Annex 1: Measurement diagrams to
T E S T R E P O R T
No.: 16-1-0180701T08a

According to:

FCC Regulations
Part 15.205
Part 15.207
Part 15.209
Part 15.247

for

Viessmann Werke GmbH & Co. KG

ViCare Thermostat

FCC ID: 2AIZ9-VT0318

Laboratory Accreditation and Listings		
DAkkS Deutsche Akkreditierungsstelle D-PL-12047-01-01 Accredited EMC-Test Laboratory	Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	Voluntary Controls for Electromagnetic Emissions Reg. No.: R-20013, C-20009, T-20006, G-20013
Wi Fi ALLIANCE AUTHORIZED RF LABORATORY	ctia Authorized™ Test Lab Lab Code: 20011130-00	FCC FEDERAL COMMUNICATIONS COMMISSION USA MRA US-EU 0003
accredited according to DIN EN ISO/IEC 17025		

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1. Conducted RF-Measurements

EUT Information for Conducted Measurements

EUT Name:	ViCare Thermostat
Applicant:	Viessmann Werke GmbH & Co. KG
Serial Number:	#21
Hardware Rev:	Rev.C
Software Rev:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Connected Interfaces	USB cable to Test Laptop with Smart Thermostat WiFi & ZigBee Test Software
Comment:	Conducted Test Sample
Power Supply:	5 V DC via USB Cable
Test Settings:	ViCare Thermostat WiFi & ZigBee Test Software V1.2
Conducted Ports:	WLAN 2.4 GHz Port to Test System | ZigBee Port Terminated with 50 Ohm

Frequencies

WLAN CH 1 (2412 MHz)	WLAN CH 6 (2437 MHz)	WLAN CH 11 (2462 MHz)

Bandwidths

20 MHz (20 MHz)

Power

20,000 dBm (20 dBm)

Beamforming Gain

20,000 dBm (20 dBm)	0 dB

Gain Tables

20,000 dBm (20 dBm)	Port 1: Onboard WLAN2.4GHz Antenna;

DUT Settings

No. of transmission chains	1
Equipment Type	Other
Digital Modulation	Yes
Frequency Hopping	No

Hardware Setup: WMS Measurements\WMS for Conducted Measurements

Spectrum Analyzer:	SA FSU 26 (SA FSU 26) @ VISA (ADR TCPIP::192.168.48.145::INST0::INSTR), SN 200571/026, FW 4.51
Vector Generator:	VG SMU200A (VG SMU200A) @ VISA (ADR TCPIP::192.168.48.148::INST0::INSTR), SN 100754, FW 2.1.96.0-02.10.111.189
Generator:	SMF100A (SMF100A) @ VISA (ADR TCPIP::192.168.48.146::INST0::INSTR), SN 102073, FW Rev 2.21.1, 02/2017, CVI 2015
OSP:	OSP (OSP) @ VISA (ADR TCPIP::192.168.48.147::INST0::INSTR), SN OSP120 V02, 101183, FW 2.53.140911
Power Meter:	OSP-B157 Power Meter (OSP-B157 Power Meter) @ USB (ADR 20), SN 25955149, FW 3.1

1.1. RF Peak Output Power Verification- WLAN 2.4 GHz b/g/n(HT20) Modes+20 dBm

WLAN 802.11b/g/n(HT20)						
Conducted Power Measurements (using RF Peak Power Meter) [dBm]						20 dBm
b-Mode (SISO)		Channel No. (Frequency MHz)			b-Mode (SISO) Maximum Conducted Value	b-Mode (SISO) Antenna Gain [dBi]
Data rate	Modulation	1 (2412)	6 (2437)	11 (2462)		
1MBit	DBPSK	16,52	16,89	16,76	17,67	-2,00
2Mbit	DQPSK	16,37	16,69	16,90		
5.5Mbit	CCK-PBCC	16,21	16,91	16,61		
11MBit	ERP-PBCC	13,29	17,67	13,14		
FCC15.247 Conducted Peak Power Limits + Antenna Gain Requirement					30.0 dBm	< 6 dBi
g-Mode (SISO)		Channel No. (Frequency MHz)			g-Mode (SISO) Maximum Conducted Value	g-Mode (SISO) Antenna Gain [dBi]
Data rate	Modulation	1 (2412)	6 (2437)	11 (2462)		
6Mbit	BPSK	13,25	17,66	13,53	17,83	-2,00
9Mbit	BPSK	13,29	17,74	12,99		
12Mbit	QPSK	13,30	17,83	13,62		
18Mbit	QPSK	13,31	17,42	13,59		
24Mbit	16-QAM	13,41	16,69	13,83		
36Mbit	16-QAM	13,65	16,08	13,85		
48Mbit	64-QAM	13,58	15,55	14,04		
54MBit	64-QAM	13,32	17,00	13,67		
FCC15.247 Conducted Peak Power Limits + Antenna Gain Requirement					30.0 dBm	< 6 dBi
247		Channel No. (Frequency MHz)			n(HT20)-Mode (SISO) Maximum Conducted Value	n(HT20)-Mode (SISO) Antenna Gain [dBi]
Data rate	Modulation	1 (2412)	6 (2437)	11 (2462)		
MCS0 -6.5Mbps	BPSK	13,46	17,14	13,72	17,42	-2,00
MCS1 - 13Mbps	QPSK	13,53	17,26	13,73		
MCS2 - 19.5Mbps	QPSK	13,68	17,42	14,02		
MCS3 - 26Mbps	QAM16	13,74	16,75	13,94		
MCS4 -39Mbps	QAM16	13,66	16,12	13,95		
MCS5 - 52MBps	QAM64	13,75	15,70	14,11		
MCS6 - 58.5MBps	QAM64	13,78	14,50	14,15		
MCS7 - 65MBps	QAM64	13,80	14,96	14,26		
FCC15.247 Conducted Peak Power Limits + Antenna Gain Requirement					30.0 dBm	< 6 dBi

For each mode data rate giving Maximum output power (Worst Case) has been found using power verification The measurements are then performed with these Maximum output power (Worst Case) Data rates.

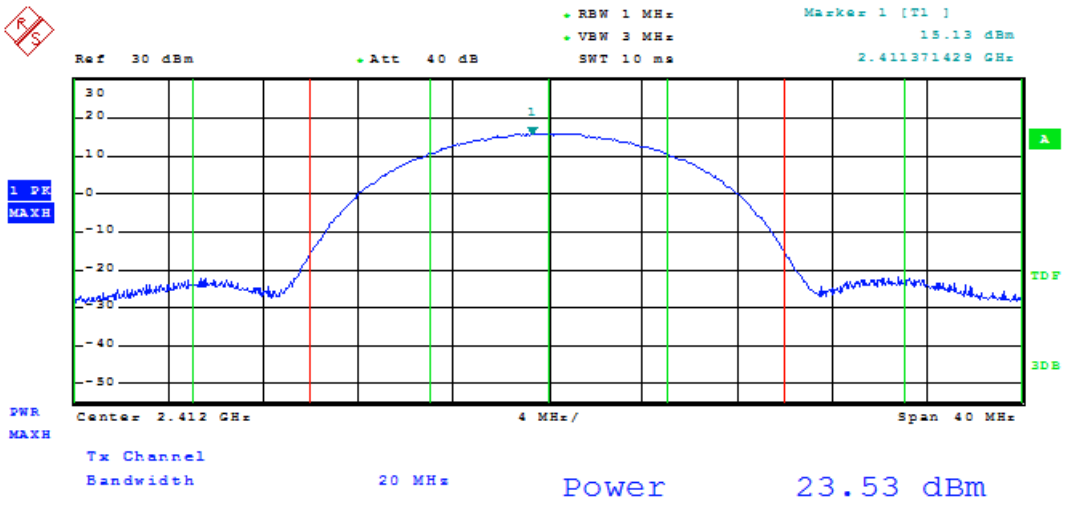
Worst Case Data Rate b Mode → 11 Mbps: 17.67 dBm

Worst Case Data Rate g Mode → 12 Mbps: 17.83 dBm

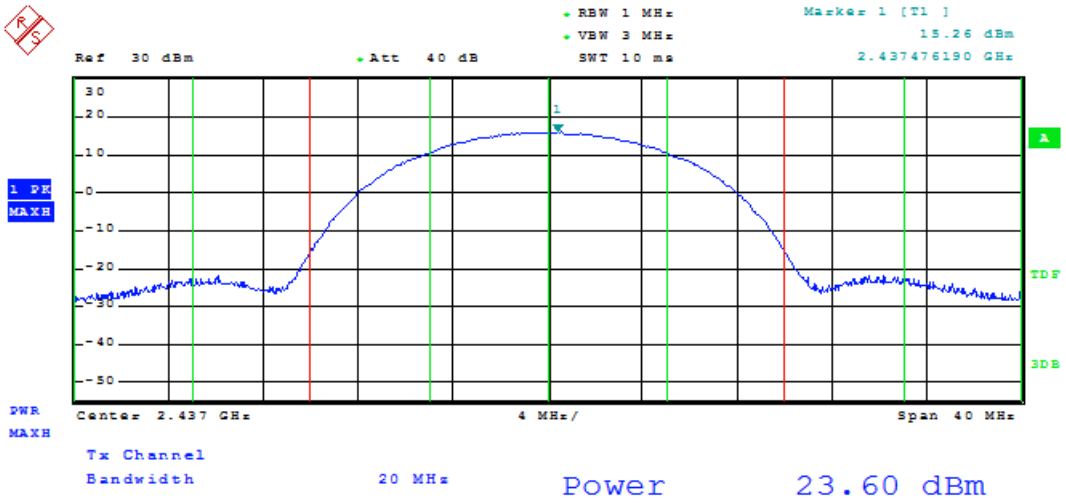
Worst Case Data Rate n(HT20)→ MCS2: 17.42 dBm

1.2. RF Peak Output Power – Band Integrated Method

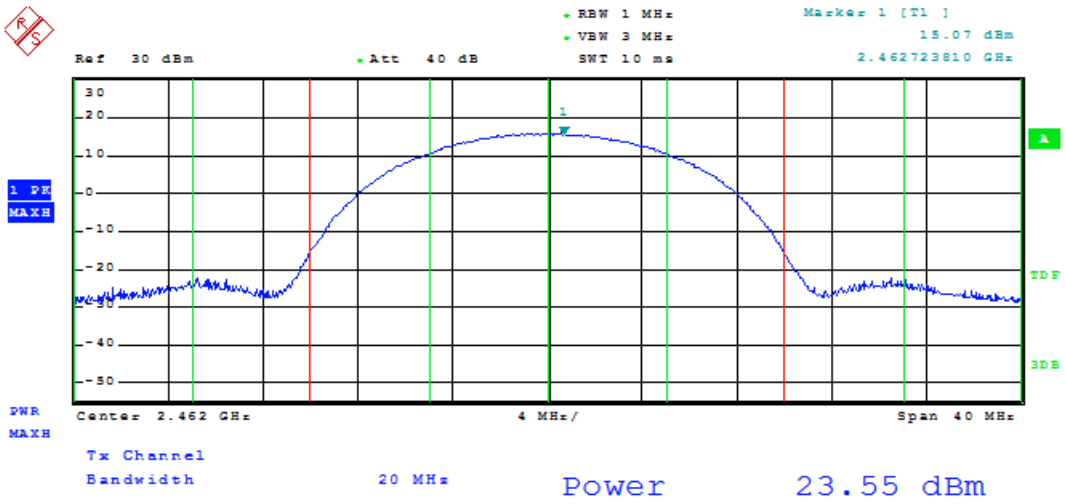
1.2.1. Band Integrated Peak Power- WLAN2.4GHz-b Mode-11Mbit



Band Integrated Peak Power- WLAN2.4GHz-b Mode-11Mbit-PWR-PK-CH1-20dBm

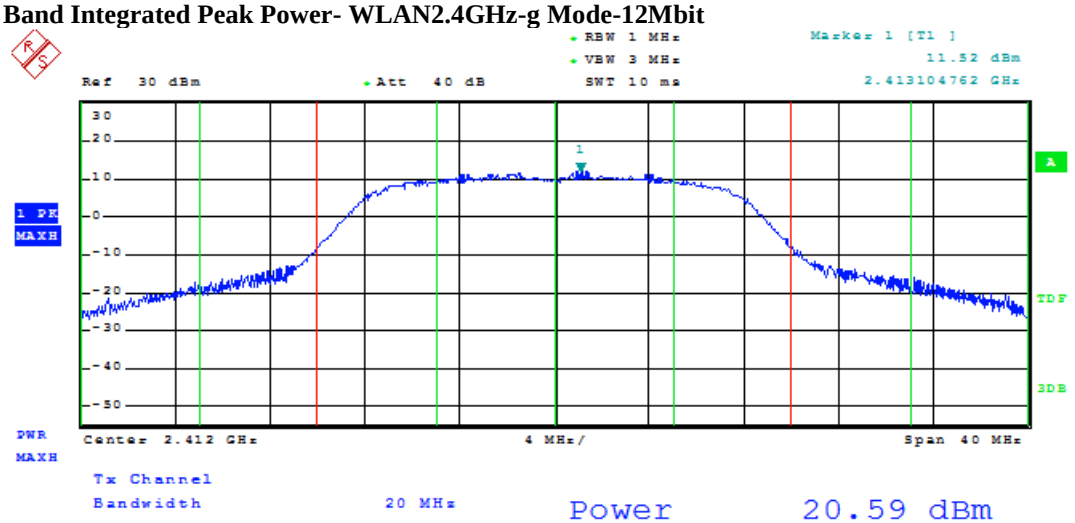


Band Integrated Peak Power- WLAN2.4GHz-b Mode-11Mbit-PWR-PK-CH6-20dBm

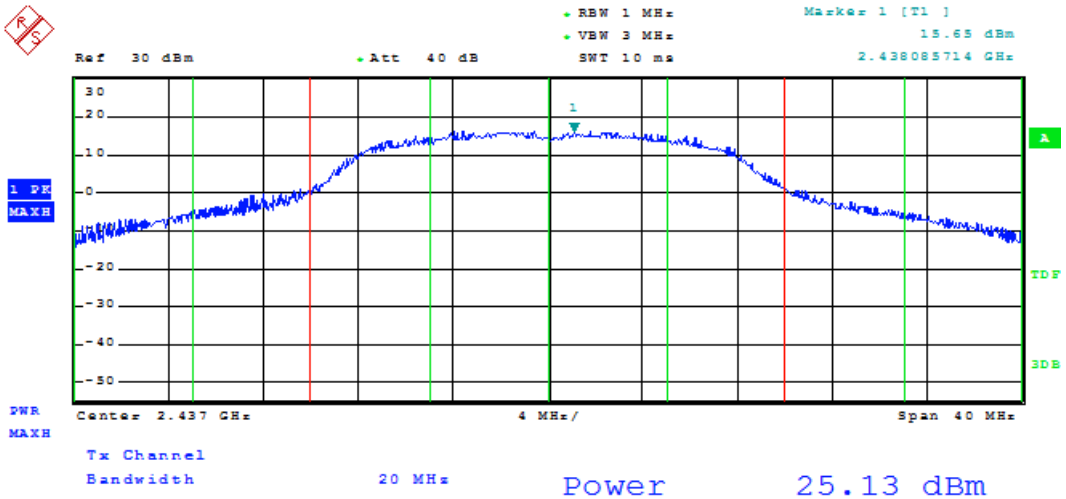


Band Integrated Peak Power- WLAN2.4GHz-b Mode-11Mbit-PWR-PK-CH11-20dBm

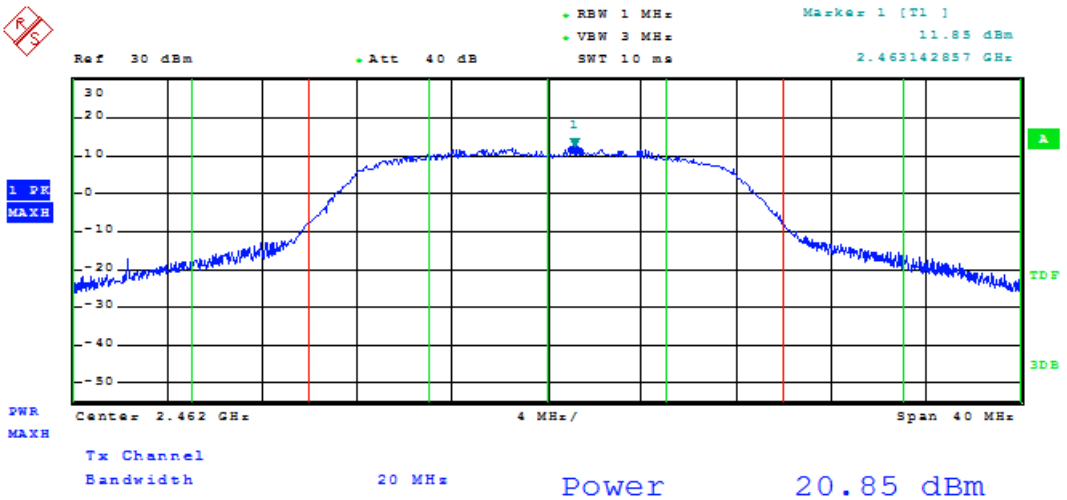
1.2.2. Band Integrated Peak Power- WLAN2.4GHz-g Mode-12Mbit



