

10.7 Frequency Stability (Temperature Variation)

REGULATIONS	: FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a) RSS-119 Section 5.3
TEST METHOD/GUIDE	: ANSI/TIA-603-D Section 2.2.2.2 RSS-Gen Section 6.11

Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Set the temperature -30 degrees C.
- 3 Leave the EUT for 1 hour after it became the temperature that was set up.
- 4 Make the EUT the transmitting state.
One minutes later, measure the output frequency.
- 5 Make the EUT the receiving state.
- 6 Set the temperature 50 degrees C by 10 degrees C.
And repeat test procedure 3 to 5.

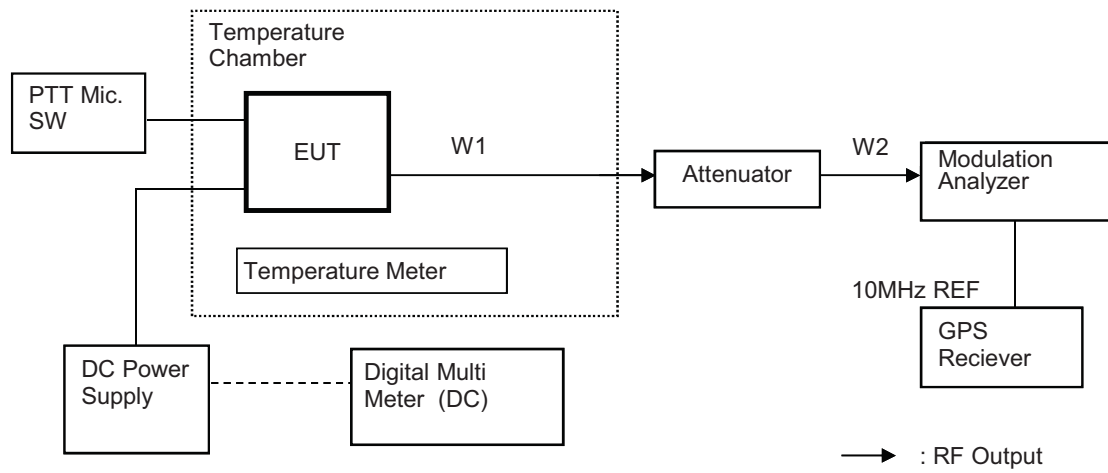
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Nov. 14, 14	Nov. 30, 15
4	DC Power Supply	Takasago	GP035-20R	1014199060	None	None
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16
6	Temperature Chamber	Tabai	PL-3F	5103661	None	None
7	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Jun. 23, 15	Jun. 30, 16
8	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Jun. 09, 15	Jun. 30, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun. 09, 15	Jun. 30, 16

Measuring Equipment Configuration



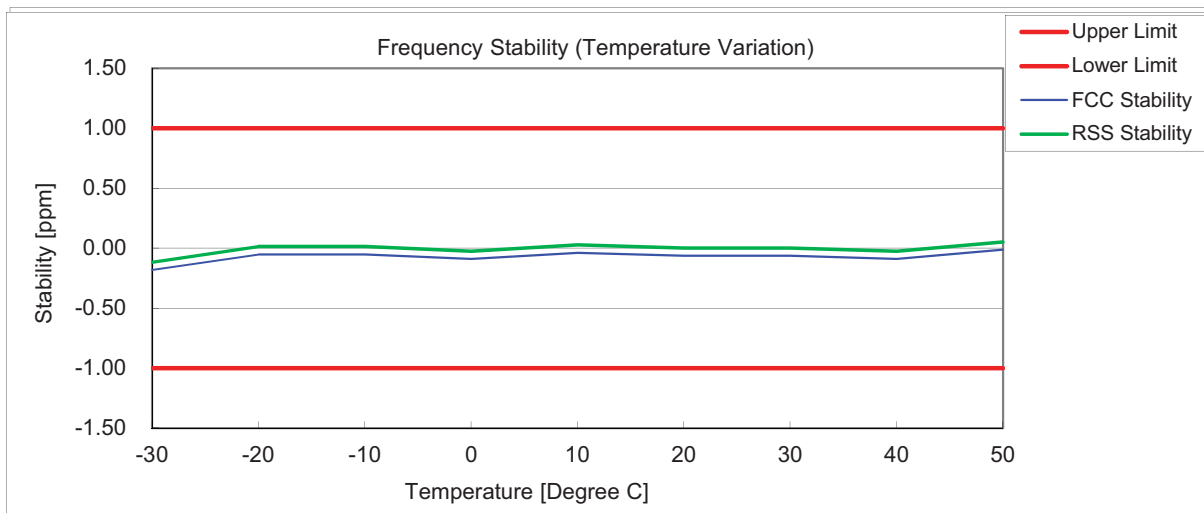
Test Results

Test date	Jul 22, 2015	to	Jul 23, 2015
Location	Kashima No.1 Test Site		
Test Engineer	Koichi Wagatsuma		

Test was carried out for all the frequency band of section 10.1
State the worst case (below).

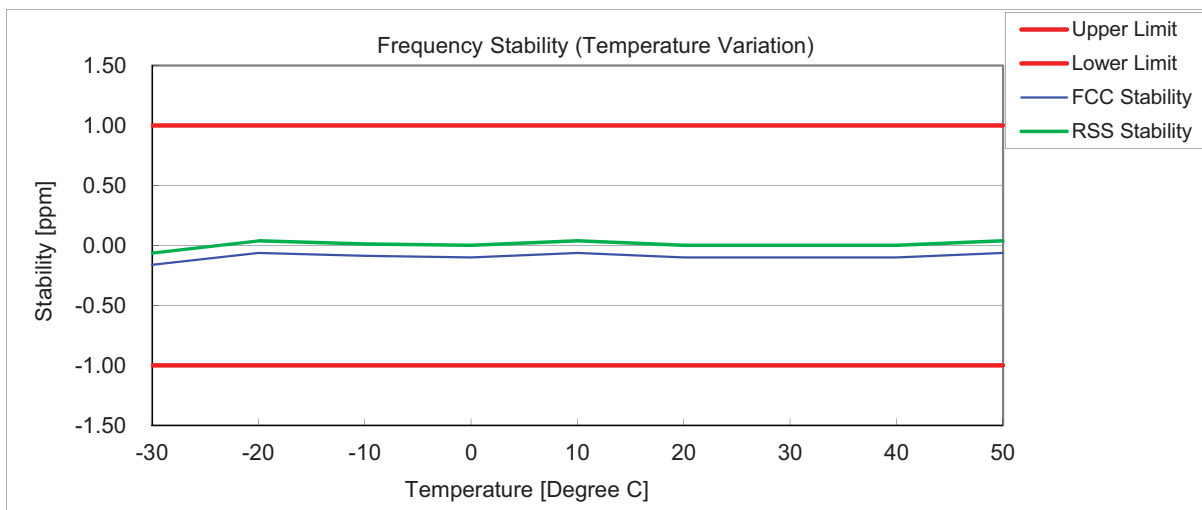
State : High Power / Authorized Bandwidth 20 kHz / 769.05 MHz (Band 1)
Reference Frequency: 769.050000 MHz(FCC Stability)
769.049950 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	769.049860	-0.18	-0.12	1.0	0.82
2	-20	769.049960	-0.05	0.01	1.0	0.95
3	-10	769.049960	-0.05	0.01	1.0	0.95
4	0	769.049930	-0.09	-0.03	1.0	0.91
5	10	769.049970	-0.04	0.03	1.0	0.96
6	20	769.049950	-0.07	0.00	1.0	0.93
7	30	769.049950	-0.07	0.00	1.0	0.93
8	40	769.049930	-0.09	-0.03	1.0	0.91
9	50	769.049990	-0.01	0.05	1.0	0.95



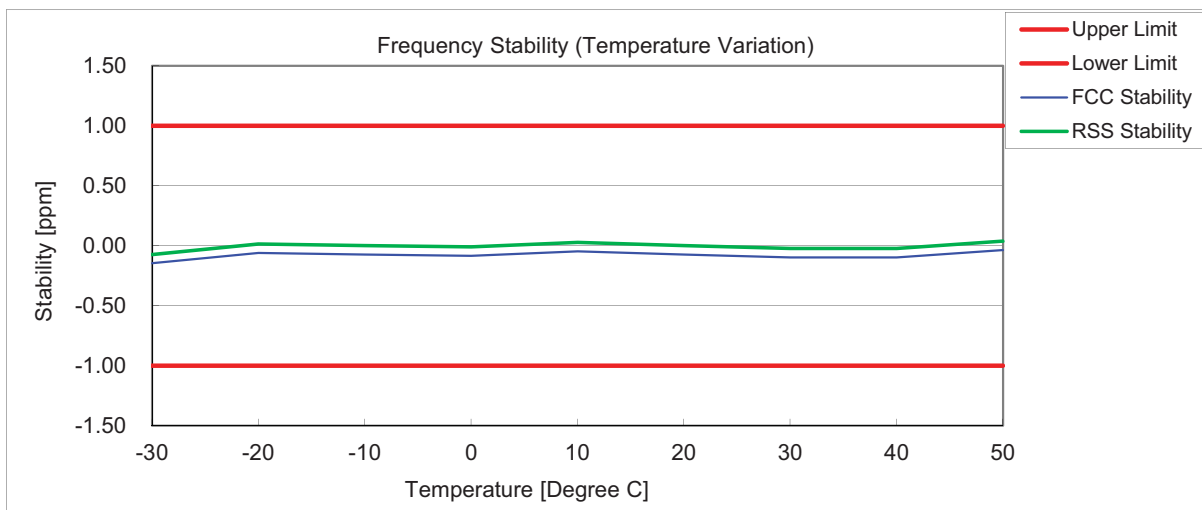
State : High Power / Authorized Bandwidth 20 kHz / 799.05 MHz (Band 2)
Reference Frequency: 799.050000 MHz(FCC Stability)
799.049920 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	799.049870	-0.16	-0.06	1.0	0.84
2	-20	799.049950	-0.06	0.04	1.0	0.94
3	-10	799.049930	-0.09	0.01	1.0	0.91
4	0	799.049920	-0.10	0.00	1.0	0.90
5	10	799.049950	-0.06	0.04	1.0	0.94
6	20	799.049920	-0.10	0.00	1.0	0.90
7	30	799.049920	-0.10	0.00	1.0	0.90
8	40	799.049920	-0.10	0.00	1.0	0.90
9	50	799.049950	-0.06	0.04	1.0	0.94



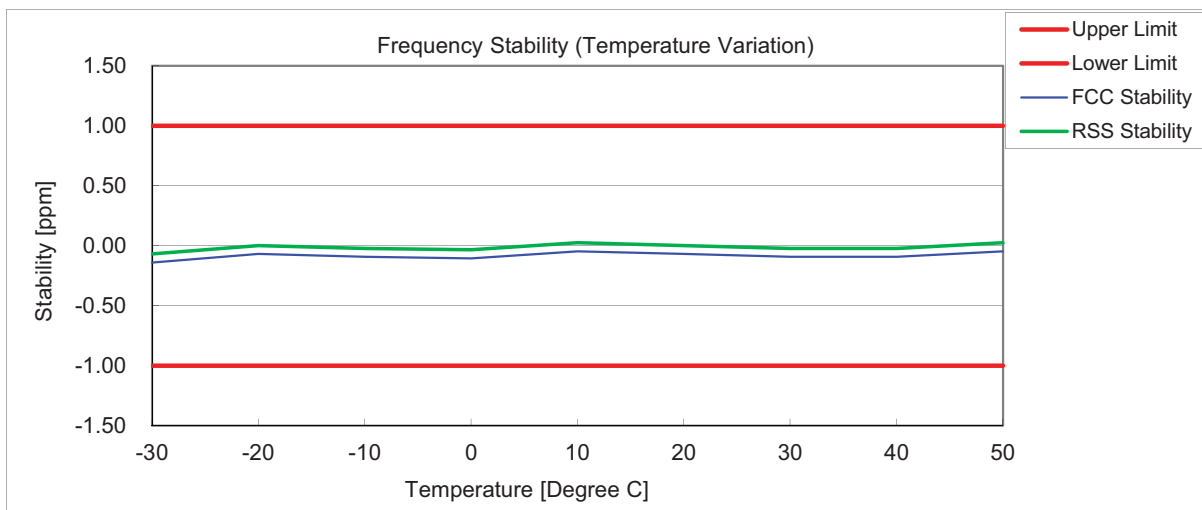
State : High Power / Authorized Bandwidth 20 kHz / 806.05 MHz (Band 3)
Reference Frequency: 806.050000 MHz(FCC Stability)
806.049940 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	806.049880	-0.15	-0.07	1.0	0.85
2	-20	806.049950	-0.06	0.01	1.0	0.94
3	-10	806.049940	-0.07	0.00	1.0	0.93
4	0	806.049930	-0.09	-0.01	1.0	0.91
5	10	806.049960	-0.05	0.02	1.0	0.95
6	20	806.049940	-0.07	0.00	1.0	0.93
7	30	806.049920	-0.10	-0.02	1.0	0.90
8	40	806.049920	-0.10	-0.02	1.0	0.90
9	50	806.049970	-0.04	0.04	1.0	0.96



State : High Power / Authorized Bandwidth 20 kHz / 851.05 MHz (Band 4)
Reference Frequency: 851.050000 MHz(FCC Stability)
851.049940 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	851.049880	-0.14	-0.07	1.0	0.86
2	-20	851.049940	-0.07	0.00	1.0	0.93
3	-10	851.049920	-0.09	-0.02	1.0	0.91
4	0	851.049910	-0.11	-0.04	1.0	0.89
5	10	851.049960	-0.05	0.02	1.0	0.95
6	20	851.049940	-0.07	0.00	1.0	0.93
7	30	851.049920	-0.09	-0.02	1.0	0.91
8	40	851.049920	-0.09	-0.02	1.0	0.91
9	50	851.049960	-0.05	0.02	1.0	0.95



10.8 Frequency Stability (Voltage Variation)

REGULATIONS	: FCC Part 2 Section 1055 (d) (1), Part 90 Section 213(a) RSS-119 Section 5.3
TEST METHOD/GUIDE	: ANSI/TIA-603-D Section 2.2.2.2 RSS-Gen Section 6.11

Test Procedure

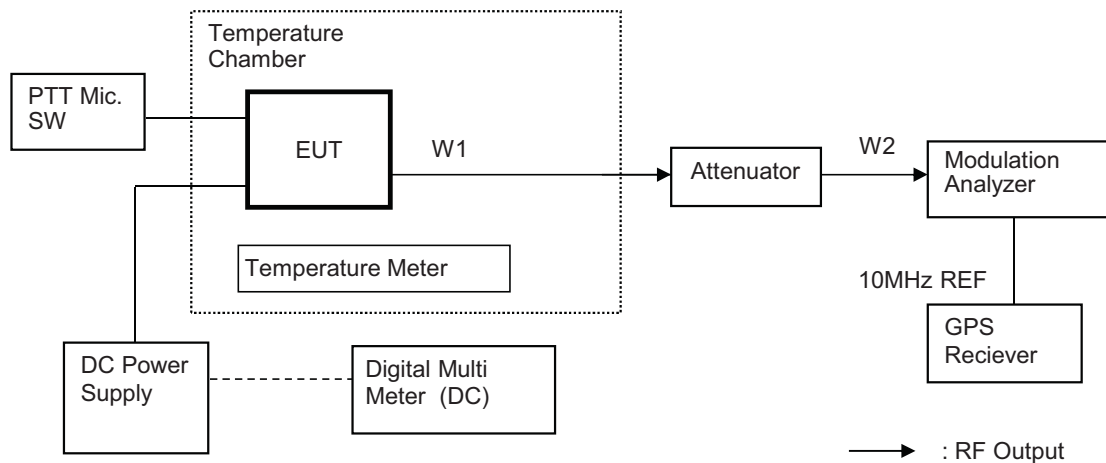
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The power supply voltage to the EUT was varied from 85 % to 115 % of the nominal value measured at the input to the EUT.

Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Nov. 14, 14	Nov. 30, 15
4	DC Power Supply	Takasago	GP035-20R	1014199060	None	None
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16
6	Temperature Chamber	Tabai	PL-3F	5103661	None	None
7	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Jun. 23, 15	Jun. 30, 16
8	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cable:

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Jun. 09, 15	Jun. 30, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun. 09, 15	Jun. 30, 16

Measuring Equipment Configuration

Test Results

Test date	Jul 22, 2015
Location	Kashima No.1 Test Site
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1
State the worst case (below).

State : High Power / Authorized Bandwidth 20 kHz / 774.95 MHz (Band 1)

Reference Frequency: 774.949940 MHz

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.56	774.949940	0.00	1.0	1.00
2	20+/-5	100	13.60	774.949940	0.00	1.0	1.00
3	20+/-5	115	15.64	774.949940	0.00	1.0	1.00

State : High Power / Authorized Bandwidth 20 kHz / 799.05 MHz (Band 2)

Reference Frequency: 799.049920 MHz

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.56	799.049930	0.01	1.0	0.99
2	20+/-5	100	13.60	799.049920	0.00	1.0	1.00
3	20+/-5	115	15.64	799.049930	0.01	1.0	0.99

State : High Power / Authorized Bandwidth 20 kHz / 815.05 MHz (Band 3)

Reference Frequency: 815.049940 MHz

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.56	815.049950	0.01	1.0	0.99
2	20+/-5	100	13.60	815.049940	0.00	1.0	1.00
3	20+/-5	115	15.64	815.049940	0.00	1.0	1.00

State : High Power / Authorized Bandwidth 20 kHz / 860.05 MHz (Band 4)

Reference Frequency: 860.049960 MHz

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.56	860.049950	-0.01	1.0	0.99
2	20+/-5	100	13.60	860.049960	0.00	1.0	1.00
3	20+/-5	115	15.64	860.049950	-0.01	1.0	0.99

10.9 Frequency Stability (Temperature Variation) AFC

REGULATIONS	: FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a), 539 RSS-119 Section 5.3
TEST METHOD/GUIDE	: ANSI/TIA-603-D Section 2.2.2.2 RSS-Gen Section 6.11

Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Set the temperature -30 degrees C.
- 3 Leave the EUT for 1 hour after it became the temperature that was set up.
- 4 Make the EUT the transmitting state.
One minutes later, measure the output frequency.
- 5 Make the EUT the receiving state.
- 6 Set the temperature 50 degrees C by 10 degrees C.
And repeat test procedure 3 to 5.

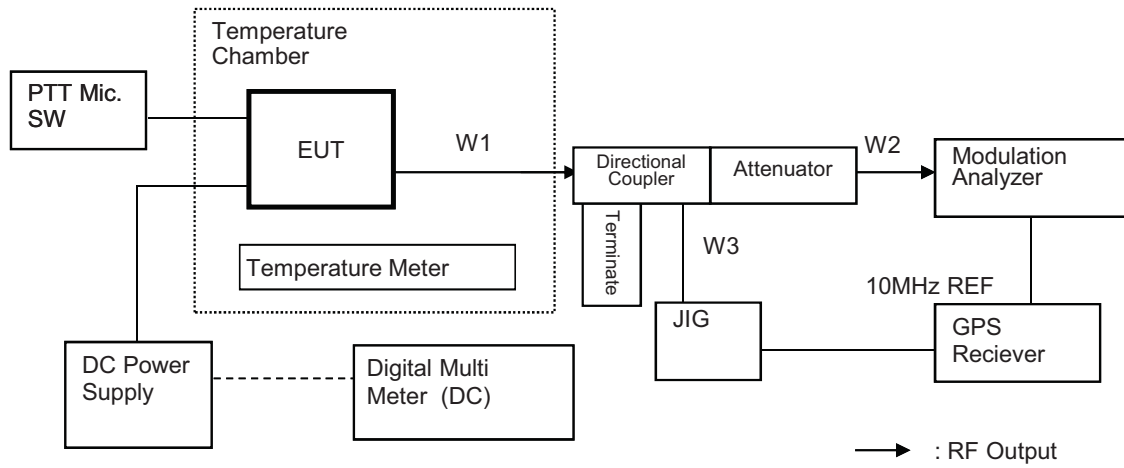
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Dual-Directional Coupler	Amplifier Research	DC6180	14376	Mar. 03, 15	Mar. 31, 16
4	Terminator	TME	CT-03BP	1002857	Mar. 03, 15	Mar. 31, 16
5	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Nov. 14, 14	Nov. 30, 15
6	DC Power Supply	Takasago	GP035-20R	1014199060	None	None
7	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16
8	Temperature Chamber	Tabai	PL-3F	5103661	None	None
9	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Jun. 23, 15	Jun. 30, 16
10	JIG	Agilent	E4438C	MY44270676	None	None
11	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Jun. 09, 15	Jun. 30, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun. 09, 15	Jun. 30, 16
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00217	Jun. 09, 15	Jun. 30, 16

Measuring Equipment Configuration



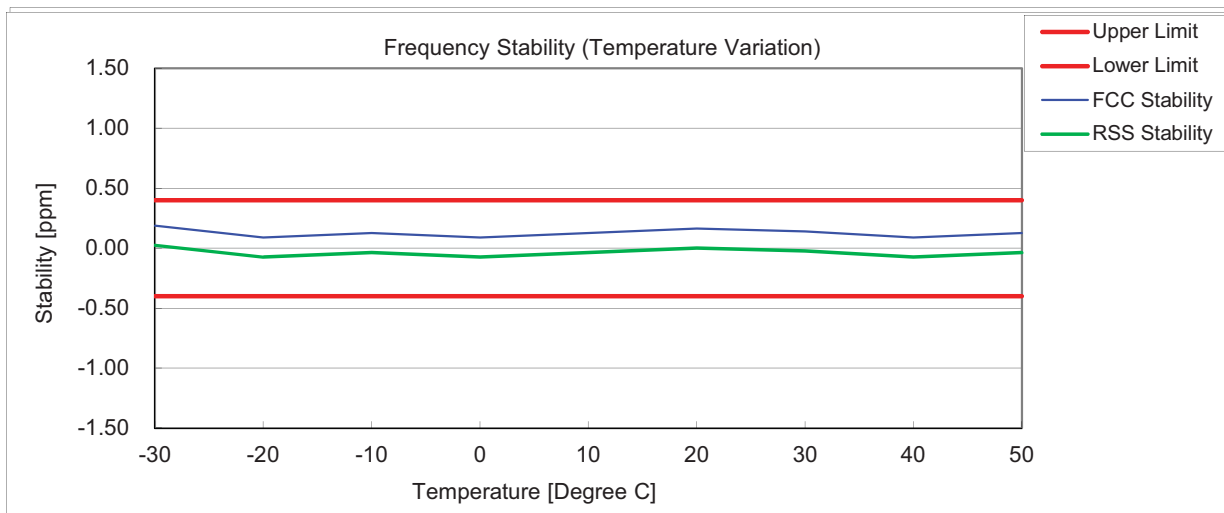
Test Results

Test date	Jul 24, 2015
Location	Kashima No.1 Test Site
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1
State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz / 799.05 MHz (Band 2) (8K10F1E/F1D)
Reference Frequency: 799.050000 MHz(FCC Stability)
799.050130 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	799.050150	0.19	0.03	0.4	0.21
2	-20	799.050070	0.09	-0.08	0.4	0.31
3	-10	799.050100	0.13	-0.04	0.4	0.27
4	0	799.050070	0.09	-0.08	0.4	0.31
5	10	799.050100	0.13	-0.04	0.4	0.27
6	20	799.050130	0.16	0.00	0.4	0.24
7	30	799.050110	0.14	-0.03	0.4	0.26
8	40	799.050070	0.09	-0.08	0.4	0.31
9	50	799.050100	0.13	-0.04	0.4	0.27



10.10 Frequency Stability (Voltage Variation) AFC

REGULATIONS	: FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a), 539 RSS-119 Section 5.3
TEST METHOD/GUIDE	: ANSI/TIA-603-D Section 2.2.2.2 RSS-Gen Section 6.11

Test Procedure

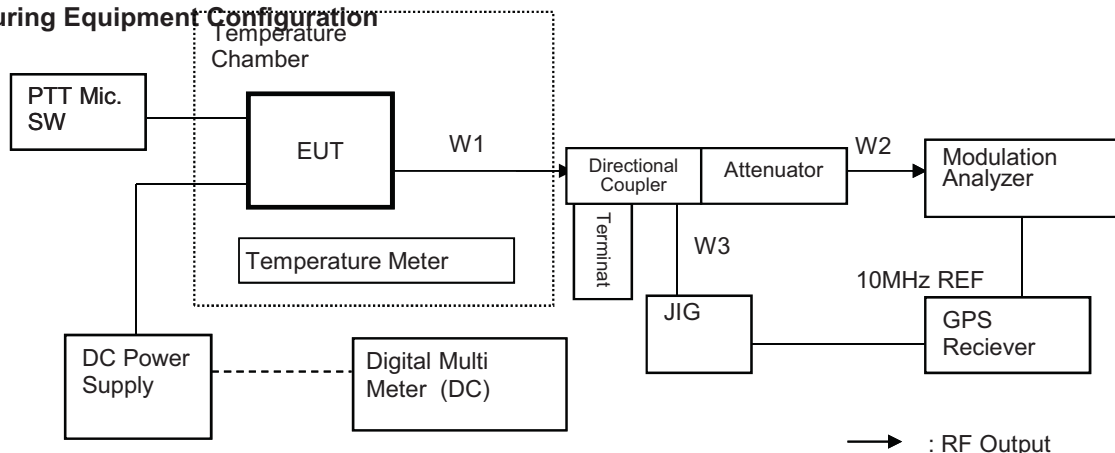
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The power supply voltage to the EUT was varied from 85 % to 115 % of the nominal value measured at the input to the EUT.

Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Dual-Directional Coupler	Amplifier Research	DC6180	14376	Mar. 03, 15	Mar. 31, 16
4	Terminator	TME	CT-03BP	1002857	Mar. 03, 15	Mar. 31, 16
5	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Nov. 14, 14	Nov. 30, 15
6	DC Power Supply	Takasago	GP035-20R	1014199060	None	None
7	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16
8	Temperature Chamber	Tabai	PL-3F	5103661	None	None
9	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Jun. 23, 15	Jun. 30, 16
10	JIG	Agilent	E4438C	MY44270676	None	None
11	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Jun. 09, 15	Jun. 30, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun. 09, 15	Jun. 30, 16
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00217	Jun. 09, 15	Jun. 30, 16

Measuring Equipment Configuration

Test Results

Test date	Jul 24, 2015
Location	Kashima No.1 Test Site
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz / 804.95 MHz (Band 2) (8K10F1E/F1D)

Reference Frequency: 804.950130 MHz

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.56	804.950130	0.00	1.0	1.00
2	20+/-5	100	13.60	804.950130	0.00	1.0	1.00
3	20+/-5	115	15.64	804.950100	-0.04	1.0	0.96

10.11 Emission Limitations

REGULATIONS : 47 CFR 2.1049, 90.543 / RSS-119 Section 5.8

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.14
ANSI/TIA-102-CAAA-A Section 2.2.8 / RSS-119 Section 4.3

10.11.1

Test Procedure

§ 90.543 (b) : ACP Measurements

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 For EUT supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for 50 % modulation.(Analog (FM))
- 3 For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent or For EUT supporting digital modulation, the modulation was digital modulation without audio input.
- 4 Setting reference level.
Using a spectrum analyzer capable of ACP measurements, set the measurement bandwidth to the channel size.
Set the frequency offset of the measurement bandwidth to zero and adjust the center frequency of the spectrum analyzer to give the power level in the measurement bandwidth.
Record this power level in dBm as the "reference power level".
- 5 Measuring the power level at frequency offsets <400 kHz.
Using a spectrum analyzer capable of ACP measurements, set the measurement bandwidth as shown in the tables in 47 CFR 90.543 (a) .
Measure the ACP in dBm. These measurements should be made at maximum power. Calculate the coupled power by subtracting the measurements than the values given in the tables in 47 CFR 90.543 (a) for each condition.
- 6 Measuring the power level at frequency offsets >400 kHz.
Set a spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth and average detection.
Set the reference level of the spectrum analyzer to RMS value of the transmitter power.
Sweep above and below the carrier frequency to the limits be fined in the tables.
Calculate ACP by subtracting the reference power level measured in step 4 from the measurements made in this step.
The absolute value of the calculated ACP must be greater than or equal to the absolute value of the ACP given in the table for each condition.

