

APPENDIX 2: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2006/06/23 17:01:18

Applicant

Kind of EUT

Model No.

Serial No.

: KEYENCE CORPORATION

: Wireless Barcode Reader (Scanner)

: BL-N90

: 5606300483

Report No.

Power

Temp./Humi.

Operator

: 26KE0058-HO

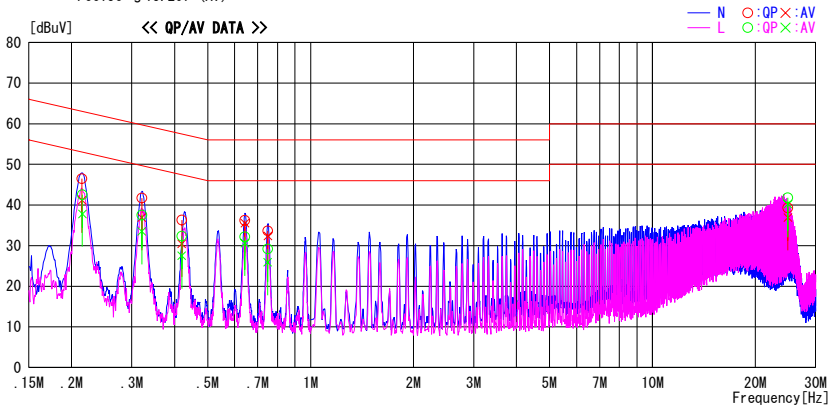
: AC 120V / 60Hz (Cradle)

: 25deg.C / 62%

: Hiroka Umeyama

Mode / Remarks : Transmitting-Receiving

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



Frequency	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP	AV		QP	AV	QP	AV	QP	AV	
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	
0.21447	46.3	41.0	0.2	46.5	41.2	63.0	53.0	16.5	11.8	N
0.32080	41.5	36.7	0.2	41.7	36.9	59.7	49.7	18.0	12.8	N
0.41990	36.1	30.2	0.2	36.3	30.4	57.5	47.5	21.2	17.1	N
0.64233	35.9	35.2	0.3	36.2	35.5	56.0	46.0	19.8	10.5	N
0.74935	33.3	32.1	0.3	33.6	32.4	56.0	46.0	22.4	13.6	N
24.87000	37.5	35.1	1.8	39.3	36.9	60.0	50.0	20.7	13.1	N
0.21510	42.3	37.6	0.2	42.5	37.8	63.0	53.0	20.5	15.2	L
0.32080	37.3	33.3	0.2	37.5	33.5	59.7	49.7	22.2	16.2	L
0.41990	32.1	27.3	0.2	32.3	27.5	57.5	47.5	25.2	20.0	L
0.64269	31.9	30.3	0.3	32.2	30.6	56.0	46.0	23.8	15.4	L
0.74897	28.9	25.6	0.3	29.2	25.9	56.0	46.0	26.8	20.1	L
24.87000	40.0	38.4	1.8	41.8	40.2	60.0	50.0	18.2	9.8	L

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

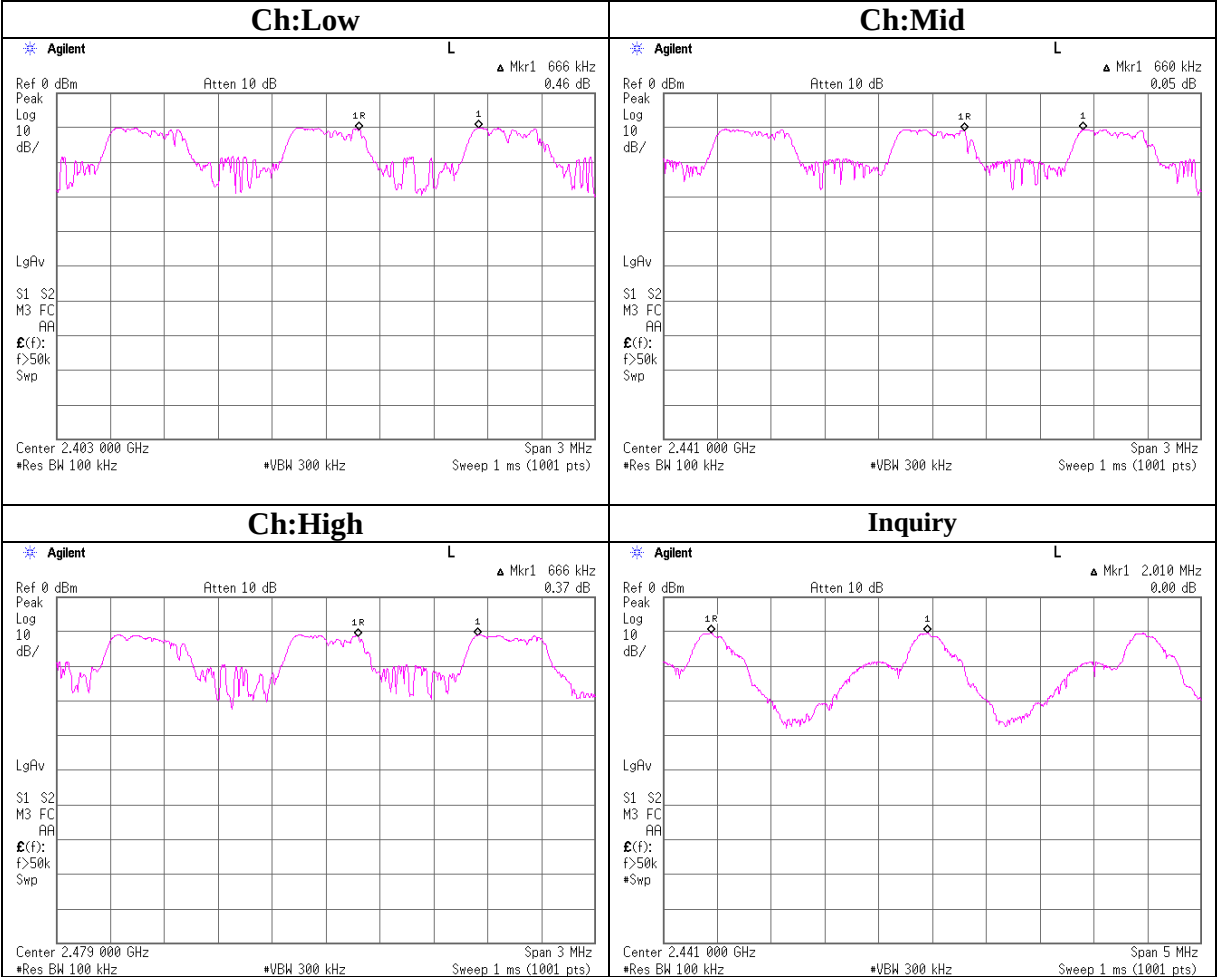
Carrier Frequency Separation

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

COMPANY	:	KEYENCE CORPORATION	REGULATION	:	FCC Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Wireless Barcode Reader (Scanner)	TEST DISTANCE	:	-
MODEL	:	BL-N90	DATE	:	08/30/2006
S/ N	:	000ca7003bc	TEMPERATURE	:	24deg.C
POWER	:	DC5.2V	HUMIDITY	:	67%
MODE	:	Tx(Hopping on)/Inquiry	ENGINEER	:	Hiroka Umeyama

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	0.666	>0.606 (two-thirds of 0.909 [MHz] (20dB Bandwidth))
Mid	2441.0	0.660	>0.632(two-thirds of 0.948 [MHz] (20dB Bandwidth))
High	2480.0	0.666	>0.640(two-thirds of 0.960 [MHz] (20dB Bandwidth))
Inquiry	2441.0	2.010	>0.738(two-thirds of 1.107 [MHz] (20dB Bandwidth))