Band Integrated Peak Power- WLAN2.4GHz-g Mode-12Mbit-PWR-PK-CH1-20dBm

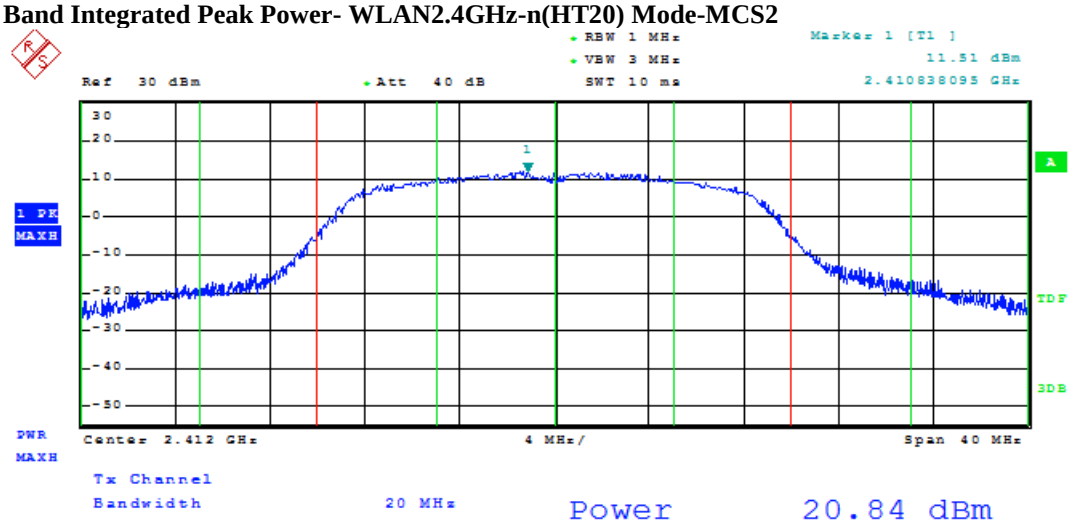


Band Integrated Peak Power- WLAN2.4GHz-g Mode-12Mbit-PWR-PK-CH6-20dBm

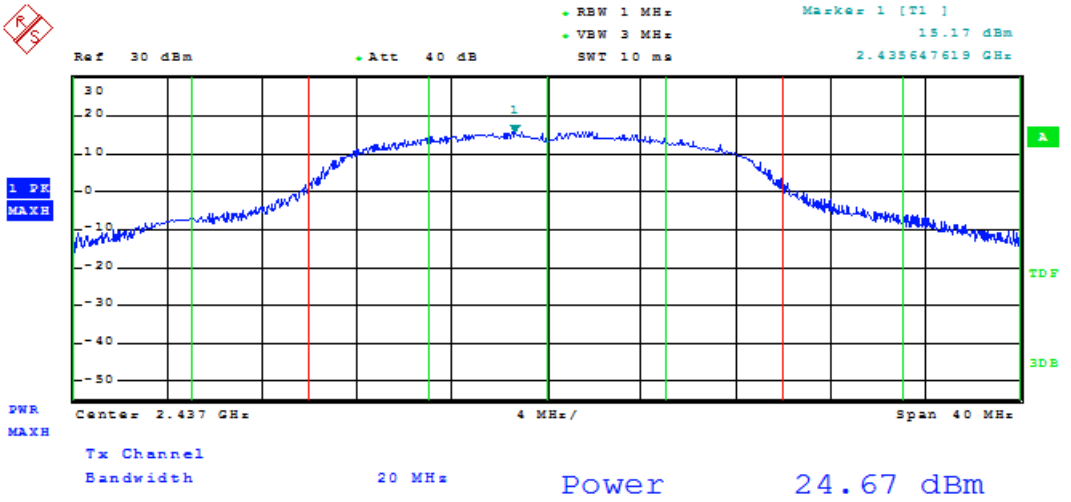


Band Integrated Peak Power- WLAN2.4GHz-g Mode-12Mbit-PWR-PK-CH11-20dBm

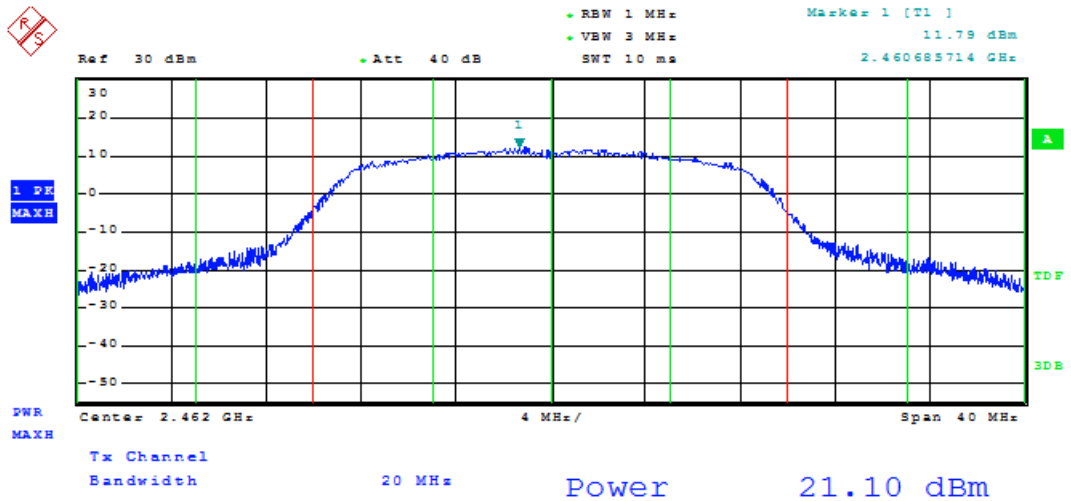
1.2.3. Band Integrated Peak Power- WLAN2.4GHz-n(HT20) Mode-MCS2



Band Integrated Peak Power- WLAN2.4GHz- n(HT20) Mode-MCS2- -PWR-PK-CH1-20dBm



Band Integrated Peak Power- WLAN2.4GHz- n(HT20) Mode-MCS2- -PWR-PK-CH6-20dBm

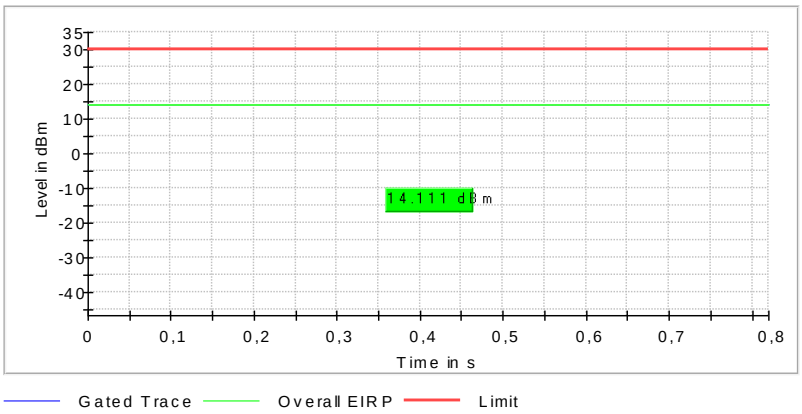


Band Integrated Peak Power- WLAN2.4GHz- n(HT20) Mode-MCS2- -PWR-PK-CH11-20dBm

1.3. RF RMS Output Power & Duty Cycle Measurement

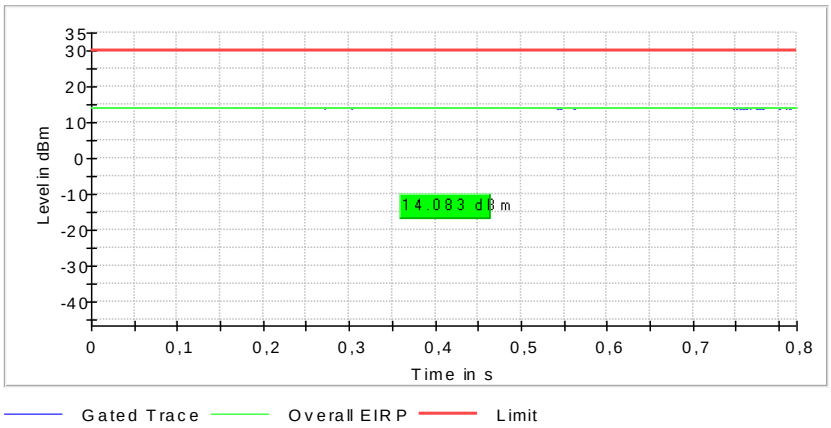
1.3.1. RMS Power + Duty Cycle - WLAN2.4GHz-b Mode-11Mbit

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2412.000000	16.1	30.0	14.1	82.147	PASS



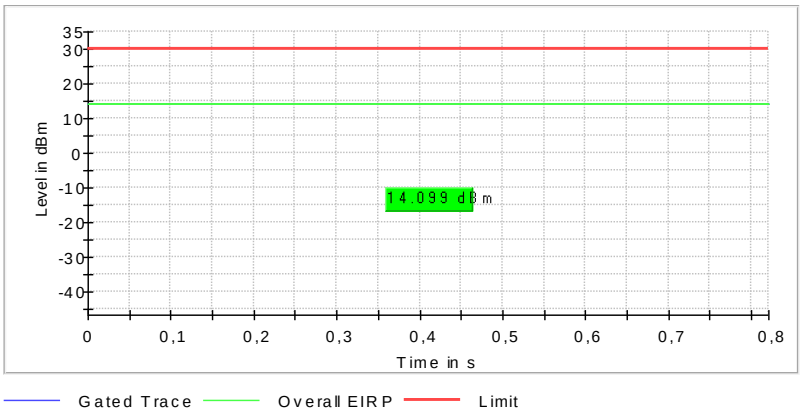
RMS Power + Duty Cycle-WLAN2.4GHz-b Mode-11Mbit-CH1-20dBm

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2437.000000	16.1	30.0	14.1	82.148	PASS



RMS Power + Duty Cycle -WLAN2.4GHz-b Mode-11Mbit-CH6-20dBm

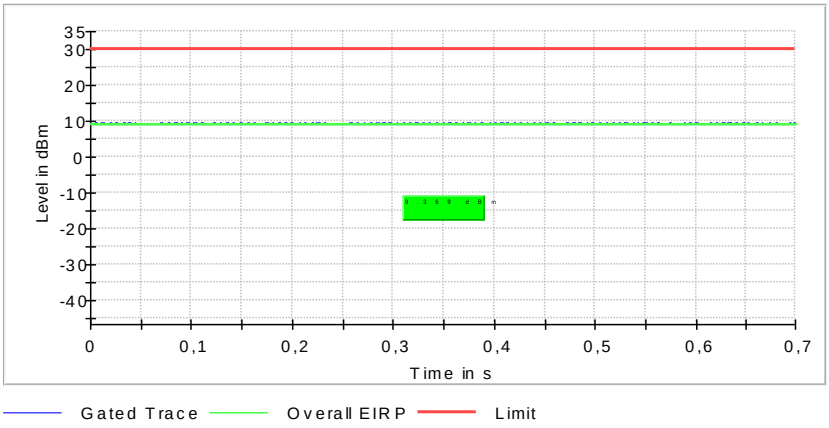
DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2462.000000	16.1	30.0	14.1	82.149	PASS



RMS Power + Duty Cycle-WLAN2.4GHz-b Mode-11Mbit-CH11-20dBm

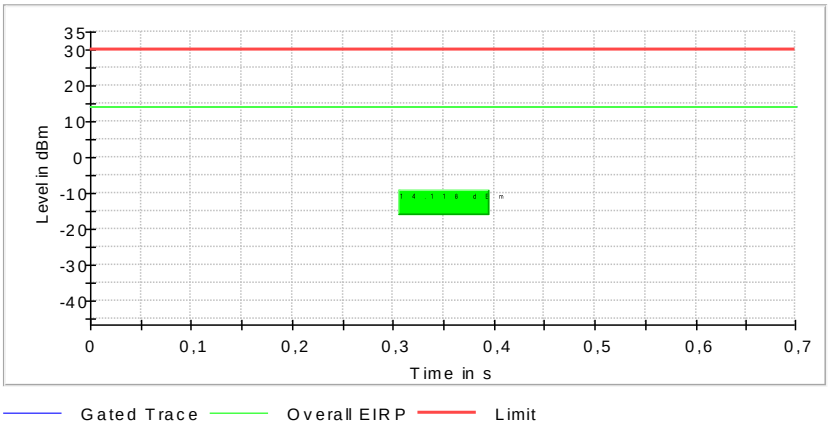
1.3.2. RMS Power + Duty Cycle - WLAN2.4GHz-g Mode-12Mbit

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2412.000000	11.4	30.0	9.4	69.904	PASS



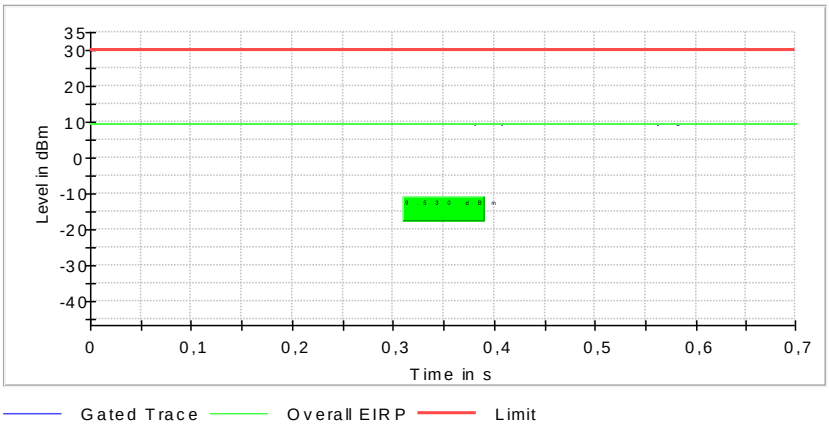
RMS Power + Duty Cycle-WLAN2.4GHz-g Mode-12Mbit-CH1-20dBm

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2437.000000	16.1	30.0	14.1	69.892	PASS



RMS Power + Duty Cycle -WLAN2.4GHz-g Mode-12Mbit-CH6-20dBm

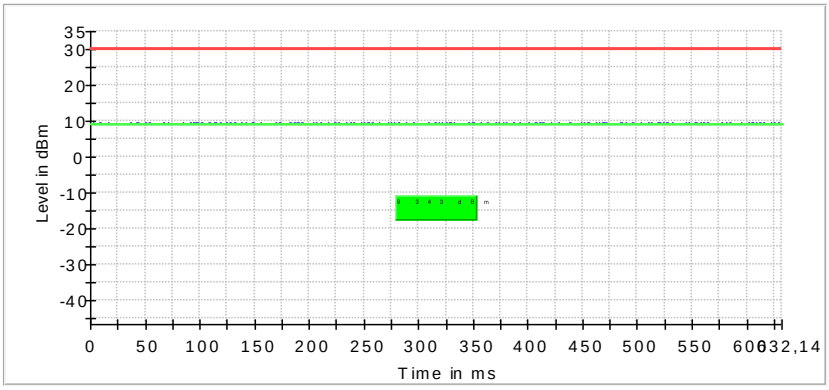
DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2462.000000	11.5	30.0	9.5	69.901	PASS