Measuring Equipments

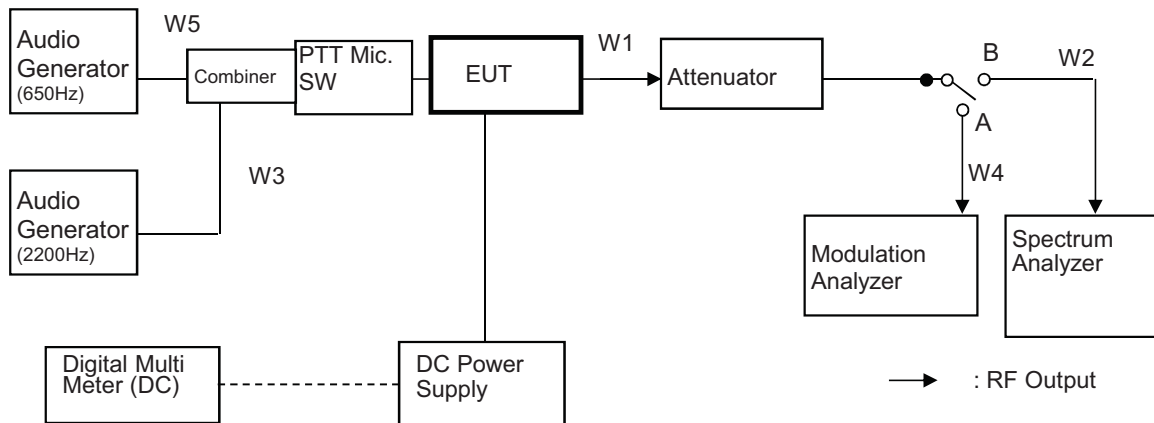
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Combiner(1)	Anritsu	Z-164A	M89249	Jan. 20, 15	Jan. 31, 16
4	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Oct. 13, 14	Oct. 31, 15
5	Audio Generator	Anritsu	MG443B	M70150	Jun. 18, 15	Jun. 30, 16
6	Audio Generator	Hewlett Packard	8903B	2818A04372	Jul. 19, 14	Jul. 31, 15
7	Spectrum Analyzer	Agilent	N9030A	US51350220	Jul. 03, 14	Jul. 31, 15
8	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
9	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W3	Balance Cable	Nicoon	3D-2V	KSR00092	Jan. 23, 15	Jan. 31, 16
W5	Coaxial Cable	Daiyu Densen	3D-2V	KSR00100	Jan. 23, 15	Jan. 31, 16
W4	Coaxial Cable	Pacific custom	RG-58 C/U	AM90C04	Jun. 09, 15	Jun. 30, 16
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 15	Jan. 31, 16

Measuring Equipment Configuration

FM Modulation



Note: Configuration of other Modulation test is composed without the Audio Generator.

Test Results

Test date	Jul 20, 2015
Location	Kashima No.1 Test Site
temperature	23 [degree C]
Humidity Variation	51 [%]
Atmospheric Pressure	100.7 [kPa]
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1
State the worst case(below)

State: Transmitter Frequency : 774.955MHz (Band1)
Channel spacing : 25kHz Modulation : FM
Type of Emmission : 16K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
15.625	Lower	6.25	-70.85	-40
	Upper	6.25	-69.98	-40
21.875	Lower	6.25	-81.98	-60
	Upper	6.25	-81.80	-60
37.5	Lower	25	-79.91	-60
	Upper	25	-79.51	-60
62.5	Lower	25	-83.17	-65
	Upper	25	-82.52	-65
87.5	Lower	25	-83.83	-65
	Upper	25	-83.60	-65
150	Lower	100	-78.68	-65
	Upper	100	-78.26	-65
250	Lower	100	-84.72	-65
	Upper	100	-84.66	-65
350	Lower	100	-87.25	-65
	Upper	100	-87.49	-65
>400k to 12MHz	Lower	30(s)	-90.10	-75
	Upper	30(s)	-89.95	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 804.95MHz (Band2)
Channel spacing : 25kHz Modulation : FM
Type of Emmision : 16K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
15.625	Lower	6.25	-70.99	-40
	Upper	6.25	-70.02	-40
21.875	Lower	6.25	-81.91	-60
	Upper	6.25	-81.75	-60
37.5	Lower	25	-80.00	-60
	Upper	25	-80.19	-60
62.5	Lower	25	-83.57	-65
	Upper	25	-83.30	-65
87.5	Lower	25	-84.50	-65
	Upper	25	-84.51	-65
150	Lower	100	-78.14	-65
	Upper	100	-78.46	-65
250	Lower	100	-84.65	-65
	Upper	100	-85.02	-65
350	Lower	100	-87.57	-65
	Upper	100	-87.75	-65
>400k to 12MHz	Lower	30(s)	-89.66	-75
	Upper	30(s)	-89.69	-75
12MHz to paired receive band		30(s)	-106.37	-75
In the paired receive band		30(s)	-104.46	-100

State: Transmitter Frequency : 769.05MHz (Band 1)
Channel spacing : 25kHz Modulation : FM
Type of Emmision : 14K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
15.625	Lower	6.25	-76.37	-40
	Upper	6.25	-75.86	-40
21.875	Lower	6.25	-82.17	-60
	Upper	6.25	-81.75	-60
37.5	Lower	25	-79.77	-60
	Upper	25	-79.24	-60
62.5	Lower	25	-83.56	-65
	Upper	25	-83.05	-65
87.5	Lower	25	-84.67	-65
	Upper	25	-84.28	-65
150	Lower	100	-77.91	-65
	Upper	100	-77.51	-65
250	Lower	100	-84.35	-65
	Upper	100	-84.42	-65
350	Lower	100	-87.50	-65
	Upper	100	-87.98	-65
>400k to 12MHz	Lower	30(s)	-89.73	-75
	Upper	30(s)	-89.60	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 804.95MHz (Band2)
Channel spacing : 25kHz Modulation : FM
Type of Emmision : 14K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
15.625	Lower	6.25	-76.37	-40
	Upper	6.25	-75.99	-40
21.875	Lower	6.25	-81.90	-60
	Upper	6.25	-81.81	-60
37.5	Lower	25	-79.98	-60
	Upper	25	-79.95	-60
62.5	Lower	25	-83.85	-65
	Upper	25	-83.42	-65
87.5	Lower	25	-84.57	-65
	Upper	25	-84.41	-65
150	Lower	100	-78.40	-65
	Upper	100	-78.53	-65
250	Lower	100	-84.95	-65
	Upper	100	-85.03	-65
350	Lower	100	-87.83	-65
	Upper	100	-87.84	-65
>400k to 12MHz	Lower	30(s)	-89.86	-75
	Upper	30(s)	-89.87	-75
12MHz to paired receive band		30(s)	-106.57	-75
In the paired receive band		30(s)	-104.71	-100

State: Transmitter Frequency : 774.95MHz (Band 1)
Channel spacing : 12.5kHz Modulation : FM
Type of Emmission : 11K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-46.11	-40
	Upper	6.25	-45.65	-40
15.625	Lower	6.25	-79.20	-60
	Upper	6.25	-79.21	-60
21.875	Lower	6.25	-81.98	-60
	Upper	6.25	-81.71	-60
37.5	Lower	25	-80.18	-60
	Upper	25	-79.50	-60
62.5	Lower	25	-83.15	-65
	Upper	25	-82.71	-65
87.5	Lower	25	-83.74	-65
	Upper	25	-83.52	-65
150	Lower	100	-78.64	-65
	Upper	100	-78.27	-65
250	Lower	100	-84.44	-65
	Upper	100	-84.64	-65
350	Lower	100	-87.47	-65
	Upper	100	-87.47	-65
>400k to 12MHz	Lower	30(s)	-90.32	-75
	Upper	30(s)	-90.09	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 804.95MHz (Band 2)
Channel spacing : 12.5kHz Modulation : FM
Type of Emmision : 11K0F3E Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-46.22	-40
	Upper	6.25	-45.77	-40
15.625	Lower	6.25	-79.05	-60
	Upper	6.25	-79.07	-60
21.875	Lower	6.25	-81.94	-60
	Upper	6.25	-81.83	-60
37.5	Lower	25	-80.08	-60
	Upper	25	-79.92	-60
62.5	Lower	25	-83.79	-65
	Upper	25	-83.24	-65
87.5	Lower	25	-84.51	-65
	Upper	25	-84.36	-65
150	Lower	100	-78.57	-65
	Upper	100	-78.34	-65
250	Lower	100	-84.60	-65
	Upper	100	-84.81	-65
350	Lower	100	-87.50	-65
	Upper	100	-87.92	-65
>400k to 12MHz	Lower	30(s)	-90.11	-75
	Upper	30(s)	-89.75	-75
12MHz to paired receive band		30(s)	-106.66	-75
In the paired receive band		30(s)	-104.59	-100

State: Transmitter Frequency : 769.05MHz (Band 1)
Channel spacing : 12.5kHz Modulation : Digital
Type of Emmission : 8K10F1E/F1D/F1W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-40.91	-40
	Upper	6.25	-42.01	-40
15.625	Lower	6.25	-79.51	-60
	Upper	6.25	-79.40	-60
21.875	Lower	6.25	-82.26	-60
	Upper	6.25	-81.87	-60
37.5	Lower	25	-80.13	-60
	Upper	25	-79.50	-60
62.5	Lower	25	-83.86	-65
	Upper	25	-83.29	-65
87.5	Lower	25	-84.78	-65
	Upper	25	-84.46	-65
150	Lower	100	-78.50	-65
	Upper	100	-78.24	-65
250	Lower	100	-84.79	-65
	Upper	100	-84.71	-65
350	Lower	100	-88.04	-65
	Upper	100	-87.60	-65
>400k to 12MHz	Lower	30(s)	-89.93	-75
	Upper	30(s)	-89.83	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 804.95MHz (Band 2)
Channel spacing : 12.5kHz Modulation : Digital
Type of Emmision : 8K10F1E/F1D/F1W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-41.03	-40
	Upper	6.25	-41.91	-40
15.625	Lower	6.25	-79.03	-60
	Upper	6.25	-79.05	-60
21.875	Lower	6.25	-81.93	-60
	Upper	6.25	-81.85	-60
37.5	Lower	25	-80.21	-60
	Upper	25	-79.88	-60
62.5	Lower	25	-83.66	-65
	Upper	25	-83.34	-65
87.5	Lower	25	-84.61	-65
	Upper	25	-84.46	-65
150	Lower	100	-78.51	-65
	Upper	100	-78.52	-65
250	Lower	100	-84.52	-65
	Upper	100	-84.83	-65
350	Lower	100	-87.58	-65
	Upper	100	-87.56	-65
>400k to 12MHz	Lower	30(s)	-90.00	-75
	Upper	30(s)	-90.17	-75
12MHz to paired receive band		30(s)	-106.63	-75
In the paired receive band		30(s)	-104.56	-100

State: Transmitter Frequency : 774.95MHz (Band 1)
Channel spacing : 12.5kHz Modulation : Digital
Type of Emmission : 8K30F1E/F1D/F7W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-44.36	-40
	Upper	6.25	-45.43	-40
15.625	Lower	6.25	-79.27	-60
	Upper	6.25	-79.20	-60
21.875	Lower	6.25	-81.99	-60
	Upper	6.25	-81.73	-60
37.5	Lower	25	-80.05	-60
	Upper	25	-79.54	-60
62.5	Lower	25	-83.33	-65
	Upper	25	-82.47	-65
87.5	Lower	25	-83.83	-65
	Upper	25	-83.69	-65
150	Lower	100	-78.52	-65
	Upper	100	-78.32	-65
250	Lower	100	-84.47	-65
	Upper	100	-84.51	-65
350	Lower	100	-87.34	-65
	Upper	100	-87.41	-65
>400k to 12MHz	Lower	30(s)	-89.84	-75
	Upper	30(s)	-90.22	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 799.05MHz (Band 2)
Channel spacing : 12.5kHz Modulation : Digital
Type of Emmision : 8K30F1E/F1D/F7W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
9.375	Lower	6.25	-44.19	-40
	Upper	6.25	-45.34	-40
15.625	Lower	6.25	-79.16	-60
	Upper	6.25	-79.21	-60
21.875	Lower	6.25	-82.02	-60
	Upper	6.25	-81.87	-60
37.5	Lower	25	-80.31	-60
	Upper	25	-79.81	-60
62.5	Lower	25	-83.74	-65
	Upper	25	-83.59	-65
87.5	Lower	25	-84.73	-65
	Upper	25	-84.61	-65
150	Lower	100	-78.59	-65
	Upper	100	-78.52	-65
250	Lower	100	-84.77	-65
	Upper	100	-84.93	-65
350	Lower	100	-87.62	-65
	Upper	100	-88.13	-65
>400k to 12MHz	Lower	30(s)	-90.70	-75
	Upper	30(s)	-90.52	-75
12MHz to paired receive band		30(s)	-106.62	-75
In the paired receive band		30(s)	-105.88	-100

State: Transmitter Frequency : 769.05MHz (Band 1)
Channel spacing : 6.25kHz Modulation : Digital
Type of Emmission : 4K00F1E/F1D/F7W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
6.25	Lower	6.25	-47.53	-40
	Upper	6.25	-50.67	-40
12.5	Lower	6.25	-77.57	-60
	Upper	6.25	-77.62	-60
18.75	Lower	6.25	-80.94	-60
	Upper	6.25	-80.76	-60
25	Lower	6.25	-83.17	-65
	Upper	6.25	-82.80	-65
37.5	Lower	25	-80.17	-65
	Upper	25	-79.66	-65
62.5	Lower	25	-83.79	-65
	Upper	25	-83.49	-65
87.5	Lower	25	-84.96	-65
	Upper	25	-84.57	-65
150	Lower	100	-78.50	-65
	Upper	100	-78.29	-65
250	Lower	100	-84.75	-65
	Upper	100	-84.72	-65
350	Lower	100	-87.83	-65
	Upper	100	-87.82	-65
>400k to 12MHz	Lower	30(s)	-89.93	-75
	Upper	30(s)	-90.24	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 804.95MHz (Band 2)
Channel spacing : 6.25kHz Modulation : Digital
Type of Emmission : 4K00F1E/F1D/F7W Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
6.25	Lower	6.25	-47.42	-40
	Upper	6.25	-50.56	-40
12.5	Lower	6.25	-77.06	-60
	Upper	6.25	-77.21	-60
18.75	Lower	6.25	-80.68	-60
	Upper	6.25	-80.58	-60
25	Lower	6.25	-83.07	-65
	Upper	6.25	-82.90	-65
37.5	Lower	25	-80.02	-65
	Upper	25	-79.80	-65
62.5	Lower	25	-83.57	-65
	Upper	25	-83.43	-65
87.5	Lower	25	-84.69	-65
	Upper	25	-84.47	-65
150	Lower	100	-78.51	-65
	Upper	100	-78.30	-65
250	Lower	100	-84.53	-65
	Upper	100	-84.89	-65
350	Lower	100	-87.71	-65
	Upper	100	-87.48	-65
>400k to 12MHz	Lower	30(s)	-90.71	-75
	Upper	30(s)	-79.61	-75
12MHz to paired receive band		30(s)	-106.31	-75
In the paired receive band		30(s)	-104.71	-100

State: Transmitter Frequency : 769.05MHz (Band 1)
Channel spacing : 6.25kHz Modulation : Digital
Type of Emmission : 4K00F2D Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
6.25	Lower	6.25	-43.07	-40
	Upper	6.25	-44.76	-40
12.5	Lower	6.25	-77.60	-60
	Upper	6.25	-77.66	-60
18.75	Lower	6.25	-80.94	-60
	Upper	6.25	-80.71	-60
25	Lower	6.25	-83.21	-65
	Upper	6.25	-82.80	-65
37.5	Lower	25	-80.37	-65
	Upper	25	-79.59	-65
62.5	Lower	25	-84.00	-65
	Upper	25	-83.42	-65
87.5	Lower	25	-84.99	-65
	Upper	25	-84.73	-65
150	Lower	100	-78.48	-65
	Upper	100	-78.06	-65
250	Lower	100	-84.56	-65
	Upper	100	-84.84	-65
350	Lower	100	-87.79	-65
	Upper	100	-87.79	-65
>400k to 12MHz	Lower	30(s)	-90.27	-75
	Upper	30(s)	-90.14	-75

This taransmit frequency does not have a paired receive band.

