Electromagnetic Compatibility Test Summary and Report

EMC Quote #	2014-035	*Testing Started*	1/29/144	*Date parts received*	1/29/14
Test Plan/ Request ID/ Approval #	None	*Testing Completed*	1/30/14	*Functional Class*	TBD
Applicable Specification	CISPR 25: (2008) ISO 11452-4 (2005)			*Product Phase*	ED - Engineering Development
Device Under Test (DUT) Description	**Serializer & Deserializer**				
Testing Requested by	Texas Instruments 2900 Semiconductor Drive Santa Clara, CA 95051			*ID/Serial #s*	*DS90UH927* Serializer *DS90UH928* Deserializer
				Model #	**Serializer/Deserializer**

Summary of Testing:

CISPR 25: (2008)	Performance Deviations? NO	Performance Deviations? YES	Compliant With Specification / Test Plan? NO	Compliant With Specification / Test Plan? YES	Compliant With Specification / Test Plan? TBD by Customer
6.3 Conducted Emissions - Current Probe Method	X			X	
6.4 Radiated Emissions - ALSE Method	X			X	

TBD = To Be Determined

Summary of Testing:

ISO 11452-4 (2005)	Performance Deviations? NO	Performance Deviations? YES	Compliant With Specification / Test Plan? NO	Compliant With Specification / Test Plan? YES	Compliant With Specification / Test Plan? TBD by Customer
11452-4 Bulk Current Injection	X			X	

TBD = To Be Determined

Date:	This report was prepared by:	This report was reviewed by:
February 3, 2014	Mark Cichon	Andrew Harding, PE
	Senior Engineering Associate	WiSE Staff Engineer NARTE-EMC-002615-NE
	Phone 248-427-5318	Phone 248-427-5323
	E-mail Mark.S.Cichon@ul.com	E-mail Andrew.Harding@ul.com

Test Method Name:	6.3 Conducted Emissions - Current Probe Method
Report Author:	Jason Harris - WiSE Laboratory Technician
Test Setup Comments:	Testing was performed in accordance with the applicable specification and customer Instruction (no customer test plan).
DUT Disposition:	Devices were retained in the UL EMC Lab for subsequent testing.
Summary of Results:	No peaks over specification limits.

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Company Name:	Texas Instruments	Test Name:	6.3 Conducted Emissions - Current Probe Method
Harness Information:	2.0 m	Date(s) test performed:	1/30/2014
Grounding Information:	Remote Ground	Temperature (°C):	20
Pretest inspection:	☒ No anomalies ☐ The following anomalies:	Humidity (%RH):	9
Posttest inspection:	☒ No anomalies ☐ The following anomalies:	Tested by:	Jason Harris
Sample #	DS90UH927		
Mode:	ON		
Ambient Compliant:	☐ No ☒ Yes		

Probe Position	Comments	Over/Under Limit
50mm	(SER)	☐ Over ☒ Under
750mm	(SER)	☐ Over ☒ Under

Company Name:	Texas Instruments	Test Name:	6.3 Conducted Emissions - Current Probe Method
Harness Information:	2.0 m	Date(s) test performed:	1/30/2014
Grounding Information:	Remote Ground	Temperature (°C):	20
Pretest inspection:	☒ No anomalies ☐ The following anomalies:	Humidity (%RH):	9
Posttest inspection:	☒ No anomalies ☐ The following anomalies:	Tested by:	Jason Harris
Sample #	DS90UH9278		
Mode:	ON		
Ambient Compliant:	☐ No ☒ Yes		

Probe Position	Comments	Over/Under Limit
50mm	(DES)	☐ Over ☒ Under
750mm	(DES)	☐ Over ☒ Under

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UL Provided Test Equipment

Asset #	Manufacturer / Model #	Description	Cal. Due
ATA804	ETS Lindgren (-)	Chamber	1/31/15
SA0014	Rohde & Schwarz (ESCI7)	Spectrum Analyzer	10/31/14
ZATA91	HP (11713A)	Switch Driver	Verify Before Each Use
ZPS006	HP (6269B)	Power Supply	Verify Before Each Use
CTO037	ETS Lindgren (93686-8)	Current Clamp	5/31/14

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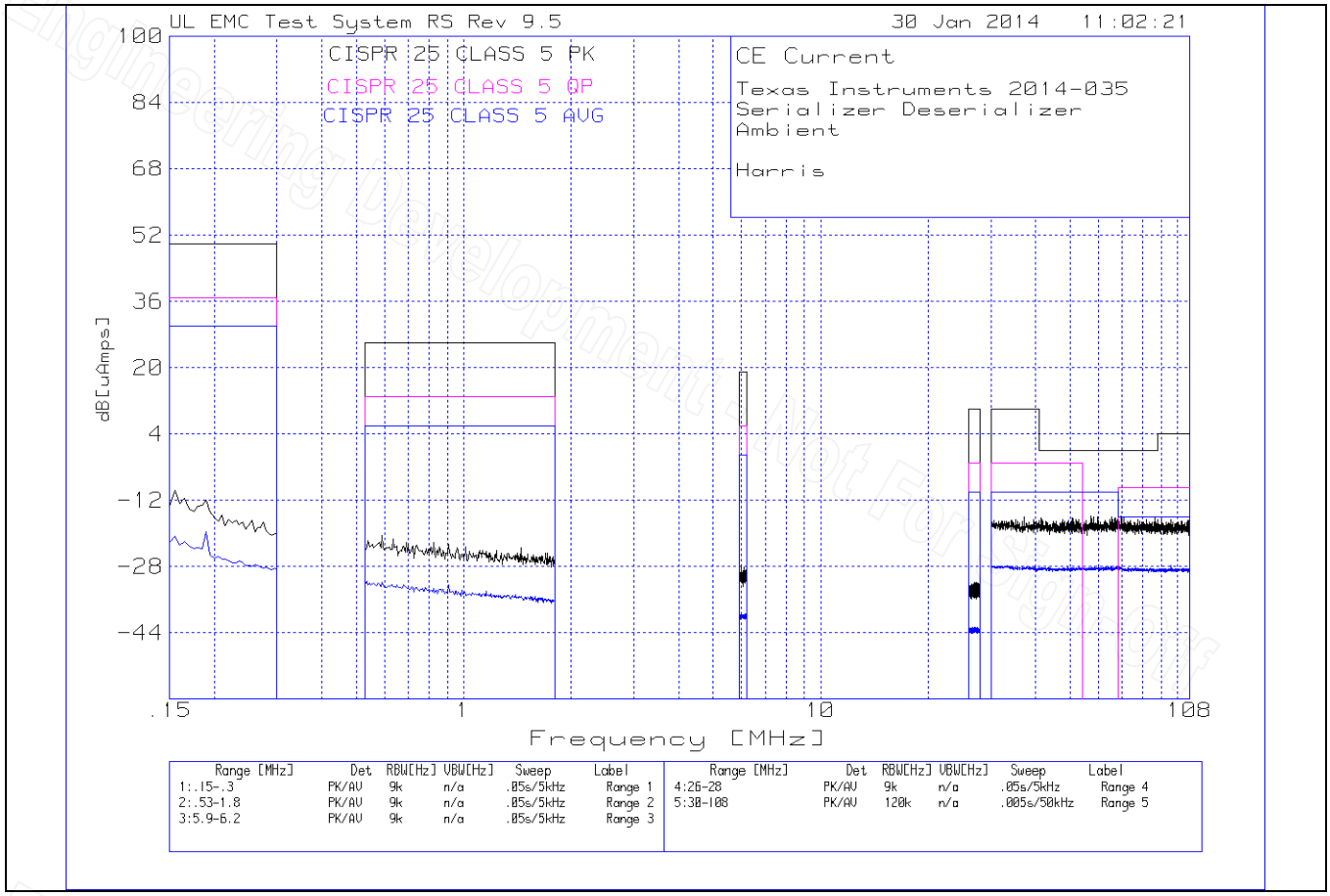
Plots & Tables



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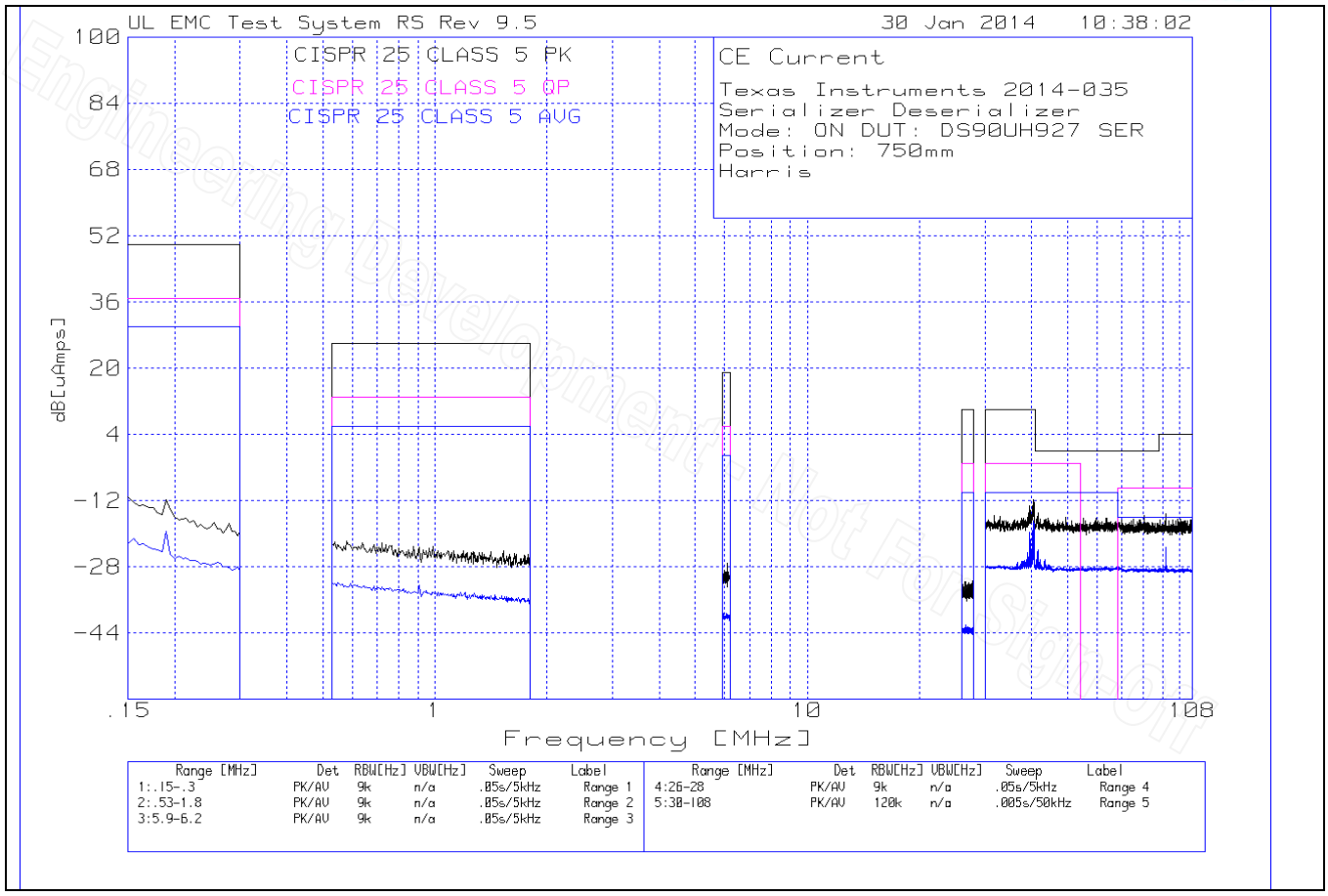

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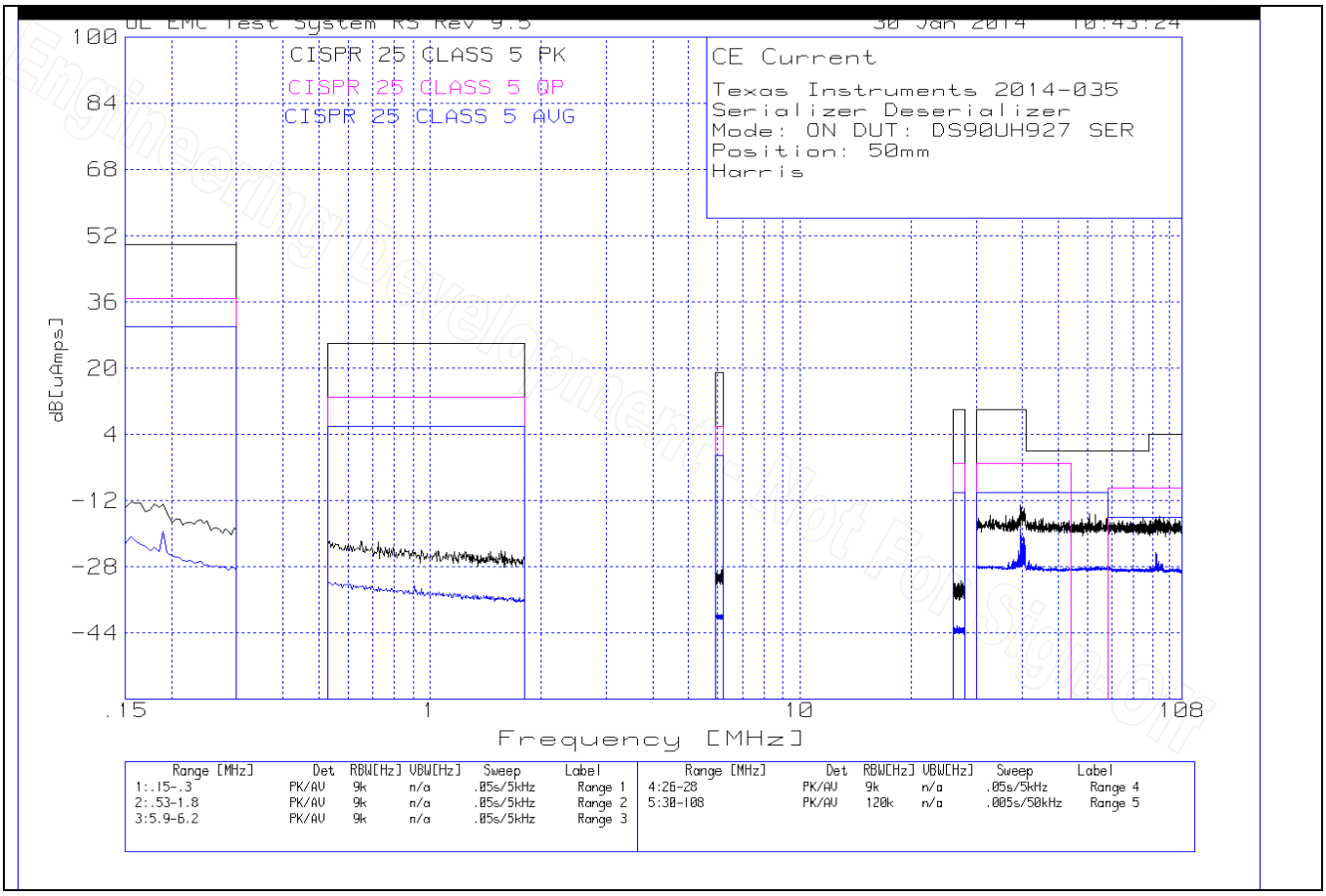

