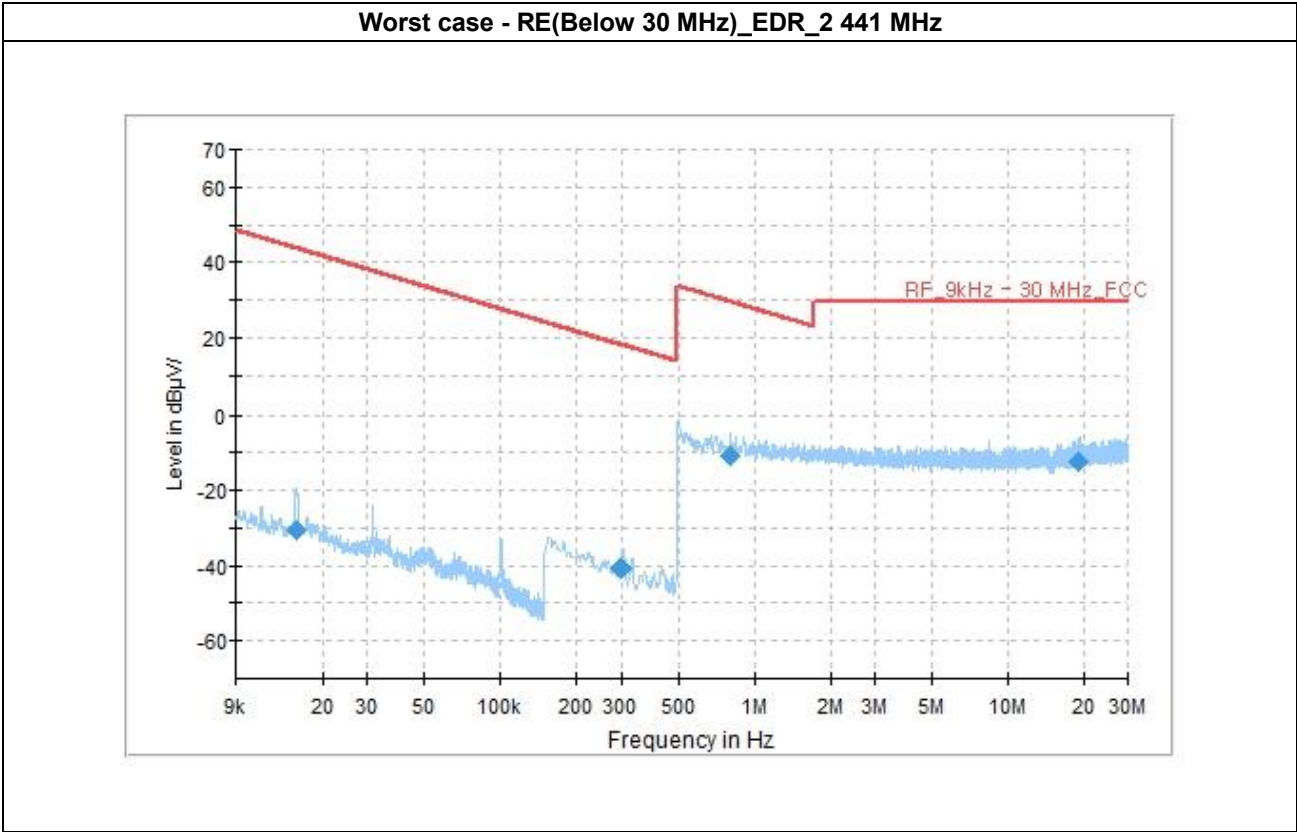




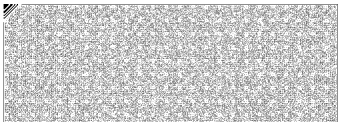
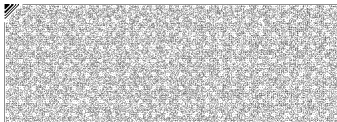
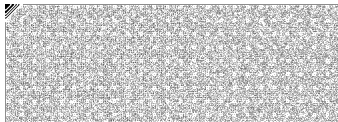
KIEL2409-YW10504

6.7.4 Test Result
Radiated Emission (Below 30 MHz)



Frequency [MHz]	Quasi-peak Reading [dBμV]	Quasi-Peak Result [dBμV/m]	Distance Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Correction Factor [dB/m]
0.016	29.50	-30.80	-80	43.75	74.55	100	Ground parallel	10	-60.30
0.298	19.67	-40.63	-80	18.11	58.74	100	Ground parallel	145	-60.30
0.799	9.44	-10.66	-40	29.55	40.21	100	Ground parallel	149	-20.10
19.019	5.93	-12.57	-40	29.54	42.11	100	Ground parallel	97	-18.50

- Note)
1. Quasi Peak(dBuV/m) = QP Reading Value(dBμV) + Correction Factor(dB/m) + Distance Factor(dB)
 2. Correction Factor(dB) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
 3. Margin(dB) = (Quasi Peak) Limit (dBμV/m) – (Quasi Peak) Result (dBμV/m)
 4. We tested three kind of Antenna Pol (Parallel, Perpendicular, Ground parallel) and reported worst case antenna Pol.

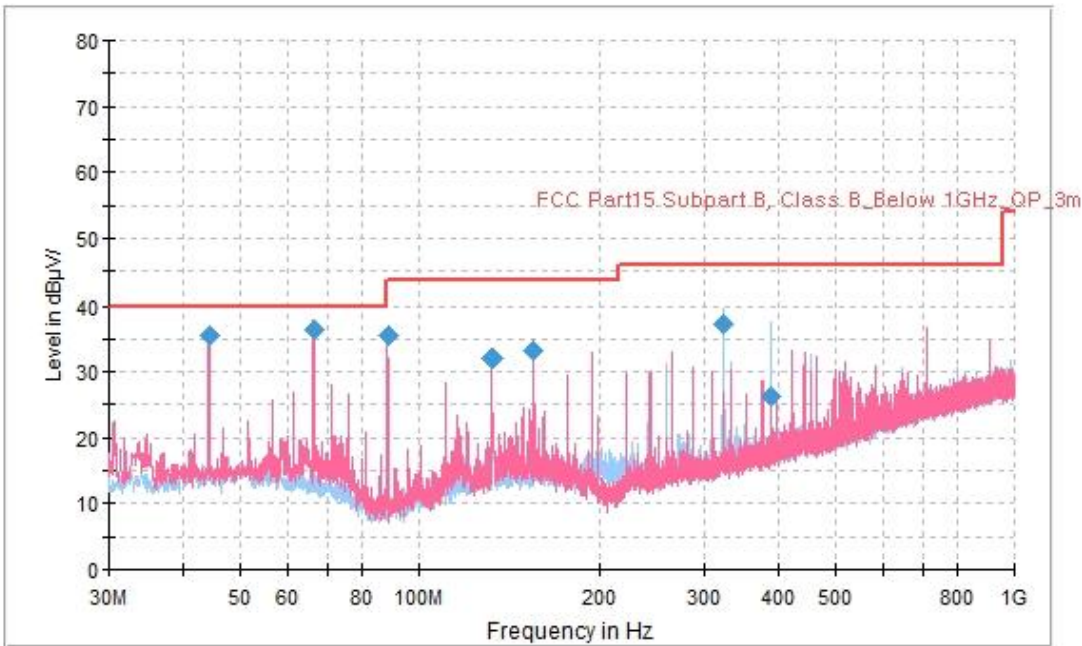




KIEL2409-YW10504

Radiated Emission (Below 1 GHz)

Worst case - RE(Below 1 GHz)_EDR_2 441 MHz



Frequency [MHz]	Quasi-Peak Reading [dBμV]	Quasi-Peak Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Correction Factor [dB/m]
44.233	42.98	35.48	40.00	4.52	100	V	82	-7.50
66.381	45.30	36.30	40.00	3.70	100	V	229	-9.00
88.476	48.83	35.63	43.50	7.87	100	V	18	-13.20
132.718	40.37	32.07	43.50	11.43	100	V	299	-8.30
154.867	40.36	33.26	43.50	10.24	100	V	261	-7.10
323.833	42.15	37.35	46.00	8.65	100	H	96	-4.80
388.084	29.29	26.19	46.00	19.81	100	H	162	-3.10

Note)

