

Wireless Display Driver

Model No.: W-DIS-D

Date: 2017-06-16

Report Prepared By:

Christopher Locke

EMC Test Report

Report Number	20292-1
EUT Nomenclature	Wireless Display Driver
Sample Identification	Model No. : W-DIS-D
	Sl. No. : MEL-122
	Software Version : 5.83
	Hardware Version : Rev A
Number of Samples	1
Date of receipt of Sample	2016-06-27
Condition of Sample on receipt	Good
Client name	Honeywell International Inc.
Client Address	Honeywell Life Safety, 12, Clintonville Road, Northford, Connecticut, USA -06472
Testing Laboratory	Honeywell Home & Building Technologies RF & EMC HWVA
Address	2 Corporate Center Dr. Suite 100 PO Box 9040 Melville, NY 11747 USA
Test Dates	2016-06-27 to 2017-04-24
Applicable Standard	FCC Part 15 Subpart C : 2010, ANSI C63.10:2013
Test Results	PASS

Prepared By: Name: Christopher Locke Signature:  Date: 2017-06-16	Reviewed By: Name: Michael Antola Signature:  Date: 2017-06-16
Authorized By: Name: Ted Ramos Signature:  Date: 2017-06-16	

TEST SUMMARY						
#	Name	Specification	Test Method	Pass	Fail	NA
FHSS						
1	20dB Bandwidth	FCC Part 15.247 :2010	DA 00-705	√		
2	Maximum Peak Output Power	FCC Part 15.247 :2010	DA 00-705	√		
3	Carrier Frequency Separation	FCC Part 15.247 :2010	DA 00-705	Note 1		
4	Number of Hopping Frequencies	FCC Part 15.247 :2010	DA 00-705	Note 1		
5	Band-edge Compliance	FCC Part 15.247 :2010	DA 00-705	√		
6	Time of Occupancy (Dwell Time)	FCC Part 15.247 :2010	DA 00-705	√		
7	Spurious RF Conducted Emissions	FCC Part 15.247 :2010	DA 00-705	√		
8	Effective Isotropic Radiated Power	FCC Part 15.247 : 2010 and 15.209 : 2010	KDB 412172	Note 1		
9	Spurious Radiated Emissions	FCC Part 15.247 : 2010 and 15.209 : 2010	DA 00-705 ANSI C63.10 – 2013	Note 1		
DTS						
1	DTS 6dB Bandwidth	FCC Part 15.247 :2010	KDB 558074	√		
2	Maximum Peak Output Power	FCC Part 15.247 :2010	KDB 558074	√		
3	Maximum Power Spectral Density	FCC Part 15.247 :2010	KDB 558074	√		
4	Band-edge Conducted Emissions	FCC Part 15.247 :2010	KDB 558074	√		
5	Effective Isotropic Radiated Power	FCC Part 15.247 : 2010 and 15.209 : 2010	KDB 412172	Note 1		
6	Radiated Spurious Emissions	FCC Part 15.247 and 15.209	KDB 558074	Note 1		
1 – Testing performed by Honeywell, Bangalore, India. Data/results are part of Test Report Number EMC0181-1						

MEASUREMENT UNCERTAINTY		
Where relevant, the following measurement uncertainty levels has been estimated for tests performed on the EUT as specified in CISPR 16-4		
The Expanded measurement uncertainty (K=2) is provided below		
#	Name	Value
1	20dB and 6dB bandwidth	± 0.22 dB
2	Maximum Peak Output Power	± 0.22 dB
3	Maximum Power Spectral Density	± 0.22 dB
4	Band-edge Emissions	± 0.22 dB
5	Spurious RF Conducted Emissions	± 0.22 dB
6	Radiated Spurious Emissions <1GHz	± 10.92 dB
7	Radiated Spurious Emissions >1GHz	± 8.53 dB

1 PRODUCT DETAILS

PRODUCT OPERATION AND INTENDED USE

The W-DIS-D is a part of the wireless network and has a specific SLC module address. The WDIS-D and ANN-80 display the wireless specific events that cannot be displayed on the FACP. These wireless events are related to the trouble and supervisory conditions that are specific to the Wireless Gateway and devices.

W-DIS-D can be powered by external 24Vdc interface from Fire Panel. It uses proprietary wireless protocol to communicate with wireless fire devices.

RATINGS AND SYSTEM DETAILS

Operating Frequency	902MHz to 928MHz	
Number of Channels	DTS	:6
	FHSS	:55
Channel Bandwidth (20 dB)	DTS	:1MHz
	FHSS	:320kHz
Transmitted Power	DTS	:12dBm
	FHSS	:17dBm
Modulation Type	FSK	
Data Rate	DTS	:300Kbps
	FHSS	:150Kbps
Antenna Type	Inverter F Patch Antenna	
No. of Antenna	4	
Antenna Gain	ANT 1	: 6.88dBi
	ANT 2	: 5.88dBi
	ANT 3	: 3.78dBi
	ANT 4	: 4.55dBi
Supply Voltage and Current	24V, 30mA	
Dimensions (Diameter x Height)	193mm x 46mm	
Environmental Conditions	Operating Temperature	:0 to 49°C
	Storage Temperature	:-10 to 60°C
	Humidity	:10 to 93%RH

TEST CONFIGURATION

Config #	Description
Conducted Test	EUT is Powered by SLC interface line from Fire Panel. EUT Debug port (UART) is connected to Laptop through USB to UART converter cable. EUT is configured to the respective operating mode through HyperTerminal. Antenna 1 is selected for the test as this is the high gain antenna. Post configuration, the USB to UART converter cable is removed for all Radiated Measurements
Radiated Test	EUT is Powered by SLC interface line from Fire Panel EUT Debug port (UART) is connected to Laptop through USB to UART converter cable. EUT is configured to the respective operating mode through HyperTerminal. Test is performed at all 4 Antennas . Post configuration, the USB to UART converter cable is removed for all Radiated Measurements

OPERATING MODES

Mode #	Description
DTS	Following DTS channels have been used for Conducted (Continuous Transmission) Tests Channel 1 : 902.875MHz Channel 3 : 914.325MHz Channel 6 : 927.125MHz
FHSS	Following FHSS channels have been used for Conducted (Continuous Transmission) Tests Channel 1 : 903.55MHz Channel 28 : 916.00MHz Channel 55 : 926.45MHz

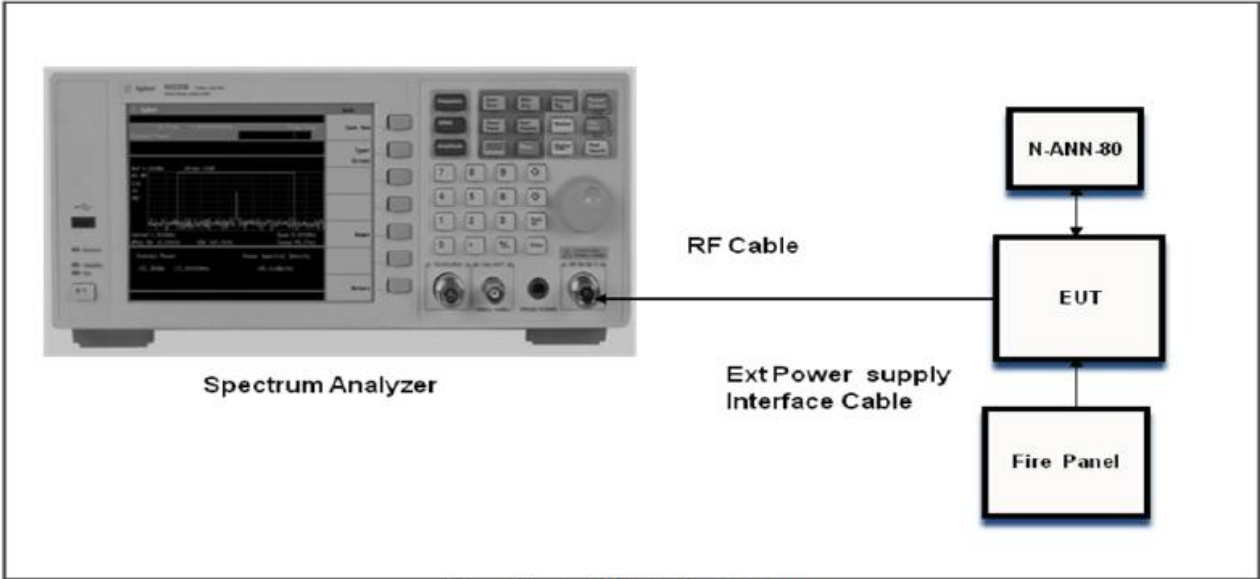
INPUT AND OUTPUT CABLES

Port #	Name	Port Type	Cable Length	Cable type Shielded/ Unshielded	Comments
1	External 24V Power Interface Cable	Input	5m	Unshielded	
*Note:	TP	AC = AC Power Port = Telecommunication Ports (e.g. Ethernet) N/E = Non-Electrical		DC DI/ DO AI/ AO	= DC Power Port = Digital Input/ Output = Analog Input/ Output

SUPPORT EQUIPMENTS AND ACCESSORIES USED

#	Item Description	Make	Model	Part No. / SI. No	Cal Due Date
1	Laptop	Dell	CORPMDTW10X64IMAGEV2	339YSC2	NA
2	USB to UART Cable	FTDI	NA	TTL-232R-3V3	NA
3	Fire Panel	Notifier	NFS-3030	NA	NA

