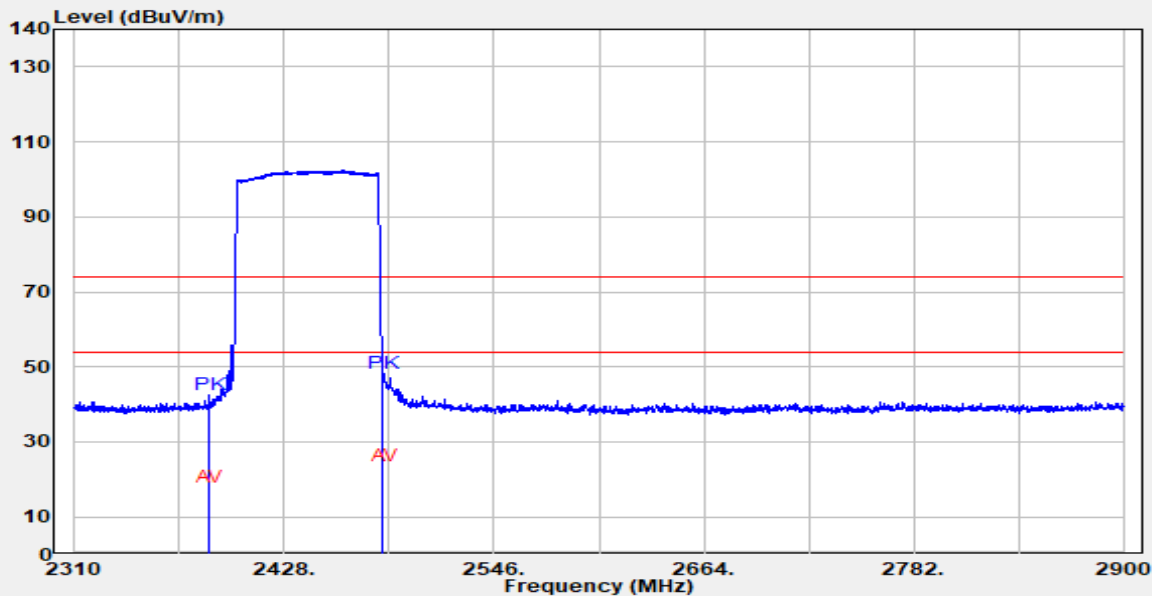


Report Number :TERF2410003027ER  
Operation Mode :EDR 3M Hopping  
Test Frequency :2402~2480 MHz  
Test Mode :Bandedge  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Horizontal  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
2385.55	Peak	47.06	-4.50	42.56	74.00	-31.44
2385.55	Average	-	-	17.83	54.00	-36.17
2483.52	Peak	52.97	-4.70	48.27	74.00	-25.73
2483.52	Average	-	-	23.54	54.00	-30.46

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

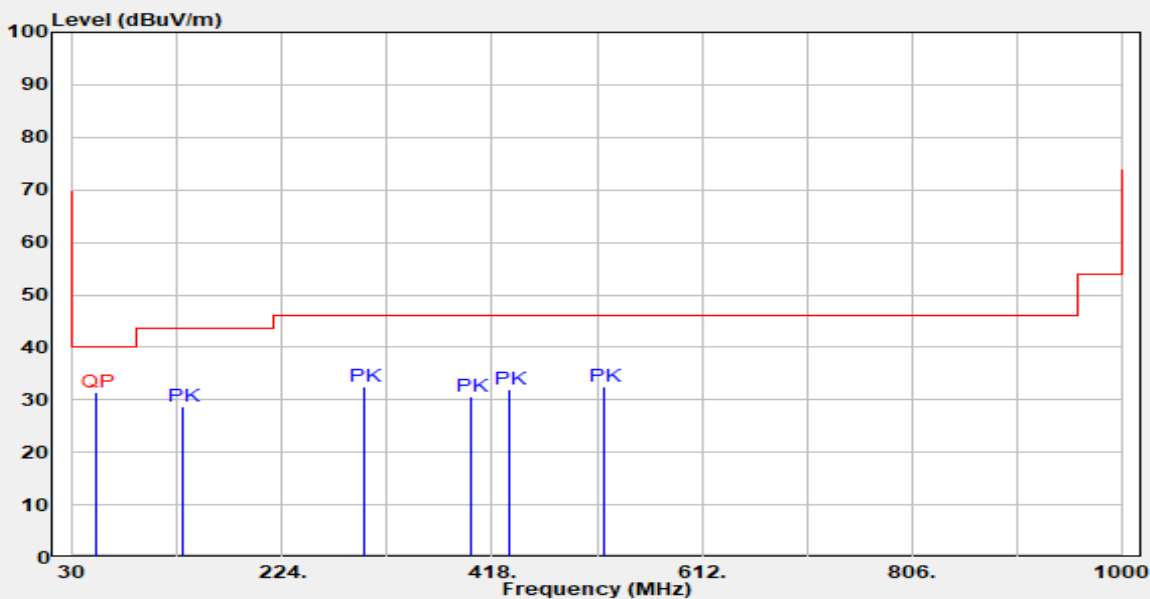
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## 12.6.4 Radiated Spurious Emission

Report Number :TERF2410003027ER  
 Operation Mode :BR  
 Test Frequency :2441 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Vertical  
 Engineer :Cooper Hsu



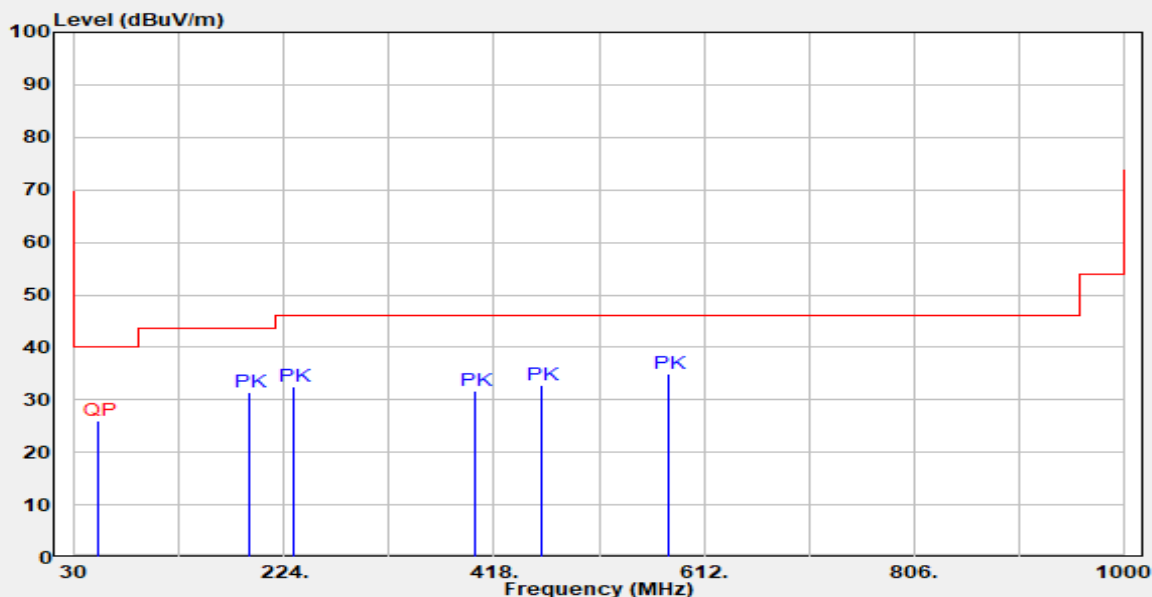
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
52.31	QP	40.13	-8.65	31.48	40.00	-8.52
131.85	Peak	38.54	-9.69	28.85	43.50	-14.65
299.66	Peak	39.36	-6.92	32.44	46.00	-13.56
398.60	Peak	35.84	-5.26	30.58	46.00	-15.42
433.52	Peak	36.38	-4.34	32.04	46.00	-13.96
520.82	Peak	35.69	-3.04	32.65	46.00	-13.35

