Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	ER0198-1 Issue 2
Client	Schechter Tech LLC DBA TemperatureAlert
Address	108 Lincoln Street, Suite BA Boston MA, 02111
Phone	617-326-7300
Items tested	Ethernet Gateway (Model: TM-WIFI440-Z)
FCC ID	SZ9TMWIFI440Z
IC ID	10940A-TMWIFI440Z
FRN	0022436158
Equipment Type	Digital Transmission System
Equipment Code	DTS
Emission Designator	2M49F1D
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1
Test Dates	1/25/2017 -2/6/2017
Results	As detailed within this report
Prepared by	Zachary Johnson – Test Engineer
Authorized by	Yunus Faziloglu – Sr. Engineer
Issue Date	6/29/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 28 of this report.

Contents

Form Final Report REV 12-07-15

Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1

TM-WIFI440-Z operates in the 2405MHz-2470MHz frequency range and has a detachable monopole antenna with -2.53dBi peak gain. It is powered by an external 5VDC USB power supply.

We found that the product met the above requirements without modification. Test sample was received in good condition.

Test Methodology

All testing was performed according to the following rules/procedures/documents;
CFR Title 47 FCC Part 15.247, RSS-247 Issue 1, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v03r05 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity. Antenna of the EUT is swivel type and was therefore maximized in its 2 possible orientations (horizontal and vertical) and worst case results recorded.

RF measurements were performed at the antenna port on 3 channels as follows:

- 2405MHz: Low Channel
- 2440MHz: Mid Channel
- 2470MHz: High Channel

AC line conducted emissions testing was performed with a 50Ω/50µH LISN.

The following bandwidths were used during radiated spurious emissions testing.

Frequency	RBW	VBW
150kHz-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	R0198		
Company:	Temperature Alert		
Company Address:	108 Lincoln Street, Suite BA		
	Boston, MA, 02111		
Contact:	Nathan Reimensnyder		
	MN	**PN**	**SN**
EUT:	TM-WIFI440-Z	TM-WIFI440-Z	11444000828031921284
EUT Description:	2.4GHz Transmission Ethernet Router		
EUT Max Frequency:	400 MHz		
EUT Min Frequency:	3 MHz		

EUT Components	**MN**	**SN**
Shenzhen Tech USB PSU	GDP06AV-0501000-UL1	

Support Equipment	**MN**	**SN**
Macbook Apple Laptop	15" Pro	

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
Sensor Ports 1-4	Ethernet	4	4	Ethernet	No	No	2	in	yes	
PC Ethernet Port	Ethernet	1	1	Ethernet	No	No	2	in	yes	
Internet Ethernet Port	Ethernet	1	1	Ethernet	No	No	2	in	yes	
5V DC Power	Power DC	1	1	Power DC	No	No	1	in	yes	
Unused USB	USB	1	1	USB	No	No	2	in	no	

Software Operating Mode Description:

6.16-9.26 Operating Software

Performance Criteria:

No Immunity testing

Statement of Conformity

The TM-WIFI440-Z has been found to conform to the following parts of 47 CFR and RSS 247 as detailed below:

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	3.2		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1, 6.5			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	The antenna for this device is a permanently installed PCB antenna.
8.10			15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable
8.8			15.207	EUT meets the AC Line conducted emissions requirements of this section.
			15.247	The unit complies with the requirements of 15.247
		RSS 247		The unit complies with the requirements of RSS-247
6.6				Occupied Bandwidth measurements were made.

Modifications Required for Compliance

None

Test Results

Bandwidth

Limit: The minimum 6 dB bandwidth shall be at least 500 kHz.
[15.247(a) (2)]

MEASUREMENTS / RESULTS

6dB Bandwidth

Date: 30-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: YF **EUT:** WiFi Ethernet Gateway Model: TM-WIFI440-Z **EUT Operating Voltage/Frequency:** 5VDC
Temp: 22.9°C **Humidity:** 27% **Pressure:** 999mbar

Frequency Range: 2405-2470 MHz **Measurement Type:** Conducted
Measurement Method: FCC KDB 558074 D01 DTS Meas Guidance v03r05 Section 8.2

Notes:

Frequency (MHz)	Reading (kHz)	6dB Bandwidth Limit (kHz)	Margin (kHz)	Result (Pass/Fail)
2405	1618.5	≥500	1119	Pass
2440	1607.0	≥500	1107	Pass
2470	1605.5	≥500	1106	Pass

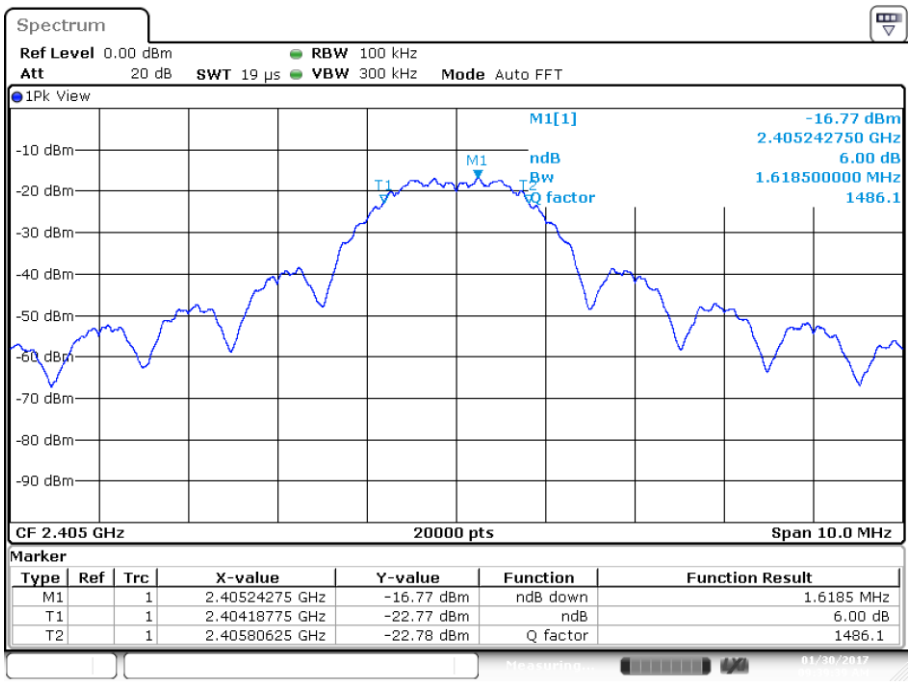
Test Site: Wireless Test Room **Cable:** EMIR-HIGH 07 **Attenuator:** A2121
Analyzer: A2200

Rev. 1/21/2017

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Signal Generators								
FSV40 Signal/Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/1/2017	6/1/2016
Cables								
REMI-High-07	1 - 26.5GHz	TRU-21B0707-120	TRU			II	8/14/2017	8/14/2016
Preamps /Couplers Attenuators / Filters								
API - 30dB 20W Attenuator	9KHz-40GHz	89-30-11	API Weinschel	703	2121	I	2/10/2017	2/10/2016
Meteorological Meters								
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2078		HTC-1	HDE		2078	II	4/5/2017	4/5/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

PLOTS



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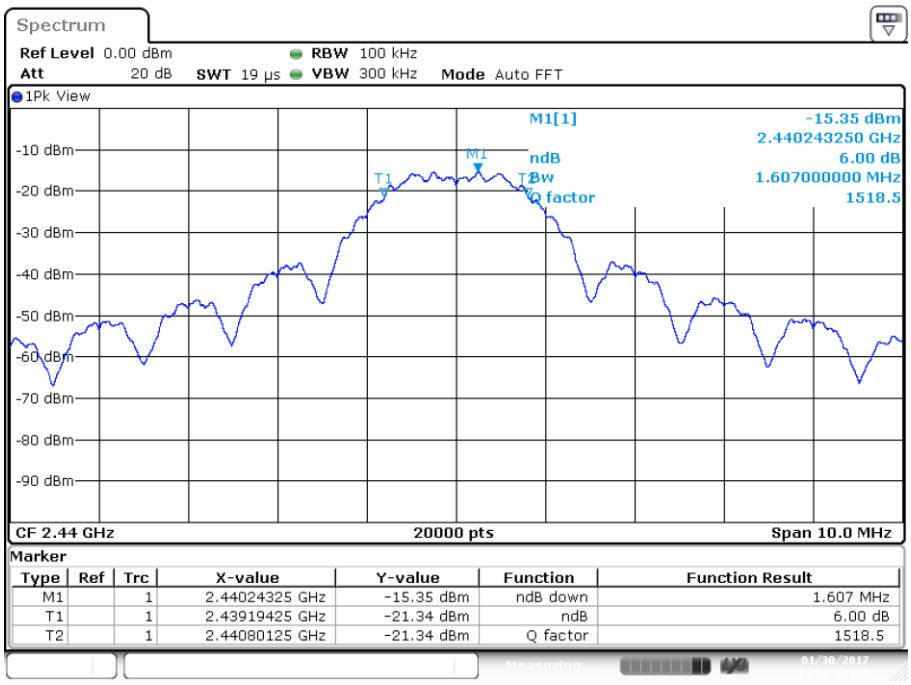
Low Channel DTS Bandwidth



