



# element

**GSL Solutions, Inc.**

**IntelliVault / IntelliCab**

**FCC 15.225:2020**

**13.56MHz Radio**

**Report: GSLS0016, Issue Date: December 9, 2020**



NVLAP LAB CODE: 200630-0



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# CERTIFICATE OF TEST



Last Date of Test: December 3, 2020  
GSL Solutions, Inc.  
EUT: IntelliVault / IntelliCab

## Radio Equipment Testing

### Standards

Specification	Method
FCC 15.207:2020	
FCC 15.225:2020	ANSI C63.10:2013

### Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.4	Field Strength of Fundamental	Yes	Pass	
6.4	Field Strength of Spurious Emissions Less Than 30 MHz	Yes	Pass	
6.5	Field Strength of Spurious Emissions Greater Than 30 MHz	Yes	Pass	
6.8	Frequency Stability	Yes	Pass	

### Deviations From Test Standards

None

### Approved By:

Kyle Holgate, 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

## 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** - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

**NVLAP** - Each laboratory is accredited by NVLAP to ISO 17025

## 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** – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

## 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

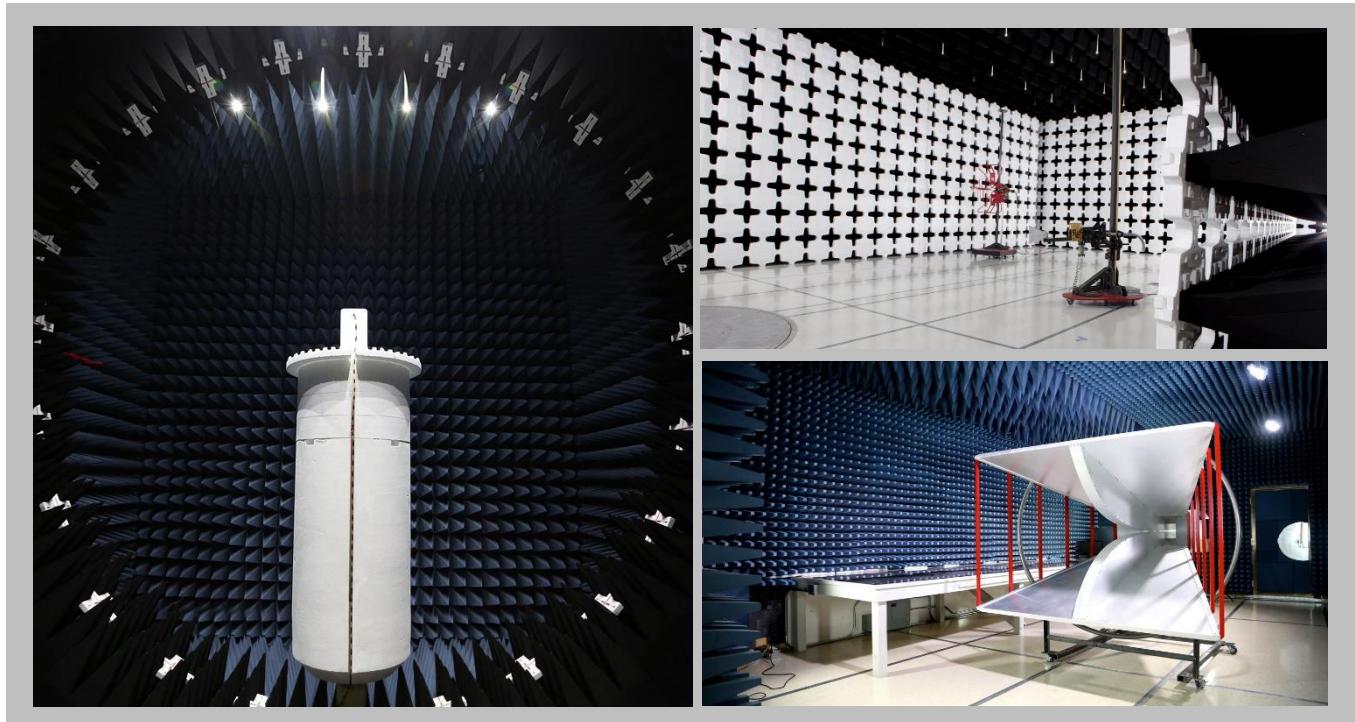
For details on the Scopes of our Accreditations, please visit:

<https://www.nwemc.com/emc-testing-accreditations>

# FACILITIES



<b>California</b> Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	<b>Minnesota</b> Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	<b>Oregon</b> Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	<b>Texas</b> Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	<b>Washington</b> Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425) 984-6600
<b>NVLAP</b>				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code: 201049-0	NVLAP Lab Code: 200629-0
<b>Innovation, Science and Economic Development Canada</b>				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
<b>BSMI</b>				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
<b>VCCI</b>				
A-0029	A-0109	A-0108	A-0201	A-0110
<b>Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA</b>				
US0158	US0175	US0017	US0191	US0157



# MEASUREMENT UNCERTAINTY



## 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.

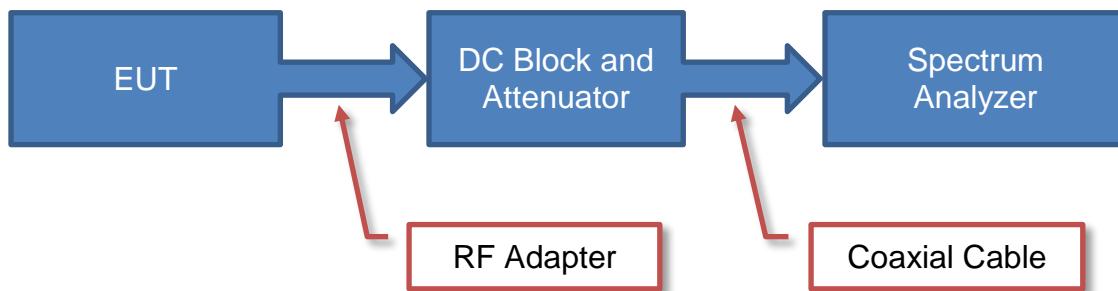
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific 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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.6 dB	-2.6 dB

# Test Setup Block Diagrams

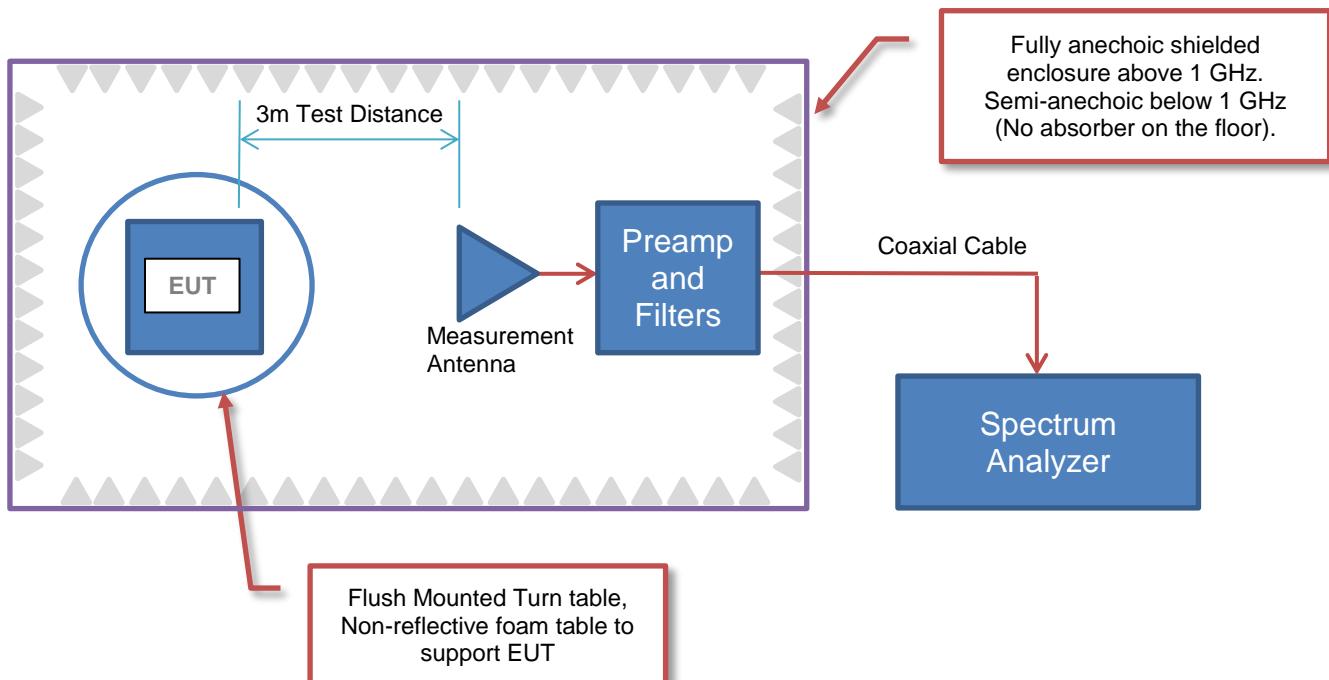
## Antenna Port Conducted Measurements



## Near Field Test Fixture Measurements



## Spurious Radiated Emissions



# PRODUCT DESCRIPTION



## Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	GSL Solutions, Inc.
<b>Address:</b>	2414 SE 125th Avenue
<b>City, State, Zip:</b>	Vancouver, WA 98683
<b>Test Requested By:</b>	Joe Intile
<b>EUT:</b>	IntelliVault / IntelliCab
<b>First Date of Test:</b>	November 5, 2020
<b>Last Date of Test:</b>	December 3, 2020
<b>Receipt Date of Samples:</b>	November 5, 2020
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage
<b>Purchase Authorization:</b>	Verified

## Information Provided by the Party Requesting the Test

<b>Functional Description of the EUT:</b>
Controlled drug storage, prescription filling, and retrieval system
<b>Testing Objective:</b>
To demonstrate compliance to FCC Part 15.225 specifications.

# CONFIGURATIONS



## Configuration GSLS0016- 1

EUT					
Description		Manufacturer		Model/Part Number	
Serial Number					
Pharmacy Storage Cabinet		GSL Solutions, INC.		IntelliVault / IntelliCab	
ITE Power Supply		GlobTek, Inc.		GTM961200P12024-T3	

Remote Equipment Outside of Test Setup Boundary			
Description		Manufacturer	
Model/Part Number		Serial Number	
Gigabit Switch	Netgear	GS105	3TL16C5H11A77

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Mains	No	1.8m	No	AC Mains	ITE Power Supply
DC Power	No	1.0m	Yes	ITE Power Supply	Pharmacy Storage Cabinet
Cat5e	No	5.0m	No	Pharmacy Storage Cabinet	Gigabit Switch

## Configuration GSLS0016- 2

EUT					
Description		Manufacturer		Model/Part Number	
Serial Number					
RFID PCB		GSL Solutions, INC.		Control RD Rev D1	

Peripherals in test setup boundary					
Description		Manufacturer		Model/Part Number	
Serial Number					
DC Power Supply		Topward Electric Instruments Co., LTD		TPS 2000	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power - Coax	Yes	3.0m	No	DC Power Supply	RFID PCB
AC Power	No	1.8m	No	AC Mains	DC Power Supply

# CONFIGURATIONS



## Configuration GSLS0016- 5

<b>EUT</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Pharmacy Storage Cabinet	GSL Solutions, INC.	IntelliVault / IntelliCab	SGV-00126

<b>Remote Equipment Outside of Test Setup Boundary</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Gigabit Switch	Netgear	GS105	3TL16C5H11A77

<b>Cables</b>					
<b>Cable Type</b>	<b>Shield</b>	<b>Length (m)</b>	<b>Ferrite</b>	<b>Connection 1</b>	<b>Connection 2</b>
AC Power	No	1.8m	No	AC Mains	DC Power Supply
AC Mains	No	1.8m	No	AC Mains	ITE Power Supply
DC Power	No	1.0m	Yes	ITE Power Supply	Pharmacy Storage Cabinet
Cat5e	No	5.0m	No	Pharmacy Storage Cabinet	Gigabit Switch

# MODIFICATIONS



## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2020-11-05	Field Strength of Fundamental	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	2020-11-05	Field Strength of Spurious Emissions less than 30 MHz	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	2020-11-09	Frequency Stability	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	2020-11-16	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.
5	2020-12-03	Field Strength of Spurious Emissions greater than 30 MHz	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)
Loop	Manufacturer	13.56 MHz	N/A

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

# POWERLINE CONDUCTED EMISSIONS



## TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT.

The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10.

In the event that the operating frequency of 13.56 MHz is causing the product to fail the FCC 15.207 limits, the following guidance can be used:

FCC KDB 174176 D01 AC Conducted FAQ v01r01, June 3, 2015 Section Q5:

For a device with a permanent or detachable antenna operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:

(1) perform the AC power-line conducted tests with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band;

(2) retest with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network which simulates the antenna in the fundamental frequency band.

All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2013.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARH	2020-05-13	2021-05-13
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2020-01-06	2021-01-06
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	2020-08-31	2021-08-31

## MEASUREMENT UNCERTAINTY

Description			
Expanded k=2	2.6 dB		-2.6 dB

## CONFIGURATIONS INVESTIGATED

GSLS0016-1

## MODES INVESTIGATED

On, all doors closed, 13.56MHz RFID radios on.