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Report Number :TERF2410003027ER  
 Operation Mode :BR  
 Test Frequency :2441 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Horizontal  
 Engineer :Cooper Hsu



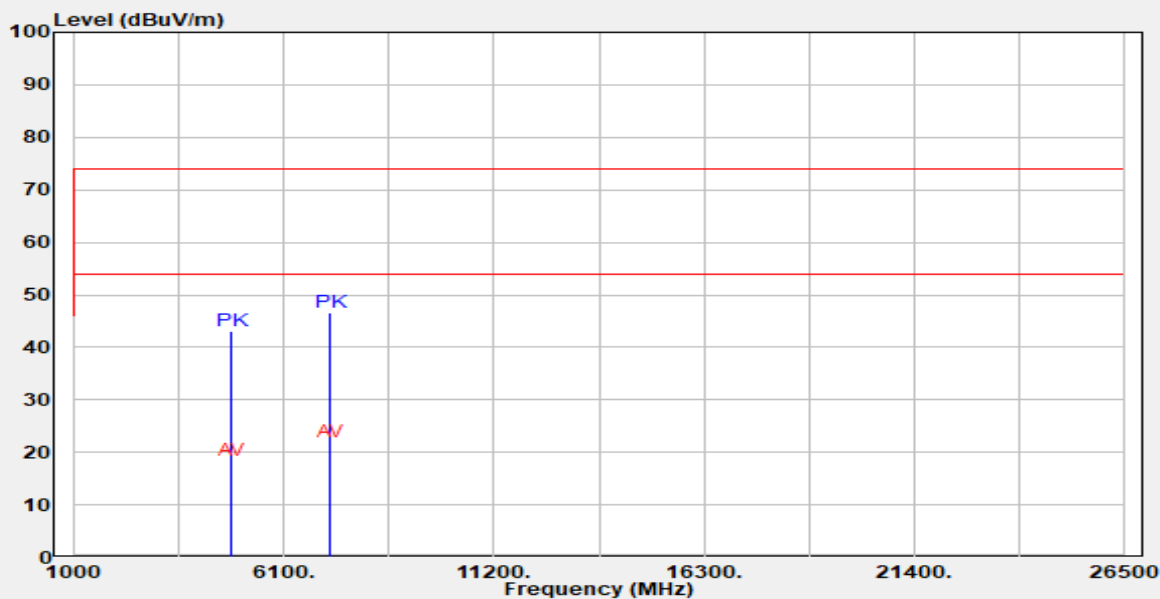
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
52.31	QP	34.78	-8.65	26.13	40.00	-13.87
191.99	Peak	41.97	-10.61	31.36	43.50	-12.14
231.76	Peak	41.94	-9.48	32.46	46.00	-13.54
400.54	Peak	36.90	-5.22	31.68	46.00	-14.32
462.62	Peak	36.58	-3.78	32.80	46.00	-13.20
579.02	Peak	36.70	-1.78	34.92	46.00	-11.08

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Report Number :TERF2410003027ER  
Operation Mode :BR  
Test Frequency :2402 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Vertical  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.00	Peak	42.81	0.31	43.12	74.00	-30.88
4804.00	Average	-	-	18.39	54.00	-35.61
7206.00	Peak	41.07	5.60	46.67	74.00	-27.33
7206.00	Average	-	-	21.94	54.00	-32.06

Average Duty Cycle Factor=-24.73 (dB)

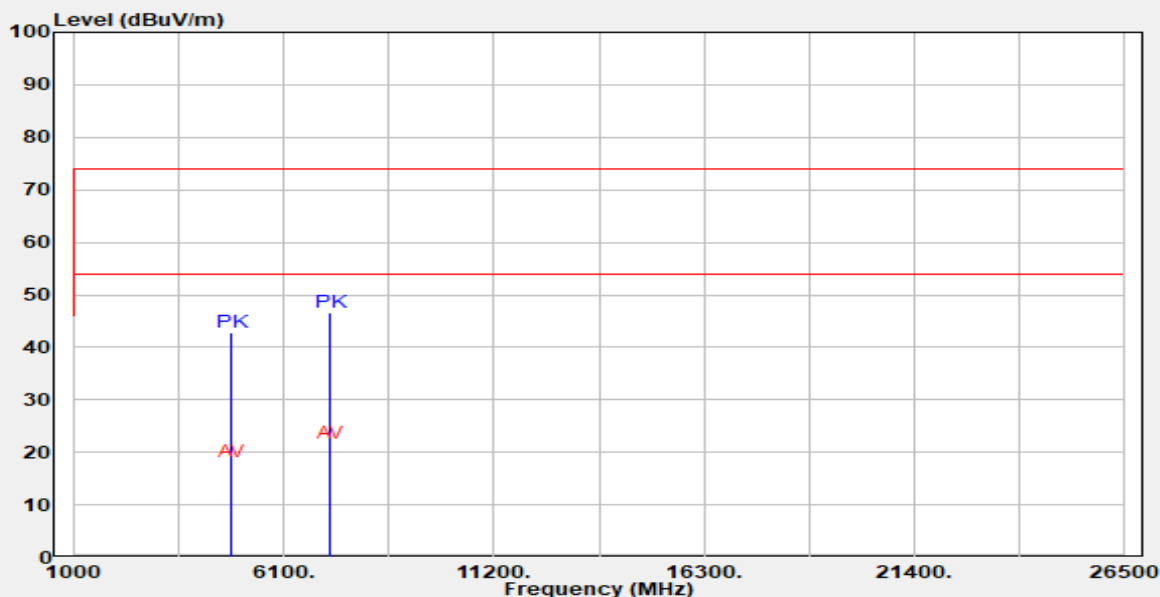
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2410003027ER  
 Operation Mode :BR  
 Test Frequency :2402 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Horizontal  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.00	Peak	42.48	0.31	42.79	74.00	-31.21
4804.00	Average	-	-	18.06	54.00	-35.94
7206.00	Peak	40.89	5.60	46.49	74.00	-27.51
7206.00	Average	-	-	21.76	54.00	-32.24

Average Duty Cycle Factor=-24.73 (dB)