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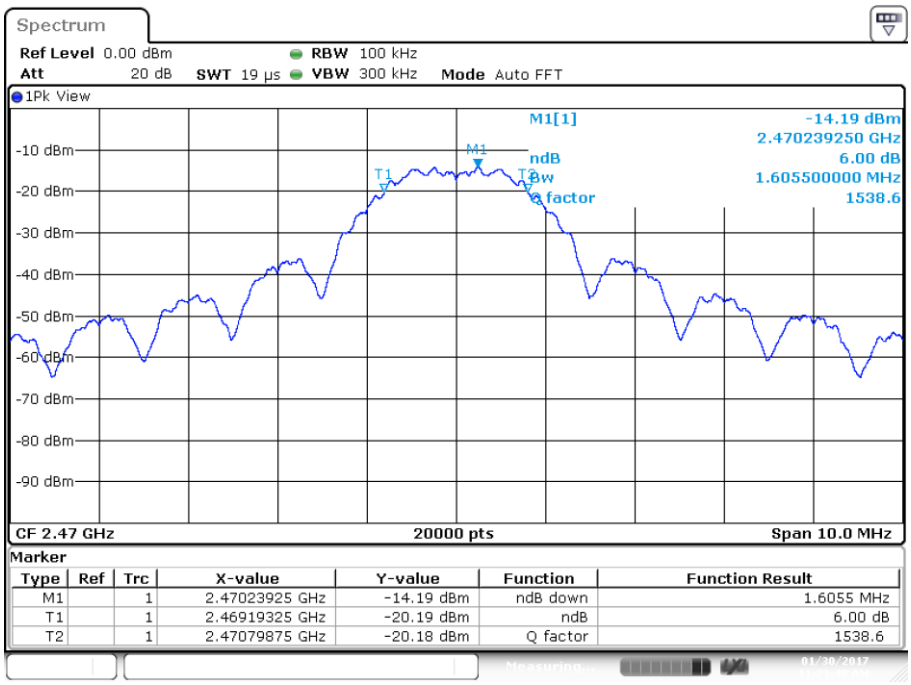
Middle Channel DTS Bandwidth



High Channel DTS Bandwidth

Peak Power

LIMIT: 1 Watt Conducted Output Power
[15.247(b) (3)]

MEASUREMENTS / RESULTS

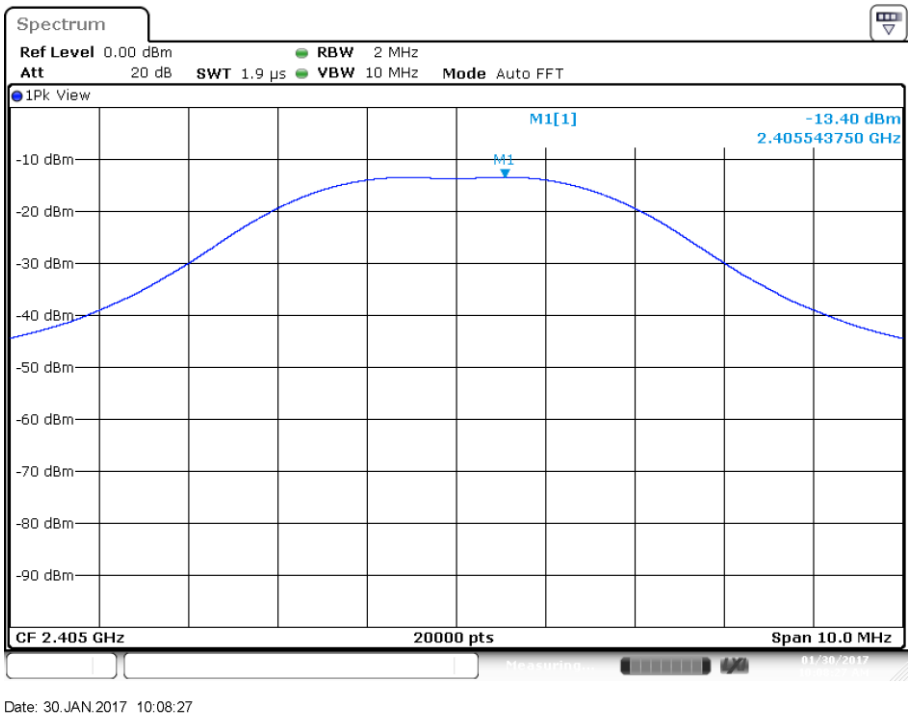
Peak Output Power

Date: 30-Jan-17		**Company:** TempAlert				**Work Order:**	R0198
Engineer: YF		**EUT:** WiFi Ethernet Gateway Model: TM-WIFI440-Z				**EUT Operating Voltage/Frequency:**	5VDC
Temp: 22.9°C		**Humidity:** 27%		**Pressure:** 999mbar			
Frequency Range: 2405-2470 MHz				**Measurement Type:** Conducted			
				Measurement Method: FCC KDB 558074 D01 DTS Meas Guidance v03r05 Section 9.1.1			
Notes:							

Frequency (MHz)	Peak Reading (dBm)	Cable Loss (dB)	Attenuator Loss (dB)	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)	Result (Pass/Fail)
2405.0	-13.40	1.88	29.44	17.92	30.0	-12.08	Pass
2440.0	-11.97	1.88	29.44	19.35	30.0	-10.65	Pass
2470.0	-10.78	1.88	29.44	20.54	30.0	-9.46	Pass

Test Site: Wireless Test Room **Cable:** EMIR-HIGH 07 **Attenuator:** A2121
Analyzer: A2200
Peak Output Power (dBm)= Peak Reading (dBm) + Cable Loss (dB) + Attenuator Loss (dB)

PLOTS



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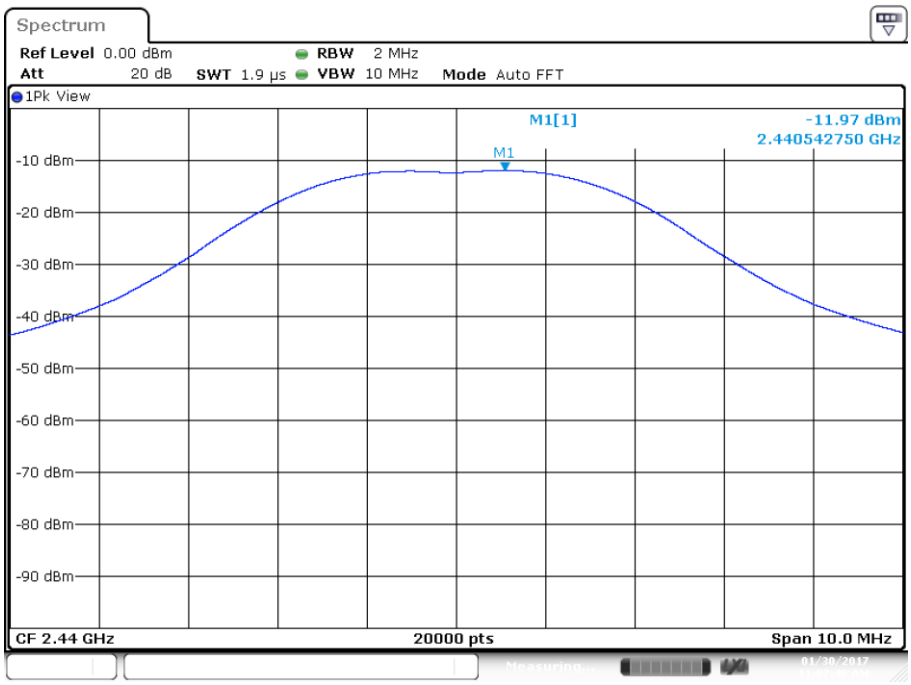
Low Channel Peak Output Power