# POWERLINE CONDUCTED EMISSIONS



EUT:	IntelliVault / IntelliCab	Work Order:	GSLS0016
Serial Number:	SGC-00124	Date:	2020-11-16
Customer:	GSL Solutions, INC.	Temperature:	23.9°C
Attendees:	Joe Intile, Tyler Dean, Tyler Seitz	Relative Humidity:	40.4%
Customer Project:	None	Bar. Pressure:	1015 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	120VAC/60Hz	Configuration:	GSLS0016-1

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2020	ANSI C63.10:2013

## TEST PARAMETERS

Run #:	7	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

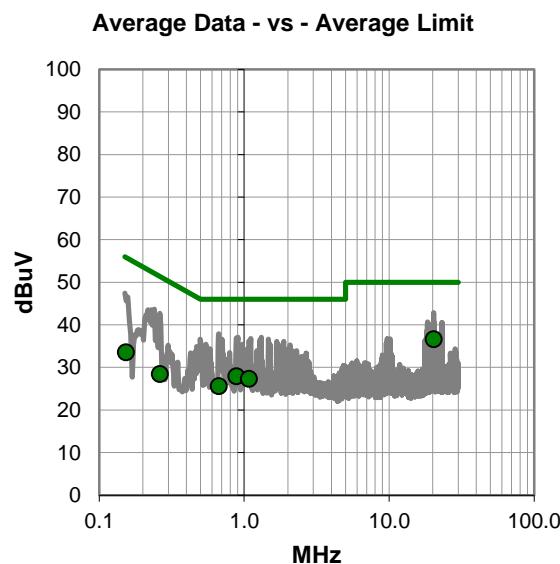
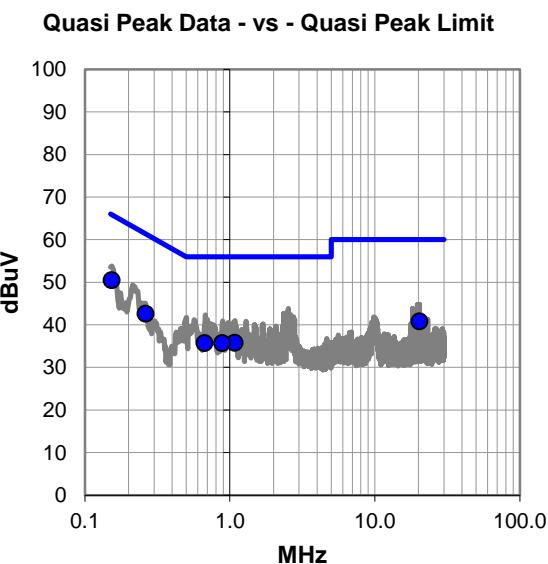
None

## EUT OPERATING MODES

On, all doors closed, 13.56MHz RFID radios on.

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.153	30.5	20.0	50.5	65.9	-15.4
0.263	22.7	19.9	42.6	61.3	-18.7
20.318	20.0	20.8	40.8	60.0	-19.2
1.081	15.9	19.9	35.8	56.0	-20.2
0.668	15.8	19.9	35.7	56.0	-20.3
0.886	15.8	19.9	35.7	56.0	-20.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
20.318	15.8	20.8	36.6	50.0	-13.4
0.886	8.0	19.9	27.9	46.0	-18.1
1.081	7.4	19.9	27.3	46.0	-18.7
0.668	5.7	19.9	25.6	46.0	-20.4
0.153	13.5	20.0	33.5	55.9	-22.4
0.263	8.5	19.9	28.4	51.3	-22.9

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	IntelliVault / IntelliCab	Work Order:	GSLS0016
Serial Number:	SGC-00124	Date:	2020-11-16
Customer:	GSL Solutions, INC.	Temperature:	23.9°C
Attendees:	Joe Intile, Tyler Dean, Tyler Seitz	Relative Humidity:	40.4%
Customer Project:	None	Bar. Pressure:	1015 mb
Tested By:	Cole Ghizzone	Job Site:	EV07
Power:	120VAC/60Hz	Configuration:	GSLS0016-1

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2020	ANSI C63.10:2013

## TEST PARAMETERS

Run #:	8	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

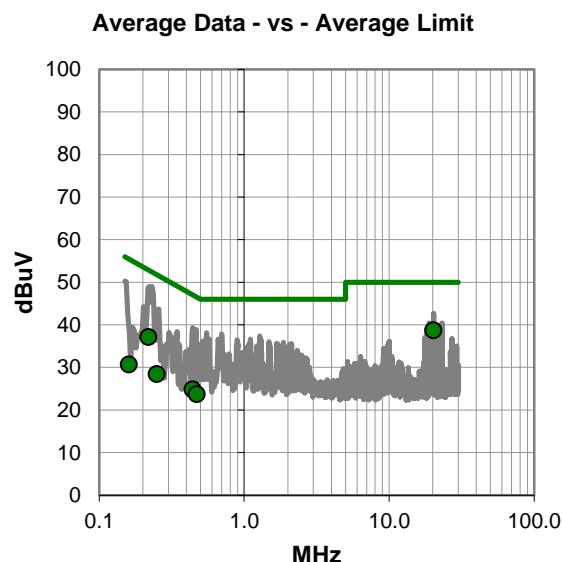
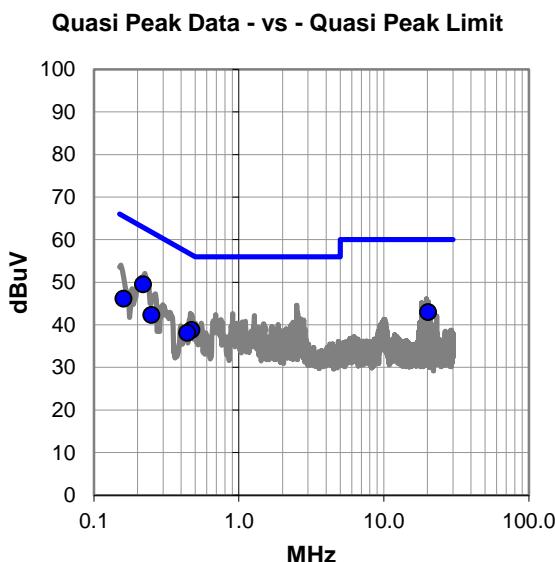
None

## EUT OPERATING MODES

On, all doors closed, 13.56MHz RFID radios on.

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #8

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.218	29.5	20.0	49.5	62.9	-13.4
20.258	22.2	20.8	43.0	60.0	-17.0
0.472	18.9	19.9	38.8	56.5	-17.7
0.441	18.2	19.9	38.1	57.0	-18.9
0.160	26.2	19.9	46.1	65.5	-19.4
0.249	22.4	19.9	42.3	61.8	-19.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
20.258	17.9	20.8	38.7	50.0	-11.3
0.218	17.1	20.0	37.1	52.9	-15.8
0.441	4.9	19.9	24.8	47.0	-22.2
0.472	3.8	19.9	23.7	46.5	-22.8
0.249	8.5	19.9	28.4	51.8	-23.4
0.160	10.8	19.9	30.7	55.5	-24.8

## CONCLUSION

Pass

Tested By

# FIELD STRENGTH OF FUNDAMENTAL



PSA-ESCI 2020.06.24.2

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**

Door 4 - 13.56 MHZ RFID array polling for RFID tags.  
Door 3 - 13.56 MHZ RFID array polling for RFID tags.  
Door 2 - 13.56 MHZ RFID array polling for RFID tags.  
Door 1 - 13.56 MHZ RFID array polling for RFID tags.  
4 x Door, 13.56 MHz RFID controller boards polling for tags.

## **POWER SETTINGS INVESTIGATED**

110VAC/60Hz

## **CONFIGURATIONS INVESTIGATED**

GSLS0016 - 1

## **FREQUENCY RANGE INVESTIGATED**

Start Frequency	12 MHz	Stop Frequency	15 MHz
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## **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.	Interval
Antenna - Loop	EMCO	6502	AOA	2020-07-06	24 mo
Cable	None	10m Test Distance Cable	EVL	2020-02-03	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2020-02-28	12 mo

## **TEST DESCRIPTION**

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

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

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.



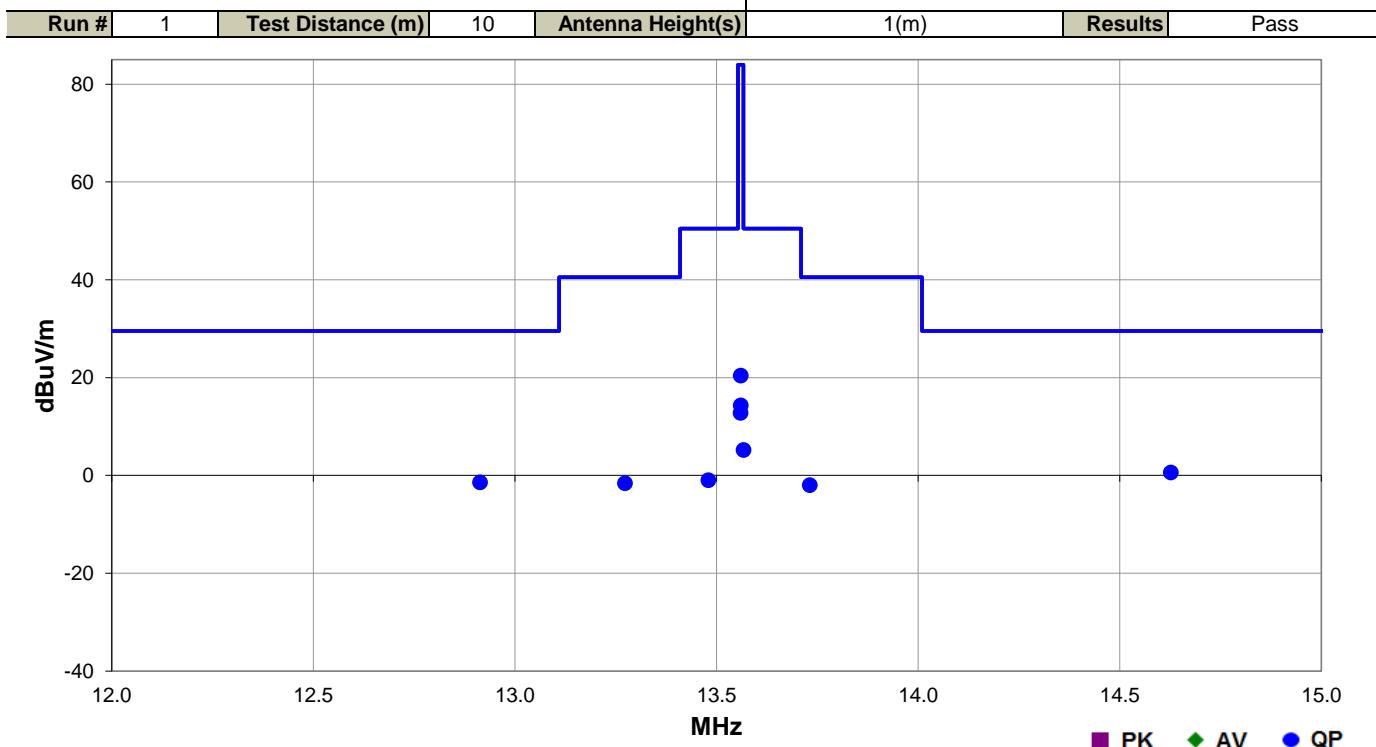
# FIELD STRENGTH OF FUNDAMENTAL

EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV11	Humidity:	46.5% RH	
Serial Number:	SGV-00124	Barometric Pres.:	1024 mbar	Tested by: Jeff Alcoke
EUT:	IntelliVault / IntelliCab			
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	4 x Door, 13.56 MHz RFID controller boards polling for tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
14.627	7.8	11.9	1.0	44.0	10.0	0.0	Perp EUT	QP	-19.1	0.6	29.5	-28.9
12.914	5.8	11.9	1.0	49.0	10.0	0.0	Perp EUT	QP	-19.1	-1.4	29.5	-30.9
13.273	5.6	11.9	1.0	49.0	10.0	0.0	Perp EUT	QP	-19.1	-1.6	40.5	-42.1
13.731	5.3	11.8	1.0	49.0	10.0	0.0	Perp EUT	QP	-19.1	-2.0	40.5	-42.5
13.567	12.5	11.8	1.0	49.0	10.0	0.0	Perp EUT	QP	-19.1	5.2	50.5	-45.3
13.480	6.2	11.9	1.0	49.0	10.0	0.0	Perp EUT	QP	-19.1	-1.0	50.5	-51.5
13.560	27.7	11.8	1.0	48.0	10.0	0.0	Perp EUT	QP	-19.1	20.4	84.0	-63.6
13.560	21.6	11.8	1.0	27.0	10.0	0.0	Par GND	QP	-19.1	14.3	84.0	-69.7
13.560	20.1	11.8	1.0	152.0	10.0	0.0	Par EUT	QP	-19.1	12.8	84.0	-71.2

# FIELD STRENGTH OF FUNDAMENTAL

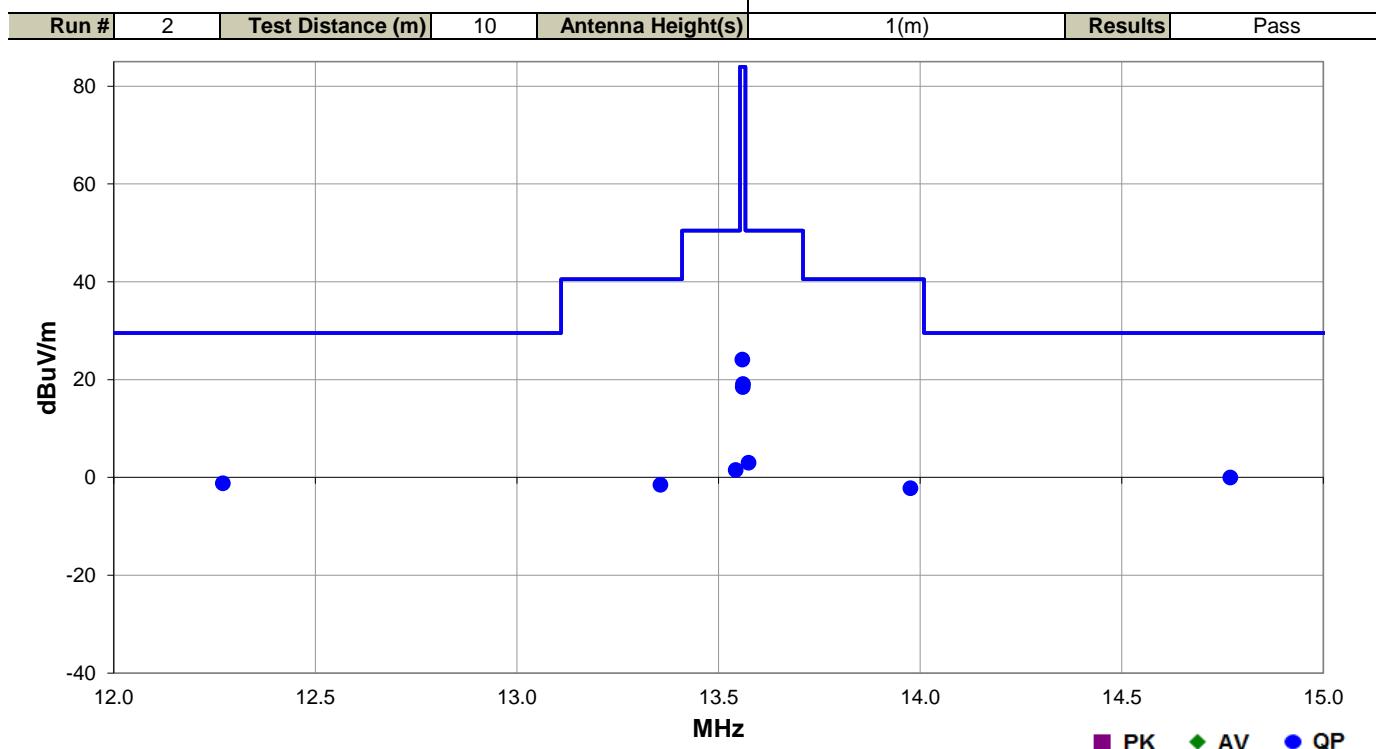


EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	Tested by:	Jeff Alcocke
Project:	None	Temperature:	22.4 °C		
Job Site:	EV11	Humidity:	50.9% RH		
Serial Number:	SGV-00124	Barometric Pres.:	1023 mbar		
EUT:	IntelliVault / IntelliCab				
Configuration:	1				
Customer:	GSL Solutions, INC.				
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile				
EUT Power:	110VAC/60Hz				
Operating Mode:	Door 1 - 13.56 MHZ RFID array polling for RFID tags.				
Deviations:	None				
Comments:	None				