RMS Power + Duty Cycle-WLAN2.4GHz-g Mode-12Mbit-CH11-20dBm

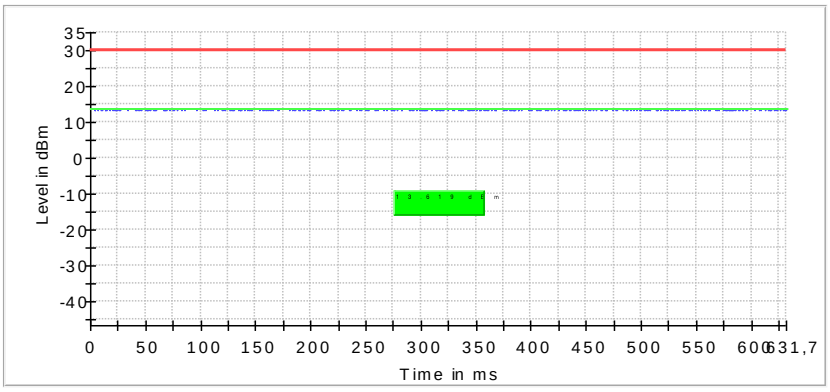
1.3.3. RMS Power + Duty Cycle - WLAN2.4GHz-n(HT20) Mode-MCS2

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2412.000000	11.3	30.0	9.3	63.230	PASS



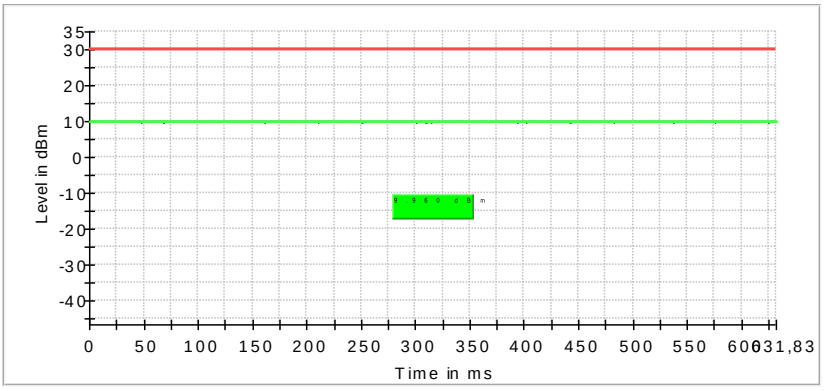
RMS Power + Duty Cycle-WLAN2.4GHz- n(HT20) Mode-MCS2-CH1-20dBm

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2437.000000	15.6	30.0	13.6	63.222	PASS



RMS Power + Duty Cycle -WLAN2.4GHz- n(HT20) Mode-MCS2- CH6-20dBm

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	Duty Cycle (%)	Result
2462.000000	12.0	30.0	10.0	63.231	PASS

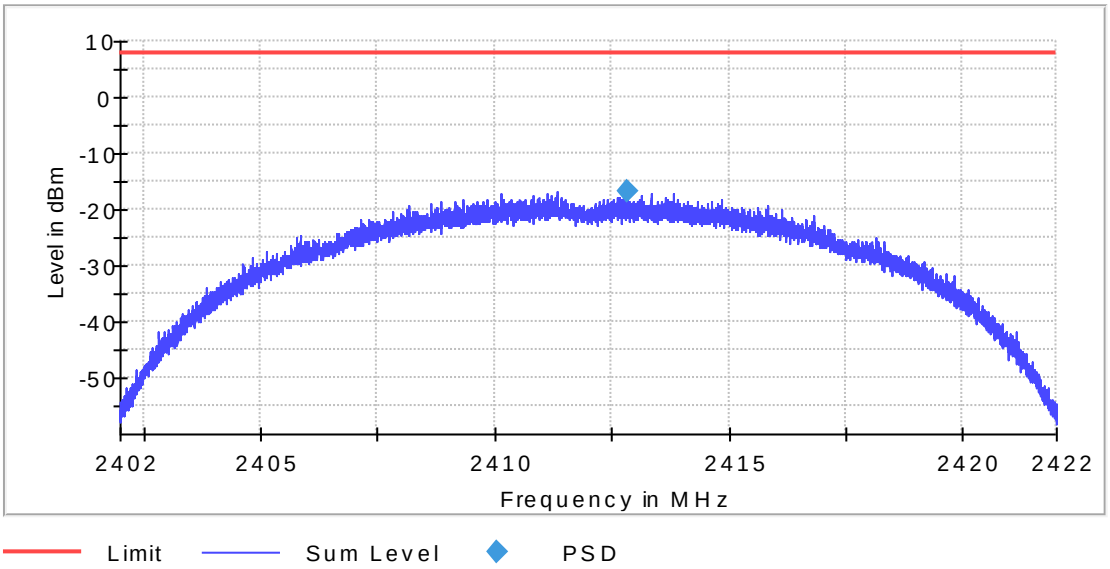


RMS Power + Duty Cycle-WLAN2.4GHz- n(HT20) Mode-MCS2-CH11-20dBm

1.4. Power Spectral Density

1.4.1. Power Spectral Density - WLAN2.4GHz-b Mode-11Mbit

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2412.834586	-16.750	8.0	PASS

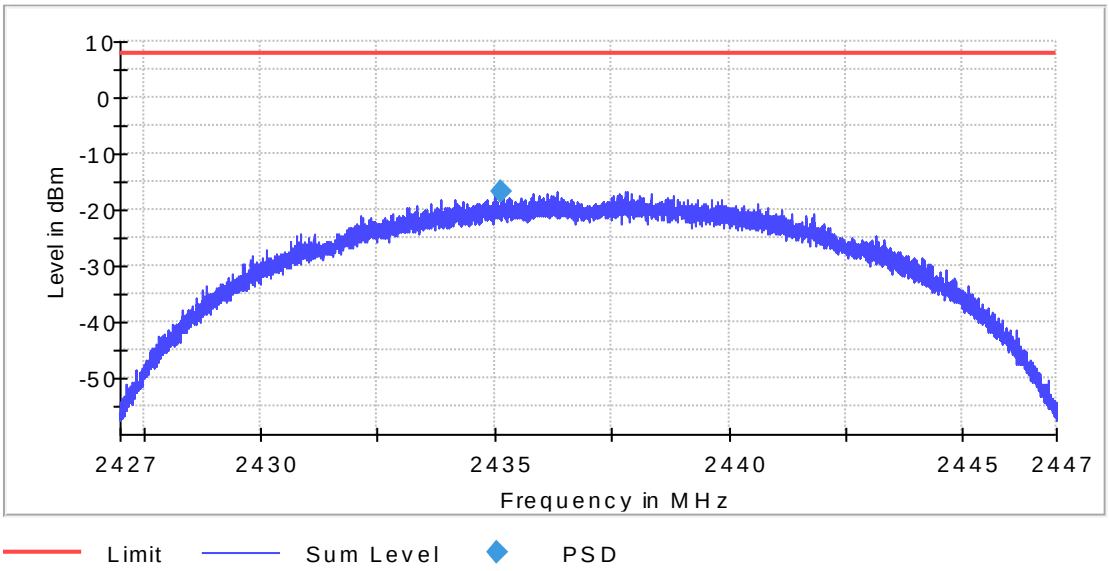


Power Spectral Density -WLAN2.4GHz-b Mode-11Mbit-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40200 GHz	2.40200 GHz
Stop Frequency	2.42200 GHz	2.42200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2435.135338	-16.650	8.0	PASS

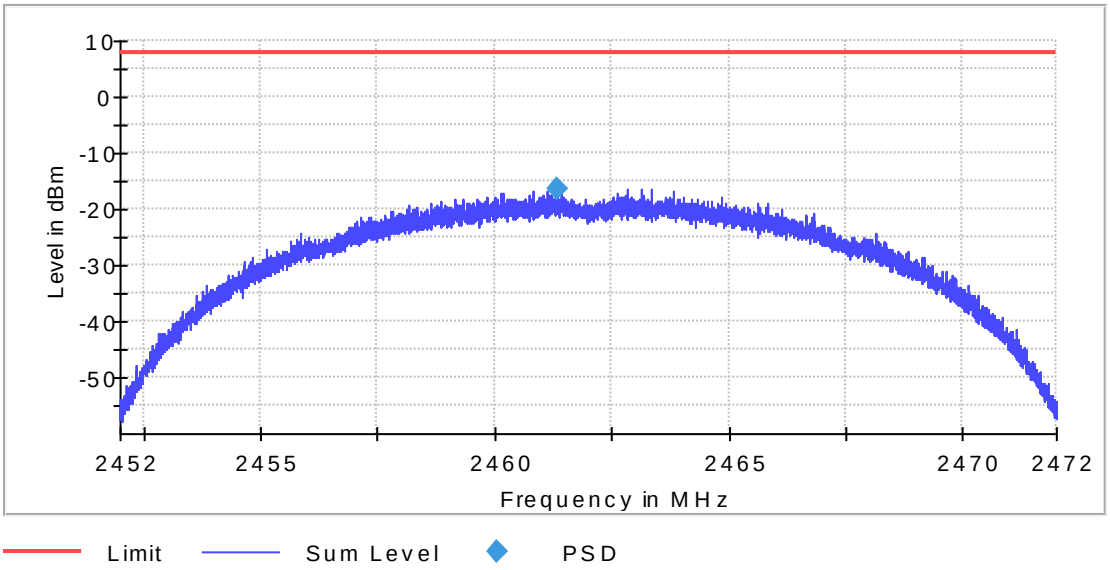


Power Spectral Density -WLAN2.4GHz-b Mode-11Mbit-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.42700 GHz	2.42700 GHz
Stop Frequency	2.44700 GHz	2.44700 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2461.335338	-16.367	8.0	PASS



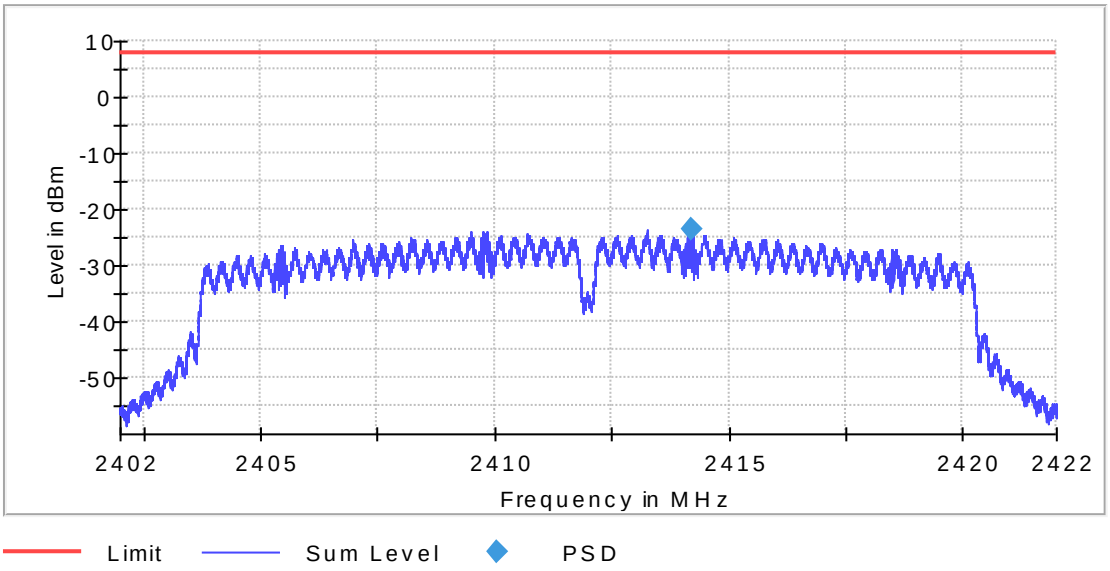
Power Spectral Density -WLAN2.4GHz-b Mode-11Mbit-CH11-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.45200 GHz	2.45200 GHz
Stop Frequency	2.47200 GHz	2.47200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

1.4.2. Power Spectral Density - WLAN2.4GHz-g Mode-12Mbit

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.218045	-23.662	8.0	PASS

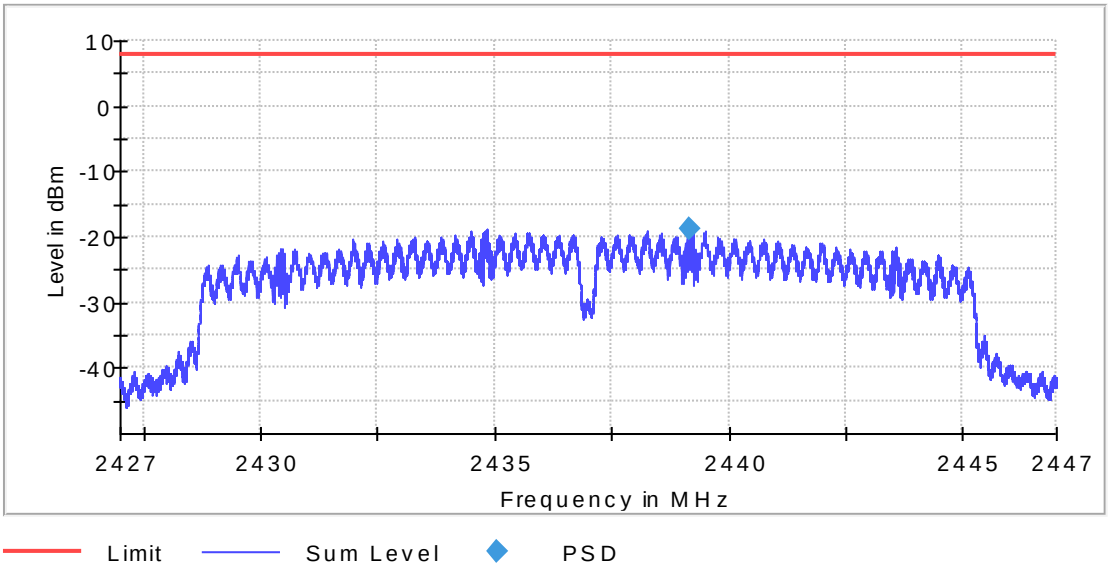


Power Spectral Density -WLAN2.4GHz-g Mode-12Mbit-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40200 GHz	2.40200 GHz
Stop Frequency	2.42200 GHz	2.42200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.166917	-18.699	8.0	PASS

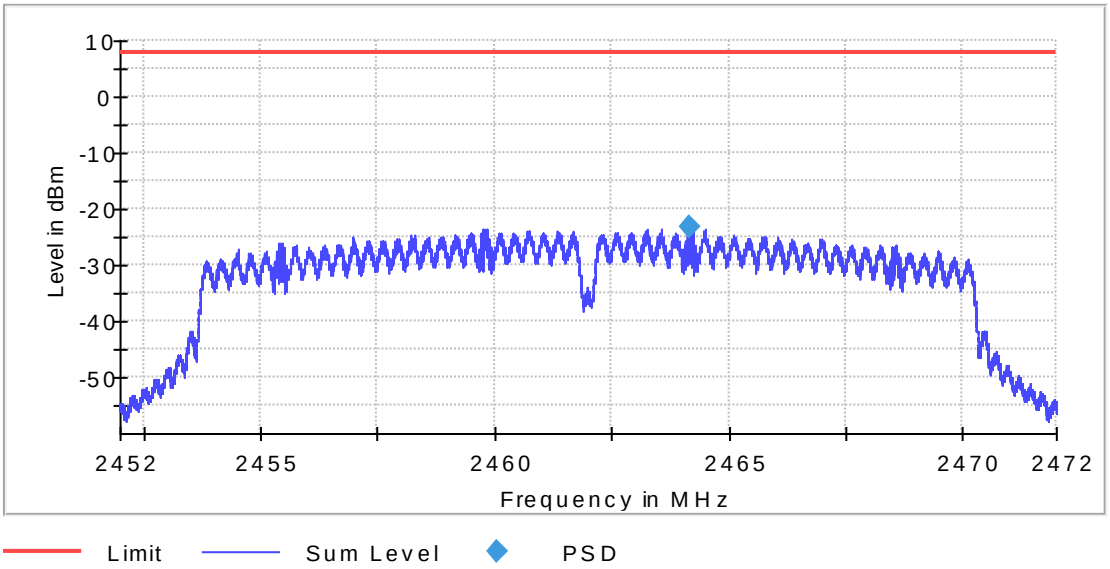


Power Spectral Density -WLAN2.4GHz-g Mode-12Mbit-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.42700 GHz	2.42700 GHz
Stop Frequency	2.44700 GHz	2.44700 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.166917	-23.171	8.0	PASS