Carrier Frequency Separation



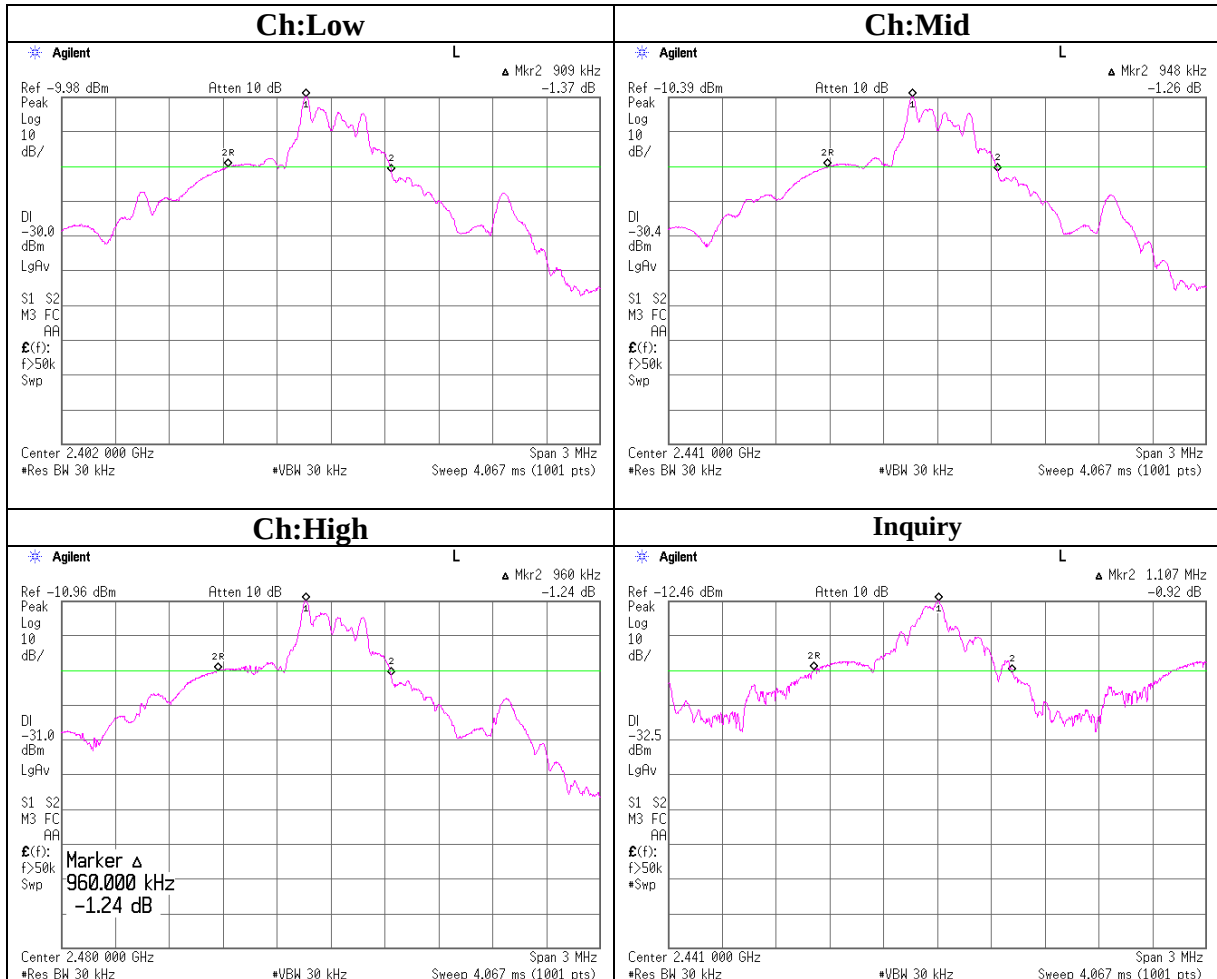
20dB Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

COMPANY	: KEYENCE CORPORATION	REGULATION	: FCC Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Wireless Barcode Reader (Scanner)	TEST DISTANCE	: -
MODEL	: BL-N90	DATE	: 08/30/2006
S/ N	: 000ca7003bc	TEMPERATURE	: 24deg.C
POWER	: DC5.2V	HUMIDITY	: 67%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.909	-
Mid	2441.0	0.948	-
High	2480.0	0.960	-
Inquiry	2441.0	1.107	-

20dB Bandwidth



Number of Hopping Frequency

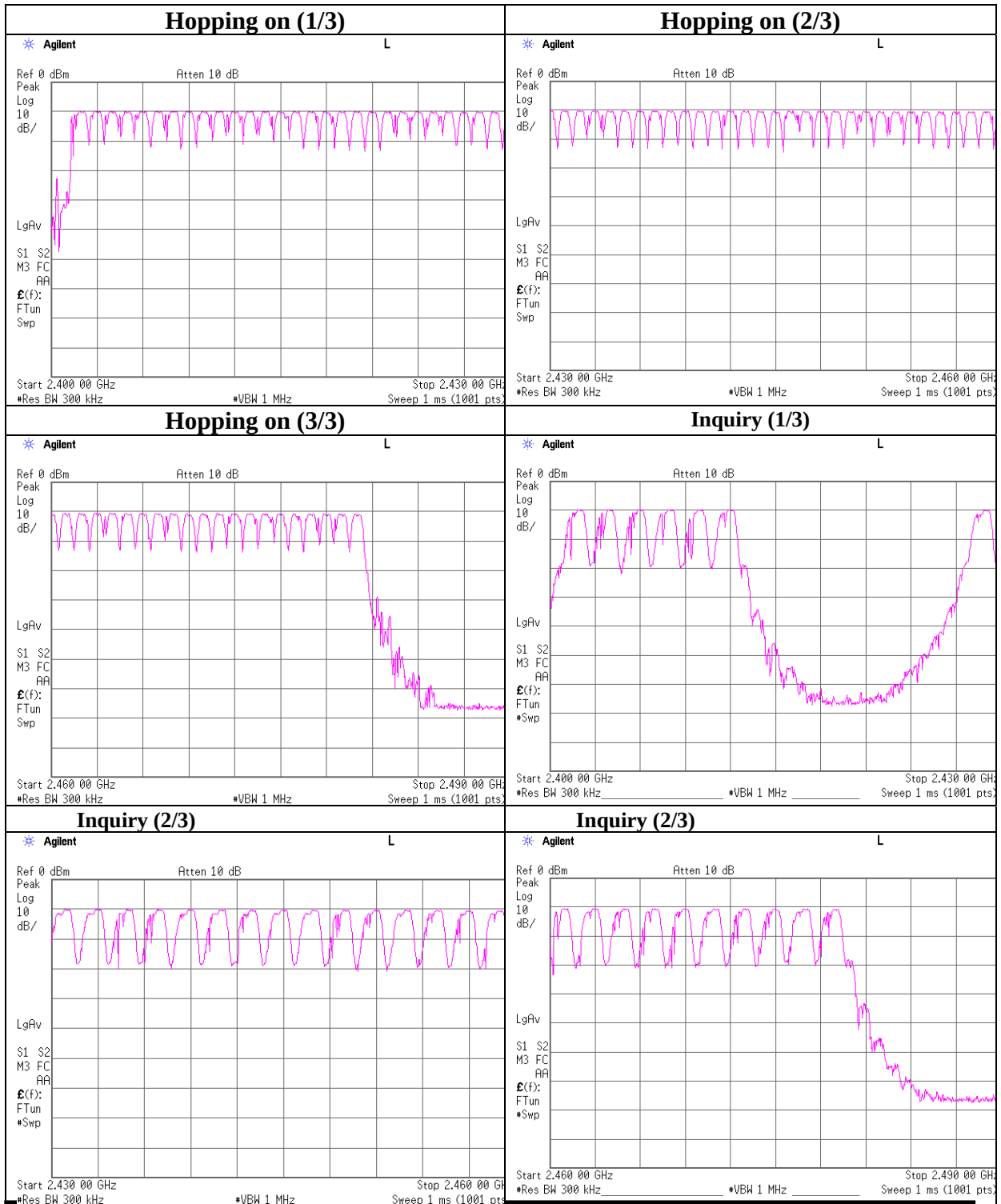
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

