

FCC 15.407 2015/RSS 247 2017

DUT Information

Frequencies

WLAN CH 36 (5180 MHz)

WLAN CH 44 (5220 MHz)

WLAN CH 48 (5240 MHz)

Gain Tables

0.000 dBm (0 dBm)

Port 1: 3.6dBi;

DUT Settings

No. of transmission chains

1

DFS capability

No

Equipment Type

Indoor

TPC

No

Hardware Setup: WMS Measurements\Hardware Setup

Spectrum Analyzer:

SA FSV 40 (SA FSV 40) @ VISA (ADR
TCPIP::192.168.48.148::INST0::INSTR), SN 1307.9002K40/101076,
FW 3.10 SP1

Vector Generator:

VG SMBV100A (VG SMBV100A) @ VISA (ADR
TCPIP::192.168.48.149::INST0::INSTR), SN 260451, FW 5.4.0

Generator:

SMB100A (SMB100A) @ VISA (ADR
TCPIP::192.168.48.144::INST0::INSTR), SN 107790, FW Rev
2.20.1, 08/2012, CVI 2009

OSP:

OSP (OSP) @ VISA (ADR TCPIP::192.168.48.147::INST0::INSTR),
SN OSP120 V02, 101258, FW 2.53.140911

Power Meter:

OSP-B157 Power Meter (OSP-B157 Power Meter) @ USB (ADR 20),
SN 26591983, FW 3.1

Summary

Test	Frequency (MHz)	Nominal Bandwidth (MHz)	Result
Emission Bandwidth 26 dB	5180.000	20.000000	PASS
RF output power	5180.000	20.000000	PASS
Power Spectral Density	5180.000	20.000000	PASS
Occupied Channel Bandwidth 99%	5180.000	20.000000	PASS
Band Edge low	5180.000	20.000000	PASS
Emission Bandwidth 26 dB	5220.000	20.000000	PASS
RF output power	5220.000	20.000000	PASS
Power Spectral Density	5220.000	20.000000	PASS
Occupied Channel Bandwidth 99%	5220.000	20.000000	PASS
Emission Bandwidth 26 dB	5240.000	20.000000	PASS
RF output power	5240.000	20.000000	PASS
Power Spectral Density	5240.000	20.000000	PASS
Occupied Channel Bandwidth 99%	5240.000	20.000000	PASS
Band Edge high	5240.000	20.000000	PASS

Emission Bandwidth 26 dB (5180 MHz)

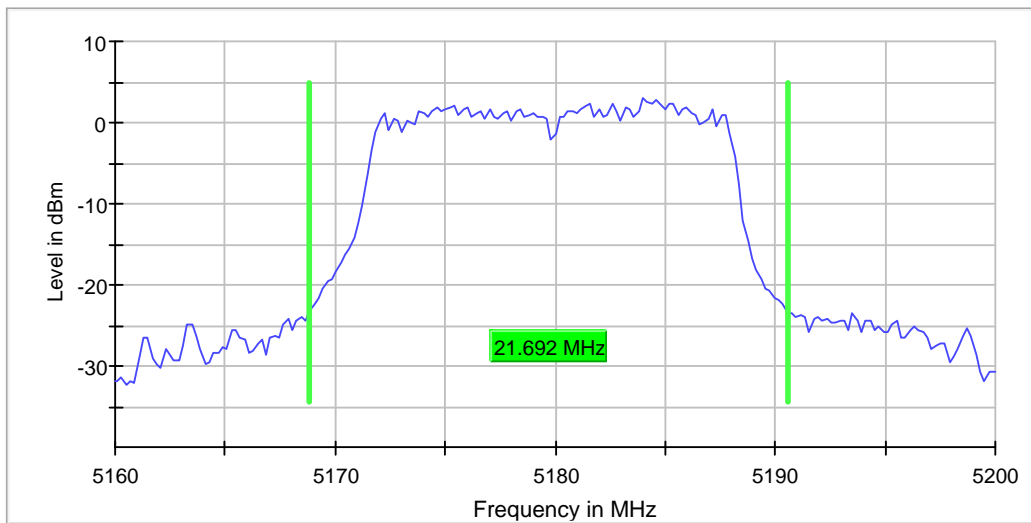
Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
5180.000000	21.691543	5168.855721	5190.547264	3.0

