Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx ANT 1 Mbps 2480 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	30.680	QP	22.80	18.44	6.47	32.20	0.00	15.51	40.00	24.4	151	3	
Hori.	194.825	QP	22.60	16.40	7.85	32.08	0.00	14.77	43.50	28.7	122	358	
Hori.	923.626	QP	21.90	22.02	11.15	30.88	0.00	24.19	46.00	21.8	100	358	
Hori.	2483.500	PK	57.03	27.65	14.19	43.72	2.46	57.61	73.90	**16.2**	341	336	
Hori.	4960.000	PK	49.38	31.54	6.56	43.89	2.46	46.05	73.90	27.8	166	204	
Hori.	7440.000	PK	48.37	37.10	8.50	43.65	2.46	52.78	73.90	21.1	206	198	
Hori.	9920.000	PK	47.12	38.97	9.25	43.48	2.46	54.32	73.90	19.5	150	0	
Hori.	19840.000	PK	50.58	39.94	12.02	47.72	-9.54	45.28	73.90	28.6	141	0	
Vert.	30.928	QP	23.10	18.35	6.47	32.20	0.00	15.72	40.00	24.2	100	303	
Vert.	196.337	QP	23.00	16.45	7.86	32.08	0.00	15.23	43.50	28.2	100	255	
Vert.	920.884	QP	21.80	22.03	11.14	30.91	0.00	24.06	46.00	21.9	100	216	
Vert.	2483.500	PK	53.65	27.65	14.19	43.72	2.46	54.23	73.90	19.6	172	283	
Vert.	4960.000	PK	49.92	31.54	6.56	43.89	2.46	46.59	73.90	27.3	173	288	
Vert.	7440.000	PK	48.60	37.10	8.50	43.65	2.46	53.01	73.90	20.8	221	182	
Vert.	9920.000	PK	47.37	38.97	9.25	43.48	2.46	54.57	73.90	19.3	150	0	
Vert.	19840.000	PK	46.02	39.94	12.02	47.72	-9.54	40.72	73.90	33.1	131	110	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	46.09	27.65	14.19	43.72	0.45	2.46	47.12	53.90	**6.8**	*1)
Hori.	4960.000	AV	39.67	31.54	6.56	43.89	0.45	2.46	36.79	53.90	17.1	
Hori.	7440.000	AV	39.64	37.10	8.50	43.65	0.45	2.46	44.50	53.90	9.4	
Hori.	9920.000	AV	37.49	38.97	9.25	43.48	0.45	2.46	45.14	53.90	8.8	
Hori.	19840.000	AV	43.33	39.94	12.02	47.72	0.45	-9.54	38.48	53.90	15.4	
Vert.	2483.500	AV	44.50	27.65	14.19	43.72	0.45	2.46	45.53	53.90	8.4	*1)
Vert.	4960.000	AV	39.75	31.54	6.56	43.89	0.45	2.46	36.87	53.90	17.0	
Vert.	7440.000	AV	38.11	37.10	8.50	43.65	0.45	2.46	42.97	53.90	10.9	
Vert.	9920.000	AV	37.41	38.97	9.25	43.48	0.45	2.46	45.06	53.90	8.8	
Vert.	19840.000	AV	36.86	39.94	12.02	47.72	0.45	-9.54	32.01	53.90	21.9	

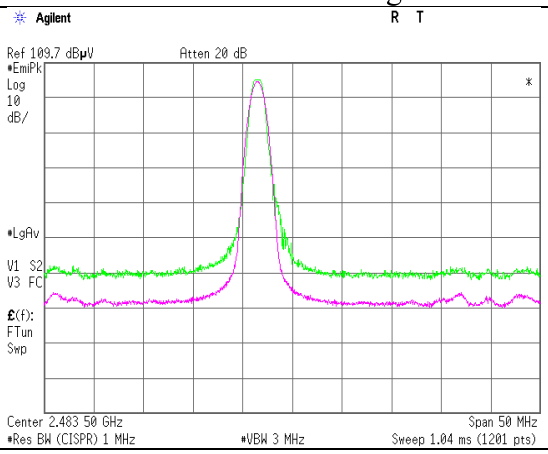
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 7, 2018
Temperature / Humidity	22 deg.C, 55 %RH
Engineer	Makoto Hosaka
	(1 GHz – 2.8 GHz)
Mode	Tx ANT 1 Mbps 2480 MHz

Horizontal

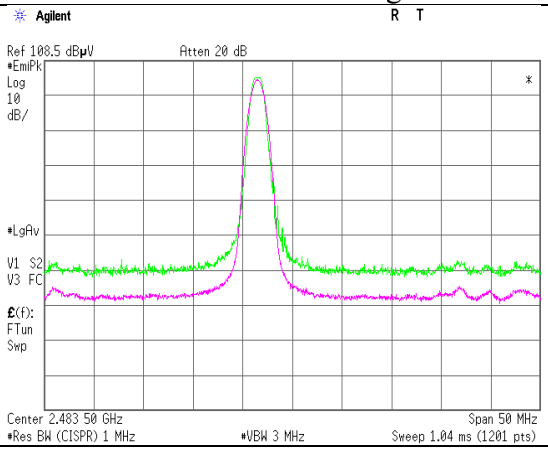
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

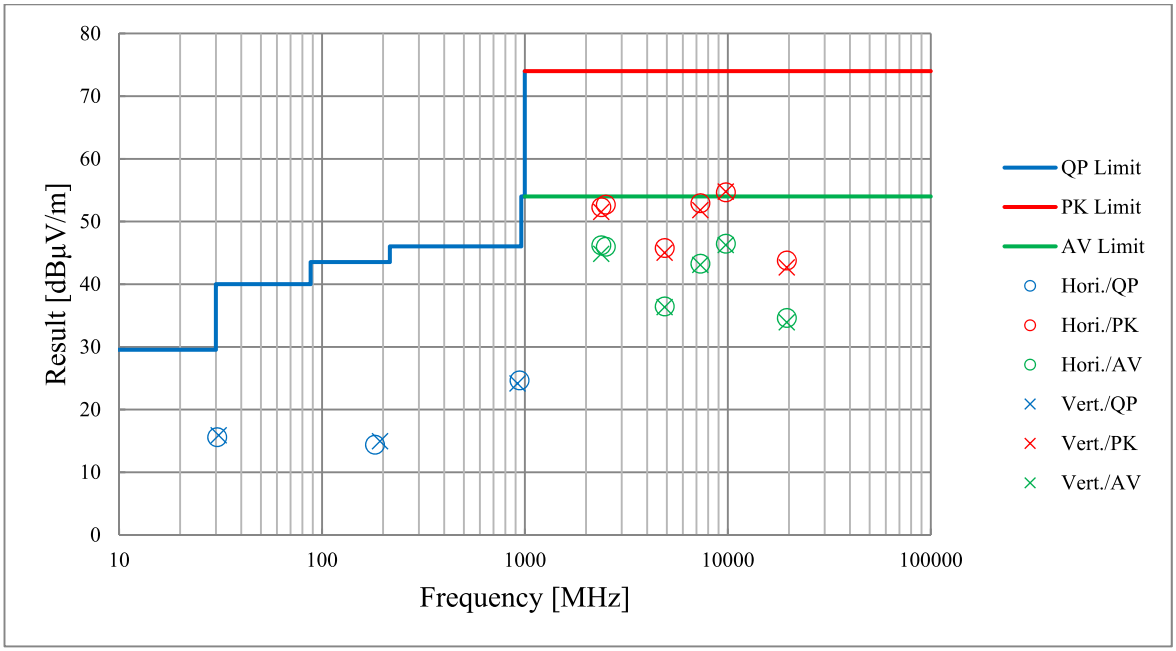


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12510206S-A-R3			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH
Engineer	Shiro Kobayashi	Makoto Hosaka	Shiro Kobayashi	Shiro Kobayashi
	(30 MHz - 1000 MHz)	(1 GHz – 2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)
Mode	Tx ANT 1 Mbps 2441 MHz			



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx Nordic Original 2 Mbps 2402 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	30.624	QP	23.00	18.46	6.46	32.20	0.00	15.72	40.00	24.2	150	358	
Hori.	188.621	QP	23.00	16.34	7.84	32.08	0.00	15.10	43.50	28.4	121	357	
Hori.	945.831	QP	21.70	22.13	11.23	30.68	0.00	24.38	46.00	21.6	100	359	
Hori.	2390.000	PK	50.74	27.86	14.11	43.71	2.46	51.46	73.90	22.4	400	354	
Hori.	4804.000	PK	50.73	31.43	6.49	43.91	2.46	47.20	73.90	26.7	202	161	
Hori.	7206.000	PK	48.65	36.79	8.31	43.66	2.46	52.55	73.90	21.3	322	155	
Hori.	9608.000	PK	49.02	38.51	9.20	43.64	2.46	55.55	73.90	18.3	143	34	
Hori.	19216.000	PK	49.49	40.14	11.69	48.17	-9.54	43.61	73.90	30.2	139	0	
Vert.	31.475	QP	22.90	18.13	6.48	32.20	0.00	15.31	40.00	24.6	100	310	
Vert.	195.303	QP	22.90	16.39	7.86	32.08	0.00	15.07	43.50	28.4	100	7	
Vert.	921.851	QP	21.80	22.02	11.14	30.90	0.00	24.06	46.00	21.9	100	200	
Vert.	2390.000	PK	50.69	27.86	14.11	43.71	2.46	51.41	73.90	22.4	152	346	
Vert.	4804.000	PK	50.40	31.43	6.49	43.91	2.46	46.87	73.90	27.0	187	136	
Vert.	7206.000	PK	48.49	36.79	8.31	43.66	2.46	52.39	73.90	21.5	162	71	
Vert.	9608.000	PK	49.39	38.51	9.20	43.64	2.46	55.92	73.90	**17.9**	286	248	
Vert.	19216.000	PK	45.88	40.14	11.69	48.17	-9.54	40.00	73.90	33.9	125	99	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	41.88	27.86	14.11	43.71	0.88	2.46	43.48	53.90	10.4	*1)
Hori.	4804.000	AV	41.13	31.43	6.49	43.91	0.88	2.46	38.48	53.90	15.4	
Hori.	7206.000	AV	38.86	36.79	8.31	43.66	0.88	2.46	43.64	53.90	10.3	
Hori.	9608.000	AV	39.58	38.51	9.20	43.64	0.88	2.46	46.99	53.90	6.9	
Hori.	19216.000	AV	40.45	40.14	11.69	48.17	0.88	-9.54	35.45	53.90	18.4	
Vert.	2390.000	AV	41.29	27.86	14.11	43.71	0.88	2.46	42.89	53.90	11.0	*1)
Vert.	4804.000	AV	41.12	31.43	6.49	43.91	0.88	2.46	38.47	53.90	15.4	
Vert.	7206.000	AV	38.81	36.79	8.31	43.66	0.88	2.46	43.59	53.90	10.3	
Vert.	9608.000	AV	39.76	38.51	9.20	43.64	0.88	2.46	47.17	53.90	**6.7**	
Vert.	19216.000	AV	36.58	40.14	11.69	48.17	0.88	-9.54	31.58	53.90	22.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

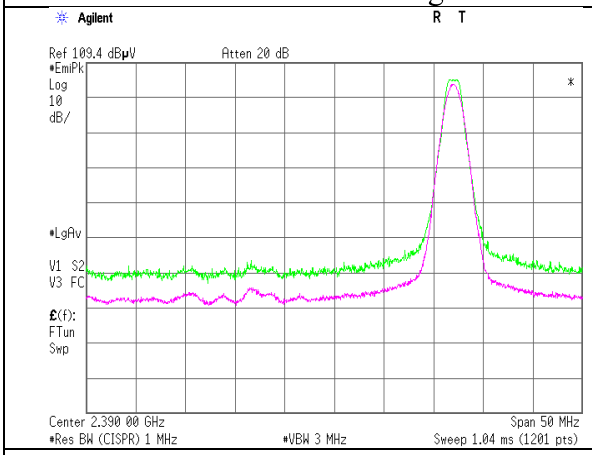
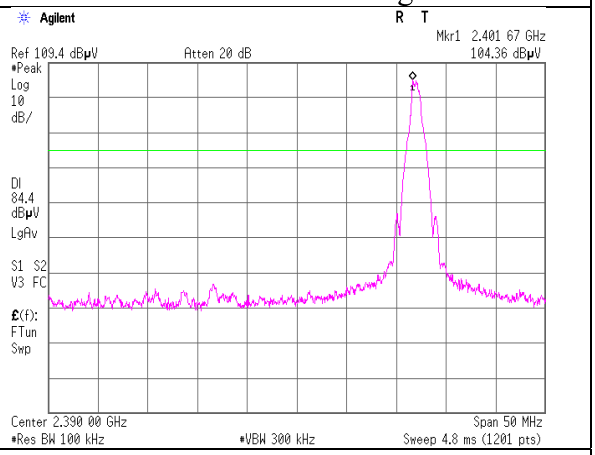
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