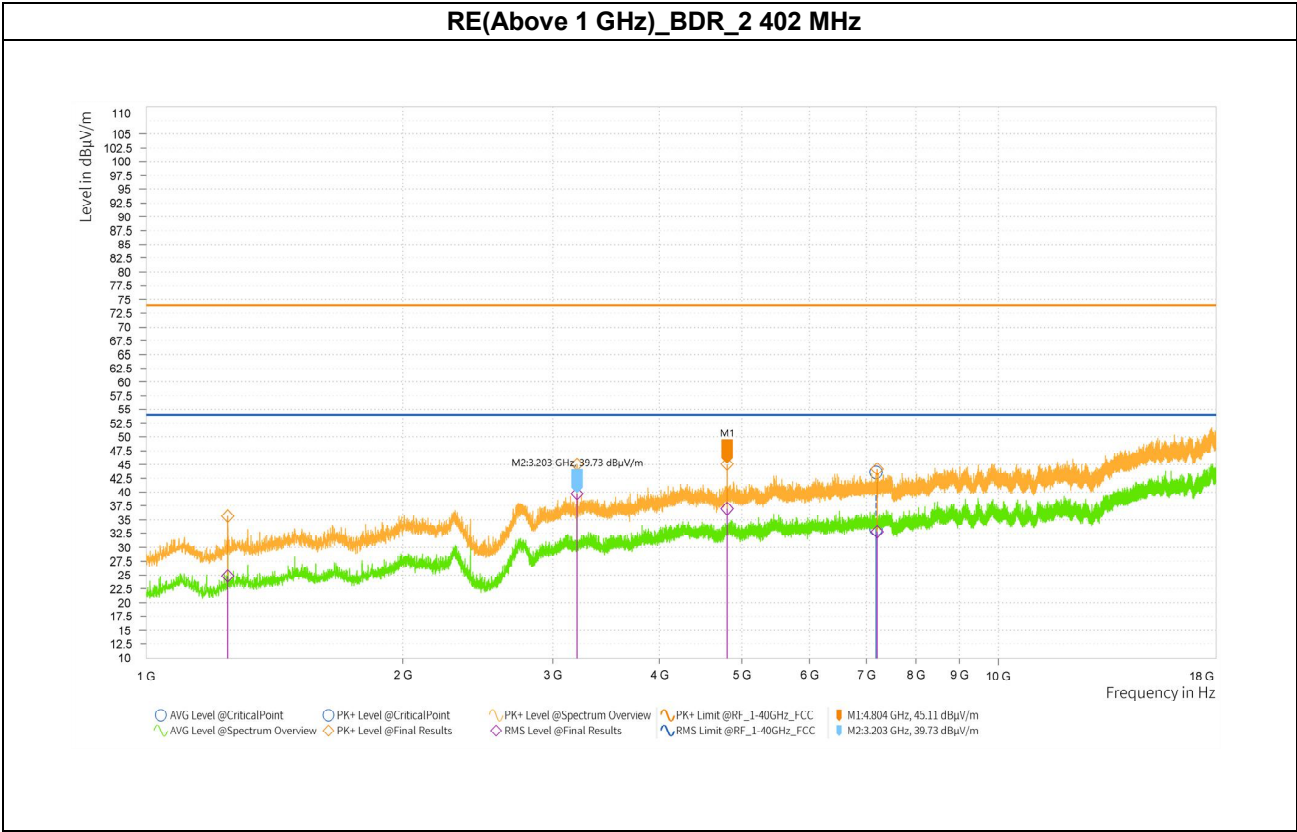
- Quasi Peak(dBμV/m) = Quasi Peak Reading Value(dBμV) + Correction Factor(dB/m)
- Correction Factor(dB) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- Margin(dB) = (Quasi Peak) Limit (dBμV/m) – (Quasi Peak) Result (dBμV/m).





KIEL2409-YW10504

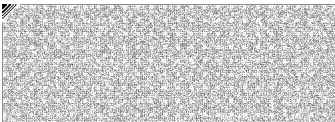
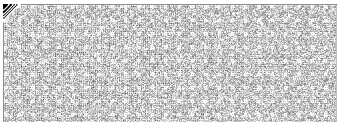
Radiated Emission (Above 1 GHz)



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 246.500	51.54	35.72	-	13.22	-22.50	3.00	V	205.5	-15.82	38.28	74.00	40.78	54.00
3 202.500	51.65	45.06	-	22.56	-22.50	2.00	H	193.3	-6.59	28.94	74.00	31.44	54.00
* 4 804.000	48.03	45.11	-	22.61	-22.50	3.00	H	4.6	-2.92	28.89	74.00	31.39	54.00
7 206.000	44.12	44.19	-	21.69	-22.50	3.00	H	271.5	0.07	29.81	74.00	32.31	54.00

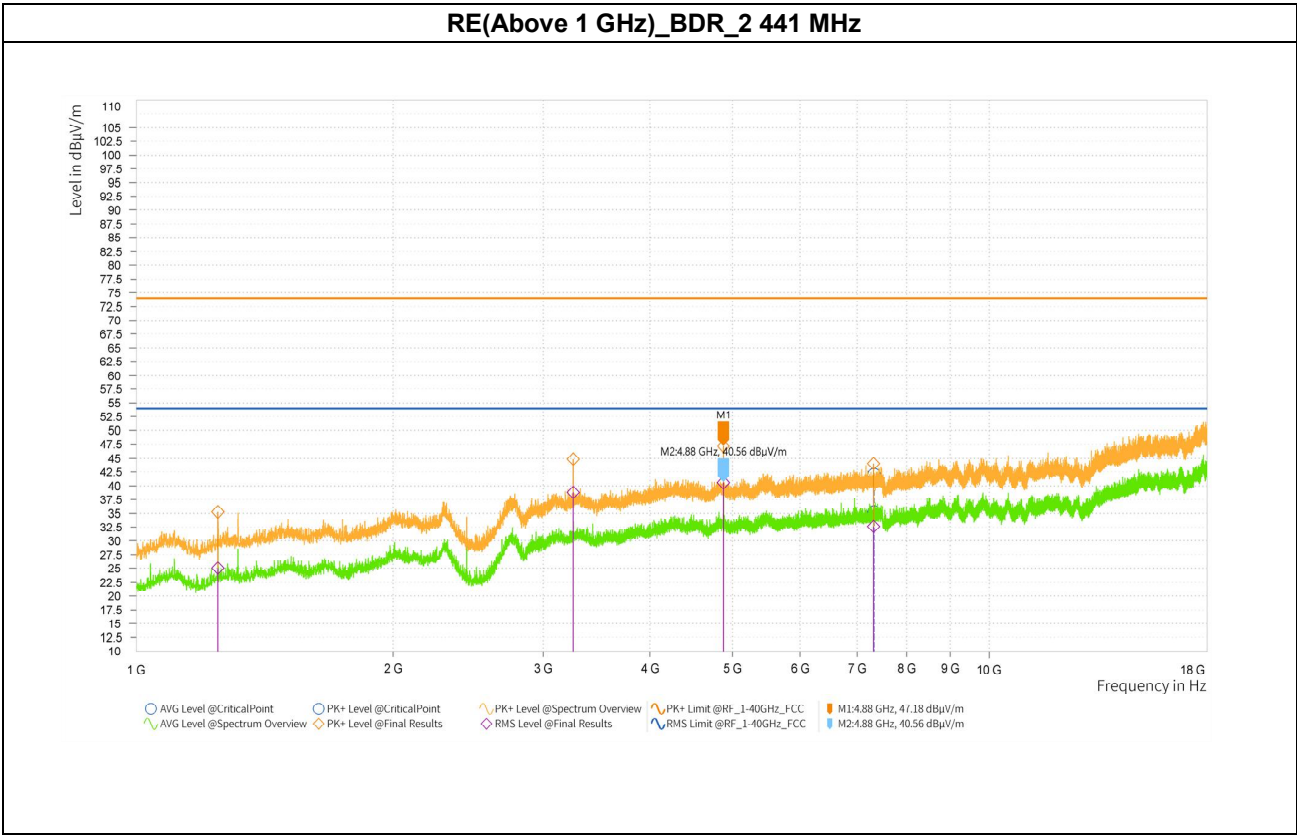
Note)

1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
6. * - indicates frequency in Restricted Band.





KIEL2409-YW10504



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 246.500	51.10	35.28	-	12.78	-22.50	3.00	H	31.8	-15.82	38.72	74.00	41.22	54.00
3 253.000	51.34	44.89	-	22.39	-22.50	2.00	H	171.9	-6.45	29.11	74.00	31.61	54.00
* 4 879.500	49.77	47.18	-	24.68	-22.50	3.00	H	8.2	-2.59	26.82	74.00	29.32	54.00
* 7 320.000	43.90	44.07	-	21.57	-22.50	3.00	H	271.9	0.17	29.93	74.00	32.43	54.00

Note)

1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)

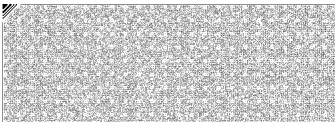
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)

3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)

4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)