(continuation of the "26 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
5180.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.16000 GHz	5.16000 GHz
Stop Frequency	5.20000 GHz	5.20000 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	~ 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	200	~ 200
Sweeptime	28.443 μ s	AUTO
Reference Level	-10.000 dBm	-20.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	9 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.04 dB	0.30 dB

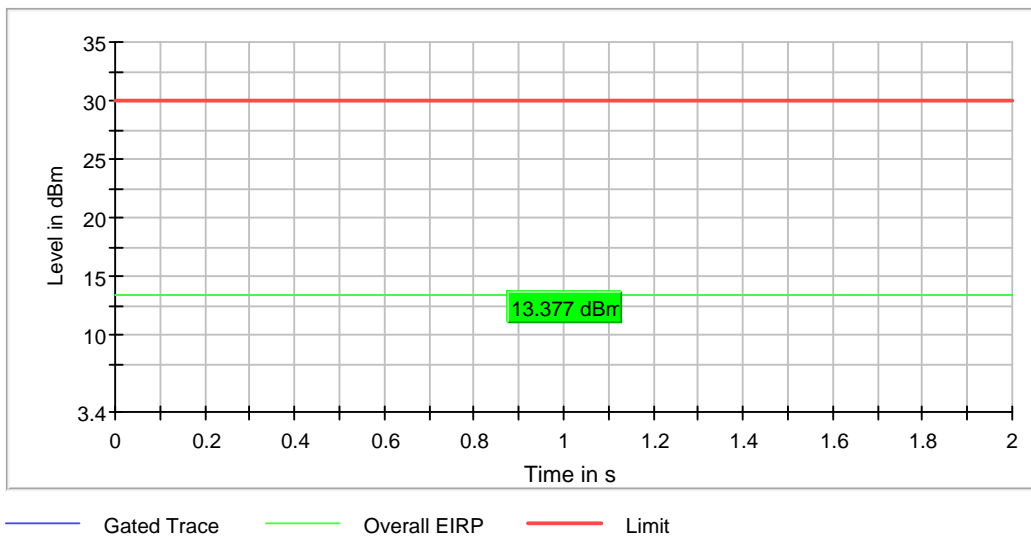
RF output power (5180 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
5180.000000	10.4	30.0	13.4	100.000	PASS



Power Spectral Density (5180 MHz)

Customized settings.

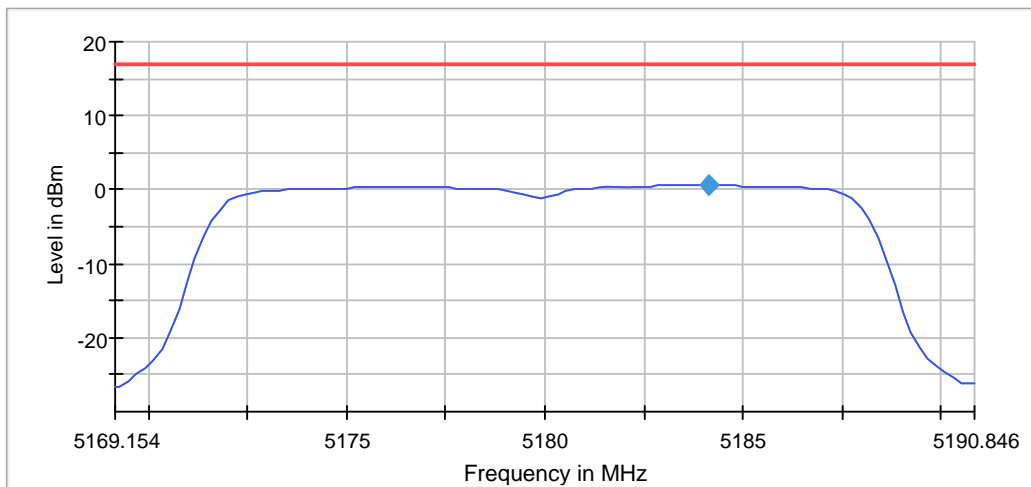
Test according to FCC title 47 part 15 §15.407(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5180.000000	5184.147000	0.548	17.0	PASS

Ports

Port	Duty Cycle (%)
1	100.000



Connector 1 Sum Level Limit PSD

Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.16915 GHz	5.16915 GHz
Stop Frequency	5.19085 GHz	5.19085 GHz
Span	21.692 MHz	21.692 MHz
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 43
Sweeptime	2.020 s	2.020 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace

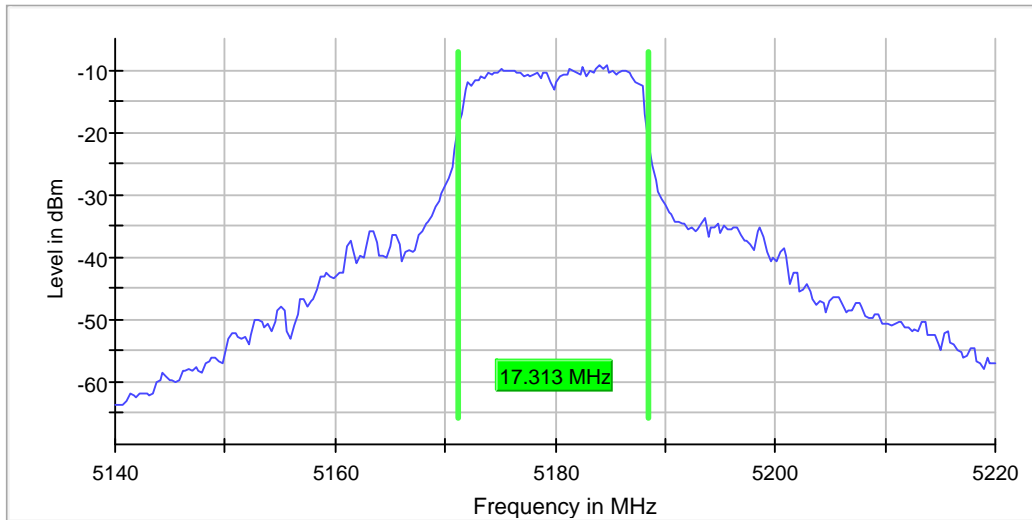
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 15	max. 15
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.30 dB

Occupied Channel Bandwidth 99% (5180 MHz)

Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5180.000000	17.313433	---	---	5171.194030	5188.507463	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.14000 GHz	5.14000 GHz
Stop Frequency	5.22000 GHz	5.22000 GHz
Span	80.000 MHz	80.000 MHz
RBW	300.000 kHz	<= 400.000 kHz
VBW	1.000 MHz	>= 900.000 kHz
SweepPoints	267	~ 267
Sweeptime	31.603 µs	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	17 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.04 dB	0.30 dB

Band Edge low (5180 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.407(b), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

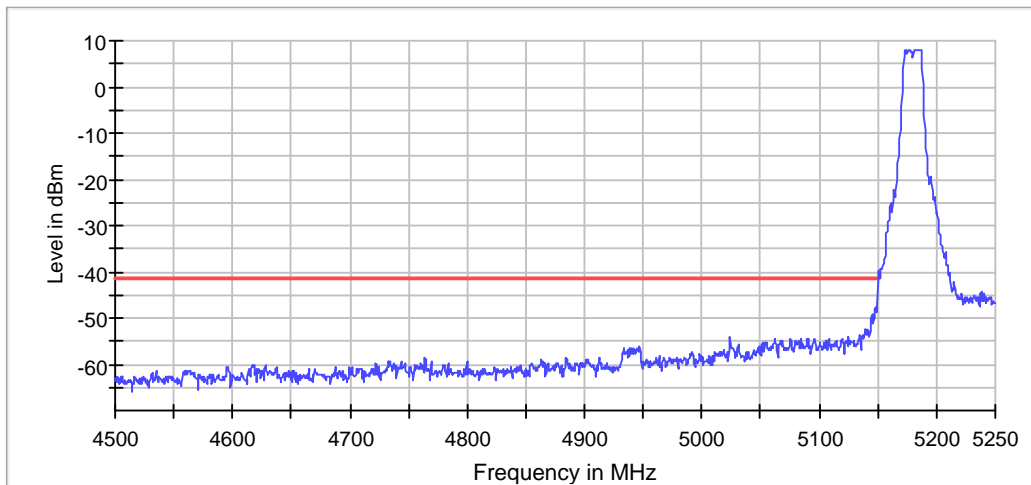
DUT Frequency (MHz)	Result
5180.000000	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
5183.084577	8.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5148.251345	-47.5	6.3	-41.2	PASS
5147.751729	-47.9	6.7	-41.2	PASS
5148.750961	-48.1	6.8	-41.2	PASS
5149.250576	-48.9	7.7	-41.2	PASS
5145.253651	-49.1	7.9	-41.2	PASS
5147.252114	-49.3	8.1	-41.2	PASS
5145.753267	-49.4	8.2	-41.2	PASS
5144.754035	-49.9	8.6	-41.2	PASS
5146.752498	-50.1	8.9	-41.2	PASS
5146.252882	-51.3	10.1	-41.2	PASS
5141.256726	-52.3	11.0	-41.2	PASS
5140.757110	-52.4	11.1	-41.2	PASS
5144.254420	-52.4	11.2	-41.2	PASS
5143.754804	-52.5	11.2	-41.2	PASS
5139.258263	-52.5	11.3	-41.2	PASS