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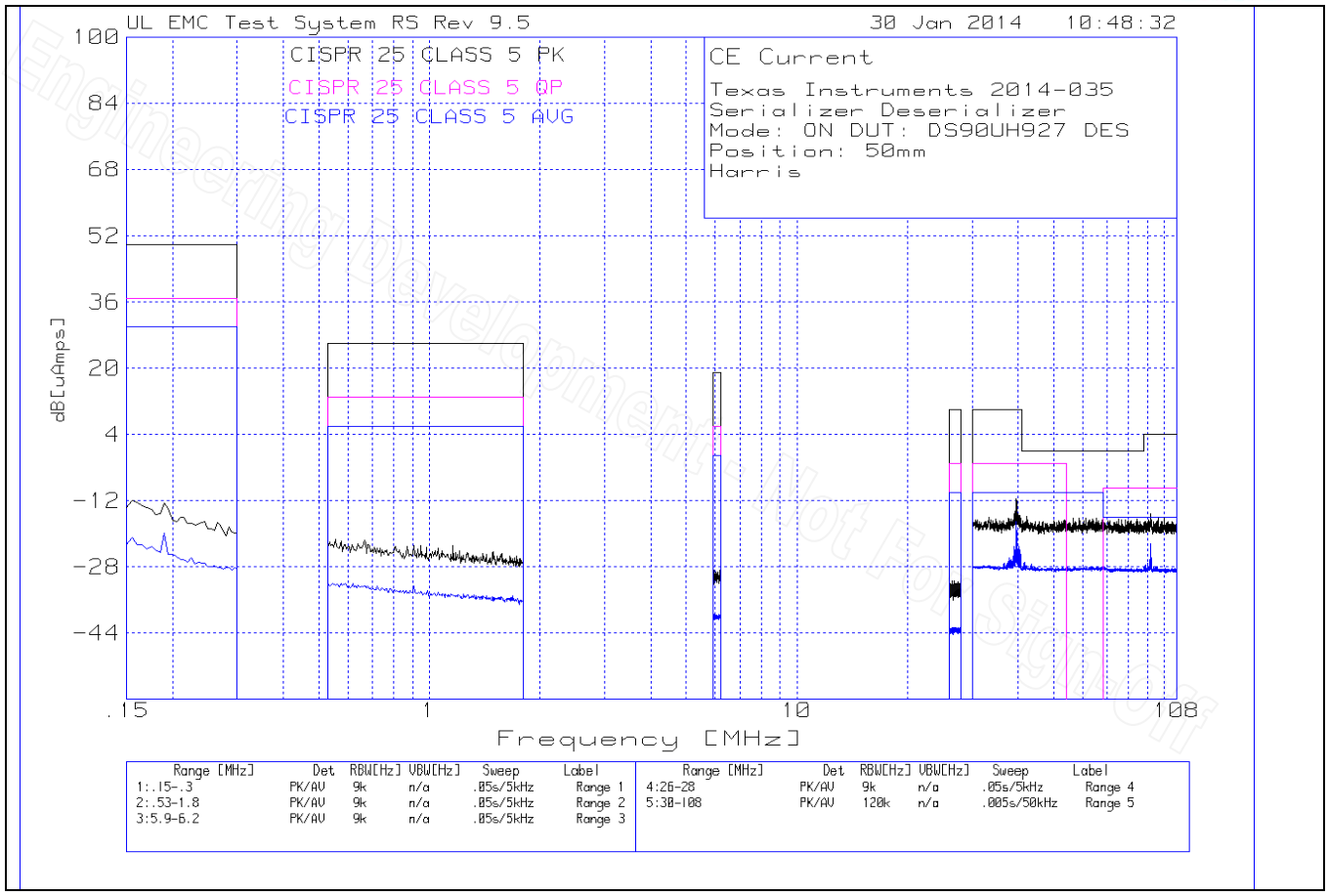

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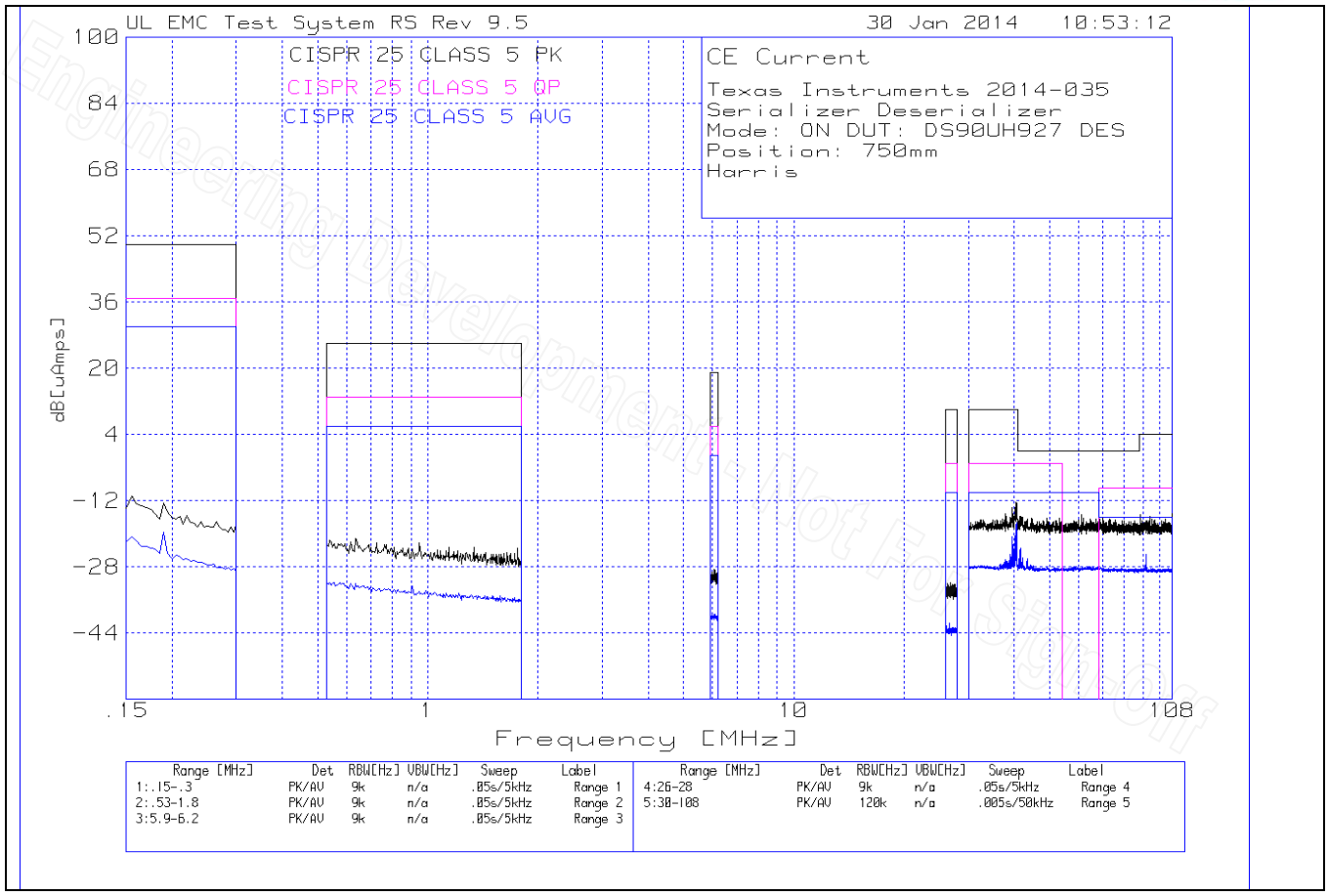

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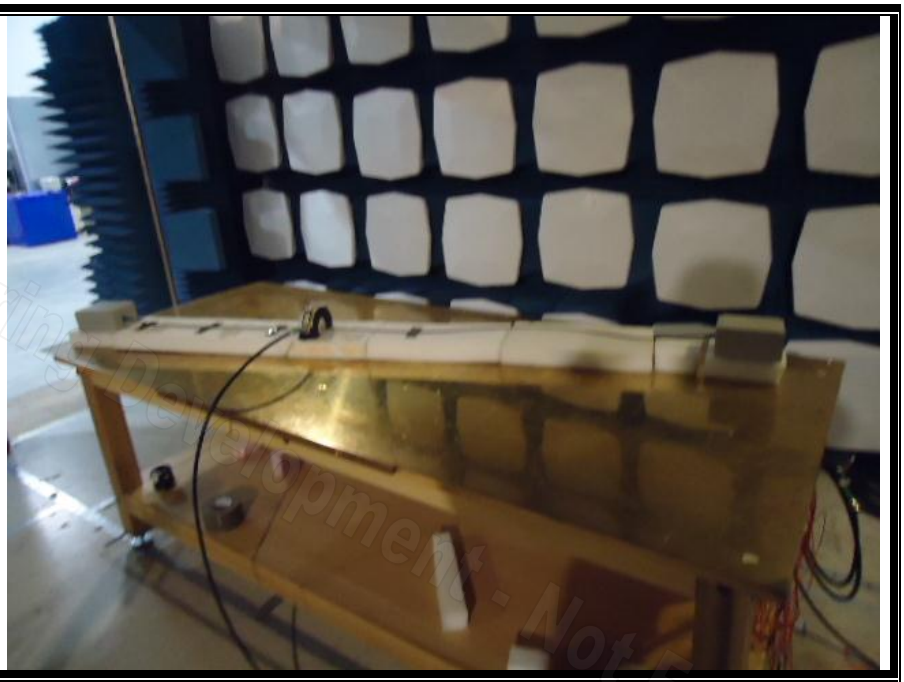
PHOTOS

DUT Serializer & Deserializer



Overall Setup

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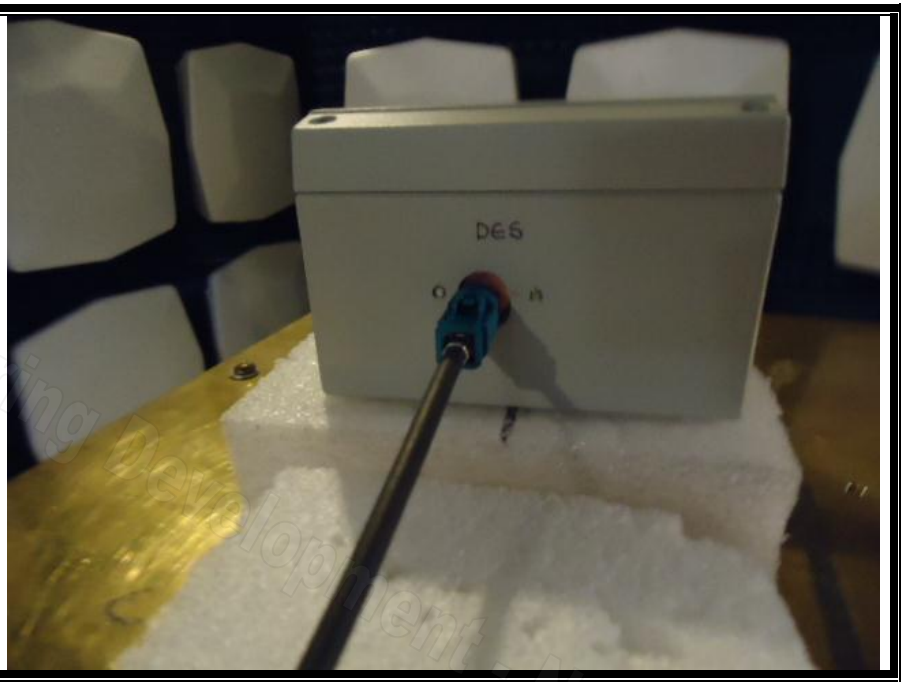
Serializer Connection to Harness