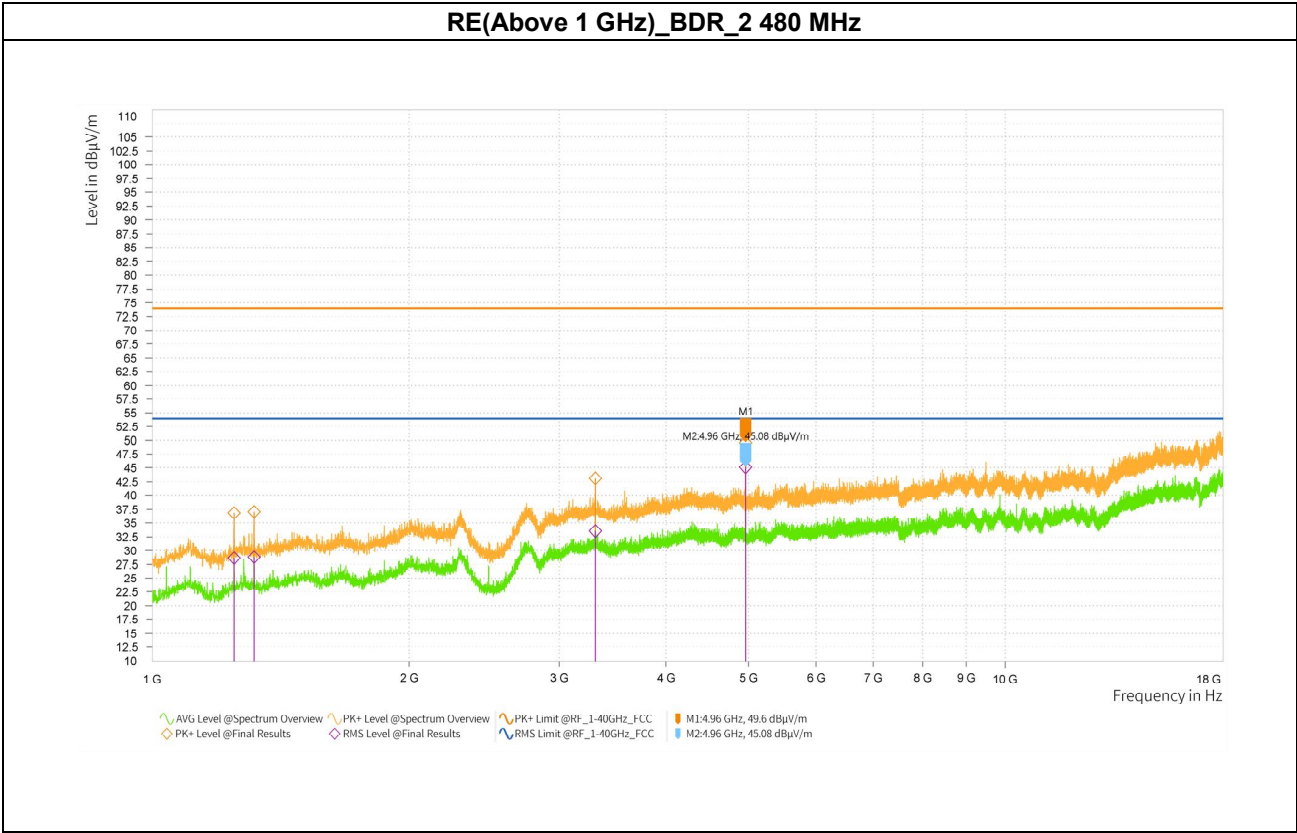
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)

6. * - indicates frequency in Restricted Band.



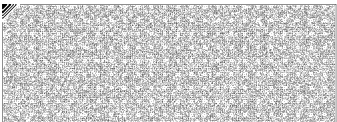


KIEL2409-YW10504



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 247.000	52.69	36.87	-	14.37	-22.50	3.00	H	192.7	-15.82	37.13	74.00	39.63	54.00
1 316.500	52.70	37.09	-	14.59	-22.50	2.00	H	193.9	-15.61	36.91	74.00	39.41	54.00
3 307.000	49.49	43.17	-	20.67	-22.50	2.00	H	168.1	-6.32	30.83	74.00	33.33	54.00
* 4 960.000	52.08	49.60	-	27.10	-22.50	3.00	V	78.8	-2.48	24.40	74.00	26.90	54.00

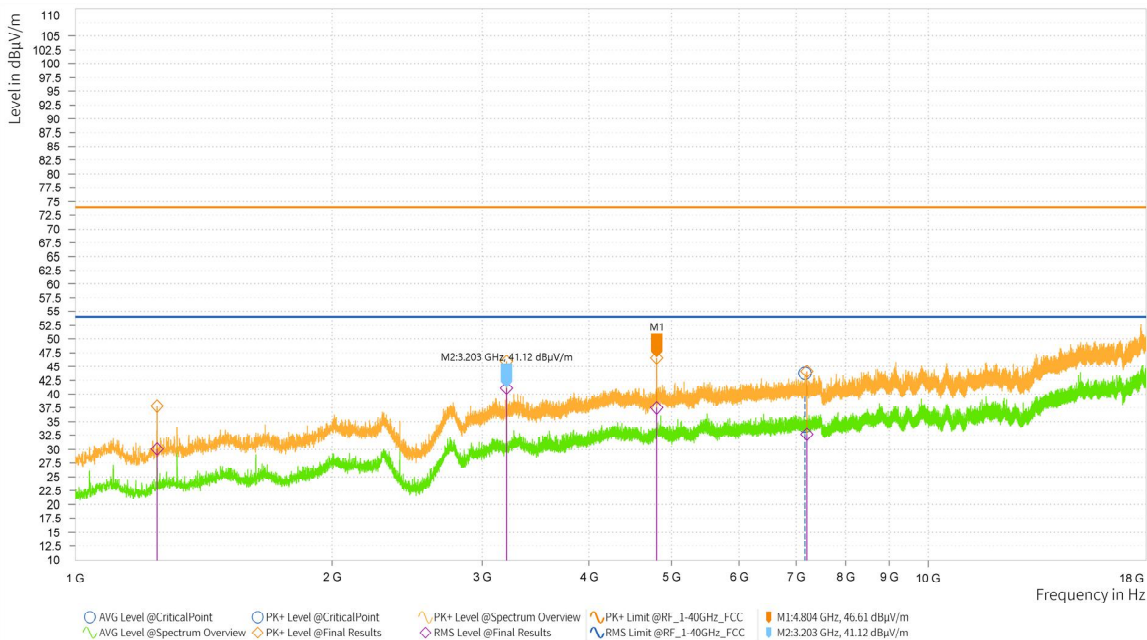
- Note)
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
 2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
 3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
 4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
 5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
 6. * - indicates frequency in Restricted Band.





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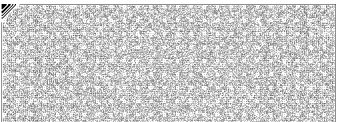
RE(Above 1 GHz)_EDR_2 402 MHz



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 247.000	53.62	37.80	-	15.30	-22.50	2.00	V	0.1	-15.82	36.20	74.00	38.70	54.00
3 202.500	52.60	46.01	-	23.51	-22.50	3.00	H	176.7	-6.59	27.99	74.00	30.49	54.00
* 4 804.000	49.53	46.61	-	24.11	-22.50	2.00	V	33.3	-2.92	27.39	74.00	29.89	54.00
7 206.000	44.04	44.11	-	21.61	-22.50	3.00	H	57.9	0.07	29.89	74.00	32.39	54.00

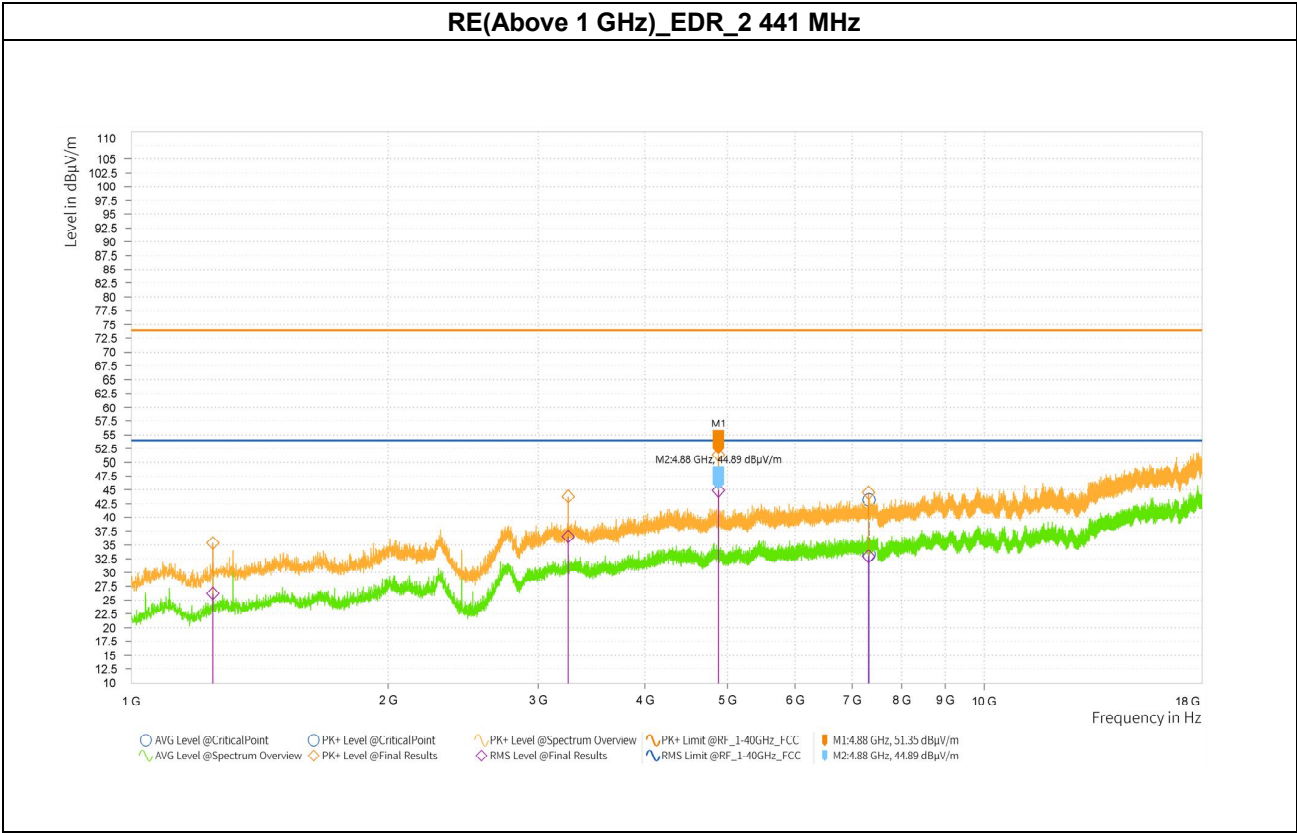
Note)

1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
6. * - indicates frequency in Restricted Band.