Measurement 1

Setting	Instrument Value	Target Value
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	200	~ 200
SweepTime	15.250 μ s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	22 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	1300	~ 1300
SweepTime	87.688 μ s	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	8 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Emission Bandwidth 26 dB (5220 MHz)

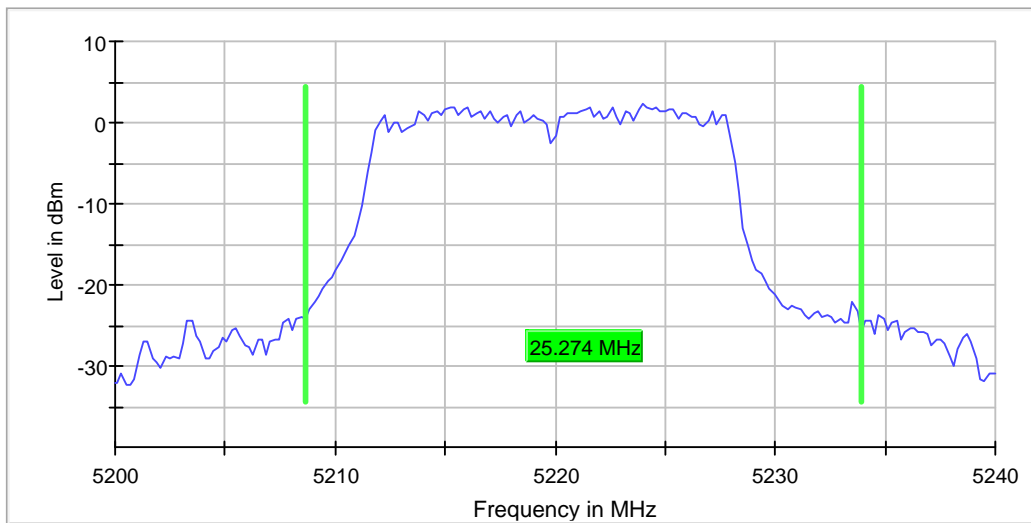
Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
5220.000000	25.273632	5208.656716	5233.930348	2.4

(continuation of the "26 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
5220.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.20000 GHz	5.20000 GHz
Stop Frequency	5.24000 GHz	5.24000 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	~ 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	200	~ 200
Sweeptime	28.443 μs	AUTO
Reference Level	-10.000 dBm	-20.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	15 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.27 dB	0.30 dB

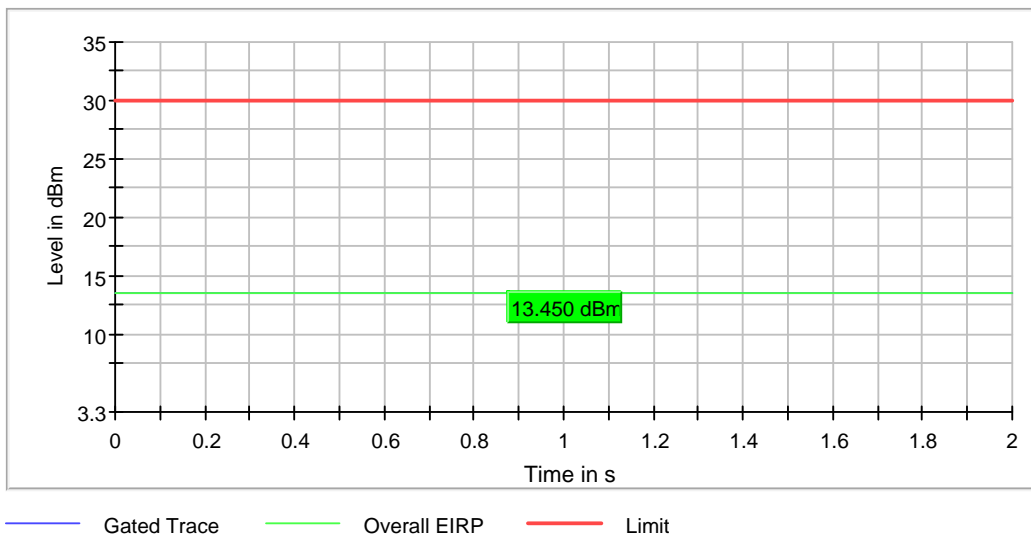
RF output power (5220 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
5220.000000	10.4	30.0	13.4	100.000	PASS



