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11/26/2025

Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda
Rua Hungria, 888
8th floor
São Paulo, Brazil
01455-000

Dear Albert Nissimoff,

Enclosed is the EMC Wireless test report for compliance testing of the Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda iDFace Max as tested to the requirements of FCC Part 15.247 and RSS-247 Issue 3 for Intentional Radiators. This test report pertains specifically to the Bluetooth Low Energy (BLE) transmitter onboard which operates in the 2400-2483.5MHz band.

Thank you for using the services of Eurofins MET Labs. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
EUROFINS MET LABS

A handwritten signature in blue ink that reads "Nancy LaBrecque". The signature is fluid and cursive.

Nancy LaBrecque
Documentation Department

Reference: WIRA136636-FCC-IC-BLE_R2

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Bluetooth Low Energy Test Report

for the

Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda
iDFace Max (Model:IDFMAXFPH)

Tested under
FCC Part 15.247 and RSS-247 Issue 3
For Intentional Radiators



Veer Patel, EMC/Wireless Test Engineer
Electromagnetic Compatibility Lab



Nancy LaBrecque
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.247 under normal use and maintenance.



Matthew Hinojosa
EMC Manager, Austin Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	July 25, 2025	Initial Issue.
1	10/13/2025	TCB Reviewer Comments
2	11/26/2025	TCB Reviewer Comments

List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB μ A	Decibels above one microamp
dB μ V	Decibels above one microvolt
dB μ A/m	Decibels above one microamp per meter
dB μ V/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	kilohertz
kPa	kilopascal
kV	kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μ H	microhenry
μ	microfarad
μ s	microseconds
NEBS	Network Equipment-Building System
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the iDFace Max, with the requirements of FCC Part 15.247 and RSS-247 Issue 3. Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the VL35LF, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15.247 and RSS-247 Issue 3, in accordance with Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda purchase order number HID026483. All tests were conducted using measurement procedures ANSI C63.4-2014 and ANSI C63.10-2013.

FCC Reference 47 CFR Part 15.247	Description	Compliance	Note
Title 47 of the CFR, Part 15 §15.203	Antenna Requirement	Compliant	---
Title 47 of the CFR, Part 15 §15.207(a)	Conducted Emission Limits	Compliant	
Title 47 of the CFR, Part 15 §15.247(a)(2)	6dB Occupied Bandwidth	Compliant	---
---	99% Occupied Bandwidth	Compliant	---
Title 47 of the CFR, Part 15 §15.247(b)	Peak Power Output	Compliant	---
Title 47 of the CFR, Part 15 §15.247(d); §15.209; §15.205	Radiated Spurious Emissions Requirements	Compliant	---
Title 47 of the CFR, Part 15 §15.247(d)	RF Conducted Spurious Emissions Requirements	Compliant	---
Title 47 of the CFR, Part 15; §15.247(e)	Peak Power Spectral Density	Compliant	---

Table 1. Executive Summary

II. Equipment Configuration

A. Overview

Eurofins MET Labs was contracted by Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda to perform testing on the iDFace Max , under Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda's purchase order number HID026483.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the VL35LF.

The results obtained relate only to the item(s) tested.

Product Name:	iDFace Max	
Model(s) Tested:	IDFMAXFPH	
Test Sample Number:	25570-11	
Equipment Specifications:	Primary Power:	12VDC via AC / DC Power Adapter
	Type of Modulations:	GFSK
	Equipment Code:	DTS
	Peak RF Output Power:	3.81
	EUT Frequency Ranges:	2402MHz – 2480MHz
	Antenna Gain ¹ :	3.47 dBi
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: -20 to 50° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Bryan Taylor, Veer Patel	
Report Date(s):	11/26/2025	

Table 2. EUT Summary Table

¹ The antenna gain information was provided by Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda and may affect compliance.

B. References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Table 3. References

C. Test Site

All testing was performed at Eurofins MET Labs, 13501 McCallen Pass, Austin, TX 78753. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 10 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

ISED Lab Info:

CAB Identifier: US0004
Company Number: 2043D

FCC Lab Info:

Designation Number: US1127

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
Occupied Bandwidth Measurements	±4.52 Hz	2	95%
Conducted Power Measurements	±2.74 dB	2	95%
Power Spectral Density Measurements	±2.74 dB	2	95%
Conducted Spurious Emissions	±2.80 dB	2	95%
Conducted Emissions (Mains)	±2.97 dB	2	95%
Radiated Spurious Emissions (9kHz – 1GHz)	±2.95 dB	2	95%
Radiated Spurious Emissions (1GHz - 40GHz)	±3.54 dB	2	95%

Table 4. Uncertainty Calculations Summary

E. Description of Test Sample

The iDFace Max, is an access control reader employing facial recognition technology, as well as RFID and Bluetooth technologies.

The VL35LF has a LF, HF and a BLE radio on board enable the use of traditional RFID access control as well as mobile access through cell phone BLE and the HID Mobile Access App.

The VL35LF allows a user that is enrolled to access a door through the means of facial recognition (by looking into the cameras on the screen) or presenting an RFID credential, in the form of a fob, card or mobile device.

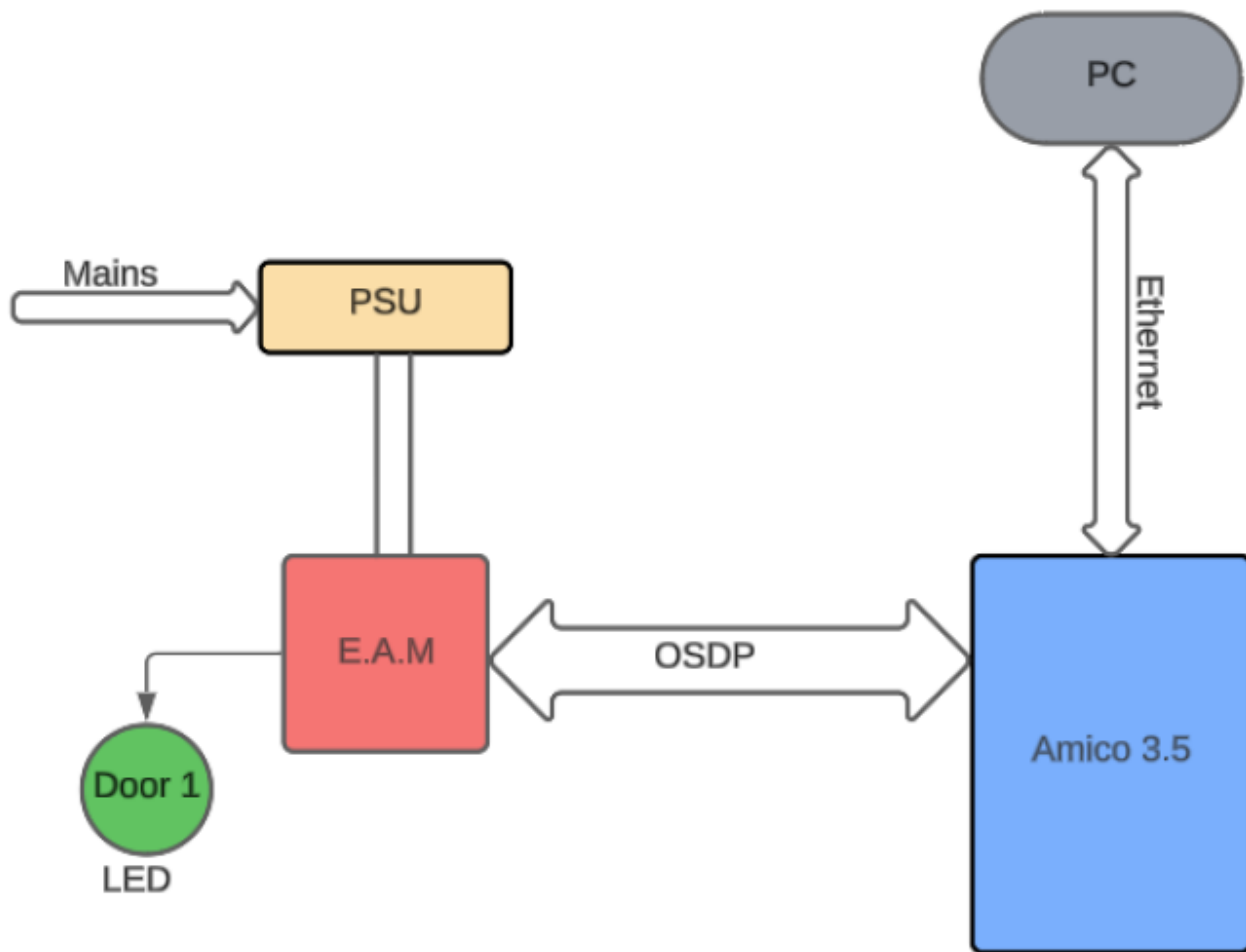


Figure 1. Block Diagram of Test Configuration

F. Equipment Configuration

A laptop was connected to the test sample and software commands were used to force the BLE radio to transmit on low, mid, or high channels and at 1Mbps or 2Mbps

G. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Name/Description	Manufacturer	Model Number	Serial Number	*Customer Supplied Calibration Data
Smart Phone	Motorola	Moto E7	ZF523HTNWG	N/A
Smart Phone	Samsung	Galaxy A03	R9XT501Z14J	N/A
Laptop	Asus	M509D	L5N0B6017297222	N/A
Power Supply	XP Power	VEC65US12	N/A	N/A

Table 5. Support Equipment

H. Ports and Cabling Information

Name/Description	Manufacturer	Model Number	Serial Number	*Customer Supplied Calibration Data
Smart Phone	Motorola	Moto E7	ZF523HTNWG	N/A
Smart Phone	Samsung	Galaxy A03	R9XT501Z14J	N/A
Laptop	Asus	M509D	L5N0B6017297222	N/A

Table 6. Ports and Cabling Information

I. Mode of Operation

A laptop was connected to the test sample and software commands were used to force the BLE radio to transmit on low, mid, or high channels and at 1Mbps or 2Mbps.