State: Transmitter Frequency : 799.05MHz (Band 2)
Channel spacing : 6.25kHz Modulation : Digital
Type of Emmission : 4K00F2D Ref Power Level : 44.7dBm(High Power)

Offset from Center frequency (kHz)	Upper/Lower	Measurement BW (kHz)	Measurement Maximaum ACP (dBc)	Maximaum ACP relative (dBc)
6.25	Lower	6.25	-43.21	-40
	Upper	6.25	-44.48	-40
12.5	Lower	6.25	-77.18	-60
	Upper	6.25	-77.26	-60
18.75	Lower	6.25	-80.78	-60
	Upper	6.25	-80.70	-60
25	Lower	6.25	-83.25	-65
	Upper	6.25	-83.02	-65
37.5	Lower	25	-80.12	-65
	Upper	25	-79.64	-65
62.5	Lower	25	-83.73	-65
	Upper	25	-83.46	-65
87.5	Lower	25	-84.67	-65
	Upper	25	-84.76	-65
150	Lower	100	-78.44	-65
	Upper	100	-78.64	-65
250	Lower	100	-84.63	-65
	Upper	100	-84.84	-65
350	Lower	100	-87.53	-65
	Upper	100	-87.77	-65
>400k to 12MHz	Lower	30(s)	-90.31	-75
	Upper	30(s)	-90.57	-75
12MHz to paired receive band		30(s)	-106.46	-75
In the paired receive band		30(s)	-105.56	-100

10.11.2

Test Procedure

§ 90.543 (c) : Out-of-band emission limit :Conducted

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The modulation mode was operated to its maximum extent (CW mode)
- 3 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 100 kHz (< 1 GHz), 1 MHz (> 1 GHz).
 - b) VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
 - c) Sweep Speed : 50ms
 - d) Detector mode : Average power
- 4 The emissions were measured for the worst case as follows:
 - a) : within a band of frequencies defined by the carrier frequency plus and minus one channel.
 - b) : from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

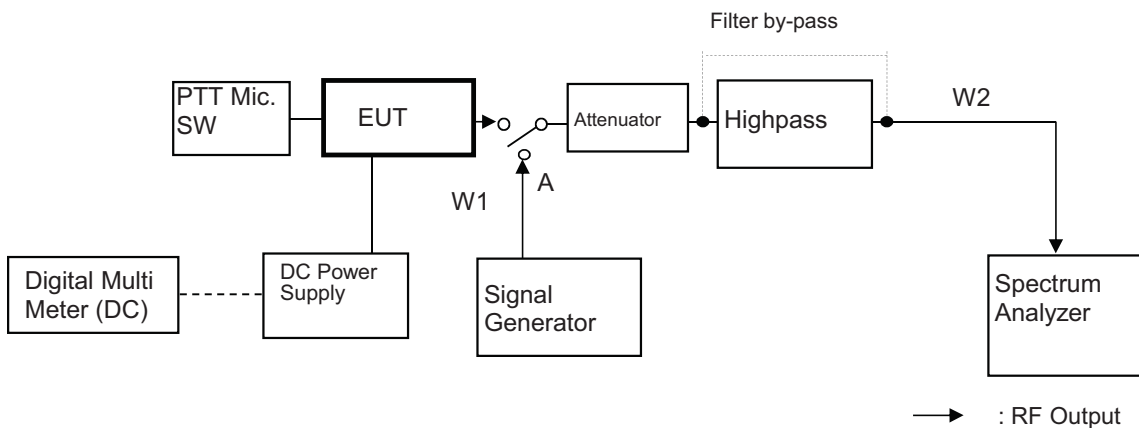
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Highpass Filter	TME	UHP-127	1511798E	Jun. 01, 15	Jun. 30, 16
4	Signal Generator	Rohde&Schwarz	SMP02	845275/007	Feb. 17, 15	Feb. 29, 16
5	Spectrum Analyzer	Agilent	N9030A	US51350220	Jul. 03, 14	Jul. 31, 15
6	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
7	Digital Multi Meter	Agilent	34401A	US36043517	Jul. 01, 14	Jul. 31, 15

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 15	Jan. 31, 16

Measuring Equipment Configuration



Test Results

Test date	Jul 9, 2015	
Location	Kashima No.1 Test Site	
temperature	22.1	[degree C]
Humidity Variation	60	[%]
Atmospheric Pressure	101.4	[kPa]
Test Engineer	Koichi Wagatsuma	

Test was carried out for all the frequency band of section 10.1

State the worst case(below)

State: High Power / Authorized Bandwidth 20 kHz

No.	Tuned Frequency (MHz)	Band	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Limit (dBc)	Margin (dB)
1	769.05 (Band 1)	Low	1538.10	-47.50	-92.27	-57.8	34.5
2	774.95 (Band 1)	High	1549.90	-49.00	-93.77	-57.8	36.0
4	799.05 (Band 2)	Low	1598.10	-47.10	-91.87	-57.8	34.1
3	804.95 (Band 2)	High	1609.90	-46.40	-91.17	-57.8	33.4
There is the margin of 20dB over except for the above points.							

State: Low Power / Authorized Bandwidth 20 kHz

No.	Tuned Frequency (MHz)	Band	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Limit (dBc)	Margin (dB)
1	769.05 (Band 1)	Low	-	-	-	-46.0	-
2	774.95 (Band 1)	High	-	-	-	-46.0	-
3	799.05 (Band 2)	Low	-	-	-	-46.0	-
4	804.95 (Band 2)	High	-	-	-	-46.0	-
There is the margin of 20dB over except for the above points.							

§ 90.543 (c) Limit (dBc) = $-(43+10\log(P))$

Correct Level (dBm) = Substitute SG Level (dBm)

Emission Level (dBc) = Correct Level (dBm) - $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

10.11.3

Test Procedure

§ 90.543 (c) : Out-of-band emission limit : Radiated

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 100 kHz (< 1 GHz), 1 MHz (> 1 GHz).
 - b) VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
 - c) Sweep Speed : 50ms.
 - d) Detector mode : Positive Peak
- 3 The transmitter was placed on a wooden turntable, and it was transmitting into non-radiating load which was also placed on the turntable.
- 4 The measurement antenna was placed at a distance of 3 meters from the EUT.
During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.
The test was performed by placing the EUT on 3-orthogonal axis.
- 5 The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 6 Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable.
The absolute levels of the spurious emissions were measured by the substitution.
- 7 Spurious emissions in dB = 10 Log (TX power in Watts/0.001) – the absolute level

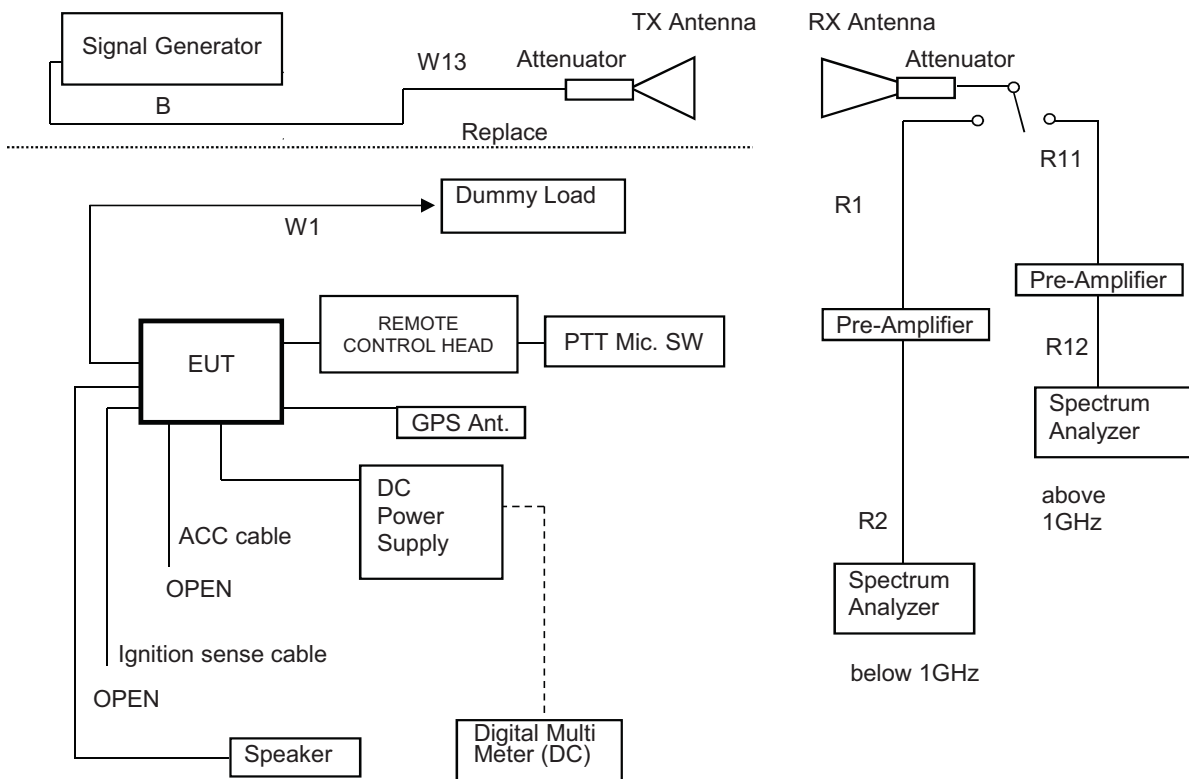
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator(6dB)	HUBER+SUHNER	6806.17B	4962	Jan. 23, 15	Jan. 31, 16
2	Attenuator(10dB)	HUBER+SUHNER	6810.17B	5061	Jun. 01, 15	Jun. 30, 16
3	Dummy Load	TME	CT-150NP	1138693	Jan. 20, 15	Jan. 31, 16
4	Signal Generator	Rohde&Schwarz	SMB 100A	105709	Mar. 18, 15	Mar. 31, 16
5	Signal Generator	Rohde&Schwarz	SMP02	845275/007	Feb. 17, 15	Feb. 29, 16
6	Spectrum Analyzer	Agilent	N9030A	US51350170	Mar. 12, 15	Mar. 31, 16
7	D.R.G Antenna(RX)	Schwarzbeck	3115	5044	Jul. 16, 14	Jul. 31, 15
8	D.R.G Antenna(TX)	Schwarzbeck	3115	5045	Apr. 15, 15	Apr. 30, 16
9	Dipole Antenna(TX)	Schwarzbeck	UHA9105	AM0082002	Jul. 31, 14	Jul. 31, 15
10	Dipole Antenna(TX)	Schwarzbeck	VHA9103	C01082007	Jul. 31, 14	Jul. 31, 15
11	Tri-log Antenna(RX)	Schwarzbeck	VULB9168WP	288	Jul. 14, 14	Jul. 31, 15
12	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
13	Digital Multi Meter	Agilent	34401A	US36043517	Jul. 01, 14	Jul. 31, 15
14	Amplifier	Intertek Japan	ZFL-1200GH+L	2013075-2	Jul. 11, 14	Jul. 31, 15
15	Amplifier	TOYO	TPA0118-30	0402	Feb. 23, 15	Feb. 29, 16
16	Attenuator	HUBER + SUHNER	6803.17.B	5111	Feb. 23, 15	Feb. 29, 16

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
R2	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W5	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun. 09, 15	Jun. 30, 16
R12	Coaxial Cable	SUHNER	SUCOFLEX	104229603	Feb. 23, 15	Feb. 29, 16
R11	Coaxial Cable	Candox	5B-048-98-98-5	111130	Feb. 23, 15	Feb. 29, 16
R1	Coaxial Cable	FUJIKURA	5D-2W	KSR00312	Jun. 09, 15	Jun. 30, 16
W13	Coaxial Cable	Suhner	SUCOFLEX106	KSR00207	Jun. 09, 15	Jun. 30, 16

Measuring Equipment Configuration



Test Results

Test date	Jul 3, 2015 to Jul 6, 2015
Location	Kashima No.12 Test Site
temperature	20.5 to 28.1 [degree C]
Humidity Variation	45 to 71 [%]
Atmospheric Pressure	98.5 to 99.5 [kPa]
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1

State the worst case(below)

State: High Power / Authorized Bandwidth 20 kHz / 769.05MHz (Band 1)

No.	Spurious Frequency (MHz)	Pol.	Reading Level (dBm)	SG Out Level (dBm)	Loss (dB)	Ant. Gain (dBi)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	1538.10	Hor.	-58.40	-50.00	13.06	8.36	-54.7	-99.5	-57.8	41.7
		Ver.	-57.75	-50.20	13.06	8.36	41.9	-99.7	-57.8	41.9
2	2307.15	Hor.	-60.70	-48.40	13.82	9.19	40.0	-97.8	-57.8	40.0
		Ver.	-60.40	-47.00	13.82	9.19	38.6	-96.4	-57.8	38.6
3	3076.20	Hor.	-	-	14.49	9.81	-	-	-57.8	-
		Ver.	-	-	14.49	9.81	-	-	-57.8	-
4	3845.25	Hor.	-	-	15.04	9.74	-	-	-57.8	-
		Ver.	-	-	15.04	9.74	-	-	-57.8	-
5	4614.30	Hor.	-	-	15.55	11.07	-	-	-57.8	-
		Ver.	-	-	15.55	11.07	-	-	-57.8	-
6	5383.35	Hor.	-63.00	-39.00	16.03	10.84	31.2	-89.0	-57.8	31.2
		Ver.	-58.95	-35.10	16.03	10.84	27.3	-85.1	-57.8	27.3
7	6152.40	Hor.	-	-	16.46	11.39	-	-	-57.8	-
		Ver.	-	-	16.46	11.39	-	-	-57.8	-
8	6921.45	Hor.	-	-	16.84	11.66	-	-	-57.8	-
		Ver.	-	-	16.84	11.66	-	-	-57.8	-
9	7690.50	Hor.	-	-	17.22	11.64	-	-	-57.8	-
		Ver.	-	-	17.22	11.64	-	-	-57.8	-

There is the margin of 20dB over except for the above points.