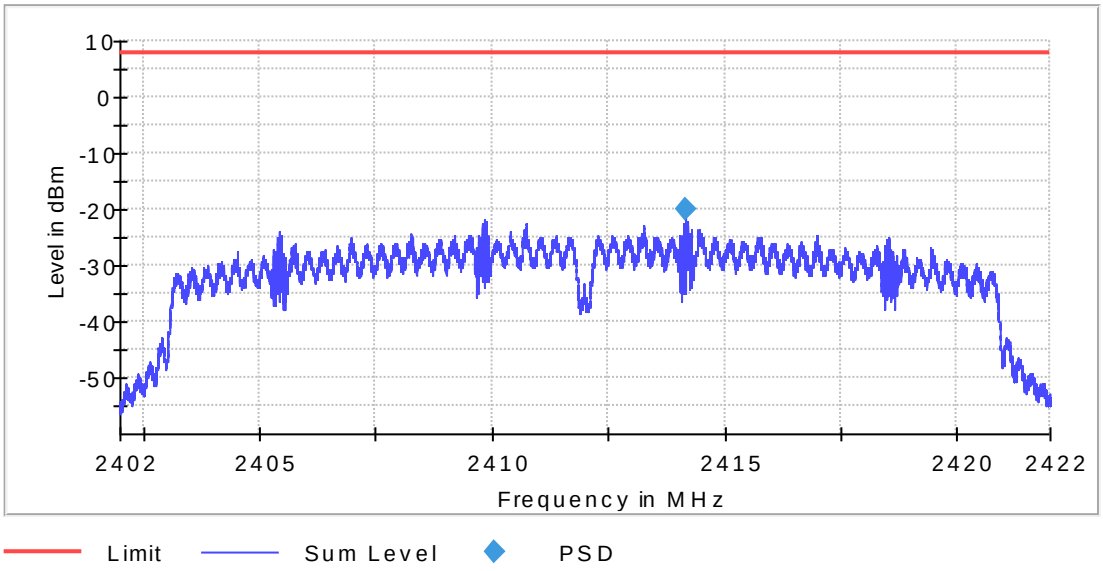
Power Spectral Density -WLAN2.4GHz-g Mode-12Mbit-CH11-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.45200 GHz	2.45200 GHz
Stop Frequency	2.47200 GHz	2.47200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

1.4.3. Power Spectral Density - WLAN2.4GHz-n(HT20) Mode-MCS2

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.178947	-19.944	8.0	PASS

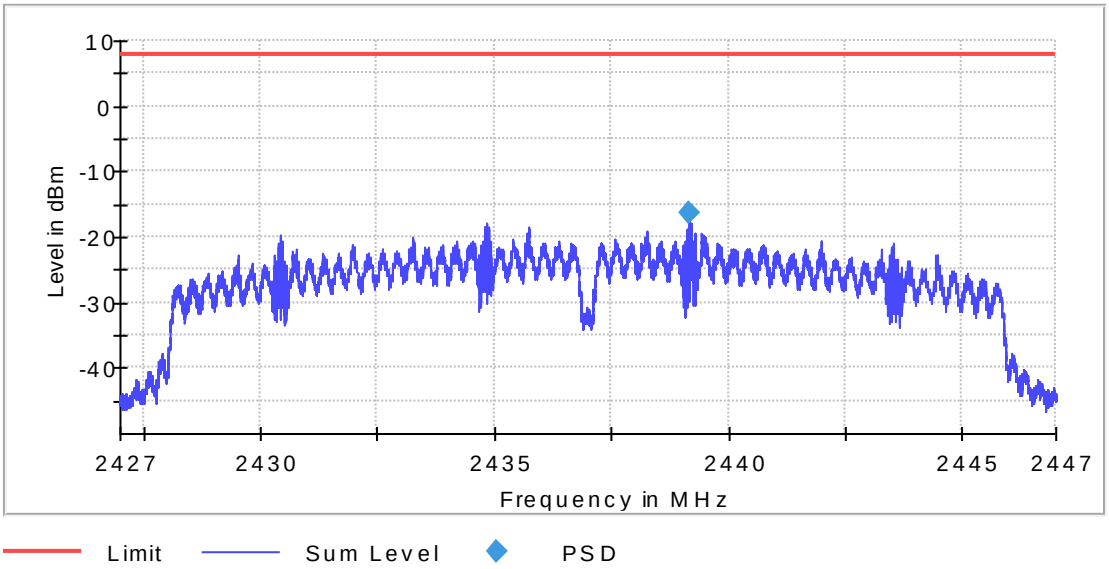


Power Spectral Density -WLAN2.4GHz- n(HT20) Mode-MCS2-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40200 GHz	2.40200 GHz
Stop Frequency	2.42200 GHz	2.42200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.178947	-16.335	8.0	PASS

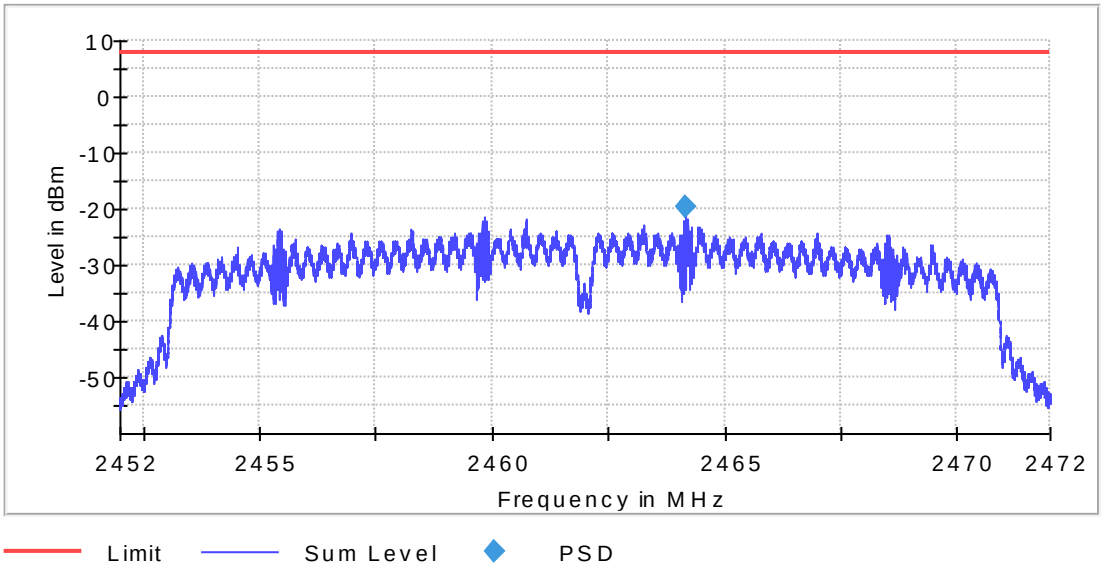


Power Spectral Density -WLAN2.4GHz-- n(HT20) Mode-MCS2-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.42700 GHz	2.42700 GHz
Stop Frequency	2.44700 GHz	2.44700 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.178947	-19.741	8.0	PASS



Power Spectral Density -WLAN2.4GHz-- n(HT20) Mode-MCS2-CH11-20dBm

Measurement

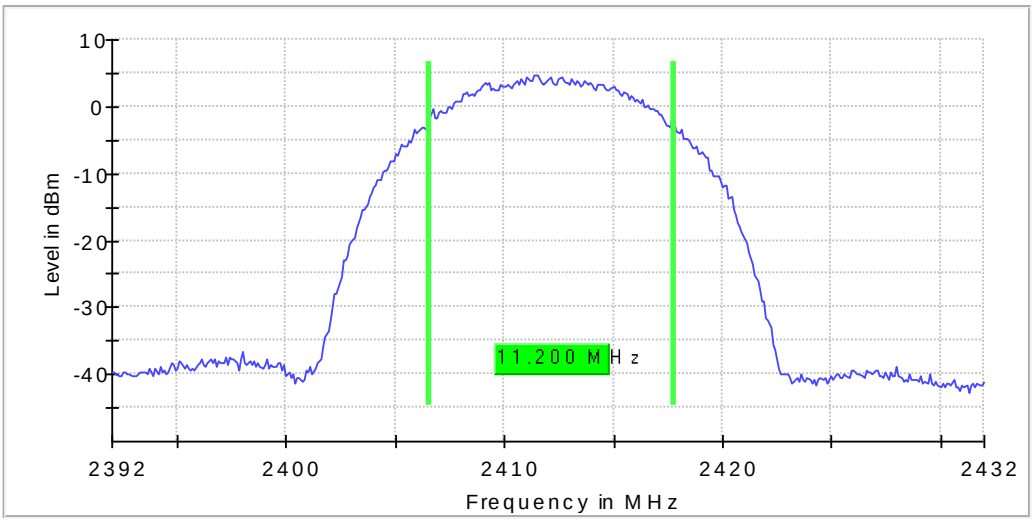
Setting	Instrument Value	Target Value
Start Frequency	2.45200 GHz	2.45200 GHz
Stop Frequency	2.47200 GHz	2.47200 GHz
Span	20.000 MHz	20.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	13301	~ 13333
Sweeptime	450.000 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	RMS	RMS
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

1.5. 6 dB Bandwidth & 99% Occupied Bandwidth

1.5.1. 6 dB BW & 99% OBW - WLAN2.4GHz-b Mode-11Mbit

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2412.000000	11.200000	0.500000	2406.600000	2417.800000	4.7	PASS

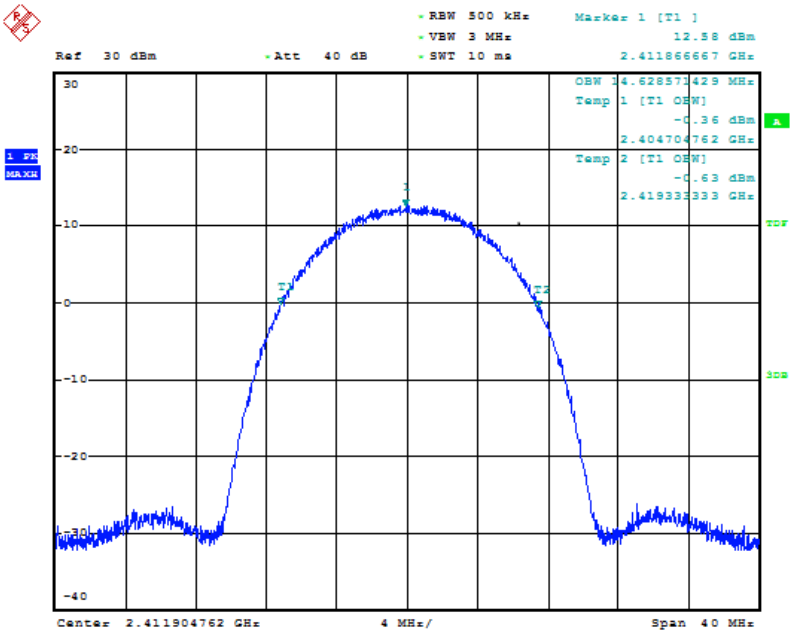


6 dB Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH1-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2412.000000	14.628357	---	---	2.404704	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2412.000000	2.41933	2483.500000	PASS



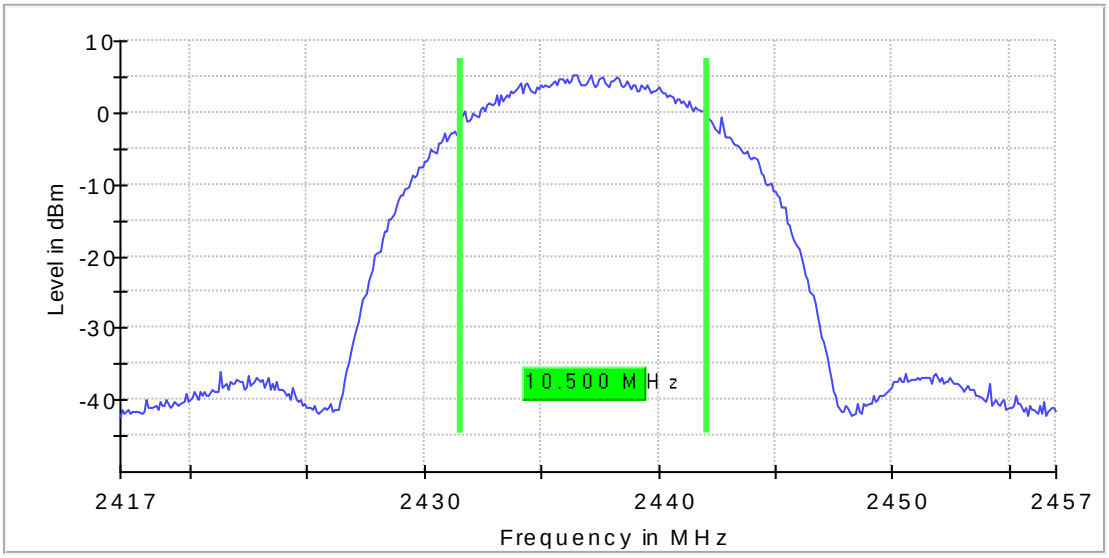
99% Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	79 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.00 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2437.000000	10.500000	0.500000	2431.600000	2442.100000	5.4	PASS

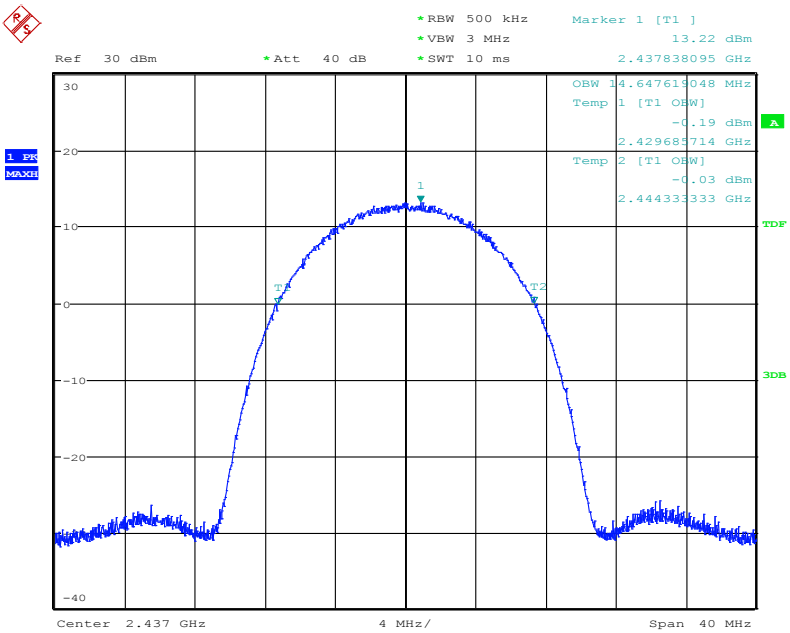


6 dB Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH6-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2437.000000	14.647619	---	---	2429.685714	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2437.000000	2444.333333	2483.500000	PASS



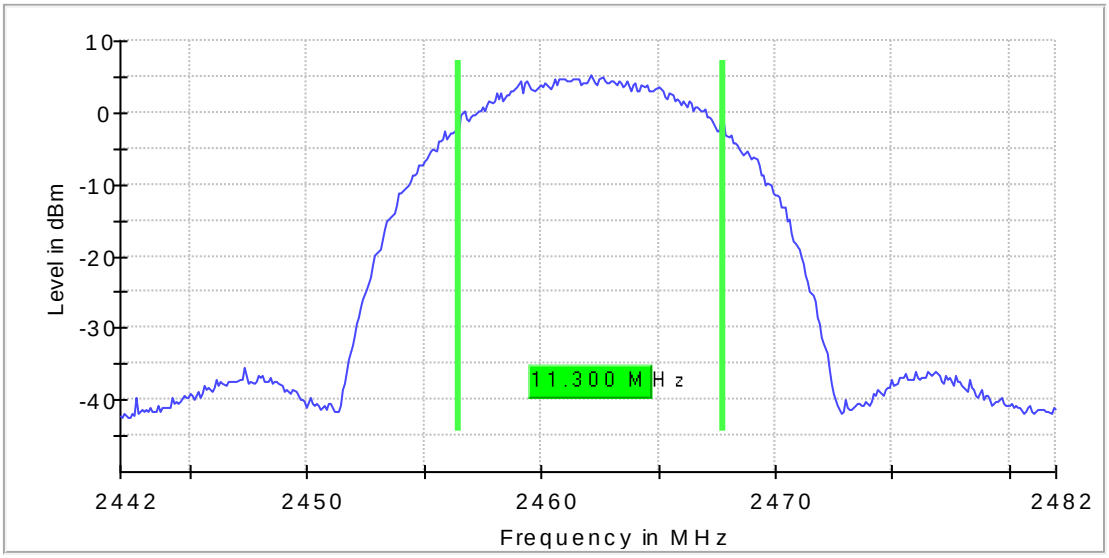
99% Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	66 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.02 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	11.300000	0.500000	2456.500000	2467.800000	5.2	PASS

