

TAF

Project No: Report No.:

TM-2309000413P TMWK2309003479KR FCC ID: 2AUXK-YE97A00

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RADIO TEST REPORT FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247
Product name	COMMUN.CONT.UNIT ASSY(BT Dongle)
Brand Name	ΥΑΜΑΗΑ
Model No.	YE97-A00
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Hong

Dally Hong Sr. Engineer

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. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 22, 2023	Initial Issue	ALL	Peggy Tsai



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1. GENERAL INFORMATION

1.1 EUT INFORMATION

	CHAO LONG MOTOR PARTS CORP.
Applicant	No.10, Lane 151, Sec.2, Guangming Rd., Luzhu Dist., Taoyuan
	City, 33848, Taiwan.
	PT Chao Long Motor Parts Indonesia.
Manufacturer	JL. Meranti 1, Blok L2 No.5-6, Delta Silicon Industrial Park 1
	Bekasi Indonesia 17530
	1. PT Chao Long Motor Parts Indonesia.
	JL. Meranti 1, Blok L2 No.5-6, Delta Silicon Industrial Park 1
Factory	Bekasi Indonesia 17530
j	2. Chao Long India Private Limited
	No.6, 8th Avenue, 1st cross road, Mahindra World City,
	Chengalpattu, Tamil Nadu 603004
Equipment	COMMUN.CONT.UNIT ASSY(BT Dongle)
Model No.	YE97-A00
Model Discrepancy	N/A
Trade Name	ҮАМАНА
Received Date	September 23, 2023
Date of Test	November 6 ~ 16, 2023
Power Supply	Powered from Car Battery: DC 12V
HW Version	BWP0-T2
SW Version	BPD-V0.08
Dementer	

Remark:

1. For more details, please refer to the User's manual of the EUT.

2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.



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1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz	
Modulation Type	GFSK for BLE 1 Mbps GFSK for BLE 2 Mbps	
Number of channel	40 Channels	

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested				
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation		
1 MHz or less	1	Middle		
1 MHz to 10 MHz	2	1 near top and 1 near bottom		
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom		

1.3 ANTENNA INFORMATION

Antenna Type	PIFA PCB Dipole Coils
Antenna Gain	-16.00 dBi
Antenna Connector	N/A

Notes:

1. Power Directional Gain: 10LOG(((10^(Ant1/10)+10^(Ant2/10))/2))

2. The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203 and RSS-GEN 6.8



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1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.213 dB
Channel Bandwidth	± 2.7 %
RF output power (Power Meter + Power sensor)	± 0.243 dB
Power Spectral density	± 2.739 dB
Conducted Bandedge	± 2.739 dB
Conducted Spurious Emission	± 2.742 dB
Radiated Emission_9kHz-30MHz	± 3.115 dB
Radiated Emission_30MHz-200MHz	± 4.071 dB
Radiated Emission_200MHz-1GHz	± 4.419 dB
Radiated Emission_1GHz-6GHz	± 5.023 dB
Radiated Emission_6GHz-18GHz	± 5.068 dB
Radiated Emission_18GHz-26GHz	± 3.349 dB
Radiated Emission_26GHz-40GHz	± 3.229 dB

Remark:

1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.



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1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

AC Powerline Conducted Emission and Conducted:

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

Radiated emission 9kHz to 40GHz:

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

No. 12, Ln. 116, Wugong 3rd Rd., Wugu Dist., New Taipei City, Taiwan 24803

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable because EUT not connect to AC Main Source direct.
Radiation	Czerny Lin	-
RF Conducted	Marco Chan	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309



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1.6 INSTRUMENT CALIBRATION

Conducted_FCC/IC/NCC (All)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Power Sensor	Anritsu	MA2411B	1911386	2023-07-25	2024-07-24	
Power Sensor	Anritsu	MA2411B	1911387	2023-07-25	2024-07-24	
Power Meter	Anritsu	ML2496A	2136002	2022-11-24	2023-11-23	
EXA Signal Analyzer	Keysight	N9030B	MY62291089	2023-10-13	2024-10-12	
DC Power Supply	GWINSTEK	SPS-3610	GPE880163	2022-12-02	2023-12-01	
Software	Radio Test Software Ver. 21					

Radiated Emission Test Site: 966 D					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Antenna	SHWARZBECK	VULB 9168	1277	2023-01-13	2024-01-12
Pre-Amplifier	EMCI	EMC118A45SE	980820	2022-12-23	2023-12-22
Pre-Amplifier	EMCI	EMC330N	980853	2022-12-23	2023-12-22
Coaxial Cable	EMC	EMC101G-KM- KM-9000	220407+211228+ 230205	2023-03-21	2024-03-20
EXA Signal Analyzer	Agilent	N9010A	MY52220817	2023-03-09	2024-03-08
Coaxial Cable	EMC	EMCCFD400	211212+211222+ 211020	2023-03-21	2024-03-20
High Pass Filter	TITAN	T04H3000180007 0S01	211215-7-1	2023-02-02	2024-02-01
Thermo-Hygro Meter	EDSDS	EDS-A49	966D1	2023-05-11	2024-05-10
Pre-Amplifier	EMCI	EMC184045SE	980872	2023-01-03	2024-01-02
Horn Antenna	RF SPIN	DRH18-E	210301A18ES	2023-02-03	2024-02-02
Horn Antenna	SHWARZBECK	BBHA 9170	1134	2022-12-30	2023-12-29
Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2022-12-27	2023-12-26
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software			e3 V9-210616c		

Remark:

1. Each piece of equipment is scheduled for calibration once a year.

2. N.C.R. = No Calibration Required.



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1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

Conducted_Sup_Units						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
NB(E)	Lenovo	T460	N/A	N/A	N/A	

Radiated_Sup_Units					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
NB(E)	Lenovo	IBM7663	N/A	N/A	N/A
Car Battery	YUASA	70B24R	N/A	N/A	N/A
DC Cable-1	N/A	N/A	N/A	N/A	N/A
Test Kitting	N/A	N/A	N/A	N/A	N/A

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

Test Mode:

Connect the fixture board to the NB, confirm the comport location from the device administrator, open the test software, set the test mode and transmit the signal.