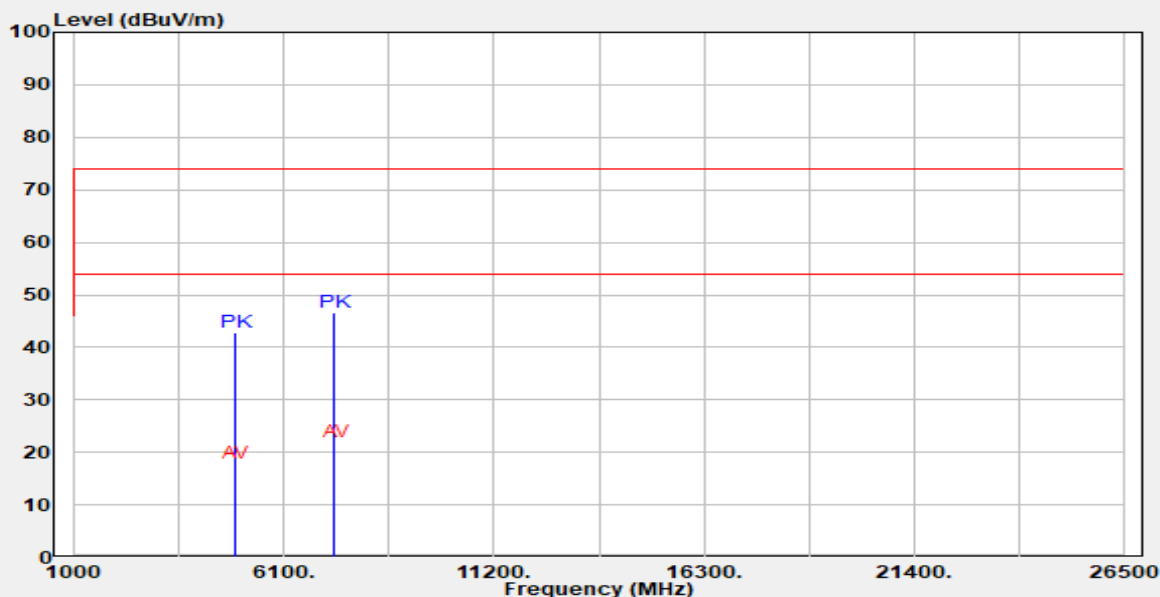
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2410003027ER  
Operation Mode :BR  
Test Frequency :2441 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Vertical  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.00	Peak	42.60	0.12	42.72	74.00	-31.28
4882.00	Average	-	-	17.99	54.00	-36.01
7323.00	Peak	40.74	5.90	46.64	74.00	-27.36
7323.00	Average	-	-	21.91	54.00	-32.09

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

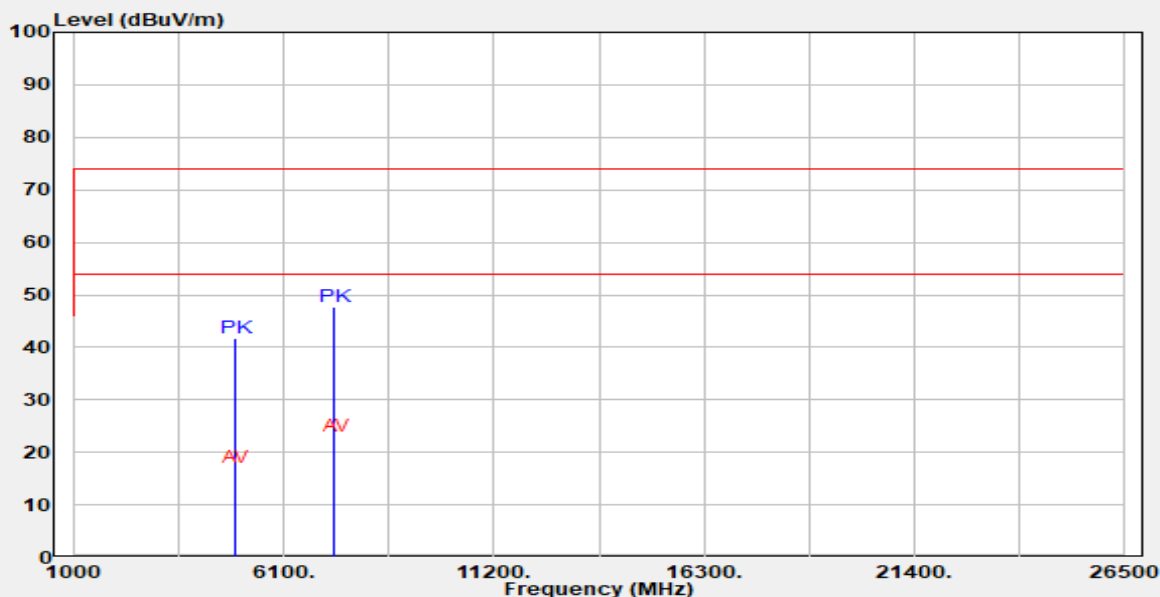
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Report Number :TERF2410003027ER  
Operation Mode :BR  
Test Frequency :2441 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Horizontal  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.00	Peak	41.61	0.12	41.73	74.00	-32.27
4882.00	Average	-	-	17.00	54.00	-37.00
7323.00	Peak	41.85	5.90	47.75	74.00	-26.25
7323.00	Average	-	-	23.02	54.00	-30.98

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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t (886-2) 2299-3279

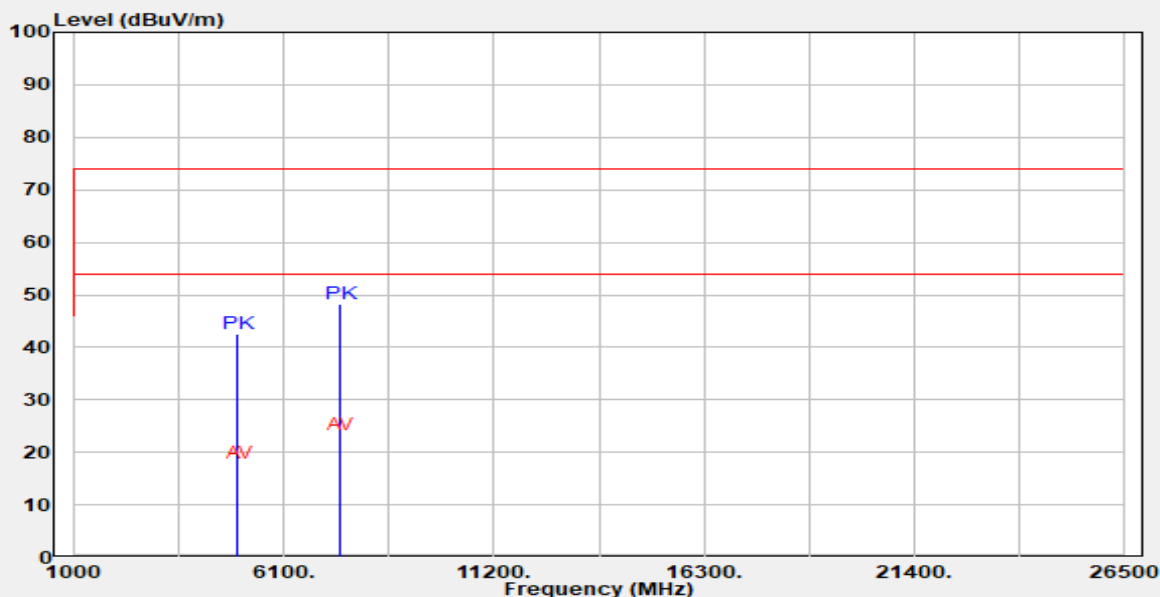
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Report Number :TERF2410003027ER  
 Operation Mode :BR  
 Test Frequency :2480 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Vertical  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.00	Peak	42.25	0.23	42.48	74.00	-31.52
4960.00	Average	-	-	17.75	54.00	-36.25
7440.00	Peak	42.31	5.84	48.15	74.00	-25.85
7440.00	Average	-	-	23.42	54.00	-30.58