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
14.769	7.2	11.9	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	0.0	29.5	-29.5
12.271	6.1	11.8	1.0	63.0	10.0	0.0	Perp EUT	QP	-19.1	-1.2	29.5	-30.7
13.356	5.7	11.9	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	-1.5	40.5	-42.0
13.976	5.0	11.9	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	-2.2	40.5	-42.7
13.574	10.3	11.8	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	3.0	50.5	-47.5
13.543	8.8	11.8	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	1.5	50.5	-49.0
13.559	31.4	11.8	1.0	68.0	10.0	0.0	Perp EUT	QP	-19.1	24.1	84.0	-59.9
13.561	26.4	11.8	1.0	91.0	10.0	0.0	Par GND	QP	-19.1	19.1	84.0	-64.9
13.560	25.8	11.8	1.0	175.0	10.0	0.0	Par EUT	QP	-19.1	18.5	84.0	-65.5

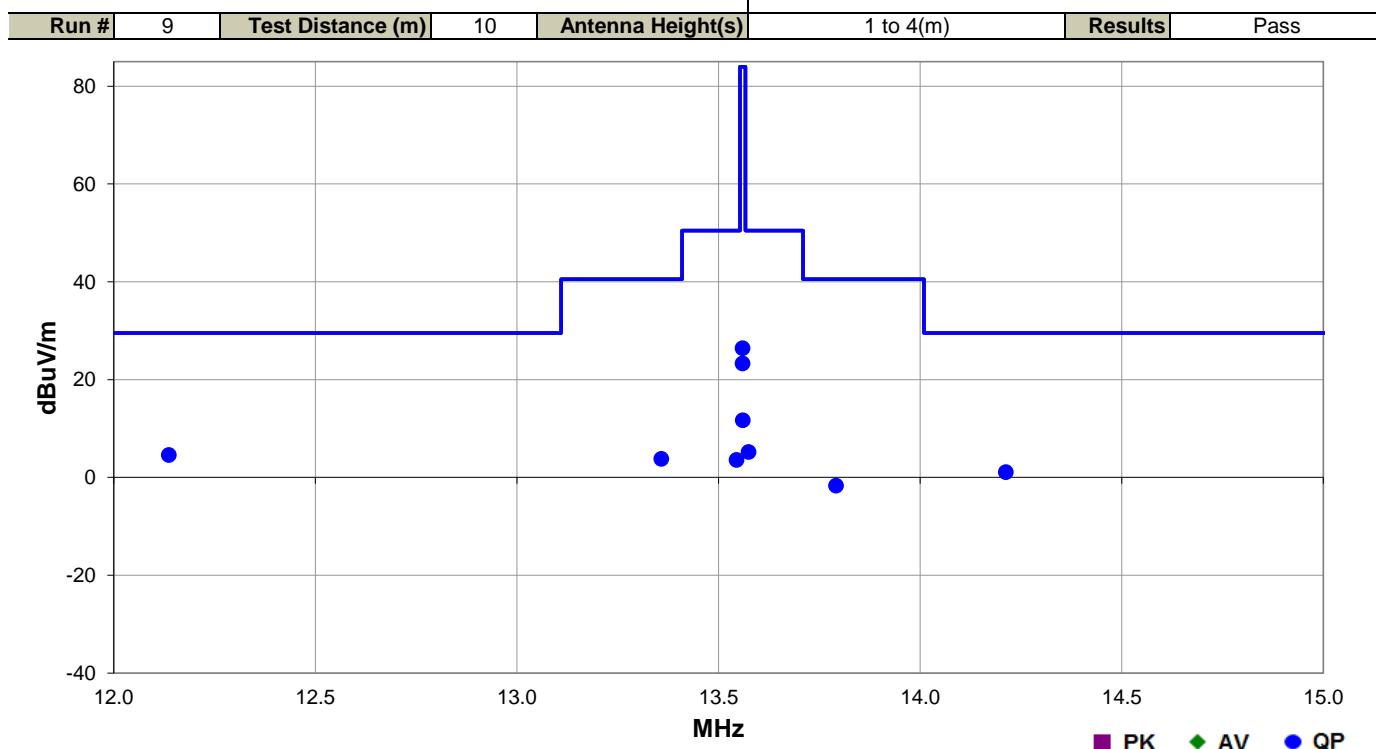
# FIELD STRENGTH OF FUNDAMENTAL

EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	 Tested by: Jeff Alcock
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00124	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab			
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 2 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
12.137	11.9	11.8	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	4.6	29.5	-24.9
14.212	8.3	11.9	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	1.1	29.5	-28.4
13.358	11.0	11.9	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	3.8	40.5	-36.7
13.791	5.5	11.9	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	-1.7	40.5	-42.2
13.575	12.5	11.8	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	5.2	50.5	-45.3
13.545	10.9	11.8	1.0	223.0	10.0	0.0	Perp EUT	QP	-19.1	3.6	50.5	-46.9
13.560	33.7	11.8	1.08	220.0	10.0	0.0	Perp EUT	QP	-19.1	26.4	84.0	-57.6
13.560	30.6	11.8	3.01	215.0	10.0	0.0	Par GND	QP	-19.1	23.3	84.0	-60.7
13.560	19.0	11.8	2.82	166.0	10.0	0.0	Par EUT	QP	-19.1	11.7	84.0	-72.3

# FIELD STRENGTH OF FUNDAMENTAL



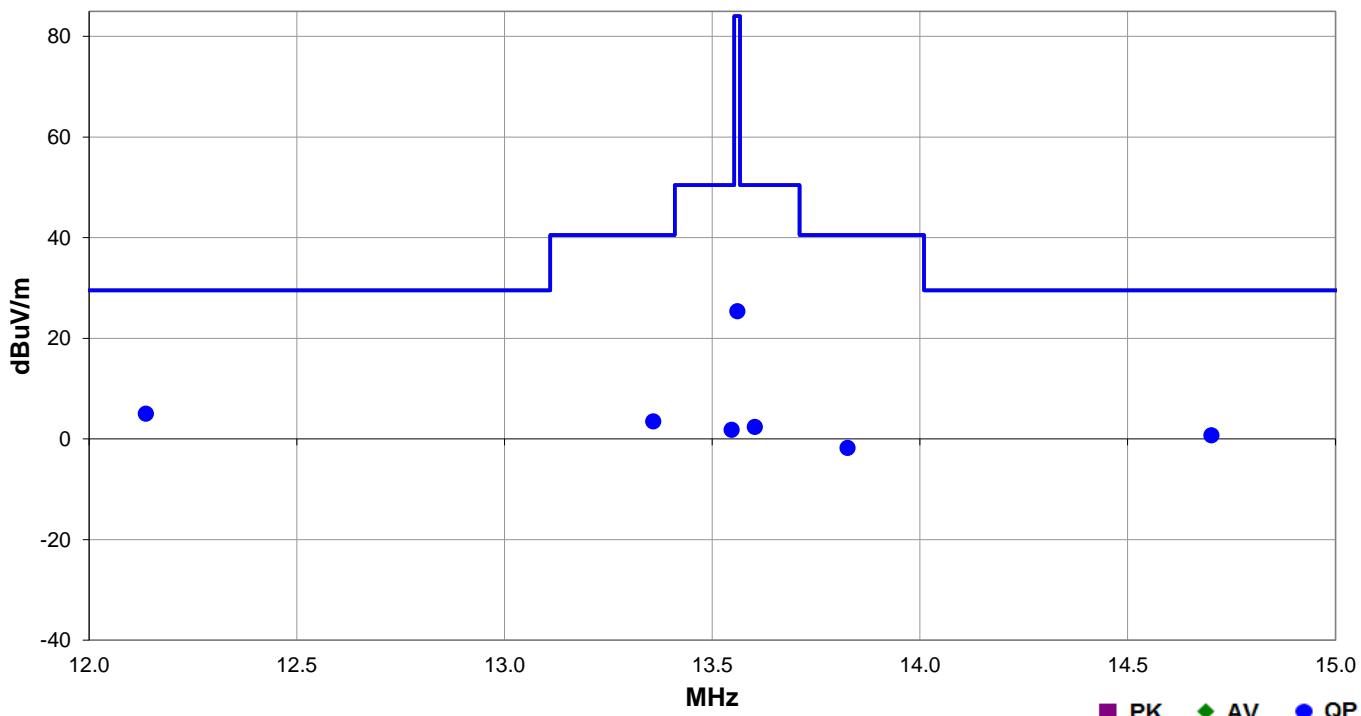
EmIR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00124	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab	Tested by:	Jeff Alcock	
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 3 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	Testing using worst case antenna orientation determined from measurements on the front panel, door 1 and door 2.			

Test Specifications		Test Method
FCC 15.225:2020		ANSI C63.10:2013

Run #	10	Test Distance (m)	10	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
12.137	12.3	11.8	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	5.0	29.5	-24.5
14.702	7.9	11.9	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	0.7	29.5	-28.8
13.358	10.7	11.9	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	3.5	40.5	-37.0
13.826	5.4	11.9	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	-1.8	40.5	-42.3
13.602	9.7	11.8	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	2.4	50.5	-48.1
13.547	9.1	11.8	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	1.8	50.5	-48.7
13.560	32.7	11.8	1.05	195.0	10.0	0.0	Perp EUT	QP	-19.1	25.4	84.0	-58.6

# FIELD STRENGTH OF FUNDAMENTAL



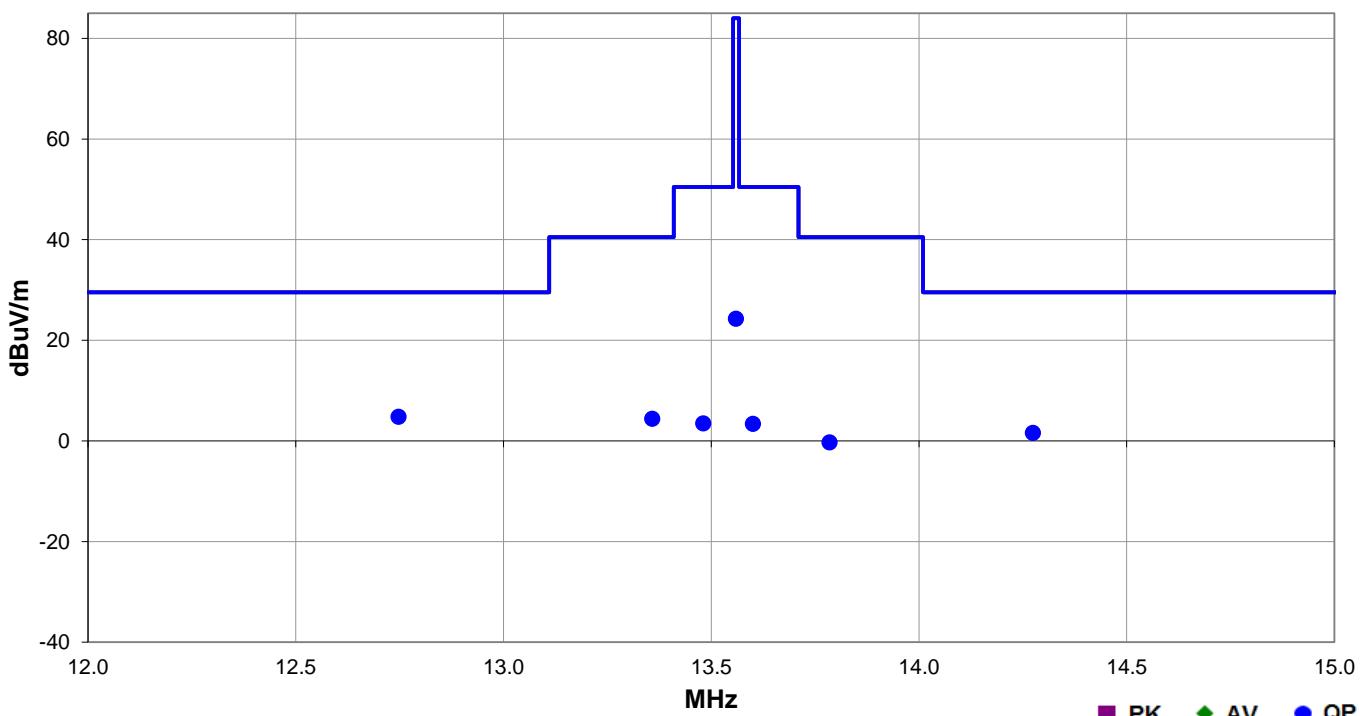
EmIR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	 <b>Tested by:</b> Jeff Alcock
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00124	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab			
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 4 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	Testing using worst case antenna orientation determined from measurements on the front panel, door 1 and door 2.			