CONNECTION DIAGRAM AND SETUP DIAGRAM



Conducted RF Test Setup

2 FHSS CHANNELS

2.1 20dB BANDWIDTH

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-09-01	Temperature (°C)	23.6°C
Test End Date	2016-09-01	Humidity RH (%)	51.9%RH
Tested By	Jose Badia/Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	DA 00-705		
Comment			

TEST DETAILS

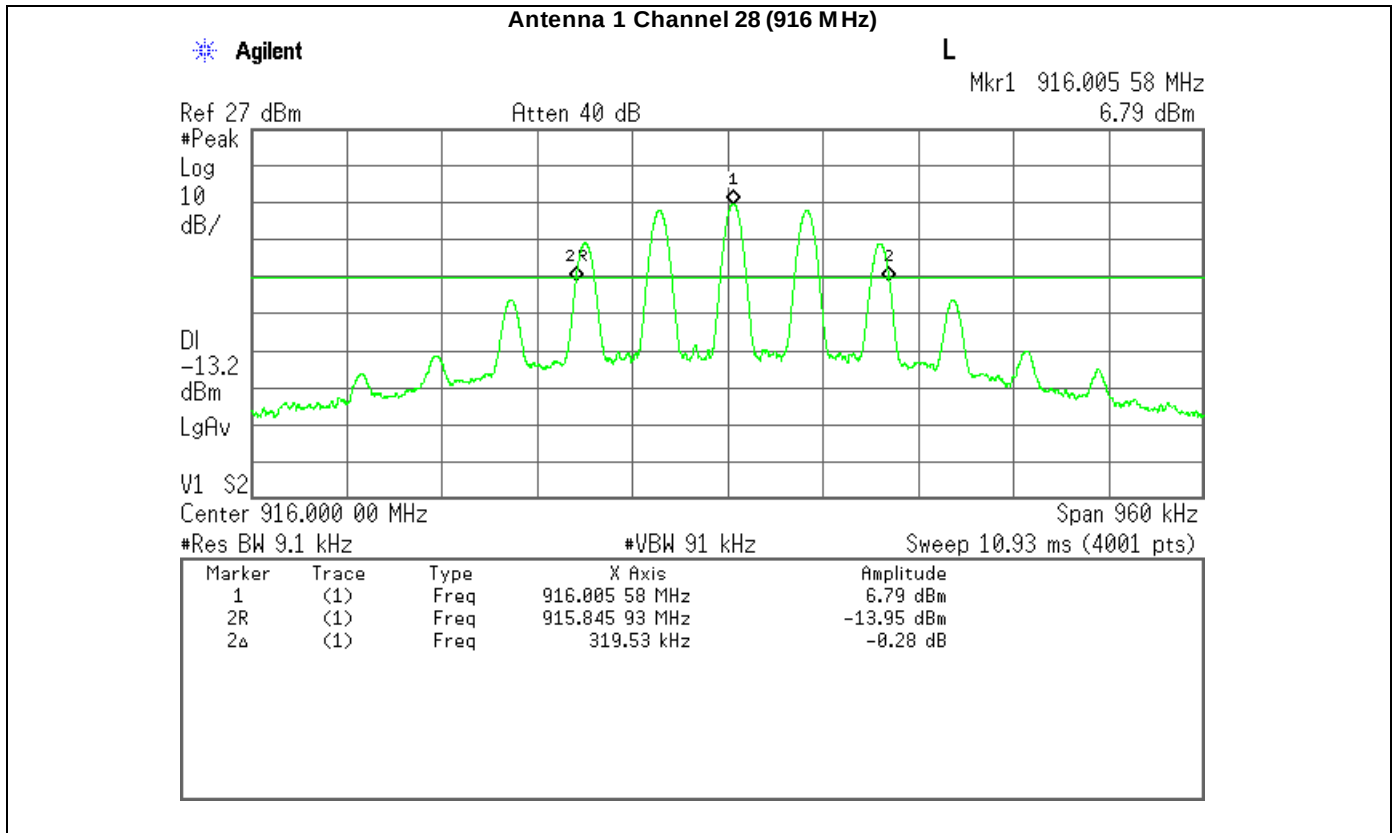
Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	192484	2017-05-18
Y	RF Cable	Digikey	1	NA	NA



TEST RESULT				
Channel	Frequency	Measured Bandwidth	Limit	Result
#	MHz	KHz	KHz	
28	916	319.53	≥250 & ≤500	Pass

TEST SETUP PHOTOGRAPH
Refer Annexure -1 Conducted RF Test setup

2.2 PEAK OUTPUT POWER

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-08-10	Temperature (°C)	23.6
Test End Date	2016-08-10	Humidity RH (%)	51.9
Tested By	Arnoldo Garcia	Pressure (mbar)	NA
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	DA 00-705		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	192484	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Antenna 1 Channel 1

* Agilent 11:19:49 Aug 10, 2016

L

Mkr1 903.466 4 MHz
11.66 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 903.550 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	903.466 4 MHz	11.66 dBm

Antenna 1 Channel 28

* Agilent 11:30:29 Aug 10, 2016

L

Mkr1 916.084 0 MHz
11.67 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 916.000 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	916.084 0 MHz	11.67 dBm

Antenna 1 Channel 55

* Agilent 11:38:12 Aug 10, 2016

L

Mkr1 926.352 0 MHz
11.64 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 926.450 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	926.352 0 MHz	11.64 dBm

Antenna 2 Channel 1

* Agilent 11:47:12 Aug 10, 2016

L

Mkr1 903.462 0 MHz
11.11 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 903.550 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	903.462 0 MHz	11.11 dBm

Antenna 2 Channel 28

* Agilent 14:16:37 Aug 10, 2016

L

Mkr1 915.914 0 MHz
11.16 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 916.000 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	915.914 0 MHz	11.16 dBm

Antenna 2 Channel 55

* Agilent 14:24:54 Aug 10, 2016

L

Mkr1 926.524 0 MHz
11.08 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 926.450 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	926.524 0 MHz	11.08 dBm

Antenna 3 Channel 1

* Agilent 14:32:04 Aug 10, 2016

L

Mkr1 903.640 0 MHz
11.56 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

M1 S2

Center 903.550 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	903.640 0 MHz	11.56 dBm

Antenna 3 Channel 28

* Agilent 14:37:12 Aug 10, 2016

L

Mkr1 915.917 6 MHz
11.60 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 916.000 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	915.917 6 MHz	11.60 dBm

Antenna 3 Channel 55

* Agilent 14:43:22 Aug 10, 2016

L

Mkr1 926.541 6 MHz
11.60 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

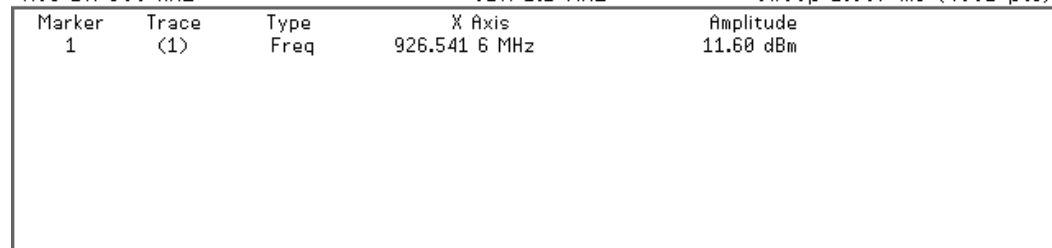
Center 926.450 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

**Antenna 4 Channel 1**

* Agilent 14:49:16 Aug 10, 2016

L

Mkr1 903.466 4 MHz
10.49 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

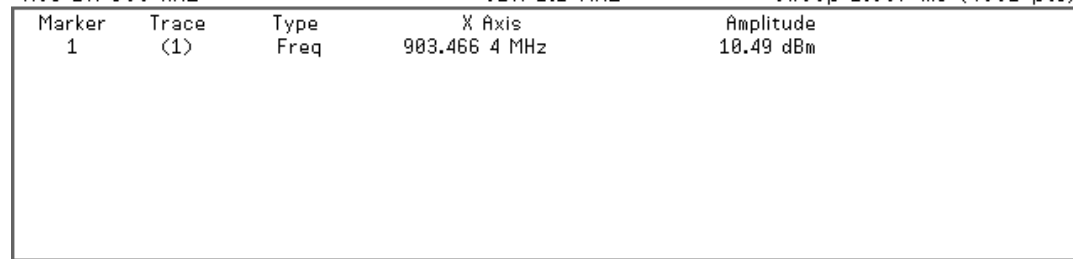
Center 903.550 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)



Antenna 4 Channel 28

* Agilent 14:56:27 Aug 10, 2016

L

Mkr1 915.916 4 MHz
10.52 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 916.000 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	915.916 4 MHz	10.52 dBm

Antenna 4 Channel 55

* Agilent 15:02:44 Aug 10, 2016

L

Mkr1 926.365 0 MHz
10.55 dBm

Ref 30 dBm

#Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 926.455 0 MHz

Span 1.6 MHz

#Res BW 360 kHz

#VBW 1.1 MHz

#Sweep 1.067 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	926.365 0 MHz	10.55 dBm

