

TEST REPORT



REPORT NUMBER: R12053557-E9c

COMPANY NAME: Bose Corporation

EUT DESCRIPTION: Wireless Module

MODEL: 424821

SERIAL NUMBER: 0122

ISSUE DATE: 2018-08-07

DATE TESTED: 4/10/2018 to 5/31/2018

APPLICABLE STANDARDS: JAPAN RADIO LAW RADIO EQUIPMENT REGULATIONS

TEST METHOD: Notice 88 of Ordinance Concerning Technical Regulations Conformity Certification of Specified Radio Equipment

Place of Testing: UL LLC
12 LABORATORY DRIVE, RESEARCH TRIANGLE PARK, NC 27709 USA

Test Result: Complies

Classification of Specified Radio Equipment: Article 2 Clause 1 Item 19-3

Type of radio wave, Frequency and antenna power:

G1D, D1D	5190-5230MHz (Interval of 40MHz 2ch) MIMO	0.001406W/MHz
	5190-5230MHz (Interval of 40MHz 2ch) SISO (Max Chain)	0.000717W/MHz

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Approved & Released For UL LLC. By:

Prepared By:

Jeffrey Moser
Operations Leader
UL LLC

Brian T. Kiewra
Project Engineer
UL LLC



1. EUT Information

Report No. : R12053557-E9c
Applicant : Bose Corporation
Equipment Description: Wireless Module
Model No. : 424821
SerialNo. : 0122
The number of Tx Antenna : 2
Max Antenna Gain : 4.0dBi
Mode : IEEE802.11n HT40
Type of Radio wave : G1D, D1D

Supply Voltage <input checked="" type="radio"/> DC <input type="radio"/> AC 4.00V - -	Modulation <input type="radio"/> OFDM (OBW<19MHz) <input checked="" type="radio"/> OFDM (OBW<19-38MHz) <input type="radio"/> DS (OBW<18MHz) <input type="radio"/> Other Modulation (OBW<18MHz)
Voltage Condition <input checked="" type="radio"/> Non-Extreme <input type="radio"/> Extreme Normal DC4V Normal-10% - Normal+10% -	EUT has <input checked="" type="radio"/> ANT Connector <input type="radio"/> No ANT Connector distance -
Band <input checked="" type="radio"/> W52 <input type="radio"/> W53	TEUT has <input type="radio"/> TPC Function <input checked="" type="radio"/> No TPC Function

The worst-case data rate for each mode is determined to be as follows, based on preliminary test of the chipset utilized in this radio.
All final tests were made at the Lowest Rate.

Factors

	[MHz]	Other than for Power and ACP		For Power	
		Cable Loss [dB]	ATT/ [dB]	Cable Loss [dB]	ATT/ [dB]
Low Channel (Tx1)	5190	16.26	0.00	16.26	0.00
Middle Channel (Tx2)	-				
High Channel (Tx3)	5230	16.26	0.00	16.26	0.00

* Cable loss and ATT are not taken into account for ACP.

Report Version Info			
Ver.	Issue Date	Description	Revised By
1	2018-06-04	Initial Release.	Brian T. Kiewra
2	2018-06-27	Revised nominal input voltage	Brian T. Kiewra
3	2018-07-23	Revised output power to include MIMO and SISO measurements.	Brian T. Kiewra
4	2018-08-07	Declared MIMO and worst-case SISO power.	Brian T. Kiewra

2.TEST Result

2.1. Frequency Tolerance

Job No. R12053557-E9c

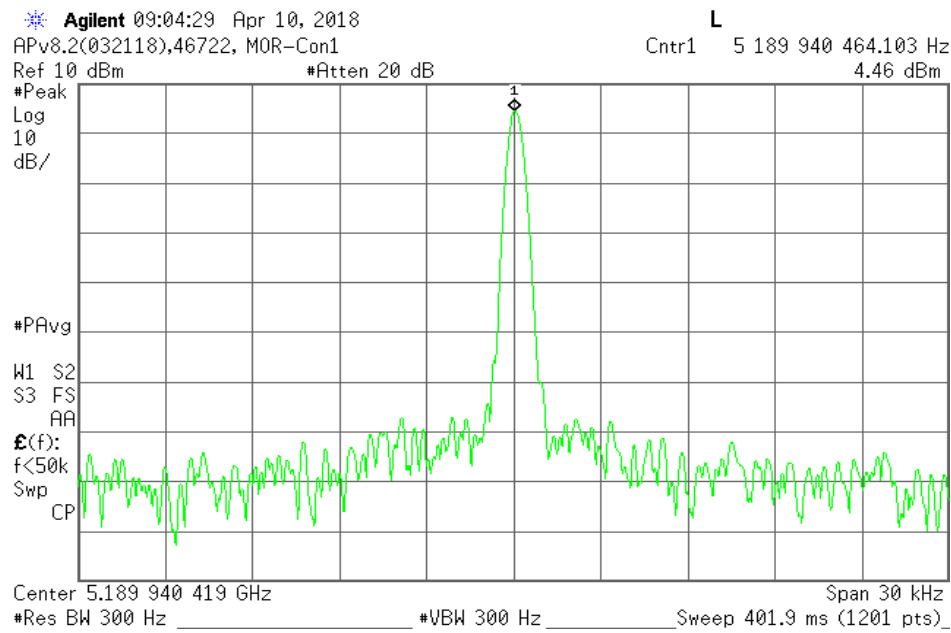
Remark1

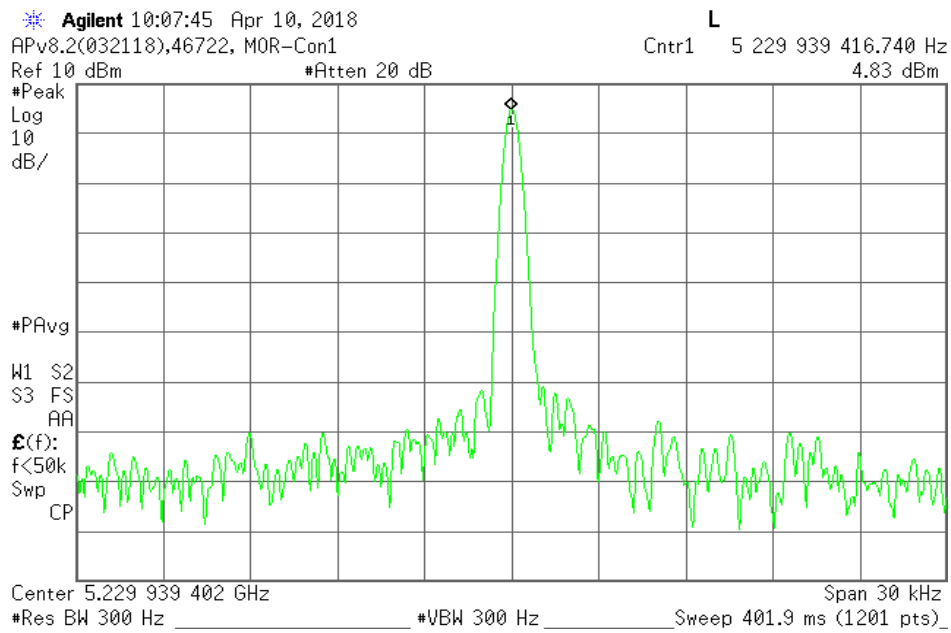
Remark2

[DATA]

Voltage	Freq. [MHz]	Result [MHz]	Tolerance [kHz]	Tolerance [ppm]	Limit [ppm]
DC4V	5190	5189.9405	-59.5000	-11.46	±20.0
	-	-	-	-	±20.0
	5230	5229.9394	-60.6000	-11.59	±20.0

Tx1_Freq_Nom





Agilent 09:48:22 Apr 10, 2018

L

APv8.2(032118),46722, MOR-Con1

Ref 20 dBm

#Atten 30 dB

#Peak

Log

10

dB/

LgAv

M1 S2

Center 5.230 00 GHz

#VBW 300 kHz

Span 100 MHz
Sweep 1.36 ms (1201 pts)

#Res BW 300 kHz

Occupied Bandwidth

35.8285 MHz

Occ BW % Pwr 99.00 %

x dB -26.00 dB

Transmit Freq Error -70.955 kHz

x dB Bandwidth 39.716 MHz

2.3.Unwanted Emission Strength (Normal Voltage)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result	Result	Limit	Remark
	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[uW]	[uW]	
DC4V	5190	705.80	-73.33	16.26	0.00	-47.07	0.020	2.500	♣1
		3137.00	-59.33	16.26	0.00	-43.07	0.049	2.500	♣1
		5125.00	-50.63	16.26	0.00	-34.37	0.366	2.500	♣1
		7067.00	-55.64	16.26	0.00	-39.38	0.115	2.500	♣2
		14817.00	-54.52	16.26	0.00	-38.26	0.149	2.500	♣2
		15029.00	-55.37	16.26	0.00	-39.11	0.123	2.500	♣2
		24715.00	-50.24	16.26	0.00	-33.98	0.400	2.500	♣2
	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
	5230	574.00	-73.11	16.26	0.00	-46.85	0.021	2.500	♣1
		4877.00	-58.01	16.26	0.00	-41.75	0.067	2.500	♣1
		5125.00	-52.55	16.26	0.00	-36.29	0.235	2.500	♣1
		5121.00	-55.20	16.26	0.00	-38.94	0.128	2.500	♣1
		13988.00	-52.81	16.26	0.00	-36.55	0.221	2.500	♣2
		15546.00	-54.65	16.26	0.00	-38.39	0.145	2.500	♣2
		24745.00	-51.16	16.26	0.00	-34.90	0.324	2.500	♣2

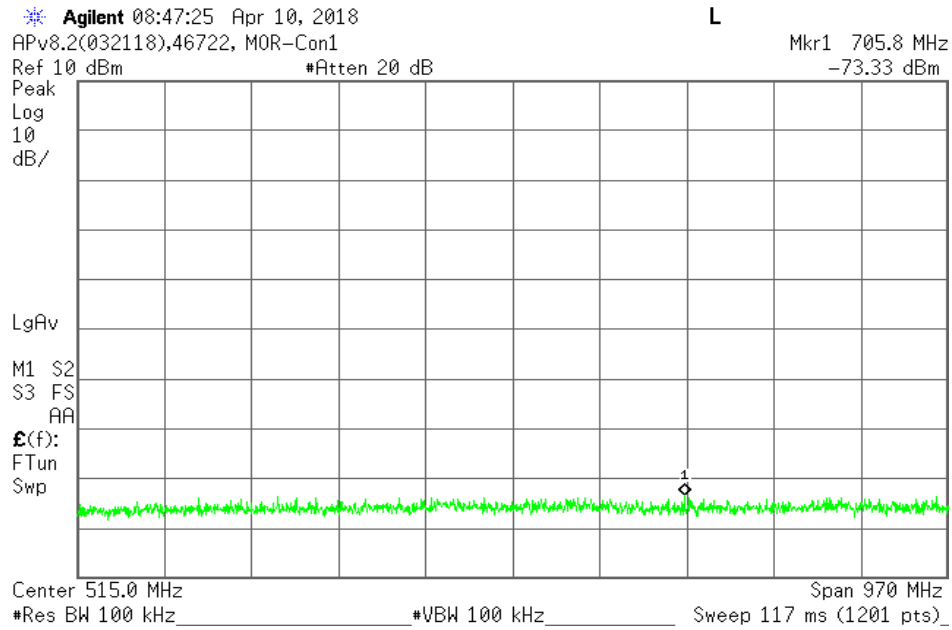
Sample Calculation :

Result = Reading + Cable Loss + Attenuator + 1MHz RBW Correction (<1000MHz)

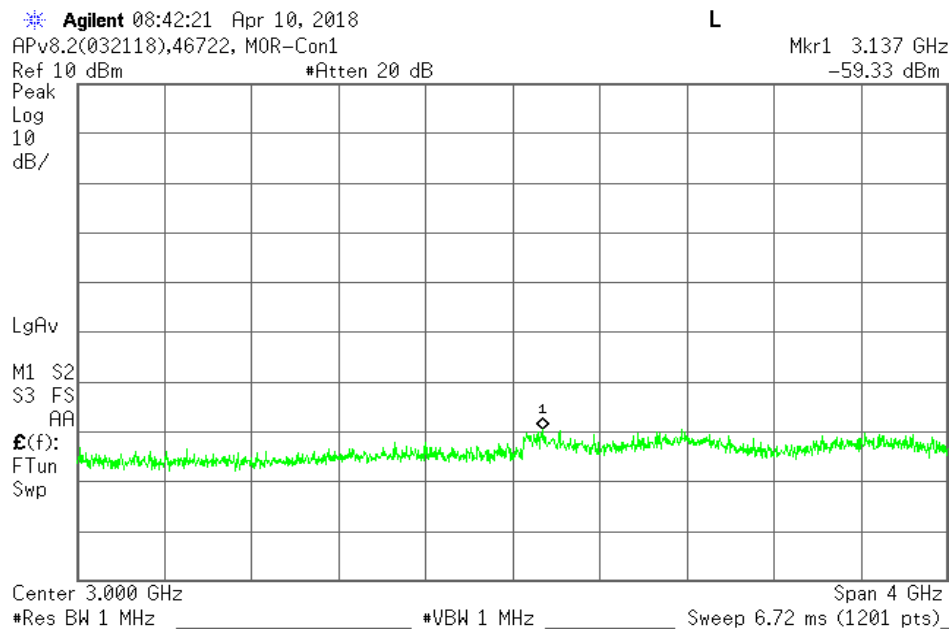
♣1:Freq Range1 (< 5,100MHz)

