
**FCC Part 18 Subpart C Consumer
For RF Lighting Equipment
Electromagnetic Compatibility Test Report**

Sunlight Supply, Inc.

902683 Galaxy DE Gen 2 1000W

December 19, 2017

Tests Conducted by:

ElectroMagnetic Investigations, LLC

20811 NW Cornell Road, Suite 600, Hillsboro, Oregon 97124, USA
Tele (503) 466-1160 Fax (503) 466-1170 support@emicomply.com

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- The Equipment was tested in the configuration and modes of operation provided by the client. Test levels were specified by the client within the test plan. Any additional tests not reported herein are the responsibility of the client as the overall product compliance is the responsibility of the client.
- This report may only be reproduced in its entirety. To reproduce this report in part, specific written permission must be obtained from ElectroMagnetic Investigations.
- The results presented in this test report pertain only to the test items described within this report.
- Specific test descriptions can be found in the specific individual section of the test report.

Deviations to the Test Standard

No Deviations were made to the standard test methods

Revision History

Version	Date Issued	Description of Revision

Authorizations

FCC: The 3-meter Semi-Anechoic Chamber and Conducted Emissions facilities are fully described in reports filed with the Federal Communications Commission. Corresponding letters of acceptance are maintained in our files.

Industry Canada: Accepted by Industry Canada for performance of radiated emissions measurements.


European Union (CE): ElectroMagnetic Investigations, LLC is equipped and capable of performing EMC CE compliance testing to European Union EMC CE requirements for Information Technology Equipment (ITE), Measurement, Control and Laboratory Equipment (MCL), and other equipment.

American Association of Lab Accreditations (A2LA): ElectroMagnetic Investigations is accredited to perform the tests contained within this report to the standards listed.




Certificate #2569.01


Report Approved By:

 _____ Signature	<u>19 DEC 2017</u> Date	<u>Henry Benitez</u> Name
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Report Written By:

 _____ Signature	<u>19 DEC 2017</u> Date	<u>Jackie Benitez</u> Name
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Testing Performed By:

 _____ Signature	<u>14 DEC1 2017</u> Date	<u>Ryan Benitez</u> Name
_____ Signature	_____ Date	_____ Name

Test Summary Information

Report Number: SUN20171213
Issue Date: December 19, 2017
Test Item: 902683 Galaxy DE Gen 2 1000W
Serial Number: None
Power Supply: Internal

Emissions:

Result	Product Standard	Test Standard	Description
Pass	FCC Part 18 Subpart C Consumer	FCC Part 18 Subpart C Section 18.305c Consumer rf lighting devices	Radiated Emissions
Pass	FCC Part 18 Subpart C Consumer	FCC Part 18 Subpart C Section 18.307c Consumer rf lighting devices	Conducted Emissions

Device Under Test Selection Justification

Sunlight Supply Inc. certifies that product tested is a representative sample of units to be sold.

I, Caleb Doerr, representative for Sunlight Supply, Inc. verify that the product tested is representative of units to be sold.



(Signature)

Testing requested by:

Company Name:	Sunlight Supply, Inc., World Headquarters
Company Address:	3204 NW 38 th Circle
City, State Zip:	Vancouver, WA 98660
Test Requested By:	Bruce LeBlanc, Caleb Doerr
Model:	902683 Galaxy DE Gen 2 1000W
First Date of Test:	December 14, 2017
Last Date of Test:	December 14, 2017
Date Samples Received:	December 13, 2017
Equipment Design Stage:	Production Representative
Equipment Condition:	Good

Device Under Test Information

Device Under Test	902683 Galaxy DE Gen 2 1000W
Functional Description of DUT	902683 Galaxy DE Gen 2 1000W
I/O Ports	N/A
Test Configuration	Test with 901465 Digimax Double Ended HPS Lamp 1000w and 904934 Sun System DE Boss Lamp Reflector on 120V 1000w setting
Clock Frequencies (>9kHz)	Unknown
Modes of Operation	120V 1000W
Operating System	N/A
Exercising Software	N/A
Power Supply Voltage, Frequency	120 V 60 Hz

Emissions Test Report

Radiated Emissions Information

The client provided the test modes, configurations, and operational settings for the DUT and any supporting equipment.