TEST RESULT							
Antenna	Channel	Frequency	Measured Power Level	Cable + Attenuation	Transmitter Power Level	Limit	Result
#	#	MHz	dBm	dB	dBm	dBm	
1	1	903.55	11.66	5.5	17.16	≤23.979	Pass
1	28	916	11.67	5.5	17.17	≤23.979	Pass
1	55	926.45	11.64	5.5	17.14	≤23.979	Pass
2	1	903.55	11.11	5.5	16.61	≤23.979	Pass
2	28	916	11.16	5.5	16.66	≤23.979	Pass
2	55	926.45	11.08	5.5	16.58	≤23.979	Pass
3	1	903.55	11.56	5.5	17.06	≤23.979	Pass
3	28	916	11.60	5.5	17.1	≤23.979	Pass
3	55	926.45	11.60	5.5	17.1	≤23.979	Pass
4	1	903.55	10.49	5.5	15.99	≤23.979	Pass
4	28	916	10.52	5.5	16.02	≤23.979	Pass
4	55	926.45	10.55	5.5	16.05	≤23.979	Pass
Note: Transmitter Output Power = Measured Level (dBm) + Cable/Attenuator Loss (dB)							

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RFT test setup

2.3 BAND-EDGE COMPLIANCE

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-09-01	Temperature (°C)	23.6°C
Test End Date	2016-09-07	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247 :2010		
Test Method	DA 00-705		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	192484	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Channel 1 CW:

Agilent

L

Ref 27 dBm

Atten 40 dB

Mkr1 903.607 5 MHz

9.86 dBm

#Peak

Log

10

dB/

LgAv

V1 S2

Start 900.000 0 MHz

Stop 904.500 0 MHz

#Res BW 100 kHz

#VBW 1 MHz

#Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	903.607 5 MHz	9.86 dBm
2	(1)	Freq	902.137 5 MHz	-49.41 dBm

Channel 1 Freq. Hop.:

Agilent

L

Ref 30 dBm

Atten 40 dB

Mkr1 903.487 5 MHz

10.72 dBm

#Peak

Log

10

dB/

LgAv

V1 S2

Start 900.000 0 MHz

Stop 904.500 0 MHz

#Res BW 100 kHz

#VBW 1 MHz

Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	903.487 5 MHz	10.72 dBm
2	(1)	Freq	902.250 0 MHz	-47.86 dBm
3	(1)	Freq	901.927 5 MHz	-47.03 dBm

Channel 55 CW:

Agilent

L

Mkr1 926.500 MHz
9.90 dBm

Ref 27 dBm

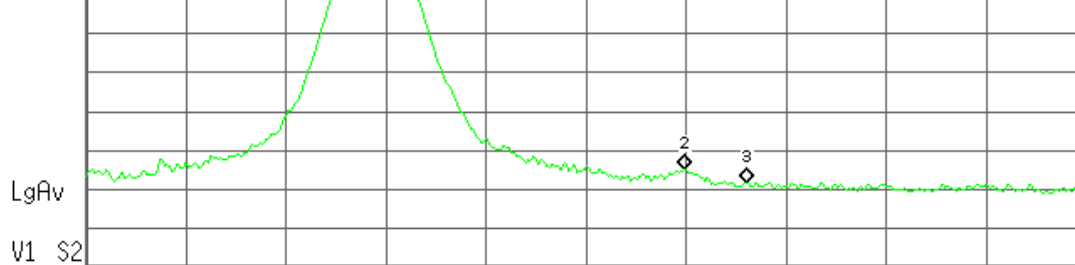
Atten 40 dB

#Peak

Log

10

dB/



V1 S2

Start 925.000 MHz

Stop 930.000 MHz

#Res BW 100 kHz

#VBW 1 MHz

#Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	926.500 MHz	9.90 dBm
2	(1)	Freq	927.992 MHz	-47.91 dBm
3	(1)	Freq	928.300 MHz	-51.27 dBm

Channel 55 Freq. Hop.:

Agilent

L

Mkr1 925.033 MHz
10.66 dBm

Ref 27 dBm

Atten 40 dB

#Peak

Log

10

dB/



V1 S2

Start 925.000 MHz

Stop 930.000 MHz

#Res BW 100 kHz

#VBW 1 MHz

#Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	925.033 MHz	10.66 dBm
2	(1)	Freq	927.567 MHz	-45.80 dBm
3	(1)	Freq	928.300 MHz	-47.10 dBm

TEST RESULT

Channel	Frequency	Measured difference		Limit	Test Results
#	MHz	SINGLE CHANNEL	FHSS ENABLED	dBc	
1	903.355	59.27	58.58	>20	Pass
55	926.45	57.81	56.46	>20	Pass

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RFT test setup

2.4 TIME OF OCCUPANCY (DWELL TIME)

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-09-07	Temperature (°C)	23.6°C
Test End Date	2016-09-07	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	DA 00-705		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	192484	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Channel 28 (916 MHz):

 Agilent

L

 ▲ Mkr2 2.814 ms
0.06 dB

Ref 27 dBm

Atten 40 dB

#Peak

Log

10

dB/

LgAv

V1 S2

Center 916.000 MHz

Res BW 1 MHz

#VBW 3 MHz

Span 0 Hz
Sweep 3.2 ms (4001 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	80.21 μ s	11.39 dBm
1Δ	(1)	Time	1.563 ms	0.13 dB
2R	(1)	Time	80.21 μ s	11.39 dBm
2Δ	(1)	Time	2.814 ms	0.06 dB

TEST RESULT

Channel	Channel Frequency	Measured DwellTime	No. of Bursts	Average Time of Occupancy in 10sec	Limit in 10s period	Results
#	MHz	Ms	#	ms	ms	
28	916	1.563	15	23.45	≤ 400	PASS

TEST SETUP PHOTOGRAPHS

Refer Annexure -1

Conducted RF Test setup

2.5 SPURIOUS RF CONDUCTED EMISSION

EUT Nomenclature	Wireless Gateway	Test Request No.	20292-1
Model No.	FWSG	Serial No.	MEL-122
Test Start Date	2016-09-07	Temperature (°C)	23.6°C
Test End Date	2016-09-07	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247 :2010		
Test Method	DA 00-705		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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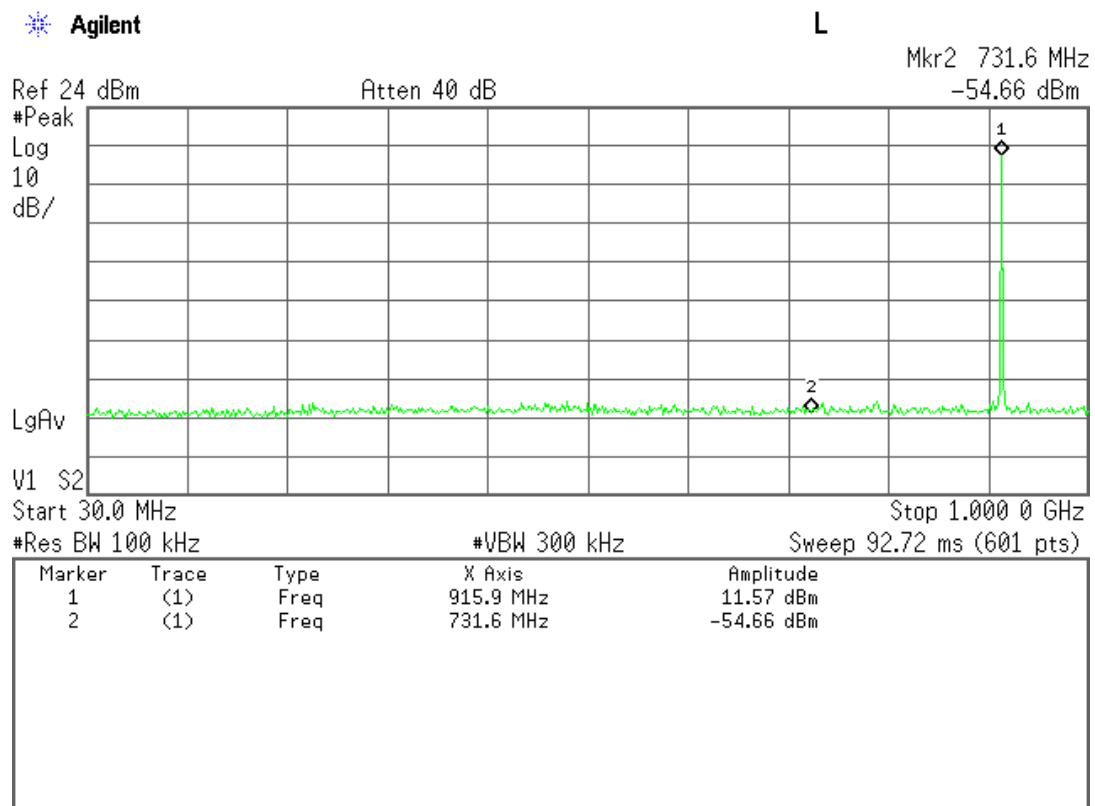
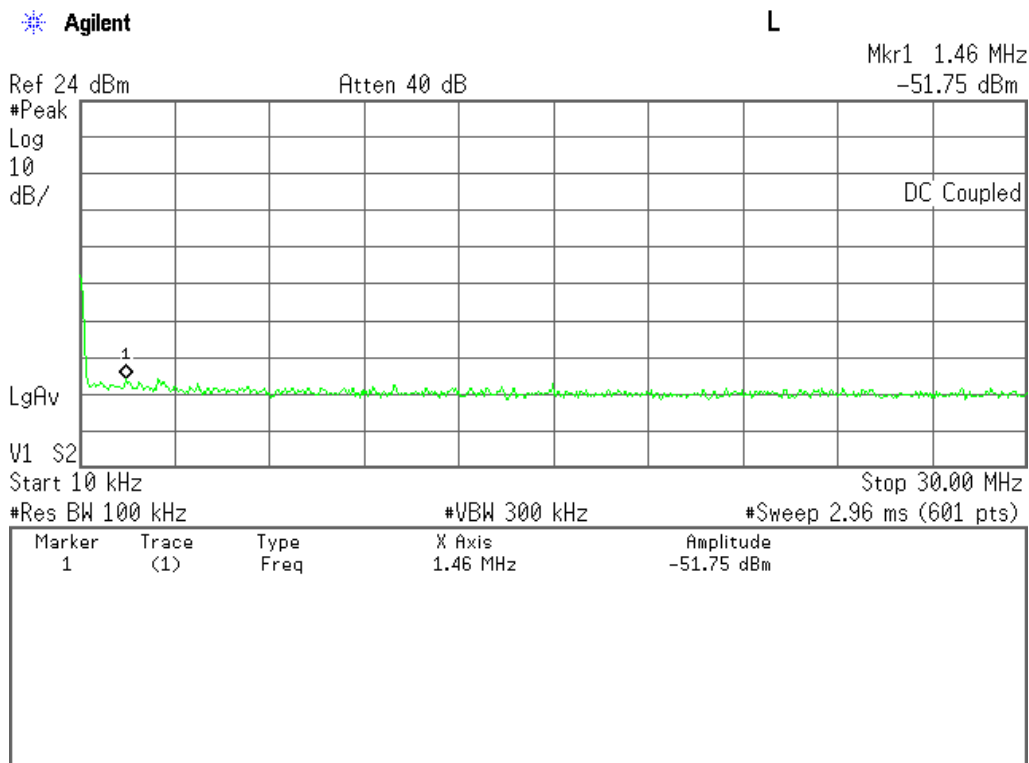
TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