§ 90.543 (c) Limit (dBc) = $-(43+10\log(P))$

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

State: Low Power / Authorized Bandwidth 11.25 kHz / 769.05MHz (Band 1)

No.	Spurious Frequency (MHz)	Pol.	Reading Level (dBm)	SG Out Level (dBm)	Loss (dB)	Ant. Gain (dBi)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	1538.10	Hor.	-63.70	-55.30	13.06	8.36	-60.0	-93.0	-46.0	47.0
		Ver.	-61.86	-54.31	13.06	8.36	-59.0	-92.0	-46.0	46.0
2	2307.15	Hor.	-	-	13.82	9.19	-	-	-46.0	-
		Ver.	-	-	13.82	9.19	-	-	-46.0	-
3	3076.20	Hor.	-	-	14.49	9.81	-	-	-46.0	-
		Ver.	-	-	14.49	9.81	-	-	-46.0	-
4	3845.25	Hor.	-	-	15.04	9.74	-	-	-46.0	-
		Ver.	-	-	15.04	9.74	-	-	-46.0	-
5	4614.30	Hor.	-	-	15.55	11.07	-	-	-46.0	-
		Ver.	-	-	15.55	11.07	-	-	-46.0	-
6	5383.35	Hor.	-	-	16.03	10.84	-	-	-46.0	-
		Ver.	-67.20	-43.35	16.03	10.84	-48.5	-81.5	-46.0	35.5
7	6152.40	Hor.	-	-	16.46	11.39	-	-	-46.0	-
		Ver.	-	-	16.46	11.39	-	-	-46.0	-
8	6921.45	Hor.	-	-	16.84	11.66	-	-	-46.0	-
		Ver.	-	-	16.84	11.66	-	-	-46.0	-
9	7690.50	Hor.	-	-	17.22	11.64	-	-	-46.0	-
		Ver.	-	-	17.22	11.64	-	-	-46.0	-

There is the margin of 20dB over except for the above points.

§ 90.543 (c) Limit (dBc) = -(43+10Log(P))

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - 10Log(P*1000)

P = Carrier Level (W)

" - " = Measurement Limit

State: High Power / Authorized Bandwidth 11.25 kHz / 804.95MHz (Band 2)

No.	Spurious Frequency (MHz)	Pol.	Reading Level (dBm)	SG Out Level (dBm)	Loss (dB)	Ant. Gain (dBi)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	1609.90	Hor.	-58.10	-48.40	13.14	8.42	-53.1	-97.9	-57.8	40.1
		Ver.	-57.60	-47.70	13.14	8.42	39.4	-97.2	-57.8	39.4
2	2414.85	Hor.	-	-	13.92	9.40	-	-	-57.8	-
		Ver.	-62.50	-48.80	13.92	9.40	40.3	-98.1	-57.8	40.3
3	3219.80	Hor.	-	-	14.59	9.89	-	-	-57.8	-
		Ver.	-	-	14.59	9.89	-	-	-57.8	-
4	4024.75	Hor.	-	-	15.16	9.67	-	-	-57.8	-
		Ver.	-	-	15.16	9.67	-	-	-57.8	-
5	4829.70	Hor.	-	-	15.69	10.96	-	-	-57.8	-
		Ver.	-	-	15.69	10.96	-	-	-57.8	-
6	5634.65	Hor.	-64.40	-44.30	16.17	10.95	36.5	-94.3	-57.8	36.5
		Ver.	-60.80	-39.80	16.17	10.95	32.0	-89.8	-57.8	32.0
7	6439.60	Hor.	-	-	16.60	11.90	-	-	-57.8	-
		Ver.	-65.40	-43.90	16.60	11.90	35.6	-93.4	-57.8	35.6
8	7244.55	Hor.	-	-	17.00	11.36	-	-	-57.8	-
		Ver.	-	-	17.00	11.36	-	-	-57.8	-
9	8049.50	Hor.	-	-	17.40	11.51	-	-	-57.8	-
		Ver.	-	-	17.40	11.51	-	-	-57.8	-

There is the margin of 20dB over except for the above points.

§ 90.543 (c) Limit (dBc) = -(43+10Log(P))

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - 10Log(P*1000)

P = Carrier Level (W)

" - " = Measurement Limit

State: Low Power / Authorized Bandwidth 11.25 kHz / 804.95MHz (Band 2)

No.	Spurious Frequency (MHz)	Pol.	Reading Level (dBm)	SG Out Level (dBm)	Loss (dB)	Ant. Gain (dBi)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	1609.90	Hor.	-64.00	-54.30	13.14	8.42	-59.0	-92.0	-46.0	46.0
		Ver.	-62.50	-52.60	13.14	8.42	44.3	-90.3	-46.0	44.3
2	2414.85	Hor.	-	-	13.92	9.40	-	-	-46.0	-
		Ver.	-	-	13.92	9.40	-	-	-46.0	-
3	3219.80	Hor.	-	-	14.59	9.89	-	-	-46.0	-
		Ver.	-	-	14.59	9.89	-	-	-46.0	-
4	4024.75	Hor.	-	-	15.16	9.67	-	-	-46.0	-
		Ver.	-	-	15.16	9.67	-	-	-46.0	-
5	4829.70	Hor.	-	-	15.69	10.96	-	-	-46.0	-
		Ver.	-	-	15.69	10.96	-	-	-46.0	-
6	5634.65	Hor.	-	-	16.17	10.95	-	-	-46.0	-
		Ver.	-	-	16.17	10.95	-	-	-46.0	-
7	6439.60	Hor.	-	-	16.60	11.90	-	-	-46.0	-
		Ver.	-	-	16.60	11.90	-	-	-46.0	-
8	7244.55	Hor.	-	-	17.00	11.36	-	-	-46.0	-
		Ver.	-	-	17.00	11.36	-	-	-46.0	-
9	8049.50	Hor.	-	-	17.40	11.51	-	-	-46.0	-
		Ver.	-	-	17.40	11.51	-	-	-46.0	-

There is the margin of 20dB over except for the above points.

§ 90.543 (c) Limit (dBc) = -(43+10Log(P))

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - 10Log(P*1000)

P = Carrier Level (W)

" - " = Measurement Limit

10.11.4

Test Procedure

§ 90.543 (f) : EIRP in GNSS Band:1559-1610MHz (Conducted Calculated)

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Modulate the transmitter with standard modulation at the necessary input level.
Standard modulation is a 1000 Hz input signal at the level that produces 60% of full rated system deviation.
- 3 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 1 MHz (for Wide Band Emmission)/ 1 kHz (for Discrete Emission)
 - b) VBW : 3 MHz (for Wide Band Emission) / 3 kHz (for Discrete Emission)
 - c) Detector mode : Average
- 4 The frequency range between 1559MHz and 1610MHz was investigated.
- 5 Replace the EUT with the signal Generator and adjust the signal level to reproduce the fequencies and levels of every spurious emission recorded in step 4.
Record the signal generator levels in dBm.
- 6 $EIRP\ Levels(dBm) = SG\ Level\ (dBm) + ANT\ Gain\ (dBi)$
(0dBm = -30dBW, ANT Gain =2.15dBi)

Measuring Equipments

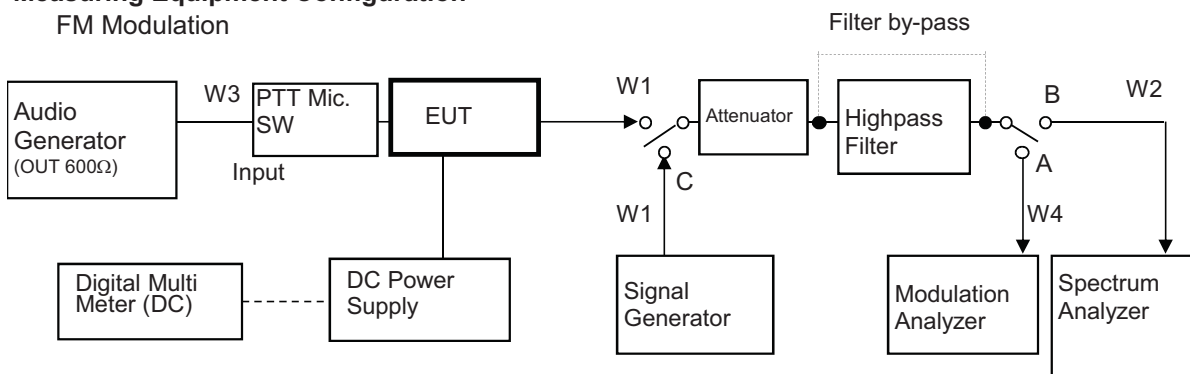
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Highpass Filter	TME	UHP-127	1511798E	Jun. 01, 15	Jun. 30, 16
4	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Oct. 13, 14	Oct. 31, 15
5	Signal Generator	Rohde&Schwarz	SMP02	845275/007	Feb. 17, 15	Feb. 29, 16
6	Audio Generator	Anritsu	MG443B	M70150	Jun. 18, 15	Jun. 30, 16
7	Spectrum Analyzer	Agilent	N9030A	US51350220	Jul. 03, 14	Jul. 31, 15
8	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
9	Digital Multi Meter	Agilent	34401A	US36043517	Jul. 01, 14	Jul. 31, 15

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W3	Balance Cable	Nicoon	3D-2V	KSR00092	Jan. 23, 15	Jan. 31, 16
W4	Coaxial Cable	Pacific custom	RG-58 C/U	AM90C04	Jun. 09, 15	Jun. 30, 16
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 15	Jan. 31, 16

Measuring Equipment Configuration

FM Modulation



Note: Configuration of other Modulation test is composed without the Audio Generator.

Test Results

Test date	Jul 9, 2015	
Location	Kashima No.1 Test Site	
temperature	22.1	[degree C]
Humidity Variation	60	[%]
Atmospheric Pressure	101.4	[kPa]
Test Engineer	Koichi Wagatsuma	

Test was carried out for all the frequency band of section 10.1
State the worst case(below)

State: High Power 769.05 MHz (Band 1) Wide Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/MHz)	Limit (dBW/MHz)	Margin (dB)
1	16K0F3E	**	-	**	<-70	-70	**
2	14K0F3E	**	-	**	<-70	-70	**
3	11K0F3E	**	-	**	<-70	-70	**
4	8K10F1E/F1D/F1W	**	-	**	<-70	-70	**
5	8K30F1E/F1D/F7W	**	-	**	<-70	-70	**
6	4K00F1E/F1D/F7W	**	-	**	<-70	-70	**
7	4K00F2D.	**	-	**	<-70	-70	**

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

State: High Power 769.05 MHz (Band 1) Discrete Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/kHz)	Limit (dBW/kHz)	Margin (dB)
1	16K0F3E	**	-	**	<-80	-80	**
2	14K0F3E	**	-	**	<-80	-80	**
3	11K0F3E	**	-	**	<-80	-80	**
4	8K10F1E/F1D/F1W	**	-	**	<-80	-80	**
5	8K30F1E/F1D/F7W	**	-	**	<-80	-80	**
6	4K00F1E/F1D/F7W	**	-	**	<-80	-80	**
7	4K00F2D.	**	-	**	<-80	-80	**

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

Correct Level (dBW) = SG Level (dBm) + ANT Gain (dB) - 30dB

" - " = Measurement Limit

State: High Power 774.95 MHz (Band 1)

Wide Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/MHz)	Limit (dBW/MHz)	Margin (dB)
1	16K0F3E	**	-	**	<-70	-70	**
2	14K0F3E	**	-	**	<-70	-70	**
3	11K0F3E	**	-	**	<-70	-70	**
4	8K10F1E/F1D/F1W	**	-	**	<-70	-70	**
5	8K30F1E/F1D/F7W	**	-	**	<-70	-70	**
6	4K00F1E/F1D/F7W	**	-	**	<-70	-70	**
7	4K00F2D.	**	-	**	<-70	-70	**

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

State: High Power 774.95 MHz (Band 1)

Discrete Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/kHz)	Limit (dBW/kHz)	Margin (dB)
1	16K0F3E	**	-	**	<-80	-80	**
2	14K0F3E	**	-	**	<-80	-80	**
3	11K0F3E	**	-	**	<-80	-80	**
4	8K10F1E/F1D/F1W	**	-	**	<-80	-80	**
5	8K30F1E/F1D/F7W	**	-	**	<-80	-80	**
6	4K00F1E/F1D/F7W	**	-	**	<-80	-80	**
7	4K00F2D.	**	-	**	<-80	-80	**

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

Correct Level (dBW) = SG Level (dBm) + ANT Gain (dB) - 30dB

" - " = Measurement Limit

State: High Power 799.05 MHz (Band 2)

Wide Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/MHz)	Limit (dBW/MHz)	Margin (dB)
1	16K0F3E	1598.10	-98.3	-47.1	-75.0	-70	5.0
2	14K0F3E	1598.10	-98.5	-47.3	-75.2	-70	5.2
3	11K0F3E	1598.10	-98.3	-47.1	-75.0	-70	5.0
4	8K10F1E/F1D/F1W	1598.10	-98.4	-47.2	-75.1	-70	5.1
5	8K30F1E/F1D/F7W	1598.10	-98.5	-47.3	-75.2	-70	5.2
6	4K00F1E/F1D/F7W	1598.10	-98.8	-47.6	-75.5	-70	5.5
7	4K00F2D	1598.10	-98.3	-47.1	-75.0	-70	5.0

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

State: High Power 799.05 MHz (Band 2)

Discrete Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/kHz)	Limit (dBW/kHz)	Margin (dB)
1	16K0F3E	1598.10	-107.5	-56.1	-83.9	-80	3.9
2	14K0F3E	1598.10	-106.8	-55.4	-83.2	-80	3.2
3	11K0F3E	1598.10	-105.3	-53.9	-81.8	-80	1.8
4	8K10F1E/F1D/F1W	1598.10	-108.2	-56.8	-84.7	-80	4.6
5	8K30F1E/F1D/F7W	1598.10	-108.7	-57.3	-85.2	-80	5.1
6	4K00F1E/F1D/F7W	1598.10	-104.7	-53.3	-81.2	-80	1.1
7	4K00F2D	1598.10	-104.6	-53.2	-81.1	-80	1.0

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

Correct Level (dBW) = SG Level (dBm) + ANT Gain (dB) - 30dB

" - " = Measurement Limit

State: High Power 804.95 MHz (Band 2)

Wide Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/MHz)	Limit (dBW/MHz)	Margin (dB)
1	16K0F3E	1609.90	-98.5	-47.3	-75.2	-70	5.2
2	14K0F3E	1609.90	-98.3	-47.1	-75.0	-70	5.0
3	11K0F3E	1609.90	-98.5	-47.3	-75.2	-70	5.2
4	8K10F1E/F1D/F1W	1609.90	-98.7	-47.5	-75.4	-70	5.4
5	8K30F1E/F1D/F7W	1609.90	-98.3	-47.1	-75.0	-70	5.0
6	4K00F1E/F1D/F7W	1609.90	-98.2	-47.0	-74.9	-70	4.9
7	4K00F2D	1609.90	-98.5	-47.3	-75.2	-70	5.2

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

State: High Power 804.95 MHz (Band 2)

Discrete Band Emmission

No.	Type of Emission	Spurious Frequency (MHz)	Reading Level (dBm)	SG Out Level (dBm)	Correct Level (dBW/kHz)	Limit (dBW/kHz)	Margin (dB)
1	16K0F3E	1609.90	-107.3	-55.9	-83.8	-80	3.7
2	14K0F3E	1609.90	-106.6	-55.2	-83.1	-80	3.0
3	11K0F3E	1609.90	-105.5	-54.1	-82.0	-80	1.9
4	8K10F1E/F1D/F1W	1609.90	-108.1	-56.7	-84.6	-80	4.5
5	8K30F1E/F1D/F7W	1609.90	-108.3	-56.9	-84.8	-80	4.7
6	4K00F1E/F1D/F7W	1609.90	-104.9	-53.5	-81.4	-80	1.3
7	4K00F2D	1609.90	-104.7	-53.3	-81.2	-80	1.1

Ther is the margin of 20dB over except for the above points.

