NORTHWEST EMC

TE Connectivity / ADC Telecommunications

Prism 2300MHz MIMO RF Module

FCC 27:2015

Report # TECO0030

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: July 21, 215
TE Connectivity / ADC Telecommunications
Model: Prism 2300MHz MIMO RF Module

Radio Equipment Testing

Standards

Specification	Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

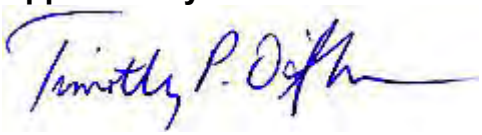
Results

Method Clause	Test Description	Applied	Results	Comments
2.2.1	Equivalent Isotropic Radiated Power (EIRP)	Yes	Pass	
2.2.1	Peak to Average Ratio	Yes	Pass	
2.2.2	Frequency Stability	Yes	Pass	
2.2.3	Emissions Bandwidth	Yes	N/A	
2.2.12	Spurious Radiated Emissions	Yes	Pass	
2.2.13	Spurious Conducted Emissions	Yes	Pass	
2.2.13	Band Edge Compliance	Yes	Pass	
2.2.13	Intermodulation	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

REVISION HISTORY

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2015.2.19

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

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

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

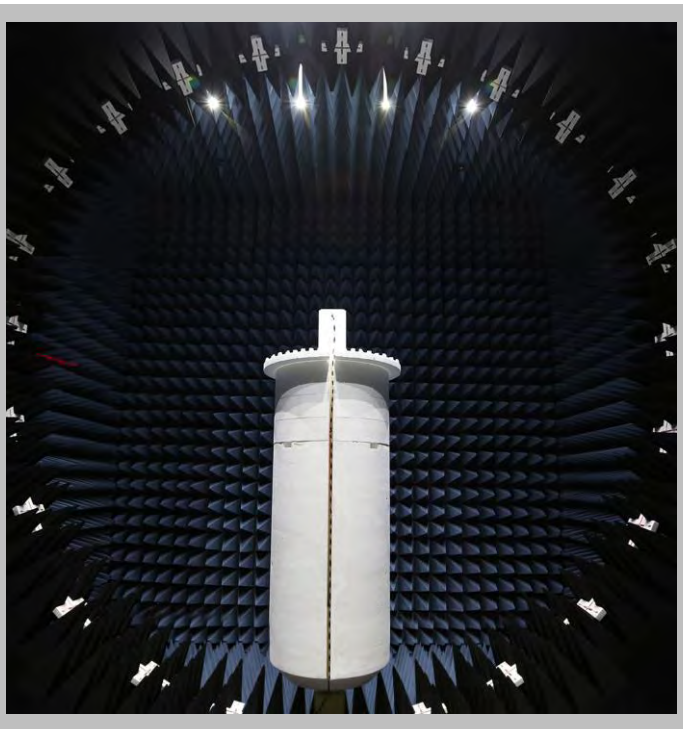
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

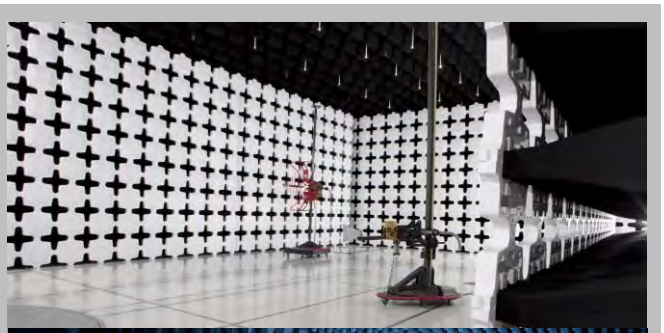
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

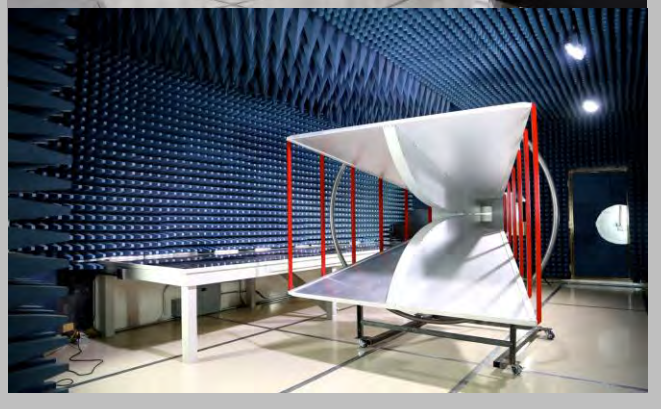
FACILITIES

NORTHWEST EMC
REV 2015.2.19

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







PRODUCT DESCRIPTION

NORTHWEST EMC
2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	TE Connectivity / ADC Telecommunications
Address:	1187 Park Place
City, State, Zip:	Shakopee, Minnesota 55379
Test Requested By:	Joshua Wittman
Model:	Prism 2300MHz MIMO RF Module
First Date of Test:	July 13, 2015
Last Date of Test:	July 21, 2015
Receipt Date of Samples:	July 13, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
20W MIMO Cellular Repeater

Testing Objective:
To demonstrate compliance of the Cellular repeater requirements of FCC 27:2015.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration TECO0030- 1

Software/Firmware Running during test	
Description	**Version**
Firmware	8.1.9.7

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Prism 2300MHz MIMO RF Module	TE Connectivity / ADC Telecommunications	FWP-W4MT000MOD	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RF Signal Generator	Aeroflex	IFR 3413	341006/252
Power Supply	Mean Well	SE-600-48	EB11101765
IO Control Device	TE Connectivity / ADC Telecommunications	SVT-GU-1011	None
30 dB attenuator	Aeroflex	57-30-43	NL616
Laptop	Lenovo	R61	L3-N9370
Laptop Supply	Lenovo	42T4418	11S42T4418Z1ZGWG19659N
30 dB attenuator	Aeroflex	49-30-33	MZ078

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	> 3m	No	Prism 2300MHz MIMO RF Module	AC Mains
Fiber	No	> 3m	No	Prism 2300MHz MIMO RF Module	IO Control Device
RF	Yes	0.9m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF x2	Yes	1.8m	No	IO Control Device	Splitter
AC Power	No	1.8m	No	RF Signal Generator	AC Mains
AC Power	No	1.8m	No	Power Supply	AC Mains
DC Power	No	2.8m	Yes	IO Control Device	Power Supply
AC Power	No	1.8m	No	Laptop Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	Laptop Supply
Ethernet	No	1.5m	No	Laptop	IO Control Device
RF	Yes	1.6m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF	Yes	0.9m	No	Splitter	RF Signal Generator

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration TECO0030- 2

Software/Firmware Running during test	
Description	**Version**
Firmware	8.1.9.7

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Prism 2300MHz MIMO RF Module	TE Connectivity / ADC Telecommunications	FWP-W4MT000MOD	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
30 dB attenuator	Aeroflex	57-30-43	NL616
30 dB attenuator	Aeroflex	49-30-33	MZ078

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RF Signal Generator	Aeroflex	IFR 3413	341006/252
Power Supply	Mean Well	SE-600-48	EB11101765
IO Control Device	TE Connectivity / ADC Telecommunications	SVT-GU-1011	None
Laptop	Lenovo	R61	L3-N9370
Laptop Supply	Lenovo	42T4418	11S42T4418Z1ZGWG19659N

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	> 3m	No	Prism 2300MHz MIMO RF Module	AC Mains
Fiber	No	> 3m	No	Prism 2300MHz MIMO RF Module	IO Control Device
RF	Yes	0.9m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF x2	Yes	1.8m	No	IO Control Device	Splitter
AC Power	No	1.8m	No	RF Signal Generator	AC Mains
AC Power	No	1.8m	No	Power Supply	AC Mains
DC Power	No	2.8m	Yes	IO Control Device	Power Supply
AC Power	No	1.8m	No	Laptop Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	Laptop Supply
Ethernet	No	1.5m	No	Laptop	IO Control Device
RF	Yes	1.6m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF	Yes	0.9m	No	Splitter	RF Signal Generator
Ground	No	1.3m	No	Prism 2300MHz MIMO RF Module	Ground

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration TECO0030- 3

Software/Firmware Running during test	
Description	**Version**
Firmware	8.1.9.7

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Prism 2300MHz MIMO RF Module	TE Connectivity / ADC Telecommunications	FWP-W4MT000MOD	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RF Signal Generator	Aeroflex	IFR 3413	341006/252
Power Supply	Mean Well	SE-600-48	EB11101765
IO Control Device	TE Connectivity / ADC Telecommunications	SVT-GU-1011	None
30 dB attenuator	Aeroflex	57-30-43	NL616
Laptop	Lenovo	R61	L3-N9370
Laptop Supply	Lenovo	42T4418	11S42T4418Z1ZGWG19659N
30 dB attenuator	Aeroflex	86-30-12DC-22 GHz	369

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	> 3m	No	Prism 2300MHz MIMO RF Module	AC Mains
Fiber	No	> 3m	No	Prism 2300MHz MIMO RF Module	IO Control Device
RF	Yes	0.9m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF x2	Yes	1.8m	No	IO Control Device	Splitter
AC Power	No	1.8m	No	RF Signal Generator	AC Mains
AC Power	No	1.8m	No	Power Supply	AC Mains
DC Power	No	2.8m	Yes	IO Control Device	Power Supply
AC Power	No	1.8m	No	Laptop Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	Laptop Supply
Ethernet	No	1.5m	No	Laptop	IO Control Device
RF	Yes	1.6m	No	Prism 2300MHz MIMO RF Module	30 dB attenuator
RF	Yes	0.9m	No	Splitter	RF Signal Generator

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	7/13/2015	Equivalent Isotropic Radiated Power (EIRP)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	7/13/2015	Peak to Average Ratio	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	7/13/2015	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/13/2015	Emissions Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	7/13/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	7/15/2015	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	7/21/2015	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	7/21/2015	Intermodulation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

EQUIVALENT ISOTROPIC RADTIATED POWER (EIRP)

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
EMPower USB RF Power Sensor	ETS Lindgren	7002-006	SRE	8/8/2014	12
EMPower USB RF Power Sensors	ETS Lindgren	7002-006	SRA	4/15/2015	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The RF output power was measured with the EUT set to low and high transmit frequencies.

The power measurement was made using a direct connection between the RF output of the EUT and an RF Power Sensor which only measures across the high time of the burst of the carrier.

The observed duty cycle was noted but not needed to calculate the EiRP.

EiRP = Max Measured Power + Antenna gain (dBi)

The measurements from Port 0 and Port 1 were summed to determine the total average power in EIRP.

EQUIVALENT ISOTROPIC RADTIATED POWER (EIRP)

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			**Work Order:**	TECO0030
Serial Number:	None			**Date:**	07/13/15
Customer:	TE Connectivity / ADC Telecommunication			**Temperature:**	23.3°C
Attendees:	None			**Humidity:**	62%
Project:	None			**Barometric Pres.:**	974.2
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

Coax cable from exterior port to module was included in the reference level offset. High wattage attenuator was provided by the customer. Antenna gain is assumed to be 0, per customer the antenna gain will be reevaluated during installation. Limit is 2kW, (63 dBm).

DEVIATIONS FROM TEST STANDARD

None

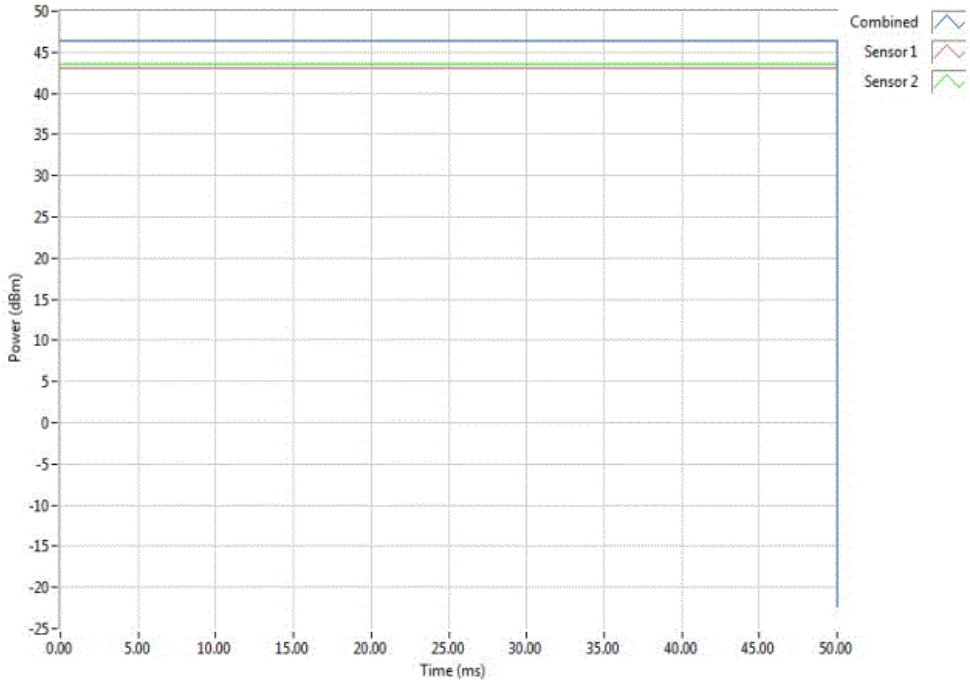
Configuration #	1	*Signature* Trevor Buls

	Avg Pwr Port 0 (dBm)	Avg Pwr Port 1 (dBm)	Duty Cycle (%)	Avg Pwr Sum (dBm)	EIRP (dBm)	Limit < (dBm)	Results
LTE 10 MHz							
Mid Channel, 2355 MHz	43.06	43.56	100	46.327	46.3	63	Pass

EQUIVALENT ISOTROPIC RADTIATED POWER (EIRP)

XMit 2015.01.14

LTE 10 MHz, Mid Channel, 2355 MHz						
Avg Pwr Port 0 (dBm)	**Avg Pwr Port 1 (dBm)**	**Duty Cycle (%)**	**Avg Pwr Sum (dBm)**	**EIRP (dBm)**	**Limit < (dBm)**	**Results**
43.06	43.56	100	46.327	46.3	63	Pass



PEAK TO AVERAGE RATIO

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Ratio was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth, centered on the transmit channel.