Power Spectral Density (5220 MHz)

Customized settings.

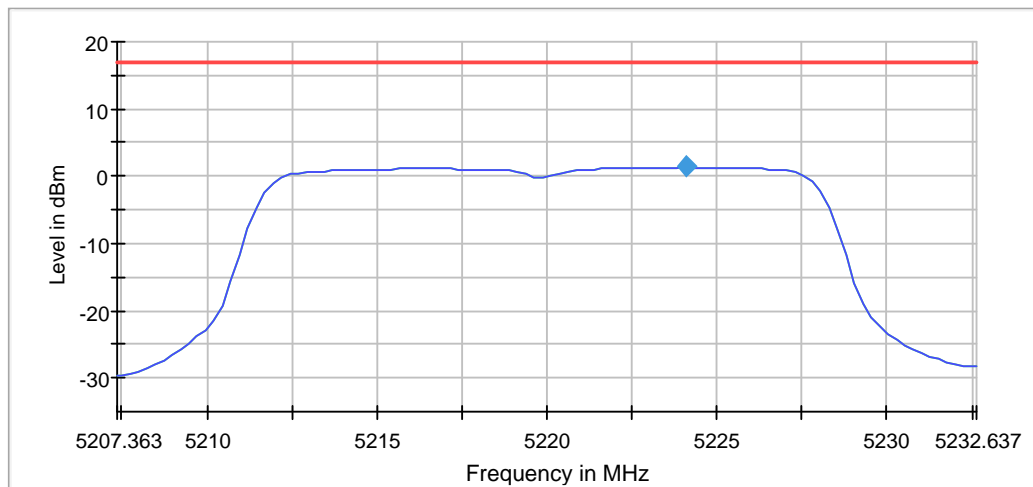
Test according to FCC title 47 part 15 §15.407(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5220.000000	5224.088441	1.346	17.0	PASS

Ports

Port	Duty Cycle (%)
1	100.000



Connector 1 Sum Level Limit PSD

Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.20736 GHz	5.20736 GHz
Stop Frequency	5.23264 GHz	5.23264 GHz
Span	25.274 MHz	25.274 MHz
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 51
Sweeptime	2.020 s	2.020 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace

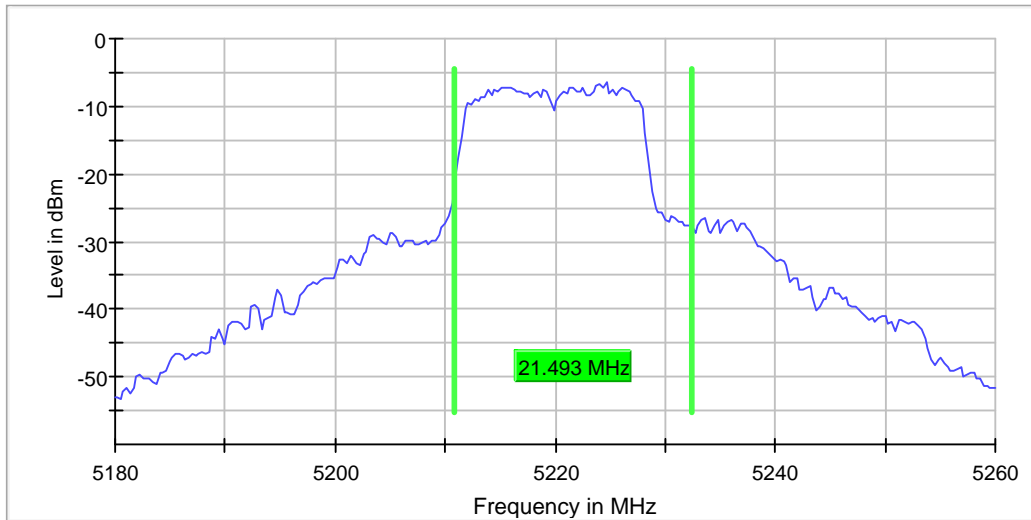
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 15	max. 15
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.30 dB