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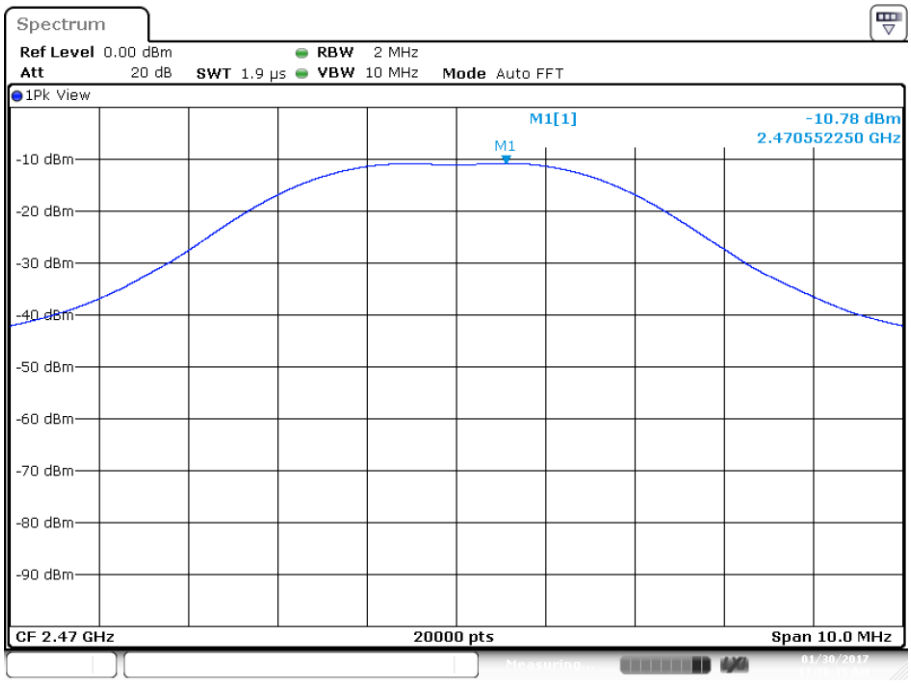
Middle Channel Peak Output Power



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High Channel Peak Output Power

Band Edge Measurements (Conducted and Radiated)

Limits: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
[15.247(d)]

MEASUREMENTS / RESULTS

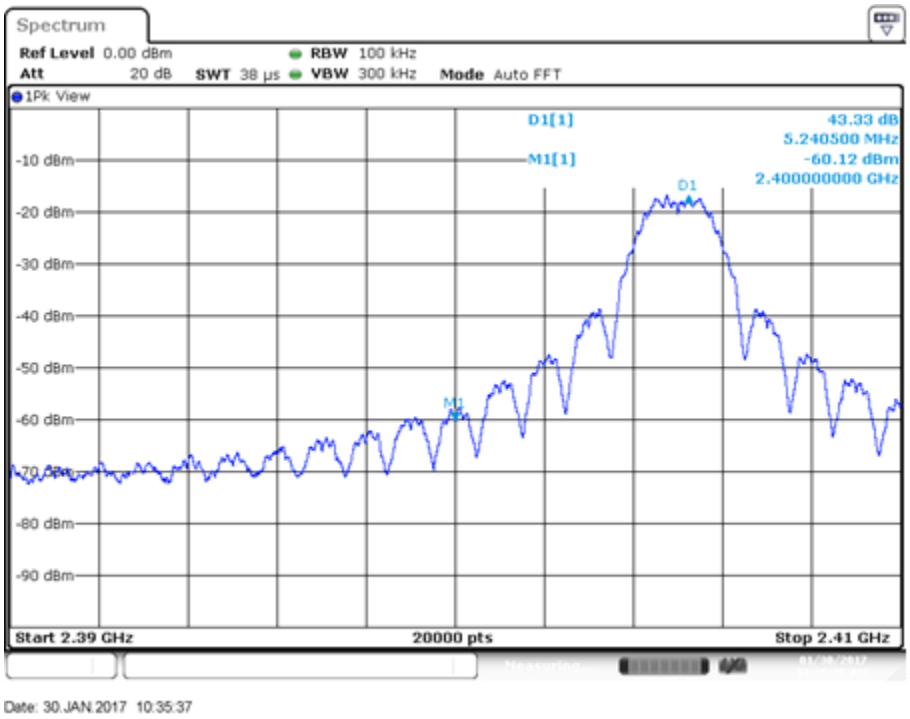
Conducted Bandedge

Date: 30-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: YF **EUT:** WiFi Ethernet Gateway Model: TM-WIFI440-Z **EUT Operating Voltage/Frequency:** 5VDC
Temp: 22.9°C **Humidity:** 27% **Pressure:** 999mbar
Frequency Range: 2405-2470 MHz **Measurement Type:** Conducted
Notes:

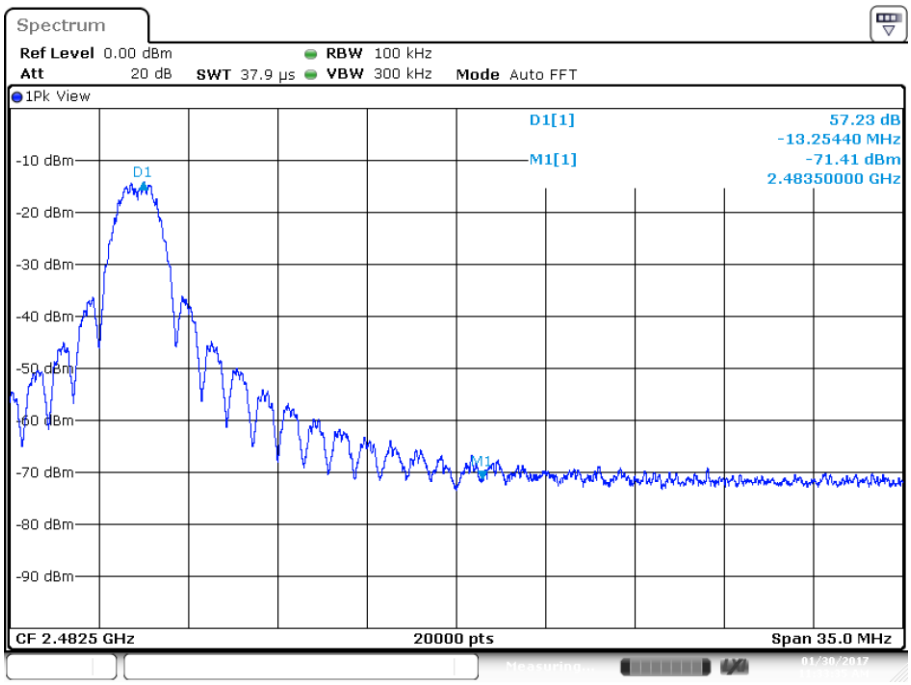
	Bandedge (dBm)	Delta (dB)	Limit (dB)	(Pass/Fail)
Low Bandedge	-60.12	43.33	≥ 20	Pass
High Bandedge	-71.41	57.23	≥ 20	Pass

Test Site: Wireless Test Room **Cable:** EMIR-HIGH 07 **Attenuator:** A2121
Analyzer: A2200

PLOTS



Low Band Edge



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High Band Edge

Radiated Bandedge

Date: 03-Feb-17 **Company:** Temperature Alert **Work Order:** R0198
Engineer: JH **EUT Desc:** Ethernet Gateway Model: TM-WIFI440-Z **EUT Operating Voltage/Frequency:** 5VDC
Temp: 22C **Humidity:** 22% **Pressure:** 1013mbar
Frequency Range: 2390-2483.5MHz **Measurement Distance:** 3 m
Notes: Band Edge Measurements **EUT Max Freq:** 2470MHz

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
H, EUT ant V, X	2483.5	31.9	20.4	0.0	28.2	3.3	63.4	51.9	74.0	-10.6	Pass	54.0	-2.1	Pass
H, EUT ant V, X	2390.0	31.6	20.4	0.0	28.2	3.4	63.2	52.0	74.0	-10.8	Pass	54.0	-2.0	Pass