The largest difference between the following two screen captures/traces was calculated:

- 1st Screen Capture/Trace: Peak detector and trace max-hold.
- 2nd Screen Capture/Trace: The same procedure and settings as was used for conducted Output Power.

PEAK TO AVERAGE RATIO

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			Work Order:	TECO0030
Serial Number:	None			Date:	07/13/15
Customer:	TE Connectivity / ADC Telecommunication			Temperature:	23.3°C
Attendees:	None			Humidity:	62%
Project:	None			Barometric Pres.:	974.2
Tested by:	Trevor Buls	Power:	110VAC/60Hz	Job Site:	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

High wattage attenuator was provided by the customer. Modules are identical, testing was performed on Port 0.

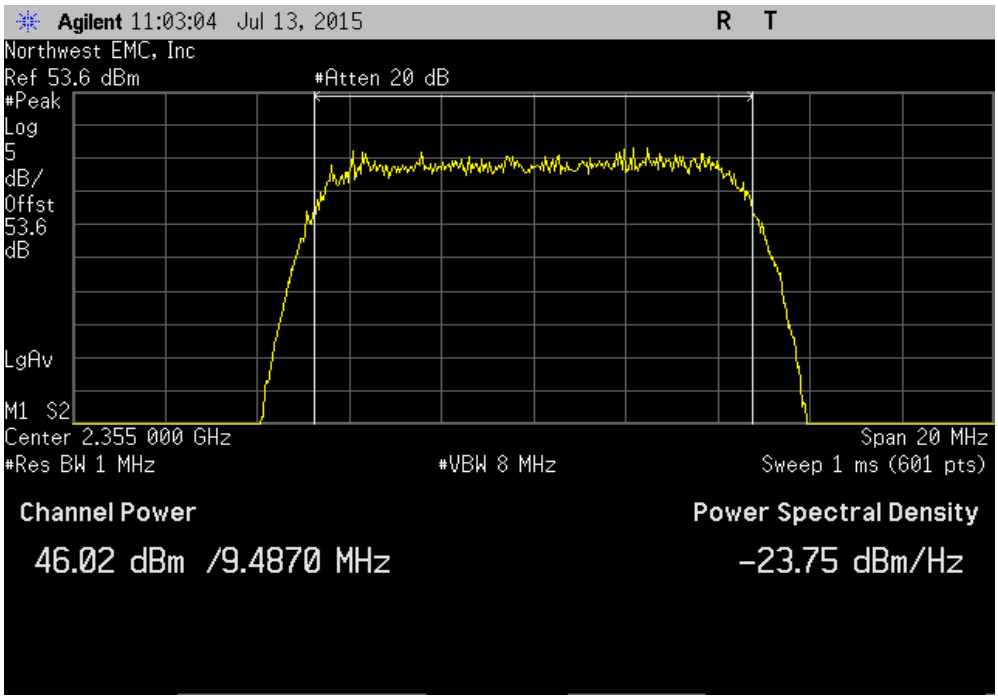
DEVIATIONS FROM TEST STANDARD

None

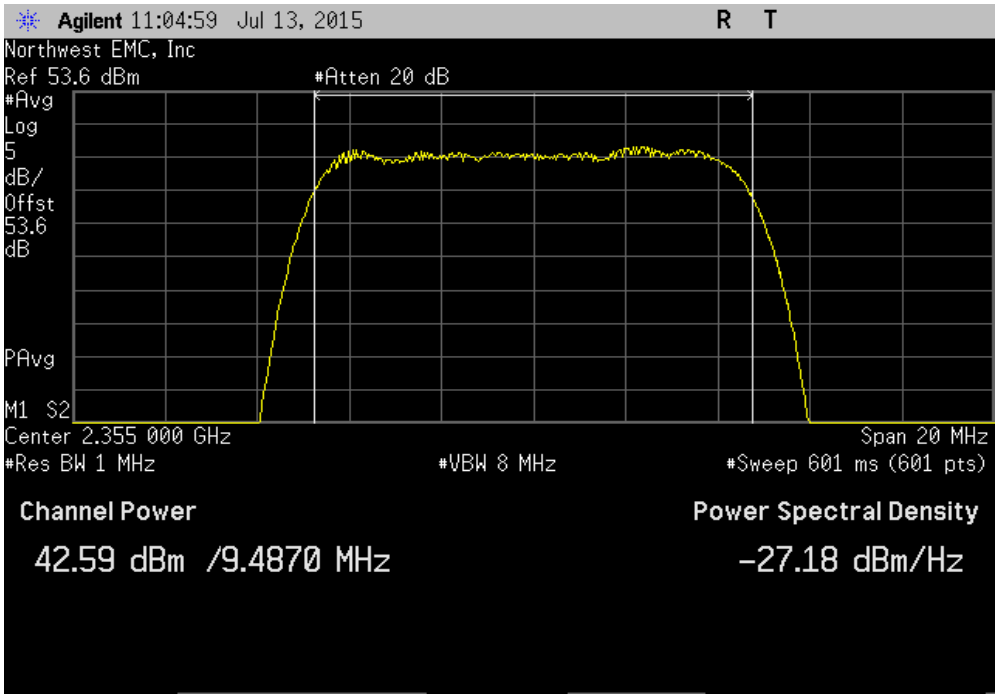
Configuration #	1	Signature	Trevor Buls

		Power (dBm)	Value (dB)	Limit < (dB)	Result
LTE 10 MHz					
	PK	46.02	N/A	N/A	N/A
	AV	42.59	3.43	13	Pass

LTE 10 MHz, PK						
			Power (dBm)	Value (dB)	Limit < (dB)	Result
			46.02	N/A	N/A	N/A



LTE 10 MHz, AV						
			Power (dBm)	Value (dB)	Limit < (dB)	Result
			42.59	3.43	13	Pass



FREQUENCY STABILITY

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
Multimeter	Fluke	117/EFSP	MLR	5/27/2015	36
Variable Transformer	Powerstat	246	XFR	NCR	0
Thermometer	Omega Engineering, Inc.	HH311	DUB	11/3/2014	36
Humidity Temperature Chamber Probe/Sensor	ESZ	Series 945	TBD	NCR	0
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Per the requirements of FCC Part 27.54:

"The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation."

No specific limits are provided in either FCC 27.54, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 1ppm will still allow the radio to be operating within the band.

FREQUENCY STABILITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	**Prism 2300MHz MIMO RF Module**			**Work Order:**	**TECO0030**
Serial Number:	**None**			**Date:**	**07/15/15**
Customer:	**TE Connectivity / ADC Telecommunication**			**Temperature:**	**23.5°C**
Attendees:	**None**			**Humidity:**	**61%**
Project:	**None**			**Barometric Pres.:**	**984.4**
Tested by:	**Trevor Buls**	**Power:**	**110VAC/60Hz**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

AC Range varied from 126.5 VAC to 93.5 VAC.

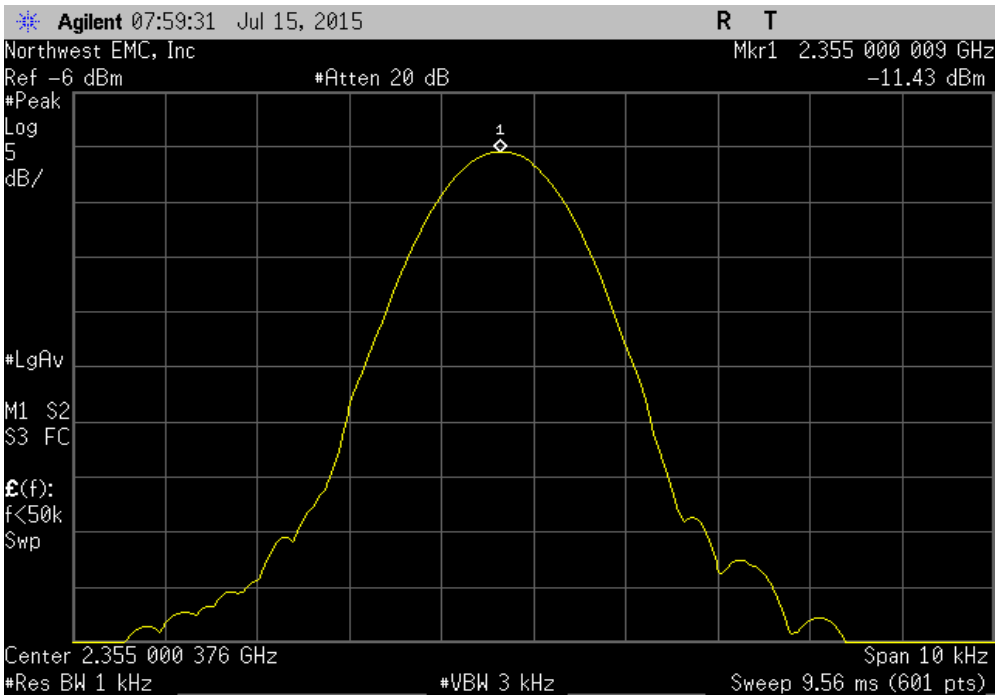
DEVIATIONS FROM TEST STANDARD

None

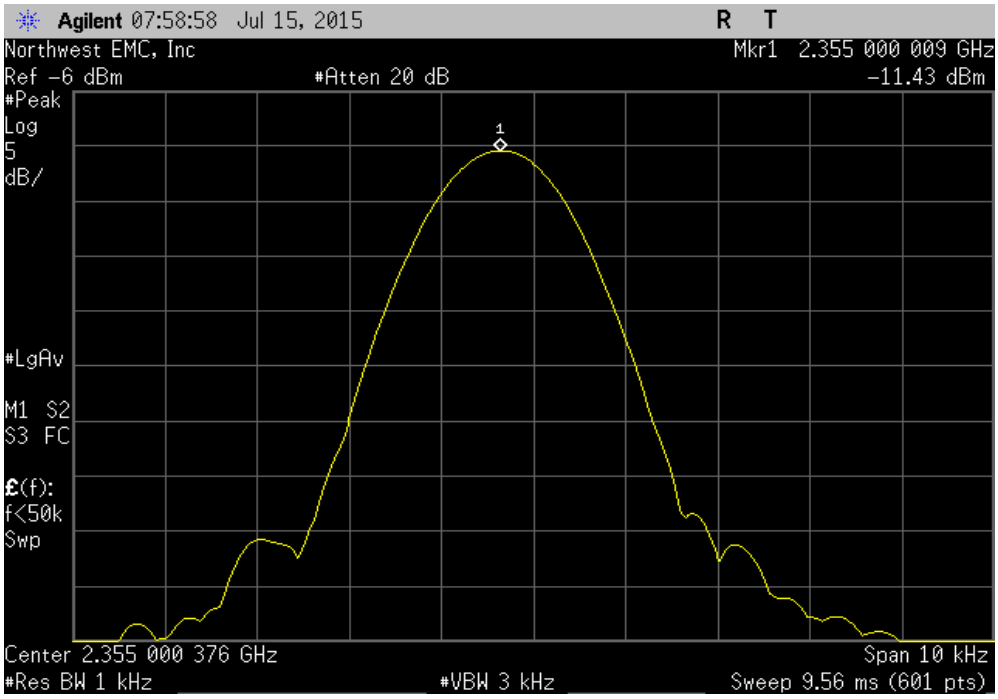
Configuration #	**1**	*Signature* Trevor Buls

