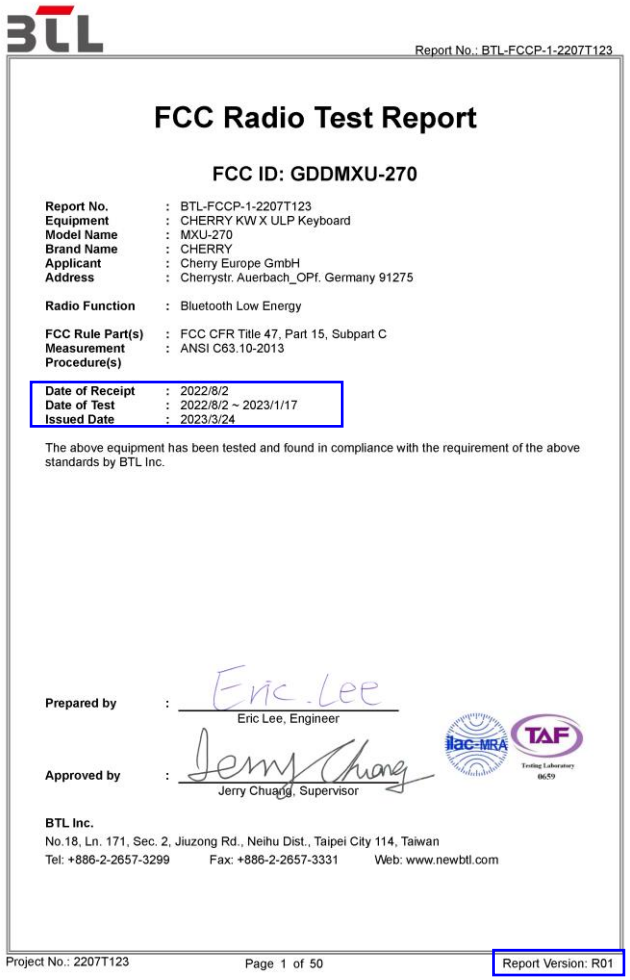
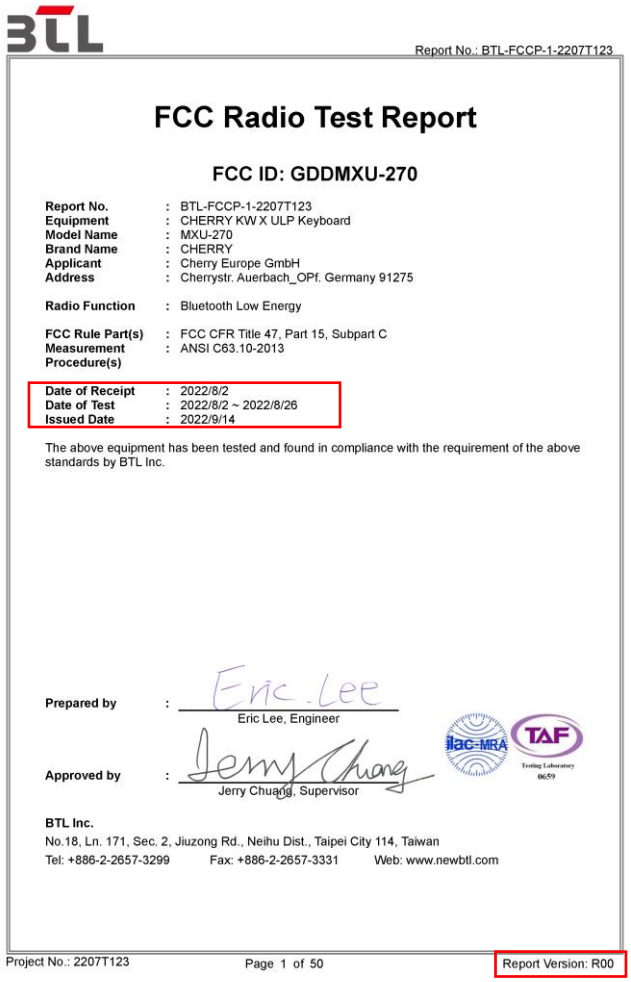
FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified	Original	Note
		On page 1, the **Date of Test** and **Issued Date** are updated, and the **Report Version** is updated to **R01** on every page due this modification.

