

TM 2 Reference (Test Channel : Highest)

TM 2 High Band-edge (Test Channel : Highest)







TM 2 Conducted Spurious Emissions 1 (Test Channel : Highest)

TM 2 Conducted Spurious Emissions 2 (Test Channel : Highest)



Keysight Spectrum Analyzer - Swept SA				
ເx RL RF 50 Ω AC Center Freq 17.50000000	O GHZ	Avg Type: Log-Pwr	6:14 PM Jun 05, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	IFGain:Low Atten: 30 dB	Mkr3 24.75	рет Р Р Р Р Р Р 51 000 GHz 29.35 dBm	Auto Tune
10.0 0.00 -10.0				Center Freq 17.50000000 GHz
-20.0			DL1 -17.15 dBm	Start Freq 10.00000000 GHz
-50.0 4444 4444 4444 4444 4444 4444 4444				Stop Freq 25.00000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stoj Sweep 40.00 m	p 25.000 GHz is (40001 pts)	CF Step 1.50000000 GHz <u>Auto</u> Man
MRR MODE IRC SL X 1 N 1 f 24,322 2 N 1 f 23,321 3 N 1 f 24,75 4	8 750 GHz -28.41 dBm 7 625 GHz -28.70 dBm 1 000 GHz -29.35 dBm			Freq Offset 0 Hz
7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9				Scale Type Log <u>Lin</u>
MSG		STATUS		

TM 2 Conducted Spurious Emissions 3 (Test Channel : Highest)



TM 3 Reference (Test Channel : Lowest)

TM 3 Low Band-edge (Test Channel : Lowest)





TM 3 Conducted Spurious Emissions 1 (Test Channel : Lowest)

TM 3 Conducted Spurious Emissions 2 (Test Channel : Lowest)





Keysight Spectrum Analyzer - Swept SA				
M RL RF 50 Ω AC Center Freq 17.50000000	CORREC SENSE:IN	ALIGN OFF	08:47:55 PM Jun 05, 2023 TRACE 1 2 3 4 5 6 TYPE M WWWWWWW	Frequency
10 dB/div Ref 20.00 dBm	IFGain:Low Atten: 30 dB	Mkr3 2	_{Det} Р РРРРР 4.781 750 GHz -28.95 dBm	Auto Tune
10.0 .000				Center Freq 17.500000000 GHz
-20.0				Start Freq 10.000000000 GHz
-50.0 44 44 44 44 44 44 44 44 44 44 44 44 44				Stop Freq 25.000000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 40.	Stop 25.000 GHz 00 ms (40001 pts)	CF Step 1.50000000 GHz <u>Auto</u> Man
1 N 1 f 24.27 2 N 1 f 23.66 3 N 1 f 24.77 4 5 6	73 250 GHz -28.00 dBm 84 125 GHz -28.89 dBm 81 750 GHz -28.95 dBm		E	Freq Offset 0 Hz
7 8 9 10 11				Scale Type
MSG		STATUS		

TM 3 Conducted Spurious Emissions 3 (Test Channel : Lowest)



TM 3 Reference (Test Channel : Middle)

TM 3 Conducted Spurious Emissions 1 (Test Channel : Middle)







TM 3 Conducted Spurious Emissions 2 (Test Channel : Middle)

TM 3 Conducted Spurious Emissions 3 (Test Channel : Middle)





TM 3 Reference (Test Channel : Highest)

TM 3 High Band-edge (Test Channel : Highest)







TM 3 Conducted Spurious Emissions 1 (Test Channel : Highest)

TM 3 Conducted Spurious Emissions 2 (Test Channel : Highest)





TM 3 Conducted Spurious Emissions 3 (Test Channel : Highest)



TM 4 Reference (Test Channel : Lowest)

TM 4 Low Band-edge (Test Channel : Lowest)





TM 4 Conducted Spurious Emissions 1 (Test Channel : Lowest)

