MEASUREMENT / TECHNICAL REPORT
Hewlett-Packard Company

LaserJet Test Lab

Test Report No. :	08-4600-012-I	**Date issued :**	18 July, 2008
Product Type :	13.25MHz Proximity Reader	**Regulatory Model No. :**	T1985AA,
Product Series	NA	**Accessories:**	None
		Toner Cartridge:	NA

EMC Test Report

Emissions Testing: [ ] ***Class A*** [x] ***Class B***

Tests Performed		***Results, Limits/Methods Used***	
[ ]	Radiated Emissions	P	CISPR 22:2005
[x]	Conducted Emissions	ND	EN55022:2006
		ND	CNS 13438:2006
		ND	47 CFR, Pt. 15

Note: ANSI C63.4 and CISPR 22 test methodology used during testing.

Comments

Testing was performed for Conducted Emissions only, for the purpose of FCC compliance. Radiated emissions testing results provided in separate test report issued by Communications Certification Laboratory.

P=Passed F=Failed ND=Not Done NA=Not Applicable

Report Revision

X	Original Report		
	Supplement to Test Report:	Report No.: NA	Issued: NA

Prepared by: Manuel Rodriguez, Hewlett-Packard Company
11311 Chinden Boulevard, Boise, ID 83714
(208) 396-7318 (Phone) / 208-396-2554 (Fax)
manuel.rodriguez@hp.com

Table of Contents Page

1 Product Information

1.1 Product Description

The product is an RFID proximity card reader transmits 13.56MHz RF Energy to power and communicate with a passive contactless smart card. The RF energy from the reader entenna (located inside the reader device) is collected by the RFI tag antenna and used to power up the microchip in order to obtain identification, location, and other information about the device embedded within.

The HP type T1985AA RFID proximity card reader interfaces to a host through a USB interface port. No other electrical connections are made to the device. It is programmed to read and interrogate HID iClass smart cards. Type T1986AA is identical to T1985AA, but also includes software which does not affect the product operation in relation to this test.

HP Type T1981AA RFID proximity card reader is identical to T1985AA, with the exception that it is programmed to interrogate Mifare smart cards. T1982AA is identical to T1981AA, but it also includes software which does not affect the product operation in relation to this test.

1.2 Product Block Diagram

Product block diagrams are maintained within Hewlett-Packard technical construction files for the device and may be made available upon request.

1.3 Product Labeling

Product label illustrations are maintained within Hewlett-Packard technical construction files for the device and may be made available upon request.

1.4 Product Constructional Photographs

Refer to Annex A for product photographs

1.5 User Manual

User's manuals are shipped with each product. EMC related statements and the Manufacturer's Declaration of Conformity can be found in the appendices and/or the inside cover of the manual.

2 Laboratory Information

2.1 Test Facility

The radiated emissions 10-meter anechoic chamber and conducted emissions measurement facility are located at 11311 Chinden Blvd., Boise, Idaho. This facility is accredited under ISO/IEC 17025-2005 by the following:

American Association for Laboratory Accreditation (A2LA) – Testing Certificate Number 957.01, valid from 01/01/07 to 12/31/09.

Designated Conformity Assessment Body (CAB) by US National Institute of Standards and Technology (NIST) to C-Taipei (BSMI) under APEC MRA, Revised March 11, 2004 (BSMI Designation Number SL2-IN-E-1022).

Subcontracted to Testing - Certification Organization HP-Europe (TCOP) – Boise Registration Number T1 057/01-10

VCCI Registration Numbers: C-1747, R1640

2.2 Test Methodology & Comments

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992 and CISPR 22:2005. Radiated testing was performed at an antenna to DUT distance of 10 meters. Level B limits are used for both tests.

Note: Only conducted emissions testing was performed during this investigation.

Note: During the conducted emissions testing, a full set of measurements were made of the device with the internal antenna attached and transmitting the 13.56MHz carrier frequency. Following that test, the antenna was replaced by a dummy load and the test was repeated to verify compliance, as allowed by the FCC.

As allowed by FCC Rules, CISPR 22 test limits were used with ANSI C63.4 test methodology.

The data contained herein is true and accurate to the best of my knowledge.

Location: Boise, Idaho
Date: 18 July, 2008

Manuel Rodriguez
Product Regulations Engineer

3 Test Information

3.1 Test Plans

A single sample of the HP type T1985AA reader was submitted for test. Only conducted emissions measurements were performed on the host PC AC powerline while the reader was connected to the host USB port and transmitting 13.56MHz signal, as in normal use applications. During the conducted emissions testing, a full set of measurements were made of the device with the internal antenna attached and transmitting the 13.56MHz carrier frequency. Following that test, the antenna was replaced by a dummy load and the test was repeated to verify compliance, as allowed by the FCC. Compliance is verified by comparing the two sets of results to assure the only frequency which exceeds the Class B limit is the carrier frequency as it is transmitted through the antenna. Testing results obtained on the HP type T1985AA RFID proximity card reader are considered to be representative of results for types T1986AA, T1981AA, and T1982AA due to similarity. Refer to item 1.1 for product description.

3.2 Special Accessories and Equipment Modifications

There were no modifications made to the equipment under test in order to achieve compliance to the FCC and CISPR 22 Class B requirements. The products as tested and described in this Report is what will be manufactured and sold as Hewlett-Packard Products RFID Reader types T1985AA, T1986AA, T1981AA, and T1982AA.

