

FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

RELAY MODULE

MODEL NUMBER: CIF-10V-CWC-SNSR, CIF-10VC1-CWC-SNSR

FCC ID: 2ACQ6-CIF IC: 11481A-CIF

REPORT NUMBER: R10015052-RF

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Prepared for CREE INC. 4600 SILICON DR. DURHAM, NC 27709 USA

Prepared by UL LLC 12 LABORATORY DR. RESEARCH TRIANGLE PARK, NC 27709 USA TEL: (919) 549-1400

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NVLAP LAB CODE 200246-0

Revision History

Rev.	lssue Date	Revisions	Revised By
	2013-11-06	Initial Issue	Jeff Moser
1	2014-07-15	Grantee Code Revised (previous one issued in error)	Jeff Moser
2	2014-08-18	Revised references to KDB 558074	Jeff Moser
3	2014-08-20	Revised to include additional part number (CIF- 10VC1-CWC-SNSR)	Jeff Moser

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	CREE INC. 4600 SILICON DR. DURHAM, NC 27709 USA			
EUT DESCRIPTION:	Relay Module with Transceiver			
MODEL:	Relay Module, p/n CIF-10V-CWC-SNSR, CIF-10VC1-CWC-SNSR			
SERIAL NUMBER:	None			
DATE TESTED:	2013-07-09- 2013-08-30, 2013-10-24			
APPLICABLE STANDARDS				

APPLICABLE STANDARDS				
STANDARD	TEST RESULTS			
CFR 47 Part 15 Subpart C	Pass			
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass			
INDUSTRY CANADA RSS-GEN Issue 3	Pass			

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL LLC By:

Bob DeLisi EMC Principle Engineer

Prepared By:

Jeff Moser EMC Program Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <u>http://ts.nist.gov/standards/scopes/2002460.htm</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	+/- 2.5 dB
Radiated Disturbance, 30 to 1000 MHz	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Relay Modules, p/n CIF-10V-CWC-SNSR and CIF-10VC1-CWC-SNSR are 2.4 GHz DSSS transceivers used with light fixtures. The Relay Module utilizes O-QPSK modulation and a 250 kbps data rate. The Relay Module receives signals from other devices to control the fixture.

The radio module is manufactured by Cree Inc.

Relay module, p/n CIF-10VC1-CWC-SNSR is constructed to route the control wires and power wires out of one opening. Relay module, p/n CIF-10V-CWC-SNSR is constructed to route the control wires out of an opening next to the RJ11 port. The power wires are routed through the same opening as the CIF-10VC1-CWC-SNSR.

The power and control wiring are not routed near the radio circuit and are strictly in the area of the unintentional circuitry.

Relay module p/n CIF-10V-CWC-SNSR was the unit used for testing.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
2405 - 2480	O-QPSK	3.4	2.2

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Monopole, PCB-Trace antenna, with a maximum gain of 1.4 dBi.

5.4. SOFTWARE AND FIRMWARE

0-10V Interface – CIF-10V-CWC-SNSR

128RFR2_MOD_11.hex 128RFR2_MOD_18.hex 128RFR2_MOD_22.hex 128RFR2_NO_RADIO.elf

All firmware has the following parameters:

- Channel 11 and 18 have transmit power of 3.5dBm, channel 26 has a transmit power of 1.2dBm.
- Channel 11 and 18 have no transmit filter, channel 26 uses a transmit filter.
- All firmware files labelled 128RFR2_MOD_XX.hex are radio tests for the ATMEGA128RFR2, where XX is the channel being constantly transmitted on.
- All firmware files labelled RFR2_MOD_XX.hex are the equivalent for the ATMEGA256RFR2.
- The 128RFR2_NO_RADIO and RFR2_NO_RADIO files put the ATMEGAXXXRFR2 into a nontranmitting, idle state.
- The XMEGA_STRESS.hex file is the stress test that puts the XMEGA into a maximal power usage state.
- The XMEGA.elf file is the standard conditions XMEGA file for testing the CT.

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5.5. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that the Y orientation (lying on back) was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

Radiated-emission testing in the 30-1000MHz range and power line conducted-emission testing were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

The Relay Module, p/n CIF-10V-CWC-SNSR was tested as a standalone device. No other equipment is a part of the configuration.

I/O CABLES

None.

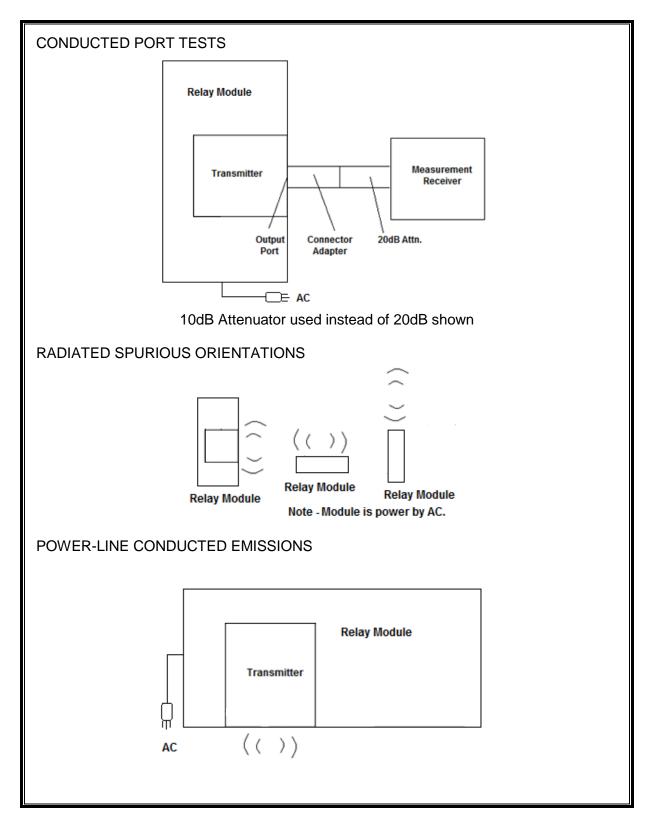
TEST SETUP

Different Relay Modules were provided. 4 units were provided for Radiated Emissions testing (Low Channel, Mid Channel and High Channel) and 4 units were provided for Conducted Port tests (Low Channel, Mid-Channel and High-Channel).

Note, the Low and Mid Channel's output power was set for 3.5dBm during testing. The High Channel output power was set for 1.2 dBm during testing.

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SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Antenna-Port Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SA0016	Spectrum Analyzer / Receiver	Agilent Technologies	N9030A	2012-10-29	2013-10-31
PSENSOR001	RF Power Meter Sensor Head	Rohde & Schwartz	NRP-Z81 (w/ NRP- Z3 USB adapter)	2012-08-21	2013-08-31
HI0041	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2013-01-25	2014-01-31

Radiated Disturbance Emissions (Prior to 2013-09-01)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	30-1000 MHz Range				
AT0021	Biconical Antenna, 30 to 300 MHz	Schaffner- Chase EMC Ltd.	VBA6106A	2013-05-10	2014-05-31
AT0022	Log-periodic Antenna, 200 MHz to 1000 MHz	Chase	UPA6109	2013-01-29	2014-01-31
	1-18 GHz				
AT0026	Horn Antenna 1 to 18 GHz	EMC Test Systems	3115	2013-02-20	2014-02-28
AT0062	Horn Antenna 1 to 18 GHz	ETS-Lindgren	3117	2012-07-26	2013-07-31
	18-26 GHz				
AT0063	Antenna	ARA	MWH-1826/B	2012-10-12	2013-10-31
	Gain-Loss Chains				
SAC_C (Biconical 3m	 ATA084: Attenuator ATA061: Amplifier ATA167: Cable ATA221: Cable ATA229: DC Bias Tee ATA199: Cable 	 Pasternack Miteq Eupen Micro-Coax Miteq Micro-Coax 	 PE7002-6 AM-3A-000110-N CMS/RG 214 UFA210A-0-6000- 50U-50U BT2000-C UFB293C-0-0720- 5GU50U) 	2012-08-01	2013-08-31
SAC_D	 ATA085: Attenuator ATA125: Amplifier ATA225: Cable ATA189: Cable ATA115: DC Bias Tee ATA198: Cable 	(3) Eupen (4) UL (5) Miteq	,	2013-02-04	2013-08-31
ATA144	Amplifier, 1-18GHz	Miteq	AFS42-00101800-25- N-42MF	2012-08-31	2013-08-31
	P	age 10 of 72	1	l	