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

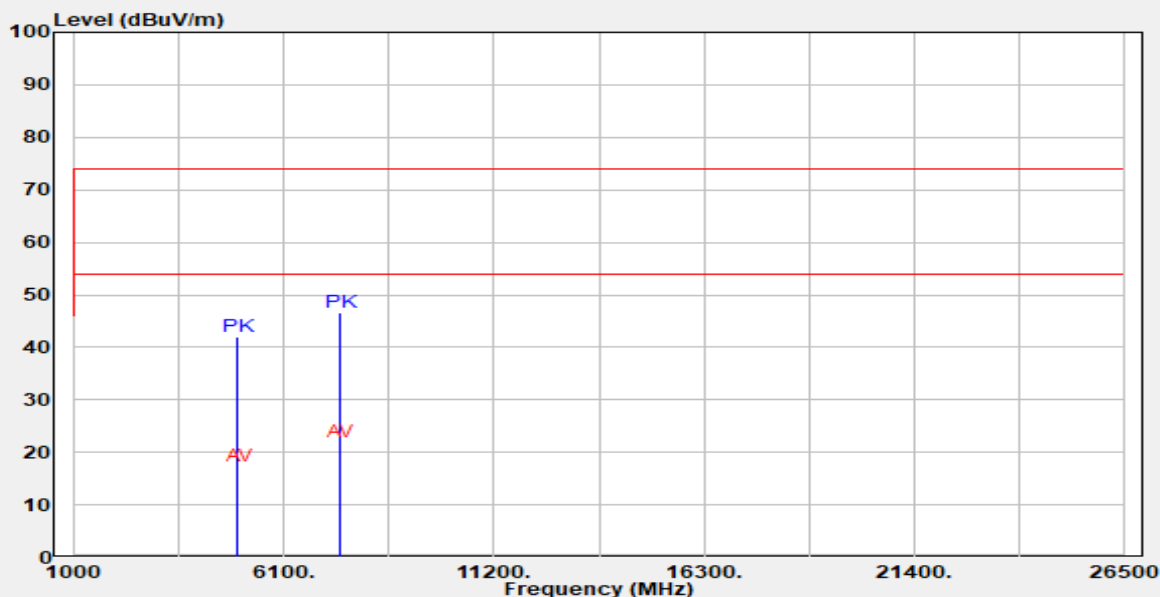
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Report Number :TERF2410003027ER  
Operation Mode :BR  
Test Frequency :2480 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Horizontal  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.00	Peak	41.75	0.23	41.98	74.00	-32.02
4960.00	Average	-	-	17.25	54.00	-36.75
7440.00	Peak	40.88	5.84	46.72	74.00	-27.28
7440.00	Average	-	-	21.99	54.00	-32.01

Average Duty Cycle Factor=-24.73 (dB)

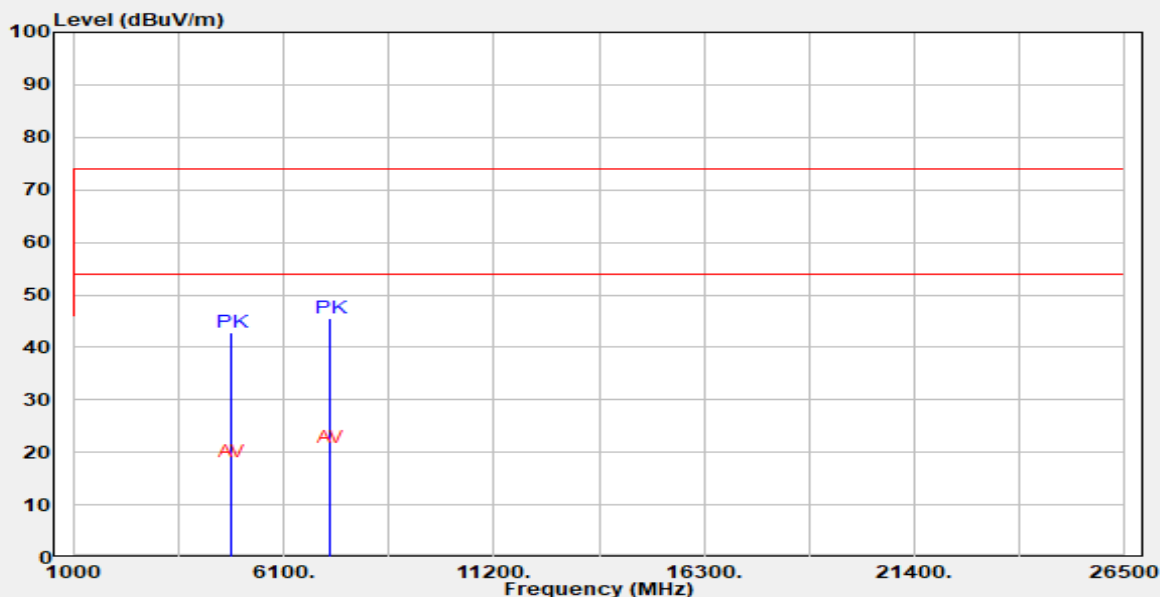
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2410003027ER  
Operation Mode :EDR 3M  
Test Frequency :2402 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Vertical  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.00	Peak	42.63	0.31	42.94	74.00	-31.06
4804.00	Average	-	-	18.21	54.00	-35.79
7206.00	Peak	40.04	5.60	45.64	74.00	-28.36
7206.00	Average	-	-	20.91	54.00	-33.09