COMPANY : KEYENCE CORPORATION REGULATION : FCC Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT : Wireless Barcode Reader (Scanner) TEST DISTANCE : -
MODEL : BL-N90 DATE : 08/30/2006
S/ N : 000ca7003bc TEMPERATURE : 24deg.C
POWER : DC5.2V HUMIDITY : 67%
MODE : Tx (Hopping off) /Inquiry ENGINEER : Hiroka Umeyama

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	79	≥ 15

Mode	Number of channel	Limit
	[time]	[time]
Inquiry	32	≥ 15

Number of Hopping Frequency



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MF060b(14.06.06)

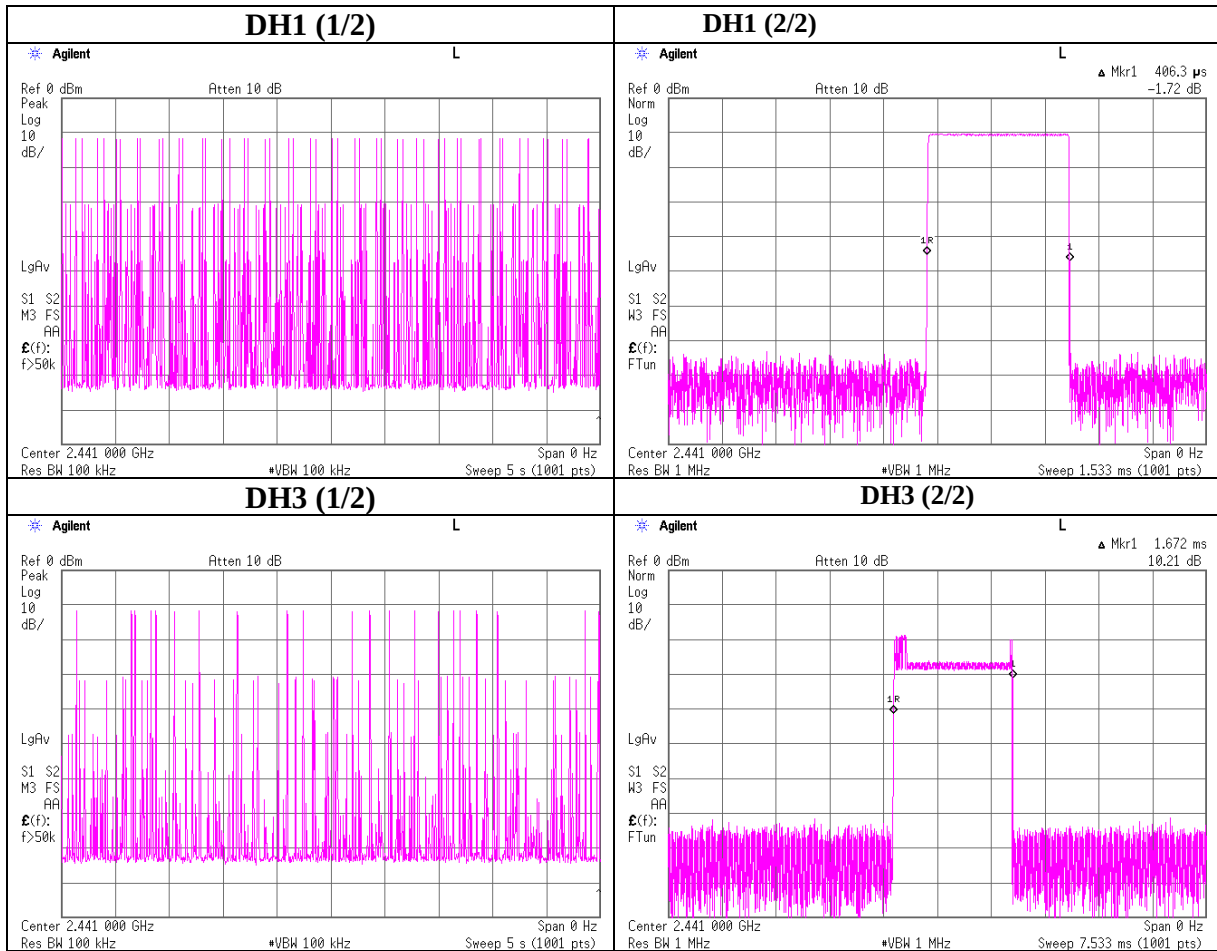
Dwell time

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

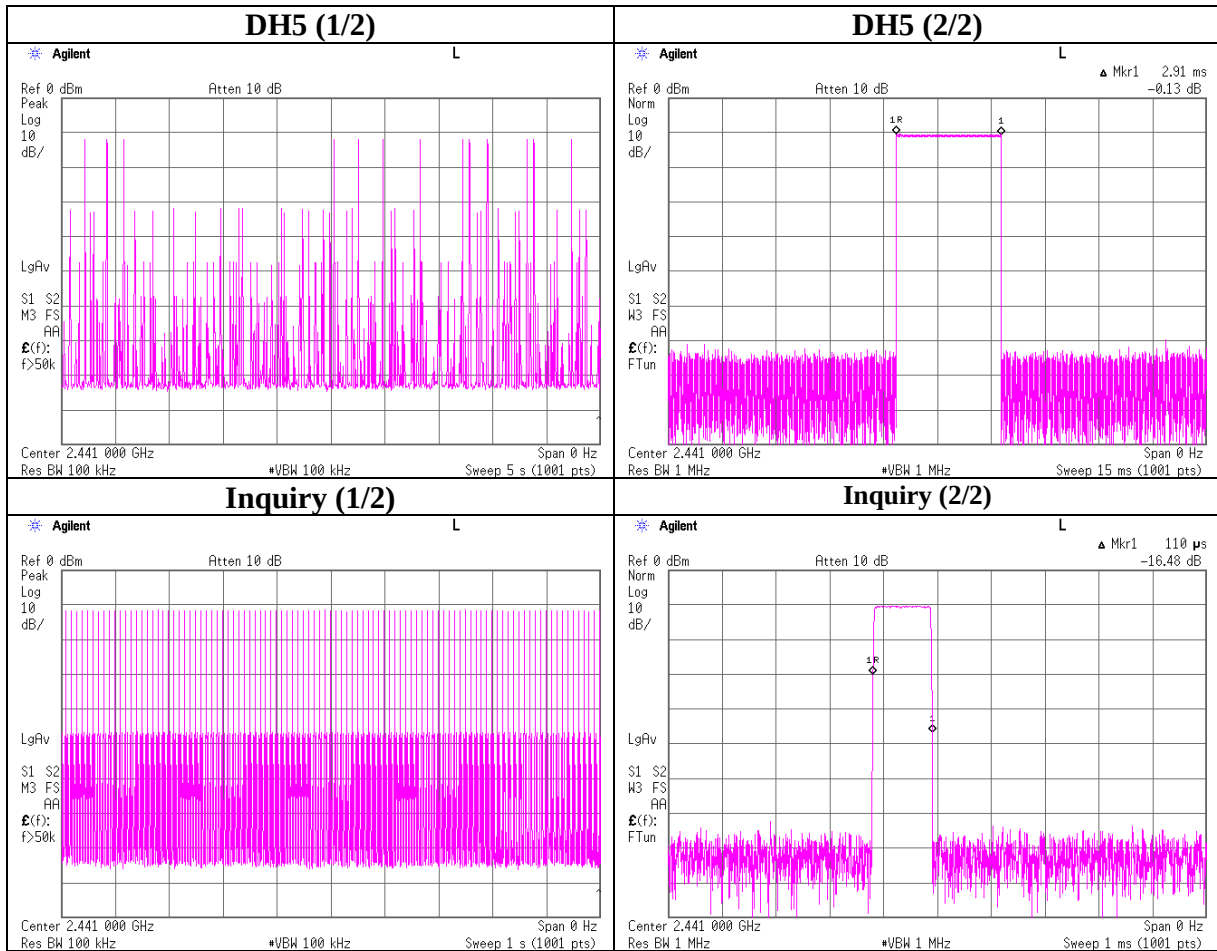
COMPANY : KEYENCE CORPORATION REGULATION : FCC Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT : Wireless Barcode Reader (Scanner) TEST DISTANCE : -
MODEL : BL-N90 DATE : 08/30/2006
S/ N : 000ca7003bc TEMPERATURE : 24deg.C
POWER : DC5.2V HUMIDITY : 67%
MODE : Tx (Hopping off) /Inquiry ENGINEER : Hiroka Umeyama