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AMP013	Amplifier, 18-40GHz	Miteq	JS44-18004000-33-8P	2013-07-10	2014-07-31
	Receiver & Software				
SAR003	Spectrum Analyzer / Receiver	Rohde & Schwarz	1088.7490K40	2012-08-28	2013-08-31
SA0016	Spectrum Analyzer / Receiver	Agilent Technologies	N9030A	2012-10-29	2013-10-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
HI0034	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2013-01-25	2014-01-31
BRF003	Band Reject Filter - 2400 to 2500 MHz	Microtronics	BRM50702-01	2012-09-04	2013-09-30

Radiated Disturbance Emissions (After 2013-09-01)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0037	Loop Antenna (Low Range)	Electro-Metrics	EM-6871	2013-06-19	2014-06-30
AT0036	Loop Antenna (High Range)	Electro-Metrics	EM-6872	2013-06-20	2014-06-30
SAC_E_LR (Loop & Rod 3m location)	Gain-Loss string for loop/rod antenna at 3m	Various	Various	2013-09-06	2014-09-30
SAR003	Spectrum Analyzer / Receiver	Rohde & Schwarz	ESIB40 (1088.7490.40)	2013-09-03	2014-09-30
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
HI0034	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2013-01-25	2014-01-31

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Power-line Conducted Disturbance Emissions

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
ATA016	Coaxial cable, 20 ft., BNC -male to BNC-male	UL	RG-223	2012-08-31	2013-08-31
ATA508	Transient Limiter, 0.009 to 100 MHz	Electro-Metrics	EM 7600	2012-08-31	2013-08-31
HI0041	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2013-01-25	2014-01-25
LISN002	LISN, 50-ohm/50-uH, 25A	Fischer Custom Com.	FCC-LISN-50-25-2- 01-550V	2013-01-09	2014-01-31
SA0015	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2012-08-28	2013-08-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

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7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
O-QPSK Mode	100.000	100.000	1.000	100.00%	0.00	0.010

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7.2. DUTY CYCLE PLOTS

2.4 GHz BAND

R RF 30 Ω	PNC	SENSE:INT D: Fast Trig: Fr in:Low #Atten:	ee Run	ALIGN AUTO #Avg Type:	RMS		45 PM Jul 23, 201: RACE 1 2 3 4 5 TYPE WANNAN DET P N N N N
0 dB/div Ref 10.00 dE	3m						
0.00							
0.0							
20.0							
0.0							
10.0							
0.0							
60.0							
70.0							
0.0							
Center 2.440000 GHz Res BW 8 MHz		#VBW 50 MH	łz	STATUS	#Swee	Spar p 100 ms	2.000 MHz (10001 pts

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8. ANTENNA PORT TEST RESULTS

8.1. O-QPSK (DSSS) MODE IN THE 2.4 GHz BAND MODE

8.1.1.6 dB BANDWIDTH

<u>LIMITS</u>

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

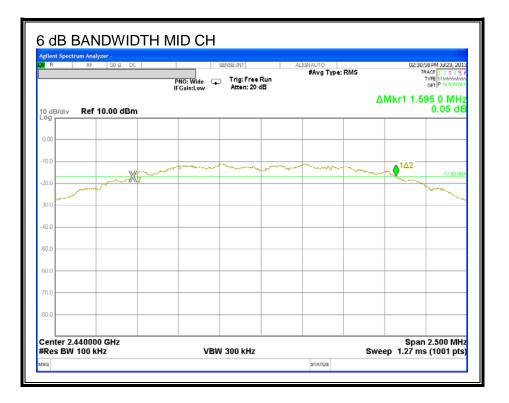
Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low	2405	1.550	0.5
Middle	2440	1.595	0.5
High	2480	1.548	0.5

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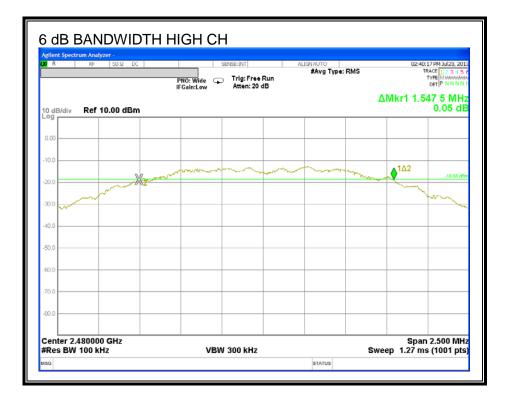
6 dB BANDWIDTH



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8.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

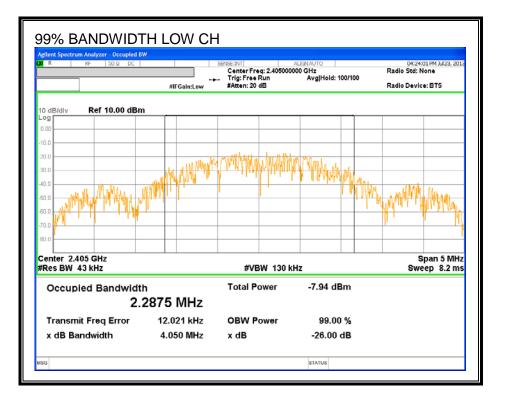
TEST PROCEDURE

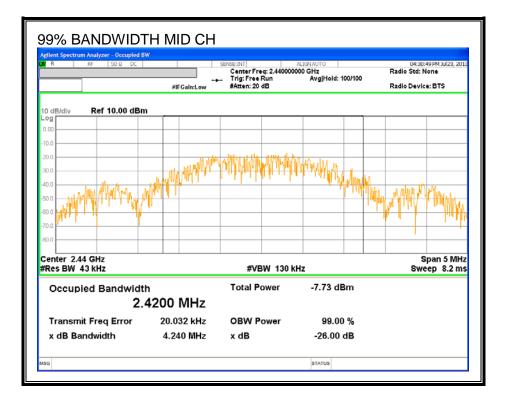
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

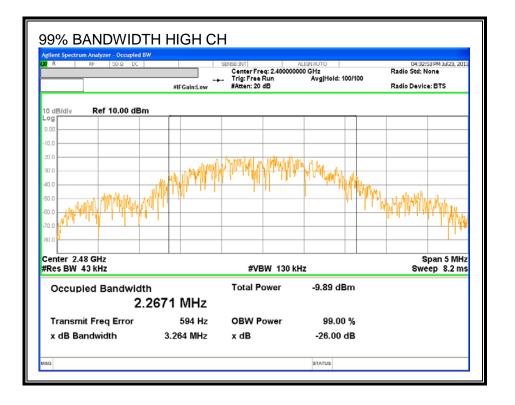
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2405	2.288
Middle	2440	2.420
High	2480	2.267

99% BANDWIDTH





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8.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

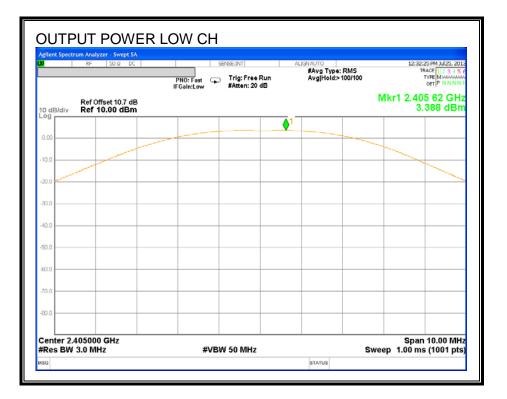
TEST PROCEDURE

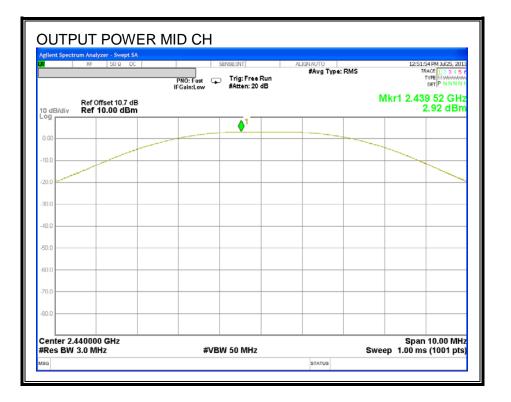
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 99% bandwidth of the EUT.

<u>RESULTS</u>

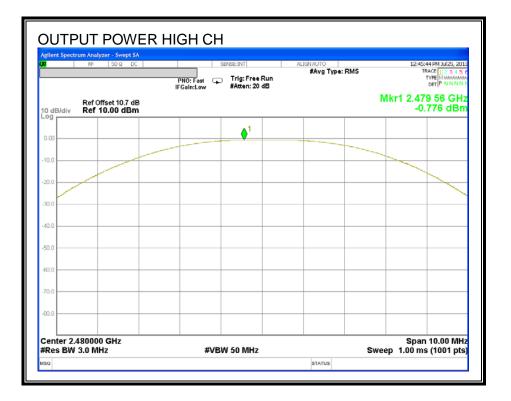
Channel	Frequency	Output	Limit	Margin
		Power		
	(MHz)	(dBm)	(dBm)	(dB)
Low	2405	3.388	30	-26.61
Middle	2440	2.920	30	-27.08
High	2480	-0.776	30	-30.78

OUTPUT POWER





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8.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency Power	
	(MHz)	(dBm)
Low	2405	3.380
Middle	2440	2.900
High	2480	-0.750

8.1.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Output power was measured based on the use of a peak measurement.