The DUT and the AE that is designated to be placed in the measurement area were placed on a non-conducting tabletop 80 cm tall. Each device is placed on the tabletop 10 cm from its neighboring device. The excess cable length was draped off the rear of the table. If the excess cable fell closer than 40 cm from the ground plane, the cable was bundled in non-inductive bundles of 30-40 cm loops (when possible) to maintain 40 cm in height. The measurement antenna was then placed 3 m from the closest approach of the DUT/AE system. Any AE that had to be placed outside the measurement area was setup either outside of the chamber or under the floor, depending on size and convenience.

The DUT and the AE were operated in the modes specified by the client while the emissions were measured.

To measure the emissions at the frequency range specified in this report, a preliminary scan was performed with a linearly polarized antenna while the turntable was rotated 360 degrees and the antenna mast was raised from 1 meter height to 4 meters in height in both a horizontal polarization and a vertical polarization. Any emissions that were found to be within 6 dB of the specified limit were then maximized to find the level that was recorded.

The maximization process included manual manipulation of the cables, continuous height scanning, and continuous azimuth scanning.

Device Under Test	902683 Galaxy DE Gen 2 1000W
Functional Description of DUT	902683 Galaxy DE Gen 2 1000W
Serial Number	None
I/O Ports Populated for test	N/A
Test Configuration	Test with 901465 Digimax Double Ended HPS Lamp 1000w and 904934 Sun System DE Boss Lamp Reflector on 120V 1000w setting
Clock Frequencies (>9kHz)	Unknown
Modes of Operation	120V 1000W
Operating System (Version)	N/A
Exercising Software (version)	N/A
Power Supply Voltage, Frequency	120 V 60 Hz
Frequency Range Tested	30 MHz to 1000 MHz

Purpose

The purpose of the testing is to determine if the 902683 Galaxy DE Gen 2 1000W is compliant to radiated electromagnetic emission limits as specified by FCC Part 18 Subpart C Consumer.

The testing was performed as per FCC measurement procedure MP-5.

DUT Modifications

No Modifications were done to the DUT. No EMI suppression was added to the cabling. The DUT was tested as delivered to EMI.

Radiated Emissions Results

Product Standard: FCC Part 18 Subpart C Consumer

Radiated Emissions:Emissions are within specification limits.

Least Margin:2.7 dB at 47 MHz.

Test Measurement uncertainties (k=2.05):

Radiated Field strength at 3m measured with:

Chase Bicon (30 MHz – 1 GHz)..... ±5.6 dB

Sample radiated emissions field strength measurement:

RF Reading from Spectrum Analyzer (dBuV) + Cable Loss Factor (dB) + Antenna Factor (dB) – Pre-Amplifier Amplification (dB) = Final Radiated Emission Level (dBuV/m).

Auxiliary Equipment in measurement area

Device	Manufacturer	Model Number	Serial Number
Double Ended HPS Lamp 1000w	Digimax	901465	None
DE Boss Lamp Reflector	Sun System	904934	None

** Note: This includes all equipment connected to the DUT and located within the measurement area. Emissions from this equipment could increase the emissions measured.*

Auxiliary Equipment outside measurement area

Device	Manufacturer	Model Number	Serial Number
N/A	N/A	N/A	N/A

** Note: This includes all equipment isolated from the DUT and the measurement area. Emissions from this equipment will not increase the emissions measured.*

Cables

Type of Cable	Shield?	Length	Ferrite?	Shipped with Product?	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Measurement Bandwidths

Frequency (MHz)	Peak (kHz)	Quasi-Peak (kHz)	Average (kHz)
0.15 – 30	9.0	9.0	9.0
30 – 1000	120	120	120
>1000	1000	N/A	1000