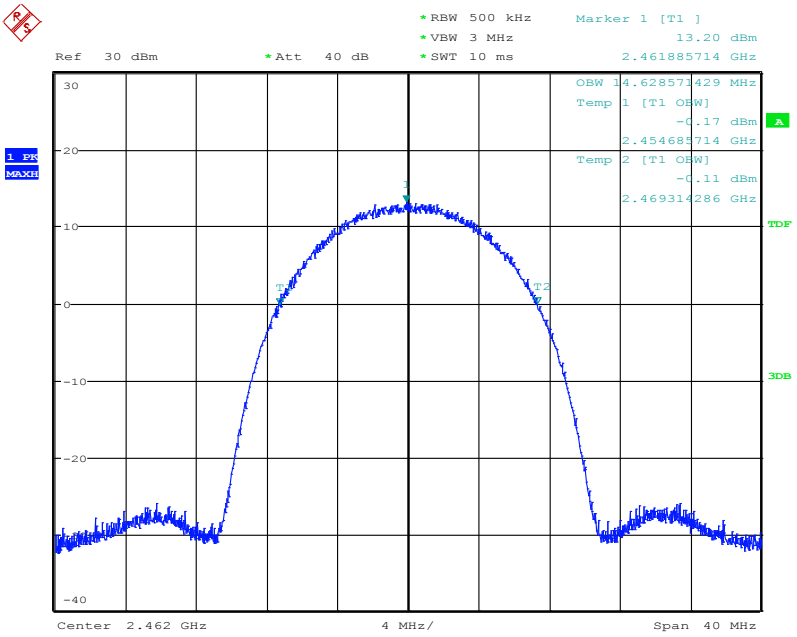


6 dB Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH11-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2462.000000	14.628571	---	---	2454.685714	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2462.000000	2469.314286	2483.500000	PASS



99% Bandwidth-WLAN2.4GHz-b Mode-11Mbit-CH11-20dBm

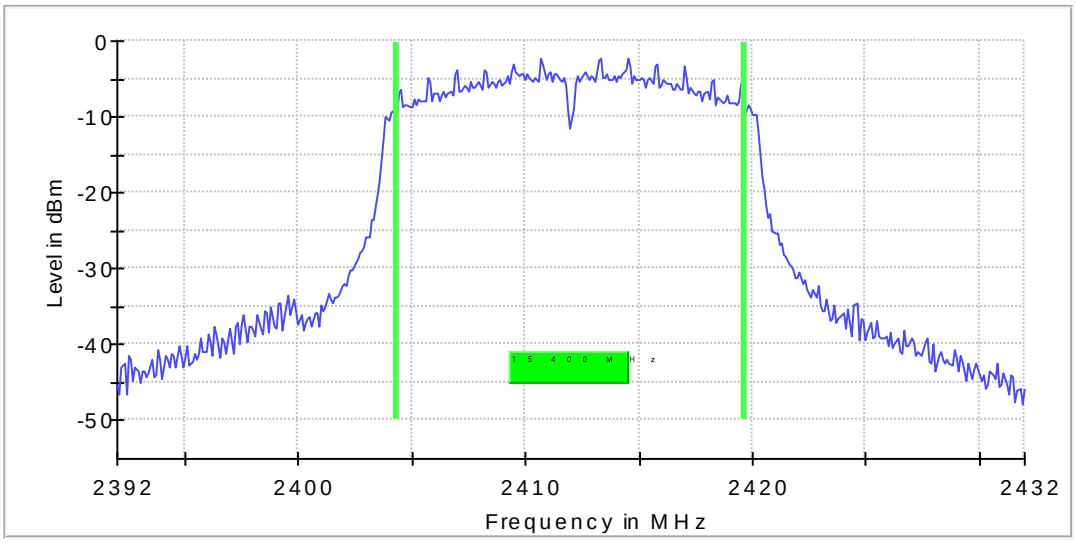
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	52 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.00 dB	0.50 dB

1.5.2. 6 dB BW & 99% OBW - WLAN2.4GHz-g Mode-12Mbit

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2412.000000	15.400000	0.500000	2404.300000	2419.700000	-2.2	PASS

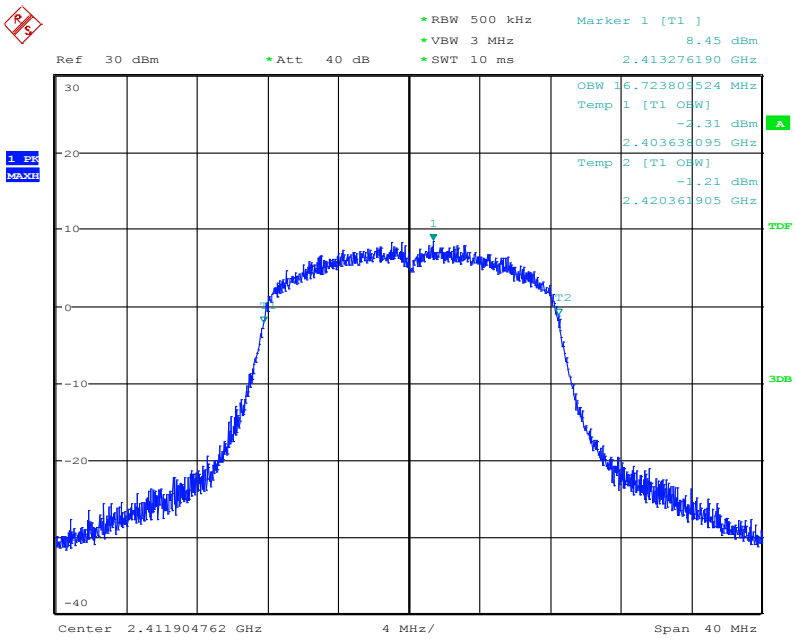


6 dB Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH1-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2412.000000	16.7238095	---	---	2403.638095	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2412.000000	2420.361905	2483.500000	PASS



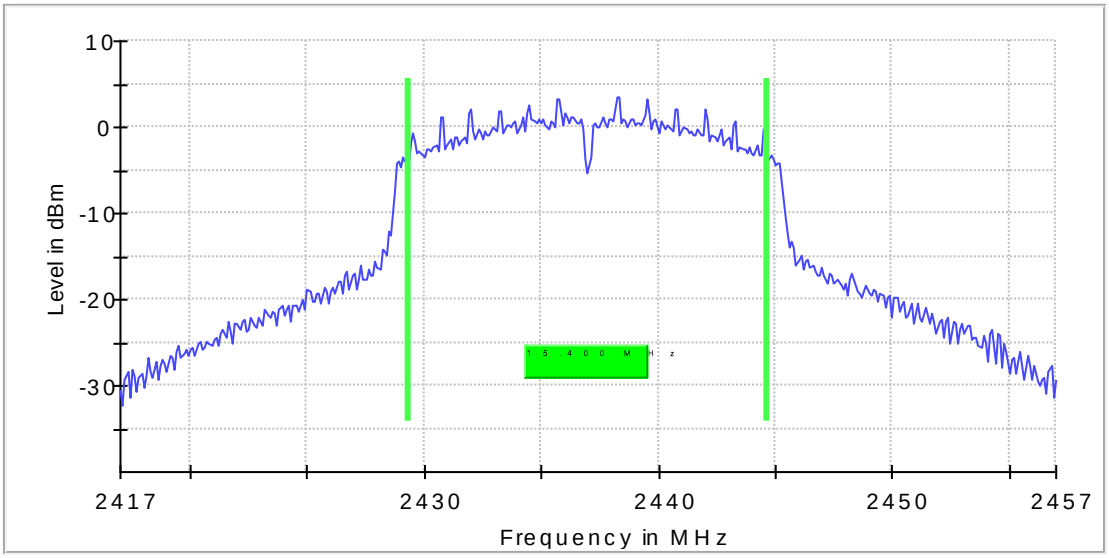
99% Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	53 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.38 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2437.000000	15.400000	0.500000	2429.300000	2444.700000	3.6	PASS



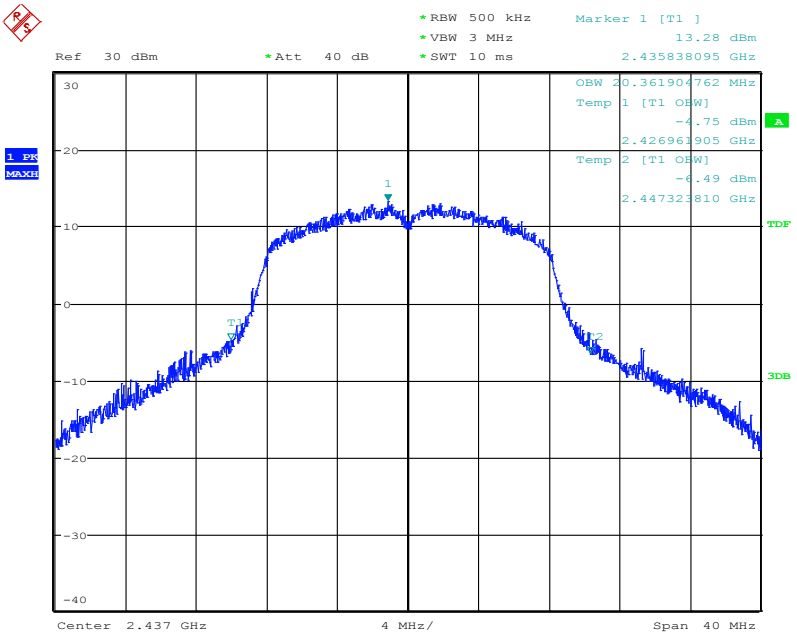
6 dB Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH6-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2437.000000	20.361904	---	---	2426.963905	2400.000000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2437.000000	2447.323810	2483.500000	PASS



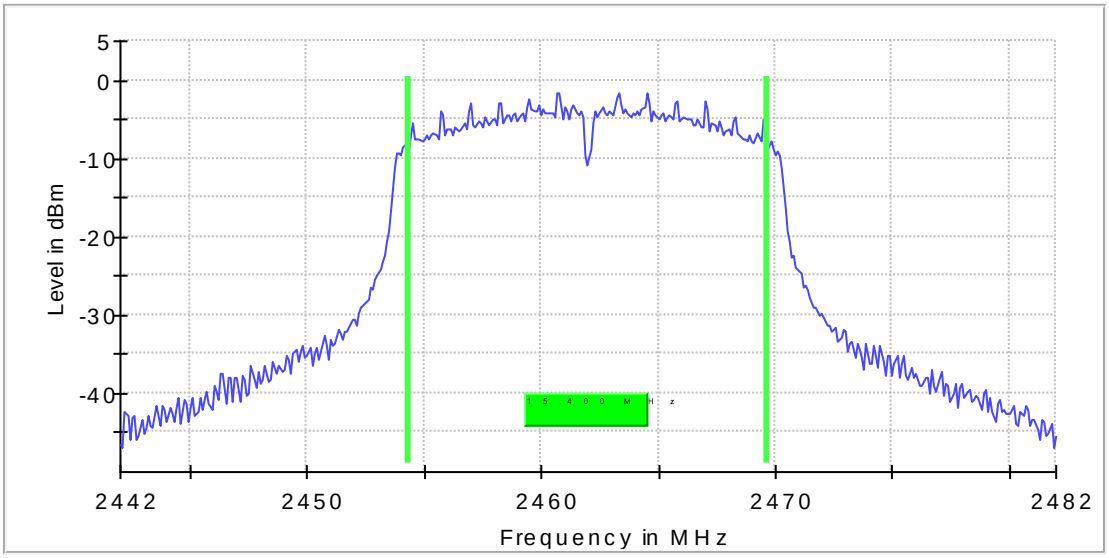
99% Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	103 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.00 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	15.400000	0.500000	2454.300000	2469.700000	-1.6	PASS

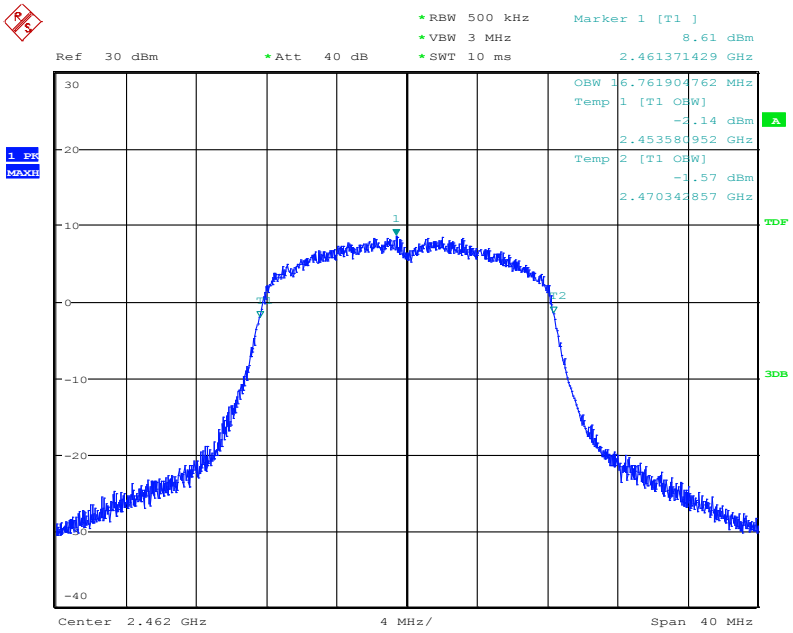


6 dB Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH11-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2462.000000	16.7619047	---	---	2453.580952	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2462.000000	2470.342857	2483.500000	PASS



99% Bandwidth-WLAN2.4GHz-g Mode-12Mbit-CH11-20dBm

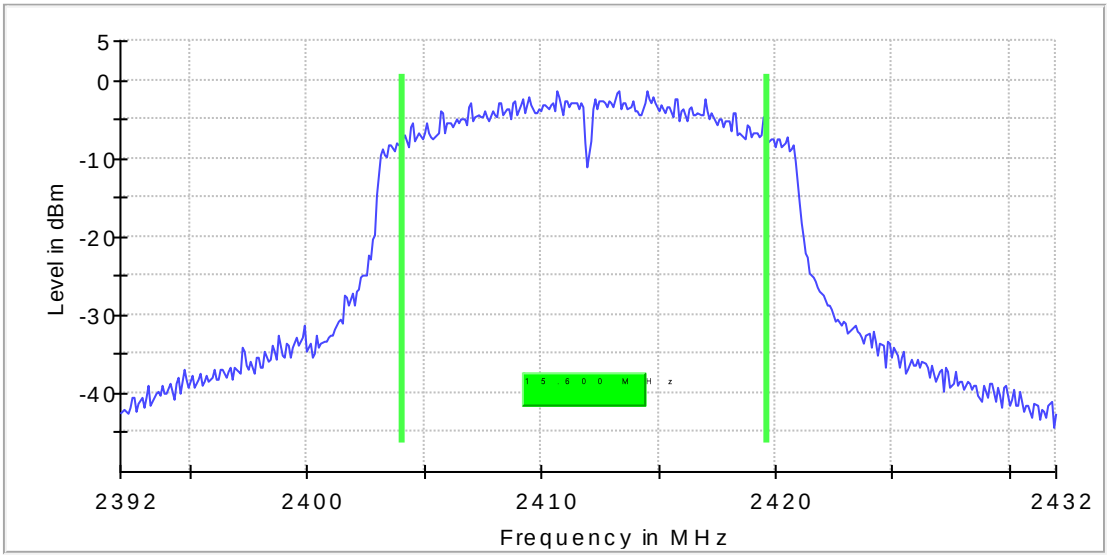
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	70 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.18 dB	0.50 dB

1.5.3. 6 dB BW & 99% OBW - WLAN2.4GHz-n(HT20) Mode-MCS2

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2412.000000	15.600000	0.500000	2404.100000	2419.700000	-1.3	PASS