Test Specifications		Test Method	
FCC 15.225:2020		ANSI C63.10:2013	

Run #	11	Test Distance (m)	10	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
12.747	12.0	11.9	1.0	47.0	10.0	0.0	Horz	QP	-19.1	4.8	29.5	-24.7
14.274	8.8	11.9	1.0	47.0	10.0	0.0	Horz	QP	-19.1	1.6	29.5	-27.9
13.358	11.6	11.9	1.0	47.0	10.0	0.0	Horz	QP	-19.1	4.4	40.5	-36.1
13.785	6.9	11.9	1.0	47.0	10.0	0.0	Horz	QP	-19.1	-0.3	40.5	-40.8
13.481	10.7	11.9	1.0	47.0	10.0	0.0	Horz	QP	-19.1	3.5	50.5	-47.0
13.601	10.7	11.8	1.0	47.0	10.0	0.0	Horz	QP	-19.1	3.4	50.5	-47.1
13.559	31.6	11.8	1.0	47.0	10.0	0.0	Horz	QP	-19.1	24.3	84.0	-59.7

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



PSA-ESCI 2020.06.24.2

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

Door 4 - 13.56 MHZ RFID array polling for RFID tags.  
Door 3 - 13.56 MHZ RFID array polling for RFID tags.  
Door 2 - 13.56 MHZ RFID array polling for RFID tags.  
Door 1 - 13.56 MHZ RFID array polling for RFID tags.  
4 x Door, 13.56 MHz RFID controller boards polling for tags.

## POWER SETTINGS INVESTIGATED

110VAC/60Hz

## CONFIGURATIONS INVESTIGATED

GSLS0016 - 1

## FREQUENCY RANGE INVESTIGATED

Start Frequency | 9 kHz | Stop Frequency | 30 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.	Interval
Antenna - Loop	EMCO	6502	AOA	2020-07-06	24 mo
Cable	None	10m Test Distance Cable	EVL	2020-02-03	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2020-02-28	12 mo

## TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

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). An active loop antenna was 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

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

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



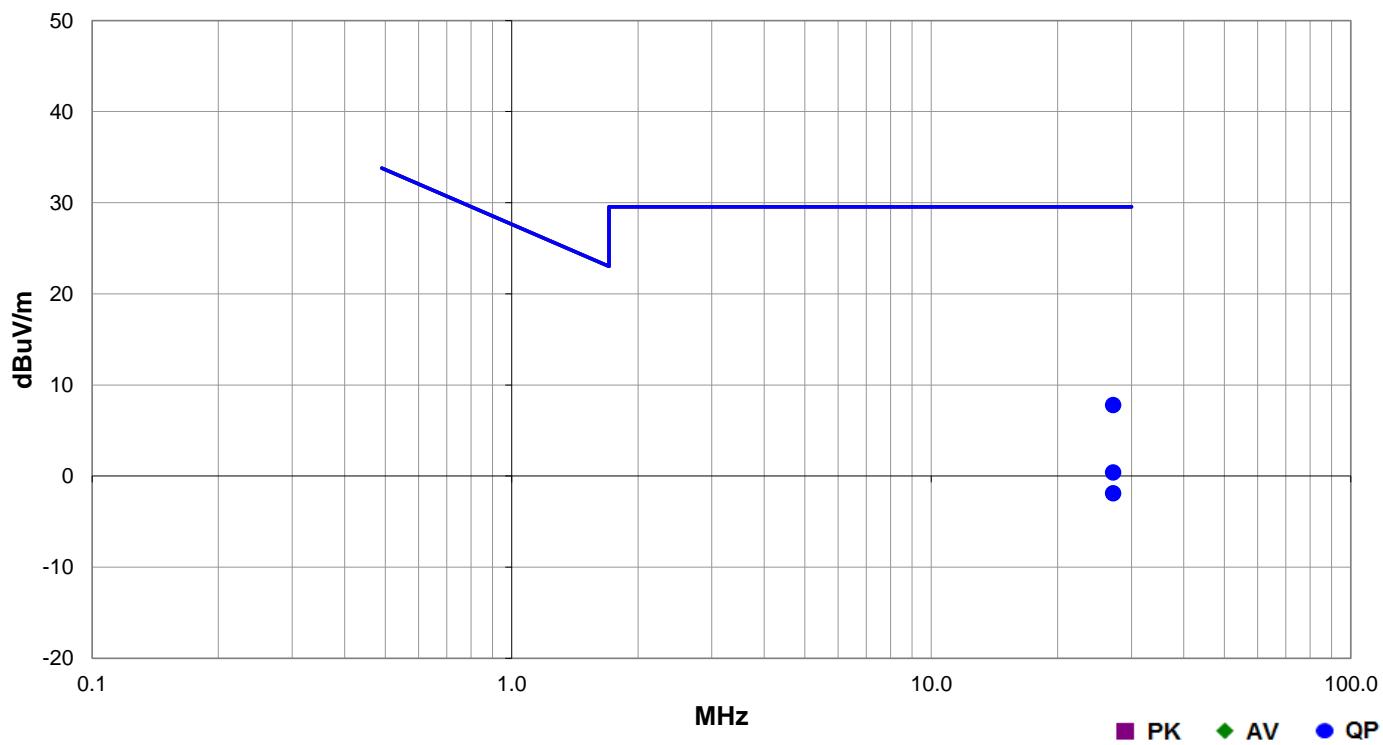
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	24.4 °C	
Job Site:	EV11	Humidity:	46.5% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1024 mbar	
EUT:	IntelliVault / IntelliCab		Tested by:	Jeff Alcock
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	4 x Door, 13.56 MHz RFID controller boards polling for tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	1	Test Distance (m)	10	Antenna Height(s)	1(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
27.121	16.9	10.0	1.0	188.0	10.0	0.0	Perp EUT	QP	-19.1	7.8	29.5	-21.7
27.119	9.5	10.0	1.0	217.0	10.0	0.0	Par GND	QP	-19.1	0.4	29.5	-29.1
27.120	7.2	10.0	1.0	92.0	10.0	0.0	Par EUT	QP	-19.1	-1.9	29.5	-31.4

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



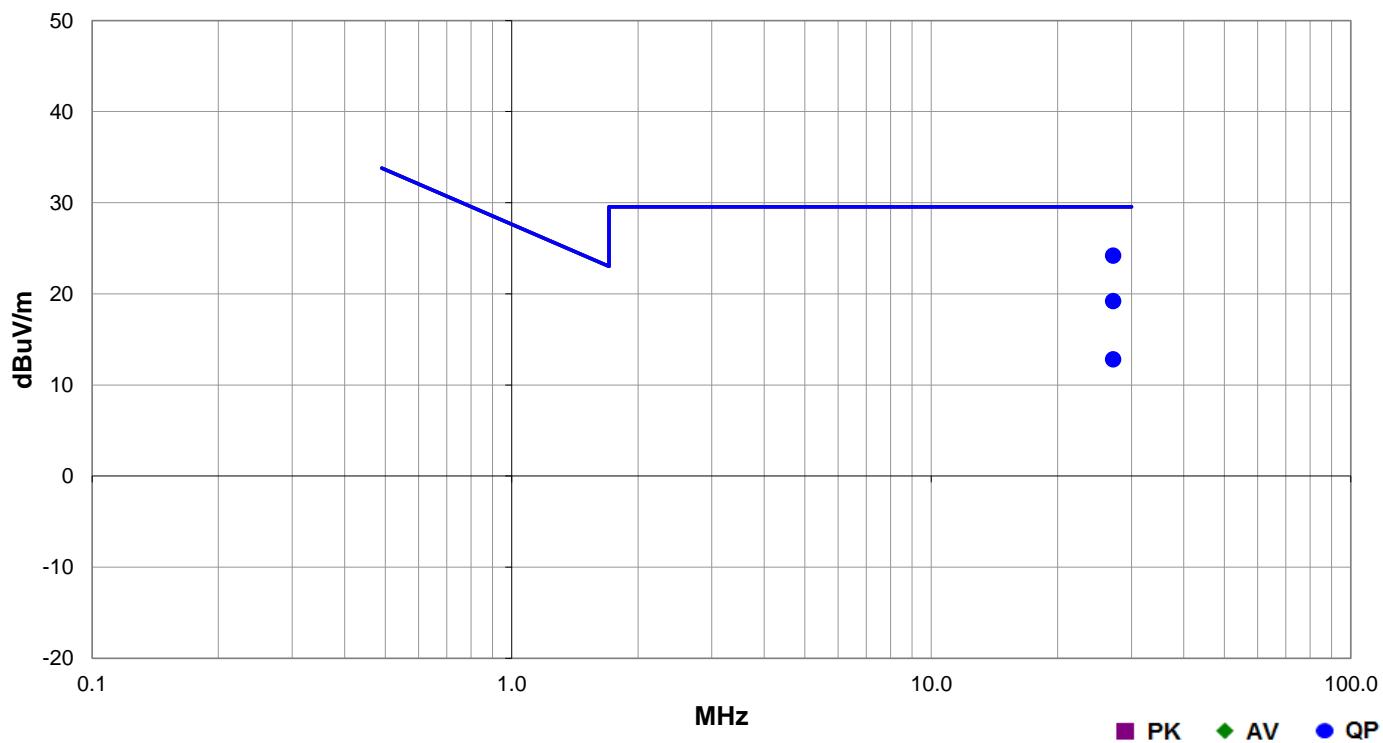
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	22.4 °C	
Job Site:	EV11	Humidity:	50.9% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1023 mbar	
EUT:	IntelliVault / IntelliCab		Tested by:	Jeff Alcock
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 1 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	2	Test Distance (m)	10	Antenna Height(s)	1(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
27.119	28.3	10.0	1.0	148.0	10.0	0.0	Par GND	QP	-19.1	19.2	29.5	-10.3
27.120	21.9	10.0	1.0	124.0	10.0	0.0	Par EUT	QP	-19.1	12.8	29.5	-16.7
27.121	33.3	10.0	1.0	33.0	10.0	0.0	Perp EUT	QP	-19.1	24.2	29.5	-5.3

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



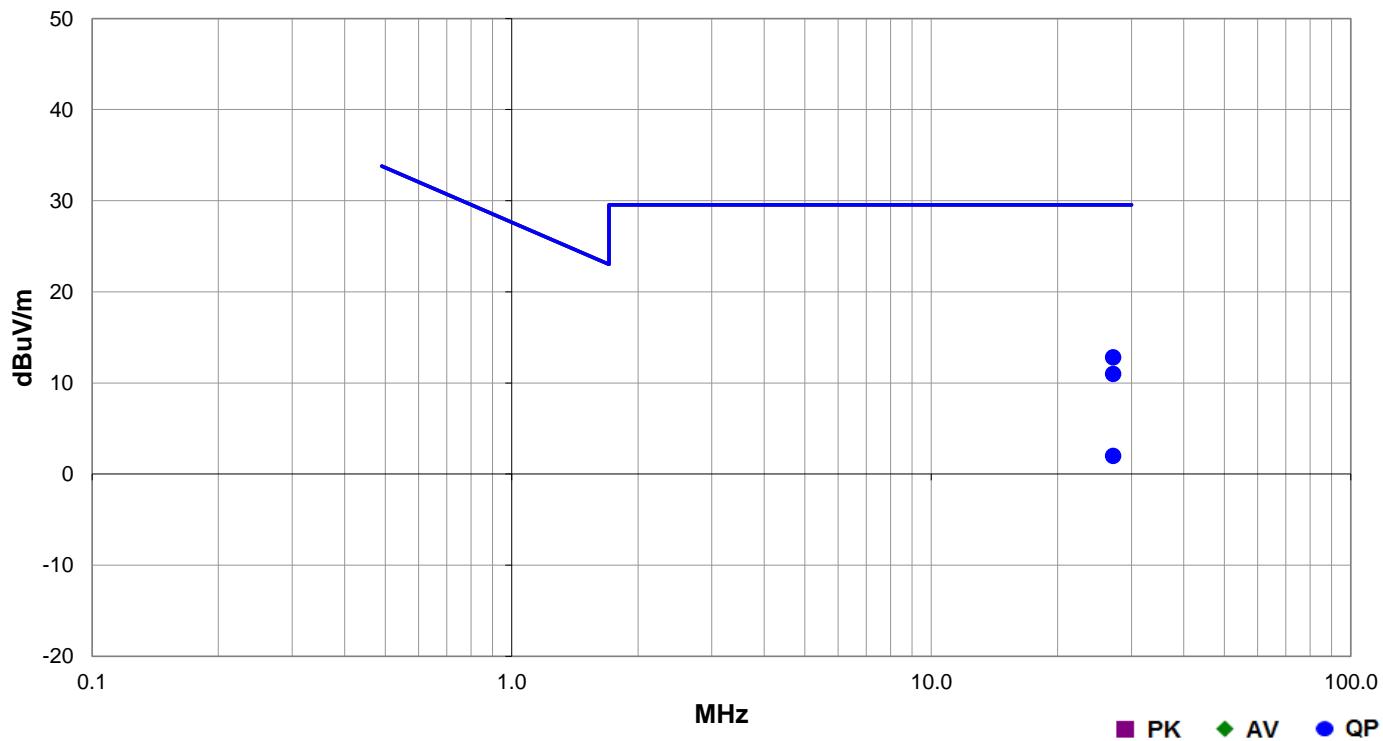
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab		Tested by:	Jeff Alcock
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 2 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	9	Test Distance (m)	10	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
27.120	21.9	10.0	4.0	208.0	10.0	0.0	Par GND	QP	-19.1	12.8	29.5	-16.7
27.120	11.1	10.0	1.0	105.0	10.0	0.0	Par EUT	QP	-19.1	2.0	29.5	-27.5
27.120	20.1	10.0	1.0	334.0	10.0	0.0	Perp EUT	QP	-19.1	11.0	29.5	-18.5