♣2:Freq Range2 (> 5,400MHz)

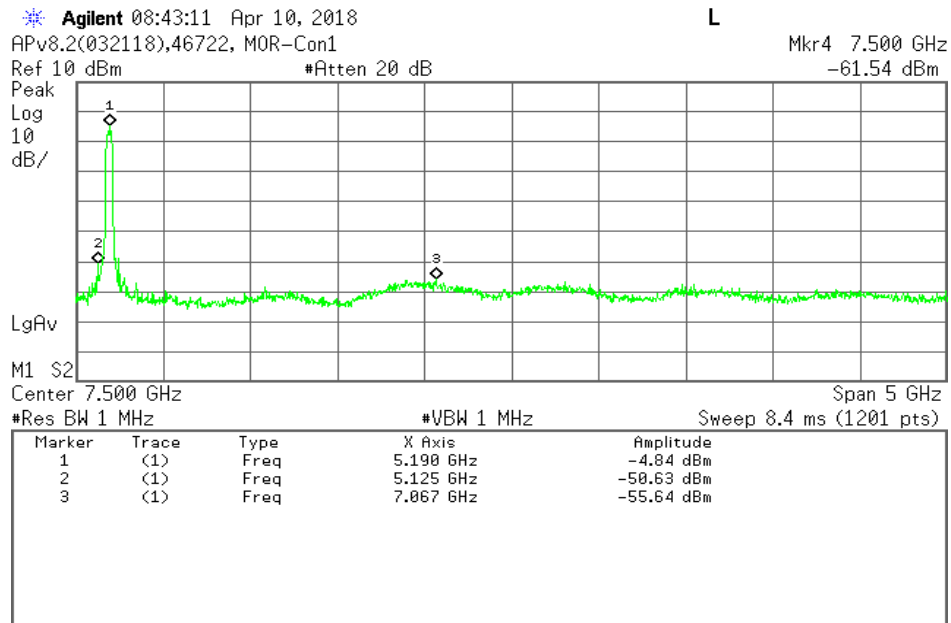
Tx1_SpuriousM_Nom



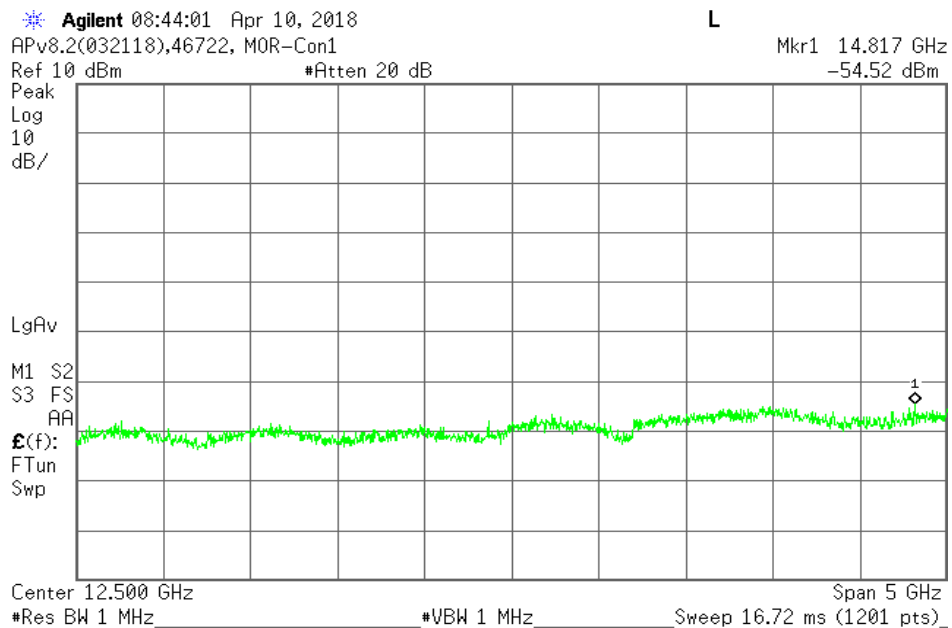
Tx1_SpuriousG1_Nom



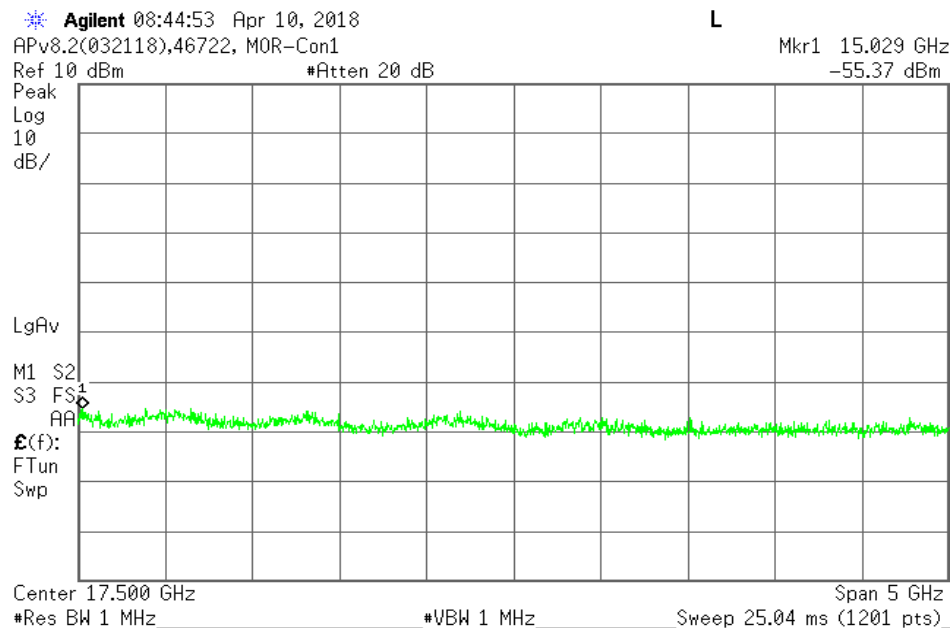
Tx1_SpuriousG2_Nom



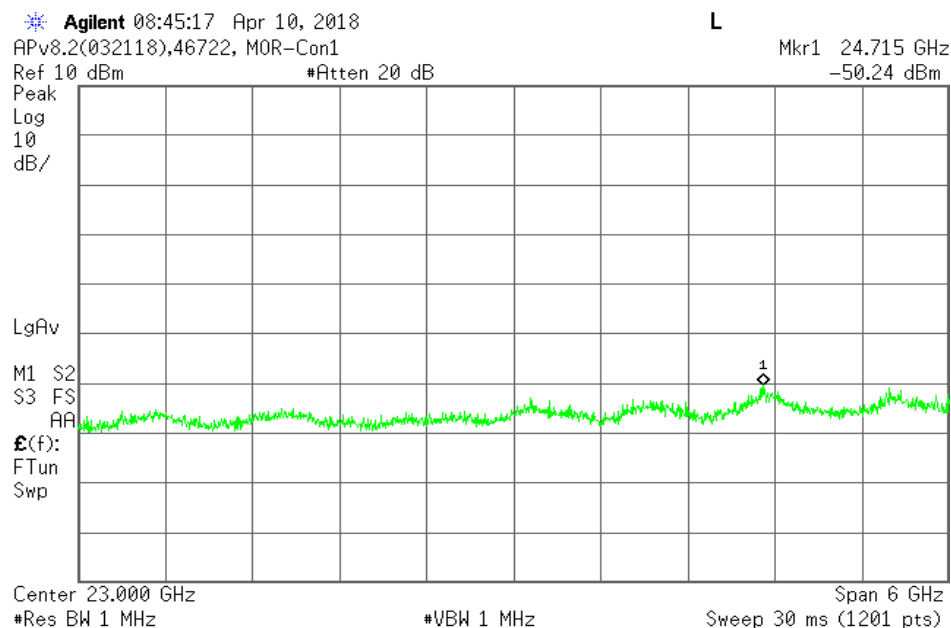
Tx1_SpuriousG3_Nom



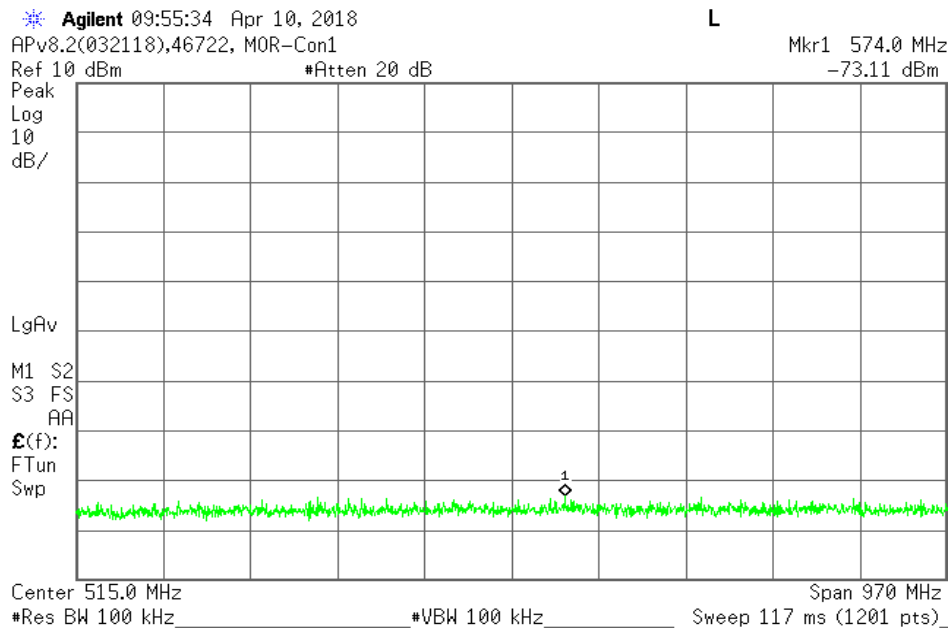
Tx1_SpuriousG4_Nom



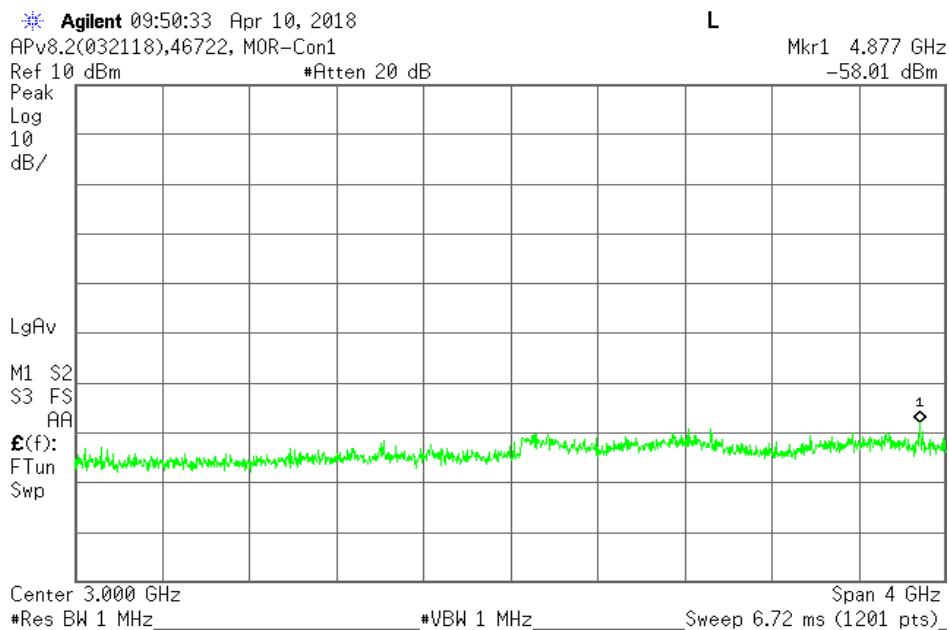
Tx1_SpuriousG5_Nom



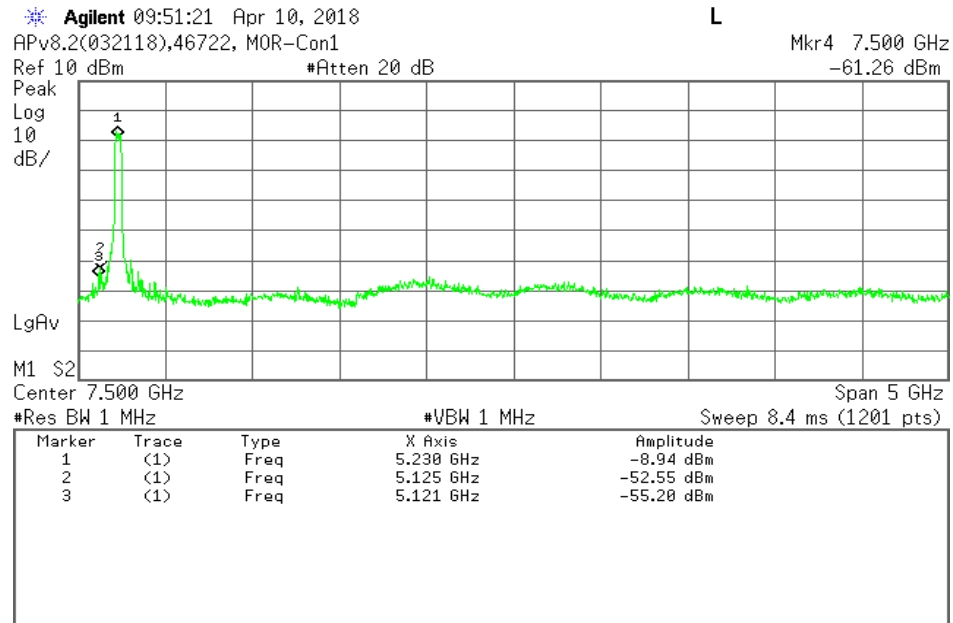
Tx3_SpuriousM_Nom



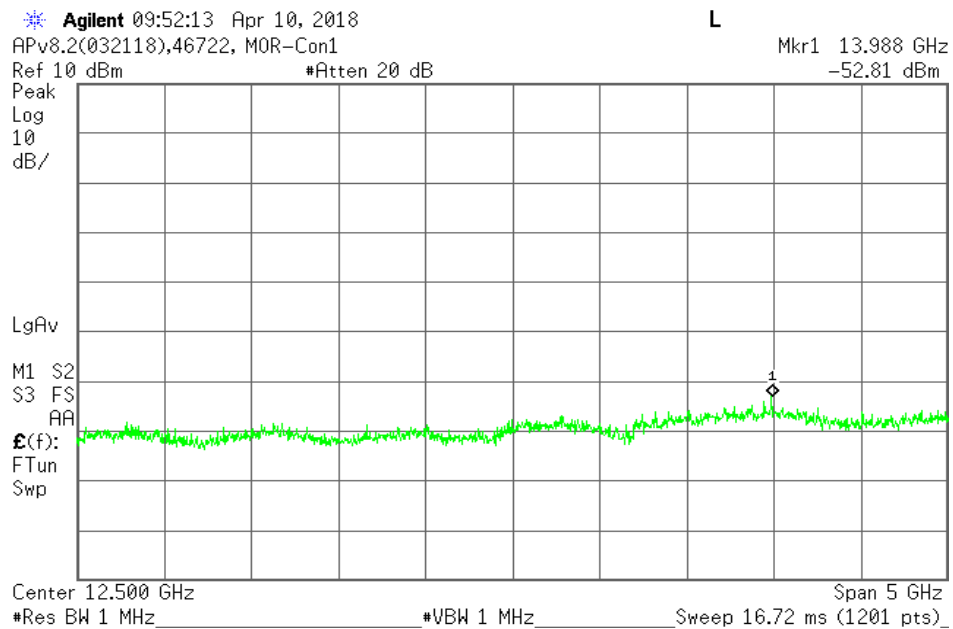
Tx3_SpuriousG1_Nom



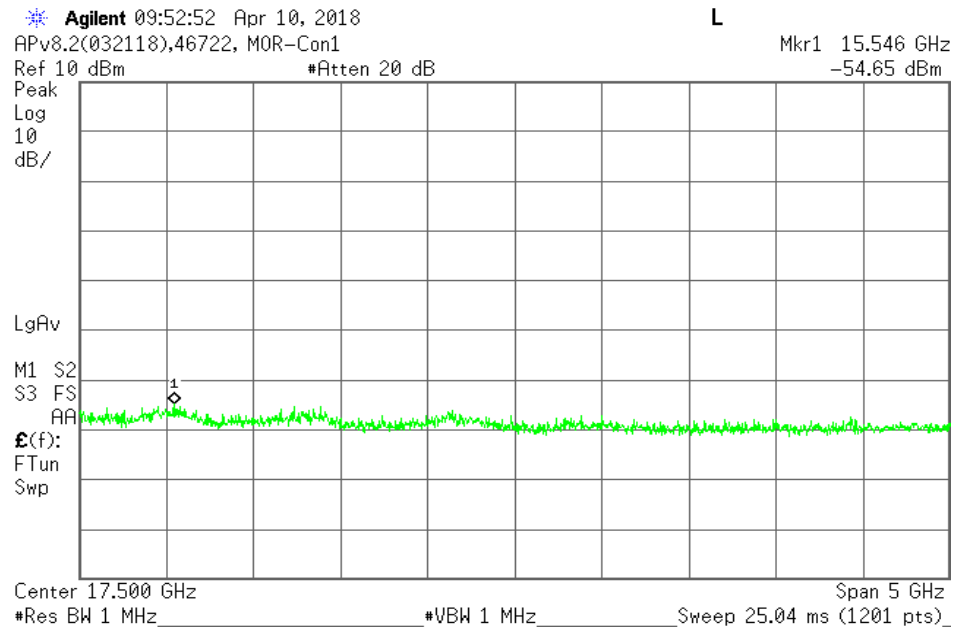
Tx3_SpuriousG2_Nom



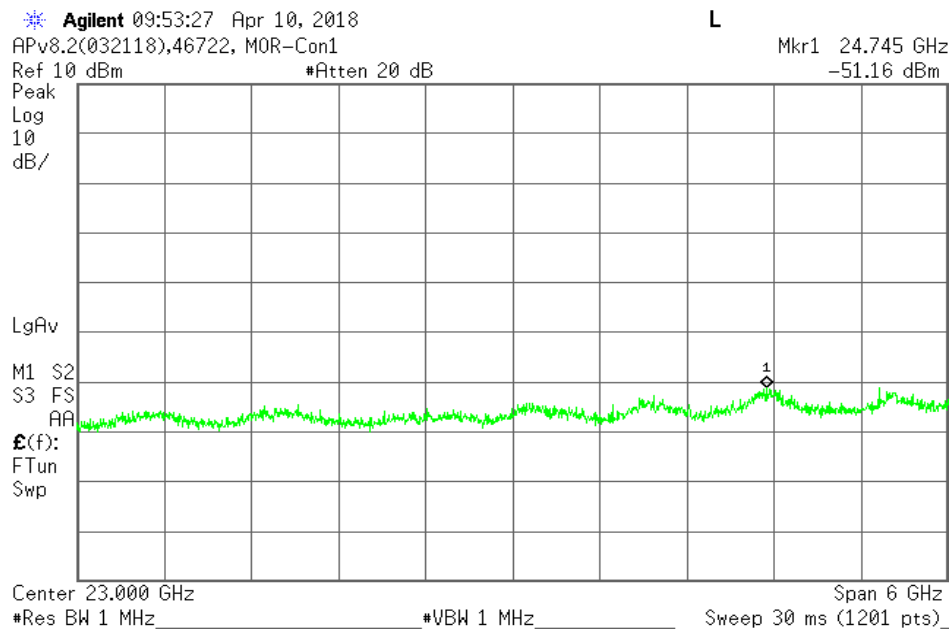
Tx3_SpuriousG3_Nom



Tx3_SpuriousG4_Nom



Tx3_SpuriousG5_Nom



2.4.1. Output Power/ E.I.R.P (MIMO)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Port No.	Freq.	Reading	Cable Loss	Atten. Loss	Burst Rate	Output Power (A) [W/MHz]	Antenna Gain [dBi]	E.I.R.P. (A) [W/MHz]
		[MHz]	[dBm]	[dB]	[dB]				
DC4V	0	5190	-22.85	16.26	0.00	2.37	0.000520	4.00	0.001306
		-	-	-	-	-	-	-	-
		5230	-21.36	16.26	0.00	2.37	0.000733	4.00	0.001842
DC4V	1	5190	-21.89	16.26	0.00	2.37	0.000648	4.00	0.001627
		-	-	-	-	-	-	-	-
		5230	-21.84	16.26	0.00	2.37	0.000656	4.00	0.001648
DC4V	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
DC4V	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-