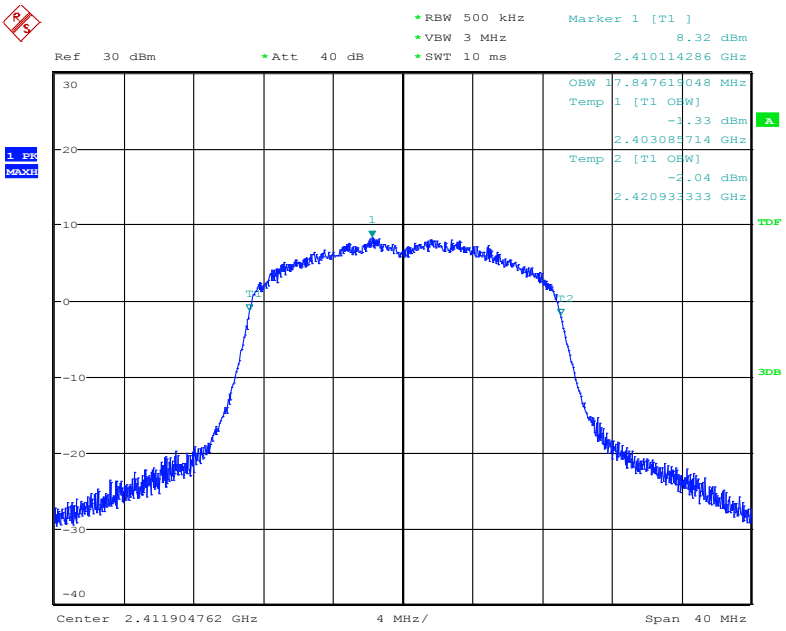


6 dB Bandwidth-WLAN2.4GHz- n(HT20) Mode-MCS2-CH1-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2412.000000	17.847619	---	---	2403.085714	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2412.000000	2420.933333	2483.500000	PASS



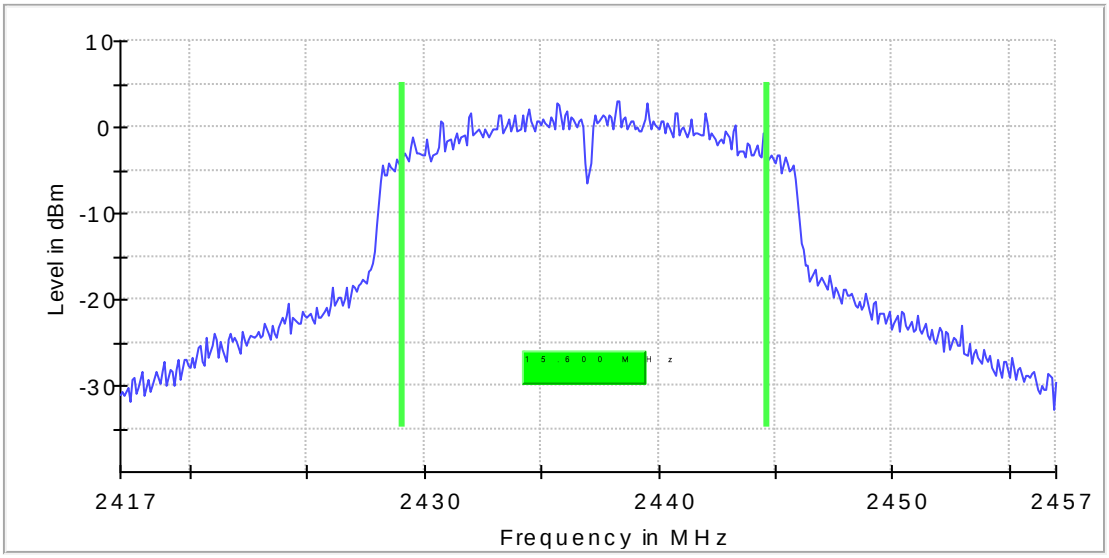
99% Bandwidth-WLAN2.4GHz- n(HT20) Mode-MCS2-CH1-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	106 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.05 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2437.000000	15.600000	0.500000	2429.100000	2444.700000	3.0	PASS

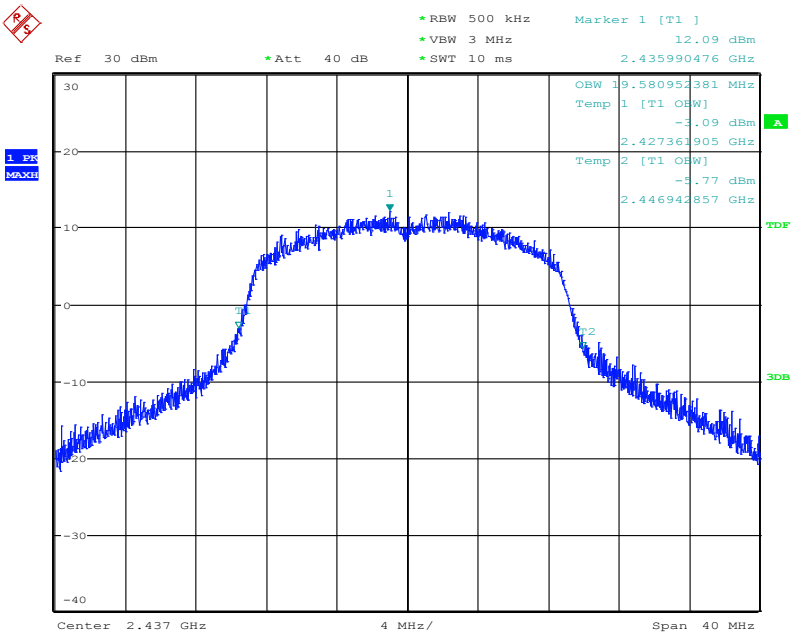


6 dB Bandwidth-WLAN2.4GHz- n(HT20) Mode-MCS2-CH6-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2437.00000	19.5809523	--	--	2427.361905	2400.00000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2437.00000	2446.942857	2483.500000	Pass



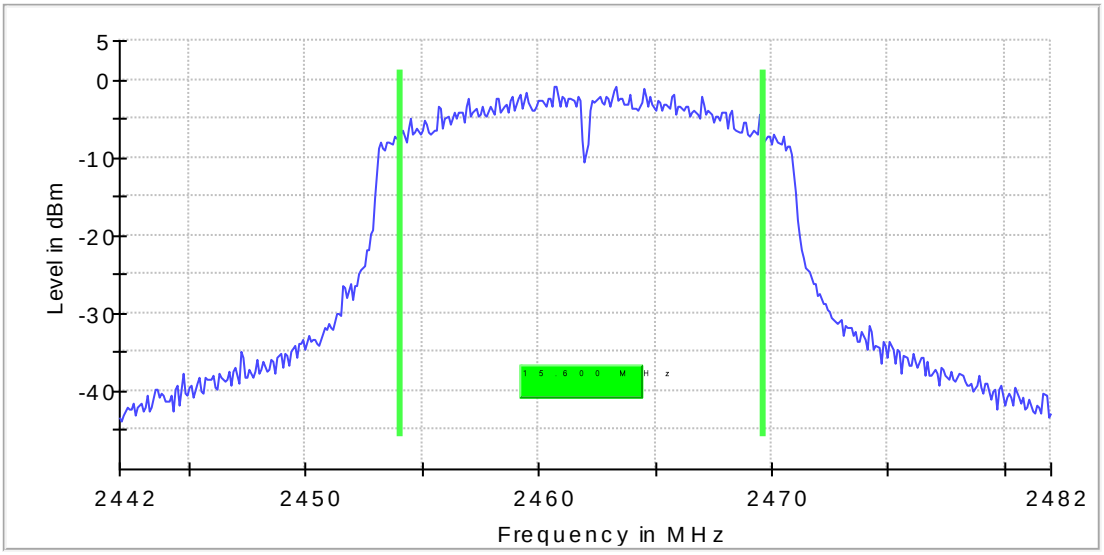
99% Bandwidth-WLAN2.4GHz- n(HT20) Mode-MCS2-CH6-20dBm

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	59 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.21 dB	0.50 dB

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	15.600000	0.500000	2454.100000	2469.700000	-0.9	PASS

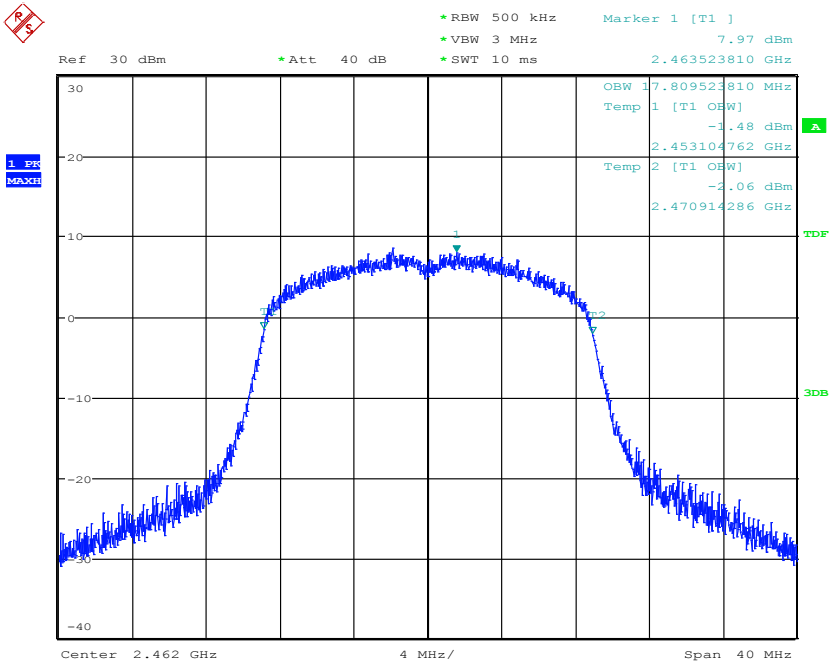


6 dB Bandwidth-WLAN2.4GHz- n(HT20) Mode-MCS2-CH11-20dBm

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)
2462.000000	17.80952318	---	---	2453.104762	2400.000000

DUT Frequency (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Result
2462.000000	2470.914286	2483.500000	PASS



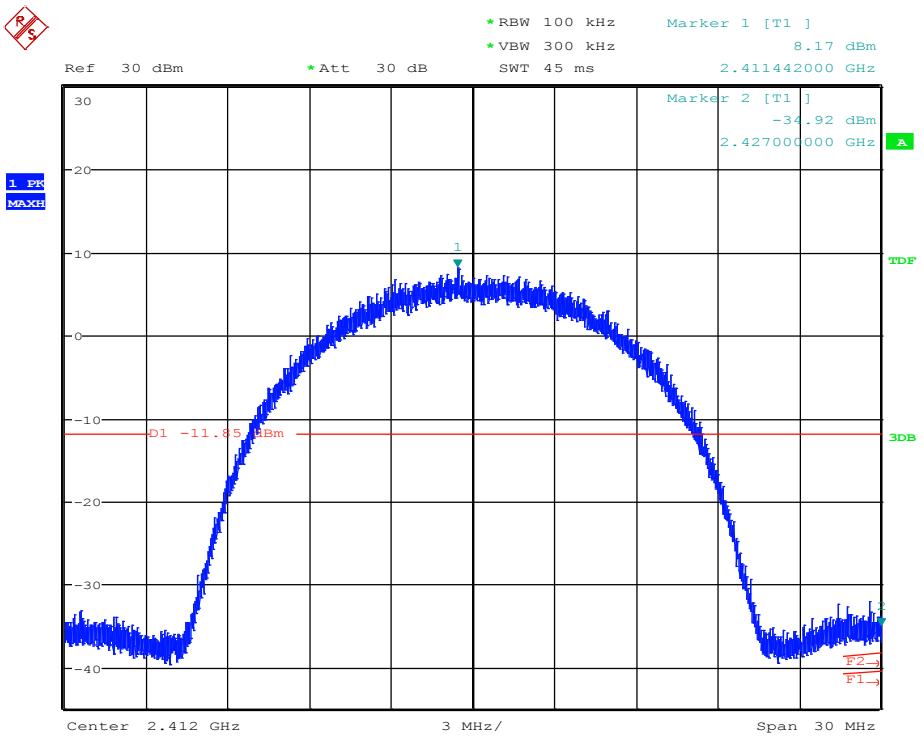
99% Bandwidth-WLAN2.4GHz-n(HT20) Mode-MCS2-CH11-20dBm

Measurement

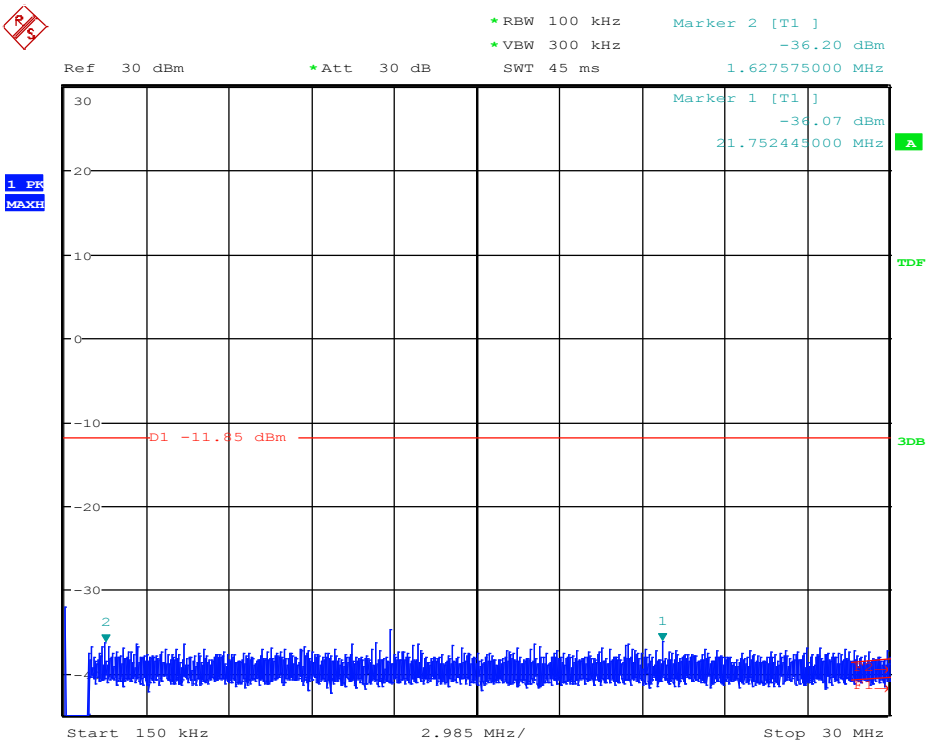
Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	401	~ 400
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	105 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.01 dB	0.50 dB

1.6. 20 dBc Conducted Spurious Emissions

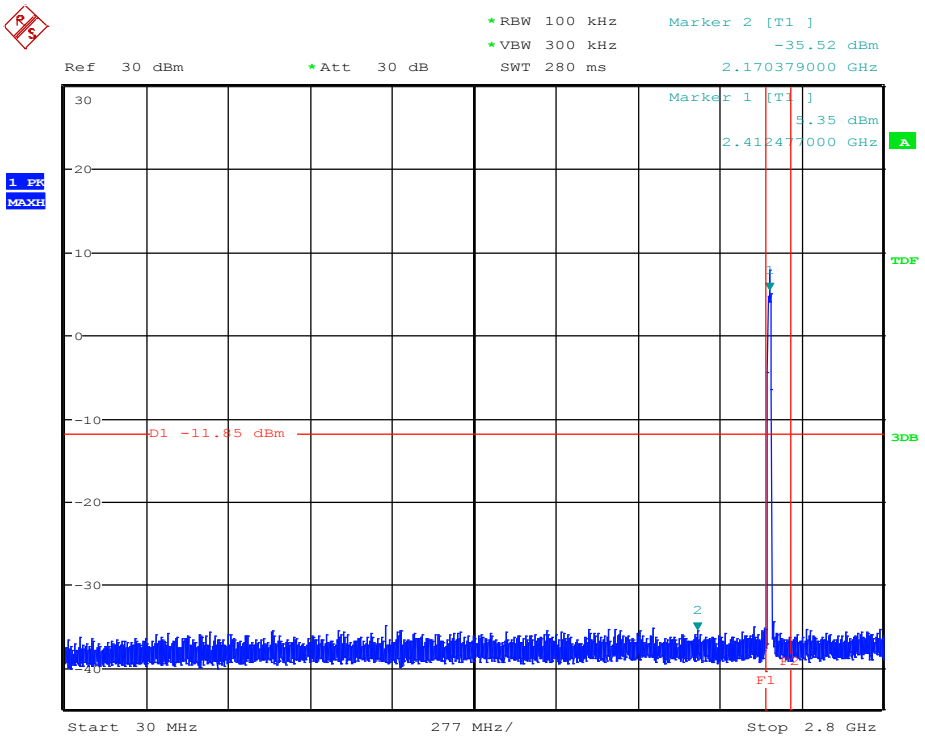
1.6.1. 20 dBc - WLAN2.4GHz-b Mode-11Mbit