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



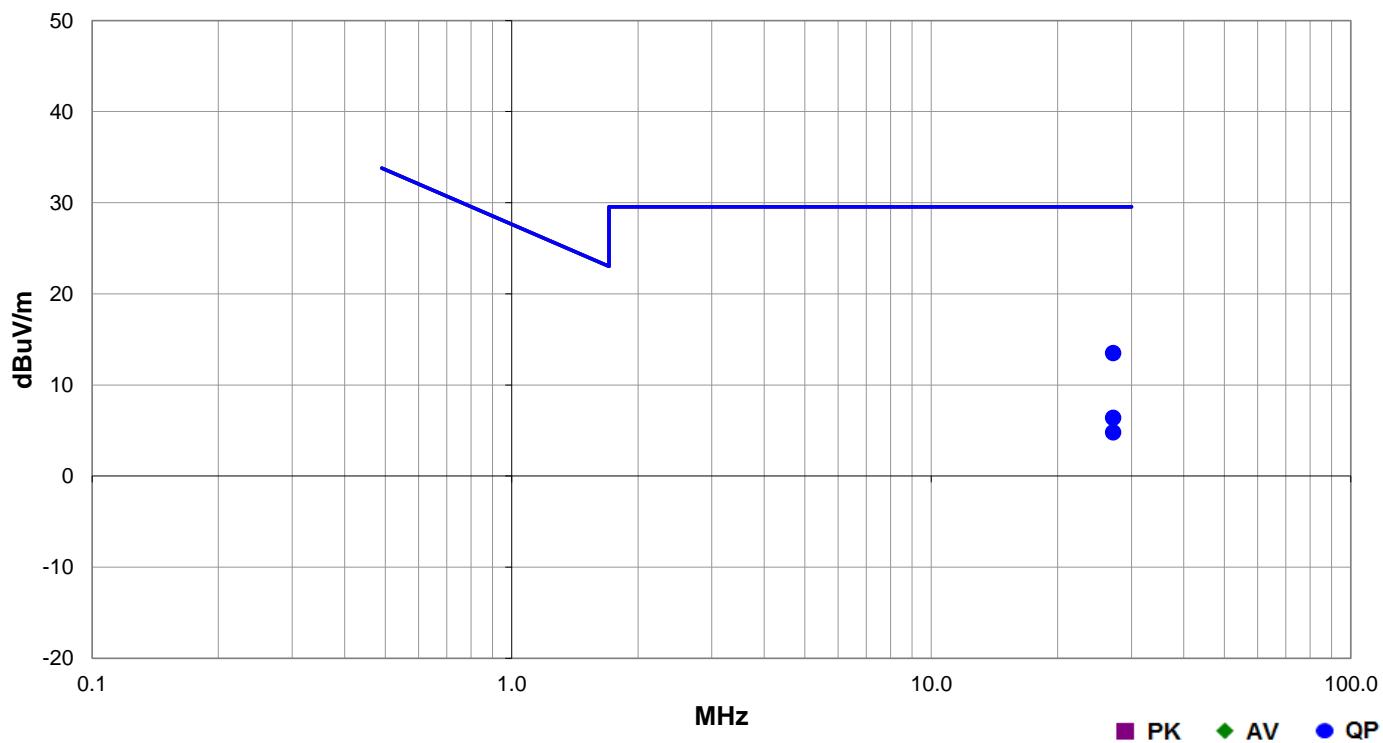
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab		Tested by:	Jeff Alcock
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 3 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:				

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	7	Test Distance (m)	10	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
27.120	22.6	10.0	1.0	365.0	10.0	0.0	Perp EUT	QP	-19.1	13.5	29.5	-16.0
27.120	15.5	10.0	1.0	139.0	10.0	0.0	Par EUT	QP	-19.1	6.4	29.5	-23.1
27.120	13.9	10.0	1.0	164.0	10.0	0.0	Par GND	QP	-19.1	4.8	29.5	-24.7

# FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ



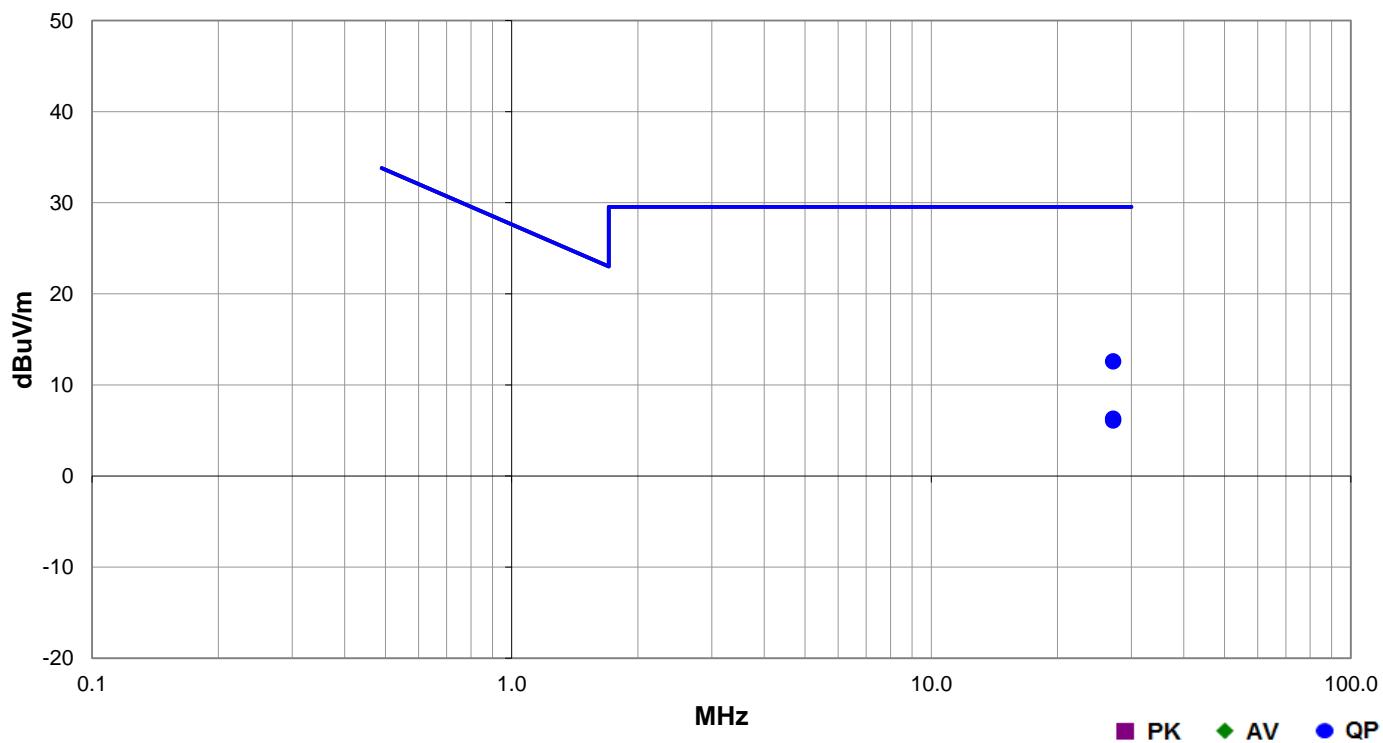
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-11-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	EV11	Humidity:	51.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1019 mbar	
EUT:	IntelliVault / IntelliCab		Tested by:	Jeff Alcock
Configuration:	1			
Customer:	GSL Solutions, INC.			
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile			
EUT Power:	110VAC/60Hz			
Operating Mode:	Door 4 - 13.56 MHZ RFID array polling for RFID tags.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	8	Test Distance (m)	10	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
27.120	21.7	10.0	1.56	13.0	10.0	0.0	Perp EUT	QP	-19.1	12.6	29.5	-16.9
27.119	15.4	10.0	1.0	147.0	10.0	0.0	Par EUT	QP	-19.1	6.3	29.5	-23.2
27.120	15.2	10.0	1.0	197.0	10.0	0.0	Par GND	QP	-19.1	6.1	29.5	-23.4

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ



PSA-ESCI 2020.06.24.2

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

- 4 x 13.56MHz RFID radios querying for RFID tags. Drawer 4 open. Ethernet idle.
- 4 x 13.56MHz RFID radios querying for RFID tags. Drawer 3 open. Ethernet idle.
- 4 x 13.56MHz RFID radios querying for RFID tags. Drawer 2 open. Ethernet idle.
- 4 x 13.56MHz RFID radios querying for RFID tags. Drawer 1 open. Ethernet idle.
- 4 x 13.56MHz RFID radios querying for RFID tags. Drawers closed. Ethernet idle.

## POWER SETTINGS INVESTIGATED

120VAC/60Hz

## CONFIGURATIONS INVESTIGATED

GSLS0016 - 1

## FREQUENCY RANGE INVESTIGATED

Start Frequency | 30 MHz | Stop Frequency | 1000 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.	Interval
Filter - Low Pass	Fairview Microwave	FMFL020	PLE	2020-02-03	12 mo
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAY	2020-02-03	12 mo
Antenna - Biconilog	EMCO	3142B	AXJ	2019-02-13	24 mo
Cable	None	10m Test Distance Cable	EVL	2020-02-03	12 mo
Cable	None	Conducted Cable	EVN	2020-02-28	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2020-02-28	12 mo

## MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

## TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

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, 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.

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ

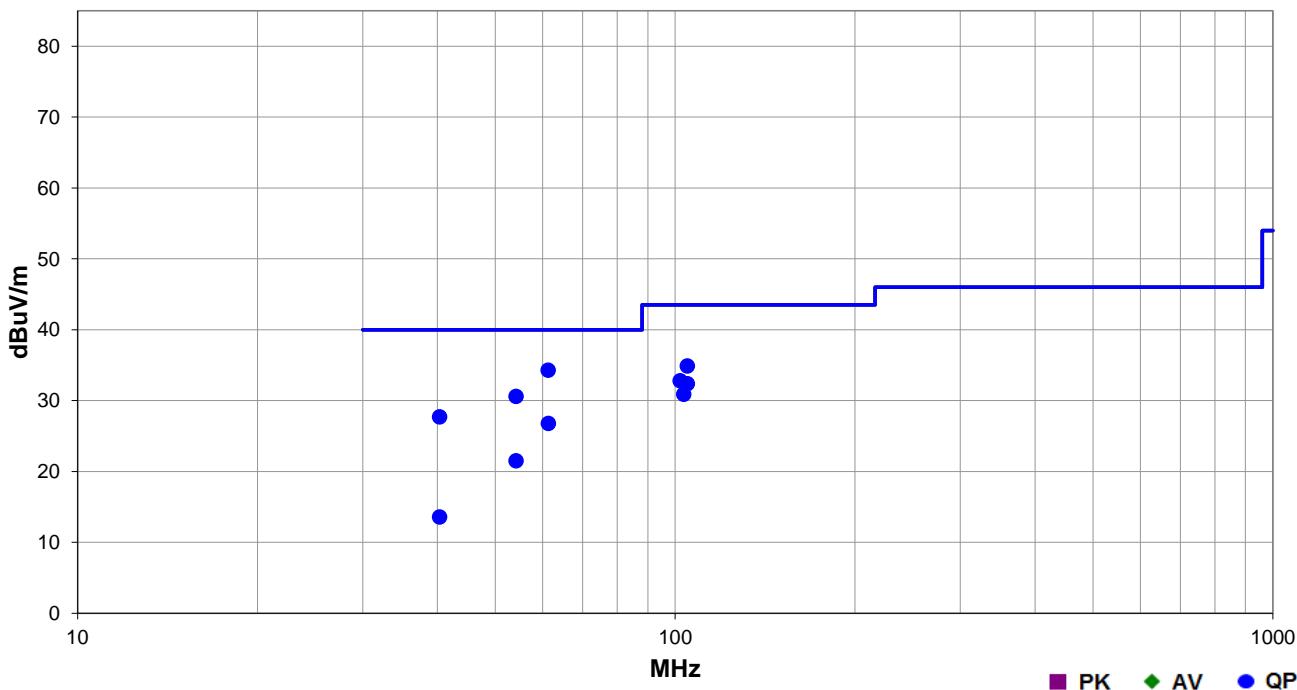


EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-12-03	
Project:	None	Temperature:	23 °C	
Job Site:	EV11	Humidity:	30.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1030 mbar	
EUT:	IntelliVault / IntelliCab	Tested by:	Cole Ghizzone	
Configuration:	5			
Customer:	GSL Solutions, Inc.			
Attendees:	Tyler Seitz, Joe Intile			
EUT Power:	120VAC/60Hz			
Operating Mode:	4 x 13.56MHz RFID radios querying for RFID tags. Drawers closed. Ethernet idle.			
Deviations:	None			
Comments:	None			
Test Specifications		Test Method		
FCC 15.225:2020		ANSI C63.10:2013		

Run #	15	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
61.316	62.6	-28.3	1.0	172.0	3.0	0.0	Vert	QP	0.0	34.3	40.0	-5.7
104.784	61.7	-26.8	1.72	-6.0	3.0	0.0	Horz	QP	0.0	34.9	43.5	-8.6
54.175	58.1	-27.5	1.0	172.0	3.0	0.0	Vert	QP	0.0	30.6	40.0	-9.4
101.900	59.5	-26.7	1.0	157.0	3.0	0.0	Vert	QP	0.0	32.8	43.5	-10.7
104.789	59.2	-26.8	1.0	145.0	3.0	0.0	Vert	QP	0.0	32.4	43.5	-11.1
40.349	51.4	-23.7	1.0	168.0	3.0	0.0	Vert	QP	0.0	27.7	40.0	-12.3
103.336	57.6	-26.7	2.39	345.0	3.0	0.0	Horz	QP	0.0	30.9	43.5	-12.6
61.320	55.1	-28.3	3.09	62.0	3.0	0.0	Horz	QP	0.0	26.8	40.0	-13.2
54.173	49.0	-27.5	4.0	48.0	3.0	0.0	Horz	QP	0.0	21.5	40.0	-18.5
40.351	37.3	-23.7	3.57	79.0	3.0	0.0	Horz	QP	0.0	13.6	40.0	-26.4