Radiated Emission Plots

ElectroMagnetic Investigations, LLC Radiated Emissions Test Sheet Revision 09

Job Reference Number: SUN20171213	Temperature (°F): 71	Device Under Test (DUT): 902683 Galaxy DE Gen 2
Test Date: 14-Dec-2017	Relative Humidity (%): 24	Serial Number: None
Location: Hillsboro	Barometric Pressure: 30	
Profile Version: 2.1	Test Distance (m): 3	

Product Standard: FCC Part 18 Subpart C Consumer
 Test Standard: Radiated Emissions FCC Part 18 Section 18.305c

	Manufacturer	Model Number	Calibration Due	Serial Number	
Analyzer:	E4440A	Agilent	E4440A	16-Jun-2018	U840420326
Pre-Amp:	LN1000	Amplifier Research	LN1000	14-Dec-2017	13983
Pre-Amp2:	N/A	N/A	N/A	N/A	N/A
Antenna:	Lab Chase	Chase	CBL 6112A	25-Nov-2019	2203
Antenna2:	N/A	N/A	N/A	N/A	N/A
Antenna3:	N/A	N/A	N/A	N/A	N/A
Pre-Selector:	N/A	N/A	N/A	N/A	N/A
Site Source:	EMISS02	COM-Power	CGO-515	N/A	291696

Deviations from Standard: None

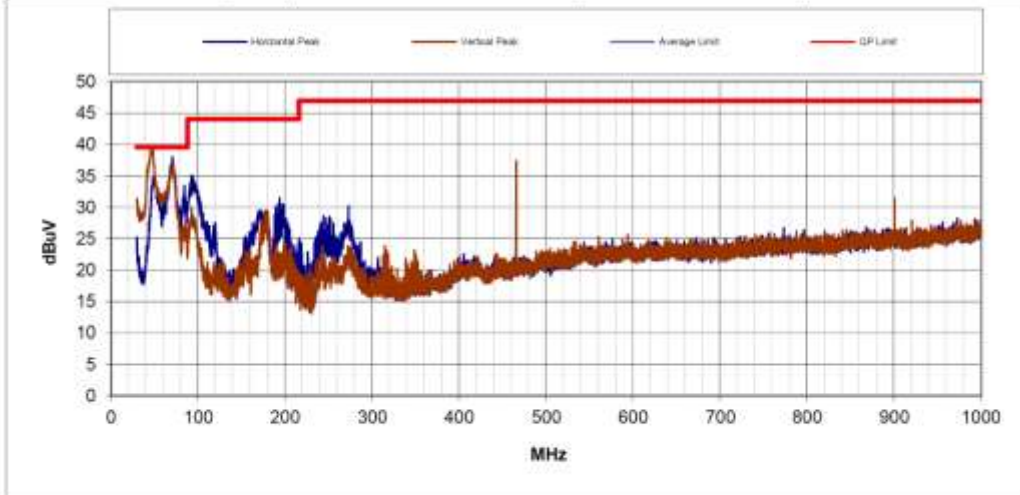


RADIATED EMISSIONS DATA SHEET

Revision 09
2/22/2017

Customer:	Sunlight Supply	Job Reference#:	SUN20171213
Contact:	Bruce LeBlanc	Date:	12/14/2017
DUT:	902683 Galaxy DE Gen 2	Temperature:	71°F
Serial Number:	None	Humidity:	24%
Voltage/Freq:	120 V 60 Hz	Barometric Pressure:	30 inHg
Tested by:	Ryan Benitez	Location:	Hillsboro
Product Standards:	FCC Part 18 Subpart C Consumer		
	N/A		
Test Standard:	FCC Part 18 Consumer		