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

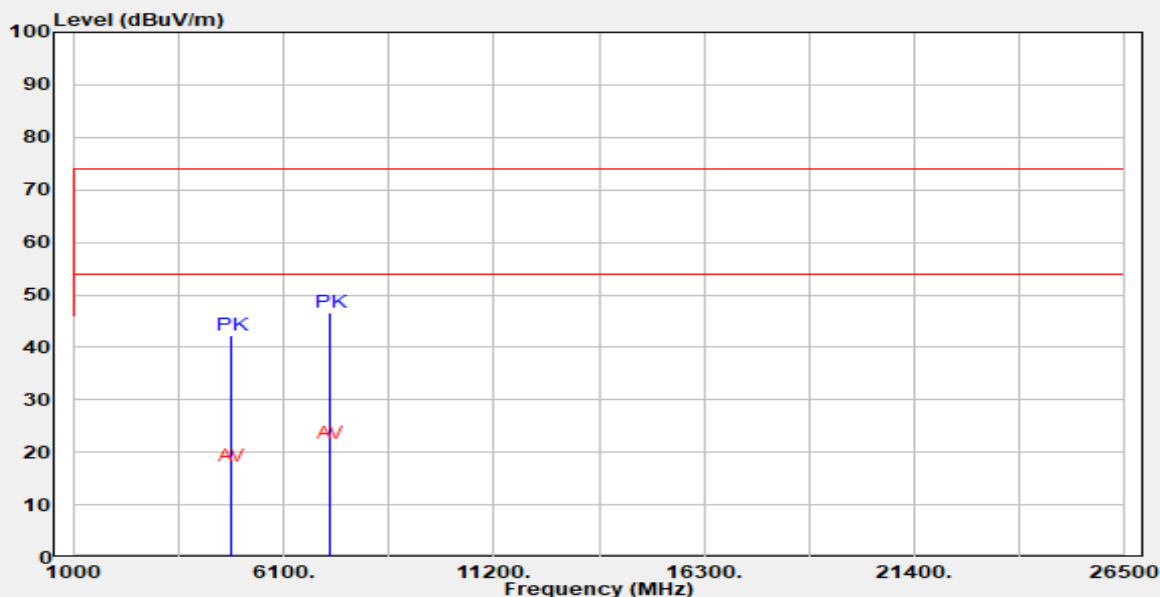
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Report Number :TERF2410003027ER  
 Operation Mode :EDR 3M  
 Test Frequency :2402 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Horizontal  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.00	Peak	41.86	0.31	42.17	74.00	-31.83
4804.00	Average	-	-	17.44	54.00	-36.56
7206.00	Peak	40.92	5.60	46.52	74.00	-27.48
7206.00	Average	-	-	21.79	54.00	-32.21

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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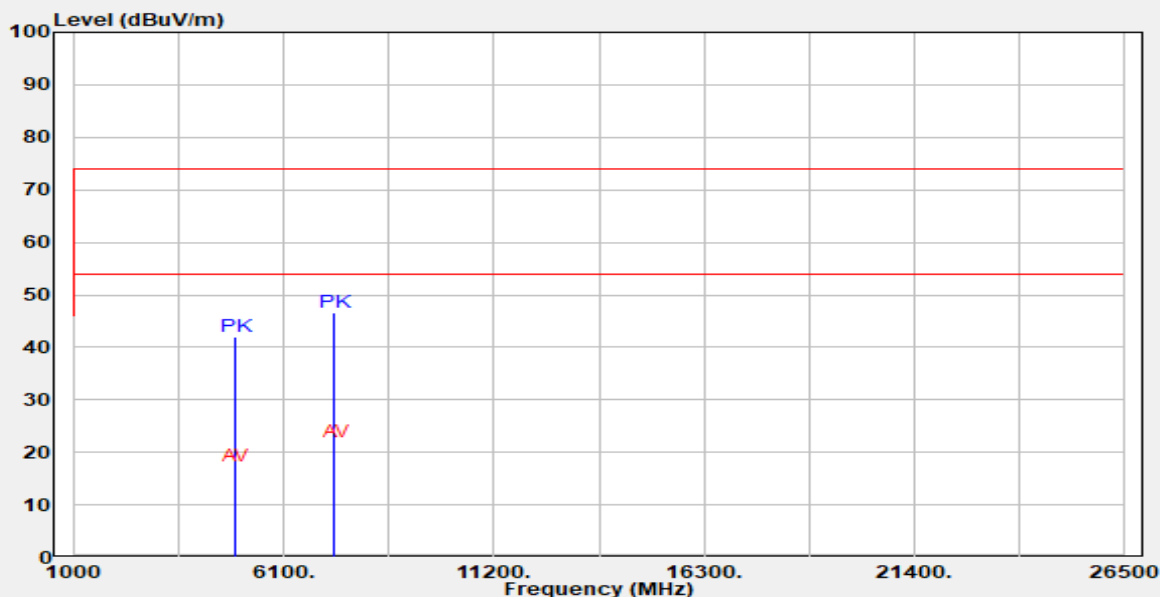
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Report Number :TERF2410003027ER  
 Operation Mode :EDR 3M  
 Test Frequency :2441 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Vertical  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.00	Peak	41.83	0.12	41.95	74.00	-32.05
4882.00	Average	-	-	17.22	54.00	-36.78
7323.00	Peak	40.66	5.90	46.56	74.00	-27.44
7323.00	Average	-	-	21.83	54.00	-32.17

Average Duty Cycle Factor=-24.73 (dB)

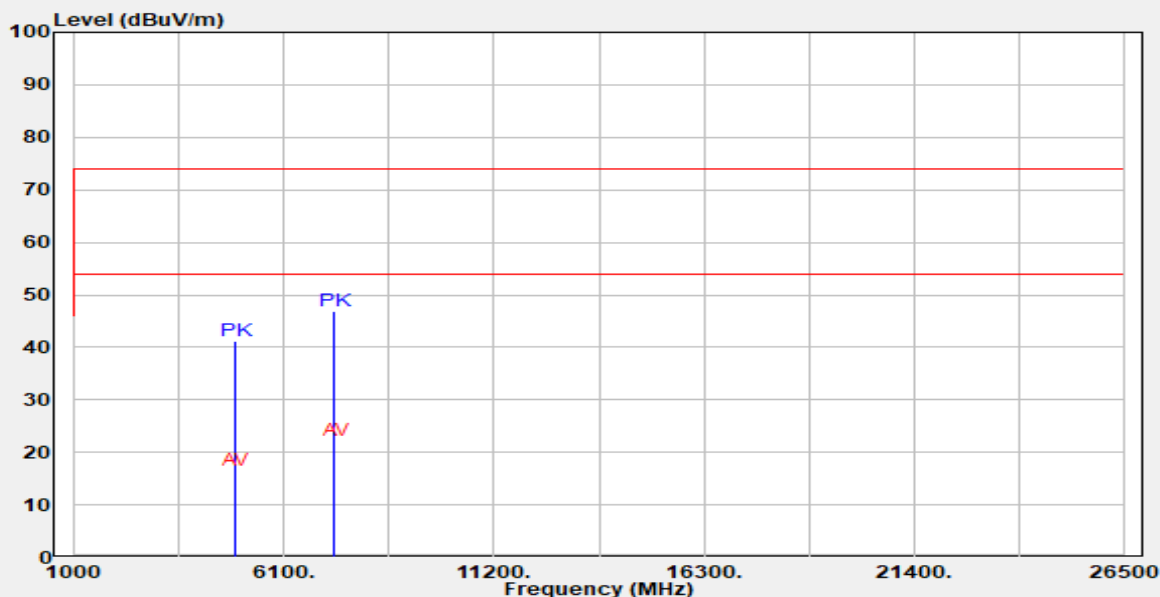
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2410003027ER  
 Operation Mode :EDR 3M  
 Test Frequency :2441 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Horizontal  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.00	Peak	41.20	0.12	41.32	74.00	-32.68
4882.00	Average	-	-	16.59	54.00	-37.41
7323.00	Peak	41.01	5.90	46.91	74.00	-27.09
7323.00	Average	-	-	22.18	54.00	-31.82