3.3 Special Taiwan Power Statement

Not applicable

3.4 Report Approval

Reviewer Signature

Date: July 18, 2008
Location: Boise, Idaho

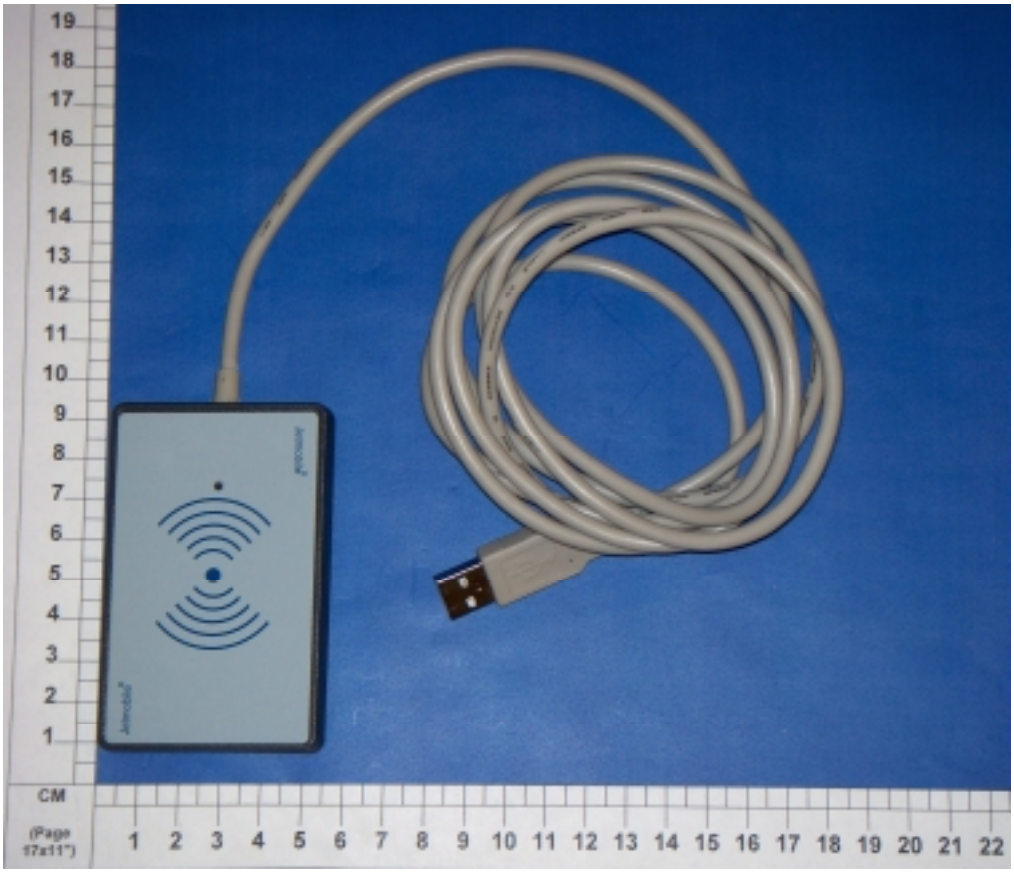
Amanda Calder
Product Regulations Engineer

Approval Signature

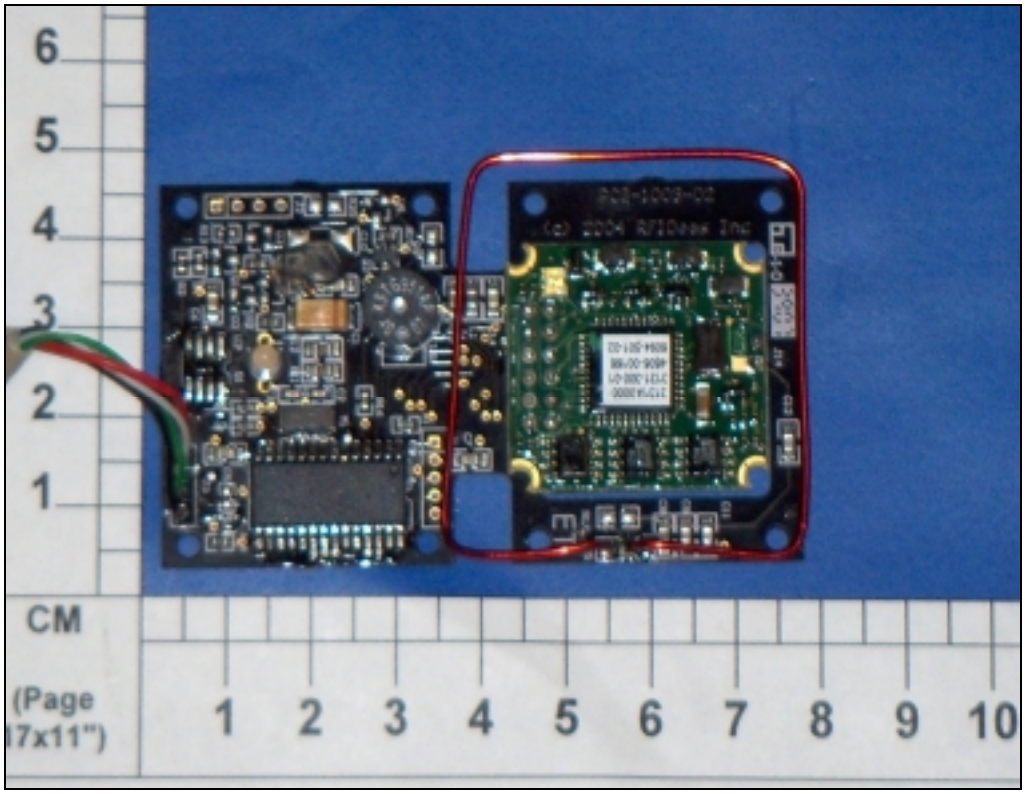
Date: July 18, 2008
Location: Boise, Idaho