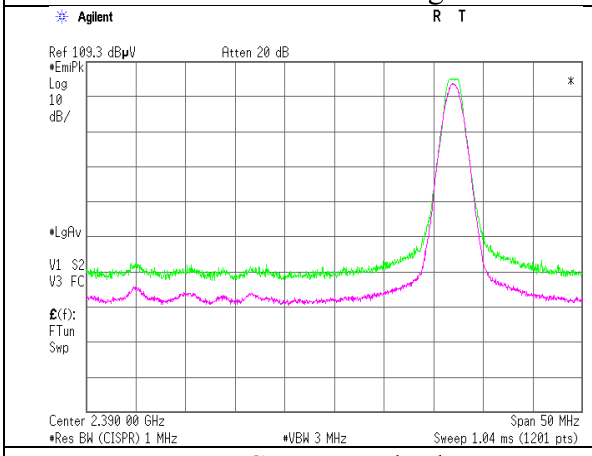
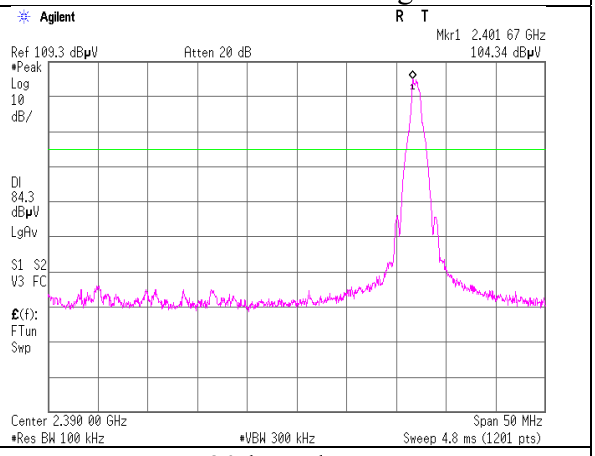
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	104.03	27.86	14.12	43.71	2.46	104.76	-	-	
Hori.	2400.000	PK	63.96	27.86	14.12	43.71	2.46	64.69	84.76	20.1	
Vert.	2402.000	PK	102.35	27.86	14.12	43.71	2.46	103.08	-	-	
Vert.	2400.000	PK	62.70	27.86	14.12	43.71	2.46	63.43	83.08	19.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 7, 2018
Temperature / Humidity	22 deg.C, 55 %RH
Engineer	Makoto Hosaka
	(1 GHz – 2.8 GHz)
Mode	Tx Nordic Original 2 Mbps 2402 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx Nordic Original 2 Mbps 2441 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	31.447	QP	23.00	18.14	6.48	32.20	0.00	15.42	40.00	24.5	150	5	
Hori.	196.201	QP	23.00	16.44	7.86	32.08	0.00	15.22	43.50	28.2	126	356	
Hori.	954.152	QP	22.00	22.15	11.25	30.62	0.00	24.78	46.00	21.2	100	355	
Hori.	2377.131	PK	51.96	27.85	14.10	43.71	2.46	52.66	73.90	21.2	153	2	
Hori.	4882.000	PK	49.92	31.37	6.53	43.90	2.46	46.38	73.90	27.5	133	309	
Hori.	7323.000	PK	48.05	37.01	8.40	43.66	2.46	52.26	73.90	21.6	221	201	
Hori.	9764.000	PK	47.80	38.92	9.22	43.56	2.46	54.84	73.90	19.0	150	0	
Hori.	19528.000	PK	50.86	40.08	11.88	47.70	-9.54	45.58	73.90	28.3	141	0	
Vert.	32.422	QP	22.70	17.74	6.50	32.20	0.00	14.74	40.00	25.2	100	300	
Vert.	196.981	QP	23.00	16.51	7.87	32.08	0.00	15.30	43.50	28.2	100	3	
Vert.	942.404	QP	21.80	22.16	11.21	30.72	0.00	24.45	46.00	21.5	100	290	
Vert.	4882.000	PK	49.34	31.37	6.53	43.90	2.46	45.80	73.90	28.1	159	326	
Vert.	7323.000	PK	48.07	37.01	8.40	43.66	2.46	52.28	73.90	21.6	114	218	
Vert.	9764.000	PK	47.90	38.92	9.22	43.56	2.46	54.94	73.90	**18.9**	150	0	
Vert.	19528.000	PK	46.62	40.08	11.88	47.70	-9.54	41.34	73.90	32.5	126	100	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2377.131	AV	44.46	27.85	14.10	43.71	0.88	2.46	46.04	53.90	7.9	
Hori.	4882.000	AV	39.51	31.37	6.53	43.90	0.88	2.46	36.85	53.90	17.1	
Hori.	7323.000	AV	37.93	37.01	8.40	43.66	0.88	2.46	43.02	53.90	10.9	
Hori.	9764.000	AV	38.33	38.92	9.22	43.56	0.88	2.46	46.25	53.90	7.7	
Hori.	19528.000	AV	41.26	40.08	11.88	47.70	0.88	-9.54	36.86	53.90	17.0	
Vert.	4882.000	AV	39.40	31.37	6.53	43.90	0.88	2.46	36.74	53.90	17.2	
Vert.	7323.000	AV	38.06	37.01	8.40	43.66	0.88	2.46	43.15	53.90	10.8	
Vert.	9764.000	AV	38.54	38.92	9.22	43.56	0.88	2.46	46.46	53.90	**7.4**	
Vert.	19528.000	AV	37.25	40.08	11.88	47.70	0.88	-9.54	32.85	53.90	21.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx Nordic Original 2 Mbps 2480 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	31.328	QP	23.00	18.19	6.48	32.20	0.00	15.47	40.00	24.5	151	357	
Hori.	193.859	QP	22.90	16.49	7.85	32.08	0.00	15.16	43.50	28.3	123	357	
Hori.	942.794	QP	21.70	22.15	11.22	30.71	0.00	24.36	46.00	21.6	100	356	
Hori.	2483.500	PK	59.21	27.65	14.19	43.72	2.46	59.79	73.90	**14.1**	353	338	
Hori.	4960.000	PK	49.45	31.54	6.56	43.89	2.46	46.12	73.90	27.7	207	209	
Hori.	7440.000	PK	48.54	37.10	8.50	43.65	2.46	52.95	73.90	20.9	210	202	
Hori.	9920.000	PK	47.29	38.97	9.25	43.48	2.46	54.49	73.90	19.4	150	0	
Hori.	19840.000	PK	49.76	39.94	12.02	47.72	-9.54	44.46	73.90	29.4	141	0	
Vert.	30.627	QP	23.10	18.46	6.47	32.20	0.00	15.83	40.00	24.1	100	303	
Vert.	198.039	QP	23.00	16.56	7.87	32.08	0.00	15.35	43.50	28.1	100	355	
Vert.	926.354	QP	21.60	22.04	11.16	30.86	0.00	23.94	46.00	22.0	100	210	
Vert.	2483.500	PK	58.16	27.65	14.19	43.72	2.46	58.74	73.90	15.1	163	283	
Vert.	4960.000	PK	49.69	31.54	6.56	43.89	2.46	46.36	73.90	27.5	165	247	
Vert.	7440.000	PK	48.13	37.10	8.50	43.65	2.46	52.54	73.90	21.3	236	184	
Vert.	9920.000	PK	47.70	38.97	9.25	43.48	2.46	54.90	73.90	19.0	150	0	
Vert.	19840.000	PK	45.21	39.94	12.02	47.72	-9.54	39.91	73.90	33.9	129	110	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	48.67	27.65	14.19	43.72	0.88	2.46	50.13	53.90	**3.8**	*1)
Hori.	4960.000	AV	39.83	31.54	6.56	43.89	0.88	2.46	37.38	53.90	16.5	
Hori.	7440.000	AV	38.70	37.10	8.50	43.65	0.88	2.46	43.99	53.90	9.9	
Hori.	9920.000	AV	37.58	38.97	9.25	43.48	0.88	2.46	45.66	53.90	8.2	
Hori.	19840.000	AV	40.49	39.94	12.02	47.72	0.88	-9.54	36.07	53.90	17.8	
Vert.	2483.500	AV	47.07	27.65	14.19	43.72	0.88	2.46	48.53	53.90	5.4	*1)
Vert.	4960.000	AV	39.80	31.54	6.56	43.89	0.88	2.46	37.35	53.90	16.6	
Vert.	7440.000	AV	38.12	37.10	8.50	43.65	0.88	2.46	43.41	53.90	10.5	
Vert.	9920.000	AV	37.78	38.97	9.25	43.48	0.88	2.46	45.86	53.90	8.0	
Vert.	19840.000	AV	36.15	39.94	12.02	47.72	0.88	-9.54	31.73	53.90	22.2	

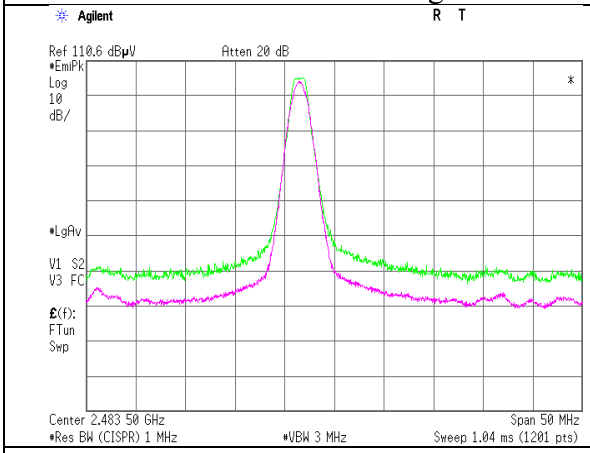
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 7, 2018
Temperature / Humidity	22 deg.C, 55 %RH
Engineer	Makoto Hosaka
	(1 GHz – 2.8 GHz)
Mode	Tx Nordic Original 2 Mbps 2480 MHz

Horizontal

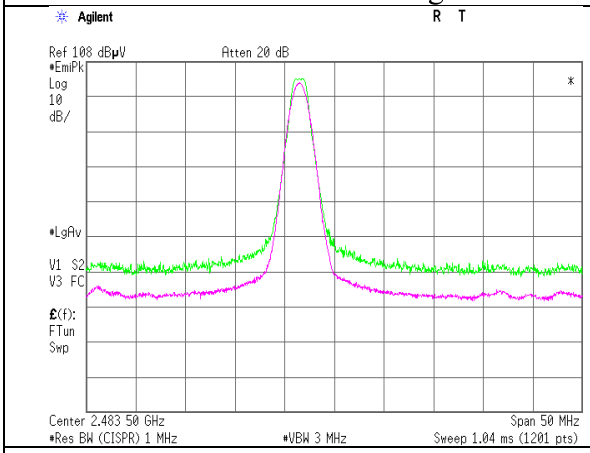
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

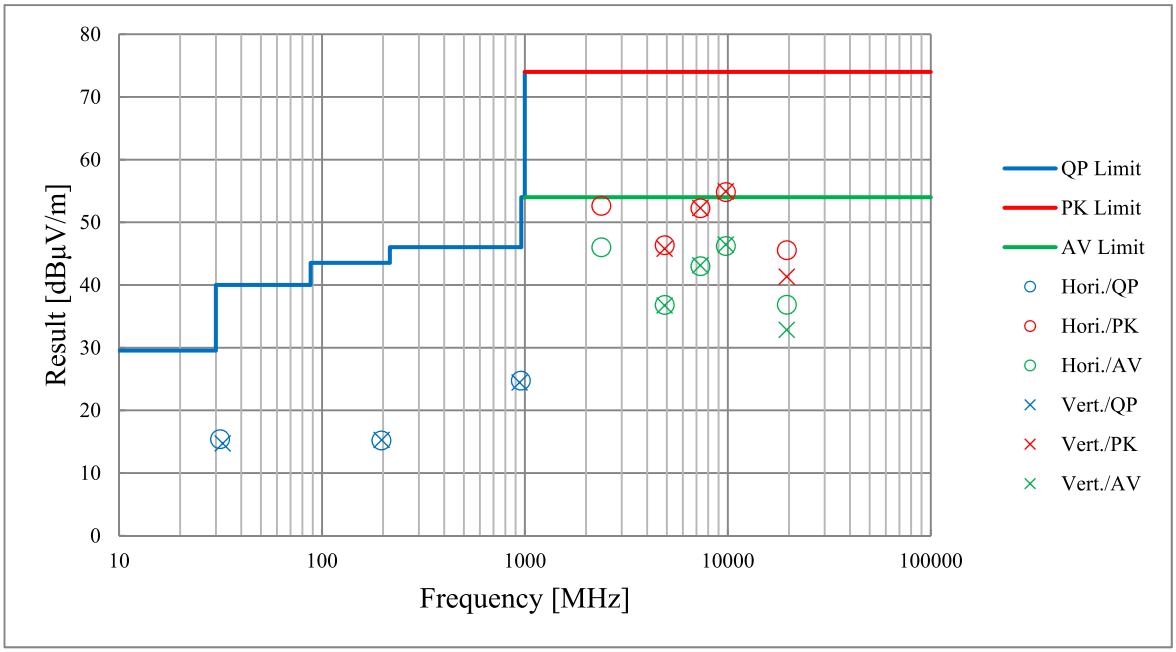


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 13, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx Nordic Original 2 Mbps 2441 MHz				