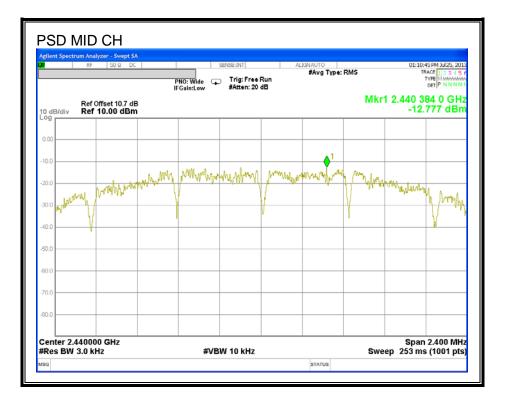
RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2405	-11.02	8	-19.02
Middle	2440	-12.78	8	-20.78
High	2480	-16.31	8	-24.31

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POWER SPECTRAL DENSITY





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8.1.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

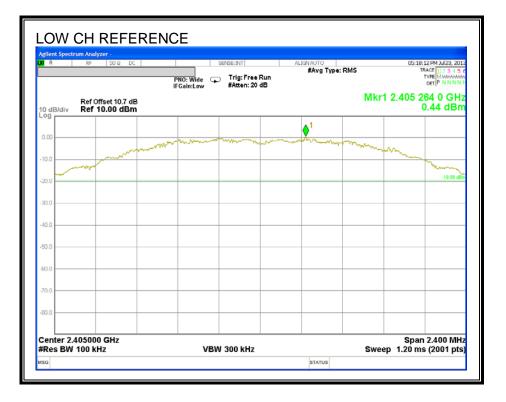
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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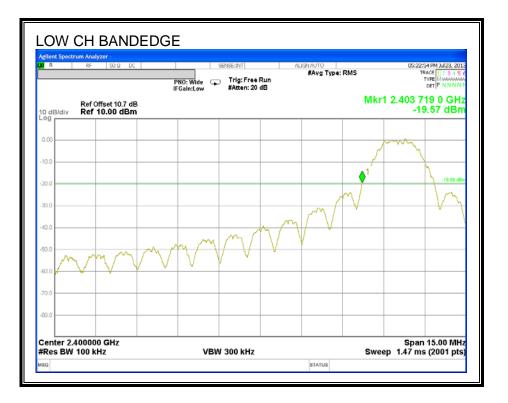
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL



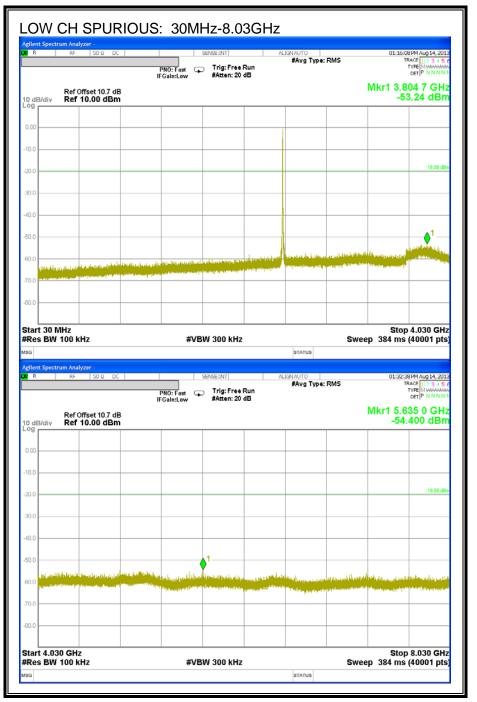
Note: Low channel had the highest peak power. Therefore, the low channel was used as the reference.

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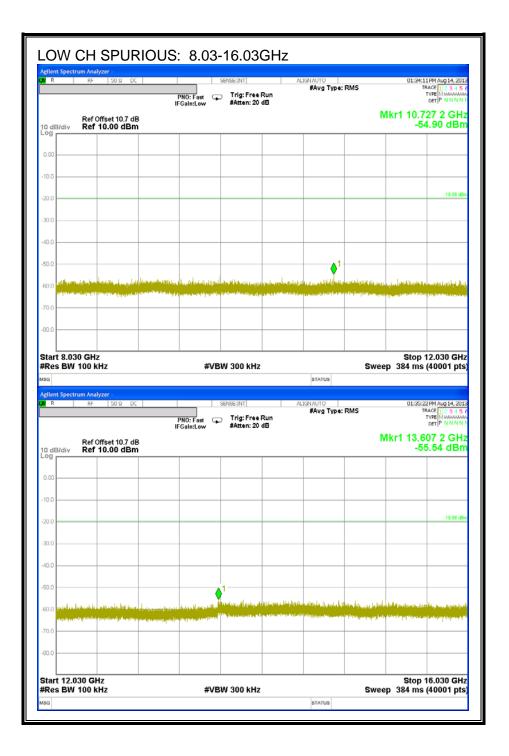


Note -2.4 GHz is the center frequency. The waveform was measured at the point on the signal that is 20dB below the reference channel peak. Based on this, the band edge is below the 20 dB threshold.

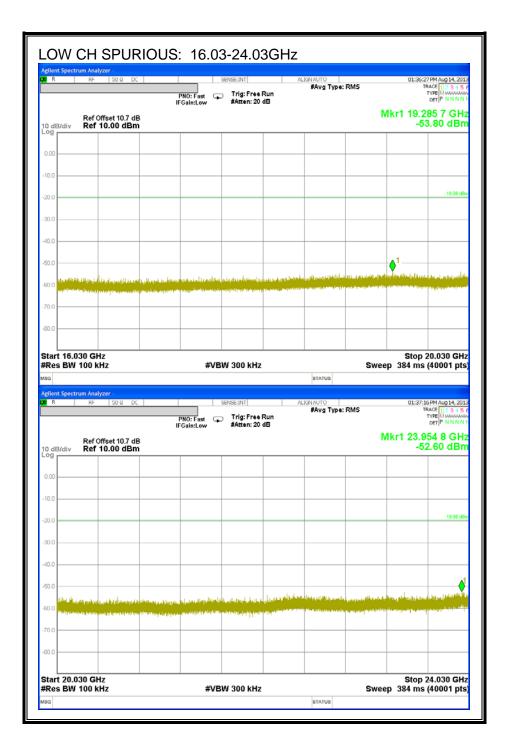
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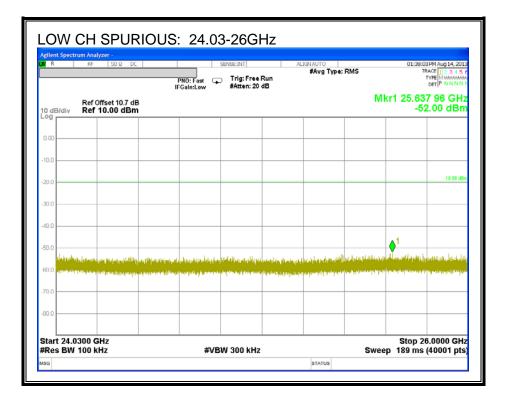
Note: Per KDB 558074, number of points must be >/= Span/RBW. Therefore, seven plots are needed to satisfy this requirement over the range of 30MHz-26GHz.