TEST RESULTS	TEST TYPE	DISTANCE	RUN #
Pass	Compliance	3m	1

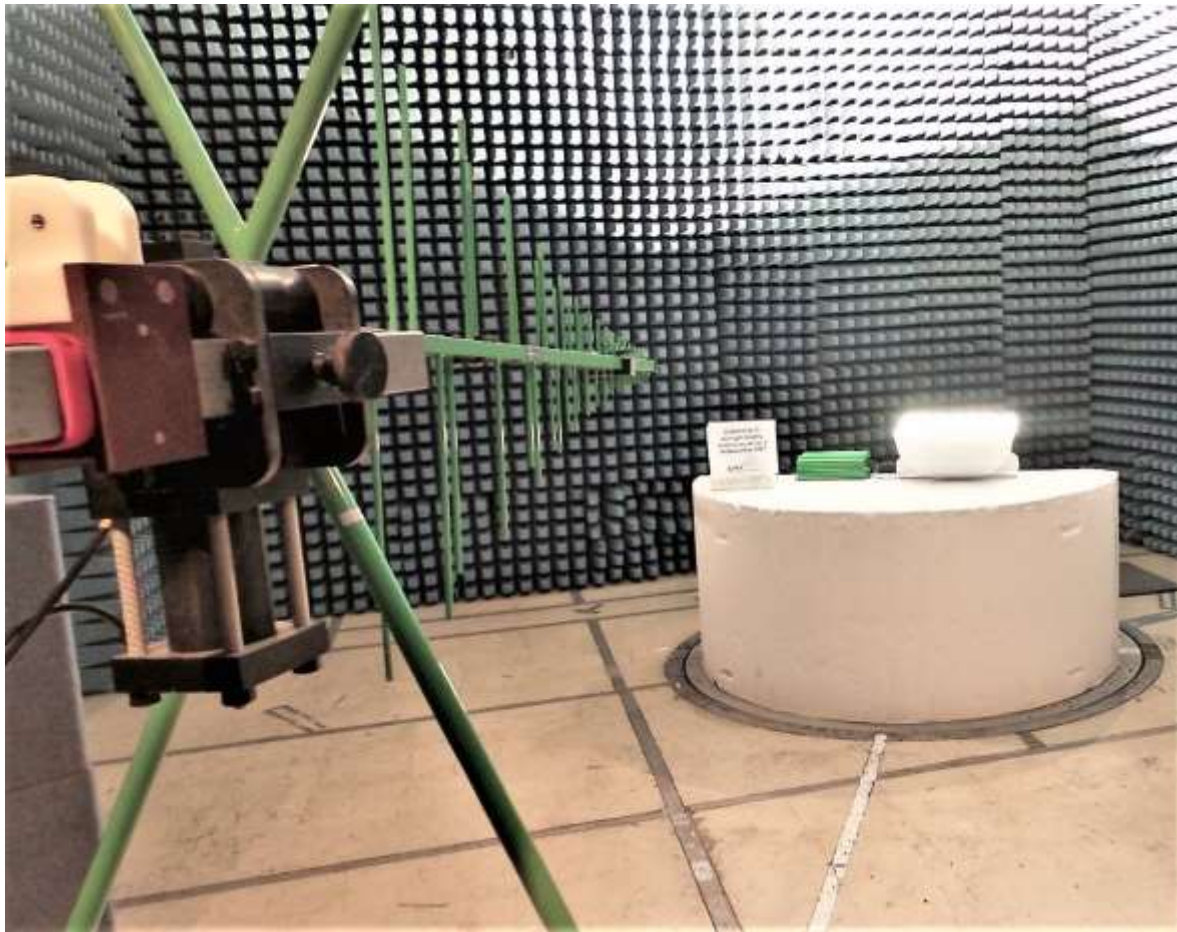


COMMENTS	SIGNATURE
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120 V 60 Hz;	<i>Ryan Benitez</i>
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Horizontal								
Freq (MHz)	Peak (dBuV)	Average (dBuV)	QP (dBuV)	Average Limit (dBuV)	QP Limit (dBuV)	Turntable (deg) / Height (cm)	Average Margin (dB)	QP Margin (dB)
70.78	37.62	N/A	34.38	39.54	39.54	0°/400cm	N/A	5.16
194.08	25.72	N/A	25.72	44.00	44.00	0°/133cm	N/A	18.28
273.03	30.06	N/A	26.50	46.90	46.90	132°/131cm	N/A	20.40
972.86	24.69	N/A	23.28	46.90	46.90	198°/400cm	N/A	23.62
Vertical								
Freq (MHz)	Peak (dBuV)	Average (dBuV)	QP (dBuV)	Average Limit (dBuV)	QP Limit (dBuV)	Turntable (deg) / Height (cm)	Average Margin (dB)	QP Margin (dB)
47.34	36.83	N/A	36.83	39.54	39.54	223°/100cm	N/A	2.71
177.75	26.52	N/A	23.46	44.00	44.00	68°/100cm	N/A	20.54
465.90	20.58	N/A	17.93	46.90	46.90	-1°/100cm	N/A	28.97
900.92	22.67	N/A	22.13	46.90	46.90	237°/247cm	N/A	24.77

Radiated Emissions Photographs





Conducted Emissions Information

The client provided the test modes, configurations, and operational settings for the DUT and any supporting equipment.

The DUT and the AE that is designated to be placed in the measurement area were placed on a non-conducting tabletop 80 cm tall. Each device is placed on the tabletop 10 cm from its neighboring device. The excess cable length was draped off the rear of the table. If the excess cable fell closer than 40 cm from the ground plane, the cable was bundled in non-inductive bundles of 30-40 cm loops (when possible) to maintain 40 cm in height. The measurement LISN was located on the floor at least 80 cm from the nearest approach of the DUT.