Transmit Band	Modulation	Channel Frequencies Tested	Test Tool Name	Test Tool Power Setting ²
2400 – 2483.5MHz	BLE (GFSK)	2402MHz / 2440MHz / 2480MHz	STM32CubeMonitor-RF Version 2.12.0	6

Table 7. Test Channels Utilized

J. Method of Monitoring EUT Operation

A spectrum analyzer was used to confirm proper transmitter operation.

K. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

L. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Controlid Industria e Comercio de Hardware e Servicos De Tecnologia Ltda upon completion of testing.

² Note the power settings are relative levels and do not necessarily correspond to the actual measured output power.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators**§ 15.203 Antenna Requirement**

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

- a.) Antenna must be permanently attached to the unit.
- b.) Antenna must use a unique type of connector to attach to the EUT.
- c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The iDface Max was compliant with this requirement. The antenna is permanently attached to the unit.

Test Engineer(s): Bryan Taylor

Test Date(s): 6/3/2025

Conducted Emissions

§ 15.207(a) Conducted Emissions Limits

Test Requirement(s): § 15.207 (a): For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dB μ V)	
	Quasi-Peak	Average
* 0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Table 8. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Note: *Decreases with the logarithm of the frequency.

RSS-GEN (8.8) AC Power-Line Conducted Emissions Limits

Test Requirement(s): **RSS-GEN (8.8):** Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in the below figure, as measured using a 50 μ H / 50 Ω line impedance stabilization network (LISN). This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in the below figure shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Frequency (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
* 0.15-0.5	66 to 56	56 to 46 ¹
0.5-5	56	46
5-30	60	50

Table 9. AC Power Line Conducted Emissions Limits

Note: *Decreases with the logarithm of the frequency.

Test Procedure: The EUT was placed on a 0.8 m-high non-conducting table above a ground plane. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω /50 μ H Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.10-2013 "Procedures for Compliance Testing of Unlicensed Wireless Devices"*. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω /50 μ H LISN as the input transducer to an EMI receiver.

Test Results: The iDFace Max was compliant with this requirement. Testing was performed on the AC input to an AC to DC power supply that was feeding the 12VDC to the HID Amico Facial Reader.

Test Engineer(s): Frank Hernandez

Test Date(s): 5/27/2025

Conducted Emissions Voltage Test Setup

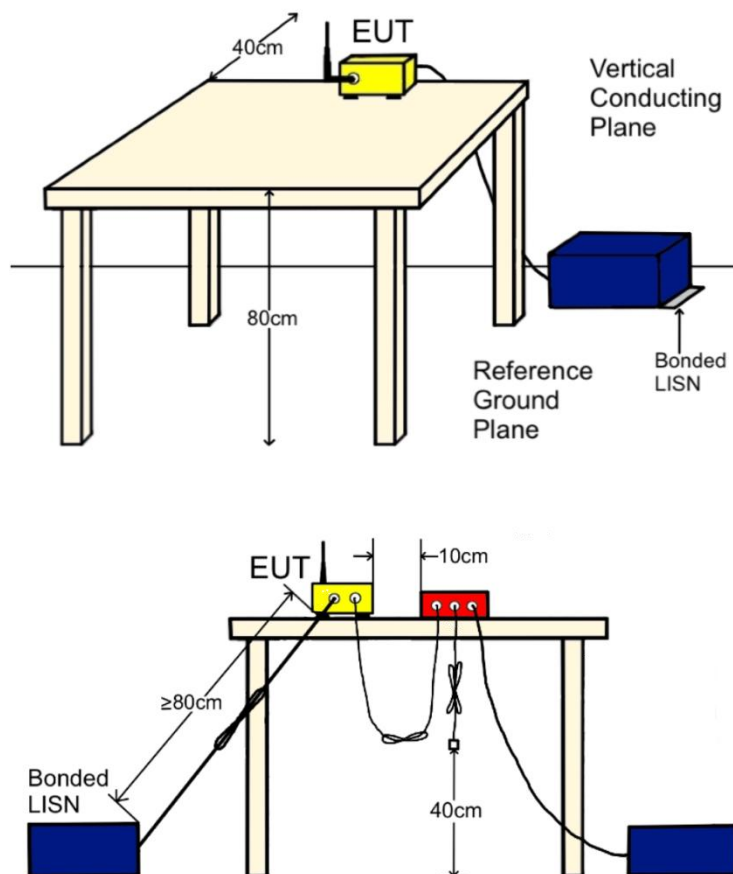
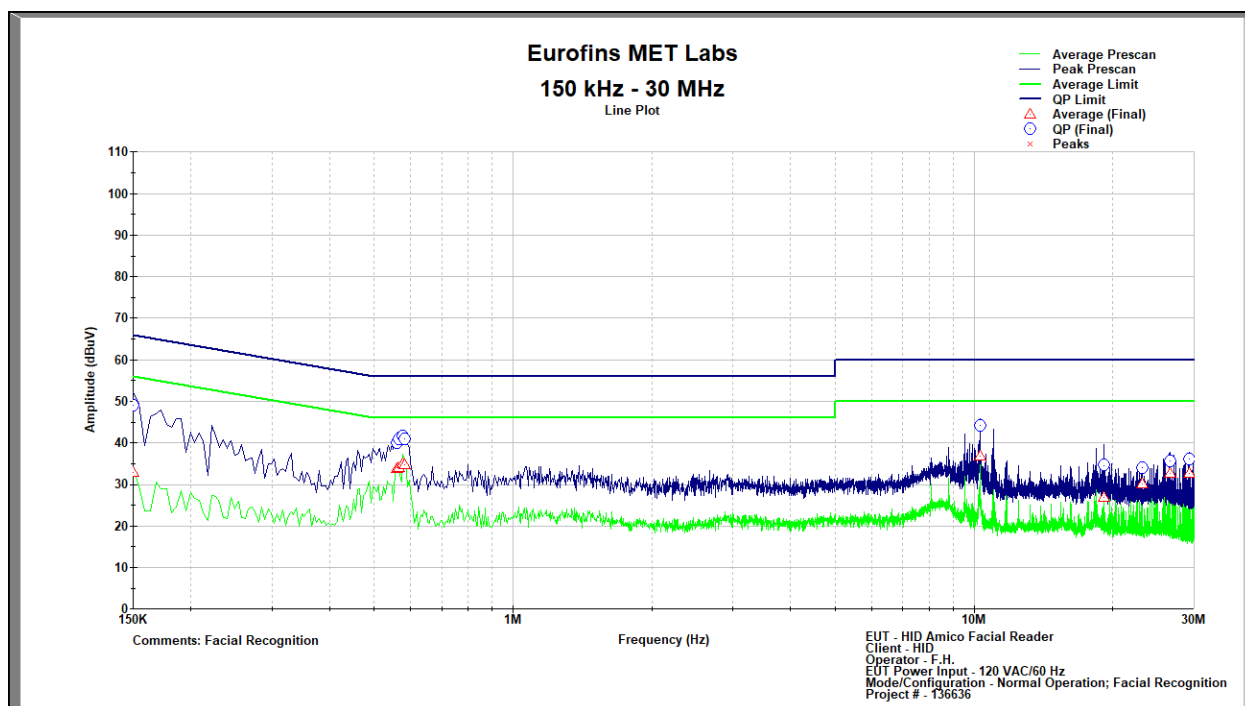


Figure 2. CEV Test Setup

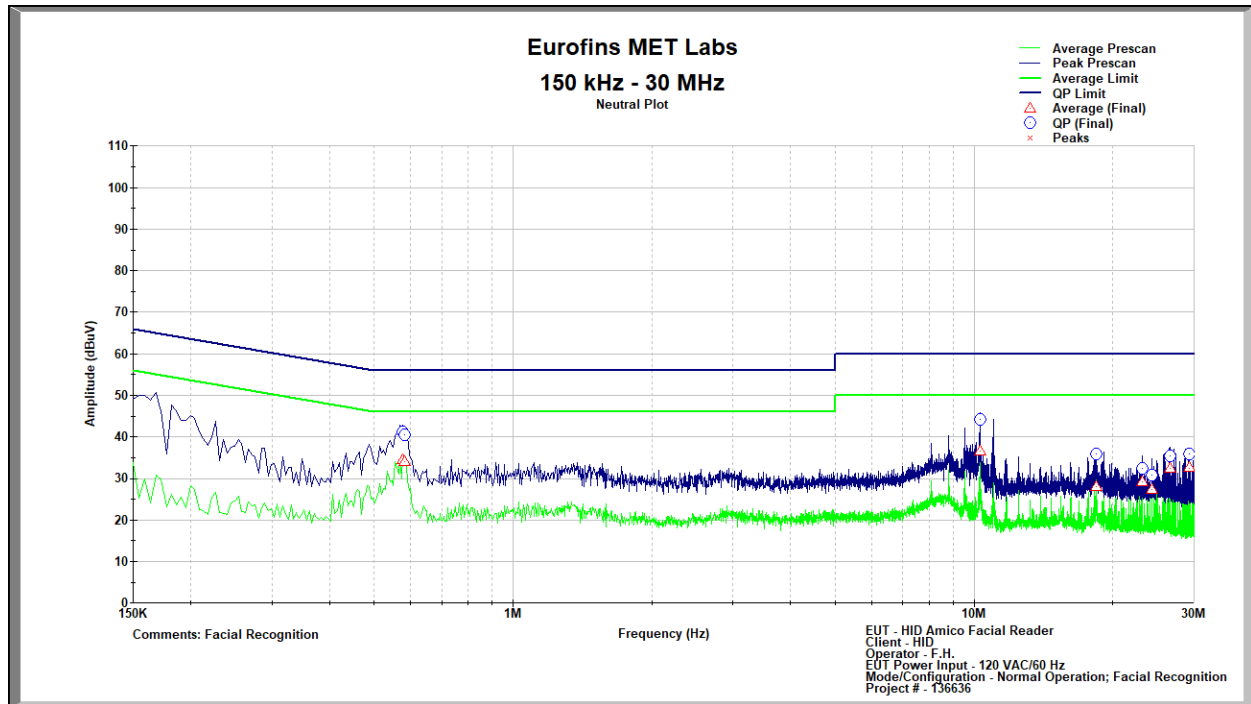
15.207(a) Conducted Emissions Test Results