	Measured Value (MHz)	**Assigned Value (MHz)**	**Error (ppm)**	**Limit ≤ (ppm)**	**Results**
Mid Band 2355 MHz					
Voltage: 115%	2355.000009	2355	0.004	1	Pass
Voltage: 100%	2355.000009	2355	0.004	1	Pass
Voltage: 85%	2355.00001	2355	0.004	1	Pass
Temperature: +50°	2355.000026	2355	0.011	1	Pass
Temperature: +40°	2355.000026	2355	0.011	1	Pass
Temperature: +30°	2355.000043	2355	0.018	1	Pass
Temperature: +20°	2355.000026	2355	0.011	1	Pass
Temperature: +10°	2355.000043	2355	0.018	1	Pass
Temperature: 0°	2355.000043	2355	0.018	1	Pass
Temperature: -10°	2355.000026	2355	0.011	1	Pass
Temperature: -20°	2355.000043	2355	0.018	1	Pass
Temperature: -30°	2355.000043	2355	0.018	1	Pass

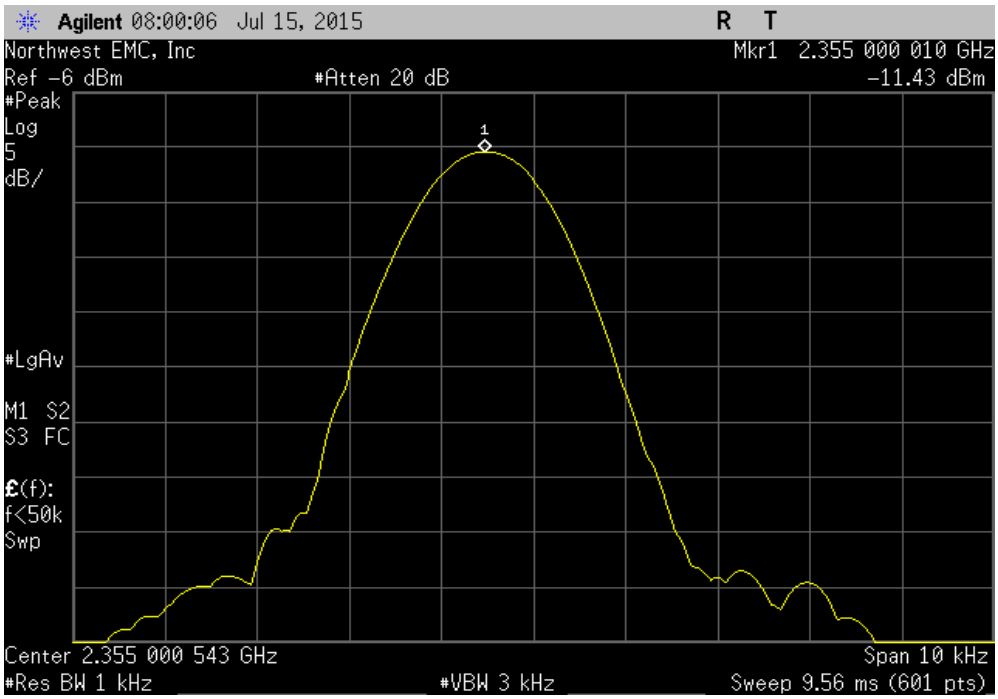
Mid Band 2355 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000009	2355	0.004	1	Pass



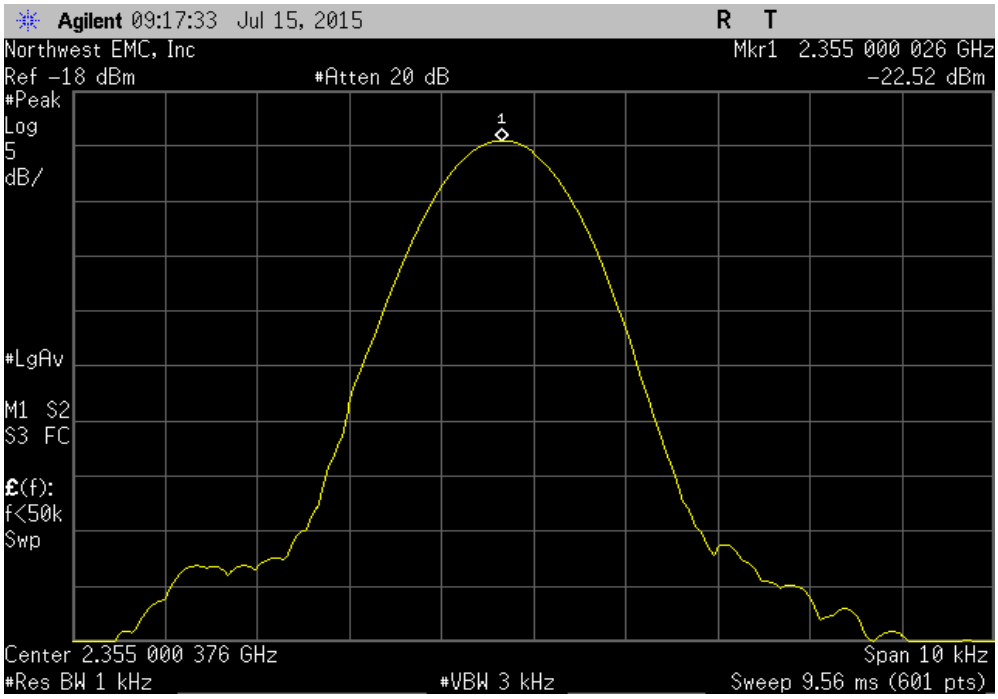
Mid Band 2355 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000009	2355	0.004	1	Pass



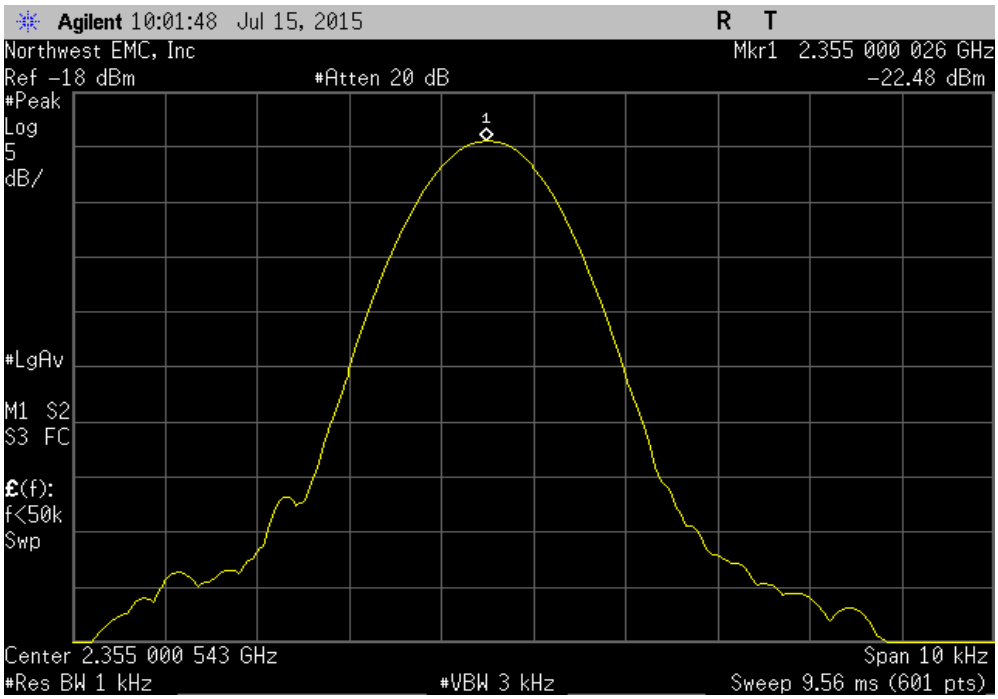
Mid Band 2355 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.00001	2355	0.004	1	Pass



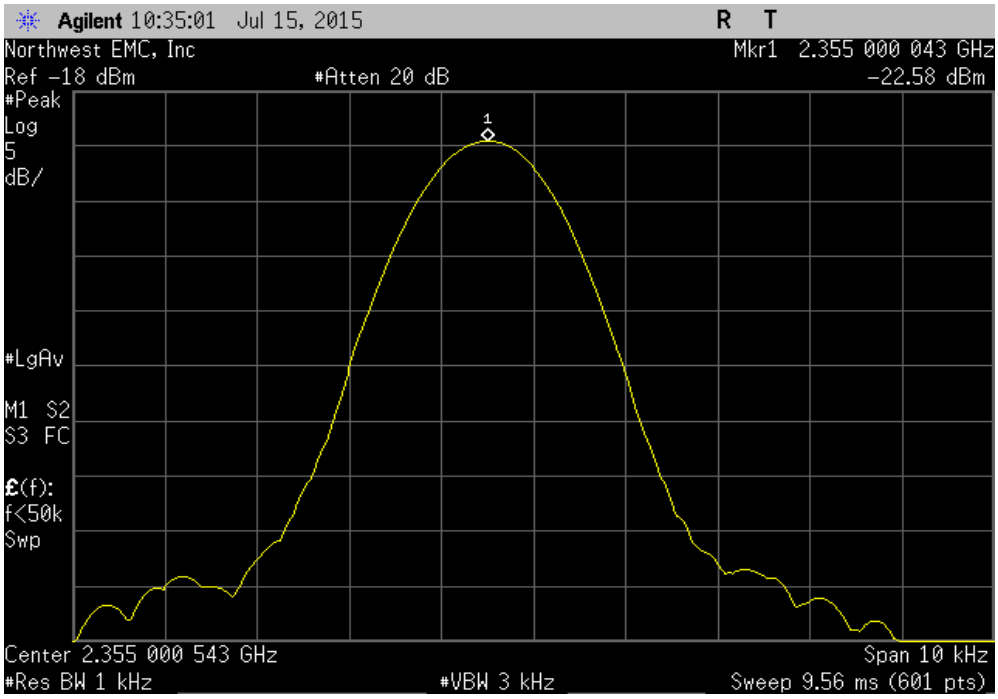
Mid Band 2355 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000026	2355	0.011	1	Pass



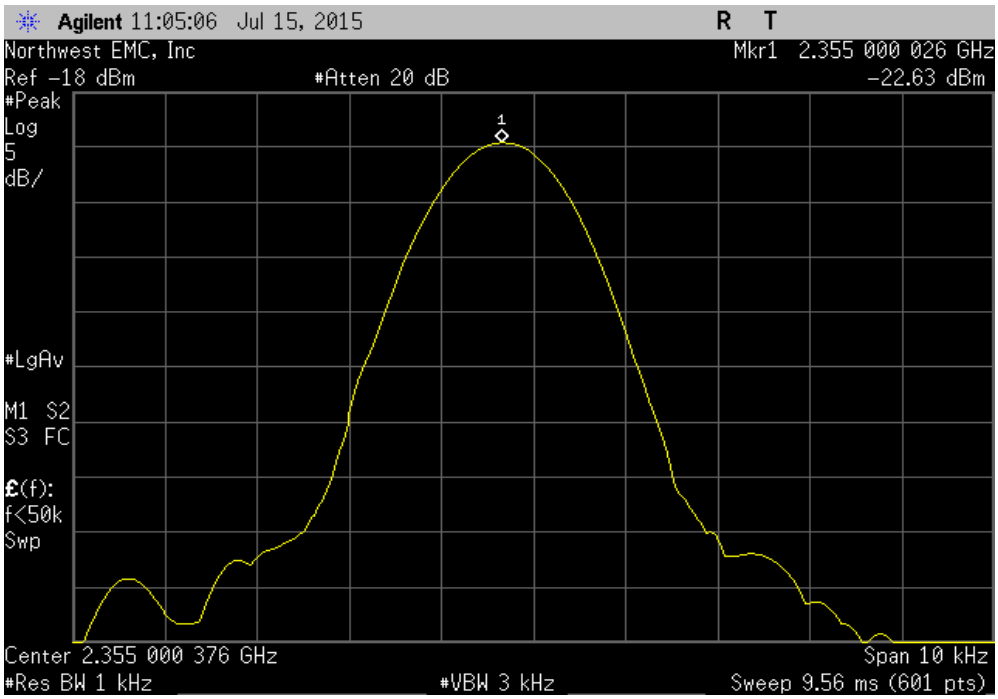
Mid Band 2355 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000026	2355	0.011	1	Pass