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074 D01.



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2. TEST SUMMERY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	N/A
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(3)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Spurious Emission	Pass
15.247(d)	4.6	Radiation Band Edge	Pass
15.247(d)	4.6	Radiation Spurious Emission	Pass



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3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	BLE Mode (1Mbps) BLE Mode (2Mbps)	
Test Channel Frequencies	1.Lowest Channel : 2402MHz 2.Middle Channel : 2442MHz 3.Highest Channel : 2480MHz	

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.



3.2 THE WORST MODE OF MEASUREMENT

Ra	Radiated Emission Measurement Above 1G		
Test Condition	Radiated Emission Above 1G		
Power supply Mode	Mode 1: EUT Power by Car Battery		
Worst Mode	Mode 1		
Worst Position	 Placed in fixed position. Placed in fixed position at X-Plane (E2-Plane) 		

Radiated Emission Measurement Below 1G		
Test Condition Radiated Emission Below 1G		
Power supply Mode Mode 1: EUT Power by Car Battery		
Worst Mode Mode 1 Mode 2 Mode 3 Mode 4		

Remark:

1. The worst mode was record in this test report.

2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report



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3.3 EUT DUTY CYCLE

perature: idity:	26.3℃ 59% RH		Test date: Tested by:	November 6, 2023 Marco Chan	
		Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
BLE 1	М	63.20	1.99	2.53	3.00
BLE 2	M	32.80	4.84	4.88	5.00



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BLE_1M_LowCH00-2402



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4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range	Limits(dBµV)		
(MHz)	Quasi-peak	Average	
0.15 to 0.50	66 to 56*	56 to 46*	
0.50 to 5	56	46	
5 to 30	60	50	

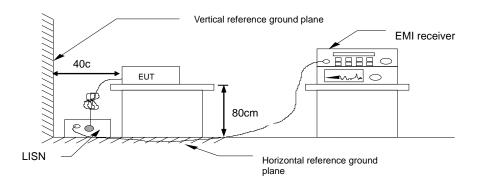
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

- 1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
- 2. EUT connected to the line impedance stabilization network (LISN)
- 3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Not applicable, because EUT not connect to AC Main Source direct..



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4.26dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2)

6 dB Bandwidth :

Limit

Shall be at least 500kHz

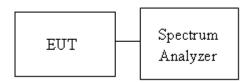
Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 and ANSI C63.10: 2013 clause 6.9.2.

- 1. The EUT RF output connected to the spectrum analyzer by RF cable.
- 2. Setting maximum power transmit of EUT
- 3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth and 99% Bandwidth.
- 4. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup





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4.2.4 Test Result

Temperature:	26.3 ℃	Test date:	November 6, 2023
Humidity:	59% RH	Tested by:	Marco Chan

BLE 1M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	0.7109	≧ 0.5	PASS
2440	0.7037	≧ 0.5	PASS
2480	0.6697	≧ 0.5	PASS

BLE 2M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	1.139	\ge 0.5	PASS
2440	1.133	≧ 0.5	PASS
2480	1.132	≧ 0.5	PASS

BLE 1M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0403
2440	1.0427
2480	1.0435

BLE 2M mode

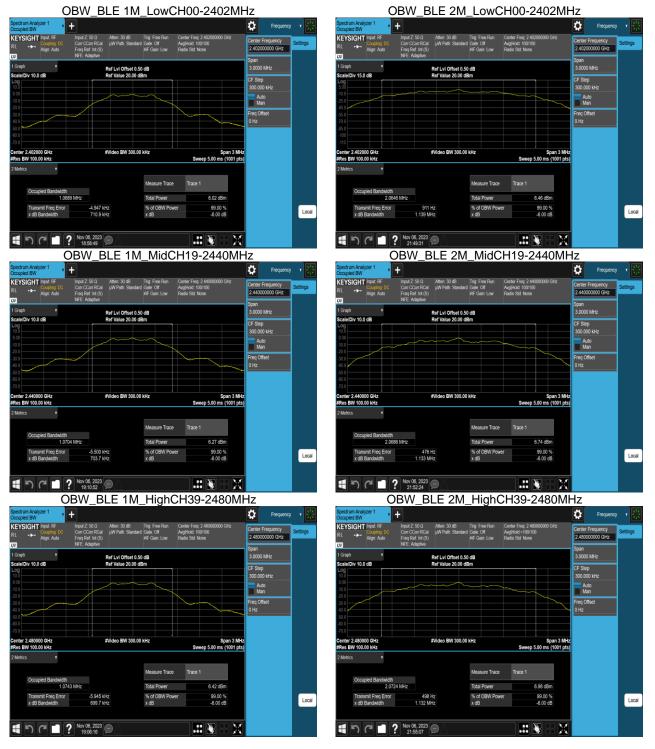
Frequency (MHz)	99%Bandwidth (MHz)
2402	2.0645
2440	2.0683
2480	2.0732



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Test Data (6dB BANDWIDTH)

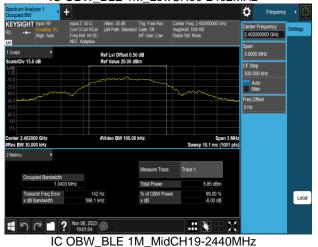




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Test Data (BANDWIDTH 99%)

IC OBW_BLE 1M_LowCH00-2402MHz





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? Nov 06, 2023

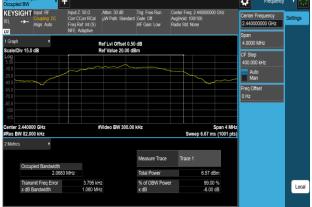
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M









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4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(3)

Peak output power :