Deserializer Connection to Harness

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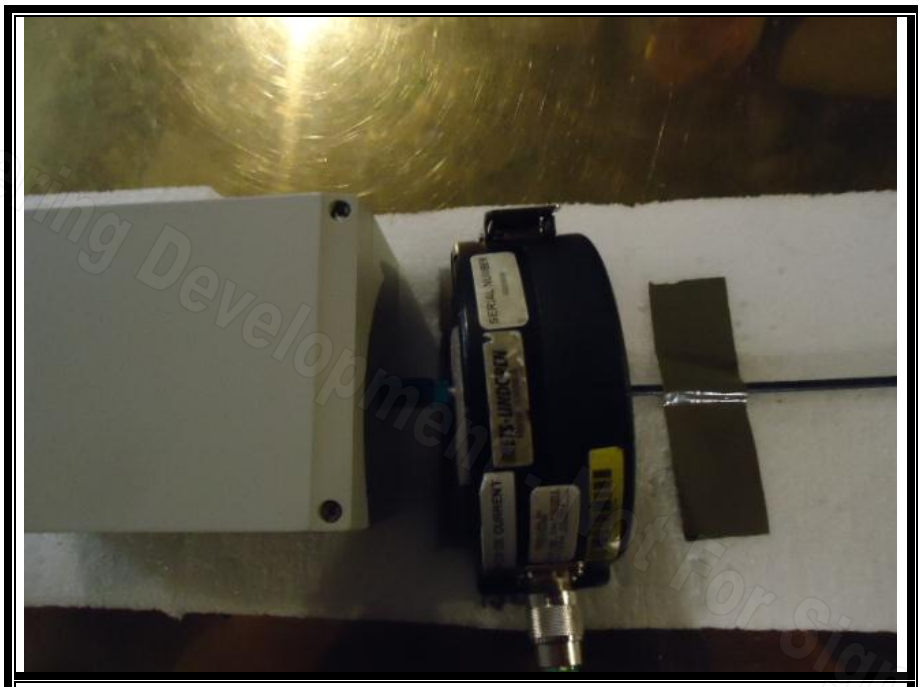
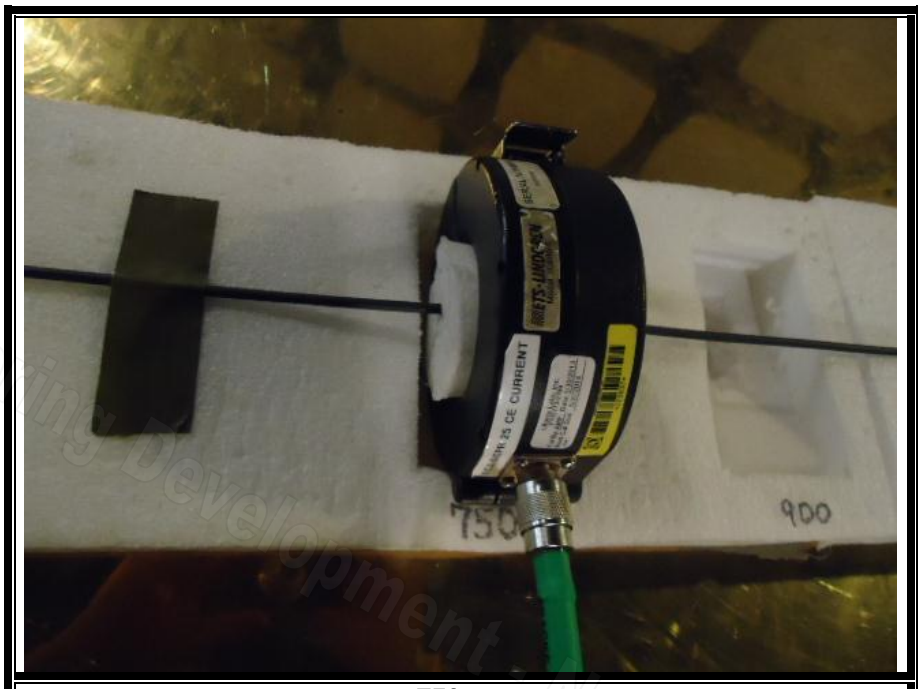


50mm



750mm

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Test Method Name:	6.4 Radiated Emissions - ALSE Method
Report Author:	Victor Daugherty, NCT - WiSE Senior Engineer
Test Setup Comments:	Testing was performed in accordance with the applicable specification and customer Instruction (no customer test plan). Note, Horn Testing not performed per customer instruction.
DUT Disposition:	Devices were retained in the UL EMC Lab for subsequent testing.
Summary of Results:	No peaks over the Class 5 limits

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Company Name:	Texas Instruments	Test Name:	6.4 Radiated Emissions - ALSE Method
Harness Information:	2.0 m	Date(s) test performed:	1/29/2014
Grounding Information:	Remote Ground	Temperature (°C):	21
Pretest inspection:	☒ No anomalies ☐ The following anomalies:	Humidity (%RH):	28
Post test inspection:	☒ No anomalies ☐ The following anomalies:	Tested by:	Victor Daugherty, NCT
		Software Version:	UL EMC 9.5
Sample #	DS90UH927 (SER)/ DS90UH928 (DES)		
Mode:	On		
Ambient Compliant	☒ Rod / ☒ V Bic / ☒H Bic / ☒ V Log / ☒ H Log		

Antenna Type	Comments	Over/Under Limit
Rod		☐ Over ☒ Under
Bicon Vertical		☐ Over ☒ Under
Bicon Horizontal		☐ Over ☒ Under
Log Vertical		☐ Over ☒ Under
Log Horizontal		☐ Over ☒ Under

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UL Provided Test Equipment

Asset #	Manufacturer / Model #	Description	Cal. Due
ATA804	ETS Lindgren (-)	Chamber	1/31/15
SA0014	Rohde & Schwarz (ESCI7)	Spectrum Analyzer	10/31/14
AT0058	ETS Lindgren (3301B)	Rod Antenna	9/28/14
AT0059	ETS Lindgren (3110C)	Bicon Antenna	6/31/14
AT0029	EMCO (3146)	Log Antenna	10/31/14
ATA406	Miteq (AM-1551-9625)	Bicon/Log Pre-amplifier/Path	11/31/15
ATA053	Solar (7333-5-TS-50-N)	LISN & 50Ω Termination	1/31/15
ATA054	Solar (7333-5-TS-50-N)	LISN & 50Ω Termination	1/31/15
ZATA91	HP (11713A)	Switch Driver	Verify Before Each Use
ZPS006	HP (6269B)	Power Supply	Verify Before Each Use

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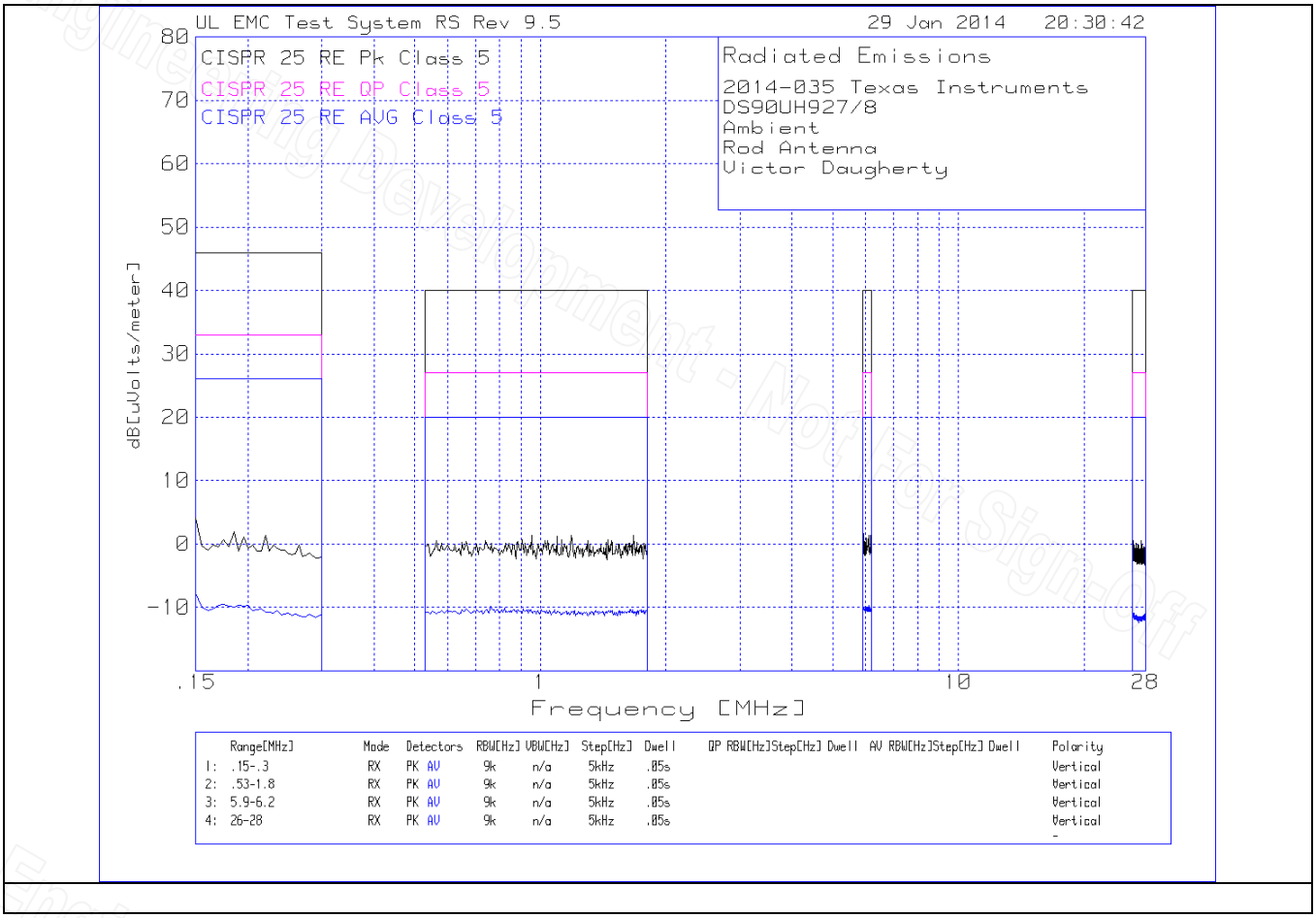
Plots & Tables



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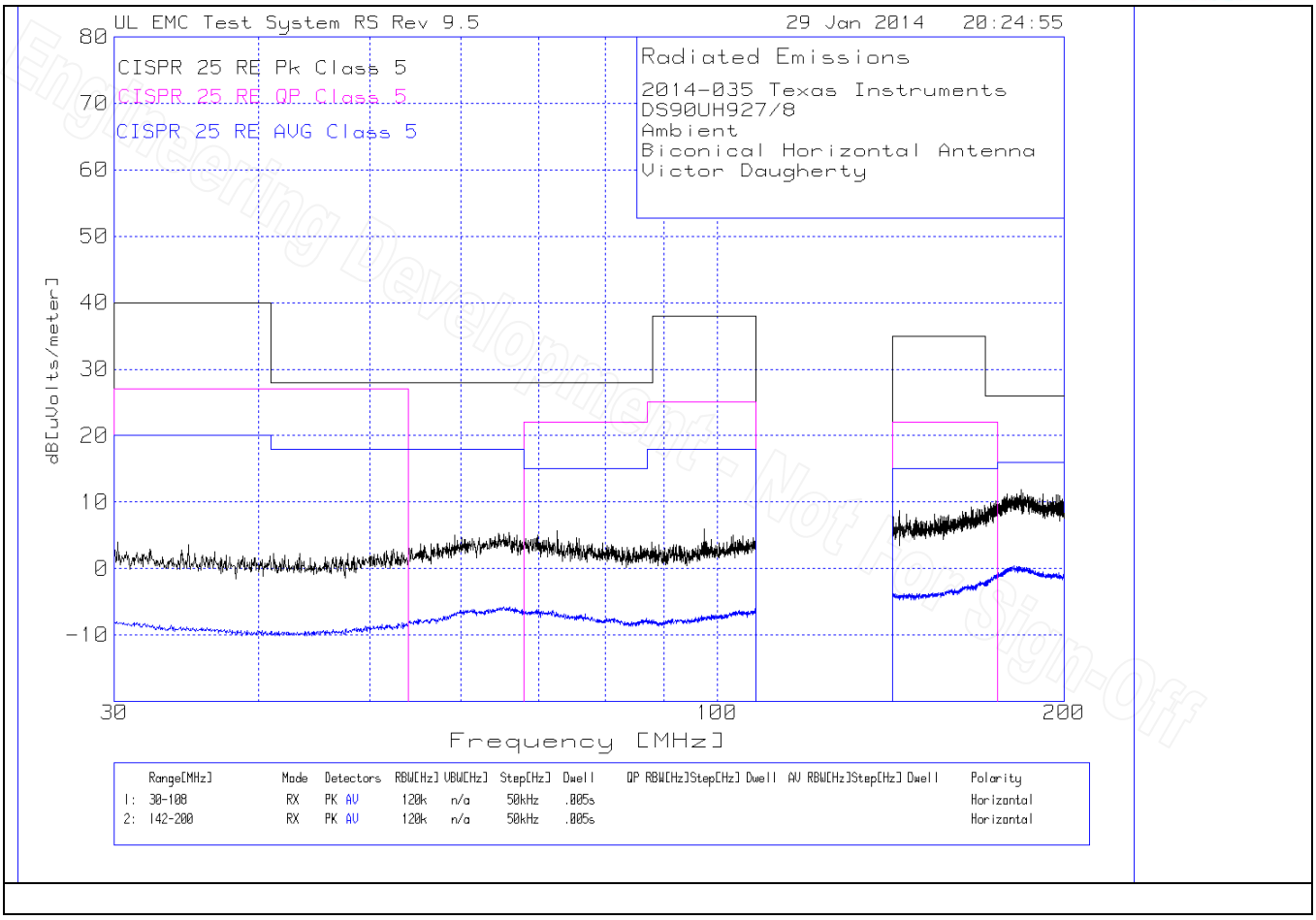