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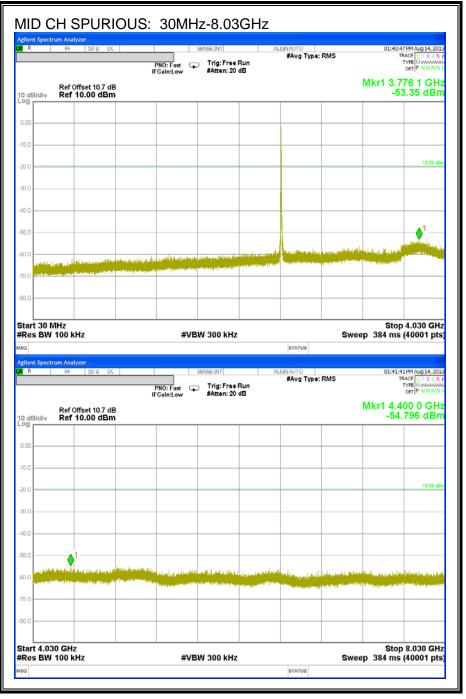


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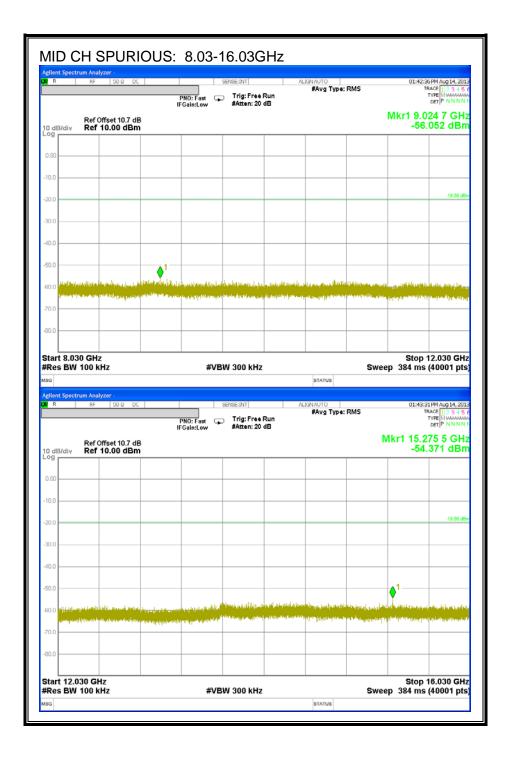


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SPURIOUS EMISSIONS, MID CHANNEL



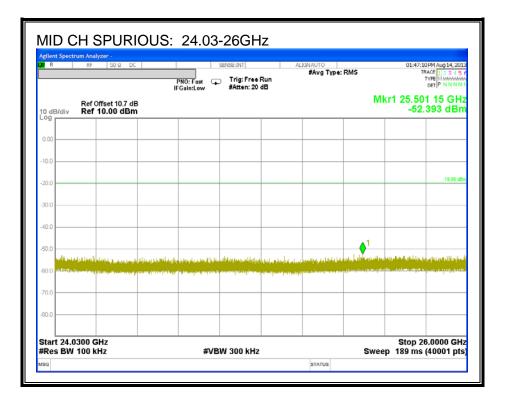
Note: Per KDB 558074, number of points must be >/= Span/RBW. Therefore, seven plots are needed to satisfy this requirement over the range of 30MHz-26GHz.



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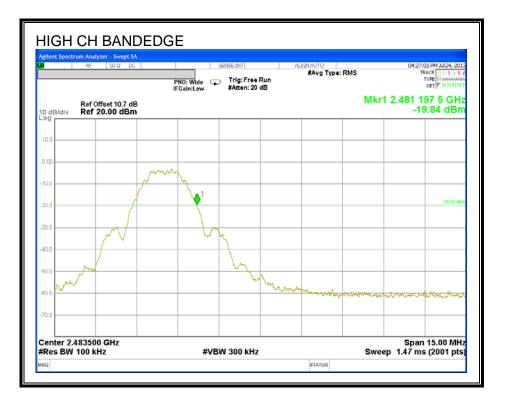
Ient Spectrum Analyzer - R RF 50 Ω DC		PNO: Fast G	SENSE:INT Trig: Free #Atten: 20	Run	IGNAUTO #Avg Type:	RMS		RACE 1 2 3 4 5 TYPE MWWW DET P N N N
Ref Offset 10.7 df	в					1	Mkr1 19.5 -54	49 8 GH .394 dBi
00								
								-19.56 d
0.0								
0.0								
0.0								
					and a state to the state			
0.0 And Antibyson and Antibyso	aliyelaray, artikar Mangalara	anter the second second	lik langshilikani ing belepi Malanga priklimikani dan	indepity of the least of the	Territ de la paparet	pelistra and	ang di sa di sa sa	a stiget for the state
0.0								
0.0								
art 16.030 GHz							Stop	20.030 GH
Res BW 100 kHz		#VB	W 300 kHz		STATUS	Swe	Stop ep 384 ms	
Res BW 100 kHz G ilent Spectrum Analyzer -			W 300 kHz	AL	IGNAUTO		ep 384 ms	(40001 pt
Res BW 100 kHz G ilent Spectrum Analyzer -	-		SENSE:INT	Run		RMS	01:46:	(40001 pt
Res BW 100 kHz g Illent Spectrum Analyzer - R RF SO Q DC Ref Offset 10.7 dl	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt
Ref Offset 10.7 di o dB/div Ref 10.00 dBn	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt
Res BW 100 kHz	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt
Res BW 100 kHz	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt D1PM Aug 14, 20 RACE [12:34 4 DET P NNNP R71 9 GH 824 dB1
Res BW 100 kHz g g Illent Spectrum Analyzer - R RF SO Q C	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt
Res BW 100 kHz a Iflent Spectrum Analyzer - R RF Block Ref Offset 10.7 dl AB/div Ref 10.00 dBn 00 00	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt D1PM Aug 14, 20 RACE [12:34 4 DET P NNNP R71 9 GH 824 dB1
Res BW 100 kHz G Itent Spectrum Analyzer - R RF SO Q D dB/div Ref Offset 10.7 di Offset 10.00 dBn O O	B	PNO: Fast	SENSE:INT	Run	IGNAUTO	RMS	01:464 01:464 1 Mkr1 23.8	(40001 pt
Res BW 100 kHz a Itent Spectrum Analyzer - R RF 50 Q DC Ref Offset 10.7 df Ref 10.00 dBn 00 00 00 00	B n	"NO: Fast Gain:Low	SENSE IVI	Run dĐ	IGNAUTO #Avg Type:	RMS	01:463 01:463 Mkr1 23.E -51	(40001 pt
Res BW 100 kHz a Ilent Spectrum Analyzer Ref R RF 500 0 DC dB/div Ref Offset 10.7 dl Ref 10.00 dBn 00	B n	"NO: Fast Gain:Low	SENSE IVI	Run dĐ	IGNAUTO #Avg Type:	RMS	01:463 01:463 Mkr1 23.E -51	(40001 pt
Res BW 100 kHz Itent.Spectrum Analyzer - R R R RF 50 2 DC dB/div Ref Offset 10.7 df Ref 10.00 dBn DC 00 0 0 0 DC 00 0 0 0 0 DC 00 0 0 0 0 DC D	B n	"NO: Fast Gain:Low	SENSE IVI	Run dĐ	IGNAUTO #Avg Type:	RMS	01:463 01:463 Mkr1 23.E -51	(40001 pt
Res BW 100 kHz a Itent Spectrum Analyzer - Iten Spectrum Anal	B n	"NO: Fast Gain:Low	SENSE IVI	Run dĐ	IGNAUTO #Avg Type:	RMS	01:463 01:463 Mkr1 23.E -51	(40001 pt

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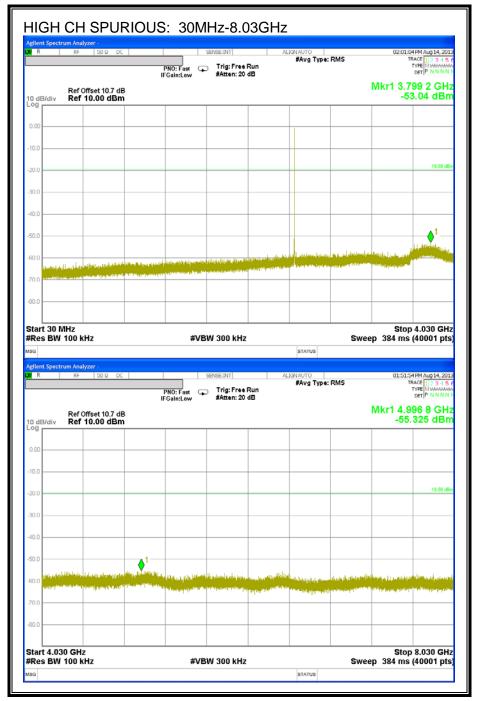
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SPURIOUS EMISSIONS, HIGH CHANNEL

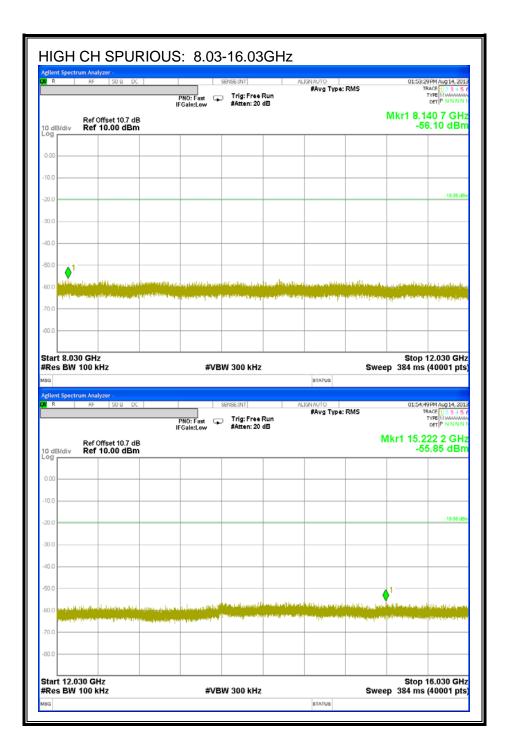


Note -2.483 GHz is the center frequency. The waveform was measured at the point on the signal that is 20dB below the reference channel peak. Based on this, the band edge is below the 20 dB threshold.