FCC

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

 Antenna not exceed 6 dBi : 30dBm Antenna with DG greater than 6 dBi
[Limit = 30 – (DG – 6)]

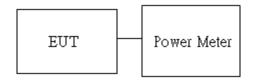
Average output power : For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01

- 1. The EUT RF output connected to the power meter by RF cable.
- 2. Setting maximum power transmit of EUT.
- 3. The path loss was compensated to the results for each measurement.
- 4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup





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4.3.4 Test Result

Temperature:	26.3 ℃	Test date:	November 6, 2023		
Humidity:	59% RH	Tested by:	Marco Chan		

Peak & Average output power :

BLE 1M mode:

СН	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)		
Low	2402	default	-0.51	30		
Mid	2440	default	-0.35	30		
High	2480	default	-0.38	30		
СН	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)		
Low	2402	default	-0.67	30		
Mid	2440	default	-0.36	30		
High	2480	default	-0.40	30		

*Note:

1.Measured by power meter, cable loss 0.5 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.



BLE 2M mode:

СН	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	2402	default	-0.16	30
Mid	2440	default	0.01	30
High	2480	default	-0.14	30
СН	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	2402	default	-0.17	30
Mid	2440	default	-0.02	30
High	2480	default	-0.15	30

*Note:

1.Measured by power meter, cable loss 0.5 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.



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4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

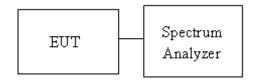
Limit	Antenna not exceed 6 dBi : 8dBm Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] Point-to-point operation :	
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4.4.2 Test Procedure

Test method Refer as KDB 558074 D01

- 1. The EUT RF output connected to the spectrum analyzer by RF cable.
- 2. Setting maximum power transmit of EUT
- 3. SA set RBW = 3kHz, VBW = 30kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
- 4. The path loss was compensated to the results for each measurement by SA.
- 5. Mark the maximum level.
- 6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup





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4.4.4 Test Result

Temperature:	26.3 ℃	Test date:	November 6, 2023		
Humidity:	59% RH	Tested by:	Marco Chan		

BLE 1M mode

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-15.92	8	PASS
2440	-15.87	8	PASS
2480	-15.75	8	PASS

*Note:

1.cable loss as 0.5dB that offsets in the spectrum

BLE 2M mode

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-18.53	8	PASS
2440	-18.25	8	PASS
2480	-18.06	8	PASS

*Note:

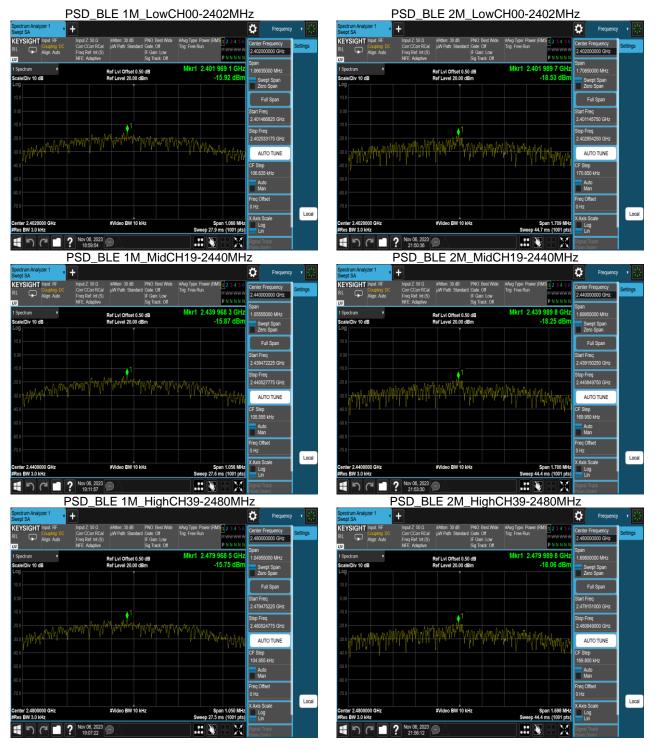
1.cable loss as 0.5dB that offsets in the spectrum



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<u>Test Data</u>



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4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d)

FCC: In any 100 kHz bandwidth outside the authorized frequency band,

Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement 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).

4.5.2 Test Procedure

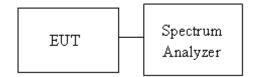
Test method Refer as KDB 558074 D01

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

4.5.3 Test Setup



4.5.4 Test Result

Temperature:	26.3 ℃	Test date:	November 6, 2023
Humidity:	59% RH	Tested by:	Marco Chan

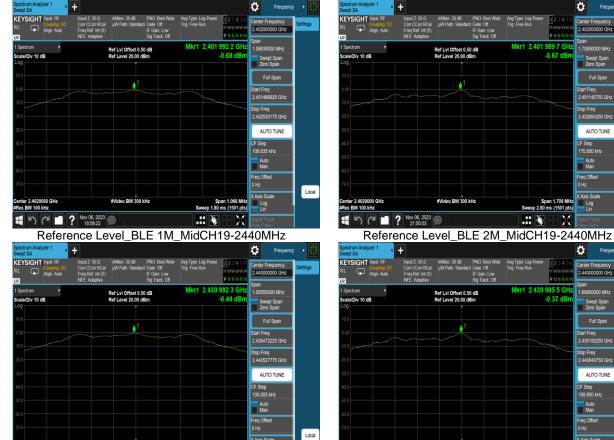


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Test Data

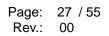
Reference Level_BLE 1M_LowCH00-2402MHz



(Axis Scale Log Lin #Video BW 300 kHz Span 1.056 1.80 ms (1501 Nov 06, 2023 .: 💦 う ペ 🗖 ? X