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ



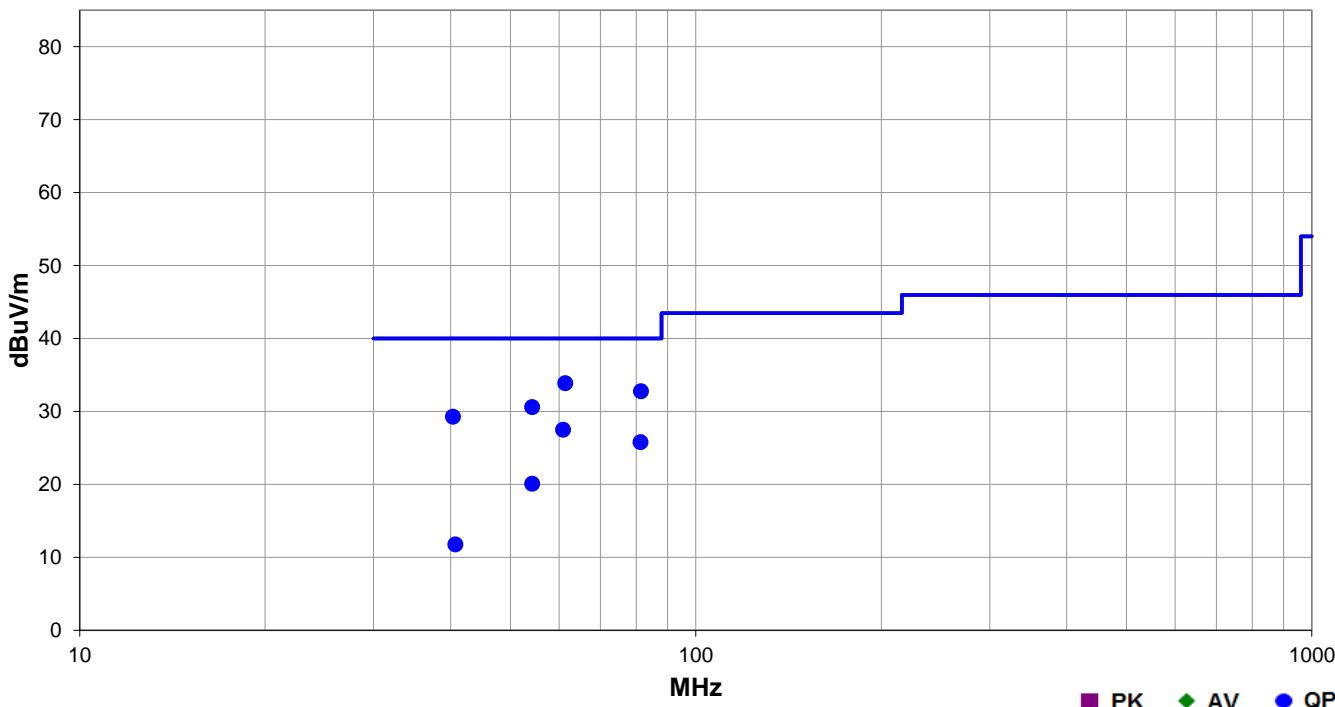
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-12-03	Signature
Project:	None	Temperature:	23 °C	
Job Site:	EV11	Humidity:	30.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1030 mbar	Tested by: Cole Ghizzone
EUT:	IntelliVault / IntelliCab			
Configuration:	5			
Customer:	GSL Solutions, Inc.			
Attendees:	Tyler Seitz, Joe Intile			
EUT Power:	120VAC/60Hz			
Operating Mode:	4 x 13.56MHz RFID radios querying for RFID tags. Drawer 1 open. Ethernet idle.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	16	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
61.401	62.2	-28.3	1.0	122.0	3.0	0.0	Vert	QP	0.0	33.9	40.0	-6.1
81.490	61.4	-28.6	1.09	121.0	3.0	0.0	Vert	QP	0.0	32.8	40.0	-7.2
54.246	58.1	-27.5	1.0	13.0	3.0	0.0	Vert	QP	0.0	30.6	40.0	-9.4
40.348	53.0	-23.7	1.0	192.0	3.0	0.0	Vert	QP	0.0	29.3	40.0	-10.7
60.897	55.8	-28.3	2.56	67.0	3.0	0.0	Horz	QP	0.0	27.5	40.0	-12.5
81.366	54.4	-28.6	2.16	272.0	3.0	0.0	Horz	QP	0.0	25.8	40.0	-14.2
54.237	47.6	-27.5	3.16	53.0	3.0	0.0	Horz	QP	0.0	20.1	40.0	-19.9
40.697	35.7	-23.9	1.0	25.0	3.0	0.0	Horz	QP	0.0	11.8	40.0	-28.2

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ



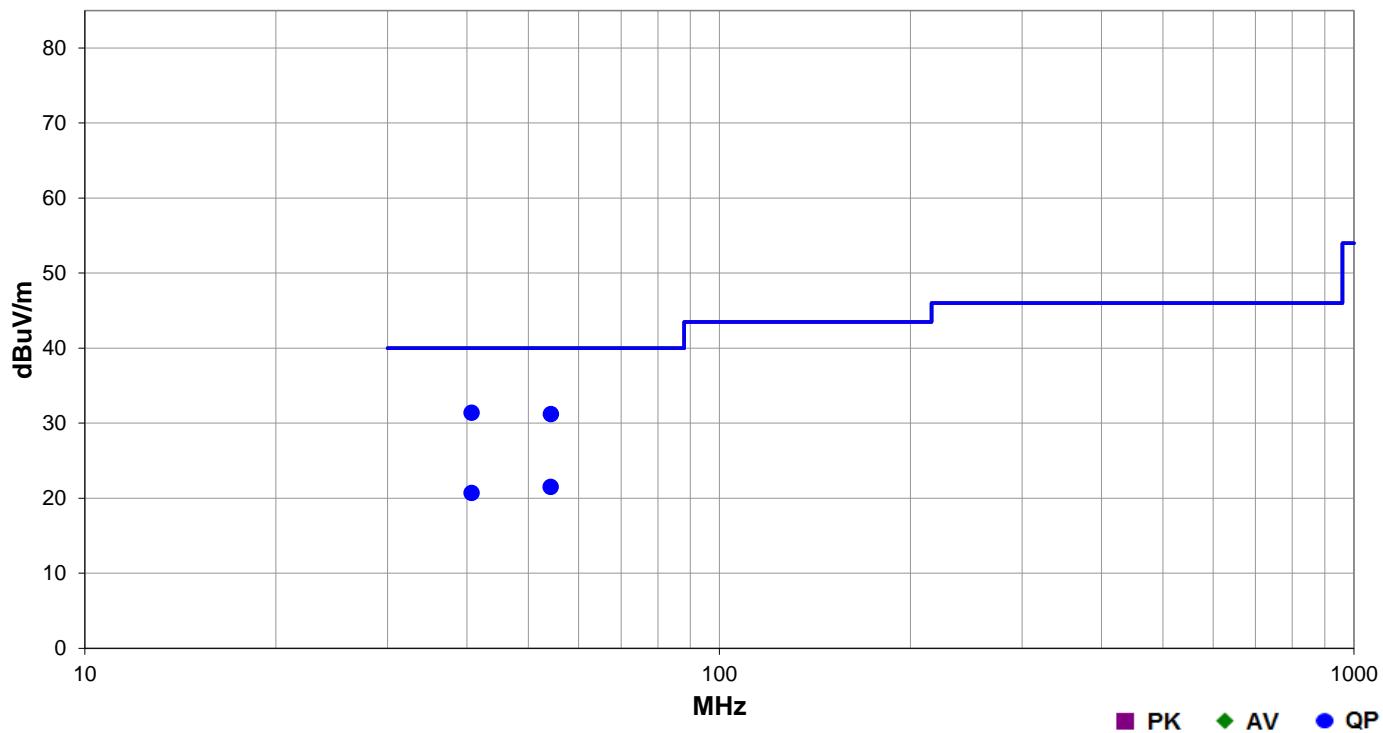
EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-12-03	 
Project:	None	Temperature:	23 °C	
Job Site:	EV11	Humidity:	30.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1030 mbar	Tested by: Cole Ghizzone
EUT:	IntelliVault / IntelliCab			
Configuration:	5			
Customer:	GSL Solutions, Inc.			
Attendees:	Tyler Seitz, Joe Intile			
EUT Power:	120VAC/60Hz			
Operating Mode:	4 x 13.56MHz RFID radios querying for RFID tags. Drawer 2 open. Ethernet idle.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2020	ANSI C63.10:2013

Run #	17	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
40.675	55.3	-23.9	1.0	38.0	3.0	0.0	Vert	QP	0.0	31.4	40.0	-8.6
54.244	58.7	-27.5	1.0	24.0	3.0	0.0	Vert	QP	0.0	31.2	40.0	-8.8
54.230	49.0	-27.5	3.63	59.0	3.0	0.0	Horz	QP	0.0	21.5	40.0	-18.5
40.678	44.6	-23.9	3.7	65.0	3.0	0.0	Horz	QP	0.0	20.7	40.0	-19.3

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ

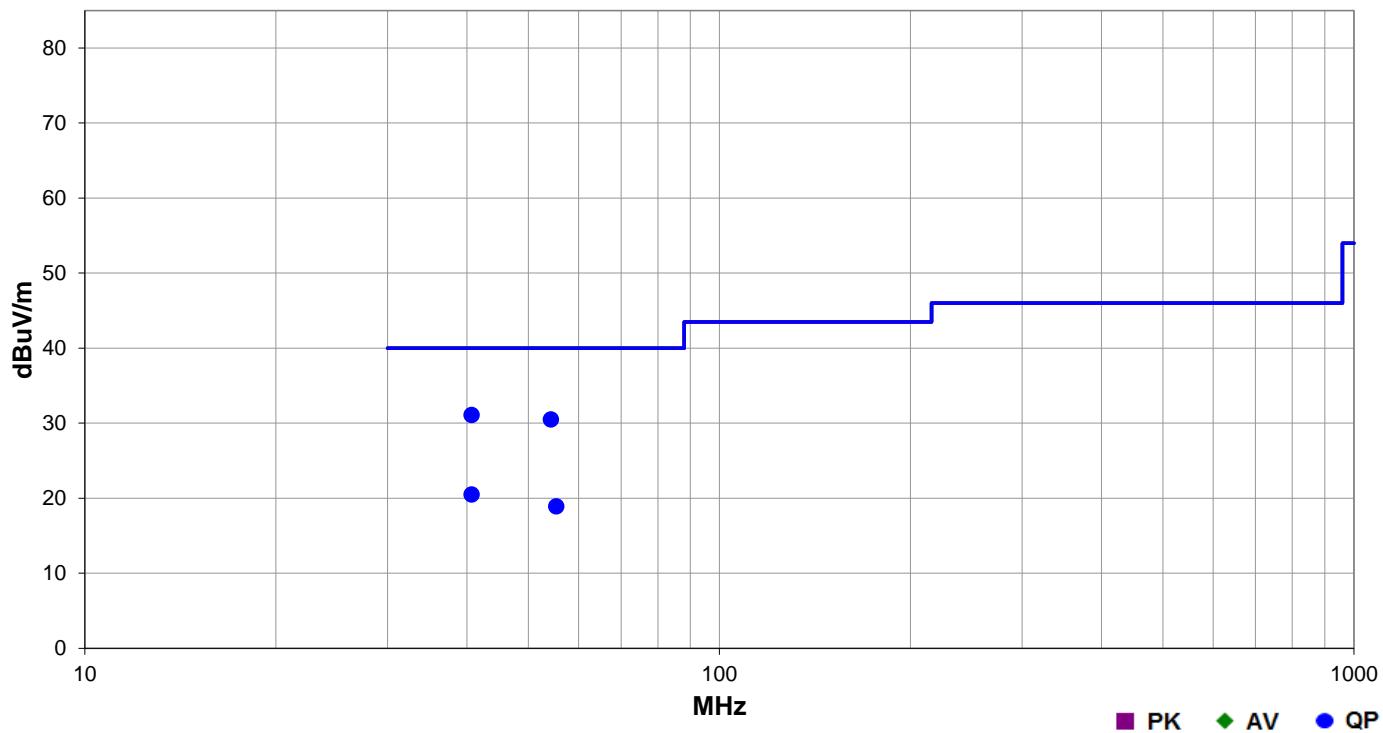


EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-12-03	 
Project:	None	Temperature:	23 °C	
Job Site:	EV11	Humidity:	30.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1030 mbar	Tested by: Cole Ghizzone
EUT:	IntelliVault / IntelliCab			
Configuration:	5			
Customer:	GSL Solutions, Inc.			
Attendees:	Tyler Seitz, Joe Intile			
EUT Power:	120VAC/60Hz			
Operating Mode:	4 x 13.56MHz RFID radios querying for RFID tags. Drawer 3 open. Ethernet idle.			
Deviations:	None			
Comments:	None			
Test Specifications		Test Method		
FCC 15.225:2020		ANSI C63.10:2013		

Run #	18	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
40.680	55.0	-23.9	1.0	366.0	3.0	0.0	Vert	QP	0.0	31.1	40.0	-8.9
54.237	58.0	-27.5	1.0	48.0	3.0	0.0	Vert	QP	0.0	30.5	40.0	-9.5
40.680	44.4	-23.9	3.13	73.0	3.0	0.0	Horz	QP	0.0	20.5	40.0	-19.5
55.303	46.5	-27.6	3.97	24.0	3.0	0.0	Horz	QP	0.0	18.9	40.0	-21.1

# FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ

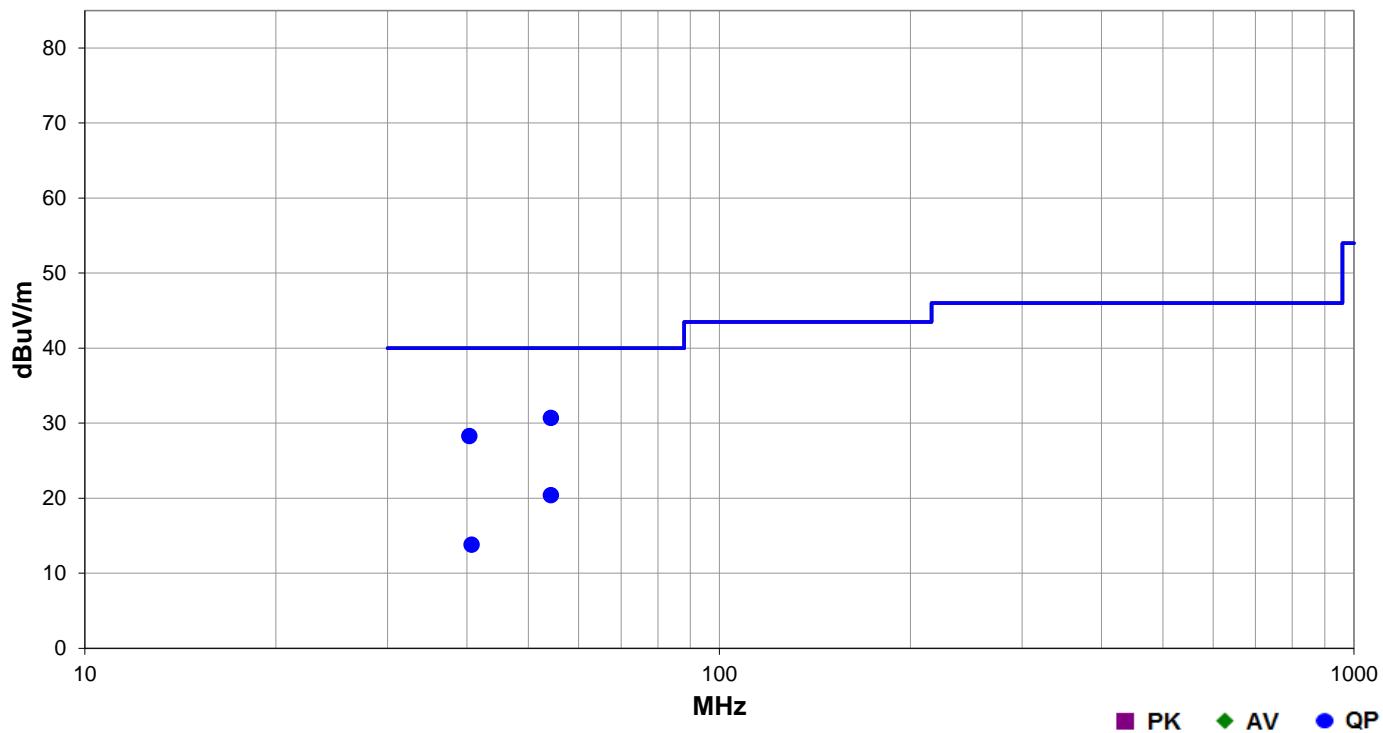


EmiR5 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	GSLS0016	Date:	2020-12-03	 
Project:	None	Temperature:	23 °C	
Job Site:	EV11	Humidity:	30.4% RH	
Serial Number:	SGV-00126	Barometric Pres.:	1030 mbar	Tested by: Cole Ghizzone
EUT:	IntelliVault / IntelliCab			
Configuration:	5			
Customer:	GSL Solutions, Inc.			
Attendees:	Tyler Seitz, Joe Intile			
EUT Power:	120VAC/60Hz			
Operating Mode:	4 x 13.56MHz RFID radios querying for RFID tags. Drawer 4 open. Ethernet idle.			
Deviations:	None			
Comments:	None			
Test Specifications		Test Method		
FCC 15.225:2020		ANSI C63.10:2013		

Run #	19	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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)
54.232	58.2	-27.5	1.45	68.0	3.0	0.0	Vert	QP	0.0	30.7	40.0	-9.3
40.348	52.0	-23.7	1.0	190.0	3.0	0.0	Vert	QP	0.0	28.3	40.0	-11.7
54.242	47.9	-27.5	3.97	130.0	3.0	0.0	Horz	QP	0.0	20.4	40.0	-19.6
40.680	37.7	-23.9	2.82	244.0	3.0	0.0	Horz	QP	0.0	13.8	40.0	-26.2

# FREQUENCY STABILITY



XMit 2020.03.25.0

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
Probe - Near Field Set	EMCO	7405	IPD	NCR	NCR
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	NCR
Attenuator	S.M. Electronics	SA26B-20	AUY	13-Mar-20	13-Mar-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	13-Mar-20	13-Mar-21
Meter - Multimeter	Tektronix	DMM912	MMH	15-Feb-19	15-Feb-22
Thermometer	Omegalette	HH311	DTY	5-Jan-18	5-Jan-21
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	28-Oct-20	28-Oct-21

## TEST DESCRIPTION

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously polling.

The primary supply voltage was varied from 85 % to 105% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -20 ° to +50° C and at 10°C intervals.

The requirement of a frequency tolerance of  $\pm 0.01\%$  is equivalent to 100 ppm

The formula to check for compliance is:

$$\text{ppm} = (\text{Measured Frequency} / \text{Measured Nominal Frequency} - 1) * 1,000,000$$

# FREQUENCY STABILITY



TbTx 2019.08.30.0 XMII 2020.03.25.0

EUT:	IntelliVault / IntelliCab		Work Order:	GSL0016				
Serial Number:	CT000864		Date:	9-Nov-20				
Customer:	GSL Solutions, INC.		Temperature:	22.7 °C				
Attendees:	Tyler Dean, Tyler Seitz, John Horton, and Joe Intile		Humidity:	28.8% RH				
Project:	None		Barometric Pres.:	1028 mbar				
Tested by:	Cole Ghizzone	Power:	24VDC	Job Site:	EV06			
TEST SPECIFICATIONS	Test Method							
FCC 15.225:2020	ANSI C63.10:2013							
COMMENTS	The manufacturer's stated maximum input voltage that can be provided to the radio without causing damage is 25.2 VDC or +5% of nominal voltage.							
DEVIATIONS FROM TEST STANDARD								
None								
Configuration #	2	Signature						
			Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
Extreme Temperature, 50°C	Nominal Voltage 24.0VDC		13.559905	13.56	7	100	Pass	
Extreme Temperature, 40°C	Nominal Voltage 24.0VDC		13.559905	13.56	7	100	Pass	
Extreme Temperature, 30°C	Nominal Voltage 24.0VDC		13.559922	13.56	5.8	100	Pass	
Nominal Temperature, 20°C	Nominal Voltage 24.0VDC		13.559955	13.56	3.3	100	Pass	
	Extreme Voltage +5%, 25.2VDC		13.559955	13.56	3.3	100	Pass	
	Extreme Voltage 15%, 20.4VDC		13.559939	13.56	4.5	100	Pass	
Extreme Temperature, 10°C	Nominal Voltage 24.0VDC		13.559972	13.56	2.1	100	Pass	
Extreme Temperature, 0°C	Nominal Voltage 24.0VDC		13.55997	13.56	2.2	100	Pass	
Extreme Temperature, -10°C	Nominal Voltage 24.0VDC		13.559953	13.56	3.5	100	Pass	
Extreme Temperature, -20°C	Nominal Voltage 24.0VDC		13.559905	13.56	7	100	Pass	

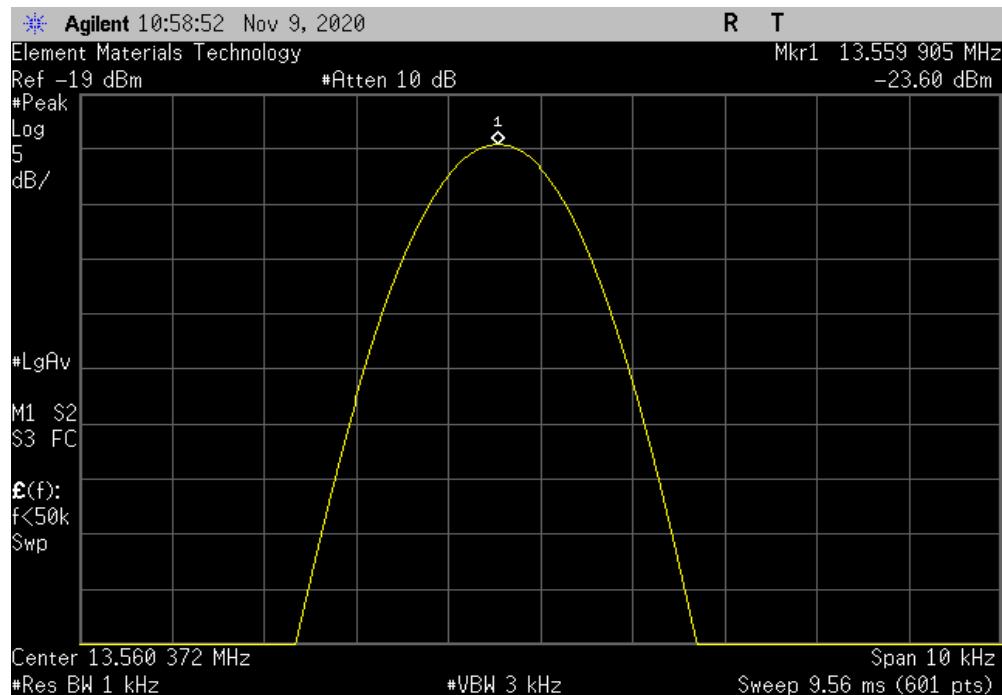
# FREQUENCY STABILITY



TbITx 2019.08.30.0 XMit 2020.03.25.0

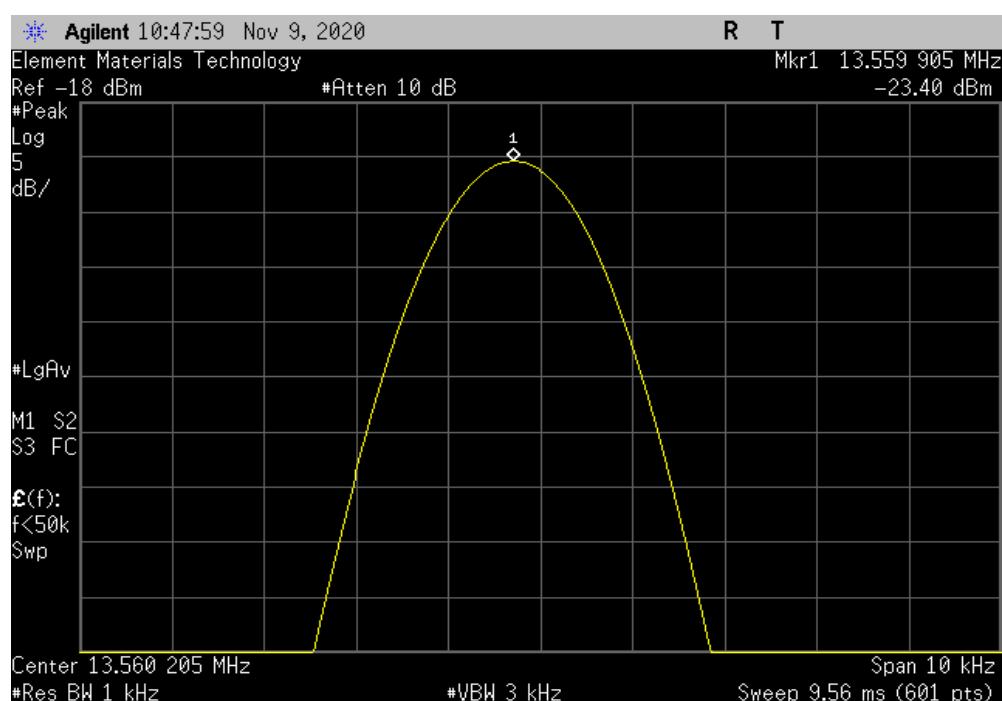
Extreme Temperature, 50°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.559905	13.56	7	100	Pass



Extreme Temperature, 40°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.559905	13.56	7	100	Pass



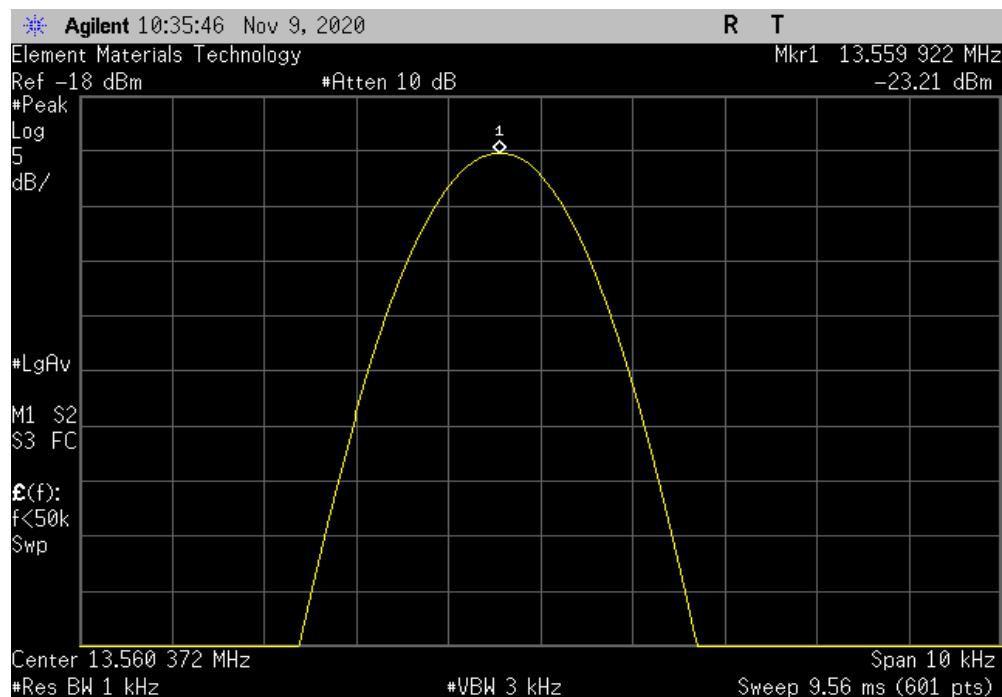
# FREQUENCY STABILITY



TbtTx 2019.08.30.0 XMit 2020.03.25.0

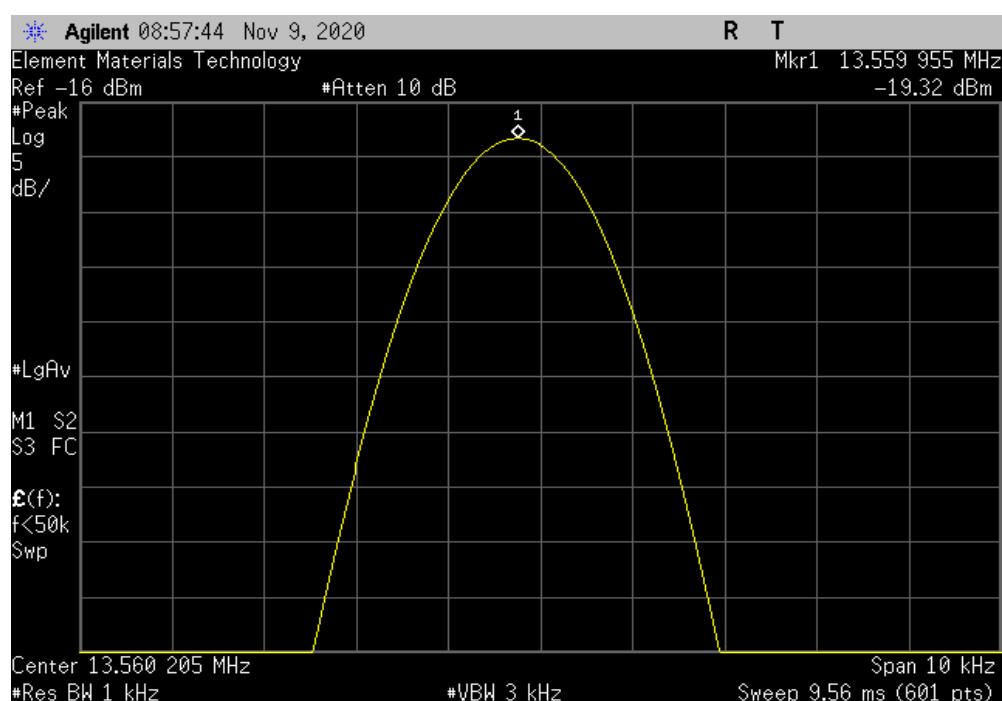
Extreme Temperature, 30°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.559922	13.56	5.8	100	Pass