Sample Calculation :

Output Power (A) = {Reading + Cable Loss + Atten. Loss} * Burst Rate

E.I.R.P. (A) = Output Power (A) * 10^{^(Antenna Gain[dBi]/10)}

[Total Power / Result and Limit]

Voltage	Freq. [MHz]	Output Power				E.I.R.P.	
		Result (B)	Tolerance Result	Limit	Tolerance Limit	Result (B)	Limit
		[W/MHz]	[%]	[W/MHz]	[%]	[W/MHz]	[W/MHz]
DC4V	5190	0.001168	-17.0	0.005000	+20 ~ -80	0.002933	0.005000
	-	-	-	0.005000	+20 ~ -80	-	0.005000
	5230	0.001389	-1.2	0.005000	+20 ~ -80	0.003489	0.005000

Sample Calculation :

Tolerance = Output Power Result (B) / Declared Output Power * 100 - 100.

Output Power Result (B) : Sum of all "Output Power (A)" at same Freq.

E.I.R.P. Result (B): Sum of all "E.I.R.P. (A)" at same Freq.

[Declared Output Power]

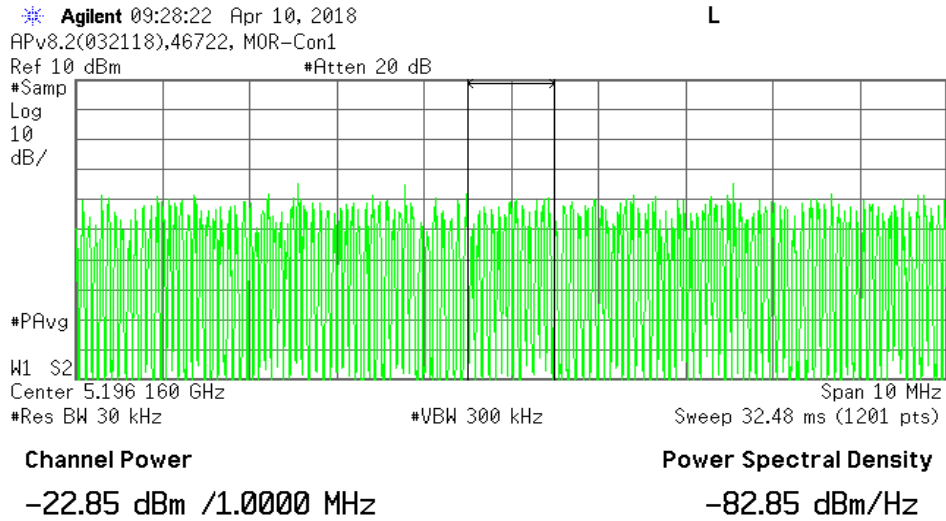
Average of Output Power Result (B)	0.001278	W/MHz	Average of E.I.R.P. Result(B)	0.003211	W/MHz
Declared Output Power	0.001406	W/MHz	E.I.R.P. for Declared Output Power	0.003532	W/MHz
+20	0.001687	W/MHz			
Middle (Declared Output Power -30%)	0.000984	W/MHz			
-80	0.000281	W/MHz			

Sample Calculation :

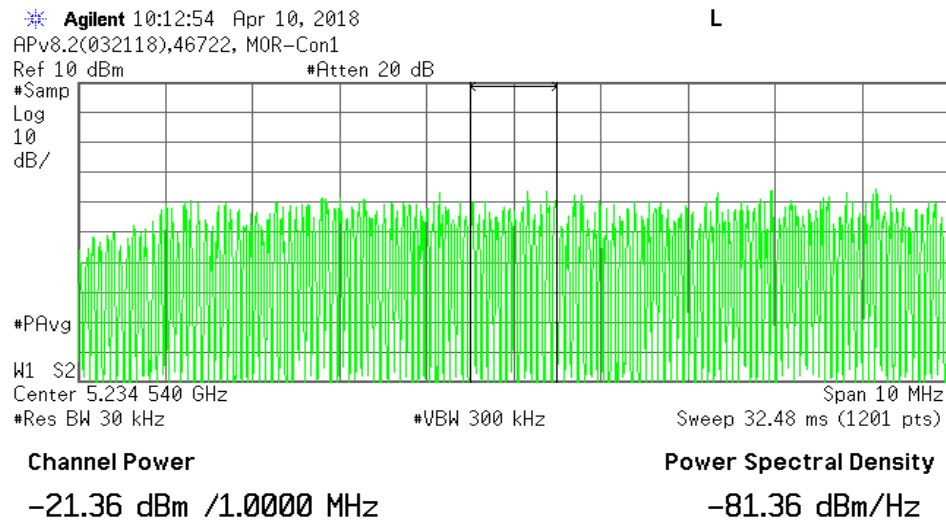
E.I.R.P. for Declared Output Power

= Average of E.I.R.P. Result (B) * (Declared Output Power / Average of Output Power Result (B))