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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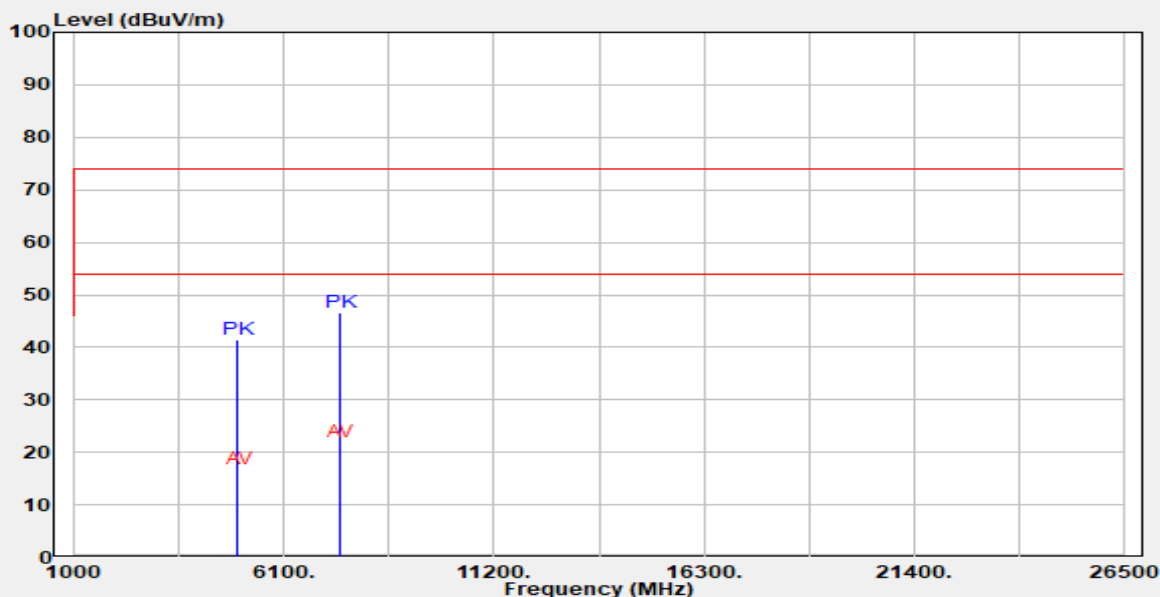
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Report Number :TERF2410003027ER  
 Operation Mode :EDR 3M  
 Test Frequency :2480 MHz  
 Test Mode :Tx  
 EUT Pol :E2 Plane

Test Site :SAC 3  
 Test Date :2024-10-21  
 Temp./Humi. :22.4°C/63%  
 Antenna Pol. :Vertical  
 Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.00	Peak	41.24	0.23	41.47	74.00	-32.53
4960.00	Average	-	-	16.74	54.00	-37.26
7440.00	Peak	40.72	5.84	46.56	74.00	-27.44
7440.00	Average	-	-	21.83	54.00	-32.17

Average Duty Cycle Factor=-24.73 (dB)

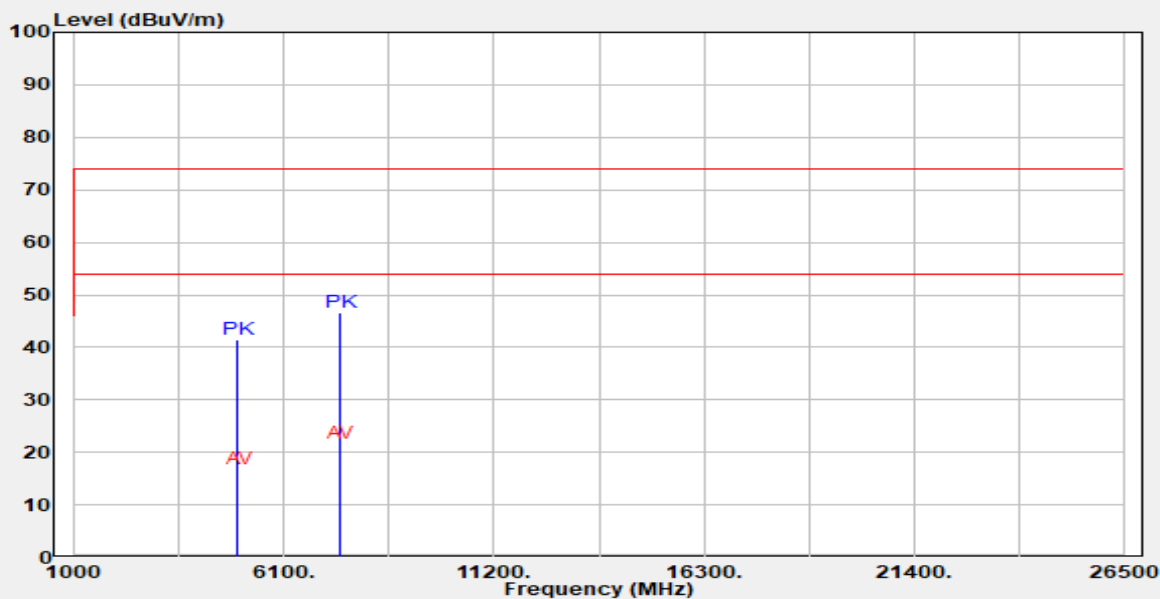
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2410003027ER  
Operation Mode :EDR 3M  
Test Frequency :2480 MHz  
Test Mode :Tx  
EUT Pol :E2 Plane

Test Site :SAC 3  
Test Date :2024-10-21  
Temp./Humi. :22.4°C/63%  
Antenna Pol. :Horizontal  
Engineer :Cooper Hsu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.00	Peak	41.19	0.23	41.42	74.00	-32.58
4960.00	Average	-	-	16.69	54.00	-37.31
7440.00	Peak	40.67	5.84	46.51	74.00	-27.49
7440.00	Average	-	-	21.78	54.00	-32.22

Average Duty Cycle Factor=-24.73 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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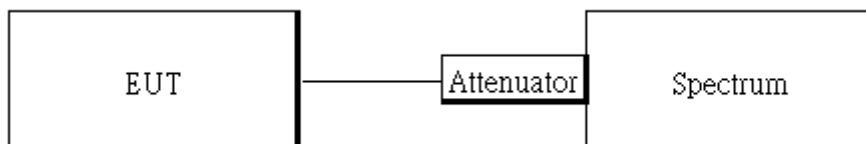
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## 13 NUMBER OF HOPPING FREQUENCY

### 13.1 Standard Applicable

Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

### 13.2 Test Setup



### 13.3 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
5. Set the spectrum analyzer as RBW = 30% of the channel spacing, VBW  $\geq$  RBW., Detector = Peak
6. Max hold, view and count how many channel in the band.