TM 4 Conducted Spurious Emissions 2 (Test Channel : Lowest)





TM 4 Conducted Spurious Emissions 3 (Test Channel : Lowest)



TM 4 Reference (Test Channel : Middle)

TM 4 Conducted Spurious Emissions 1 (Test Channel : Middle)







TM 4 Conducted Spurious Emissions 2 (Test Channel : Middle)

TM 4 Conducted Spurious Emissions 3 (Test Channel : Middle)





TM 4 Reference (Test Channel : Highest)

TM 4 High Band-edge (Test Channel : Highest)







TM 4 Conducted Spurious Emissions 1 (Test Channel : Highest)

TM 4 Conducted Spurious Emissions 2 (Test Channel : Highest)





🔤 Keysight Sp	ectrum Analyz	er - Swept SA						
LXI RL	RF	50 Ω AC	CORREC	SENSE	:INT	ALIGN OFF	09:05:40 PM Jun 05, 202	B Erequency
Center F	req 17.5	60000000	0 GHz	Trig: Free P	Avç	J Type: Log-Pwr	TRACE 1 2 3 4 5	6 Trequency
			PNO: Fast	#Atten: 30 d	B		DET PPPP	P
			II Guilleon			NU		Auto Tune
						MIKES 2	3.604 625 GH	
10 dB/div	Ref 20	.00 dBm					-29.34 aBn	
LOg				Ť				
10.0								Center Freq
0.00								17.500000000 GHz
-10.0								
							DL 1 19.02 dBr	n
-20.0								Start Freq
-30.0							at a state of the	10.00000000 GHz
-40.0				والمحجب المحجبا المردوري	and a stand of the state	Contractor of the second second	and the second	
TO O MARINE	مقالي والمعرومي	willing a state of the		and the state of the second	And the second se	and the second		
-50.0	and the second se							Stop Fred
-60.0								25 00000000 GHz
-70.0								25.00000000 GH2
Start 10.	000 GHz						Stop 25.000 GH:	CF Step
#Res BW	(1.0 MHz		#VBW	3.0 MHz		Sweep 40	.00 ms (40001 pts	1.50000000 GHz
we wood t		×	1	~	FUNCTION	- FUNCTION NOT	SUNCTIONNALUS	Auto Man
MKR MODE I	AC SCL	24 30	975 CHz	7 28.62 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 N	1 f	23.75	250 GHz	-29.05 dBm				
3 N	1 f	23.604	4 625 GHz	-29.34 dBm				FreqOffset
4								0 Hz
6								
7								
8								Scale Type
10								log lin
11								- Log <u>Lin</u>
•				m			Þ	
MSG						STATUS		

TM 4 Conducted Spurious Emissions 3 (Test Channel : Highest)

(m)

5.5. Unwanted Emissions (Radiated)

Test Requirements and limit,

Part 15.247(d), Part 15.205, Part 15.209 & RSS-247 [5.5], RSS-Gen [8.9], RSS-Gen [8.10]

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

- Fait 15.209 & KSS-Genje	o.aj. General requirements		
Frequency (MHz)	FCC Limit (uV/m)	IC Limit (µA/m)	Measurement Distance
0.009 - 0.490	2 400 / F (kHz)	6.37/F (F in kHz)	300
0.490 - 1.705	24 000 / F (kHz)	63.7/F (F in kHz)	30
1.705 – 30.0	30	0.08	30

- Part 15.209 & RSS-Gen[8.9]: General requirements

Frequency (MHz)	FCC Limit (uV/m)	IC Limit (uV/m)	Measurement Distance (m)
30 ~ 88	100 **	100	3
88 ~ 216	150 **	150	3
216 ~ 960	200 **	200	3
Above 960	500	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.