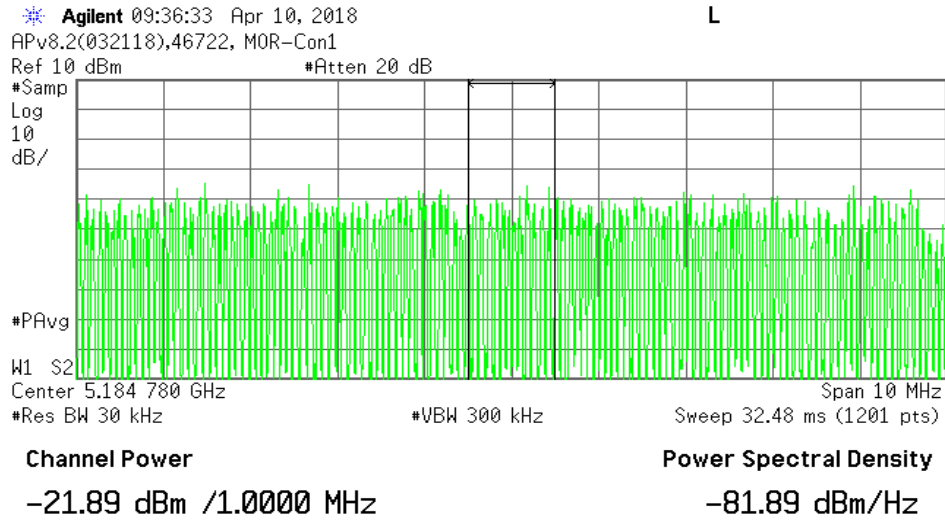
Tx1_Power_Chain0_Nom



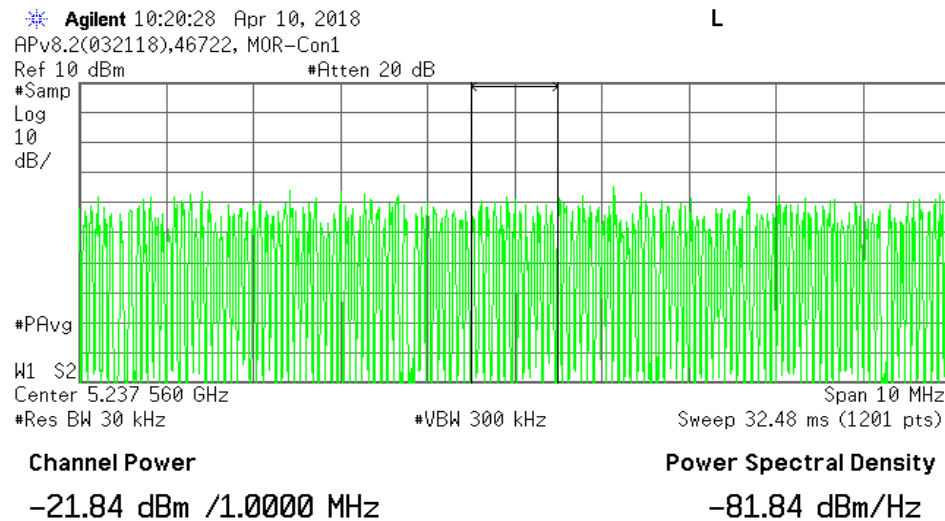
Tx3_Power_Chain0_Nom



Tx1_Power_Chain1_Nom



Tx3_Power_Chain1_Nom



2.4.2. Output Power/ E.I.R.P (SISO CH0)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Port No.	Freq.	Reading	Cable Loss	Atten. Loss	Burst Rate	Output Power (A) [W/MHz]	Antenna Gain [dBi]	E.I.R.P. (A) [W/MHz]
		[MHz]	[dBm]	[dB]	[dB]				
DC4V	0	5190	-22.85	16.26	0.00	2.37	0.000520	4.00	0.001306
		-	-	-	-	-	-	-	-
		5230	-21.36	16.26	0.00	2.37	0.000733	4.00	0.001842
-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-

Sample Calculation :

Output Power (A) = {Reading + Cable Loss + Atten. Loss} * Burst Rate

E.I.R.P. (A) = Output Power (A) * 10^{^(Antenna Gain[dBi]/10)}

[Total Power / Result and Limit]

Voltage	Freq. [MHz]	Output Power				E.I.R.P.	
		Result (B)	Tolerance Result	Limit	Tolerance Limit	Result (B)	Limit
		[W/MHz]	[%]	[W/MHz]	[%]	[W/MHz]	[W/MHz]
DC4V	5190	0.000520	-27.5	0.005000	+20 ~ -80	0.001306	0.005000
	-	-	-	0.005000	+20 ~ -80	-	0.005000
	5230	0.000733	2.2	0.005000	+20 ~ -80	0.001842	0.005000

Sample Calculation :

Tolerance = Output Power Result (B) / Declared Output Power * 100 - 100.

Output Power Result (B) : Sum of all "Output Power (A)" at same Freq.

E.I.R.P. Result (B): Sum of all "E.I.R.P. (A)" at same Freq.

[Declared Output Power]

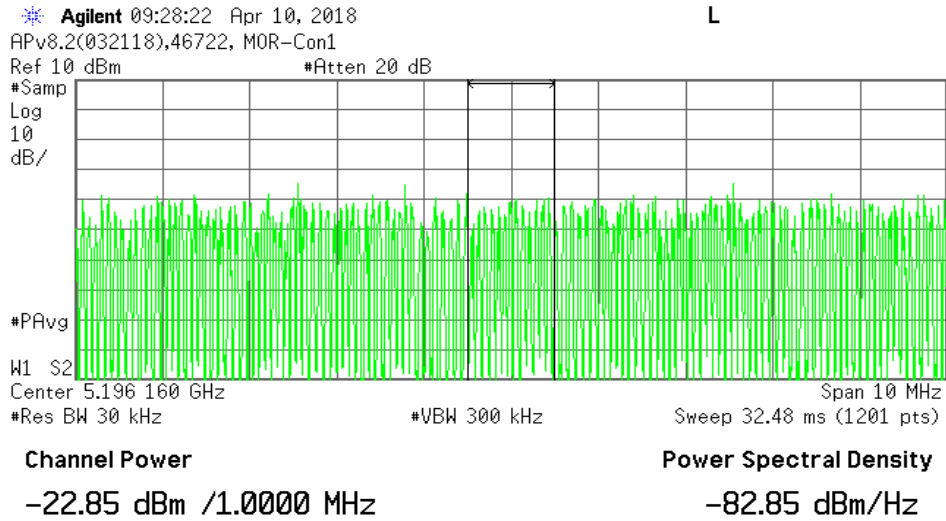
Average of Output Power Result (B)	0.000652	W/MHz	Average of E.I.R.P. Result(B)	0.001638	W/MHz
Declared Output Power	0.000717	W/MHz	E.I.R.P. for Declared Output Power	0.001801	W/MHz
+20	0.000861	W/MHz			
Middle (Declared Output Power -30%)	0.000502	W/MHz			
-80	0.000143	W/MHz			

Sample Calculation :

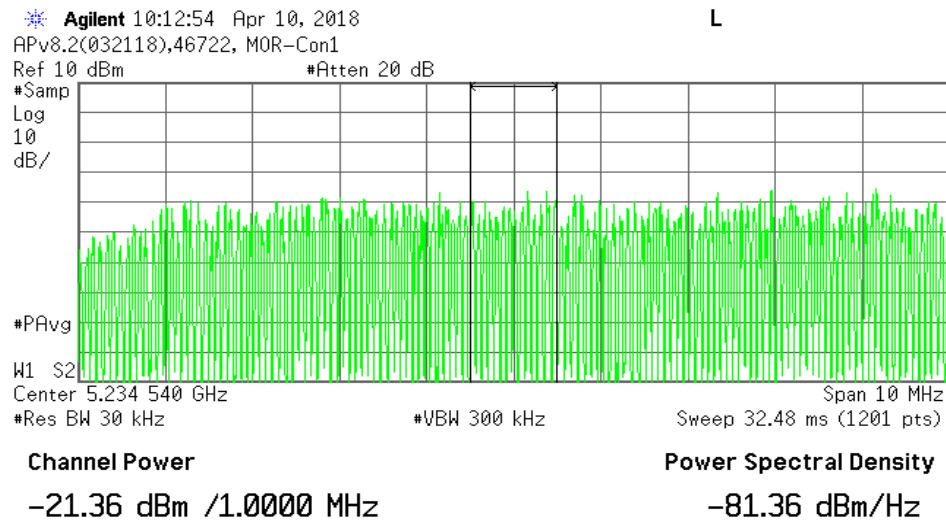
E.I.R.P. for Declared Output Power

= Average of E.I.R.P. Result (B) * (Declared Output Power / Average of Output Power Result (B))

Tx1_Power_Chain0_Nom



Tx3_Power_Chain0_Nom



2.4.3. Output Power/ E.I.R.P (SISO CH1)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Port No.	Freq.	Reading	Cable Loss	Atten. Loss	Burst Rate	Output Power (A) [W/MHz]	Antenna Gain [dBi]	E.I.R.P. (A) [W/MHz]
		[MHz]	[dBm]	[dB]	[dB]				
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
DC4V	1	5190	-21.89	16.26	0.00	2.37	0.000648	4.00	0.001627
		-	-	-	-	-	-	-	-
		5230	-21.84	16.26	0.00	2.37	0.000656	4.00	0.001648
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-

Sample Calculation :

Output Power (A) = {Reading + Cable Loss + Atten. Loss} * Burst Rate

E.I.R.P. (A) = Output Power (A) * 10^{^(Antenna Gain[dBi]/10)}

[Total Power / Result and Limit]

Voltage	Freq.	Output Power				E.I.R.P.	
		Result (B)	Tolerance Result	Limit	Tolerance Limit	Result (B)	Limit
	[MHz]	[W/MHz]	[%]	[W/MHz]	[%]	[W/MHz]	[W/MHz]
DC4V	5190	0.000648	-9.7	0.005000	+20 ~ -80	0.001627	0.005000
	-	-	-	0.005000	+20 ~ -80	-	0.005000
	5230	0.000656	-8.5	0.005000	+20 ~ -80	0.001648	0.005000

Sample Calculation :

Tolerance = Output Power Result (B) / Declared Output Power * 100 - 100.

Output Power Result (B) : Sum of all "Output Power (A)" at same Freq.

E.I.R.P. Result (B): Sum of all "E.I.R.P. (A)" at same Freq.

[Declared Output Power]

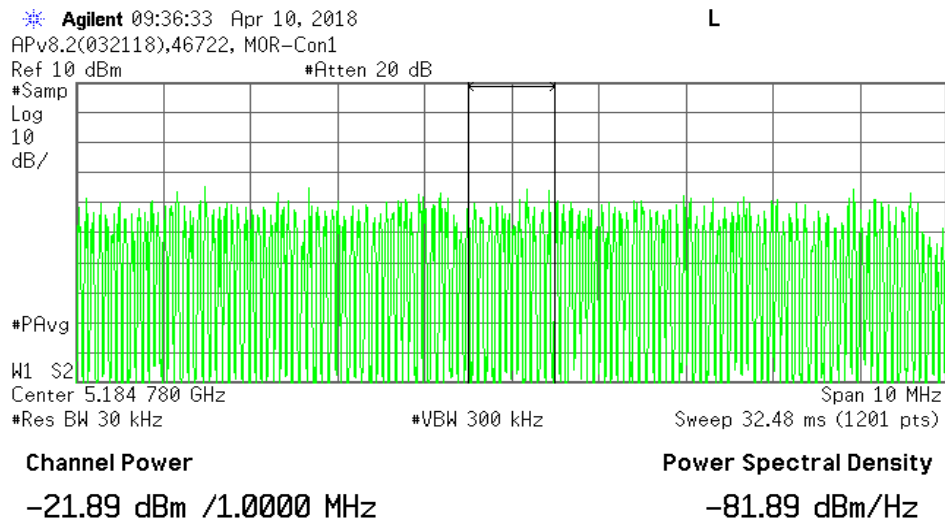
Average of Output Power Result (B)	0.000652	W/MHz	Average of E.I.R.P. Result(B)	0.001638	W/MHz
Declared Output Power	0.000717	W/MHz	E.I.R.P. for Declared Output Power	0.001801	W/MHz
+20	0.000861	W/MHz			
Middle (Declared Output Power -30%)	0.000502	W/MHz			
-80	0.000143	W/MHz			

Sample Calculation :

