NORTHWEST EMC

Intel Corporation

Skylake

Report # INTE5584.1

NVLAP Lab Code: 200630-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: July 10, 2015
Intel Corporation
Model: Skylake

Emissions

Standards

Specification	Method
EN 55022: 2010 Class B	CISPR 22:2008
EN 61000-3-2:2014	IEC 61000-3-2:2014
EN 61000-3-3:2013	IEC 61000-3-3:2013
FCC 15.107:2015 Class B	ANSI C63.4:2009
FCC 15.109:2015 Class B	ANSI C63.4:2009
FCC 15.109(g):2015 Class B	ANSI C63.4:2009
ICES-003:2012 Class B	ANSI C63.4:2014

Results

Test Description	Applied	Results	Comments
Radiated Emissions	Yes	Pass	
Radiated Emissions High Frequency	Yes	Pass	
Conducted Emissions	Yes	Pass	
Telecom Conducted Emissions	Yes	Pass	
Voltage Fluctuations and Flicker	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: July 10, 2015
Intel Corporation
Model: Skylake

Immunity

Standards

Specification	Method
EN 55024:2010	IEC 61000-4-2:2008
	IEC 61000-4-3:2010
	IEC 61000-4-4:2012
	IEC 61000-4-5:2014
	IEC 61000-4-6:2013
	IEC 61000-4-8:2009
	IEC 61000-4-11:2004

Results

Test Description	Performance Criteria			Comments
	Applied	Standard Specified	Observed Criteria	
Electrostatic Discharge (ESD)	Yes	B	A	
Radiated Immunity	Yes	A	A	
Electrical Fast Transients and Bursts (EFT)	Yes	B	B	
Surge	Yes	B	A	
Conducted Immunity	Yes	A	A	
Magnetic Field Immunity	Yes	A	A	
Voltage Interruptions	Yes	C	A	
Voltage Dips	Yes	B/C	A	

Details on the application of the performance criteria, as well as any manufacturer provided performance criteria or acceptable degradation of performance, are all contained within the report.

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

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

EMISSIONS MEASUREMENTS

NORTHWEST EMC
REV 2014.10.08

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) can be found included as part of the applicable test description page. 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.

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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

Sample Calculations

Radiated Emissions:

Field Strength		Measured Level		Antenna Factor		Cable Factor		Amplifier Gain		Distance Adjustment Factor		External Attenuation
33.5	=	42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0

Conducted Emissions:

Adjusted Level		Measured Level		Transducer Factor		Cable Factor		External Attenuation
47.1	=	26.7	+	0.3	+	0.1	+	20.0

EXPLANATION OF NWEMC PERFORMANCE CRITERIA

REV 2014.10.08

How Important Is It To Understand Performance Criteria?

It is the responsibility of the test laboratory to observe the performance of the equipment under test (EUT) and to accurately report those results. The manufacturer has the obligation to express the performance criteria in terms which relate to the performance of his specific product when used as intended. As the responsible party (manufacturer, importer, etc) one must take those results, compare them against the specifications and standards, then, if appropriate make a declaration of conformity.

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

The variety and the diversity of the apparatus within the scope of the EMC Directive make it difficult to define precise criteria for the evaluation of the immunity test results for every product. If we are not provided a test plan documenting the expected performance criteria and acceptable degradation of performance, we will use the following:

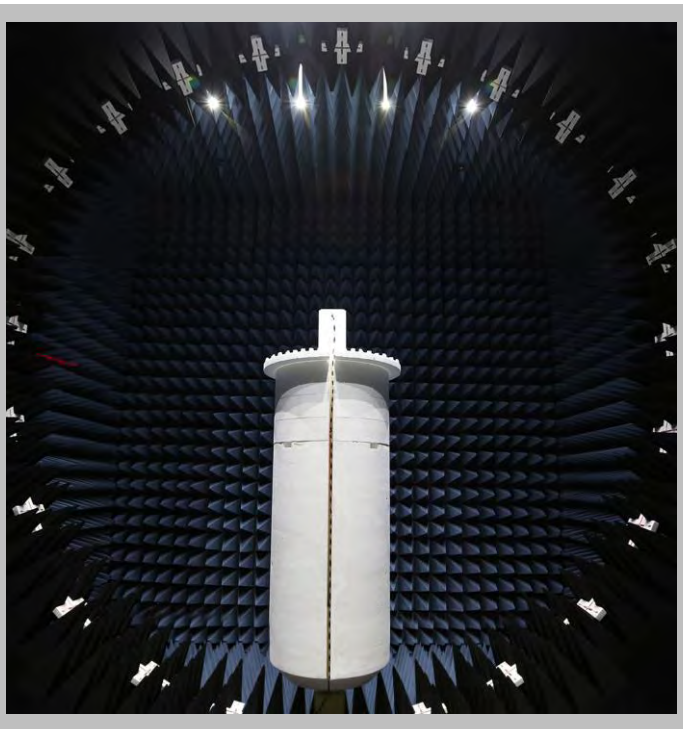
- Performance Criteria A
  - The EUT exhibited no change in performance when operating as specified by the manufacturer. In this case no changes were observed during the test.
- Performance Criteria B
  - The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment returned to previous operation without any operator intervention, once the test stimulus was removed.
- Performance Criteria C
  - The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment required some operator intervention in order to return to previous operation.
- Performance Criteria D
  - The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment appears to have been damaged and would not recover.

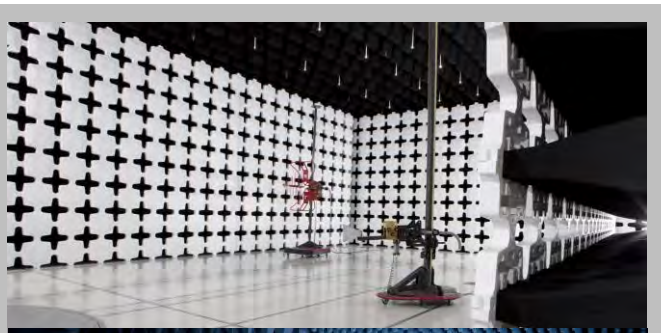
If we are provided a test plan or information detailing the precise criteria for evaluating the test results, we will use that information and reference it as part of the test data.

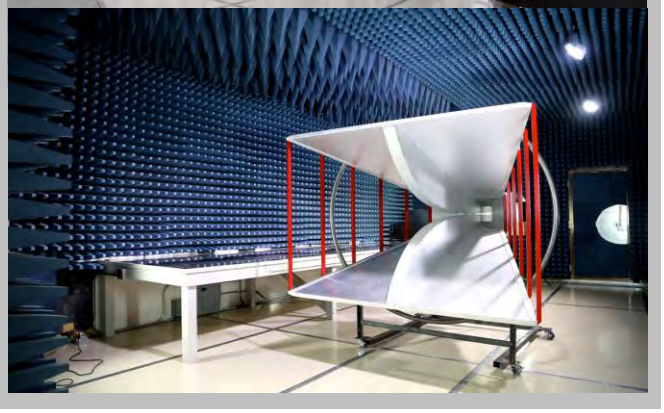
FACILITIES

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:	Intel Corporation
Address:	5200 NE Elam Young Pkwy
City, State, Zip:	Hillsboro, OR 97124
Test Requested By:	Mike Lowe
Model:	Skylake
First Date of Test:	June 16, 2015
Last Date of Test:	July 10, 2015
Receipt Date of Samples:	June 16, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
802.11abgn/ac, 2x2 MIMO, Bluetooth, NFC, LTE, GSM

Highest frequency generated or used in the device:
CPU core 1.2GHz

Testing Objective:
These tests were selected to satisfy the EMC requirements requested by the client.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 1

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Tablet
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
HDMI Cable	Yes	1.3	No	Thunderbolt HDMI Adapter	Unterminated
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 3

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor 1	BENQ	Q24WS	ETD6701610sl0
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
HDMI Cable	Yes	1.3m	No	Thunderbolt HDMI Adapter	Monitor 1
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 4

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor 1	BENQ	Q24WS	ETD6701610sl0
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
HDMI Cable	Yes	1.3m	No	Thunderbolt HDMI Adapter	Monitor 1
AC Power	No	1.8m	No	AC Mains	Monitor 1

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 5

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor 1	BENQ	Q24WS	ETD6701610sl0
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock
HDMI	Yes	3.0m	No	Tablet	Monitor 1

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 6

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Tablet
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
HDMI Cable	Yes	1.3	No	Thunderbolt HDMI Adapter	Unterminated
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Tablet

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 7

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
HDMI Cable	Yes	1.3	No	Thunderbolt HDMI Adapter	Unterminated
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock
Audio	No	1.2m	No	Earbud Headphones	Tablet

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 8

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
HDMI Cable	Yes	1.3	No	Thunderbolt HDMI Adapter	Unterminated
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock
Audio	No	1.2m	No	Earbud Headphones	Tablet

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 9

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor 1	BENQ	Q24WS	ETD6701610sl0
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
HDMI Cable	Yes	1.3m	No	Thunderbolt HDMI Adapter	Monitor 1
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock
Audio	No	1.2m	No	Earbud Headphones	Tablet

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 10

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor 1	BENQ	Q24WS	ETD6701610sl0
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
Earbud Headphones	Samsung	Unknown	None
Earbud Headphones	Samsung	Unknown	None
Keyboard	Lenovo	KU-0989	0012482

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
HDMI Cable	Yes	1.3m	No	Thunderbolt HDMI Adapter	Monitor 1
AC Power	No	1.8m	No	AC Mains	Monitor 1
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
Audio	No	1.2m	No	Earbud Headphones	Tablet
USB	No	1.8m	No	Keyboard Dock	Keyboard

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration INTE5584- 11

Software/Firmware Running during test	
Description	**Version**
Windows 10	Pro Technical Preview
Intel EMC Exerciser	1.0.89.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Tablet	Intel Corporation	SKL21-SDS	IASY515S0016
Keyboard Dock	Intel Corporation	21SLHSINB	IASY515S0016
AC Adapter	Delta Electronics, Inc.	ADP-45GE AA	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Mouse 1	Microsoft	1113	91705-523-2624511-61247
USB Mouse 2	Microsoft	1113	91705-523-3663262-61248
USB Mouse 3	Microsoft	1113	91705-523-9790021-51244
Earbud Headphones	Samsung	Unknown	None
Earbud Headphones	Samsung	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.55m	No	AC Mains	AC Adapter
DC Power	Unknown	1.45m	Yes	AC Adapter	Keyboard Dock
Thunderbolt HDMI Adapter	Yes	0.2m	No	Tablet	HDMI Cable
HDMI Cable	Yes	1.3	No	Thunderbolt HDMI Adapter	Unterminated
USB	Unknown	1.8m	Yes	USB Mouse 1	Tablet
Audio	No	1.2m	No	Earbud Headphones	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 2	Keyboard Dock
USB	Unknown	1.8m	Yes	USB Mouse 3	Keyboard Dock
Audio	No	1.2m	No	Earbud Headphones	Tablet

MODIFICATIONS

NORTHWEST EMC 2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/16/2015	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.
2	6/17/2015	Radiated Immunity	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	6/18/2015	Conducted Immunity	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	6/18/2015	Harmonics	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	6/18/2015	Flicker	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	6/19/2015	Surge	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	6/19/2015	Magnetic Field Immunity	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	6/19/2015	Voltage Dips and Interrupts	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.
9	6/19/2015	EFT	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.
10	6/22/2015	Radiated Emissions High Frequency 1GHz to 6GHz	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.
11	6/22/2015	ESD	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.
12	6/22/2015	Radiated Emissions High Frequency 1GHz to 18GHz	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.
13	7/10/2015	Radiated Emissions	Modified from delivered configuration.	28A0592-0A2 ferrite added to the DC power cable next to the AC adapter. Modification authorized by Mike Lowe.	Scheduled testing was completed.

RADIATED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT.

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Spectrum Analyzer	Agilent	E4443A	AFB	3/17/2015	03/17/2016
Antenna, Biconilog	Teseq	CBL 6141B	AXR	7/7/2014	07/07/2016
Pre-Amplifier	Miteq	AM-1551	AOY	5/11/2015	05/11/2016
Cable	None	10m Test Distance Cable	EVL	5/11/2015	05/11/2016

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.8 dB	-3.8 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

110VAC/60Hz
230VAC/50Hz

CONFIGURATIONS INVESTIGATED

INTE5584-6
INTE5584-7
INTE5584-8
INTE5584-9 – determined to be worst case.
INTE5584-10
INTE5584-11

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

RADIATED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	07/10/2015
Customer:	Intel Corporation	Temperature:	24.4°C
Attendees:	Mike Lowe	Relative Humidity:	41.6%
Customer Project:	SKL21-SDS	Bar. Pressure:	1011.5 mb
Tested By:	Cole Ghizzone	Job Site:	EV11
Power:	230VAC/50Hz	Configuration:	INTE5584-9

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008

TEST PARAMETERS

Run #:	24	Test Distance (m):	10	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

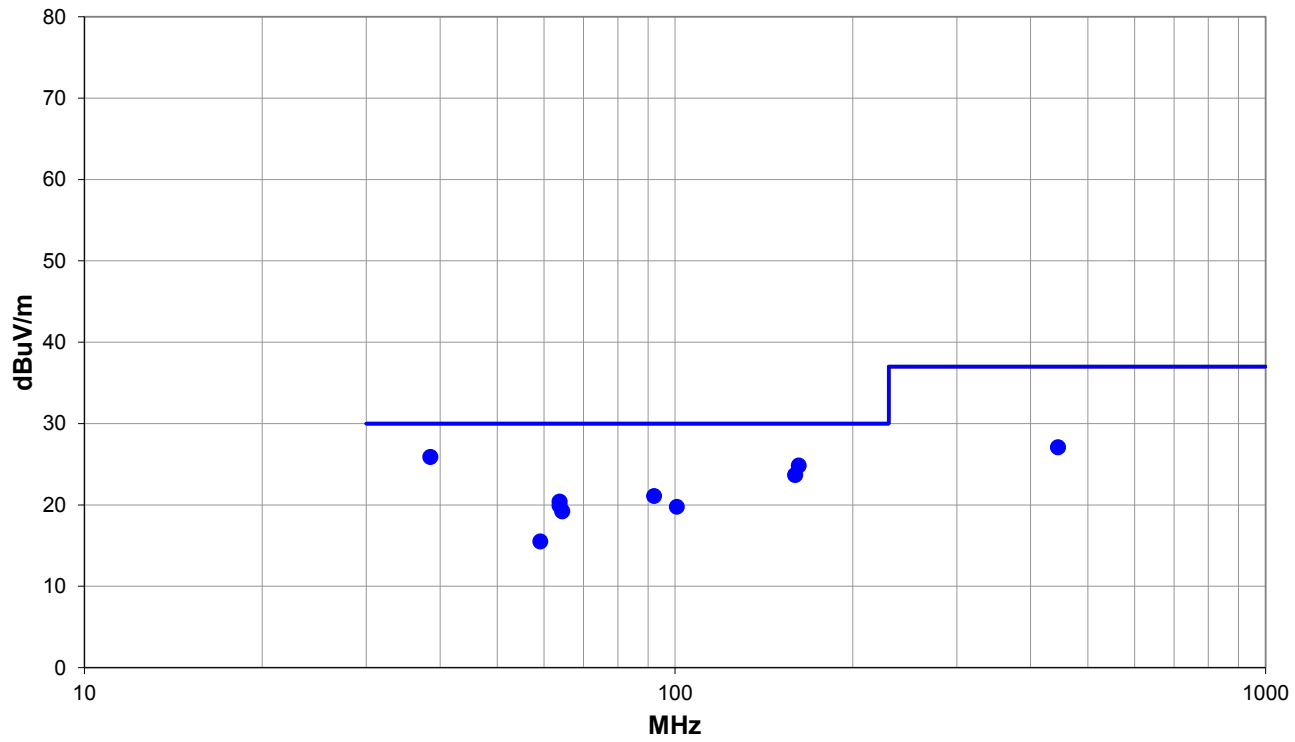
Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10, radios powered and idle.

DEVIATIONS FROM TEST STANDARD

None



Run #: 24 ■ PK ◆ AV ● QP

RADIATED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #24

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
38.520	45.2	-19.3	1.0	57.0	10.0	0.0	Vert	QP	0.0	25.9	30.0	-4.1
161.988	50.1	-25.3	1.2	356.0	10.0	0.0	Vert	QP	0.0	24.8	30.0	-5.2
159.728	48.8	-25.1	1.4	365.0	10.0	0.0	Vert	QP	0.0	23.7	30.0	-6.3
92.149	49.6	-28.5	1.1	115.0	10.0	0.0	Vert	QP	0.0	21.1	30.0	-8.9
63.761	49.7	-29.3	2.0	37.0	10.0	0.0	Vert	QP	0.0	20.4	30.0	-9.6
445.061	46.1	-19.0	1.4	172.0	10.0	0.0	Horz	QP	0.0	27.1	37.0	-9.9
63.727	49.2	-29.3	2.8	29.0	10.0	0.0	Vert	QP	0.0	19.9	30.0	-10.1
100.674	47.1	-27.3	1.5	39.0	10.0	0.0	Vert	QP	0.0	19.8	30.0	-10.2
64.396	48.6	-29.4	2.3	106.0	10.0	0.0	Vert	QP	0.0	19.2	30.0	-10.8
59.126	43.7	-28.2	1.0	128.0	10.0	0.0	Vert	QP	0.0	15.5	30.0	-14.5

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	07/10/2015
Customer:	Intel Corporation	Temperature:	24.4°C
Attendees:	Mike Lowe	Relative Humidity:	41.6%
Customer Project:	SKL21-SDS	Bar. Pressure:	1011.5 mb
Tested By:	Cole Ghizzone	Job Site:	EV11
Power:	110VAC/60Hz	Configuration:	INTE5584-9

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.109(g):2015	ANSI C63.4:2009

TEST PARAMETERS

Run #:	25	Test Distance (m):	10	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

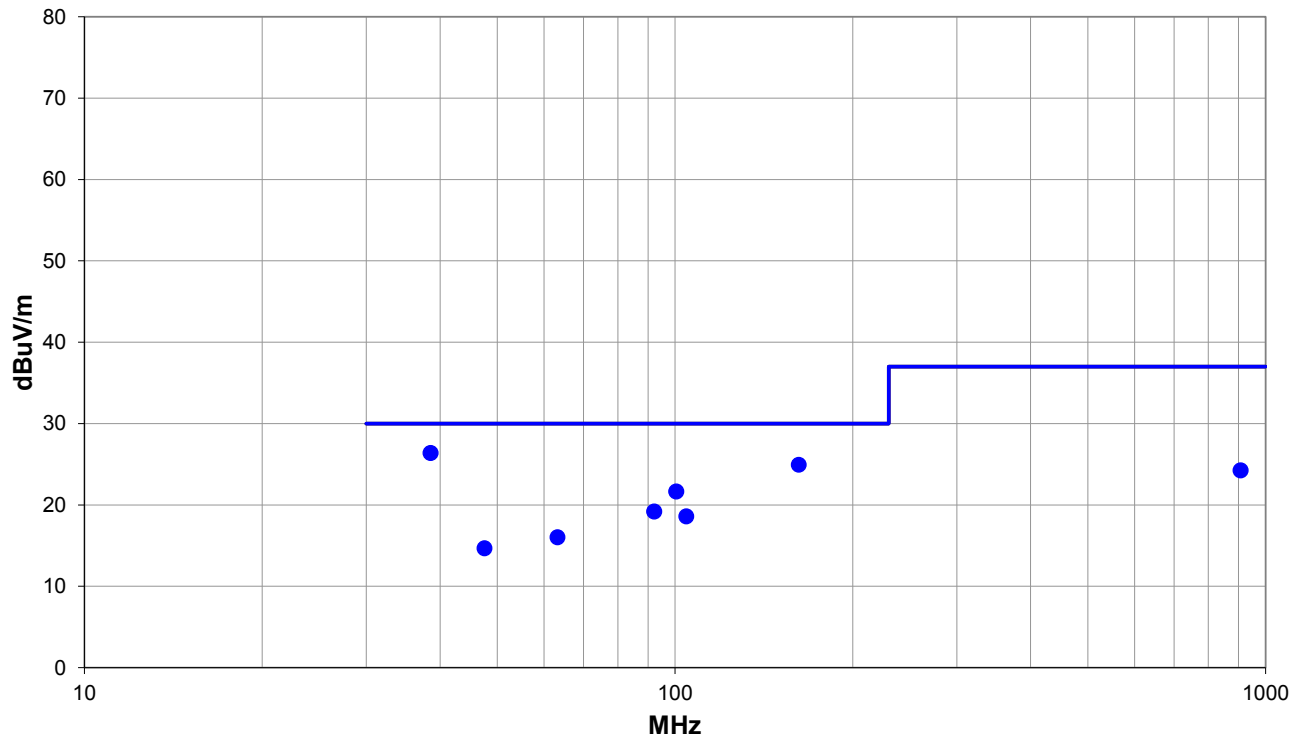
Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10, radios powered and idle.

DEVIATIONS FROM TEST STANDARD

None



Run #: 25 ■ PK ◆ AV ● QP

RADIATED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

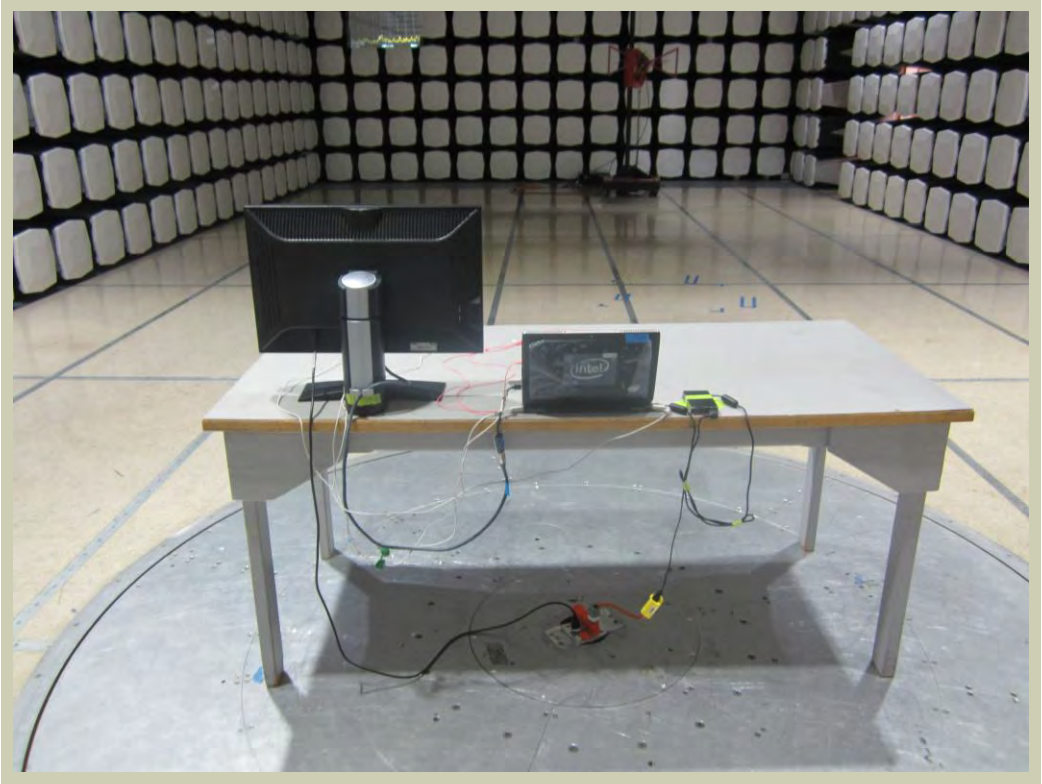
RESULTS - Run #25

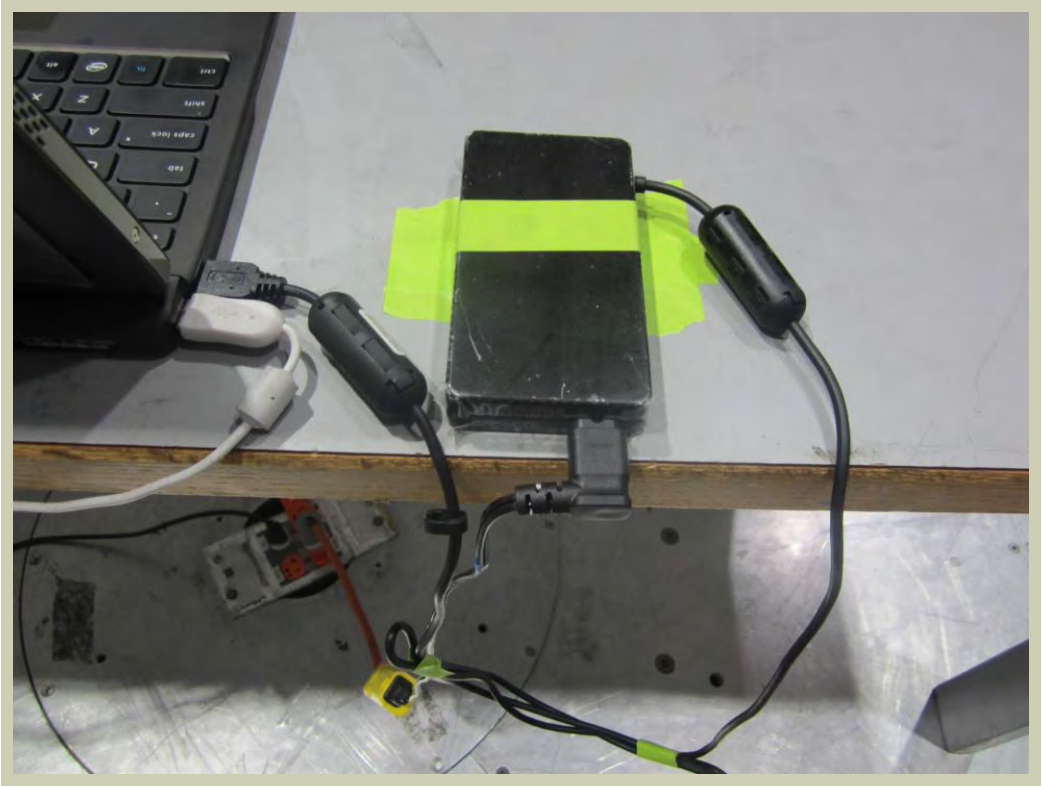
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
38.550	45.7	-19.3	1.0	59.0	10.0	0.0	Vert	QP	0.0	26.4	30.0	-3.6
161.983	50.2	-25.3	1.1	355.0	10.0	0.0	Vert	QP	0.0	24.9	30.0	-5.1
100.485	49.0	-27.3	2.0	60.0	10.0	0.0	Vert	QP	0.0	21.7	30.0	-8.3
92.159	47.7	-28.5	2.0	134.0	10.0	0.0	Vert	QP	0.0	19.2	30.0	-10.8
104.455	45.5	-26.9	2.0	43.0	10.0	0.0	Vert	QP	0.0	18.6	30.0	-11.4
907.236	36.6	-12.3	2.0	254.0	10.0	0.0	Horz	QP	0.0	24.3	37.0	-12.7
63.220	45.2	-29.2	2.8	52.0	10.0	0.0	Vert	QP	0.0	16.0	30.0	-14.0
47.566	38.1	-23.4	2.8	19.0	10.0	0.0	Vert	QP	0.0	14.7	30.0	-15.3

CONCLUSION

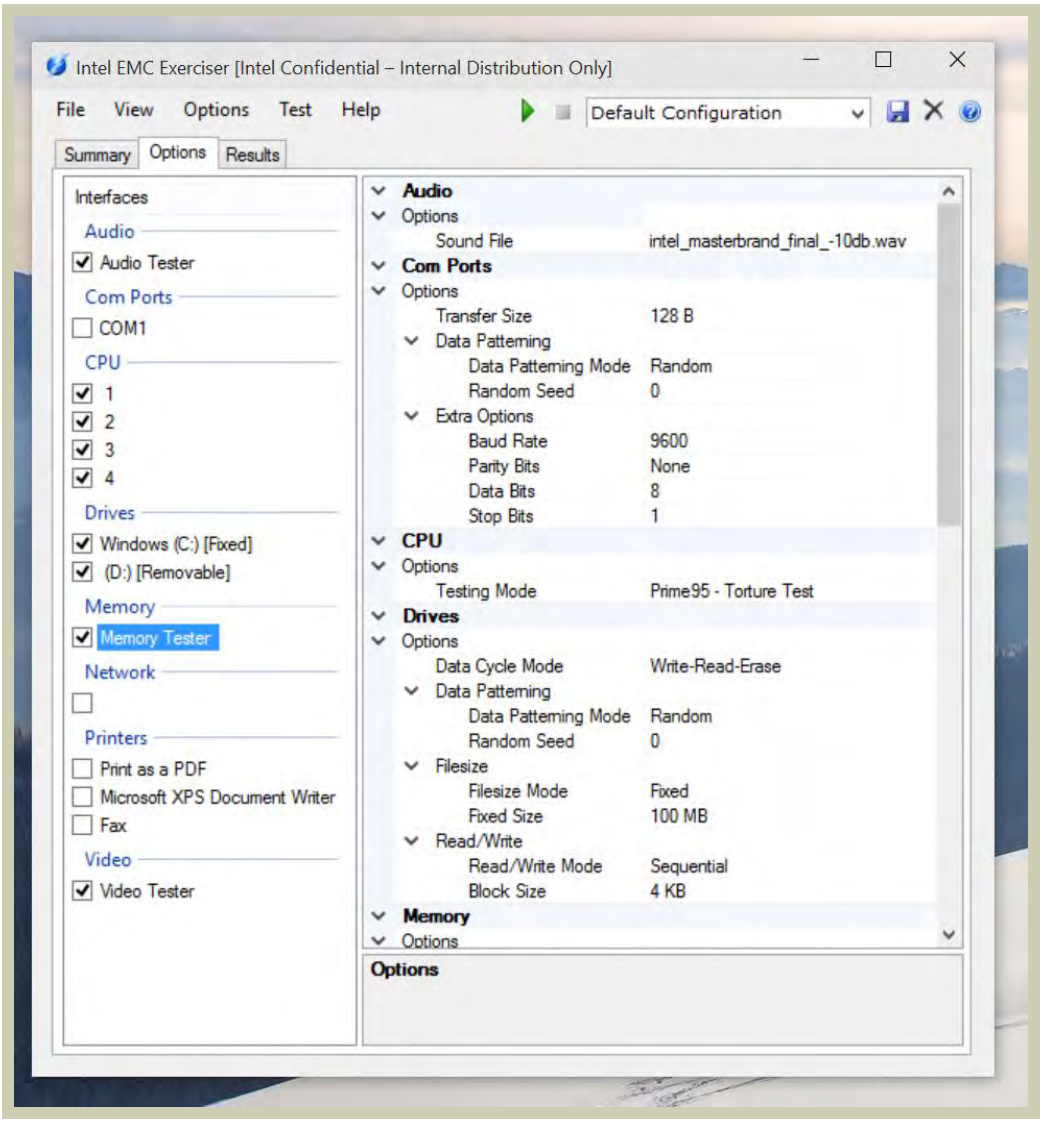
Pass

Tested By





EMC EXERCISER SETTINGS



RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT.

