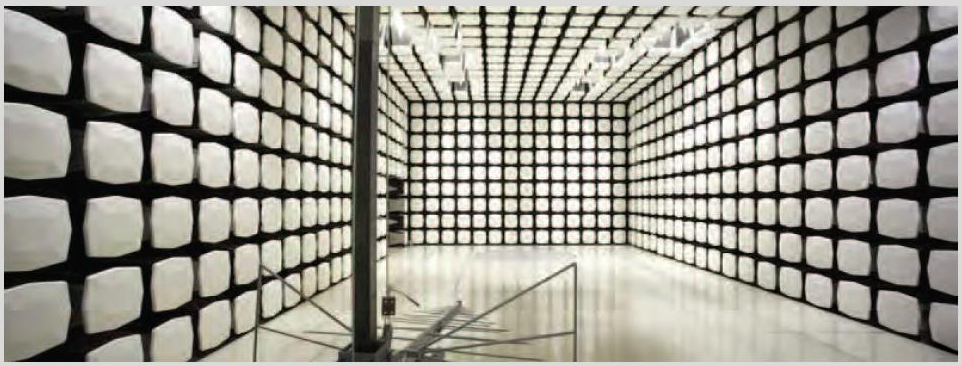
Paycom Software, Inc.

Microfence Model PCM-001B

FCC 15.247:2021

Bluetooth Low Energy (DTS) Radio

Report: PAYC0002.1, Issue Date: August 23, 2021



CERT #3310.03

CERTIFICATE OF TEST

Last Date of Test: July 15, 2021
Paycom Software, Inc.
EUT: Microfence Model PCM-001B

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2021	ANSI C63.10:2013, KDB 558074
FCC 15.247:2021	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	N/A	No Pass/Fail criteria. Verified.
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Adam Bruno, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

element
2021.02.26

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

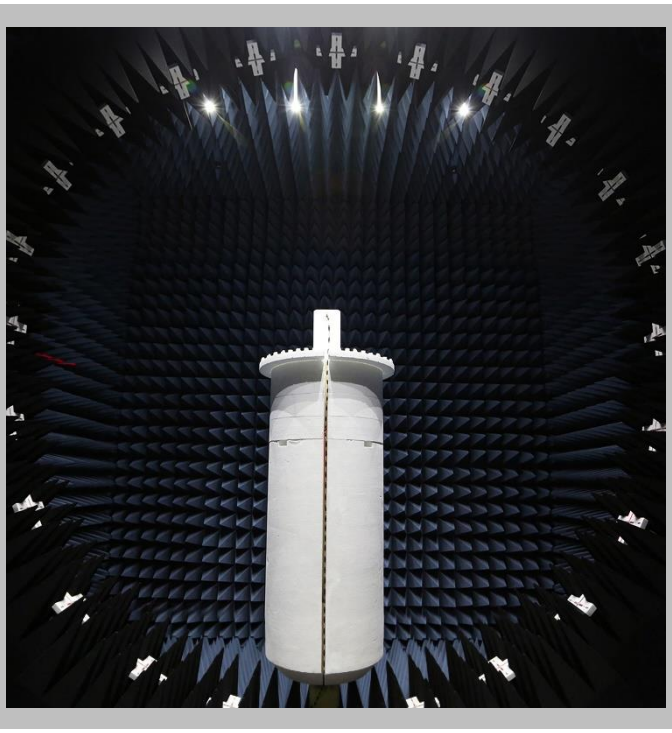
SCOPE

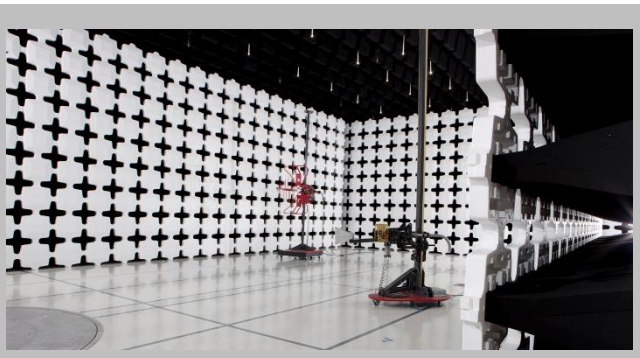
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

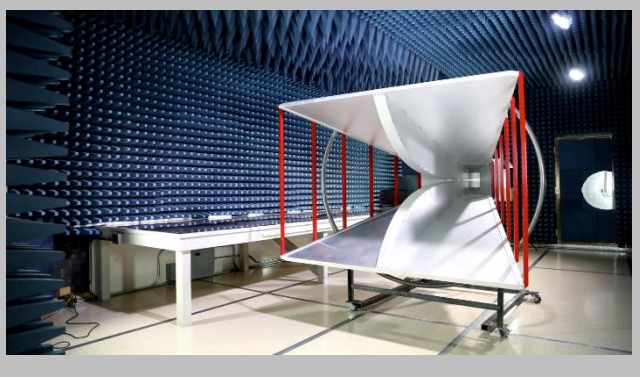
FACILITIES

element
2020.12.15

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

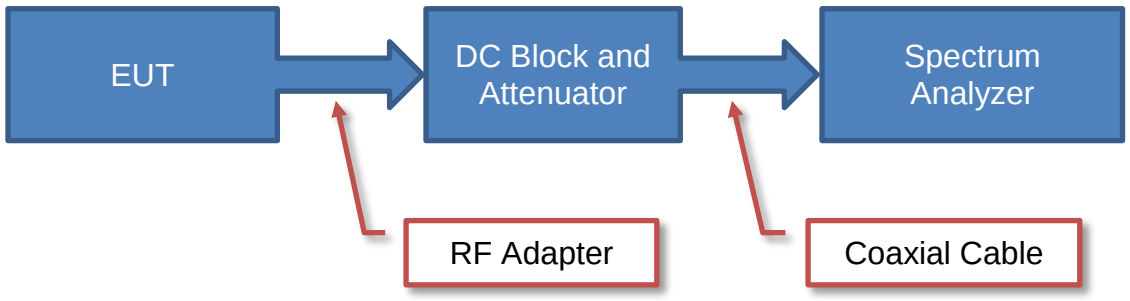
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

TEST SETUP BLOCK DIAGRAMS

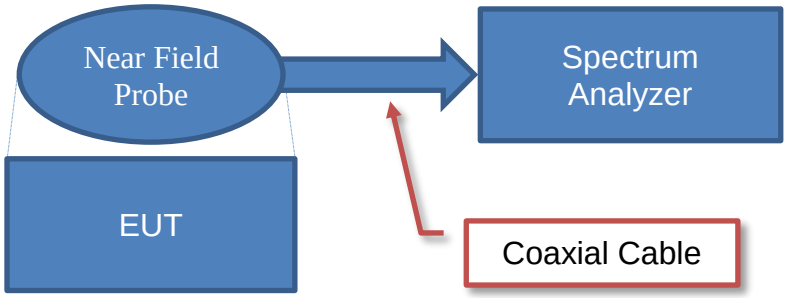
Antenna Port Conducted Measurements



Sample Calculation

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

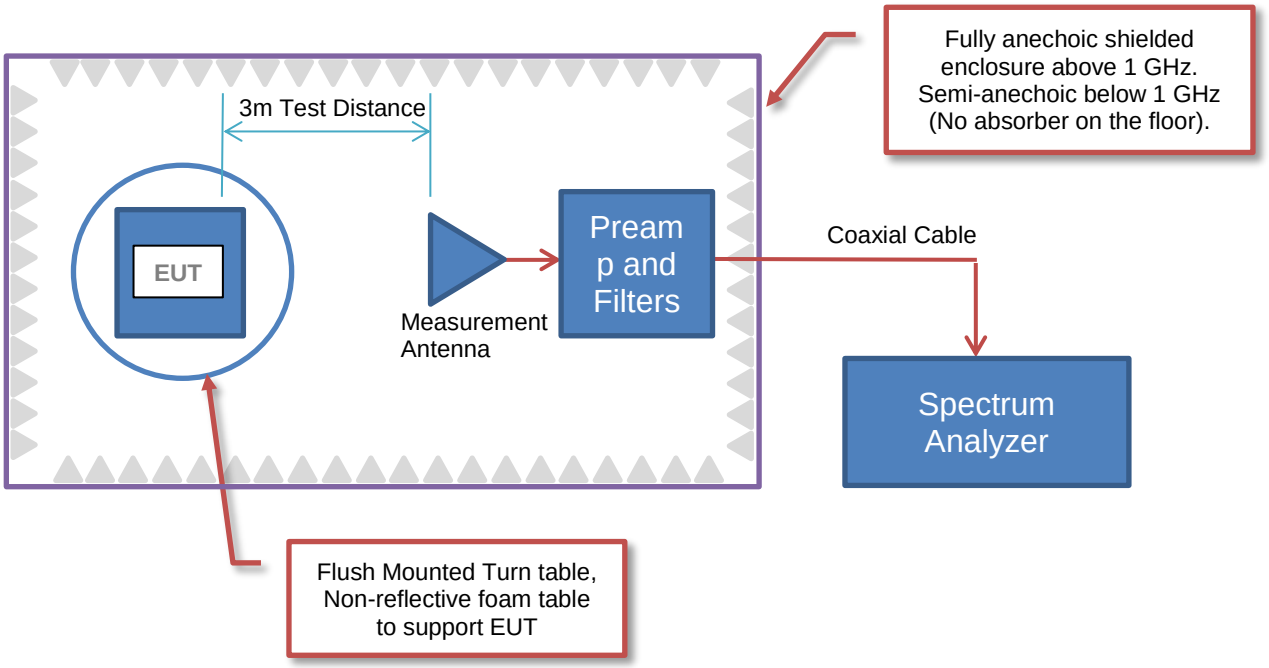


Sample Calculation

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

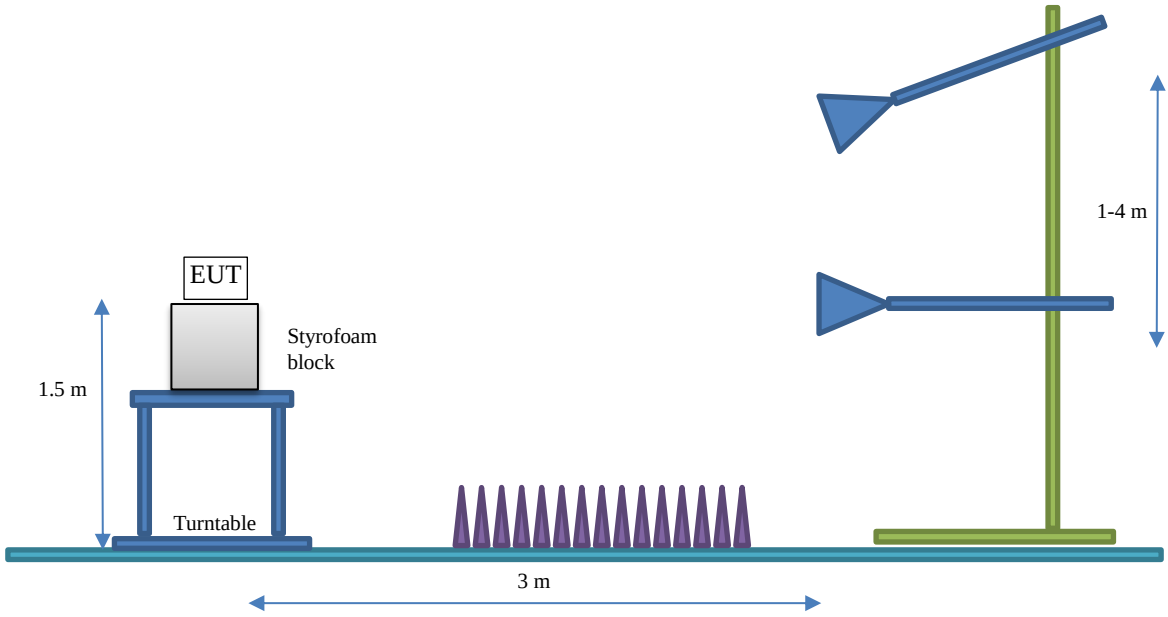
TEST SETUP BLOCK DIAGRAMS

Spurious Radiated Emissions



Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Paycom Software, Inc.
Address:	7501 W. Memorial Rd
City, State, Zip:	Oklahoma City, OK 73142
Test Requested By:	Dennis English
EUT:	Microfence Model PCM-001B
First Date of Test:	July 14, 2021
Last Date of Test:	July 15, 2021
Receipt Date of Samples:	July 14, 2021
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
This is BL product based on TI's CC2640R2F BLE radio chip. It also has a Real time clock. The RF section is a copy of the TI launchXL-CC2640R@ evaluation board.