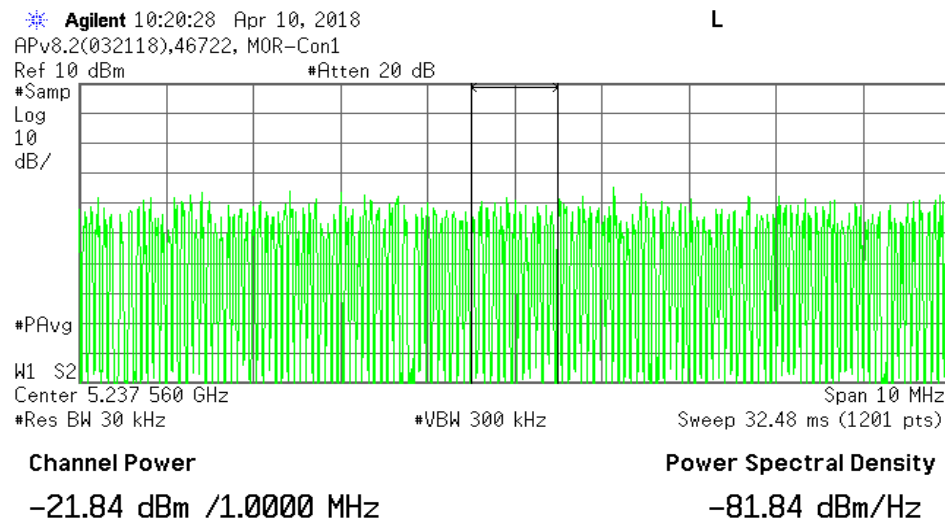
E.I.R.P. for Declared Output Power

= Average of E.I.R.P. Result (B) * (Declared Output Power / Average of Output Power Result (B))

Tx1_Power_Chain1_Nom



Tx3_Power_Chain1_Nom



2.5.Secondary Radiated Emission Strength(Normal Voltage)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result	Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[nW]	[nW]	
DC4V	5190	617.7	-92.71	16.26	0.00	-76.45	0.023	4.000	♦9
		3123.0	-79.18	16.26	0.00	-62.92	0.511	20.000	♦10
		7846.0	-75.92	16.26	0.00	-59.66	1.081	20.000	♦10
		10379.0	-74.04	16.26	0.00	-57.78	1.667	20.000	♦10
		15504.0	-75.12	16.26	0.00	-58.86	1.300	20.000	♦10
		24690.0	-70.74	16.26	0.00	-54.48	3.565	20.000	♦10

The sum of the results exceeding 1/10 of the Limit [nW] : 3.565

Sample Calculation :

Result = Reading + Cable Loss + Atten

♦9:Freq Range9 (< 1GHz)

♦10:Freq Range10 (≥ 1GHz)

Rx1_SpuriousM_Nom

Agilent 14:05:35 May 15, 2018

APv8.3(050118),46722, M0R-DFS

Ref -10 dBm

#Atten 0 dB

Mkr1 617.7 MHz

-92.71 dBm

Peak
Log
10
dB/

LgAv

M1 S2
S3 FS
AA

£(f):
FTun
Swp

Center 515.0 MHz

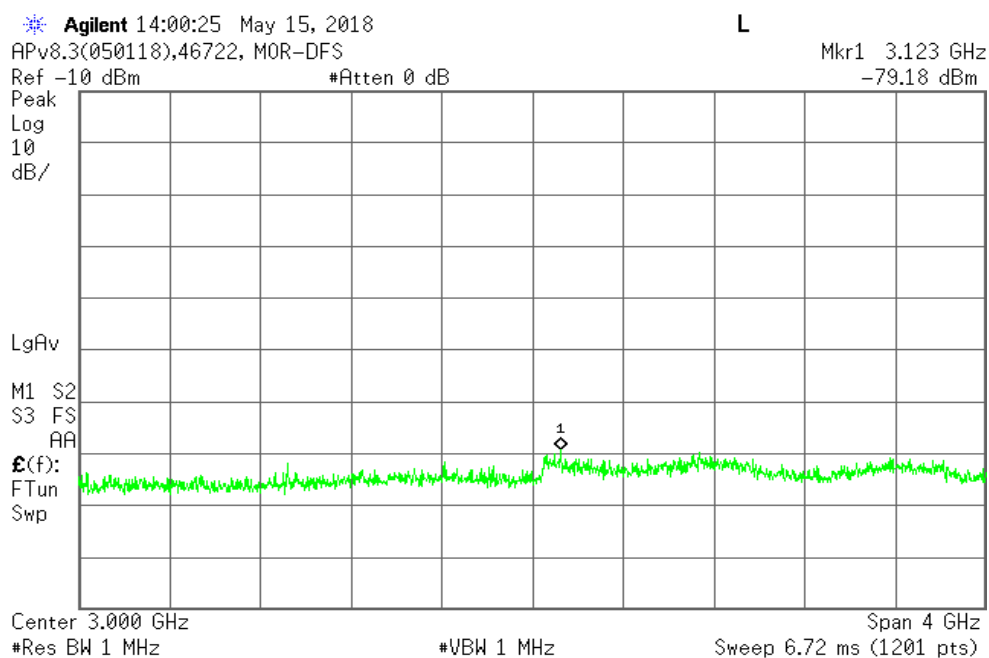
#Res BW 100 kHz

#VBW 100 kHz

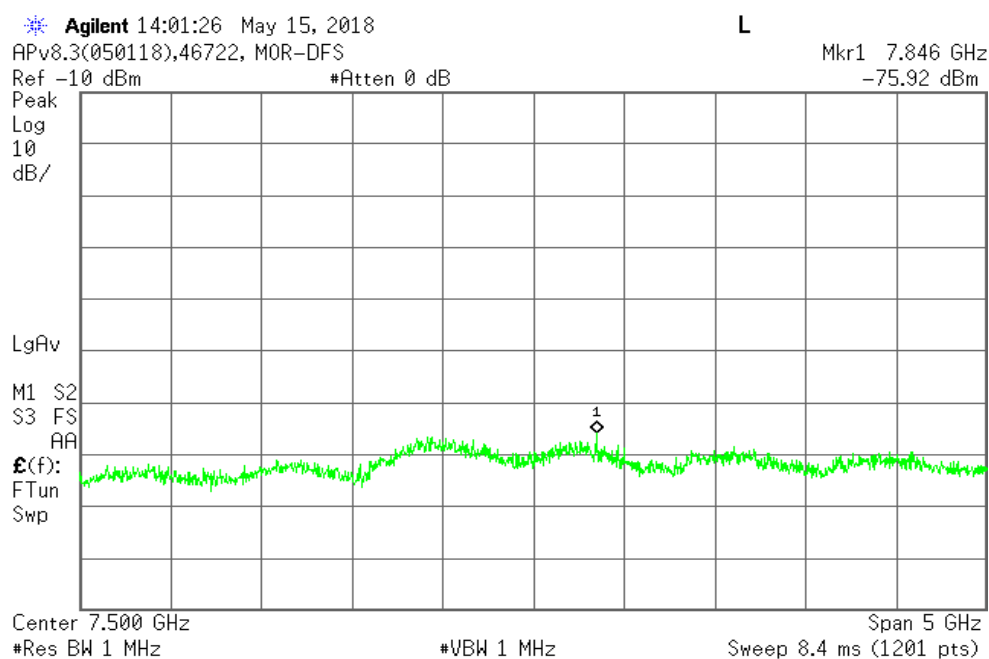
Span 970 MHz

Sweep 117 ms (1201 pts)

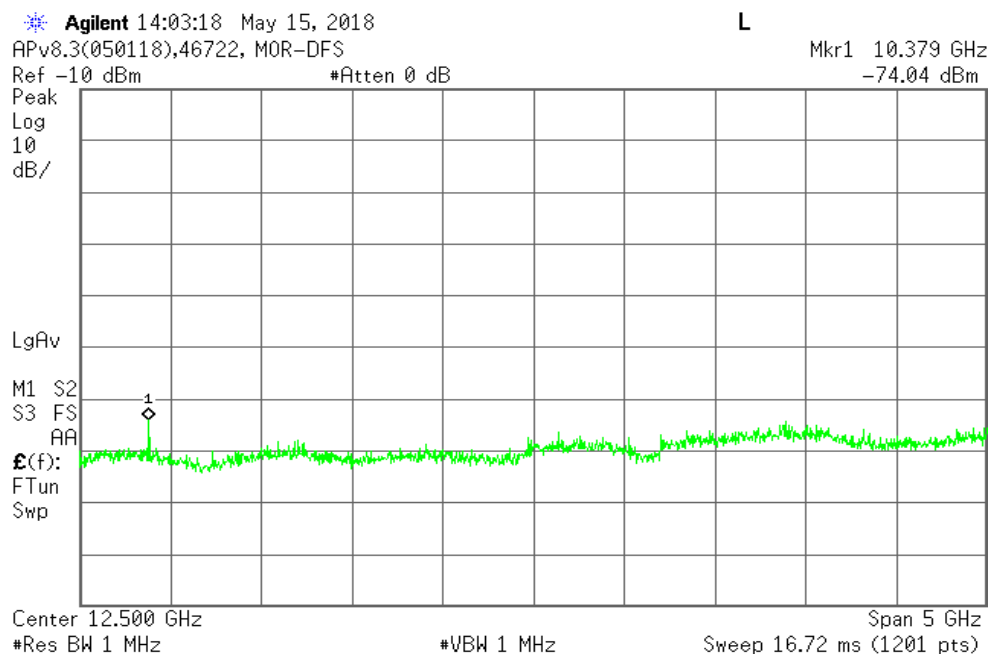
Rx1_SpuriousG1_Nom



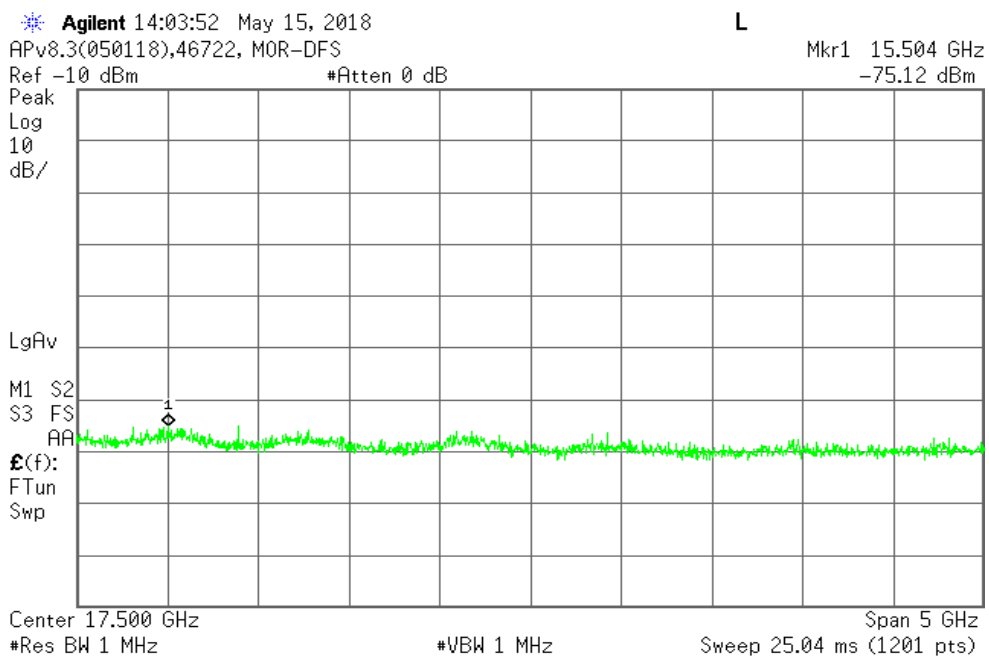
Rx1_SpuriousG2_Nom



Rx1_SpuriousG3_Nom



Rx1_SpuriousG4_Nom



Rx1_SpuriousG5_Nom

Agilent 14:04:23 May 15, 2018

L

APv8.3(050118),46722, MOR-DFS

Mkr1 24.690 GHz

Ref -10 dBm

*Atten 0 dB

-70.74 dBm

Peak
Log
10
dB/

LgAv

M1 S2
S3 FS
AA

$\mathcal{E}(f)$:
FTun
Swp

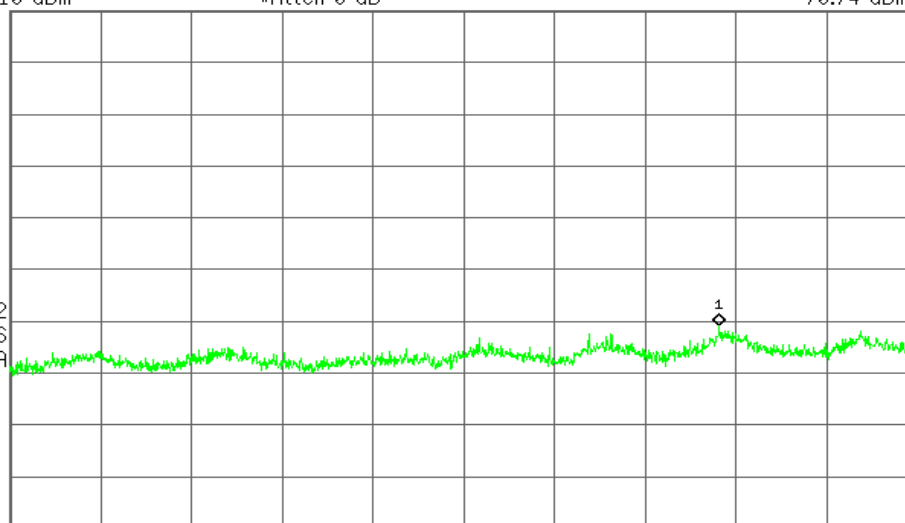
Center 23.00 GHz

*Res BW 1 MHz

*VBW 1 MHz

Span 6 GHz

Sweep 30 ms (1201 pts)