Conducted Emissions, 15.207(a), Phase

Frequency (MHz)	Quasi-Peak (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Quasi-Peak Margin (dB)	Average (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
0.150	49.108	66.000	16.892	32.857	56.000	23.143
0.559	39.990	56.000	16.010	33.751	46.000	12.249
0.564	40.895	56.000	15.105	34.092	46.000	11.908
0.578	41.568	56.000	14.432	34.969	46.000	11.031
0.582	40.978	56.000	15.022	34.638	46.000	11.362
10.293	44.301	60.000	15.699	36.905	50.000	13.095
19.117	34.594	60.000	25.406	26.799	50.000	23.201
23.128	34.090	60.000	25.910	30.048	50.000	19.952
26.613	35.608	60.000	24.392	32.612	50.000	17.388
29.238	36.034	60.000	23.966	32.703	50.000	17.297

Table 10. Conducted Emissions, 15.207(a), Phase, Test Results



Conducted Emissions, 15.207(a), Neutral

Frequency (MHz)	Quasi-Peak (dBμV)	Quasi-Peak Limit (dBμV)	Quasi-Peak Margin (dB)	Average (dBμV)	Average Limit (dBμV)	Average Margin (dB)
0.578	41.105	56.000	14.895	34.530	46.000	11.470
0.582	40.457	56.000	15.543	34.090	46.000	11.910
10.293	44.092	60.000	15.908	36.642	50.000	13.358
18.380	35.779	60.000	24.221	27.926	50.000	22.074
23.133	32.342	60.000	27.658	29.141	50.000	20.859
24.354	30.911	60.000	29.089	27.420	50.000	22.580
26.613	35.356	60.000	24.644	32.385	50.000	17.615
29.238	35.819	60.000	24.181	32.511	50.000	17.489

Table 11. Conducted Emissions, 15.207(a), Neutral, Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(a)(2) 6 dB Bandwidth

Test Requirements: § 15.247(a)(2): Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Procedure: The transmitter was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately 1% of the total emission bandwidth, and the VBW > RBW. The 6 dB Bandwidth was measured and recorded. The measurements were performed on the low, mid and high channels.

Test Results The HID Amico Facial Reader was compliant with § 15.247 (a)(2). The 6 dB Bandwidth was determined from the plots on the following pages.

Test Engineer(s): Veer Patel

Test Date(s): 06/03/2025

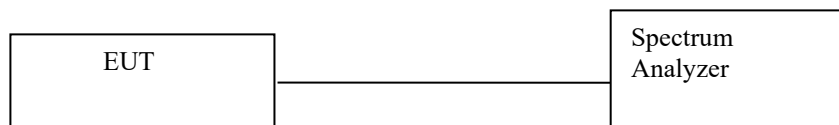


Figure 3. Block Diagram, Occupied Bandwidth Test Setup

Data Rate	Channel	Frequency (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
1Mbps	Low	2402	1.054	0.677	> 0.5	Pass
	Middle	2440	1.046	0.673	> 0.5	Pass
	High	2480	1.028	0.664	> 0.5	Pass

Table 12. 99% Occupied Bandwidth, Test Results (1Mbps)

Data Rate	Channel	Frequency (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
2Mbps	Low	2402	2.026	1.14	> 0.5	Pass
	Middle	2440	2.014	1.13	> 0.5	Pass
	High	2480	1.997	1.15	> 0.5	Pass

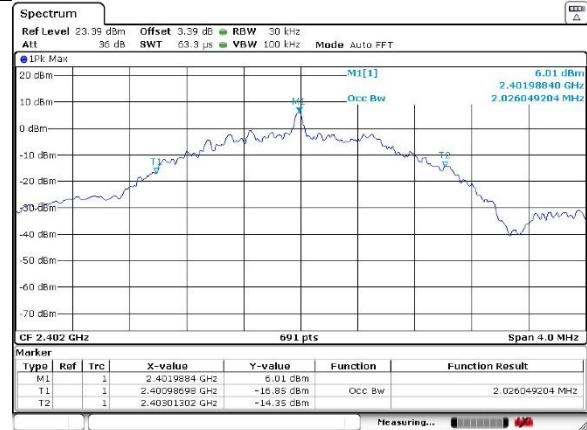
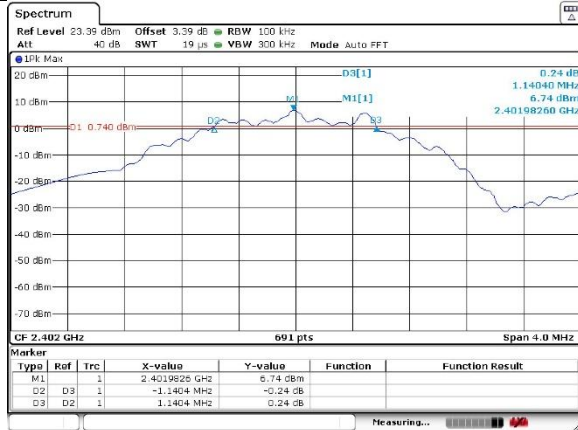
Table 13. 99% Occupied Bandwidth, Test Results (2Mbps)

Occupied Bandwidth Test Results

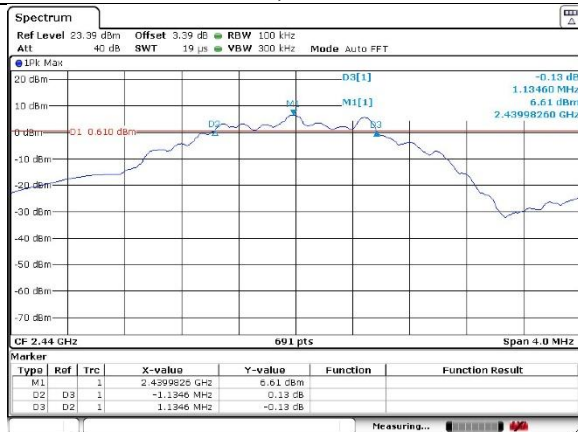
Occupied Bandwidth Plots (1Mbps)



Occupied Bandwidth Plots (2Mbps)



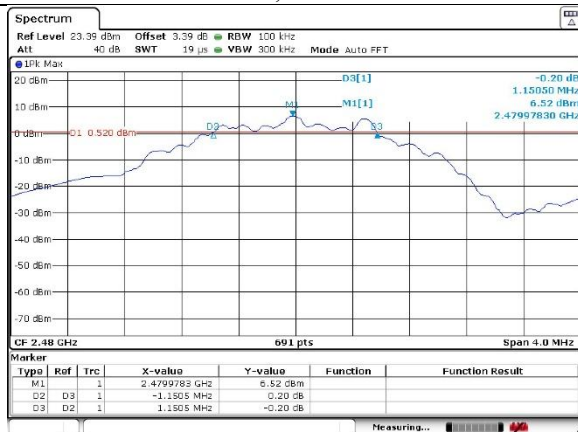
Low Channel, 6dB Bandwidth



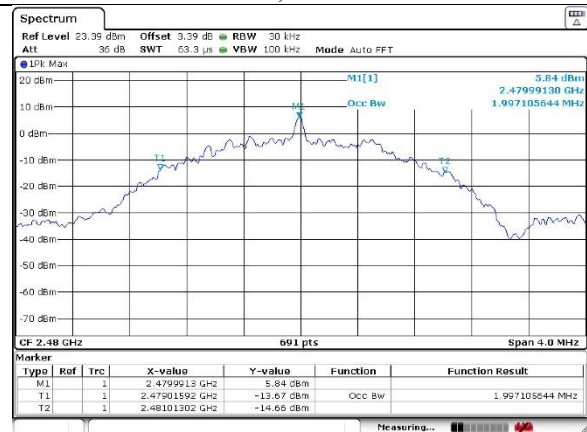
Low Channel, 99% Bandwidth



Mid Channel, 6dB Bandwidth



Mid Channel, 99% Bandwidth



High Channel, 6dB Bandwidth

High Channel, 99% Bandwidth

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(b) Peak Power Output

Test Requirements: §15.247(b): The maximum peak output power of the intentional radiator shall not exceed the following:

Digital Transmission Systems (MHz)	Output Limit (Watts)
902-928	1.000
2400-2483.5	1.000
5725- 5850	1.000

Table 14. Output Power Requirements from §15.247(b)

§15.247(c): if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in the Table 14, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400 – 2483.5 MHz band and using a point to point application may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Fixed, point-to-point operation excludes the use of point-to-multipoint systems, Omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

Test Procedure: The transmitter was connected to a calibrated spectrum analyzer. The analyzer reference level was offset by cable loss connecting to the test sample. The peak power was measured at the low, mid and high channels of each band at the maximum power level. The antenna gain provided by the manufacturer was added to the measured conducted power to arrive at the EIRP.

Test Results: The iDFace Max was compliant with the Peak Power Output limits of §15.247(b).