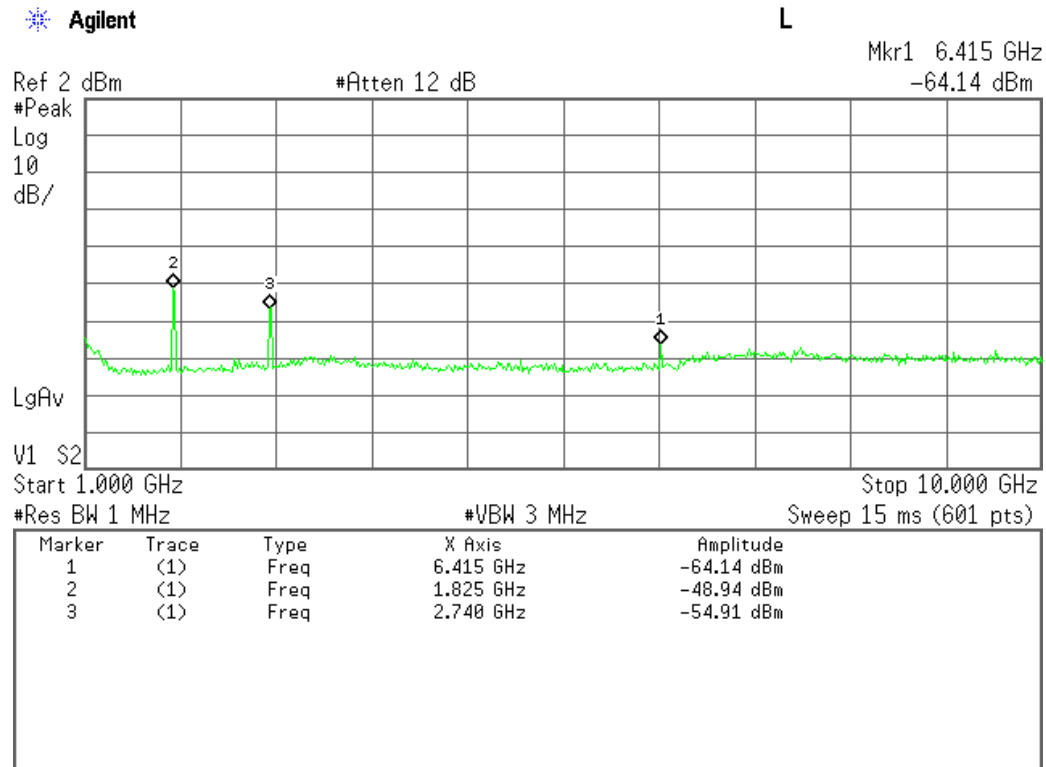
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	192484	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Channel 28 (916 MHz): 9KHz to 30MHz



Channel 28 (916 MHz): 30MHz to 1GHz



Channel 28 (916 MHz): 1GHz to GHz

TEST RESULT

Channel	Channel Frequency	Measured Parameters			Difference (B-A)	Limit	Result
		Spurious Frequency (GHz)	Spurious Level (dBm) (A)	Fundamental Level (dBm) (B)		dBc	
28	916	1.82	-48.9	16.57	32.3	>20	PASS
28	916	2.74	-54.9	16.57	38.3		
28	916	6.4	-64.1	16.57	47.5		

TEST SETUP PHOTOGRAPHS

Refer Annexure -1

Conducted RF Test setup

3 DTS CHANNELS

3.1 DTS 6dB BANDWIDTH

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-08-19	Temperature (°C)	23.6°C
Test End Date	2016-08-19	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247 :2010		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	MY41000078	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Channel 3

* Agilent

L

▲ Mkr2 706 kHz
-0.10 dB

Ref 27 dBm

Atten 40 dB

#Peak

Log

10

dB/

DI

-4.3

dBm

LgAv

V1 S2

Center 914.325 MHz

Span 3 MHz

#Res BW 100 kHz

#VBW 300 kHz

#Sweep 1.344 s (1000 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	914.179 MHz	1.74 dBm
2R	(1)	Freq	913.978 MHz	-5.07 dBm
2Δ	(1)	Freq	706 kHz	-0.10 dB

Channel 6

* Agilent

L

▲ Mkr2 724 kHz
-0.10 dB

Ref 27 dBm

Atten 40 dB

#Peak

Log

10

dB/

DI

-4.1

dBm

LgAv

V1 S2

Center 927.125 MHz

Span 3 MHz

#Res BW 100 kHz

#VBW 300 kHz

#Sweep 1.344 s (1000 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	926.979 MHz	1.59 dBm
2R	(1)	Freq	926.769 MHz	-5.28 dBm
2Δ	(1)	Freq	724 kHz	-0.10 dB

TEST RESULT				
Channel	Frequency	Measured Value	Limit	Result
#	MHz	KHz	KHz	
3	914.325	706	>500	Pass
6	927.125	724	>500	Pass

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RF Test Setup

3.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-09-07	Temperature (°C)	23.6°C
Test End Date	2016-09-07	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NR
Input Voltage / Freq.	24VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	Radiated ☐	Conducted ☒
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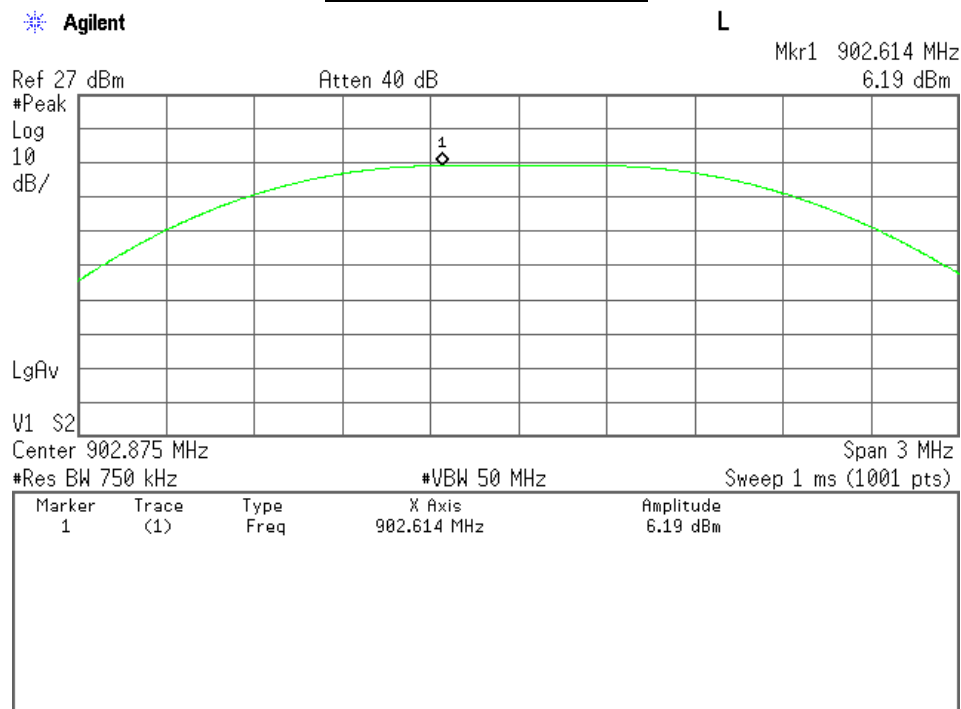
TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