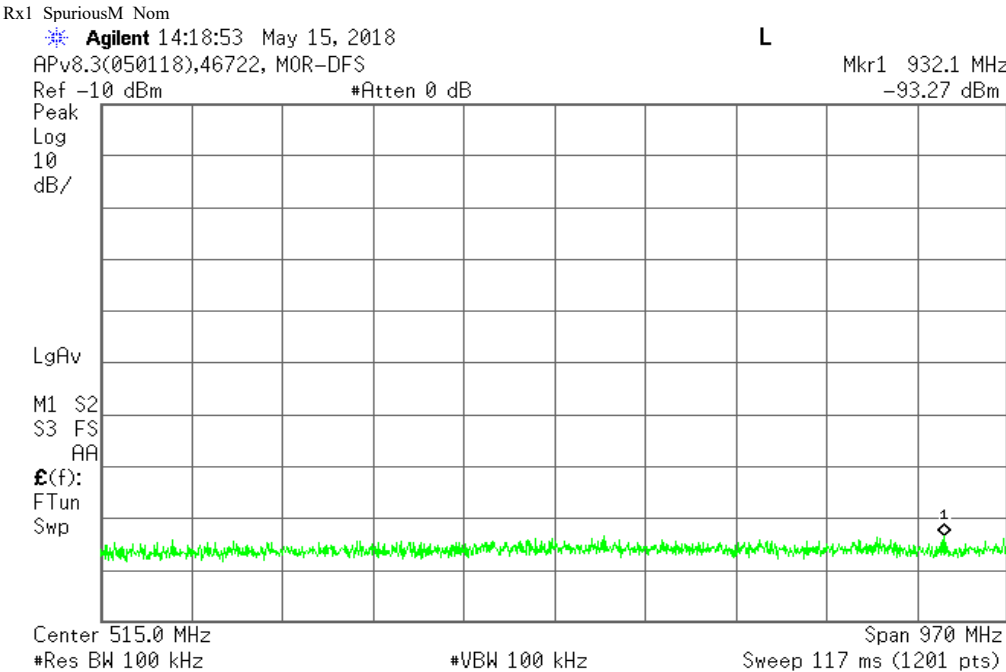
2.5.Secondary Radiated Emission Strength(Normal Voltage)

Job No.	R12053557-E9c
Remark1	
Remark2	

[DATA]									
Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result	Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[nW]	[nW]	
DC4V	5230	932.1	-93.27	16.26	0.00	-77.01	0.020	4.000	♦9
		1927.0	-79.03	16.26	0.00	-62.77	0.528	20.000	♦10
		6971.0	-75.50	16.26	0.00	-59.24	1.191	20.000	♦10
		13542.0	-74.32	16.26	0.00	-58.06	1.563	20.000	♦10
		16233.0	-75.31	16.26	0.00	-59.05	1.245	20.000	♦10
		24770.0	-71.24	16.26	0.00	-54.98	3.177	20.000	♦10

The sum of the results exceeding 1/10 of the Limit [nW] : 3.177

Sample Calculation :
Result = Reading + Cable Loss + Atten.
♦9:Freq Range9 (< 1GHz)
♦10:Freq Range10 (≥ 1GHz)



Rx1 SpuriousG1_Nom

Agilent 14:13:12 May 15, 2018

L

APv8.3(050118),46722, MOR-DFS

Mkr1 1.927 GHz

Ref -10 dBm

#Atten 0 dB

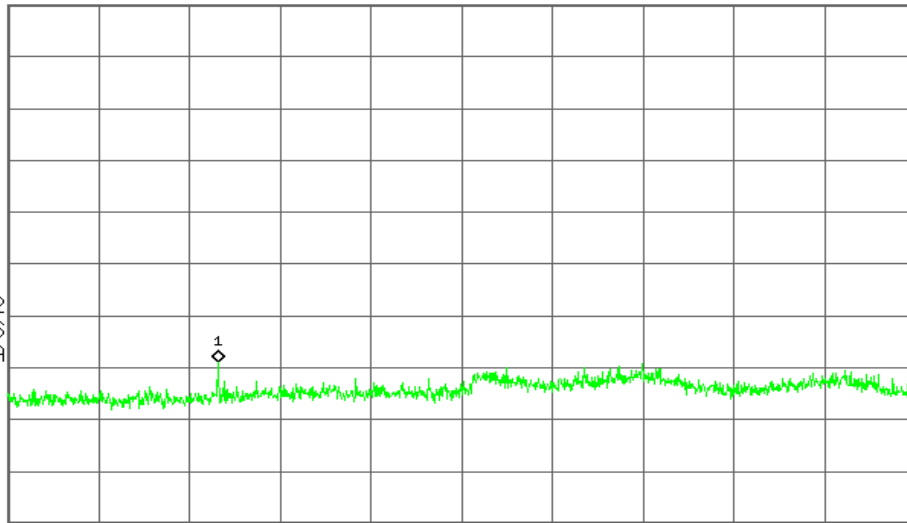
-79.03 dBm

Peak
Log
10
dB/

LgAv

M1 S2
S3 FS
AA

E(f):
FTun
Swp



Center 3.000 GHz

Span 4 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 6.72 ms (1201 pts)

Rx1_SpuriousG2_Nom

Agilent 14:13:48 May 15, 2018

L

APv8.3(050118),46722, MOR-DFS

Mkr1 6.971 GHz

Ref -10 dBm

#Atten 0 dB

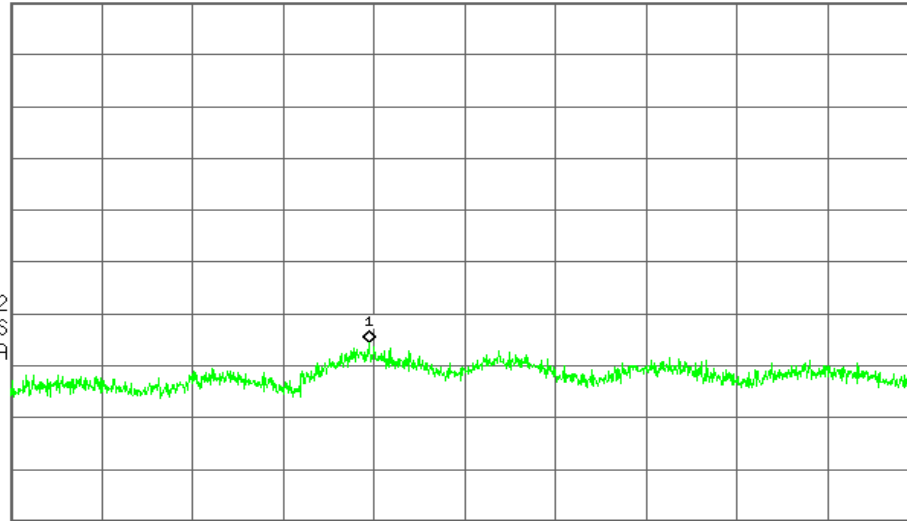
-75.50 dBm

Peak
Log
10
dB/

LgAv

M1 S2
S3 FS
AA

E(f):
FTun
Swp



Center 7.500 GHz

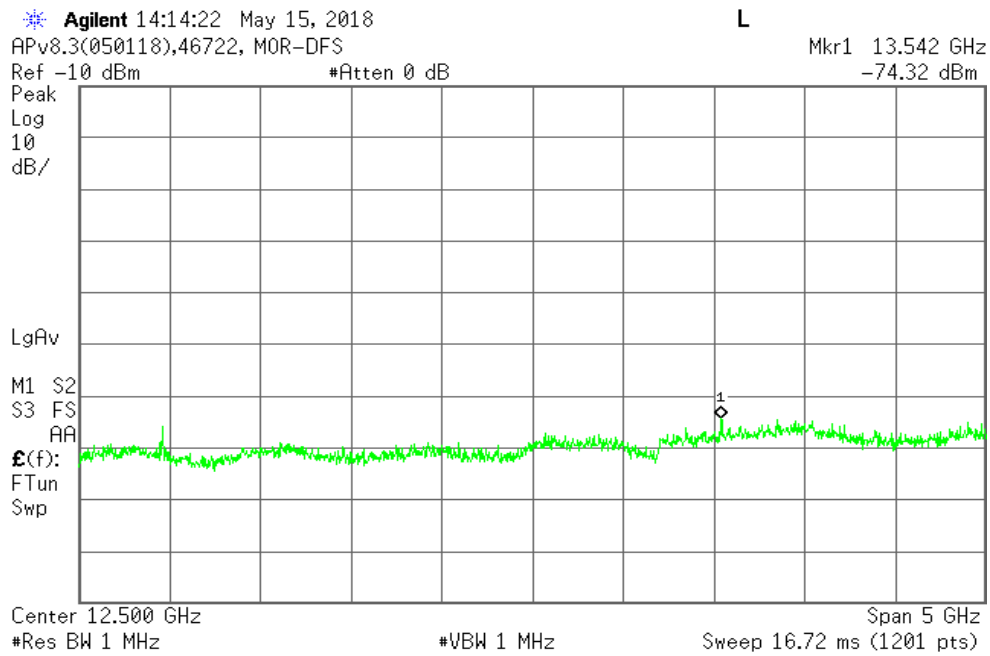
Span 5 GHz

#Res BW 1 MHz

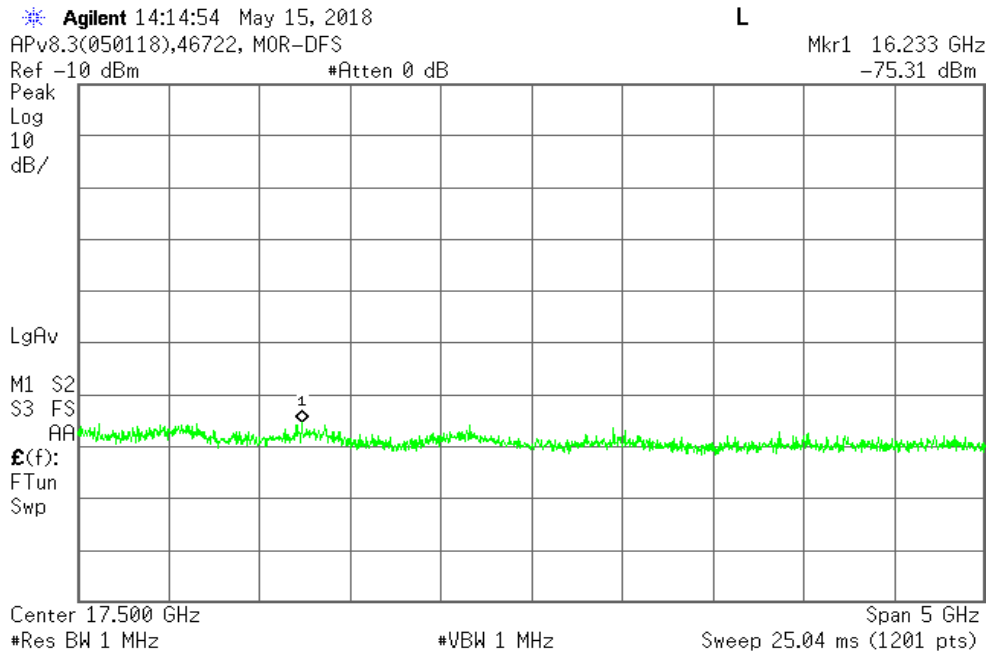
#VBW 1 MHz

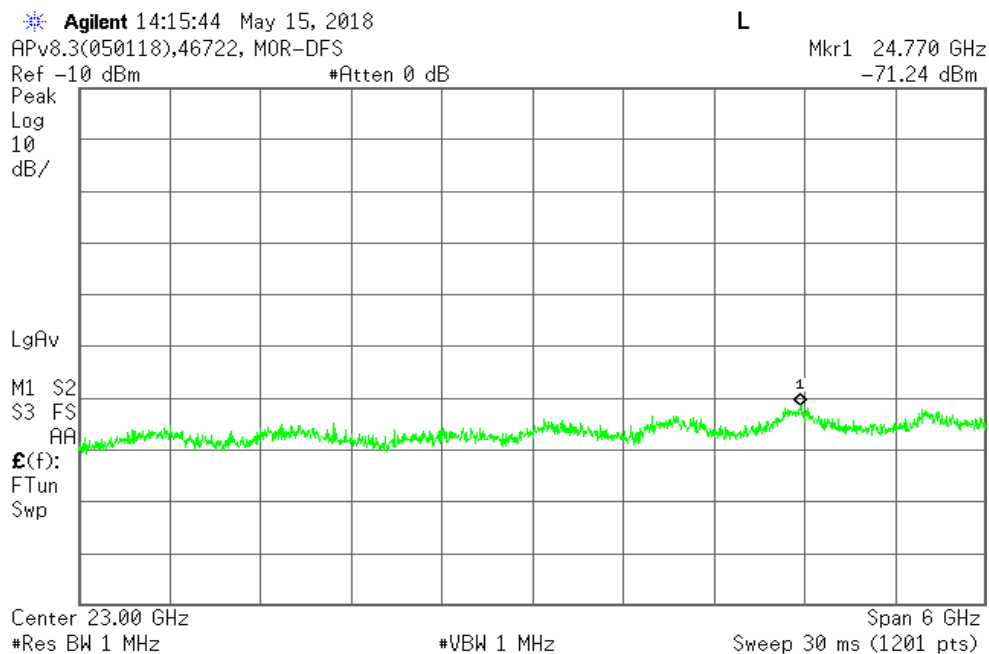
Sweep 8.4 ms (1201 pts)