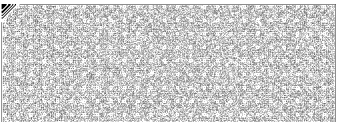
KIEL2409-YW10504



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 246.500	51.22	35.40	-	12.90	-22.50	2.00	V	0.0	-15.82	38.60	74.00	41.10	54.00
3 253.000	50.32	43.87	-	21.37	-22.50	2.00	H	169.5	-6.45	30.13	74.00	32.63	54.00
* 4 880.000	53.94	51.35	-	28.85	-22.50	2.00	H	131.6	-2.59	22.65	74.00	25.15	54.00
* 7 320.000	44.39	44.56	-	22.06	-22.50	3.00	H	62.3	0.17	29.44	74.00	31.94	54.00

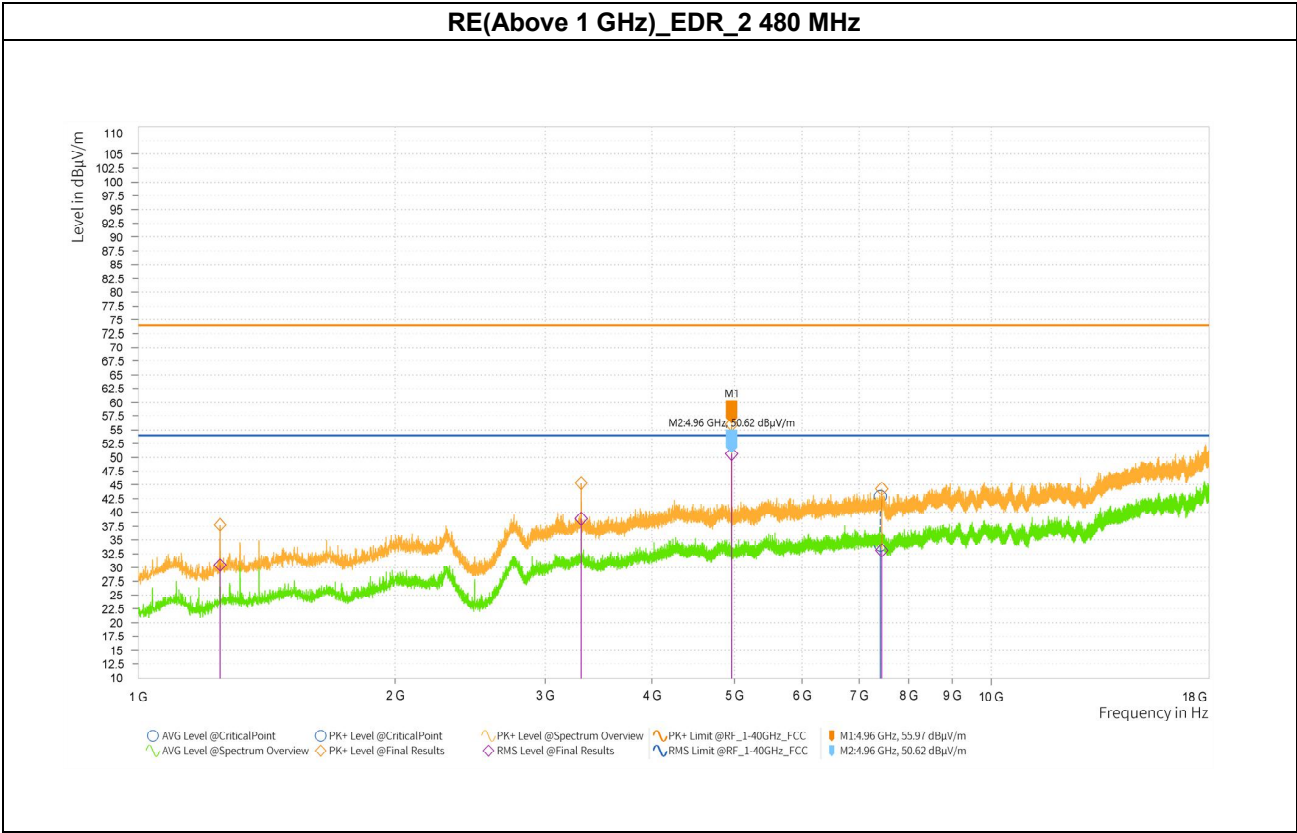
Note)

1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
6. * - indicates frequency in Restricted Band.





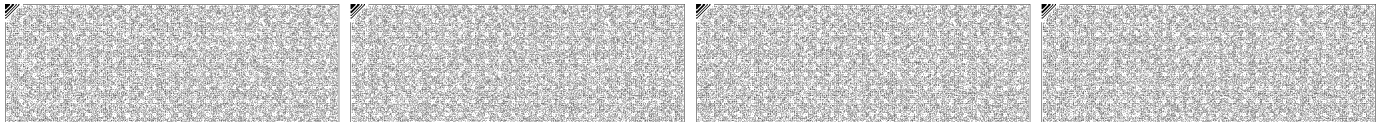
KIEL2409-YW10504



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
1 247.000	53.65	37.83	-	15.33	-22.50	2.00	V	74.5	-15.82	36.17	74.00	38.67	54.00
3 306.500	51.62	45.30	-	22.80	-22.50	2.00	H	177.6	-6.32	28.70	74.00	31.20	54.00
* 4 960.000	58.45	55.97	-	33.47	-22.50	1.00	V	297.6	-2.48	18.03	74.00	20.53	54.00
* 7 440.000	44.04	44.32	-	21.82	-22.50	3.00	H	357.2	0.28	29.68	74.00	32.18	54.00

Note)

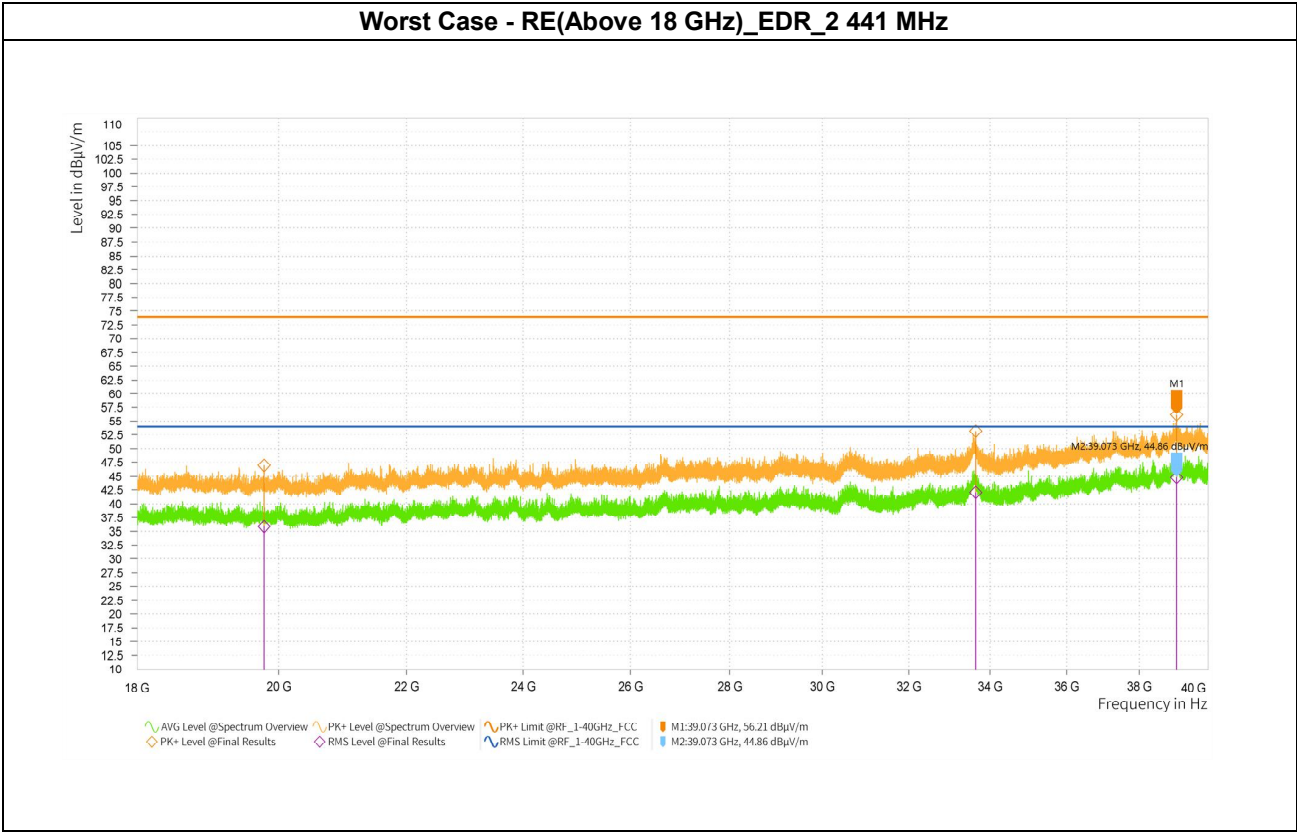
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
6. * - indicates frequency in Restricted Band.