Testing Objective:
To demonstrate compliance of the Bluetooth Low Energy (DTS) radio to FCC 15.247 requirements.

CONFIGURATIONS

Configuration PAYC0002- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Microfence Model PCM-001B	Paycom Software, Inc.	PMF-001B	1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Power Supply	Phihong USA Corporation	PSAA05A-05QL6	VL27005853A3

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	2.0m	No	EUT	USB Power Supply

Configuration PAYC0002- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Microfence Model PCM-001B	Paycom Software, Inc.	PMF-001B	2

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Power Supply	Phihong USA Corporation	PSAA05A-05QL6	VL27005853A3

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Coax Patch Cable	Yes	7.0cm	No	EUT	RF Test Cable
USB Cable	Yes	2.0m	No	EUT	USB Power Supply

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-07-14	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2021-07-14	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2021-07-14	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2021-07-14	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2021-07-14	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2021-07-14	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2021-07-14	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2021-07-14	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2021-07-15	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

ANTENNA GAIN (dBi)

Type	Provided by	Frequency Range (MHz)	Gain (dBi)
Inverted F Antenna	Texas Instruments	2402-2480	3.3

No adjustable power settings were provided. The EUT was tested using power settings pre-defined by the manufacturer.

AC POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
LISN	Solar Electronics	9252-50-R-24-BNC	LJK	2020-08-25	2021-08-25
Cable - Conducted Cable Assembly	Northwest EMC	TXA, HFC, TQU	TXAA	2021-01-26	2022-01-26
Receiver	Gauss	TDEMI 30M	ARL	2021-03-23	2022-03-23
Power Source/Analyzer	Hewlett Packard	6841A	THC	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.6 dB	-2.6 dB

CONFIGURATIONS INVESTIGATED

PAYC0002-1

MODES INVESTIGATED

BLE TX Continuous Mid Channel 2442 MHz

AC POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

EUT:	Microfence Model PCM-001B	Work Order:	PAYC0002
Serial Number:	2	Date:	2021-07-14
Customer:	Paycom Software, Inc.	Temperature:	20.9°C
Attendees:	Mike Pearson	Relative Humidity:	56.9%
Customer Project:	None	Bar. Pressure:	1025 mb
Tested By:	Brandon Hobbs	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	PAYC0002-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	3	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

None

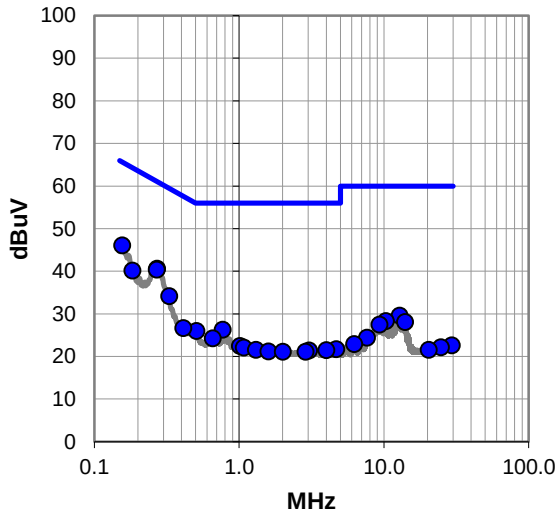
EUT OPERATING MODES

BLE Tx Continuous Mid Channel 2442 MHz

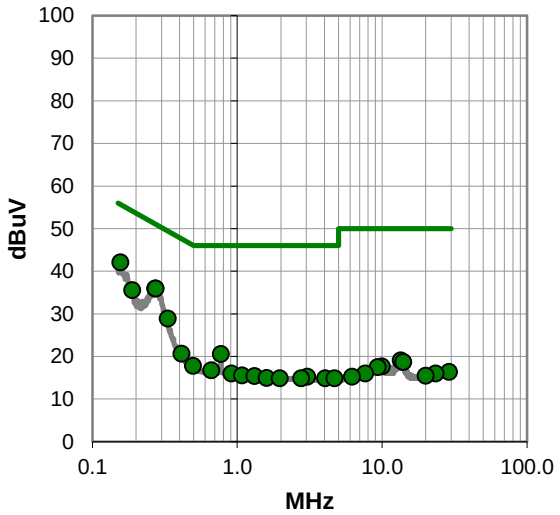
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	25.7	20.4	46.1	65.7	-19.6
0.272	20.2	20.4	40.6	61.1	-20.5
0.271	20.0	20.4	40.4	61.1	-20.7
0.184	19.8	20.4	40.2	64.3	-24.1
0.330	14.0	20.2	34.2	59.5	-25.3
0.769	6.1	20.2	26.3	56.0	-29.7
0.507	5.8	20.2	26.0	56.0	-30.0
12.814	8.6	21.0	29.6	60.0	-30.4
0.412	6.5	20.2	26.7	57.6	-30.9
0.658	4.1	20.2	24.3	56.0	-31.7
10.324	7.6	20.7	28.3	60.0	-31.7
14.017	7.0	21.1	28.1	60.0	-31.9
9.337	6.9	20.6	27.5	60.0	-32.5
1.017	2.3	20.2	22.5	56.0	-33.5
1.076	1.9	20.2	22.1	56.0	-33.9
4.689	1.4	20.3	21.7	56.0	-34.3
1.311	1.3	20.3	21.6	56.0	-34.4
4.000	1.2	20.3	21.5	56.0	-34.5
3.044	1.1	20.3	21.4	56.0	-34.6
1.596	0.9	20.3	21.2	56.0	-34.8
2.004	0.8	20.3	21.1	56.0	-34.9
2.875	0.8	20.3	21.1	56.0	-34.9
7.639	3.9	20.5	24.4	60.0	-35.6
6.249	2.5	20.4	22.9	60.0	-37.1
29.378	-0.1	22.7	22.6	60.0	-37.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	21.7	20.4	42.1	55.7	-13.6
0.271	15.6	20.4	36.0	51.1	-15.1
0.272	15.6	20.4	36.0	51.1	-15.1
0.188	15.2	20.4	35.6	54.1	-18.5
0.330	8.7	20.2	28.9	49.5	-20.6
0.769	0.4	20.2	20.6	46.0	-25.4
0.411	0.5	20.2	20.7	47.6	-26.9
0.495	-2.4	20.2	17.8	46.1	-28.3
0.660	-3.4	20.2	16.8	46.0	-29.2
0.910	-4.3	20.3	16.0	46.0	-30.0
1.076	-4.6	20.2	15.6	46.0	-30.4
1.311	-4.9	20.3	15.4	46.0	-30.6
3.041	-5.0	20.3	15.3	46.0	-30.7
13.402	-2.0	21.1	19.1	50.0	-30.9
1.596	-5.3	20.3	15.0	46.0	-31.0
1.961	-5.4	20.3	14.9	46.0	-31.1
2.761	-5.4	20.3	14.9	46.0	-31.1
4.047	-5.4	20.3	14.9	46.0	-31.1
4.691	-5.4	20.3	14.9	46.0	-31.1
14.020	-2.4	21.1	18.7	50.0	-31.3
9.972	-3.0	20.7	17.7	50.0	-32.3
9.331	-3.1	20.6	17.5	50.0	-32.5
28.936	-6.3	22.7	16.4	50.0	-33.6
7.636	-4.5	20.5	16.0	50.0	-34.0
23.435	-6.0	22.0	16.0	50.0	-34.0

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

EUT:	Microfence Model PCM-001B	Work Order:	PAYC0002
Serial Number:	2	Date:	2021-07-14
Customer:	Paycom Software, Inc.	Temperature:	20.9°C
Attendees:	Mike Pearson	Relative Humidity:	56.9%
Customer Project:	None	Bar. Pressure:	1025 mb
Tested By:	Brandon Hobbs	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	PAYC0002-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