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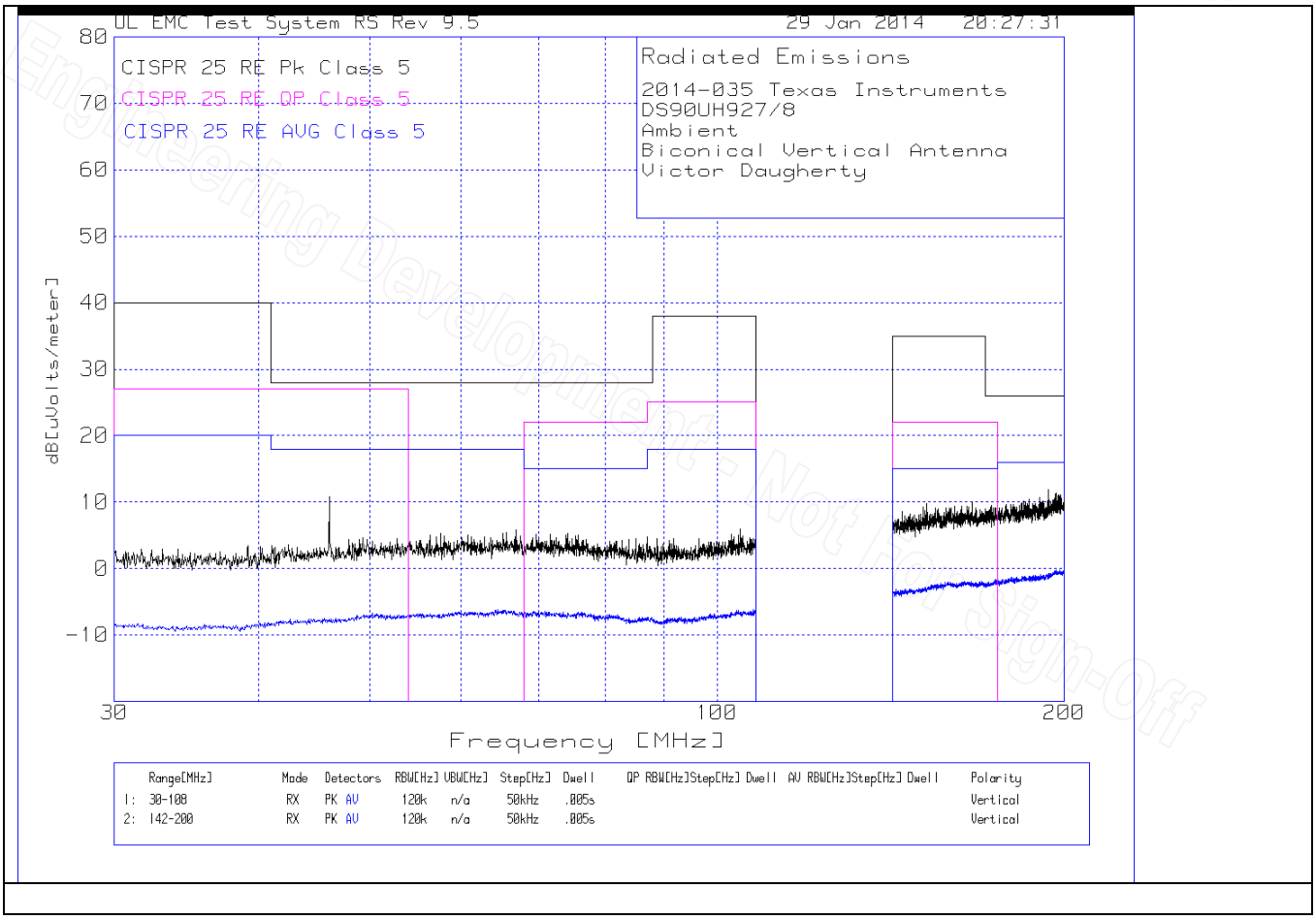

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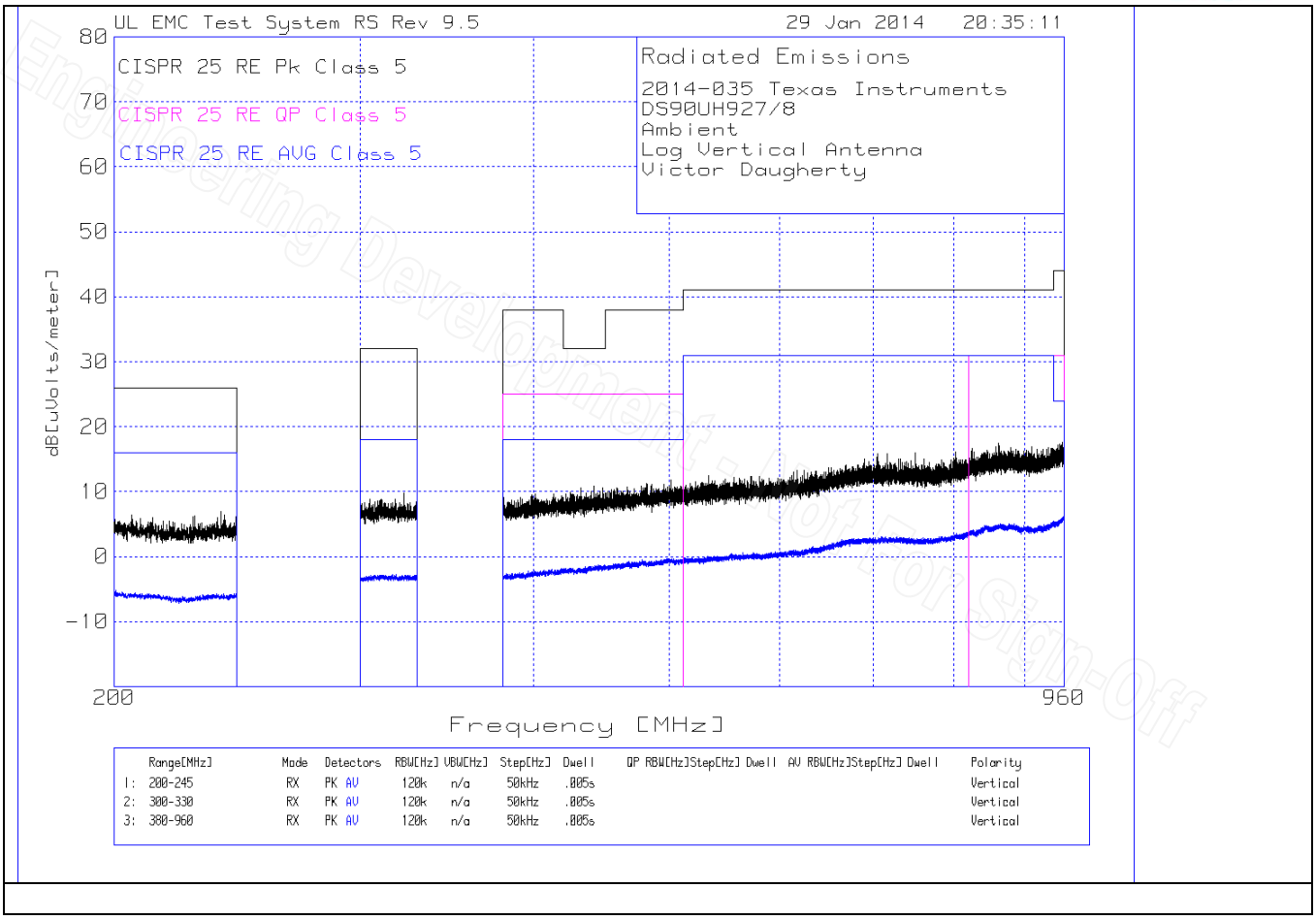

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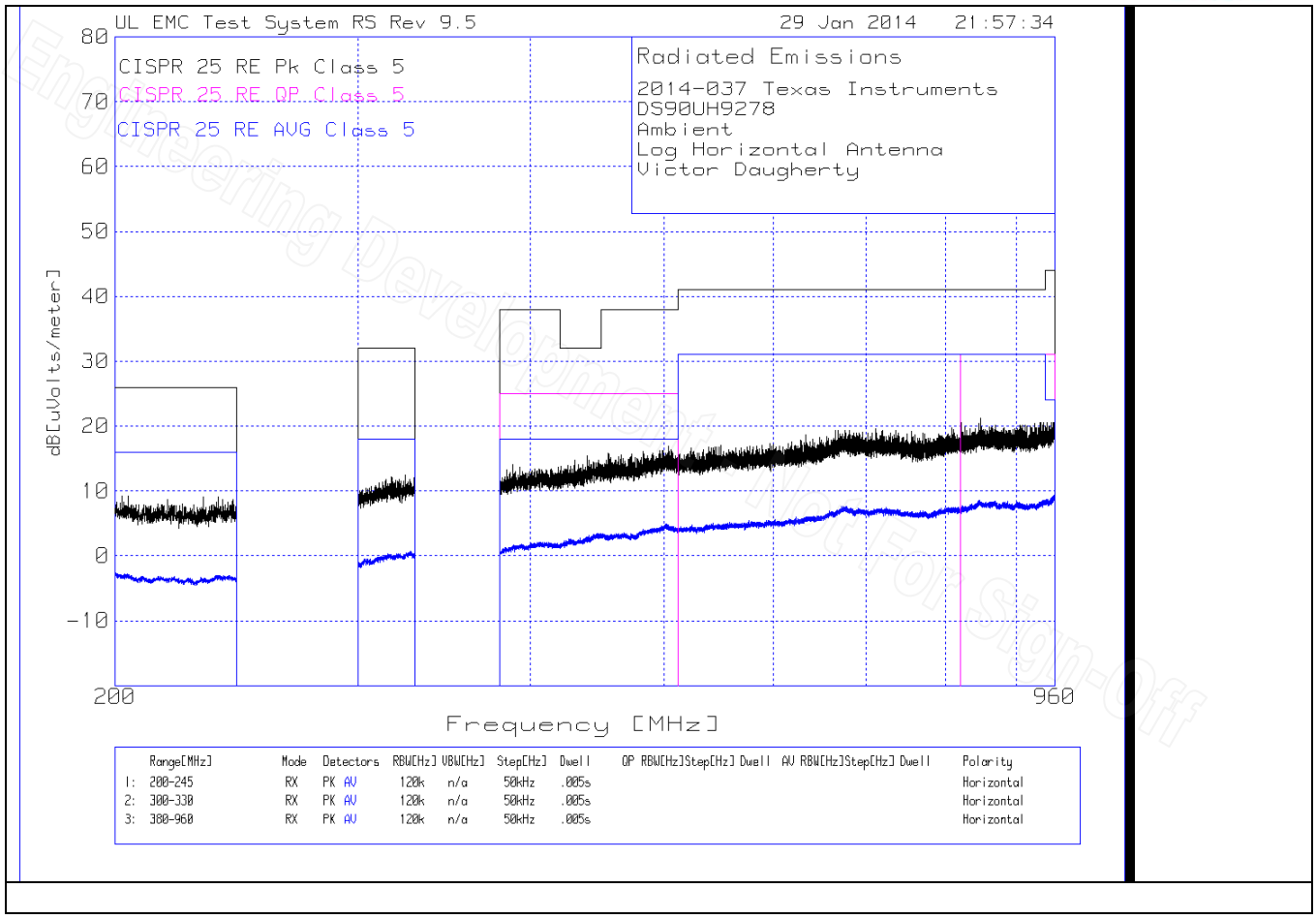

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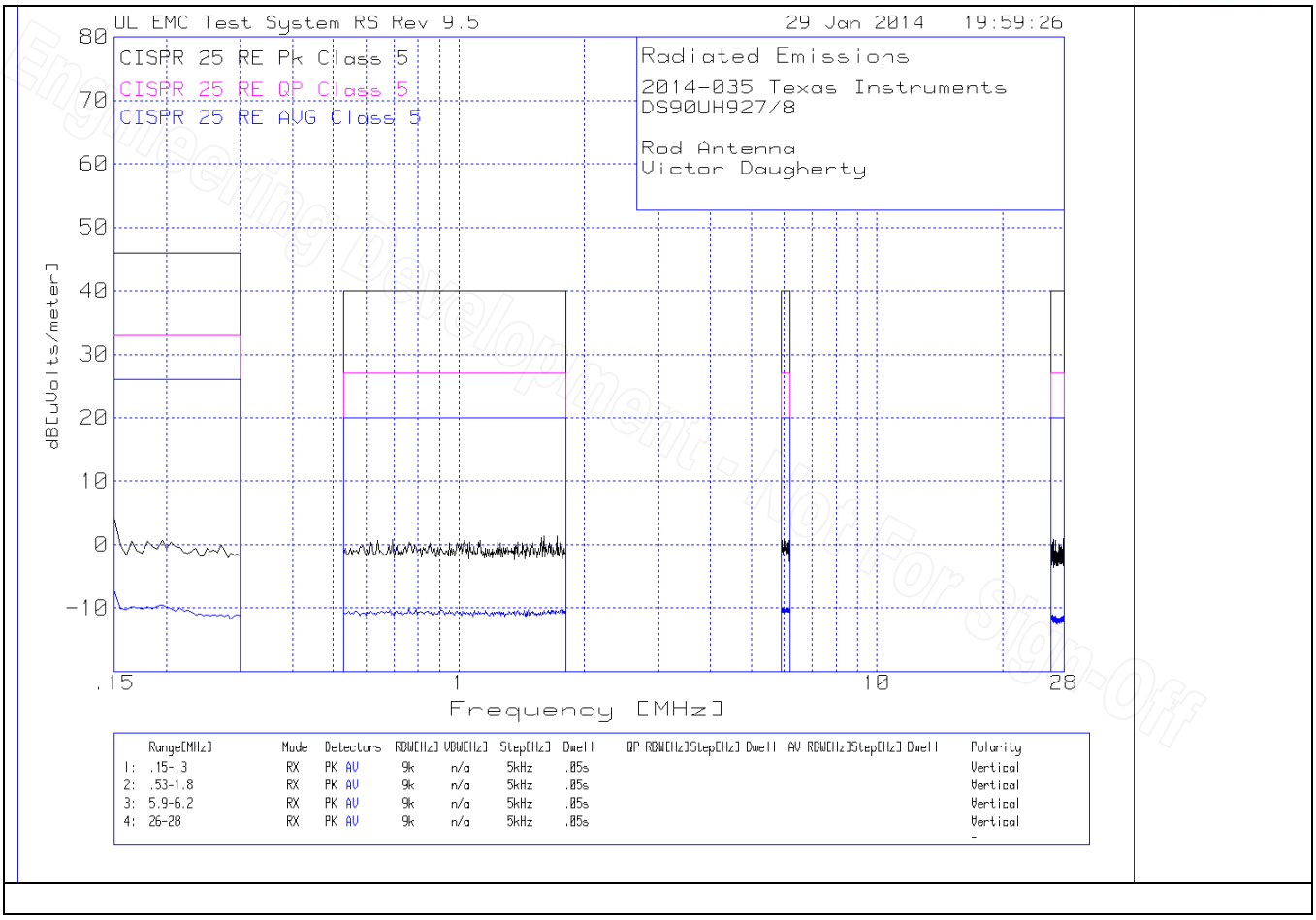