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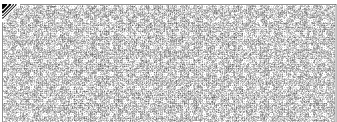
Radiated Emission (Above 18 GHz)



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
* 19 784.500	56.12	46.95	-	24.45	-22.50	1.00	H	261.8	-9.17	27.05	74.00	29.55	54.00
33 638.000	52.89	53.16	-	30.66	-22.50	2.00	H	178.6	0.27	20.84	74.00	23.34	54.00
39 072.500	51.92	56.21	-	33.71	-22.50	3.00	V	137.6	4.29	17.79	74.00	20.29	54.00

Note)

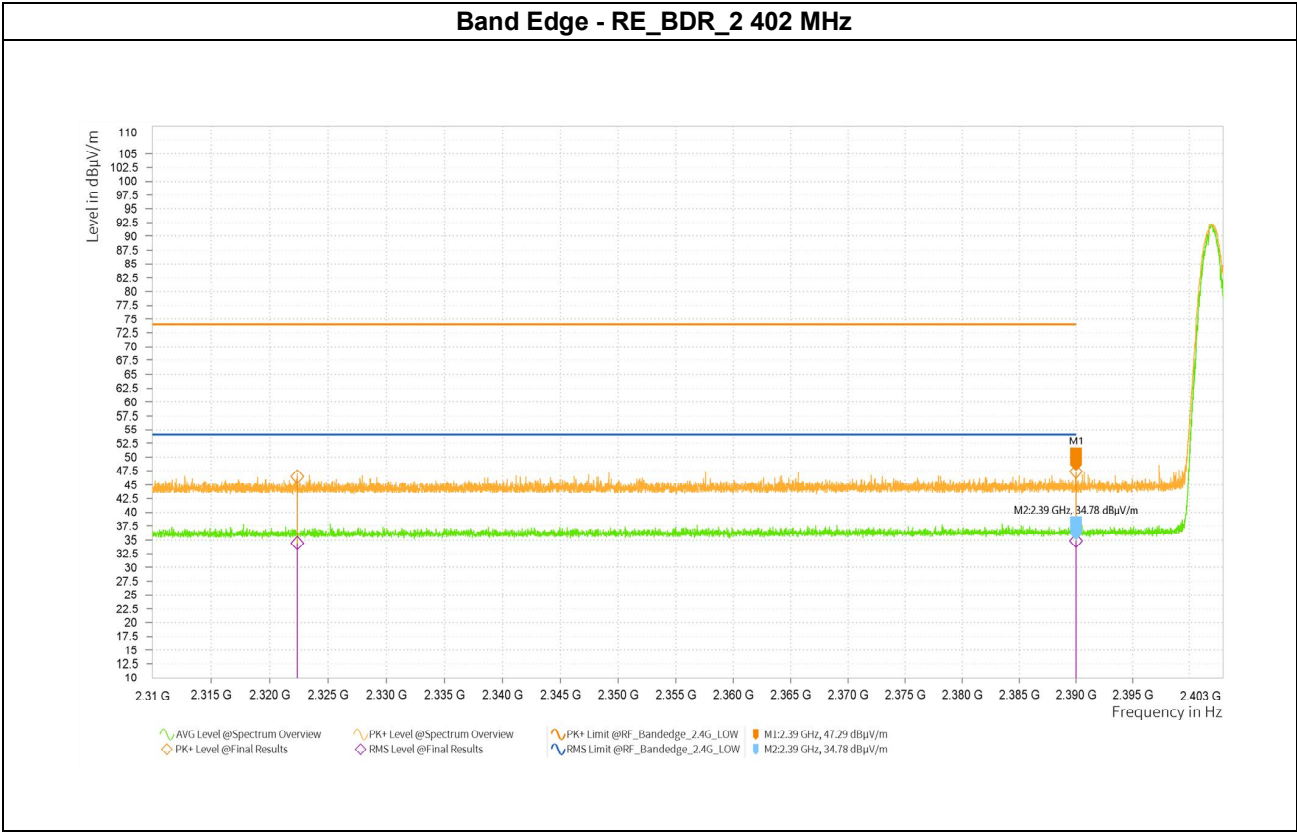
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
6. * - indicates frequency in Restricted Band.





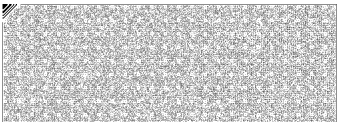
KIEL2409-YW10504

Band Edge



Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
* 2 322.367	47.45	46.46	-	23.96	-22.50	1.00	H	244.0	-0.99	27.54	74.00	30.04	54.00
* 2 390.000	47.96	47.29	-	24.79	-22.50	1.00	H	4.7	-0.67	26.71	74.00	29.21	54.00

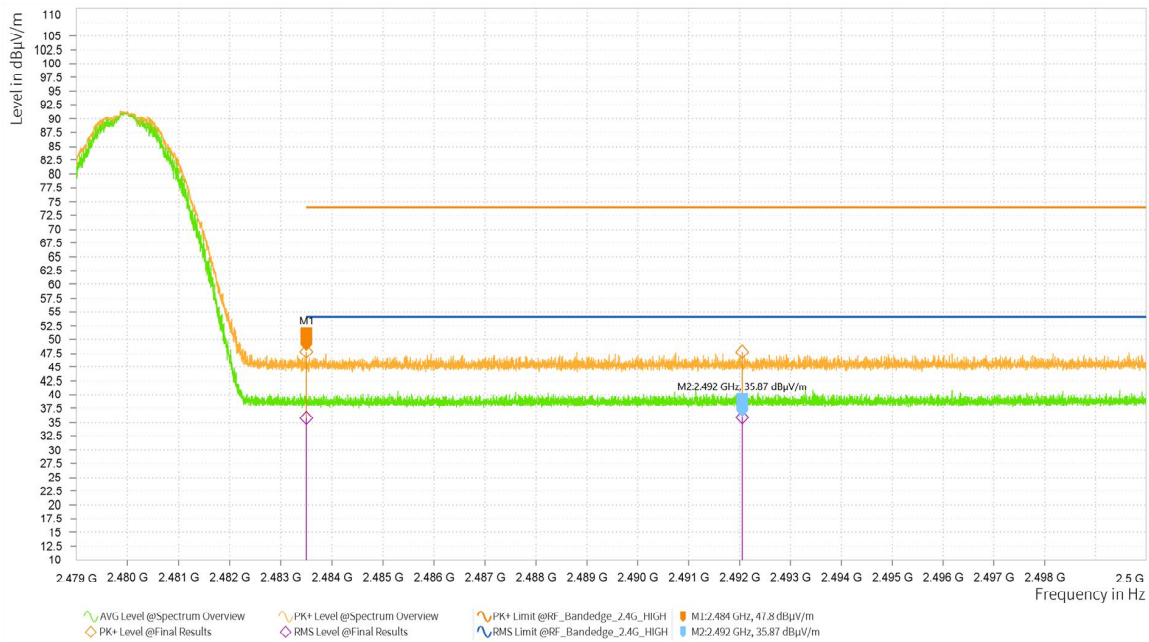
- (Note)
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
 2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
 3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
 4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
 5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
 6. * - indicates frequency in Restricted Band.