The DUT and the AE were operated in the modes specified by the client while the emissions were measured.

To measure the emissions at the frequency range specified in this report, cables were arranged in a manner to maximize emissions and a preliminary peak scan was performed. Any peaks found to be within 6 dB of the QP limit were remeasured using the QP detector.

Device Under Test	902683 Galaxy DE Gen 2 1000W
Functional Description of DUT	902683 Galaxy DE Gen 2 1000W
Serial Number	None
I/O Ports Populated for test	N/A
Test Configuration	Test with 901465 Digimax Double Ended HPS Lamp 1000w and 904934 Sun System DE Boss Lamp Reflector on 120V 1000w setting
Clock Frequencies (>9kHz)	Unknown
Modes of Operation	120V 1000W
Operating System (Version)	N/A
Exercising Software (version)	N/A
Power Supply Voltage, Frequency	120 V 60 Hz
Frequency Range Tested	150 kHz – 30 MHz

Purpose

The purpose of the testing is to determine if the 902683 Galaxy DE Gen 2 1000W is compliant to conducted electromagnetic emission limits as specified by FCC Part 18 Subpart C Consumer.

The testing was performed as per FCC measurement procedure MP-5.

DUT Modifications

No Modifications were done to the DUT. No EMI suppression was added to the cabling. The DUT was tested as delivered to EMI.

Conducted Emissions Results

Product Standard: FCC Part 18 Subpart C Consumer

Conducted Emissions: Emissions are within specification limits.

Least Margin:11.4 dB at 510 kHz.

Conducted Emissions Measurement System uncertainty (k=2.05)..... ±3.7 dB

Sample conducted emissions measurement:

RF Reading from Spectrum Analyzer (dBuV) + Cable Loss Factor (dB) + LISN Factor (dB) = Final Conducted Emission Level (dBuV).