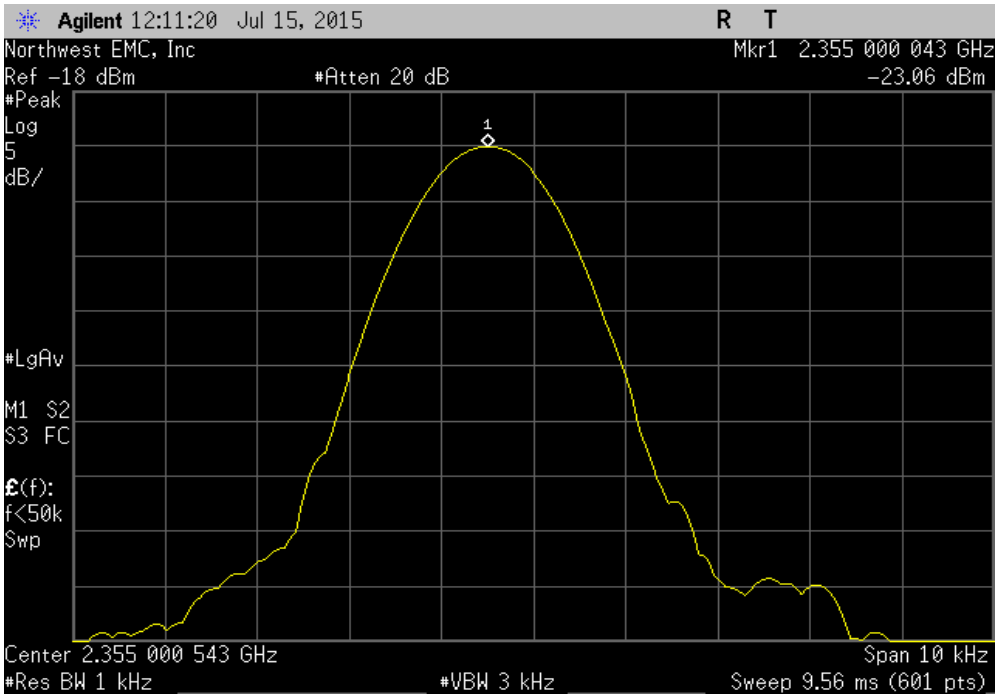
Mid Band 2355 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000043	2355	0.018	1	Pass



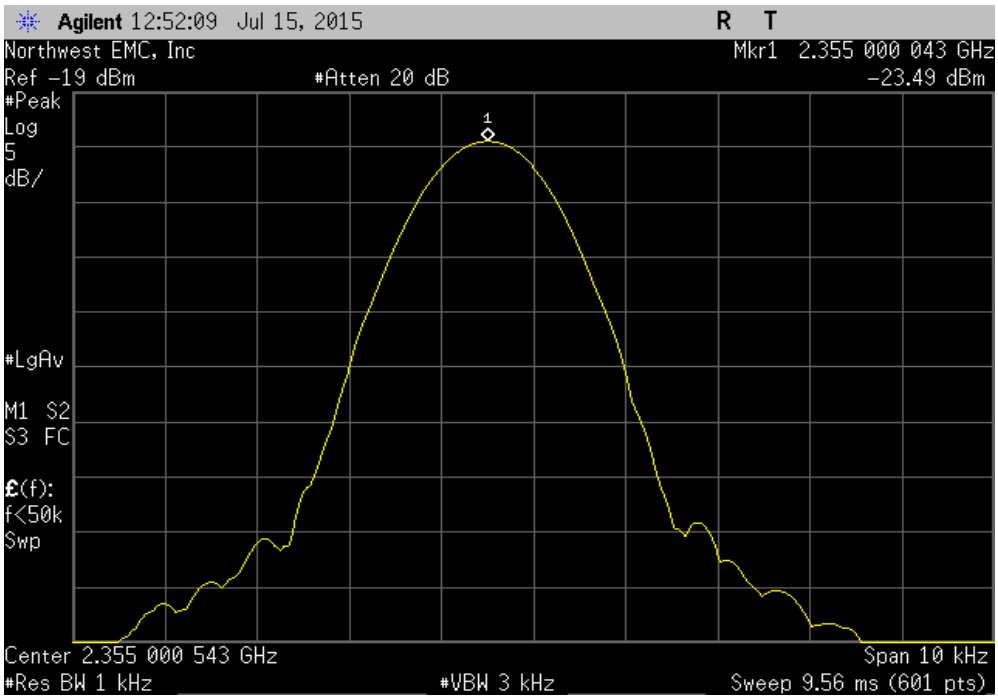
Mid Band 2355 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000026	2355	0.011	1	Pass



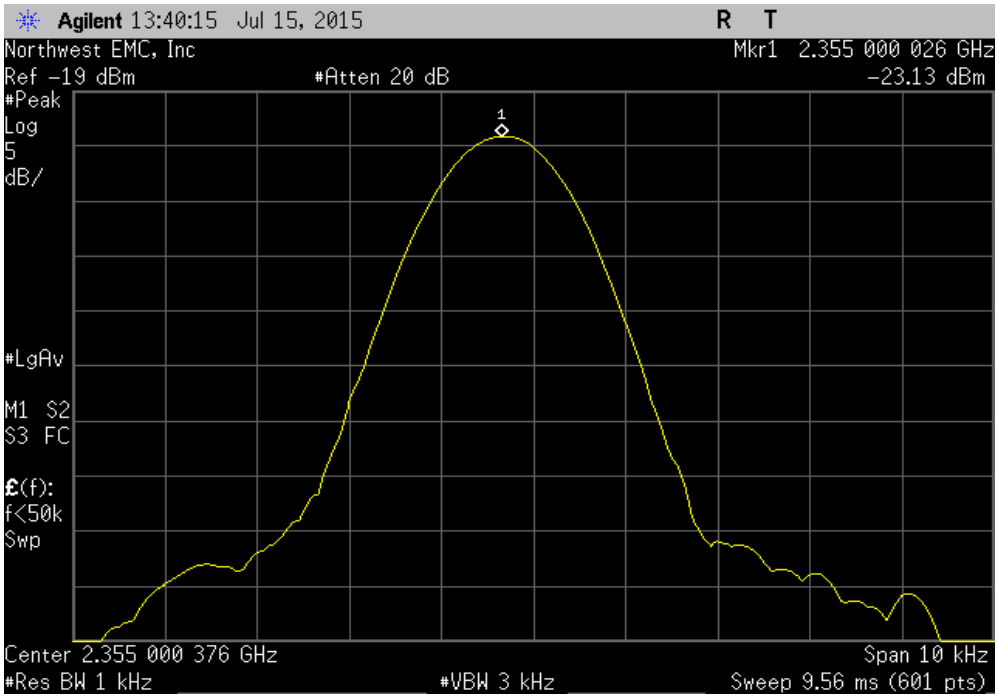
Mid Band 2355 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000043	2355	0.018	1	Pass



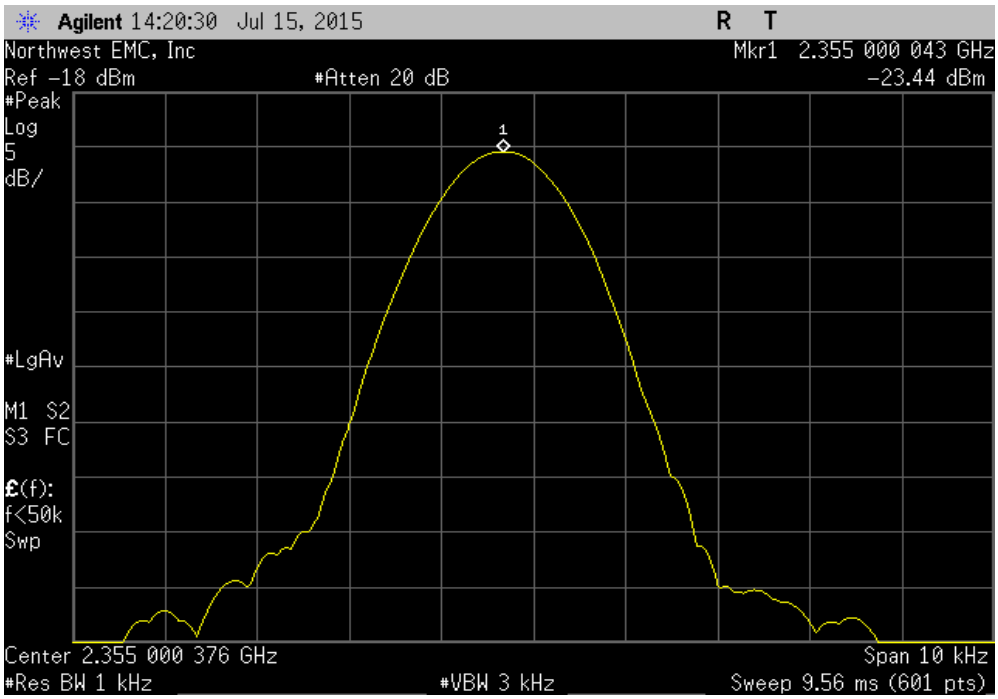
Mid Band 2355 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000043	2355	0.018	1	Pass



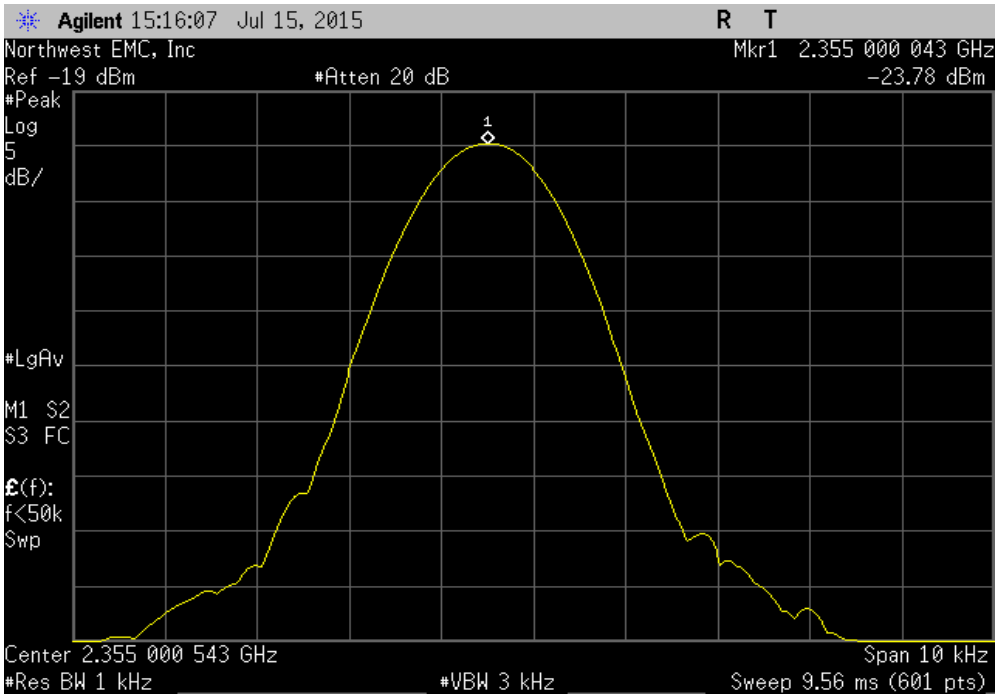
Mid Band 2355 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000026	2355	0.011	1	Pass



Mid Band 2355 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000043	2355	0.018	1	Pass



Mid Band 2355 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit ≤ (ppm)	Results
		2355.000043	2355	0.018	1	Pass



EMISSIONS BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW= > RBW
- A peak detector was used
- Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

EMISSIONS BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			**Work Order:**	TECO0030
Serial Number:	None			**Date:**	07/13/15
Customer:	TE Connectivity / ADC Telecommunication			**Temperature:**	23.3°C
Attendees:	None			**Humidity:**	62%
Project:	None			**Barometric Pres.:**	974.2
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

High wattage attenuator was provided by the customer. Modules are identical, testing was performed on Port 0.