Occupied Channel Bandwidth 99% (5220 MHz)

Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5220.000000	21.492538	5210.895522	5232.388060	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.18000 GHz	5.18000 GHz
Stop Frequency	5.26000 GHz	5.26000 GHz
Span	80.000 MHz	80.000 MHz
RBW	300.000 kHz	<= 400.000 kHz
VBW	1.000 MHz	>= 900.000 kHz
SweepPoints	267	~ 267
Sweeptime	31.603 µs	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	14 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.10 dB	0.30 dB

Emission Bandwidth 26 dB (5240 MHz)

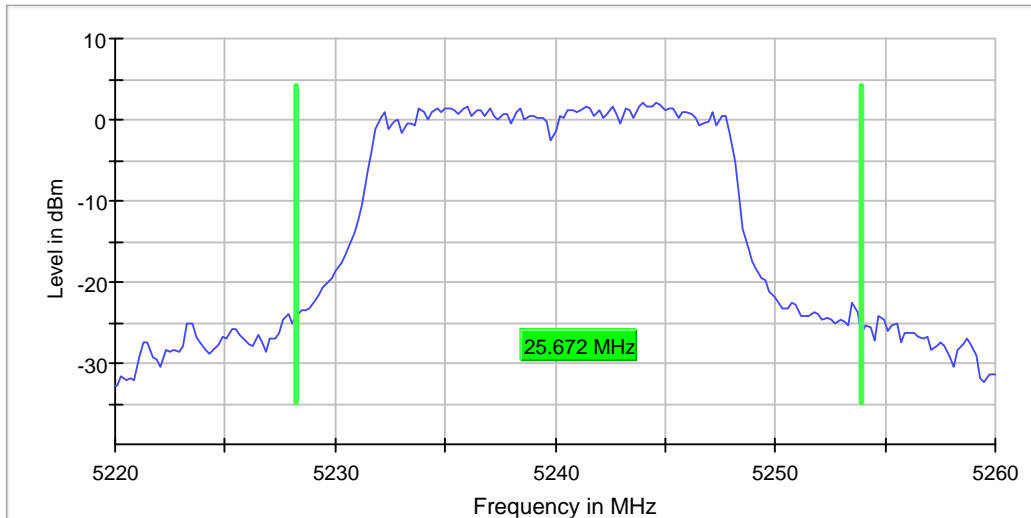
Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)
5240.000000	25.671642	5228.258706	5253.930348	2.2

(continuation of the "26 dB Bandwidth" table from column 7 ...)

DUT Frequency (MHz)	Result
5240.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.22000 GHz	5.22000 GHz
Stop Frequency	5.26000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	~ 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	200	~ 200
Sweeptime	28.443 µs	AUTO
Reference Level	-10.000 dBm	-20.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	16 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.04 dB	0.30 dB

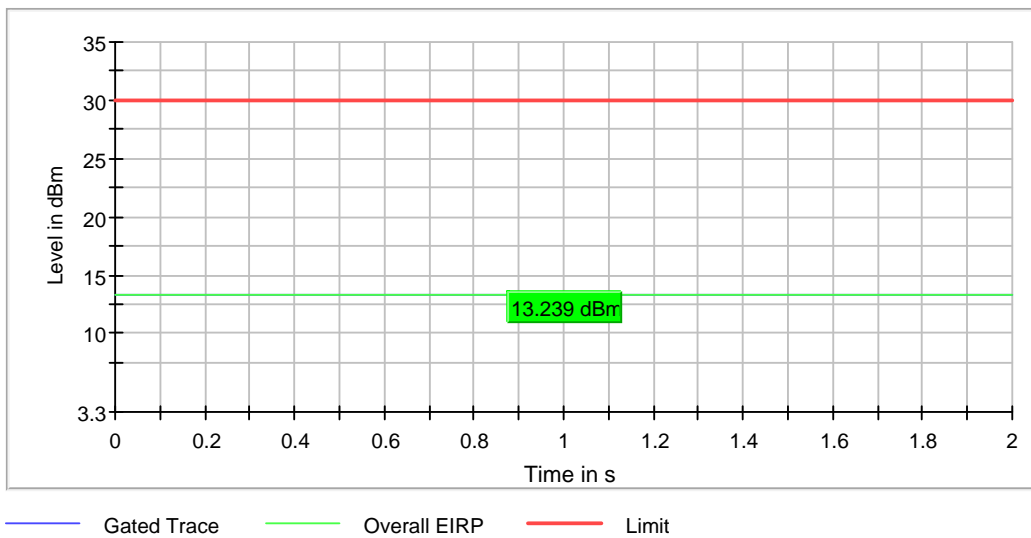
RF output power (5240 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
5240.000000	10.2	30.0	13.2	100.000	PASS



