.4	0.0	46.4	46.6	74.0	27.6	27.4
5.	7206.00	BB	40.3	40.8	36.6	36.2	9.0	0.0	49.7	50.2	74.0	24.3	23.8
6.	9608.00	BB	41.1	41.6	38.8	36.3	10.0	0.0	53.6	54.1	74.0	20.4	19.9
7.	12010.00	BB	42.1	42.3	38.7	35.6	10.7	0.0	55.9	56.1	74.0	18.1	17.9

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA : KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE : KCC-D13/D16 ■ AMP : KAF-02 (8449B) ■ SPECTRUMANALYZER : KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2402MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15.209(AV Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.90	BB	39.4	41.2	24.6	37.7	4.6	0.0	30.9	32.7	54.0	23.1	21.3
2.	2390.00	BB	32.9	33.1	28.0	36.5	7.2	0.0	31.6	31.8	54.0	22.4	22.2
3.	2400.00	BB	52.8	53.4	28.0	36.5	7.2	0.0	51.5	52.1	54.0	2.5	1.9
4.	4804.00	BB	32.2	33.5	32.2	36.2	8.4	0.0	36.6	37.9	54.0	17.4	16.1
5.	7206.00	BB	30.5	30.5	36.6	36.2	9.0	0.0	39.9	39.9	54.0	14.1	14.1
6.	9608.00	BB	30.9	31.1	38.8	36.3	10.0	0.0	43.4	43.6	54.0	10.6	10.4
7.	12010.00	BB	31.9	31.9	38.7	35.6	10.7	0.0	45.7	45.7	54.0	8.3	8.3

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA : KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE : KCC-D13/D16 ■ AMP : KAF-02 (8449B) ■ SPECTRUMANALYZER : KSA-04 (R3271A)



# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	1086.86	BB	57.5	60.4	24.6	37.7	4.6	0.0	49.0	51.9	74.0	25.0	22.1	
2.	4882.00	BB	41.9	41.6	32.2	36.1	8.4	0.0	46.4	46.1	74.0	27.6	27.9	
3.	7323.00	BB	40.9	41.3	36.9	36.3	9.0	0.0	50.5	50.9	74.0	23.5	23.1	
4.	9764.00	BB	41.4	41.5	38.9	36.2	10.1	0.0	54.2	54.3	74.0	19.8	19.7	
5.	12205.00	BB	42.6	42.8	39.0	35.2	10.7	0.0	57.1	57.3	74.0	16.9	16.7	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) / KHA-04 (18-26GHz)

■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2441MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209 (AV Detection) 1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	1086.86	BB	39.3	42.0	24.6	37.7	4.6	0.0	30.8	33.5	54.0	23.2	20.5	
2.	4882.00	BB	32.2	32.1	32.2	36.1	8.4	0.0	36.7	36.6	54.0	17.3	17.4	
3.	7323.00	BB	30.7	30.6	36.9	36.3	9.0	0.0	40.3	40.2	54.0	13.7	13.8	
4.	9764.00	BB	30.7	30.7	38.9	36.2	10.1	0.0	43.5	43.5	54.0	10.5	10.5	
5.	12205.00	BB	32.2	32.1	39.0	35.2	10.7	0.0	46.7	46.6	54.0	7.3	7.4	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) / KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/PK:RBW=1MHz, VBW=1MHz  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(PK Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	1086.92	BB	56.7	60.9	24.6	37.7	4.6	0.0	48.2	52.4	74.0	25.8	21.6
2.	2483.50	BB	42.7	42.9	28.0	36.5	7.3	0.0	41.5	41.7	74.0	32.5	32.3
3.	4960.00	BB	42.0	42.0	32.3	36.1	8.5	0.0	46.7	46.7	74.0	27.3	27.3
4.	7440.00	BB	41.6	41.2	37.2	36.3	9.0	0.0	51.5	51.1	74.0	22.5	22.9
5.	9920.00	BB	41.3	41.2	39.1	36.2	10.1	0.0	54.3	54.2	74.0	19.7	19.8
6.	12400.00	BB	43.0	42.7	39.3	34.9	10.7	0.0	58.1	57.8	74.0	15.9	16.2