Eric Hoffman
Product Regulations Manager

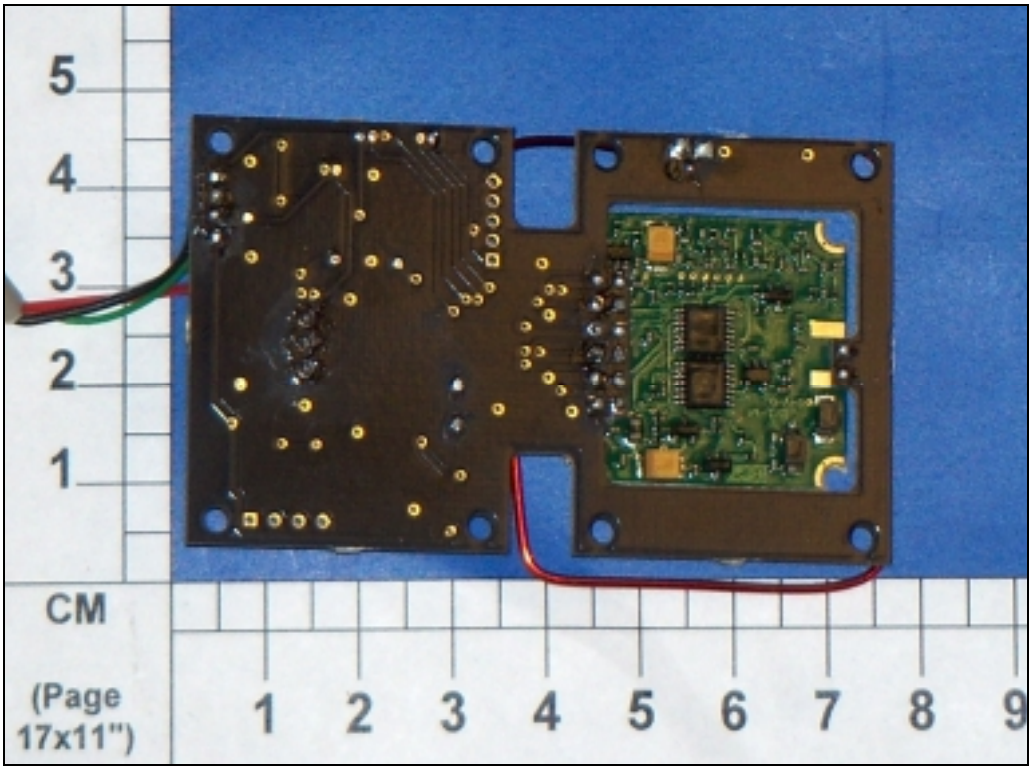
Annex A – Constructional Photographs



External View



Internal -- PCB, Top Side



PCB, Back Side

Annex B – Radiated Emissions Testing Records

Test Records:

Not applicable. Radiated emissions testing not performed as part of this investigation.

Annex C – Conducted Emissions Testing Records

Test Records:

Mains:

CESCA007 RF-ID	(8 pages)
CESCA007A RFID	(8 pages)

Telecom Port testing:

Not applicable. No telecom ports.

	HP LASERJET TEST LAB **CONDUCTED EMISSIONS TEST RECORD**	**HP RESTRICTED**

LaserJet Test Lab
11311 Chinden Blvd.
Boise, ID 83714
208/396-6000

TEST NAME	**Conducted Emissions**
WORK ORDER NUMBER(S)	**CESCA007 RF-ID**
PROJECT NAME(S)	**SCARLET**
MODEL NUMBER(S)	**T1985AA**
DATE(S) TEST PERFORMED	**10-Jul-2008**
CLIENT NAME	**KATHRYN MCDONALD**
CLIENT ADDRESS	**11311 Chinden Blvd** **Boise, ID 83714**
TEST PERFORMED BY:	**Warren Briest**
APPROVED BY:	**Carrie Snyder**

TEST PURPOSE:	**RF-ID Product Qualification**

STANDARDS	PASS/FAIL STATUS
EN55022:2006	**PASS** **See report CDSCA007A RF-ID for passing data on carrier frequency 13.5f93 MHz where the antenna was replaced with a dummy load.**

TEST LIMIT	**CISPR 'B'**

Approved By:  7/17/08

Hardware Test Engineer — Date

Supplement to EMC Test Report 08-4600-012-I
Annex C

CE_FINALTEST_FINAL_L1.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 10 Jul, 2008 at 10:53:53.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

Measured Corrected Freq (MHz)	Measured Value (dBuV(A)	Correction	Measured Corrected Value (dBuV(A)	Margin (dB)	Detector	Phase	Limit	Notes
13.5593	50.6	10.5	61.1	-1.1	QP	LINE1	60	
2.1529	26.3	10.3	36.6	9.4	AVG	LINE1	46	
0.1500	28.3	12.9	41.2	14.8	AVG	LINE1	56	
2.1528	29.9	10.3	40.2	15.8	QP	LINE1	56	
0.1998	26.0	11.4	37.4	16.2	AVG	LINE1	53.6	
0.1500	34.9	12.9	47.8	18.2	QP	LINE1	66	
13.5593	20.4	10.5	30.9	19.1	AVG	LINE1	50	
0.1998	30.7	11.4	42.1	21.5	QP	LINE1	63.6	

CE_FINALTEST_FINAL_L2.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 10 Jul, 2008 at 11:12:12.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

Measured Corrected Freq (MHz)	Measured Value (dBuV(A)	Correction	Measured Corrected Value (dBuV(A)	Margin (dB)	Detector	Phase	Limit	Notes
13.5590	50.6	10.5	61.1	-1.1	QP	LINE2	60	
2.2519	27.1	10.3	37.4	8.6	AVG	LINE2	46	
0.1500	29.7	12.9	42.6	13.4	AVG	LINE2	56	
2.2519	30.7	10.3	41.0	15	QP	LINE2	56	
0.2988	23.0	10.8	33.8	16.4	AVG	LINE2	50.2	
0.1500	36.1	12.9	49.0	17	QP	LINE2	66	
13.5590	21.1	10.5	31.6	18.4	AVG	LINE2	50	
0.2988	25.8	10.8	36.6	23.7	QP	LINE2	60.3	

*Results do not take into uncertainty calculations.
**Expanded uncertainty for telecom=+/- 3.2 dB
***Expanded uncertainty for mains=+/-3.4 dB.
****The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

EQUIPMENT UNDER TEST DESCRIPTION/SYSTEM CONFIGURATION:

Project Name	SCARLET
Model Number	**T1985AA**
Serial Number	MT66033060
Description	7/10/08 -- Qualification Data -- Host PC with RF-ID Reader Power Supply: Canon 110 Volt @ 60 Hz Formatter: N/A Firmware: N/A Total Memory:N/A DIMM Slot #1:N/A
System Configuration	The EUT was sitting to the right of the PC, with the Digital Camera sitting in front of the PC. The EUT and PC were connected with a USB cable, while the PC and Camera were connected with a Special Serial Cable (1.5 meters).
Software/Firmware	IDLE
Verification Method	TESTED AS RECEIVED
Test Parameters	Temp.: 22C Humidity: 40%

Operating Mode

Description	RF-ID Modual Active	Active I/O Port:	n/a
Source Tray:	n/a	Cable (P/N):	n/a
Destination Tray:	n/a	Software:	n/a
Duplex/Simplex	n/a	Color/Monochrome:	n/a

EUT Condition When Received:	GOOD

Procedure:	"Conducted Emissions Procedure_042605.doc **or** CE TeleCom Procedure_101207.doc
Variance from procedure:	NONE