None

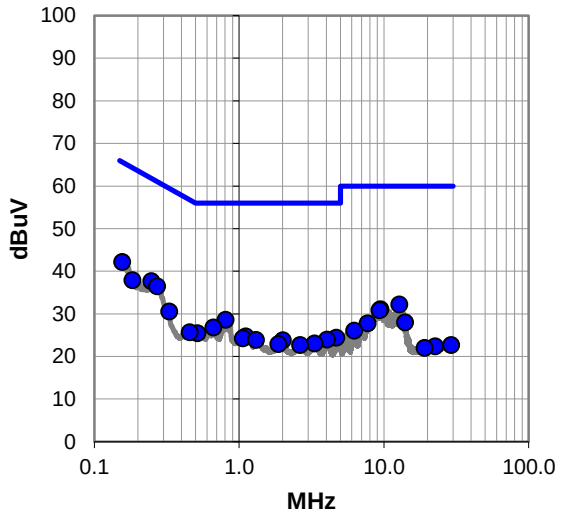
EUT OPERATING MODES

BLE Tx Continuous Mid Channel 2442 MHz

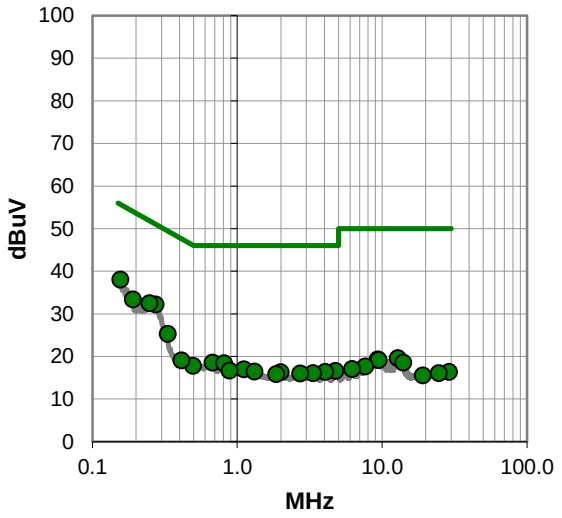
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.06.24.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	21.8	20.4	42.2	65.7	-23.5
0.248	17.3	20.4	37.7	61.8	-24.1
0.272	16.1	20.4	36.5	61.1	-24.6
0.184	17.5	20.4	37.9	64.3	-26.4
0.808	8.4	20.2	28.6	56.0	-27.4
12.810	11.2	21.0	32.2	60.0	-27.8
0.330	10.4	20.2	30.6	59.5	-28.9
9.445	10.5	20.6	31.1	60.0	-28.9
9.326	10.3	20.6	30.9	60.0	-29.1
0.664	6.6	20.2	26.8	56.0	-29.2
0.516	5.3	20.2	25.5	56.0	-30.5
0.457	5.5	20.2	25.7	56.8	-31.1
1.110	4.5	20.2	24.7	56.0	-31.3
4.695	4.1	20.3	24.4	56.0	-31.6
1.064	4.1	20.2	24.3	56.0	-31.7
4.050	3.7	20.3	24.0	56.0	-32.0
14.013	6.9	21.1	28.0	60.0	-32.0
1.311	3.6	20.3	23.9	56.0	-32.1
2.002	3.5	20.3	23.8	56.0	-32.2
7.712	7.3	20.5	27.8	60.0	-32.2
3.327	2.8	20.3	23.1	56.0	-32.9
1.868	2.6	20.3	22.9	56.0	-33.1
2.639	2.4	20.3	22.7	56.0	-33.3
6.250	5.7	20.4	26.1	60.0	-33.9
29.140	0.0	22.7	22.7	60.0	-37.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	17.7	20.4	38.1	55.7	-17.6
0.272	11.8	20.4	32.2	51.1	-18.9
0.248	12.1	20.4	32.5	51.8	-19.3
0.190	13.0	20.4	33.4	54.1	-20.7
0.330	5.1	20.2	25.3	49.5	-24.2
0.673	-1.6	20.2	18.6	46.0	-27.4
0.811	-1.8	20.2	18.4	46.0	-27.6
0.495	-2.4	20.2	17.8	46.1	-28.3
0.412	-1.1	20.2	19.1	47.6	-28.5
1.111	-3.2	20.2	17.0	46.0	-29.0
0.884	-3.6	20.3	16.7	46.0	-29.3
4.746	-3.7	20.3	16.6	46.0	-29.4
1.316	-3.8	20.3	16.5	46.0	-29.5
4.045	-3.9	20.3	16.4	46.0	-29.6
1.990	-4.0	20.3	16.3	46.0	-29.7
3.336	-4.2	20.3	16.1	46.0	-29.9
2.723	-4.3	20.3	16.0	46.0	-30.0
1.853	-4.4	20.3	15.9	46.0	-30.1
12.807	-1.4	21.0	19.6	50.0	-30.4
9.329	-1.3	20.6	19.3	50.0	-30.7
9.431	-1.4	20.6	19.2	50.0	-30.8
14.023	-2.5	21.1	18.6	50.0	-31.4
7.629	-2.8	20.5	17.7	50.0	-32.3
6.195	-3.3	20.4	17.1	50.0	-32.9
28.922	-6.3	22.7	16.4	50.0	-33.6

CONCLUSION

Pass

Tested By

DUTY CYCLE

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST DESCRIPTION

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle. This Duty Cycle was confirmed.

OCCUPIED BANDWIDTH

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**21.2 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**54.1% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**5 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

DEVIATIONS FROM TEST STANDARD

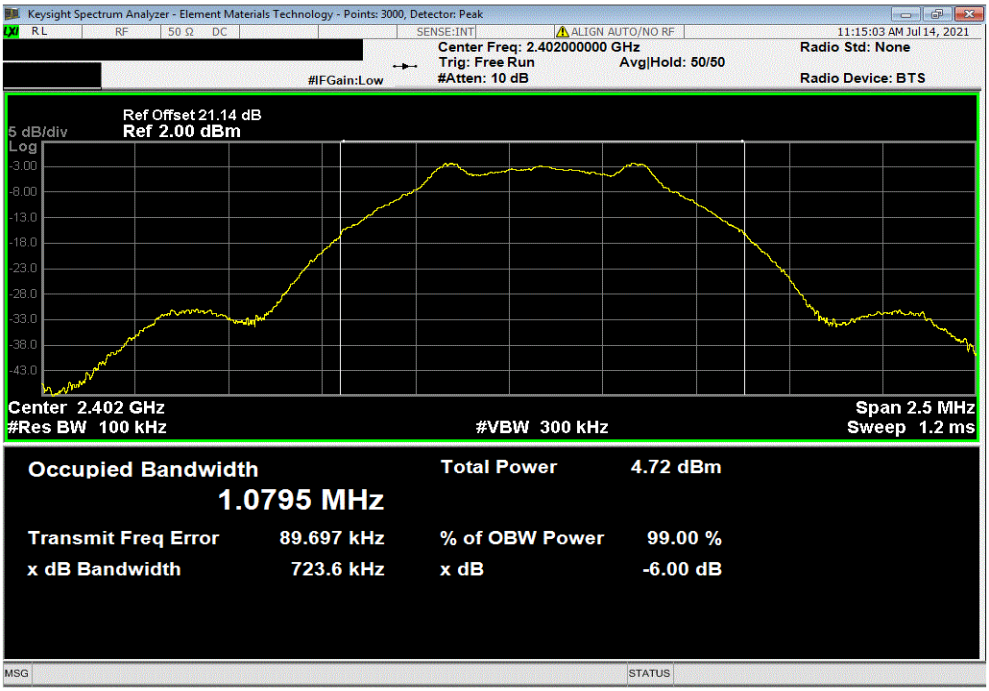
None

Configuration #	**2**	*Signature*

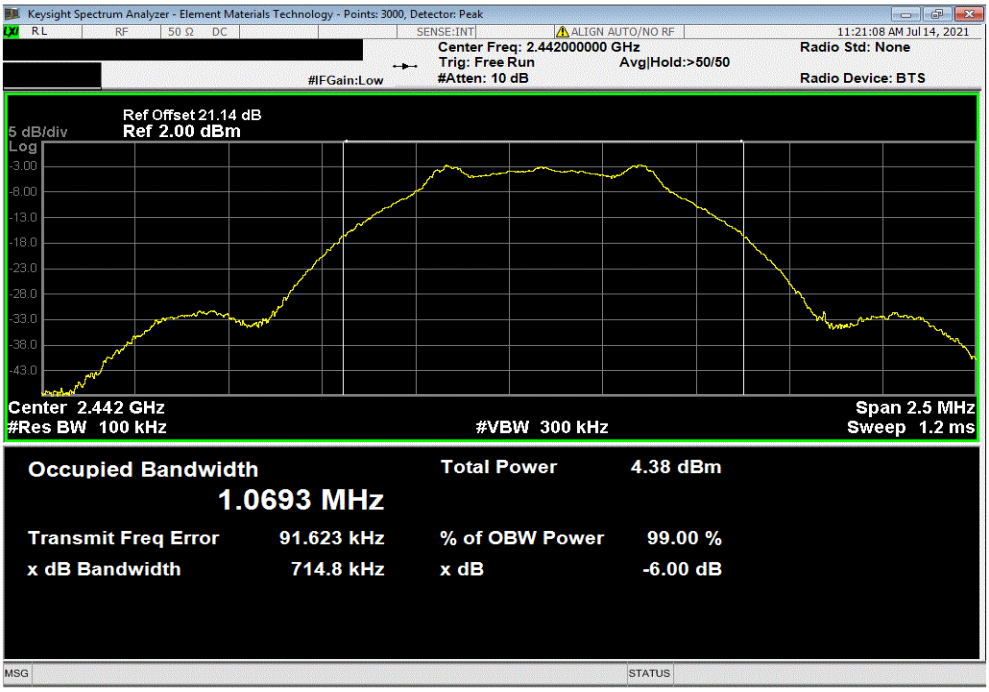
		Value	**Limit (≥)**	**Result**
BLE/GFSK				
	1Mbps Modulation			
	Low Channel, 2402 MHz	723.626 kHz	500 kHz	Pass
	Mid Channel, 2442 MHz	714.832 kHz	500 kHz	Pass
	High Channel, 2480 MHz	730.47 kHz	500 kHz	Pass

OCCUPIED BANDWIDTH

BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				723.626 kHz	500 kHz	Pass

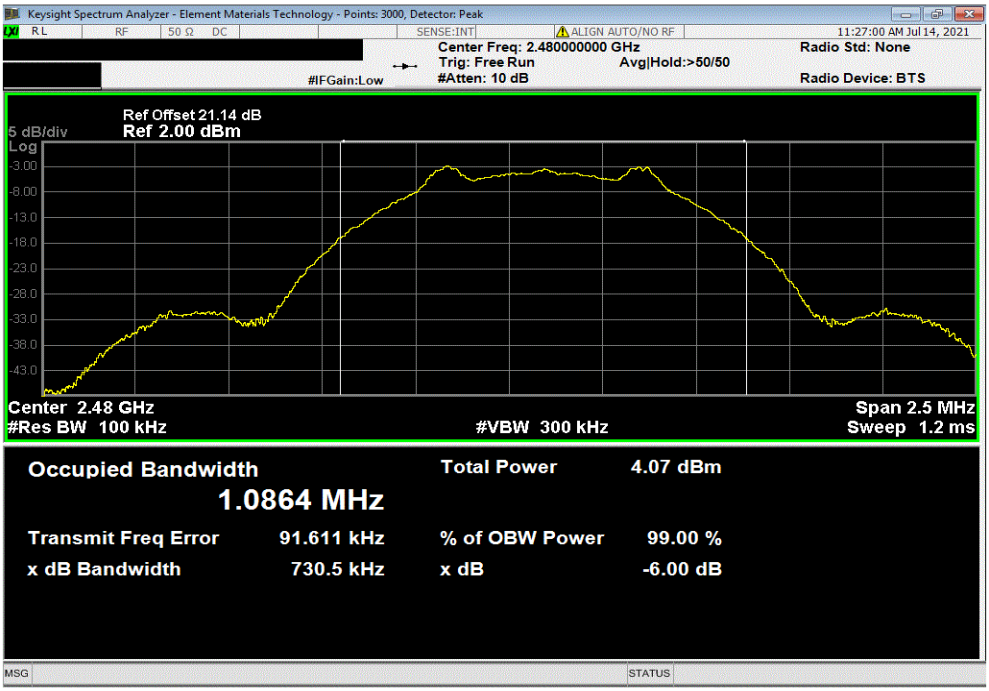


BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz						
				Value	Limit (≥)	Result
				714.832 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz							
					Value	Limit (≥)	Result
					730.47 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**20.9 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**54.6% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**110VAC/60Hz**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