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

# Data of Radiated Disturbance Test

UL Japan, Inc.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 29LE0246-YK-01

Applicant : ALPINE ELECTRONICS, INC.  
 Kind of Equipment : BLUETOOTH MODULE  
 Model No. : IAM2.1 BT PWB US  
 Serial No. : 6  
 Power : DC12V  
 Mode : Transmitting (2480MHz 3DH5)  
 Remarks : Hor:Ant X, Mod X/Ver:AntY, Mod X/AV:RBW=1MHz, VBW=300Hz (No. 1:10Hz)  
 Date : 9/7/2009  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 62 %  
 Limit : FCC Part15C § 15. 209(AV Detection)1-26GHz:3m  
 Engineer : Yasumasa Owaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	1086.92	BB	38.9	41.5	24.6	37.7	4.6	0.0	30.4	33.0	54.0	23.6	21.0	
2.	2483.50	BB	34.5	35.7	28.0	36.5	7.3	0.0	33.3	34.5	54.0	20.7	19.5	
3.	4960.00	BB	31.4	32.2	32.3	36.1	8.5	0.0	36.1	36.9	54.0	17.9	17.1	
4.	7440.00	BB	30.7	30.8	37.2	36.3	9.0	0.0	40.6	40.7	54.0	13.4	13.3	
5.	9920.00	BB	30.4	30.5	39.1	36.2	10.1	0.0	43.4	43.5	54.0	10.6	10.5	
6.	12400.00	BB	32.3	32.2	39.3	34.9	10.7	0.0	47.4	47.3	54.0	6.6	6.7	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

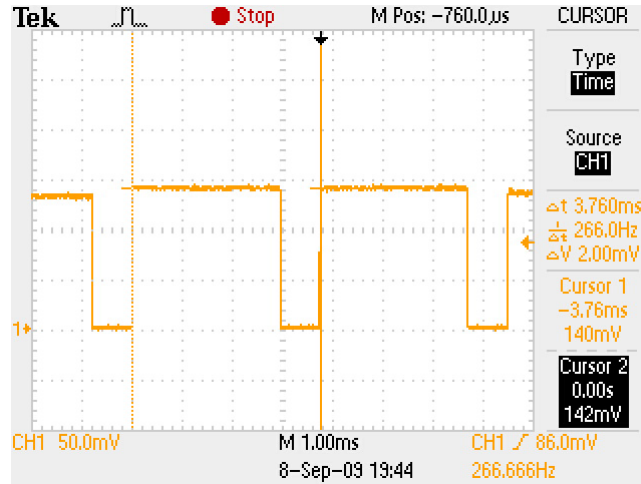
■ ANTENNA: KHA-02 (1-18GHz) /KHA-04 (18-26GHz)  
 ■ CABLE: KCC-D13/D16 ■ AMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KSA-04 (R3271A)

### Duty Cycle

UL Japan, Inc. Yamakita EMC lab.  
 Date:  
 Temp./Humid.:  
 Engineer:  
 Test mode:

No.4 shielded room  
 2009/09/08  
 23 deg. C. / 50 %  
 Akira Sato  
 Transmitting

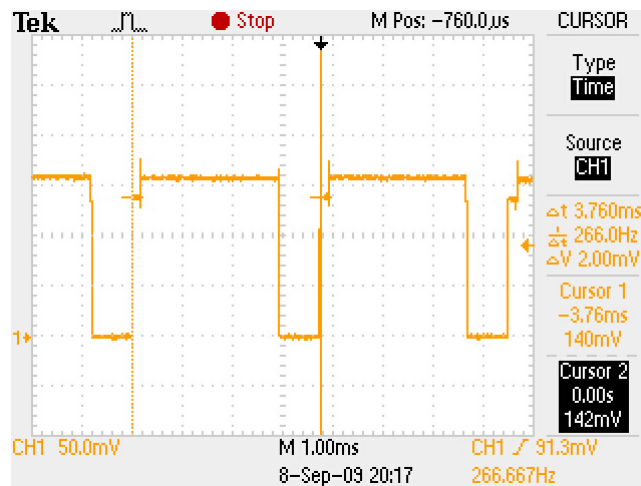
[DH5]



Duty Cycle: 3.76ms

AV Detector VBW:  $1000 / 3.76\text{ms} = 266.0\text{Hz} \rightarrow 300\text{Hz}$

[3DH5]



Duty Cycle: 3.76ms

AV Detector VBW:  $1000 / 3.76\text{ms} = 266.0\text{Hz} \rightarrow 300\text{Hz}$

- \* All the measured noise was pulse emission.
- \* Duty cycle was within 100msec.