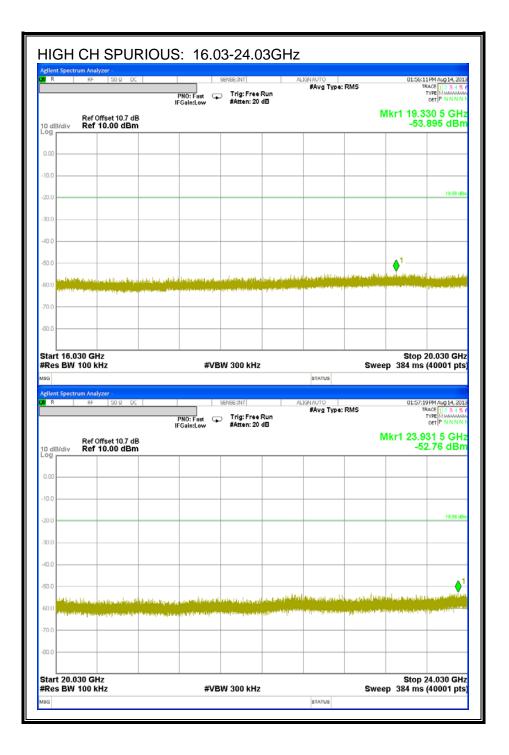
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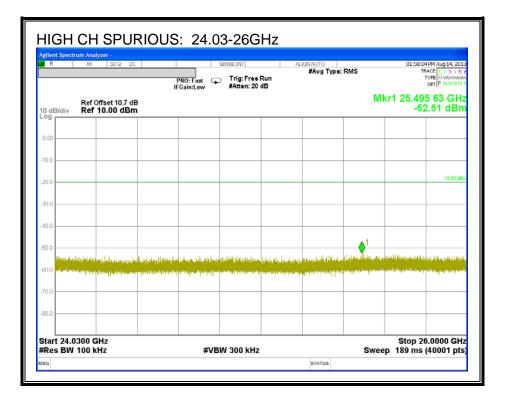


Note: Per KDB 558074, number of points must be >/= Span/RBW. Therefore, seven plots are needed to satisfy this requirement over the range of 30MHz-26GHz.



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9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements between 30 MHz and 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

For measurements below 30 MHz loop antennas were used per FCC requirements, and measurement equipment settings test method were consistent with ANSI C63.4.

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9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. TX ABOVE 1 GHz FOR O-QPSK (DSSS) MODE IN THE 2.4 GHz BAND

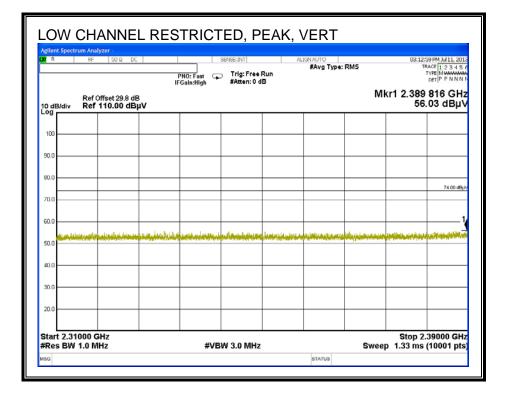
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

gilen ØR	t Spectrum A	F 50 Q C	IF	PNO: Fast Galn:High	SENSE:INT Trig: Free #Atten: 0 d	Run	IGN AUTO #Avg Type:		т	28 PM Jul 11, 201 RACE 1 2 3 4 5 TYPE MMWWW DET P P N N N
Ref 015et29.8 dB 56.631 dBμV Log										
100										
90.0										
80.0										
70.0										74.00 dBj
60.0					1					
50.0	telepetelesisten Alternational	anidekterisi	n de lagel system.	an a tha an	andra in a strande tij ber	den delinen etallen per	والمستغل وتوسلوه سيعاره	entre services and the	laide Laternia	a sind a single data a
40.0										
30.0										
20.0										
	t 2.31000 s BW 1.0			#VB	W 3.0 MHz			Sweet		.39000 GH (10001 pts

glient Spectrum Analyzer - R RF 50 Q DC		ED, AVG,	ALIGNAUTO	03:01:27 PM	1 2 2 4 5 6
Ref Offset 29.8 dB 0 dB/div Ref 110.00 dB µ		Trig: Free Run #Atten: 0 dB	Avg Hold: 100/100	Mkr1 2.389 76 46.148	8 GHz
100					
90.0					
80.0				_	
70.0					
60.0					54.00 dBu/v
50.0					1
40.0	uningkanal and given and and an inter	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	***************************************	***************************************	1944-1974 A
30.0					
20.0					
Start 2.31000 GHz Res BW 1.0 MHz	#VB	W 3.0 MHz*	Sv	Stop 2.390 /eep 1.33 ms (100	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

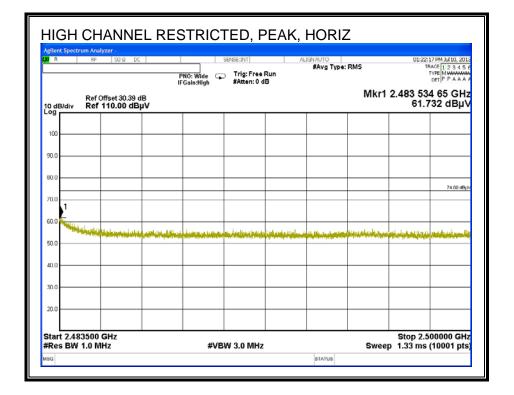


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ilent Spectrum R	Analyzer - RF 50 Q DC		PNO: Fast -+ Gain:High	SENSE:INT . Trig: Free #Atten: 0 d	Run	IGNAUTO #Avg Type: Avg Hold: 1/	00/100	03:11: Tr	55 PM 3J11, 2013 ACE 1 2 3 4 5 6 TYPE A WWWW DET A P N N N 1
0 dB/div	tef Offset 29.8 dE						IVI		288 dBµV
og									
100									
0.0									
.0.0									
30.0									
'a.a									
0.0									54.00 GL
0.0									1
			****		*****		****		****
0.0									
0.0	_								
0.0									
tart 2.3100 Res BW 1.0			#\/P	W 3.0 MHz	*		Swaa	Stop 2. p 1.33 ms	39000 GHz

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

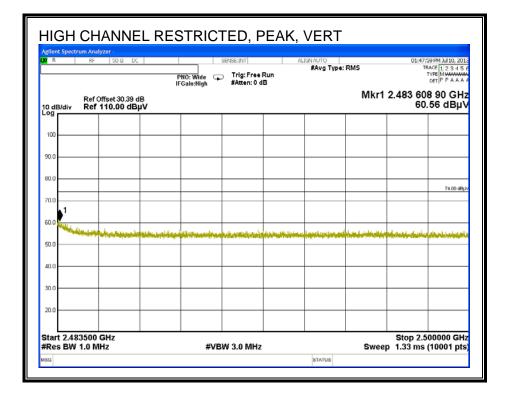


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HIGH CHA	ANNEL RE	STRIC	ΓED, Α	VG, H	ORIZ			
	iset 30.39 dB 10.00 dBµV	PNO: Wide -> IFGain:High	SENSE:INT . Trig: Free F #Atten: 0 df	Run	#Avg Type: R Avg Hold: 100	0/100	2.483 50	орм 2013 405 6 туре оет АРАААА 8 25 GHz 68 dBµV
100								
90.0								
80.0								
70.0								
60.0								54.00 dDµ/v
50.0 50.0	****		~~~	الأزندية مزناه للواحة والمراجع	***	***	****	***
40.0								
30.0								
20.0								
Start 2.483500 G Res BW 1.0 MH		#VB	W 3.0 MHz*			Sweep		00000 GHz (10001 pts)
ISG					STATUS			