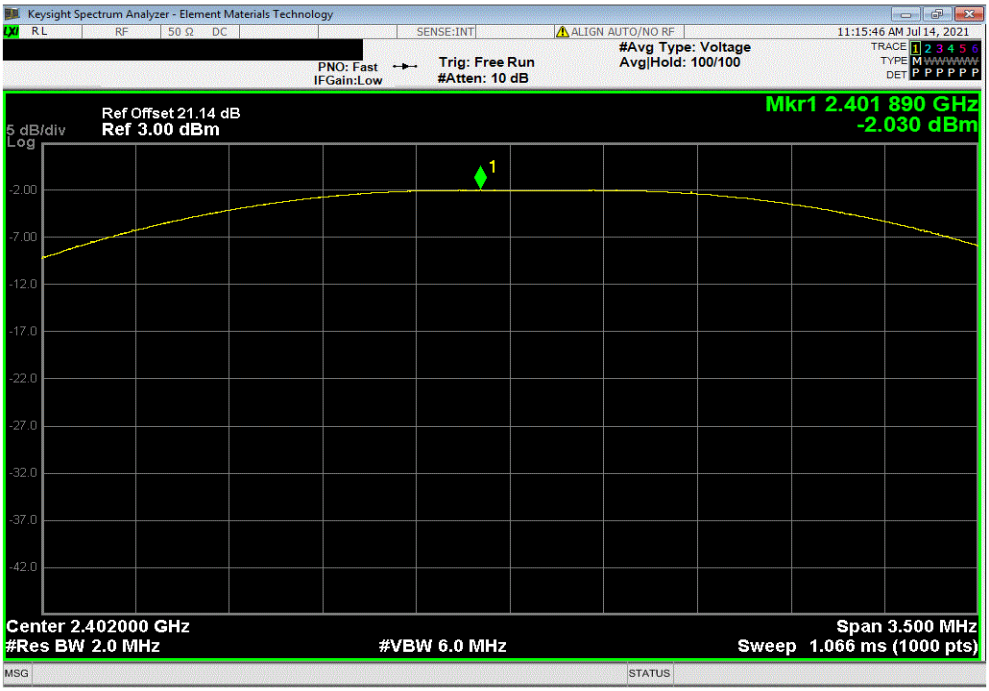
DEVIATIONS FROM TEST STANDARD

None

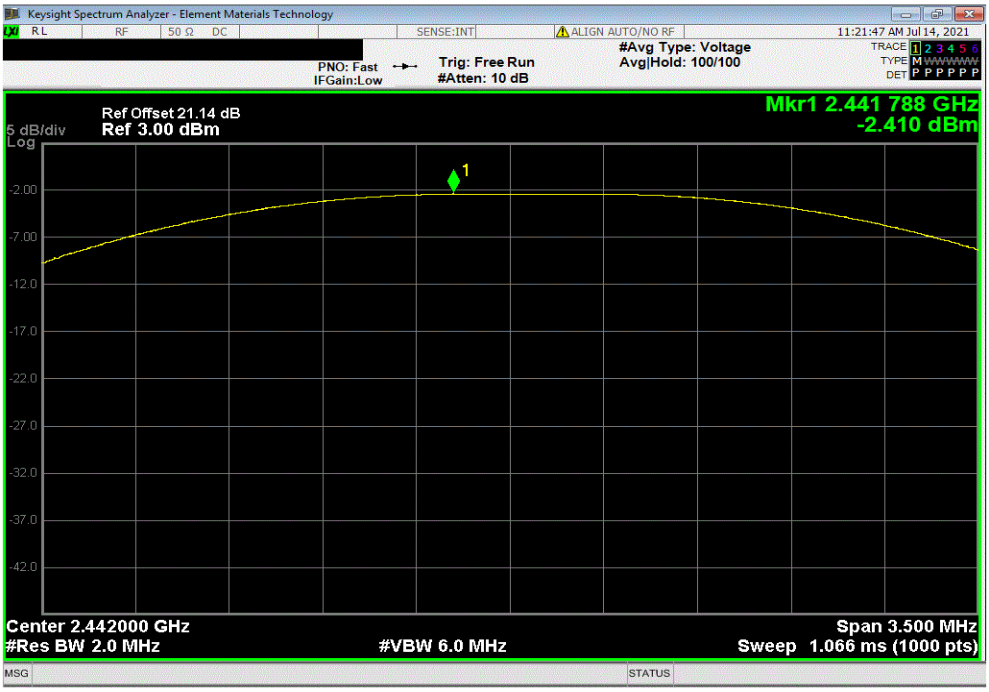
Configuration #	**2**	*Signature*

	Out Pwr (dBm)	**Limit (dBm)**	**Result**
BLE/GFSK			
1Mbps Modulation			
Low Channel, 2402 MHz	-2.03	30	Pass
Mid Channel, 2442 MHz	-2.41	30	Pass
High Channel, 2480 MHz	-2.765	30	Pass

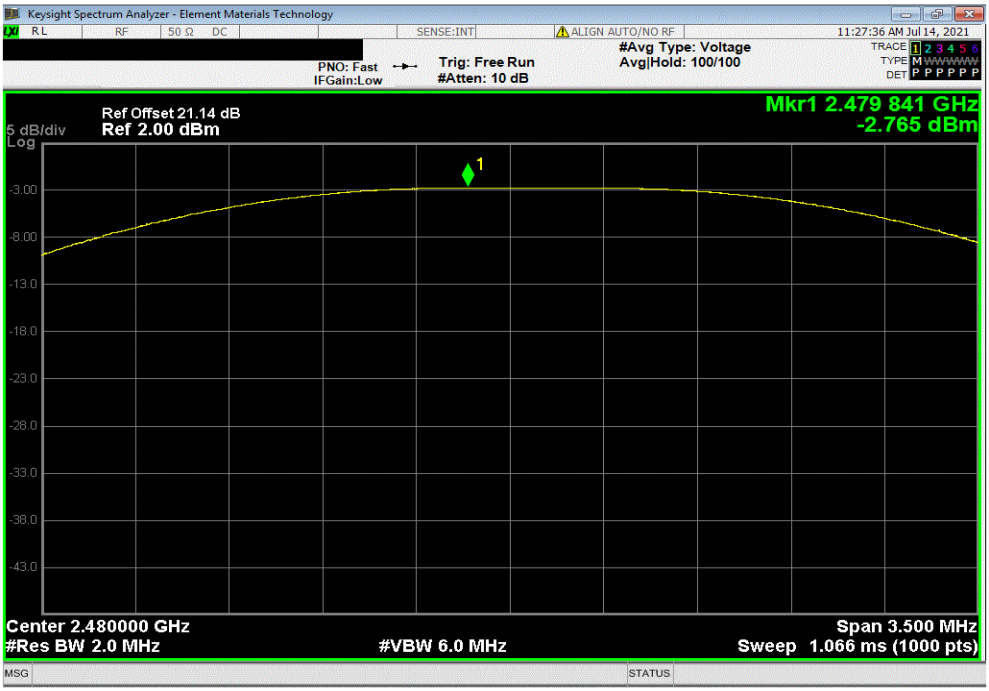
BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-2.03	30	Pass



BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-2.41	30	Pass



BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz							
					Out Pwr (dBm)	Limit (dBm)	Result
					-2.765	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**21.6 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**53.4% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**110VAC/60Hz**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

DEVIATIONS FROM TEST STANDARD

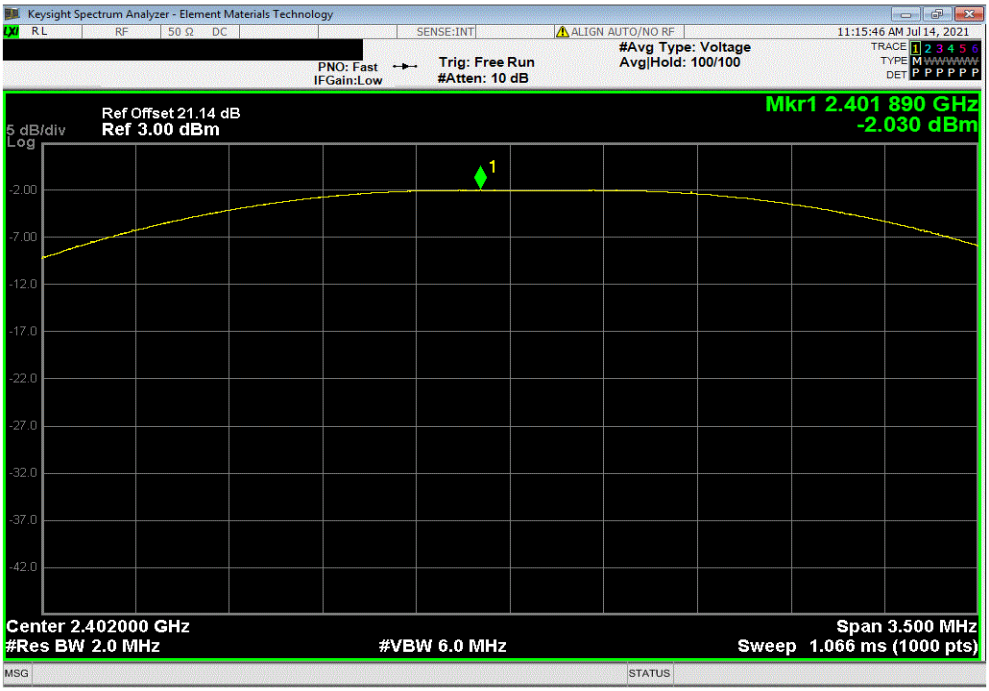
None

Configuration #	**2**	*Signature*

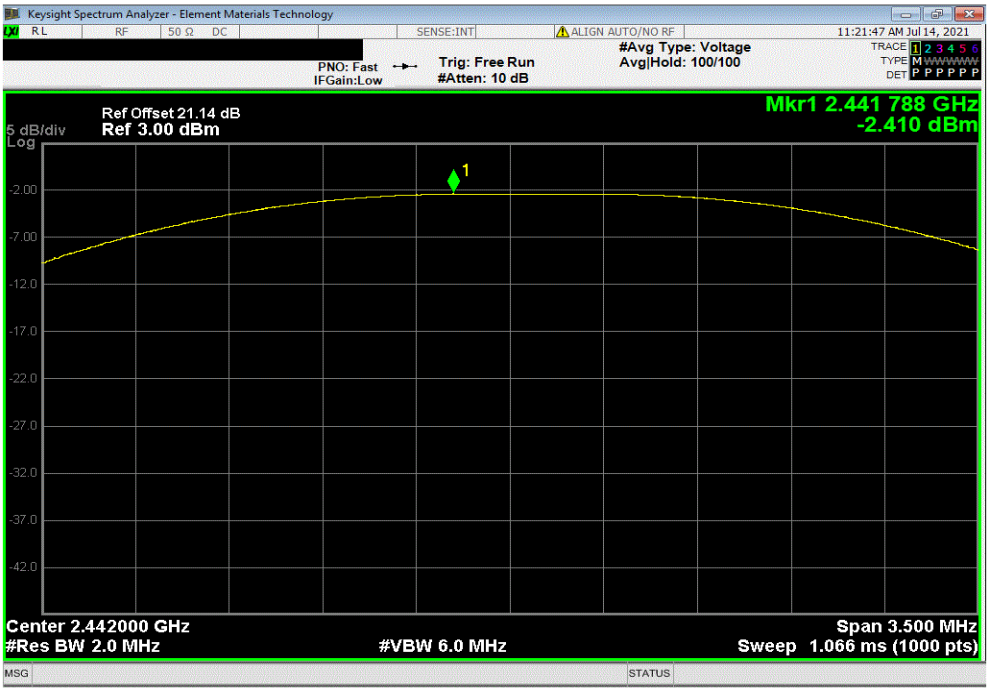
		Out Pwr (dBm)	**Antenna Gain (dBi)**	**EIRP (dBm)**	**EIRP Limit (dBm)**	**Result**
BLE/GFSK						
	1Mbps Modulation					
	Low Channel, 2402 MHz	-2.03	3.3	1.27	36	Pass
	Mid Channel, 2442 MHz	-2.41	3.3	0.89	36	Pass
	High Channel, 2480 MHz	-2.765	3.3	0.535	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-2.03	3.3	1.27	36	Pass