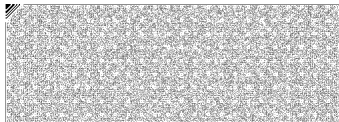
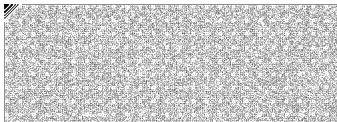
KIEL2409-YW10504

Band Edge - RE_BDR_2 480 MHz



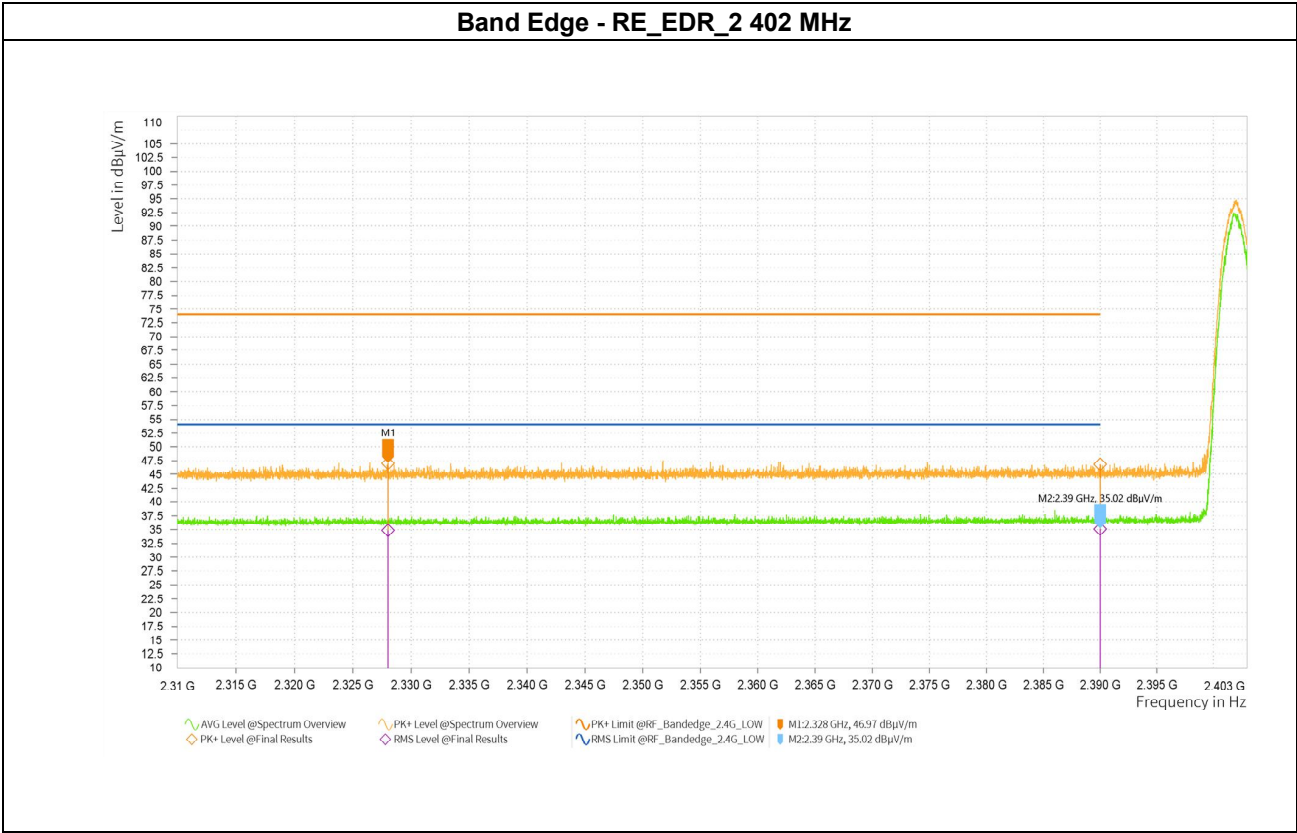
	Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
*	2 483.500	47.74	47.80	-	25.30	-22.50	3.00	V	310.1	0.06	26.20	74.00	28.70	54.00
*	2 492.052	47.54	47.70	-	25.20	-22.50	1.00	H	229.0	0.16	26.30	74.00	28.80	54.00

- Note)
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
 2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
 3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
 4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
 5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
 6. * - indicates frequency in Restricted Band.



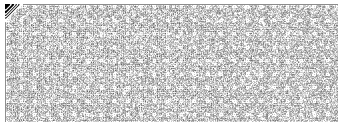


KIEL2409-YW10504



	Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
*	2 328.035	47.94	46.97	-	24.47	-22.50	1.00	H	22.1	-0.97	27.03	74.00	29.53	54.00
*	2 390.000	47.46	46.79	-	24.29	-22.50	1.00	H	148.2	-0.67	27.21	74.00	29.71	54.00

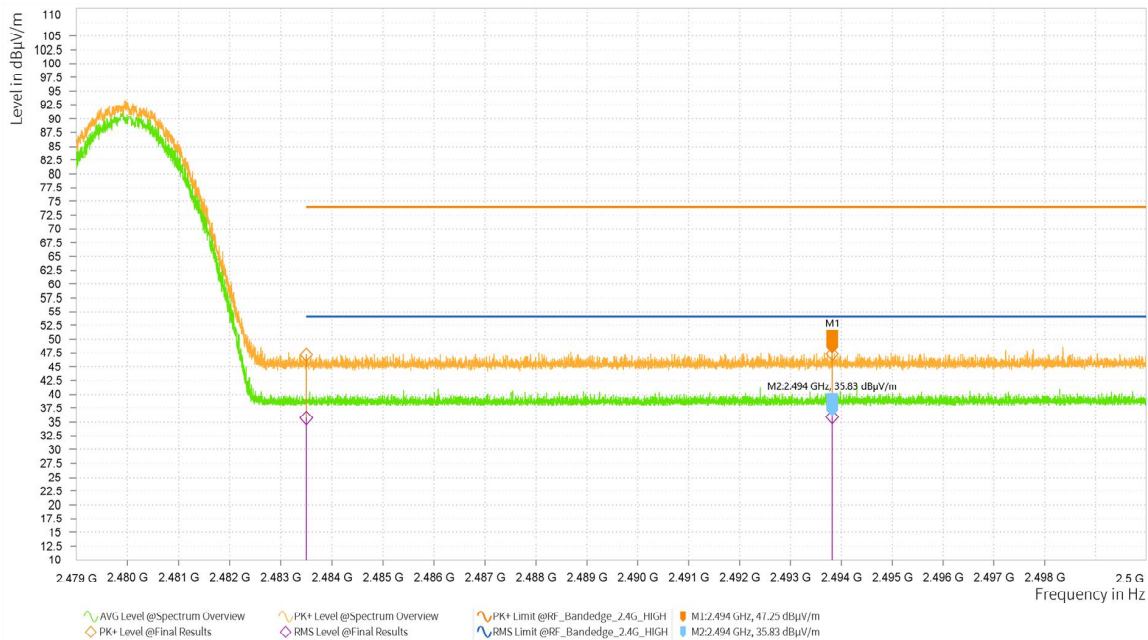
- Note)**
- Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
 - AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
 - DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
 - Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
 - Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
 - * - indicates frequency in Restricted Band.





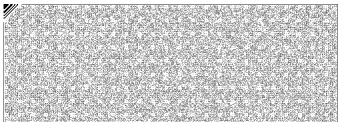
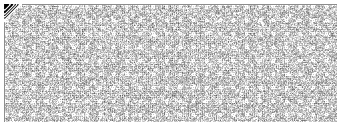
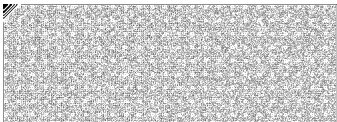
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Band Edge - RE_EDR_2 480 MHz



	Frequency [MHz]	Peak Reading [dBuV]	Peak Result [dBuV/m]	AVG Reading [dBuV]	AVG Result [dBuV/m]	DCCF [dB]	Height [cm]	Pol	Azimuth [deg]	Corr. [dB/m]	Peak Margin [dB]	Peak Limit [dBuV/m]	AVG Margin [dB]	AVG Limit [dBuV/m]
*	2 483.500	47.08	47.14	-	24.64	-22.50	2.00	H	341.9	0.06	26.86	74.00	29.36	54.00
*	2 493.820	47.07	47.25	-	24.75	-22.50	3.00	V	322.1	0.18	26.75	74.00	29.25	54.00

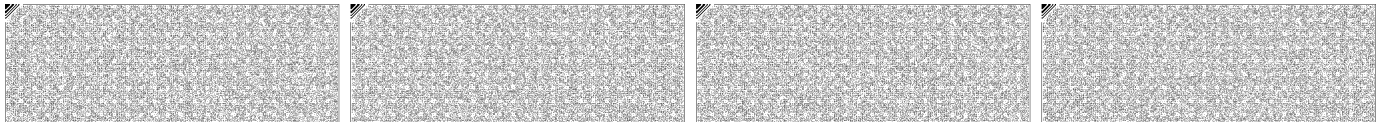
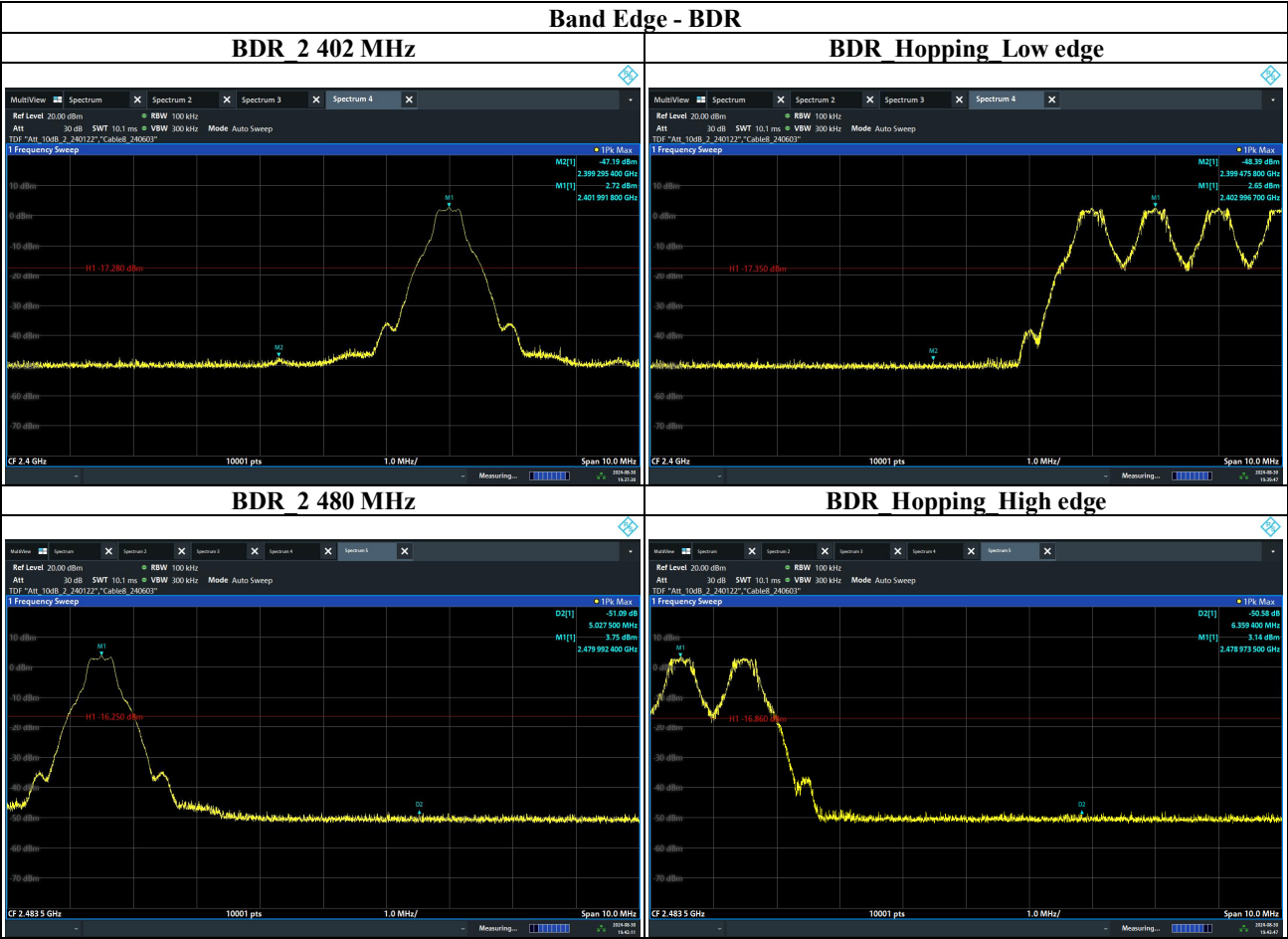
- Note)
1. Peak Result(dBuV/m) = Peak Reading Value(dBuV) + Correction Factor(dB/m)
 2. AVG Result(dBuV/m) = Peak Result(dBuV/m) + DCCF(dB)
 3. DCCF(Duty Cycle Correction Factor) = 20 x Log(worst dwell time/100 ms)
 4. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor (dB)
 5. Margin(dB) = (Peak/AVG) Limit (dBuV/m) – (Peak/AVG) Result (dBuV/m)
 6. * - indicates frequency in Restricted Band.





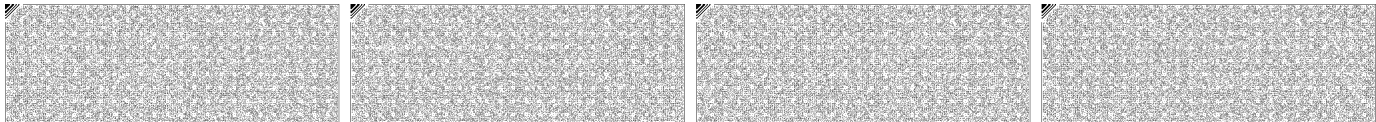
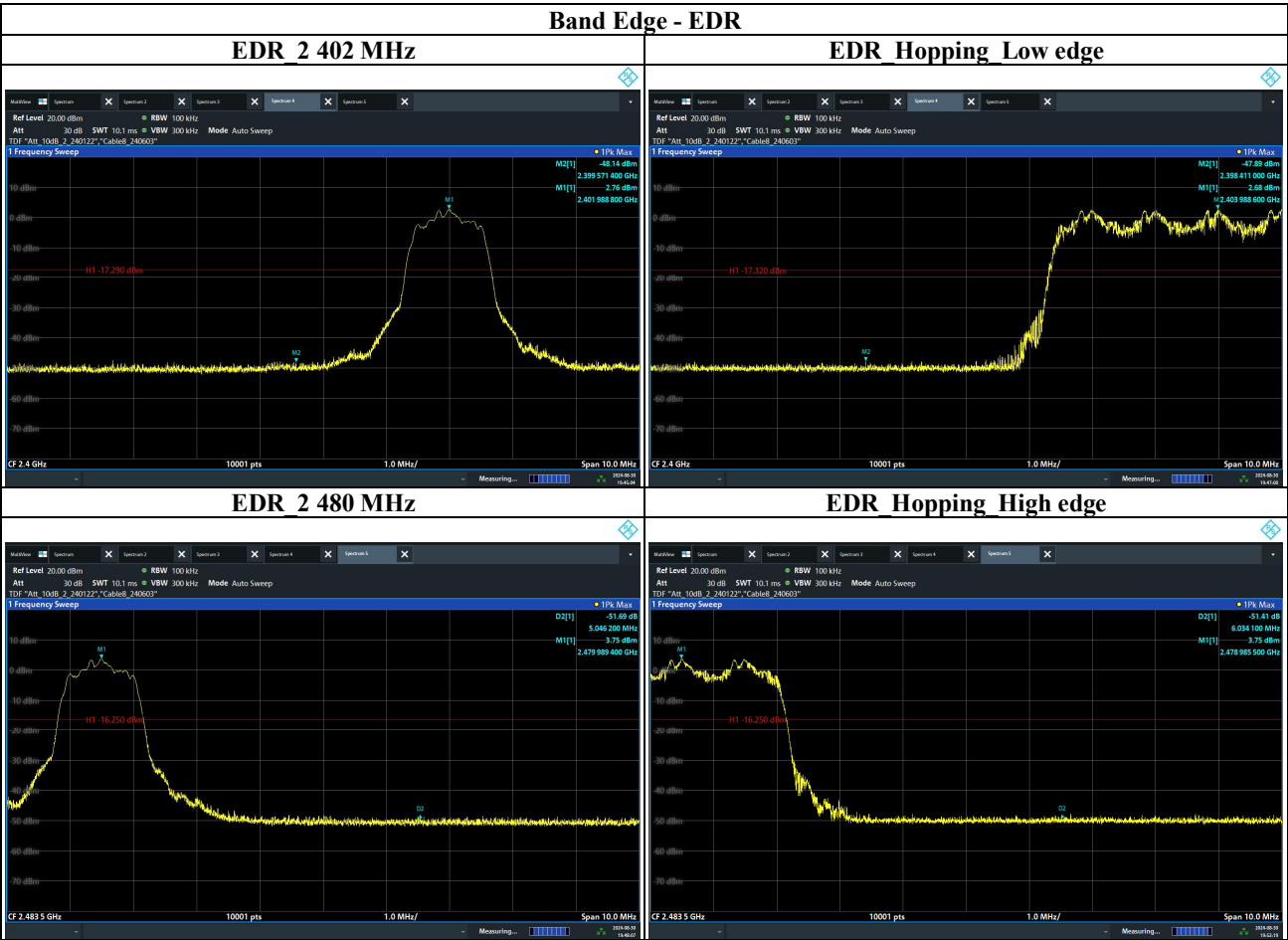
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Test Plot of Conducted Spurious Emissions