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 14, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx IEEE802.15.4 2405 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	30.641	QP	22.81	18.46	6.47	32.20	0.00	15.54	40.00	24.4	119	13	
Hori.	193.766	QP	22.03	16.49	7.85	32.08	0.00	14.29	43.50	29.2	105	359	
Hori.	921.405	QP	21.20	22.02	11.14	30.90	0.00	23.46	46.00	22.5	100	359	
Hori.	2390.000	PK	51.23	27.86	14.11	43.71	2.46	51.95	73.90	21.9	400	343	
Hori.	4810.000	PK	49.71	31.44	6.49	43.91	2.46	46.19	73.90	27.7	154	202	
Hori.	7215.000	PK	48.98	36.81	8.32	43.66	2.46	52.91	73.90	20.9	303	199	
Hori.	9620.000	PK	48.21	38.55	9.19	43.63	2.46	54.78	73.90	19.1	112	47	
Hori.	19240.000	PK	49.62	40.17	11.71	48.13	-9.54	43.83	73.90	30.0	140	0	
Vert.	32.559	QP	22.76	17.69	6.50	32.20	0.00	14.75	40.00	25.2	100	353	
Vert.	195.802	QP	22.04	16.41	7.86	32.08	0.00	14.23	43.50	29.2	100	351	
Vert.	925.349	QP	21.18	22.02	11.16	30.87	0.00	23.49	46.00	22.5	100	246	
Vert.	2390.000	PK	50.53	27.86	14.11	43.71	2.46	51.25	73.90	22.6	158	238	
Vert.	4810.000	PK	49.70	31.44	6.49	43.91	2.46	46.18	73.90	27.7	178	134	
Vert.	7215.000	PK	48.52	36.81	8.32	43.66	2.46	52.45	73.90	21.4	141	49	
Vert.	9620.000	PK	49.04	38.55	9.19	43.63	2.46	55.61	73.90	**18.2**	222	255	
Vert.	19240.000	PK	45.30	40.17	11.71	48.13	-9.54	39.51	73.90	34.3	129	100	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	41.99	27.86	14.11	43.71	0.00	2.46	42.71	53.90	11.2	*1)
Hori.	4810.000	AV	40.06	31.44	6.49	43.91	0.00	2.46	36.54	53.90	17.4	
Hori.	7215.000	AV	38.84	36.81	8.32	43.66	0.00	2.46	42.77	53.90	11.1	
Hori.	9620.000	AV	38.98	38.55	9.19	43.63	0.00	2.46	45.55	53.90	8.4	
Hori.	19240.000	AV	42.51	40.17	11.71	48.13	0.00	-9.54	36.72	53.90	17.2	
Vert.	2390.000	AV	41.54	27.86	14.11	43.71	0.00	2.46	42.26	53.90	11.6	*1)
Vert.	4810.000	AV	40.43	31.44	6.49	43.91	0.00	2.46	36.91	53.90	17.0	
Vert.	7215.000	AV	39.30	36.81	8.32	43.66	0.00	2.46	43.23	53.90	10.7	
Vert.	9620.000	AV	40.23	38.55	9.19	43.63	0.00	2.46	46.80	53.90	**7.1**	
Vert.	19240.000	AV	37.31	40.17	11.71	48.13	0.00	-9.54	31.52	53.90	22.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

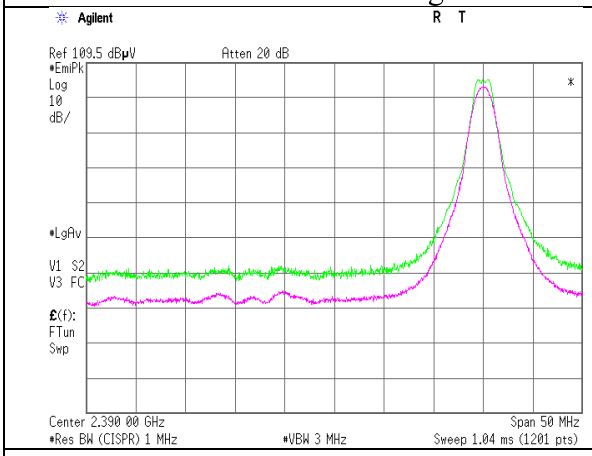
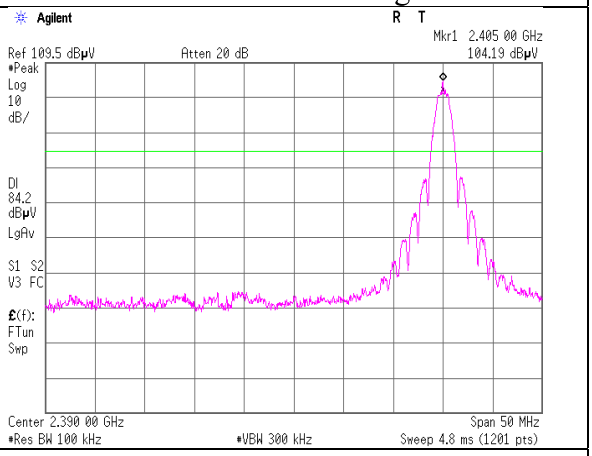
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

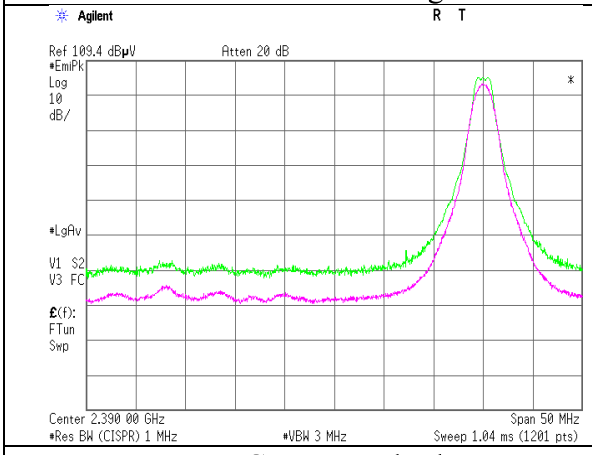
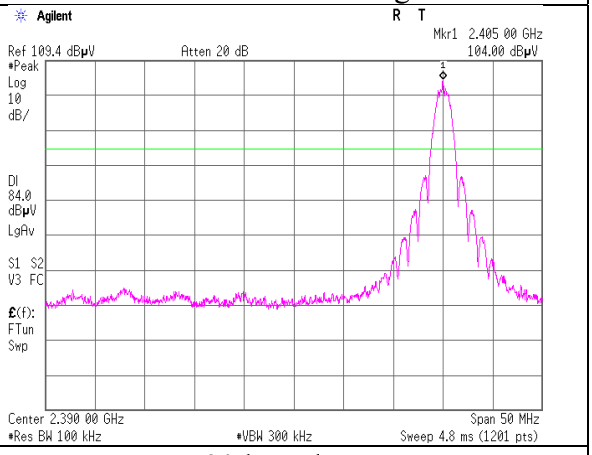
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2405.000	PK	102.50	27.85	14.12	43.71	2.46	103.22	-	-	
Hori.	2400.000	PK	52.83	27.86	14.12	43.71	2.46	53.56	83.22	29.7	
Vert.	2405.000	PK	101.41	27.85	14.12	43.71	2.46	102.13	-	-	
Vert.	2400.000	PK	50.78	27.86	14.12	43.71	2.46	51.51	82.13	30.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 7, 2018
Temperature / Humidity	22 deg.C, 55 %RH
Engineer	Makoto Hosaka
	(1 GHz – 2.8 GHz)
Mode	Tx IEEE802.15.4 2405 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 14, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx IEEE802.15.4 2440 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	31.808	QP	22.69	18.00	6.48	32.20	0.00	14.97	40.00	25.0	109	8	
Hori.	194.387	QP	22.04	16.45	7.85	32.08	0.00	14.26	43.50	29.2	116	359	
Hori.	892.039	QP	20.42	22.12	11.05	31.14	0.00	22.45	46.00	23.5	131	358	
Hori.	4880.000	PK	48.66	31.37	6.53	43.90	2.46	45.12	73.90	28.7	169	85	
Hori.	7320.000	PK	48.29	37.00	8.40	43.66	2.46	52.49	73.90	21.4	158	152	
Hori.	9760.000	PK	47.57	38.92	9.22	43.56	2.46	54.61	73.90	**19.2**	150	0	
Hori.	19520.000	PK	50.63	40.09	11.88	47.70	-9.54	45.36	73.90	28.5	141	0	
Vert.	30.081	QP	22.72	18.67	6.45	32.20	0.00	15.64	40.00	24.3	118	355	
Vert.	196.442	QP	22.03	16.46	7.87	32.08	0.00	14.28	43.50	29.2	100	359	
Vert.	930.087	QP	20.20	22.11	11.17	30.82	0.00	22.66	46.00	23.3	124	359	
Vert.	4880.000	PK	48.73	31.37	6.53	43.90	2.46	45.19	73.90	28.7	116	318	
Vert.	7320.000	PK	47.83	37.00	8.40	43.66	2.46	52.03	73.90	21.8	112	210	
Vert.	9760.000	PK	47.28	38.92	9.22	43.56	2.46	54.32	73.90	19.5	100	0	
Vert.	19520.000	PK	46.59	40.09	11.88	47.70	-9.54	41.32	73.90	32.5	124	99	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4880.000	AV	38.77	31.37	6.53	43.90	0.00	2.46	35.23	53.90	18.7	
Hori.	7320.000	AV	37.88	37.00	8.40	43.66	0.00	2.46	42.08	53.90	11.8	
Hori.	9760.000	AV	38.60	38.92	9.22	43.56	0.00	2.46	45.64	53.90	**8.3**	
Hori.	19520.000	AV	42.98	40.09	11.88	47.70	0.00	-9.54	37.71	53.90	16.2	
Vert.	4880.000	AV	38.99	31.37	6.53	43.90	0.00	2.46	35.45	53.90	18.4	
Vert.	7320.000	AV	37.78	37.00	8.40	43.66	0.00	2.46	41.98	53.90	11.9	
Vert.	9760.000	AV	38.54	38.92	9.22	43.56	0.00	2.46	45.58	53.90	**8.3**	
Vert.	19520.000	AV	38.09	40.09	11.88	47.70	0.00	-9.54	32.82	53.90	21.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission

Report No.	12510206S-A-R3		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 14, 2018	October 10, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	25 deg.C, 50 %RH	23 deg.C, 56 %RH
Engineer	Shiro Kobayashi	Shiro Kobayashi	Yasumasa Owaki
	(30 MHz - 1000 MHz)	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)
Mode	Tx IEEE802.15.4 2475 MHz		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	31.876	QP	22.75	17.97	6.49	32.20	0.00	15.01	40.00	24.9	147	4	
Hori.	189.480	QP	22.03	16.36	7.84	32.08	0.00	14.15	43.50	29.3	101	360	
Hori.	936.019	QP	21.08	22.10	11.19	30.77	0.00	23.60	46.00	22.4	152	359	
Hori.	2483.500	PK	54.58	27.65	14.22	43.72	2.46	55.19	73.90	**18.7**	236	201	
Hori.	4950.000	PK	48.81	31.46	6.56	43.89	2.46	45.40	73.90	28.5	100	0	
Hori.	7425.000	PK	47.59	37.06	8.50	43.65	2.46	51.96	73.90	21.9	119	198	
Hori.	9900.000	PK	46.15	38.96	9.24	43.49	2.46	53.32	73.90	20.5	100	0	
Hori.	19800.000	PK	49.39	39.92	12.00	47.72	-9.54	44.05	73.90	29.8	141	0	
Vert.	30.719	QP	22.78	18.43	6.47	32.20	0.00	15.48	40.00	24.5	108	352	
Vert.	187.856	QP	22.04	16.29	7.83	32.08	0.00	14.08	43.50	29.4	100	349	
Vert.	934.313	QP	21.02	22.08	11.19	30.79	0.00	23.50	46.00	22.5	145	352	
Vert.	2483.500	PK	54.03	27.65	14.22	43.72	2.46	54.64	73.90	19.2	100	142	
Vert.	4950.000	PK	48.60	31.46	6.56	43.89	2.46	45.19	73.90	28.7	100	0	
Vert.	7425.000	PK	47.04	37.06	8.50	43.65	2.46	51.41	73.90	22.4	100	210	
Vert.	9900.000	PK	47.37	38.96	9.24	43.49	2.46	54.54	73.90	19.3	100	0	
Vert.	19800.000	PK	45.28	39.92	12.00	47.72	-9.54	39.94	73.90	33.9	128	96	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	46.74	27.65	14.22	43.72	0.00	2.46	47.35	53.90	**6.6**	*1)
Hori.	4950.000	AV	40.56	31.46	6.56	43.89	0.00	2.46	37.15	53.90	16.8	
Hori.	7425.000	AV	39.60	37.06	8.50	43.65	0.00	2.46	43.97	53.90	9.9	
Hori.	9900.000	AV	37.96	38.96	9.24	43.49	0.00	2.46	45.13	53.90	8.8	
Hori.	19800.000	AV	41.73	39.92	12.00	47.72	0.00	-9.54	36.39	53.90	17.5	
Vert.	2483.500	AV	45.12	27.65	14.22	43.72	0.00	2.46	45.73	53.90	8.2	*1)
Vert.	4950.000	AV	40.44	31.46	6.56	43.89	0.00	2.46	37.03	53.90	16.9	
Vert.	7425.000	AV	38.97	37.06	8.50	43.65	0.00	2.46	43.34	53.90	10.6	
Vert.	9900.000	AV	38.60	38.96	9.24	43.49	0.00	2.46	45.77	53.90	8.1	
Vert.	19800.000	AV	36.45	39.92	12.00	47.72	0.00	-9.54	31.11	53.90	22.8	

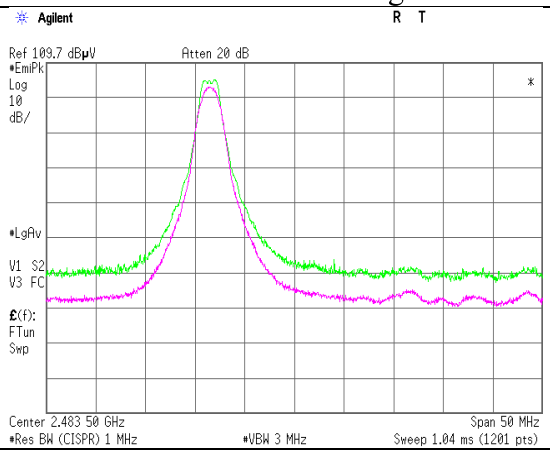
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.98 m / 3.0 m) = 2.46 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 10, 2018
Temperature / Humidity	25 deg.C, 50 %RH
Engineer	Shiro Kobayashi
	(1 GHz – 2.8 GHz)
Mode	Tx IEEE802.15.4 2475 MHz

Horizontal

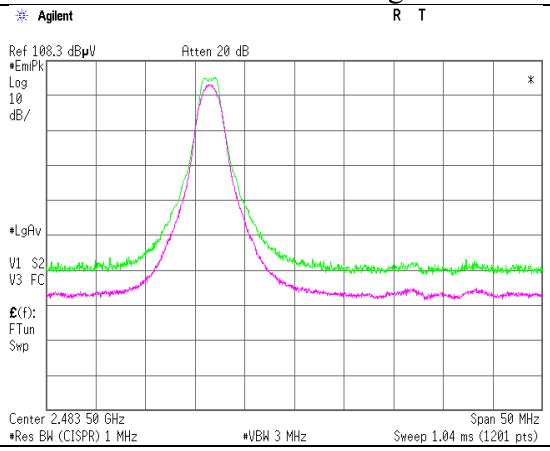
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

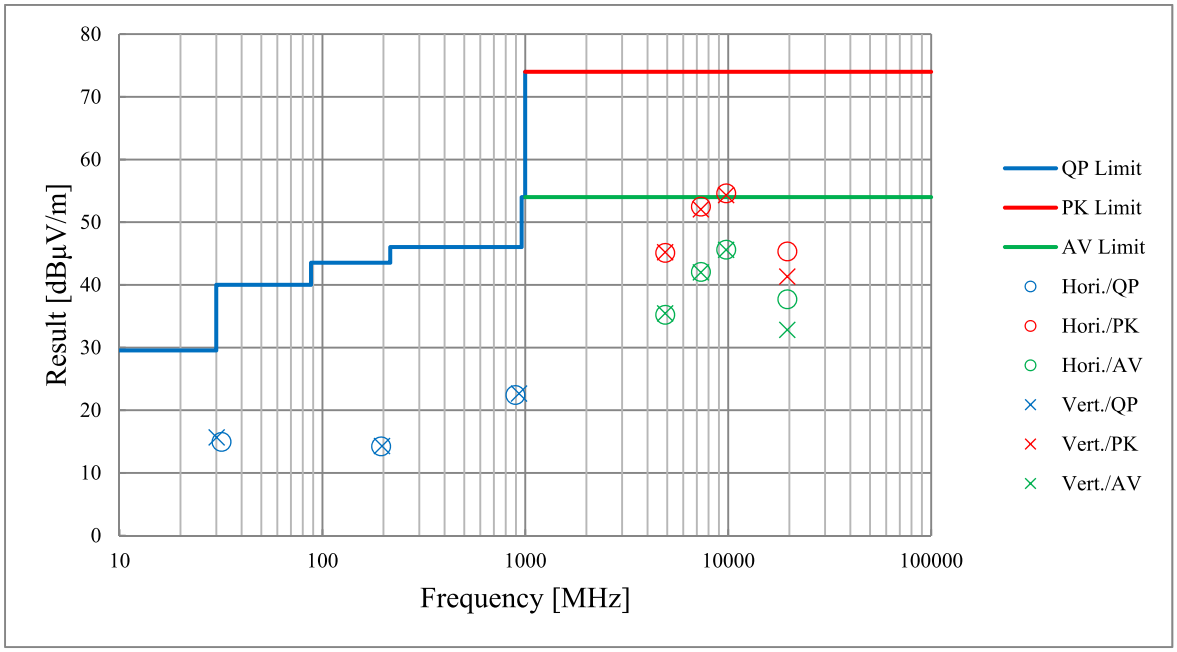


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12510206S-A-R3				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	No.3	No.3	No.3	No.3	No.3
Date	October 14, 2018	October 7, 2018	October 8, 2018	October 9, 2018	October 11, 2018
Temperature / Humidity	24 deg.C, 42 %RH	22 deg.C, 55 %RH	25 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 42 %RH
Engineer	Shiro Kobayashi (30 MHz - 1000 MHz)	Makoto Hosaka (1 GHz – 2.8 GHz)	Shiro Kobayashi (2.8 GHz -13 GHz)	Shiro Kobayashi (13 GHz -18 GHz)	Yasumasa Owaki (18 GHz -26.5 GHz)
Mode	Tx IEEE802.15.4 2440 MHz				

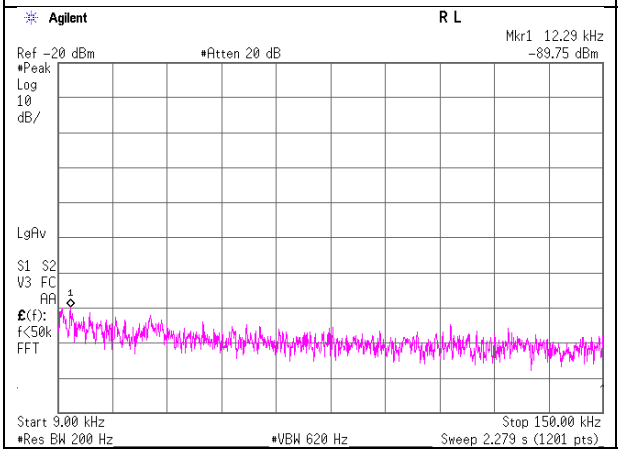


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

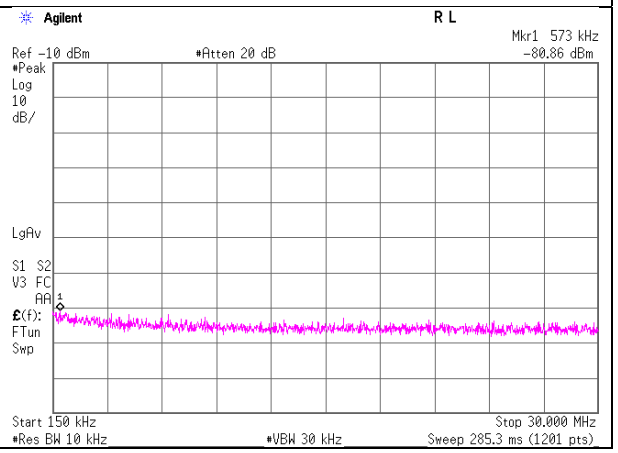
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room / No.5 Shielded Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 500 kbps 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.29	-89.8	0.01	9.8	2.0	1	-77.9	300	6.0	-16.7	45.8	62.5	
573.00	-80.9	0.02	9.8	2.0	1	-69.0	30	6.0	12.2	32.4	20.2	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

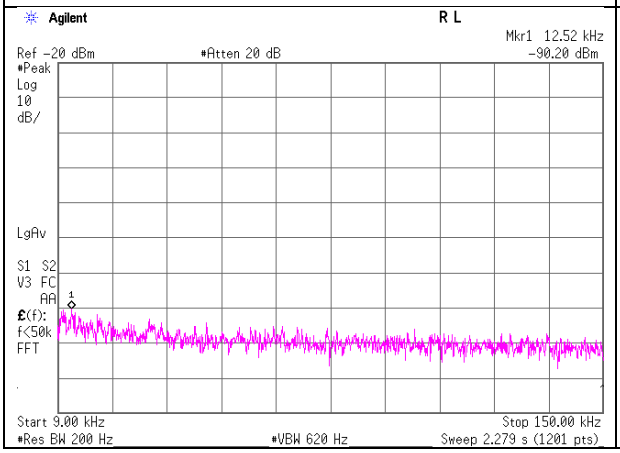
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

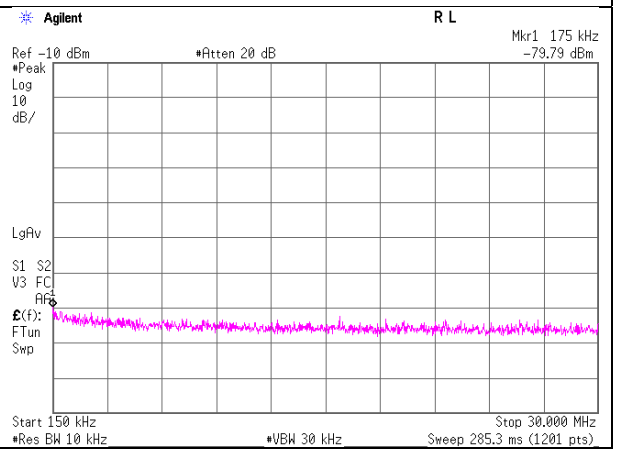
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 500 kbps 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.52	-90.2	0.01	9.8	2.0	1	-78.4	300	6.0	-17.1	45.6	62.7	
175.00	-79.8	0.01	9.8	2.0	1	-68.0	300	6.0	-6.7	22.7	29.4	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

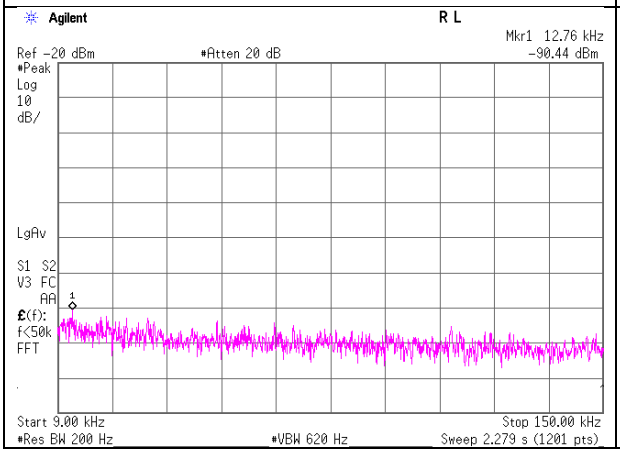
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