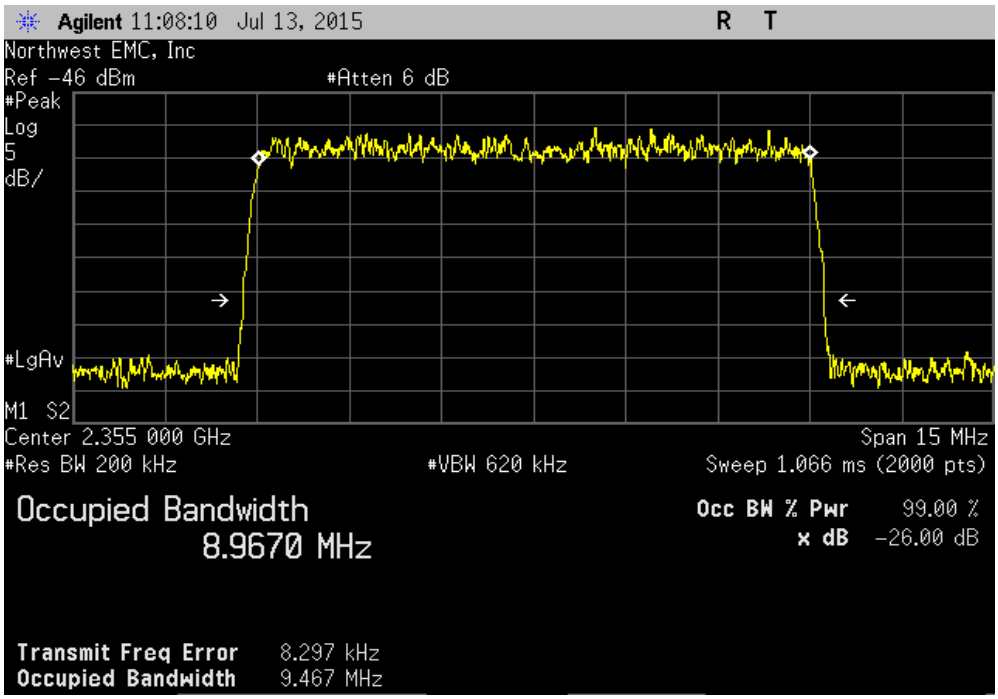
DEVIATIONS FROM TEST STANDARD

None

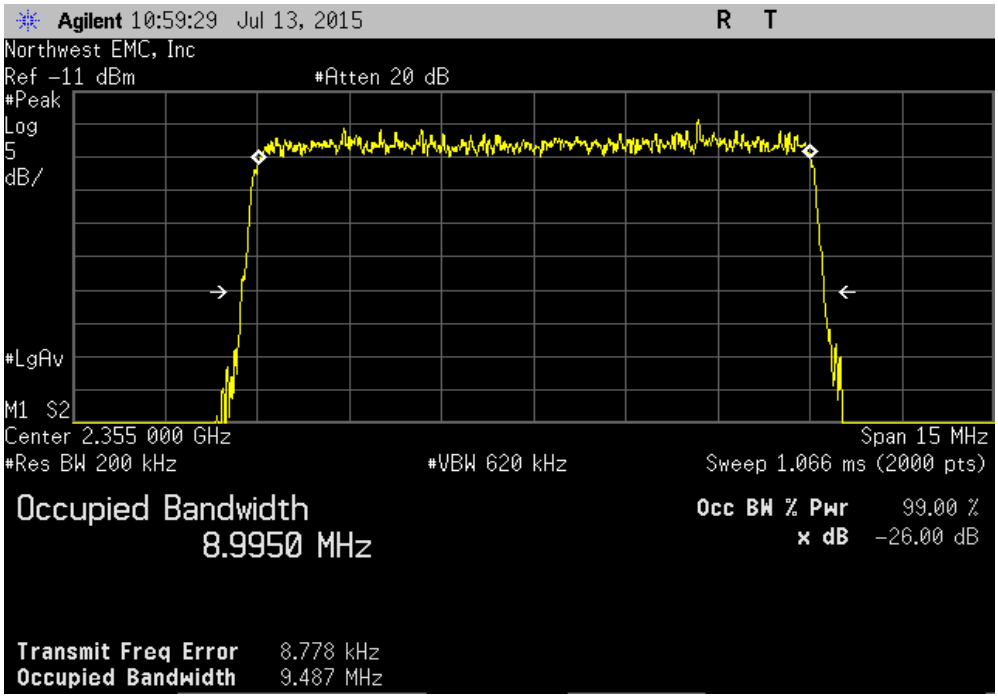
Configuration #	1	Signature	Trevor Buls

		Value	Limit	Result
LTE 10 MHz				
	Mid Channel, 2355 MHz			
	Input	9.467 MHz	N/A	N/A
	EUT	9.487 MHz	N/A	N/A

LTE 10 MHz, Mid Channel, 2355 MHz, Input						
				Value	Limit	Result
				9.467 MHz	N/A	N/A



LTE 10 MHz, Mid Channel, 2355 MHz, EUT						
				Value	Limit	Result
				9.487 MHz	N/A	N/A



SPURIOUS RADIATED EMISSIONS

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

MODES OF OPERATION

Transmitting 2355 MHz with LTE 10MHz modulation.

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

TECO0030 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator, 20 dB, 'SMA'	S.M. Electronics	SA6-20	REO	3/2/2015	12 mo
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HGQ	3/2/2015	12 mo
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGK	3/2/2015	12 mo
Band Reject Filter, Tunable	Wainwright Instruments GmbH	WTRCJV8-2200-2400-20-100-50EEK	CUN	3/3/2015	12 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	10/3/2014	12 mo
MN05 Cable	Northwest EMC	18-26GHz Standard Gain Horn Cable	MNP	10/3/2014	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AHG	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	5/5/2015	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-07	AXP	NCR	0 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/5/2015	12 mo
Antenna, Horn	ETS Lindgren	3115	AJA	6/3/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/30/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

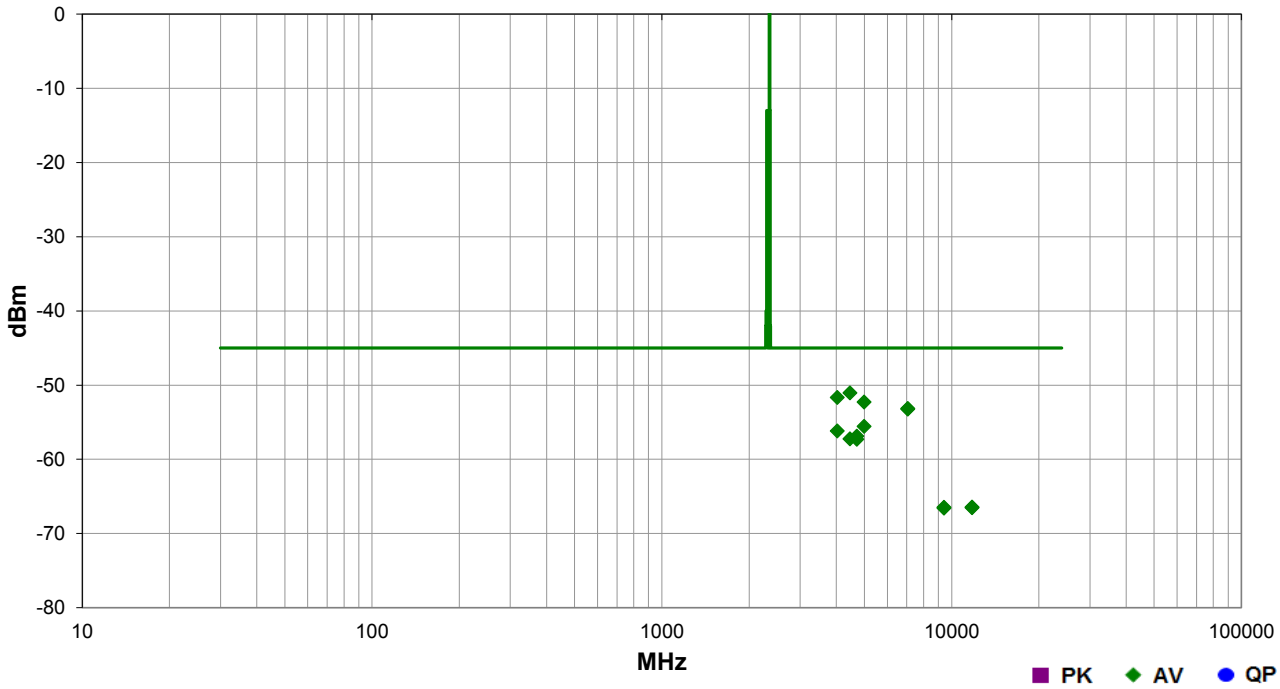
At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

SPURIOUS RADIATED EMISSIONS

Work Order:	TECO0030	**Date:**	07/14/15		
Project:	None	**Temperature:**	22.8 °C		
Job Site:	MN05	**Humidity:**	59.1% RH		
Serial Number:	None	**Barometric Pres.:**	977.2 mbar	**Tested by:**	Dustin Sparks
EUT:	Prism 2300MHz MIMO RF Module				
Configuration:	2				
Customer:	TE Connectivity				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 2355 MHz with LTE 10MHz modulation.				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 27:2015	ANSI/TIA/EIA-603-C:2004

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



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	4464.250	1.2	74.0	Horz	AV	7.85E-09	-51.0	-45.0	-6.0	LTE 10MHz, EUT vert
	4031.933	1.2	343.0	Horz	AV	6.79E-09	-51.7	-45.0	-6.7	LTE 10MHz, EUT vert
	4988.033	1.3	75.0	Horz	AV	5.92E-09	-52.3	-45.0	-7.3	LTE 10MHz, EUT vert
	7066.842	1.0	203.1	Horz	AV	4.83E-09	-53.2	-45.0	-8.2	LTE 10MHz, EUT vert
	7067.325	1.5	190.0	Vert	AV	4.72E-09	-53.3	-45.0	-8.3	LTE 10MHz, EUT vert
	4988.008	1.0	299.0	Vert	AV	2.77E-09	-55.6	-45.0	-10.6	LTE 10MHz, EUT vert
	4031.975	1.0	257.0	Vert	AV	2.41E-09	-56.2	-45.0	-11.2	LTE 10MHz, EUT vert
	4710.608	1.0	27.0	Vert	AV	2.04E-09	-56.9	-45.0	-11.9	LTE 10MHz, EUT vert
	4464.167	1.0	37.1	Vert	AV	1.88E-09	-57.2	-45.0	-12.2	LTE 10MHz, EUT vert
	4710.475	1.8	29.1	Horz	AV	1.86E-09	-57.3	-45.0	-12.3	LTE 10MHz, EUT vert
	11777.180	1.0	116.1	Vert	AV	2.27E-10	-66.4	-45.0	-21.4	LTE 10MHz, EUT vert
	9420.708	2.2	229.0	Horz	AV	2.25E-10	-66.5	-45.0	-21.5	LTE 10MHz, EUT vert
	11777.070	3.7	28.0	Horz	AV	2.22E-10	-66.5	-45.0	-21.5	LTE 10MHz, EUT vert
	9421.917	1.0	209.1	Vert	AV	2.20E-10	-66.6	-45.0	-21.6	LTE 10MHz, EUT vert

SPURIOUS CONDUCTED EMISSIONS

XMit 2015.01.14

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
High Pass Filter	K&L Microwave	11SH10-18000/T50000-2.4	HIC	2/16/2015	12
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HGY	10/2/2014	12
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGV	9/24/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Band Reject Filter, Tunable	Wainwright Instruments GmbH	WTRCJV8-2200-2400-20-100-50EEK	CUN	3/3/2015	12
Signal Generator	Agilent	E4422B	TGQ	3/23/2015	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT with external attenuation on the RF input of the spectrum analyzer. Analyzer plots utilizing a 1 MHz resolution bandwidth and no video filtering were made for each modulation type from 30 MHz to 24 GHz. The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than or equal to the limit. Emissions close to the limit were remeasured using an RMS Average detector.

SPURIOUS CONDUCTED EMISSIONS

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			**Work Order:**	TECO0030
Serial Number:	None			**Date:**	07/21/15
Customer:	TE Connectivity / ADC Telecommunication			**Temperature:**	23.4°C
Attendees:	Josh Wittman			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	985.5
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

High wattage attenuator was provided by the customer. Alterrnate unit.