Nominal Temperature, 20°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.559955	13.56	3.3	100	Pass



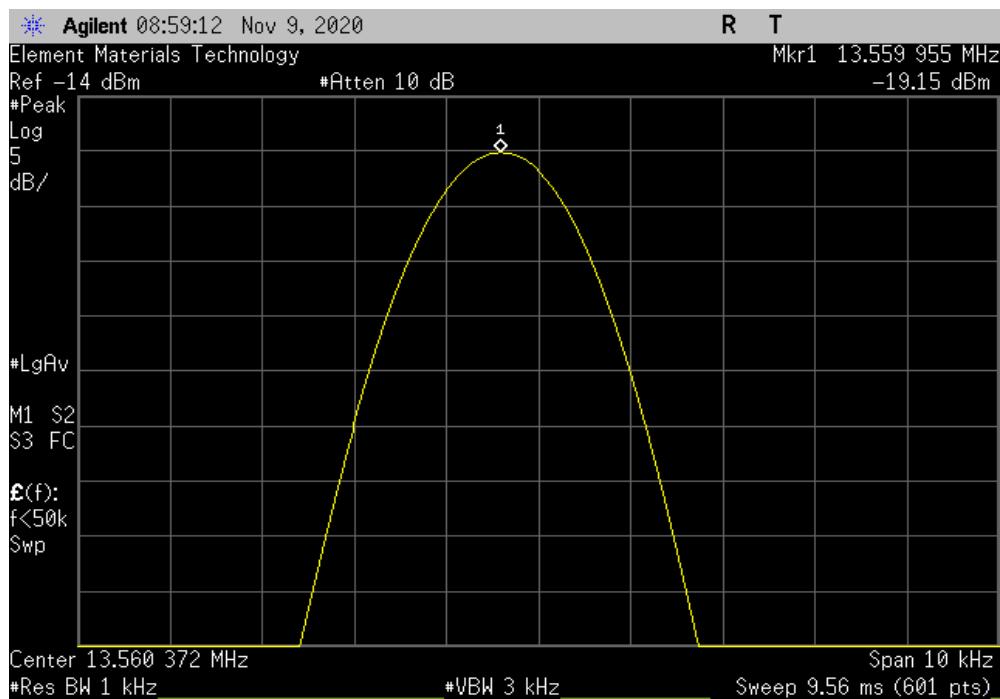
# FREQUENCY STABILITY



TbITx 2019.08.30.0 XMit 2020.03.25.0

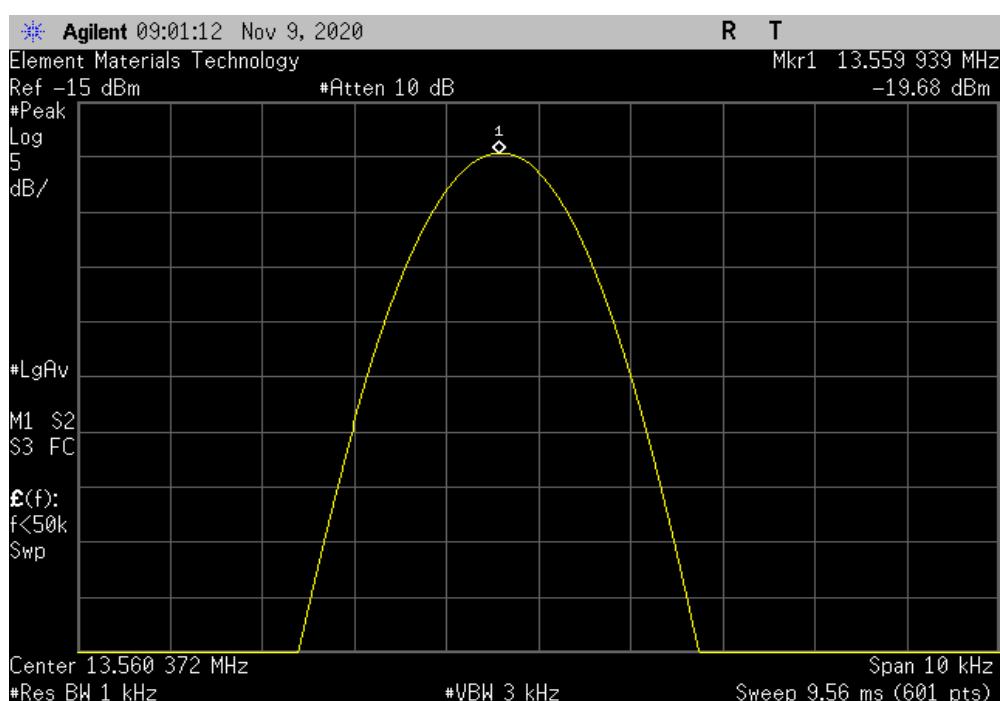
Nominal Temperature, 20°C, Extreme Voltage +5%, 25.2VDC

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.559955	13.56	3.3	100	Pass



Nominal Temperature, 20°C, Extreme Voltage 15%, 20.4VDC

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.559939	13.56	4.5	100	Pass



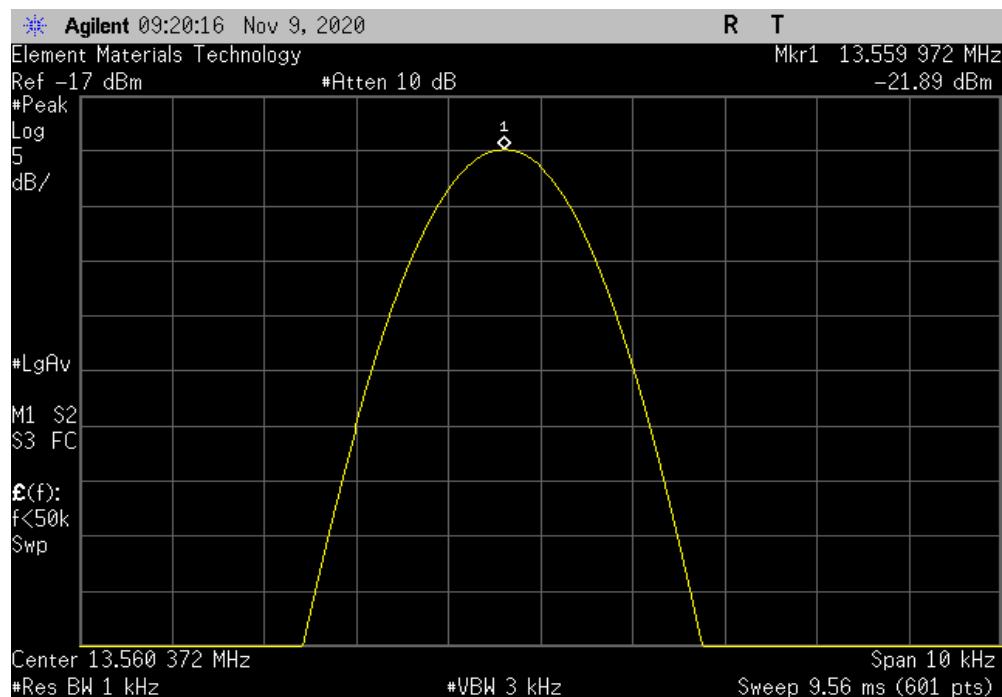
# FREQUENCY STABILITY



TbITx 2019.08.30.0 XMit 2020.03.25.0

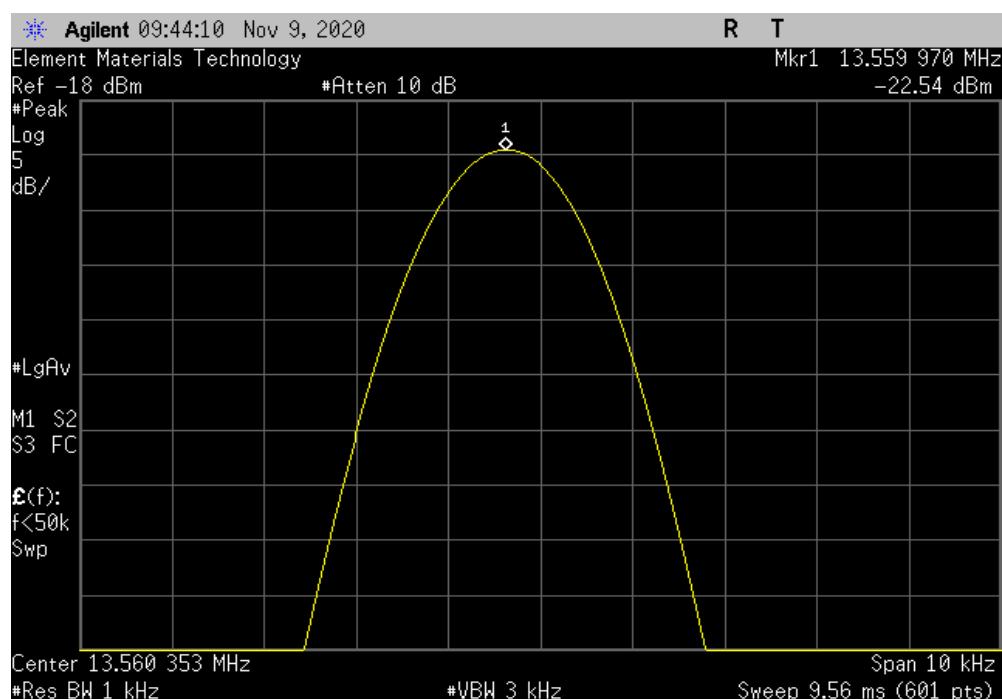
Extreme Temperature, 10°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.559972	13.56	2.1	100	Pass



Extreme Temperature, 0°C, Nominal Voltage 24.0VDC

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.55997	13.56	2.2	100	Pass



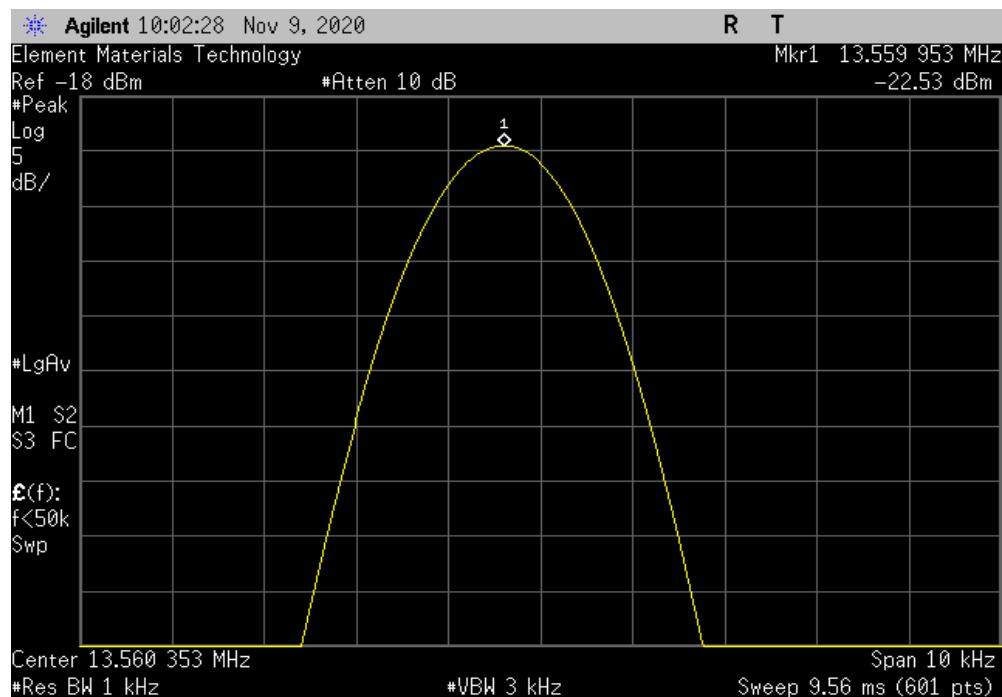
# FREQUENCY STABILITY



TbITx 2019.08.30.0 XMit 2020.03.25.0

Extreme Temperature, -10°C, Nominal Voltage 24.0VDC

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.559953	13.56	3.5	100	Pass



Extreme Temperature, -20°C, Nominal Voltage 24.0VDC

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.559905	13.56	7	100	Pass