COMMENTS: None

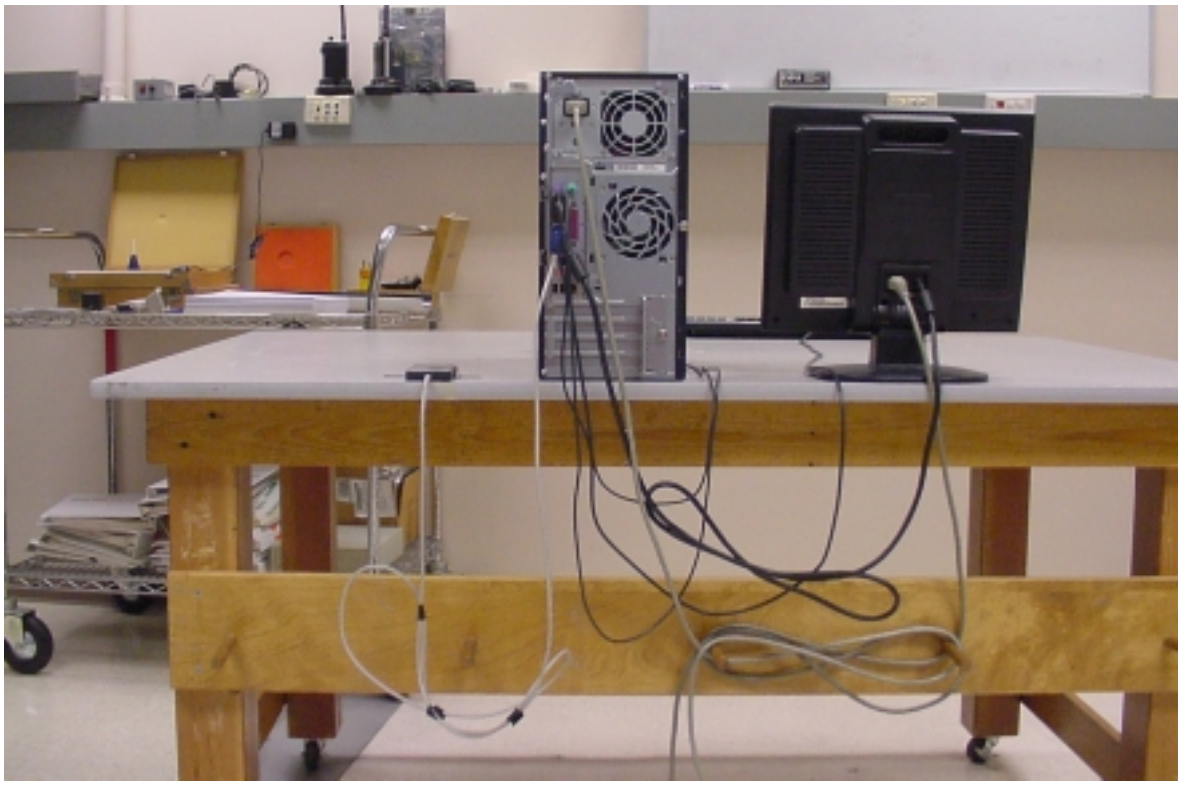
EUT Support Equipment:

Description	Model	Serial Number	BSMI ID
Host PC	Compaq PC dc5100MT	2ua6370F00	R33001
Host Monitor	hp P9617D	CNN4522LNQ	T3A002
Keyboard	Compaq KB-9009	B55680FS9OB04W	3902C952
Host Mouse	Compaq M-S69	F466B0MN3O90NFH	38920101
Peripheral (camera)	Casio TranP QV-770	1011830A	N/A

Test Equipment/Software

Description	Manufacturer	Model	ID Number	Cal Interval	Cal Due Date
Analyzer	hp	8566B	#12	12 month	2/28/09
QP Adaptor	hp	85650A	#12	12 month	2/28/09
PreSelector	hp	85685A	#12	12 month	2/28/09
LISN 220 - 240V	EMCO	3825/2	9004-1639	12 month	2/28/09
LISN 100 - 120V	EMCO	3825/2	9202-1938	12 month	2/28/09
LISN 208V 60Hz	EMCO	3825/2	9406-2217	12 month	2/28/09
TLISN	FCC	FCC-TLISN-T4	20488	12 month	11/30/08
TLISN	FCC	FCC-TLISN-T8	20489	12 month	11/30/08
TLISN	FCC	FCC-TLISN-T2	20487	12 month	11/30/08
Software	hp	Test Executive	V2.0.4	N/A	N/A
Software	hp	CE Test Module	V1.1.7	N/A	N/A

EUT/System Pictures



REFERENCES:

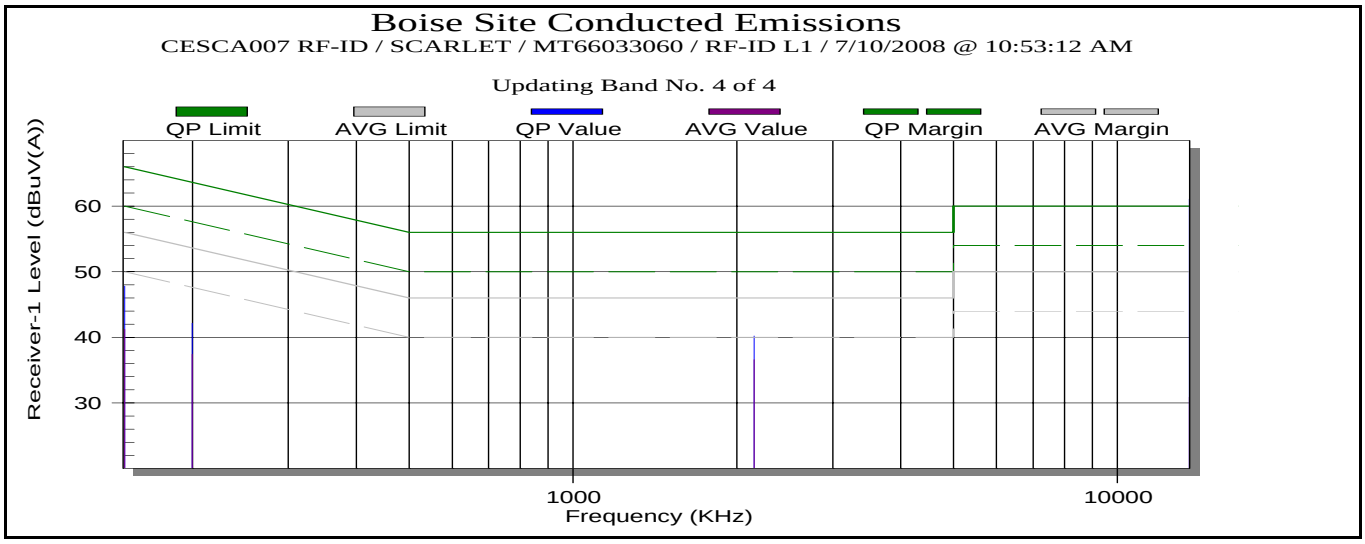
CISPR22:2005
EN55022:2006
CNS 13438
ANSI C63.4 (2003)
CFR 47