The emissions were scanned from 1590MHz to 1610MHz and no significant emissions were found.

Correct Level (dBW) = SG Level (dBm) + ANT Gain (dB) - 30dB

" - " = Measurement Limit

10.12 Receiver Spurious Emissions(Radiated)

REGULATIONS	:	RSS-119 Section 5.11, RSS-Gen Section 7
TEST METHOD/GUIDE	:	RSS-Gen Section 7

TEST PROCEDURE

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Tabletop Equipment
EUT is placed on the wooden table, the top of which is 0.8meter above the metal ground plane(turntable).
- 3 Interconnecting Cables
Excess part of the interconnecting cables longer than 1 meter are bundled in the center.
Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.
- 4 Measuring Instruments
Measuring instruments list and their calibration schedule are shown on Measurement Equipment Configuration.
The brief description are as follows;
- 5 Antennas
The broadband Bi-cog antenna is used for measurement on the frequency range 30 – 1000 MHz.
The Double ridged guide antenna is used for frequency higher than 1000 MHz.
- 6 Pre-amplifier
The broadband pre-amplifier is used for radiated emission measurement.
The signal to noise ratio is improved by using pre-amplifier.
- 7 Spectrum Analyzer
The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz (RBW : 1 MHz).
- 8 EMI Test Receiver
The Quasi-peak detector (IF bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30 – 1000 MHz.
The test receiver is complied with the specification of the CISPR publication 16.
- 9 Turntable
The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.
- 10 Antenna Mast
The antenna mast is attachable to all antennas described on antenna
height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.
- 11 Preliminary Measurement
EUT is tested on all operating conditions.
The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to find the worst emission conditions in configuration, operating mode, or ambient noise notation.

12 Final Measurement

The EUT operated in the condition where maximum emission is found in the preliminary test.

The turntable azimuth(EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

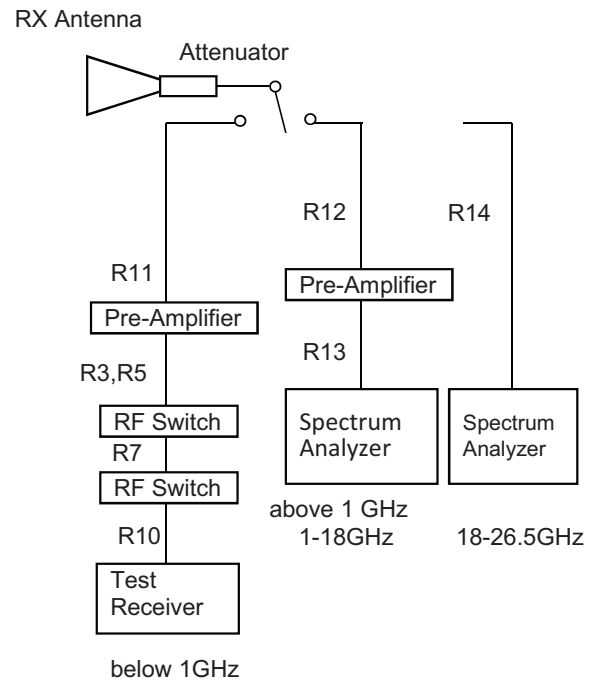
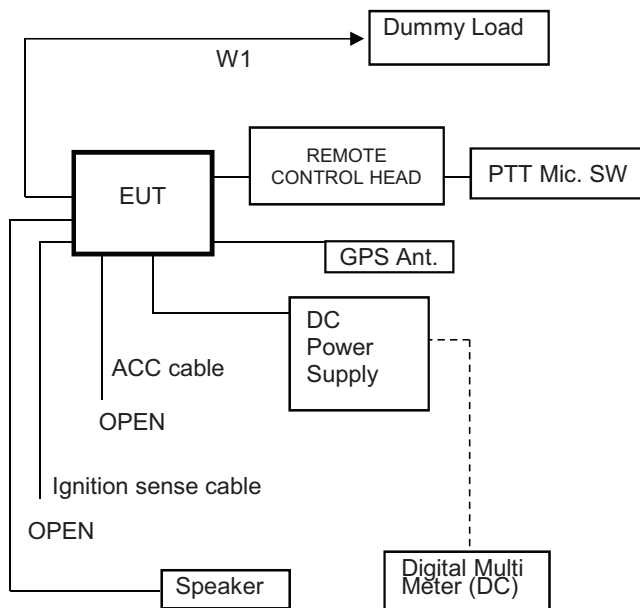
TEST EQUIPMENTS

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Biconical Antenna	Schwarzbeck	BBA9106	A09082007	Sep. 24, 14	Sep. 30, 15
2	Log periodic Antenna	Schwarzbeck	USLP9143B	043	Jun. 17, 15	Jun. 30, 16
3	Amplifier	Intertek Japan	ZX60-3018G	005	Jan. 23, 15	Jan. 31, 16
4	6dB Attenuator	TAMAGAWA	CFA-01	A00040805	Jan. 23, 15	Jan. 31, 16
5	Double Ridged Antenna	ETS·LINDGREN	3117	55157	May. 21, 15	May. 31, 16
6	3dB Attenuator	HUBER + SUHNER	6803.17.B	5111	Feb. 23, 15	Feb. 29, 16
7	Amplifier	TOYO	TPA0118-30	0402	Feb. 23, 15	Feb. 29, 16
8	Double Ridged Antenna	TSJ	MLA-18265-B03-	1694440	Sep. 11, 14	Sep. 30, 15
9	Spectrum Analyzer	Agilent	N9030A	US51350170	Mar. 12, 15	Mar. 31, 16
10	Test receiver	Agilent	N9038A	MY51210201	Aug. 16, 14	Aug. 31, 15
11	RF Switch	Intertek Japan	ACX-150-1	A12301501	Jan. 23, 15	Jan. 31, 16
12	Site Attenuation	Intertek Japan	-	-	Feb. 20, 15	Feb. 29, 16
13	SVSWR	Intertek Japan	-	-	Jun. 05, 15	Jun. 30, 16
14	Dummy Load	TME	CT-150NP	1138693	Jan. 20, 15	Jan. 31, 16

USED CABLES

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
R11	Coaxial Cable	FUJIKURA	5D-2W	R11	Jan 23, 15	Jan. 31, 16
R3	Coaxial Cable	FUJIKURA	10D-2W	R3	Jan 23, 15	Jan. 31, 16
R5	Coaxial Cable	FUJIKURA	RG-5A/U	R5	Jan 23, 15	Jan. 31, 16
R7	Coaxial Cable	MIYAZAKI	5D-2W	R7	Jan 23, 15	Jan. 31, 16
R10	Coaxial Cable	FUJIKURA	5D-2W	R10	Jan 23, 15	Jan. 31, 16
R13	Coaxial Cable	SUHNER	SUCOFLEX 104	229603	Feb 23, 15	Feb. 29, 16
R12	Coaxial Cable	Candox	5B-048-98-98-5000	111130	Feb 23, 15	Feb. 29, 16
R14	Coaxial Cable	Candox	5B-048-98-98-6000	120315	Sep 12, 14	Sep. 30, 15
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	Jun 09, 15	Jun. 30, 16

MEASUREMENT EQUIPMENT CONFIGURATION



TEST RESULTS

Test date	Jul. 15, 2015 and Jul. 17, 2015
Location	Kashima No.12 Test Site
temperature	22 to 27 [degree C]
Humidity Variation	50 to 61 [%]
Atmospheric Pressure	100.4 to 100.8 [kPa]
Test Engineer	Katsuya Uchida

Test was carried out for the frequency band of section 10.1

State the worst case (below).

State : 851.05 MHz Receiver Condition

No.	Frequency (MHz)	Pol	Mode	Reading Level (dBuv)	Factor* (dB)	Emission Level (dBuV/m)	Limit Level (dBuV/m)	Margin (dB)
1	41.48	Hor.		-	-0.2	-	40.0	-
		Ver.		22.3	-0.2	22.1	40.0	17.9
2	42.49	Hor.		-	-0.5	-	40.0	-
		Ver.		22.0	-0.5	21.5	40.0	18.5
3	61.50	Hor.		-	-6.9	-	40.0	-
		Ver.		26.5	-6.9	19.6	40.0	20.4
4	432.00	Hor.		20.3	5.3	25.6	46.0	20.4
		Ver.		-	5.3	-	46.0	-
5	720.00	Hor.		15.4	10.9	26.3	46.0	19.7
		Ver.		-	10.9	-	46.0	-
6	864.00	Hor.		14.6	13.6	28.2	46.0	17.8
		Ver.		13.0	13.6	26.6	46.0	19.4
7	2379.00	Hor.	AVG	28.0	7.8	35.8	54.0	18.2
		Ver.	AVG	28.0	7.8	35.8	54.0	18.2
8	3172.00	Hor.	AVG	27.4	9.2	36.6	54.0	17.4
		Ver.	AVG	27.5	9.2	36.7	54.0	17.3
9	3965.00	Hor.	AVG	27.3	9.9	37.2	54.0	16.8
		Ver.	AVG	27.4	9.9	37.3	54.0	16.7
10	4758.00	Hor.	AVG	27.1	11.7	38.8	54.0	15.2
		Ver.	AVG	27.3	11.7	39.0	54.0	15.0
11	5551.00	Hor.	AVG	25.9	12.7	38.6	54.0	15.4
		Ver.	AVG	26.1	12.7	38.8	54.0	15.2

There is the margin of 20dB over except for the above points.
 * Factor = Antenna, Antenna Pad, Cable, Preamp
 Emission Level = Reading Level + Factor

Note:

- 1 Measurement distance is 3 metres. (Above 1GHz is 4.8 meters)
- 2 Scanned frequency are 30 to 25000 MHz.
- 3 Highest oscillator frequency is 4960 MHz.
(TXRX UNIT : 869MHz.)

10.13 Necessary Bandwidth and Emission Bandwidth

REGULATIONS	: FCC Part 2 Section 202 (g) & Federal Register/ Vol.68, No236 TRC 43
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Calculation Results

State : 16K0F3E (Authorized Bandwidth 20 kHz)

Item	Mark		
Maximum Modulation	(M)	3	kHz
Maximum Deviation	(D)	5	kHz
Constant Factor	(K)	1	
Necessary Bandwidth	(Bn)	16	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$

State : 14K0F3E (Authorized Bandwidth 20 kHz)

Item	Mark		
Maximum Modulation	(M)	3	kHz
Maximum Deviation	(D)	4	kHz
Constant Factor	(K)	1	
Necessary Bandwidth	(Bn)	14	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$

State : 11K0F3E (Authorized Bandwidth 11.25 kHz)

Item	Mark		
Maximum Modulation	(M)	3	kHz
Maximum Deviation	(D)	2.5	kHz
Constant Factor	(K)	1	
Necessary Bandwidth	(Bn)	11	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$

State: 8K10F1D / 8K10F1E / 8K10F1W (9600bps, Authorized Bandwidth 11.25 kHz)

Item	Mark		
Digital information rate	(R)	9600	bps
Peak frequency deviation	(D)	3.111	kHz
Signaling states	(S)	4	
Numerical factor	(K)	1	
Necessary Bandwidth	(Bn)	8.1	kHz Measurements were done*

*Measurements per Rule 47CFR Part 2.202(c)(4) were done because Part 2.202(g) Table III-A.1.

formulation produces an excessive result using the value of K recommended in the Table. Therefore the 99% energy rule (title 47CFR 2.202(a)) was used for digital mode and is more accurate than Carson's rule. It basically states that 99% of the modulation energy falls within X kHz, in this case, 8.10kHz Measurements were performed in accordance with TIA/EIA 102.CAAB Section 2.2.5.2. The emission mask was obtained from 47CFR 90.210(d).