Test Engineer(s): Veer Patel

Test Date(s): 06/03/2025

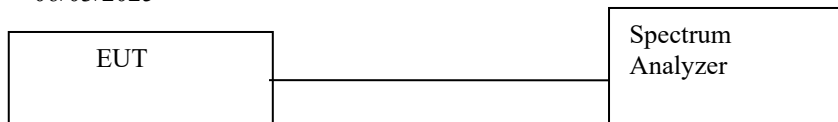


Figure 4. Peak Power Output Test Setup

Peak Power Output Test Results

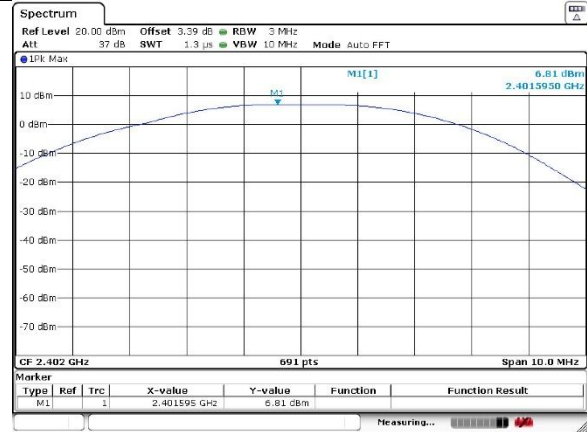
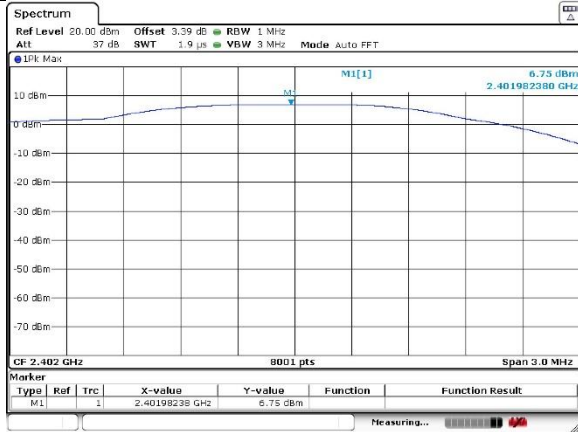
Data Rate	Channel	Frequency (MHz)	Peak Conducted Power (dBm)	Peak Power Limit (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
1Mbps	Low	2402MHz	3.75	30	3.47	7.22	36	Pass
	Middle	2440MHz	3.70	30	3.47	7.17	36	Pass
	High	2480MHz	3.53	30	3.47	7	36	Pass

Table 15. Peak Power and EIRP, Test Results (1Mbps)

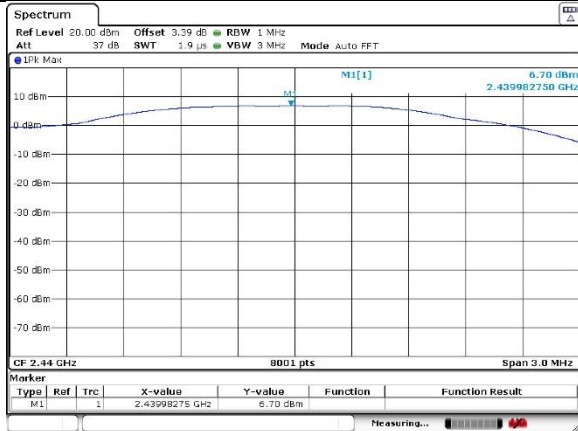
Data Rate	Channel	Frequency (MHz)	Peak Conducted Power (dBm)	Peak Power Limit (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
2Mbps	Low	2402MHz	3.81	30	3.47	7.28	36	Pass
	Middle	2440MHz	3.76	30	3.47	7.23	36	Pass
	High	2480MHz	3.61	30	3.47	7.08	36	Pass

Table 16. Peak Power and EIRP, Test Results (2Mbps)

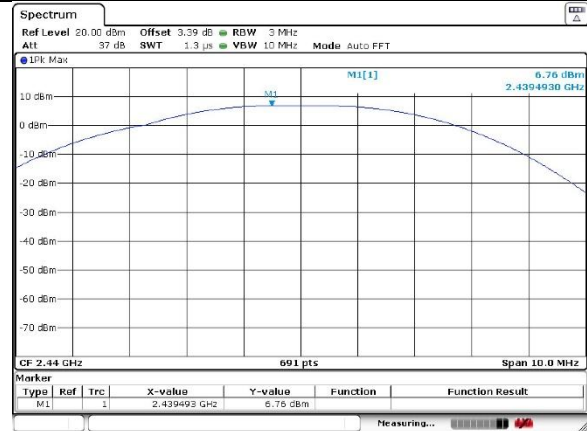
Peak EIRP Plots



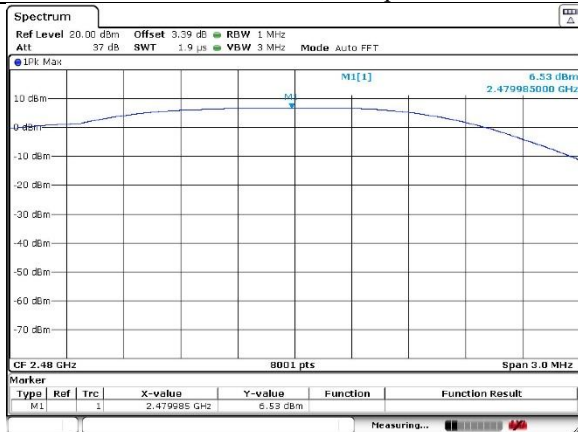
Low Channel, 1Mbps



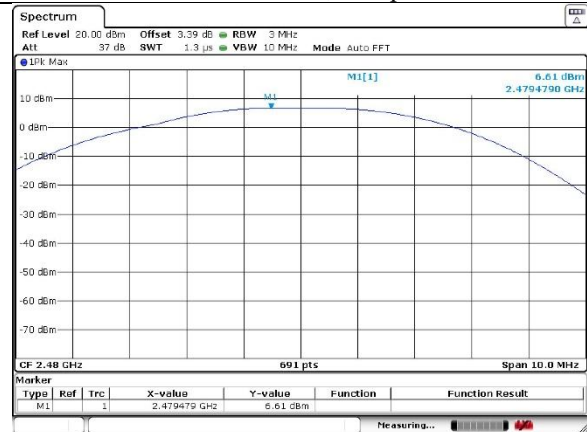
Low Channel, 2Mbps



Mid Channel, 1Mbps



Mid Channel, 2Mbps



High Channel, 1Mbps

High Channel, 2Mbps

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(e) Peak Power Spectral Density

Test Requirements: §15.247(e): For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure: The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level. The RBW was set between 3kHz and 100 kHz. The VBW was set to 3x the RBW. The spectrum analyzer was set to an auto sweep time and a peak detector was used. Measurements were carried out at the low, mid and high channels.

Test Results: The iDFace Max was compliant with the peak power spectral density limits of § 15.247 (e).

Test Engineer: Veer Patel

Test Date: 06/03/2025

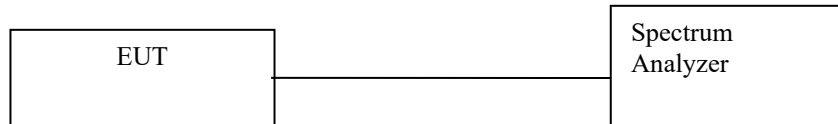


Figure 5. Block Diagram, Peak Power Spectral Density Test Setup

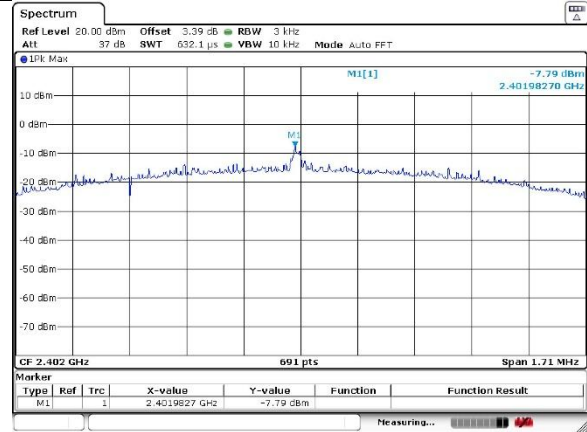
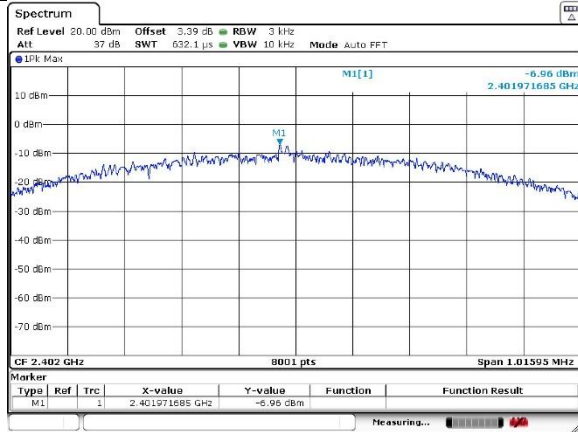
Data Rate	Channel	Frequency (MHz)	Peak Conducted PSD (dBm/3kHz)	Peak PSD Limit (dBm/3kHz)	Antenna Gain (dBi)	EIRP PSD (dBm/kHz)	Result
1Mbps	Low	2402MHz	-9.96	8	3	-6.96	Pass
	Middle	2440MHz	-10.15	8	3	-7.15	Pass
	High	2480MHz	-10.88	8	3	-7.88	Pass

Table 17. Peak Power Spectral Density, Test Results (1Mbps)

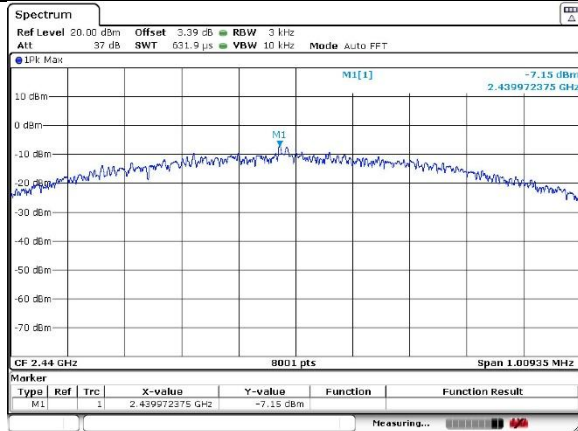
Data Rate	Channel	Frequency (MHz)	Peak Conducted PSD (dBm/3kHz)	Peak PSD Limit (dBm/3kHz)	Antenna Gain (dBi)	EIRP PSD (dBm/kHz)	Result
2Mbps	Low	2402MHz	-10.79	8	3	-7.79	Pass
	Middle	2440MHz	-10.76	8	3	-7.76	Pass
	High	2480MHz	-10.97	8	3	-7.97	Pass