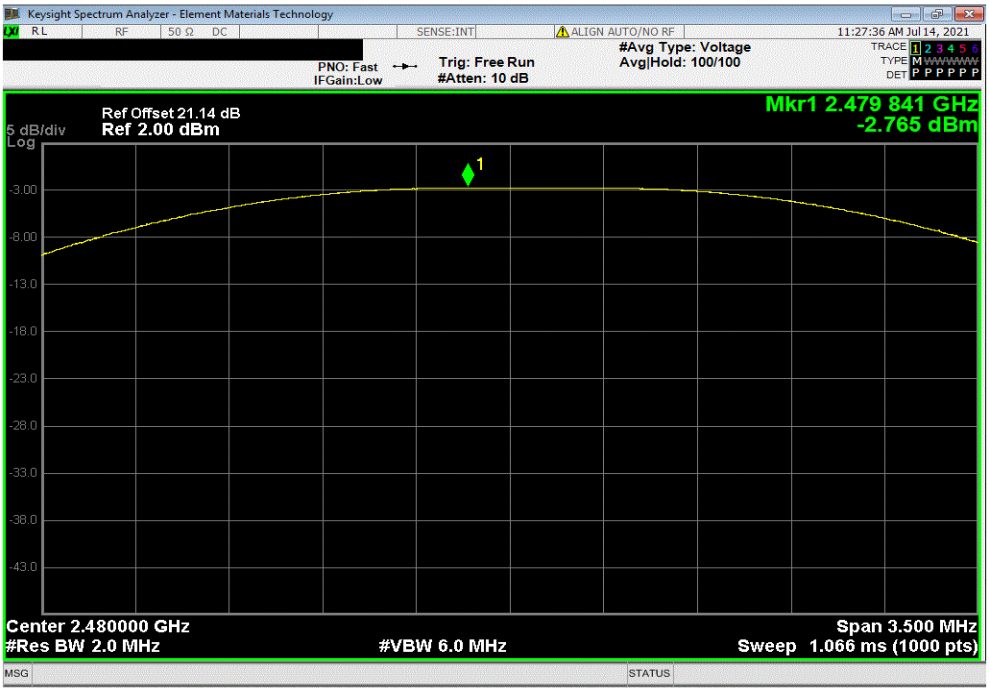


BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-2.41	3.3	0.89	36	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-2.765	3.3	0.535	36	Pass



POWER SPECTRAL DENSITY

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**20.8 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**55% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**110VAC/60Hz**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

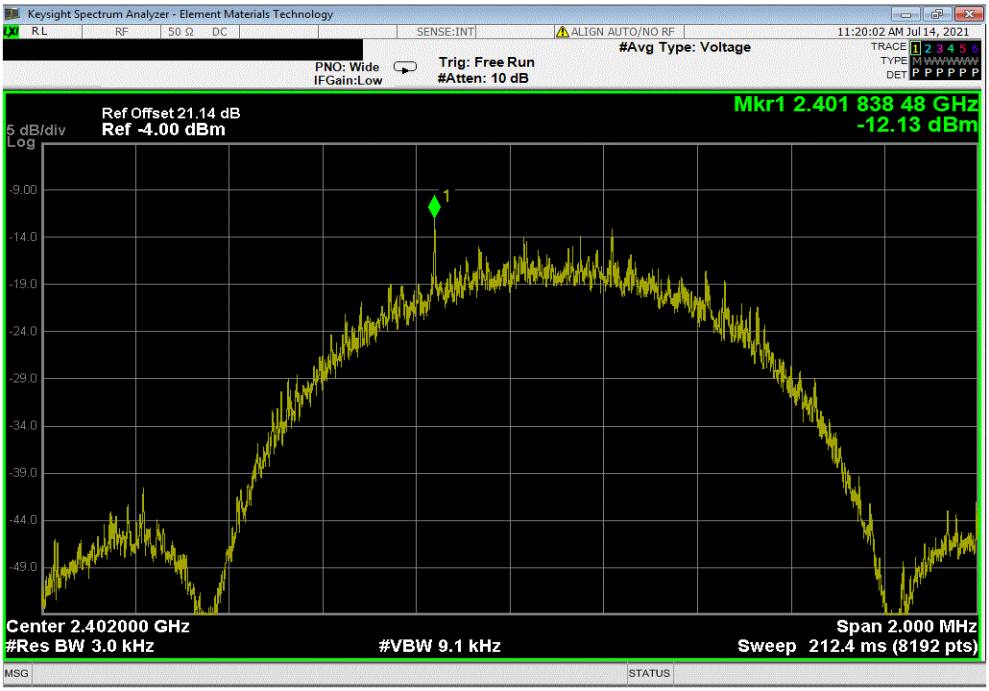
DEVIATIONS FROM TEST STANDARD

None

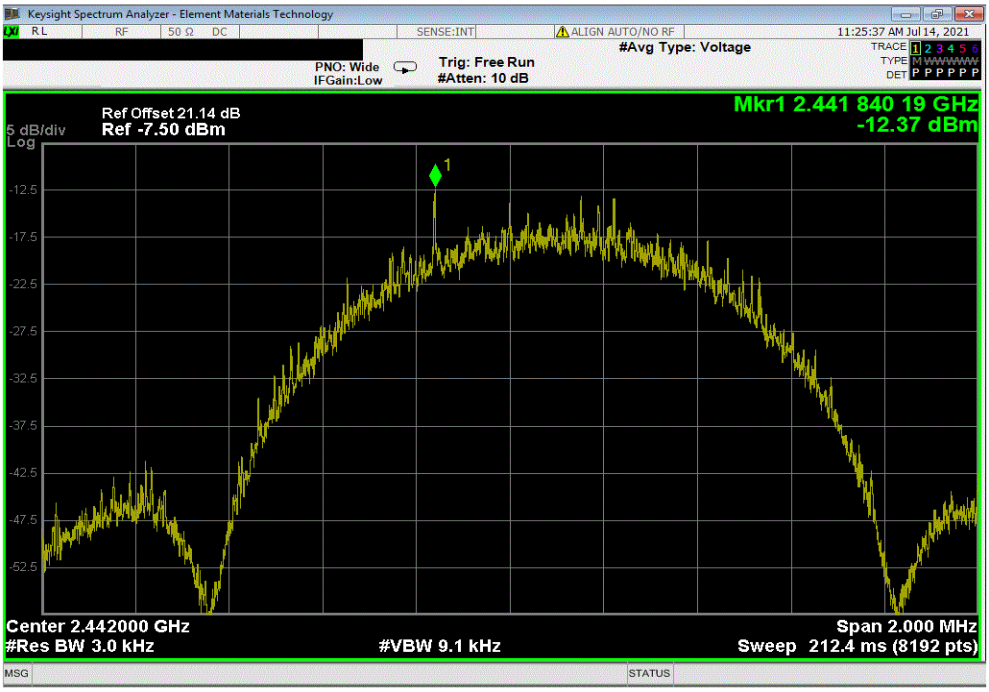
Configuration #	**2**	*Signature*

		Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
BLE/GFSK				
	1Mbps Modulation			
	Low Channel, 2402 MHz	-12.127	8	Pass
	Mid Channel, 2442 MHz	-12.374	8	Pass
	High Channel, 2480 MHz	-12.732	8	Pass

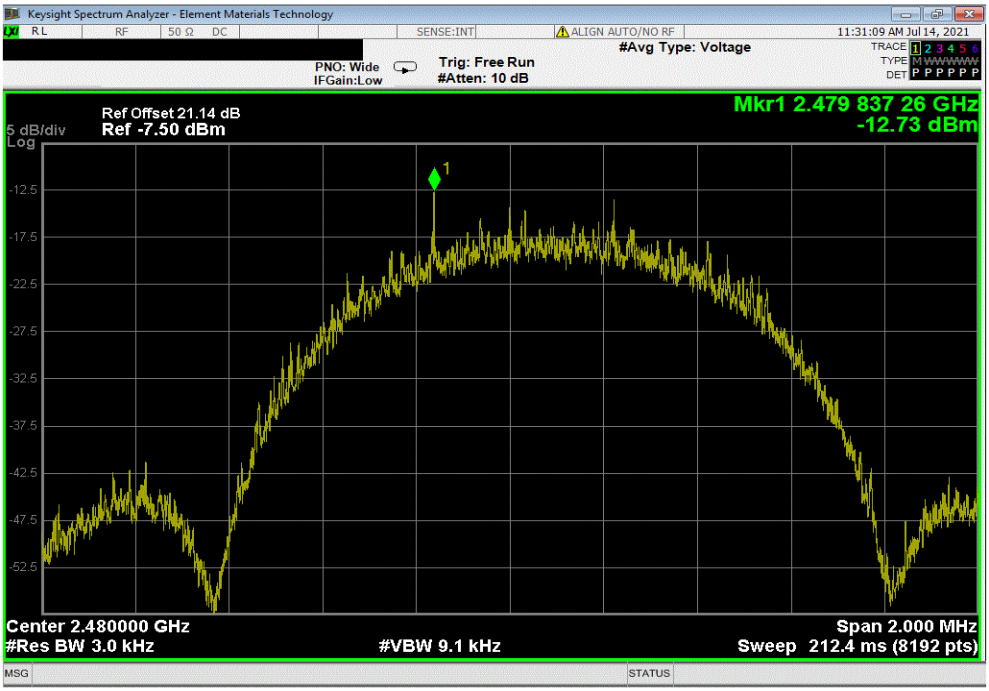
BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.127	8	Pass



BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.374	8	Pass



BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz							
					Value dBm/3kHz	Limit < dBm/3kHz	Results
					-12.732	8	Pass



BAND EDGE COMPLIANCE

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**20.9 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**54.4% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**110VAC/60Hz**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