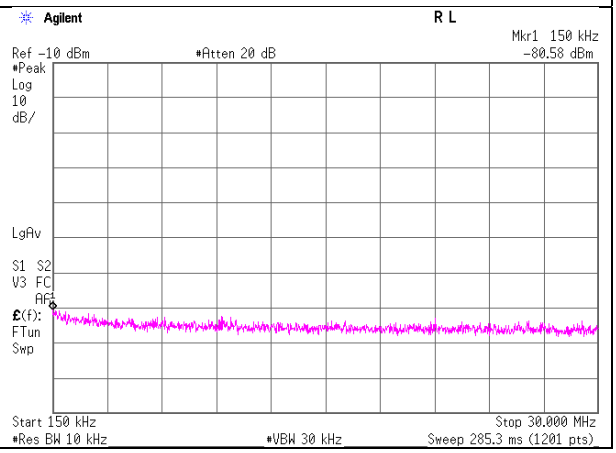
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 500 kbps 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.76	-90.4	0.01	9.8	2.0	1	-78.6	300	6.0	-17.4	45.4	62.8	
150.00	-80.6	0.01	9.8	2.0	1	-68.8	300	6.0	-7.5	24.0	31.5	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

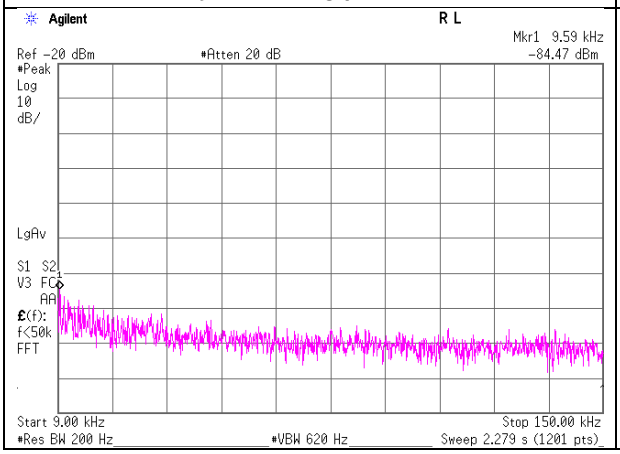
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

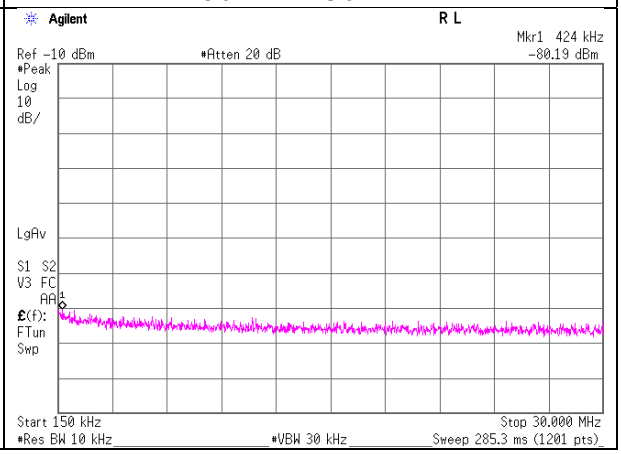
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room / No.5 Shielded Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 2 Mbps 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.59	-84.5	0.01	9.8	2.0	1	-72.7	300	6.0	-11.4	47.9	59.3	
424.00	-80.2	0.02	9.8	2.0	1	-68.4	300	6.0	-7.1	15.0	22.1	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

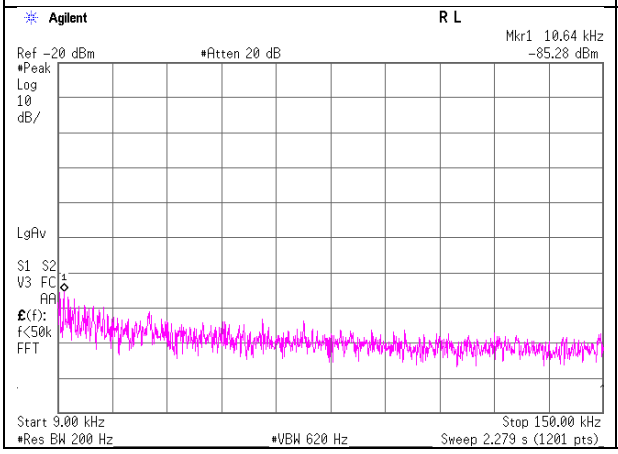
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

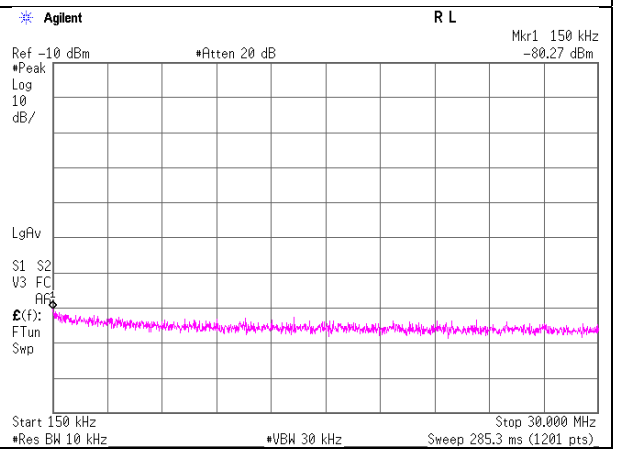
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 2 Mbps 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.64	-85.3	0.01	9.8	2.0	1	-73.5	300	6.0	-12.2	47.0	59.2	
150.00	-80.3	0.01	9.8	2.0	1	-68.5	300	6.0	-7.2	24.0	31.2	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

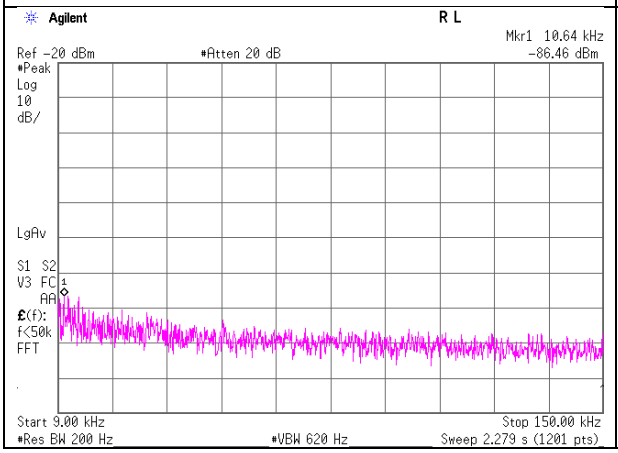
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

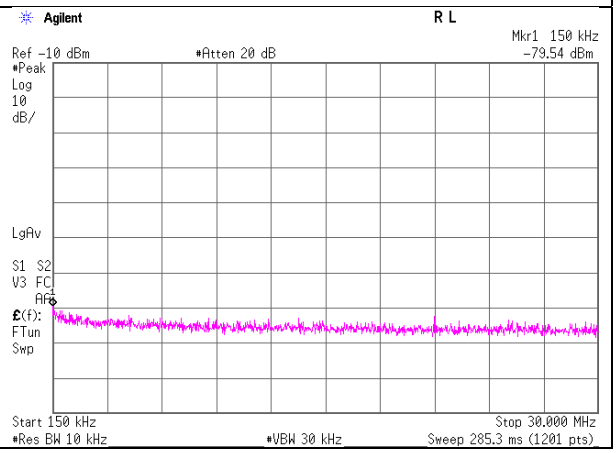
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE 2 Mbps 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.64	-86.5	0.01	9.8	2.0	1	-74.6	300	6.0	-13.4	47.0	60.4	
150.00	-79.5	0.01	9.8	2.0	1	-67.7	300	6.0	-6.5	24.0	30.5	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

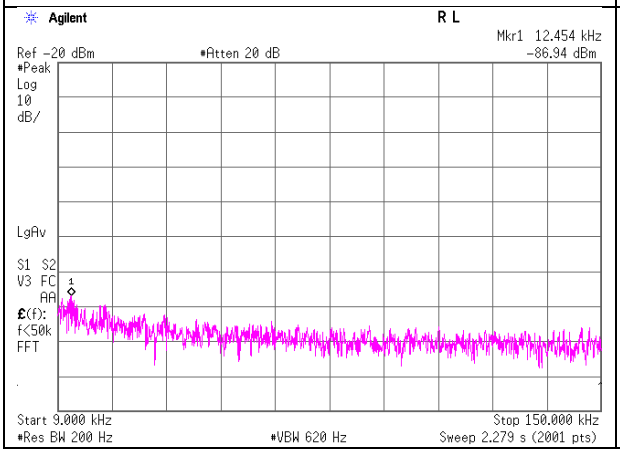
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

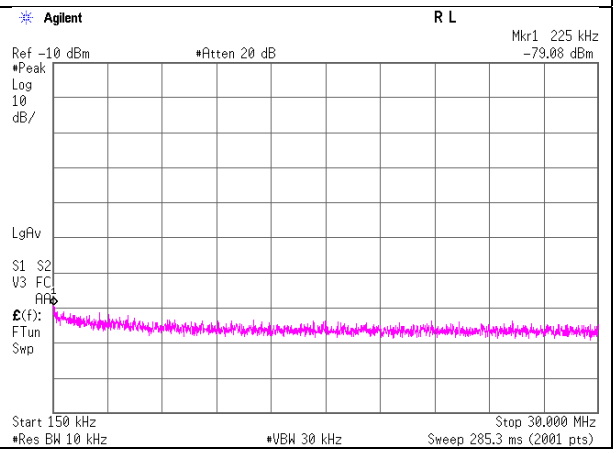
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx ANT 1 Mbps 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.45	-86.9	0.01	9.8	2.0	1	-75.1	300	6.0	-13.9	45.6	59.5	
225.00	-79.1	0.02	9.8	2.0	1	-67.3	300	6.0	-6.0	20.5	26.5	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

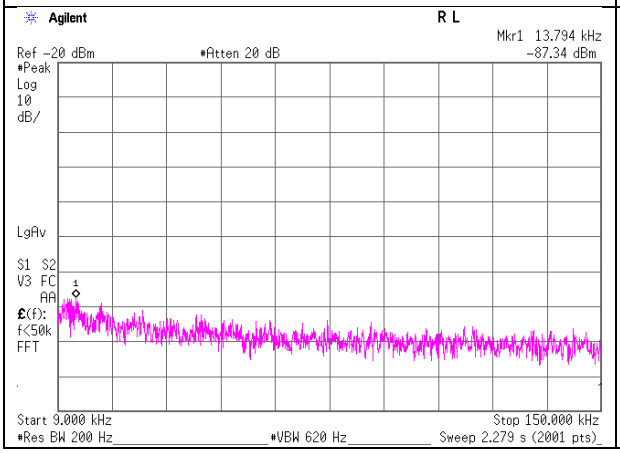
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

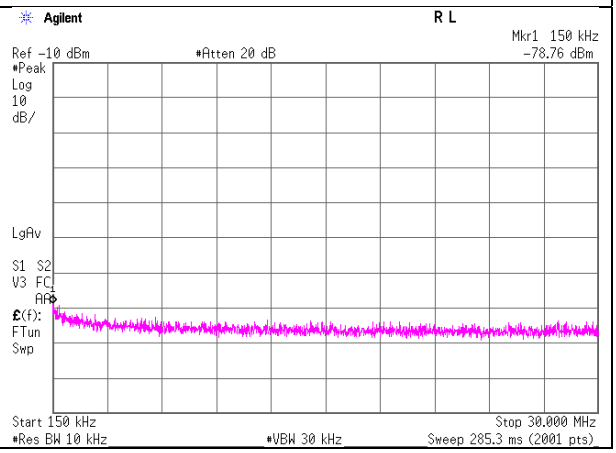
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx ANT 1 Mbps 2441 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.79	-87.3	0.01	9.8	2.0	1	-75.5	300	6.0	-14.3	44.8	59.1	
150.00	-78.8	0.01	9.8	2.0	1	-66.9	300	6.0	-5.7	24.0	29.7	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