Table 18. Peak Power Spectral Density, Test Results (2Mbps)

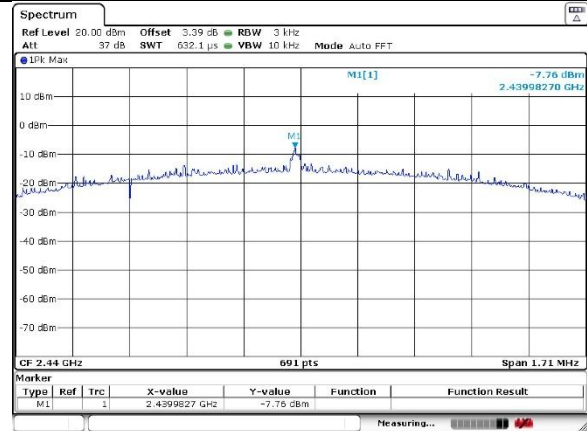
Peak Power Spectral Density Plots



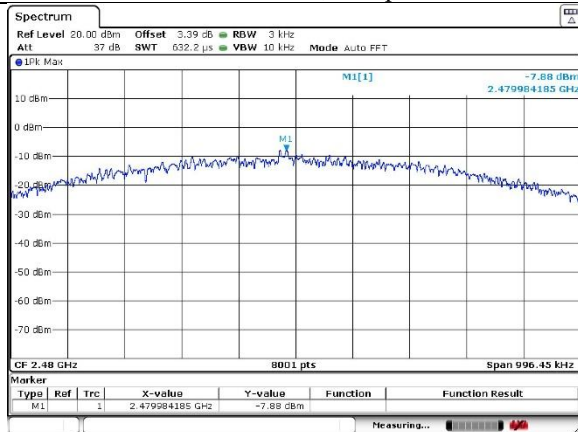
Low Channel, 1Mbps



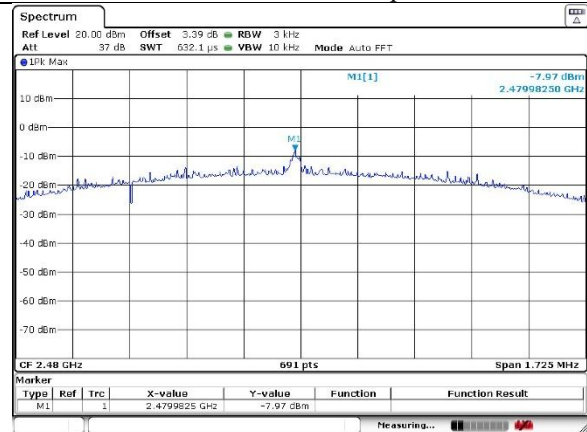
Low Channel, 2Mbps



Mid Channel, 1Mbps



Mid Channel, 2Mbps



High Channel, 1Mbps

High Channel, 2Mbps

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) RF Conducted Spurious Emissions Requirements

Test Requirement: **15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Procedure: For intentional radiators with a digital device portion which operates below 10 GHz, the spectrum was investigated as per §15.33(a)(1) and §15.33(a)(4); i.e., the lowest RF signal generated or used in the device up to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level. The RBW was set to 100 kHz. The VBW was set to 3x the RBW. The spectrum analyzer was set to an auto sweep time and a peak detector was used. Measurements were carried out at the low, mid and high channels.

See following pages for detailed test results with RF Conducted Spurious Emissions.

Test Results: The iDFace Max was compliant with the Conducted Spurious Emission limits of §15.247(d).

Test Engineer(s): Veer Patel

Test Date(s): 6/4/2025

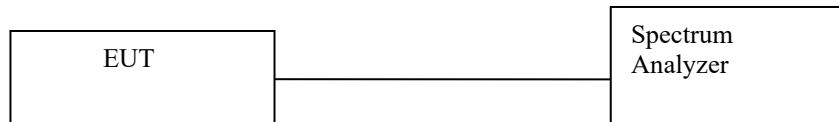
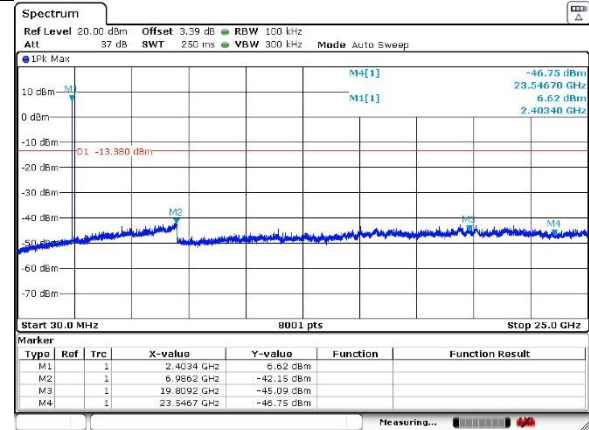
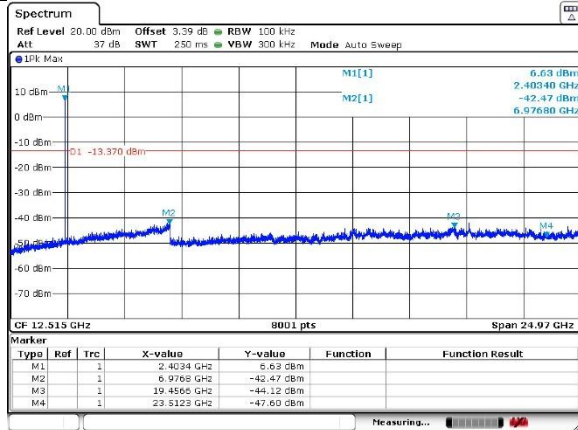
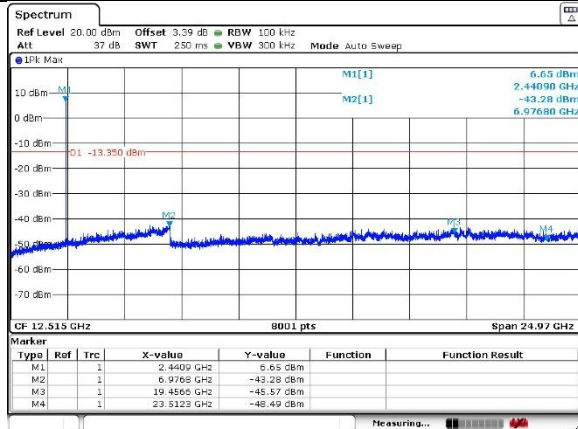


Figure 6. Block Diagram, Conducted Spurious Emissions Test Setup

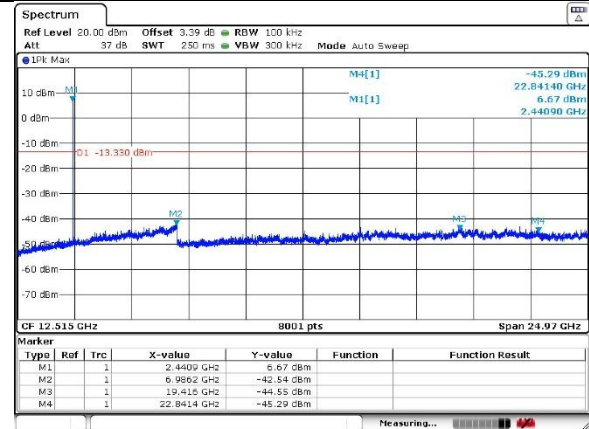
Conducted Spurious Emission Plots



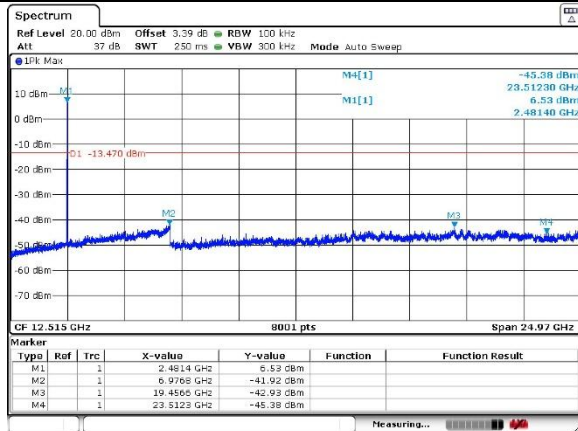
Low Channel, 1Mbps



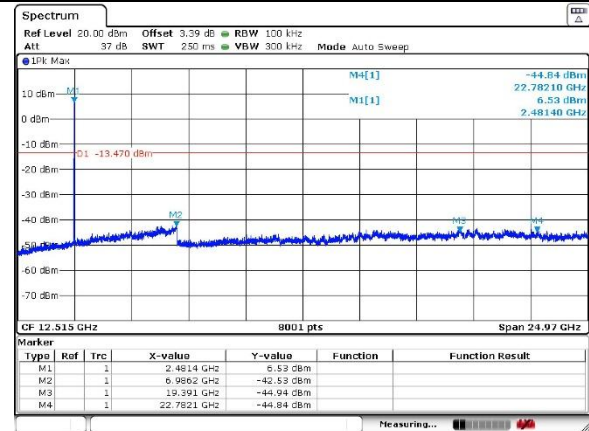
Low Channel, 2Mbps



Mid Channel, 1Mbps



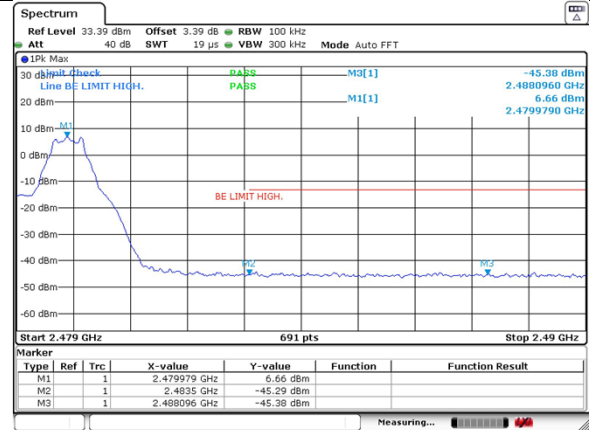
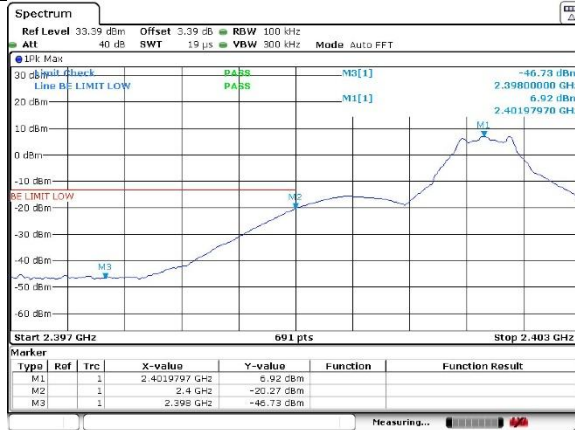
Mid Channel, 2Mbps