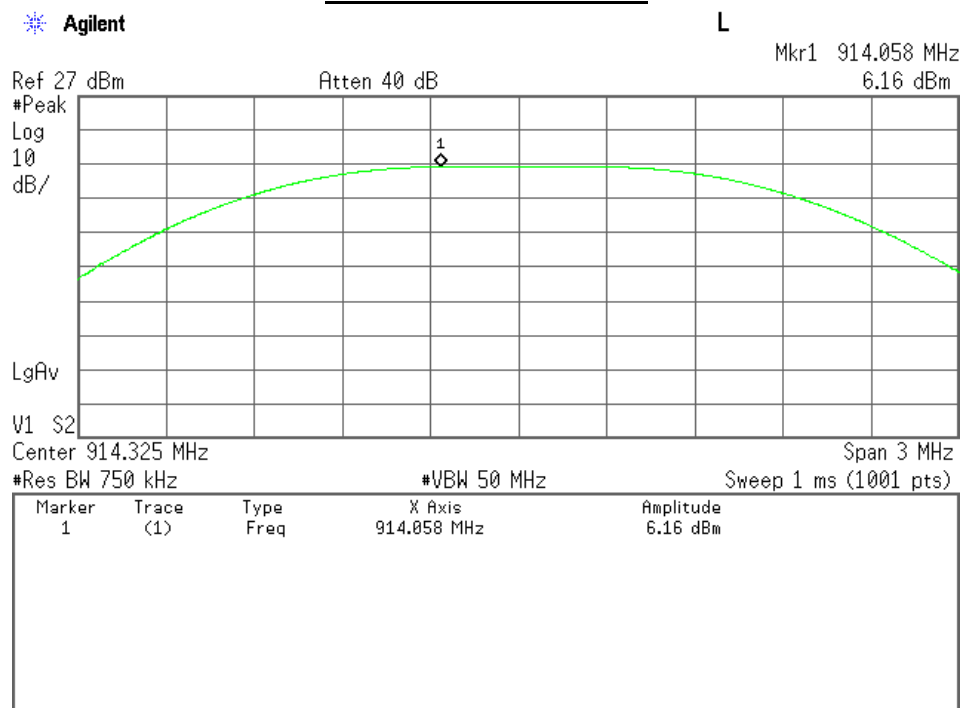
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	MY41000078	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

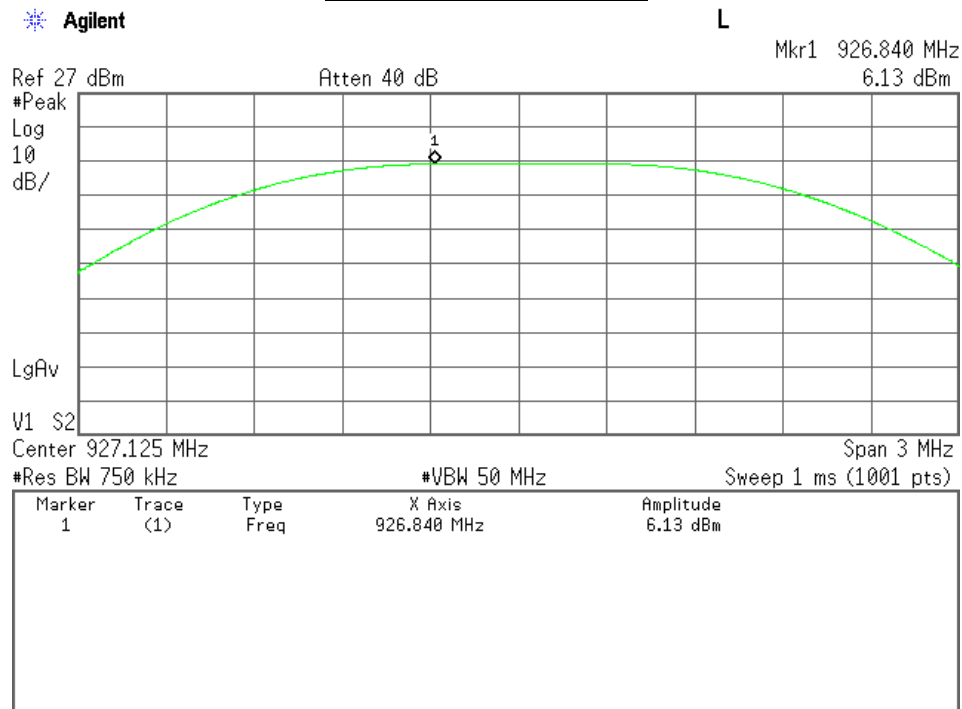
Antenna 1 Channel 1



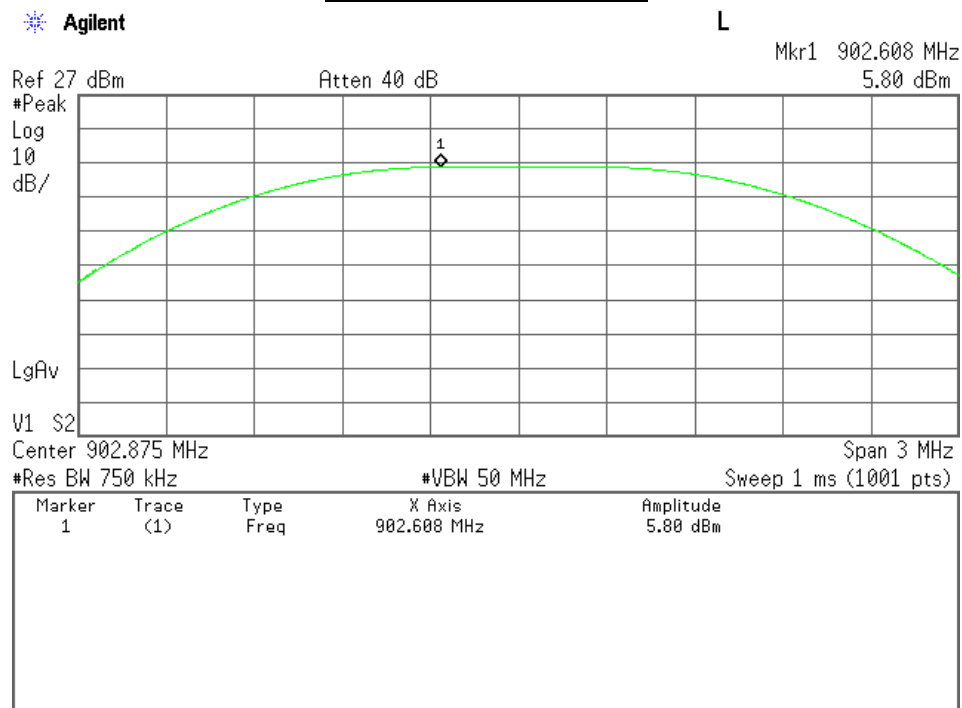
Antenna 1 Channel 3

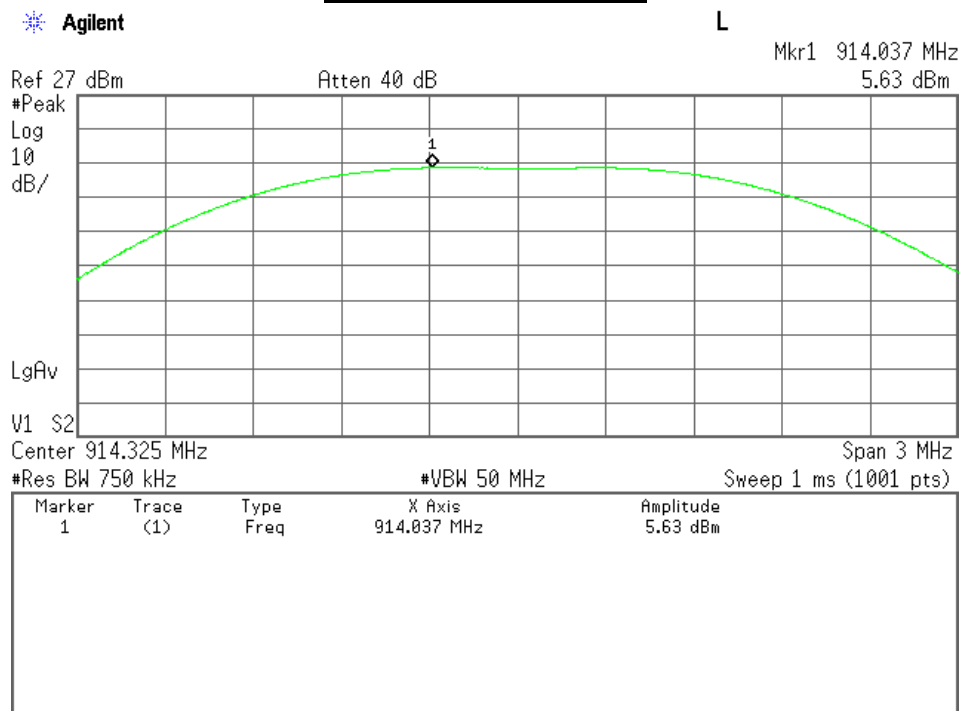
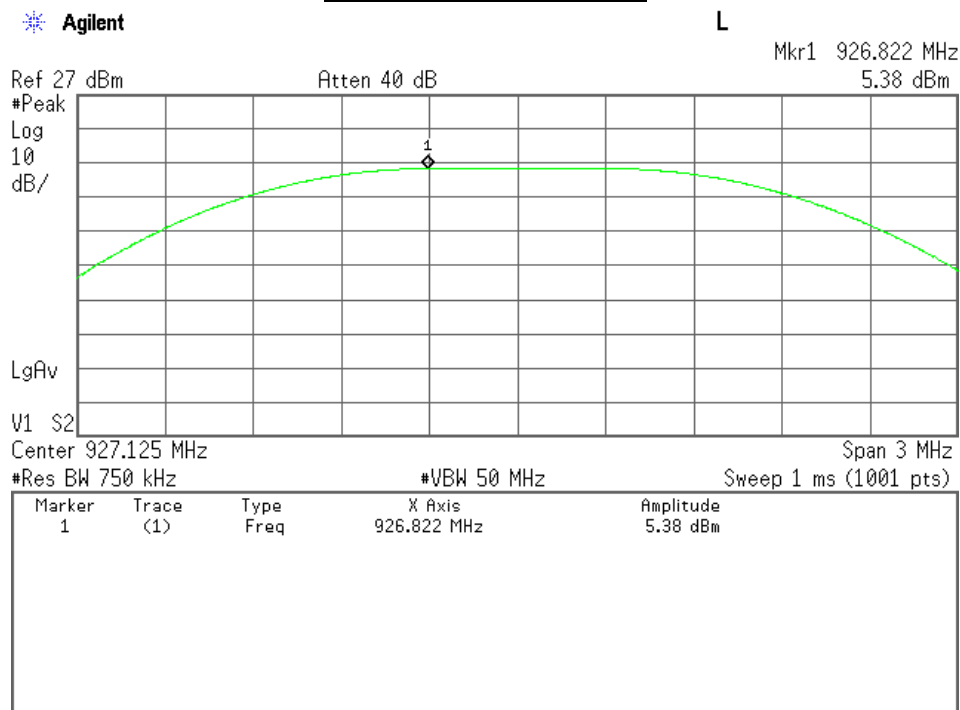