Reference Level_BLE 1M_HighCH39-2480MHz

1.01010			i ngitot i	00 -		
Spectrum Analyzer 1 Swept SA	+				Frequency	· • 😤
KEYSIGHT Input: RF RL Align: Auto	Input Z: 50 Ω #Atten: 30 dB Corr CCorr RCal µW Path: Stand Freq Ref: Int (S) NFE: Adaptive	PNO: Best Wide ard Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Power Trig: Free Run	123456 MWWWWW PNNNNN	Center Frequency 2.480000000 GHz Span	Settings
1 Spectrum Scale/Div 10 dB Log	Ref Lvi Offset 0 Ref Level 20.00		Mkr1 2.479	992 3 GHz -0.28 dBm	1.04955000 MHz Swept Span Zero Span	
0.00	1				Full Span Start Freq 2.479475225 GHz	
					2.479475225 GHz Stop Freq 2.480524775 GHz	
					AUTO TUNE	
					104.955 kHz Auto Man	
					Freq Offset 0 Hz	
Center 2.4800000 GHz #Res BW 100 kHz	#Video BW 30) kHz		oan 1.050 MHz ms (1501 pts)	X Axis Scale Log Lin	Local
1997	? Nov 06, 2023				Signal Track	



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1.700 Span 1.700 2.90 ms (1501

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Reference Level_BLE 2M_LowCH00-2402MHz

#Video BW 300 kHz

#Video BW 300 kHz

Reference Level_BLE 2M_HighCH39-2480MHz

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Nov 06, 2023 21:55:40

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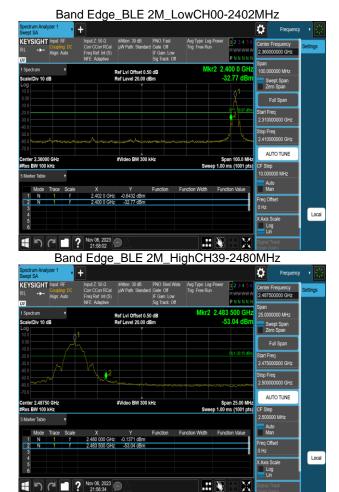
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Band Edge_BLE 1M_LowCH00-2402MHz



Band Edge_BLE 1M_HighCH39-2480MHz

Spectrum Analyzer 1 Swept SA	+					Frequency	
RL + Align: Auto	Input Z: 50 Ω Corr CCorr RCal Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB µW Path: Standa	PNO: Best Wide rd Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log- Trig: Free Run	Power 123456 MWWWWW PNNNNN	Center Frequency 2.487500000 GHz	Settings
1 Spectrum v Scale/Div 10 dB		tef Lvi Offset 0.1 tef Level 20.00 d		Mkr2	2.483 500 GHz -54.77 dBm	Span 25.0000000 MHz Swept Span Zero Span	
10.0					QL1 -20.28 dBm	Full Span Start Freq	
30.0 -40.0 -50.0 -60.0	h 2		manamanantan			2.475000000 GHz Stop Freq 2.500000000 GHz	
-70.0 Center 2.48750 GHz #Res BW 100 kHz		#Video BW 300	kHz	Swee	Span 25.00 MHz p 1.00 ms (1001 pts)	AUTO TUNE CF Step	
5 Marker Table Mode Trace Scale	X	Y	Function Fu	unction Width	Function Value	2.500000 MHz Auto Man	
1 N 1 f 2 N 1 f 3 4	2.480 000 GHz 2.483 500 GHz	-0.2758 dBm -54.77 dBm				Freq Offset 0 Hz X Axis Scale	Lor
5 6	Nov 06, 2023					Log Lin Signal Track	







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Local

Axis So Log Lin

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Spurious Emission_BLE 1M_LowCH00-2402MHz

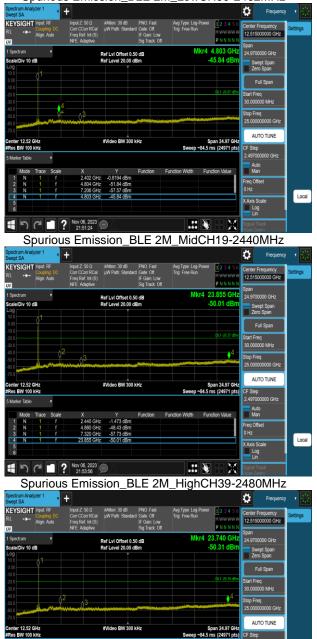


Spurious Emission_BLE 1M_MidCH19-2440MHz

Spect Swept	'um Anal : SA	lyzer 1	•	+								\$	Frequency	
RL	SIGH1	Coupli Aign: J			Corr RCal ef: Int (S)	#Atten: 30 dB µW Path: Stand	PNO: I lard Gate: I IF Gait Sig Tra	Diff 1: Low	Avg Type: Lo Trig: Free Ru		123456 M WWWW PNNNNN	12.515	requency 000000 GHz	Settings
1 Spe Scale	:trum /Div 10 (18	•			Ref LvI Offset (Ref Level 20.00			l		.881 GHz 8.18 dBm		0000 GHz	
Log 10.0							- CLEHIN						ept Span o Span	
0.00		¥.										F	uli Span	
-20.0 -30.0											DL1-20.44 dBm	Start Fre 30.000	eq DOO MHz	
-40.0 -50.0 -60.0			,	4	3					-		Stop Fre 25.000	4 000000 GHz	
-70.0 Cente	r 12.52	GHz				#Video BW 30	10 kHz			Sp	an 24.97 GHz		TO TUNE	
	BW 100	kHz							Sweep		s (24971 pts)	CF Step	00000 GHz	
5 Mari	ker Table		•									Aut		
	Mode	Trace	Scale		K		Functi	on Fu	nction Width	Fund	tion Value	Ma	n	
1	Ν				2.440 GHz	+0.7392 dBm						Freq Off	cot	
2	N		f		.880 GHz	-47.85 dBm						0 Hz	301	
3	N	1	1		.320 GHz	-58.25 dBr						UHZ		
4 5 6	N				.881 GHz	-48.18 dBm						X Axis S Loç Lin	,	Loca







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Nov 06, 2023



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4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)	
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300	
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30	
1.705-30 MHz	30	N/A	30	

Above 30 MHz

Frequency	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)				
(MHz)	Transmitters	Receivers			
30-88	100 (3 nW)	100 (3 nW)			
88-216	150 (6.8 nW)	150 (6.8 nW)			
216-960	200 (12 nW)	200 (12 nW)			
Above 960	500 (75 nW)	500 (75 nW)			

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.