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

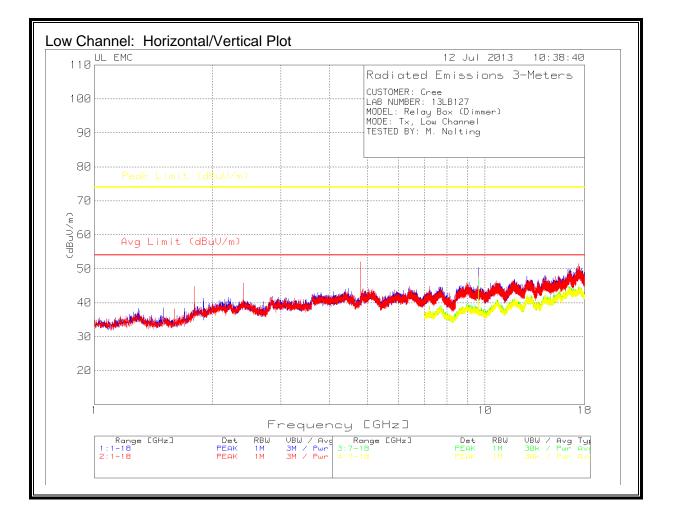


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glient Spectrum Analyzer - R RF 50 Ω	PNO: Wide ↔	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100	T	23 PM Jul 10, 201 RACE 1 2 3 4 5 TYPE A WWWW DET A P A A A
Ref Offset 30.3 0 dB/div Ref 110.00 d	IFGain:High 9 dB	#Atten: 0 dB	M	lkr1 2.483 55	
100					
90.0					
80.0					
70.0					
50.0					54.00 dDµ
50.0 Martine of the second state line	-	****	-	4	
40.0					
30.0					
20.0					
tart 2.483500 GHz Res BW 1.0 MHz	#VI	3W 3.0 MHz*	s	Stop 2.5 weep 1.33 ms	00000 GHz (10001 pts

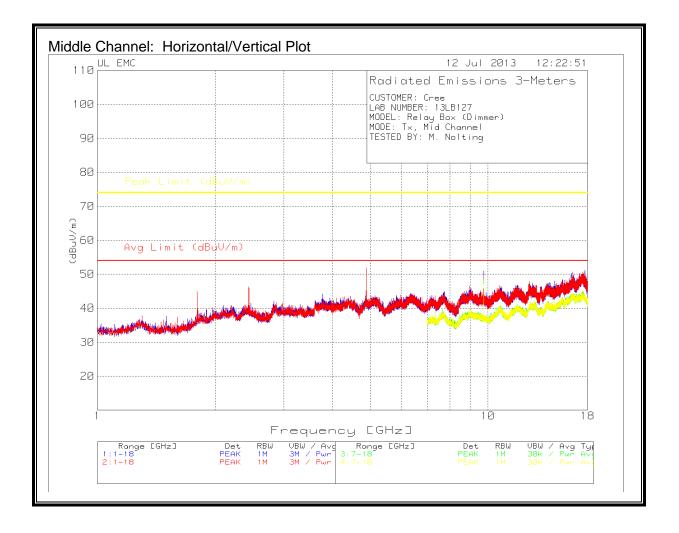
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HARMONICS AND SPURIOUS EMISSIONS



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CUSTOMER											ļ
MODEL: Rel											
MODE: Tx, L											
TESTED BY:	M. Noiting										
Freg (GHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Field Strength [dBuV/m]	Average Limit [dBuV/m]	Margin [dB]	Peak Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In Restricted Band?
4.811	50.46	PK	34.00	-35.30	49.2	-	-	74.0	-24.8	Н	Y
4.809	46.31	MAv1	34.00	-35.30	45.0	54.0	-9.0	-	-	Н	Y
4.810	53.30	PK	34.00	-35.30	52.0	-	-	74.0	-22.0	V	Y
4.809	49.75	MAv1	34.00	-35.30	48.5	54.0	-5.6	-	-	V	Y
1.801	48.16	PK	30.30	-35.20	43.3	-	-	-	-	Н	N
7.215	40.00	PK	35.60	-31.30	44.3	-	-	-	-	Н	N
9.619	43.19	PK	36.70	-29.60	50.3	-	-	-	-	Н	N
9.622	39.51	MAv1	36.70	-29.60	46.6	-	-	-	-	Н	N
1.801	49.57	PK	30.30	-35.20	44.7	-	-	-	-	V	N
7.217	40.61	PK	35.60	-31.30	44.9	-	-	-	-	V	N
9.619	41.00	PK	36.70	-29.60	48.1	-	-	-	-	V	N
9.622	36.33	MAv1	36.70	-29.60	43.4	-	-	-	-	V	N
PK - Peak de	tector										
MAv1 - KDB	558074 Optic	on 1 Maxim	um RMS Av	erage							