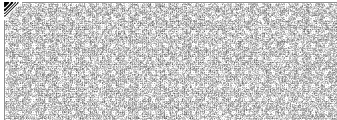
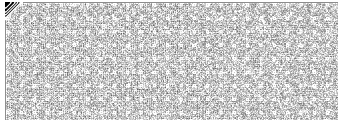
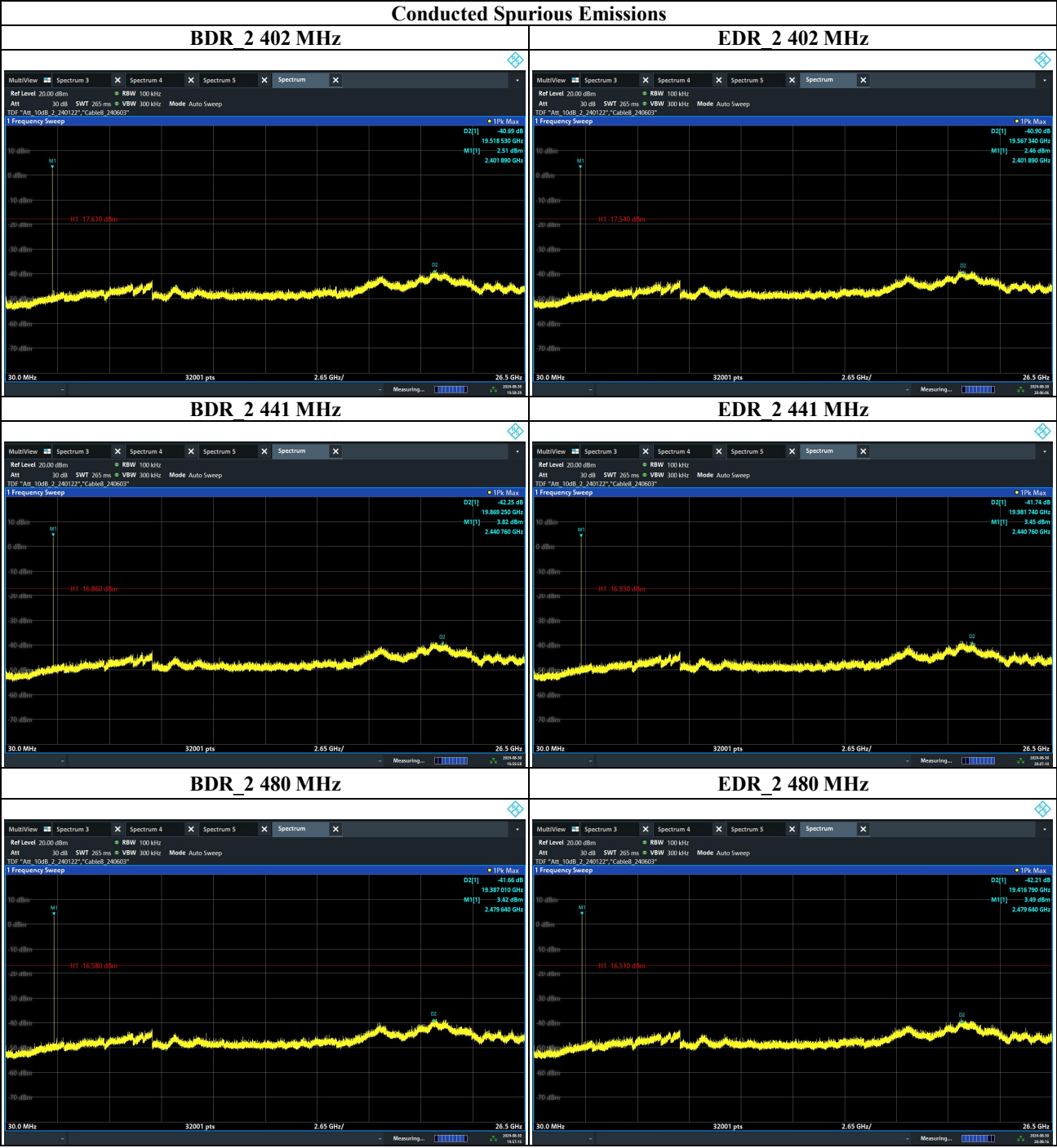


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6.8 AC Conducted Emissionss (150 kHz to 30 MHz)

6.8.1 Regulation

§15.207(a) : Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

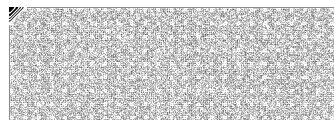
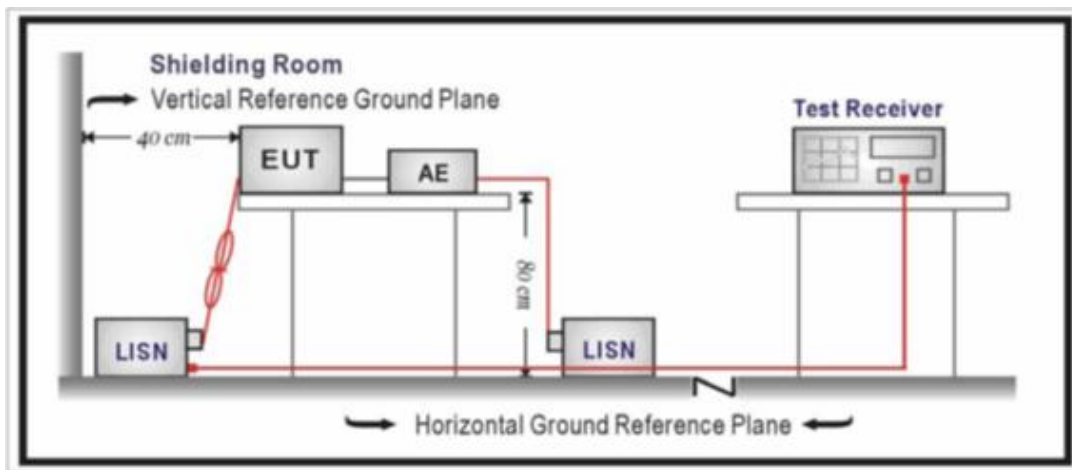
* Decreases with the logarithm of the frequency.

6.8.2 Test Procedure

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm / 50 μ H of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

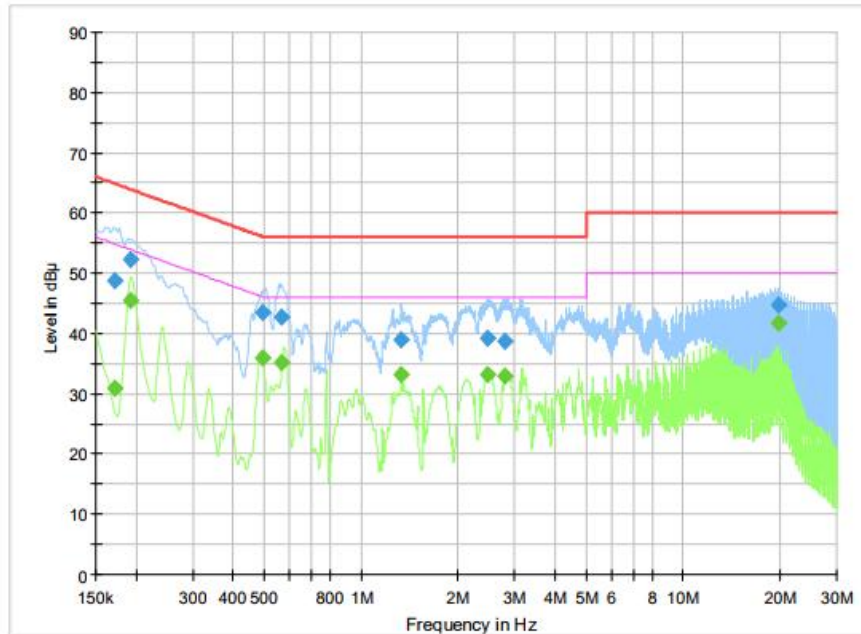
Remark : The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

6.8.3 Test Setup



6.8.4 Test Result

Worst Case - EDR_2 441 MHz



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.173	48.84	---	64.84	16.00	9.0	N	ON	10.2
0.173	---	30.97	54.84	23.87	9.0	N	ON	10.2
0.193	---	45.61	53.92	8.30	9.0	N	ON	10.1
0.193	52.20	---	63.92	11.72	9.0	N	ON	10.1
0.497	---	36.04	46.06	10.02	9.0	L1	ON	9.9
0.497	43.58	---	56.06	12.48	9.0	L1	ON	9.9
0.566	---	35.13	46.00	10.87	9.0	N	ON	9.9
0.566	42.82	---	56.00	13.18	9.0	N	ON	9.9
1.334	---	33.30	46.00	12.70	9.0	N	ON	9.6
1.334	39.01	---	56.00	16.99	9.0	N	ON	9.6
2.481	---	33.31	46.00	12.69	9.0	L1	ON	9.6
2.481	39.19	---	56.00	16.81	9.0	L1	ON	9.6
2.792	---	32.86	46.00	13.14	9.0	L1	ON	9.7
2.792	38.67	---	56.00	17.33	9.0	L1	ON	9.7
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
19.750	44.82	---	60.00	15.18	9.0	L1	ON	9.8
19.750	---	41.76	50.00	8.24	9.0	L1	ON	9.8

Note)

1. Final Value (QP and/or CAV) = Reading Value (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)
2. Margin (QP and/or CAV) = Limit – Final Value (QP and/or CAV)
3. Two graphs measured for both Live (L1) and Neutral (N) of the LISN are combined into one graph.

- END of report -