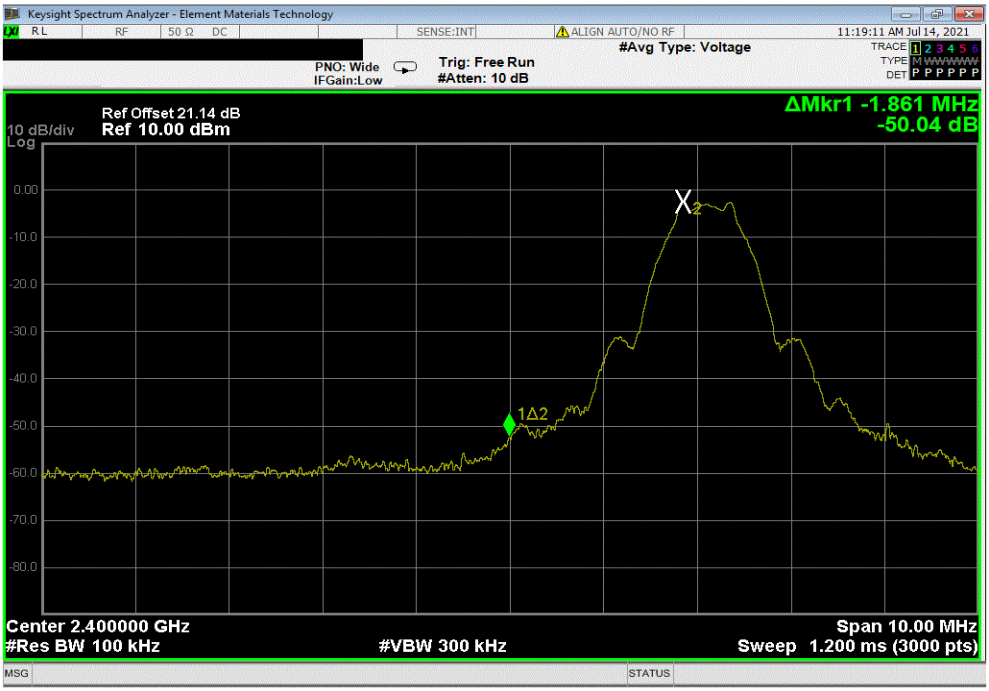
DEVIATIONS FROM TEST STANDARD

None

Configuration #	**2**	*Signature*

		Value (dBc)	**Limit ≤ (dBc)**	**Result**
BLE/GFSK				
	1Mbps Modulation			
	Low Channel, 2402 MHz	-50.04	-20	Pass
	High Channel, 2480 MHz	-54.78	-20	Pass

BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.04	-20	Pass



BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.78	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2020-09-22	2021-09-22
Attenuator	Fairview Microwave	SA4018-20	TYE	2020-09-18	2021-09-18

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	**Microfence Model PCM-001B**			**Work Order:**	**PAYC0002**
Serial Number:	**2**			**Date:**	**14-Jul-21**
Customer:	**Paycom Software, Inc.**			**Temperature:**	**21.1 °C**
Attendees:	**Mike Pearson**			**Humidity:**	**56.4% RH**
Project:	**None**			**Barometric Pres.:**	**1025 mbar**
Tested by:	**Brandon Hobbs**	**Power:**	**110VAC/60Hz**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

All losses down the measurement path were accounted for: DC block, attenuater and cable.

DEVIATIONS FROM TEST STANDARD

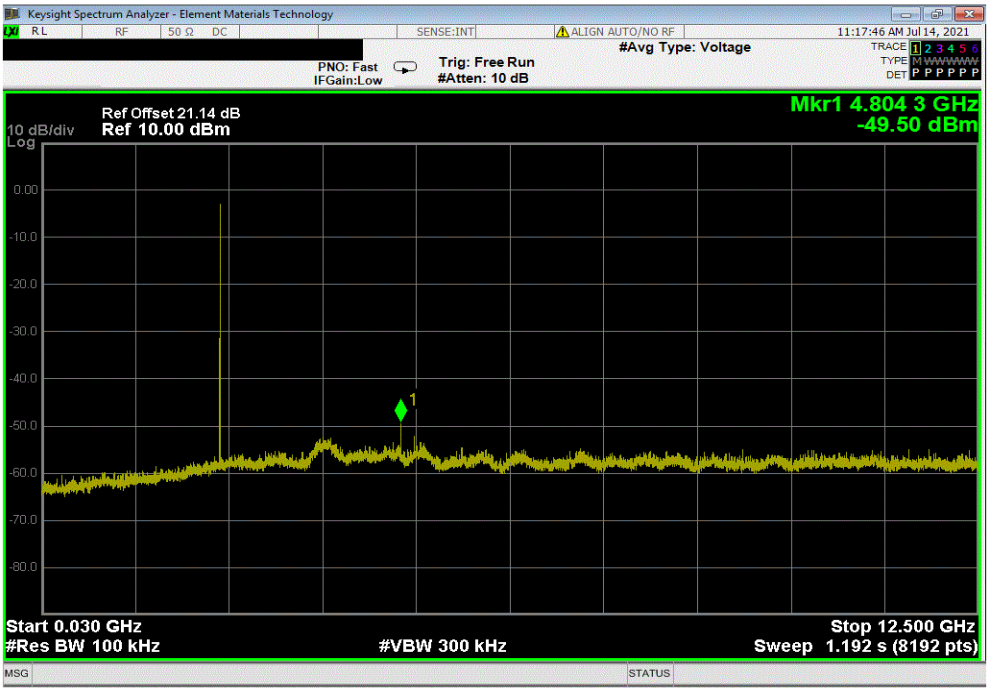
None

Configuration #	**2**	*Signature*

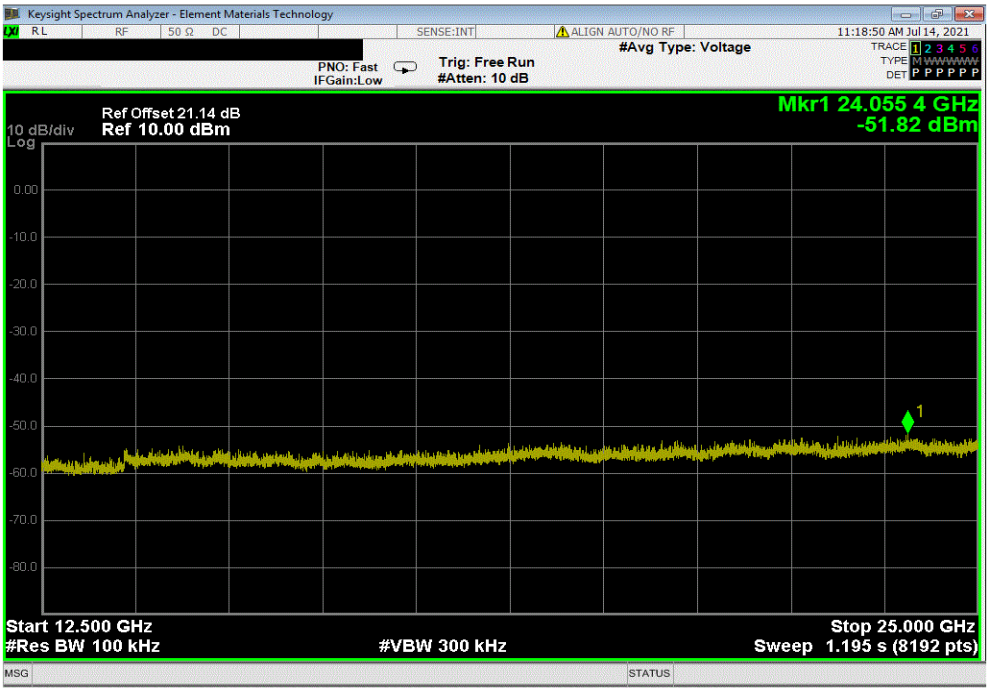
		Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
BLE/GFSK						
	1Mbps Modulation					
	Low Channel, 2402 MHz	Fundamental	2402.34	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.25	-47.31	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24055.37	-49.64	-20	Pass
	Mid Channel, 2442 MHz	Fundamental	2442.34	N/A	N/A	N/A
	Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	3817.74	-48.22	-20	Pass
	Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	23985.17	-48.85	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.35	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	3729.44	-48.56	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	22572.03	-48.49	-20	Pass

BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental		2402.34	N/A	N/A	N/A

BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4804.25	-47.31	-20	Pass

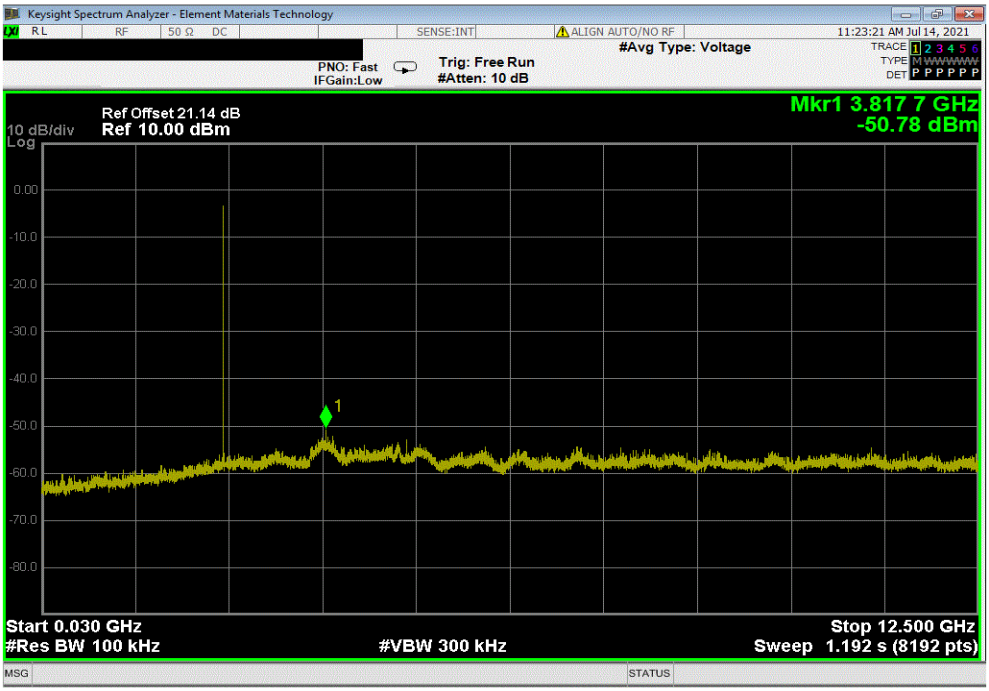


BLE/GFSK , 1Mbps Modulation, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24055.37	-49.64	-20	Pass