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50 times / 5 sec. x 31.6 sec. = 316 times	0.406	128	400
DH3	27 times / 5 sec. x 31.6 sec. = 171 times	1.672	285	400
DH5	13 times / 5 sec. x 31.6 sec. = 82 times	2.910	239	400
Inquiry	100 times / 1 sec. x 12.8 sec. = 1280 times	0.110	141	400

Dwell time



Dwell time



Maximum Peak Output Power

UL Apex Co., Ltd.
Head Office EMC Lab. No.7 Shielded Room

COMPANY	: KEYENCE CORPORATION	REGULATION	: FCC Part15 Subpart C 15.247(b)(1)
EQUIPMENT	: Wireless Barcode Reader (Scanner)	TEST DISTANCE	: -
MODEL	: BL-N90	DATE	: 08/30/2006
S/ N	: 000ca7003bc	TEMPERATURE	: 24deg.C
POWER	: DC5.2V	HUMIDITY	: 67%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	-9.80	1.27	10.22	1.69	1.48	20.97	125	19.28
Mid	2441.0	-10.24	1.27	10.22	1.25	1.33	20.97	125	19.72
High	2480.0	-10.81	1.27	10.22	0.68	1.17	20.97	125	20.29
Inquiry	2441.0	-9.82	1.27	10.22	1.67	1.47	20.97	125	19.30

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)+ Attenuator

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Radiated Spurious Emission(below 1GHz)

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

* Each channel L/M/H has the same spurious emission level.

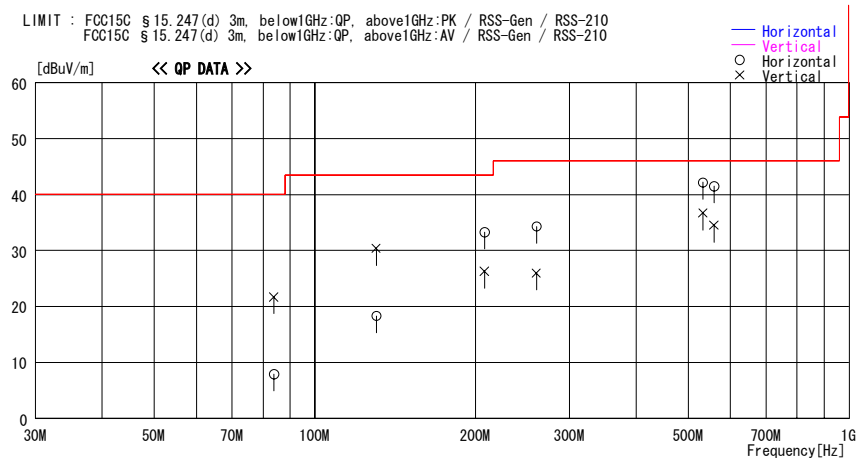
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Date : 2006/08/28 14:44:31

Company : KEYENCE CORPORATION Report No. : 26IE0265-HO
Kind of EUT : Wireless Barcode Reader (Scanner) Power : DC 5.0V
Model No. : BL-N90 Temp./Humi. : 25deg.C./60%
Serial No. : 5606300483 Operator : Hiroka Umeyama

Mode / Remarks : Transmitting, Max-Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK / RSS-Gen / RSS-210
FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:AV / RSS-Gen / RSS-210



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
83.840	24.3	QP	7.8	-24.2	7.9	117	300	Hori.	40.0	32.1
83.840	38.1	QP	7.8	-24.2	21.7	0	100	Vert.	40.0	18.3
130.280	27.5	QP	14.4	-23.6	18.3	40	195	Hori.	43.5	25.2
130.280	39.6	QP	14.4	-23.6	30.4	346	100	Vert.	43.5	13.1
208.000	38.9	QP	17.3	-22.9	33.3	263	140	Hori.	43.5	10.2
208.000	31.9	QP	17.3	-22.9	26.3	0	100	Vert.	43.5	17.2
260.000	38.3	QP	18.5	-22.5	34.3	220	137	Hori.	46.0	11.7
260.000	30.0	QP	18.5	-22.5	26.0	0	100	Vert.	46.0	20.0
532.990	44.1	QP	19.1	-21.0	42.2	98	172	Hori.	46.0	3.8
532.990	38.6	QP	19.1	-21.0	36.7	348	179	Vert.	46.0	9.3
559.030	43.0	QP	19.4	-20.9	41.5	293	140	Hori.	46.0	4.5
559.030	36.0	QP	19.4	-20.9	34.5	354	35	Vert.	46.0	11.5

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

Radiated Spurious Emission(below 1GHz)

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

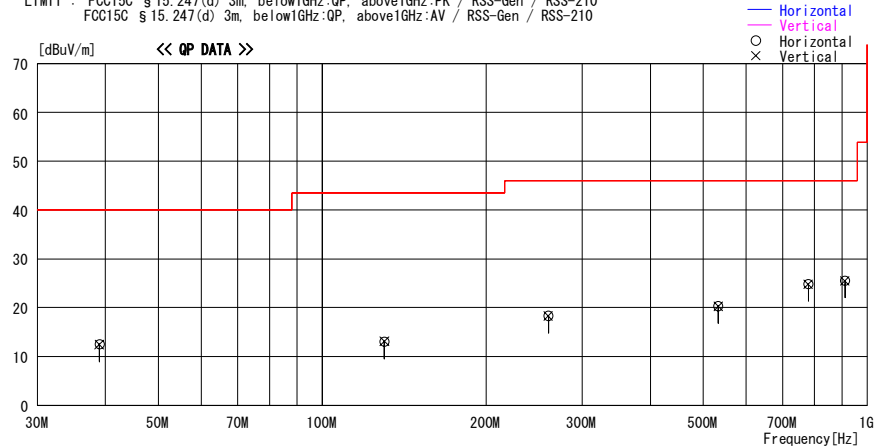
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2006/08/29 11:35:59