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Spectrum Analyzer	Keysight	N9010A	AFN	2/10/2015	02/10/2016
Antenna, Horn	ETS Lindgren	3115	AIZ	1/27/2014	01/27/2016
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	4/16/2015	04/16/2016
Cable	N/A	Double Ridge Horn Cables	EVB	4/16/2015	04/16/2016

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	4.6 dB	-4.6 dB

FREQUENCY RANGE INVESTIGATED

1 GHz TO 6 GHz

POWER INVESTIGATED

230VAC/50Hz

CONFIGURATIONS INVESTIGATED

INTE5584-6
INTE5584-7
INTE5584-8
INTE5584-9 determined to be worst case.
INTE5584-10
INTE5584-11

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/22/2015
Customer:	Intel Corporation	Temperature:	23.5°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.5 mb
Tested By:	Cole Ghizzone	Job Site:	EV01
Power:	230VAC/50Hz	Configuration:	INTE5584-9

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008
FCC 15.109(g):2015	ANSI C63.4:2009

TEST PARAMETERS

Run #:	1	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

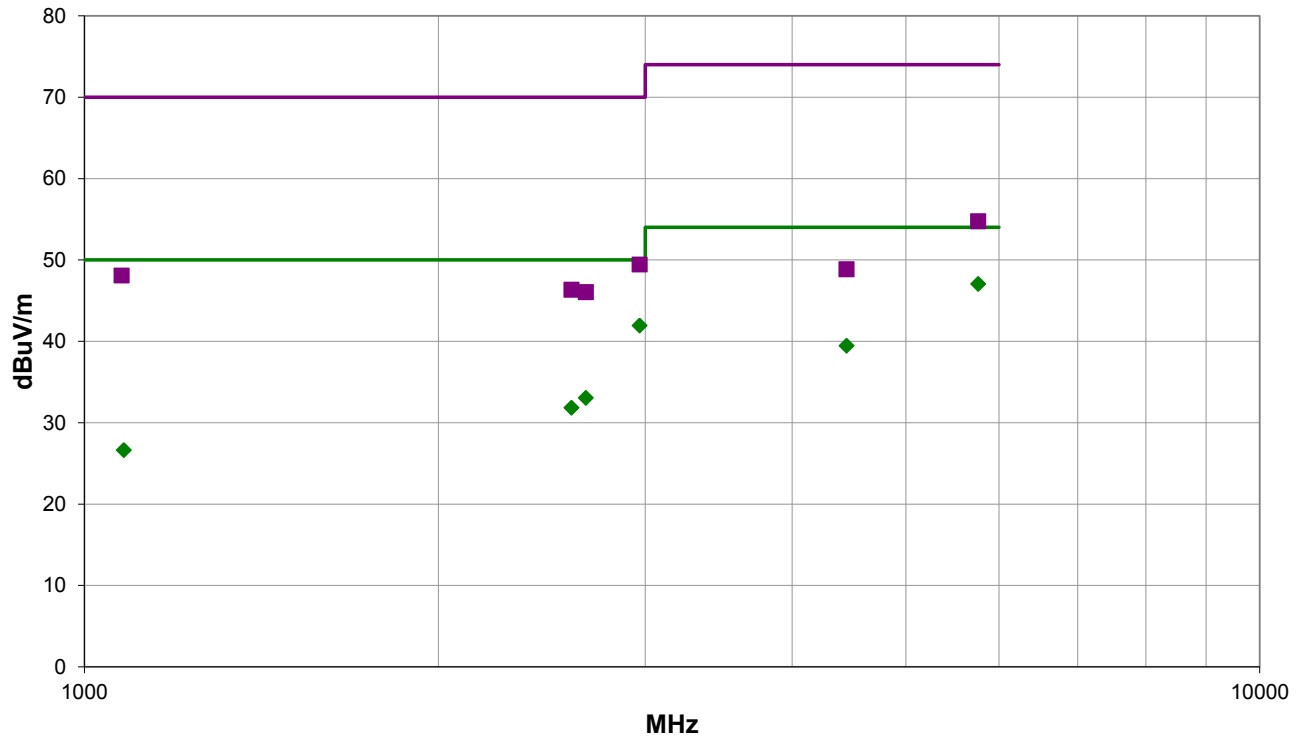
Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

DEVIATIONS FROM TEST STANDARD

None



Run #: 1 ■ PK ◆ AV ● QP

RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #1

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
5760.005	36.5	10.6	1.2	167.0	3.0	0.0	Horz	AV	0.0	47.1	54.0	-6.9
2967.035	42.6	-0.7	1.3	158.0	3.0	0.0	Horz	AV	0.0	41.9	50.0	-8.1
4450.545	33.2	6.3	1.2	29.0	3.0	0.0	Vert	AV	0.0	39.5	54.0	-14.5
2670.295	34.8	-1.7	1.2	119.0	3.0	0.0	Horz	AV	0.0	33.1	50.0	-16.9
2596.150	33.9	-2.1	1.9	243.0	3.0	0.0	Horz	AV	0.0	31.8	50.0	-18.2
5760.125	44.2	10.6	1.2	167.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2
2967.045	50.1	-0.7	1.3	158.0	3.0	0.0	Horz	PK	0.0	49.4	70.0	-20.6
1075.508	56.7	-8.6	1.2	164.0	3.0	0.0	Horz	PK	0.0	48.1	70.0	-21.9
1080.025	35.2	-8.6	1.2	164.0	3.0	0.0	Horz	AV	0.0	26.6	50.0	-23.4
2596.145	48.4	-2.1	1.9	243.0	3.0	0.0	Horz	PK	0.0	46.3	70.0	-23.7
2670.215	47.8	-1.7	1.2	119.0	3.0	0.0	Horz	PK	0.0	46.1	70.0	-23.9
4450.690	42.6	6.3	1.2	29.0	3.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS HIGH FREQUENCY

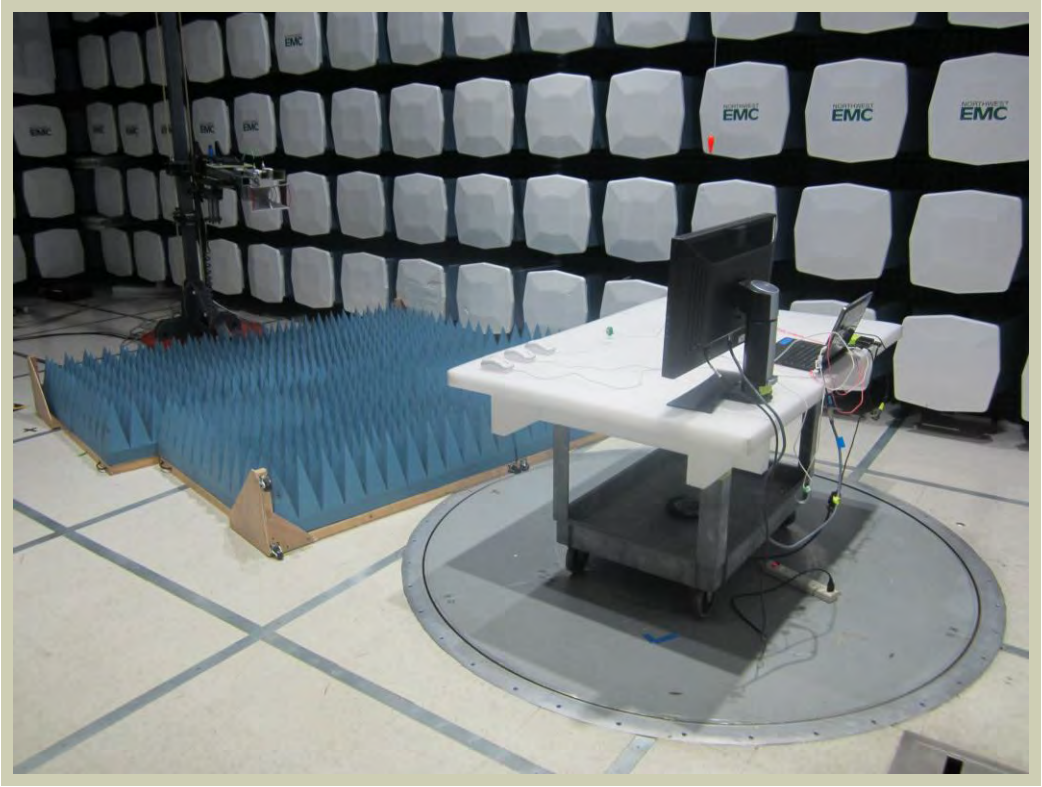
NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

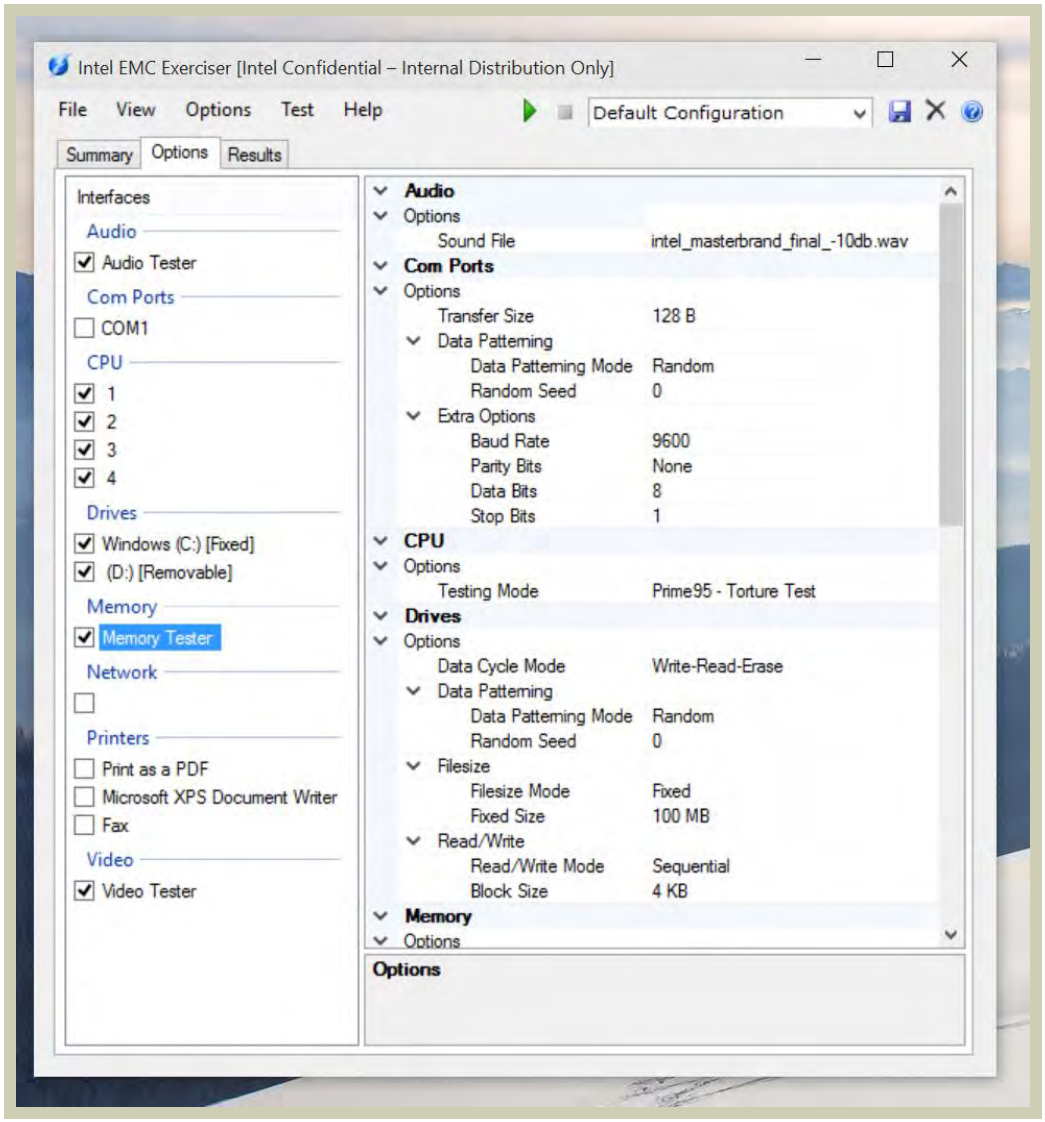
RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29



EMC EXERCISER SETTINGS



RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

TEST DESCRIPTION

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Spectrum Analyzer	Keysight	N9010A	AFN	2/10/2015	02/10/2016
Antenna, Horn	ETS Lindgren	3115	AIZ	1/27/2014	01/27/2016
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	4/16/2015	04/16/2016
Cable	N/A	Double Ridge Horn Cables	EVB	4/16/2015	04/16/2016
Antenna, Horn	ETS Lindgren	3160-07	AHU	NCR	NCR
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	4/20/2015	04/20/2016
Cable	None	Standard Gain Horns Cable	EVF	4/20/2015	04/20/2016
Antenna, Horn	ETS Lindgren	3160-08	AHV	NCR	NCR
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	4/16/2015	04/16/2016

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

1 GHz TO 18 GHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

INTE5584-6
INTE5584-7
INTE5584-8
INTE5584-9 determined to be worst case.
INTE5584-10
INTE5584-11

MODES INVESTIGATED

Running Intel EMC Exerciser in Widows 10, radios powered and idle.

RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/22/2015
Customer:	Intel Corporation	Temperature:	23.5°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.5 mb
Tested By:	Cole Ghizzone	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	INTE5584-9

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.109:2015	ANSI C63.4:2009

TEST PARAMETERS

Run #:	2	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

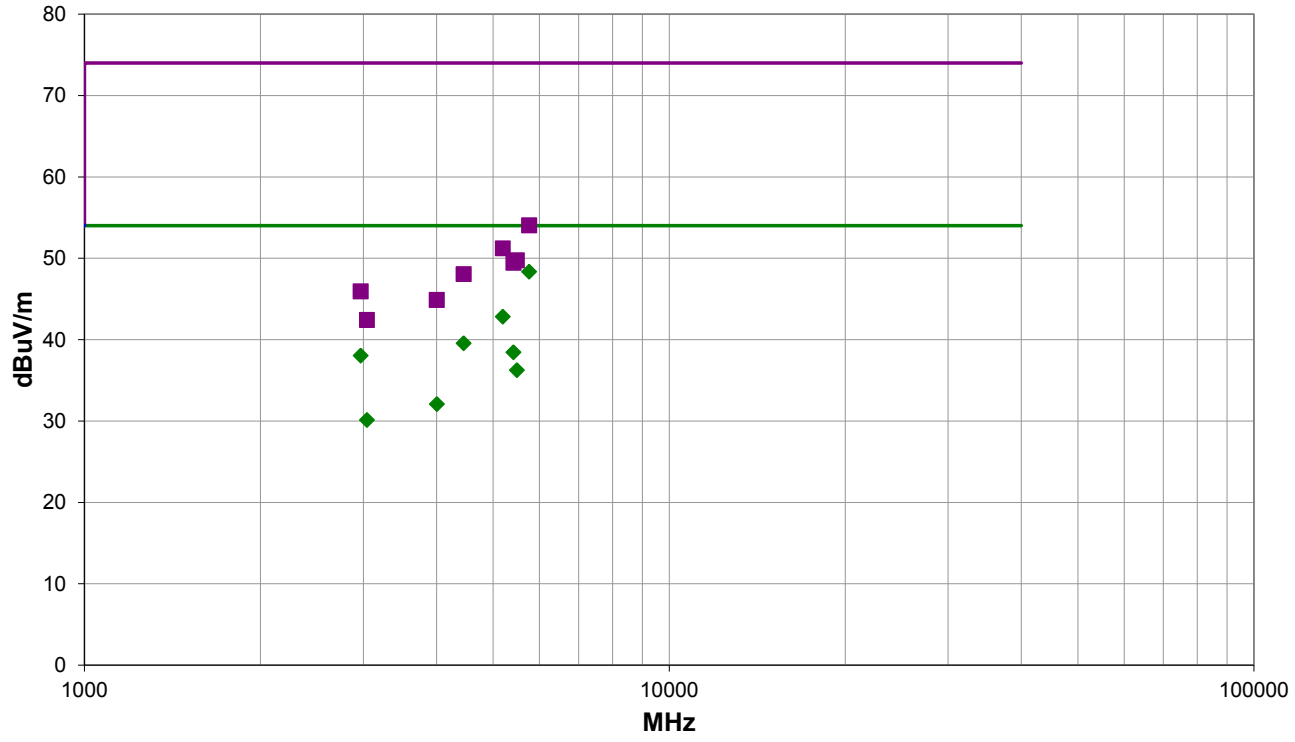
Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Widows 10, radios powered and idle.

DEVIATIONS FROM TEST STANDARD

None



Run #: 2 ■ PK ◆ AV ● QP

RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #2

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
5760.010	37.8	10.6	1.0	142.0	3.0	0.0	Horz	AV	0.0	48.4	54.0	-5.6
5192.305	35.2	7.6	1.2	14.0	3.0	0.0	Vert	AV	0.0	42.8	54.0	-11.2
4450.555	33.3	6.3	1.2	180.0	3.0	0.0	Horz	AV	0.0	39.6	54.0	-14.4
5414.835	29.5	9.0	1.2	148.0	3.0	0.0	Horz	AV	0.0	38.5	54.0	-15.5
2967.045	38.7	-0.7	1.2	158.0	3.0	0.0	Horz	AV	0.0	38.0	54.0	-16.0
5489.005	26.8	9.5	1.2	349.0	3.0	0.0	Vert	AV	0.0	36.3	54.0	-17.7
5759.915	43.5	10.6	1.0	142.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9
4005.515	26.4	5.7	1.2	57.0	3.0	0.0	Vert	AV	0.0	32.1	54.0	-21.9
5192.340	43.6	7.6	1.2	14.0	3.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8
3041.225	30.1	0.0	1.2	182.0	3.0	0.0	Horz	AV	0.0	30.1	54.0	-23.9
5489.060	40.3	9.5	1.2	349.0	3.0	0.0	Vert	PK	0.0	49.8	74.0	-24.2
5415.000	40.5	9.0	1.2	148.0	3.0	0.0	Horz	PK	0.0	49.5	74.0	-24.5
4450.690	41.8	6.3	1.2	180.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9
2967.080	46.6	-0.7	1.2	158.0	3.0	0.0	Horz	PK	0.0	45.9	74.0	-28.1
4004.150	39.2	5.7	1.2	57.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1
3041.165	42.4	0.0	1.2	182.0	3.0	0.0	Horz	PK	0.0	42.4	74.0	-31.6

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS HIGH FREQUENCY

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	10/7/2014	10/07/2015
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	1/27/2015	01/27/2016
Cable	None	Conducted Cable	EVG	5/12/2015	05/12/2016
Attenuator, BNC 10 Watt	Fairview Microwave	SA6B10W-20	TQQ	11/20/2014	11/20/2015
High Pass Filter	TTE	H97-100K-50-720B	HHD	1/5/2015	01/05/2016
Receiver	Rohde & Schwarz	ESCI	ARH	3/11/2015	03/11/2016

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

INTE5584-1
INTE5584-3

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	23.9°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.1 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	INTE5584-1

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.107:2015	ANSI C63.4:2009
ICES-003:2012	ANSI C63.4:2014

TEST PARAMETERS

Run #:	3	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

Tablet face up on table.

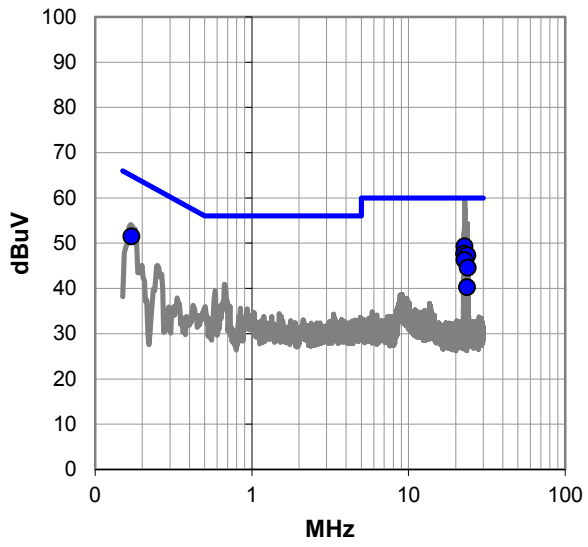
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

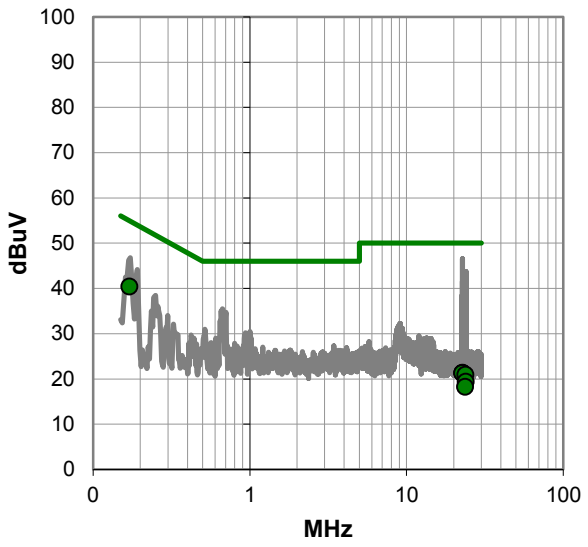
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.858	28.1	21.2	49.3	60.0	-10.7
22.738	26.5	21.2	47.7	60.0	-12.3
23.772	26.1	21.2	47.3	60.0	-12.7
0.171	31.5	20.0	51.5	64.9	-13.4
22.794	25.1	21.2	46.3	60.0	-13.7
23.919	23.3	21.2	44.5	60.0	-15.5
23.691	19.0	21.2	40.2	60.0	-19.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.171	20.4	20.0	40.4	54.9	-14.5
22.858	0.2	21.2	21.4	50.0	-28.6
22.794	0.1	21.2	21.3	50.0	-28.7
22.738	0.1	21.2	21.3	50.0	-28.7
23.772	-0.3	21.2	20.9	50.0	-29.1
23.919	-1.9	21.2	19.3	50.0	-30.7
23.691	-3.0	21.2	18.2	50.0	-31.8

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	23.9°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.1 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	INTE5584-1

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.107:2015	ANSI C63.4:2009
ICES-003:2012	ANSI C63.4:2014

TEST PARAMETERS

Run #:	4	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

Tablet face up on table.

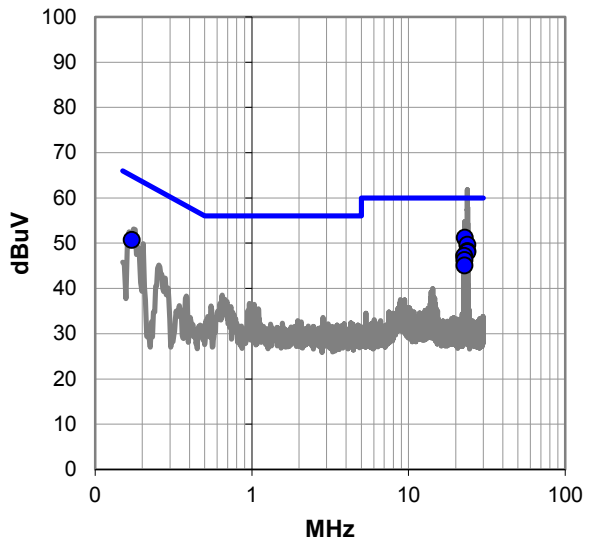
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

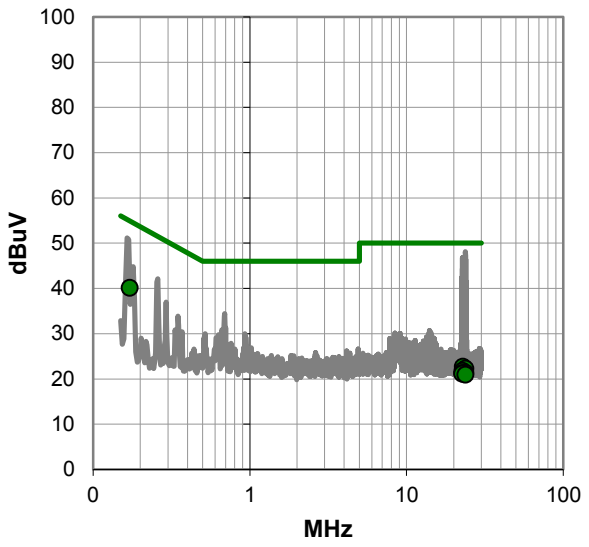
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.893	30.0	21.2	51.2	60.0	-8.8
23.805	28.4	21.2	49.6	60.0	-10.4
23.849	27.0	21.2	48.2	60.0	-11.8
23.782	26.8	21.2	48.0	60.0	-12.0
22.759	26.0	21.2	47.2	60.0	-12.8
22.829	25.1	21.2	46.3	60.0	-13.7
0.171	30.7	20.0	50.7	64.9	-14.2
22.810	23.9	21.2	45.1	60.0	-14.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.171	20.1	20.0	40.1	54.9	-14.8
22.893	1.5	21.2	22.7	50.0	-27.3
23.805	1.0	21.2	22.2	50.0	-27.8
22.829	0.6	21.2	21.8	50.0	-28.2
23.782	0.1	21.2	21.3	50.0	-28.7
22.810	0.1	21.2	21.3	50.0	-28.7
22.759	0.0	21.2	21.2	50.0	-28.8
23.849	-0.3	21.2	20.9	50.0	-29.1

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	23.9°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.1 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	230VAC/50Hz	Configuration:	INTE5584-1

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008

TEST PARAMETERS

Run #:	5	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

Tablet face up on table.

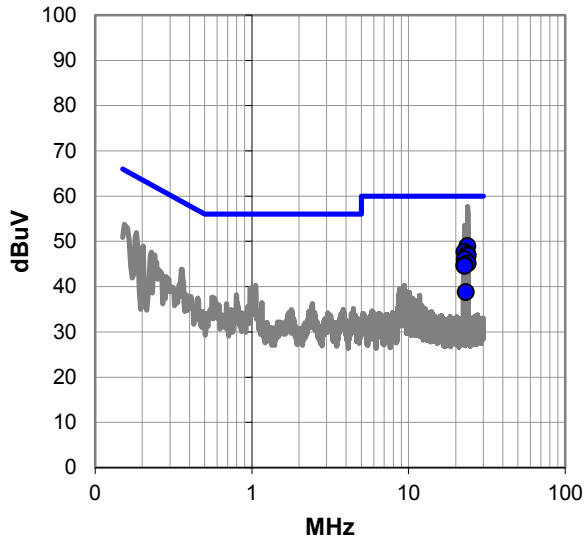
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

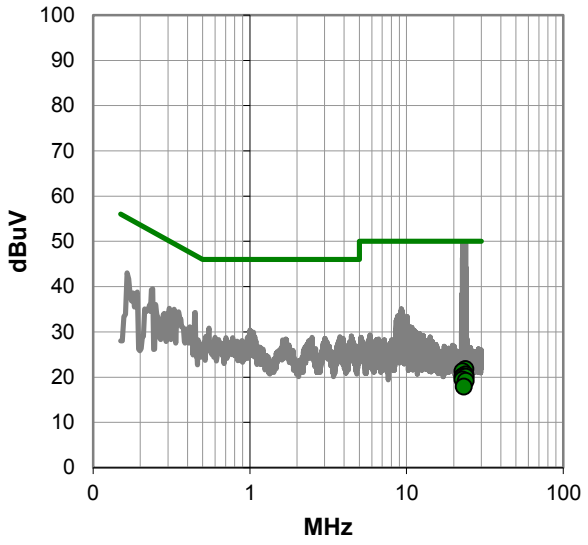
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
23.823	27.7	21.2	48.9	60.0	-11.1
22.775	26.5	21.2	47.7	60.0	-12.3
23.856	25.9	21.2	47.1	60.0	-12.9
23.875	25.6	21.2	46.8	60.0	-13.2
22.887	24.9	21.2	46.1	60.0	-13.9
23.926	23.9	21.2	45.1	60.0	-14.9
22.862	23.6	21.2	44.8	60.0	-15.2
22.817	23.4	21.2	44.6	60.0	-15.4
23.205	17.6	21.2	38.8	60.0	-21.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
23.823	0.5	21.2	21.7	50.0	-28.3
22.775	0.1	21.2	21.3	50.0	-28.7
23.856	-0.7	21.2	20.5	50.0	-29.5
22.817	-1.0	21.2	20.2	50.0	-29.8
22.887	-1.1	21.2	20.1	50.0	-29.9
23.875	-1.2	21.2	20.0	50.0	-30.0
22.862	-1.7	21.2	19.5	50.0	-30.5
23.926	-2.1	21.2	19.1	50.0	-30.9
23.205	-3.3	21.2	17.9	50.0	-32.1

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	23.9°C
Attendees:	Mike Lowe	Relative Humidity:	40%
Customer Project:	SKL21-SDS	Bar. Pressure:	1019.1 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	230VAC/50Hz	Configuration:	INTE5584-1

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008

TEST PARAMETERS

Run #:	6	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

Tablet face up on table.