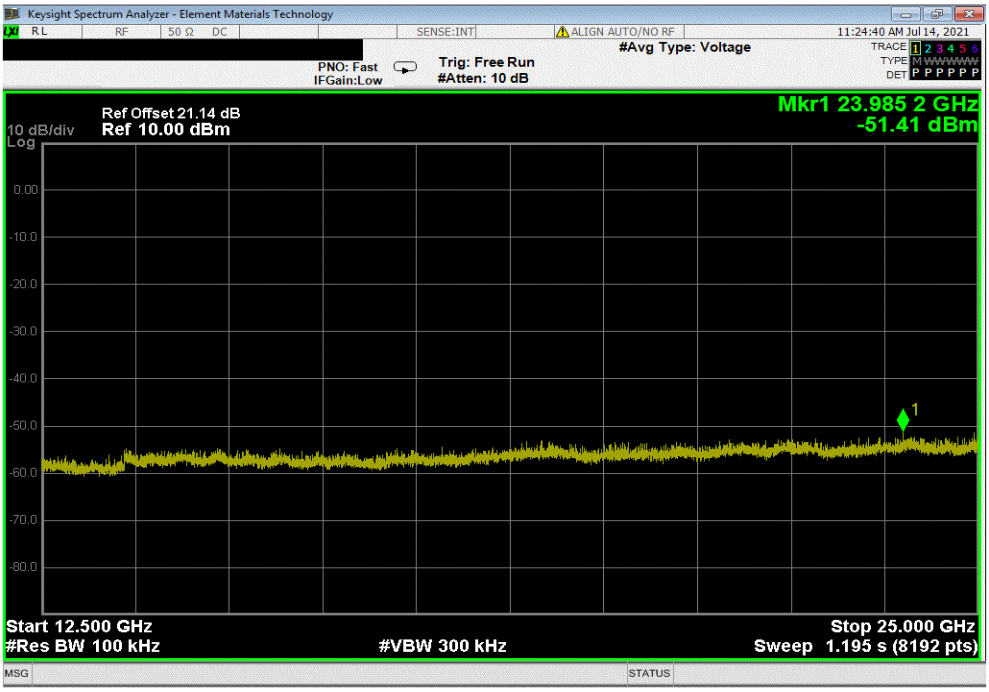


BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2442.34	N/A	N/A	N/A

BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	3817.74	-48.22	-20	Pass

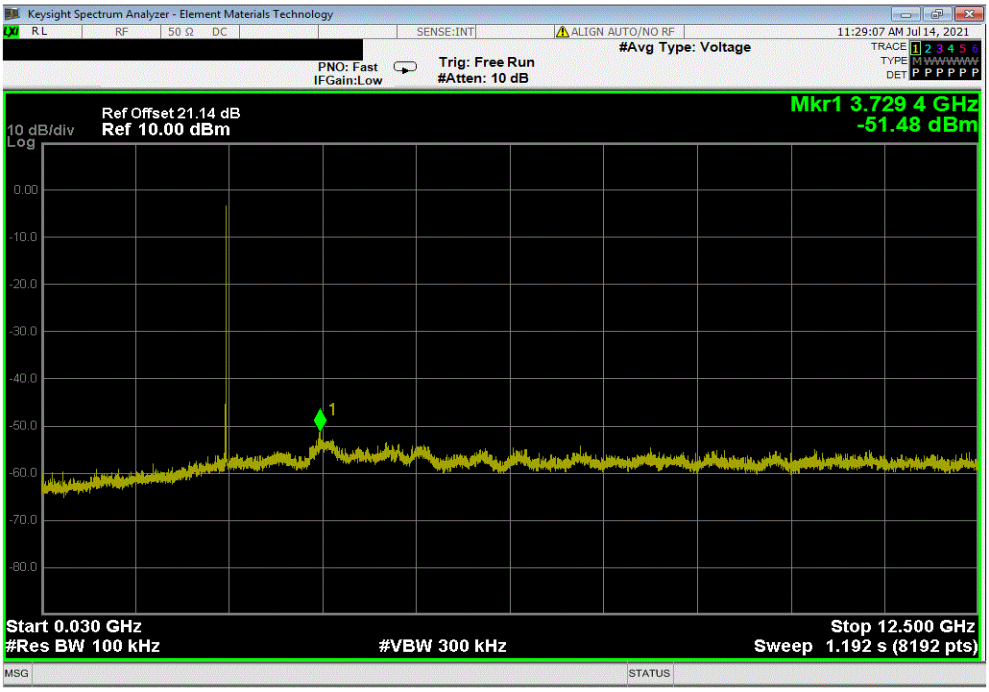


BLE/GFSK , 1Mbps Modulation, Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	23985.17	-48.85	-20	Pass

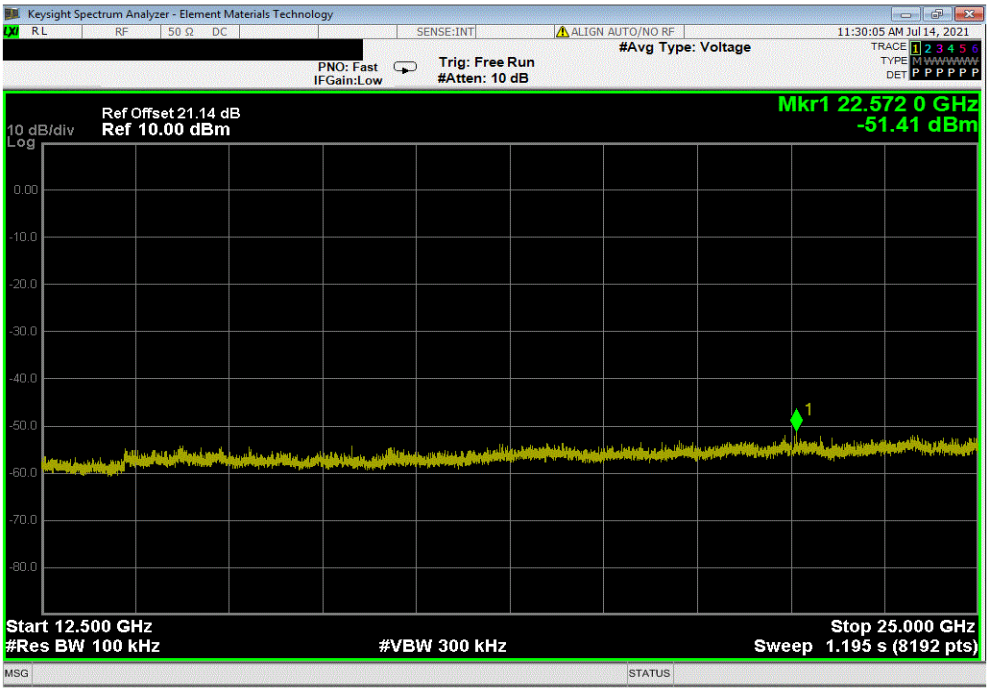


BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2480.35	N/A	N/A	N/A

BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	3729.44	-48.56	-20	Pass



BLE/GFSK , 1Mbps Modulation, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	22572.03	-48.49	-20	Pass



SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2021.03.17.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTL Tx Continuous, 1 Mbps data rate, 100% Duty Cycle, Low Channel 2402 MHz
BTL Tx Continuous, 1 Mbps data rate, 100% Duty Cycle, Mid Channel 2442 MHz
BTL Tx Continuous, 1 Mbps data rate, 100% Duty Cycle, High Channel 2480 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz, 3.3 VDC via Battery

CONFIGURATIONS INVESTIGATED

PAYC0002 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	2020-09-18	2021-09-18
Cable	Northwest EMC	18-40GHz	TXE	2020-09-18	2021-09-18
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	2020-09-02	2022-09-02
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	2020-09-17	2021-09-17
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	2020-09-17	2021-09-17
Cable	Northwest EMC	8-18GHz	TXD	2021-04-30	2022-04-30
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	2021-05-24	2022-05-24
Cable	Northwest EMC	1-8.2 GHz	TXC	2021-05-24	2022-05-24
Antenna - Double Ridge	ETS Lindgren	3115	AJL	2020-10-20	2022-10-20
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	2021-05-24	2022-05-24
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2021-05-24	2022-05-24
Antenna - Biconilog	ETS Lindgren	3143B	AYF	2020-06-25	2022-06-25
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	2020-07-30	2021-07-30

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*log(1/dc).

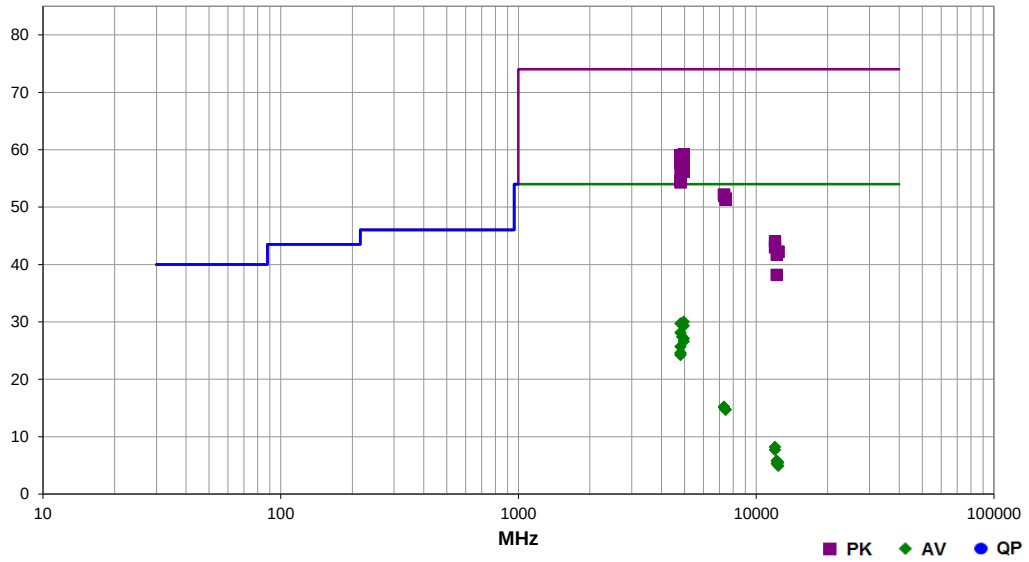
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.06.24.0 PSA-ESCI 2021.03.17.0

Work Order:	PAYC0002	**Date:**	2021-07-15		
Project:	None	**Temperature:**	20.9 °C		
Job Site:	TX02	**Humidity:**	58.1% RH		
Serial Number:	2	**Barometric Pres.:**	1022 mbar	**Tested by:**	Brandon Hobbs
EUT:	Microfence Model PCM-001B				
Configuration:	1				
Customer:	Paycom Software, Inc.				
Attendees:	Mike Pearson				
EUT Power:	Reference data comments for EUT Power				
Operating Mode:	BTL Tx Continuous, 1 Mbps data rate, 100% Duty Cycle Please reference data comments for EUT orientation and Channel				
Deviations:	None				
Comments:	Using a client provided on-time, a downward correction was applied per FCC part 15.35 sections c and KDB 558074 Q&A (3) using the following calculation: 10*log(.248mSec/100mSec) = -26.1dB. This correction factor was applied to all average values.				