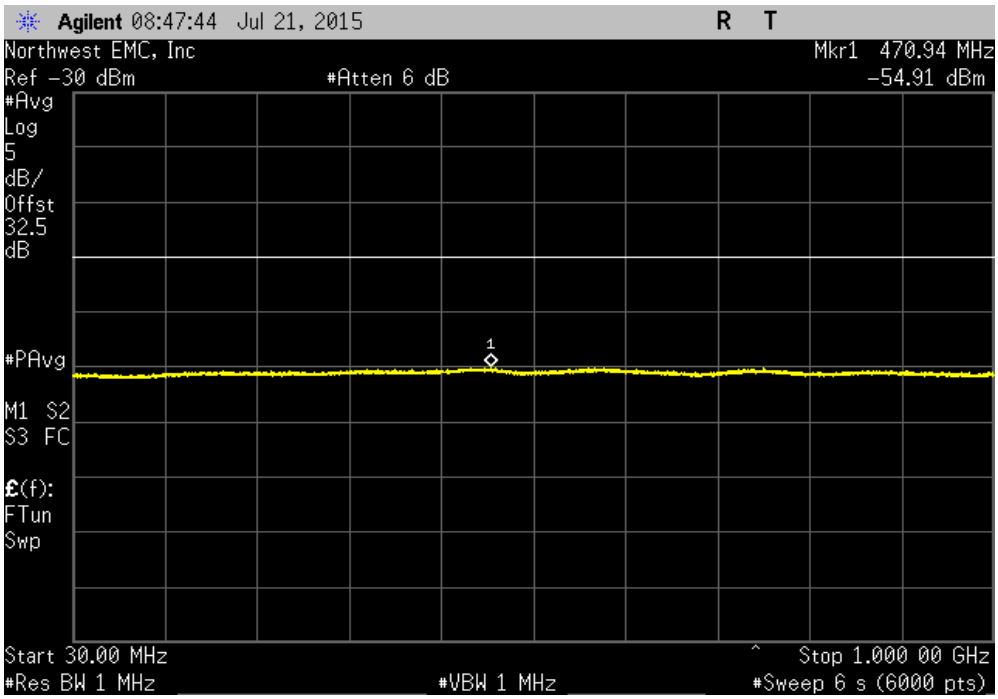
DEVIATIONS FROM TEST STANDARD

None

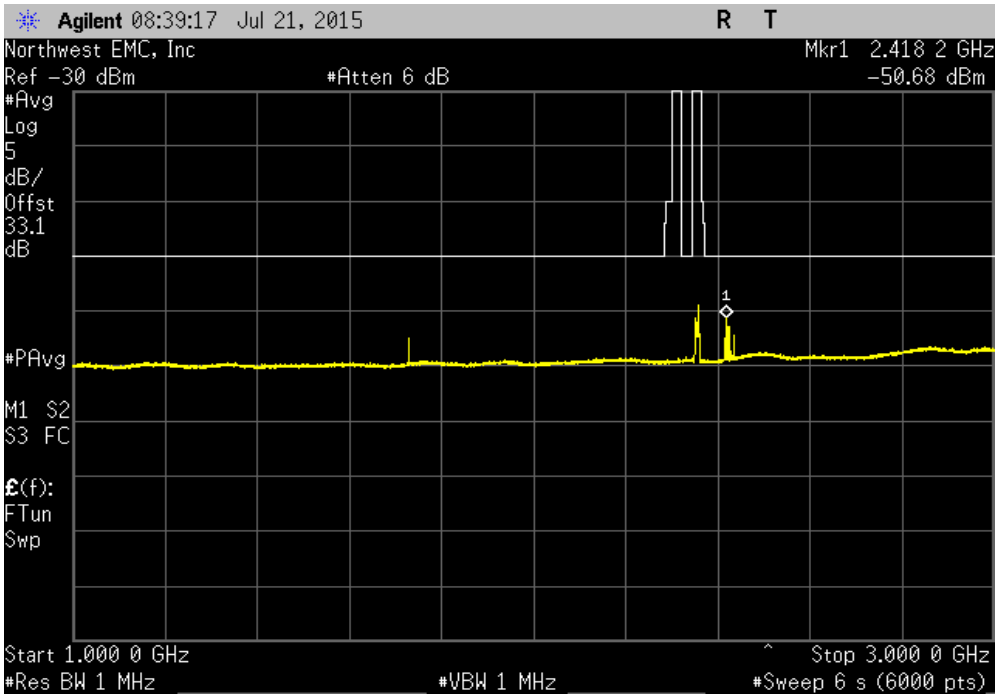
Configuration #	3	Signature	Trevor Buls

	Frequency Range	Value (dBm)	Limit ≤ (dBm)	Result
Port 0	30 MHz - 1 GHz	-54.91	-45	Pass
Port 0	1 GHz - 3 GHz	-50.68	-45	Pass
Port 0	3 GHz - 18 GHz	-48.57	-45	Pass
Port 0	18 GHz - 24 GHz	-49.22	-45	Pass
Port 1	30 MHz - 1 GHz	-55.02	-45	Pass
Port 1	1 GHz - 3 GHz	-53.38	-45	Pass
Port 1	3 GHz - 18 GHz	-47.09	-45	Pass
Port 1	18 GHz - 24 GHz	-49.22	-45	Pass

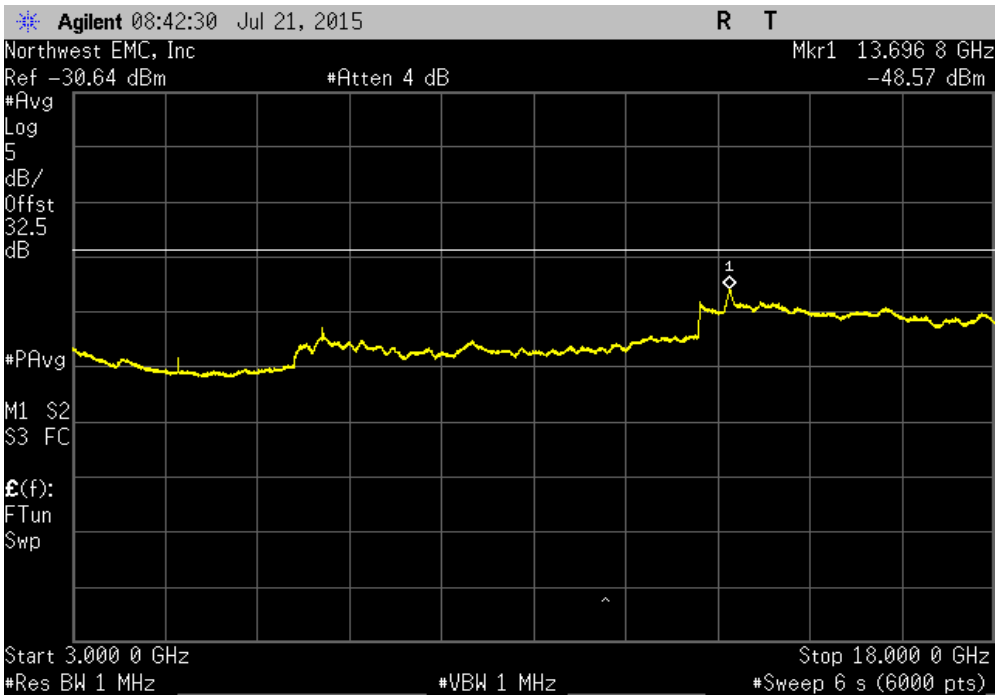
Port 0						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	30 MHz - 1 GHz			-54.91	-45	Pass



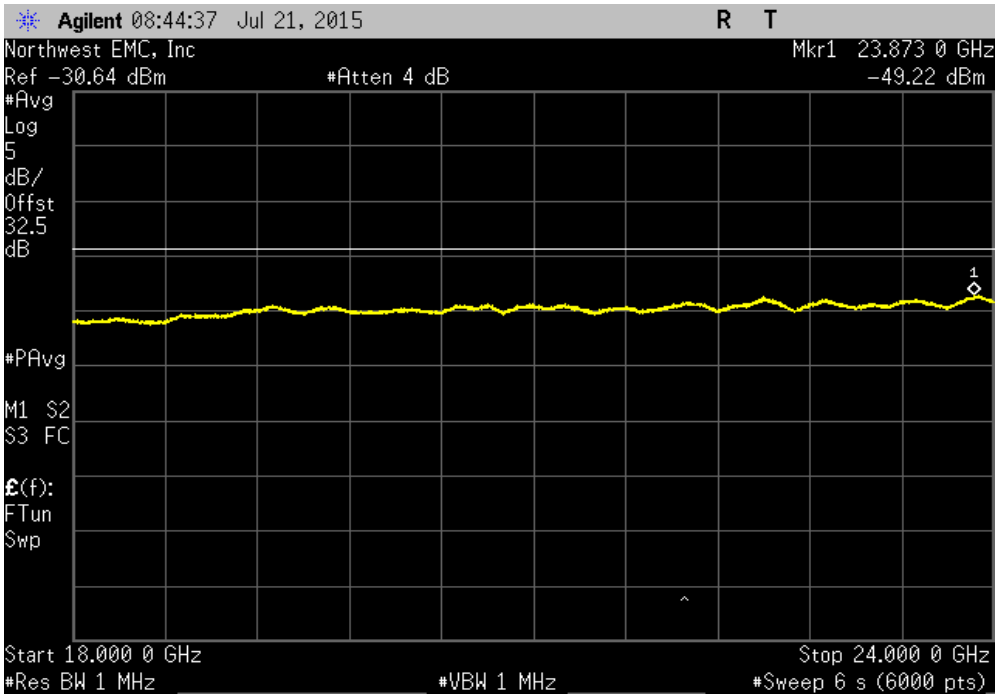
Port 0						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	1 GHz - 3 GHz			-50.68	-45	Pass



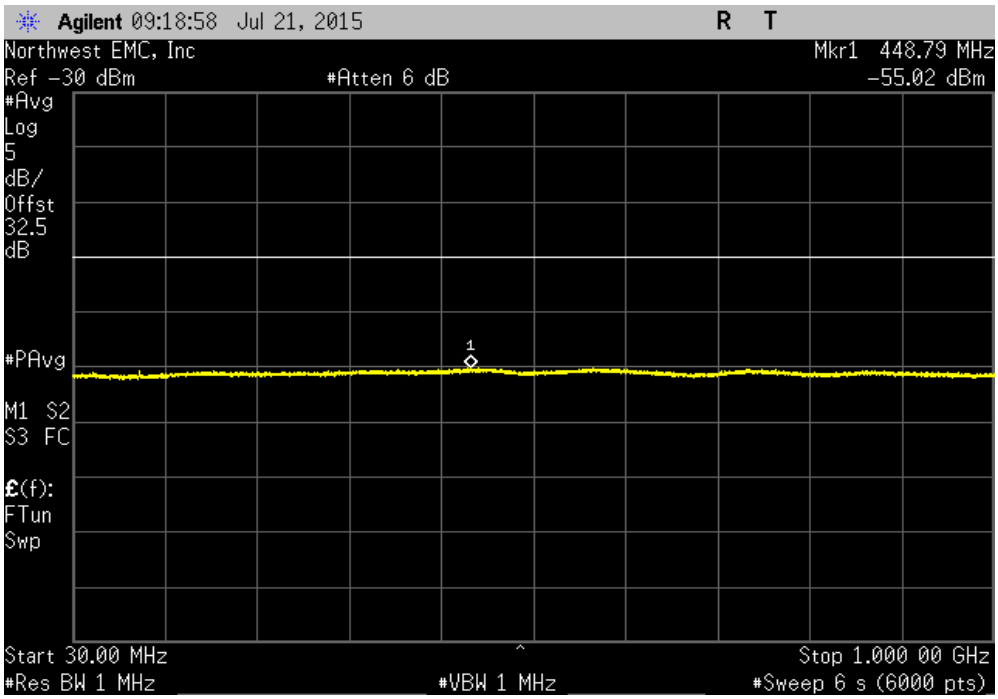
Port 0					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
3 GHz - 18 GHz			-48.57	-45	Pass



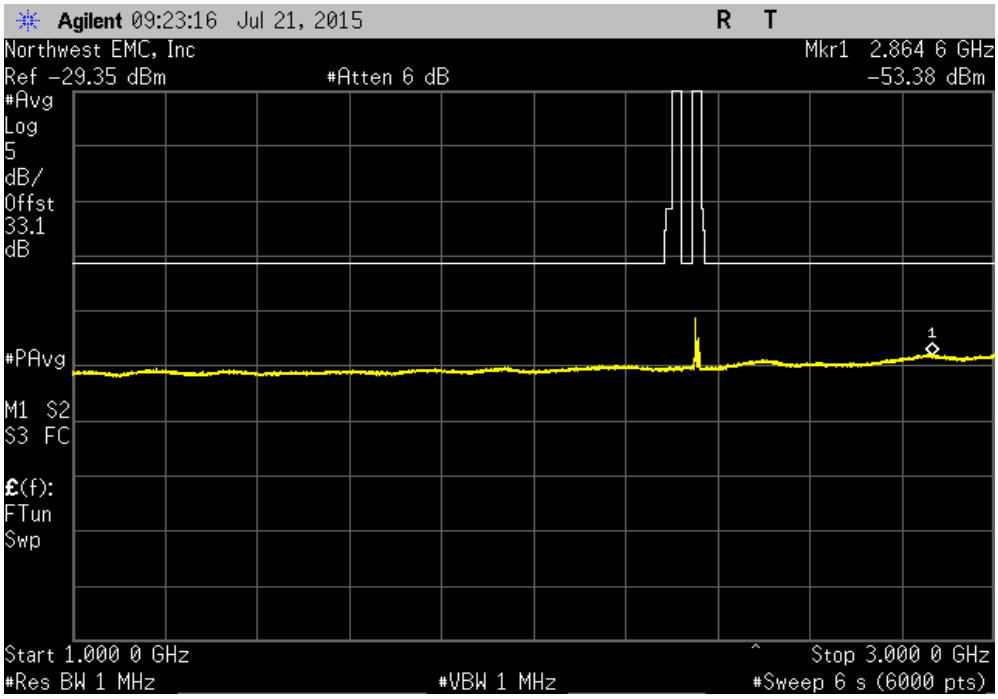
Port 0					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
18 GHz - 24 GHz			-49.22	-45	Pass



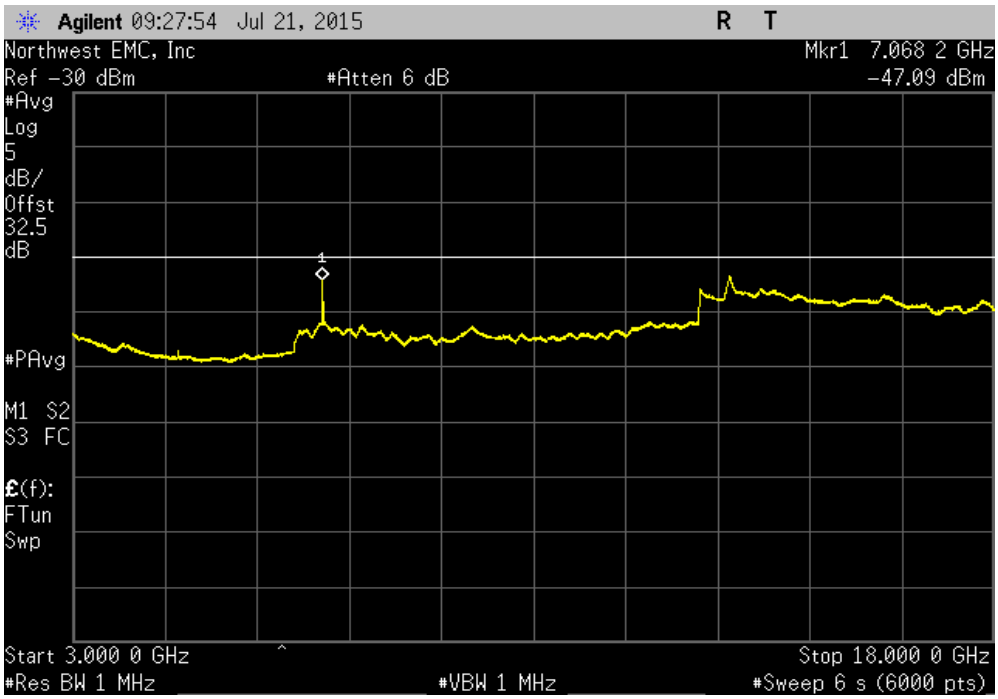
Port 1						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	30 MHz - 1 GHz			-55.02	-45	Pass