- Part 15.205(a): Restricted band of operation

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.414 25 ~ 8.414 75	108 ~ 121.94	1 300 ~ 1 427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1 435 ~ 1 626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.173 5 ~ 2.190 5	12.519 75 ~ 12.520 25	149.9 ~ 150.05	1 645.5 ~ 1 646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.576 75 ~ 12.577 25	156.524 75 ~ 156.525 25	1 660 ~ 1 710	8.025 ~ 8.5	22.01 ~ 23.12
4.177 25 ~ 4.177 75	13.36 ~ 13.41	156.7 ~ 156.9	1 718.8 ~ 1 722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.207 25 ~ 4.207 75	16.42 ~ 16.423	162.012 5 ~ 167.17	2 200 ~ 2 300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 310 ~ 2 390	10.6 ~ 12.7	36.43 ~ 36.5
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 483.5 ~ 2 500	13.25 ~ 13.4	Above 38.6
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	2 655 ~ 2 900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 260 ~ 3 267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 332 ~ 3 339		
8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 240	3 345.8 ~ 3 358		
			3 600 ~ 4 400		

- RSS-Gen[8.10]: Restricted frequency bands

MHz	MHz	MHz	MHz	MHz	GHz
0.090 ~ 0.110	8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 345.8 ~ 3 358	9.0 ~ 9.2
0.495 ~ 0.505	8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 427	3 500 ~ 4 400	9.3 ~ 9.5
2.173 5 ~ 2.190 5	8.414 25 ~ 8.414 75	108 ~ 138	1 435 ~ 1 626.5	4 500 ~ 5 150	10.6 ~ 12.7
3.020 ~ 3.026	12.29 ~ 12.293	149.9 ~ 150.05	1 645.5 ~ 1 646.5	5 350 ~ 5 460	13.25 ~ 13.4
4.125 ~ 4.128	12.519 75 ~ 12.520 25	156.524 75 ~	1 660 ~ 1 710	7 250 ~ 7 750	14.47 ~ 14.5
4.177 25 ~ 4.177 75	12.576 75 ~ 12.577 25	156.525 25	1 718.8 ~ 1 722.2	8 025 ~ 8 500	15.35 ~ 16.2
4.207 25 ~ 4.207 75	13.36 ~ 13.41	156.7 ~ 156.9	2 200 ~ 2 300		17.7 ~ 21.4
5.677 ~ 5.683	16.42 ~ 16.423	162.01 25 ~ 167.17	2 310 ~ 2 390		22.01 ~ 23.12
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 483.5 ~ 2 500		23.6 ~ 24.0
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 655 ~ 2 900		31.2 ~ 31.8
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	3 260 ~ 3 267		36.43 ~ 36.5
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 332 ~ 3 339		Above 38.6



5.5.1. Test Setup

Refer to the APPENDIX I.

5.5.2. Test Procedures

- 1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

Note: Measurement Instrument Setting for Radiated Emission Measurements.

- KDB558074 D01v05r02 Section 8.6
- ANSI C63.10-2013 Section 11.12
- 1. Frequency Range Below 1 GHz

RBW = 100 or 120 kHz, VBW = 3 x RBW, Detector = Peak or Quasi Peak

- 2. Frequency Range > 1 GHz
 - Peak Measurement > 1 GHz

RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto, Trace mode = Max Hold until the trace stabilizes Average Measurement > 1 GHz

- 1. RBW = 1 MHz (unless otherwise specified).
- 2. VBW ≥ 3 x RBW.
- 3. Detector = RMS (Number of points ≥ 2 x Span / RBW)
- 4. Averaging type = power (i.e., RMS).
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.
- 7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
- 1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is 10 log(1 / D), where D is the duty cycle.
- 2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1 / D), where D is the duty cycle.
- 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Date Rate	T _{on} (ms)	T _{on} + T _{off} (ms)	$D = T_{on} / (T_{on+off})$	DCCF = 10 log(1 / D) (dB)
1 Mbps (TM 1, 5)	0.378	0.626	0.603 8	2.19
2 Mbps (TM 2, 6)	0.194	0.626	0.309 9	5.09
500 kbps (TM 3, 7)	1.062	1.878	0.565 5	2.48
125 kbps (TM 4, 8)	3.105	3.750	0.828 0	0.82

Note1: Where, T= Transmission duration / D= Duty cycle Note2: Please refer to the appendix II for duty cycle plots.