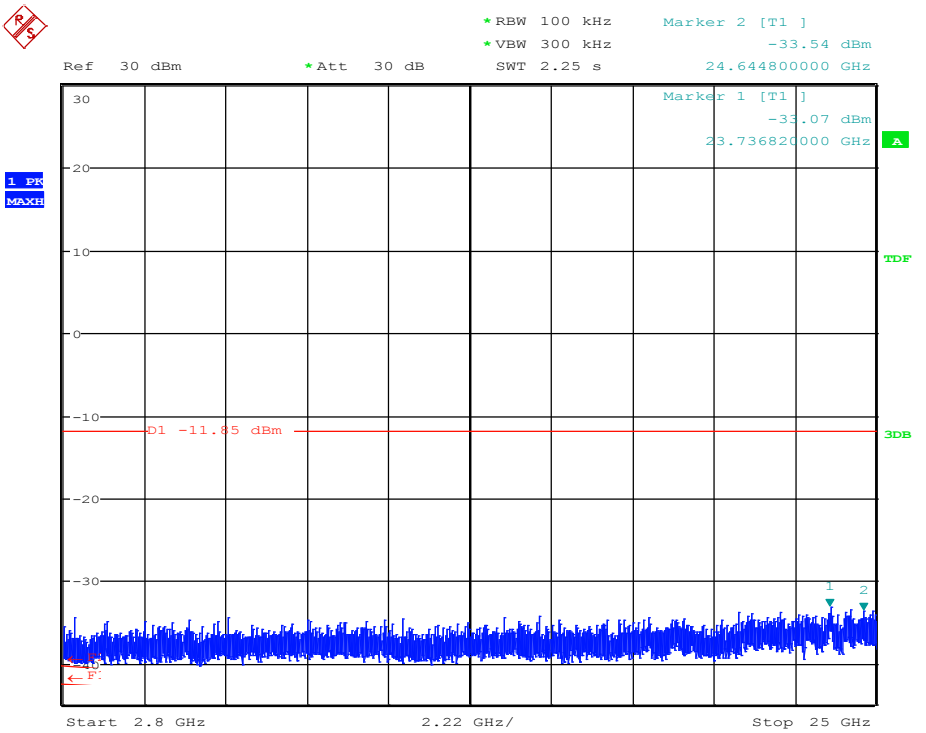
WLAN2.4GHz-b Mode-11MBit-20dBc-Ref-CH1-20dBm



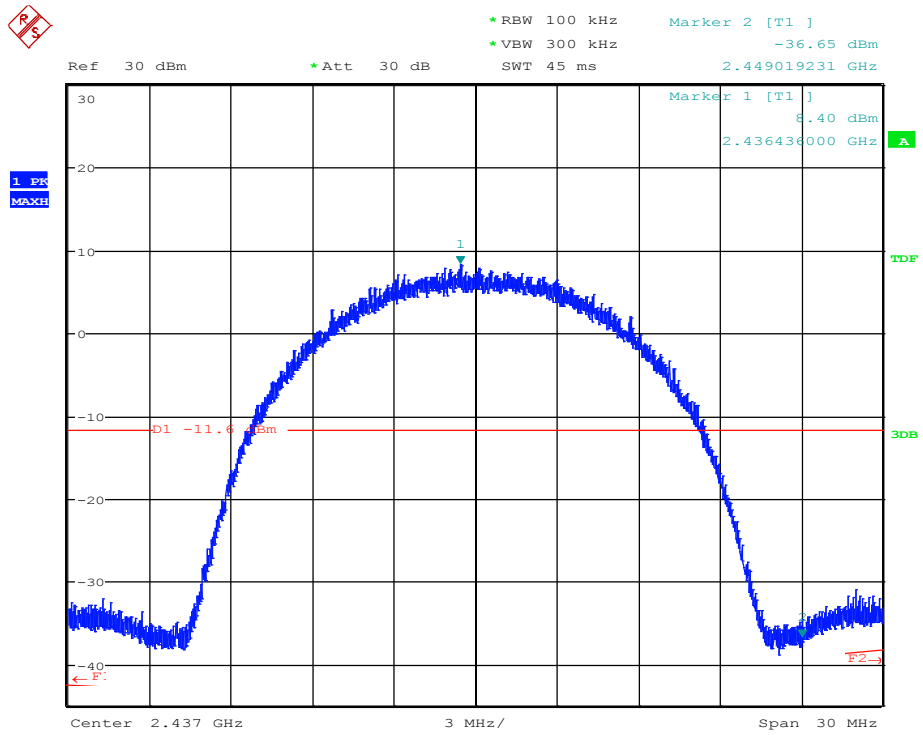
WLAN2.4GHz-b Mode-11MBit-20dBc-0.15 MHz-30MHz-CH1-20dBm



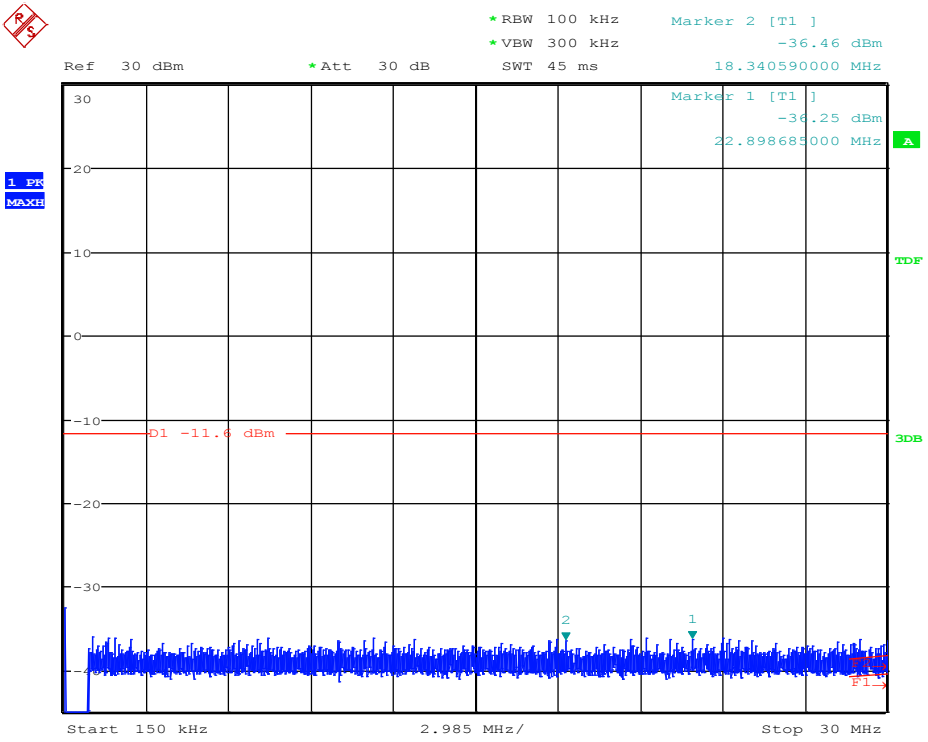
WLAN2.4GHz-b Mode-11MBit-20dBc-30 MHz-2.8GHz-CH1-20dBm



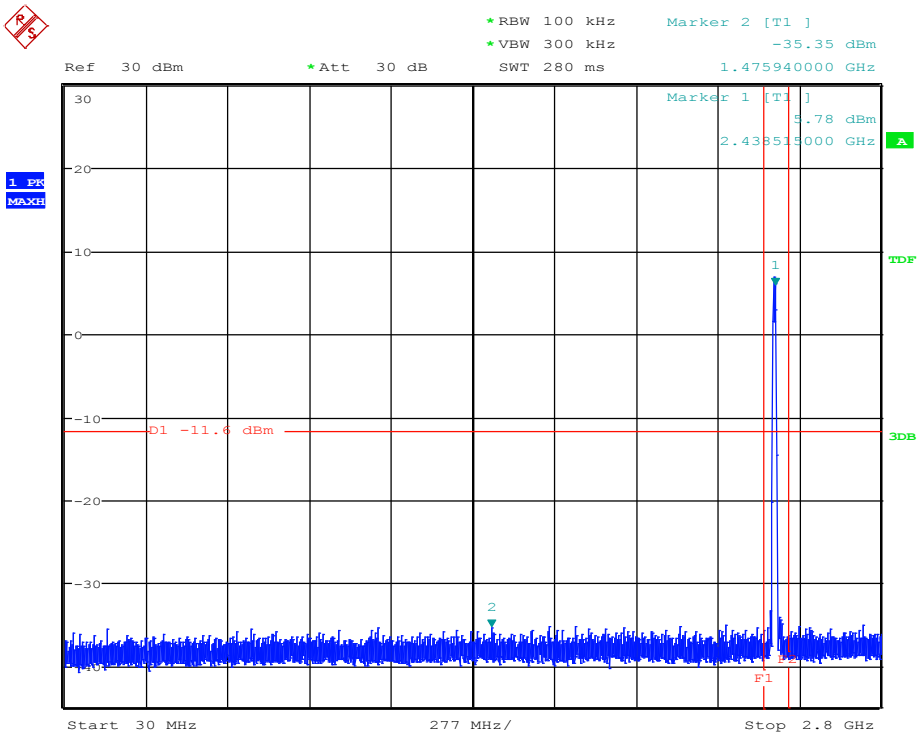
WLAN2.4GHz-b Mode-11MBit-20dBc-2.8GHz-25GHz-CH1-20dBm



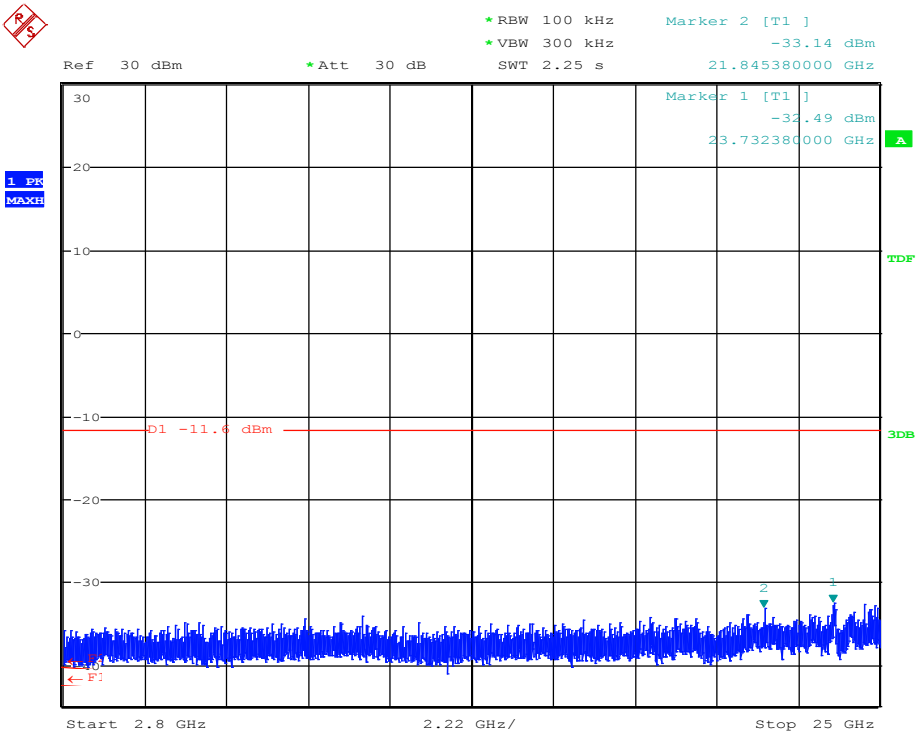
WLAN2.4GHz-b Mode-11MBit-20dBc-Ref-CH6-20dBm



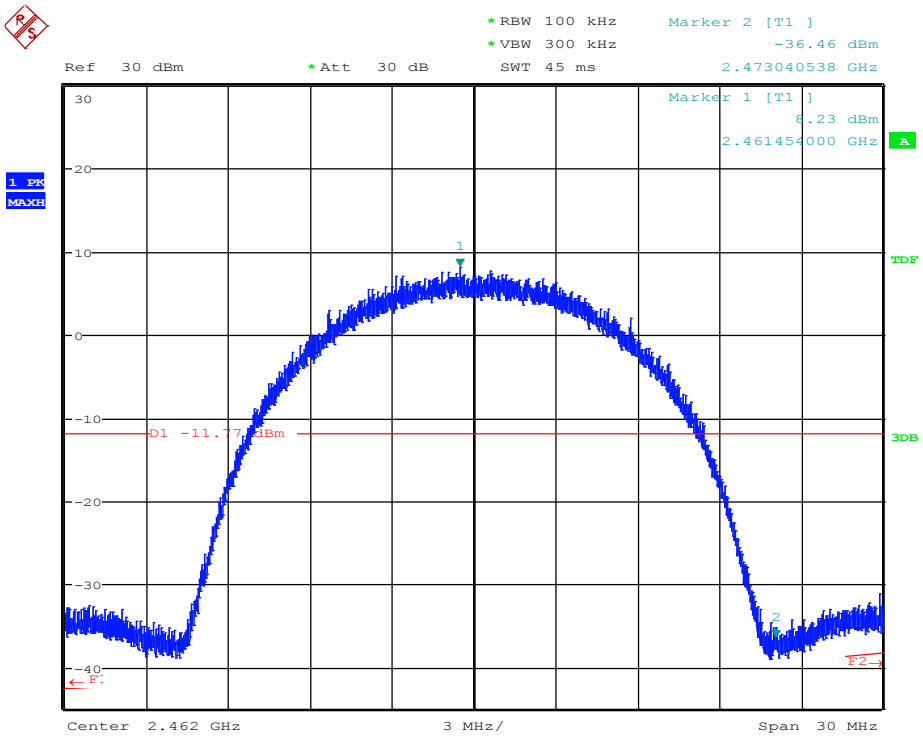
WLAN2.4GHz-b Mode-11MBit-20dBc-0.15 MHz-30MHz-CH6-20dBm



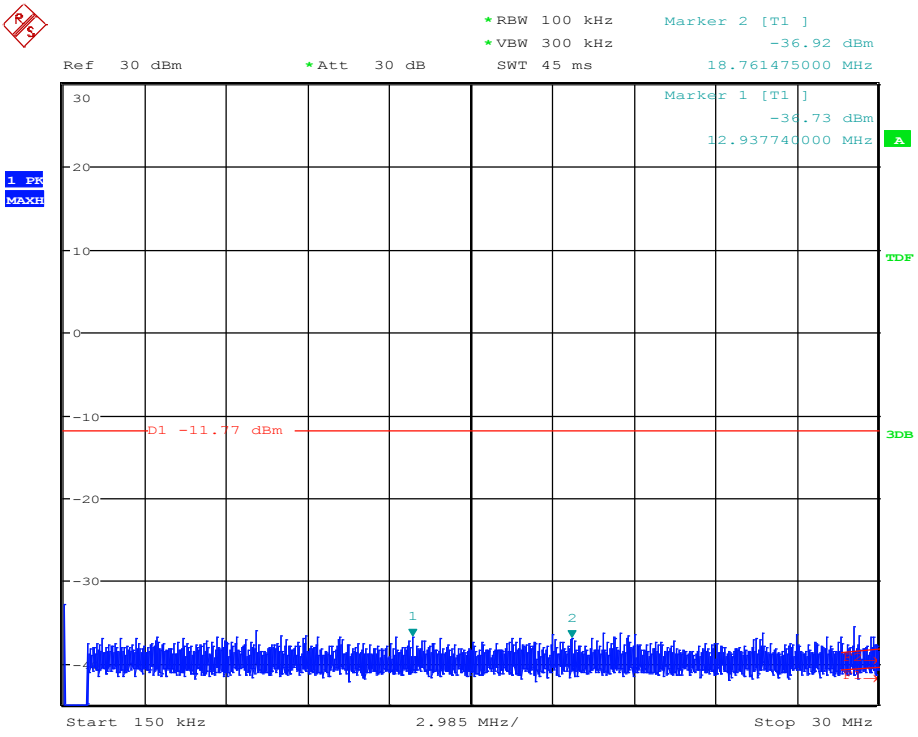
WLAN2.4GHz-b Mode-11MBit-20dBc-30 MHz-2.8GHz-CH6-20dBm