Test Specifications	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

Run #	4	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4959.833	53.2	6.0	2.0	32.0	0.0	0.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
4803.608	53.4	5.6	2.0	307.0	0.0	0.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
4884.650	53.2	5.8	2.2	306.0	0.0	0.0	Horz	PK	0.0	59.0	74.0	-15.0	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
4959.808	52.6	6.0	2.3	39.0	0.0	0.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch.2480 Mhz, EUT Horz, Battery Mode
4803.650	52.1	5.6	2.5	285.9	0.0	0.0	Vert	PK	0.0	57.7	74.0	-16.3	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
4883.775	51.4	5.8	3.3	284.0	0.0	0.0	Vert	PK	0.0	57.2	74.0	-16.8	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
4960.775	50.7	6.0	3.3	318.0	0.0	0.0	Vert	PK	0.0	56.7	74.0	-17.3	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
4959.850	50.2	6.0	2.9	325.0	0.0	0.0	Vert	PK	0.0	56.2	74.0	-17.8	High Ch.2480 Mhz, EUT Horz, Battery Mode
4804.575	50.0	5.6	1.9	260.0	0.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
4804.625	49.0	5.6	1.1	12.0	0.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
4803.967	49.0	5.6	1.5	344.0	0.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
4804.742	48.7	5.6	1.9	322.9	0.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
7327.242	40.3	11.9	2.9	345.9	0.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
7327.992	40.1	11.9	1.7	150.0	0.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
7438.550	39.4	12.1	1.5	165.9	0.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
7441.542	39.2	12.1	1.5	79.0	0.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
4960.283	50.1	6.0	2.0	32.0	-26.1	0.0	Horz	AV	0.0	30.0	54.0	-24.0	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
4804.333	50.2	5.6	2.0	307.0	-26.1	0.0	Horz	AV	0.0	29.7	54.0	-24.3	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
4884.333	50.0	5.8	2.2	306.0	-26.1	0.0	Horz	AV	0.0	29.7	54.0	-24.3	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
4960.283	49.4	6.0	2.3	39.0	-26.1	0.0	Horz	AV	0.0	29.3	54.0	-24.7	High Ch.2480 Mhz, EUT Horz, Battery Mode
4804.383	48.6	5.6	2.5	285.9	-26.1	0.0	Vert	AV	0.0	28.1	54.0	-25.9	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
4884.375	47.7	5.8	3.3	284.0	-26.1	0.0	Vert	AV	0.0	27.4	54.0	-26.6	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
4960.267	47.2	6.0	3.3	318.0	-26.1	0.0	Vert	AV	0.0	27.1	54.0	-26.9	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
4960.242	46.7	6.0	2.9	325.0	-26.1	0.0	Vert	AV	0.0	26.6	54.0	-27.4	High Ch.2480 Mhz, EUT Horz, Battery Mode
4804.375	46.2	5.6	1.9	260.0	-26.1	0.0	Horz	AV	0.0	25.7	54.0	-28.3	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
4804.400	45.1	5.6	1.1	12.0	-26.1	0.0	Vert	AV	0.0	24.6	54.0	-29.4	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
4804.325	44.9	5.6	1.5	344.0	-26.1	0.0	Vert	AV	0.0	24.4	54.0	-29.6	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
4804.308	44.7	5.6	1.9	322.9	-26.1	0.0	Horz	AV	0.0	24.2	54.0	-29.8	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
12011.130	47.3	-3.3	3.5	337.0	0.0	0.0	Horz	PK	0.0	44.0	74.0	-30.0	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
12011.980	46.3	-3.3	3.4	278.0	0.0	0.0	Vert	PK	0.0	43.0	74.0	-31.0	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
12399.480	44.2	-2.0	3.6	333.0	0.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12399.680	44.2	-2.0	2.8	276.0	0.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
12209.330	44.1	-2.4	2.2	166.9	0.0	0.0	Horz	PK	0.0	41.7	74.0	-32.3	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
12208.730	40.6	-2.4	2.3	140.0	0.0	0.0	Vert	PK	0.0	38.2	74.0	-35.8	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
7326.517	29.4	11.9	1.7	150.0	-26.1	0.0	Vert	AV	0.0	15.2	54.0	-38.8	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
7326.750	29.3	11.9	2.9	345.9	-26.1	0.0	Horz	AV	0.0	15.1	54.0	-38.9	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
7442.367	28.7	12.1	1.5	165.9	-26.1	0.0	Horz	AV	0.0	14.7	54.0	-39.3	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
7442.208	28.7	12.1	1.5	79.0	-26.1	0.0	Vert	AV	0.0	14.7	54.0	-39.3	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
12009.220	37.6	-3.3	3.5	337.0	-26.1	0.0	Horz	AV	0.0	8.2	54.0	-45.8	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
12009.420	37.1	-3.3	3.4	278.0	-26.1	0.0	Vert	AV	0.0	7.7	54.0	-46.3	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
12211.550	34.3	-2.4	2.2	166.9	-26.1	0.0	Horz	AV	0.0	5.8	54.0	-48.2	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
12399.500	33.6	-2.0	3.6	333.0	-26.1	0.0	Horz	AV	0.0	5.5	54.0	-48.5	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
12211.500	33.8	-2.4	2.3	140.0	-26.1	0.0	Vert	AV	0.0	5.3	54.0	-48.7	Mid Ch.2442 Mhz, EUT Horz, 110VAC/60Hz
12399.290	33.0	-2.0	2.8	276.0	-26.1	0.0	Vert	AV	0.0	4.9	54.0	-49.1	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz

SPURIOUS RADIATED EMISSIONS

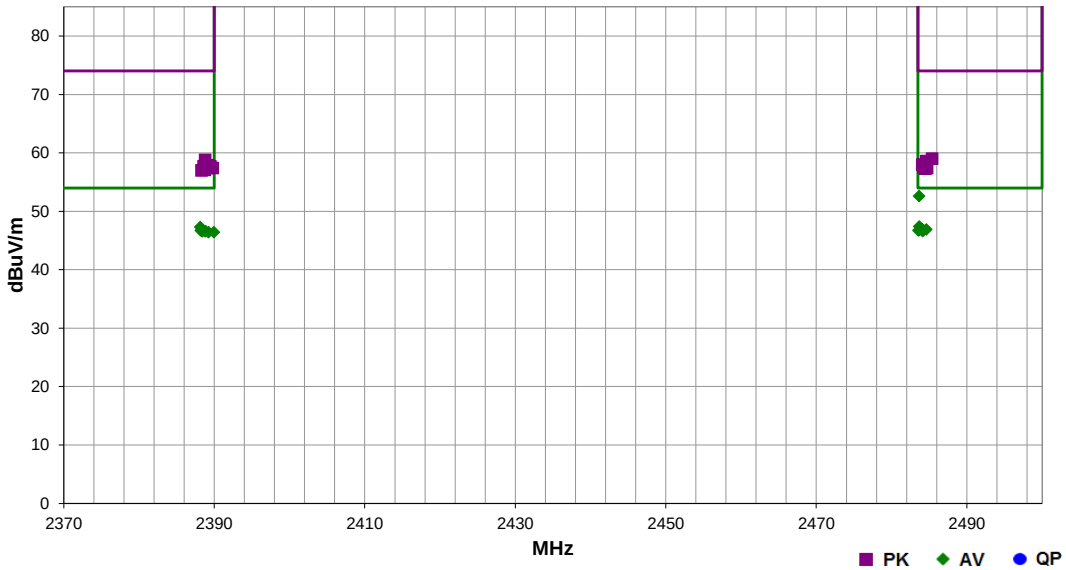
element

EmiR5 2021.06.24.0 PSA-ESCI 2021.03.17.0

Work Order:	PAYC0002	**Date:**	2021-07-15		
Project:	None	**Temperature:**	20.9 °C		
Job Site:	TX02	**Humidity:**	58.1% RH		
Serial Number:	2	**Barometric Pres.:**	1022 mbar	**Tested by:**	Brandon Hobbs
EUT:	Microfence Model PCM-001B				
Configuration:	1				
Customer:	Paycom Software, Inc.				
Attendees:	Mike Pearson				
EUT Power:	Reference data comments for EUT Power				
Operating Mode:	BTL Tx Continuous, 1 Mbps data rate, 100% Duty Cycle Please reference data comments for EUT orientation and Channel				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

Run #	6	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.663	38.0	-5.4	1.5	270.0	3.0	20.0	Horz	AV	0.0	52.6	54.0	-1.4	High Ch.2480 Mhz, EUT Vert 110VAC/60Hz
2483.700	32.8	-5.4	1.5	249.9	3.0	20.0	Horz	AV	0.0	47.4	54.0	-6.6	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
2388.140	33.1	-5.8	4.0	122.0	3.0	20.0	Horz	AV	0.0	47.3	54.0	-6.7	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
2484.013	32.4	-5.4	4.0	274.9	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch.2480 Mhz, EUT On Side 110VAC/60Hz
2484.113	32.3	-5.4	2.9	38.0	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
2484.627	32.3	-5.4	1.5	244.9	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch.2480 Mhz, EUT On Side 110VAC/60Hz
2483.710	32.2	-5.4	3.5	346.9	3.0	20.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch.2480 Mhz, EUT Vert 110VAC/60Hz
2388.213	32.5	-5.8	1.5	231.0	3.0	20.0	Vert	AV	0.0	46.7	54.0	-7.3	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
2483.583	32.1	-5.4	1.5	360.0	3.0	20.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch.2480 Mhz, EUT Vert, Battery Mode
2388.763	32.4	-5.8	1.5	128.0	3.0	20.0	Horz	AV	0.0	46.6	54.0	-7.4	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
2388.857	32.4	-5.8	1.5	39.9	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
2388.387	32.4	-5.8	3.8	92.0	3.0	20.0	Horz	AV	0.0	46.6	54.0	-7.4	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
2388.420	32.4	-5.8	3.1	237.0	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
2484.153	32.0	-5.4	1.5	153.0	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	High Ch.2480 Mhz, EUT On Side, Battery Mode
2389.953	32.2	-5.8	1.5	57.0	3.0	20.0	Horz	AV	0.0	46.4	54.0	-7.6	Low Ch.2402 MHz, EUT Horz, Battery Mode
2389.247	32.2	-5.8	1.5	66.4	3.0	20.0	Vert	AV	0.0	46.4	54.0	-7.6	Low Ch.2402 MHz, EUT Horz, Battery Mode
2485.387	44.4	-5.4	1.5	270.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch.2480 Mhz, EUT Vert 110VAC/60Hz
2388.797	44.6	-5.8	4.0	122.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
2484.617	44.0	-5.4	1.5	249.9	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
2484.077	43.4	-5.4	2.9	38.0	3.0	20.0	Vert	PK	0.0	58.0	74.0	-16.0	High Ch.2480 Mhz, EUT Horz, 110VAC/60Hz
2389.173	43.7	-5.8	1.5	39.9	3.0	20.0	Vert	PK	0.0	57.9	74.0	-16.1	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
2484.630	43.3	-5.4	1.5	244.9	3.0	20.0	Horz	PK	0.0	57.9	74.0	-16.1	High Ch.2480 Mhz, EUT On Side 110VAC/60Hz
2389.480	43.5	-5.8	3.8	92.0	3.0	20.0	Horz	PK	0.0	57.7	74.0	-16.3	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
2388.570	43.5	-5.8	3.1	237.0	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	Low Ch.2402 MHz, EUT Vert 110VAC/60Hz
2484.550	43.1	-5.4	3.5	346.9	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	High Ch.2480 Mhz, EUT Vert 110VAC/60Hz
2484.243	42.9	-5.4	1.5	153.0	3.0	20.0	Vert	PK	0.0	57.5	74.0	-16.5	High Ch.2480 Mhz, EUT Vert, Battery Mode
2389.780	43.2	-5.8	1.5	231.0	3.0	20.0	Vert	PK	0.0	57.4	74.0	-16.6	Low Ch.2402 MHz, EUT Horz, 110VAC/60Hz
2484.717	42.8	-5.4	1.5	360.0	3.0	20.0	Horz	PK	0.0	57.4	74.0	-16.6	High Ch.2480 Mhz, EUT On Side, Battery Mode
2389.037	43.2	-5.8	1.5	66.4	3.0	20.0	Vert	PK	0.0	57.4	74.0	-16.6	Low Ch.2402 MHz, EUT Horz, Battery Mode

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.487	42.7	-5.4	4.0	274.9	3.0	20.0	Vert	PK	0.0	57.3	74.0	-16.7	High Ch.2480 Mhz, EUT On Side 110VAC/60Hz
2388.743	42.9	-5.8	1.5	128.0	3.0	20.0	Horz	PK	0.0	57.1	74.0	-16.9	Low Ch.2402 MHz, EUT On Side 110VAC/60Hz
2388.300	42.8	-5.8	1.5	57.0	3.0	20.0	Horz	PK	0.0	57.0	74.0	-17.0	Low Ch.2402 MHz, EUT Horz, Battery Mode

End of Test Report