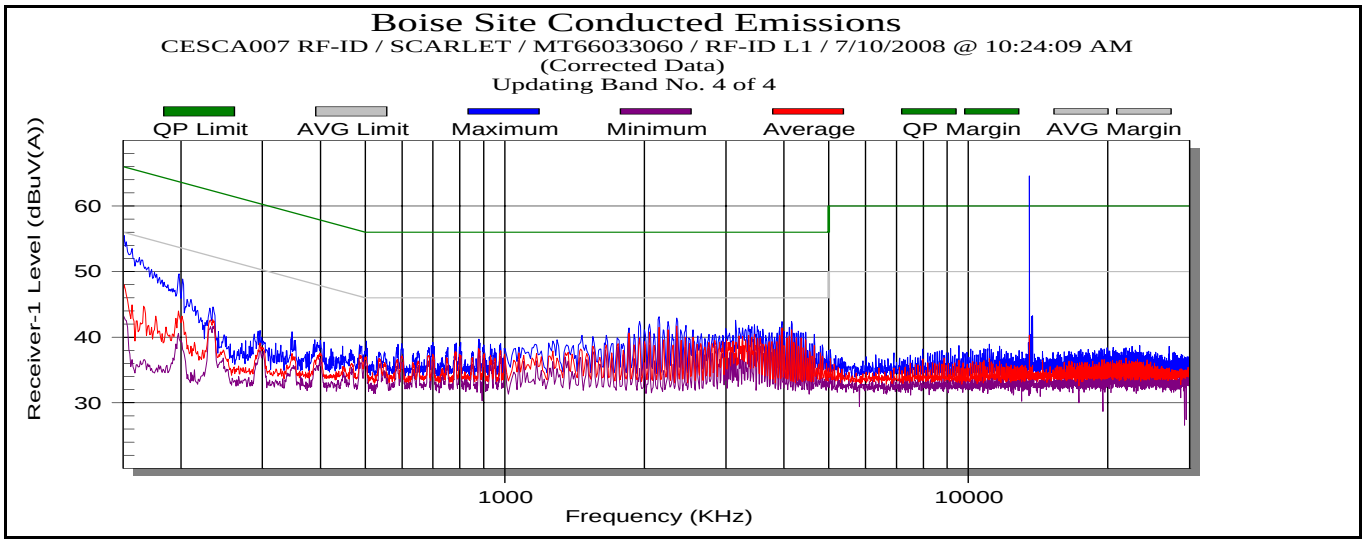
BOILER FORMAT FILE: CE Full Report.TXM

Test Data for SCARLET_MT66033060_RF-ID L1

CE_FINALTEST_FINAL_L1.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 10 Jul, 2008 at 10:53:53.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

X	Prescan Freq. (MHz)	Limit (dBuV) (A)	Max. Cor. Level (dBuV) (A)	Mar. (dB)	QPD Cor. Freq. (MHz)	QPD Value (dBuV) (A)	QPD Cor. Value (dBuV) (A)	QPD Mar. (dB)	Avg. D. Cor. Freq. (MHz)	Avg. D. Value (dBuV) (A)	Avg. D. Corr. Value (dBuV) (A)	Avg. D. Mar. (dB)
P	0.1509	56.0	55.5	0.5	0.1500	34.9	47.8	18.2	0.1500	28.3	41.2	14.8
P	0.1968	53.6	47.6	6.1	0.1998	30.7	42.1	21.5	0.1998	26.0	37.4	16.2
P	2.1520	46.0	43.1	2.9	2.1528	29.9	40.2	15.8	2.1529	26.3	36.6	9.4
F	13.5600	50.0	64.6	-14.6	13.5593	50.6	61.1	-1.1	13.5593	20.4	30.9	19.1