Antenna 1 Channel 6

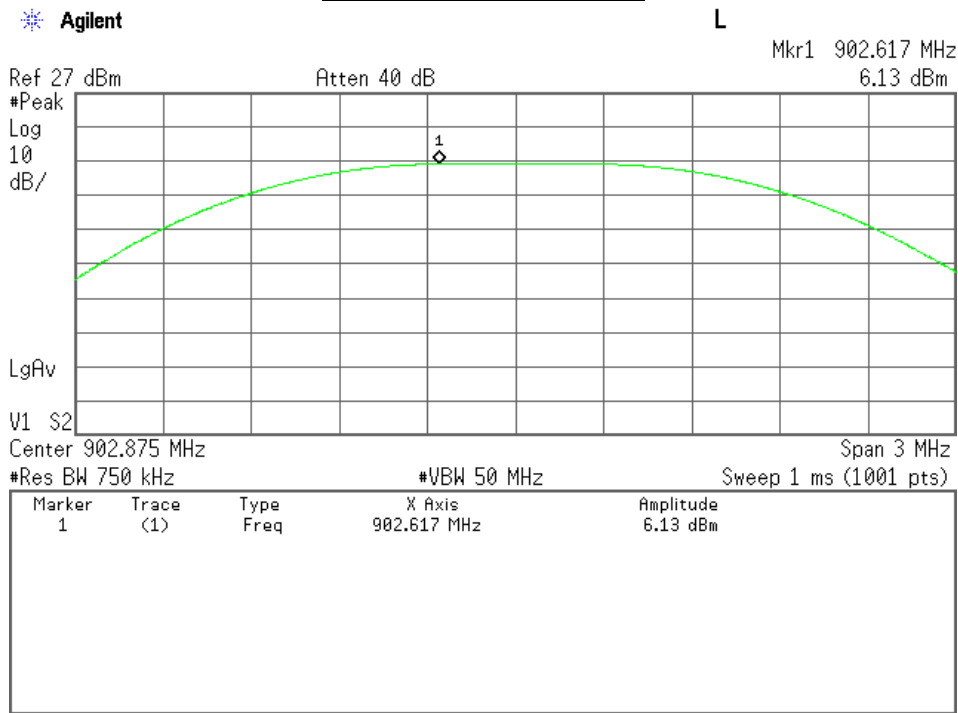


Antenna 2 Channel 1

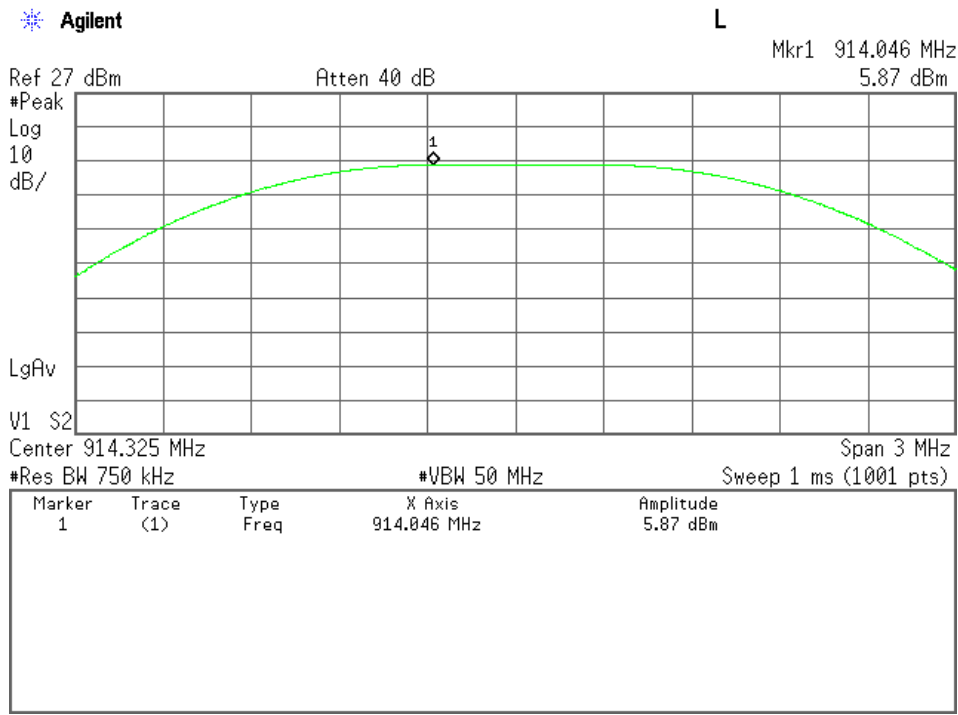


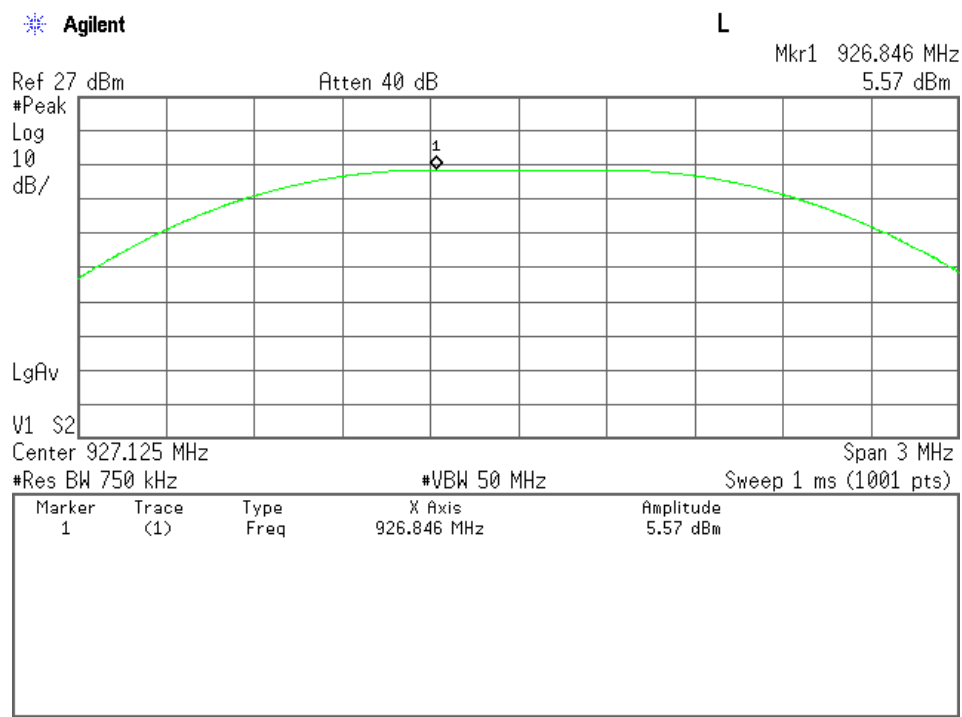
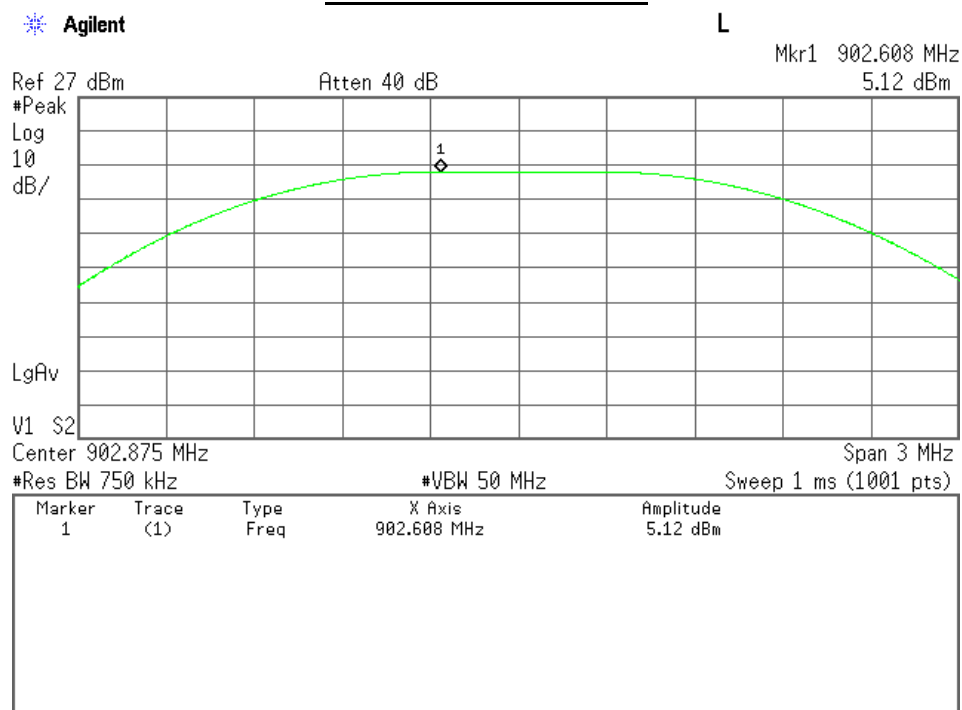
Antenna 2 Channel 3**Antenna 2 Channel 6**