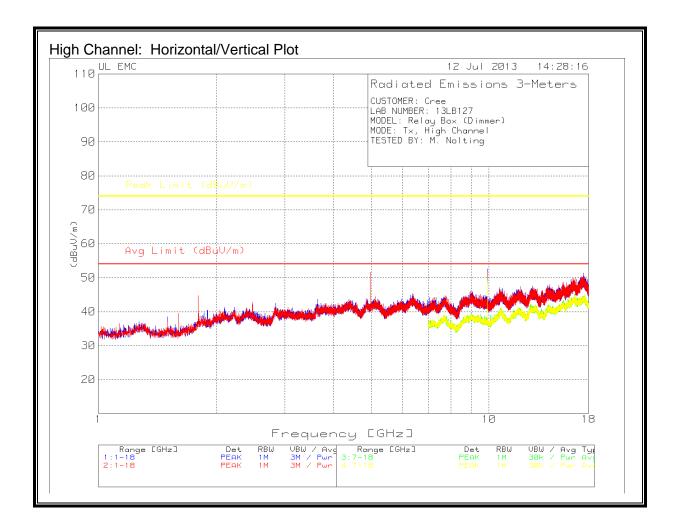


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LAB NUMBER: 13LB127 MODEL: Relay Box Margin [dB)	CUSTOMER:					l						
MODE: Tx, Mid Channel TESTED BY: M. Nolting Antenna Factor [dBw/] Antenna Factor [dBm] Field Gain/Loss [dBw/] Average binnt [dBw/m] Peak Limit [dBw/m] Margin [dBw/m] Antenna Restricter [dBw/m] Antenna Restricter [dBw/m] Antenna Band? 4.882 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 7.319 38.56 PK 35.60 -31.00 43.2 - - 74.0 -23.2 H Y 4.879 49.64 MAvt 34.00 -34.90 48.7 54.0 -5.3 - - H Y 7.322 33.57 MAvt 35.60 -31.00 38.2 54.0 -15.8 - - H Y 4.882 52.74 PK 34.00 -34.90 51.8 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 37.5 54.0 -5.8 - - V <th></th>												
Meter Reading [dBuV] Antenna Detector Antenna Factor [dB/m] Field Gain/Loss [dB) Average Limit [dBuV/m] Peak Limit [dB/m] Margin [dB) Antenna Polarity In Restricter Band? 4.882 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 4.882 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 7.319 38.56 PK 35.60 -31.00 43.2 - - 74.0 -23.2 H Y 7.322 33.57 MAvt 34.00 -34.90 48.7 54.0 -5.3 - - H Y 7.322 33.57 MAvt 35.60 -31.00 38.2 54.0 -15.8 - - H Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 7.322 39.0												
Meter Reading (dBuV) Antenna Factor (dB/m) Antenna Factor (dB/m) Field Strength (dBuV/m) Average Limit (dBuV/m) Peak Limit (dBuV/m) Margin (dB) Margin Polarity Antenna Restricter Band? 4.882 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 7.319 38.56 PK 35.60 -31.00 43.2 - - 74.0 -30.8 H Y 7.322 33.57 MAvi 35.60 -31.00 43.2 - - 74.0 -30.8 H Y 7.322 33.57 MAvi 35.60 -31.00 38.2 54.0 -15.8 - - H Y 4.882 52.74 PK 34.00 -34.90 51.8 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 7.322												
Reading [dBuV] Factor Detector Gain/Loss [dB/m] Strength [dB/m] Limit [dBuV/m] Margin [dBJ Peak Limit [dBuV/m] Margin [dBJ Antenna Polarity Restricter Band? 4.882 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 7.319 38.56 PK 35.60 -31.00 43.2 - - 74.0 -30.8 H Y 4.879 49.64 MAvt 34.00 -34.90 48.7 54.0 -5.3 - - H Y 7.322 33.57 MAv1 35.60 -31.00 38.2 54.0 -15.8 - - H Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 7.322 3	IESIEUBI.	M. Notting										
1.82 51.75 PK 34.00 -34.90 50.9 - - 74.0 -23.2 H Y 7.319 38.56 PK 35.60 -31.00 43.2 - - 74.0 -23.2 H Y 4.879 49.64 MAv1 34.00 -34.90 48.7 54.0 -5.3 - - H Y 7.322 33.57 MAv1 35.60 -31.00 38.2 54.0 -15.8 - - H Y 7.322 33.57 MAv1 35.60 -31.00 38.2 54.0 -15.8 - - H Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 4.879 49.09 MAv1 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAv1 35.60 -3	Frea (GHz)	Reading	Detector	Factor		Strength	Limit	Margin [dB]		•		Restricted
4.879 49.64 MAvi 34.00 -34.90 48.7 54.0 -5.3 - - H Y 7.322 33.57 MAvi 35.60 -31.00 38.2 54.0 -15.8 - - H Y 4.882 52.74 PK 34.00 -34.90 51.8 - - T H Y 4.882 52.74 PK 34.00 -34.90 51.8 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 4.879 49.09 MAvi 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAvi 35.60 -31.00 37.5 54.0 -16.5 - - V Y 7.322 32.92 MAvi 36.90 -29.50 51.0 - - V Y 1.801 47.72 PK 30.3	/						<u> </u>			-23.2	H	Y
7.322 33.57 MAvi 35.60 -31.00 38.2 54.0 -15.8 - - H Y 4.882 52.74 PK 34.00 -34.90 51.8 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 4.879 49.09 MAvi 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAvi 35.60 -31.00 37.5 54.0 -16.5 - - V Y 7.322 32.92 MAvi 36.90 -29.50 42.8 - - - H N 9.759 43.59 PK 36.90 -29.50 51.0	7.319	38.56	PK	35.60	-31.00	43.2	<u> </u>	-	74.0	-30.8	Н	Y
A.822 52.74 PK 34.00 -34.90 51.8 - - 74.0 -22.2 V Y 7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -22.2 V Y 4.879 49.09 MAv1 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAv1 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 4.879 49.09 MAv1 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAv1 35.60 -31.00 37.5 54.0 -16.5 - - V Y 7.322 32.92 PK 30.30 -35.20 42.8 - - - H N 9.759 43.59 PK 36.90 -29.50 51.0<	4.879	49.64	MAv1	34.00	-34.90	48.7	54.0	-5.3	-	-	Н	
Non- Original Original <thoriginal< th=""> Original <tho< td=""><td>7.322</td><td>33.57</td><td>MAv1</td><td>35.60</td><td>-31.00</td><td>38.2</td><td>54.0</td><td>-15.8</td><td></td><td></td><td>Н</td><td>Y</td></tho<></thoriginal<>	7.322	33.57	MAv1	35.60	-31.00	38.2	54.0	-15.8			Н	Y
7.322 39.06 PK 35.60 -31.00 43.7 - - 74.0 -30.3 V Y 4.879 49.09 MAv1 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAv1 35.60 -31.00 37.5 54.0 -16.5 - - V Y 7.322 32.92 MAv1 35.60 -31.00 37.5 54.0 -16.5 - - V Y 1.801 47.72 PK 30.30 -35.20 42.8 - - - H N 9.759 43.59 PK 36.90 -29.50 51.0 - - - H N 9.762 41.29 MAv1 36.90 -29.50 48.7 - - - - H N 1.801 49.81 PK 30.30 -35.20 44.9 - - - V N 9.759 42.26 PK 36.90 <t< td=""><td>4.882</td><td>52.74</td><td>РК</td><td>34.00</td><td>-34.90</td><td>51.8</td><td>-</td><td></td><td>74.0</td><td>-22.2</td><td>V</td><td>Y</td></t<>	4.882	52.74	РК	34.00	-34.90	51.8	-		74.0	-22.2	V	Y
4.879 49.09 MAv1 34.00 -34.90 48.2 54.0 -5.8 - - V Y 7.322 32.92 MAv1 35.60 -31.00 37.5 54.0 -16.5 - - V Y 7.322 32.92 MAv1 35.60 -31.00 37.5 54.0 -16.5 - - V Y 1.801 47.72 PK 30.30 -35.20 42.8 - - - H N 9.759 43.59 PK 36.90 -29.50 51.0 - - - H N 9.762 41.29 MAv1 36.90 -29.50 48.7 - - - H N 1.801 49.81 PK 30.30 -35.20 44.9 - - - H N 9.759 42.26 PK 30.30 -35.20 44.9 - - - V N 9.759 42.26 PK 36.90 -29.50 49.7 <	7.322	39.06	PK	35.60	-31.00	43.7	-	-	74.0	-30.3	V	Y
NSEE Since No. No.<	4.879		MAv1	34.00		48.2	54.0	-5.8	- 1	-	V	Y
9.759 43.59 PK 36.90 -29.50 51.0 - - - H N 9.762 41.29 MAv1 36.90 -29.50 48.7 - - - H N 1.801 49.81 PK 30.30 -35.20 44.9 - - - V N 9.759 42.26 PK 36.90 -29.50 49.7 - - - V N	7.322	32.92	MAv1	35.60	-31.00	37.5	54.0	-16.5			V	Y
9.759 43.59 PK 36.90 -29.50 51.0 - - - H N 9.762 41.29 MAv1 36.90 -29.50 48.7 - - - H N 1.801 49.81 PK 30.30 -35.20 44.9 - - - V N 9.759 42.26 PK 36.90 -29.50 49.7 - - - V N	1.801	47.72	РК	30.30	-35.20	42.8	-		<u>├</u>		+ н	
1.801 49.81 PK 30.30 -35.20 44.9 - - - V N 9.759 42.26 PK 36.90 -29.50 49.7 - - - V N						-	-	-	- 1	-		
9.759 42.26 PK 36.90 -29.50 49.7 V N	9.762	41.29	MAv1	36.90	-29.50	48.7	<u> </u>	-			н	N
	1.801	49.81	РК	30.30	-35.20	44.9	-	-	-	-	V	N
9.758 37.55 MAv1 36.90 -29.50 45.0 V N	9.759	42.26	PK	36.90	-29.50	49.7	-	-	-	-	V	N
	9.758	37.55	MAvi	36.90	-29.50	45.0	<u> </u>		-		V	N

18-26GHz frequency range: No EUT-related noise observed in this range.

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CUSTOMER:	R: Cree ER: 13LB127	<u> </u>			<i>└───′</i>	'		+			
_AB NUMBE MODEL: Rela		'			<i>└───′</i>	'		ļ			
	High Channel	1			'	'		<u>↓</u> →			
ESTED BY:					'			++			
									·		
Freq (GHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Field Strength [dBuV/m]	Average Limit [dBuV/m]	Margin [dB]	Peak Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In Restricted Band?
4.960	48.69	PK	34.00	-35.00	47.7	-	-	74.0	-26.3	H	Y
7.442	37.18	PK	35.70	-30.80	42.1	54.0	-11.9	74.0	-31.9	н	Y
4.961	46.36	MAv1	34.00	-35.00	45.4	54.0	-8.6	-	· - ·	Н	Y
	Ē'	Ē'	Ē	<u> </u>	['	['	「 <u> </u>	\square		<u> </u>	<u> </u>
4.959	52.58	PK	34.00	-35.00	51.6	-	-	74.0	-22.4	V	Y
7.443	38.26	PK	35.70	-30.80	43.2	54.0	-10.8	74.0	-30.8	V	Y
4.959	48.15	MAv1	34.00	-35.00	47.2	54.0	-6.9	-	<u> </u>	V	Y
1.801	46.08	PK	30.30	-35.20	41.2	-	<u> </u> '	-	-	н	N
9.920	45.61	PK	37.10	-30.20	52.5	-	-	-	-	H	N
9.922	44.25	MAv1	37.10	-30.20	51.2	-	-	-	-	Н	N
	<u> </u>			<u> </u>	<u> </u>						
1.801	49.64	PK	30.30	-35.20	44.7	-	-	-	-	V	Ν
9.920	44.73	PK	37.10	-30.20	51.6	-	-	-	-	V	Ν
9.922	39.92	MAv1	37.10	-30.20	46.8	-	- '	-	-	V	N
	·	<u>ا</u> ــــــــــــا	L		L'	<u>'</u> '	·				
PK - Peak de			um RMS Av								

18-26GHz frequency range: No EUT-related noise observed in this range.