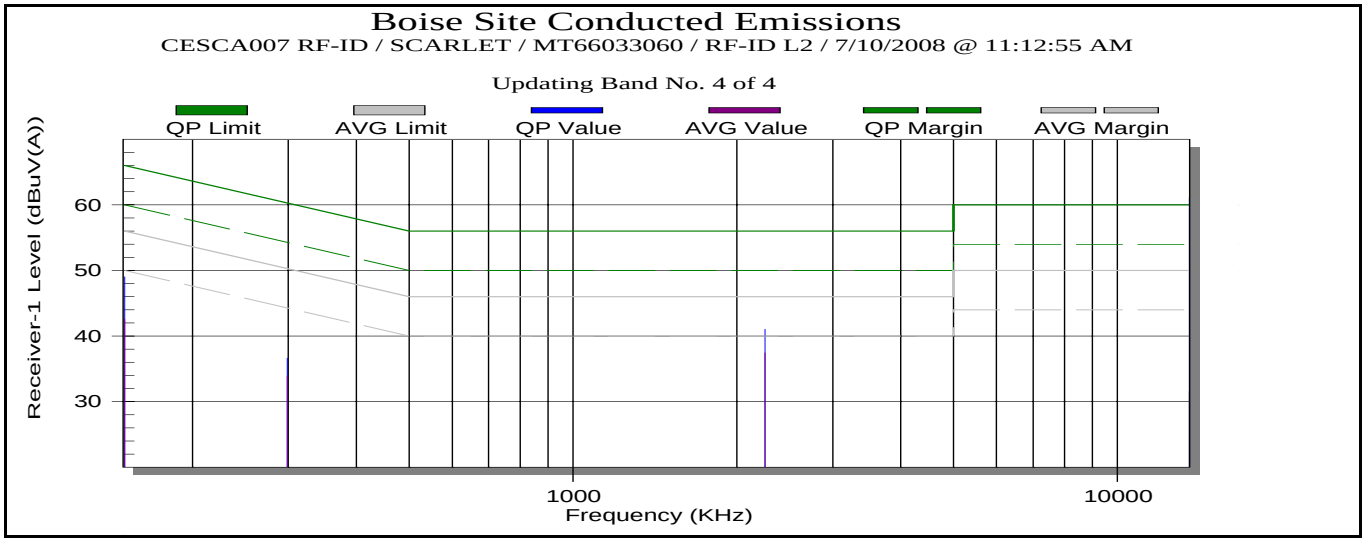


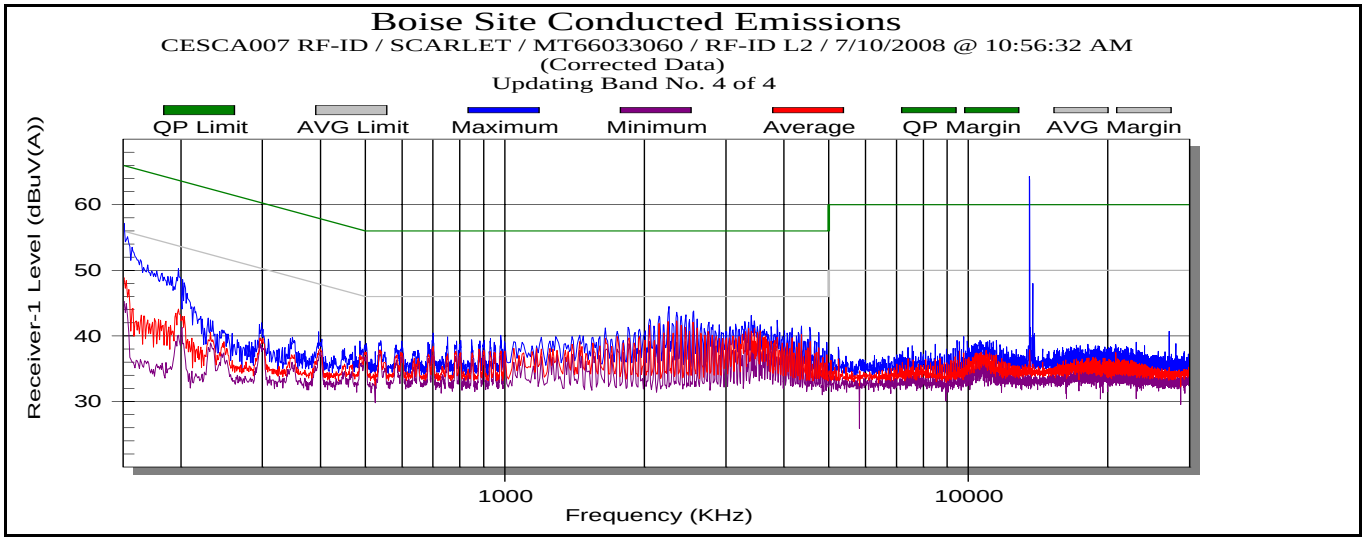


Test Data for SCARLET_MT66033060_RF-ID L2

CE_FINALTEST_FINAL_L2.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 10 Jul, 2008 at 11:12:12.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

X	Prescan Freq. (MHz)	Limit (dBuV) (A)	Max. Cor. Level (dBuV) (A)	Mar. (dB)	QPD Cor. Freq. (MHz)	QPD Value (dBuV) (A)	QPD Cor. Value (dBuV) (A)	QPD Mar. (dB)	Avg. D. Cor. Freq. (MHz)	Avg. D. Value (dBuV) (A)	Avg. D. Corr. Value (dBuV) (A)	Avg. D. Mar. (dB)
P	0.1509	56.0	57.2	-1.2	0.1500	36.1	49.0	17.0	0.1500	29.7	42.6	13.4
P	0.2988	50.3	42.0	8.3	0.2988	25.8	36.6	23.7	0.2988	23.0	33.8	16.4
P	2.2510	46.0	43.4	2.6	2.2519	30.7	41.0	15.0	2.2519	27.1	37.4	8.6
F	13.5600	50.0	64.3	-14.3	13.5590	50.6	61.1	-1.1	13.5590	21.1	31.6	18.4





	HP LASERJET TEST LAB **CONDUCTED EMISSIONS TEST RECORD**	**HP RESTRICTED**

LaserJet Test Lab
11311 Chinden Blvd.
Boise, ID 83714
208/396-6000

TEST NAME	**Conducted Emissions**
WORK ORDER NUMBER(S)	**CESCA007A RF-ID**
PROJECT NAME(S)	**SCARLET**
MODEL NUMBER(S)	**T1985AA**
DATE(S) TEST PERFORMED	**17-Jul-2008**
CLIENT NAME	**KATHRYN MCDONALD**
CLIENT ADDRESS	**11311 Chinden Blvd** **Boise, ID 83714**
TEST PERFORMED BY:	**Von Mendenhall**
APPROVED BY:	**Carrie Snyder**

TEST PURPOSE:	**Supplemental report to CESCA007 RF-ID with antenna replaced with a dummy load.**

STANDARDS	PASS/FAIL STATUS
EN55022:2006	**PASS**

TEST LIMIT	**CISPR 22 "B"**

Approved By:  7/17/08

Hardware Test Engineer — Date

Supplement to EMC Test Report 08-4600-012-I
Annex C

CE_FINALTEST_FINAL_L1.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 17 Jul, 2008 at 09:33:33.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

Measured Corrected Freq (MHz)	Measured Value (dBuV(A)	Correction	Measured Corrected Value (dBuV(A)	Margin (dB)	Detector	Phase	Limit	Notes
13.5596	41.3	10.5	51.8	8.2	QP	LINE1	60	
2.0544	25.4	10.3	35.7	10.3	AVG	LINE1	46	
0.2334	28.0	11.2	39.2	13.1	AVG	LINE1	52.3	
0.1509	27.8	12.9	40.7	15.3	AVG	LINE1	56	
13.5596	23.7	10.5	34.2	15.8	AVG	LINE1	50	
2.0544	29.3	10.3	39.6	16.4	QP	LINE1	56	
0.1509	35.2	12.9	48.1	17.9	QP	LINE1	66	
0.2334	29.4	11.2	40.6	21.7	QP	LINE1	62.3	

CE_FINALTEST_FINAL_L2.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 17 Jul, 2008 at 10:11:11.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

Measured Corrected Freq (MHz)	Measured Value (dBuV(A)	Correction	Measured Corrected Value (dBuV(A)	Margin (dB)	Detector	Phase	Limit	Notes
13.5592	41.2	10.5	51.7	8.3	QP	LINE2	60	
2.3511	27.1	10.3	37.4	8.6	AVG	LINE2	46	
0.1500	29.4	12.9	42.3	13.7	AVG	LINE2	56	
2.3511	30.8	10.3	41.1	14.9	QP	LINE2	56	
0.1500	36.9	12.9	49.8	16.2	QP	LINE2	66	
0.2001	25.7	11.4	37.1	16.5	AVG	LINE2	53.6	
13.5592	22.5	10.5	33.0	17	AVG	LINE2	50	
0.2001	30.4	11.4	41.8	21.8	QP	LINE2	63.6	

*Results do not take into uncertainty calculations.
**Expanded uncertainty for telecom=+/- 3.2 dB
***Expanded uncertainty for mains=+/-3.4 dB.
****The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

EQUIPMENT UNDER TEST DESCRIPTION/SYSTEM CONFIGURATION:

Project Name	SCARLET
Model Number	**T1985AA**
Serial Number	MT66033060
Description	7/10/08 -- Qualification Data -- Antenna replaced with 150 ohm dummy load Host PC with RF-ID Reader Power Supply: Canon 110 Volt @ 60 Hz
System Configuration	The EUT was sitting to the right of the PC, with the Digital Camera sitting in front of the PC. The EUT and PC were connected with a USB cable, while the PC and Camera were connected with a Special Serial Cable (1.5 meters).
Software/Firmware	IDLE
Verification Method	TESTED AS RECEIVED
Test Parameters	22°C, 39% rH

Operating Mode

Description	RF-ID Module Active	Active I/O Port:	N/A
Source Tray:	N/A	Cable (P/N):	N/A
Destination Tray:	N/A	Software:	N/A
Duplex/Simplex	N/A	Color/Monochrome:	N/A

EUT Condition When Received:	GOOD

Procedure:	"Conducted Emissions Procedure_042605.doc **or** CE TeleCom Procedure_101207.doc
Variance from procedure:	NONE

COMMENTS: None

EUT Support Equipment:

Description	Model	Serial Number	BSMI ID
Host PC	Compaq PC dc5100MT	2ua6370F00	R33001
Host Monitor	hp P9617D	CNN4522LNQ	T3A002
Keyboard	Compaq KB-9009	B55680FS9OB04W	3902C952
Host Mouse	Compaq M-S69	F466B0MN3O90NFH	38920101
Peripheral (camera)	Casio TranP QV-770	1011830A	N/A
1000 Base T switch	hp J4898A	TW516MY007	N/A

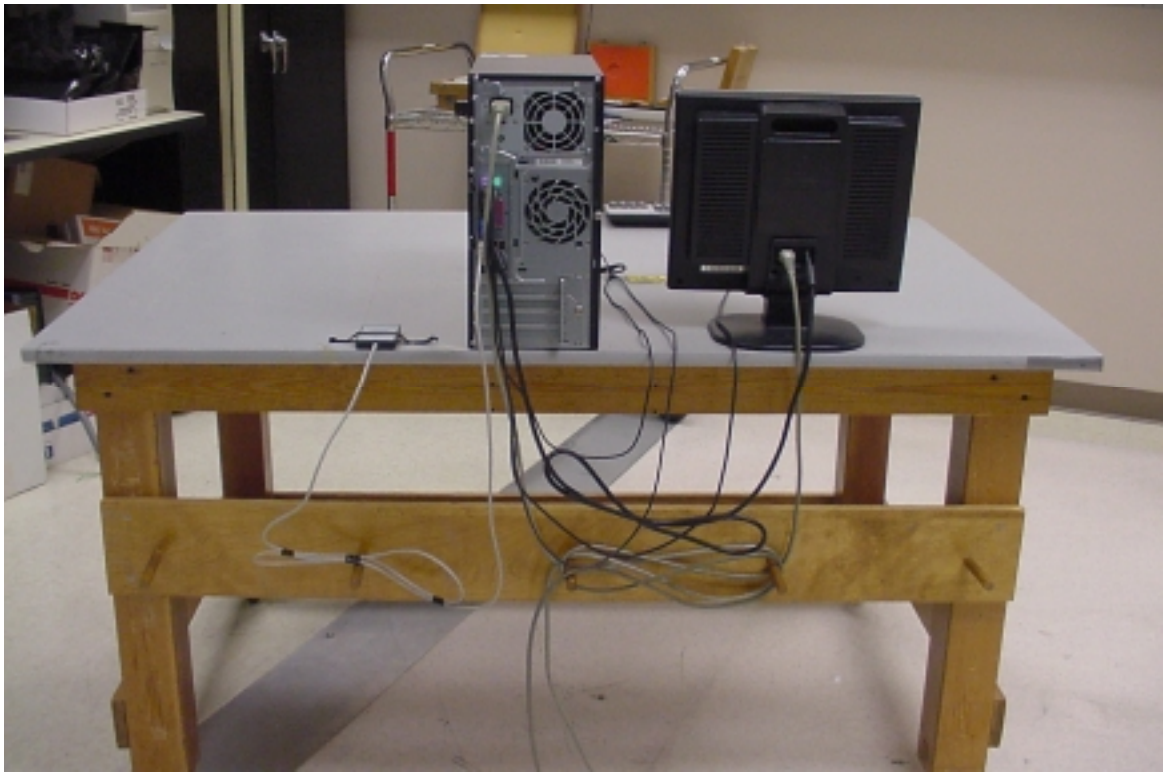
Test Equipment/Software

Description	Manufacturer	Model	ID Number	Cal Interval	Cal Due Date
Analyzer	hp	8566B	#12	12 month	2/28/09
QP Adaptor	hp	85650A	#12	12 month	2/28/09
PreSelector	hp	85685A	#12	12 month	2/28/09
LISN 220 - 240V	EMCO	3825/2	9004-1639	12 month	2/28/09
LISN 100 - 120V	EMCO	3825/2	9202-1938	12 month	2/28/09
LISN 208V 60Hz	EMCO	3825/2	9406-2217	12 month	2/28/09
TLISN	FCC	FCC-TLISN-T4	20488	12 month	11/30/08
TLISN	FCC	FCC-TLISN-T8	20489	12 month	11/30/08
TLISN	FCC	FCC-TLISN-T2	20487	12 month	11/30/08
Software	hp	Test Executive	V2.0.4	N/A	N/A
Software	hp	CE Test Module	V1.1.7	N/A	N/A

EUT/System Pictures

Front View

Rear View



REFERENCES:

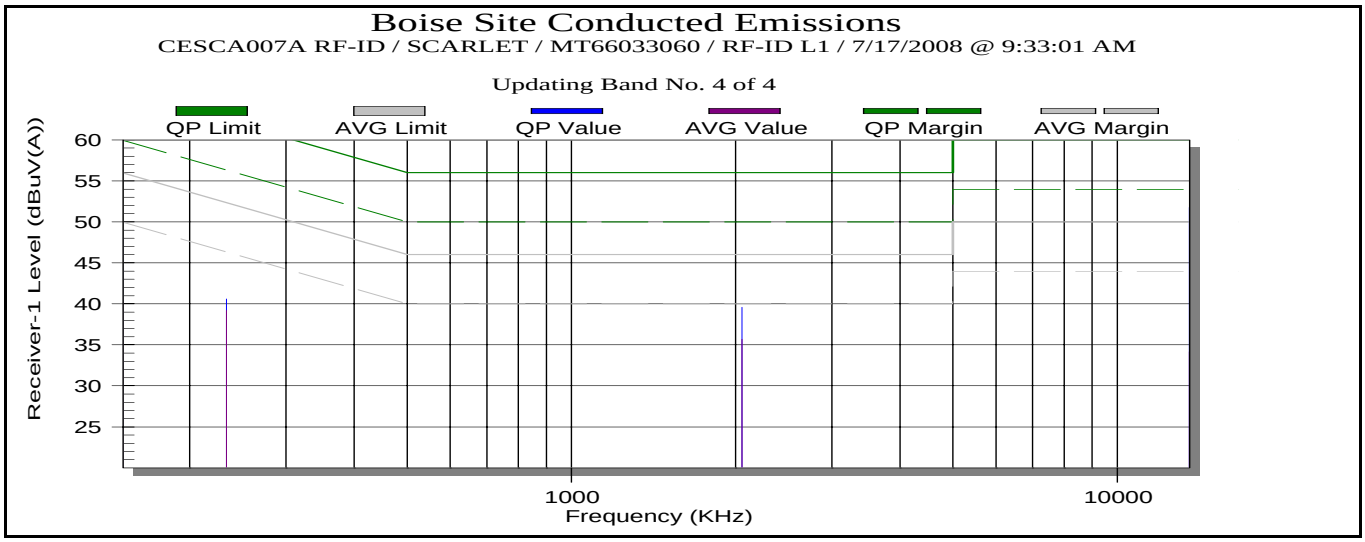
CISPR22:2005
EN55022:2006
CNS 13438
ANSI C63.4 (2003)
CFR 47

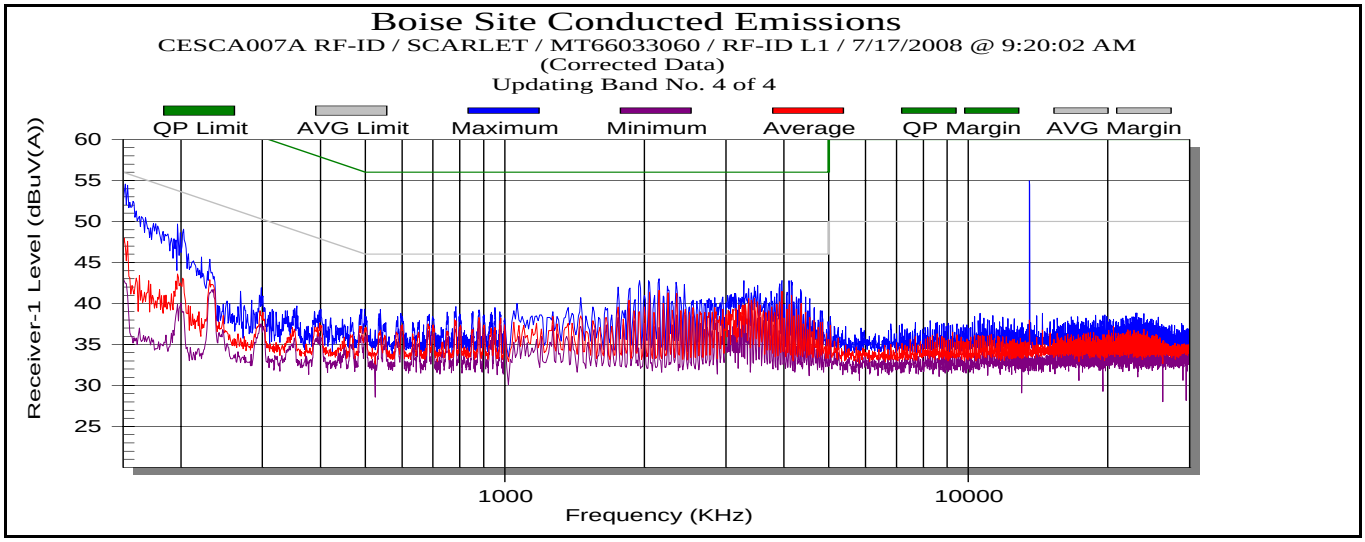
BOILER FORMAT FILE: CE Full Report.TXM

Test Data for SCARLET_MT66033060_RF-ID L1

CE_FINALTEST_FINAL_L1.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 17 Jul, 2008 at 09:33:33.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

X	Prescan Freq. (MHz)	Limit (dBuV) (A)	Max. Cor. Level (dBuV) (A)	Mar. (dB)	QPD Cor. Freq. (MHz)	QPD Value (dBuV) (A)	QPD Cor. Value (dBuV) (A)	QPD Mar. (dB)	Avg. D. Cor. Freq. (MHz)	Avg. D. Value (dBuV) (A)	Avg. D. Corr. Value (dBuV) (A)	Avg. D. Mar. (dB)
P	0.1509	56.0	48.0	8.0	0.1509	35.2	48.1	17.9	0.1509	27.8	40.7	15.3
P	0.2308	52.3	42.9	9.5	0.2334	29.4	40.6	21.7	0.2334	28.0	39.2	13.1
P	2.0530	46.0	41.4	4.6	2.0544	29.3	39.6	16.4	2.0544	25.4	35.7	10.3
P	13.5600	50.0	38.0	12.0	13.5596	41.3	51.8	8.2	13.5596	23.7	34.2	15.8





Test Data for SCARLET_MT66033060_RF-ID L2

CE_FINALTEST_FINAL_L2.DAT
Project Name: SCARLET, Serial Number: MT66033060
Test completed on 17 Jul, 2008 at 10:11:11.
110 Volts AC @ 60 Hz,1-Phase Power
N/R Deg C,N/R % RH

X	Prescan Freq. (MHz)	Limit (dBuV) (A)	Max. Cor. Level (dBuV) (A)	Mar. (dB)	QPD Cor. Freq. (MHz)	QPD Value (dBuV) (A)	QPD Cor. Value (dBuV) (A)	QPD Mar. (dB)	Avg. D. Cor. Freq. (MHz)	Avg. D. Value (dBuV) (A)	Avg. D. Corr. Value (dBuV) (A)	Avg. D. Mar. (dB)
P	0.1509	56.0	47.3	8.7	0.1500	36.9	49.8	16.2	0.1500	29.4	42.3	13.7
P	0.1984	53.6	44.1	9.5	0.2001	30.4	41.8	21.8	0.2001	25.7	37.1	16.5
P	2.3500	46.0	43.1	2.9	2.3511	30.8	41.1	14.9	2.3511	27.1	37.4	8.6
P	13.5600	50.0	38.2	11.8	13.5592	41.2	51.7	8.3	13.5592	22.5	33.0	17.0