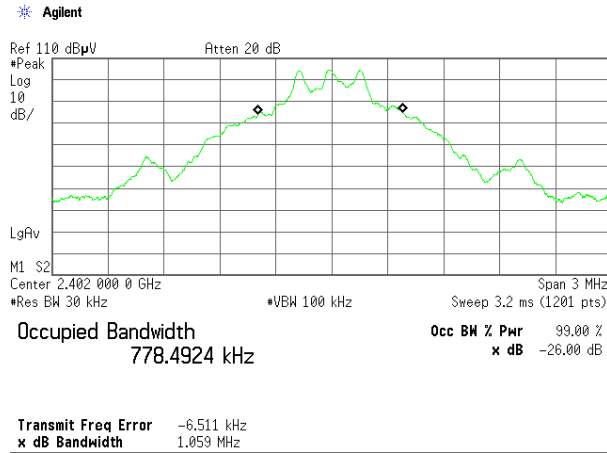
This purpose of the Duty Cycle calculation measures the pulse timing that we ensure Spectrum Analyzer can detect the pulse emission correctly. Therefore, if the pulse train can happen by 50msec(20Hz) or less, the average value measurement by setting the repetition frequency is done more correctly than VBW=10Hz that DA 00-705 accepts for AV detect. For instance, if pulse cycle is every 10msec, we set VBW = 100Hz(=1000/10) in order not to overlook a pulse unexpectedly.

**Occupied Bandwidth (99%) (Regulation: RSS-Gen 4.6.1)**

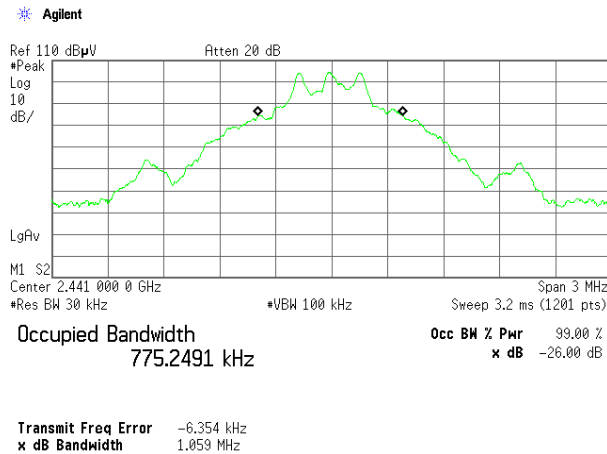
UL Japan, Inc. Yamakita EMC lab. No.4 shielded room  
 Date: 2009/09/09  
 Temp: 22 deg. C.  
 Humid: 64 %  
 Engineer: Akira Sato  
 Test mode: Transmitting

[Hopping off, DHS]

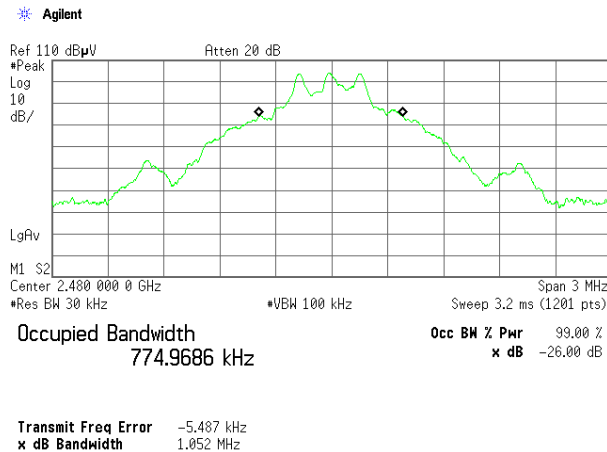
1. ch : 2402MHz/Occupied Bandwidth: 778.4924kHz