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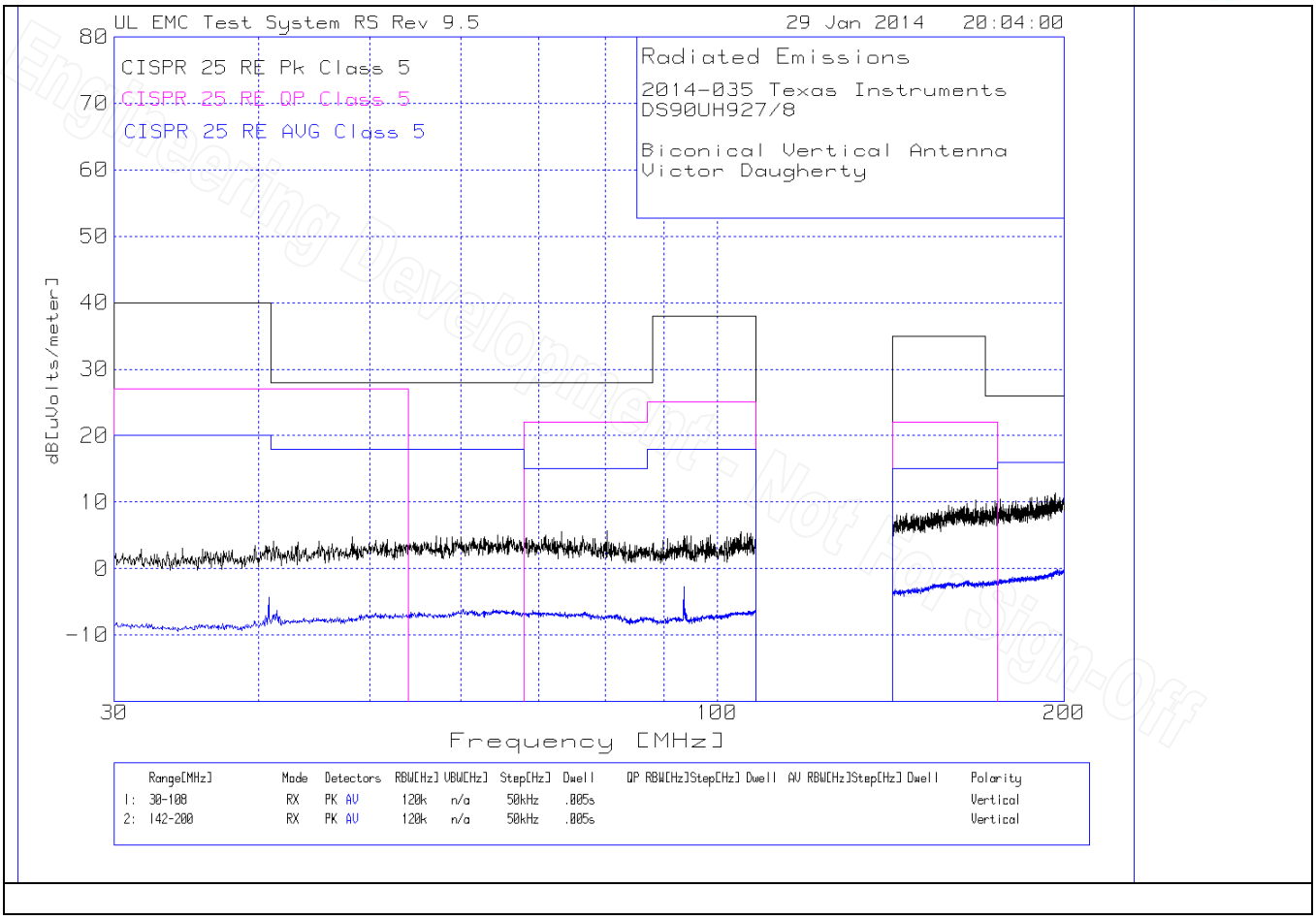

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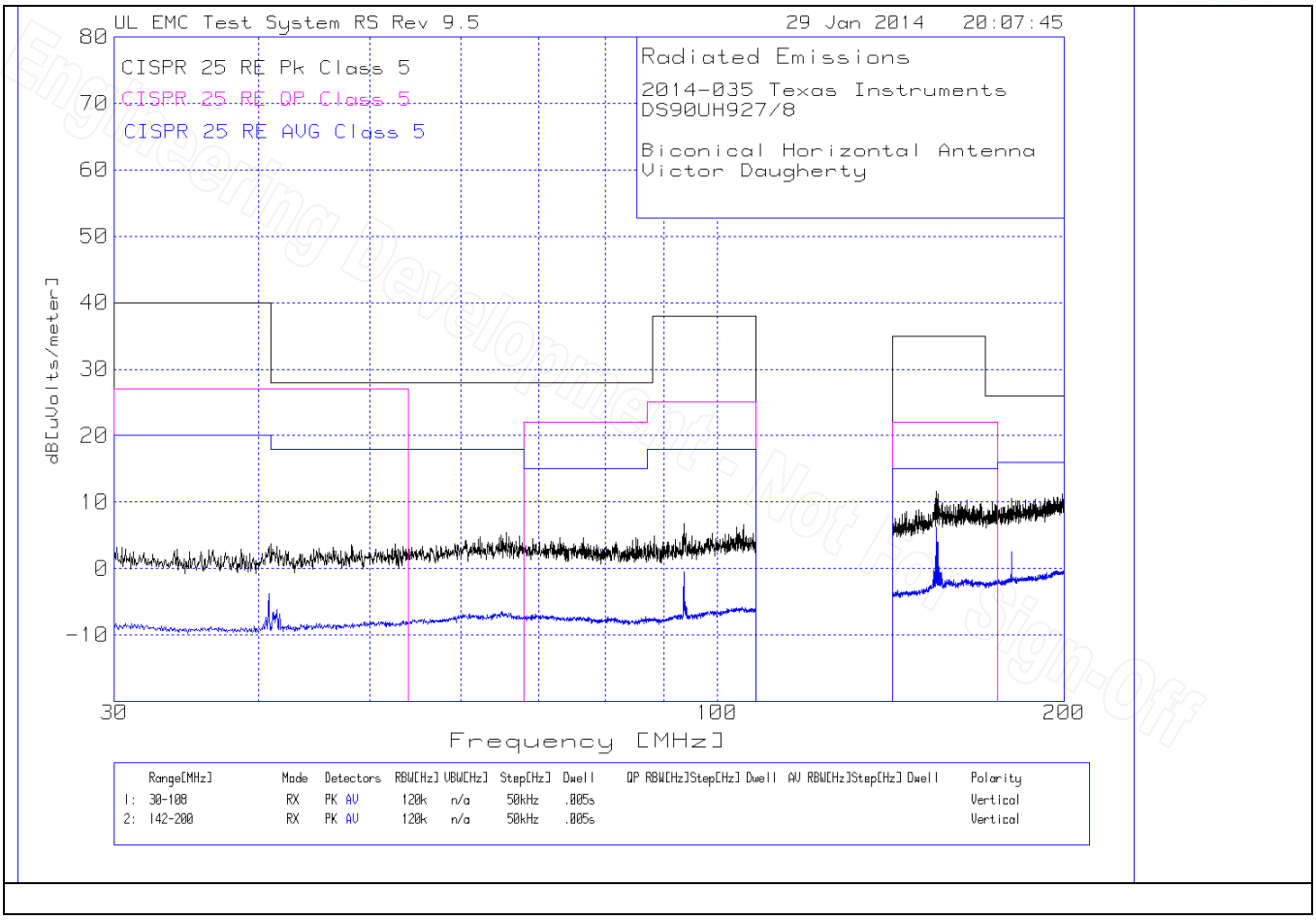

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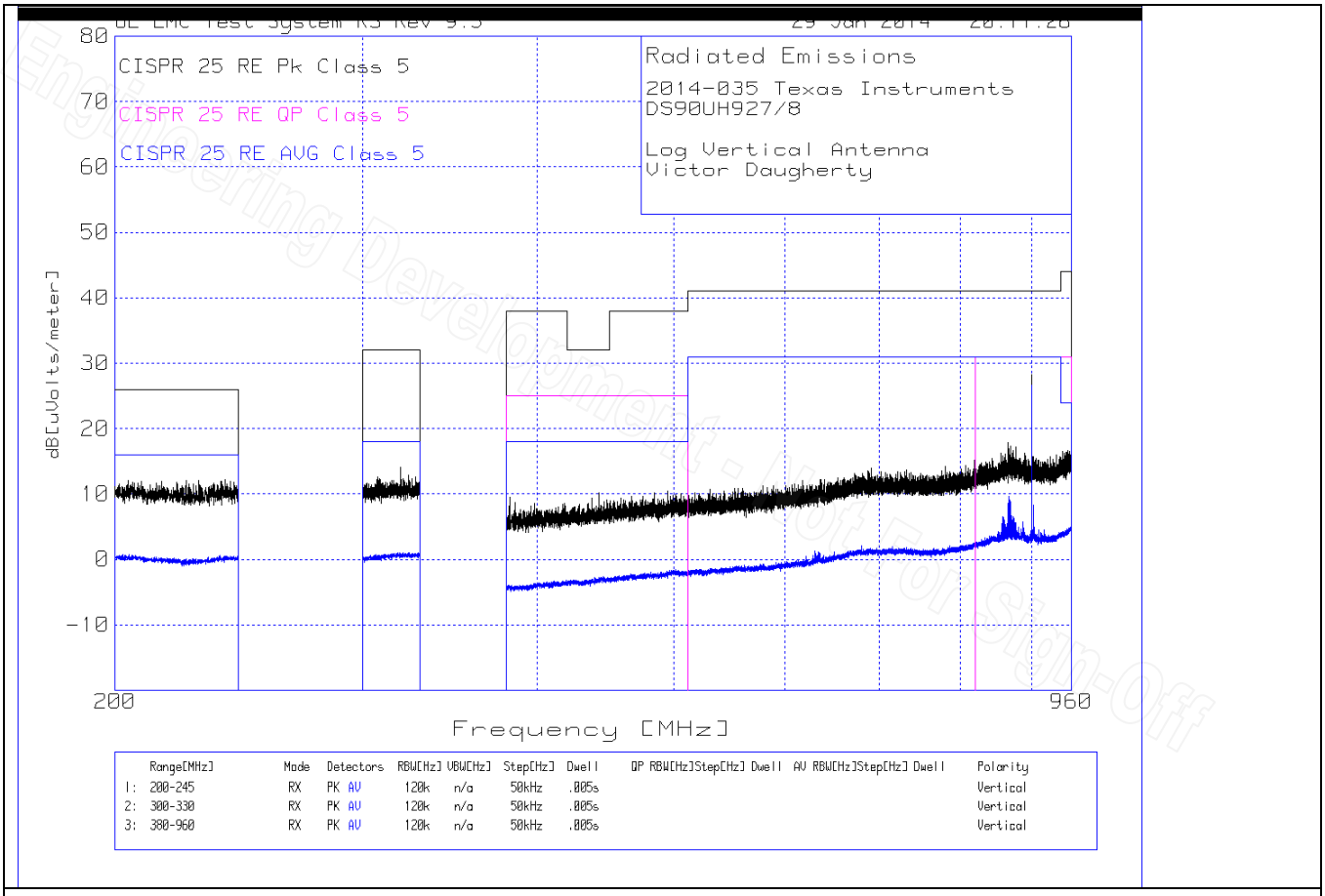

Frequency (MHz)	Detector	Level dBuV/m	Limit 1 dBuV/m	Margin 1	Limit 2 dBuV/m	Margin 2	Limit 3 dBuV/m	Margin 3
900.05	PK	24.7	41	-16.3	31	-6.3	31	-6.3
900.05	AV	21.95	41	-19.05	31	-9.05	31	-9.05