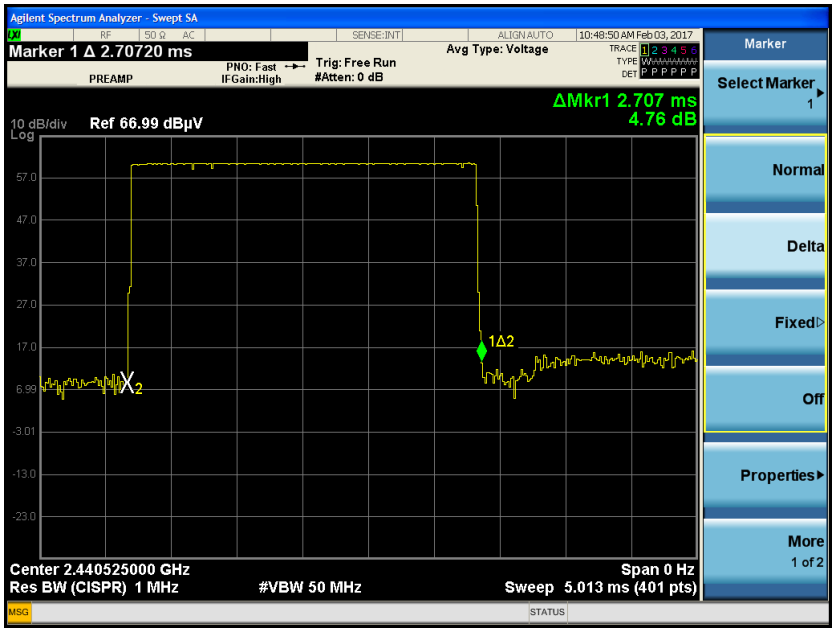
Table Result: Pass by -2.0 dB ***Worst Freq:*** 2390.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** ---
Analyzer: --- **Preamp:** none **Antenna:** Yellow Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.181

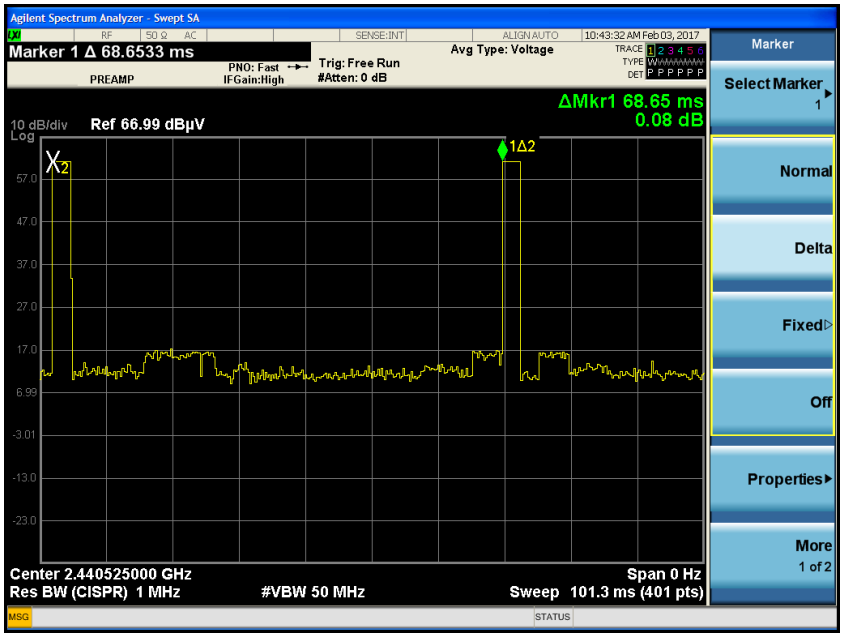
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Duty-Cycle Correction Factor

Duty-Cycle Correction Factor				
Date: 03-Feb-17	**Company:** Temperature Alert			**Work Order:** R0198
Engineer: Jason Haley	**EUT Desc:** Ethernet Gateway Model: TM-WIFI440-Z			**EUT Operating Voltage/Frequency:** 5VDC
Temp: 22C	**Humidity:** 22%		**Pressure:** 1013mbar	
Notes: Maximum -20dB correction factor will be used.				
Channel	**Frequency** (MHz)	**Transmitter On Time** (mS)	**Transmitter Repetition Rate** (mS)	**Duty Cycle Correction Factor** (dB)
Middle	2440	2.707	68.65	-28.08



Single pulse



Pulse Train

Radiated Spurious Emissions

Limits: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
[15.247(d)]

MEASUREMENTS / RESULTS

Radiated Emissions Table

Date: 27-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: Yunus Faziloglu **EUT Desc:** WiFi Ethernet Gateway Model: TM-WIFI440-Z **EUT Operating Voltage/Frequency:** 5VDC
Temp: 22.8C **Humidity:** 25% **Pressure:** 989mbar
Frequency Range: 30MHz - 1GHz **Measurement Distance:** 3 m
Notes: Worst case: EUT in X Orientation, EUT swivel antenna in horizontal position **EUT Max Freq:** 2470MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
V	30.6	13.4	0.0	20.9	0.3	34.6	---	---	---	40.0	-5.4	Pass
V	45.3	28.5	0.0	10.1	0.4	39.0	---	---	---	40.0	-1.0	Pass
V	62.5	24.8	0.0	7.9	0.5	33.2	---	---	---	40.0	-6.8	Pass
V	719.1	16.8	0.0	20.4	1.8	39.0	---	---	---	46.0	-7.0	Pass
V	890.2	15.8	0.0	22.3	2.1	40.2	---	---	---	46.0	-5.8	Pass
H	980.5	14.3	0.0	23.2	2.0	39.5	---	---	---	54.0	-14.5	Pass

Table Result: Pass by -1.0 dB ***Worst Freq:*** 45.3 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Red-White **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.180

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Rev. 1/21/2017

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz		II	3/22/2017	3/22/2015
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	8/12/2017	8/12/2015
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2052	9kHz - 18GHz		Florida RF			II	3/2/2017	3/2/2016
Asset #2053	9kHz - 18GHz		Florida RF			II	10/1/3017	10/30/2016
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	8/9/2017	8/9/2016
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

1GHz-6GHz

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting low channel (2405MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1400.13	52.4	37.3	25.3	3.8	1.0	45.2	0	45.2	74	54	-28.8	-8.8	PASS	26	100	
3947	45.9	37.9	32.7	6.6	0.2	47.5	0	47.5	74	54	-26.5	-6.5	PASS	173	300	
4809	56.1	37	33.1	7.5	0.5	60.2	20	40.2	74	54	-13.8	-13.8	PASS	174	100	
5587.13	43.8	36.4	34.2	8.3	0.4	50.3	0	50.3	74	54	-23.7	-3.7	PASS	168	200	-3.7

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting low channel (2405MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

2.4 GHz Transceiver
120VAC/60Hz
Chamber 1
22°C; 22%RH
1013 mBar
2.4GHz
R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1400	51.5	37.3	25.3	3.8	1	44.3	0	44.3	74	54	-29.7	-9.7	PASS	215	200	
4055.75	46.1	37.9	32.5	6.6	0.2	47.5	0	47.5	74	54	-26.5	-6.5	PASS	138	100	
4809.13	52.7	37	33.1	7.5	0.5	56.8	20	36.8	74	54	-17.2	-17.2	PASS	252	200	
5558.63	43.7	36.4	34.3	8.3	0.4	50.3	0	50.3	74	54	-23.7	-3.7	PASS	248	300	-3.7

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting middle channel (2440MHz.)
4881 is the 2nd Harmonic *The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1400	52.4	37.3	25.3	3.8	1	45.2	0	45.2	74	54	-28.8	-8.8	PASS	26	100	
4881	60.1	37.1	33.2	7.5	0.3	64	20	44	74	54	-10.0	-10.0	PASS	216	200	
5636.25	43.8	36.3	34.2	8.4	0.4	50.5	0	50.5	74	54	-23.5	-3.5	PASS	173	100	-3.5

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting middle channel (2440MHz.)
4881 is the 2nd Harmonic *The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

2.4 GHz Transceiver
120VAC/60Hz
Chamber 1
22°C; 22%RH
1013 mBar
2.4GHz
R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1101.5	48.8	36.6	24.6	3.4	0.1	40.3	0	40.3	74	54	-33.7	-13.7	PASS	137	100	
1400.13	51.4	37.3	25.3	3.8	1	44.2	0	44.2	74	54	-29.8	-9.8	PASS	215	200	
4030.63	46.3	37.9	32.5	6.7	0.1	47.7	0	47.7	74	54	-26.3	-6.3	PASS	209	300	
4881	54.2	37.1	33.2	7.5	0.2	58	20	38	74	54	-16.0	-16.0	PASS	137	100	
5365.75	43.9	36.6	34.2	8.1	0.4	50	0	50	74	54	-24.0	-4.0	PASS	283	100	-4.0

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting high channel (2470MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1400.13	51.7	37.3	25.3	3.8	1	44.5	0	44.5	74	54	-29.5	-9.5	100	0	100	
1732.25	48	37.4	26.1	4.2	1	41.9	0	41.9	74	54	-32.1	-12.1	300	26	300	
4938.88	60.4	37.1	33.3	7.5	0.3	64.4	20	44.4	74	54	-9.6	-9.6	200	216	200	
5702.38	43.4	36.3	34.2	8.5	0.5	50.3	0	50.3	74	54	-23.7	-3.7	200	179	200	-3.7