### 13.4 Measurement Result

Tabular Data of Total Channel Number

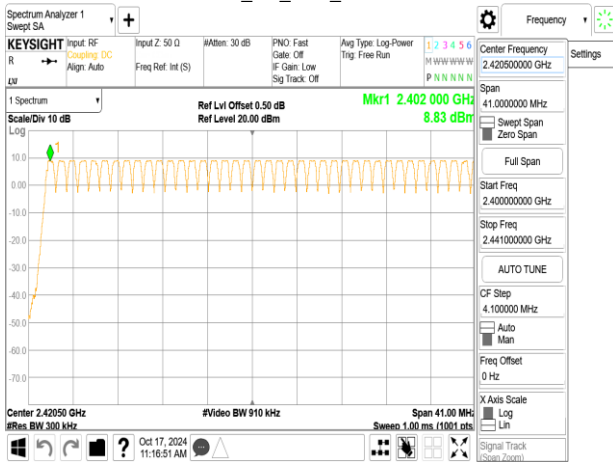
	Channel Number	Limit
2.4 GHz – 2.441 GHz	40	>15
2.441 GHz – 2.4835 GHz	39	
2.4 GHz ~2.4835 GHz	(40+39) = 79	

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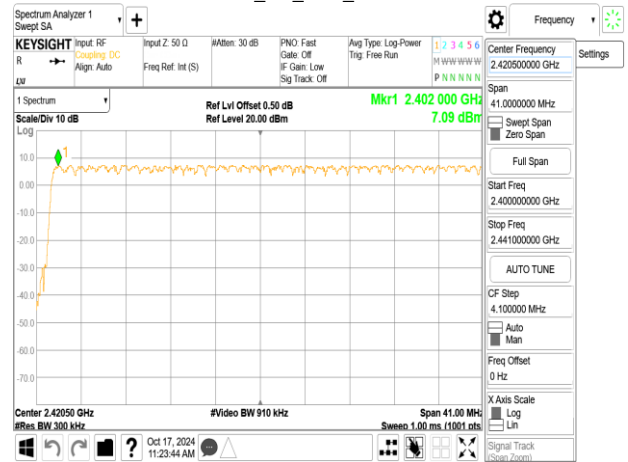
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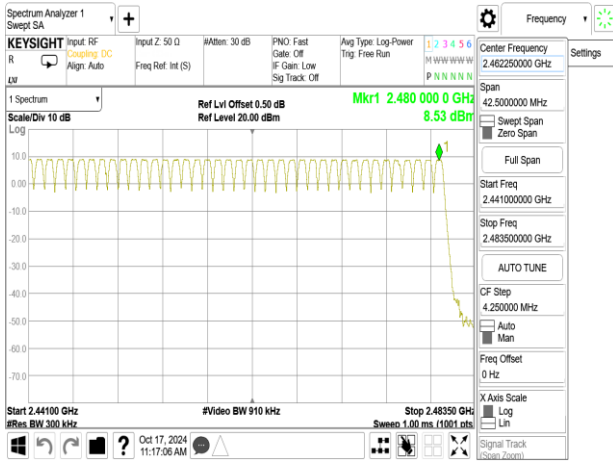
GFSK\_1M\_DH5\_2400-2441



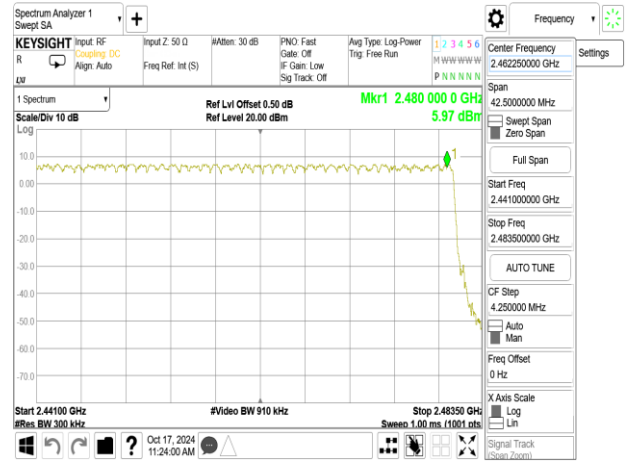
8DPSK\_3M\_DH5\_2400-2441



GFSK\_1M\_DH5\_2441-2480



8DPSK\_3M\_DH5\_2441-2480



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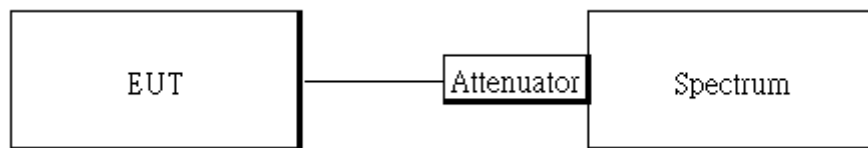
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## 14 TIME OF OCCUPANCY (DWELL TIME)

### 14.1 Standard Applicable

Frequency hopping systems operating in the 2400MHz-2483.5MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

### 14.2 Test Setup



### 14.3 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.
5. Set the spectrum analyzer as RBW, VBW=1MHz, 3MHz, Span = 0Hz, Detector = Peak, Adjust Sweep = 2~8ms.
6. Repeat above procedures until all frequency of the interest measured were complete.

Formula Deduced: time occupancy of one time slot X Hopping rate / total slot in one channel / total channel that hops X period of working channels.

Where, standard hopping rate is 1600 hops/s, slot in one channel for DH1, DH3, and DH5 is 2, 4, and 6, respectively.

DH1 consists of single time slot of the uplink, and one slot of the downlink Total Slot: 2

DH3 consists of three time slot of the uplink, and one slot of the downlink. Total Slot: 4

DH5 consists of five time slot of the uplink, and one slot of the downlink. Total Slot: 6

Note: the result of the complete test default channel at 1Mbps is recorded on the test report, 2Mbps, and 3Mbps only records the measurement result at middle channel that reveals no much deviation.

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## 14.4 Measurement Result

### GFSK (1Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	DH1	123.20	400
	DH3	264.00	400
	DH5	308.80	400

### $\pi/4$ DQPSK (2Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	2DH1	123.20	400
	2DH3	262.40	400
	2DH5	307.20	400

### 8-DPSK (3Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	3DH1	123.20	400
	3DH3	262.40	400
	3DH5	307.20	400

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### GFSK (1Mbps):

CH Mid	DH1 time slot	=	0.385	*	(1600/2/79)	*	31.6	=	123.20 (ms)
	DH3 time slot	=	1.650	*	(1600/4/79)	*	31.6	=	264.00 (ms)
	DH5 time slot	=	2.895	*	(1600/6/79)	*	31.6	=	308.80 (ms)

### $\pi/4$ -DQPSK (2Mbps):

CH Mid	2DH1 time slot	=	0.385	*	(1600/2/79)	*	31.6	=	123.20 (ms)
	2DH3 time slot	=	1.640	*	(1600/4/79)	*	31.6	=	262.40 (ms)
	2DH5 time slot	=	2.880	*	(1600/6/79)	*	31.6	=	307.20 (ms)

### 8-DPSK (3Mbps):

CH Mid	3DH1 time slot	=	0.385	*	(1600/2/79)	*	31.6	=	123.20 (ms)
	3DH3 time slot	=	1.640	*	(1600/4/79)	*	31.6	=	262.40 (ms)
	3DH5 time slot	=	2.880	*	(1600/6/79)	*	31.6	=	307.20 (ms)

A period time = 0.4 (s) \* 79 = 31.6 (s)