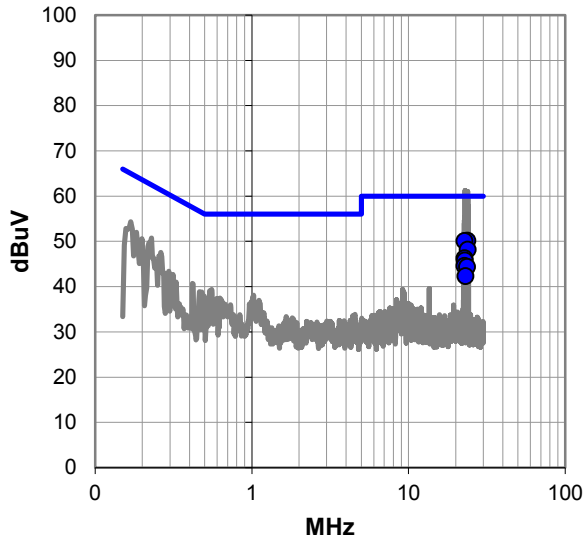
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

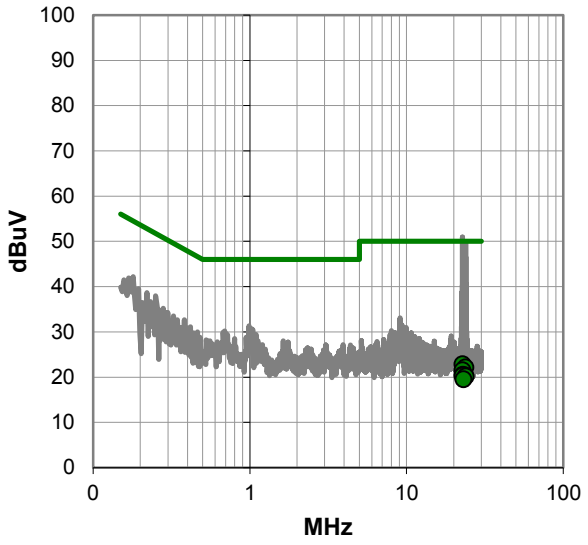
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
23.826	28.9	21.2	50.1	60.0	-9.9
22.787	28.9	21.2	50.1	60.0	-9.9
23.890	26.9	21.2	48.1	60.0	-11.9
22.804	25.1	21.2	46.3	60.0	-13.7
22.888	24.6	21.2	45.8	60.0	-14.2
22.828	23.4	21.2	44.6	60.0	-15.4
23.693	23.1	21.2	44.3	60.0	-15.7
23.091	21.1	21.2	42.3	60.0	-17.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.787	1.7	21.2	22.9	50.0	-27.1
23.826	0.9	21.2	22.1	50.0	-27.9
22.804	0.3	21.2	21.5	50.0	-28.5
22.888	-0.7	21.2	20.5	50.0	-29.5
23.693	-0.9	21.2	20.3	50.0	-29.7
22.828	-0.9	21.2	20.3	50.0	-29.7
23.890	-1.1	21.2	20.1	50.0	-29.9
23.091	-1.7	21.2	19.5	50.0	-30.5

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	24.9°C
Attendees:	Mike Lowe	Relative Humidity:	41.3%
Customer Project:	SKL21-SDS	Bar. Pressure:	1017.3 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.107:2015	ANSI C63.4:2009
ICES-003:2012	ANSI C63.4:2014

TEST PARAMETERS

Run #:	11	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

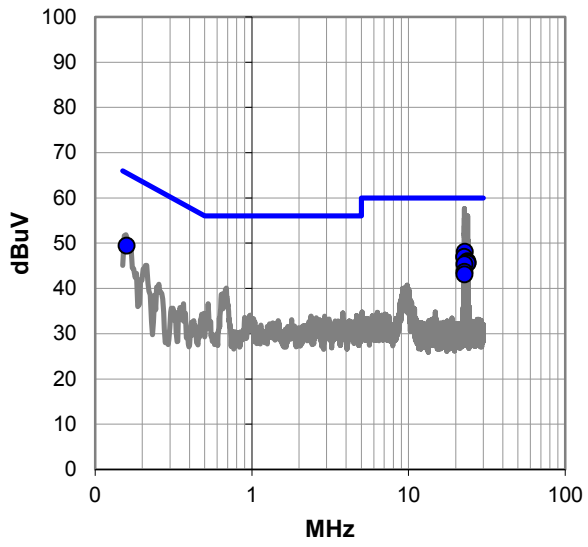
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

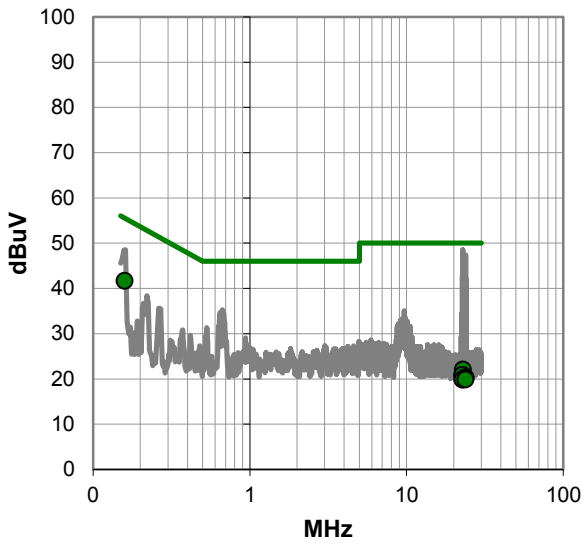
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #11

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.879	26.9	21.2	48.1	60.0	-11.9
22.727	25.8	21.1	46.9	60.0	-13.1
23.855	24.7	21.2	45.9	60.0	-14.1
23.955	24.4	21.2	45.6	60.0	-14.4
23.783	24.3	21.2	45.5	60.0	-14.5
22.851	24.2	21.2	45.4	60.0	-14.6
0.159	29.4	20.1	49.5	65.5	-16.1
22.764	22.5	21.2	43.7	60.0	-16.3
22.802	21.9	21.2	43.1	60.0	-16.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.159	21.6	20.1	41.7	55.5	-13.9
22.879	0.9	21.2	22.1	50.0	-27.9
22.851	-0.3	21.2	20.9	50.0	-29.1
22.727	-0.3	21.1	20.8	50.0	-29.2
23.783	-0.9	21.2	20.3	50.0	-29.7
23.955	-1.1	21.2	20.1	50.0	-29.9
22.802	-1.3	21.2	19.9	50.0	-30.1
22.764	-1.3	21.2	19.9	50.0	-30.1
23.855	-1.4	21.2	19.8	50.0	-30.2

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	24.9°C
Attendees:	Mike Lowe	Relative Humidity:	41.3%
Customer Project:	SKL21-SDS	Bar. Pressure:	1017.3 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.107:2015	ANSI C63.4:2009
ICES-003:2012	ANSI C63.4:2014

TEST PARAMETERS

Run #:	12	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

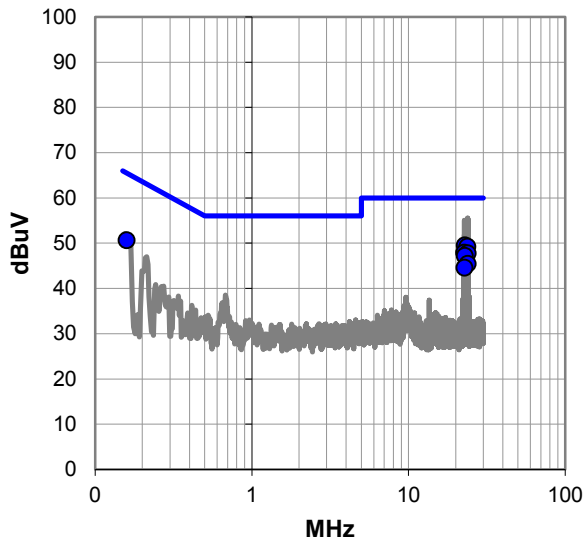
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

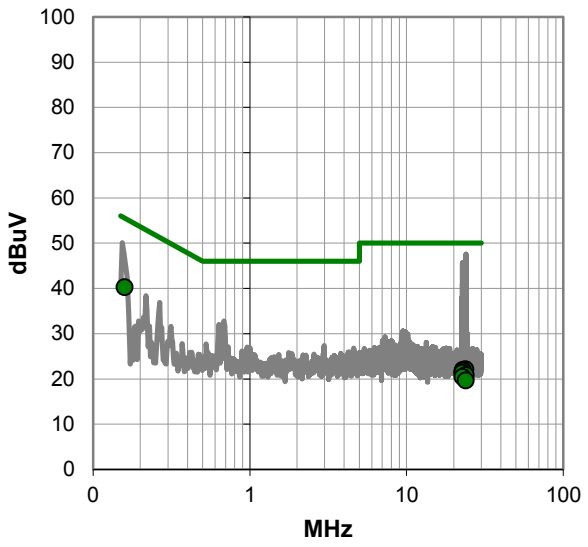
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #12

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.900	28.3	21.2	49.5	60.0	-10.5
23.798	28.0	21.2	49.2	60.0	-10.8
22.753	26.7	21.2	47.9	60.0	-12.1
23.943	26.5	21.2	47.7	60.0	-12.3
22.879	26.0	21.2	47.2	60.0	-12.8
23.888	24.2	21.2	45.4	60.0	-14.6
0.159	30.6	20.1	50.7	65.5	-14.9
22.791	23.4	21.2	44.6	60.0	-15.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.159	20.2	20.1	40.3	55.5	-15.3
23.798	0.9	21.2	22.1	50.0	-27.9
22.900	0.8	21.2	22.0	50.0	-28.0
22.879	0.6	21.2	21.8	50.0	-28.2
22.753	0.2	21.2	21.4	50.0	-28.6
23.943	-0.4	21.2	20.8	50.0	-29.2
22.791	-0.7	21.2	20.5	50.0	-29.5
23.888	-1.6	21.2	19.6	50.0	-30.4

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	25°C
Attendees:	Mike Lowe	Relative Humidity:	41.2%
Customer Project:	SKL21-SDS	Bar. Pressure:	1016.9 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	230VAC/50Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008

TEST PARAMETERS

Run #:	13	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

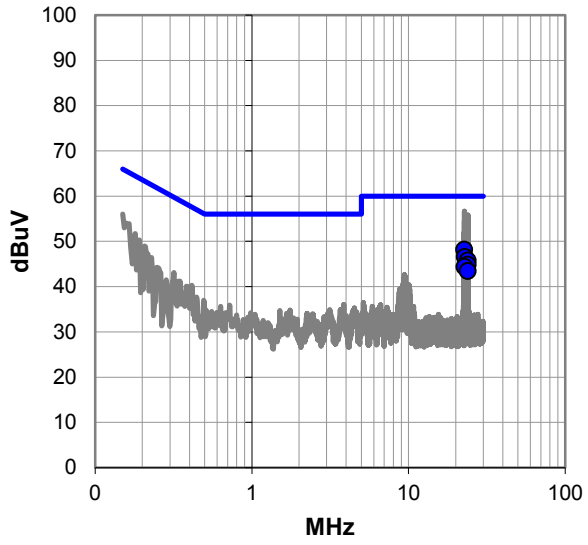
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

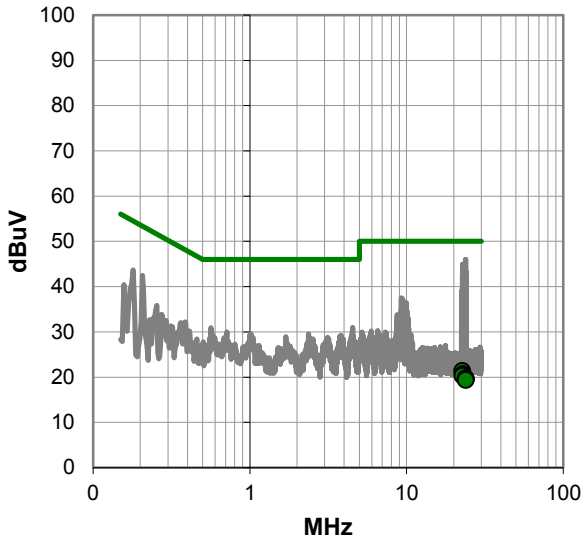
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #13

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.742	27.0	21.2	48.2	60.0	-11.8
22.882	25.4	21.2	46.6	60.0	-13.4
23.866	24.5	21.2	45.7	60.0	-14.3
23.962	23.6	21.2	44.8	60.0	-15.2
22.817	23.2	21.2	44.4	60.0	-15.6
23.916	22.2	21.2	43.4	60.0	-16.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.742	0.2	21.2	21.4	50.0	-28.6
22.882	-0.5	21.2	20.7	50.0	-29.3
22.817	-0.9	21.2	20.3	50.0	-29.7
23.866	-1.5	21.2	19.7	50.0	-30.3
23.916	-1.7	21.2	19.5	50.0	-30.5
23.962	-1.9	21.2	19.3	50.0	-30.7

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/16/2015
Customer:	Intel Corporation	Temperature:	25°C
Attendees:	Mike Lowe	Relative Humidity:	41.2%
Customer Project:	SKL21-SDS	Bar. Pressure:	1016.9 mb
Tested By:	Dan Haas	Job Site:	EV07
Power:	230VAC/50Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
EN 55022: 2010	CISPR 22:2008

TEST PARAMETERS

Run #:	14	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

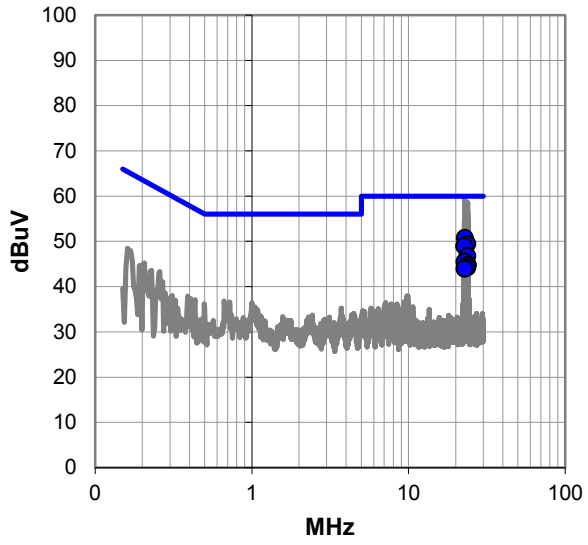
EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. All radios at idle.

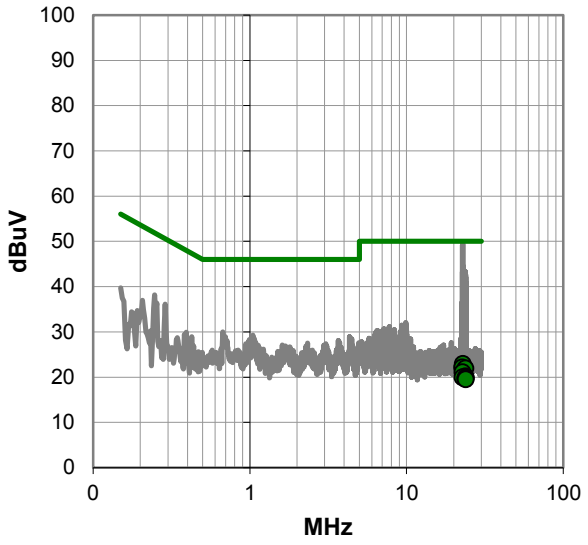
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.886	29.6	21.2	50.8	60.0	-9.2
23.802	28.2	21.2	49.4	60.0	-10.6
22.736	27.8	21.2	49.0	60.0	-11.0
23.847	25.5	21.2	46.7	60.0	-13.3
22.843	24.3	21.2	45.5	60.0	-14.5
23.946	23.5	21.2	44.7	60.0	-15.3
23.884	23.5	21.2	44.7	60.0	-15.3
23.781	23.0	21.2	44.2	60.0	-15.8
22.782	22.8	21.2	44.0	60.0	-16.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
22.886	1.7	21.2	22.9	50.0	-27.1
22.736	1.0	21.2	22.2	50.0	-27.8
23.802	0.7	21.2	21.9	50.0	-28.1
22.843	-0.1	21.2	21.1	50.0	-28.9
23.847	-1.1	21.2	20.1	50.0	-29.9
22.782	-1.2	21.2	20.0	50.0	-30.0
23.946	-1.4	21.2	19.8	50.0	-30.2
23.781	-1.5	21.2	19.7	50.0	-30.3
23.884	-1.7	21.2	19.5	50.0	-30.5

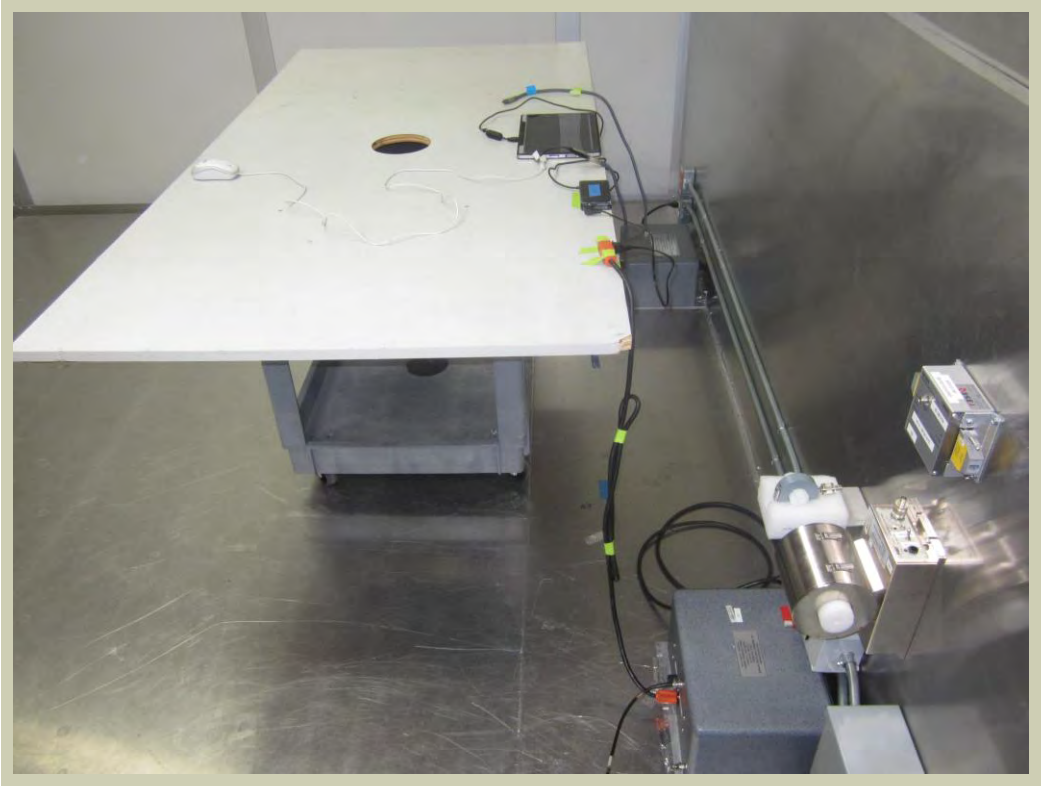
CONCLUSION

Pass

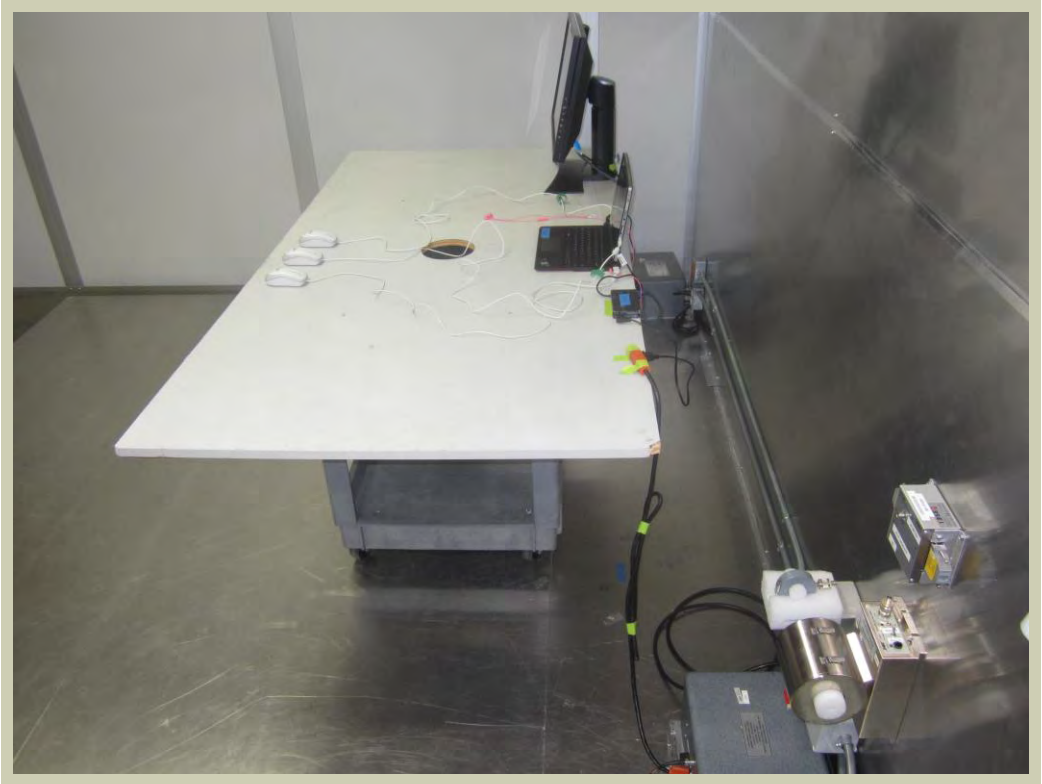
Tested By

CONDUCTED EMISSIONS

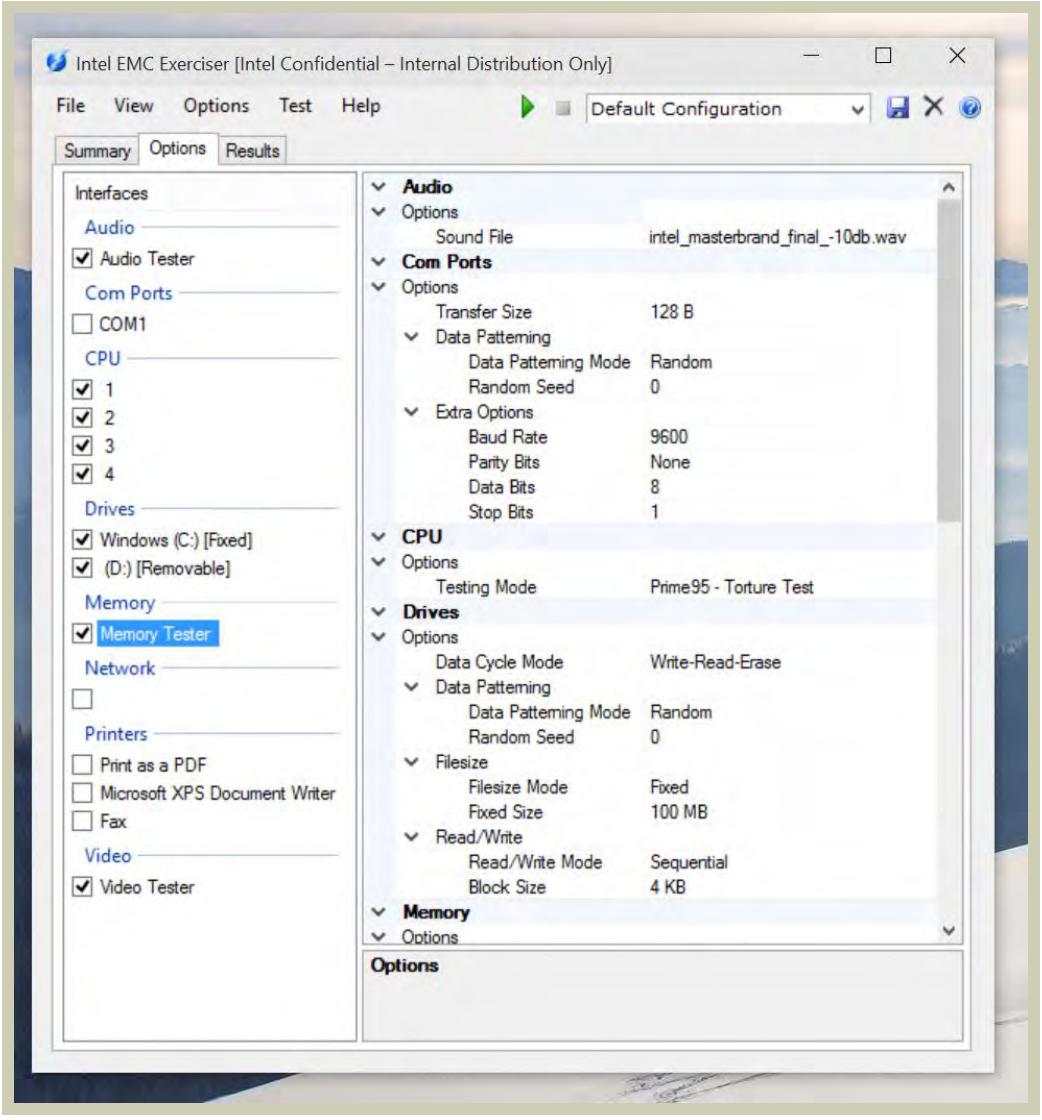
CONDUCTED EMISSIONS



CONDUCTED EMISSIONS



EMC EXERCISER SETTINGS



HARMONIC CURRENT EMISSIONS

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

This test measures the harmonic currents injected into the AC mains by the EUT. It is applicable to electrical and electronic equipment having an input current up to and including 16A per phase, and intended to be connected to public low-voltage distribution systems of between 220 V and 250 V at 50 Hz line to neutral.

The test is conducted using frequency domain instrumentation as described in EN 61000-3-2 Annex B. The amplitude of each specific harmonic is measured.

The necessary observation period for the test is determined by the repeating the test until the repeatability requirement, as stated in standard in paragraph 6.3.2.1 has been met.

The repeatability of the average value for the individual harmonic currents over the entire test observation period shall be better than ±5 % of the applicable limit, when the following conditions are met:
– the same equipment under test (EUT);
– identical test conditions;
– the same test system;
– identical climatic conditions, if relevant.

Equipment Classification

Class A: *Balanced three-phase equipment, household appliances, tools (excluding portable), dimmers for incandescent lamps, audio equipment.*
Equipment not specified in one of the three other classes shall be Class A

Class B: *Portable tools, Arc welding equipment*

Class C: *Lighting equipment*

Class D: *Equipment having specified power according to EN 61000-3-2 of P≤ 600 W, of the following equipment types:*
Personal Computers, Personal Computer Monitors and Television Receivers.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Harmonics/Flicker System	Teseq	5001IX-CTS-160-413-TSQ	THV	3/20/2013	03/20/2016
5kVA AC Power Source	Teseq	NSG 1007-5	THW	11/12/2013	11/12/2016

CONFIGURATIONS INVESTIGATED

INTE5584-3

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

HARMONIC CURRENT EMISSIONS

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/18/2015
Customer:	Intel Corporation	Temperature:	24°C
Attendees:	Mike Lowe	Relative Humidity:	40.1%
Customer Project:	SKL21-SDS	Bar. Pressure:	1007.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	230VAC/50Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification:	Method:
EN 61000-3-2:2014	IEC 61000-3-2:2014

TEST PARAMETERS

Equipment Class:	A	Fund. Current (A):	0.062	Power Factor:	0.335	Test Duration (min):	2.5
Ave. Input Curr. (A):	0.173	Maximum THC (A):	0.16	Meas. Power (W):	13.3		

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

RESULTS

Pass
Repeatability of results of measurements Passed.

Tested By

HARMONIC CURRENT EMISSIONS

NORTHWEST EMC
WTD.2015.05.26

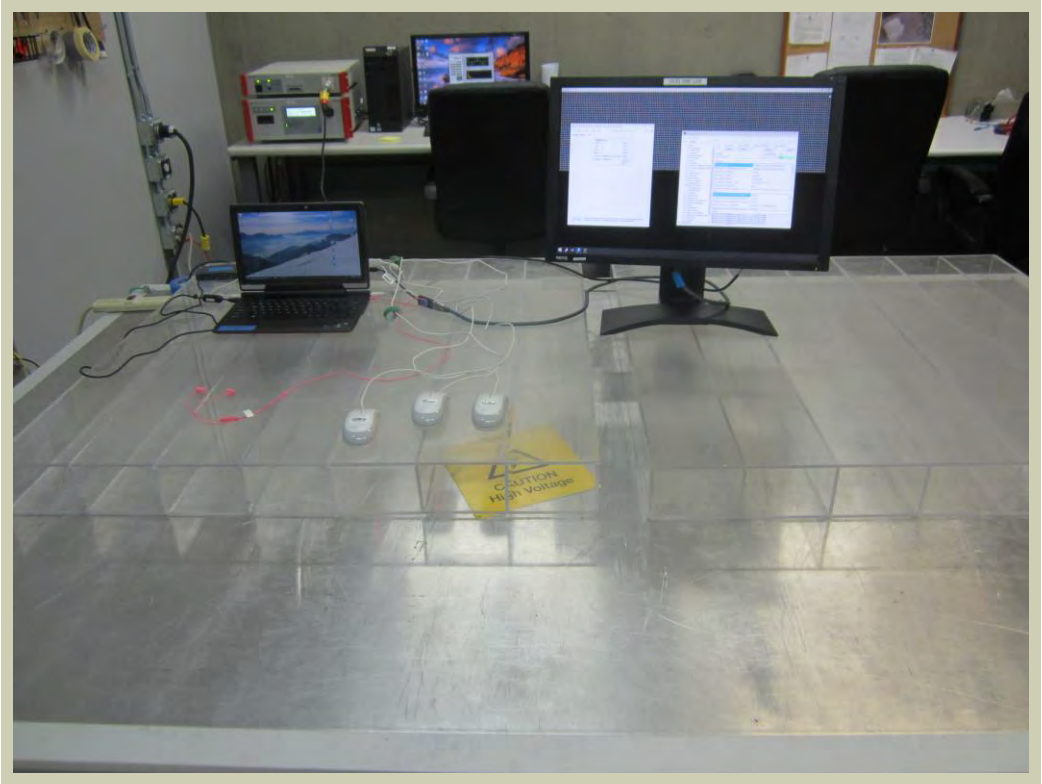
TEST 1

Harmonic	Limit 1 (L1)	Limit 2 (L2)	Average (AV) Reading	AV < L1	AV < L2	Max Reading	Max < L2	Pass/Fail
2	1.080A	1.620A	0.002A	Y	Y	0.003A	Y	Pass
3	2.300A	3.450A	0.056A	Y	Y	0.056A	Y	Pass
4	0.430A	0.645A	0.002A	Y	Y	0.003A	Y	Pass
5	1.140A	1.710A	0.055A	Y	Y	0.055A	Y	Pass
6	0.300A	0.450A	0.002A	Y	Y	0.003A	Y	Pass
7	0.770A	1.155A	0.053A	Y	Y	0.053A	Y	Pass
8	0.230A	0.345A	0.002A	Y	Y	0.003A	Y	Pass
9	0.400A	0.600A	0.051A	Y	Y	0.051A	Y	Pass
10	0.184A	0.276A	0.002A	Y	Y	0.003A	Y	Pass
11	0.330A	0.495A	0.049A	Y	Y	0.049A	Y	Pass
12	0.153A	0.230A	0.002A	Y	Y	0.003A	Y	Pass
13	0.210A	0.315A	0.047A	Y	Y	0.047A	Y	Pass
14	0.131A	0.197A	0.002A	Y	Y	0.003A	Y	Pass
15	0.150A	0.225A	0.044A	Y	Y	0.044A	Y	Pass
16	0.115A	0.173A	0.002A	Y	Y	0.003A	Y	Pass
17	0.132A	0.199A	0.041A	Y	Y	0.041A	Y	Pass
18	0.102A	0.153A	0.002A	Y	Y	0.003A	Y	Pass
19	0.118A	0.178A	0.037A	Y	Y	0.037A	Y	Pass
20	0.092A	0.138A	0.002A	Y	Y	0.003A	Y	Pass
21	0.107A	0.161A	0.034A	Y	Y	0.034A	Y	Pass
22	0.084A	0.125A	0.002A	Y	Y	0.002A	Y	Pass
23	0.098A	0.147A	0.030A	Y	Y	0.031A	Y	Pass
24	0.077A	0.115A	0.002A	Y	Y	0.002A	Y	Pass
25	0.090A	0.135A	0.027A	Y	Y	0.027A	Y	Pass
26	0.071A	0.106A	0.002A	Y	Y	0.002A	Y	Pass
27	0.083A	0.125A	0.024A	Y	Y	0.024A	Y	Pass
28	0.066A	0.099A	0.002A	Y	Y	0.002A	Y	Pass
29	0.078A	0.116A	0.020A	Y	Y	0.020A	Y	Pass
30	0.061A	0.092A	0.001A	Y	Y	0.002A	Y	Pass
31	0.073A	0.109A	0.017A	Y	Y	0.017A	Y	Pass
32	0.058A	0.086A	0.001A	Y	Y	0.002A	Y	Pass
33	0.068A	0.102A	0.014A	Y	Y	0.014A	Y	Pass
34	0.054A	0.081A	0.001A	Y	Y	0.001A	Y	Pass
35	0.064A	0.096A	0.011A	Y	Y	0.011A	Y	Pass
36	0.051A	0.077A	0.001A	Y	Y	0.001A	Y	Pass
37	0.061A	0.091A	0.009A	Y	Y	0.009A	Y	Pass
38	0.048A	0.073A	0.001A	Y	Y	0.001A	Y	Pass
39	0.058A	0.087A	0.006A	Y	Y	0.006A	Y	Pass
40	0.046A	0.069A	0.001A	Y	Y	0.001A	Y	Pass

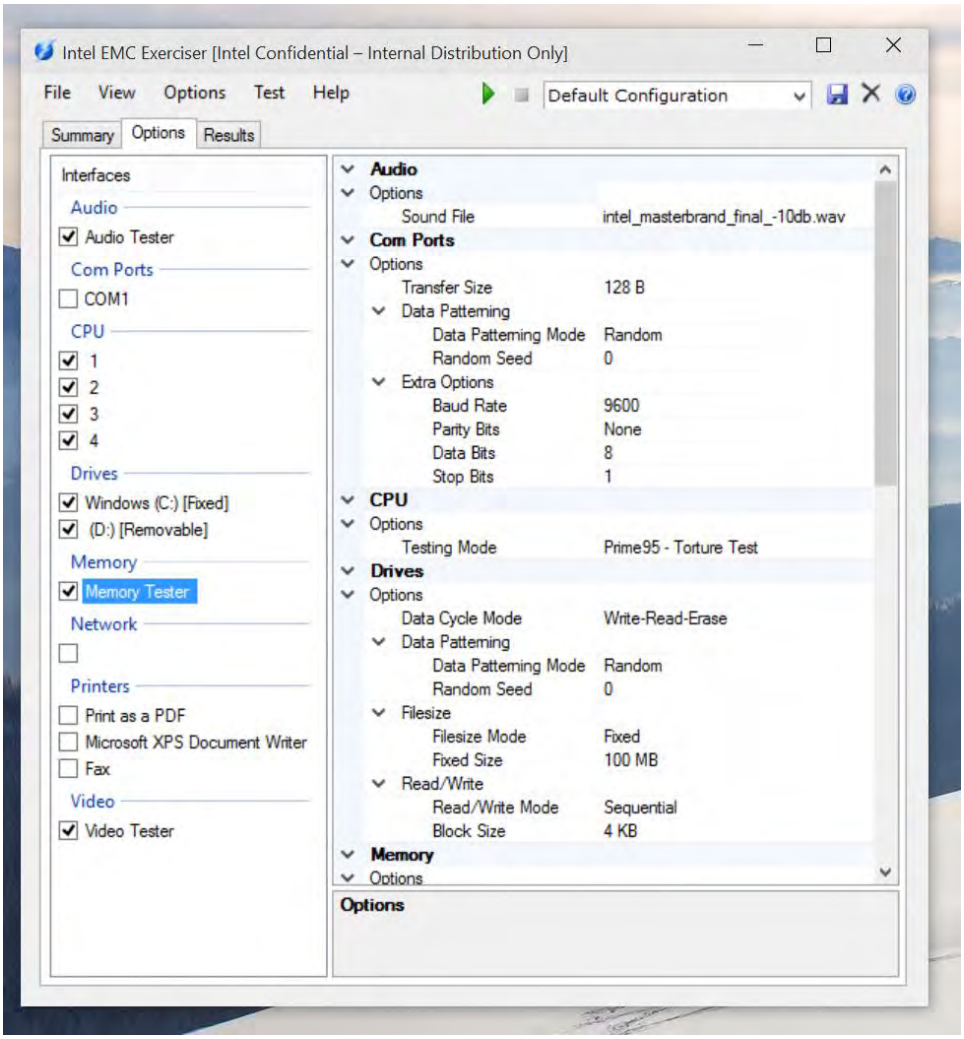
TEST 2

Harmonic	Limit 1 (L1)	Limit 2 (L2)	Average (AV) Reading	AV < L1	AV < L2	Max Reading	Max < L2	Pass/Fail
2	1.080A	1.620A	0.002A	Y	Y	0.003A	Y	Pass
3	2.300A	3.450A	0.056A	Y	Y	0.056A	Y	Pass
4	0.430A	0.645A	0.002A	Y	Y	0.003A	Y	Pass
5	1.140A	1.710A	0.054A	Y	Y	0.055A	Y	Pass
6	0.300A	0.450A	0.002A	Y	Y	0.003A	Y	Pass
7	0.770A	1.155A	0.053A	Y	Y	0.053A	Y	Pass
8	0.230A	0.345A	0.002A	Y	Y	0.003A	Y	Pass
9	0.400A	0.600A	0.051A	Y	Y	0.051A	Y	Pass
10	0.184A	0.276A	0.002A	Y	Y	0.003A	Y	Pass
11	0.330A	0.495A	0.049A	Y	Y	0.049A	Y	Pass
12	0.153A	0.230A	0.002A	Y	Y	0.003A	Y	Pass
13	0.210A	0.315A	0.046A	Y	Y	0.047A	Y	Pass
14	0.131A	0.197A	0.002A	Y	Y	0.003A	Y	Pass
15	0.150A	0.225A	0.044A	Y	Y	0.044A	Y	Pass
16	0.115A	0.173A	0.002A	Y	Y	0.003A	Y	Pass
17	0.132A	0.199A	0.041A	Y	Y	0.041A	Y	Pass
18	0.102A	0.153A	0.002A	Y	Y	0.002A	Y	Pass
19	0.118A	0.178A	0.037A	Y	Y	0.037A	Y	Pass
20	0.092A	0.138A	0.002A	Y	Y	0.002A	Y	Pass
21	0.107A	0.161A	0.034A	Y	Y	0.034A	Y	Pass
22	0.084A	0.125A	0.002A	Y	Y	0.002A	Y	Pass
23	0.098A	0.147A	0.030A	Y	Y	0.031A	Y	Pass
24	0.077A	0.115A	0.002A	Y	Y	0.002A	Y	Pass
25	0.090A	0.135A	0.027A	Y	Y	0.027A	Y	Pass
26	0.071A	0.106A	0.002A	Y	Y	0.002A	Y	Pass
27	0.083A	0.125A	0.024A	Y	Y	0.024A	Y	Pass
28	0.066A	0.099A	0.002A	Y	Y	0.002A	Y	Pass
29	0.078A	0.116A	0.020A	Y	Y	0.020A	Y	Pass
30	0.061A	0.092A	0.001A	Y	Y	0.002A	Y	Pass
31	0.073A	0.109A	0.017A	Y	Y	0.017A	Y	Pass
32	0.058A	0.086A	0.001A	Y	Y	0.001A	Y	Pass
33	0.068A	0.102A	0.014A	Y	Y	0.014A	Y	Pass
34	0.054A	0.081A	0.001A	Y	Y	0.001A	Y	Pass
35	0.064A	0.096A	0.011A	Y	Y	0.011A	Y	Pass
36	0.051A	0.077A	0.001A	Y	Y	0.001A	Y	Pass
37	0.061A	0.091A	0.009A	Y	Y	0.009A	Y	Pass
38	0.048A	0.073A	0.001A	Y	Y	0.001A	Y	Pass
39	0.058A	0.087A	0.006A	Y	Y	0.007A	Y	Pass
40	0.046A	0.069A	0.001A	Y	Y	0.001A	Y	Pass

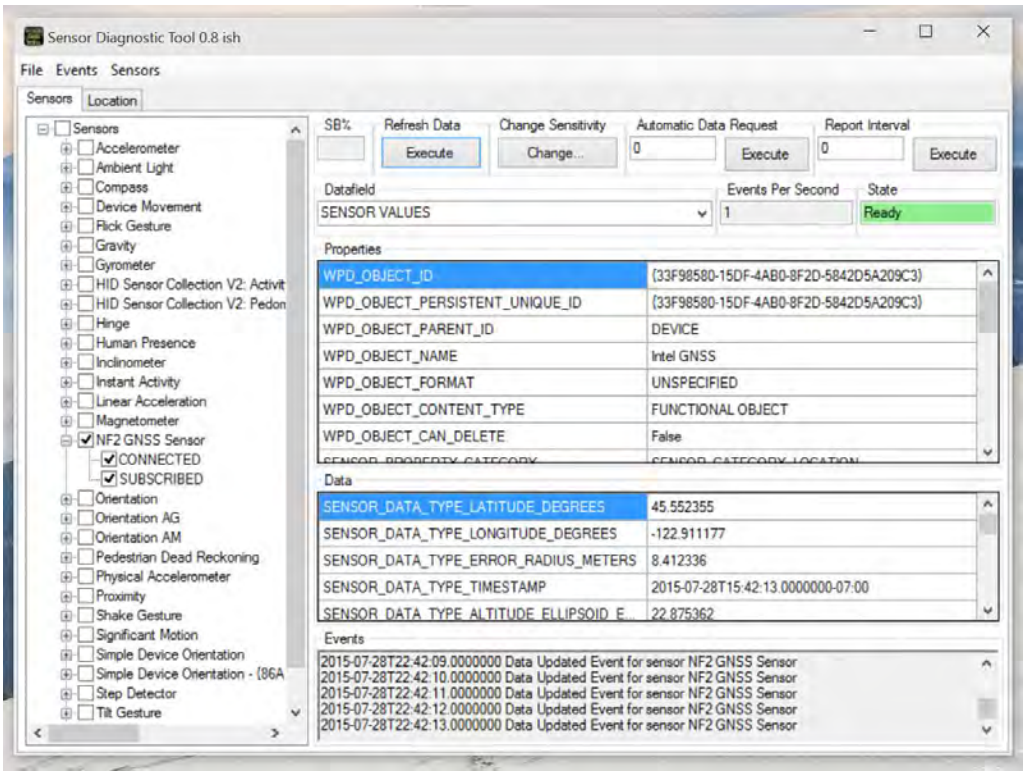
HARMONIC CURRENT EMISSIONS



EMC EXERCISER SETTINGS



GPS READINGS



VOLTAGE FLUCTUATIONS AND FLICKER

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

This test measures the voltage fluctuations and flicker impressed on the AC mains by the EUT. It is applicable to electrical and electronic equipment having an input current up to and including 16A per phase, and intended to be connected to public low-voltage distribution systems of between 220 V and 250 V at 50 Hz line to neutral.

The test is conducted using frequency domain instrumentation as described in EN 61000-3-3 Section 4. All types of voltage fluctuations are assessed at the supply terminals of the EUT by direct measurement using a flickermeter, which complies with the specification given in IEC 868.

The percentage total harmonic distortion of the supply voltage shall be less than 3%.

Equipment that employs varying duty cycle or multiple loads operating simultaneously is evaluated against the Plt (Long Term Flicker) requirement. The value is made up of 12 consecutive Pst (Short Term Flicker) values per the specified formula. All other equipment is assessed against the Pst requirement.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Harmonics/Flicker System	Teseq	5001IX-CTS-160-413-TSQ	THV	3/20/2013	03/20/2016
5kVA AC Power Source	Teseq	NSG 1007-5	THW	11/12/2013	11/12/2016

CONFIGURATIONS INVESTIGATED

INTE5584-3

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

VOLTAGE FLUCTUATIONS AND FLICKER

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/18/2015
Customer:	Intel Corporation	Temperature:	24°C
Attendees:	Mike Lowe	Relative Humidity:	40.1%
Customer Project:	SKL21-SDS	Bar. Pressure:	1007.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	230VAC/50Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification:	Method:
EN 61000-3-3:2013	IEC 61000-3-3:2013

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

TEST PARAMETERS

Periods Run	N = 1

TEST DATA

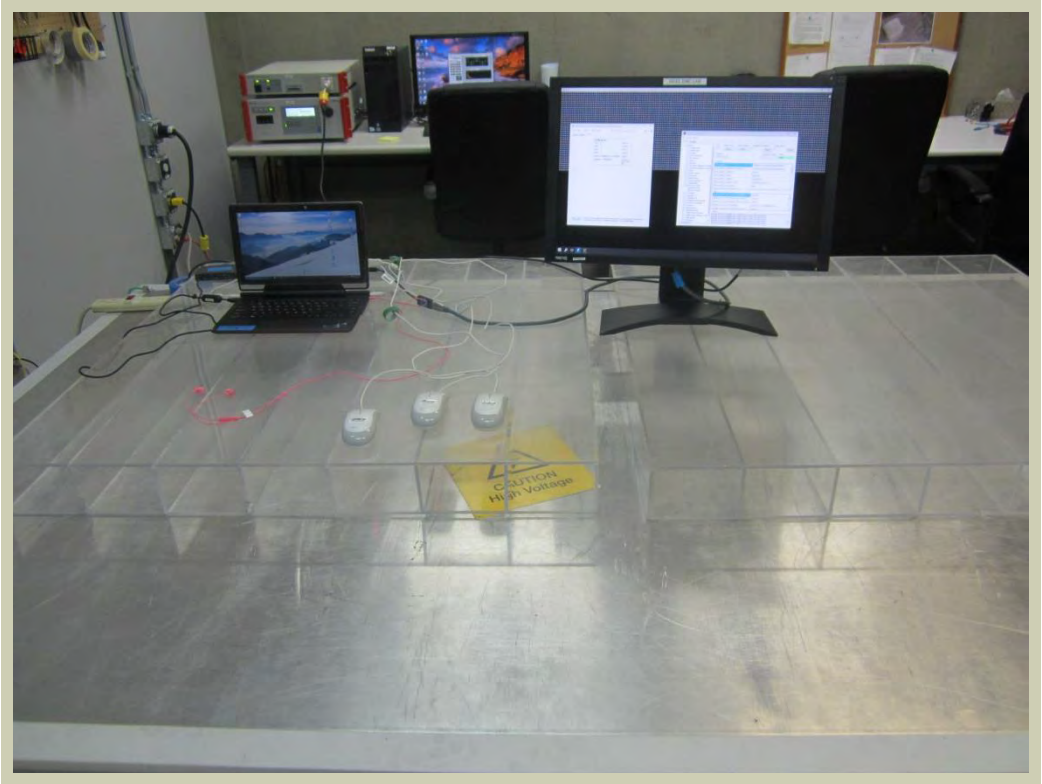
Parameter	Limit	Reading	Result
dc - the relative steady-state voltage change	3.3%	0	Pass
dmax - the maximum relative voltage change	4% (without additional conditions)	0	Pass
d(t) - the relative voltage change **	Shall not exceed 3.3% for more than 500ms	0	Pass
Pst - short-term flicker	1.0	0.064	Pass
Plt - long-term flicker	0.65	0.064	Pass

The time function of the r.m.s. voltage change evaluated as a single value for each successive half period between zero-crossings of the source voltage between time intervals in which the voltage is in a steady-state condition for at least 1 s.

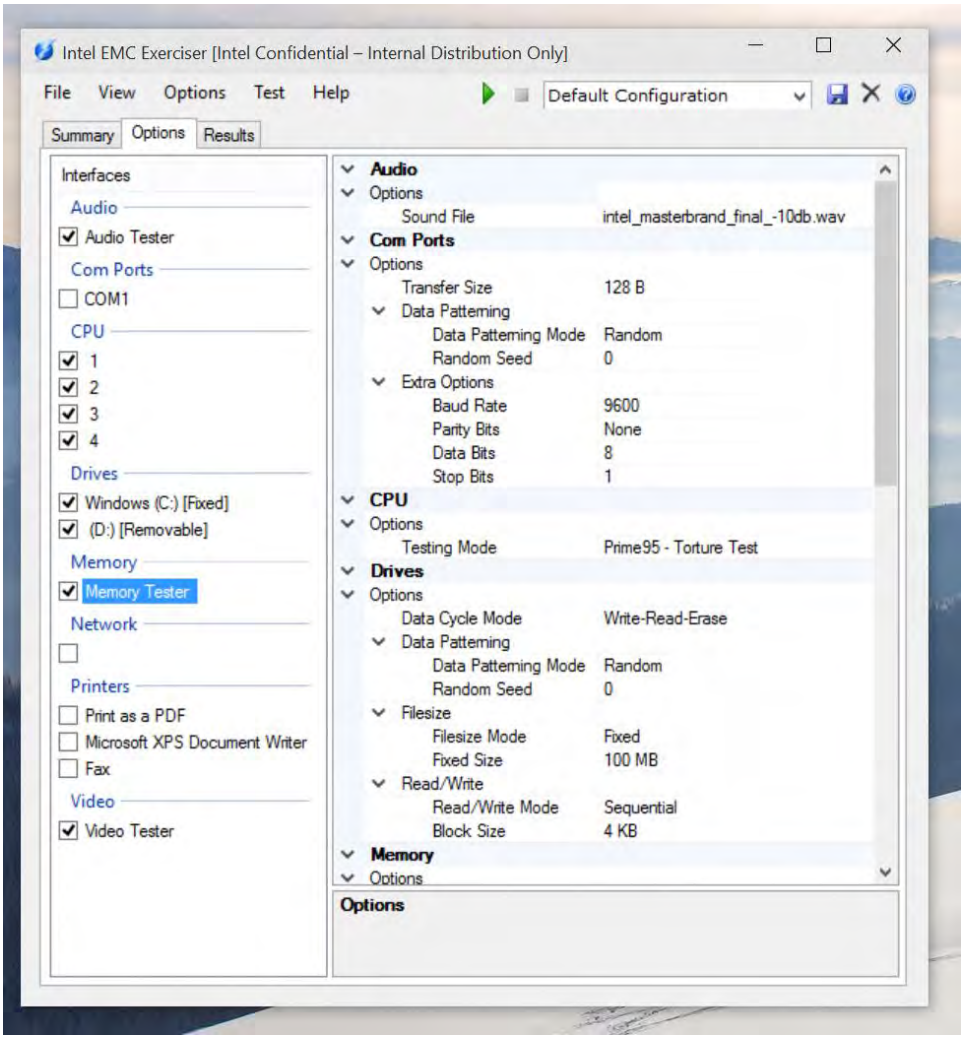
RESULTS

Pass

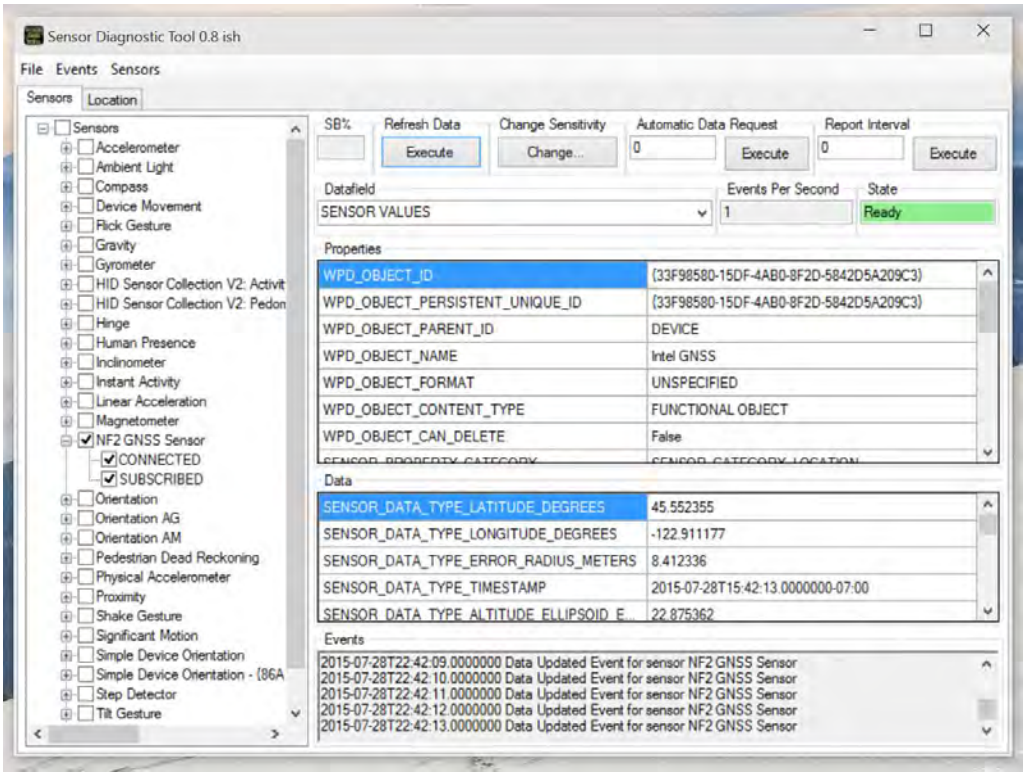
Tested By


CAUTION
High Voltage

EMC EXERCISER SETTINGS



GPS READINGS



ELECTROSTATIC DISCHARGE (ESD)

WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, the ESD Immunity test was performed according to the test method and the product related standard(s) listed on the data sheets. If called out, contact discharges were applied to the conductive accessible surfaces of the EUT and the coupling plane(s). If called out, air discharges were applied to accessible insulating surfaces and conductive non-accessible portions of accessible parts of the EUT as required by the product related standard. The number of discharges specified on the data sheets applies to each test voltage, preselected point, and each polarity (ie 25 at +4 kV and 25 at -4 kV). If the EUT was tested with a vertical coupling plane, testing on all four sides (front, back, left, right) was performed unless otherwise noted. The pictures depict one of those orientations. If a response was detected after discharge, the type of response, discharge level, and location were noted.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
ESD Gun	ThermoFisher Scientific	MZ-15/EC	IGR	5/7/2015	10/07/2015

CONFIGURATIONS INVESTIGATED

INTE5584-3

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/22/2015
Customer:	Intel Corporation	Temperature:	24.9°C
Attendees:	Mike Lowe	Relative Humidity:	40.8%
Customer Project:	SKL21-SDS	Bar. Pressure:	1011.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV03
Power:	230VAC/50Hz		

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-2:2008

TEST PARAMETERS

Energy Storage Capacitor:	150pf	Discharge Resistance:	330 ohms
Polarity of Output Voltage:	Positive and Negative	Time Between Successive Discharges:	>= 1 sec

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

TEST RESULT

See the following data sheets.

CONCLUSION

Meets NWEMC Performance Criteria	A

The EUT exhibited no change in performance when operating as specified by the manufacturer.

Tested By

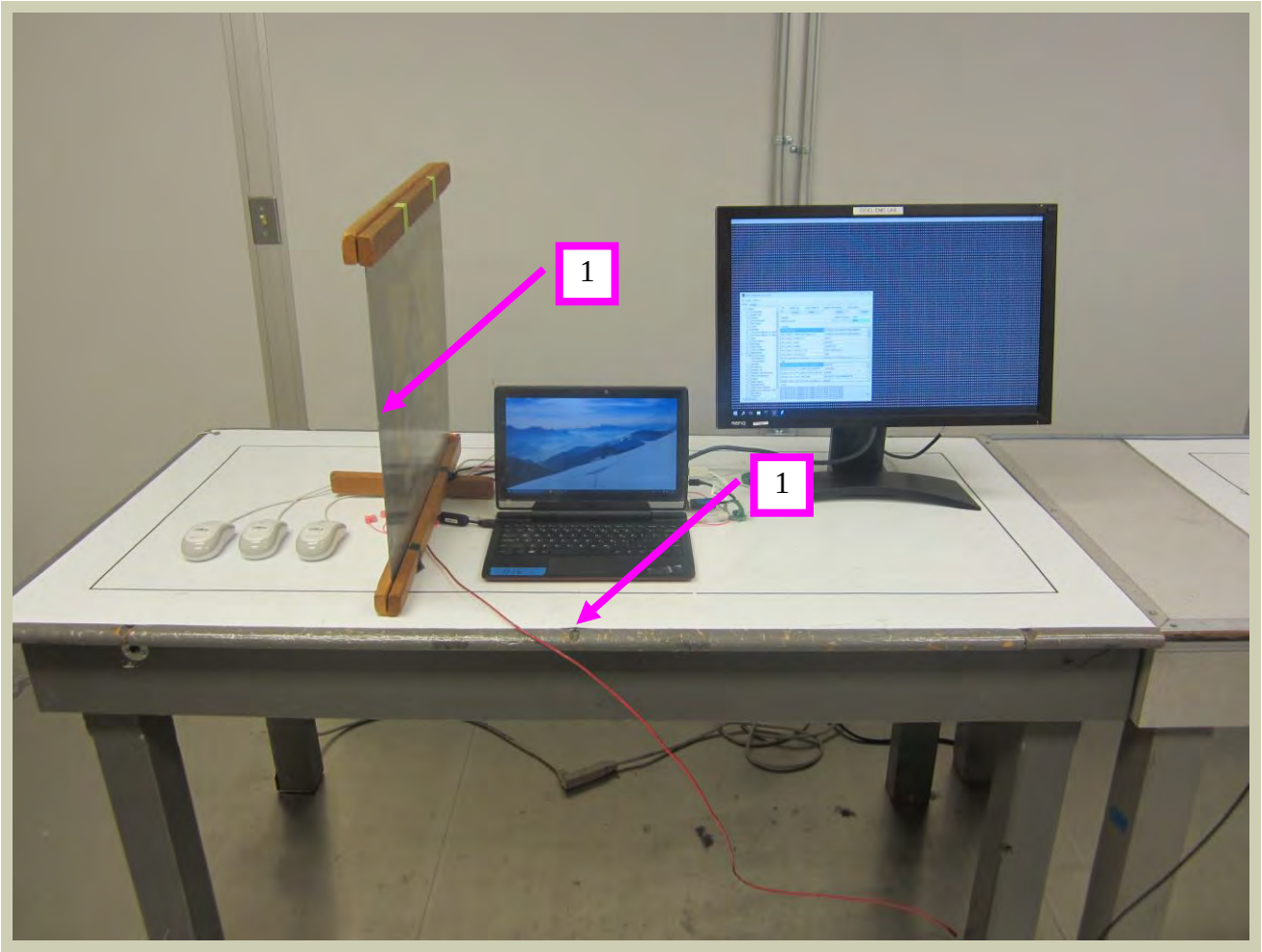
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

CONTACT DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 4
Number of Discharges, Each Polarity	25

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

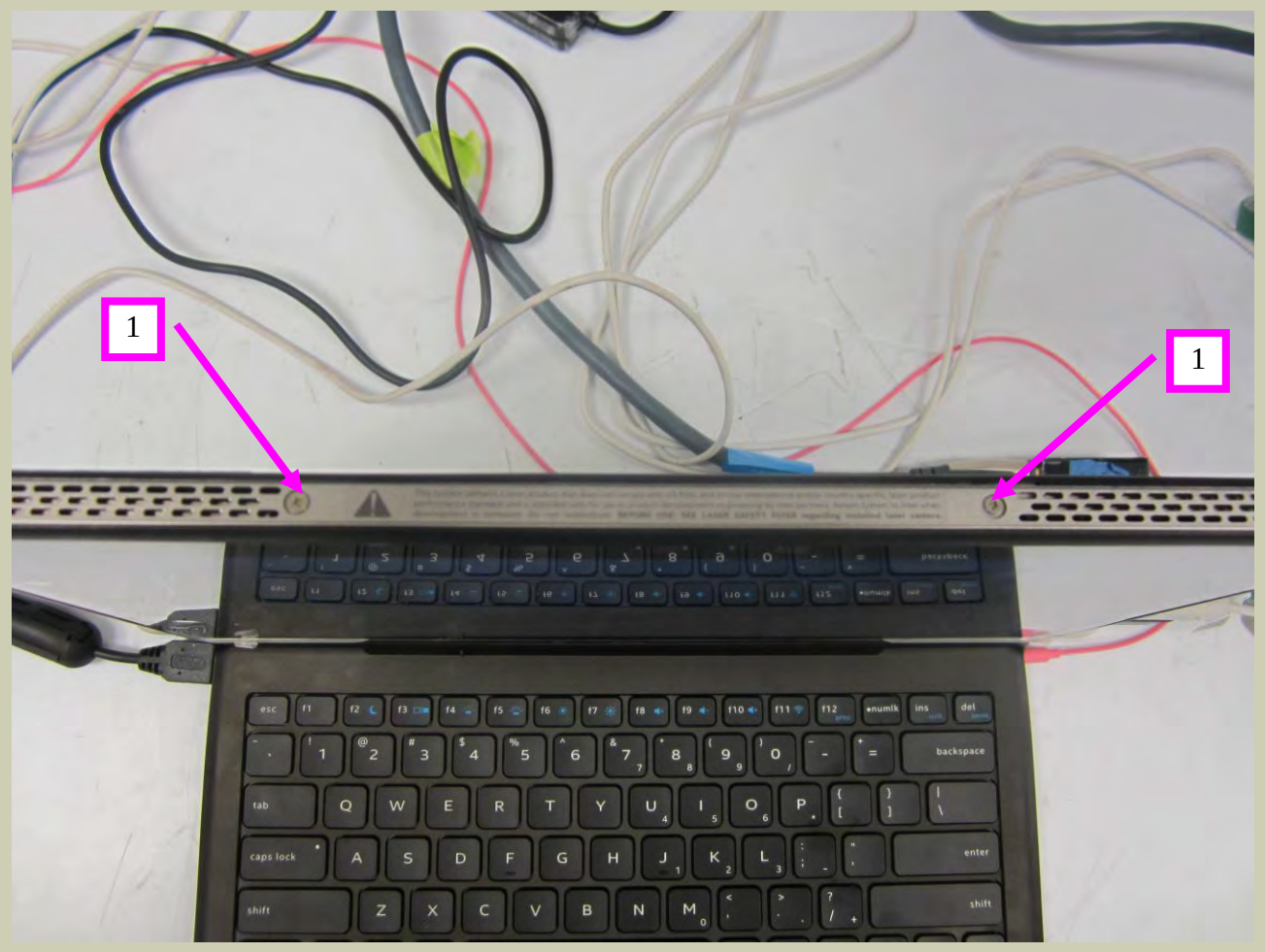
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

CONTACT DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 4
Number of Discharges, Each Polarity	25

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

CONTACT DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 4
Number of Discharges, Each Polarity	25

Configuration:	INTE5584-3

OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

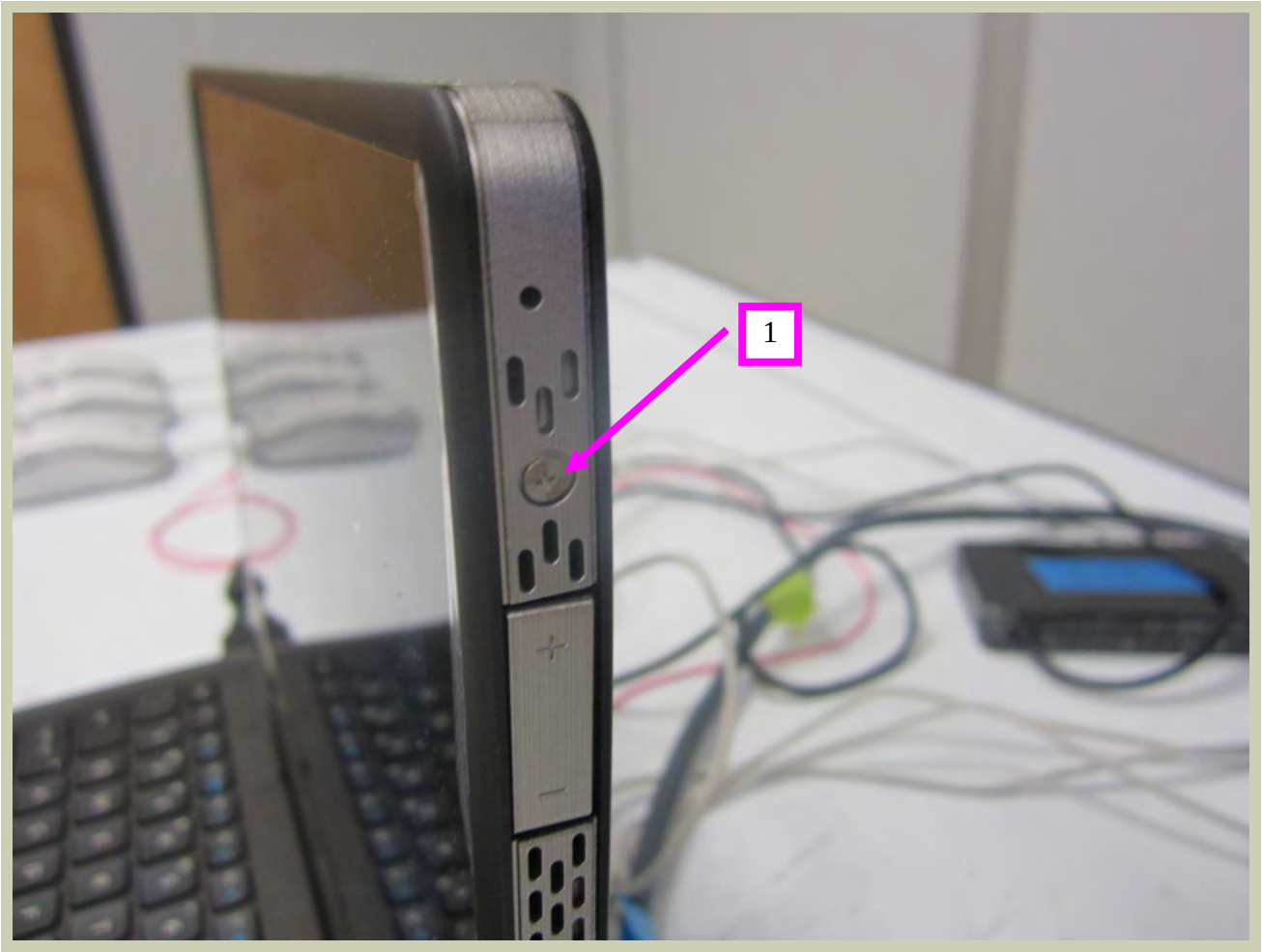
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

CONTACT DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 4
Number of Discharges, Each Polarity	25

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

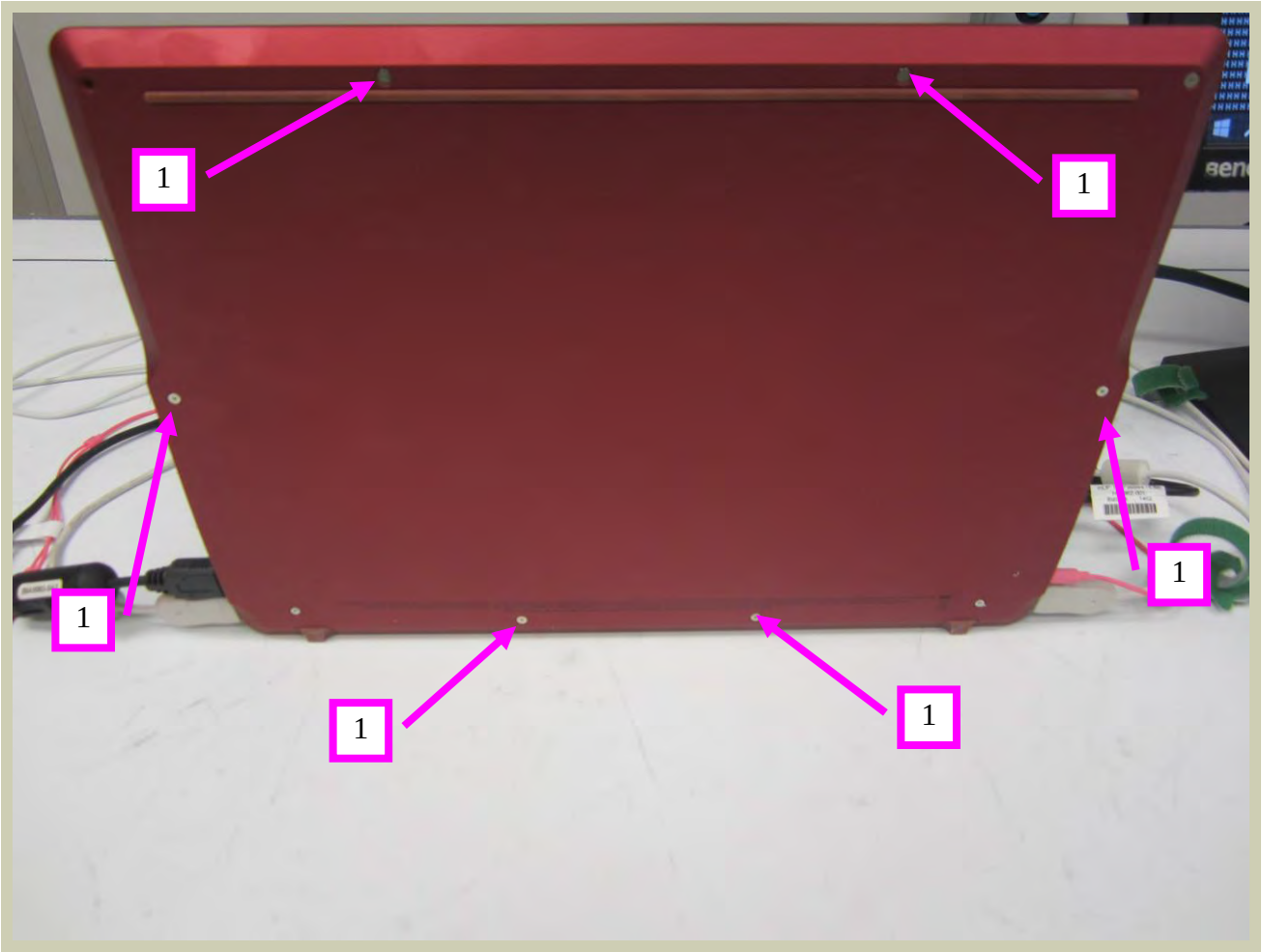
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

CONTACT DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 4
Number of Discharges, Each Polarity	25

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

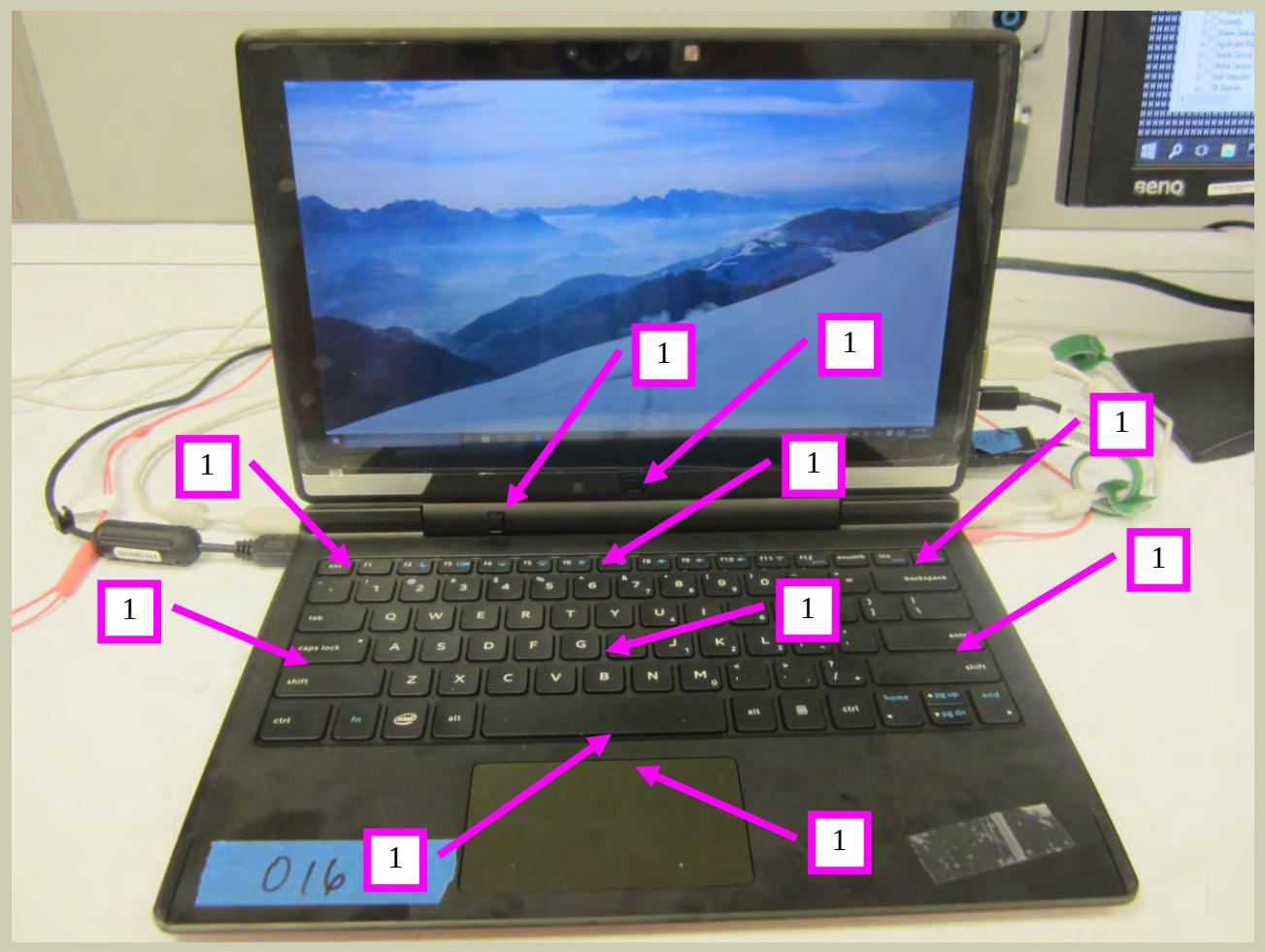
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

AIR DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 2	+/- 4	+/- 8
Number of Discharges, Each Polarity	10	10	10

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

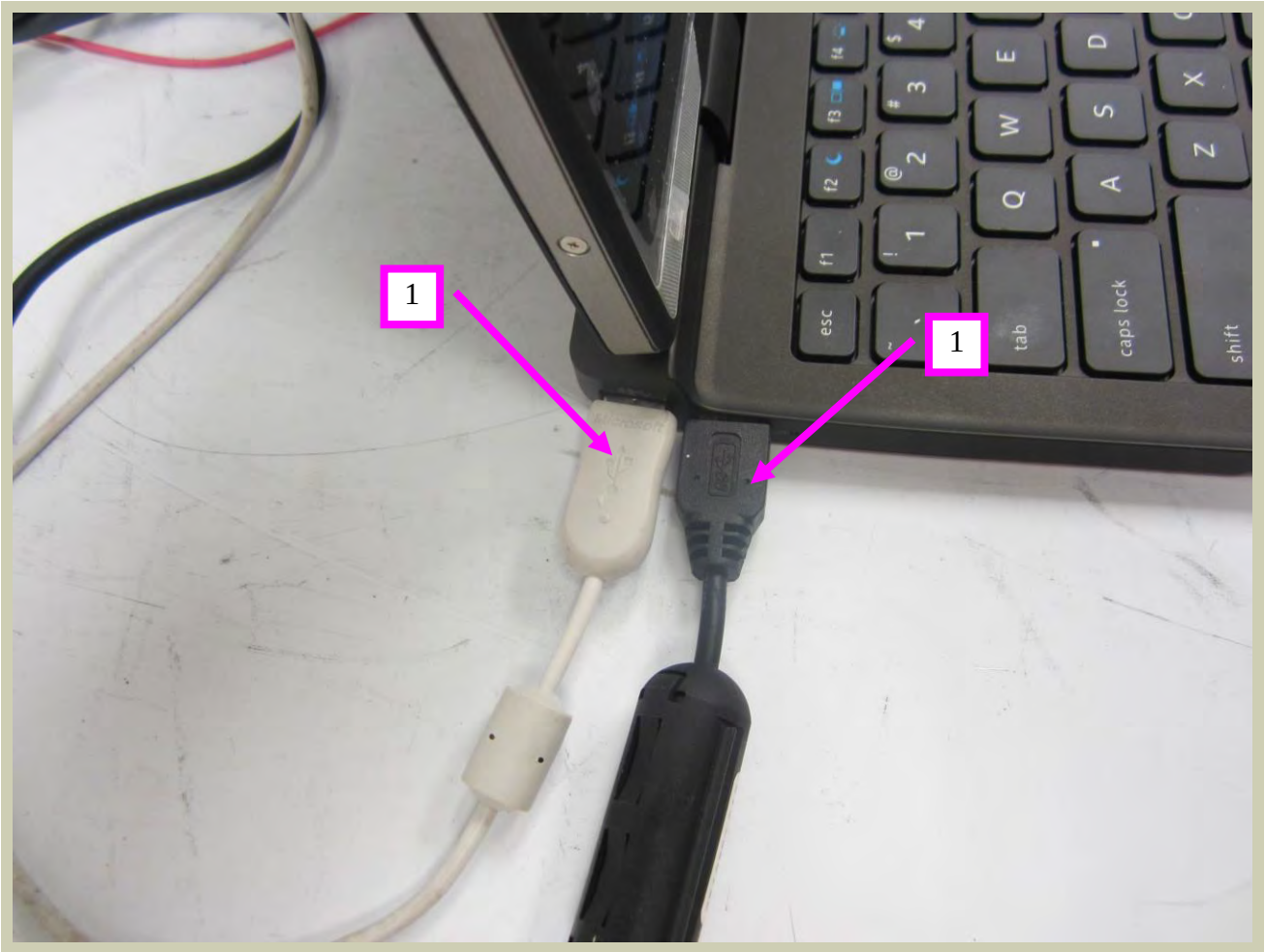
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

AIR DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 2	+/- 4	+/- 8
Number of Discharges, Each Polarity	10	10	10

Configuration:	INTE5584-3



OBSERVATIONS (See Arrows)

Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

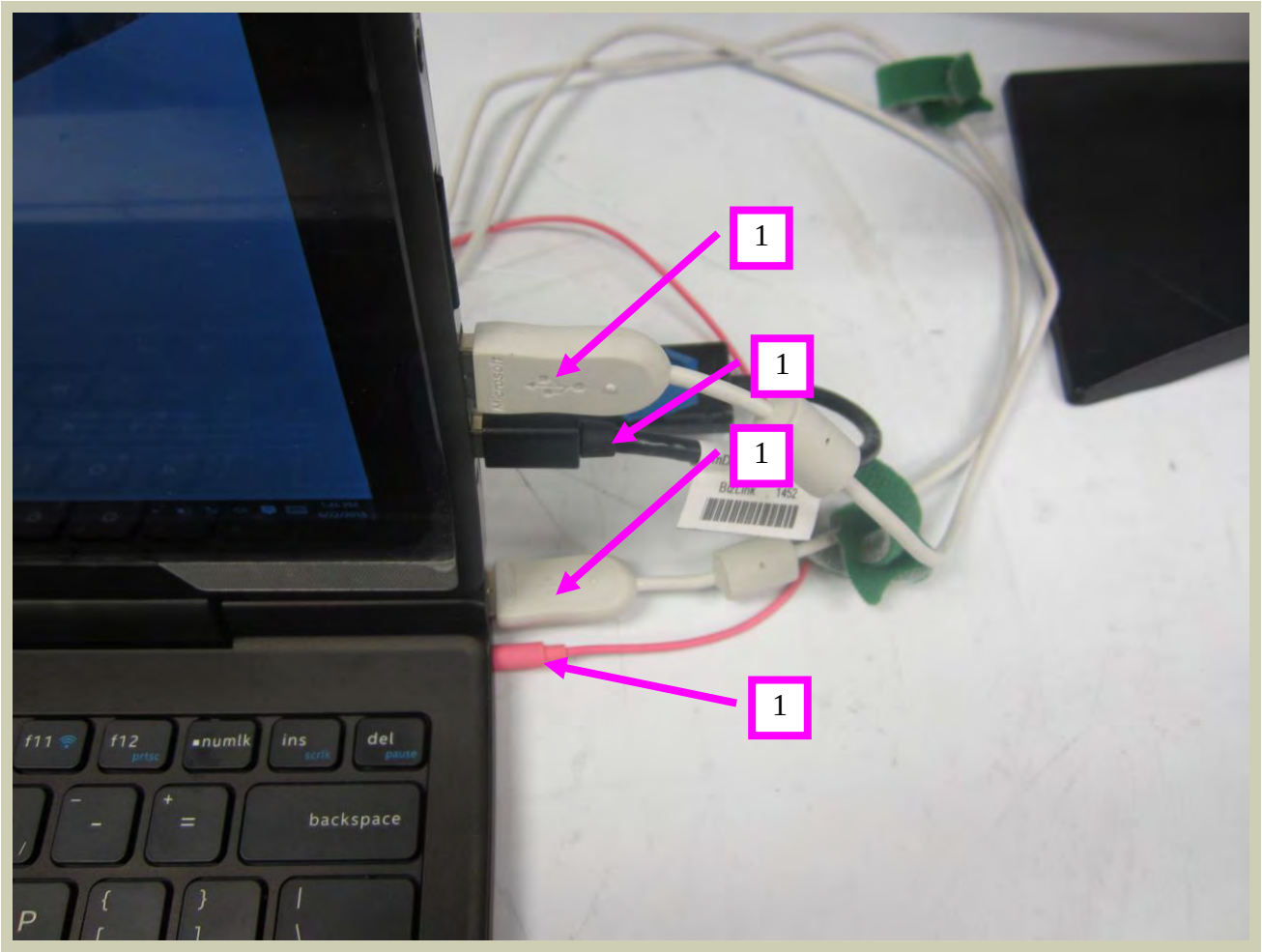
ELECTROSTATIC DISCHARGE (ESD)

NORTHWEST EMC
WTD.2015.05.26

AIR DISCHARGE – OBSERVATIONS

ESD Test Level (kV)	+/- 2	+/- 4	+/- 8
Number of Discharges, Each Polarity	10	10	10

Configuration:	INTE5584-3

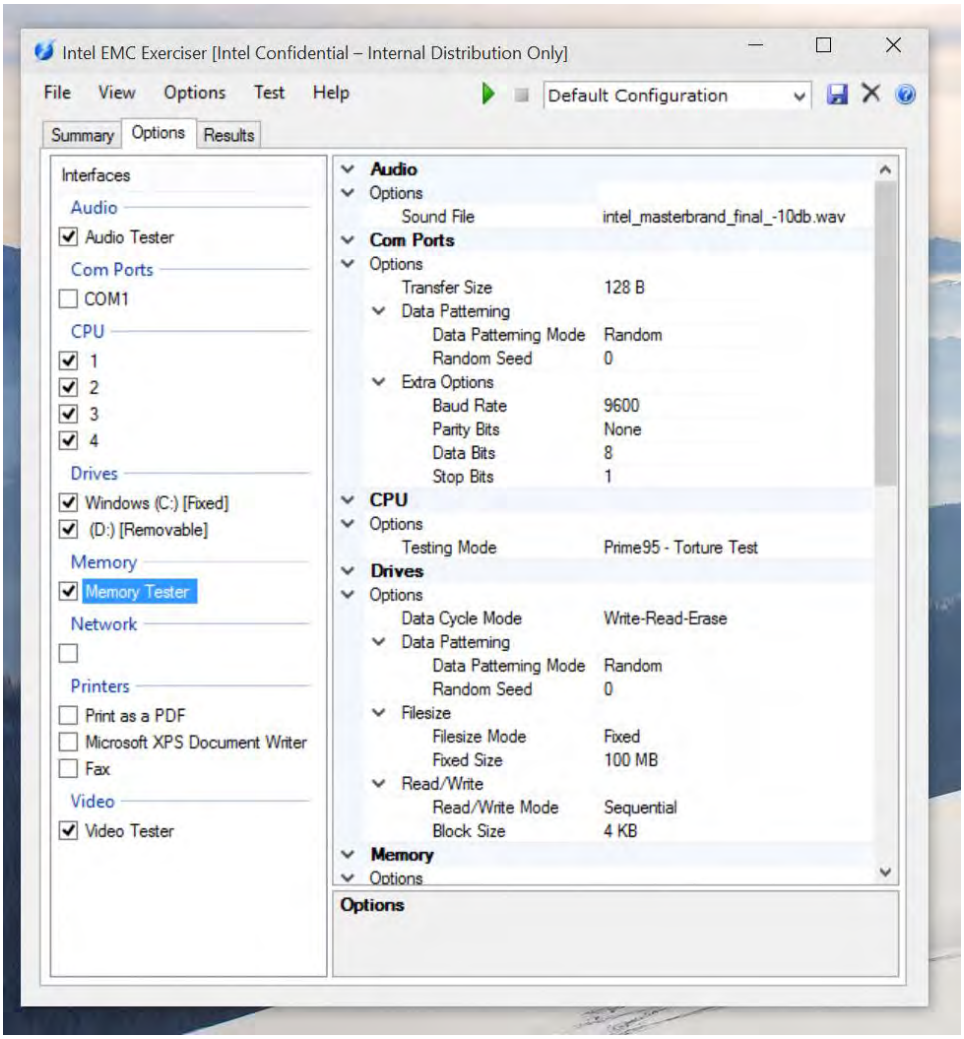


OBSERVATIONS (See Arrows)

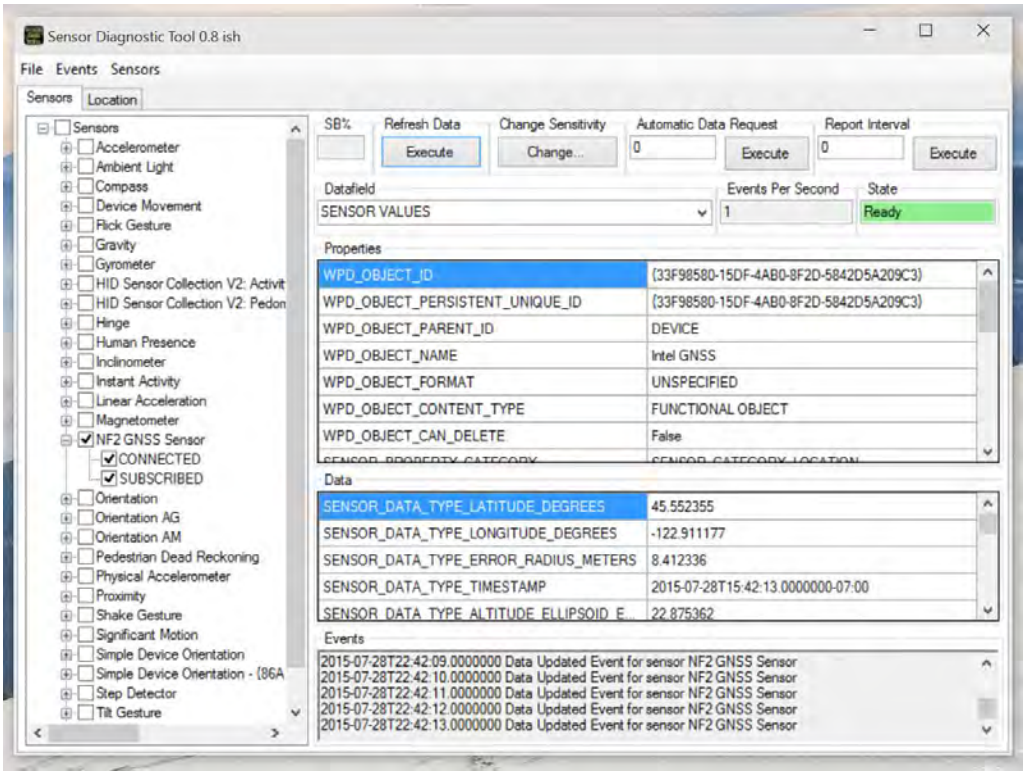
Arrow No.	Voltage	Observation
1	All	No Phenomena Observed

Notes: The arrow colors have no meaning. For test points with observation notes, it is implied that no phenomena was observed at all other test levels (voltages, polarities) except what is noted.

EMC EXERCISER SETTINGS



GPS READINGS



RADIATED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a Radiated RF Immunity test was performed according to IEC 61000-4-3. The field was first established with no EUT present then maintained at the specified level. If an error is detected, the field strength may have been reduced to a level in which the error disappeared. This would be determined as the threshold of susceptibility. The test was conducted using horizontal and vertical antenna orientations.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Power Sensor	Amplifier Research	PH2000	SQQ	11/10/2014	11/10/2015
Power Sensor	Amplifier Research	PH2000	SQM	3/9/2015	03/09/2016
Power Meter	Amplifier Research	PM2002	SQY	11/18/2014	11/18/2015
Dual Directional Coupler	Amplifier Research	DC6180A	IRO	NCR	NCR
Field Monitor	Amplifier Research	FL7040/Kit	IEP	10/29/2014	10/29/2016
Antenna, Log Periodic	EMCO	3144	ALJ	NCR	NCR
Amplifier	Amplifier Research	500W1000A	TTC	NCR	NCR
MXG Analog Signal Generator	Agilent	N5181A	TIG	3/28/2014	03/28/2017

CONFIGURATIONS INVESTIGATED

INTE5584-3

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

RADIATED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/17/2015
Customer:	Intel Corporation	Temperature:	23.3°C
Attendees:	Mike Lowe	Relative Humidity:	37.4%
Customer Project:	SKL21-SDS	Bar. Pressure:	1011.9 mbar
Tested By:	Dan Haas	Job Site:	EV12
Power:	230VAC/50Hz	Configuration:	INTE5584-3

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-3:2010

TEST PARAMETERS

Test Level:	>= 3 V/m	Spec. Level:	3 V/m	Mod. Type:	AM
Start Frequency:	80MHz	Stop Frequency:	1000MHz	Mod. Frequency:	1kHz
Mod. Depth:	80%	Step Size:	1%	Dwell Time:	1 Sec.

SIDES TESTED

Front, Back, Left, Right

POLARITIES TESTED

Horizontal, Vertical

TEST DISTANCE

3m

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

CLOCKS AND OSCILLATORS

No Clocks or Oscillators were provided by the customer.

OBSERVATIONS

There were no observations reported.

CONCLUSION

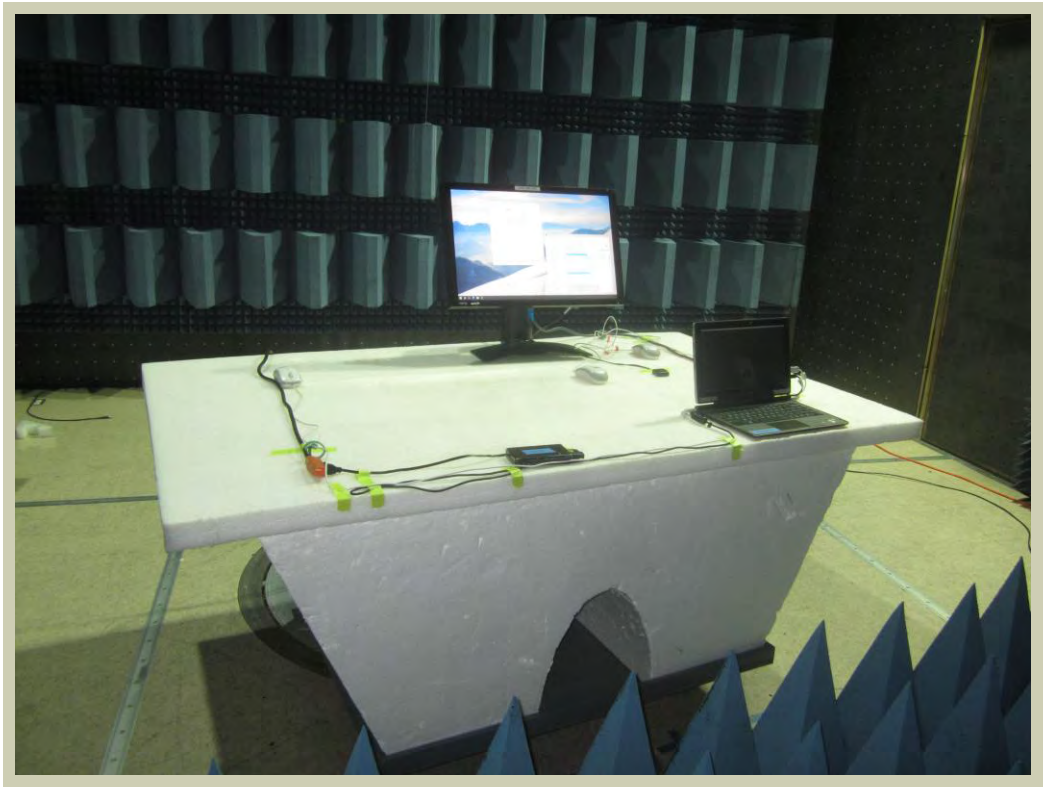
Meets NWEMC Performance Criteria	A

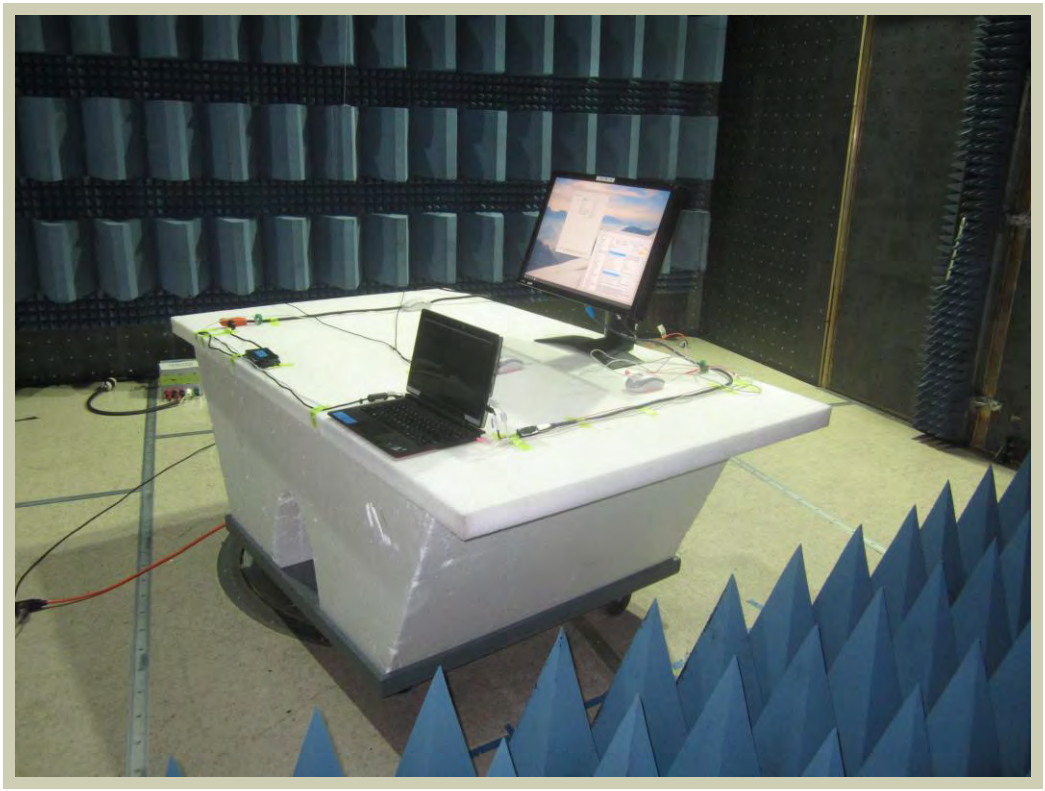
The EUT exhibited no change in performance when operating as specified by the manufacturer.

Tested By

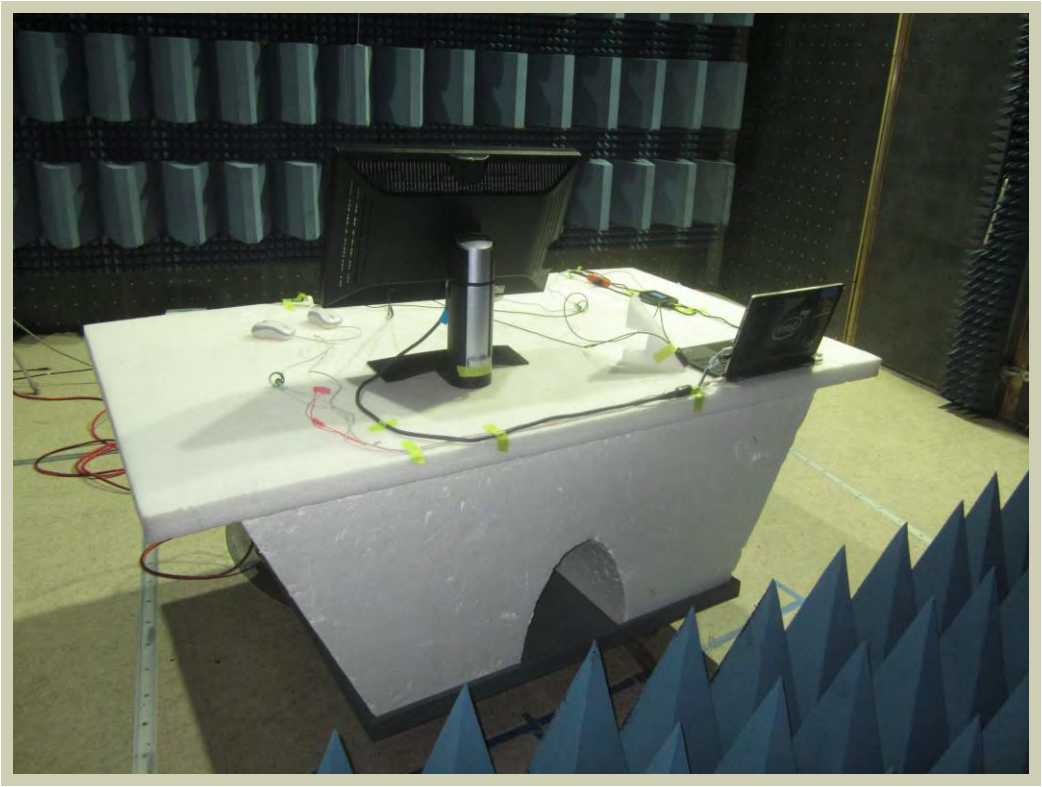
RADIATED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

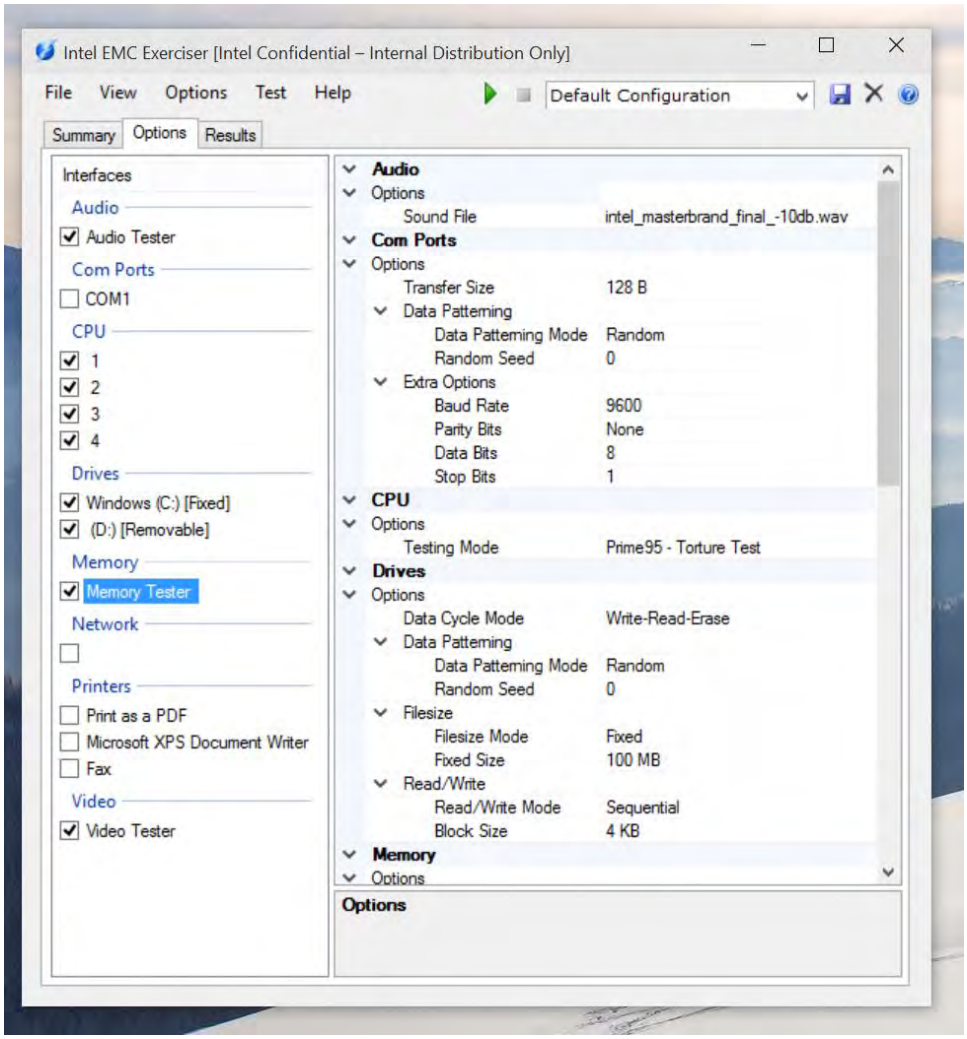




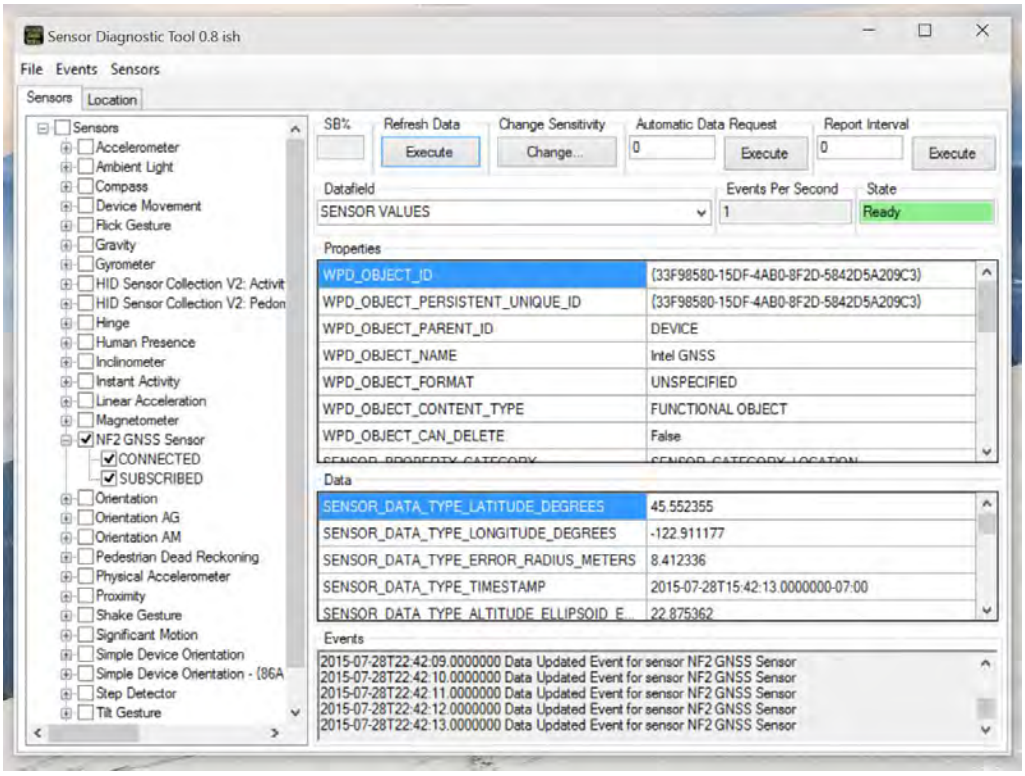
RADIATED IMMUNITY



EMC EXERCISER SETTINGS



GPS READINGS



ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, an EFT/Burst Immunity test was performed. The test is intended to demonstrate the immunity of electrical and electronic equipment when subjected to types of transient disturbances such as those originating from switching transients (interruption of inductive loads, relay contact bounce, etc.). The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled into power supply, control and signal ports of electrical and electronic equipment. Significant for the test is short rise time, the repetition rate and the low energy of the transients. Unless noted, AC Terminals are tested using common mode coupling (simultaneous coupling to all lines versus the ground reference plane). The cable between the EUT and the coupling device, if detachable, shall be as short as possible to comply with the requirements. If the manufacturer provides a cable exceeding the distance between the coupling device end the point of entry of the EUT, the excess length of this cable shall be bundled and situated at a distance of 0.1m above the ground plane.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
EFT Surge VDI Test System	Haefely	ECOMPACT 4	IBK	4/13/2015	10/13/2015
EFT Clamp	Amplifier Research	None	ICI	5/28/2015	05/28/2016

CONFIGURATIONS INVESTIGATED

INTE5584-5

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/19/2015
Customer:	Intel Corporation	Temperature:	24.1°C
Attendees:	Mike Lowe	Relative Humidity:	41%
Customer Project:	SKL21-SDS	Bar. Pressure:	1012.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	230VAC/50Hz	Configuration:	INTE5584-5

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-4:2012

TEST PARAMETERS

Period Time:	300mS ± 20%	Duration of Burst:	15mS ±20%,
Relation of Power Supply:	Asynchronous	Risetime of One Pulse:	5nS ± 30%
Frequency of Burst:	5kHz,	Impulse Duration:	50nS ± 30%
Test Duration per Port:	60 sec.		

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port. The EUT could not be kept 0.5m away from the capacitive clamp because of short cables.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

OBSERVATIONS

Line	Voltage	Observation
AC Terminals (L1,N,Gnd)	+1kV	No Phenomena Observed
AC Terminals (L1,N,Gnd)	-1kV	No Phenomena Observed
Audio	+.5kV	No Phenomena Observed
Audio	-.5kV	No Phenomena Observed
HDMI	+.5kV	Video on external monitor was intermittent.
HDMI	-.5kV	Video on external monitor was intermittent.
USB	+.5kV	No Phenomena Observed
USB	-.5kV	No Phenomena Observed

CONCLUSION

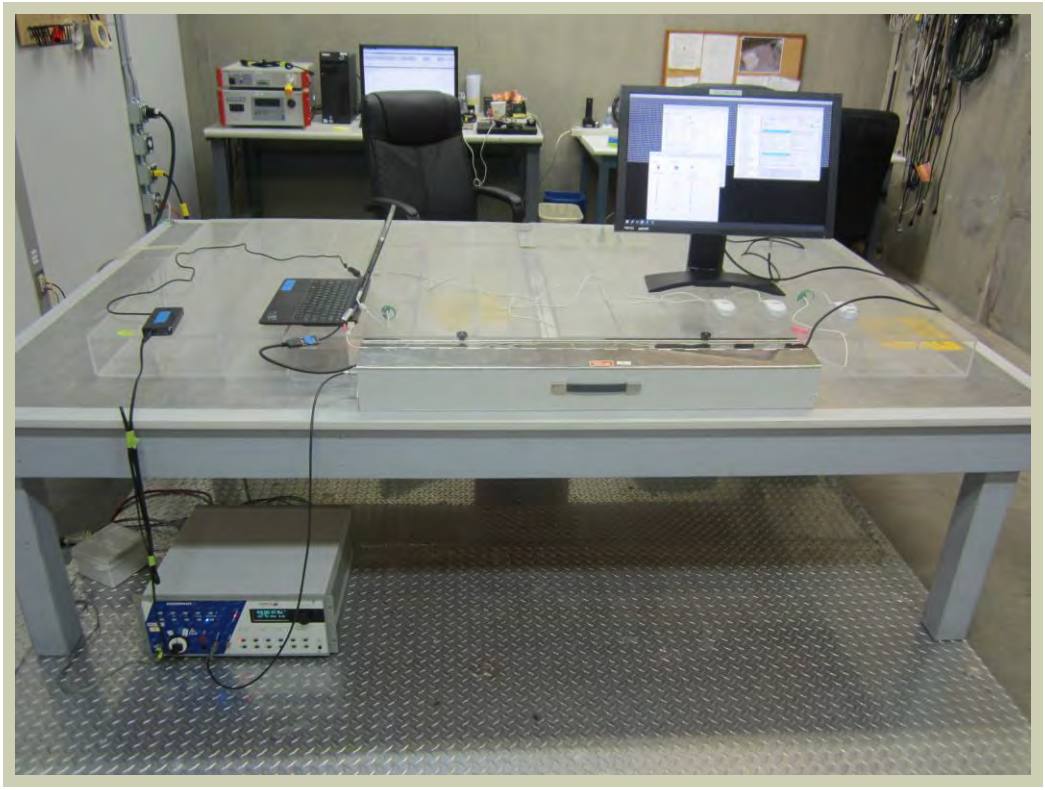
Meets NWEMC Performance Criteria	B

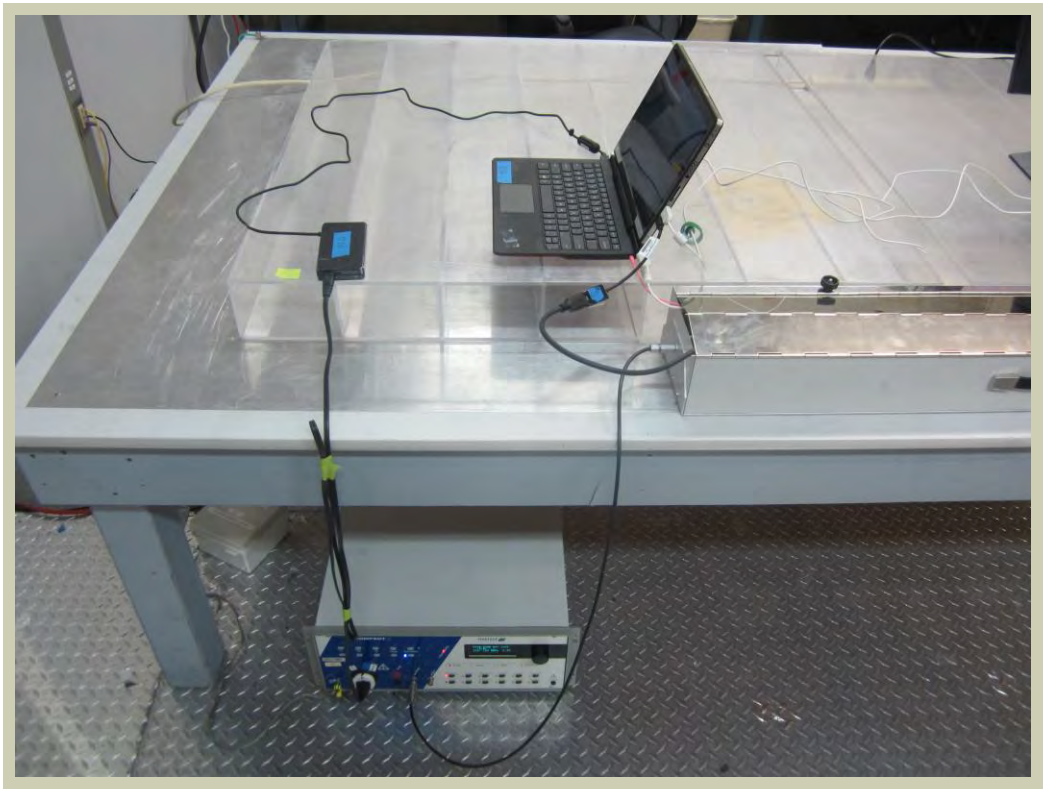
The EUT exhibited a change in performance when operating as specified by the manufacturer, the EUT self-recovered.

Tested By

ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

NORTHWEST EMC
WTD.2015.05.26

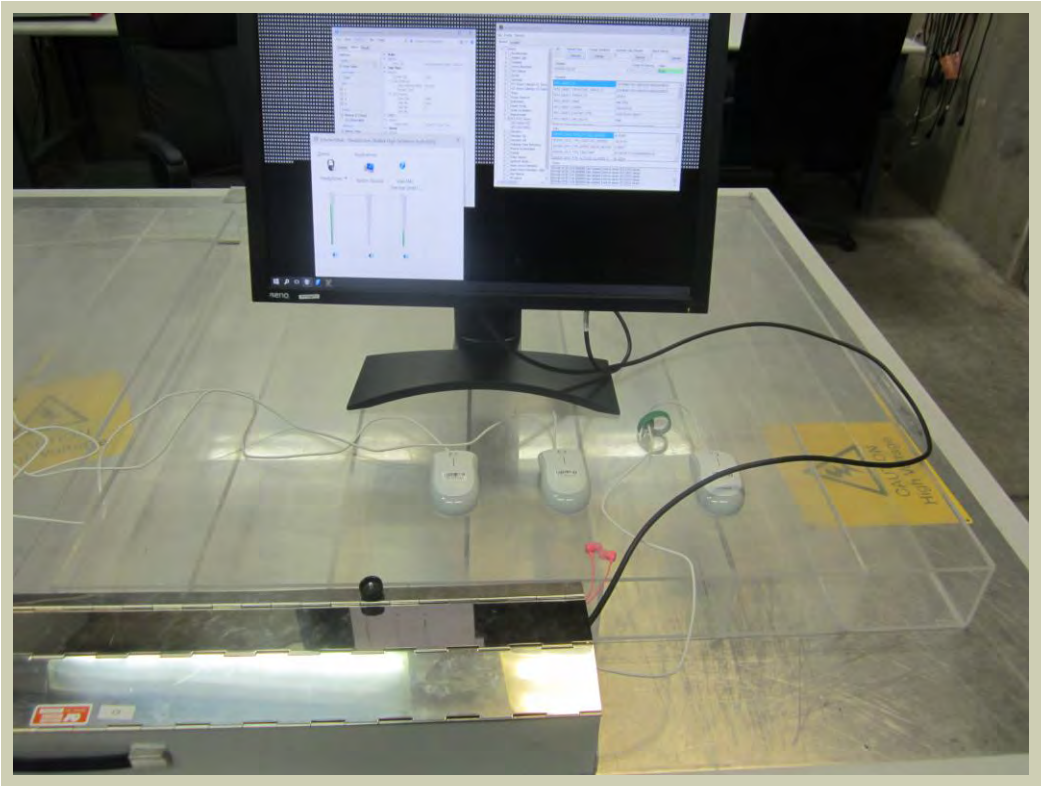




ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

NORTHWEST EMC

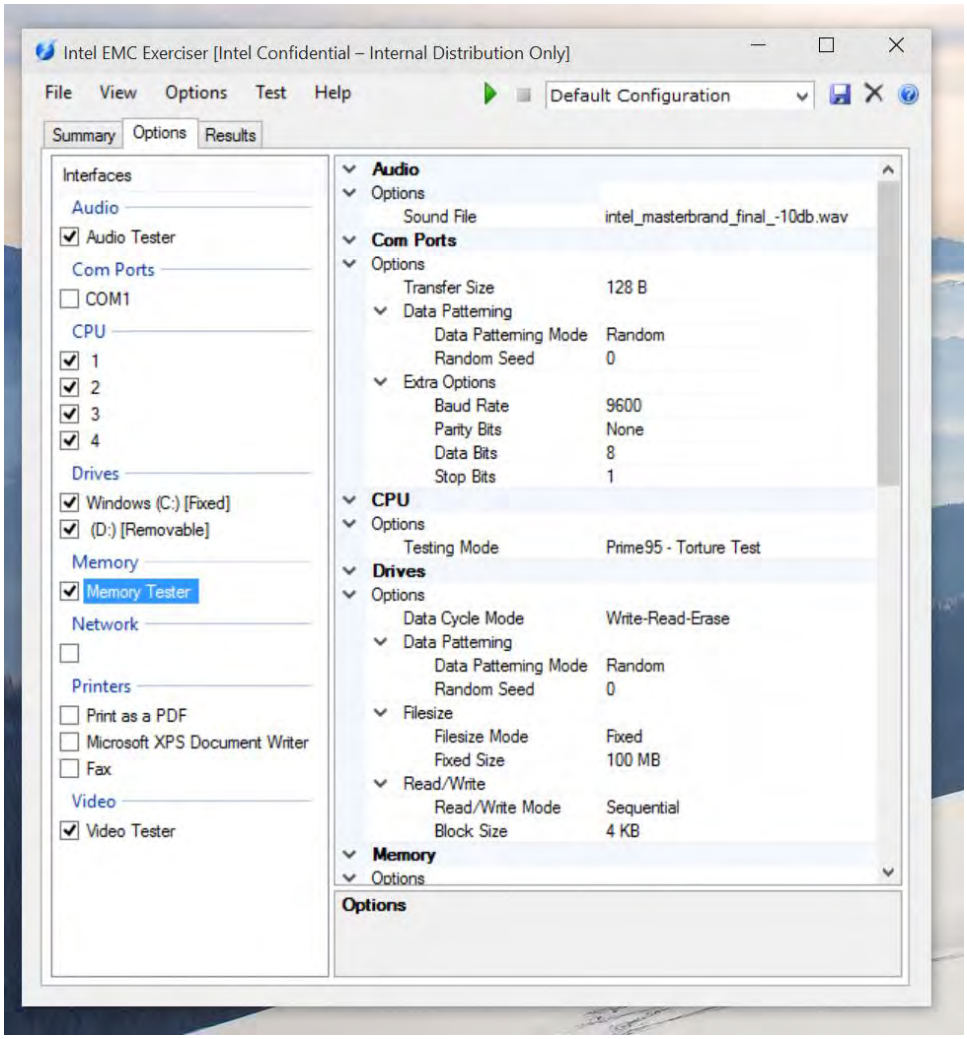
WTD.2015.05.26



ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

NORTHWEST EMC
WTD.2015.05.26

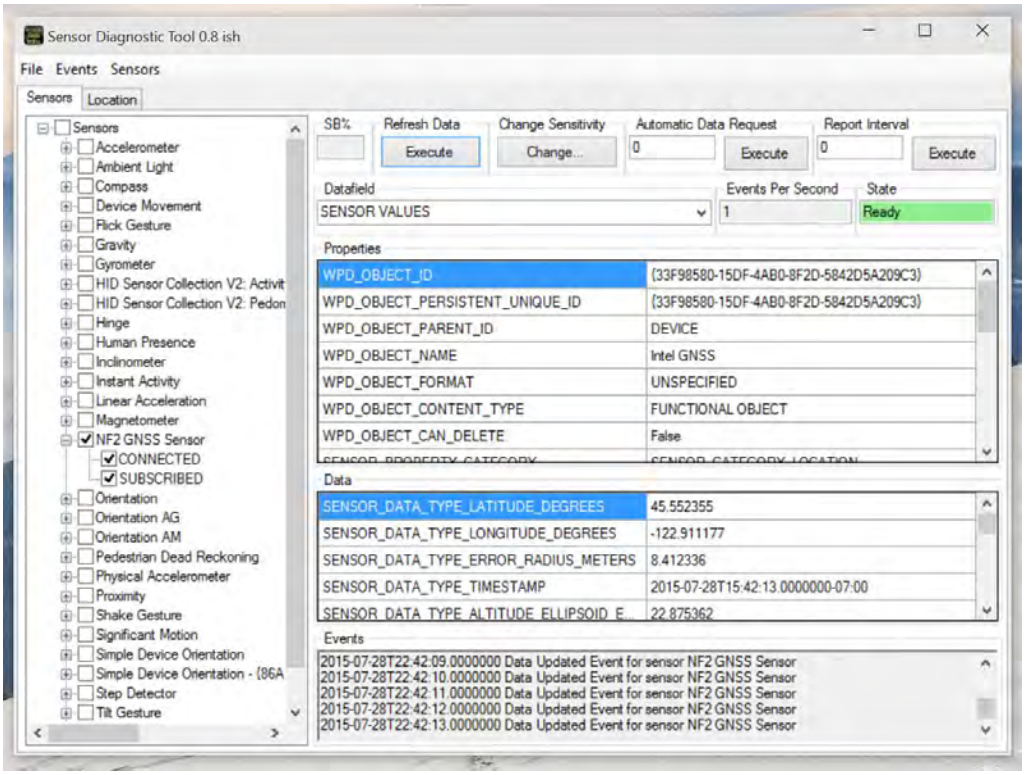
EMC EXERCISER SETTINGS



ELECTRICAL FAST TRANSIENTS AND BURSTS (EFT)

NORTHWEST EMC
WTD.2015.05.26

GPS READINGS



SURGE

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a Surge Immunity test was performed. The task of the defined laboratory test is to find the reaction of the EUT under specified operational conditions caused by surge voltages from switching and lightning effects at certain threat levels.

The major mechanisms by which lightning produces surge voltages are the following:
a) A direct lightning strike to an external circuit (outdoor) injecting high currents
producing voltages by either flowing through earth resistance or flowing through the impedance of the external circuit;

b) An indirect lightning strike (i.e. a strike between or within clouds or to nearby objects which produces electromagnetic fields) that induces voltages/currents on the conductors outside and/or inside a building;

c) Lightning earth current flow resulting from nearby direct-to-earth discharges coupling into the common earth paths of the earthing system of the installation.

If not otherwise specified the power cord between the EUT and the coupling/decoupling network shall not exceed 2 m in length.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
EFT Surge VDI Test System	Haefely	ECOMPACT 4	IBK	4/13/2015	10/13/2015

CONFIGURATIONS INVESTIGATED

INTE5584-5

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

SURGE

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/19/2015
Customer:	Intel Corporation	Temperature:	24.2°C
Attendees:	Mike Lowe	Relative Humidity:	40.2%
Customer Project:	SKL21-SDS	Bar. Pressure:	1012.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	230VAC/50Hz	Configuration:	INTE5584-5

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-5:2014

TEST PARAMETERS

Open Circuit Voltage, Risetime:	1.2 us ± 30%	Short Circuit Current, Risetime:	8 us ± 20%
Open Circuit Voltage, Time to ½ Value:	50 us ± 20%	Short Circuit Current, Time to ½ Value:	20 us ± 20%
Time Between Successive Pulses:	20 seconds		

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

RESULTS

5 Surges Each Setting

	COMMON MODE LOW LINE TO GROUND (12Ω IMPEDANCE)				COMMON MODE HIGH LINE TO GROUND (12Ω IMPEDANCE)				DIFFERENTIAL MODE HIGH LINE TO LOW LINE (2Ω IMPEDANCE)			
kV	**0°**	**90°**	**180°**	**270°**	**0°**	**90°**	**180°**	**270°**	**0°**	**90°**	**180°**	**270°**
0.5	1	1	1	1	1	1	1	1	1	1	1	1
-0.5	1	1	1	1	1	1	1	1	1	1	1	1
1.0	1	1	1	1	1	1	1	1	1	1	1	1
-1.0	1	1	1	1	1	1	1	1	1	1	1	1
2.0	1	1	1	1	1	1	1	1	2	2	2	2
-2.0	1	1	1	1	1	1	1	1	2	2	2	2

OBSERVATIONS

Results	Observation
1	No Phenomena Observed
2	Not Required
3	Not Tested

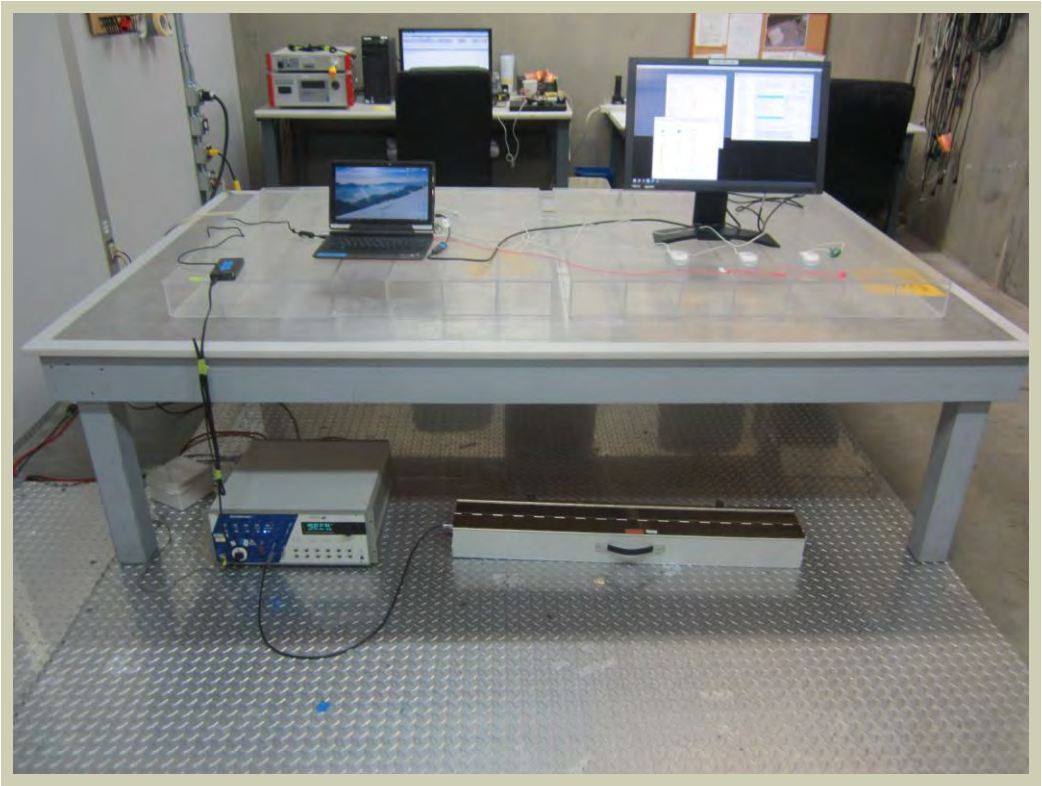
CONCLUSION

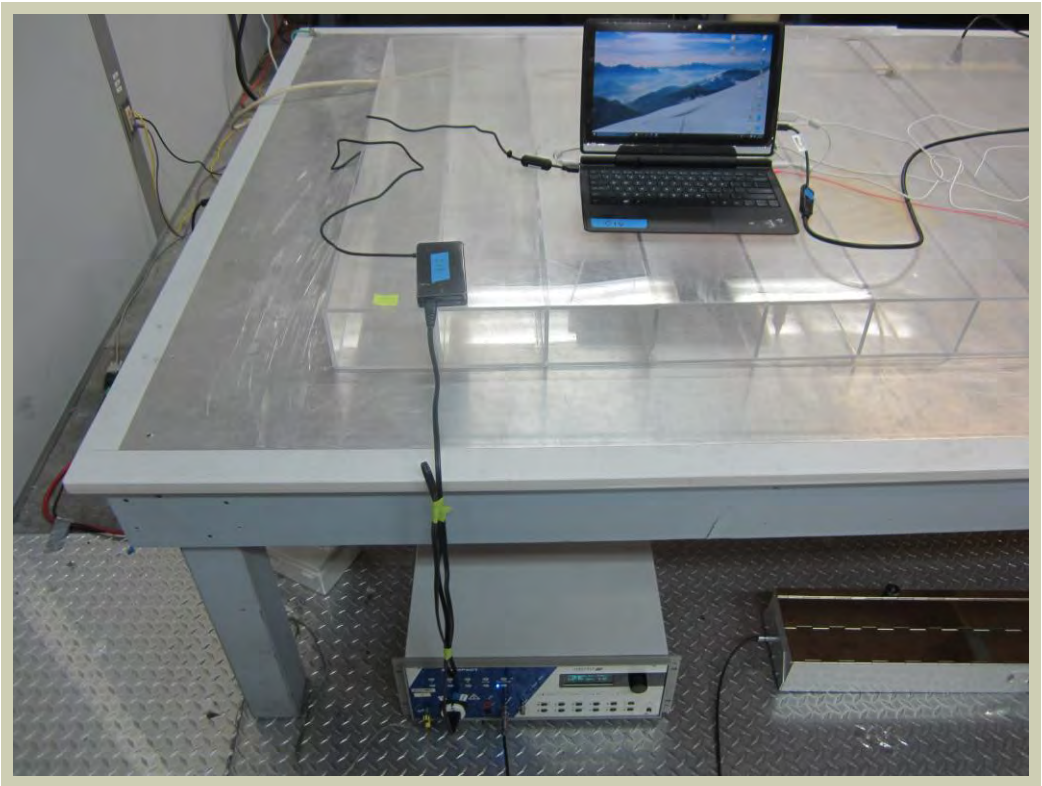
Meets NWEMC Performance Criteria	A

The EUT exhibited no change in performance when operating as specified by the manufacturer.

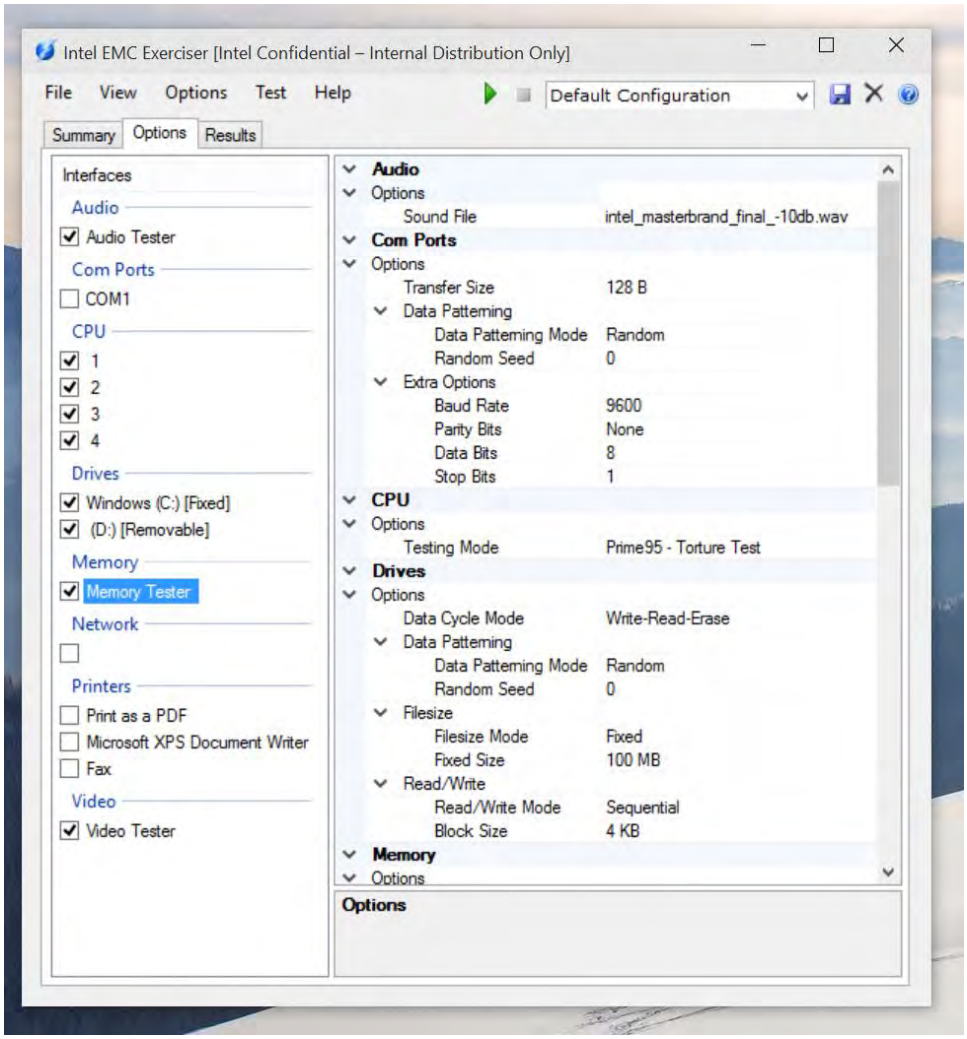
Tested By

SURGE

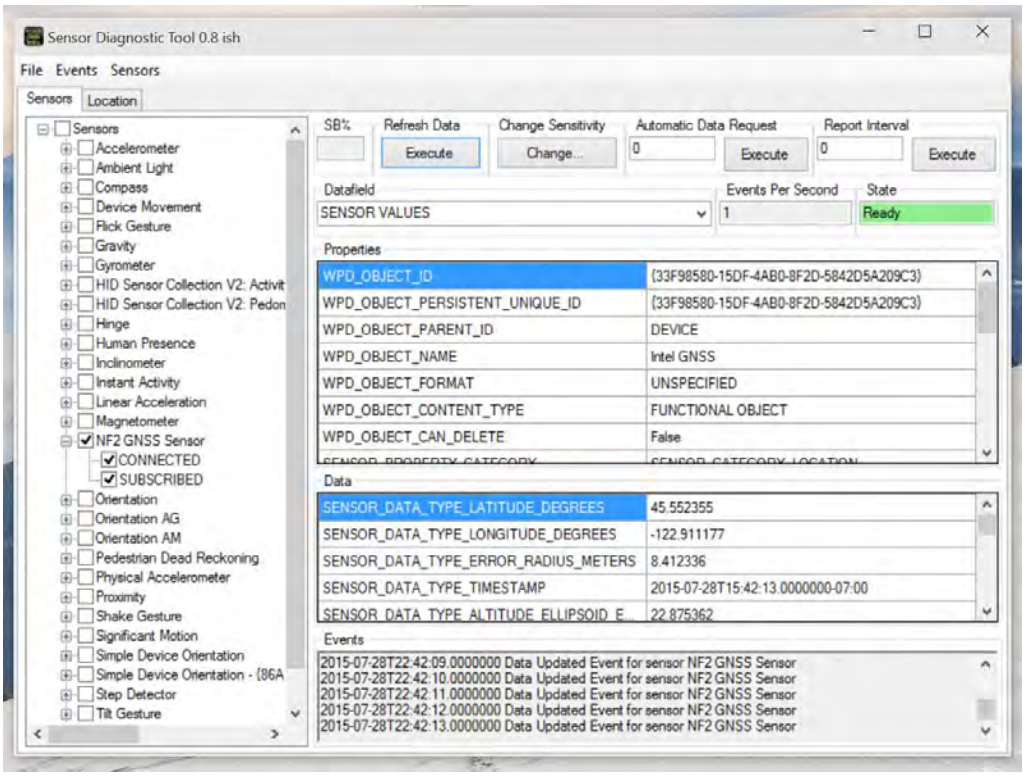




EMC EXERCISER SETTINGS



GPS READINGS



CONDUCTED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a Conducted RF Immunity test was performed. The source of disturbance covered by the standard is basically an electromagnetic field, coming from intended RF transmitters, that may act on the whole length of cables connected to installed equipment. The dimensions of the disturbed equipment, mostly a sub-part of a larger system, are assumed to be small compared with the wavelengths involved. The ingoing and outgoing leads: e.g. mains, communication lines, and interface cables, behave as passive receiving antenna networks because they can be several wavelengths long. The use of coupling and decoupling devices to apply the disturbing signal to one cable at a time, while keeping all other cables non-excited, can only approximate the real situation where disturbing sources act on all cables simultaneously, with a range of different amplitudes and phases. Coupling and decoupling devices are defined by their characteristics. Any coupling and decoupling device fulfilling these characteristics can be used. Unless permanently attached, the power cable between the coupling and decoupling devices and the EUT shall be as short as possible and shall not be bundled or wrapped. Their height above the ground reference plane shall be between 30 mm and 50 mm.

During testing, if anomalies are observed, the current is monitored by inserting an additional current probe in between the injection clamp and the EUT. If the current, exceeds the nominal circuit current value, then the test generator output level is reduced until the current equals the nominal circuit current level. The reduced test generator output value is recorded.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Signal Generator	Rohde & Schwarz	SML-03	TIZ	3/10/2015	03/10/2018
Amplifier	Agilent	75A250A	TTL	NCR	NCR
Power Meter	Amplifier Research	PM2002	SQJ	3/9/2015	03/09/2016
Power Sensor	Amplifier Research	PH2000	SQK	3/9/2015	03/09/2016
Power Sensor	Amplifier Research	PH2000	SQX	9/2/2014	09/02/2015
Directional Coupler	Amplifier Research	DC2600A	IRT	NCR	NCR
Attenuator, 6dB, 100W	S.M. Electronics	SA3N100-06F	REQ	9/29/2014	09/29/2015
CDN	Dressler	CDN-M3	INN	9/3/2014	09/03/2015
CDN	Dressler	CDN-M3	INM	1/27/2015	01/27/2016
Injection Probe	Fischer Custom Communications	F-120-9A	III	NCR	NCR
Current Probe	Fischer Custom Communications	F-35	IIB	9/11/2014	09/11/2017
Adapter, 50-150 Ohm	Teseq	SL 403-403	RDS	11/18/2014	11/18/2015
Terminator, 150 Ohm	Teseq	SL 403-404	RDT	11/18/2014	11/18/2015

CONFIGURATIONS INVESTIGATED

INTE5584-4

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

CONDUCTED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/18/2015
Customer:	Intel Corporation	Temperature:	23.9°C
Attendees:	Mike Lowe	Relative Humidity:	39.9%
Customer Project:	SKL21-SDS	Bar. Pressure:	1007.6 mbar
Tested By:	Dan Haas	Job Site:	EV02
Power:	230VAC/50Hz	Configuration:	INTE5584-4

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-6:2013

TEST PARAMETERS

Test Level:	>= 3 VRMS	Spec. Level:	3 VRMS	Mod. Type:	AM
Start Frequency:	150kHz	Stop Frequency:	80MHz	Mod. Frequency:	1kHz
Mod. Depth:	80%	Step Size:	1%	Dwell Time:	1sec.

CABLES TESTED

AC Power	Audio	HDMI Cable	USB

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

CLOCKS AND OSCILLATORS

No Clocks or Oscillators were provided by the customer.

OBSERVATIONS

There were no observations reported.

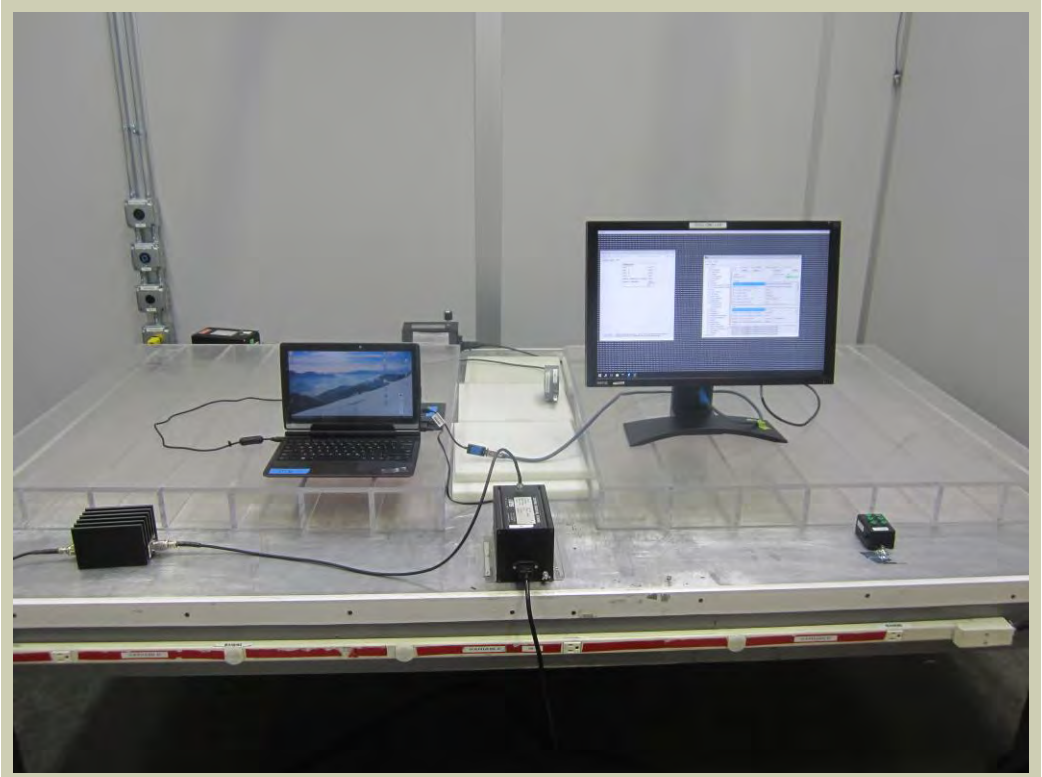
CONCLUSION

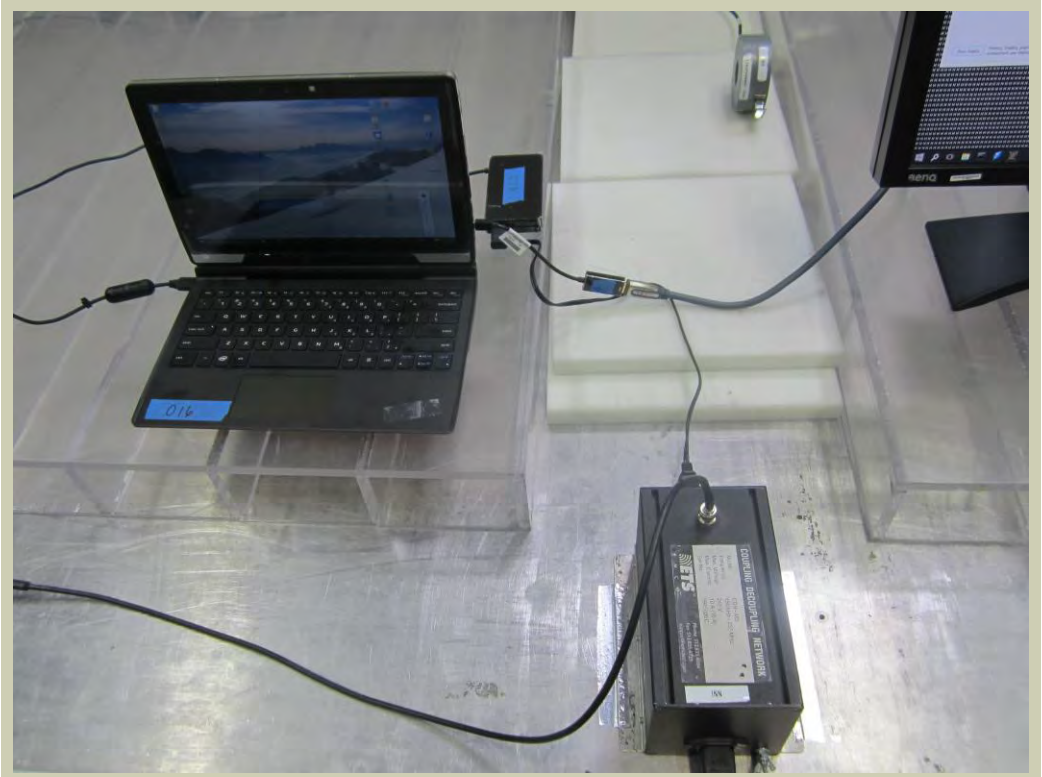
Meets NWEMC Performance Criteria	A

The EUT exhibited no change in performance when operating as specified by the manufacturer.

Tested By

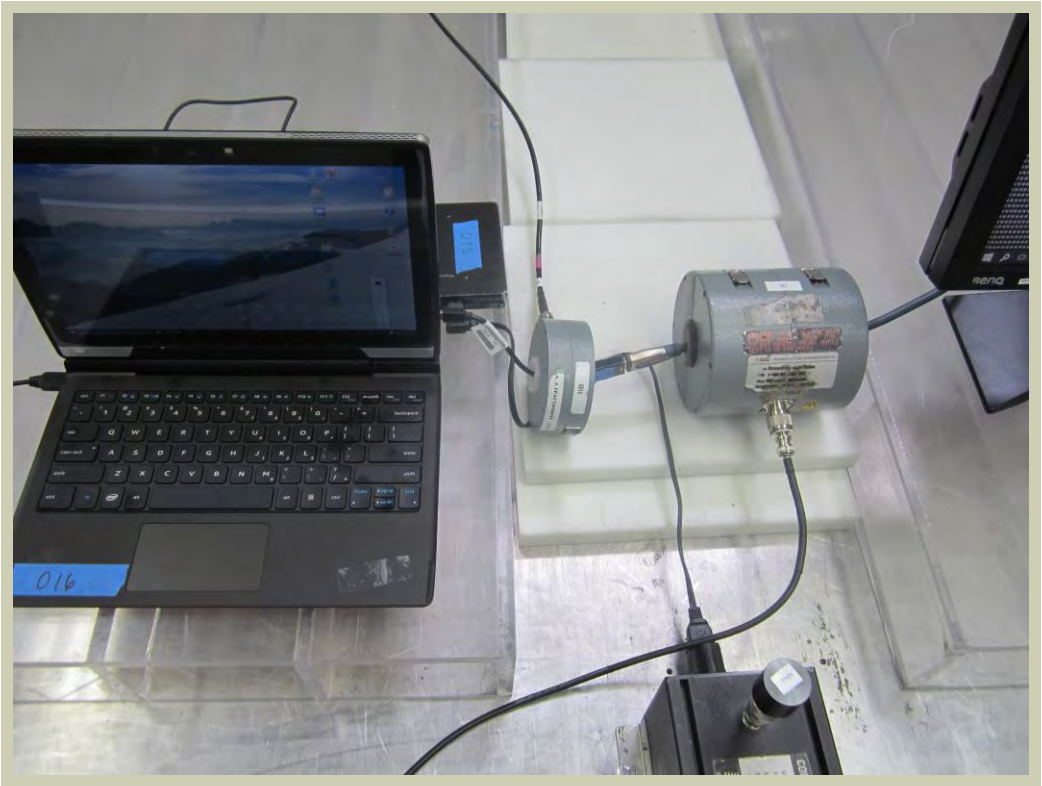
CONDUCTED IMMUNITY

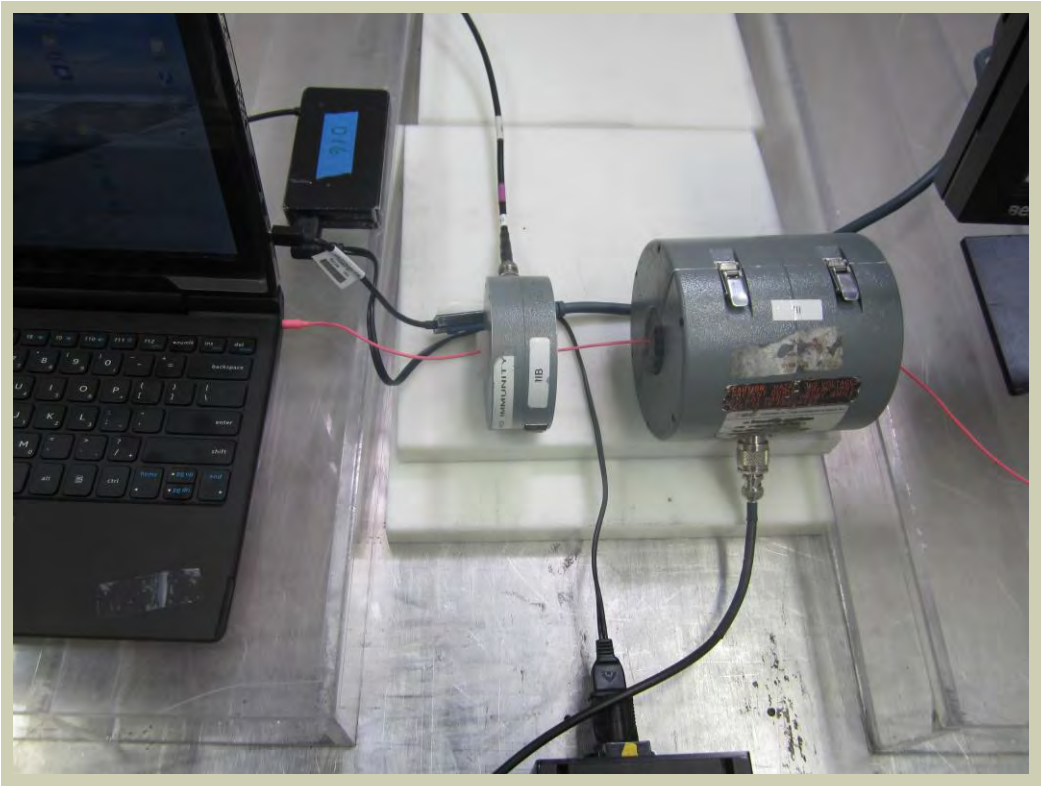




CONDUCTED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

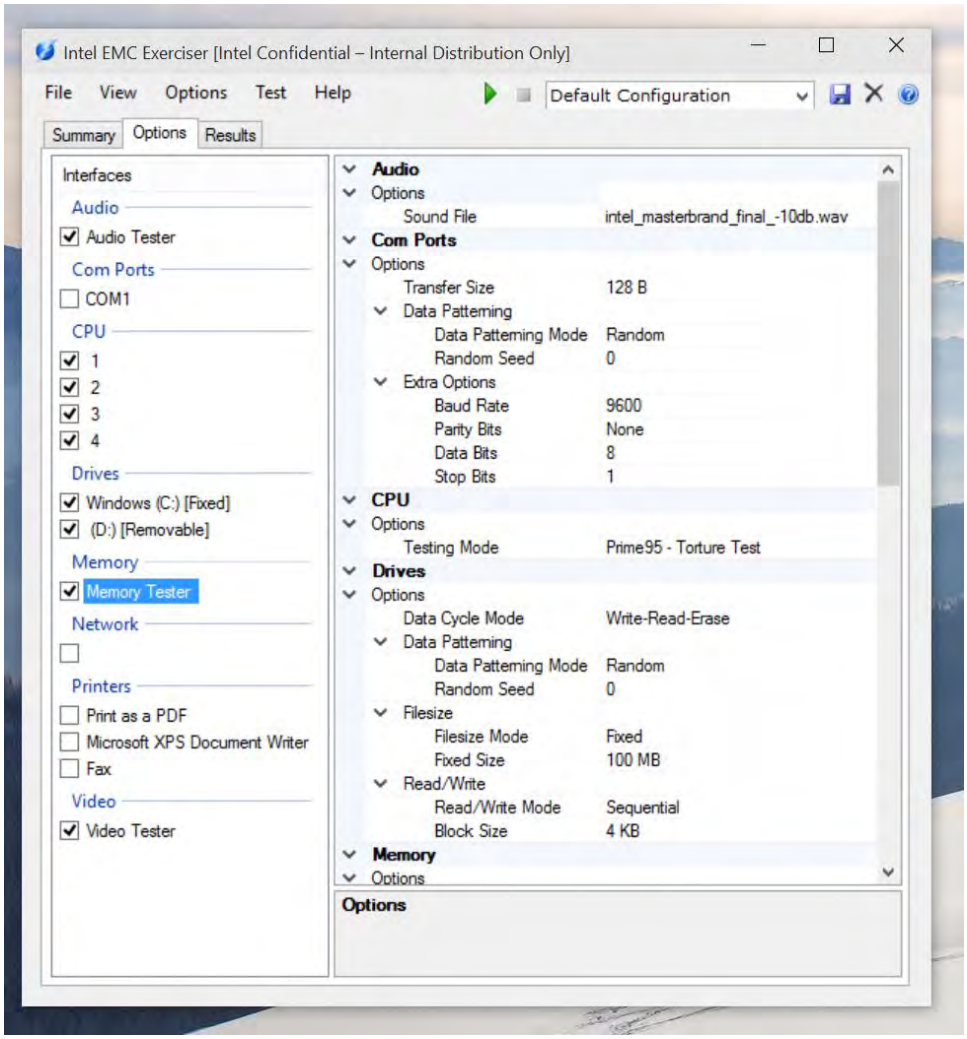




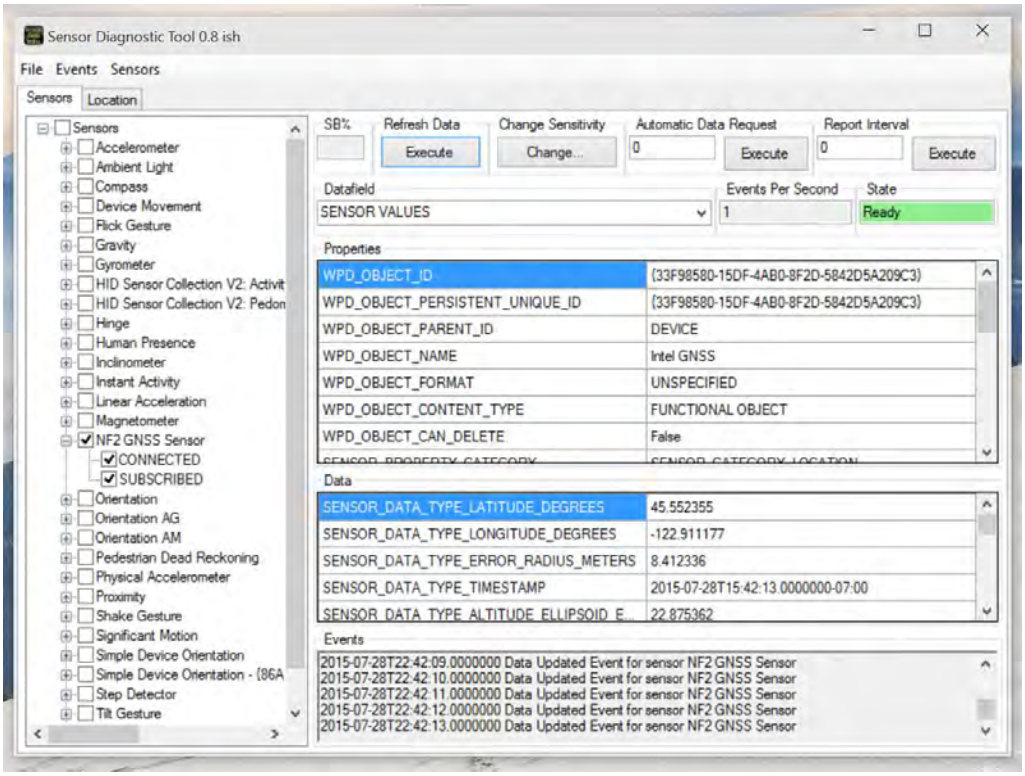
CONDUCTED IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

EMC EXERCISER SETTINGS



GPS READINGS



MAGNETIC FIELD IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a Power Frequency Magnetic Field Immunity test was performed. The tests are intended to demonstrate the immunity of equipment when subjected to power frequency magnetic fields related to the specific location and installation condition of the equipment (e.g. proximity of equipment to the disturbance source). The power frequency magnetic field is generated by power frequency current in conductors or, rarely, from other devices (e.g. leakage or transformers) in the proximity of equipment.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Harmonics/Flicker System	Teseq	5001IX-CTS-160-413-TSQ	THV	3/20/2013	03/20/2016
5kVA AC Power Source	Teseq	NSG 1007-5	THW	11/12/2013	11/12/2016
70cm Helmholtz Coil	Northwest EMC	N/A	IMK	2/26/2013	02/26/2016

CONFIGURATIONS INVESTIGATED

INTE5584-5

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

MAGNETIC FIELD IMMUNITY

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/19/2015
Customer:	Intel Corporation	Temperature:	24.5°C
Attendees:	Mike Lowe	Relative Humidity:	40.1%
Customer Project:	SKL21-SDS	Bar. Pressure:	1012.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	230VAC/50Hz	Configuration:	INTE5584-5

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-8:2009

TEST PARAMETERS

Test Level:	1 A/m	Test Frequency:	50Hz

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

OBSERVATIONS

X	No Phenomena Observed
Y	No Phenomena Observed
Z	No Phenomena Observed

CONCLUSION

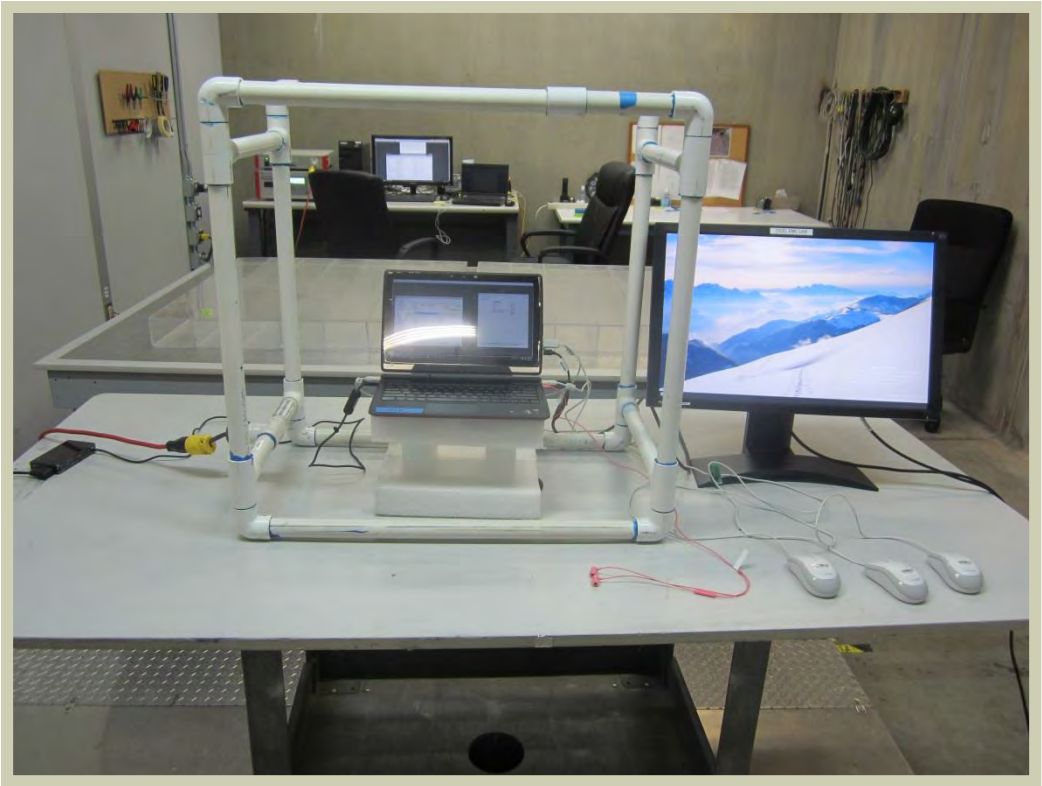
Meets NWEMC Performance Criteria	A

The EUT exhibited no change in performance when operating as specified by the manufacturer.

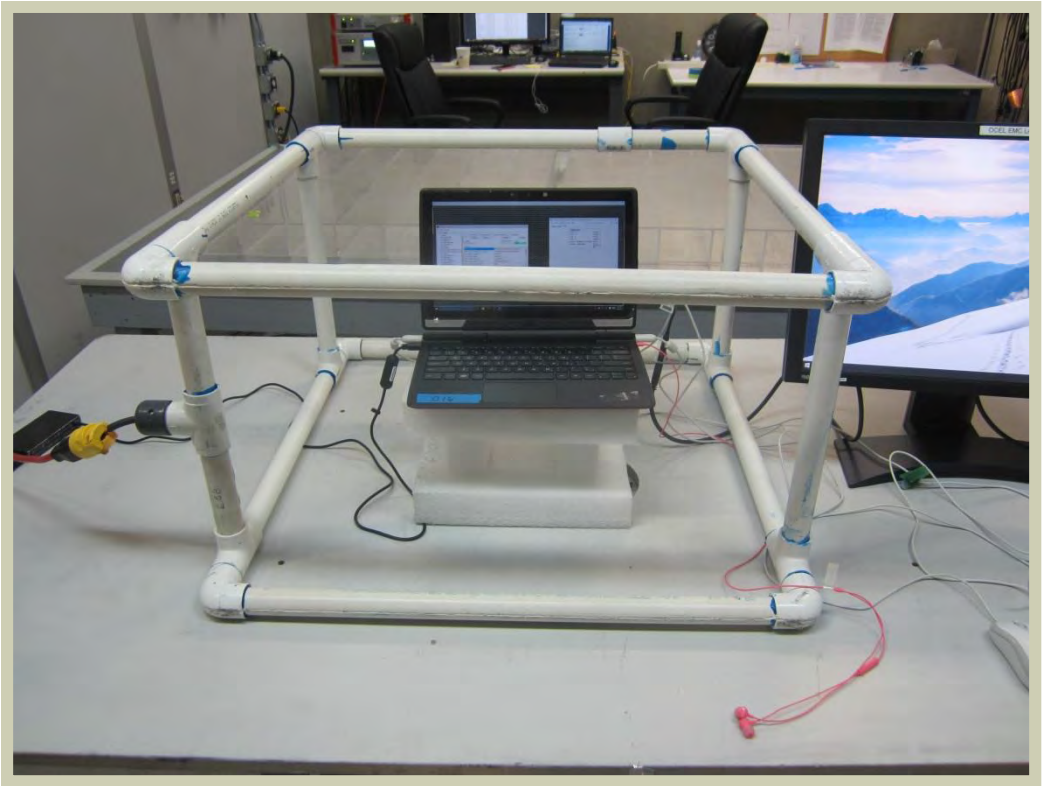
Tested By

MAGNETIC FIELD IMMUNITY

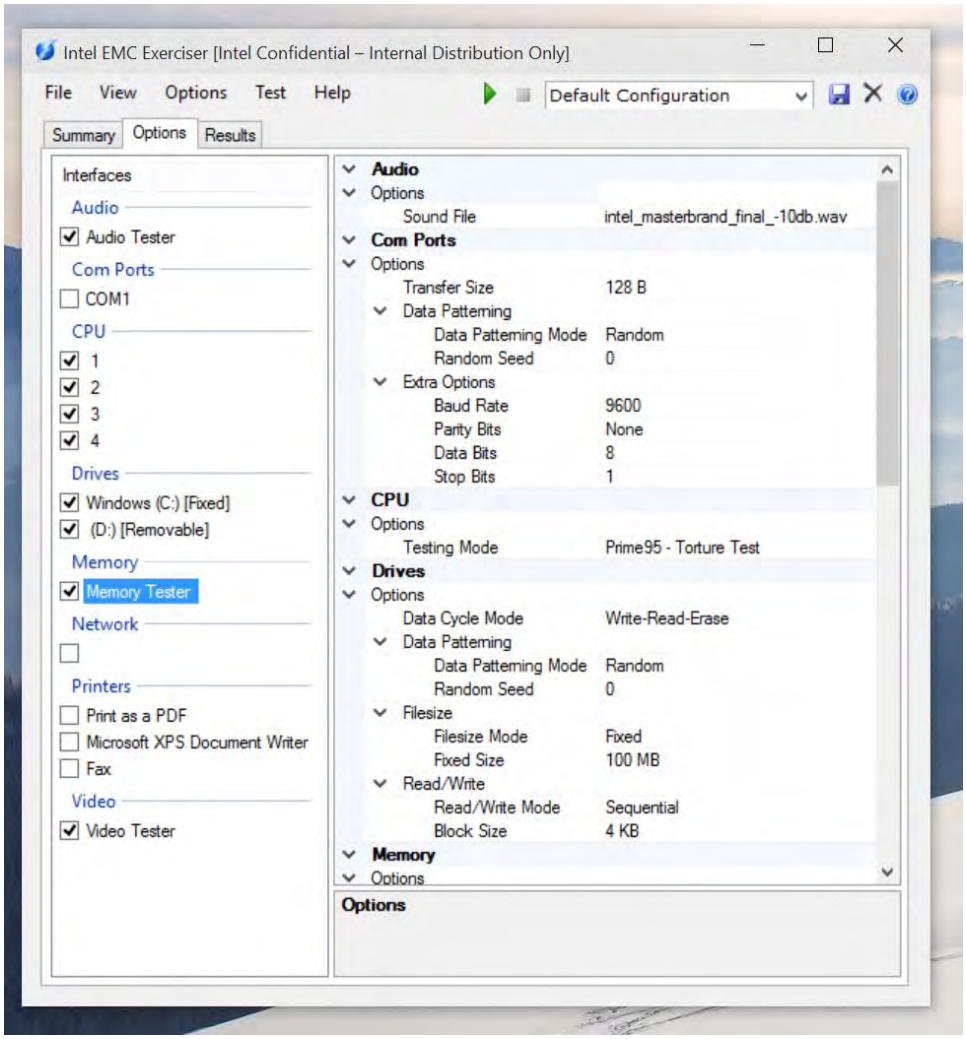
NORTHWEST EMC
WTD.2015.05.26



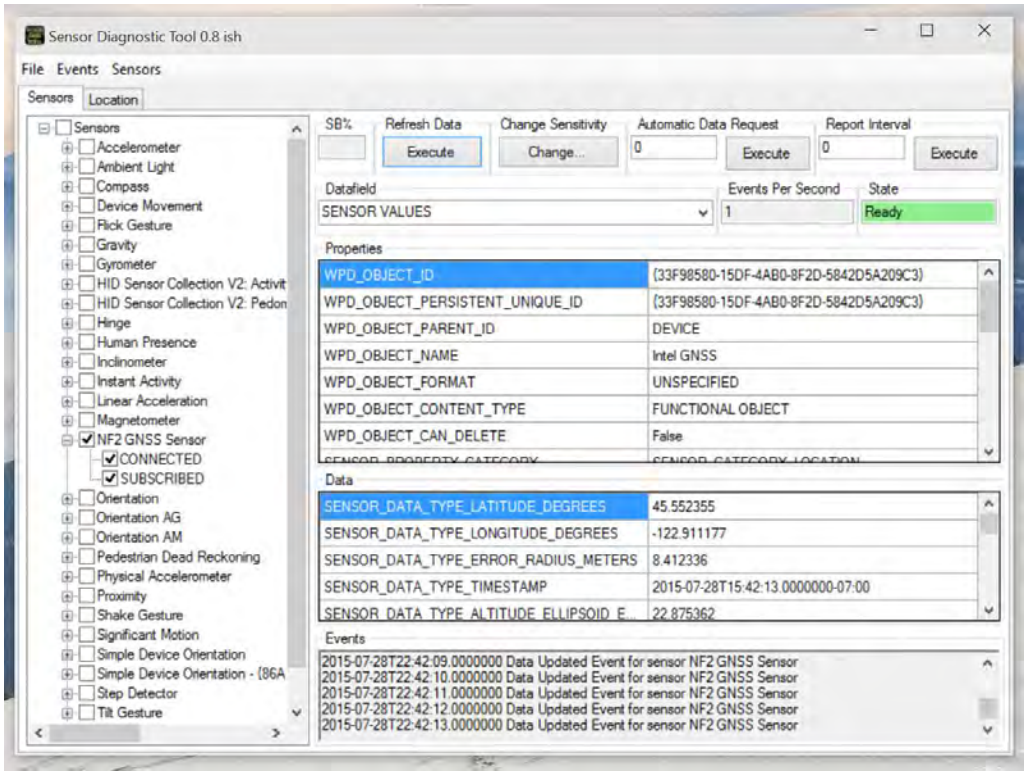
MAGNETIC FIELD IMMUNITY



EMC EXERCISER SETTINGS



GPS READINGS



VOLTAGE DIPS AND INTERRUPTIONS (VDI)

NORTHWEST EMC
WTD.2015.05.26

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a Voltage interruption and dip Immunity test was performed. The standard applies to electrical and electronic equipment having a rated input current not exceeding 16 A per phase. It does not apply to electrical and electronic equipment for connection to D.C. networks or 400 Hz A.C. networks. Electrical and electronic equipment may be affected by voltage dips, short interruptions or voltage variations of power supply. Voltage dips and short interruptions are caused by faults in the network, in installations or by a sudden large change of load. In certain cases, two or more consecutive dips or interruptions may occur. The continuously varying loads connected to the network cause voltage variations. The test shall be performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
EFT Surge VDI Test System	Haefely	ECOMPACT 4	IBK	4/13/2015	10/13/2015
Storage Capacitor	Northwest EMC	30uF	CPH	NCR	NCR

CONFIGURATIONS INVESTIGATED

INTE5584-5

MODES INVESTIGATED

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

VOLTAGE DIPS AND INTERRUPTIONS (VDI)

NORTHWEST EMC
WTD.2015.05.26

EUT:	Skylake	Work Order:	INTE5584
Serial Number:	IASY515S0016	Date:	06/19/2015
Customer:	Intel Corporation	Temperature:	24.4°C
Attendees:	Mike Lowe	Relative Humidity:	39.7%
Customer Project:	SKL21-SDS	Bar. Pressure:	1012.6 mbar
Tested By:	Cole Ghizzone	Job Site:	EV05
Power:	100VAC/50Hz, 230VAC/50Hz	Configuration:	INTE5584-5

TEST SPECIFICATIONS

Specification:	Method:
EN 55024:2010	IEC 61000-4-11:2004

COMMENTS

Tablet connected to Keyboard dock. Power, mouse, and audio to keyboard dock. External monitor to tablet Thunderbolt port.

EUT OPERATING MODES

Running Intel EMC Exerciser in Windows 10 with the following selected: Audio Tester, all CPU's, Windows (C:) Fixed and (D:) Removable drives, Memory Tester and the Video Tester. Continuous GPS connection with latitude, longitude and elevation readings. All other radios at idle.

DEVIATIONS FROM TEST STANDARD

None

EUT FUNCTIONS MONITORED

Monitored all selected parameters in the EMC Exerciser and looked for any other changes in operating state. Monitored GPS for continuous connection and looked for any major changes in position.

OBSERVATIONS

Number of Events	Percentage Reduction	Duration	Phase Angle	NWEMC Performance Criteria	Observation
3	100%	0.5 Cycles (50Hz)	0°	A	No Phenomena Observed
3	100%	0.5 Cycles (50Hz)	180°	A	No Phenomena Observed
3	100%	1 Cycle (50Hz)	0°	A	No Phenomena Observed
3	100%	1 Cycle (50Hz)	180°	A	No Phenomena Observed
3	30%	25 Cycles (50Hz)	0°	A	No Phenomena Observed
3	30%	25 Cycles (50Hz)	180°	A	No Phenomena Observed
1	100%	250 Cycles (50Hz)	0°	A	No Phenomena Observed

CONCLUSION (DIPS)

Meets NWEMC Performance Criteria	A

The EUT exhibited no change in performance when operating as specified by the manufacturer.

CONCLUSION (INTERRUPTS)

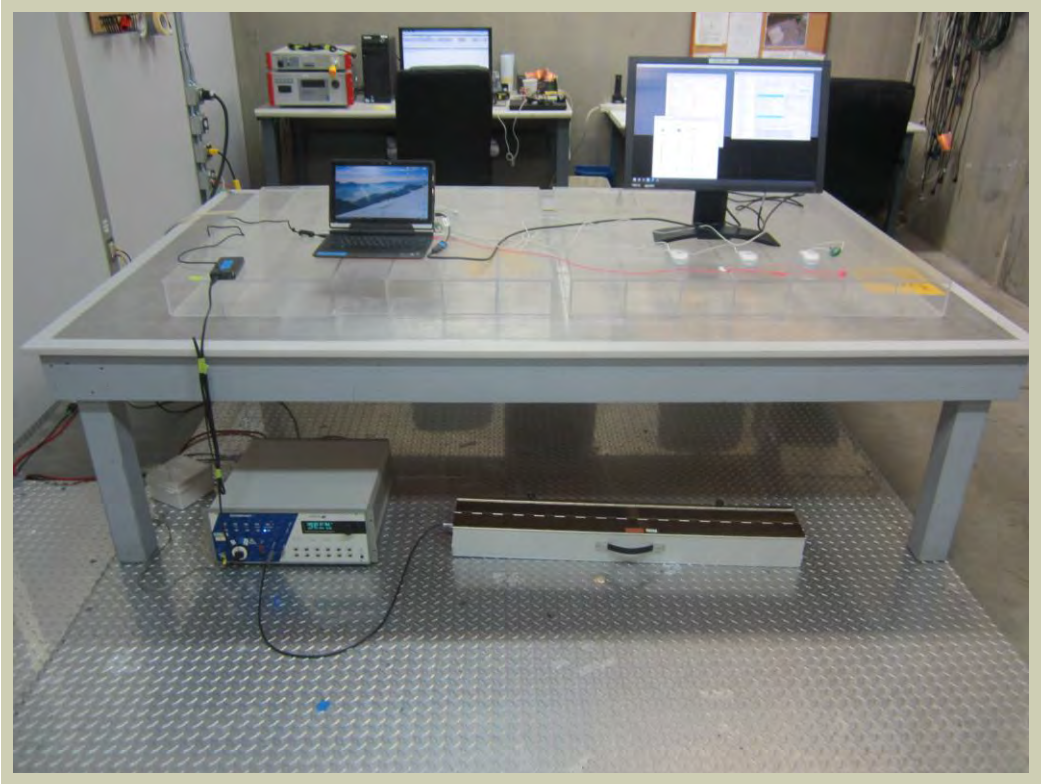
Meets NWEMC Performance Criteria	A

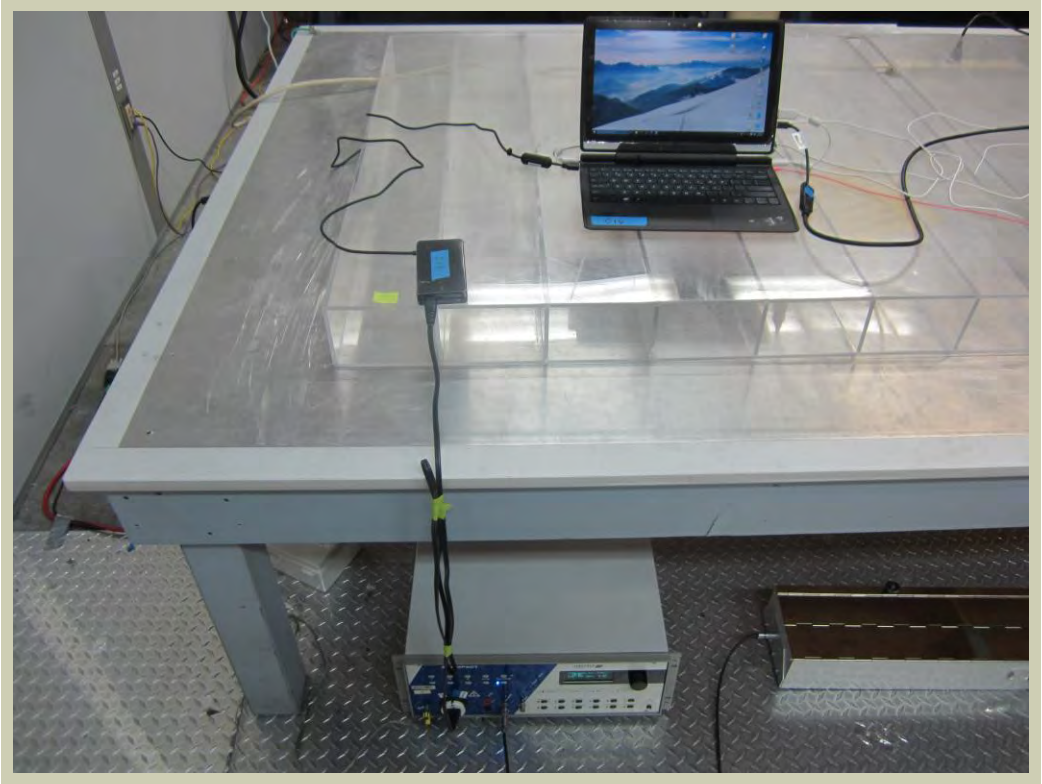
The EUT exhibited no change in performance when operating as specified by the manufacturer.

Tested By

VOLTAGE DIPS AND INTERRUPTIONS (VDI)

NORTHWEST EMC
WTD.2015.05.26

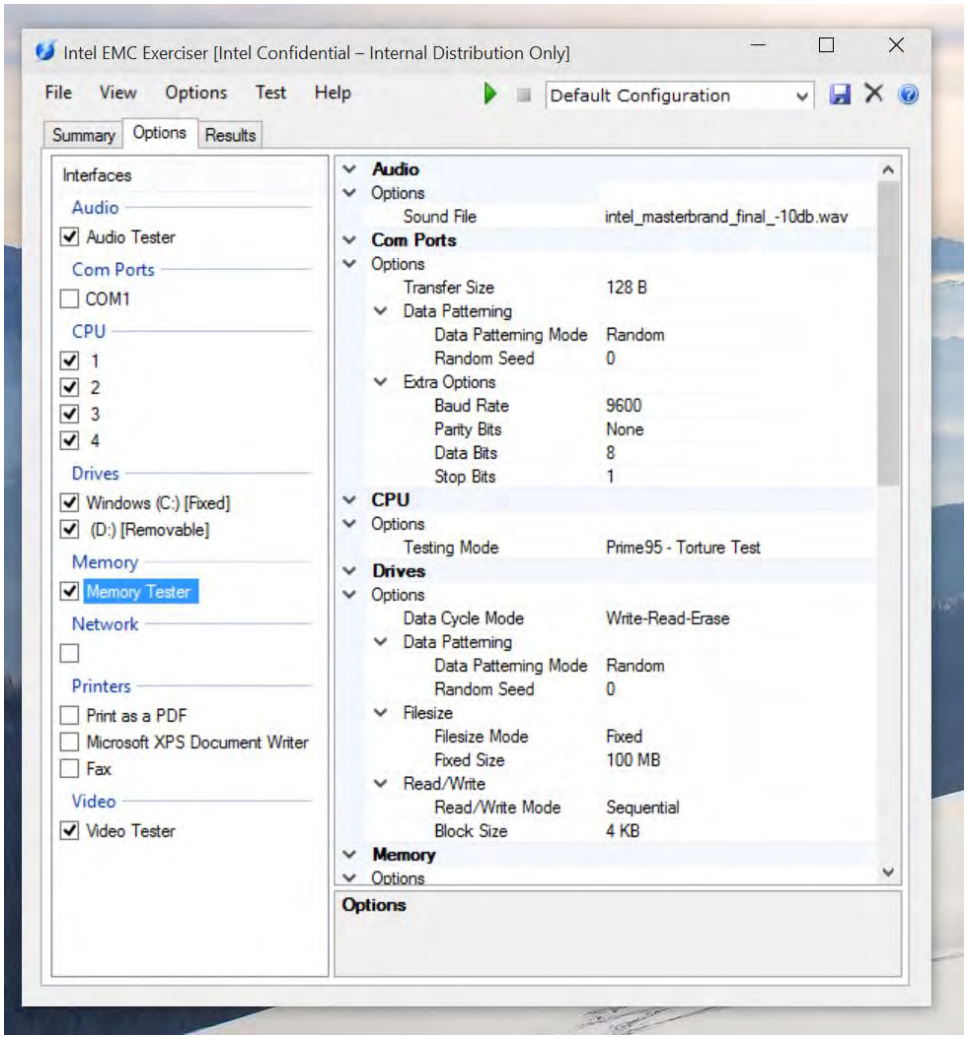




VOLTAGE DIPS AND INTERRUPTIONS (VDI)

NORTHWEST EMC
WTD.2015.05.26

EMC EXERCISER SETTINGS



GPS READINGS