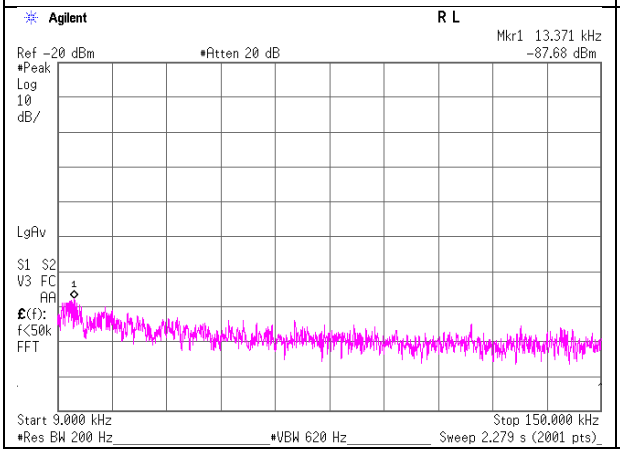
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

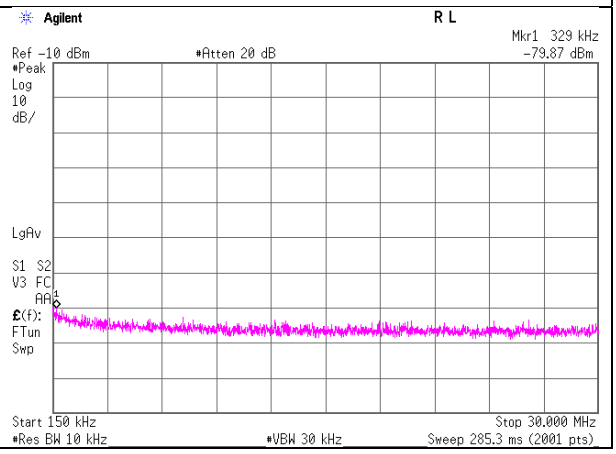
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx ANT 1 Mbps 2480MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.37	-87.7	0.01	9.8	2.0	1	-75.9	300	6.0	-14.6	45.0	59.6	
329.00	-79.9	0.02	9.8	2.0	1	-68.0	300	6.0	-6.8	17.2	24.0	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

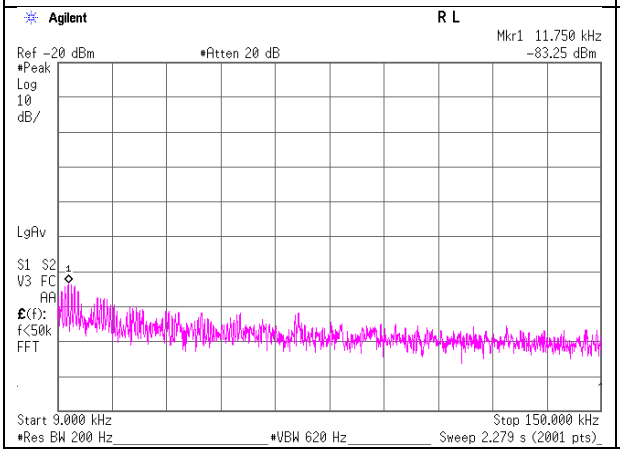
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

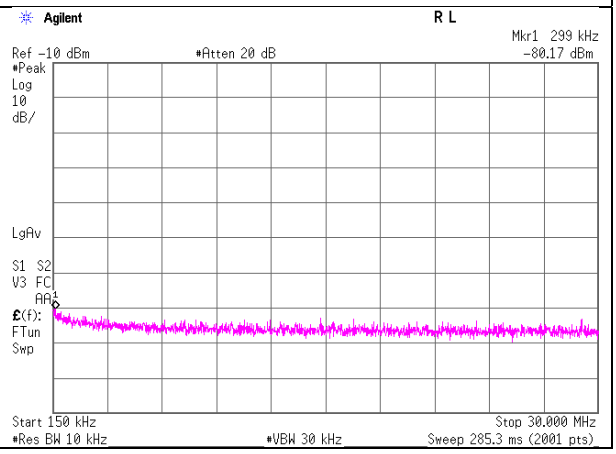
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Nordic Original 2 Mbps 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
11.75	-83.3	0.01	9.8	2.0	1	-71.4	300	6.0	-10.2	46.2	56.4	
299.00	-80.2	0.02	9.8	2.0	1	-68.3	300	6.0	-7.1	18.0	25.1	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

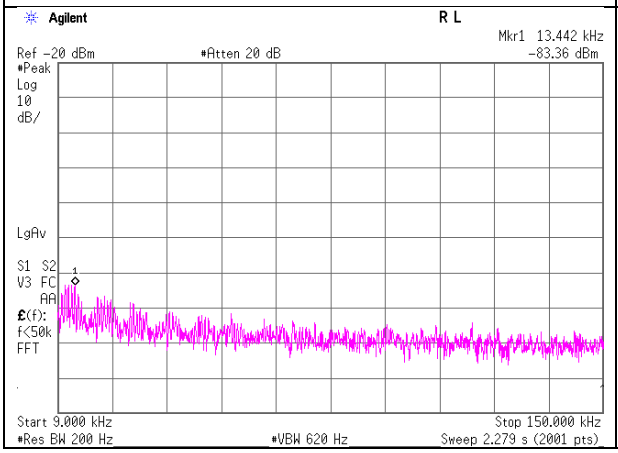
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

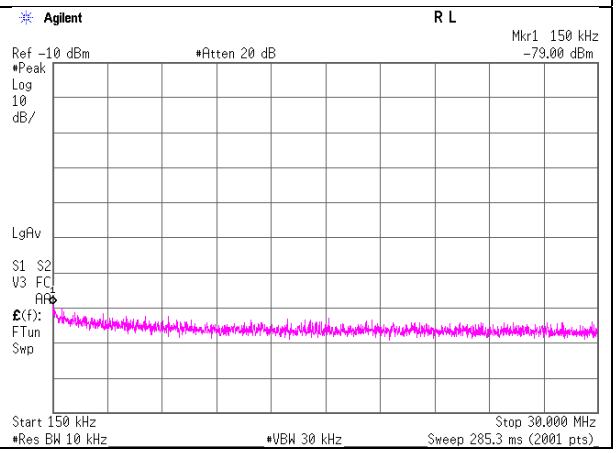
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Nordic Original 2 Mbps 2441 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.44	-83.4	0.01	9.8	2.0	1	-71.5	300	6.0	-10.3	45.0	55.3	
150.00	-79.0	0.01	9.8	2.0	1	-67.2	300	6.0	-5.9	24.0	29.9	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

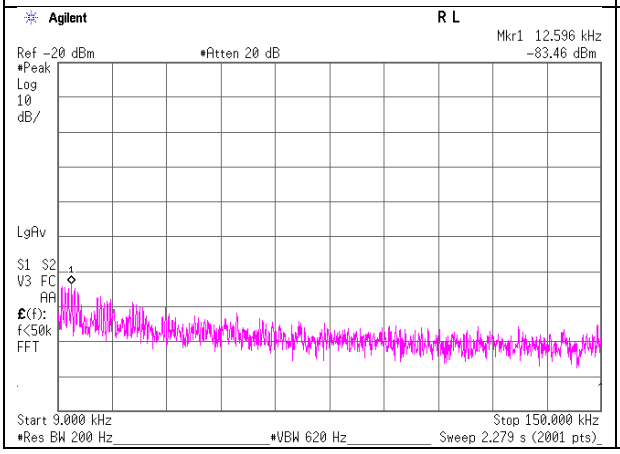
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

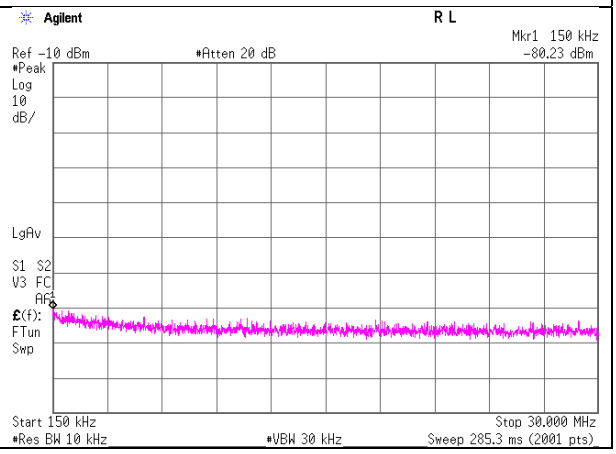
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 26, 2018
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Nordic Original 2 Mbps 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.60	-83.5	0.01	9.8	2.0	1	-71.6	300	6.0	-10.4	45.5	55.9	
150.00	-80.2	0.01	9.8	2.0	1	-68.4	300	6.0	-7.2	24.0	31.2	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

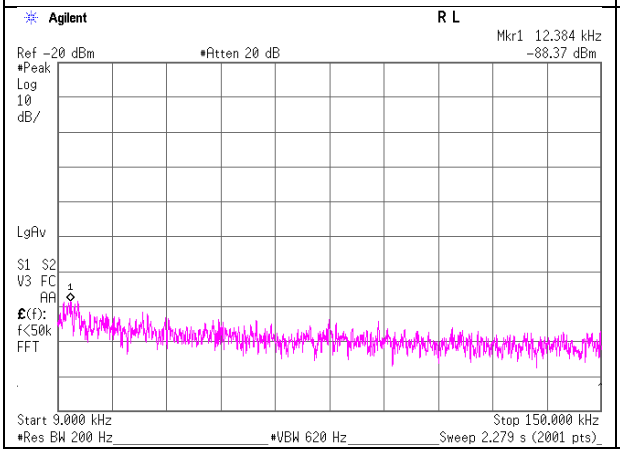
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

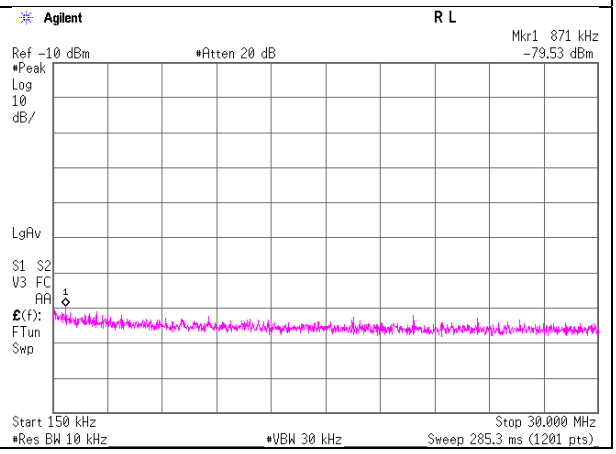
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 1, 2018
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Shiro Kobayashi
Mode	Tx IEEE802.15.4 2405 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.38	-88.4	0.01	9.8	2.0	1	-76.6	300	6.0	-15.3	45.7	61.0	
871.00	-79.5	0.03	9.8	2.0	1	-67.7	30	6.0	13.6	28.8	15.2	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

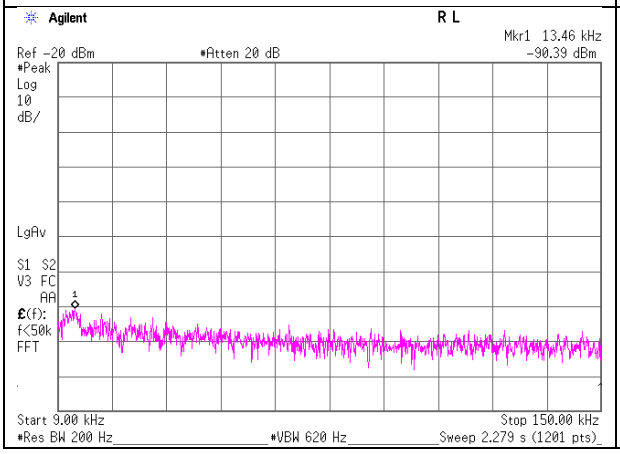
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

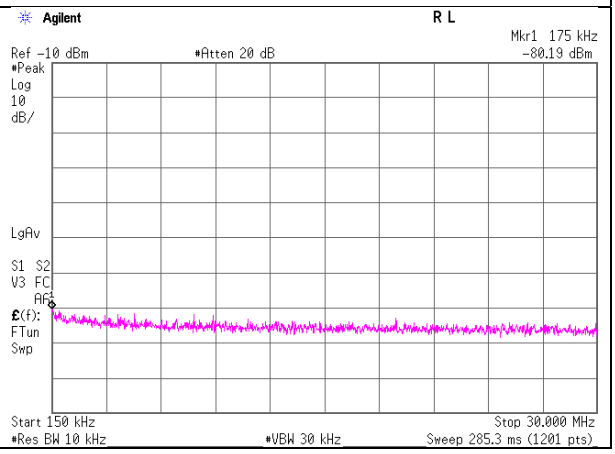
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 1, 2018
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Shiro Kobayashi
Mode	Tx IEEE802.15.4 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.46	-90.4	0.01	9.8	2.0	1	-78.6	300	6.0	-17.3	45.0	62.3	
175.00	-80.2	0.01	9.8	2.0	1	-68.4	300	6.0	-7.1	22.7	29.8	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