Rx1_SpuriousG3_Nom



Rx1_SpuriousG4_Nom





2.6. Burst Length / Duty

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Freq.	On Time	Period	Result (Duty)	Result (Burst Rate)	Limit
[V]	[MHz]	[msec]	[msec]	[%]		[msec]
DC4V	5190	0.124	0.293	42.2	2.371	4

Sample Calculation :

Result(Duty) = On Time / Period * 100

Result(Burst Rate) = Period / On Time

Tx1_Duty_Nom

Agilent 09:32:13 Apr 10, 2018

L

APv8.2(032118),46722, MOR-Con1

Mkr3 293.3 μ s

Ref 10 dBm

#Atten 20 dB

-0.237 dB

#Samp

Log

10

dB/

#PAvg

1

W1 S2

Center 5.190 000 GHz

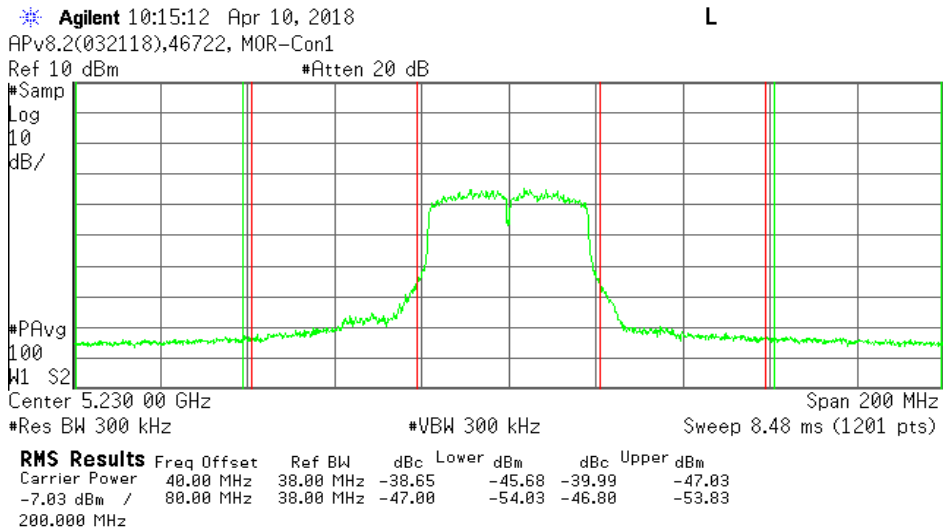
Span 0 Hz

Res BW 1 MHz

#VBW 8 MHz

Sweep 1.28 ms (1201 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	349.9 μ s	-35.75 dBm
1a	(1)	Time	123.7 μ s	11.49 dB
3R	(1)	Time	349.9 μ s	-35.75 dBm
3a	(1)	Time	293.3 μ s	-0.24 dB



2.7.2. Adjacent Channel Power(Chain1)

Job No. R12053557-E9c

Remark1 Chain 1

Remark2

[DATA]

Voltage	Freq.	Separation	Lower Side Result	Upper Side Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBc]	[dBc]	[dBc]	
DC4V	5190	40	-37.45	-38.53	-25.00	
		80	-47.75	-47.74	-40.00	
	-	-	-	-	-	
		-	-	-	-	
	5230	40	-37.86	-39.22	-25.00	
		80	-47.23	-46.98	-40.00	

Tx1_ACP_Chain1_Nom

Agilent 09:38:28 Apr 10, 2018

L

APv8.2(032118),46722, MOR-Con1

Ref 10 dBm

#Atten 20 dB

#Samp

Log

10

dB/

#PAvg

100

#1 S2

Center 5.190 00 GHz

Span 200 MHz

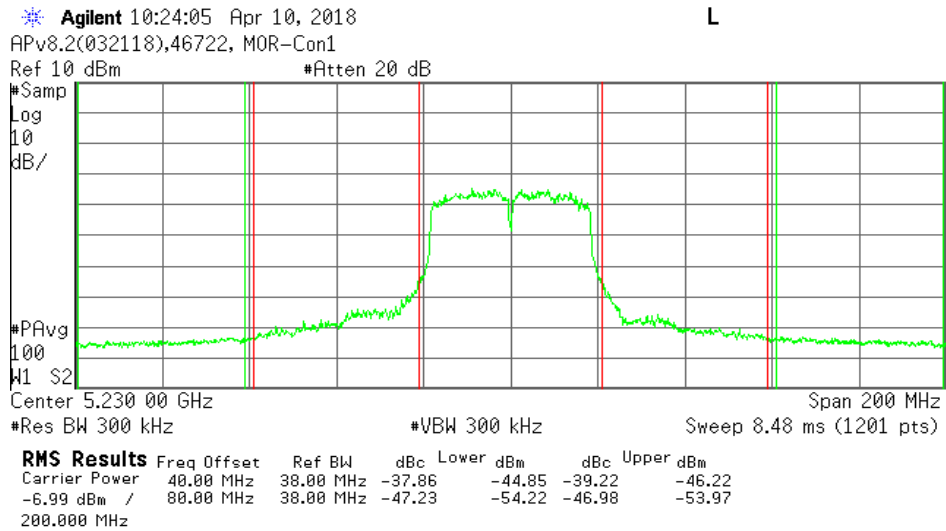
#Res BW 300 kHz

#VBW 300 kHz

Sweep 8.48 ms (1201 pts)

RMS Results

	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	40.00 MHz	38.00 MHz	-37.45	-44.76	-38.53	-45.84
-7.31 dBm /	80.00 MHz	38.00 MHz	-47.75	-55.05	-47.74	-55.04
200.000 MHz						



2.8.Outband Leakage Power Strength (Normal Voltage)

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[uW/MHz]	[uW/MHz]	
DC4V	5190	5135.57	-49.47	16.26	0.00	4.00	-29.21	1.199	2.500	◆3
		5145.77	-49.44	16.26	0.00	4.00	-29.18	1.208	15.000	◆4
	5230	5250.01	-33.69	16.26	0.00	4.00	-13.43	45.394	492.346	◆5
		5251.06	-37.13	16.26	0.00	4.00	-16.87	20.559	49.710	◆6
		5271.95	-47.66	16.26	0.00	4.00	-27.40	1.820	6.056	◆7
		5279.41	-51.40	16.26	0.00	4.00	-31.14	0.769	2.500	◆8

Sample Calculation :

Result = Reading + Cable Loss + Attenuator+Antenna Gain

◆3:Freq Range3 ($\geq 5,100\text{MHz}$, $\leq 5,141.6\text{MHz}$)

◆4:Freq Range4 ($> 5,141.6\text{MHz}$, $\leq 5,150\text{MHz}$)

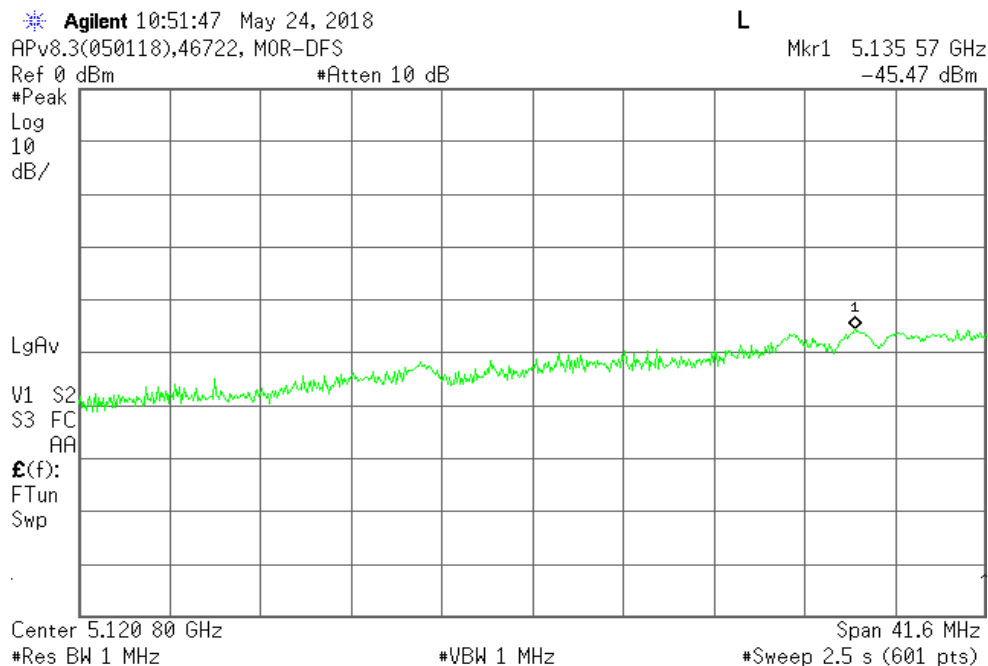
◆5:Freq Range5 ($\geq 5,250\text{MHz}$, $< 5,251\text{MHz}$)

◆6:Freq Range6 ($\geq 5,251\text{MHz}$, $< 5,270\text{MHz}$)

◆7:Freq Range7 ($\geq 5,270\text{MHz}$, $< 5,278.4\text{MHz}$)

◆8:Freq Range8 ($\geq 5,278.4\text{MHz}$, $\leq 5,400\text{MHz}$)

Tx1_Leak1_Nom



Txl_Leak1_ALT

Agilent 16:29:30 May 31, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 1.000 3 MHz

Band Pwr -49.47 dBm

#Peak
Log
10
dB/

PAvg

W1 S2

S3 FSR

AA

$\mathcal{E}(f)$:

f>50k

Swp

Center 5.135 570 0 GHz

#Res BW 30 kHz

#VBW 300 kHz

Span 1 MHz
#Sweep 2.5 s (1201 pts)

Txl_Leak2_Nom

Agilent 10:54:50 May 24, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 5.145 772 GHz

-41.01 dBm

#Peak
Log
10
dB/

LgAv

V1 S2

S3 FC

AA

$\mathcal{E}(f)$:

FTun

Swp

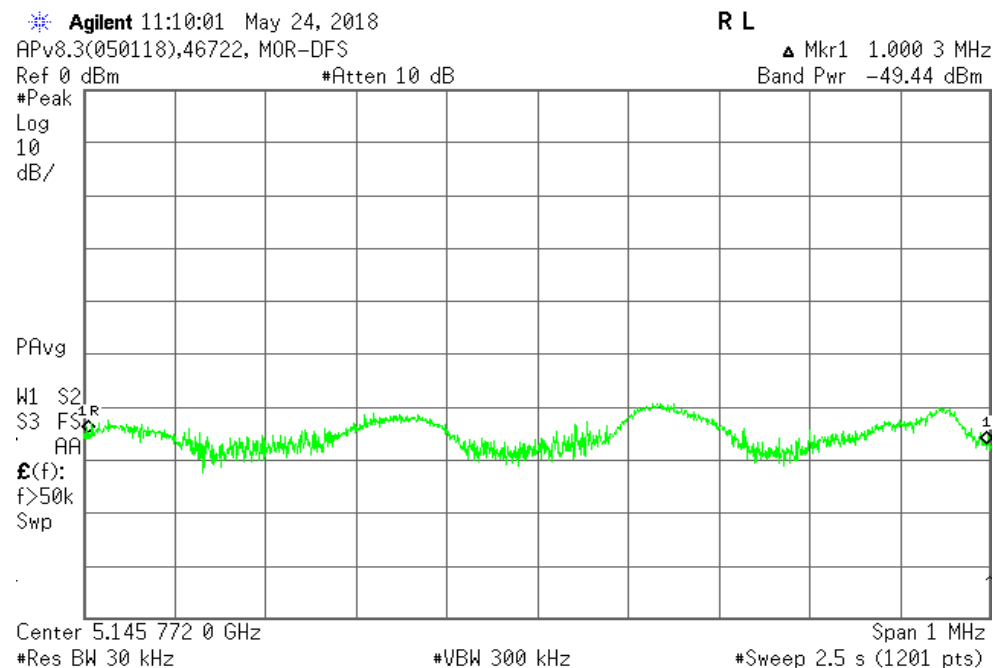
Center 5.145 800 GHz

#Res BW 1 MHz

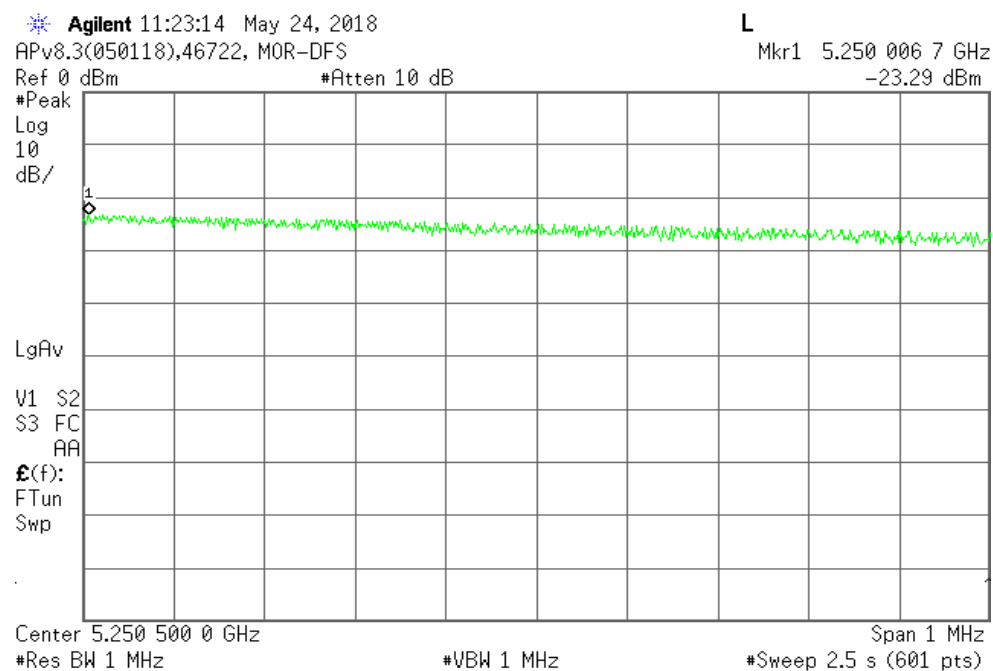
#VBW 1 MHz

Span 8.4 MHz
#Sweep 2.5 s (601 pts)