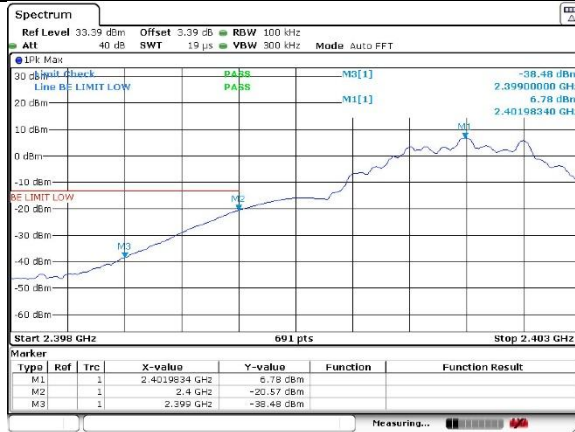
High Channel, 1Mbps

High Channel, 2Mbps

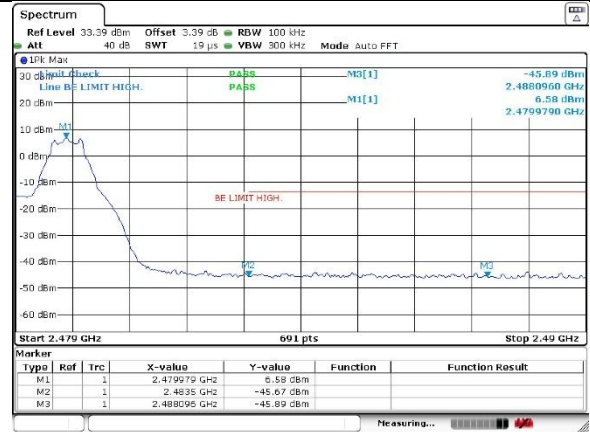
Conducted Spurious Emission Plots (Low and High Band Edge)



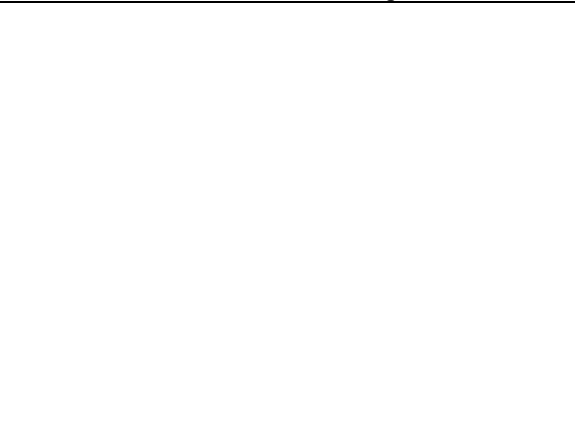
Low Channel, 1Mbps



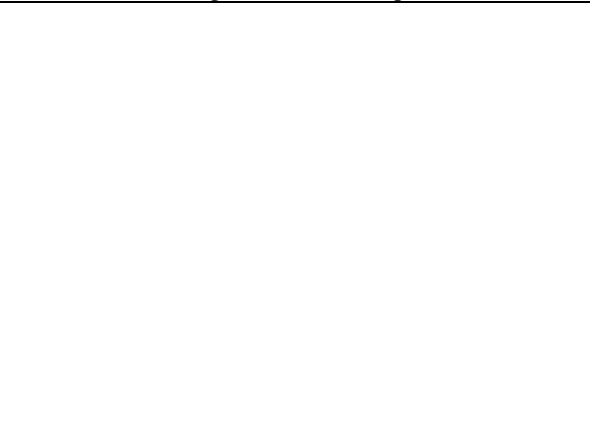
High Channel, 1Mbps



Low Channel, 2Mbps



High Channel, 2Mbps



Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) Radiated Spurious Emissions Requirements and Band Edge

Test Requirements: §15.247(d); §15.205: Emissions outside the frequency band.

§15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

§15.205(a): Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090–0.110-----	16.42–16.423	399.9–410	4.5–5.15
¹ 0.495–0.505-----	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905-----	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128-----	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775-----	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775-----	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218-----	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825-----	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225-----	123–138	2200–2300	14.47–14.5
8.291–8.294-----	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366-----	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675-----	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475-----	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293-----	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025-----	240–285	3345.8–3358 36.	43–36.5
12.57675–12.57725-----	322–335.4	3600–4400	(²)

Table 19. Restricted Bands of Operation

¹ Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.

² Above 38.6

Test Requirement(s): § 15.209 (a): Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in Table 20.

Frequency (MHz)	§ 15.209(a), Radiated Emission Limits (dBμV) @ 3m
30 - 88	40.00
88 - 216	43.50
216 - 960	46.00
Above 960	54.00

Table 20. Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)

Test Procedures: The radiated methodology referenced in ANSI C63.10: 2013 Section 11.12.1 was utilized in order to assess the unwanted emissions in the restricted bands.

A radiated scan was performed with the antenna of proper impedance installed. The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes if multiple mounting orientations are supported. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line.

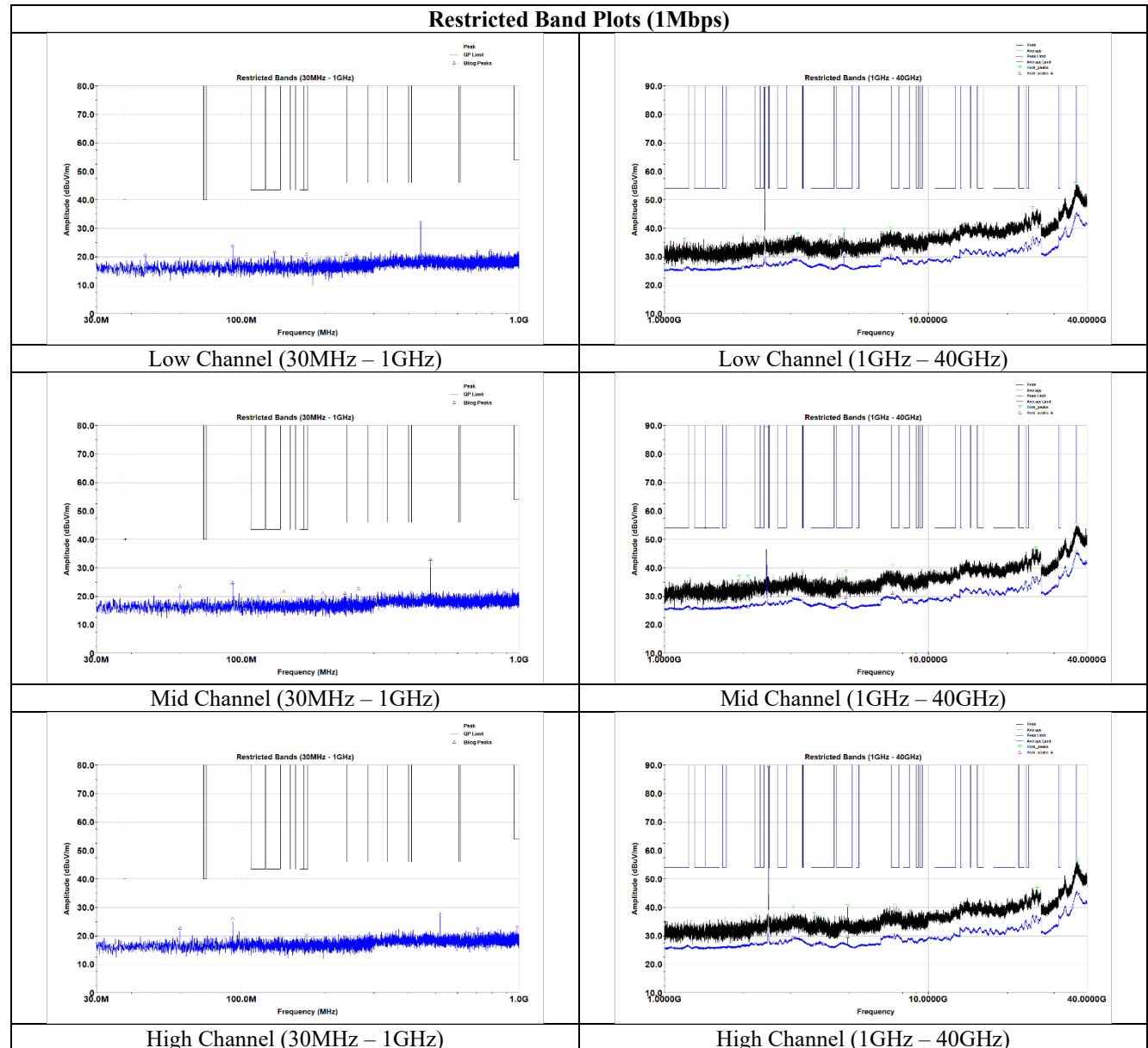
Radiated measurements below 30MHz were performed in a semi-anechoic chamber that has been correlated to an open area site.