Auxiliary Equipment in measurement area

Device	Manufacturer	Model Number	Serial Number
Double Ended HPS Lamp 1000w	Digimax	901465	None
DE Boss Lamp Reflector	Sun System	904934	None

** Note: This includes all equipment connected to the DUT and located within the measurement area. Emissions from this equipment could increase the emissions measured.*

Auxiliary Equipment outside measurement area

Device	Manufacturer	Model Number	Serial Number
N/A	N/A	N/A	N/A

** Note: This includes all equipment isolated from the DUT and the measurement area. Emissions from this equipment will not increase the emissions measured.*

Cables

Type of Cable	Shield?	Length	Ferrite?	Shipped with Product?	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Measurement Bandwidths

Frequency (MHz)	Peak (kHz)	Quasi-Peak (kHz)	Average (kHz)
0.15 – 30	9.0	9.0	9.0
30 – 1000	120	120	120
>1000	1000	N/A	1000

Conducted Emission Plots

ElectroMagnetic Investigations, LLC Conducted Emissions Test Sheet Revision 09

Job Reference Number: <input type="text" value="SUN20171213"/>	Temperature (°F): <input type="text" value="71"/>	Device Under Test (DUT): <input type="text" value="902683 Galaxy DE Gen 2"/>
Test Date: <input type="text" value="14-Dec-2017"/>	Relative Humidity (%): <input type="text" value="24"/>	Serial Number: <input type="text" value="None"/>
Location: <input type="text" value="Hillsboro"/>	Barometric Pressure: <input type="text" value="30"/>	
Profile Version: <input type="text" value="4.1"/>		

Product Standard:
 Test Standard:

	Manufacturer	Model Number	Calibration Due	Serial Number	
Analyzer	E4443A	Agilent	E4443A	25-Jul-2022	MY45300803
Pre-Selector	N/A	N/A	N/A	N/A	N/A
LISN 1	Main	FCC	FCC-LISN-50-50-4-02	24-May-2018	6105
LISN 2	N/A	N/A	N/A	N/A	N/A
TLISN	N/A	N/A	N/A	N/A	N/A
Site Source	EMISS01	COM-Power	CGC-510E	N/A	311780

Deviations from Standard:

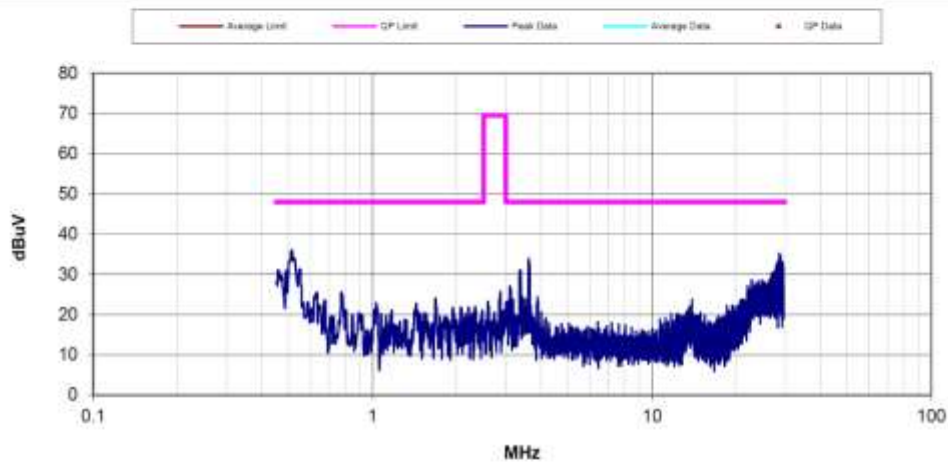


CONDUCTED EMISSIONS DATA SHEET

Revision 09
2/22/2017

Customer:	Sunlight Supply	Job Reference#:	SUN20171213
Contact:	Bruce LeBlanc	Date:	12/14/2017
DUT:	902683 Galaxy DE Gen 2	Temperature:	71°F
Serial Number:	None	Humidity:	24%
Voltage/Freq:	120 V 60 Hz	Barometric Pressure:	30 inHg
Tested by:	Ryan Benitez	Location:	Hillsboro
Product Standards:	FCC Part 18 Subpart C Consumer		
	N/A		
Test Standard:	FCC Part 18 Consumer		