5.5.3. Test Results

Test Notes _

1. The radiated emissions were investigated 9 kHz to 25 GHz. And no other spurious and harmonic emissions were found below listed frequencies. 2. Information of Distance Correction Factor

For finding emissions, measurements may be performed at a distance closer than that specified in the regulations.

In this case, the distance factor is applied to the result.

- Calculation of distance correction factor

At frequencies below 30 MHz = 40 log(tested distance / specified distance)

At frequencies at or above 30 MHz = 20 log(tested distance / specified distance)

When distance factor is "N/A", the measurements were performed at the specified distance and distance factor is not applied.

3. Sample Calculation.

Margin = Limit – Result / Result = Reading + TF+ DCCF + DCF / TF = AF + CL + HL + AL – AG Where, TF = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, HL = High pass filter Loss, AL = Attenuator Loss, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

Frequency Range : 9 kHz ~ 25 GHz_TM 1

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.07	V	Z	PK	50.57	4.60	N/A	N/A	55.17	74.00	18.83
2 389.67	V	Z	AV	39.53	4.60	2.19	N/A	46.32	54.00	7.68
4 803.67	Н	Y	PK	50.02	2.43	N/A	N/A	52.45	74.00	21.55
4 803.02	Н	Y	AV	39.31	2.43	2.19	N/A	43.93	54.00	10.07

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 879.74	Н	Y	PK	49.60	2.33	N/A	N/A	51.93	74.00	22.07
4 879.93	Н	Y	AV	39.02	2.34	2.19	N/A	43.55	54.00	10.45

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.34	V	Z	PK	50.02	5.63	N/A	N/A	55.65	74.00	18.35
2 484.04	V	Z	AV	40.33	5.62	2.19	N/A	48.14	54.00	5.86
4 959.13	Н	Y	PK	49.32	2.69	N/A	N/A	52.01	74.00	21.99
4 959.25	Н	Y	AV	38.53	2.69	2.19	N/A	43.41	54.00	10.59



Frequency Range : 9 kHz ~ 25 GHz_TM 2

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.50	V	Z	PK	49.90	4.60	N/A	N/A	54.50	74.00	19.50
2 389.89	V	Z	AV	39.79	4.60	5.09	N/A	49.48	54.00	4.52
4 805.69	Н	Y	PK	49.56	2.42	N/A	N/A	51.98	74.00	22.02
4 805.17	Н	Y	AV	39.21	2.42	5.09	N/A	46.72	54.00	7.28

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 880.68	Н	Y	PK	50.46	2.36	N/A	N/A	52.82	74.00	21.18
4 881.05	Н	Y	AV	38.86	2.36	5.09	N/A	46.31	54.00	7.69

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 483.50	V	Z	PK	50.88	5.62	N/A	N/A	56.50	74.00	17.50
2 483.51	V	Z	AV	40.75	5.62	5.09	N/A	51.46	54.00	2.54
4 960.32	Н	Y	PK	48.74	2.69	N/A	N/A	51.43	74.00	22.57
4 960.53	Н	Y	AV	38.58	2.69	5.09	N/A	46.36	54.00	7.64

Frequency Range : 9 kHz ~ 25 GHz_TM 6 (2 Mbps & Low power setting)

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.37	V	Z	PK	50.55	5.63	N/A	N/A	56.18	74.00	17.82
2 483.79	V	Z	AV	40.34	5.62	5.12	N/A	51.08	54.00	2.92
4 959.40	Н	Y	PK	48.67	2.67	N/A	N/A	51.34	74.00	22.66
4 959.70	Н	Y	AV	38.43	2.67	5.12	N/A	46.22	54.00	7.78