State : 8K30F1E / 8K30F1D / 8K30F7W (4Level FSK / 9600bps, Authorized Bandwidth 11.25 kHz)

Item	Mark		
Digital information rate	(R)	9600	bps
Peak frequency deviation	(D)	3.391	kHz
Signaling states	(S)	4	
Numerical factor	(K)	0.516	
Necessary Bandwidth	(Bn)	8.3	kHz

$$B_n = (R / \log_2 S) + 2 \times D \times K$$

State : 4K00F1E / 4K00F1D / 4K00F7W (4Level FSK / 4800bps, Authorized Bandwidth 6 kHz)

Item	Mark		
Digital information rate	(R)	4800	bps
Peak frequency deviation	(D)	1.55	kHz
Signaling states	(S)	4	
Numerical factor	(K)	0.516	
Necessary Bandwidth	(Bn)	4	kHz

$$B_n = (R / \log_2 S) + 2 \times D \times K$$

State : 4K00F2D (CWID, Authorized Bandwidth 6 kHz)

Item	Mark		
Maximum Modulation	(M)	0.8	kHz
Maximum Deviation	(D)	1.2	kHz
Numerical factor	(K)	1	
Necessary Bandwidth	(Bn)	4	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$

10.14 99% Occupied Bandwidth

REGULATIONS	: RSS-119 Section 5.5
TEST METHOD/GUIDE	: RSS-Gen Section 6.6

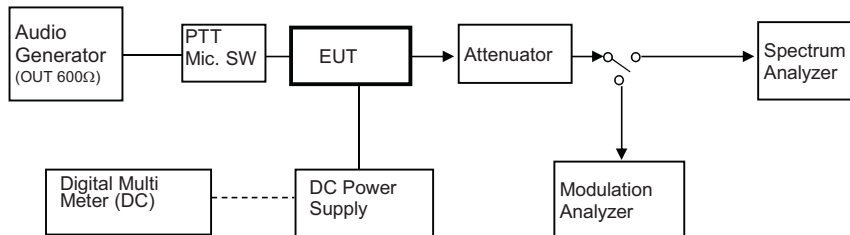
Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the test instrument for the following setting:
RBW : 1 % to 5 % of the Necessary bandwidth
VBW : at least 3 times the RBW
Detector : Peak
Sweep Time : Auto
Trace mode : Max Hold
- 3 Allow trace to fully stabilize.
- 4 Use "Occupied Bandwidth Measurement" function to measure the 99% Occupied Bandwidth.
- 5 Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that necessary to produce 50 % of rated system deviation.(Only 16K0F3E, 11K0F3E)

Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 2015	Jun. 30, 2016
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 2015	Jun. 30, 2016
3	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Oct. 13, 2014	Oct. 31, 2015
4	Audio Generator	Anritsu	MG443B	M70150	Jun. 18, 2015	Jun. 30, 2016
5	Spectrum Analyzer	Agilent	N9030A	US51350220	Jul. 03, 2014	Jul. 31, 2015
6	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
7	Digital Multi Meter	Agilent	34401A	US36043517	Jul. 01, 2014	Jul. 31, 2015
8	Balance Cable	Nicoon	3D-2V	KSR00092	Jan. 23, 2015	Jan. 31, 2016
9	Coaxial Cable	Pacific custom	RG-58 C/U	AM90C04	Jun. 09, 2015	Jun. 30, 2016
10	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 2015	Jan. 31, 2016
11	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 2015	Jan. 31, 2016

Measuring Equipment Configuration

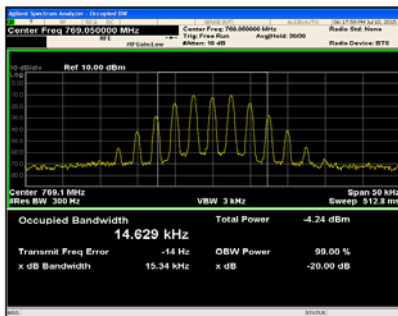
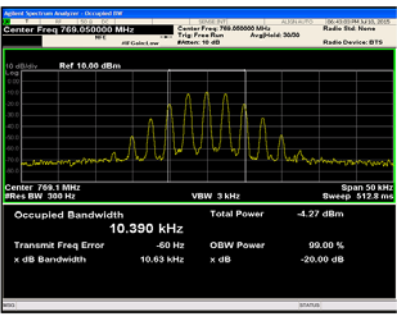
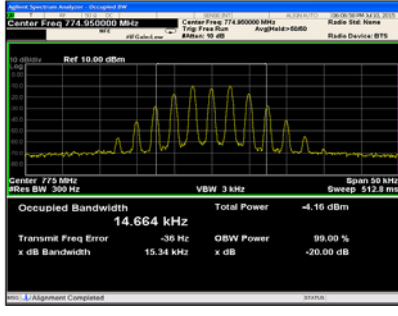
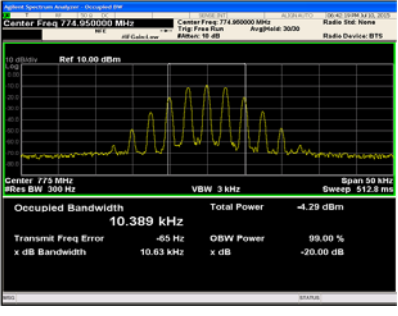
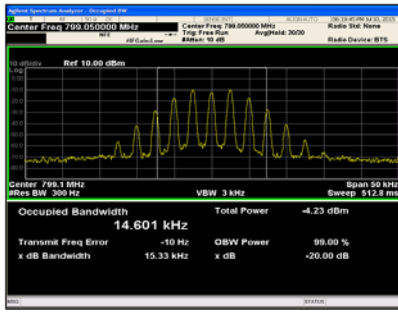
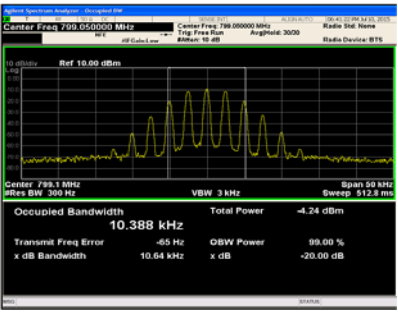
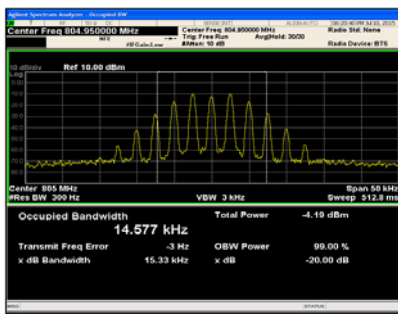
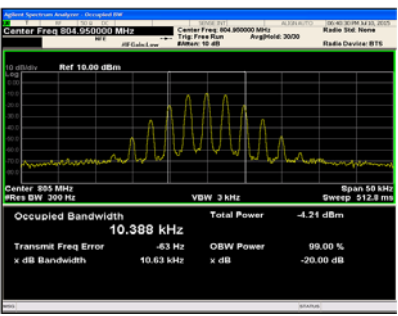
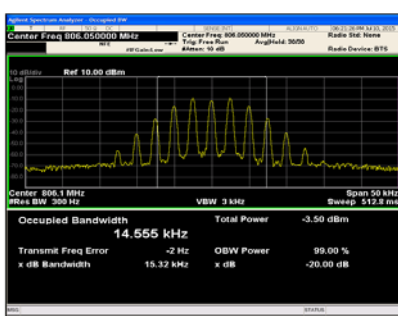
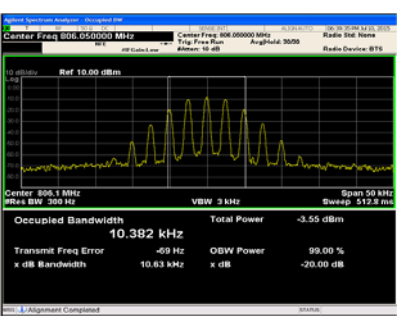


Test Results

Test date	Jun 23, 2015
Location	Kashima No.1 Test Site
temperature	20 [degree C]
Humidity Variation	60 [%]
Atmospheric Pressure	101 [kPa]
Test Engineer	Koichi Wagatsuma

Emission Designation	Freq.(MHz)				Authorized bandwidth (kHz)
	769.05	774.95	799.05	804.95	
16K0F3E	14.63	14.63	14.60	14.58	20
14K0F3E	10.39	10.39	10.39	10.39	20
11K0F3E	9.87	9.89	9.88	9.88	11.25
8K10F1E/F1D/F1W	7.90	7.90	7.90	7.90	11.25
8K30F1E/F1D/F7W	7.57	7.57	7.56	7.56	11.25
4K00F1E/F1D/F7W	3.49	3.48	3.48	3.48	6
4K00F2D	3.32	3.31	3.31	3.31	6

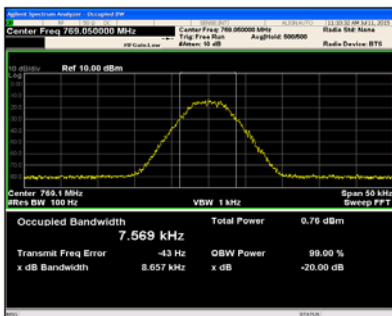
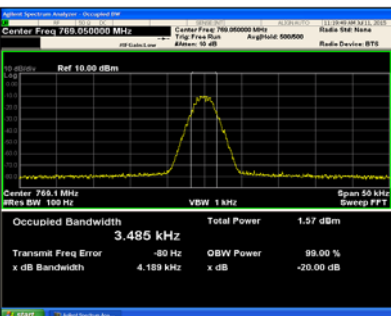
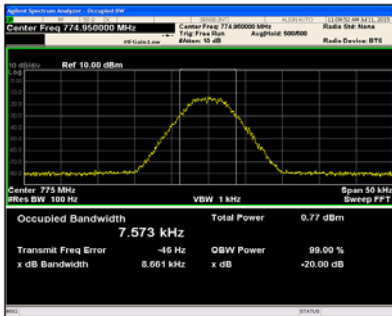
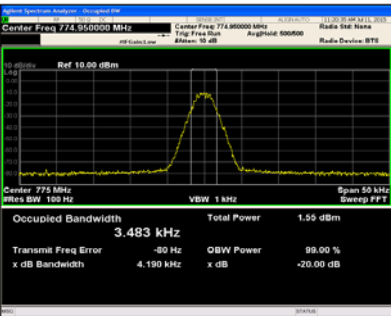
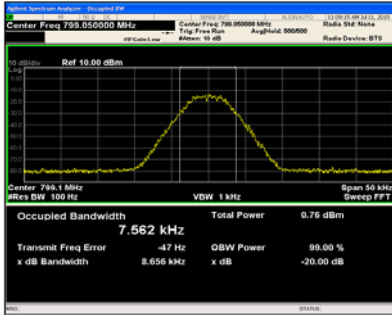
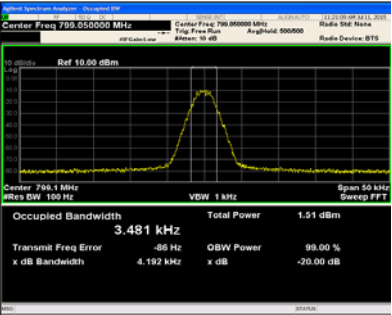
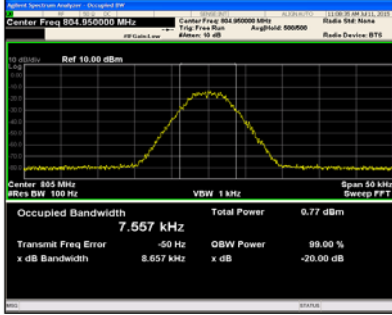
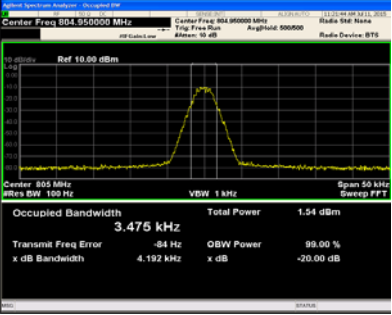
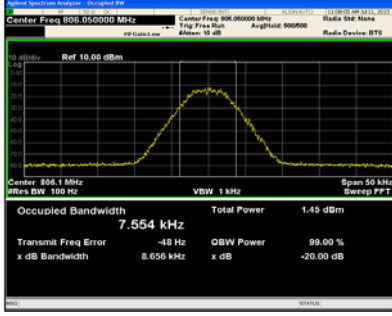
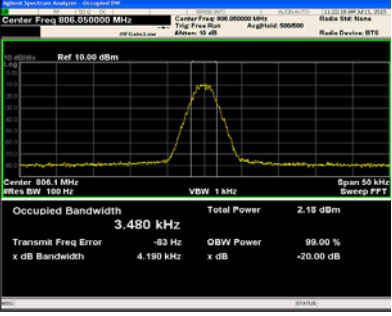
Emission Designation	Freq.(MHz)						Authorized bandwidth (kHz)
	806.05	815.05	823.95	851.05	860.05	868.95	
16K0F3E	14.56	14.56	14.56	14.57	14.61	14.62	20
14K0F3E	10.38	10.38	10.39	10.39	10.39	10.39	20
11K0F3E	9.88	9.89	9.89	9.89	9.89	9.88	11.25
8K10F1E/F1D/F1W	7.90	7.90	7.90	7.90	7.91	7.91	11.25
8K30F1E/F1D/F7W	7.55	7.56	7.55	7.55	7.57	7.57	11.25
4K00F1E/F1D/F7W	3.48	3.48	3.48	3.48	3.48	3.48	6
4K00F2D	3.31	3.31	3.31	3.31	3.31	3.31	6