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 1-6GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting high channel (2470MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

2.4 GHz Transceiver
120VAC/60Hz
Chamber 1
22°C; 22%RH
1013 mBar
2.4GHz
R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
1000	48.9	37.3	23.9	3.3	0.1	38.9	0	38.9	74	54	-35.1	-15.1	PASS	215	200	
1400	51.1	37.3	25.3	3.8	1	43.9	0	43.9	74	54	-30.1	-10.1	PASS	215	200	
3994.38	45.9	37.9	32.6	6.7	0.1	47.4	0	47.4	74	54	-26.6	-6.6	PASS	288	200	
4941	56.1	37.1	33.3	7.5	0.3	60.1	20	40.1	74	54	-13.9	-13.9	PASS	315	200	
5774.75	43.4	36.4	34.2	8.6	0.5	50.3	0	50.3	74	54	-23.7	-3.7	PASS	99	100	-3.7

6GHz-18GHz

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Vertical 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting low channel (2405MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
7213.5	52.5	37.1	37.2	9.6	0.4	62.6	20	42.6	83.5	63.5	-20.9	-20.9	PASS	136	125	
12022.5	44.2	37	38.9	12.3	0.5	58.9	20	38.9	83.5	63.5	-24.6	-24.6	PASS	216	200	
13843.8	41.9	36.5	41.4	12.8	0.4	60	0	60	83.5	63.5	-23.5	-3.5	PASS	63	125	
14513.7	42.5	37.3	40.7	13.1	0.7	59.7	0	59.7	83.5	63.5	-23.8	-3.8	PASS	215	150	
17046.6	40.2	36.1	41.3	14.6	0.6	60.6	0	60.6	83.5	63.5	-22.9	-2.9	PASS	216	100	
17782.2	36.8	35.6	44.2	15.1	0.8	61.3	0	61.3	83.5	63.5	-22.2	-2.2	PASS	64	175	-2.2

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Horizontal 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting low channel (2405MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency MHz	Raw Peak Reading dBµV	Preamplifier Factor dB	Antenna Factor dB/m	Cable Factor dB	Filter Insertion Loss dB	Adjusted Peak Reading dBµV/m	Duty Cycle Correction Factor dB	Adjusted Avg Reading* dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m	Delta to Peak Limit dB	Delta to Average Limit dB	Test Result Pass/Fail	EUT Azimuth degrees	Antenna Height cm	Worst Margin dB
7213.5	49.9	37.1	37.2	9.6	0.4	60	20	40	83.5	63.5	-23.5	-23.5	PASS	289	175	
12887.4	42.4	37.1	39.9	12.7	0.3	58.2	0	58.2	83.5	63.5	-25.3	-5.3	PASS	106	125	
13324.8	41.4	36.4	41.1	12.9	0.5	59.5	0	59.5	83.5	63.5	-24.0	-4.0	PASS	0	100	
13884	42.4	36.4	41.5	12.9	0.3	60.7	0	60.7	83.5	63.5	-22.8	-2.8	PASS	216	175	
17148	40.4	36.3	41.5	14.6	0.6	60.8	0	60.8	83.5	63.5	-22.7	-2.7	PASS	210	100	
17864.1	36.4	35.4	44.5	15.2	0.8	61.5	0	61.5	83.5	63.5	-22.0	-2.0	PASS	106	175	-2.0

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Vertical 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting middle channel (2440MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency	Raw Peak Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Filter Insertion Loss	Adjusted Peak Reading	Duty Cycle Correction Factor	Adjusted Avg Reading*	Peak Limit	Average Limit	Delta to Peak Limit	Delta to Average Limit	Test Result	EUT Azimuth	Antenna Height	Worst Margin
MHz	dBµV	dB	dB/m	dB	dB	dBµV/m	dB	dBµV/m	dBµV/m	dBµV/m	dB	dB	Pass/Fail	degrees	cm	dB
7321.5	60.3	37	37.6	9.6	0.4	70.9	20	50.9	83.5	63.5	-12.6	-12.6	PASS	142	125	
12202.5	49.1	37.1	38.7	12.5	0.6	63.8	20	43.8	83.5	63.5	-19.7	-19.7	PASS	63	200	
12842.7	43.3	37.2	39.8	12.7	0.4	59	0	59	83.5	63.5	-24.5	-4.5	PASS	136	150	
13881.9	41.7	36.4	41.5	12.9	0.3	60	0	60	83.5	63.5	-23.5	-3.5	PASS	315	125	
17109.9	40	36.2	41.4	14.6	0.6	60.4	0	60.4	83.5	63.5	-23.1	-3.1	PASS	315	125	
17819.4	36.1	35.5	44.4	15.2	0.8	61	0	61	83.5	63.5	-22.5	-2.5	PASS	210	150	-2.5

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Horizontal 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting middle channel (2440MHz.)

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency	Raw Peak Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Filter Insertion Loss	Adjusted Peak Reading	Duty Cycle Correction Factor	Adjusted Avg Reading*	Peak Limit	Average Limit	Delta to Peak Limit	Delta to Average Limit	Test Result	EUT Azimuth	Antenna Height	Worst Margin
MHz	dBµV	dB	dB/m	dB	dB	dBµV/m	dB	dBµV/m	dBµV/m	dBµV/m	dB	dB	Pass/Fail	degrees	cm	dB
7318.5	54.5	37	37.6	9.6	0.4	65.1	20	45.1	83.5	63.5	-18.4	-18.4	PASS	173	125	
12202.8	43.4	37.1	38.7	12.5	0.5	58	20	38	83.5	63.5	-25.5	-25.5	PASS	178	150	
13323.6	41.6	36.4	41.1	12.9	0.5	59.7	0	59.7	83.5	63.5	-23.8	-3.8	PASS	142	100	
13876.5	41	36.4	41.5	12.9	0.3	59.3	0	59.3	83.5	63.5	-24.2	-4.2	PASS	69	150	
17002.2	40.6	36.1	41.2	14.6	0.7	61	0	61	83.5	63.5	-22.5	-2.5	PASS	288	150	
17746.5	36.9	35.7	44.1	15.1	0.8	61.2	0	61.2	83.5	63.5	-22.3	-2.3	PASS	106	200	-2.3

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Vertical 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting high channel (2470MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency	Raw Peak Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Filter Insertion Loss	Adjusted Peak Reading	Duty Cycle Correction Factor	Adjusted Avg Reading*	Peak Limit	Average Limit	Delta to Peak Limit	Delta to Average Limit	Test Result	EUT Azimuth	Antenna Height	Worst Margin
MHz	dBµV	dB	dB/m	dB	dB	dBµV/m	dB	dBµV/m	dBµV/m	dBµV/m	dB	dB	Pass/Fail	degrees	cm	dB
7408.5	69.7	36.9	37.6	9.6	0.5	80.5	20	60.5	83.5	63.5	-3.0	-3.0	PASS	100	125	-3.0
9881.7	50.8	36.1	38.8	10.6	0.5	64.6	20	44.6	83.5	63.5	-18.9	-18.9	PASS	27	175	
12352.5	49.6	36.5	38.9	12.6	0.6	65.2	20	45.2	83.5	63.5	-18.3	-18.3	PASS	0	175	
14817	54.8	37	39.8	13.3	0.6	71.5	20	51.5	83.5	63.5	-12.0	-12.0	PASS	0	175	

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
Top Peaks Horizontal 6-18GHz
Operator: Jason Haley
Client Present: Yes
Company: Temperature Alert
EUT is in X-axis with the external antenna Vertical.
Transmitting high channel (2470MHz.)
*The Adjusted Average reading is the Peak reading minus the duty cycle correction factor. Only used for harmonics.