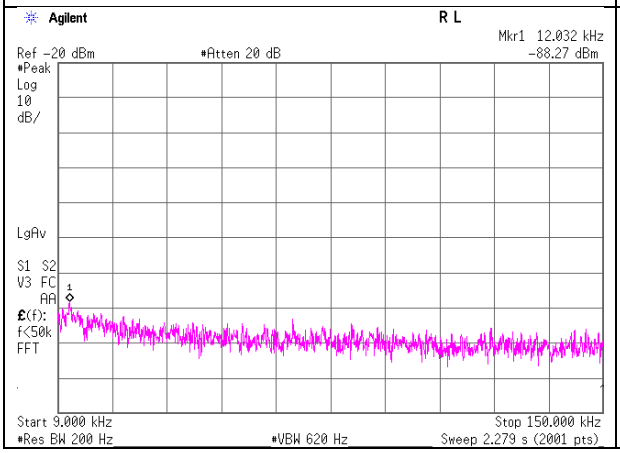
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

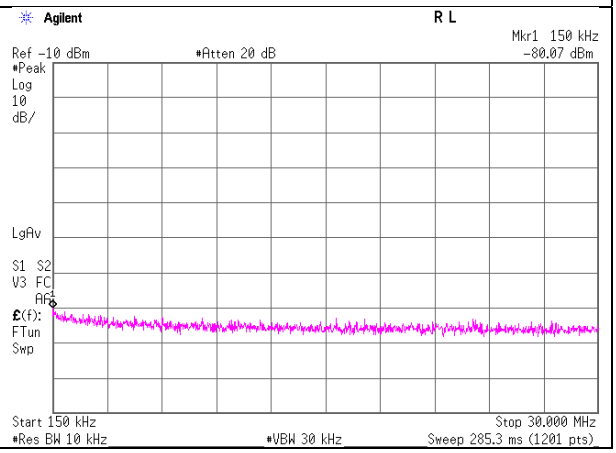
Conducted Spurious Emission

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 12, 2018
Temperature / Humidity	25 deg. C / 36 % RH
Engineer	Kazutaka Takeyama
Mode	Tx IEEE802.15.4 2475 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.03	-88.3	0.01	9.8	2.0	1	-76.5	300	6.0	-15.2	45.9	61.1	
150.00	-80.1	0.01	9.8	2.0	1	-68.3	300	6.0	-7.0	24.0	31.0	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Power Density

Report No.	12510206S-A-R3
Test place	Shonan EMC Lab. No.1 Measurement Room / No.5 Shielded Room
Date	September 25, 2018
Temperature / Humidity	26 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx

BT LE 500 kbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-10.24	1.69	9.85	1.30	8.00	6.70
2440.00	-10.04	1.70	9.84	1.50	8.00	6.50
2480.00	-10.19	1.71	9.84	1.36	8.00	6.64

BT LE 2 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-21.52	1.69	9.85	-9.98	8.00	17.98
2440.00	-21.39	1.70	9.84	-9.85	8.00	17.85
2480.00	-21.52	1.71	9.84	-9.97	8.00	17.97

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Power Density

Report No.	12510206S-A-R3		
Test place	Shonan EMC Lab. No.5 Shielded Room		
Date	September 26, 2018	October 1, 2018	October 12, 2018
Temperature / Humidity	25 deg. C / 49 % RH	25 deg. C / 59 % RH	25 deg. C / 36 % RH
Engineer	Yosuke Ishikawa	Shiro Kobayashi	Kazutaka Takeyama
Mode	Tx		

ANT 1 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-15.76	1.69	9.85	-4.22	8.00	12.22
2441.00	-15.64	1.70	9.84	-4.10	8.00	12.10
2480.00	-15.88	1.71	9.84	-4.33	8.00	12.33

Nordic Original 2 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-18.36	1.69	9.85	-6.82	8.00	14.82
2441.00	-18.15	1.70	9.84	-6.61	8.00	14.61
2480.00	-18.43	1.71	9.84	-6.88	8.00	14.88

IEEE802.15.4

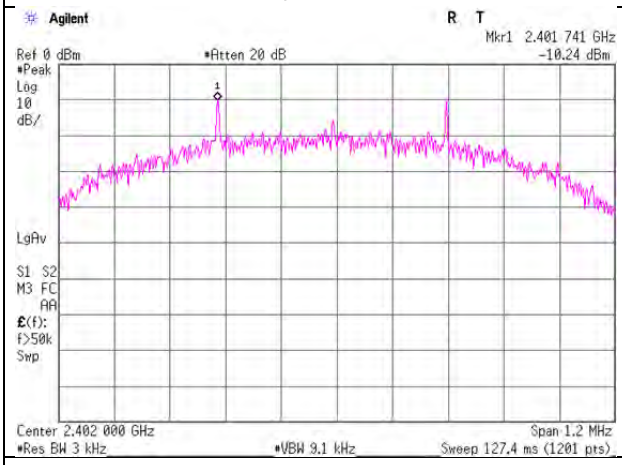
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2405.00	-17.68	1.69	9.85	-6.14	8.00	14.14
2440.00	-18.13	1.70	9.84	-6.59	8.00	14.59
2475.00	-18.32	1.71	9.84	-6.77	8.00	14.77