Power Spectral Density (5240 MHz)

Customized settings.

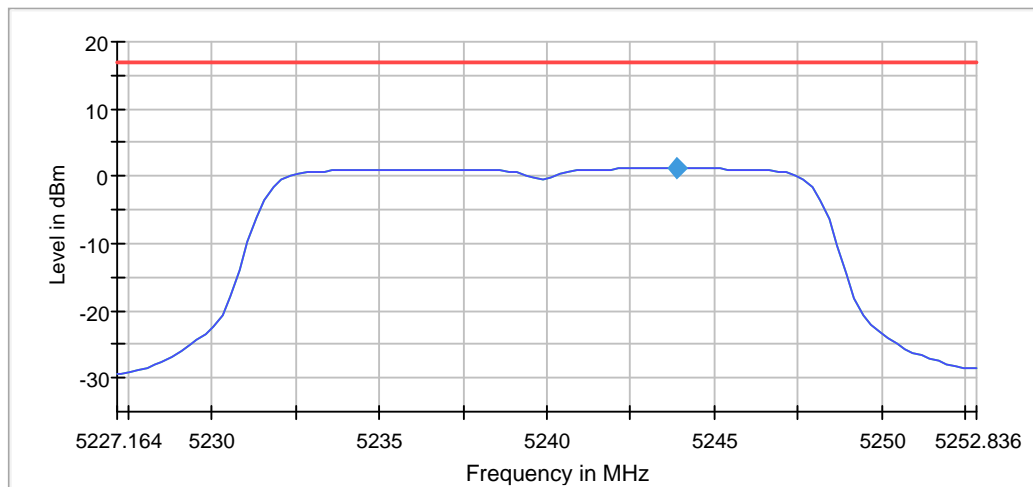
Test according to FCC title 47 part 15 §15.407(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5240.000000	5243.901137	1.185	17.0	PASS

Ports

Port	Duty Cycle (%)
1	100.000



Connector 1 Sum Level Limit PSD

Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.22716 GHz	5.22716 GHz
Stop Frequency	5.25284 GHz	5.25284 GHz
Span	25.672 MHz	25.672 MHz
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	101	~ 51
Sweeptime	2.020 s	2.020 s
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	RMS	RMS
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace

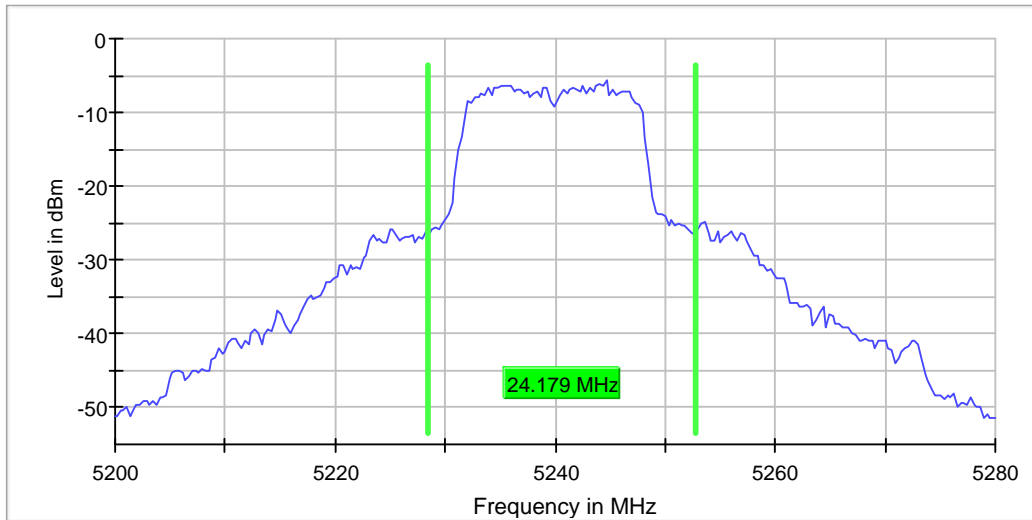
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 15	max. 15
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.30 dB