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4.6.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 9KHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Remark:

 Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
 No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

- 3. The SA setting following :
 - (1) Below 1G : RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2) Above 1G :
 - (2.1) For Peak measurement : RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2.2) For Average measurement : RBW = 1MHz, VBW

If Duty Cycle \geq 98%, VBW=10Hz.

'If Duty Cycle < 98%, VBW=1/T.

4. Data result

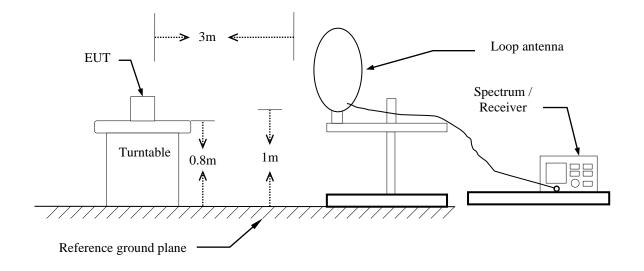
Actual FS=Spectrum Reading Level+Factor

Margin=Actual FS- Limit

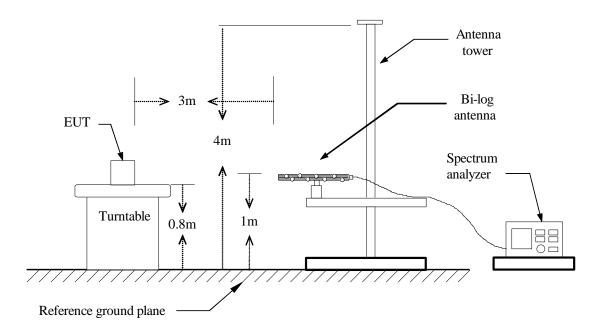


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4.6.3 Test Setup <u>9kHz ~ 30MHz</u>



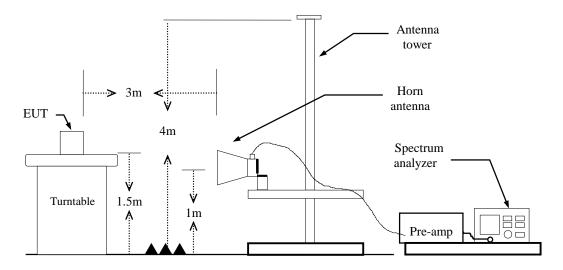
<u>30MHz ~ 1GHz</u>





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Above 1 GHz

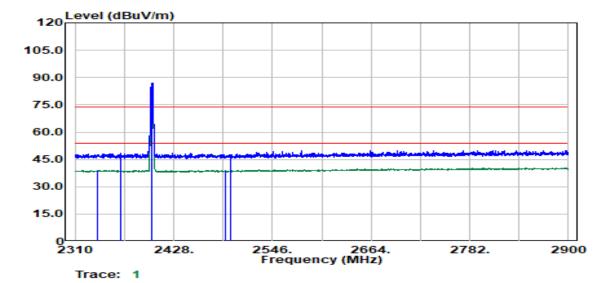




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4.6.4 Test Result

Band Edge Test Data



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBµV	Factor dB	Actual FS dBµV/m	Limit dBµV/m	Margin dB
		p.				
2337.26	Average	34.24	4.74	38.98	54.00	-15.02
2364.02	Peak	43.89	4.75	48.64	74.00	-25.36
2402.00	Peak	82.56	4.51	87.07		
2402.00	Average	81.29	4.51	85.81		
2490.33	Average	34.24	4.55	38.79	54.00	-15.21
2496.58	Peak	43.16	4.62	47.77	74.00	-26.23



Report No.:	FMWK230900	3479KR			Page: 35 / 55 Rev.: 00
Frequency	Operation Band:BLE 1MFrequency:2402 MHzOperation Mode:BandedgeEUT Pol:E2		Test Date Temp./Hu Antenna Engineer Test Cha	:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D	
120 Level (d	BuV/m)				
105.0					
90.0					
75.0					
60.0					
45.0		and a start strate and a strate st			
30.0					
15.0					
0 2310 Trace:	2428.	2546. Freque	2664. ncy (MHz)	2782.	2900
Freq	Detector	Spectrum	Factor	Actual	Limit Margin

	Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
	2338.01	Average	35.62	4.75	40.37	54.00	-13.63	
	2357.02	Peak	44.75	4.81	49.56	74.00	-24.44	
	2402.00	Peak	86.62	4.51	91.13			
	2402.00	Average	85.31	4.51	89.82			
	2516.59	Peak	43.70	4.74	48.44	74.00	-25.56	
	2530.09	Average	36.27	4.79	41.06	54.00	-12.94	

Dogg



2351.52

2355.52

2480.00

2480.00

2483.57

2483.57

Average

Peak

Peak

Average

Peak

Average

35.47

44.75

81.16

79.78

48.43

35.46

4.87

4.83

4.65

4.65

4.61

4.61

40.33

49.58

85.80

84.42

53.04

40.08

54.00

74.00

--

74.00

54.00

-13.67

-24.42

-20.96

-13.92

Report No.:	TMWK23090	03479KR			Pa(Re	ge: 36 / 55 ev.: 00
Project No.:TM-230900Operation Band:BLE 1MFrequency:2480 MHzOperation Mode:BandedgeEUT Pol:E2Setting:		Ζ	Test Date Temp./Humi. Antenna Pol. Engineer Test Chamber		:2023-′ :24.8/5 :VERT :Czerny : 966D	9 ICAL y Lin
120	el (dBuV/m)					
105.0						
90.0						_
75.0						
60.0						_
45.0						
30.0		ما				
15.0						_
0 2310 2428. Trace: 1		2546. Freque	2664. ncy (MHz)	278	2. :	2900
Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB



2351.77

2352.27

2480.00

2480.00

2483.57

2483.57

Average

Peak

Peak

Average

Peak

Average

37.39

46.09

85.62

84.34

49.31

37.33

4.86

4.86

4.65

4.65

4.61

4.61

42.25

50.95

90.26

88.98

53.92

41.94

54.00

74.00

--

74.00

54.00

-11.75

-23.05

-20.08

-12.06

Report No.:	T	MWK23090	03479KR						age: 37 / 55 Rev.: 00
Project No. Operation E Frequency Operation M EUT Pol Setting	Band	:TM-2309 :BLE 1M :2480 MH :Bandedg :E2 :	Z		Ter An En	st Date mp./Hu tenna gineer st Cha	umi. Pol.	:24.8/ :HOR	IZONTAL ny Lin
120	vel (dB	uV/m)							
105.0									
90.0									
75.0									_
60.0									
45.0		<u></u>							
30.0									
15.0									
0 231	0	2428.	254 Fre	6. equend	26(cy (MH)		27	B2.	2900
т	race:	1							
Freq.	C	Detector Mode	Spectru Read Le		Facto	r	Actual FS	Limit	Margin
MHz	P	K/QP/AV	dBµV		dB	C	lBµV/m	dBµV/m	n dB



2313.75

2351.02

2402.00

2402.00

2486.83

2490.58

Average

Peak

Peak

Average

Peak

Average

34.94

43.78

82.36

81.28

44.00

34.66

4.71

4.87

4.51

4.51

4.58

4.55

39.66

48.65

86.87

85.79

48.58

39.22

54.00

74.00

--

74.00

54.00

-14.34

-25.35

--

-25.42

-14.78

Report No.:	TMWK230900	03479KR			Pag Re	
Project No. Operation Ban Frequency Operation Mod EUT Pol Setting	:2402 MHz	1	Test D Temp./ Antenr Engine Test C	/Humi. na Pol.	:2023-1 :24.8/59 :VERTI :Czerny : 966D	9 CAL
120	(dBuV/m)					
105.0						_
90.0						
75.0						
60.0						_
45.0					ungen under ber under	
30.0						
15.0						_
0 2310	2428.	2546. Frequer	2664. 1cy (MHz)	278	2. 2	2900
Trac	e: 1					
Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB



Report No.: T	MWK230900	03479KR			Pa Re	ge: 39 / 55 ev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:TM-23090 :BLE 2M :2402 MHz :Bandedge :E2 :	1	Test Da Temp./I Antenn Engine Test Ch	Humi. a Pol. er	:2023- :24.8/5 :HORI2 :Czern : 966D	9 ZONTAL y Lin
120 Level (dl	BuV/m)					
105.0						
90.0						
75.0						_
60.0						
45.0		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
30.0						—
15.0						
0 2310 Trace:	2428. 1	2546. Freque	2664. ency (MHz)	2782	2.	2900
Freq.	Detector Mode	Spectrum Read Level	Factor	Actual	Limit	Margin

	Freq.	Mode	Read Level	Factor	FS	Limit	Margin	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
	2338.26	Average	35.73	4.75	40.49	54.00	-13.51	
	2346.52	Peak	43.83	4.84	48.67	74.00	-25.33	
	2402.00	Peak	86.09	4.51	90.60			
	2402.00	Average	85.00	4.51	89.51			
	2530.09	Peak	44.34	4.79	49.13	74.00	-24.87	
	2530.09	Average	36.43	4.79	41.22	54.00	-12.78	



Report No.:	TMWK23090	03479KR			Pa(Re	ge: 40 / 55 ev.: 00
Project No. Operation Bar Frequency Operation Mod EUT Pol Setting	:2480 MHz	2	Anten Engine	/Humi. na Pol.	:2023- :24.8/5 :VERT :Czern : 966D	9 ICAL y Lin
120 Level	(dBuV/m)					
105.0						
90.0						
75.0						
60.0						
45.0						
30.0		***				
15.0						_
0 2310 Trac	2428. ce: 1	2546. Freque	2664. ncy (MHz)	278	2.	2900
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB

	•	IVIOde	Read Level		FS		5	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
	2351.77	Peak	44.53	4.86	49.39	74.00	-24.61	
	2351.77	Average	36.01	4.86	40.87	54.00	-13.13	
	2480.00	Peak	81.39	4.65	86.04			
	2480.00	Average	80.21	4.65	84.86			
	2483.57	Peak	47.15	4.61	51.76	74.00	-22.24	
	2483.57	Average	35.85	4.61	40.46	54.00	-13.54	



Report No.:	T	MWK2309	003479KF	२					Page: Rev.:	41 / 55 00
Project No. Operation I Frequency Operation I EUT Pol Setting	Band	:TM-2309 :BLE 2M :2480 MH :Bandedg :E2 :	lz		Ter An En	st Date np./H tenna ginee st Cha	umi. Pol.	:24 :H(:C;	023-11-(4.8/59 ORIZOI zerny Li 66D	NTAL
120	evel (dE	BuV/m)								1
105.0										
90.0			-							
75.0										
60.0										
45.0		M, Maran Maran			and a second			-Laura-da		
30.0										
15.0										
0 231	I0 frace:	2428. 1		46. requen	260 cy (MH		278	32.	290] 00
Freq. MHz		Detector Mode K/QP/AV	Specti Read L dBu	evel	Facto dB		Actual FS BuV/m	Lim dBu\		/largin dB