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

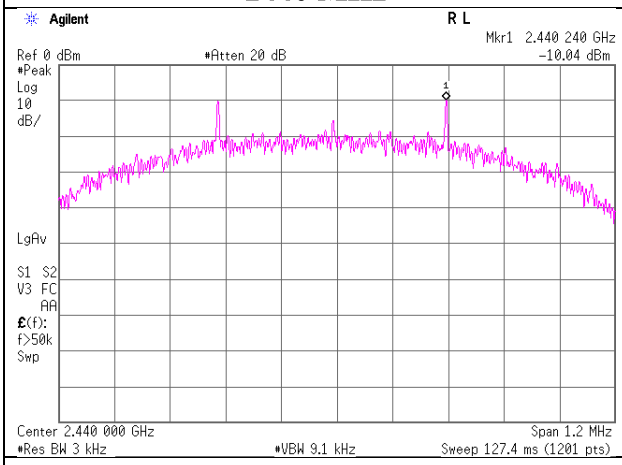
Power Density

BT LE 500 kbps

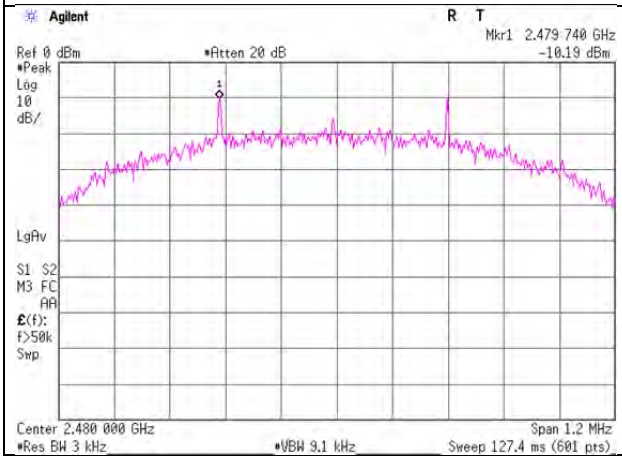
2402 MHz



2440 MHz

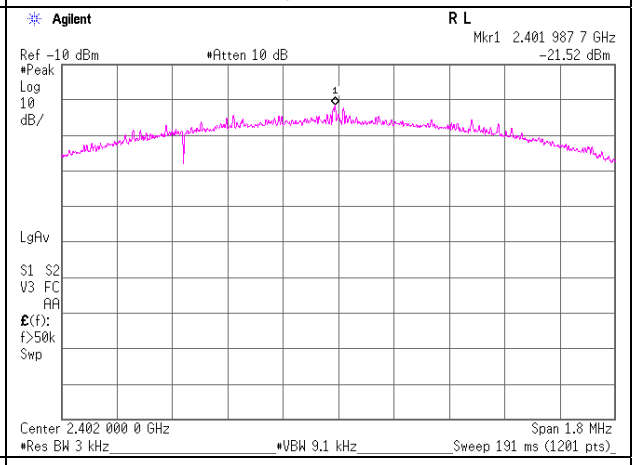


2480 MHz

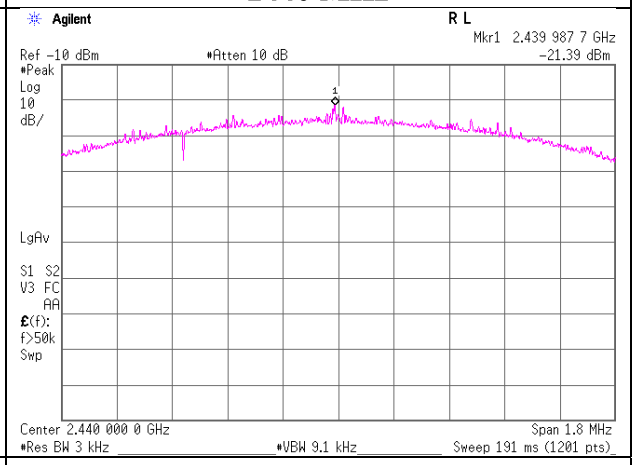


BT LE 2 Mbps

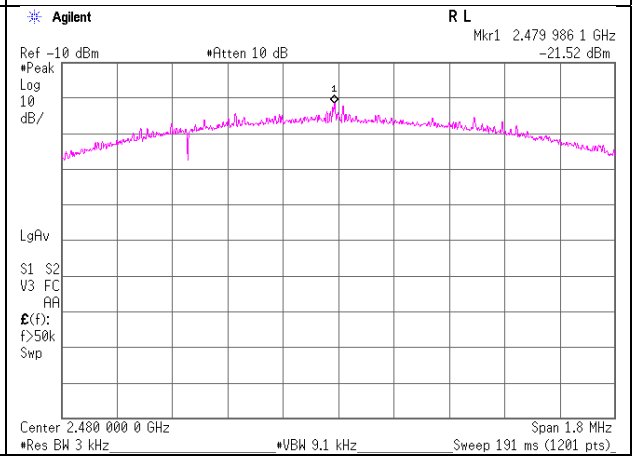
2402 MHz



2440 MHz



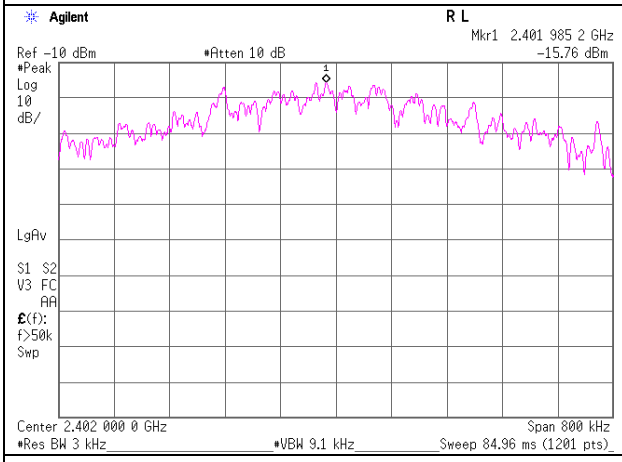
2480 MHz



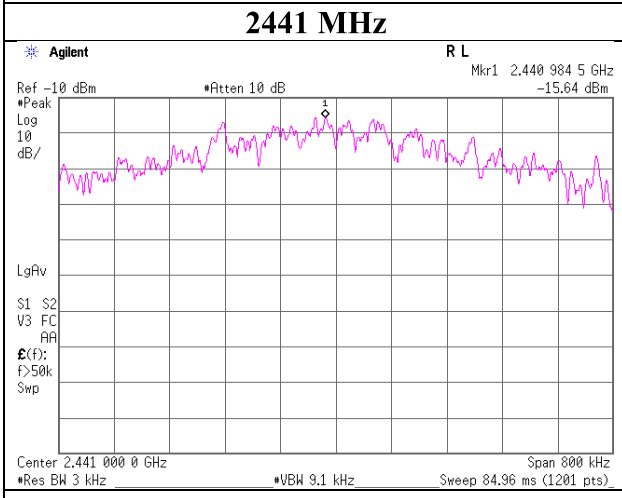
Power Density

ANT 1 Mbps

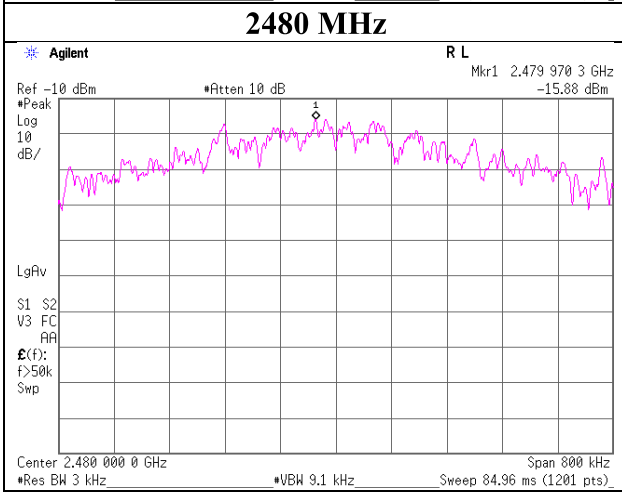
2402 MHz



2441 MHz

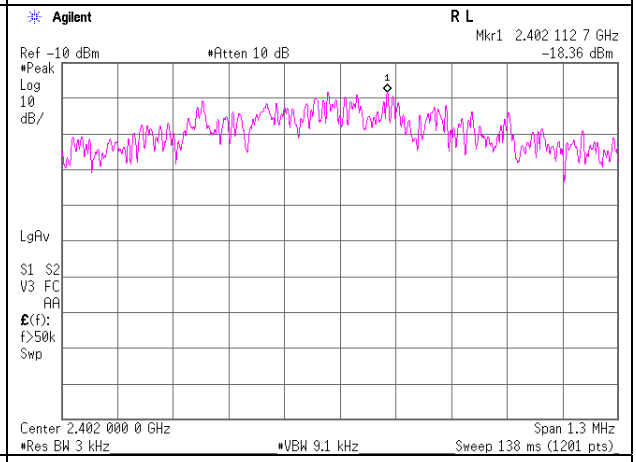


2480 MHz

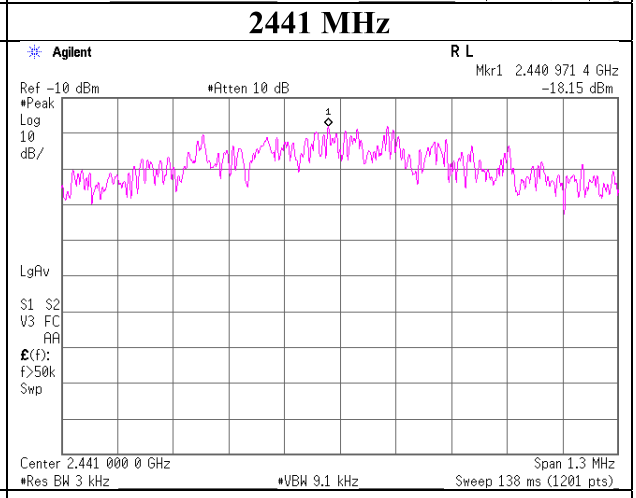


Nordic Original 2 Mbps

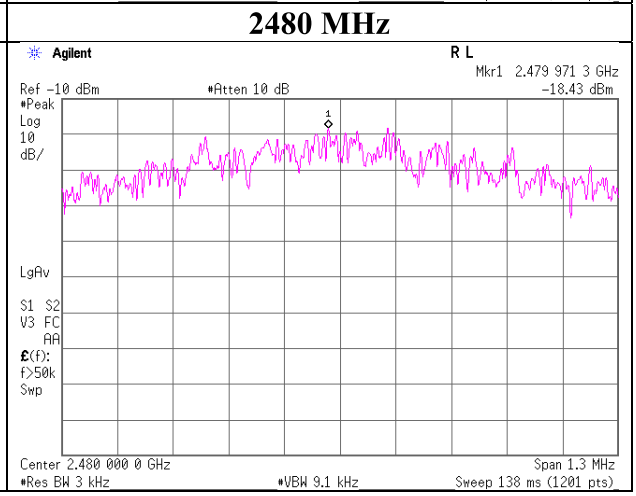
2402 MHz



2441 MHz



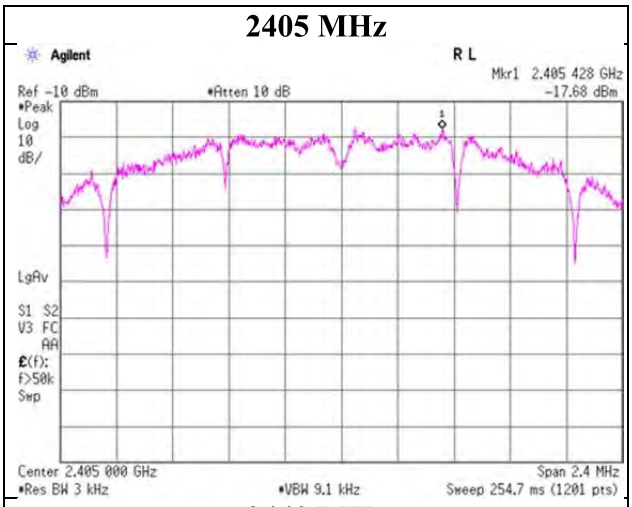
2480 MHz



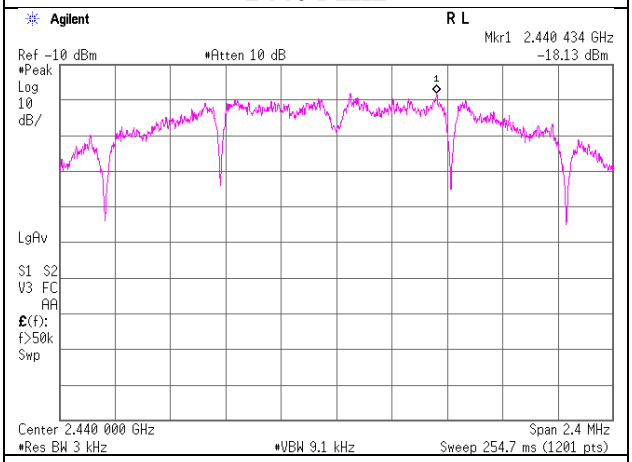
Power Density

IEEE.802.15.4

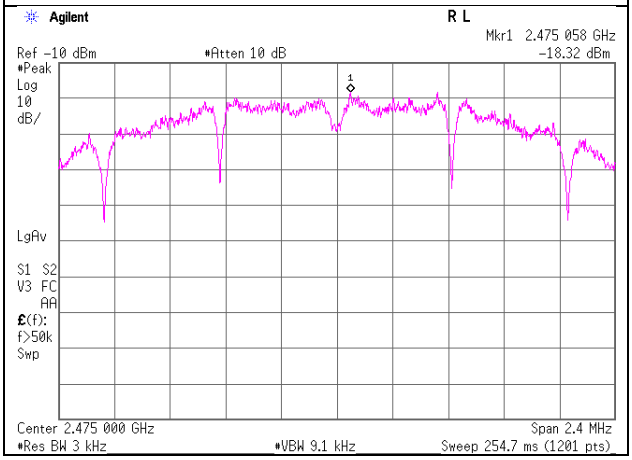
2405 MHz



2440 MHz



2475 MHz



APPENDIX 2: Test instruments

Test Instruments

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
KTS-06	AT	145110	Digital Tester	SANWA	PC500	7019240	2018/3/5	2019/3/31	12
KTS-07	AT	145111	Digital Tester	SANWA	PC500	7019232	2017/10/11	2018/10/31	12
KTS-08	AT	145095	Digital Tester	SANWA	PC500	7019224	2018/3/5	2019/3/31	12
SAT10-16	AT	160494	Attenuator	Weinschel Corp.	54A-10	83406	2017/12/8	2018/12/31	12
SCC-G14	AT	145175	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	2018/3/19	2019/3/31	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2017/12/21	2018/12/31	12
SOS-13	AT	146321	Humidity Indicator	CUSTOM	CTH-202	Q.C.17	2017/12/21	2018/12/31	12
SRENT-09	AT	150461	Spectrum Analyzer	AGILENT (KEYSIGHT)	E4440A	MY46186392	2017/11/8	2018/11/30	12
SSA-03	AT	145801	Spectrum Analyzer	AGILENT	E4448A	MY48250152	2018/8/30	2019/8/31	12
SSA-02	AT,RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2018/3/5	2019/3/31	12
SAT3-13	CE	150923	Attenuator	JFW	50HF-003N		2018/2/22	2019/2/28	12
SCC-A12/A13/SRSE-01	CE	144966	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SLS-01	CE	145538	LISN	Rohde & Schwarz	ENV216	100511	2018/2/26	2019/2/28	12
SLS-02	CE	145539	LISN	Rohde & Schwarz	ENV216	100512	2018/2/26	2019/2/28	12
SOS-16	CE	167990	Humidity Indicator	CUSTOM	CTH-202	708Q08R	2018/3/27	2019/3/31	12
STM-25	CE	145745	Terminator	TME	CT-01 BP	-	2017/12/14	2018/12/31	12
COTS-SEMI-1	CE,RE	144865	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	-	-	-
KJM-09	CE,RE	145929	Measure	KOMELON	KMC-36	-	-	-	-
STR-01	CE,RE	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2018/4/13	2019/4/30	12
STS-02	CE,RE	145793	Digital Hitester	HIOKI	3805-50	80997819	2018/3/8	2019/3/31	12
KJM-02	RE	146432	Measure	TAJIMA	GL19-55	-	-	-	-
KSA-08	RE	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2017/10/10	2018/10/31	12
SAEC-01(SVSWR)	RE	145561	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	2018/7/19	2019/7/31	12
SAEC-02(SVSWR)	RE	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2018/7/15	2019/7/31	12
SAEC-03(NSA)	RE	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2018/6/2	2019/6/30	12
SAEC-03(SVSWR)	RE	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2018/7/17	2019/7/31	12
SAF-03	RE	145126	Pre Amplifier	SONOMA	310N	290213	2018/2/16	2019/2/28	12

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SAF-04	RE	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2018/6/26	2019/6/30	12
SAF-05	RE	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2018/2/15	2019/2/28	12
SAF-06	RE	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2018/9/14	2019/9/30	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2018/3/27	2019/3/31	12
SAT10-05	RE	145136	Attenuator(above1GHz)	AGILENT	8493C-010	74864	2017/11/22	2018/11/30	12
SAT10-12	RE	151609	Attenuator	Weinschel Corp.	54A-10	81601	2018/3/22	2019/3/31	12
SAT6-13	RE	167094	Attenuator	JFW	50HF-006N		2018/2/9	2019/2/28	12
SCC-G41	RE	151617	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S006	2018/1/29	2019/1/31	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104_E	SN MY 13406/4E	2018/7/10	2019/7/31	12
SCC-G44	RE	168300	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800070/4A	2018/3/28	2019/3/31	12
SCC-G45	RE	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2EA	2018/3/28	2019/3/31	12
SFL-02	RE	145301	Highpass Filter	MICRO-TRONICS	HPM50111	51	2017/11/16	2018/11/30	12
SFL-18	RE	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2018/4/20	2019/4/30	12
SHA-01	RE	145383	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	2018/7/23	2019/7/31	12
SHA-02	RE	145384	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	2018/7/23	2019/7/31	12
SHA-03	RE	145501	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	2018/7/23	2019/7/31	12
SHA-04	RE	145512	Horn Antenna	ETS LINDGREN	Sep-60	LM3640	2018/7/23	2019/7/31	12
SJM-02	RE	147479	Measure	KOMELON	KMC-36	-	-	-	-
SJM-09	RE	145336	Measure	PROMART	SEN1935	-	-	-	-
SLA-07	RE	145529	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	2018/6/17	2019/6/30	12
SOS-01	RE	146316	Humidity Indicator	A&D	AD-5681	4062555	2017/10/30	2018/10/31	12
SOS-03	RE	146317	Humidity Indicator	A&D	AD-5681	4063325	2017/10/30	2018/10/31	12
SOS-05	RE	146293	Humidity Indicator	A&D	AD-5681	4062518	2017/10/30	2018/10/31	12
STR-08	RE	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2017/11/24	2018/11/30	12
STS-03	RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2017/10/16	2018/10/31	12
STS-04	RE	146211	Digital Hitester	HIOKI	3805-50	80997827	2018/3/8	2019/3/31	12

***Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data 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: **CE: Conducted Emission test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test