TEST RESULTS	TEST TYPE	LINE	RUN #
Pass	Compliance	Line	1



COMMENTS	SIGNATURE
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120 V 60 Hz;								
Peak Data			Average Data			QP Data		
Freq (MHz)	Amplitude (dBµV)	Margin (dB)	Amplitude (dBµV)	Limit (dBmV)	Margin (dB)	Amplitude (dBµV)	Limit (dBmV)	Margin (dB)
0.46	33.81	14.19				33.46	48.00	14.54
0.52	34.31	13.69				28.57	48.00	19.43
3.39	25.94	22.06				23.85	48.00	24.15
3.62	24.72	23.28				24.61	48.00	23.39
28.70	35.75	12.25				35.18	48.00	12.82
28.95	34.89	13.12				35.02	48.00	12.98

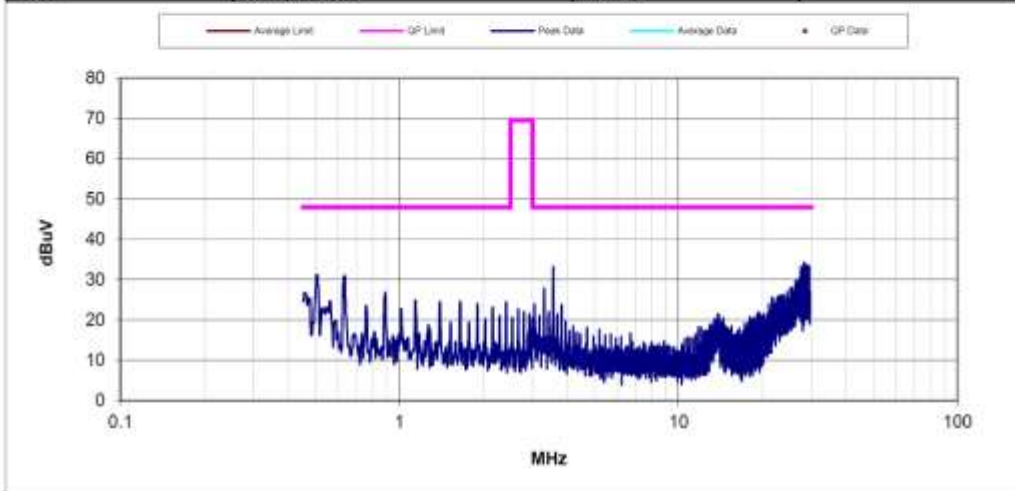


CONDUCTED EMISSIONS DATA SHEET

Revision 09
2/22/2017

Customer:	Sunlight Supply	Job Reference#:	SUN20171213
Contact:	Bruce LeBlanc	Date:	12/14/2017
DUT:	902683 Galaxy DE Gen 2	Temperature:	71°F
Serial Number:	None	Humidity:	24%
Voltage/Freq:	120 V 60 Hz	Barometric Pressure:	30 inHg
Tested by:	Ryan Benitez	Location:	Hillsboro
Product Standards:	FCC Part 18 Subpart C Consumer		
	N/A		
Test Standard:	FCC Part 18 Consumer		

TEST RESULTS	TEST TYPE	LINE	RUN #
Pass	Compliance	Neutral	1



COMMENTS SIGNATURE

120 V 60 Hz: *Ryan Benitez*

Peak Data			Average Data			QP Data		
Freq (MHz)	Amplitude (dBuV)	Margin (dB)	Amplitude (dBuV)	Limit (dBmV)	Margin (dB)	Amplitude (dBuV)	Limit (dBmV)	Margin (dB)
0.51	36.80	11.20				36.58	48.00	11.42
0.63	33.68	14.32				34.36	48.00	13.64
3.56	34.75	13.25				34.84	48.00	13.16
28.17	34.94	13.06				34.79	48.00	13.21
28.41	34.03	13.97				29.89	48.00	18.11
28.68	34.22	13.78				35.48	48.00	12.52

Conducted Emissions Photographs