EUT Description - 2.4 GHz Transceiver
EUT Power Input - 120VAC/60Hz
Test Site - Chamber 1
Temperature; Humidity - 22°C; 22%RH
Barometric Pressure - 1013 mBar
EUT Maximum Frequency - 2.4GHz
Work Order # - R0198

Frequency	Raw Peak Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Filter Insertion Loss	Adjusted Peak Reading	Duty Cycle Correction Factor	Adjusted Avg Reading*	Peak Limit	Average Limit	Delta to Peak Limit	Delta to Average Limit	Test Result	EUT Azimuth	Antenna Height	Worst Margin
MHz	dBµV	dB	dB/m	dB	dB	dBµV/m	dB	dBµV/m	dBµV/m	dBµV/m	dB	dB	Pass/Fail	degrees	cm	dB
7408.5	69.2	36.9	37.6	9.6	0.4	79.9	20	59.9	83.5	63.5	-3.6	-3.6	PASS	70	175	-3.6
9877.8	50.9	36.1	38.8	10.6	0.4	64.6	20	44.6	83.5	63.5	-18.9	-18.9	PASS	315	175	
12352.5	48	36.5	38.9	12.6	0.6	63.6	20	43.6	83.5	63.5	-19.9	-19.9	PASS	253	175	
14817	50.8	37	39.8	13.3	0.5	67.4	20	47.4	83.5	63.5	-16.1	-16.1	PASS	282	150	

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	1/19/2018	1/19/2017
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**		**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz		I	5/23/2017	5/23/2015
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
A#2111 HF Preamp	0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/5/2017	11/5/2016
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	9/16/2017	9/16/2016
2116 BRF	0.009-18000MHz	BRM50702	Micro-Tronics	G226	2116	II	11/26/2017	11/26/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	8/9/2018	8/6/2016
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2080		HTC-1	HDE		2080	II	4/5/2017	4/5/2016
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/2/2017	3/2/2016
Asset #2054	9kHz - 18GHz		Florida RF			II	10/1/3017	10/30/2016
REMI-High-07	1 - 26.5GHz	TRU-21B0707-120	TRU			II	8/14/2017	8/14/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

18GHz-25GHz

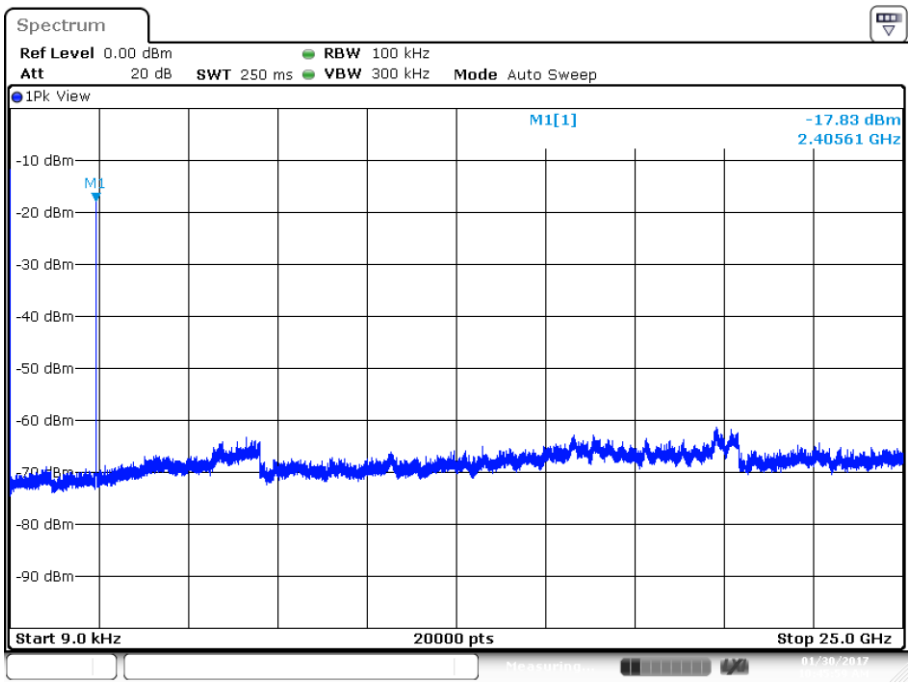
No emissions found.

Conducted Spurious Emissions

Limits: In any 100kHz 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 20dB below that in the 100kHz bandwidth that contains the highest level of desired power.
[15.247(d)]

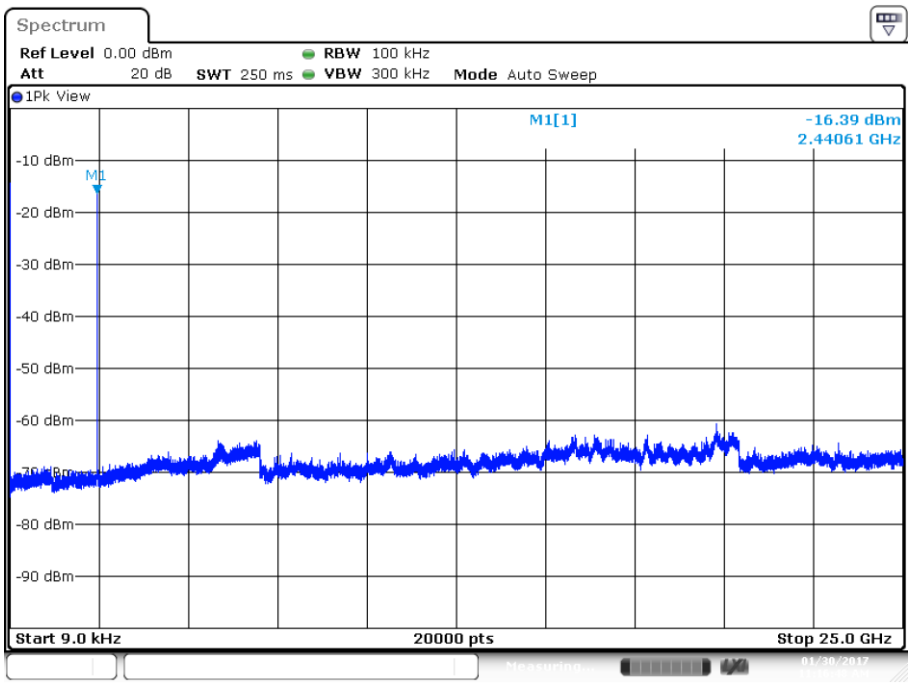
MEASUREMENTS / RESULTS

9kHz to 25GHz frequency range was investigated for 3 channels (low, middle and high) and no emissions within 20dB of their corresponding fundamentals were observed.



Date: 30.JAN.2017 10:45:59

9kHz-25GHz Conducted Spurious (Low channel)



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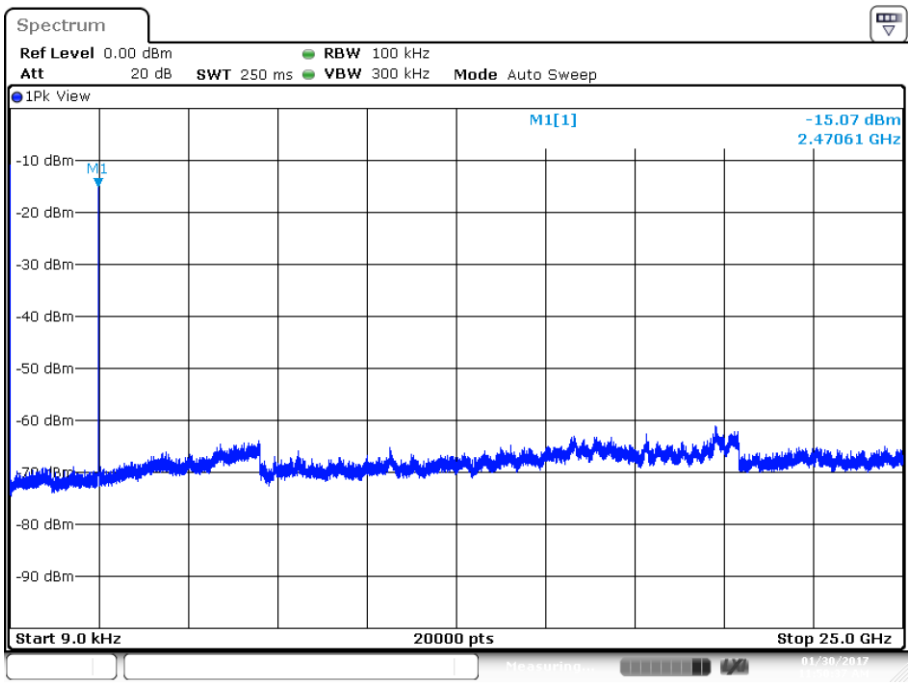
9kHz-25GHz Conducted Spurious (Mid channel)



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9kHz-25GHz Conducted Spurious (High channel)

Power Spectral Density

Limit: The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission. [15.247(e)]