Company : KEYENCE CORPORATION
Kind of EUT : Wireless Barcode Reader (Scanner)
Model No. : BL-N90
Serial No. : 5606300483
Report No. : 26IE0265-H0
Power : DC 5.0V
Temp./Humi. : 25deg. C. /66%
Operator : Hiroka Umeyama

Mode / Remarks : Recieving, Max-Axis

LIMIT : FCC15C § 15.247(d) 3m, below1GHz:QP, above1GHz:PK / RSS-Gen / RSS-210
FCC15C § 15.247(d) 3m, below1GHz:QP, above1GHz:AV / RSS-Gen / RSS-210



Frequency	Reading	DET	Antenna		Level	Angle	Height	Polar.	Limit	Margin
			Factor	Gain						
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
39.000	22.7	QP	14.7	-24.9	12.5	0	300	Hori.	40.0	27.5
39.000	22.6	QP	14.7	-24.9	12.4	0	100	Vert.	40.0	27.6
130.000	22.3	QP	14.3	-23.6	13.0	0	300	Hori.	43.5	30.5
130.000	22.4	QP	14.3	-23.6	13.1	0	100	Vert.	43.5	30.4
260.000	22.3	QP	18.5	-22.5	18.3	0	300	Hori.	46.0	27.7
260.000	22.3	QP	18.5	-22.5	18.3	0	100	Vert.	46.0	27.7
533.000	22.2	QP	19.1	-21.0	20.3	0	100	Vert.	46.0	25.7
533.000	22.2	QP	19.1	-21.0	20.3	0	100	Hori.	46.0	25.7
780.000	22.7	QP	21.6	-19.5	24.8	0	100	Hori.	46.0	21.2
780.000	22.7	QP	21.6	-19.5	24.8	0	100	Vert.	46.0	21.2
910.000	22.0	QP	21.7	-18.2	25.5	0	100	Vert.	46.0	20.5
910.000	22.0	QP	21.7	-18.2	25.5	0	100	Hori.	46.0	20.5

CHART: WITH FACTOR ANT TYPE: -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

Test report No. : 26IE0265-HO-A-2
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Revised date : September 28, 2006
FCC ID : RF40823A

Radiated Spurious Emission(above 1GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Semi Anechoic Chambe

Company	: KEYENCE CORPORATION	REPORT NO	: 26IE0265-HO
Equipment	: Wireless Barcode Reader (Scanner)	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: BL-N90	TEST DISTANCE	: 3/1m
Sample No.	: 5606300483	DATE	: 08/29/2006
Power	: DC 5.0V	TEMPERATURE	: 25deg.C
Mode	: Transmitting 2402MHz	HUMIDITY	: 60%
Remarks	: Hor X , Ver Y-axis	ENGINEER	: Hiroka Umeyama

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1430.0	50.0	49.5	26.0	34.2	1.8	0.0	43.6	43.1	74.0	30.4	30.9
2	2390.0	44.1	43.8	29.1	32.8	2.2	0.0	42.6	42.3	74.0	31.4	31.7
3	2400.0	79.8	76.1	29.1	32.8	2.2	0.0	78.3	74.6	74.0	-	-
4	4804.0	43.0	42.8	33.4	31.6	3.5	0.0	48.3	48.1	74.0	25.7	25.9
5	7206.0	44.8	43.7	37.3	32.1	4.3	0.0	54.3	53.2	74.0	19.7	20.8
6	9608.0	44.5	44.5	39.4	33.1	5.0	0.0	55.8	55.8	74.0	18.2	18.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
7	24020.0	46.1	46.2	39.1	31.6	8.1	0.0	52.2	52.3	74.0	21.8	21.7

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1430.0	42.7	42.3	26.0	34.2	1.8	0.0	36.3	35.9	54.0	17.7	18.1
2	2390.0	29.8	30.0	29.1	32.8	2.2	0.0	28.3	28.5	54.0	25.7	25.5
3	2400.0	30.6	30.1	29.1	32.8	2.2	0.0	29.1	28.6	54.0	24.9	25.4
4	4804.0	28.9	28.7	33.4	31.6	3.5	0.0	34.2	34.0	54.0	19.8	20.0
5	7206.0	30.1	30.1	37.3	32.1	4.3	0.0	39.6	39.6	54.0	14.4	14.4
6	9608.0	30.4	30.5	39.4	33.1	5.0	0.0	41.7	41.8	54.0	12.3	12.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
7	24020.0	32.1	32.2	39.1	31.6	8.1	0.0	38.2	38.3	54.0	15.8	15.7

* Reference data

20dBc(Fundamental 2402MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2402.0	99.8	94.4	29.1	32.8	2.2	0.0	98.3	92.9	-	-	-
2	2400.0	62.6	58.5	29.1	32.8	2.2	0.0	61.1	57.0	Funda-20dB	17.2	15.9

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

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FCC ID : RF40823A

Radiated Spurious Emission(above 1GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

Company	: KEYENCE CORPORATION	REPORT NO	: 26IE0265-HO
Equipment	: Wireless Barcode Reader (Scanner)	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: BL-N90	TEST DISTANCE	: 3/1m
Sample No.	: 5606300483	DATE	: 08/29/2006
Power	: DC 5.0V	TEMPERATURE	: 25deg.C
Mode	: Transmitting 2441MHz	HUMIDITY	: 60%
Remarks	: Hor X , Ver Y-axis	ENGINEER	: Hiroka Umeyama

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.0	42.9	42.1	33.6	31.6	3.5	0.0	48.4	47.6	74.0	25.6	26.4
2	7323.0	44.0	43.7	37.4	32.2	4.3	0.0	53.5	53.2	74.0	20.5	20.8
3	9764.0	43.8	43.1	39.6	33.2	5.0	0.0	55.2	54.5	74.0	18.8	19.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	24410.0	44.8	45.1	39.1	31.1	8.2	0.0	51.5	51.8	74.0	22.5	22.2

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.0	28.7	28.6	33.6	31.6	3.5	0.0	34.2	34.1	54.0	19.8	19.9
2	7323.0	30.0	30.0	37.4	32.2	4.3	0.0	39.5	39.5	54.0	14.5	14.5
3	9764.0	30.0	30.1	39.6	33.2	5.0	0.0	41.4	41.5	54.0	12.6	12.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	24410.0	31.3	31.4	39.1	31.1	8.2	0.0	38.0	38.1	54.0	16.0	15.9

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

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FCC ID : RF40823A

Radiated Spurious Emission(above 1GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

Company	: KEYENCE CORPORATION	REPORT NO	: 26IE0265-HO
Equipment	: Wireless Barcode Reader (Scanner)	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: BL-N90	TEST DISTANCE	: 3/1m
Sample No.	: 5606300483	DATE	: 08/29/2006
Power	: DC 5.0V	TEMPERATURE	: 25deg.C
Mode	: Transmitting 2480MHz	HUMIDITY	: 60%
Remarks	: Hor X , Ver Y-axis	ENGINEER	: Hiroka Umeyama

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.5	47.3	46.0	29.2	32.7	2.3	0.0	46.1	44.8	74.0	27.9	29.2
2	4960.0	41.9	42.3	33.7	31.6	3.5	0.0	47.5	47.9	74.0	26.5	26.1
3	7440.0	42.9	43.4	37.6	32.3	4.3	0.0	52.5	53.0	74.0	21.5	21.0
4	9920.0	44.0	43.7	39.8	33.2	5.1	0.0	55.7	55.4	74.0	18.3	18.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	24800.0	45.0	45.7	39.3	30.6	8.3	0.0	52.5	53.2	74.0	21.5	20.8

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.5	29.9	29.9	29.2	32.7	2.3	0.0	28.7	28.7	54.0	25.3	25.3
2	4960.0	28.6	28.6	33.7	31.6	3.5	0.0	34.2	34.2	54.0	19.8	19.8
3	7440.0	29.9	29.9	37.6	32.3	4.3	0.0	39.5	39.5	54.0	14.5	14.5
4	9920.0	30.2	30.2	39.8	33.2	5.1	0.0	41.9	41.9	54.0	12.1	12.1
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	24800.0	32.0	32.1	39.3	30.6	8.3	0.0	39.5	39.6	54.0	14.5	14.4

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

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Test report No. : 26IE0265-HO-A-2
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Radiated Spurious Emission(above 1GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

Company	: KEYENCE CORPORATION	REPORT NO	: 26IE0265-HO
Equipment	: Wireless Barcode Reader (Scanner)	REGULATION	: Fcc Part15 Subpart B / RSS-210 / RSS-Gen
Model	: BL-N90	TEST DISTANCE	: 3m
Sample No.	: 5606300483	DATE	: 08/29/2006
Power	: DC 5.0V	TEMPERATURE	: 25deg.C
Mode	: Receiving	HUMIDITY	: 60%
Remarks	: Hor X , Ver Y-axis	ENGINEER	: Hiroka Umeyama

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1500.0	46.0	47.2	26.1	34.0	1.8	0.0	39.9	41.1	74.0	34.1	32.9

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING [dBuV]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT [dBuV/m]		Limit AV [dBuV/m]	MARGIN [dB]	
		HOR	VER					HOR	VER		HOR	VER
		Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss										
1	1500.0	33.2	35.1	26.1	34.0	1.8	0.0	27.1	29.0	54.0	26.9	25.0

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

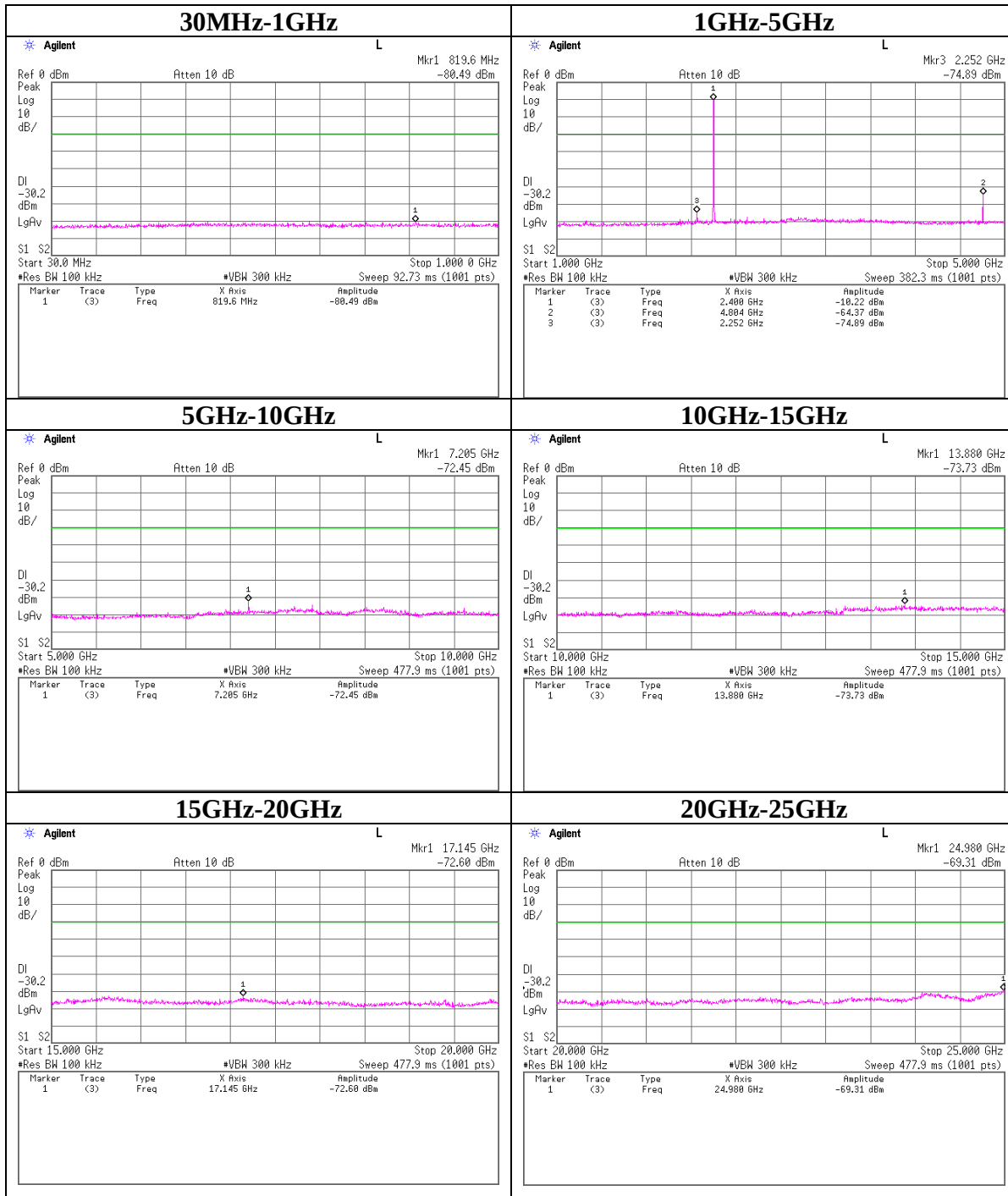
*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

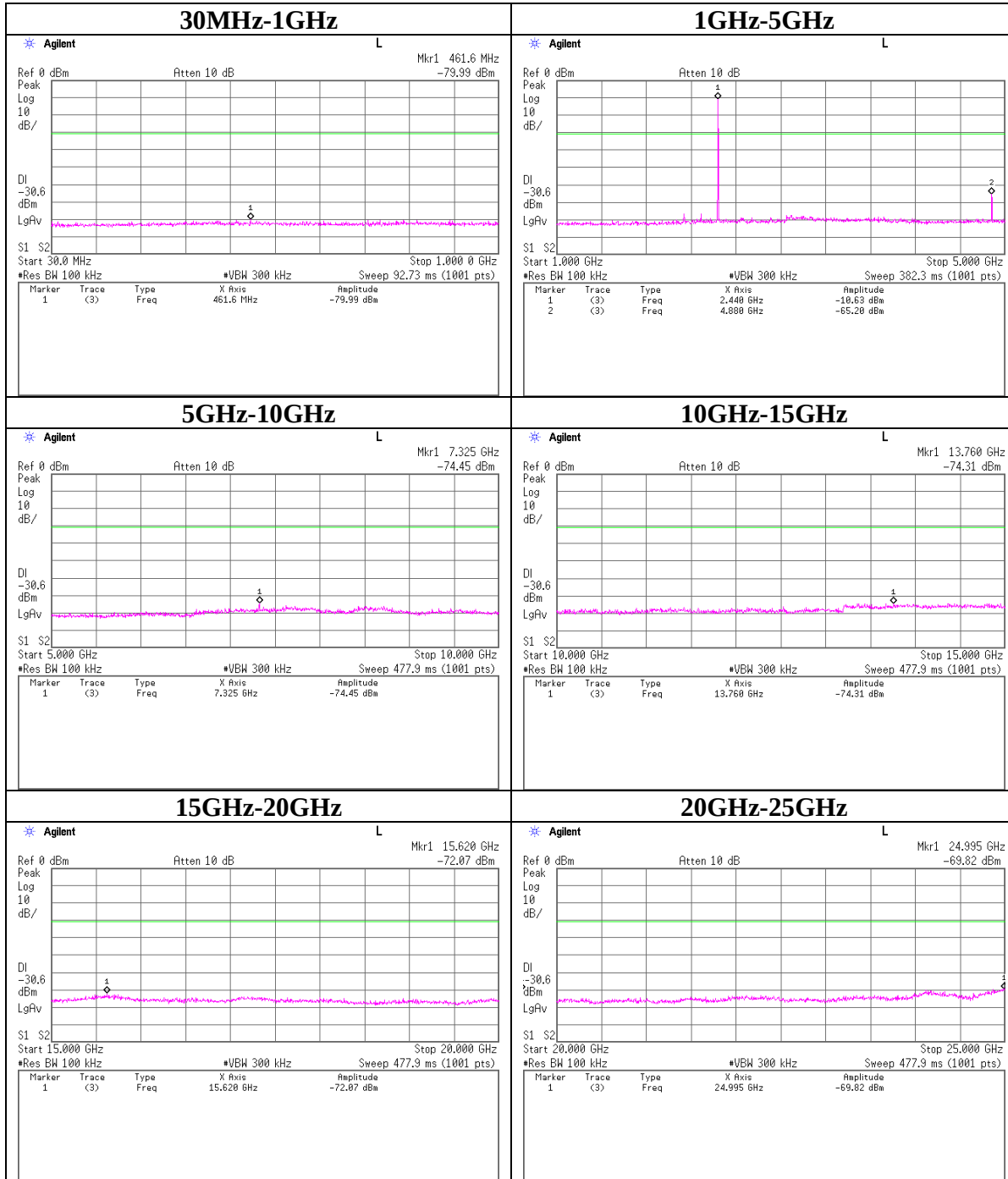
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Conducted Spurious Emission
Ch:Low