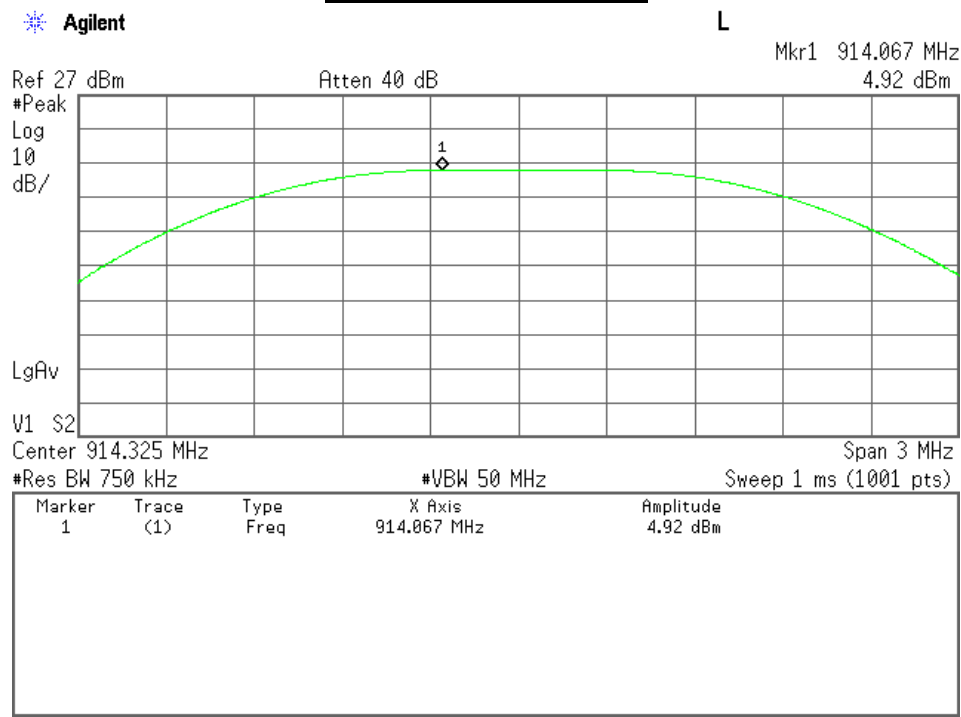
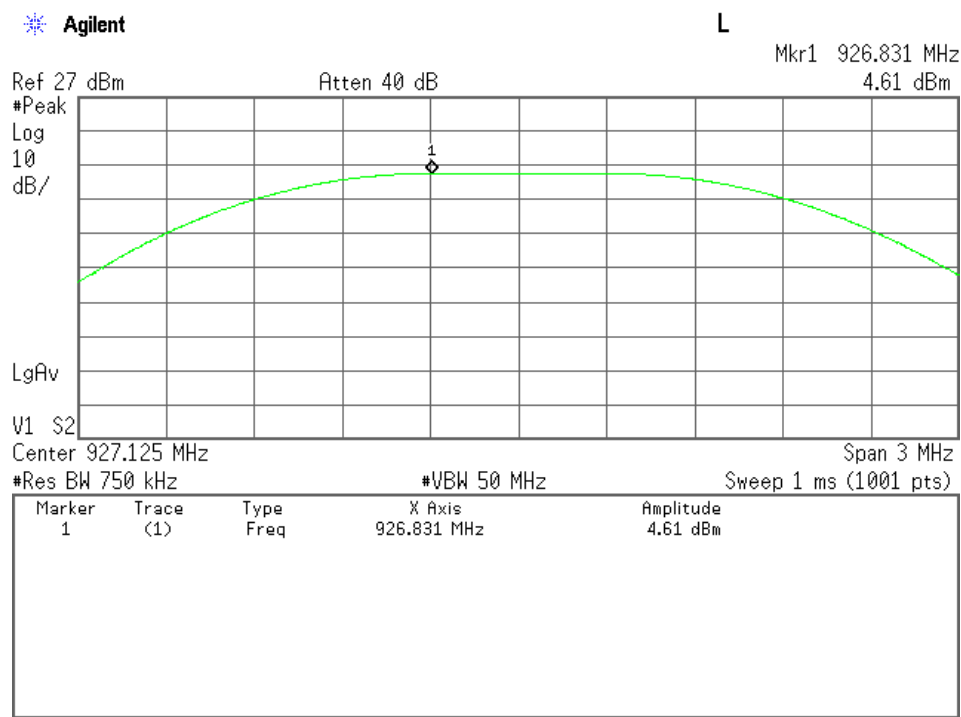
Antenna 3 Channel 1



Antenna 3 Channel 3



Antenna 3 Channel 6**Antenna 4 Channel 1**

Antenna 4 Channel 3**Antenna 4 Channel 6**

TEST RESULT							
Antenna	Channel	Frequency	Measured Level	Cable + Attenuator	Corrected Reading	Limit	Result
#	#	MHz	dBm	dB	dBm	dBm	
1	1	902.875	6.19	5.5	11.69	≤30	Pass
1	3	914.325	6.16	5.5	11.66	≤30	Pass
1	6	927.125	6.13	5.5	11.63	≤30	Pass
2	1	902.875	5.80	5.5	11.3	≤30	Pass
2	3	914.325	5.63	5.5	11.13	≤30	Pass
2	6	927.125	5.38	5.5	10.88	≤30	Pass
3	1	902.875	6.13	5.5	11.63	≤30	Pass
3	3	914.325	5.87	5.5	11.37	≤30	Pass
3	6	927.125	5.57	5.5	11.07	≤30	Pass
4	1	902.875	5.12	5.5	10.62	≤30	Pass
4	3	914.325	4.92	5.5	10.42	≤30	Pass
4	6	927.125	4.61	5.5	10.11	≤30	Pass

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RF Test Setup

3.3 MAXIMUM POWER SPECTRAL DENSITY

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-08-25	Temperature (°C)	23.6°C
Test End Date	2016-08-25	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NA
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment			