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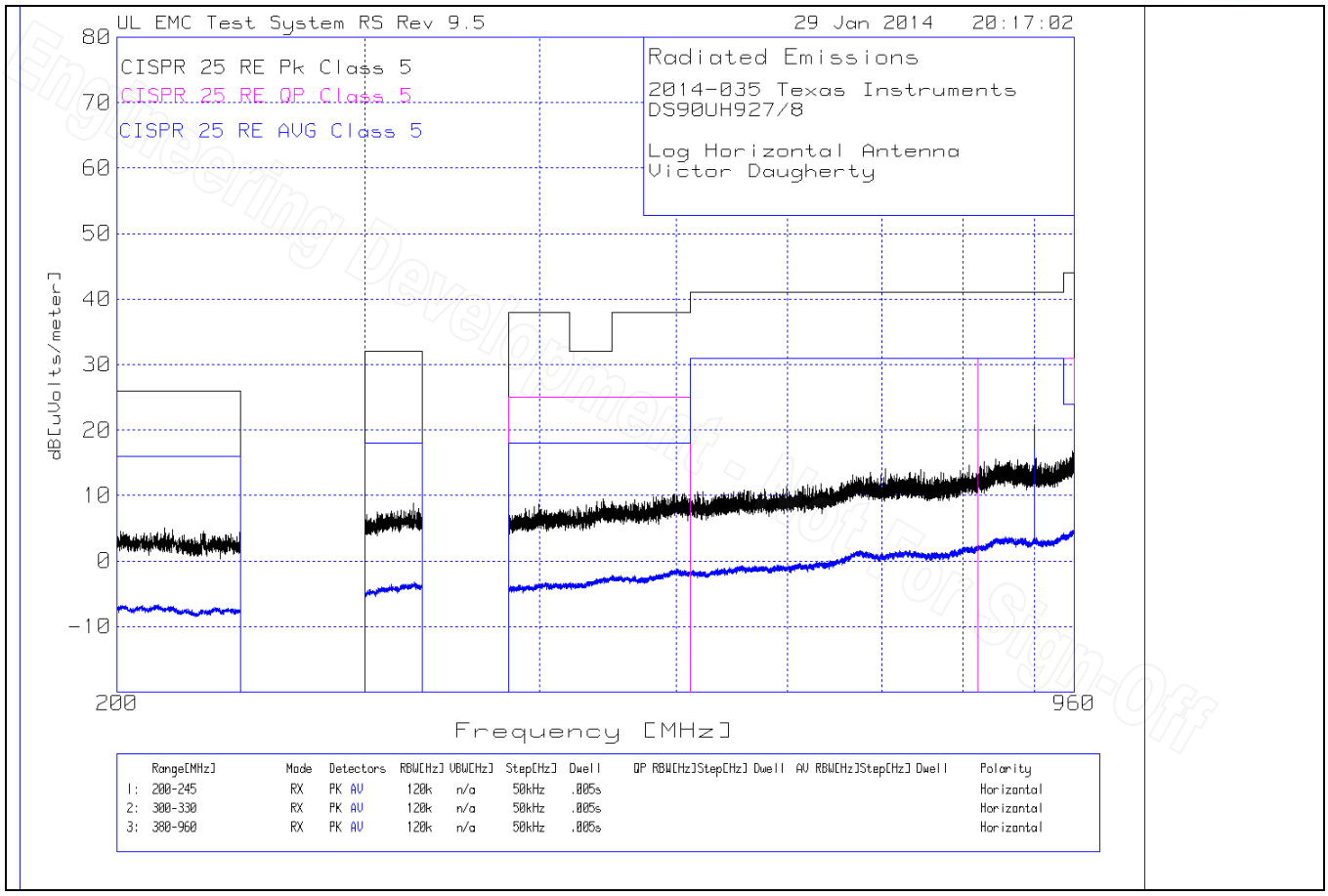

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PHOTOS

DUT Serializer & Deserializer

Overall Setup

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Rod Antenna setup

Deserializer setup

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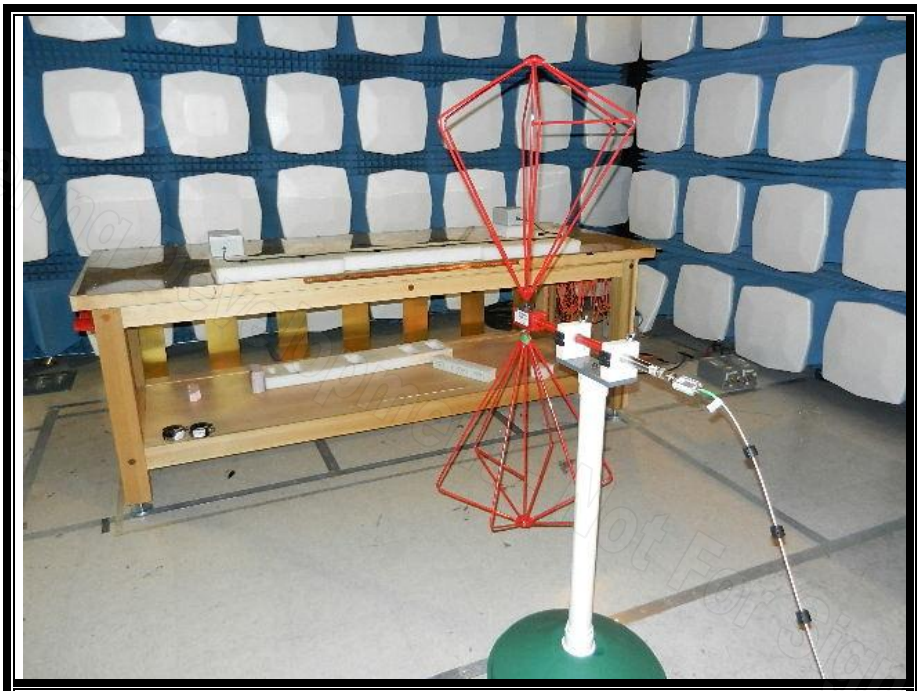
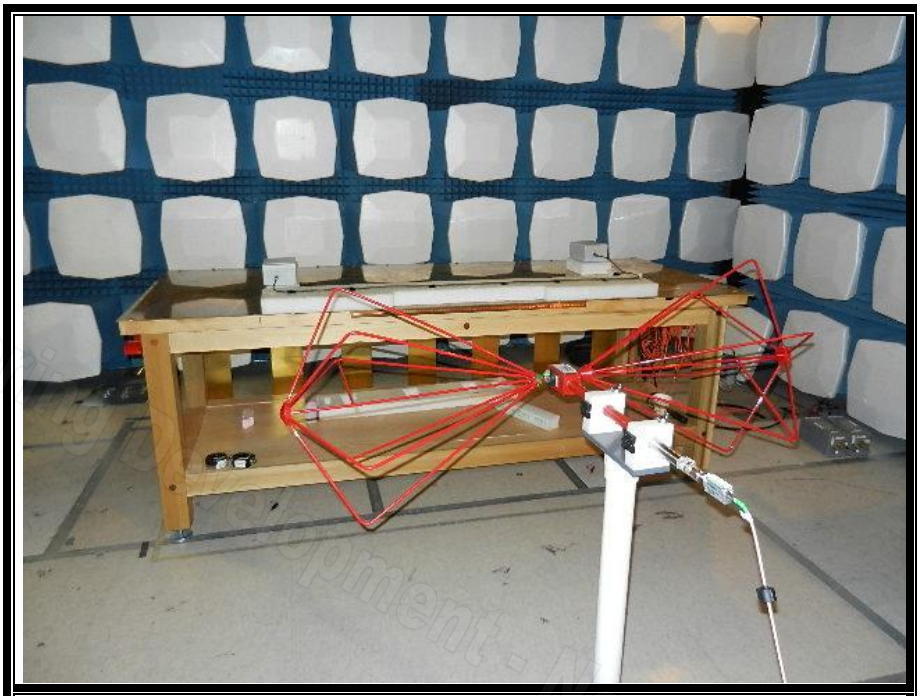


Biconical Vertical setup



Biconical Horizontal setup

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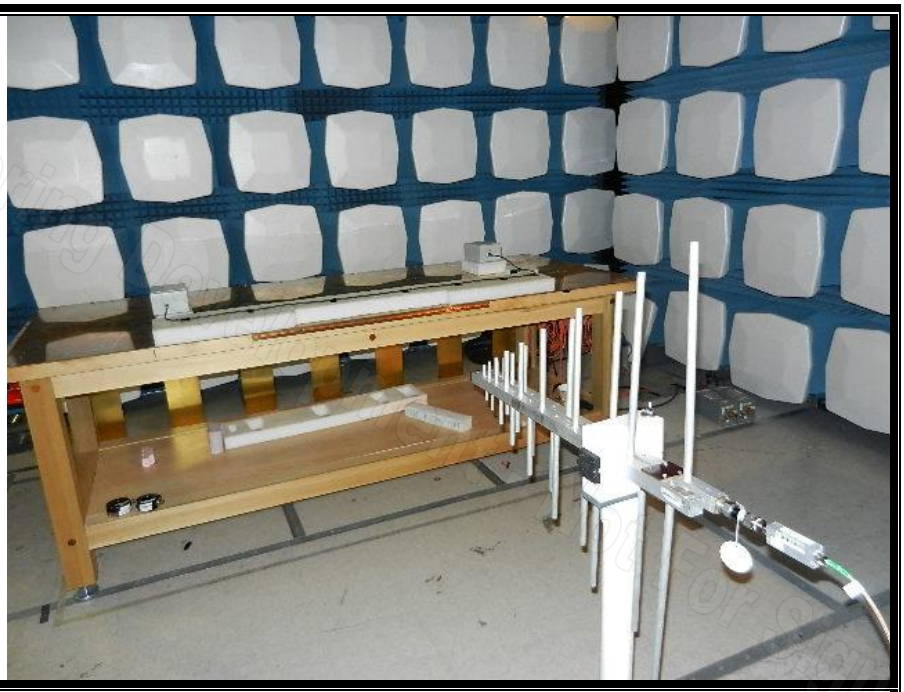

Log Vertical setup

Log Horizontal setup

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Test Method Name:	11452-4 Bulk Current Injection
Report Author:	Jason Harris – WiSE Laboratory Technician
Test Setup Comments:	Testing was performed in accordance with the applicable specification and customer Instruction (no customer test plan)/.
Device Monitoring:	Customer performed Pre and Post functional only.
DUT Disposition:	Devices were retained in the UL EMC Lab for subsequent testing.
Summary of Results:	No anomalies noted during testing.

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Company Name:	Texas Instruments	Test Name:	11452-4 Bulk Current Injectio
Harness Information:	2.0 m	Date(s) test performed:	1/30/2014
Grounding Information:	Remote Ground	Temperature (°C):	21
Frequency Range:	1-400MHz	Humidity (%RH):	14
Dwell Time (Seconds):	2	Tested by:	Jason Harris
Modulation:	CW and AM	Software Version:	BCI 2.5
Sample #	DS90UH927 (SER)	*Pretest inspection:*	☒ No anomalies ☐ The following anomalies:
Mode:	On	Post test inspection:	☒ No anomalies ☐ The following anomalies:
Position (mm)	Frequency (MHz)	Level (mA)	DUT Performance
☒ 150 CBCI	☒ CW (1-400) ☒ AM	200	1
☒ 450 CBCI	☒ CW (1-400) ☒ AM	200	1
☒ 750 CBCI	☒ CW (1-400) ☒ AM	200	1

1 - No anomalies

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Company Name:	Texas Instruments	Test Name:	11452-4 Bulk Current Injectio
Harness Information:	2.0 m	Date(s) test performed:	1/30/2014
Grounding Information:	Remote Ground	Temperature (°C):	21
Frequency Range:	1-400MHz	Humidity (%RH):	14
Dwell Time (Seconds):	2	Tested by:	Jason Harris
Modulation:	CW and AM	Software Version:	BCI 2.5
Sample #	DS90UH928 (DESER)	*Pretest inspection:*	☒ No anomalies ☐ The following anomalies:
Mode:	On	Posttest inspection:	☒ No anomalies ☐ The following anomalies:

Position (mm)	Frequency (MHz)	Level (mA)	DUT Performance
☒ 150 CBCI	☒ CW (1-400) ☒ AM	200	1
☒ 450 CBCI	☒ CW (1-400) ☒ AM	200	1
☒ 750 CBCI	☒ CW (1-400) ☒ AM	200	1

1 - No anomalies

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UL Provided Test Equipment

Asset #	Manufacturer / Model #	Description	Cal. Due
ATA801	Chamber (-)	BCI #1A Chamber	1/31/15
ZCT014	Fischer Custom Communications (F140)	Current Injection Probe (100 kHz - 1000 MHz)	Verified before use
ATA048	Fischer Custom Communications (FCC-BCICF-1)	Calibration Fixture (10kHz - 450MHz)	6/20/14
FG0015	Rhode & Schwarz (SMT02)	Signal Generator (5kHZ - 1.5MHz)	1/31/15
SA0005	Hewlett Packard (8591E)	Spectrum Analyzer	1/31/15
ZATA29	Amplifier Research (100W1000B)	Amplifier (1MHz - 1000MHz)	Verified before use
ATA119	Termaline (8166)	50 Ohm Termination	1/31/15
ATA043	Werlatone (C2630)	Directional Coupler (10kHz - 1000MHz)	1/31/15
ATA115	Amplifier Research (LA150)	Attenuator (40dB)	1/31/15
PAR014	Gigatronics (80301A)	Power Sensor	1/31/15
PAR015	Gigatronics (80301A)	Power Sensor	1/31/15
PA0011	Gigatronics (8542C)	Power Meter	1/31/15