Tx1_Leak2_ALT



Tx3_Leak3_Nom



Tx3_Leak3_ALT

Agilent 11:54:33 May 24, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 1.000 4 MHz

Band Pwr -33.69 dBm

#Peak

Log

10

dB/

PAvg

W1 S2

S3 FS

AA

E(f):

f>50k

Swp

Center 5.250 006 7 GHz

#Res BW 30 kHz

#VBW 300 kHz

Span 1 MHz

#Sweep 2.5 s (1201 pts)

Tx3_Leak4_Nom

Agilent 11:24:26 May 24, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 5.251 06 GHz

-26.98 dBm

#Peak

Log

10

dB/

LgAvg

V1 S2

S3 FC

AA

E(f):

FTun

Swp

Center 5.260 50 GHz

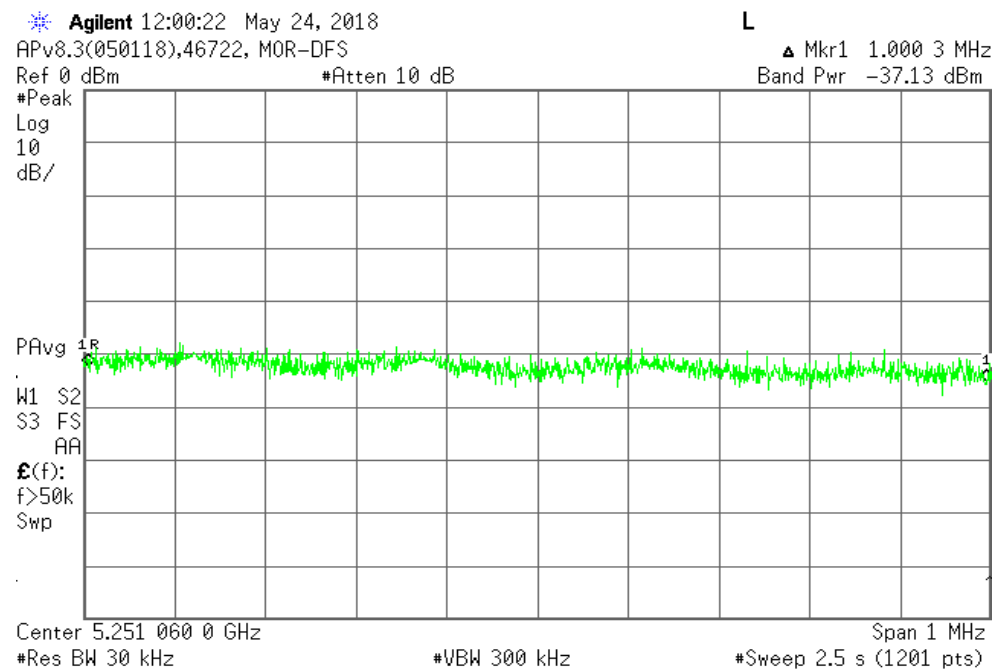
#Res BW 1 MHz

#VBW 1 MHz

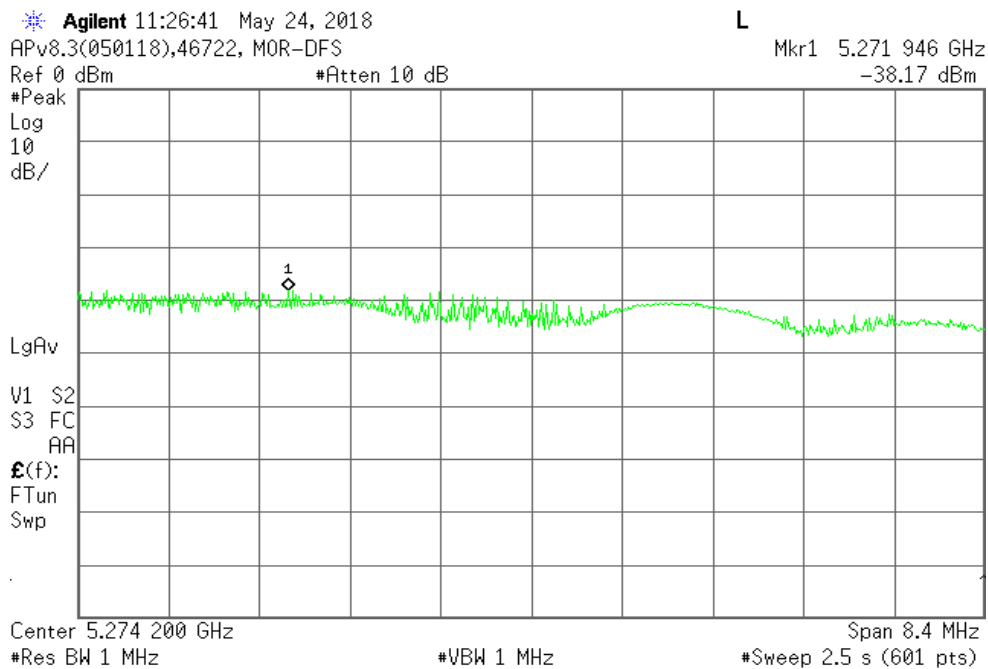
Span 19 MHz

#Sweep 2.5 s (601 pts)

Tx3_Leak4_ALT



Tx3_Leak5_Nom



Tx3_Leak5_ALT

Agilent 12:04:40 May 24, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 1.000 3 MHz

Band Pwr -47.66 dBm

#Peak

Log

10

dB/

PAvg

W1 S21R

S3 FS

AA

$E(f)$:

f>50k

Swp

Center 5.271 946 0 GHz

#Res BW 30 kHz

#VBW 300 kHz

Span 1 MHz

#Sweep 2.5 s (1201 pts)

Tx3_Leak6_Nom

Agilent 11:27:57 May 24, 2018

APv8.3(050118),46722, M0R-DFS

Ref 0 dBm

*Atten 10 dB

L

Mkr1 5.279 41 GHz

-44.20 dBm

#Peak

Log

10

dB/

LgAv

V1 S2

S3 FC

AA

$E(f)$:

FTun

Swp

Center 5.339 20 GHz

#Res BW 1 MHz

#VBW 1 MHz

Span 121.6 MHz

#Sweep 2.5 s (601 pts)

Tx3_Leak6_ALT

Agilent 12:09:42 May 24, 2018

APv8.3(050118),46722, MOR-DFS

Ref 0 dBm

#Atten 10 dB

L

Δ Mkr1 1.000 4 MHz

Band Pwr -51.40 dBm

#Peak

Log

10

dB/

PAvg

W1 S2

S3 FS

AA

£(f):

f>50k

Swp

Center 5.279 410 0 GHz

#Res BW 30 kHz

#VBW 300 kHz

Span 1 MHz

#Sweep 2.5 s (1201 pts)

Average Power

Job No. R12053557-E9c

Remark1

Remark2

[DATA]

Voltage	Port No.	Freq.	Reading	Cable Loss	Atten. Loss	Burst Rate	Output Power Result
		[MHz]	[dBm]	[dB]	[dB]		[dBm]
DC4V	0	5190	-7.23	16.26	0.00	2.37	12.78
		-	-	-	-	-	-
		5230	-6.72	16.26	0.00	2.37	13.29
DC4V	1	5190	-7.09	16.26	0.00	2.37	12.92
		-	-	-	-	-	-
		5230	-6.91	16.26	0.00	2.37	13.10
DC4V	-	-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
DC4V	-	-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-

Total Output Power

Voltage	Freq.	Power
	[MHz]	[mW]
DC4V	5190	38.54
	-	-
	5230	41.74

3. Measurement Equipment

Use	Int. No.	Kind of Equipment	Model No.	Manufacturer	Serial No.	Calibration Authority	Calibration Date
X	72822	Spectrum Analyzer	E4446A	Agilent	MY51100032	World Cal	2017-08-21
X	PWM005	Power Meter	N1912A	Keysight	MY55116004	World Cal	2017-05-22
X	PWS005	Power Sensor	N1921A	Keysight	MY55090030	World Cal	2017-05-18

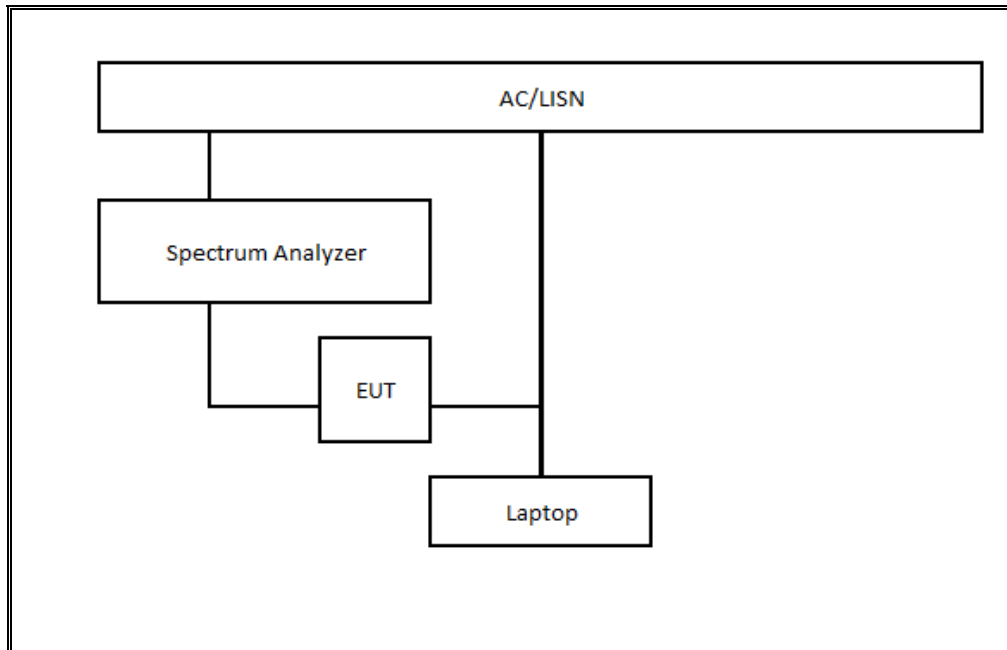
- Note :
1. The calibration of measurement equipment is valid for a one year period.
 2. "X" used equipment.
 3. All equipment is calibrated and traceable to ISO17025

4. Test Condition

Test Item	Date	Temp	Hum	Engineer	Test Room
Frequency Tolerance	2018-04-10	22.8C	57%	46722	MOR-Con1
Occupied Bandwidth	2018-04-10	22.8C	57%	46722	MOR-Con1
Unwanted Emission Strength	2018-04-10	22.8C	57%	46722	MOR-Con1
Output Power/ E.I.R.P	2018-04-10	22.8C	57%	46722	MOR-Con1
Secondary Radiated Emission Strength	2018-05-15	23.4C	57%	46722	MOR-DFS
Burst Length / Duty	2018-04-10	22.8C	57%	46722	MOR-Con1
Adjacent Channel Power	2018-04-10	22.8C	57%	46722	MOR-Con1
Outband Leakage Power Strength	2018-05-24 2018-05-31	21.5C	52%	46722	MOR-DFS

5. TEST CONFIGURATION

TEST CirCuit



PHOTO