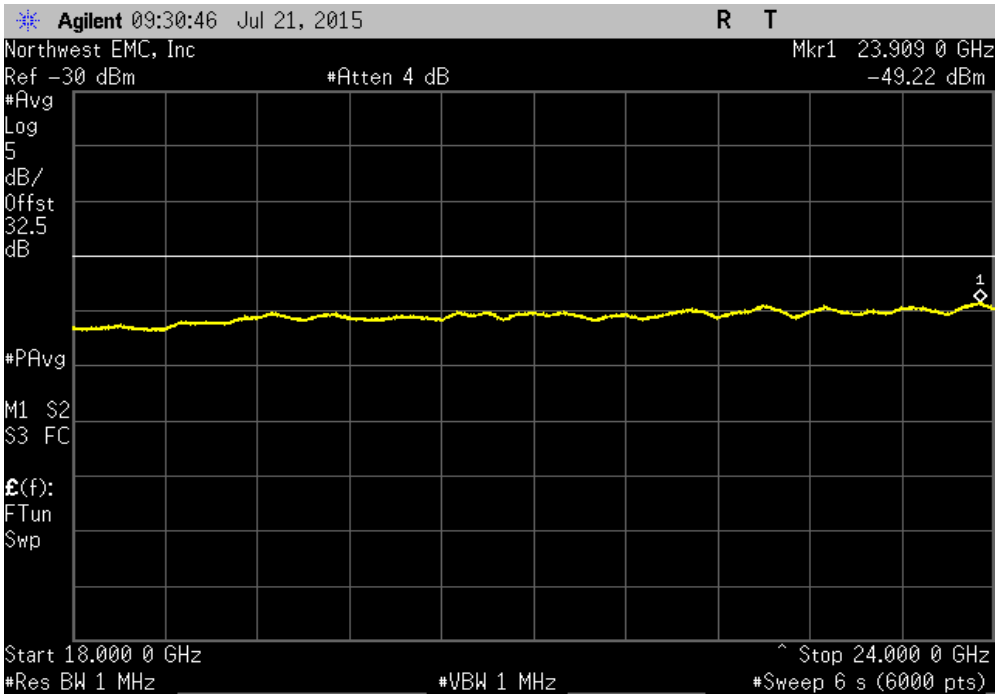
Port 1						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	1 GHz - 3 GHz			-53.38	-45	Pass



Port 1					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
3 GHz - 18 GHz			-47.09	-45	Pass



Port 1					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
18 GHz - 24 GHz			-49.22	-45	Pass



BAND EDGE COMPLIANCE

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
Band Reject Filter, Tunable	Wainwright Instruments GmbH	WTRCJV8-2200-2400-20-100-50EEK	CUN	3/3/2015	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge. The resolution bandwidth was set to approximately 1% of the measured emissions bandwidth within the first 1 MHz block adjacent to the transmit band. An average RMS detector was used to match the method used during Output Power. The screen capture shows the margin between the measured value and the limit at the band edge. Failing measurements were remeasured using the channel power integration method as called out in the standard.

BAND EDGE COMPLIANCE

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			Work Order:	TECO0030
Serial Number:	None			Date:	07/13/15
Customer:	TE Connectivity / ADC Telecommunication			Temperature:	23.3°C
Attendees:	None			Humidity:	62%
Project:	None			Barometric Pres.:	974.2
Tested by:	Trevor Buls	Power:	110VAC/60Hz	Job Site:	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

High wattage attenuator was provided by the customer. Reference level offset includes a factor of the insertion loss of the tunable notch filter at the band edge frequencies. Modules are identical, testing was performed on Port 0.

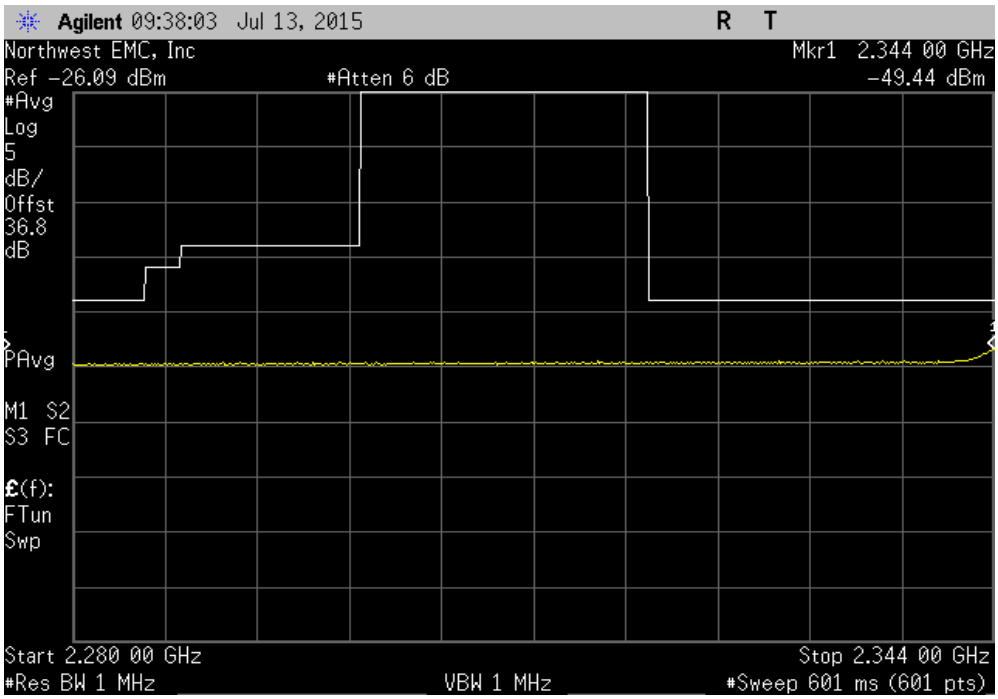
DEVIATIONS FROM TEST STANDARD

None

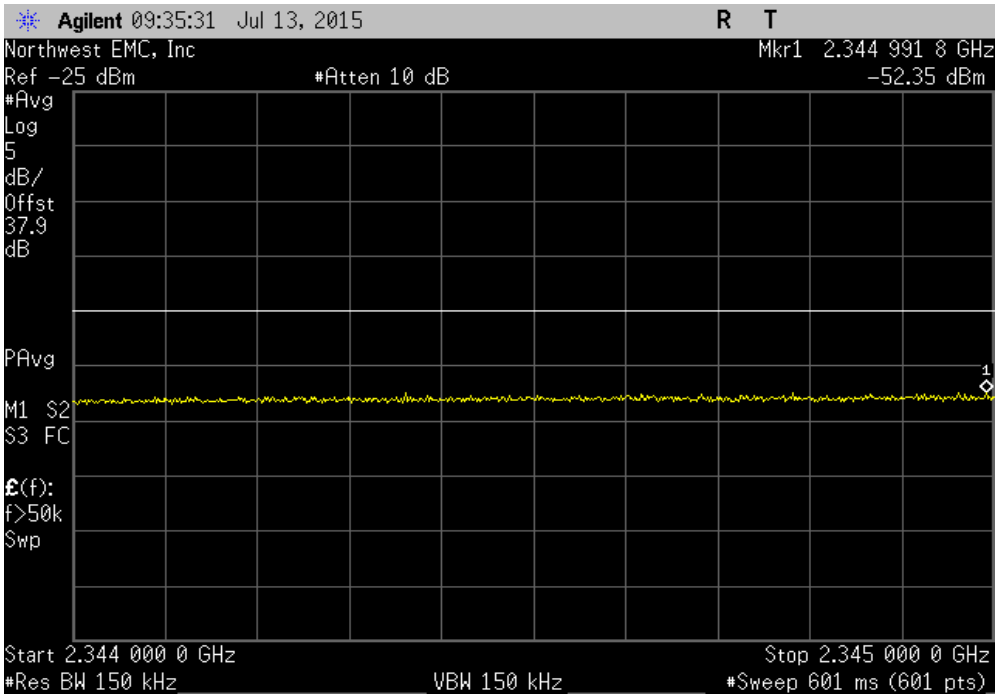
Configuration #	1	Signature	Trevor Buls

		Value (dBm)	Limit < (dBm)	Result
LTE 10 MHz				
	2280-2344 MHz	-49.44	-45	Pass
	2344-2345 MHz	-52.35	-45	Pass
	2360-2361 MHz	-22.54	-13	Pass
	2361-2365 MHz	-15.5	-13	Pass
	2365-2380 MHz	-47.22	-40	Pass

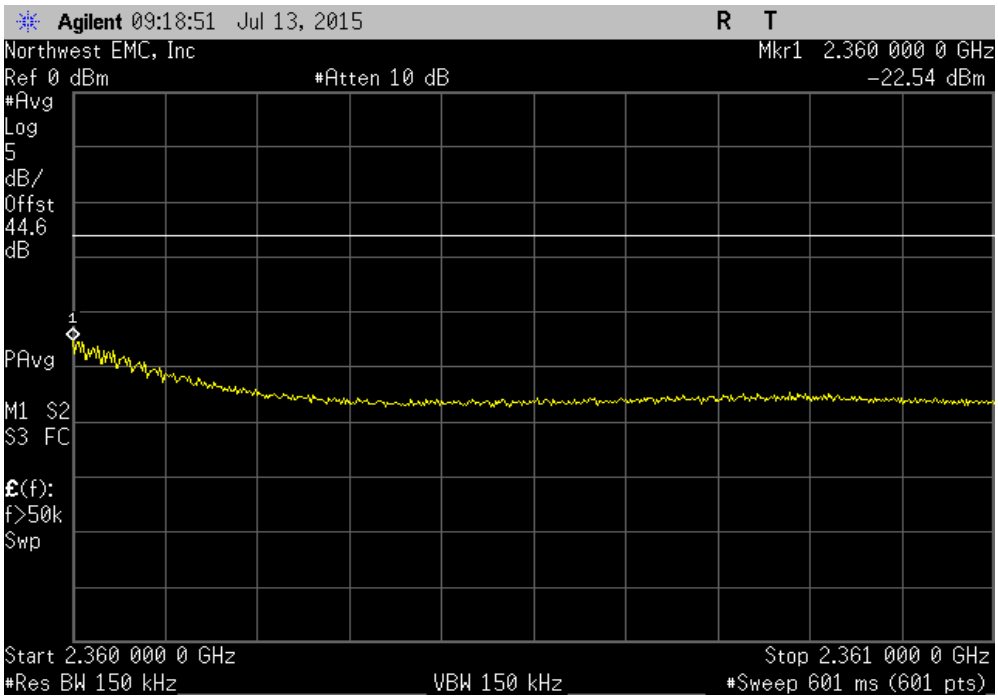
LTE 10 MHz, 2280-2344 MHz						
				Value (dBm)	Limit < (dBm)	Result
				-49.44	-45	Pass



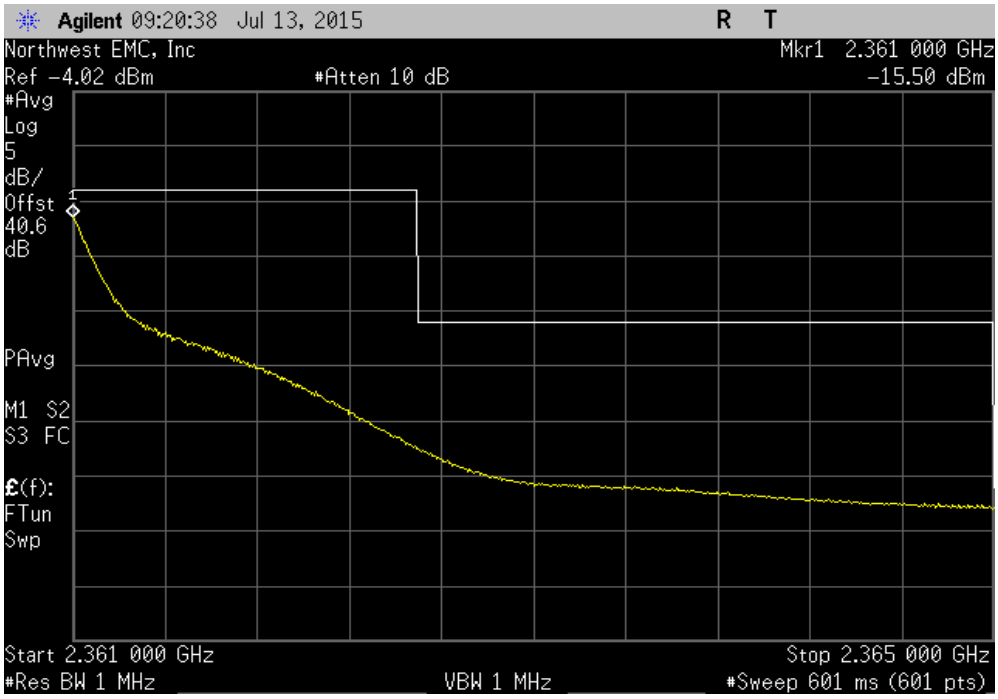
LTE 10 MHz, 2344-2345 MHz						
				Value (dBm)	Limit < (dBm)	Result
				-52.35	-45	Pass