Occupied Channel Bandwidth 99% (5240 MHz)

Test according to FCC title 47 part 15 §15.407(a),(e), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5240.000000	24.179104	---	---	5228.507463	5252.686567	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	5.20000 GHz	5.20000 GHz
Stop Frequency	5.28000 GHz	5.28000 GHz
Span	80.000 MHz	80.000 MHz
RBW	300.000 kHz	<= 400.000 kHz
VBW	1.000 MHz	>= 900.000 kHz
SweepPoints	267	~ 267
Sweeptime	31.603 μs	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	16 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.03 dB	0.30 dB

Band Edge high (5240 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.407(b), KDB 789033 D02 General U-NII Test Procedures New Rules v01r03 and ANSI C63.10

Result

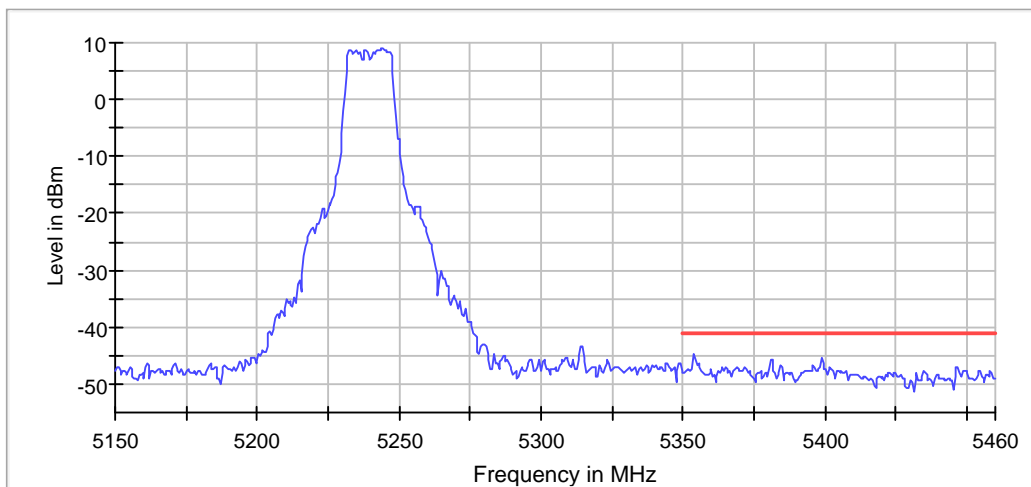
DUT Frequency (MHz)	Result
5240.000000	PASS

Inband Peak

Frequency (MHz)	Level (dBm)
5243.781095	9.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5354.002375	-44.7	3.5	-41.2	PASS
5353.503563	-44.9	3.7	-41.2	PASS
5398.895487	-45.5	4.2	-41.2	PASS
5354.501188	-45.8	4.5	-41.2	PASS
5380.938242	-45.8	4.6	-41.2	PASS
5381.437055	-45.9	4.6	-41.2	PASS
5399.394299	-46.4	5.2	-41.2	PASS
5355.498812	-46.5	5.3	-41.2	PASS
5384.429929	-46.7	5.4	-41.2	PASS
5395.902613	-46.8	5.6	-41.2	PASS
5355.000000	-46.8	5.6	-41.2	PASS
5371.959620	-46.9	5.7	-41.2	PASS
5446.781473	-47.0	5.7	-41.2	PASS
5384.928741	-47.0	5.7	-41.2	PASS
5371.460808	-47.0	5.8	-41.2	PASS



— Limit — Sum Level × Fail

Measurement 1

Setting	Instrument Value	Target Value
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	200	~ 200
SweepTime	15.250 μ s	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	12 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	1.000 MHz	<= 1.000 MHz
VBW	3.000 MHz	>= 3.000 MHz
SweepPoints	420	~ 420
SweepTime	28.594 μ s	AUTO
Reference Level	-10.000 dBm	-20.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB