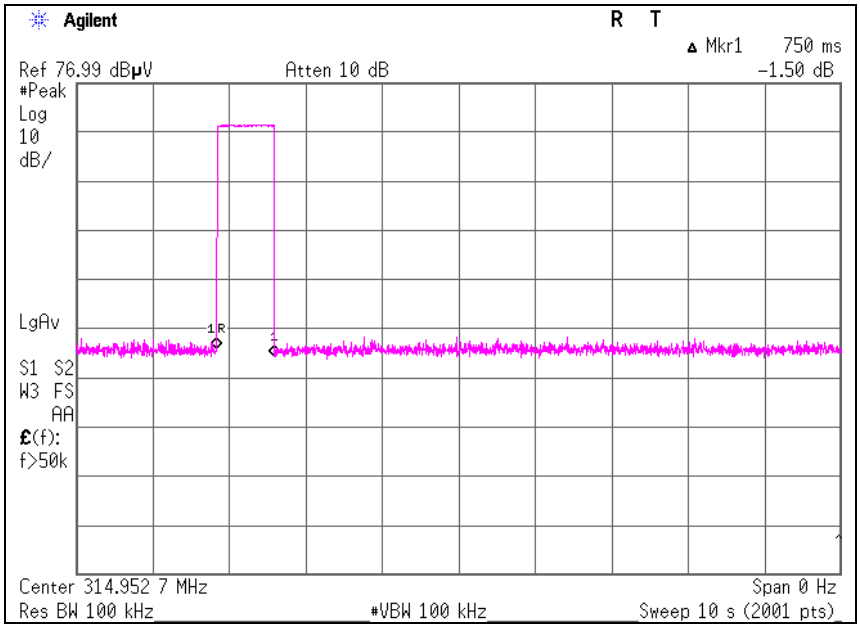
APPENDIX 2: Data of EMI test

Automatically deactivate

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	30AE0049-HO-01
Date	08/17/2009
Temperature/ Humidity	23 deg.C./ 63%
Engineer	Hironobu Ohnishi
Mode	Normal use mode

Time of Transmitting [sec]	Limit [sec]	Result
0.750	5.00	Pass



Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	30AE0049-HO-01
Date	08/17/2009
Temperature/ Humidity	23 deg.C./ 63%
Engineer	Hironobu Ohnishi
Mode	Transmitting mode

PK

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]		Remark Inside or Outside
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver	of Restricted Bands
314.976	PK	71.6	68.0	12.8	10.5	27.9	-	67.0	63.4	95.6	28.6	32.2	Carrier
370.781	PK	57.7	56.4	15.4	11.0	28.2	-	55.9	54.6	75.6	19.7	21.0	Outside
629.951	PK	31.4	34.2	19.7	12.7	28.8	-	35.0	37.8	75.6	40.6	37.8	Outside
944.927	PK	36.5	37.0	22.6	14.3	28.0	-	45.4	45.9	75.6	30.2	29.7	Outside
1259.902	PK	53.3	56.1	25.8	1.7	36.8	-	44.0	46.8	75.6	31.6	28.8	Outside
1574.878	PK	62.6	62.3	26.4	1.9	36.6	-	54.3	54.0	73.9	19.6	19.9	Inside
1889.854	PK	56.7	50.5	25.8	2.0	36.4	-	48.1	41.9	75.6	27.5	33.7	Outside
2204.829	PK	54.5	54.5	26.4	2.2	36.1	-	47.0	47.0	73.9	26.9	26.9	Inside
2519.805	PK	58.2	62.1	27.4	2.3	35.8	-	52.1	56.0	75.6	23.5	19.6	Outside
2834.780	PK	56.2	58.2	28.2	2.5	35.9	-	51.0	53.0	73.9	22.9	20.9	Inside
3149.756	PK	51.1	52.4	28.7	2.6	35.9	-	46.5	47.8	75.6	29.1	27.8	Outside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

PK with Duty factor

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]		Remark
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver	
314.976	PK	71.6	68.0	12.8	10.5	27.9	-6.1	60.9	57.3	75.6	14.7	18.3	Carrier
370.781	PK	57.7	56.4	15.4	11.0	28.2	-6.1	49.8	48.5	55.6	5.8	7.1	Outside
629.951	PK	31.4	34.2	19.7	12.7	28.8	-6.1	28.9	31.7	55.6	26.7	23.9	Outside
944.927	PK	36.5	37.0	22.6	14.3	28.0	-6.1	39.3	39.8	55.6	16.3	15.8	Outside
1259.902	PK	53.3	56.1	25.8	1.7	36.8	-6.1	37.9	40.7	55.6	17.7	14.9	Outside
1574.878	PK	62.6	62.3	26.4	1.9	36.6	-6.1	48.2	47.9	53.9	5.7	6.0	Inside
1889.854	PK	56.7	50.5	25.8	2.0	36.4	-6.1	42.0	35.8	55.6	13.6	19.8	Outside
2204.829	PK	54.5	54.5	26.4	2.2	36.1	-6.1	40.9	40.9	53.9	13.0	13.0	Inside
2519.805	PK	58.2	62.1	27.4	2.3	35.8	-6.1	46.0	49.9	55.6	9.6	5.7	Outside
2834.780	PK	56.2	58.2	28.2	2.5	35.9	-6.1	44.9	46.9	53.9	9.0	7.0	Inside
3149.756	PK	51.1	52.4	28.7	2.6	35.9	-6.1	40.4	41.7	55.6	15.2	13.9	Outside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Duty factor (Refer to Duty factor data sheet)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

* The test above 1GHz was performed with PK detect. Average emission measurements were calculated with PK detect and Duty cycle factor.
* Duty Factor was calculated with the assumption of the worst condition in 100msec.
* All the measured noise was pulse emission.

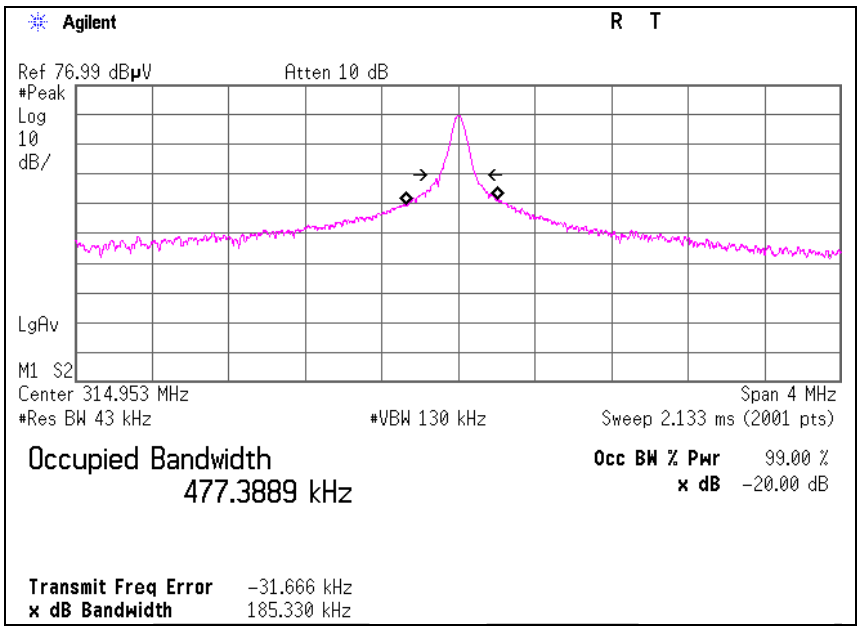
-20dB and 99% Occupied Bandwidth

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	30AE0049-HO-01
Date	08/17/2009
Temperature/ Humidity	23 deg.C./ 63%
Engineer	Hironobu Ohnishi
Mode	Normal use mode

Bandwidth Limit : Fundamental Frequency **314.95** MHz x 0.25% = 787.37 kHz

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
185.33	787.37	Pass

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
477.39	787.37	Pass



Duty Cycle

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	30AE0049-HO-01
Date	08/17/2009
Temperature/ Humidity	23 deg.C./ 63%
Engineer	Hironobu Ohnishi
Mode	Normal use mode

Type	Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
A	37	0.800	29.60
B	12	1.635	19.62

*1)ON time(in 100ms) = Times * ON time(One pulse)

*2)The train of pulses was exceeding 100msec, and that sampled 100msec was the worst case against the pulse train.

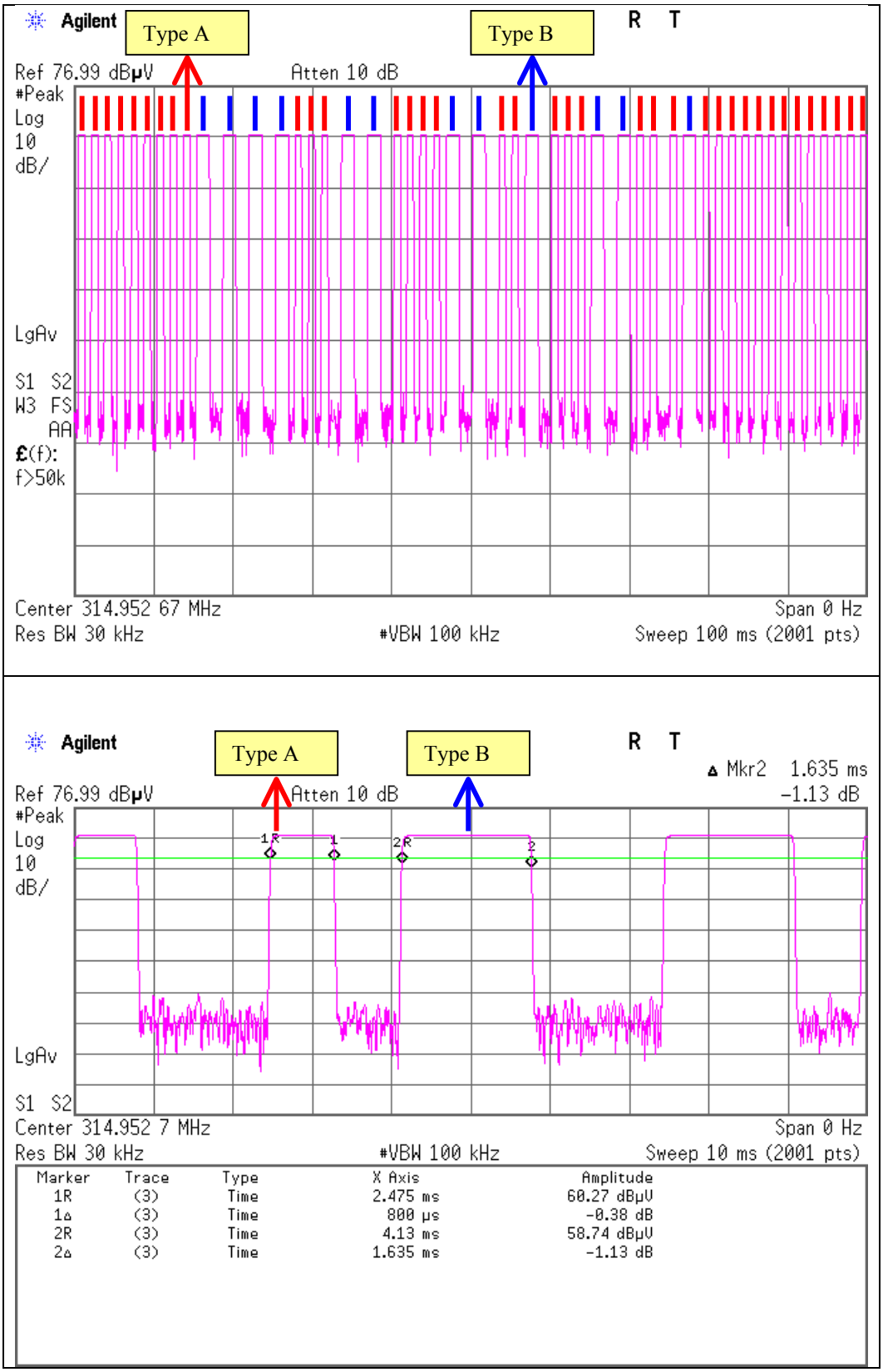
(Total)

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
49.22	100.00	0.492	-6.15

*3)ON time = Type A's ON time (in 100ms) + Type B's ON time (in 100ms)

*4)Duty = 20log10(ON time/Cycle)

Duty Cycle


Agilent
Type A
Type B
R T
Ref 76.99 dBµV
Atten 10 dB
#Peak
Log
10
dB/
LgAv
S1 S2
W3 FS
AA
£(f):
f>50k
Center 314.952 67 MHz
Span 0 Hz
Res BW 30 kHz
#VBW 100 kHz
Sweep 100 ms (2001 pts)
Agilent
Type A
Type B
R T
Δ Mkr2 1.635 ms
-1.13 dB
Ref 76.99 dBµV
Atten 10 dB
#Peak
Log
10
dB/
1R
1
2R
2
LgAv
S1 S2
Center 314.952 7 MHz
Span 0 Hz
Res BW 30 kHz
#VBW 100 kHz
Sweep 10 ms (2001 pts)
Marker Trace Type X Axis Amplitude
1R (3) Time 2.475 ms 60.27 dBµV
1Δ (3) Time 800 µs -0.38 dB
2R (3) Time 4.13 ms 58.74 dBµV
2Δ (3) Time 1.635 ms -1.13 dB

APPENDIX 3:Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE	2009/06/26 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE	2009/02/06 * 12
MJM-01	Measure	KDS	ES19-55	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2008/12/01 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032007	RE	2008/11/12 * 12
MLA-09	Logperiodic Antenna	Schwarzbeck	USLP9143B	9143B006	RE	2008/11/12 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	BL1069	RE	2008/11/14 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent /TSJ	-	-	RE	2008/10/02 * 12
MPA-04	Pre Amplifier	Agilent	8447D	2944A09965	RE	2009/07/03 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2009/06/15 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	233010(1m) / 292410(5m)	RE	2008/09/09 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2009/02/12 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2009/02/25 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:
RE: Radiated emission, 99% Occupied Bandwidth, -20dB bandwidth , Automatically deactivate and Duty cycle tests