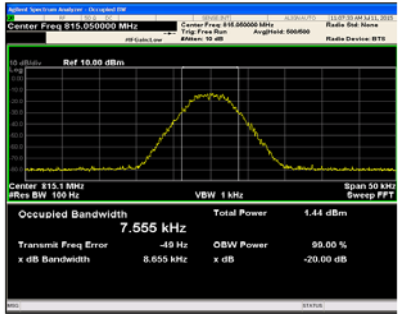
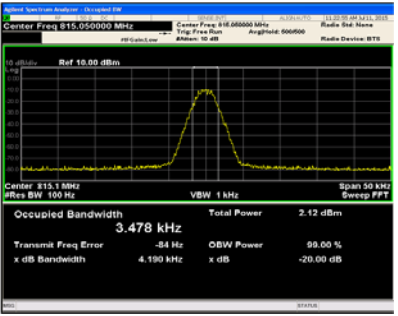
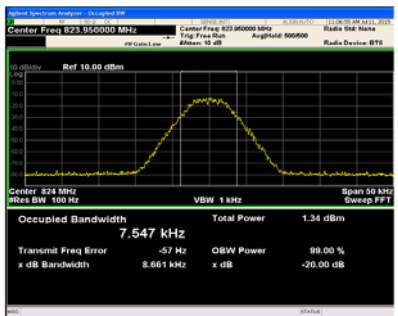
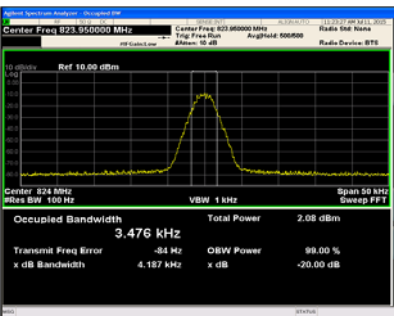
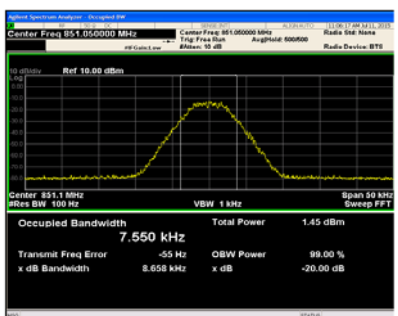
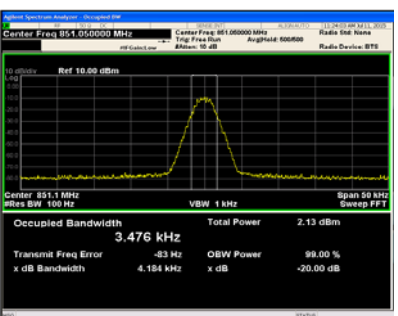
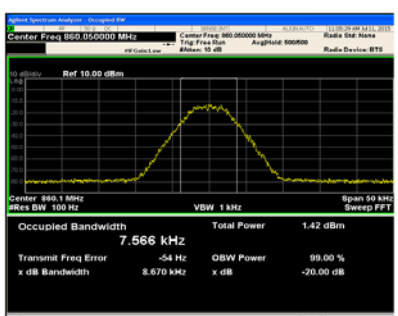
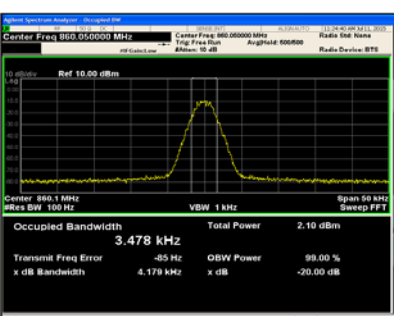
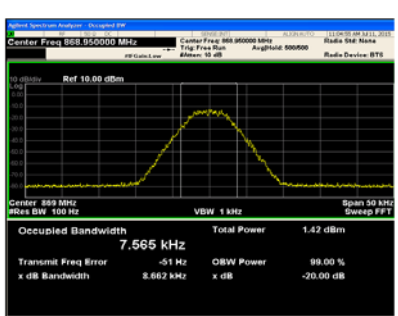
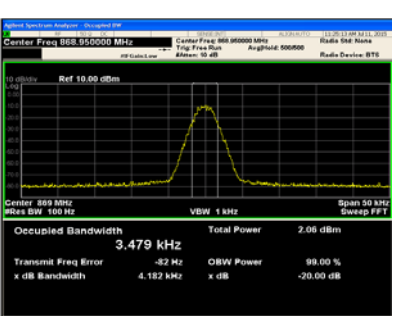
Frequency (MHz)	Emission Designation	
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769.05		
774.95		
799.05		
804.95		
806.05		

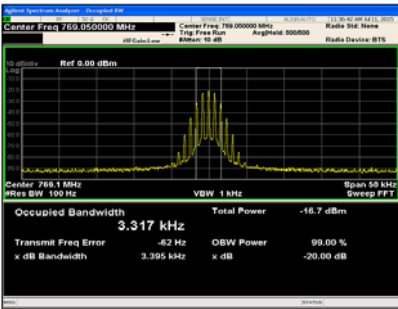
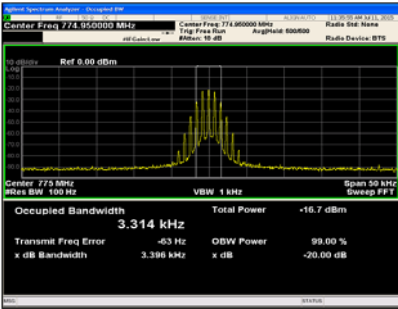
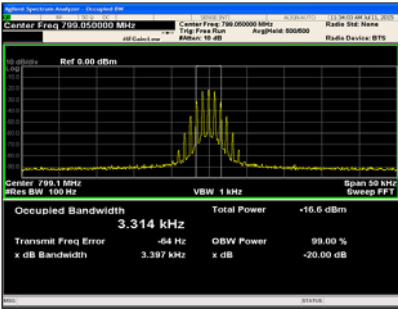
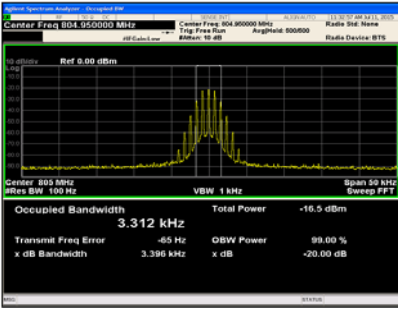
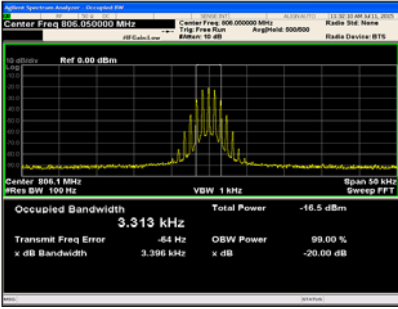
Frequency (MHz)	Emission Designation	
	16K0F3E	14K0F3E
815.05		
823.95		
851.05		
860.05		
868.95		

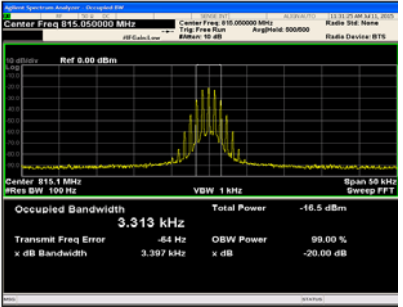
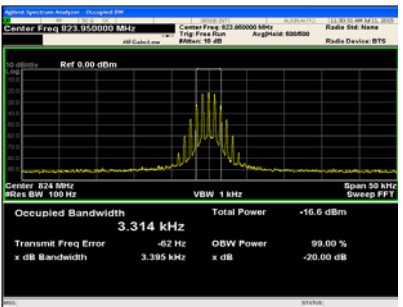
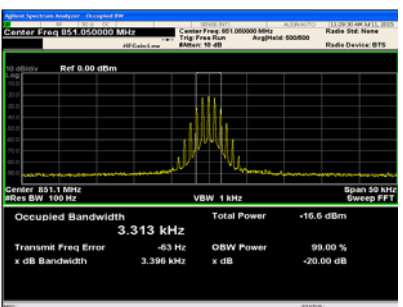
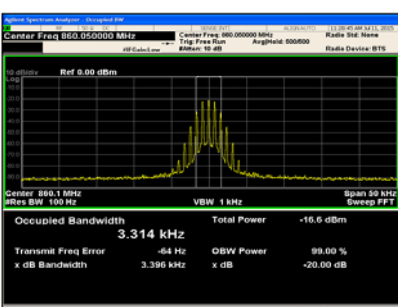
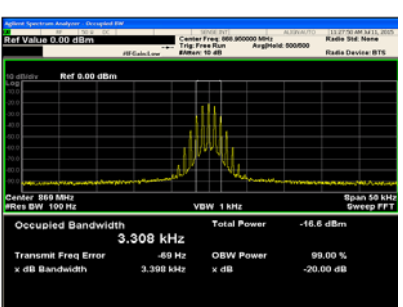
Frequency (MHz)	Emission Designation	
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769.05		
774.95		
799.05		
804.95		
806.05		

Frequency (MHz)	Emission Designation	
	11K0F3E	8K10F1E/F1D/F1W
815.05		
823.95		
851.05		
860.05		
868.95		

Frequency (MHz)	Emission Designation	
	8K30F1E/F1D/F7W	4K00F1E/F1D/F7W
769.05	 Center Freq 769.050000 MHz Center Freq 769.050000 MHz Transmit Freq Error -43 Hz x dB Bandwidth 8.657 kHz Occupied Bandwidth 7.569 kHz Total Power 0.76 dBm OSW Power 99.00 % x dB -20.00 dB	 Center Freq 769.050000 MHz Center Freq 769.050000 MHz Transmit Freq Error -80 Hz x dB Bandwidth 4.189 kHz Occupied Bandwidth 3.485 kHz Total Power 1.57 dBm OSW Power 99.00 % x dB -20.00 dB
774.95	 Center Freq 774.950000 MHz Center Freq 774.950000 MHz Transmit Freq Error -46 Hz x dB Bandwidth 8.661 kHz Occupied Bandwidth 7.573 kHz Total Power 0.77 dBm OSW Power 99.00 % x dB -20.00 dB	 Center Freq 774.950000 MHz Center Freq 774.950000 MHz Transmit Freq Error -80 Hz x dB Bandwidth 4.190 kHz Occupied Bandwidth 3.483 kHz Total Power 1.55 dBm OSW Power 99.00 % x dB -20.00 dB
799.05	 Center Freq 799.050000 MHz Center Freq 799.050000 MHz Transmit Freq Error -47 Hz x dB Bandwidth 8.656 kHz Occupied Bandwidth 7.562 kHz Total Power 0.78 dBm OSW Power 99.00 % x dB -20.00 dB	 Center Freq 799.050000 MHz Center Freq 799.050000 MHz Transmit Freq Error -86 Hz x dB Bandwidth 4.192 kHz Occupied Bandwidth 3.481 kHz Total Power 1.51 dBm OSW Power 99.00 % x dB -20.00 dB
804.95	 Center Freq 804.950000 MHz Center Freq 804.950000 MHz Transmit Freq Error -50 Hz x dB Bandwidth 8.657 kHz Occupied Bandwidth 7.557 kHz Total Power 0.77 dBm OSW Power 99.00 % x dB -20.00 dB	 Center Freq 804.950000 MHz Center Freq 804.950000 MHz Transmit Freq Error -84 Hz x dB Bandwidth 4.192 kHz Occupied Bandwidth 3.475 kHz Total Power 1.54 dBm OSW Power 99.00 % x dB -20.00 dB
806.05	 Center Freq 806.050000 MHz Center Freq 806.050000 MHz Transmit Freq Error -48 Hz x dB Bandwidth 8.656 kHz Occupied Bandwidth 7.554 kHz Total Power 1.45 dBm OSW Power 99.00 % x dB -20.00 dB	 Center Freq 806.050000 MHz Center Freq 806.050000 MHz Transmit Freq Error -83 Hz x dB Bandwidth 4.190 kHz Occupied Bandwidth 3.480 kHz Total Power 2.18 dBm OSW Power 99.00 % x dB -20.00 dB

Frequency (MHz)	Emission Designation	
	8K30F1E/F1D/F7W	4K00F1E/F1D/F7W
815.05		
823.95		
851.05		
860.05		
868.95		

Frequency (MHz)	Emission Designation	
	4K00F2D	
769.05	 Center Freq 769.050000 MHz Center Freq 769.050000 MHz Trig Free Run Amplitude 500.000 Radio Device B75 Center 769.1 MHz Span 50 kHz VBW 1 kHz Sweep FFT Occupied Bandwidth 3.317 kHz Total Power -16.7 dBm Transmit Freq Error -62 Hz OBW Power 99.00 % x dB Bandwidth 3.395 kHz x dB -20.00 dB	
774.95	 Center Freq 774.950000 MHz Center Freq 774.950000 MHz Trig Free Run Amplitude 500.000 Radio Device B75 Center 775.0 MHz Span 50 kHz VBW 1 kHz Sweep FFT Occupied Bandwidth 3.314 kHz Total Power -16.7 dBm Transmit Freq Error -63 Hz OBW Power 99.00 % x dB Bandwidth 3.396 kHz x dB -20.00 dB	
799.05	 Center Freq 799.050000 MHz Center Freq 799.050000 MHz Trig Free Run Amplitude 500.000 Radio Device B75 Center 799.1 MHz Span 50 kHz VBW 1 kHz Sweep FFT Occupied Bandwidth 3.314 kHz Total Power -16.6 dBm Transmit Freq Error -64 Hz OBW Power 99.00 % x dB Bandwidth 3.397 kHz x dB -20.00 dB	
804.95	 Center Freq 804.950000 MHz Center Freq 804.950000 MHz Trig Free Run Amplitude 500.000 Radio Device B75 Center 805.0 MHz Span 50 kHz VBW 1 kHz Sweep FFT Occupied Bandwidth 3.312 kHz Total Power -16.5 dBm Transmit Freq Error -65 Hz OBW Power 99.00 % x dB Bandwidth 3.396 kHz x dB -20.00 dB	
806.05	 Center Freq 806.050000 MHz Center Freq 806.050000 MHz Trig Free Run Amplitude 500.000 Radio Device B75 Center 806.1 MHz Span 50 kHz VBW 1 kHz Sweep FFT Occupied Bandwidth 3.313 kHz Total Power -16.5 dBm Transmit Freq Error -64 Hz OBW Power 99.00 % x dB Bandwidth 3.396 kHz x dB -20.00 dB	

Frequency (MHz)	Emission Designation	
815.05	4K00F2D  Center Freq 815.050000 MHz Center Freq 815.050000 MHz Trig Pres Run Ref 0.00 dBm Occupied Bandwidth 3.313 kHz Transmit Freq Error -43 Hz x dB Bandwidth 3.397 kHz Total Power -16.5 dBm OBW Power 99.00 % x dB -20.00 dB	
823.95	 Center Freq 823.950000 MHz Center Freq 823.950000 MHz Trig Pres Run Ref 0.00 dBm Occupied Bandwidth 3.314 kHz Transmit Freq Error -62 Hz x dB Bandwidth 3.395 kHz Total Power -16.6 dBm OBW Power 99.00 % x dB -20.00 dB	
851.05	 Center Freq 851.050000 MHz Center Freq 851.050000 MHz Trig Pres Run Ref 0.00 dBm Occupied Bandwidth 3.313 kHz Transmit Freq Error -63 Hz x dB Bandwidth 3.396 kHz Total Power -16.6 dBm OBW Power 99.00 % x dB -20.00 dB	
860.05	 Center Freq 860.050000 MHz Center Freq 860.050000 MHz Trig Pres Run Ref 0.00 dBm Occupied Bandwidth 3.314 kHz Transmit Freq Error -64 Hz x dB Bandwidth 3.396 kHz Total Power -16.6 dBm OBW Power 99.00 % x dB -20.00 dB	
868.95	 Center Freq 868.950000 MHz Center Freq 868.950000 MHz Trig Pres Run Ref 0.00 dBm Occupied Bandwidth 3.308 kHz Transmit Freq Error -69 Hz x dB Bandwidth 3.398 kHz Total Power -16.6 dBm OBW Power 99.00 % x dB -20.00 dB	