IC: 10664A-PM86

Frequency Range : 9 kHz ~ 25 GHz_TM 3

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.24	V	Z	PK	50.87	4.60	N/A	N/A	55.47	74.00	18.53
2 389.31	V	Z	AV	39.79	4.60	2.48	N/A	46.87	54.00	7.13
4 805.11	Н	Y	PK	49.26	2.43	N/A	N/A	51.69	74.00	22.31
4 805.53	Н	Y	AV	39.18	2.42	2.48	N/A	44.08	54.00	9.92

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 880.07	Н	Y	PK	49.14	2.34	N/A	N/A	51.48	74.00	22.52
4 880.28	Н	Y	AV	39.07	2.35	2.48	N/A	43.90	54.00	10.10

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 483.50	V	Z	PK	49.78	5.62	N/A	N/A	55.40	74.00	18.60
2 483.73	V	Z	AV	39.72	5.62	2.48	N/A	47.82	54.00	6.18
4 960.42	Н	Y	PK	48.81	2.69	N/A	N/A	51.50	74.00	22.50
4 960.01	Н	Y	AV	38.39	2.69	2.48	N/A	43.56	54.00	10.44

Frequency Range : 9 kHz ~ 25 GHz_TM 4

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.46	V	Z	PK	49.28	4.60	N/A	N/A	53.88	74.00	20.12
2 389.93	V	Z	AV	39.43	4.60	0.82	N/A	44.85	54.00	9.15
4 804.55	Н	Y	PK	49.59	2.43	N/A	N/A	52.02	74.00	21.98
4 805.00	Н	Y	AV	39.09	2.43	0.82	N/A	42.34	54.00	11.66

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 879.49	Н	Y	PK	50.27	2.33	N/A	N/A	52.60	74.00	21.40
4 879.38	Н	Y	AV	39.01	2.32	0.82	N/A	42.15	54.00	11.85

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.56	V	Z	PK	50.18	5.63	N/A	N/A	55.81	74.00	18.19
2 484.54	V	Z	AV	39.80	5.63	0.82	N/A	46.25	54.00	7.75
4 959.97	Н	Y	PK	49.27	2.21	N/A	N/A	51.48	74.00	22.52
4 959.96	Н	Y	AV	38.56	2.21	0.82	N/A	41.59	54.00	12.41

5.6. AC Power-Line Conducted Emissions

Test Requirements and limit, Part 15.207 & RSS-Gen [8.8]

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 uH/50 ohm line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

	Conducted Limit (dBuV)					
Frequency Range (MHZ)	Quasi-Peak	Average				
0.15 ~ 0.5	66 to 56 *	56 to 46 *				
0.5 ~ 5.0	56	46				
5 ~ 30	60	50				

* Decreases with the logarithm of the frequency

5.6.1. Test Setup

See test photographs for the actual connections between EUT and support equipment.

5.6.2. Test Procedures

Conducted emissions from the EUT were measured according to the ANSI C63.10-2013.

- The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
- 2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
- 3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
- 4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

5.6.3. Test Results

Refer to the next page. (The worst case data was reported. The worst data is TM 1 & Lowest)

AC Power-Line Conducted Emissions (Graph)



Results of Conducted Emission



DTNC

AC Power-Line Conducted Emissions (List)

Results of Conducted Emission

Order No. Model No. PM86 Serial No. Test Condition LE Mamo		Referren Power St Temp/Hu Operator	ce No. upply umi. 21 'C / 4 S.M.Gil	21 'C / 41 % S.M.Gil						
Memo	1M_2402									
LIMIT : FCC P15.207 AV FCC P15.207 QP										
NO FREQ [MHz]	READING C.FACT(QP CAV [dBuV][dBuV] [dB]	DR RESULT L QP CAV QP [dBuV][dBuV] [dBu	.IMIT MARGIN ° CAV QP CA V][dBuV] [dBuV][dE	PHASE V uV]						
1 0.20158 2 0.41764 3 0.84358 4 1.19240 5 5.07660 6 18.59520 7 0.16712 8 0.45023 9 0.8460 10 1.21200 11 5.47480	23.9512.52 9.98 18.50 8.95 9.99 17.06 3.88 10.00 16.53 1.92 10.01 1.25 -4.67 10.20 3.06 -3.96 10.56 28.22 13.04 9.90 27.62 21.82 9.90 16.39 7.34 10.01 0.16.39 7.34 10.01	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	5 N 5 N 2 N 7 N 5 L 5 L 5 L 8 L						