	печ.	Mode	Read Level	i actor	FS		Margin	
_	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
	2351.27	Peak	45.37	4.87	50.23	74.00	-23.77	
	2351.77	Average	37.80	4.86	42.67	54.00	-11.33	
	2480.00	Peak	85.80	4.65	90.45			
	2480.00	Average	84.69	4.65	89.33			
	2483.57	Peak	51.38	4.61	55.99	74.00	-18.01	
	2483.57	Average	38.37	4.61	42.99	54.00	-11.01	

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Report No.:	TMWK2309003479KR		Page: 42 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mod EUT Pol Setting	:2402 MHz	Test Date Temp./Humi. Antenna Pol. Engineer Test Chamber	:2023-11-16 :24.4/63 :VERTICAL :Czerny Lin : 966D
120 Level	(dBuV/m)		
105.0			
90.0			
75.0			
60.0			
45.0			
30.0	A	an and descent of set open set of the set of	
15.0			
0 30	224. 418. Freque	612. 806 ency (MHz)	. 1000

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
37.08	Peak	43.57	-13.76	29.81	40.00	-10.19
55.90	Peak	39.55	-12.61	26.94	40.00	-13.06
129.23	Peak	49.60	-14.62	34.99	43.50	-8.51
311.98	Peak	37.01	-11.92	25.09	46.00	-20.91
345.64	Peak	36.09	-11.18	24.91	46.00	-21.09
532.85	Peak	36.49	-6.85	29.64	46.00	-16.36



Report No.:	TMWK2309003479K	R		Page: 43 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2402 MHz	Temp./I Antenn Engine	Humi. a Pol.	:2023-11-16 :24.4/63 :HORIZONTAL :Czerny Lin : 966D
120 Level (d	BuV/m)			
105.0				
90.0				
75.0				
60.0				
45.0				
30.0	A			
15.0				
0 30		18. 612. requency (MHz)	806.	1000

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
55.90	Peak	34.20	-12.61	21.59	40.00	-18.41
130.40	Peak	44.69	-14.42	30.27	43.50	-13.23
301.50	Peak	35.93	-12.34	23.59	46.00	-22.41
375.22	Peak	36.10	-10.20	25.90	46.00	-20.10
531.01	Peak	35.70	-6.89	28.81	46.00	-17.19
633.63	Peak	32.41	-4.57	27.84	46.00	-18.16



Report No.:	FMWK230900347	9KR			Page: 44 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2402 MHz	3P	Test Date Temp./Humi. Antenna Pol. Engineer Test Chambe	:2 :V :C	023-11-09 4.8/59 ERTICAL zerny Lin 966D
120 Level (d	BuV/m)				
105.0					
90.0					
75.0					
60.0					
45.0					
30.0					
15.0					
0 1000	6100.	11200. Frequency	16300. (MHz)	21400.	26500
	Detector Sp	ectrum	Actu	ıal	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	47.26	0.38	47.65	74.00	-26.35
4804.00	Average	41.82	0.38	42.21	54.00	-11.79
7206.00	Peak	42.83	5.33	48.16	74.00	-25.84
7206.00	Average	33.16	5.33	38.49	54.00	-15.51

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Report No.: T	MWK2309003	3479KR			Page: 45 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2402 MHz :TX :E2 :	0413P	Test Date Temp./Hu Antenna I Engineer Test Chai	mi. Pol.	:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D
120	bu v/m)				
105.0					
90.0					
75.0					
60.0					
45.0					
30.0					
15.0					
0	6100.	11200. Frequenc	16300. cy (MHz)	21400.	26500

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBµV	Factor dB	Actual FS dBµV/m	Limit dBµV/m	Margin dB
4804.00	Peak	53.20	0.38	53.58	74.00	-20.42
4804.00	Average	47.06	0.38	47.44	54.00	-6.56
7206.00	Peak	41.27	5.33	46.59	74.00	-27.41
7206.00	Average	35.55	5.33	40.88	54.00	-13.12

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Report No.:	TMWK2309003479KI	۲		Page: 46 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2440 MHz	Temp Anter Engir	o./Humi. nna Pol.	:2023-11-09 :24.8/59 :VERTICAL :Czerny Lin : 966D
120 Level (d	iBuV/m)			
105.0				
90.0				
75.0				
60.0				
45.0				
30.0				
15.0				
0 1000		200. 16300 requency (MHz)). 21400.	26500
	Detector Spect	rum	Actual	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4880.00	Peak	45.70	0.48	46.18	74.00	-27.82
4880.00	Average	38.48	0.48	38.96	54.00	-15.04
7320.00	Peak	41.12	5.48	46.60	74.00	-27.40
7320.00	Average	33.24	5.48	38.73	54.00	-15.28

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Report No.:	Т	MWK230	09003	479KF	र					Page: Rev.:	47 / 55 00
Project No. Operation B Frequency Operation M EUT Pol Setting	lode	:2440 M :TX :E2 :	М)413P		Tei An En	st Date mp./Hu tenna I gineer st Char	mi. ² ol.	:2 :H :C	2023-11-(24.8/59 HORIZOI Czerny Li 966D	NTAL
120 Lev	el (dE	3uV/m)									1
105.0											
90.0											
75.0											
60.0											
45.0											
30.0											
15.0											
0 1000	0	6100).		200. requen	163 ncy (MH	300. z)	214	00.	265] 00
		Dotootor		Snaati				\ otu ol			

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4880.00	Peak	51.92	0.48	52.40	74.00	-21.60
4880.00	Average	45.10	0.48	45.59	54.00	-8.41
7320.00	Peak	44.00	5.48	49.48	74.00	-24.52
7320.00	Average	36.19	5.48	41.68	54.00	-12.32