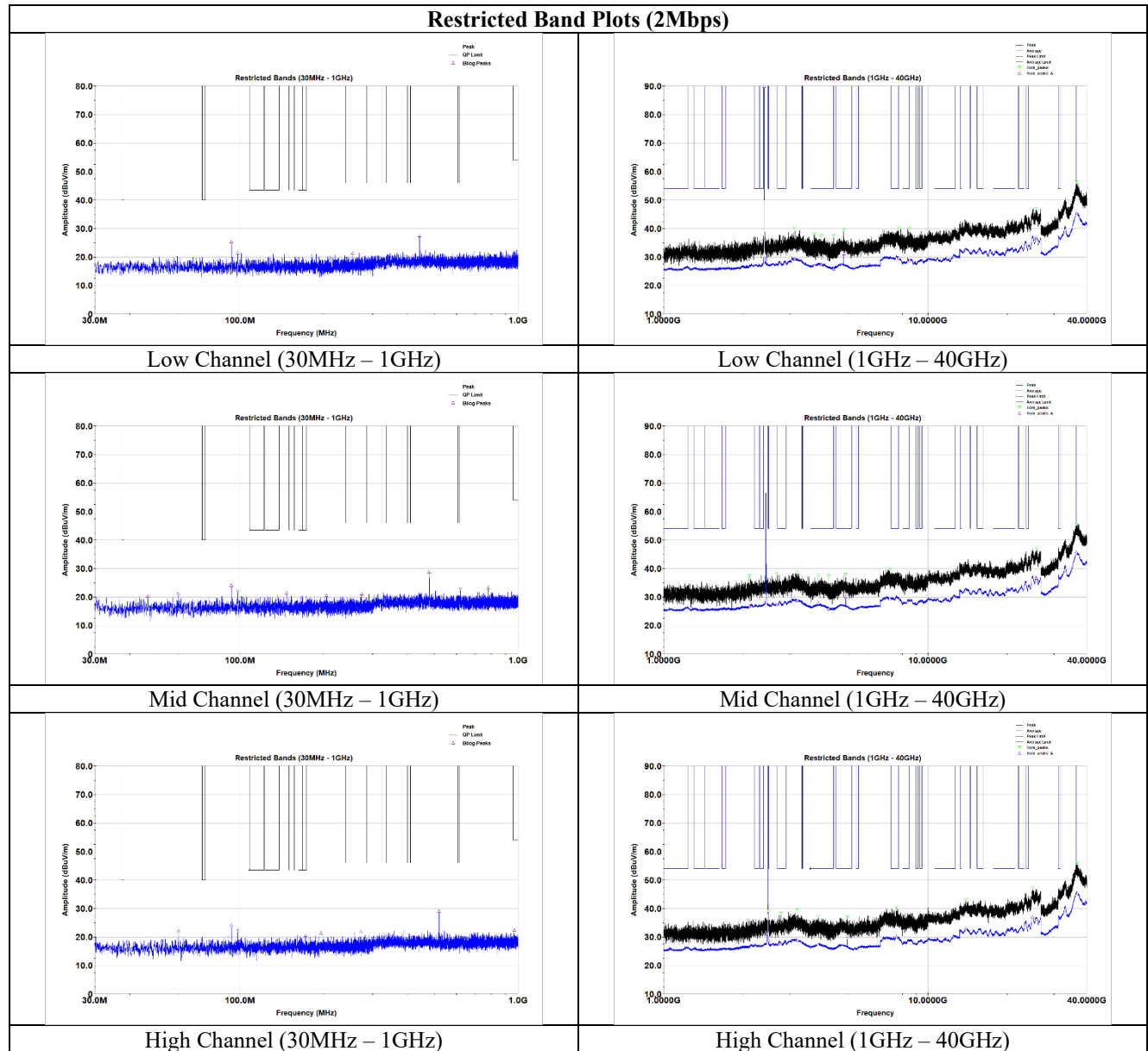
Test Software: TILE Version 7.4.2.5 (Manufactured by ETS Lindgren) and ELEKTRA Version 4.61 (Manufactured by Rohde&Schwarz) was utilized to perform these measurements.

Test Results: The iDFace Max was compliant with the Radiated Spurious Emission limits of § 15.247(d).

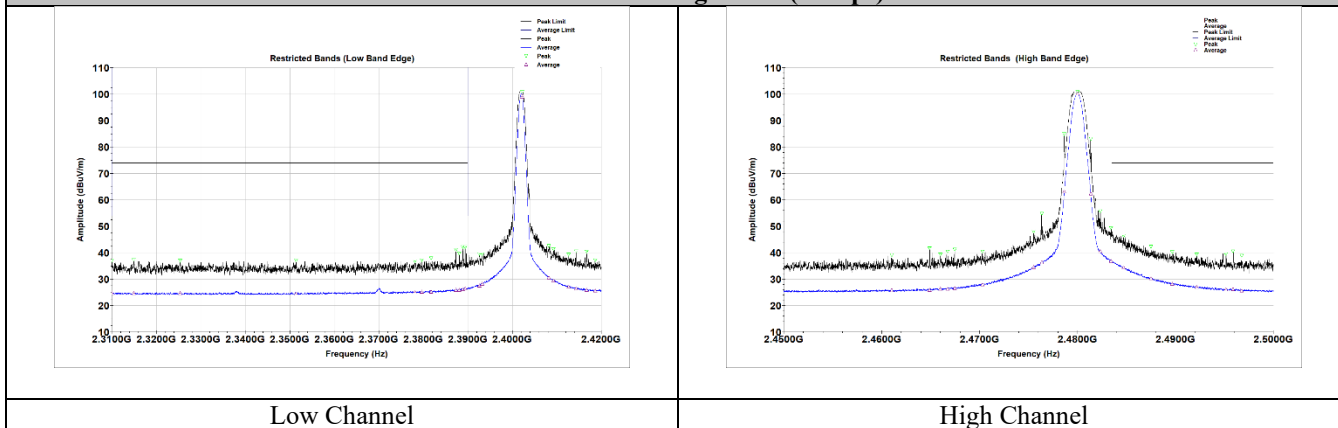
Test Engineer(s): Veer Patel, Bryan Taylor

Test Date(s): 6/6/2025 – 7/18/2025





Restricted Band Edge Plots (1Mbps)



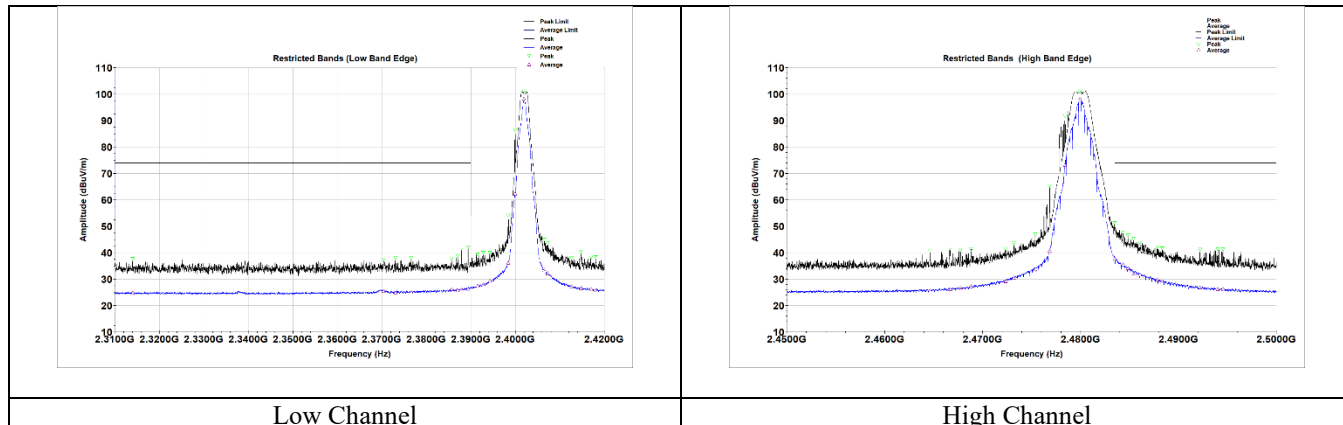
Frequency (MHz)	Peak Reading (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Avg Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dBuV/m)	Result
2310.028	37.06	74	36.94	24.61	54	29.39	Pass
2314.964	37.4	74	36.6	24.6	54	29.4	Pass
2325.331	36.94	74	37.06	24.71	54	29.29	Pass
2351.456	37.17	74	36.83	24.41	54	29.59	Pass
2378.117	36.82	74	37.18	25.1	54	28.9	Pass
2379.616	37.24	74	36.76	25.21	54	28.79	Pass
2381.734	38	74	36	25.22	54	28.78	Pass
2387.289	41.07	74	32.93	25.88	54	28.12	Pass
2388.073	39.69	74	34.31	25.85	54	28.15	Pass
2388.87	42.18	74	31.82	26.17	54	27.83	Pass
2389.392	42.23	74	31.77	26.41	54	27.59	Pass

Figure 7. Restricted Band Edge Spurious Emissions (Low Band Edge, 1Mbps)

Frequency (MHz)	Peak Reading (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Avg Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dBuV/m)	Result
2484.694	46.37	74	27.63	34.33	54	19.67	Pass
2487.506	42.25	74	31.75	30.26	54	23.74	Pass
2489.675	40.3	74	33.7	28.25	54	25.75	Pass
2492.188	39.31	74	34.69	27	54	27	Pass
2495.162	39.65	74	34.35	26.02	54	27.98	Pass
2495.9	40.66	74	33.34	26.14	54	27.86	Pass
2496.762	38.85	74	35.15	25.58	54	28.42	Pass

Figure 8. Restricted Band Edge Spurious Emissions (High Band Edge, 1Mbps)