Report No.: BTL-FCCP-1-2207T123

FCC Radio Test Report

FCC ID: GDDMXU-270

Report No. : BTL-FCCP-1-2207T123
Equipment : CHERRY KW X ULP Keyboard
Model Name : MXU-270
Brand Name : CHERRY
Applicant : Cherry Europe GmbH
Address : Cherrystr. Auerbach_OPf. Germany 91275

Radio Function : Bluetooth Low Energy

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C
Measurement Procedure(s) : ANSI C63.10-2013

Date of Receipt : 2022/8/2
Date of Test : 2022/8/2 ~ 2023/1/17
Issued Date : 2023/3/24

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by : Eric Lee, Engineer

Approved by : Jerry Chuang, Supervisor

BTL Inc.
No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan
Tel: +886-2-2657-3299 Fax: +886-2-2657-3331 Web: www.newbtl.com

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Report No.: BTL-FCCP-1-2207T123

FCC Radio Test Report

FCC ID: GDDMXU-270

Report No. : BTL-FCCP-1-2207T123
Equipment : CHERRY KW X ULP Keyboard
Model Name : MXU-270
Brand Name : CHERRY
Applicant : Cherry Europe GmbH
Address : Cherrystr. Auerbach_OPf. Germany 91275

Radio Function : Bluetooth Low Energy

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C
Measurement Procedure(s) : ANSI C63.10-2013

Date of Receipt : 2022/8/2
Date of Test : 2022/8/2 ~ 2022/8/26
Issued Date : 2022/9/14

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by : Eric Lee, Engineer

Approved by : Jerry Chuang, Supervisor

BTL Inc.
No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan
Tel: +886-2-2657-3299 Fax: +886-2-2657-3331 Web: www.newbtl.com

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FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified	Original	Note
Report No.: BTL-FCCP-1-2207T123 **REVISION HISTORY** Report No. | Version | Description | Issued Date | Note BTL-FCCP-1-2207T123 | R00 | Original Report. | 2022/9/14 | Invalid BTL-FCCP-1-2207T123 | R01 | Revised report to address TAF Audit's comments. | 2023/3/24 | Valid Project No.: 2207T123 Page 5 of 50 Report Version: R01	Report No.: BTL-FCCP-1-2207T123 **REVISION HISTORY** Report No. | Version | Description | Issued Date | Note BTL-FCCP-1-2207T123 | R00 | Original Report. | 2022/9/14 | Valid Project No.: 2207T123 Page 5 of 50 Report Version: R00	On page 5, in the **Report REVISION HISTORY**, a Version **R01** description is added due this modification.

FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified

Report No.: BTL-FCCP-1-2207T123

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.
☒ C05 ☐ CB08 ☐ CB11 ☐ CB15 ☐ CB16
☒ SR05

No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.
☐ C06 ☒ CB21 ☐ CB22

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**, where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k = 2**, providing a level of confidence of approximately **95 %**. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C05	CISPR	150 kHz ~ 30MHz	3.44

B. Radiated emissions test :

Test Site	Measurement Frequency Range	U,(dB)
CB21	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

C. Conducted test :

Test Item	U,(dB)
Occupied Bandwidth	0.5334
Output power	0.3669
Power Spectral Density	0.6591
Conducted Spurious emissions	0.5416
Conducted Band edges	0.5348

NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	21 °C, 51 %	AC 120V	Jay Tien
Radiated emissions below 1 GHz	23 °C, 59 %	DC 5V	Mark Wang
Radiated emissions above 1 GHz	28 °C, 62 %	DC 5V	Mark Wang
Bandwidth	23.9 °C, 56 %	DC 5V	Paul Shen
Output Power	23.9 °C, 56 %	DC 5V	Paul Shen
Power Spectral Density	23.9 °C, 56 %	DC 5V	Paul Shen
Antenna conducted Spurious Emission	23.9 °C, 56 %	DC 5V	Paul Shen

Project No.: 2207T123 Page 7 of 50 Report Version: R01

Original

Report No.: BTL-FCCP-1-2207T123

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.
☒ C05 ☐ CB08 ☐ CB11 ☐ CB15 ☐ CB16
☒ SR05

No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.
☐ C06 ☐ CB21 ☐ CB22

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**, where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k = 2**, providing a level of confidence of approximately **95 %**. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C05	CISPR	150 kHz ~ 30MHz	3.44

B. Radiated emissions test :

Test Site	Measurement Frequency Range	U,(dB)
CB21	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

C. Conducted test :

Test Item	U,(dB)
Occupied Bandwidth	0.5334
Output power	0.3669
Power Spectral Density	0.6591
Conducted Spurious emissions	0.5416
Conducted Band edges	0.5348

NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	21 °C, 51 %	AC 120V	Jay Tien
Radiated emissions below 1 GHz	28 °C, 62 %	DC 5V	Mark Wang
Radiated emissions above 1 GHz	28 °C, 62 %	DC 5V	Mark Wang
Bandwidth	23.9 °C, 56 %	DC 5V	Paul Shen
Output Power	23.9 °C, 56 %	DC 5V	Paul Shen
Power Spectral Density	23.9 °C, 56 %	DC 5V	Paul Shen
Antenna conducted Spurious Emission	23.9 °C, 56 %	DC 5V	Paul Shen

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Note

On page 7, the Environment Condition of Radiated Emission (below 1GHz) is updated due this modification.

FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified

BTL

Report No.: BTL-FCCP-1-2207T123

9 LIST OF MEASURING EQUIPMENTS

AC Power Line Conducted Emissions

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	TWO-LINE V-NETWORK	R&S	ENV216	101051	2022/6/15	2023/6/14
2	Test Cable	EMCI	EMCRG58-BM-BM-9000	210501	2022/5/2	2023/5/1
3	EMI Test Receiver	R&S	ESR 7	101433	2021/11/24	2022/11/23
4	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC330N	980850	2021/9/23 2022/9/19	2022/9/22 2023/9/18
2	Preamplifier	EMCI	EMC118A45SE	980819	2022/3/8	2023/3/7
3	Preamplifier	EMCI	EMC001340	980555	2022/4/6	2023/4/5
4	Test Cable	EMCI	EMC104-SM-SM-1000	220319	2022/3/15	2023/3/14
5	Test Cable	EMCI	EMC104-SM-SM-3000	220322	2022/3/15	2023/3/14
6	Test Cable	EMCI	EMC104-SM-SM-7000	220324	2022/3/15	2023/3/14
7	EXA Signal Analyzer	keysight	N9020A	MY57120120	2022/3/7	2023/3/6
8	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2022/6/16	2023/6/15
9	Horn Antenna	RFSPIN	DRH18-E	211202A18EN	2022/5/18	2023/5/17
10	Horn Ant	Schwarzbeck	BBHA 9170D	1136	2022/5/18	2023/5/17
11	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2022/5/20	2023/5/19
12	6dB Attenuator	EMCI	EMCI-N-6-06	AT-N0625	2022/5/20	2023/5/19
13	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A

Bandwidth

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2022/3/2	2023/3/1

Output Power

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2022/3/2	2023/3/1
2	Power Meter	Keysight	8990B	MY51000517	2022/3/18	2023/3/17
3	Power Sensor	Keysight	N1923A	MY58310005	2022/3/18	2023/3/17

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Original

BTL

Report No.: BTL-FCCP-1-2207T123

9 LIST OF MEASURING EQUIPMENTS

AC Power Line Conducted Emissions

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	TWO-LINE V-NETWORK	R&S	ENV216	101051	2022/6/15	2023/6/14
2	Test Cable	EMCI	EMCRG58-BM-BM-9000	210501	2022/5/2	2023/5/1
3	EMI Test Receiver	R&S	ESR 7	101433	2021/11/24	2022/11/23
4	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC330N	980850	2021/9/23	2022/9/22
2	Preamplifier	EMCI	EMC118A45SE	980819	2022/3/8	2023/3/7
3	Preamplifier	EMCI	EMC001340	980555	2022/4/6	2023/4/5
4	Test Cable	EMCI	EMC104-SM-SM-1000	220319	2022/3/15	2023/3/14
5	Test Cable	EMCI	EMC104-SM-SM-3000	220322	2022/3/15	2023/3/14
6	Test Cable	EMCI	EMC104-SM-SM-7000	220324	2022/3/15	2023/3/14
7	EXA Signal Analyzer	keysight	N9020A	MY57120120	2022/3/7	2023/3/6
8	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2022/6/16	2023/6/15
9	Horn Antenna	RFSPIN	DRH18-E	211202A18EN	2022/5/18	2023/5/17
10	Horn Ant	Schwarzbeck	BBHA 9170D	1136	2022/5/18	2023/5/17
11	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2022/5/20	2023/5/19
12	6dB Attenuator	EMCI	EMCI-N-6-06	AT-N0625	2022/5/20	2023/5/19
13	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A

Bandwidth

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2022/3/2	2023/3/1

Output Power

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2022/3/2	2023/3/1
2	Power Meter	Keysight	8990B	MY51000517	2022/3/18	2023/3/17
3	Power Sensor	Keysight	N1923A	MY58310005	2022/3/18	2023/3/17

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Note

On page 23, in **Radiated Emissions, Item 1**, the dates of **Calibrated Date** and **Calibrated Until** are updated due this modification.

FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified	Original	Note

Modified

Report No.: BTL-FCCP-1-2207T123

Test Mode	BLE (1 Mbps)	Test Date	2023/1/17
Test Frequency	2402MHz	Polarization	Vertical
Temp	23°C	Hum.	59%

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		41.1550	39.41	-11.78	27.63	40.00	-12.37	peak	
2		181.3523	47.09	-13.55	33.54	43.50	-9.96	peak	
3		350.3587	46.15	-10.35	35.80	46.00	-10.20	peak	
4	*	531.2637	48.36	-5.94	42.42	46.00	-3.58	peak	
5		714.6260	40.61	-2.50	38.11	46.00	-7.89	peak	
6		791.9997	36.72	-1.16	35.56	46.00	-10.44	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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Original

Report No.: BTL-FCCP-1-2207T123

Test Mode	BLE (1 Mbps)	Test Date	2022/8/18
Test Frequency	2402MHz	Polarization	Vertical
Temp	28°C	Hum.	62%

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		41.1550	39.41	-17.60	21.81	40.00	-18.19	peak	
2		181.3523	47.09	-20.11	26.98	43.50	-16.52	peak	
3		350.3587	46.15	-17.00	29.15	46.00	-16.85	peak	
4	*	531.2637	48.36	-12.62	35.74	46.00	-10.26	peak	
5		714.6260	40.61	-8.79	31.82	46.00	-14.18	peak	
6		791.9997	36.72	-7.14	29.58	46.00	-16.42	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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Note

On page 32, the test result is replaced with new test result which is applied with amended correct factors.

FCC ID: GDDMXU-270 DTS test report modification cross comparison chart

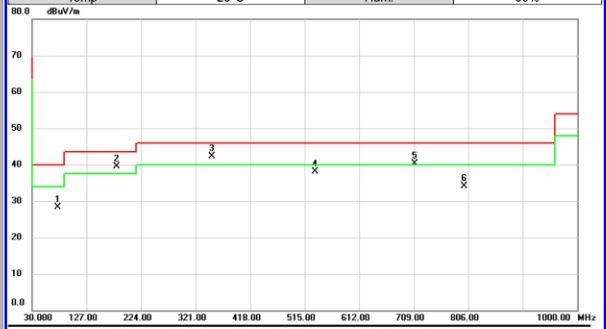
FCC ID	GDDMXU-270
Equipment Class	DTS
Radio Function	BLE
Report No.	BTL-FCCP-1-2207T123
Modified Page Number	1, 5, 7, 23, 32, 33; Total 6 pages.

Modified	Original	Note

Modified

Report No.: BTL-FCCP-1-2207T123

Test Mode	BLE (1 Mbps)	Test Date	2023/1/17
Test Frequency	2402MHz	Polarization	Horizontal
Temp	23°C	Hum.	59%



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure-ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		76.2367	43.96	-15.68	28.28	40.00	-11.72	peak	
2	!	180.7380	52.92	-13.48	39.44	43.50	-4.06	peak	
3	*	350.2940	52.60	-10.35	42.25	46.00	-3.75	peak	
4		533.2037	43.96	-5.91	38.05	46.00	-7.95	peak	
5	!	711.5543	42.92	-2.57	40.35	46.00	-5.65	peak	
6		799.3070	35.21	-1.09	34.12	46.00	-11.88	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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Original

Report No.: BTL-FCCP-1-2207T123

Test Mode	BLE (1 Mbps)	Test Date	2022/8/18
Test Frequency	2402MHz	Polarization	Horizontal
Temp	28°C	Hum.	62%

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure-ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		76.2367	43.96	-21.65	22.31	40.00	-17.69	peak	
2		180.7380	52.92	-20.04	32.88	43.50	-10.62	peak	
3	*	350.2940	52.60	-17.00	35.60	46.00	-10.40	peak	
4		533.2037	43.96	-12.57	31.39	46.00	-14.61	peak	
5		711.5543	42.92	-8.86	34.06	46.00	-11.94	peak	
6		799.3070	35.21	-7.02	28.19	46.00	-17.81	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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Note

On page 33, the test result is replaced with new test result which is applied with amended correct factors.