5.7. Occupied Bandwidth

Test Requirements, RSS-Gen [6.7]

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

5.7.1. Test Setup

Refer to the APPENDIX I.

5.7.2. Test Procedures

The 99 % power bandwidth was measured with a calibrated spectrum analyzer.

The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 × RBW.

5.7.3. Test Results

Test Mode	Tested Channel	Test Results (MHz)			
	Lowest	1.048			
TM 1	Middle	1.049			
	Highest	1.049			
	Lowest	2.096			
TM 2	Middle	2.104			
	Highest	2.117			
	Lowest	1.030			
ТМ 3	Middle	1.032			
	Highest	1.031			
	Lowest	1.067			
TM 4	Middle	1.068			
	Highest	1.068			

Test Mode	Tested Channel	Test Results (MHz)				
	Lowest	1.048				
TM 5	Middle	1.050				
	Highest	1.047				
	Lowest	2.095				
TM 6	Middle	2.095				
	Highest	2.098				
	Lowest	1.030				
TM 7	Middle	1.032				
	Highest	1.031				
	Lowest	1.070				
TM 8	Middle	1.068				
	Highest	1.068				

TM 1 Test Channel : Lowest



Occupied Bandwidth

TM 1 Test Channel : Middle



TM 1 Test Channel : Highest



TM 2 Test Channel : Lowest



Occupied Bandwidth

TM 2 Test Channel : Middle



TM 2 Test Channel : Highest







Occupied Bandwidth

TM 3 Test Channel : Middle



TM 3 Test Channel : Highest







Occupied Bandwidth

TM 4 Test Channel : Middle







TM 5 Test Channel : Lowest



Occupied Bandwidth

TM 5 Test Channel : Middle



TM 5 Test Channel : Highest



TM 6 Test Channel : Lowest



Occupied Bandwidth

TM 6 Test Channel : Middle



TM 6 Test Channel : Highest



TM 7 Test Channel : Lowest



Occupied Bandwidth

TM 7 Test Channel : Middle



TM 7 Test Channel : Highest







Occupied Bandwidth

TM 8 Test Channel : Middle



TM 8 Test Channel : Highest



APPENDIX I

Test set up diagrams

Radiated Measurement



Conducted Measurement



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)		
0.03	10.77	15	11.88		
1	11.05	20	12.16		
2.402 & 2.440 & 2.480	11.18	25	12.94		
5	11.32	-	-		
10	11.70	-	-		

Note 1 : The path loss from EUT to Spectrum analyzer was measured and used for test. Path loss (S/A's correction factor) = Cable A (Attenuator, Applied only when it was used externally)



APPENDIX II

Duty cycle plots

Test Procedures

- KDB558074 D01v05r02 - Section 6

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set VBW \geq RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50 /T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \le 16.7$ microseconds.)