2. ch : 2441MHz/Occupied Bandwidth: 775.2491kHz

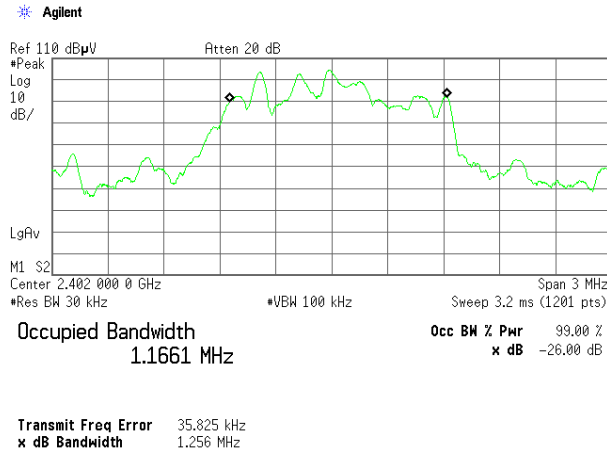


3. ch : 2480MHz/Occupied Bandwidth: 774.9686kHz

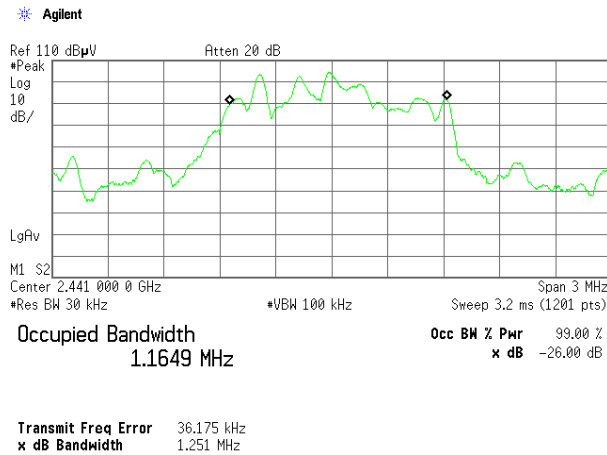


[Hopping off, 3DH5]

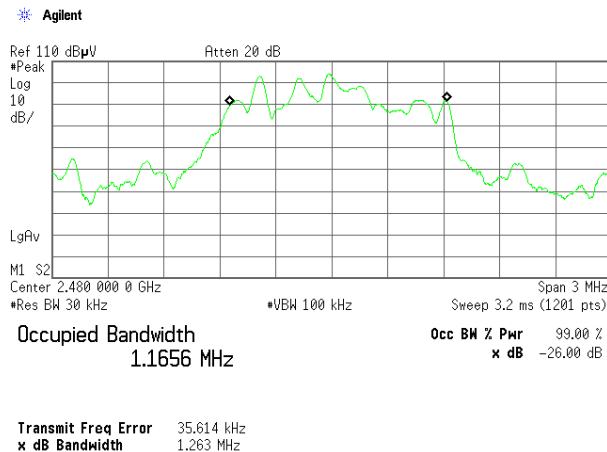
4. ch : 2402MHz/Occupied Bandwidth: 1.1661MHz



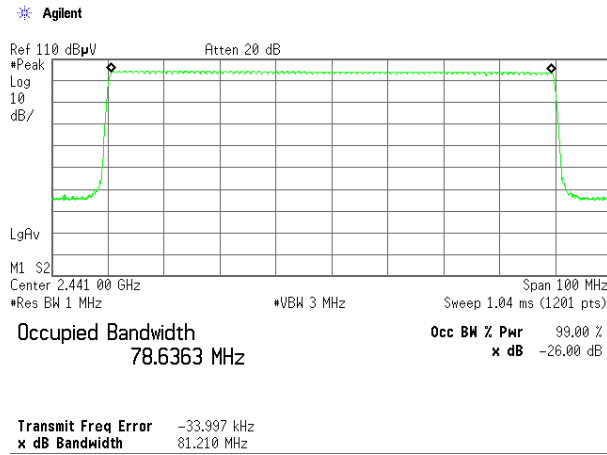
5. ch : 2441MHz/Occupied Bandwidth: 1.1649MHz