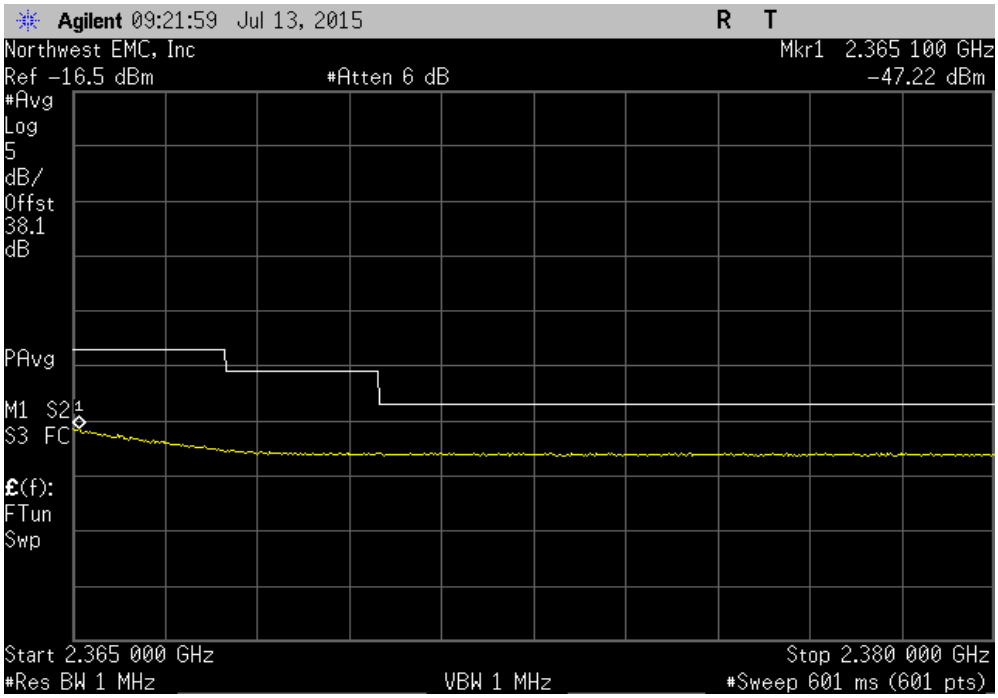
LTE 10 MHz, 2360-2361 MHz						
				Value (dBm)	Limit < (dBm)	Result
				-22.54	-13	Pass



LTE 10 MHz, 2361-2365 MHz						
				Value (dBm)	Limit < (dBm)	Result
				-15.5	-13	Pass



LTE 10 MHz, 2365-2380 MHz						
				Value (dBm)	Limit < (dBm)	Result
				-47.22	-40	Pass



INTERMODULATION

XMit 2015.01.14

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mo)
Power Divider/Combiner	Fairview Microwave	MP0208-2	IAF	NCR	0
Power Divider/Combiner	Fairview Microwave	MP0208-2	IAE	NCR	0
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HGY	10/2/2014	12
High Pass Filter	K&L Microwave	11SH10-18000/T50000-2.4	HIC	2/16/2015	12
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGV	9/24/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Band Reject Filter, Tunable	Wainwright Instruments GmbH	WTRCJV8-2200-2400-20-100-50EEK	CUN	3/3/2015	12
Signal Generator	Agilent	E4422B	TGQ	3/23/2015	36
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The EUT was configured with an input of two CW pulses at the edges of the band and a modulated pulse in the band.

The antenna port spurious emissions were measured at the RF output terminal of the EUT with external attenuation on the RF input of the spectrum analyzer. Analyzer plots utilizing a 1MHz resolution bandwidth and no video filtering were made for each modulation type from 30 MHz to 24 GHz. The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than or equal to the spurious conducted emissions limits. Measurements close to the limit were remeaured using a RMS average detector.

INTERMODULATION

NORTHWEST EMC

XMit 2015.01.14

EUT:	Prism 2300MHz MIMO RF Module			**Work Order:**	TECO0030
Serial Number:	None			**Date:**	07/21/15
Customer:	TE Connectivity / ADC Telecommunication			**Temperature:**	23.4°C
Attendees:	Josh Wittman			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	985.5
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 27:2015	ANSI/TIA/EIA-603-C-2004

COMMENTS

High wattage attenuator was provided by the customer. Alterrnate unit. Additional tones placed outside of normal transmit band. EUT is a single channel device that uses the entire band simultaneously.

DEVIATIONS FROM TEST STANDARD

None

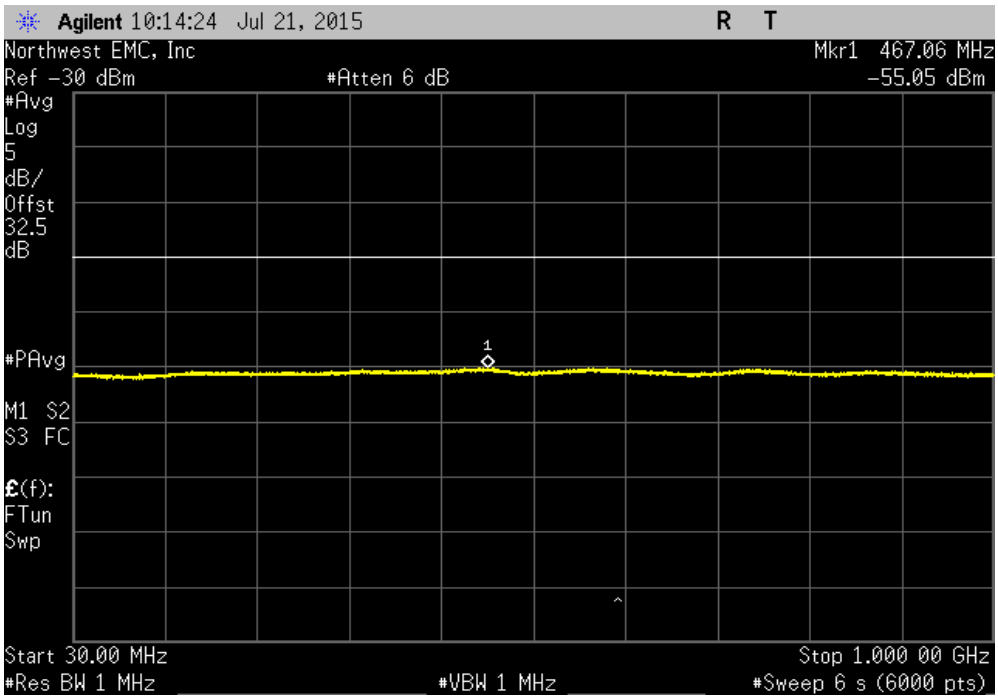
Configuration #	3	*Signature* Trevor Buls

	Frequency Range	Value (dBm)	Limit ≤ (dBm)	Result
Port 1	30 MHz - 1 GHz	-55.05	-45	Pass
Port 1	1 GHz - 3 GHz	-53.82	-45	Pass
Port 1	3 GHz - 18 GHz	-48.82	-45	Pass
Port 1	18 GHz - 24 GHz	-49.28	-45	Pass

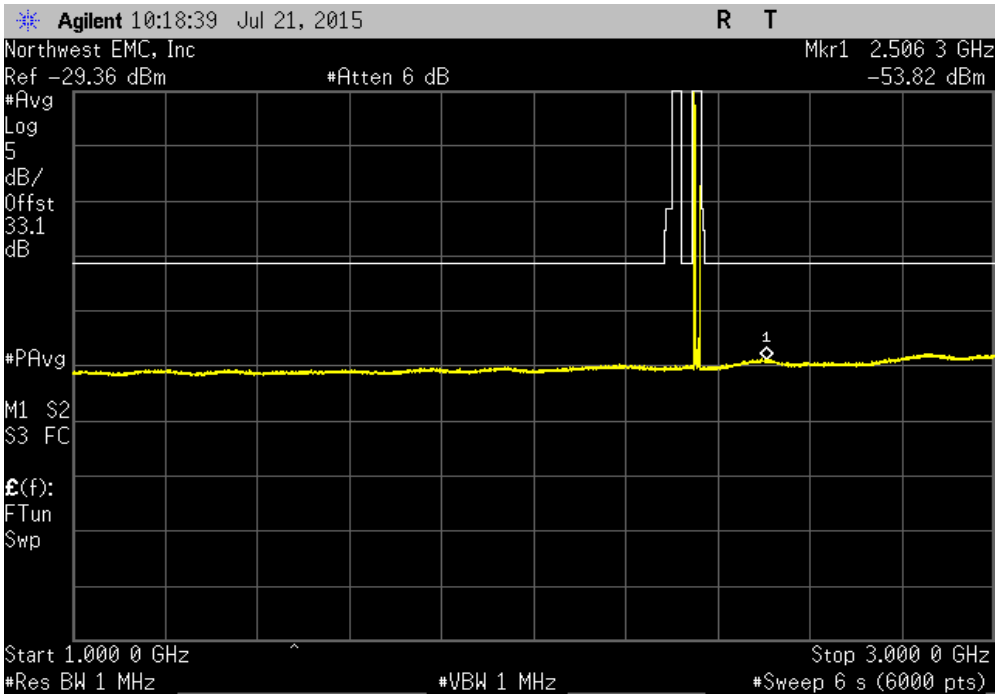
INTERMODULATION

XMit 2015.01.14

Port 1						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	30 MHz - 1 GHz			-55.05	-45	Pass



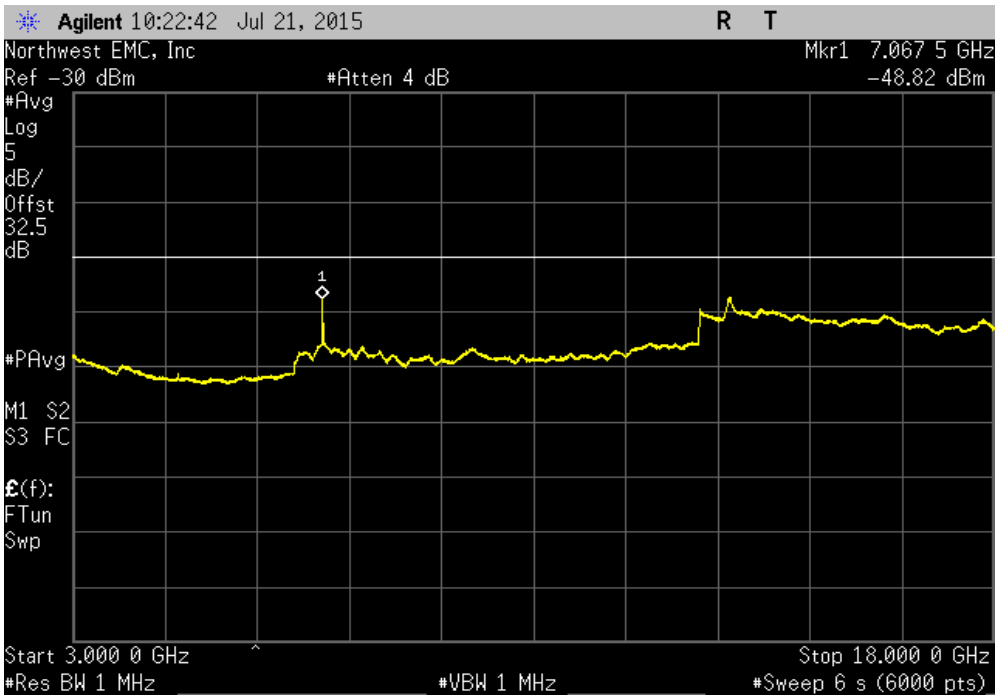
Port 1						
	Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
	1 GHz - 3 GHz			-53.82	-45	Pass



INTERMODULATION

XMit 2015.01.14

Port 1					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
3 GHz - 18 GHz			-48.82	-45	Pass



Port 1					
Frequency Range			Value (dBm)	Limit ≤ (dBm)	Result
18 GHz - 24 GHz			-49.28	-45	Pass