TEST DETAILS

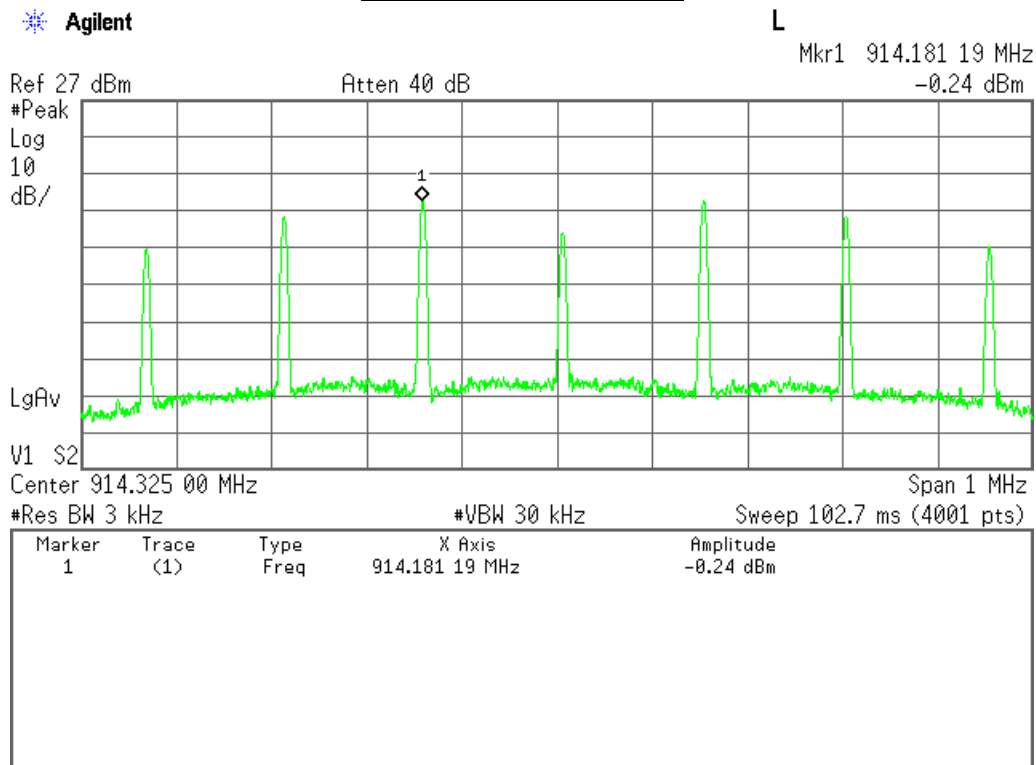
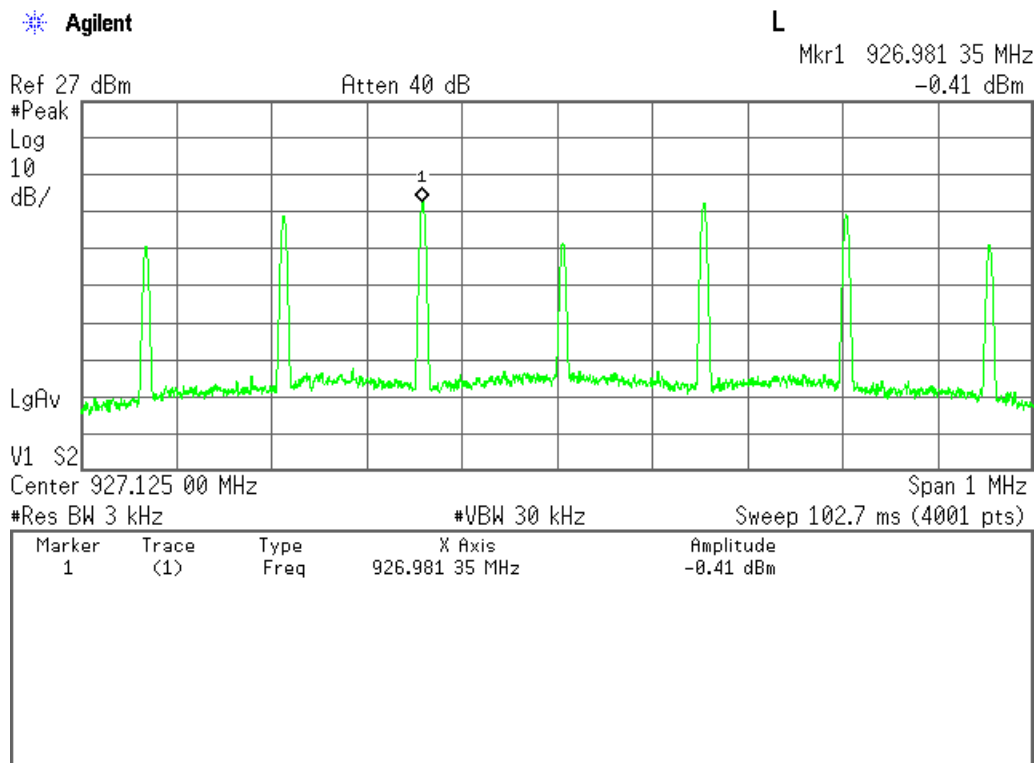
Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	MY41000078	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Antenna 1 Channel 3**Antenna 1 Channel 6**

TEST RESULT				
Channel	Freq	Measured Level	Limit	Result
#	MHz	dBm/3KHz	dBm/ 3KHz	
3	914.325	5.26	<8	Pass
6	927.125	5.09	<8	Pass
Note: RF Cable & Attenuator factor was added as an offset in the analyzer.				

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RFTest Setup

3.4 BAND-EDGE MEASUREMENTS

EUT Nomenclature	Wireless Display Driver	Test Request No.	20292-1
Model No.	W-DIS-D	Serial No.	MEL-122
Test Start Date	2016-08-18	Temperature (°C)	23.6°C
Test End Date	2016-09-01	Humidity RH (%)	51.9%RH
Tested By	Arnoldo Garcia	Pressure (mbar)	NA
Input Voltage / Freq.	24 VDC		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment			

TEST DETAILS

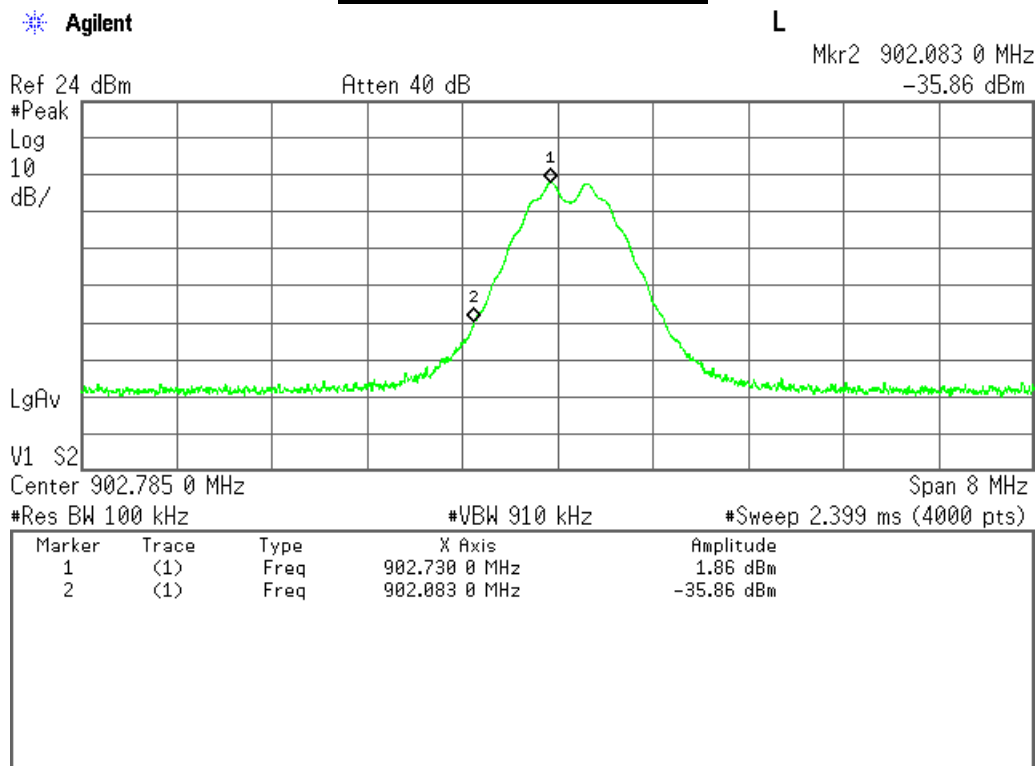
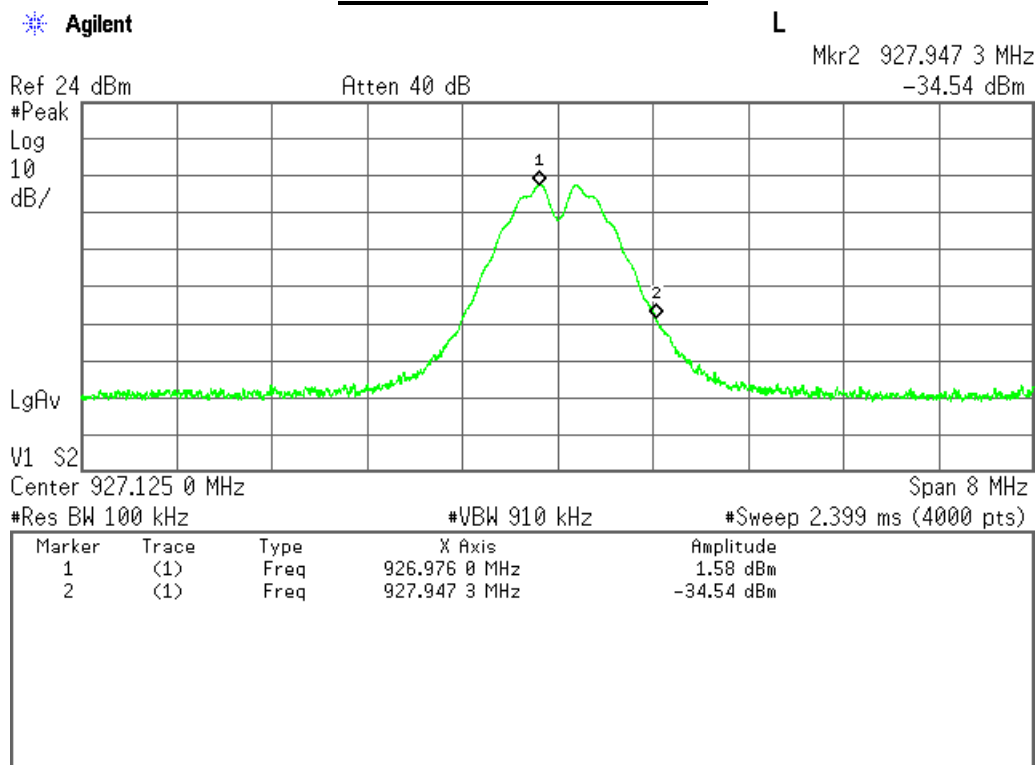
Method	Radiated ☐	Conducted ☒
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TEST PARAMETERS

Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	E4440A	MY41000078	2017-05-18
Y	RF Cable	Digikey	1	NA	NA

Antenna 1 Channel 1**Antenna 1 Channel 6**

TEST RESULT				
Channel	Frequency	Measured Level	Limit	Results
#	MHz	dB	dBc	
1	902.017	37.72	>20	Pass
6	928.073	36.12	>20	Pass

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RF Test Setup