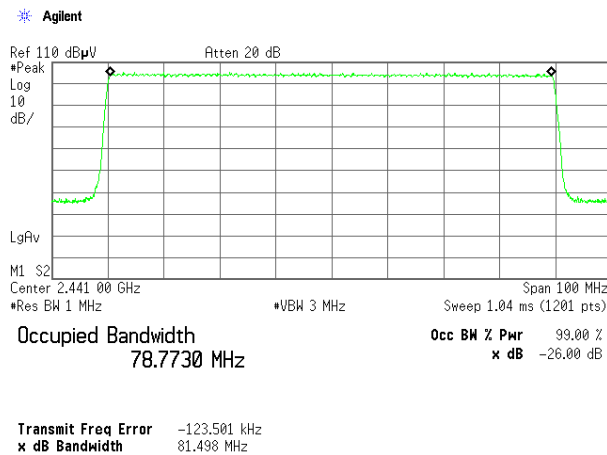
6. ch : 2480MHz/Occupied Bandwidth: 1.1656MHz



**7. Hopping, DH5/Occupied Bandwidth: 78.6363MHz**



**8. Hopping, 3DH5/Occupied Bandwidth: 78.7730MHz**





**APPENDIX 3**  
**Test Instruments**

**EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CUST-YA-RE	Radiated emission(software)	UL Japan	RE(Ver.1.9)	-	RE	-
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	1	RE	2009/08/20 * 12
KAF-05	Pre Amplifier	Agilent	8447D	2944A10150	RE	2009/03/27 * 12
KAT6-01	Attenuator	INMET	18N-6dB	-	RE	2009/03/10 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1926	RE	2008/12/28 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	170	RE	2008/12/28 * 12
KCC-30/31/32 /34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	-/01055	RE	2008/10/22 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	95060087	RE	2009/09/15 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	3008A01268	RE	2009/04/24 * 12
KCC-D13/D16	Coaxial cable	Suhner/INSULATED WIRE INC	SUCOFLEX104/KP S-1501-200-KPS	200723/4 /04202005	RE	2009/04/27 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	230	RE	2009/04/24 * 12
KHA-04	Horn Antenna	EMCO	3160-09	1278	RE	2009/04/24 * 12
KPM-08	Power meter	Anritsu	ML2495A	6K00003356	AT 5	2008/10/02 * 12
KPSS-04	Power sensor	Anritsu	MA2411B	012088	AT 5	2008/10/02 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT 1,2,3,4,6	2009/01/22 * 12
KCC-D20	Coaxial Cable	SUHNER	SUCOFLEX102	31110/2	AT 1,2,3,4,6,7	2009/07/30 * 12
KCC-D22	Microwave Cable	Hirose Electric	U.FL-2LP-066J1-A-(200)	-	AT all	Pre Check
KOSC-01	Oscilloscope	Tektronix	TDS-2022B	C050588	AT 7	2009/05/20 * 12
KOS-07	Humidity Indicator	Custom	CTH-190	K-07	AT all	2009/07/29 * 12
KOS-02	Humidity Indicator	Custom	CTH-190	K-02	RE	2009/07/23 * 12
KJM-07	Measure	KOMELON	KMC-36	-	RE	-
KDT-01	Coaxial Crystal Detector	Agilent	8473C	1822A05320	AT 7	Pre Check
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	825475/006	RE	2009/03/03 * 12

The expiration date of the calibration is the end of the expired month .

As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with traceable calibrations . Each calibration is traceable to the national or international standards.

Test Item :

- RE: Out of Band Emission (Radiated)
- AT: Antenna terminal conducted test
  - 1: Carrier Frequency Separation
  - 2: 20dB Bandwidth
  - 3: Number of Hopping Frequency
  - 4: Dwell time
  - 5: Maximum Peak Output Power
  - 6: Out of Band Emission (Conducted)
  - 7: Duty cycle