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Report No.: T	MWK2309003479k	R		Page: 48 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2480 MHz	Ti A E	est Date emp./Humi. ntenna Pol. ngineer est Chamber	:2023-11-09 :24.8/59 :VERTICAL :Czerny Lin : 966D
120 Level (dl	BuV/m)			
105.0				
90.0				
75.0				
60.0				
45.0				
30.0				
15.0				
0 1000		200. 16 Frequency (M	3300. 2140 Hz)	00. 26500
	Detector Spec	trum	Actual	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	44.06	0.65	44.70	74.00	-29.30
4960.00	Average	36.88	0.65	37.53	54.00	-16.47
7440.00	Peak	40.88	5.56	46.44	74.00	-27.56
7440.00	Average	32.98	5.56	38.55	54.00	-15.46



Report No.: T	MWK2309003	479KR			Page: 49 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:TM-2309000 :BLE 1M :2480 MHz :TX :E2 :)413P	Test Date Temp./Hu Antenna I Engineer Test Cha	ımi. Pol.	:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D
120 Level (dl	BuV/m)				
105.0					
90.0					
75.0					
60.0					
45.0					
30.0					
15.0					
0	6100.	11200. Frequenc	16300. cy (MHz)	21400.	26500
Frog	Detector	Spectrum	Factor /	Actual	Limit Morgin

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59
7
27
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Report No.:	TI	MWK2309	9003479KF	R					Page: Rev.:	50 / 55 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting		:2402 MHz :TX :E2 :		Test Date Temp./Humi. Antenna Pol. Engineer Test Chamber			:2023-11-09 :24.8/59 :VERTICAL :Czerny Lin : 966D			
120 Lev	el (dE	3uV/m)								1
105.0										
90.0										
75.0										
60.0										
45.0										
30.0										
15.0										
1000)	6100.		00. requend	163 су (МН		214	00.	265] 00
	_	_	-							

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	49.24	0.38	49.63	74.00	-24.37
4804.00	Average	42.99	0.38	43.37	54.00	-10.63
7206.00	Peak	43.31	5.33	48.64	74.00	-25.36
7206.00	Average	34.12	5.33	39.45	54.00	-14.55

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Report No.: 7	MWK23090034	79KR			Page: 51 / 55 Rev.: 00					
Operation Band	:2402 MHz	413P	Test Date Temp./Humi. Antenna Pol. Engineer Test Chamber		:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D					
120 Level (d	120 Level (dBuV/m)									
105.0										
90.0										
75.0										
60.0										
45.0										
30.0										
15.0										
0	6100.	11200. Frequency	16300. / (MHz)	21400.	26500					

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4804.00	Peak	53.79	0.38	54.17	74.00	-19.83
4804.00	Average	47.81	0.38	48.19	54.00	-5.81
7206.00	Peak	45.38	5.33	50.70	74.00	-23.30
7206.00	Average	37.02	5.33	42.35	54.00	-11.65



Report No.: T	MWK2309003479KR			Page: 52 / 55 Rev.: 00		
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2440 MHz :TX :E2 :	Test Date Temp./He Antenna Engineer Test Cha	umi. Pol.	:2023-11-09 :24.8/59 :VERTICAL :Czerny Lin : 966D		
120 Level (dl	BuV/m)					
105.0						
90.0						
75.0						
60.0						
45.0						
30.0						
15.0						
0 1000	6100. 112 Fr	00. 16300. equency (MHz)	21400.	26500		
			A			

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4880.00	Peak	45.90	0.48	46.38	74.00	-27.62
4880.00	Average	37.34	0.48	37.83	54.00	-16.17
7320.00	Peak	41.06	5.48	46.55	74.00	-27.45
7320.00	Average	32.94	5.48	38.42	54.00	-15.58



Report No.:	TMWK2309003	479KR			Page: 53 / 55 Rev.: 00				
Project No. Operation Band Frequency Operation Mod EUT Pol Setting	:2440 MHz	0413P	Test Date Temp./Hu Antenna F Engineer Test Char	Pol.	:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D				
120 Level (dBuV/m)									
105.0									
90.0									
75.0									
60.0									
45.0									
30.0									
15.0									
0	6100.	11200. Frequenc	16300. у (MHz)	21400.	26500				

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4880.00 4880.00 7320.00 7320.00	Peak Average Peak Average	50.84 45.34 42.01 37.06	0.48 0.48 5.48 5.48	51.32 45.83 47.50 42.54	74.00 54.00 74.00 54.00	-22.68 -8.17 -26.50 -11.46



Report No.:	TMWK230900	3479KR			Page: 54 / 55 Rev.: 00
Project No. Operation Band Frequency Operation Mode EUT Pol Setting	:2480 MHz	00413P	Test Date Temp./Hu Antenna Engineer Test Cha	ımi. Pol.	:2023-11-09 :24.8/59 :Vertical :Czerny Lin : 966D
120 Lever (Buvillij				
105.0					
90.0					
75.0					
60.0					
45.0					
30.0					
15.0					
15.0					
0L 1000	6100.	11200. Frequen	16300. cy (MHz)	21400.	26500
	Detector	On a stream		A	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin	
 MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
4960.00	Peak	43.51	0.65	44.15	74.00	-29.85	
4960.00	Average	34.49	0.65	35.14	54.00	-18.86	
7440.00	Peak	42.13	5.56	47.69	74.00	-26.31	
7440.00	Average	32.92	5.56	38.48	54.00	-15.52	



Report No.: T	MWK23090034	79KR			Page: 55 / 55 Rev.: 00				
Operation Band	:2480 MHz	13P	Test Date Temp./Hur Antenna P Engineer Test Cham	ol.	:2023-11-09 :24.8/59 :HORIZONTAL :Czerny Lin : 966D				
120 Level (dBuV/m)									
105.0									
90.0									
75.0									
60.0									
45.0									
30.0									
15.0									
0	6100.	11200. Frequency	16300. (MHz)	21400.	26500				

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4960.00	Peak	48.09	0.65	48.73	74.00	-25.27
4960.00	Average	41.39	0.65	42.03	54.00	-11.97
7440.00	Peak	43.65	5.56	49.22	74.00	-24.78
7440.00	Average	35.47	5.56	41.03	54.00	-12.97