MEASUREMENTS / RESULTS

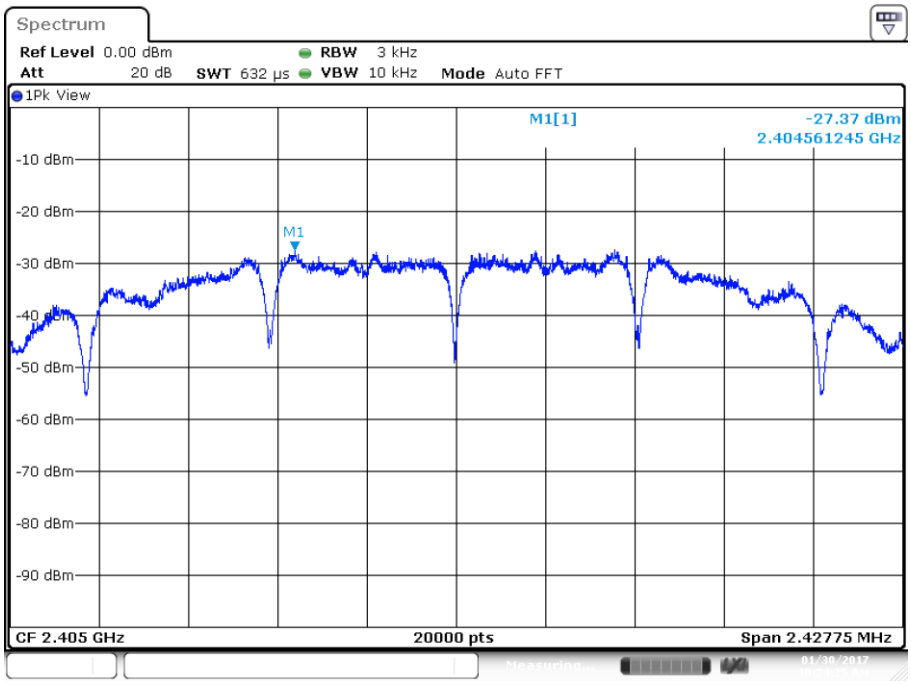
Peak Power Spectral Density

Date: 30-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: YF **EUT:** WiFi Ethernet Gateway Model: TM-WIFI440-Z **Operating Voltage/Frequency:** 5VDC
Temp: 22.9°C **Humidity:** 27% **Pressure:** 999mbar
Frequency Range: 2405-2470 MHz **Measurement Type:** Conducted
Measurement Method: FCC KDB 558074 D01 DTS Meas Guidance v03r05 Section 10.2
Notes:

Frequency (MHz)	Peak Reading (dBm)	Cable Loss (dB)	Attenuator Loss (dB)	Peak PSD (dBm)	Limit (dBm)	Margin (dB)	Result
2405.0	-27.37	1.88	29.44	3.95	8.0	-4.05	Pass
2440.0	-26.46	1.88	29.44	4.86	8.0	-3.14	Pass
2470.0	-24.99	1.88	29.44	6.33	8.0	-1.67	Pass

Test Site: Wireless Test Room **Cable:** EMIR-HIGH 07 **Attenuator:** A2121
Analyzer: A2200
PSD(dBm) = Reading (dBm) + Cable Loss (dB) + Attenuator Loss (dBm)

PLOTS



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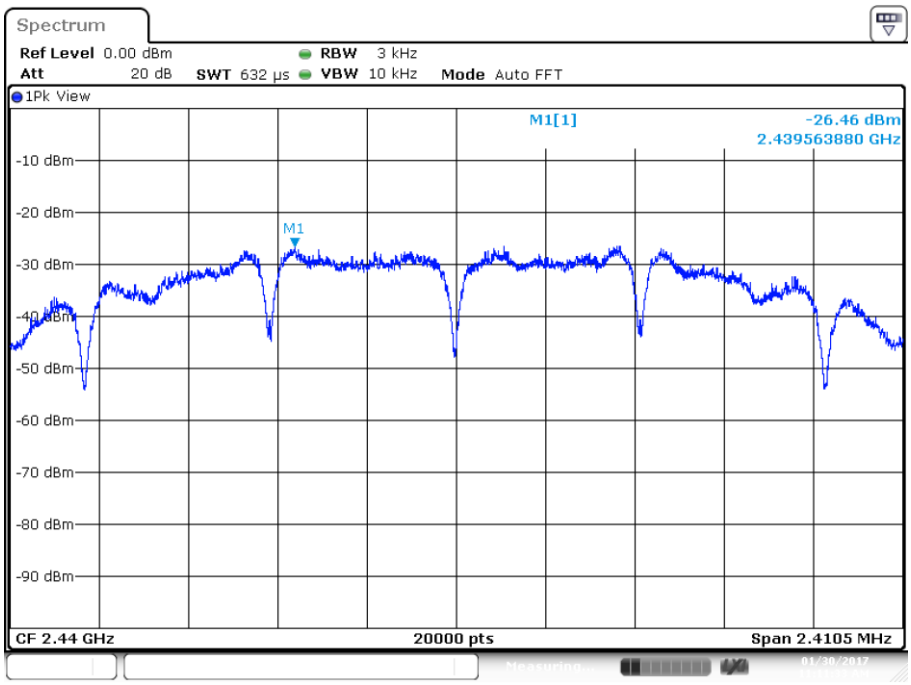
Low Channel PSD



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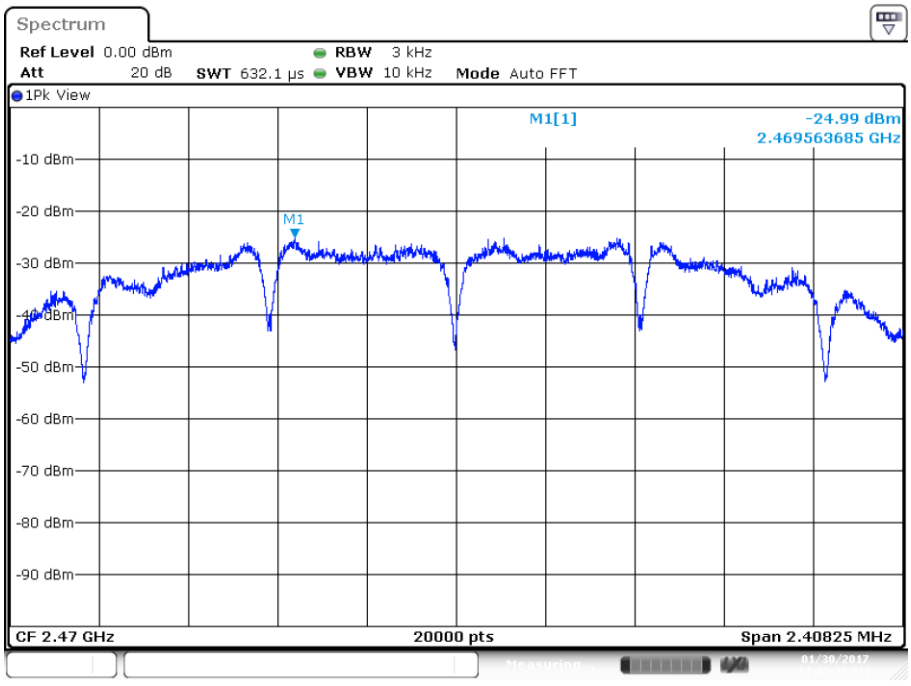
Middle Channel PSD



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High Channel PSD

AC Line Conducted Emissions

Limits:

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

AC Side of a DC Supply Conducted Emissions

Date: 30-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: Zac Johnson **EUT Desc:** 2.4GHz Transceiver
Temp: 22.0 ºC **Humidity:** 27% **Pressure:** 999 mBar
Notes: EUT transmitting at center channel 2440MHz
Frequency Range: 0.15-30MHz **EUT Input Voltage/Frequency:** 120V/60Hz to 5V DC

	Quasi-Peak Readings		Average Readings		LISN Factors		Cable	ATTN	FCC/CISPR Class B			FCC/CISPR Class B		
Frequency (MHz)	QP1 (dBµV)	QP2 (dBµV)	AVG1 (dBµV)	AVG2 (dBµV)	L1 (dB)	L2 (dB)	Factor (dB)	Factor (dB)	QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dBµV)	Margin (dB)	Result (Pass/Fail)
0.15	27.2	26.2	12.2	15.0	0.0	0.0	-0.1	-19.9	66.0	-18.8	Pass	56.0	-21.0	Pass
6.79	8.4	13.0	4.0	8.4	-0.1	-0.1	-0.1	-19.9	60.0	-26.9	Pass	50.0	-21.5	Pass
11.79	15.7	15.6	7.6	9.9	-0.2	-0.2	-0.1	-19.9	60.0	-24.1	Pass	50.0	-19.9	Pass
12.54	17.7	18.6	8.6	11.4	-0.2	-0.2	-0.1	-19.9	60.0	-21.2	Pass	50.0	-18.4	Pass
18.73	10.8	9.9	5.1	5.6	-0.2	-0.2	-0.2	-20.0	60.0	-28.9	Pass	50.0	-24.1	Pass
24.85	3.9	4.0	2.3	0.3	-0.2	-0.2	-0.2	-20.0	60.0	-35.7	Pass	50.0	-27.4	Pass

Result: Pass ***Worst Margin:*** -18.4 dB ***Frequency:*** 12.540 MHz

Measurement Device: LISN Asset 1791 **Cable:** CEMI-11 **Spectrum Analyzer:** Gold
Attenuator: 20dB Attenuator-06 **Site:** CEMI 3

C-S CEMI Calculator Version 3.0.14 *Equipment Factor Sheet rev: 1/15/2017*
Adjusted Reading = Raw Reading + LISN Insertion Loss + Cable Loss + Attenuation

Rev. 1/21/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	2/13/2017	1/13/2016
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 1791	9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-603	1791	I	6/23/2017	6/23/2016
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 3	719150		A-0015			III	NA	N/A
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-11	9kHz - 2GHz		C-S			II	10/2/2017	1/2/2016
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-06	9kHz-2GHz			N/A		II	10/2/2017	10/2/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Occupied Bandwidth

Requirement: When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is its 99% emission bandwidth, as calculated or measured.
[RSS-GEN 6.6]

MEASUREMENTS / RESULTS

99% Occupied Bandwidth

Date: 30-Jan-17 **Company:** TempAlert **Work Order:** R0198
Engineer: YF **EUT:** WiFi Ethernet Gateway Model: TM-WIFI440-Z **EUT Operating Voltage/Frequency:** 5VDC
Temp: 22.9°C **Humidity:** 27% **Pressure:** 999mbar

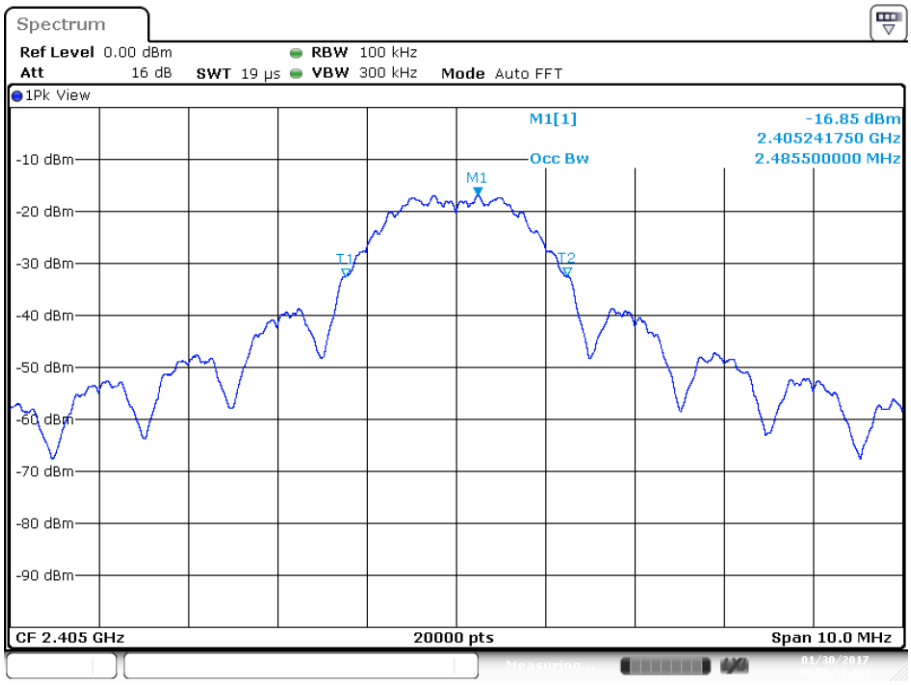
Frequency Range: 2405-2470 MHz **Measurement Type:** Conducted
Measurement Method: RSS-Gen Issue 4 Section 6.6

Notes:

Frequency (MHz)	99% OBW (kHz)
2405	2485.5
2440	2471.5
2470	2478.0

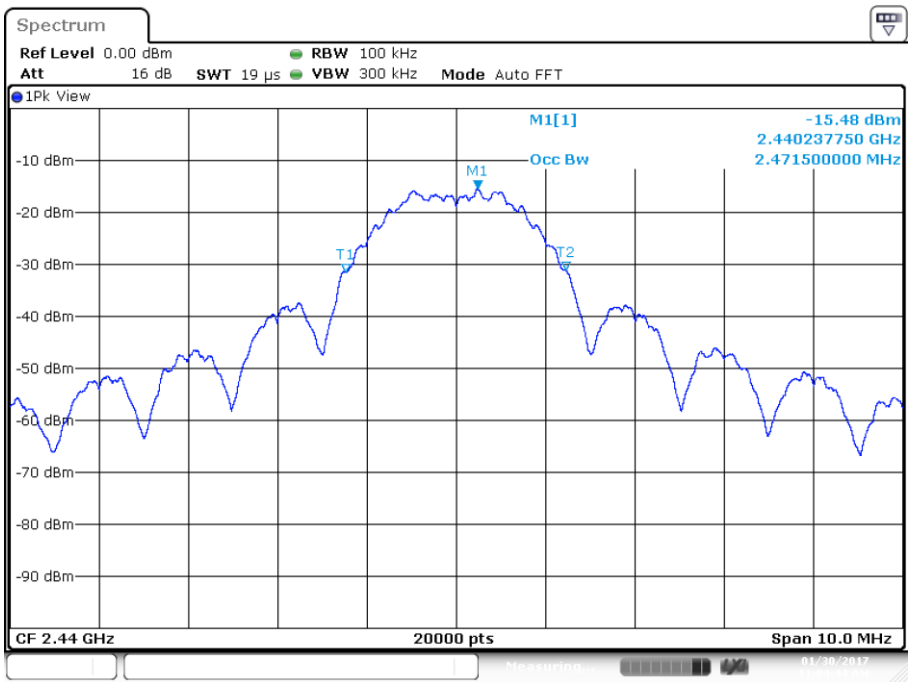
Test Site: Wireless Test Room **Cable:** EMIR-HIGH 07 **Attenuator:** A2121
Analyzer: A2200

PLOTS



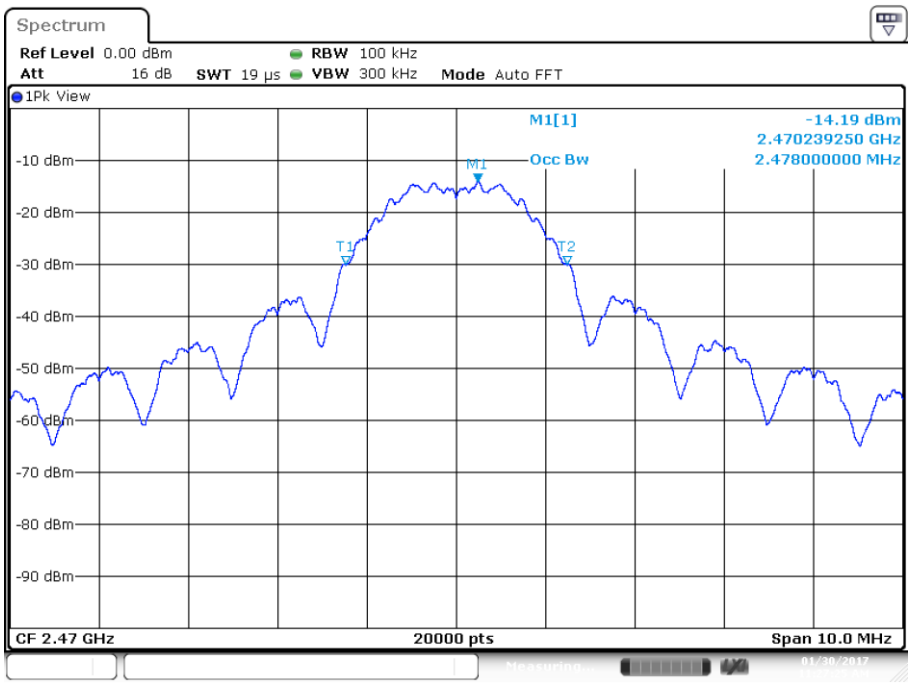
Date: 30.JAN.2017 09:55:57

99% Occupied Bandwidth Low Channel



Date: 30.JAN.2017 11:04:44

99% Occupied Bandwidth Middle Channel



Date: 30.JAN.2017 11:27:26

99% Occupied Bandwidth High Channel

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST CISPR	 5.6dB 4.6dB	 N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST CISPR	 3.9dB 3.6dB	 N/A 3.6dB (Ucispr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	 3.4% 0.3dB	 5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		

Conditions of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS** (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.
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