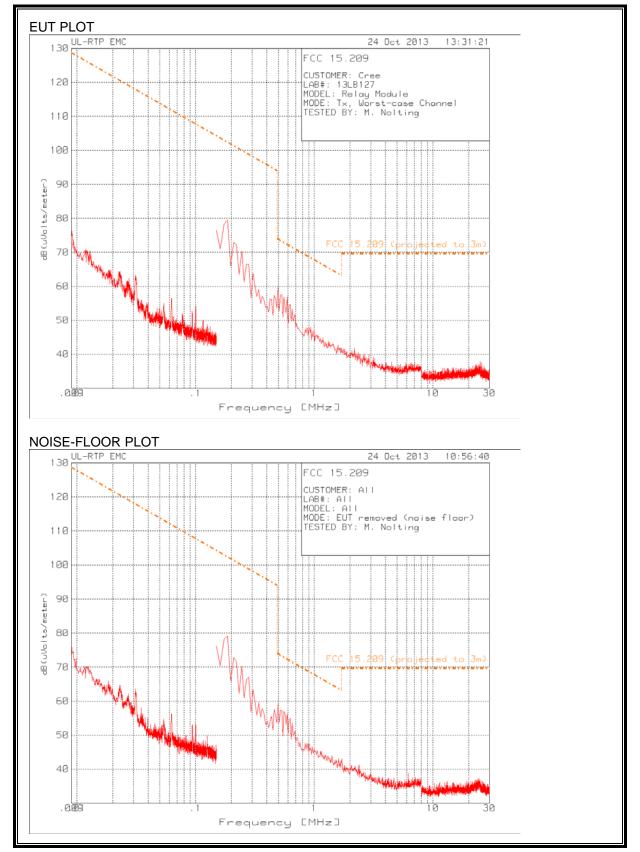
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9.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

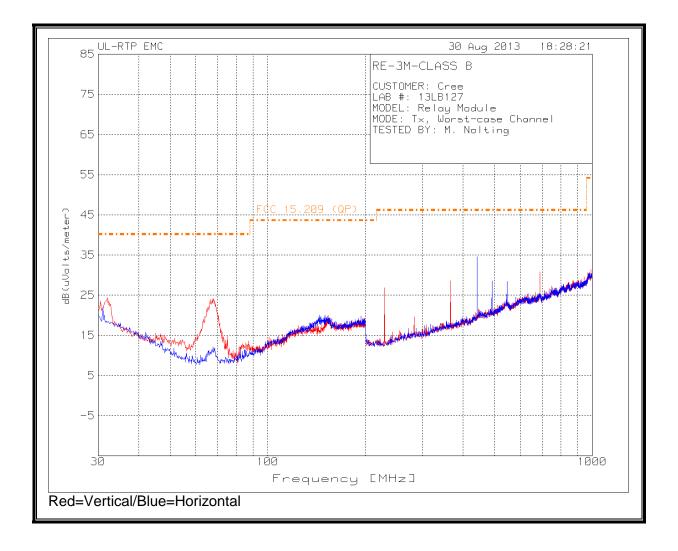
Note: All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (specification distance / test distance).

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The above plots demonstrate there were no EUT-related emissions of interest relative to the FCC 15.209 limit below 30MHz.

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION



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TABULAR DATA

CUSTOMER: Cree LAB NUMBER: 13LB127 MODEL: Relay Module MODE: Tx, Worst-case Channel TESTED BY: M. Nolting

Freq (MHz)	Meter Reading [dBuV]	Detector	Antenna Factor [dB/m]	Gain/Loss [dB]	Field Strength [dBuV/m]	15.209 QP Limit [dBuV/m]	Margin [dB]	Antenna Polarity	In Restricted Band?
32.042	36.68	PK	16.70	-29.00	24.4	40.0	-15.6	Vert	N
67.778	46.69	PK	6.10	-28.70	24.1	40.0	-15.9	Vert	N
228.819	44.10	PK	10.90	-28.10	26.9	46.0	-19.1	Vert	N
365.977	40.76	PK	14.70	-26.90	28.6	46.0	-17.4	Vert	N
689.927	35.86	PK	20.70	-25.70	30.9	46.0	-15.1	Vert	N
441.761	44.53	PK	16.70	-26.70	34.5	46.0	-11.5	Horz	N
PK - Peak de	tector								
QP - Quasi-r	beak detecto	or							

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted I	Limit (dBuV)
	Quasi-peak	Average
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.

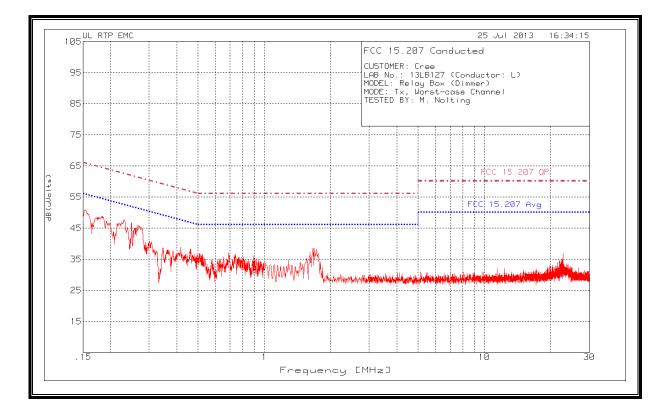
TEST PROCEDURE

ANSI C63.4

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RESULTS

LINE CONDUCTOR PLOT



LINE CONDUCTOR TABULAR DATA

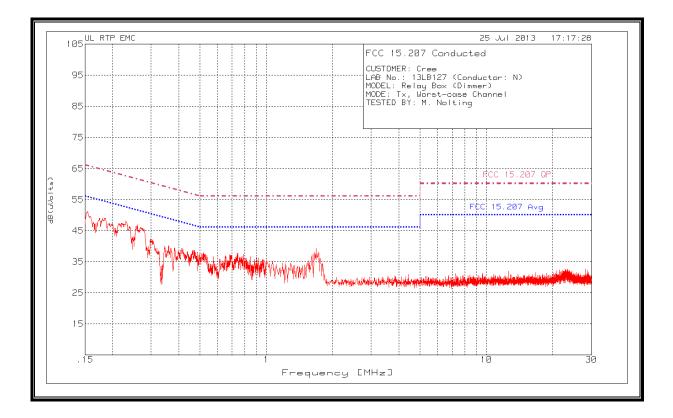
CUSTOMER: Cree LAB No.: 13LB127 (Conductor: L) MODEL: Relay Box (Dimmer) MODE: Tx, Worst-case Channel TESTED BY: M. Nolting

Test Frequency [MHz]	Meter Reading [dBuV]	Detector*	LISN [dB]	Cable Loss [dB]	RF Line Voltage [dBuV]	FCC 15.207 (QP) [dBuV]	Margin [dB]	FCC 15.207 (AV) [dBuV]	Margin [dB]
0.154	41.08	PK	0.4	9.5	50.98	65.8	-14.8	-	-
0.183	39.07	PK	0.3	9.5	48.87	64.3	-15.4	-	-
0.231	38.01	PK	0.2	9.5	47.71	62.4	-14.7	-	-
0.249	37.17	PK	0.2	9.5	46.87	61.8	-14.9	-	-
0.270	35.81	PK	0.2	9.6	45.61	61.1	-15.5	-	-
1.667	28.82	PK	0.1	9.6	38.52	56.0	-17.5	46.0	-7.5
22.748	26.92	PK	0.3	9.8	37.02	60.0	-23.0	50.0	-13.0
0.154	29.80	AV	0.4	9.5	39.70	-	-	55.8	-16.1
0.183	18.36	AV	0.3	9.5	28.16	-	-	54.3	-26.1
0.231	28.82	AV	0.2	9.5	38.52	-	-	52.4	-13.9
0.250	0.53	AV	0.2	9.6	10.33	-	-	51.8	-41.5
0.269	30.32	AV	0.2	9.6	40.12	-	-	51.1	-11.0

*PK = Peak, QP = Quasi-Peak, AV = Average

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NEUTRAL CONDUCTOR PLOT



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NEUTRAL CONDUCTOR TABULAR DATA

CUSTOMER: LAB No.: 13L MODEL: Rel	_B127 (Con	,							
MODE: Tx, W		Channel							
TESTED BY:	M. Notung								
				•		·			
T - at			l l		DELine	FCC		FCC	
Test Frequency	Meter Reading		1	Cable	RF Line Voltage	15.207 (QP)	Margin	15.207 (AV)	Margin
[MHz]	[dBuV]	Detector*	LISN [dB]	Loss [dB]	[dBuV]	(GP) [dBuV]	[dB]	[dBuV]	Margin [dB]
0.154	41.30	PK	0.4	9.5	51.20	65.8	-14.6	-	-
0.187	38.81	PK	0.3	9.5	48.61	64.2	-15.6	-	-
0.230	38.35	PK	0.2	9.5	48.05	62.5	-14.5	-	-
0.268	36.21	PK	0.2	9.6	46.01	61.2	-15.2	-	-
0.300	31.91	PK	0.1	9.6	41.61	60.2	-18.6	50.2	-8.6
0.154	30.63	AV	0.4	9.5	40.53	-	-	55.8	-15.3
0.187	22.92	AV	0.3	9.5	32.72	-	-	54.2	-21.5
0.192	30.07	AV	0.3	9.5	39.87	-	-	53.9	-14.0
0.231	29.63	AV	0.2	9.5	39.33	-	-	52.4	-13.1
0.201	30.84	AV	0.2	9.6	40.64	-	-	51.1	-10.5

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END OF REPORT