Restricted Band Edge Plots, 2Mbps



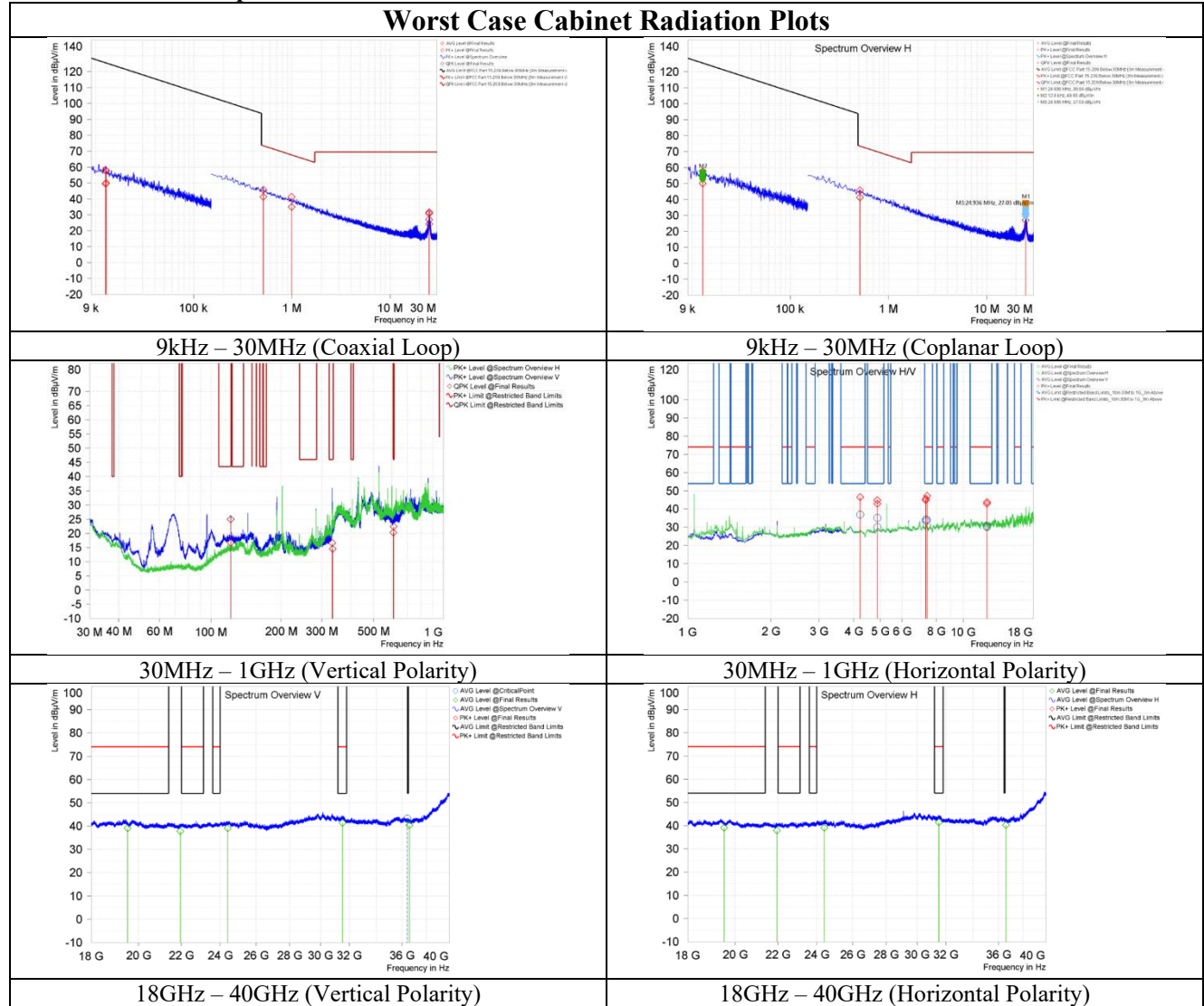
Frequency (MHz)	Peak Reading (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Avg Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dBuV/m)	Result
2314.029	37.61	74	36.39	24.8	54	29.2	Pass
2370.418	37.57	74	36.43	25.44	54	28.56	Pass
2373.085	38.1	74	35.9	24.91	54	29.09	Pass
2376.564	38.03	74	35.97	25.1	54	28.9	Pass
2385.707	37.75	74	36.25	26.1	54	27.9	Pass
2387	38.79	74	35.21	25.69	54	28.31	Pass
2387.88	41.59	74	32.41	26.02	54	27.98	Pass
2389.406	42	74	32	26.34	54	27.66	Pass

Figure 9. Restricted Band Edge Spurious Emissions (Low Band Edge, 2Mbps)

Frequency (MHz)	Peak Reading (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Avg Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dBuV/m)	Result
2484.325	48.1	74	25.9	35.55	54	18.45	Pass
2484.856	46.62	74	27.38	34.07	54	19.93	Pass
2485.412	45.4	74	28.6	31.58	54	22.42	Pass
2486.075	43.94	74	30.06	31.58	54	22.42	Pass
2487.825	42.22	74	31.78	29.83	54	24.17	Pass
2488.363	41.79	74	32.21	28.98	54	25.02	Pass
2492.2	41.2	74	32.8	26.84	54	27.16	Pass
2494.006	41.33	74	32.67	26.19	54	27.81	Pass
2494.563	41.41	74	32.59	26.24	54	27.76	Pass

Figure 10. Restricted Band Edge Spurious Emissions (High Band Edge, 2Mbps)

Worst Case Cabinet Spurious Emissions



Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.013	58.18	125.58	67.40	17.58	V	265.8	1.00	0.200	Pass
0.013	57.67	125.44	67.78	17.47	H	95.5	1.00	0.200	Pass
0.510	45.68	73.45	27.77	11.35	H	218.2	1.00	9.000	Pass
0.992	41.24	67.67	26.43	11.76	V	55.2	1.00	9.000	Pass
24.936	30.84	69.50	38.66	9.71	H	286.4	1.00	9.000	Pass
25.161	31.57	69.50	37.93	9.63	V	346.9	1.00	9.000	Pass

Figure 11. Worst Case Cabinet Radiation, 9kHz - 30MHz

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
121.500	16.71	43.52	26.81	-6.27	H	251.9	3.72	120.000	Pass
121.500	24.93	43.52	18.59	-6.57	V	157.8	1.00	120.000	Pass
332.430	16.62	46.02	29.40	-4.60	V	336.4	1.29	120.000	Pass
333.480	14.49	46.02	31.53	-4.69	H	322.9	3.27	120.000	Pass
608.490	20.28	46.02	25.74	1.34	V	16.7	2.39	120.000	Pass
610.050	22.36	46.02	23.66	1.16	H	40.5	1.45	120.000	Pass

Figure 12. Radiated Spurious, 30MHz - 1GHz

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
4,224.500	46.54	74.00	27.46	36.88	54.00	17.12	-3.75	H	284.1	2.24	Pass
4,880.000	44.78	74.00	29.22	35.14	54.00	18.86	-3.35	H	285.7	1.26	Pass
4,880.000	42.88	74.00	31.12	30.00	54.00	24.00	-3.35	V	328.7	1.50	Pass
7,320.000	45.65	74.00	28.35	34.18	54.00	19.82	-2.79	H	308.1	1.01	Pass
7,320.500	44.78	74.00	29.22	33.41	54.00	20.59	-2.79	V	310.5	3.17	Pass
7,392.500	47.25	74.00	26.75	34.00	54.00	20.00	-2.49	V	318	3.18	Pass
12,208.500	42.93	74.00	31.07	30.13	54.00	23.87	-1.93	H	123.8	3.01	Pass
12,208.500	43.75	74.00	30.25	30.49	54.00	23.51	-1.93	V	66.7	3.42	Pass
19,520.000	50.55	74.00	23.45	39.05	54.00	14.95	12.35	H	309.9	1.50	Pass
19,520.000	50.42	74.00	23.58	39.02	54.00	14.98	12.35	V	280.1	4.00	Pass
31,494.250	52.72	74.00	21.28	41.42	54.00	12.58	16.75	H	0	4.00	Pass
31,528.625	52.53	74.00	21.47	41.36	54.00	12.64	16.79	V	182.2	1.50	Pass

Figure 13. Radiated Spurious, 1GHz to 40GHz

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

MET Asset #	Description	Manufacturer	Model	Last Cal Date	Cal Due Date
1A1234	FSV Signal Analyzer	Rohde & Schwarz	FSV 40	03/13/2025	03/13/2026
1A1250	EMI Test Receiver	Rohde & Schwarz	ESW44	03/28/2025	03/28/2026
MY46180897	Spectrum Analyzer	Agilent Technologies	E4448A	08/28/2024	08/28/2025
1A1176	Active Loop Antenna (9KHz-30MHz)	ETS-Lindgren	6502	08/22/2024	08/22/2025
1A1050	Bi-Log Antenna	Schaffner	CBL-6112D	03/05/2024	03/05/2026
1A1183	Double Ridged Waveguide Antenna	ETS Lindgren	3117	02/20/2024	02/20/2026
1A1180	Preamplifier	Miteq	AMF-7D-01001800-22-10P	04/16/2025	04/16/2026
1A1161	Horn Antenna (18-40GHz)	ETS - Lindgren	3116c	07/11/2023	07/11/2024
1A1065	EMI Test Receiver	Rohde & Schwarz	ESCI	08/20/2024	08/20/2025
1A1177	Pulse Limiter	Rohde & Schwarz	ESH3Z2	12/11/2024	12/11/2025
1A1149	DC Milli-Ohm Meter	GW Instek	GOM-802	10/15/2024	10/15/2025
3A3377	Thermohygrometer with barometer	Omega	Q68706	03/31/2025	03/31/2026
1A1257	True-RMS Multimeter	Fluke	179	02/07/2025	02/07/2026
1A1123	LISN	TESEQ	NNB 51	12/11/2024	12/11/2025
1A1225	Environmental Chamber	Espec	EXP-2H/New	05/16/2025	05/16/2026
1A1099	Generator	Com-Power	CGO-51000	See Note	
1A1044	Generator	Com-Power	CG-520	See Note	
1A1073	Multi Device Controller	ETS	2090	See Note	
1A1074	System Controller	Panasonic	WV-CU101	See Note	
1A1080	Multi-Device	ETS	2090	See Note	

Table 21. Test Equipment Table 22. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

End of Report