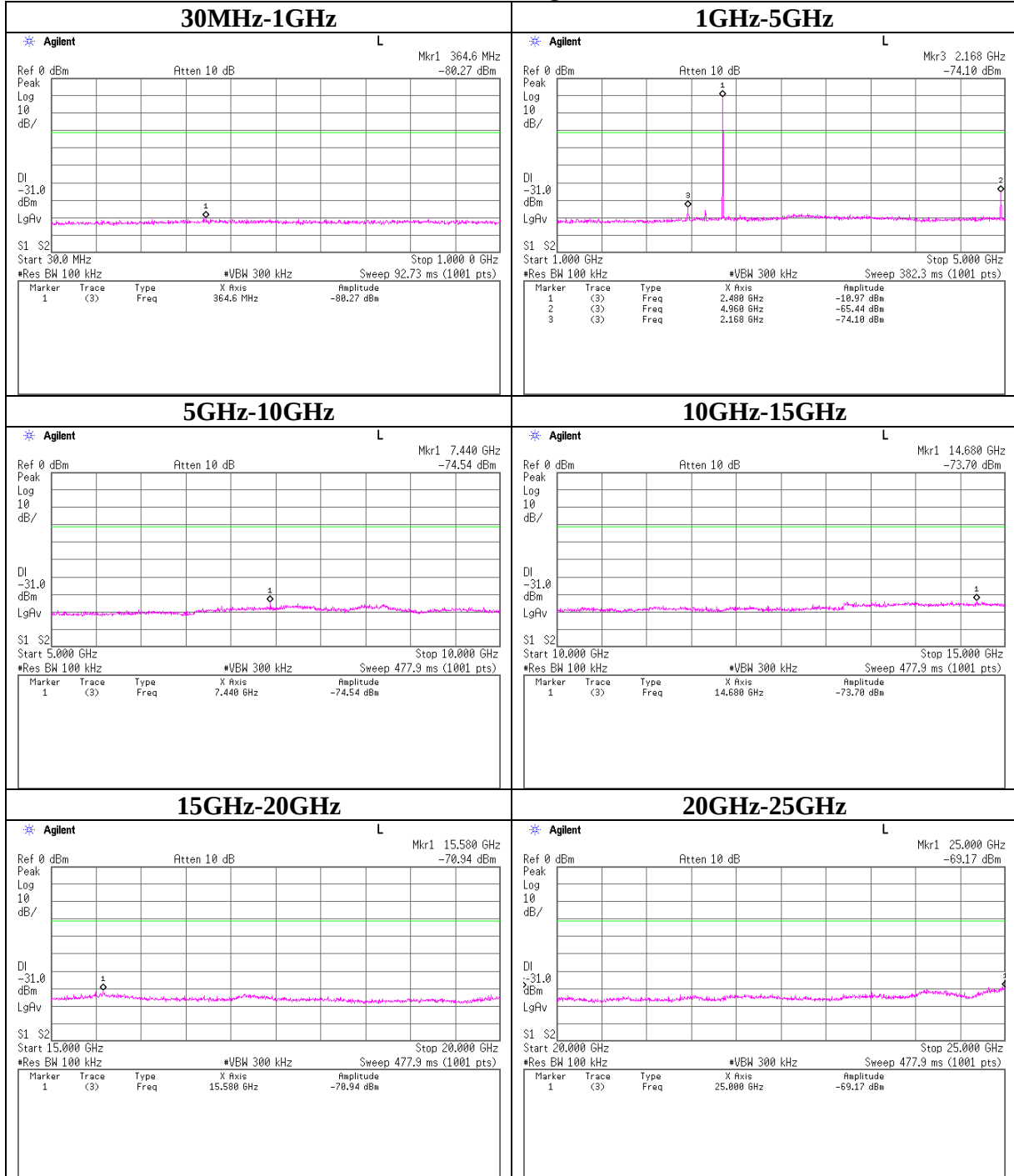


Conducted Spurious Emission
Ch:Mid

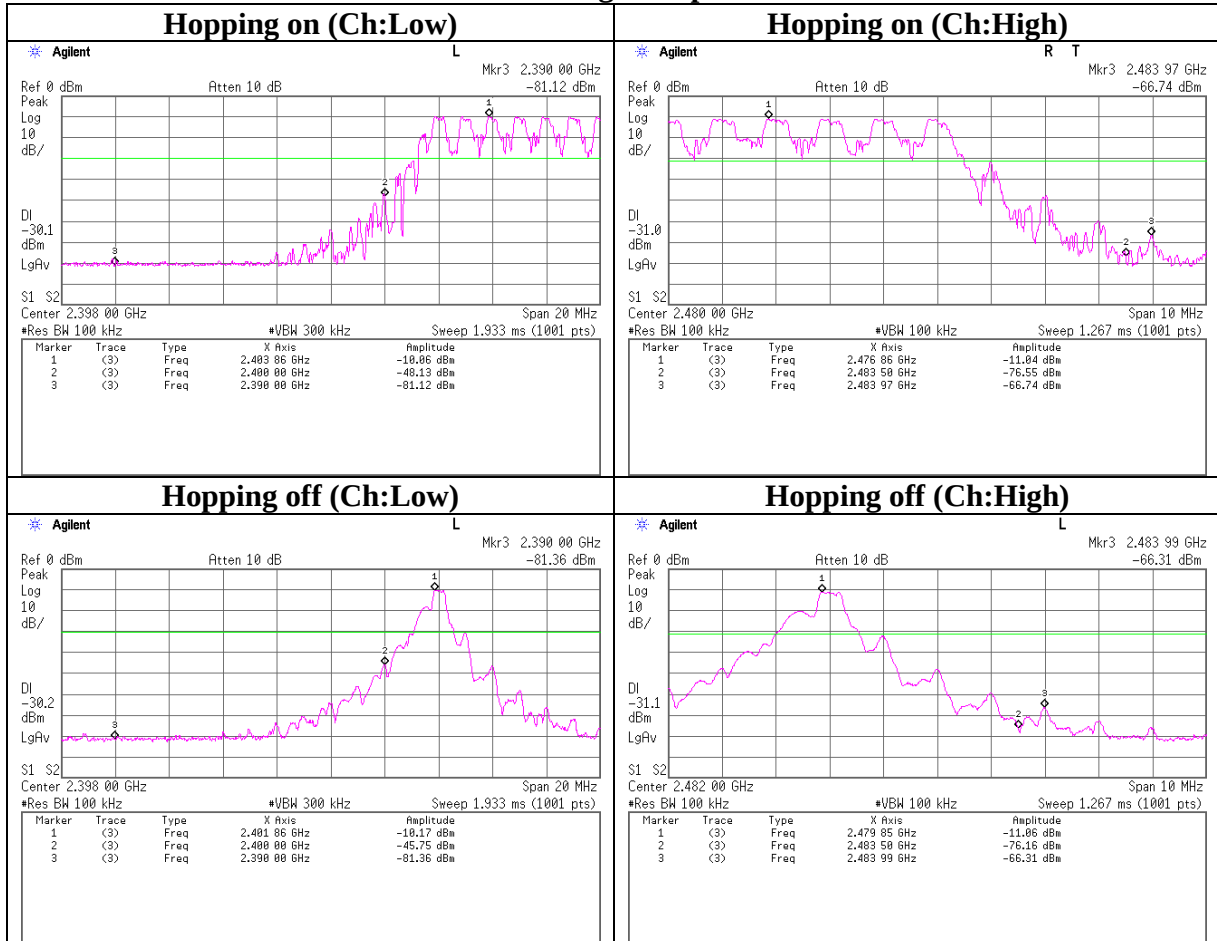


Conducted Spurious Emission

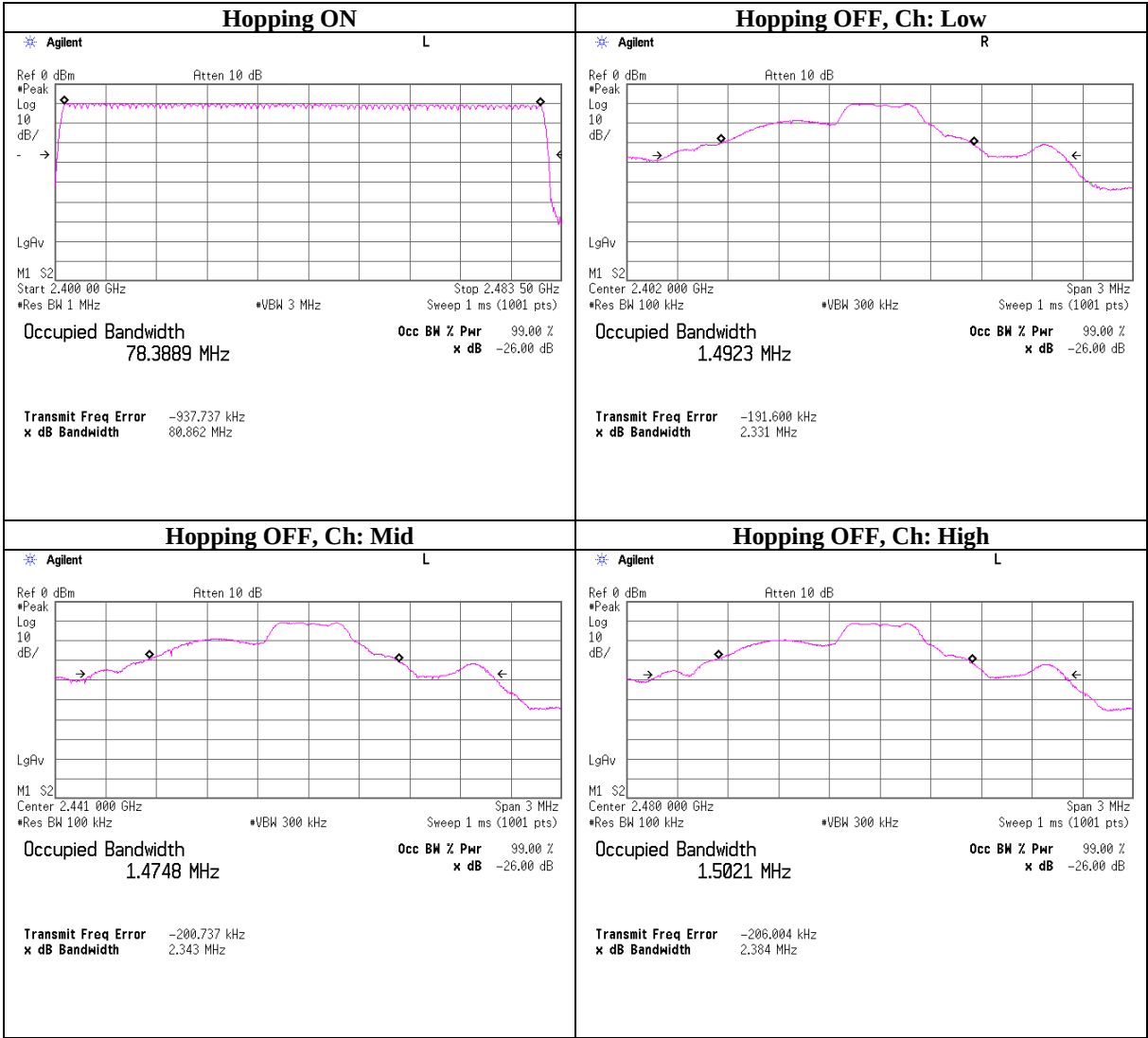
Ch:High



Conducted Spurious Emission
Band Edge compliance



99% Occupied Bandwidth



APPENDIX 3:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/CE	2006/03/03 * 12
MOS-12	Thermo-Hygrometer	Custom	CTH-180	RE/CE/AT	2006/01/19 * 24
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/CE	-
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/01/29 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/01/29 * 12
MCC-51	Coaxial cable	UL Apex	-	RE/CE	2006/03/11 * 12
MAT-30	Attenuator(6dB)	TME	UFA-01	RE	2006/03/11 * 12
MPA-13	Pre Amplifier	SONOA INSTRUMENT	310	RE	2006/03/25 * 12
TR-07	Test Receiver	Rohde & Schwarz	ESCS30	RE/CE	2005/09/14 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	RE/AT	2006/06/02 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	RE	2006/04/06 * 12
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	RE	2006/04/15 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	RE	2006/03/27 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2006/01/09 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(AE)	2006/02/06 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2006/02/06 * 12
MTA-04	Terminator	MCL	NTRM-50	CE	2006/02/06 * 12
MSA-06	Spectrum Analyzer	Agilent	E4407B	AT	2006/05/24 * 12
MAT-25	Attenuator(10dB)(above1GHz)	Agilent	8493C	AT	2006/06/02 * 12
MRENT-35	Power Meter	Anritsu	ML2496A	AT	2006/04/25 * 12
MRENT-34	Power sensor	Anritsu	MA2411B	AT	2006/04/25 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	AT	2004/11/25 * 24

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

Test Item:

RE: Radiated Spurious Emission
CE: Conducted Emission
AT: Antenna Terminal Conducted test

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