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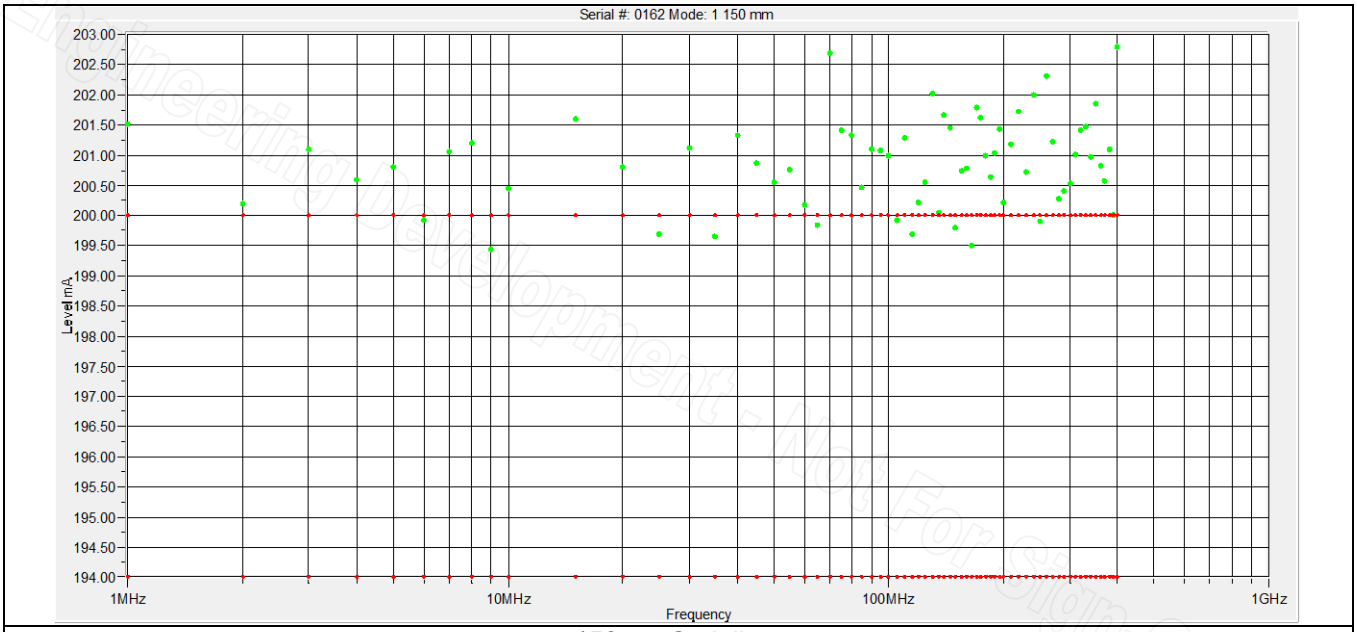
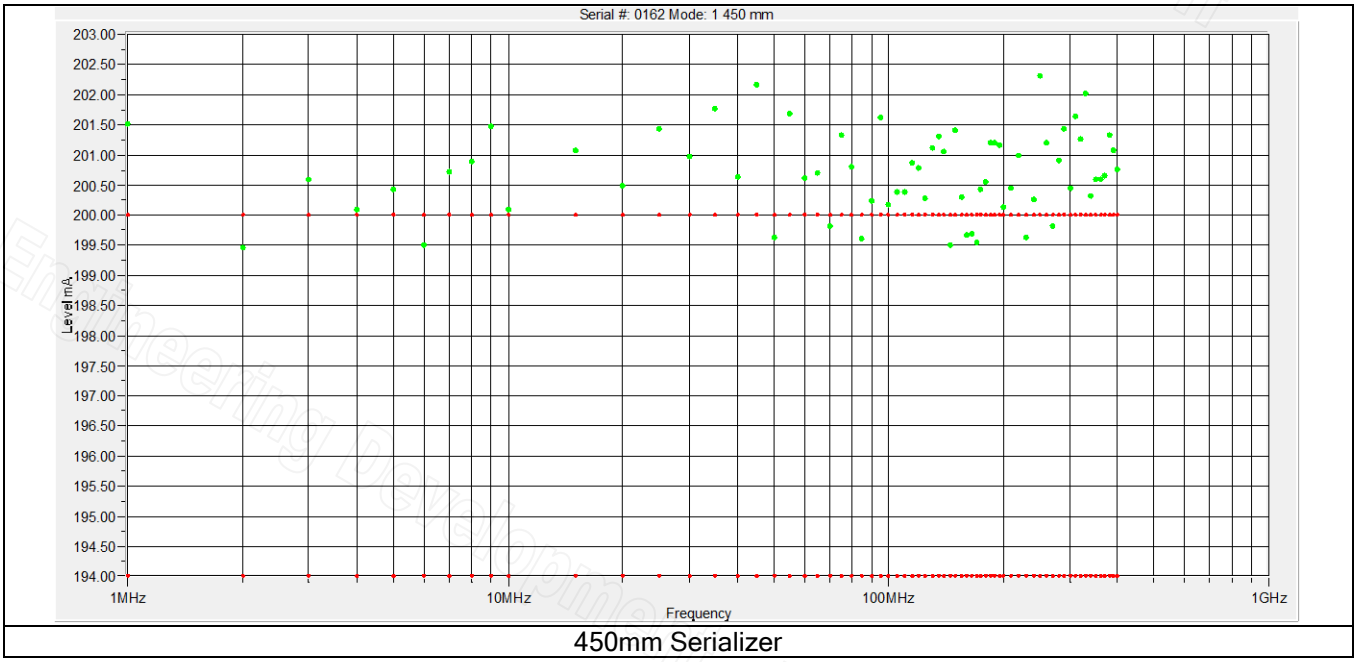
Plots & Tables



150mm Serializer



450mm Serializer

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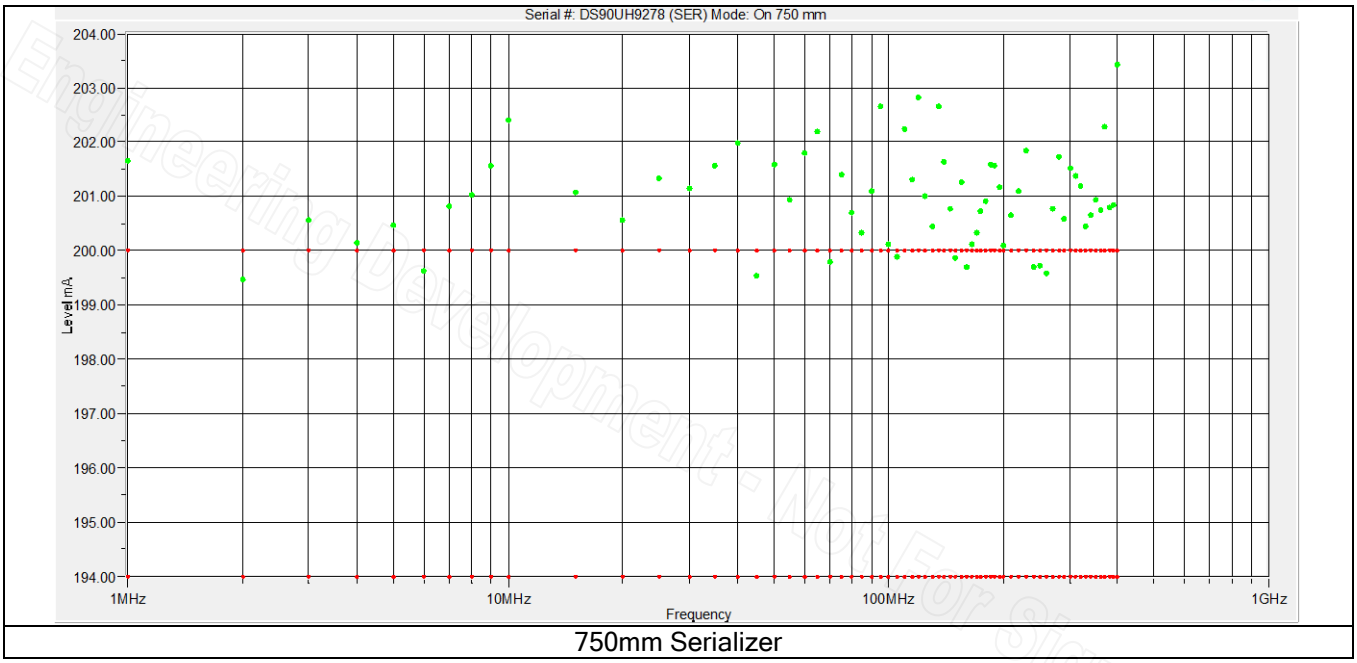

750mm Serializer

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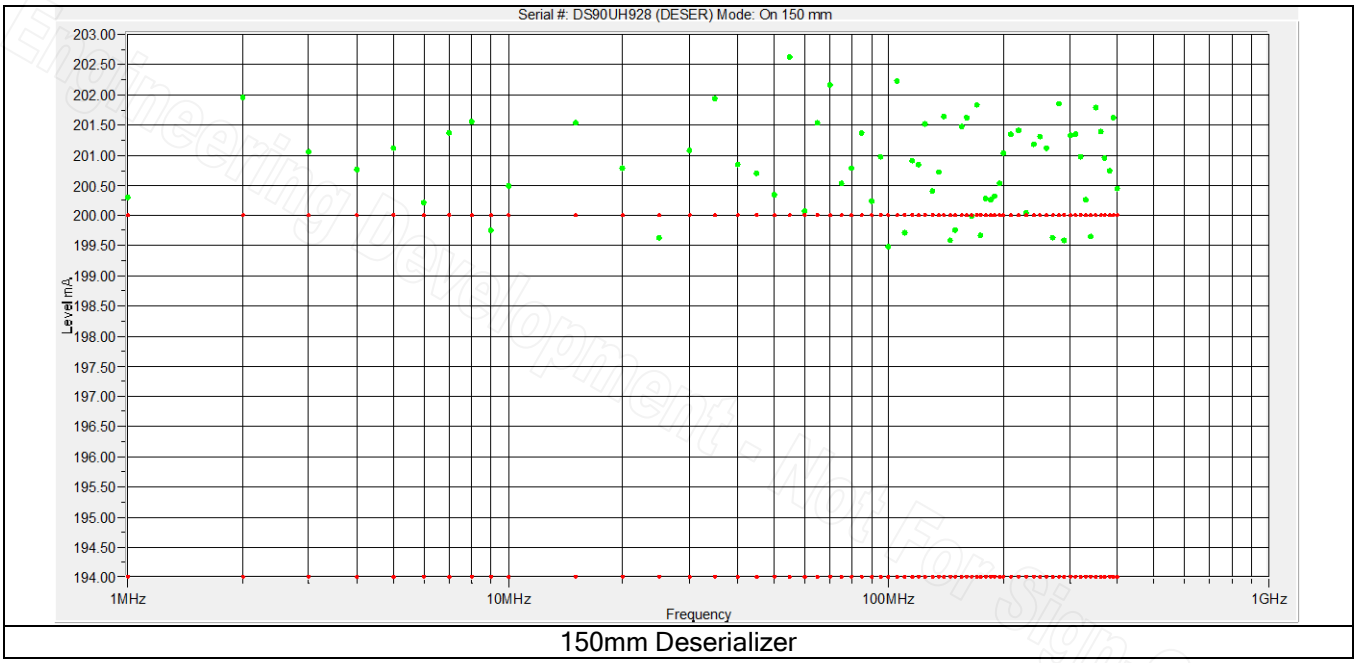
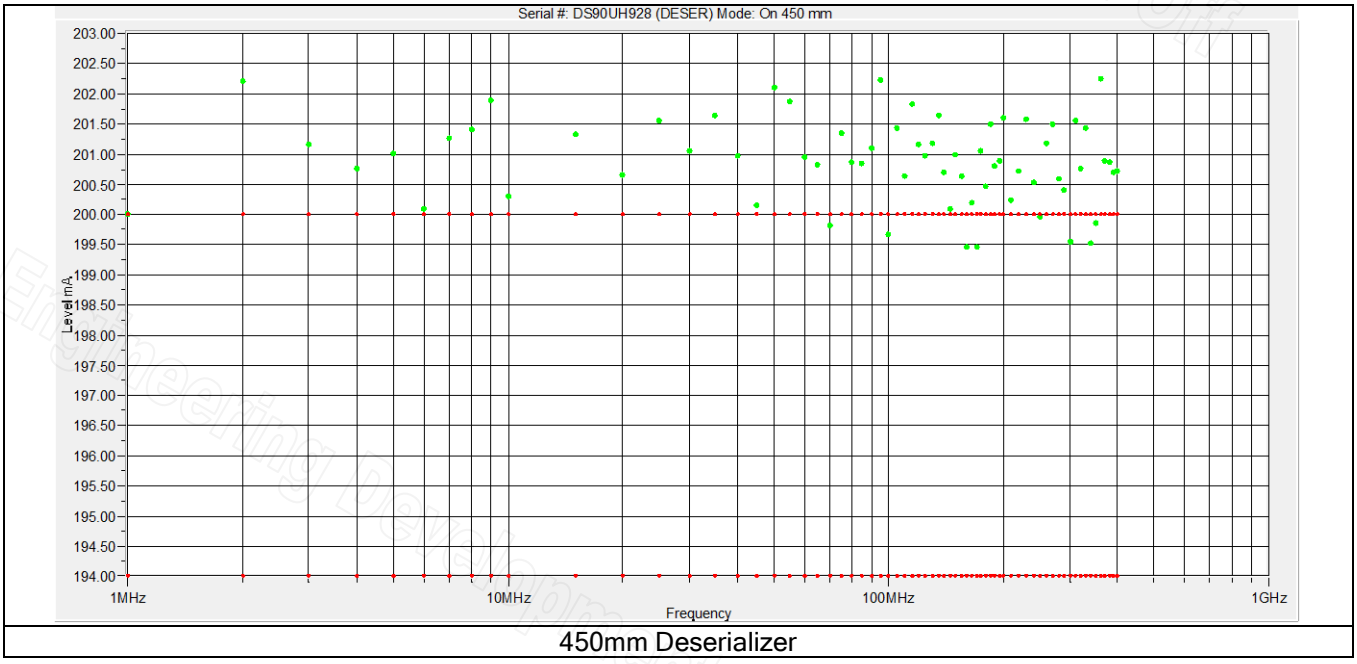