Duty Cycle

TM 1 Test Channel : Middle



Duty Cycle

Dt&C

TM 2 Test Channel : Middle

C RL RF 50 Ω AC COR Sweep Time 2.000 ms PN IFG	REC	Trig: Free Run	Avg Typ	ALIGN OFF	08:44:44 PM TRACE	Jun 05, 2023	Sweep/Control
Sweep Time 2.000 ms PN IFG	IO: Fast 📮 ain:Low	Trig: Free Run	Avg Typ	e: Log-Pwr	TRACE		
PN IFG	IO: Fast 🕞) ing. Free Run		-	TYPE		
110	annie on	Atten: 30 dB			DET	PPPPP	Sweep Time
						20.0.00	2.000 ms
				4	ZIVIKES O	20.0 µs	
10 dB/div Ref 20.00 dBm						.04 aB	
-og*		. 1/\2	▲ 3∆4	4			
10.0	V						
0.00	<u>_^ª</u>						
-10.0							
20.0							
-20.0							
-30.0							
-40.0							
50.0 bill		in te se		6. 16	والأطار في الم الم	dealer of	
-2010 Martin Martin Martin Martin Martin Martin Construction of the Line of th	urdal	HILL AND	NAMANA MANA	- Search	Alta Media Autor	MANAU	
-60.0							
70.0							
Center 2.440000000 GHz					Sp	oan 0 Hz	
Res BW 2.4 MHz	#VBW	8.0 MHz		Sweep 2	.000 ms (1	001 pts)	
MKR MODELTRC SCI X		Y	EUNCTION EU	NCTION WIDTH	FUNCTIO		
$1 \Delta 2 1 t (\Delta)$ 19	4.0 us (Δ)	-0.83 dB	Pononion Po		1010101		
2 F 1 t 67	4.0 µs	3.81 dBm					Cata
$3 \Delta 4 1 t (\Delta) 621$	6.0 μs (Δ)	0.04 dB				_	Gale
4 - 1 t 6/4	4.0 µs	3.81 dBm				=	[Off,LO]
6							
7							
9						_	Points
10							1001
11						-	
< [•	
SG				STATUS			

Duty Cycle

TM 3 Test Channel : Middle



Duty Cycle

TM 4 Test Channel : Middle

Keysight Spectrum Analyzer - Swept SA				
RL RF 50Ω AC	CORREC SENS	E:INT ALIG	N OFF 09:00:58 PM Jun 05, 2	Sweep/Control
Sweep Time 15.00 ms	Trig: Free	Avg Type: Log Pun	g-Pwr TRACE 1 2 3 4	5 6
	IFGain: I ow Atten: 30 d	dB	DET P P P P	P P Sweep Time
	in Gamillow .			15.00 ms
			ΔMKr3 3.750 n	IS I
10 dB/div Ref 20.00 dBm			0.00 c	B
Logy	. 1	A23A4		
10.0	\mathbf{v}			Sween Setun)
0.00				oncep octup
-10.0				
20.0				
-2010				
-30.0				
-40.0				
-50 0 Mar	الي ا	40¥	Lallacia	
-30.0				
-60.0				
-70.0				-
Center 2.440000000 GHz			Span 0	Hz
Res BW 2.4 MHz	#VBW 8.0 MHz	Swe	ep 15.00 ms (1001 p	ts)
MKR MODE TRC SCL X	Y	FUNCTION FUNCTION	N WIDTH FUNCTION VALUE	
1 Δ2 1 t (Δ)	3.105 ms (Δ) -0.38 d	В		
2 F 1 t	4.215 ms 3.81 dBi	m		Cate
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>3.750 ms (Δ) 0.00 d</u> 4.215 ms 3.81 dB	m		IOFFL OI
5	4.2101113 0.01 0.01			≡ [Oπ,LO]
6				
8				Deinte
9				Points
10				1001
				*
MSG			STATUS	

APPENDIX III

Unwanted Emissions (Radiated) Test Plot

TM 1 & Lowest & Z & Ver



TM 1 & Lowest & Z & Ver

ctrum Analyzer - Swept SA SENSE:INT Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run PNO: Fast IFGain:Low Atten: 10 dB Auto Tune Mkr3 2.38 389 670 GH 39,525 dBu Ref 106.99 dBµV **Center Freq** 2.387500000 GHz Start Freq 2.370000000 GHz <mark>♦</mark>3! Stop Freq 2.40500000 GHz CF Step 5.30000000 GHz uto <u>Man</u> Start 2.37000 GHz #Res BW 1.0 MHz Stop 2.40500 GHz Sweep 1.000 ms (5001 pts) #VBW 3.0 MHz* ۹uto Freq Offset 0 Hz STATUS