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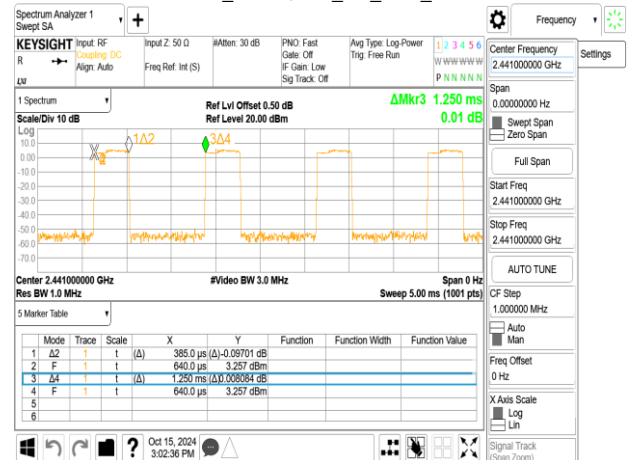
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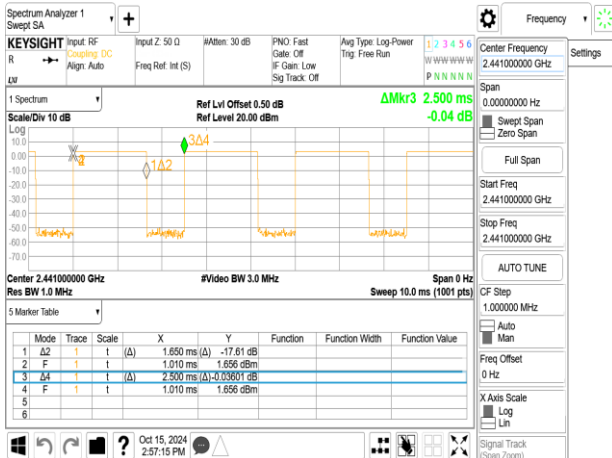
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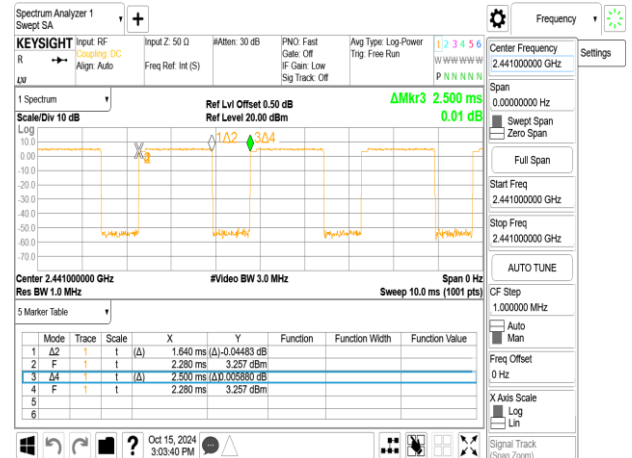
Dwell Time\_π/4DQPSK\_2M\_DH1\_2441MHz



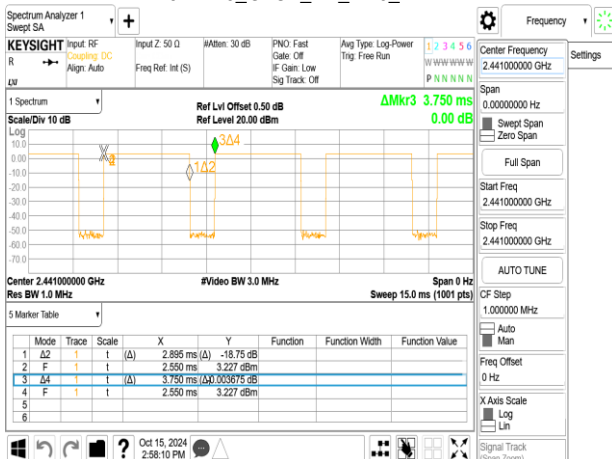
Dwell Time\_GFSK\_1M\_DH3\_2441MHz



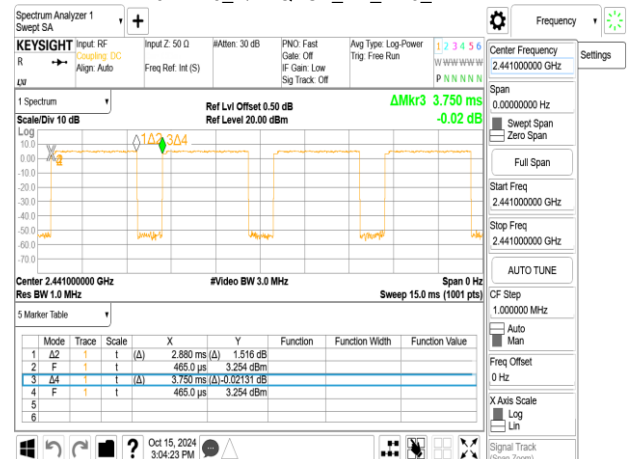
Dwell Time\_π/4DQPSK\_2M\_DH3\_2441MHz



Dwell Time\_GFSK\_1M\_DH5\_2441MHz



Dwell Time\_π/4DQPSK\_2M\_DH5\_2441MHz

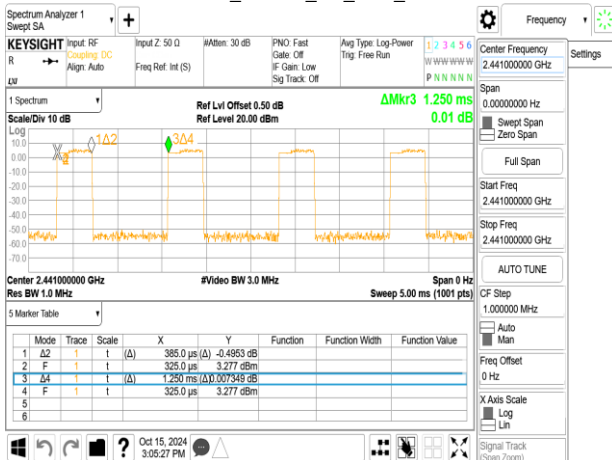


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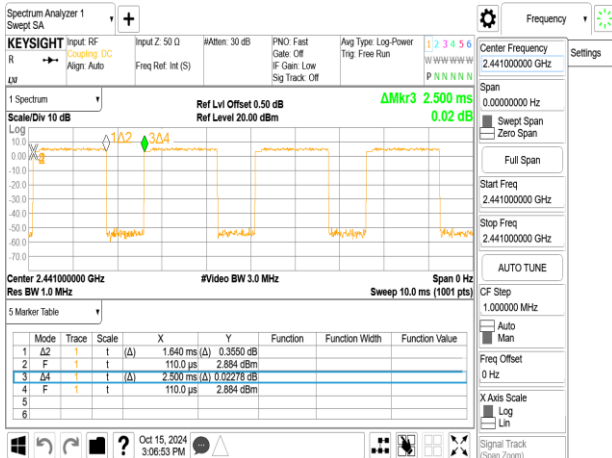
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Dwell Time\_8DPSK\_3M\_DH1\_2441MHz



Dwell Time\_8DPSK\_3M\_DH3\_2441MHz



Dwell Time\_8DPSK\_3M\_DH5\_2441MHz



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## 15 ANTENNA REQUIREMENT

### 15.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 15.2 Antenna Connected Construction:

The antenna complies with this requirement and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

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