150mm Deserializer



450mm Deserializer

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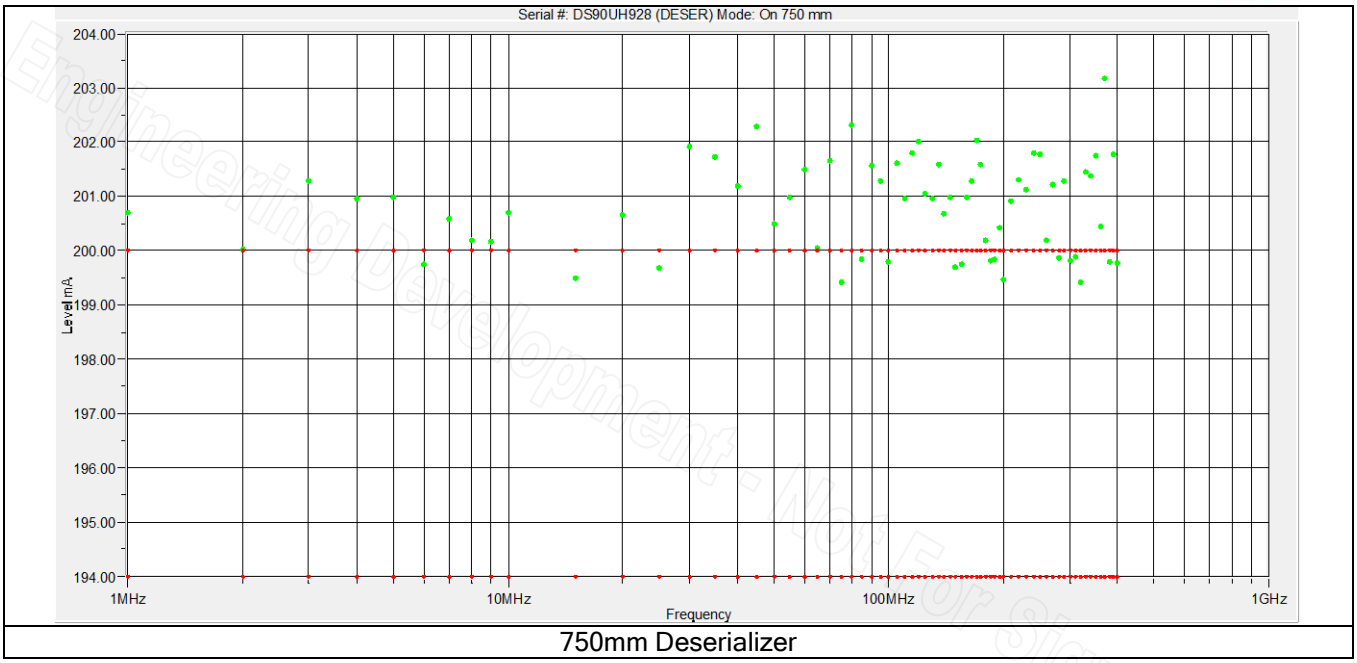

750mm Deserializer

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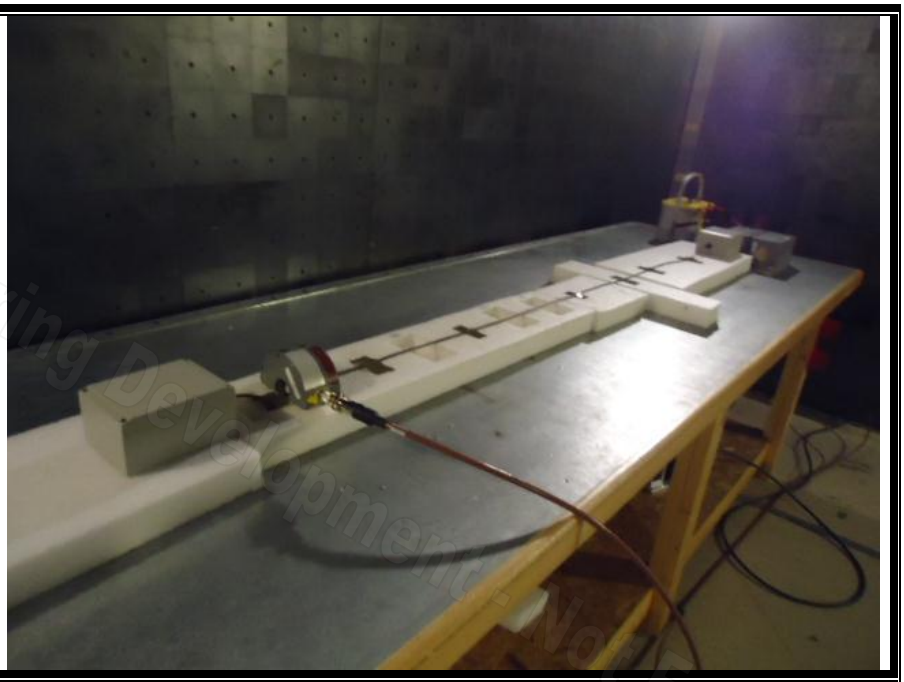
PHOTOS

DUT Serializer & Deserializer



Overall Setup

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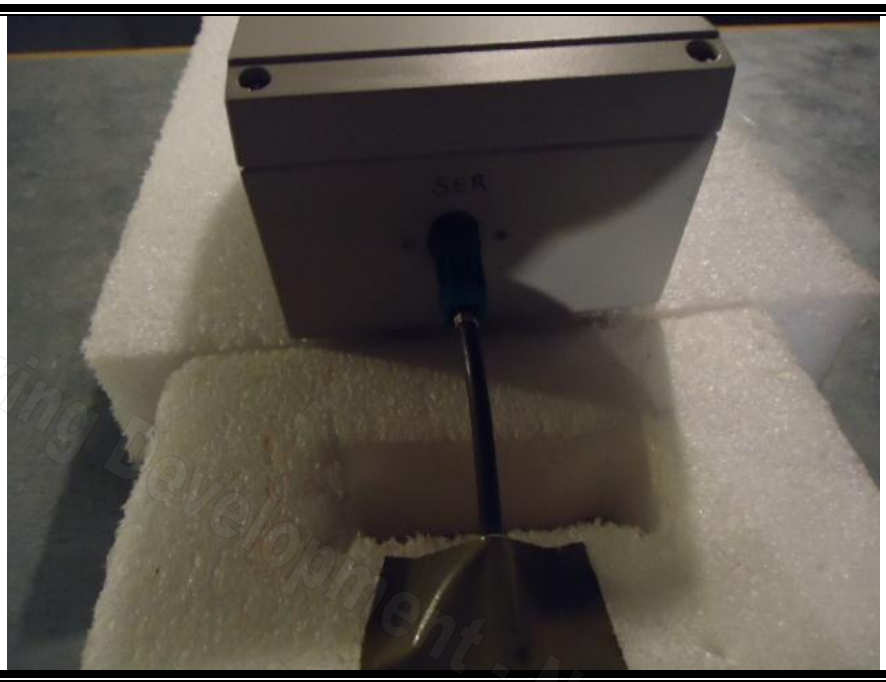
DES Connection to Harness



SER Connection to Harness

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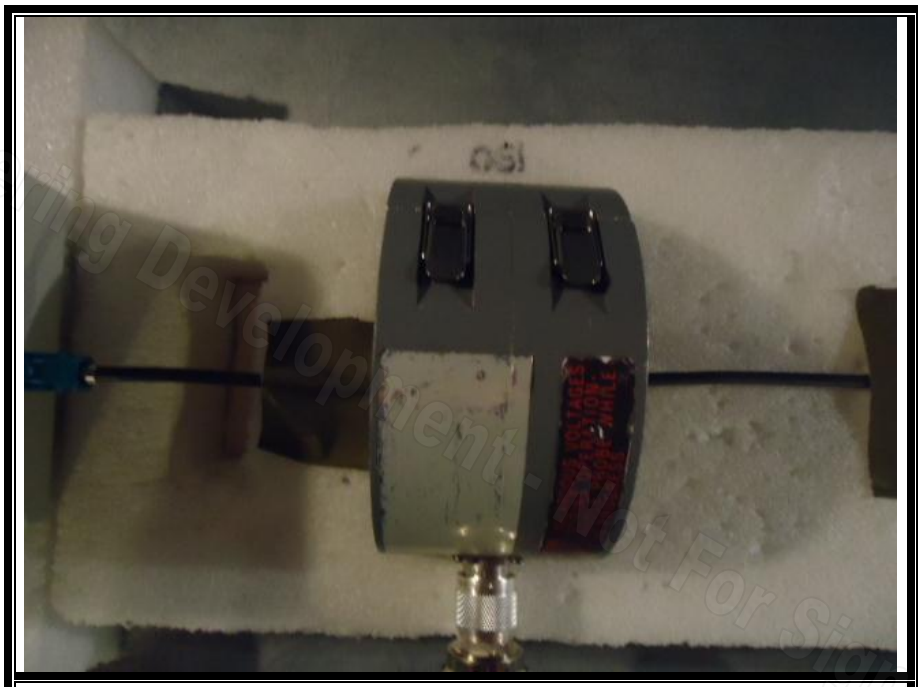
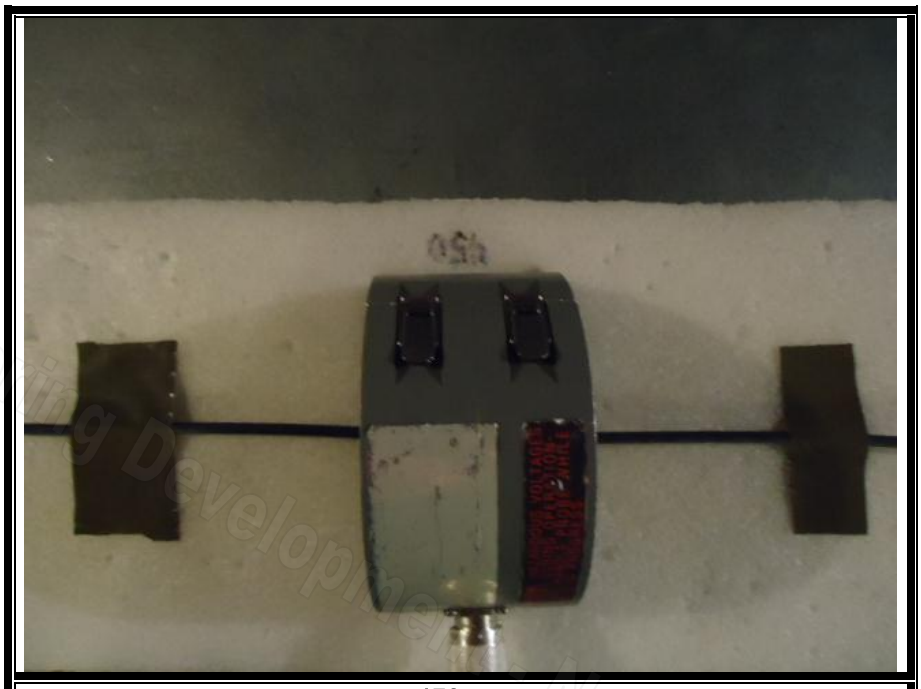


150mm



450mm

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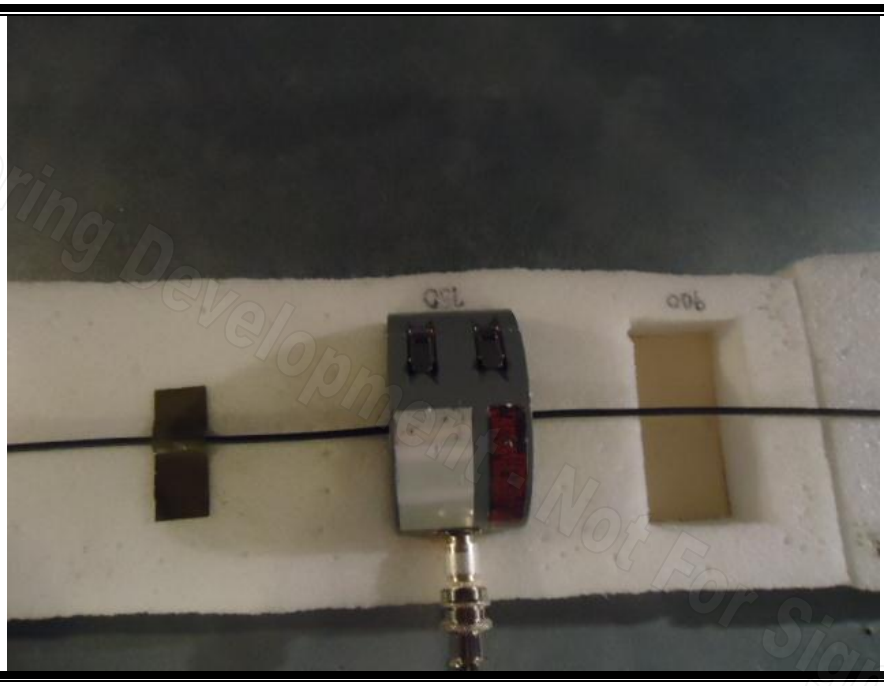

750mm

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