Detector Mode : AV

Detector Mode : PK



TM 1 & Highest & Z & Ver



TM 1 & Highest & Z & Ver





TM 2 & Lowest & Z & Ver

Detector Mode : PK



TM 2 & Lowest & Z & Ver

trum Analyzer SENSE:INT Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB PNO: Fast IFGain:Low DET Auto Tune Mkr3 2.389 888 GHz 39.791 dBµV Ref 106.99 dBµV 10 dB/div og **Center Freq** 2.387500000 GHz Start Freq 2.370000000 GHz <mark>6</mark>3 Stop Freq 2.405000000 GHz Start 2.37000 GHz #Res BW 1.0 MHz Stop 2.40500 GHz Sweep 1.000 ms (5001 pts) CF Step 5.30000000 GHz #VBW 3.0 MHz* uto Man FUNCTION FUNCTION WIDTH Freq Offset 0 Hz STATUS



TM 2 & Highest & Z & Ver



TM 2 & Highest & Z & Ver





TM 3 & Lowest & Z & Ver



Detector Mode : AV

TM 3 & Lowest & Z & Ver





TM 3 & Highest & Z & Ver



TM 3 & Highest & Z & Ver





TM 4 & Lowest & Z & Ver



TM 4 & Lowest & Z & Ver





TM 4 & Highest & Z & Ver



TM 4 & Highest & Z & Ver



Detector Mode : AV



TM 1 & Lowest & Y & Hor



TM 2 & Lowest & Y & Hor

gilent Spectrum Analyzer - Swept SA M Jun 02, 202 SENSE:INT ALIGNAUTO Avg Type: RMS Avg|Hold: 200/200 Frequency - Trig: Free Run Atten: 6 dB TYPE A WWWWA PNO: Fast +++ IFGain:Low Auto Tune Mkr1 4.805 169 GHz 39.212 dBµV 5 dB/div Ref 66.99 dBµV **Center Freq** 4.804000000 GHz Start Freq 4.801500000 GHz Stop Freq 4.806500000 GHz <mark>أ</mark> CF Step 2.40200000 GHz Man Auto Freq Offset 0 Hz Center 4.804000 GHz #Res BW 1.0 MHz Span 5.000 MHz Sweep 1.00 ms (5001 pts) #VBW 3.0 MHz* **STATUS**

Detector Mode : AV



TM 3 & Lowest & Y & Hor

Agilent Spectrum Analyzer - Swept SA											
L XI		RF 50 Ω	AC		SE	NSE:INT	Ava Type	ALIGNAUTO	03:40:08 F	M Jun 02, 2023	Frequency
5 dB	/div	Ref 66.99 (dBuV	PNO: Fast ++ IFGain:Low	Atten: 6	e Run 18	Avg Hold:	200/200 Mkr1	4.805 5 39.17	28 GHz 6 dBµV	Auto Tune
Log 62.0											Center Freq 4.804000000 GHz
57.0 52.0											Start Freq 4.801500000 GHz
47.0 42.0									¢1		Stop Freq 4.806500000 GHz
37.0 32.0	uniperspirately in the		ang providented and a		ndende formen de	un pristanget jan.	in a subsection of the subsect	ini nani mani d	ddalana, rawisdow	(ig vir i vije) og en strank	CF Step 2.40200000 GHz Auto <u>Man</u>
27.0											Freq Offset 0 Hz
Cen #Re:	ter 4.80 s BW 1	04000 GHz .0 MHz		#VBW	3.0 MHz	k.		Sweep	Span 5 1.00 ms (.000 MHz 5001 pts)	
MSG								to STATU:	5		

TM 4 & Lowest & Y & Hor