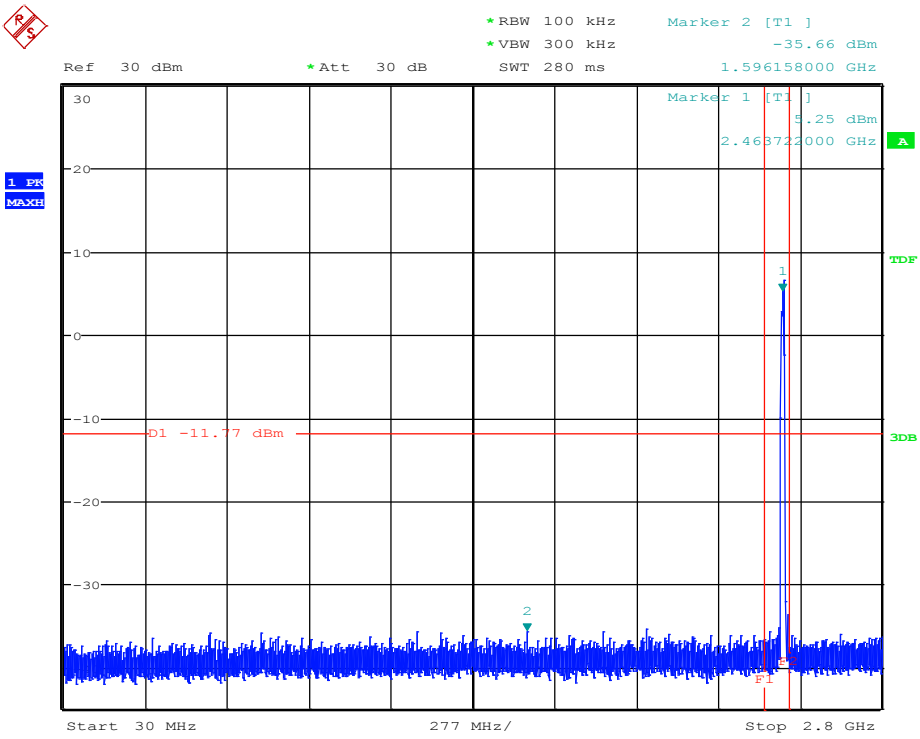
WLAN2.4GHz-b Mode-11MBit-20dBc-2.8GHz-25GHz-CH6-20dBm



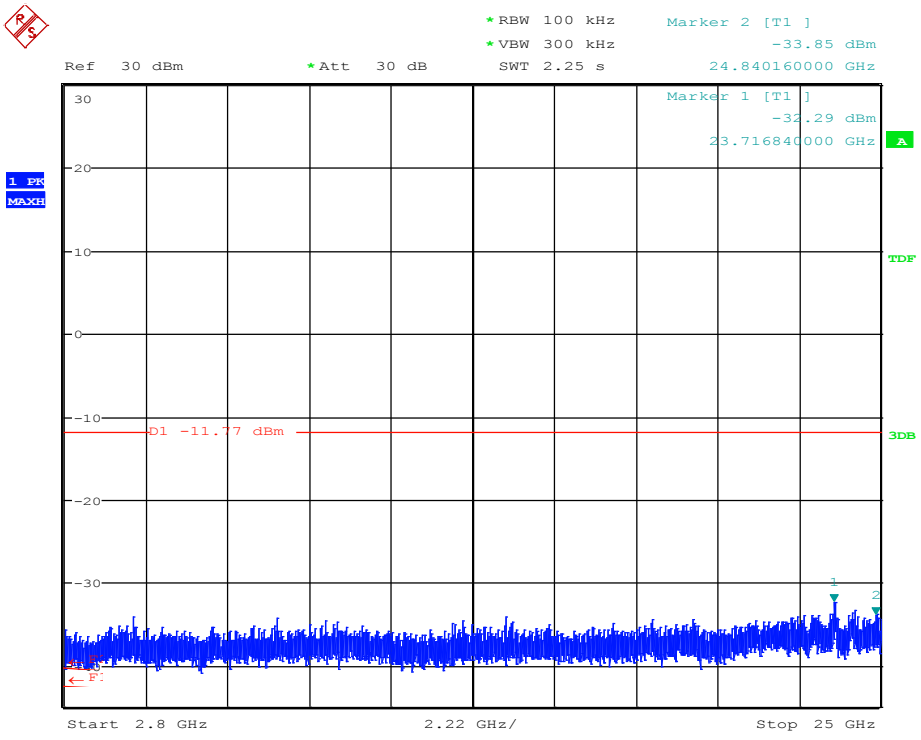
WLAN2.4GHz-b Mode-11MBit-20dBc-Ref-CH11-20dBm



WLAN2.4GHz-b Mode-11MBit-20dBc-0.15 MHz-30MHz-CH11-20dBm

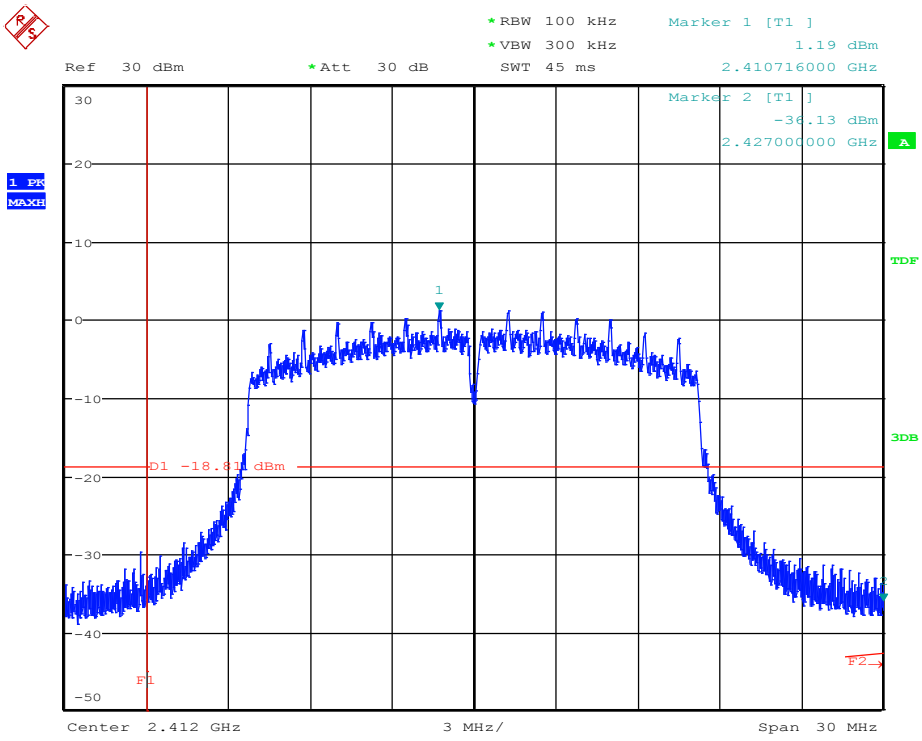


WLAN2.4GHz-b Mode-11MBit-20dBc-30 MHz-2.8GHz-CH11-20dBm

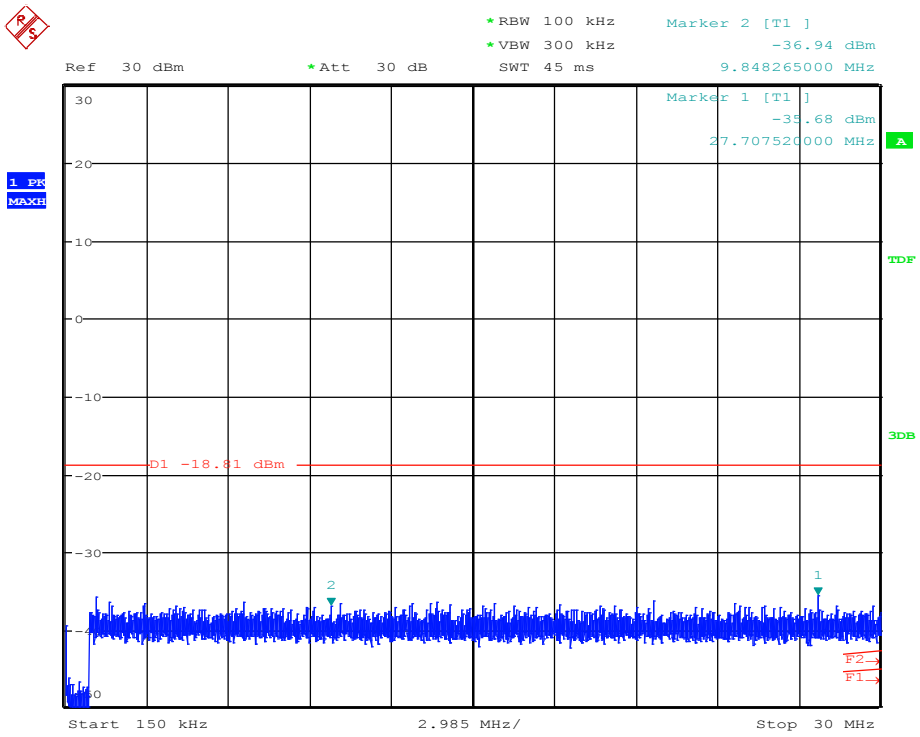


WLAN2.4GHz-b Mode-11MBit-20dBc-2.8GHz-25GHz-CH11-20dBm

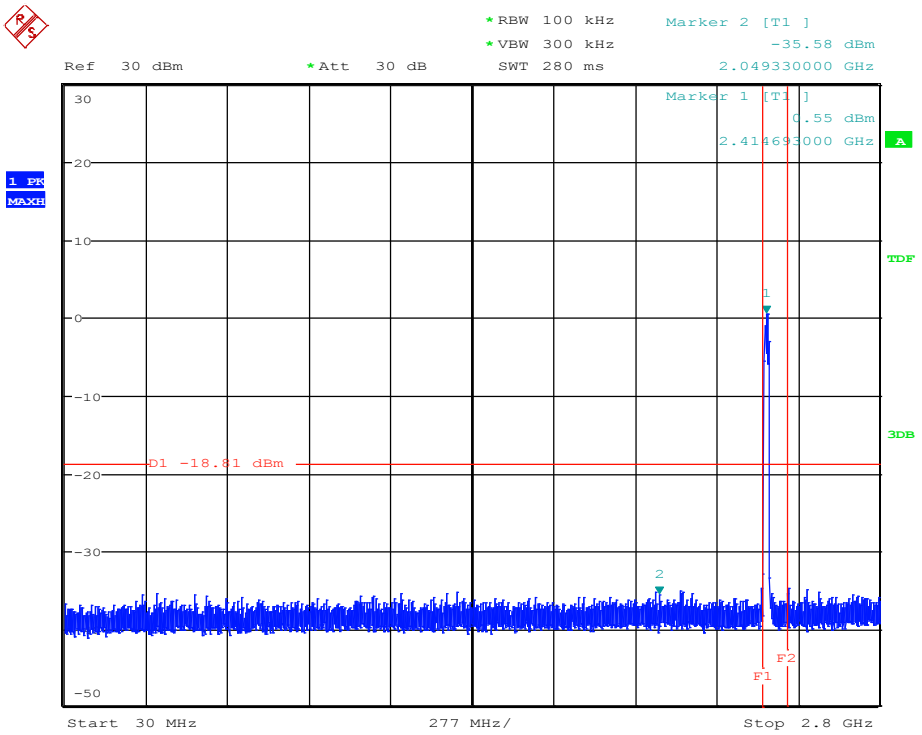
1.6.2. 20 dBc - WLAN2.4GHz-g Mode-12Mbit



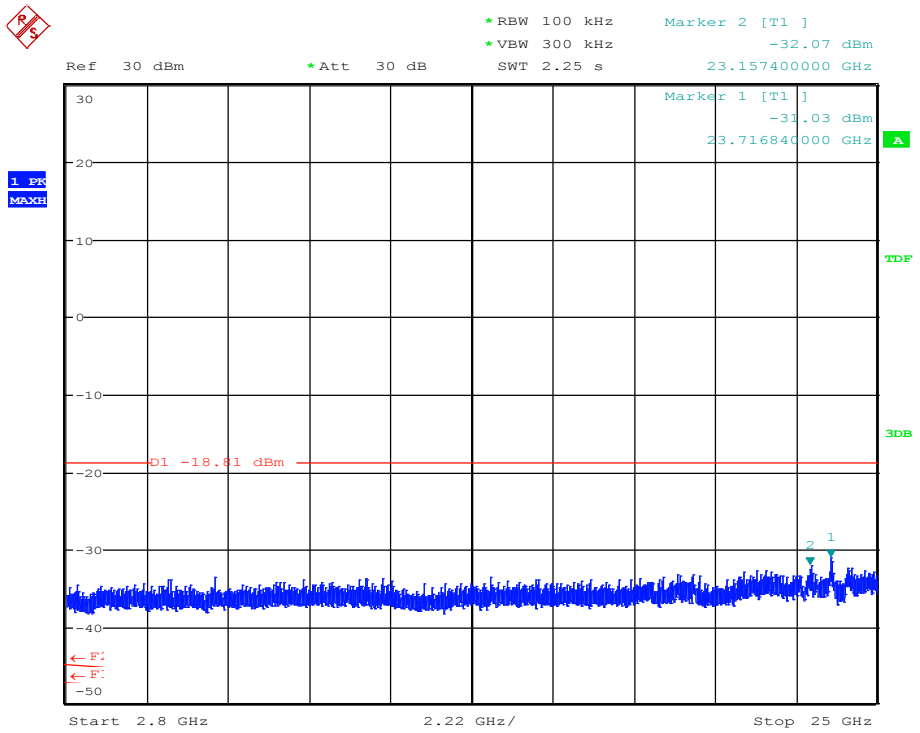
WLAN2.4GHz-g Mode-12MBit-20dBc-Ref-CH1-20dBm



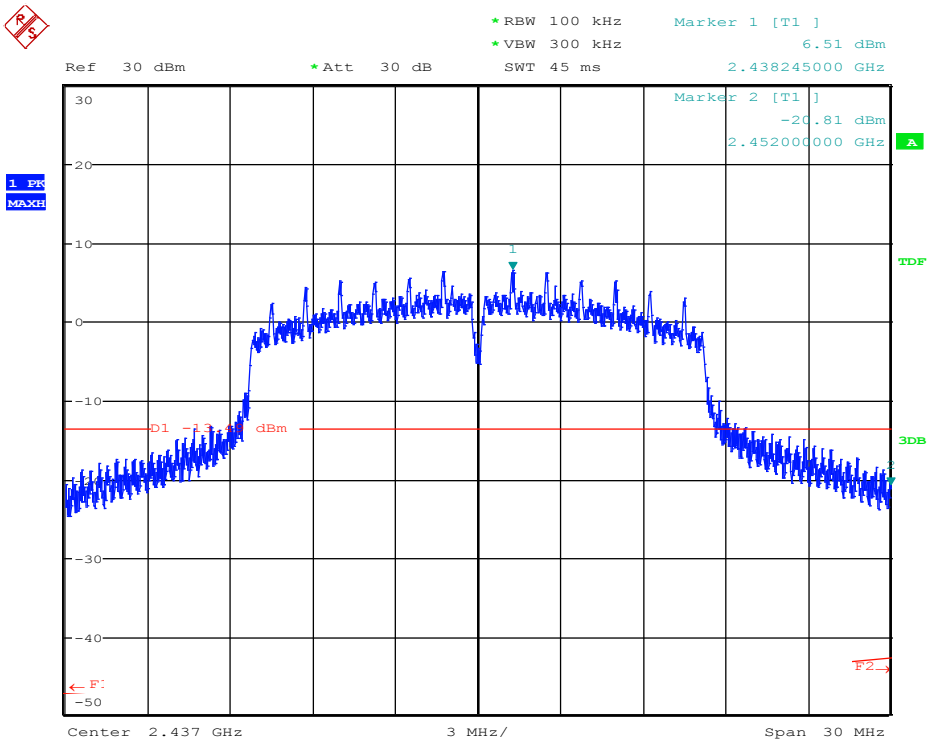
WLAN2.4GHz-g Mode-12MBit-20dBc-0.15 MHz-30MHz-CH1-20dBm



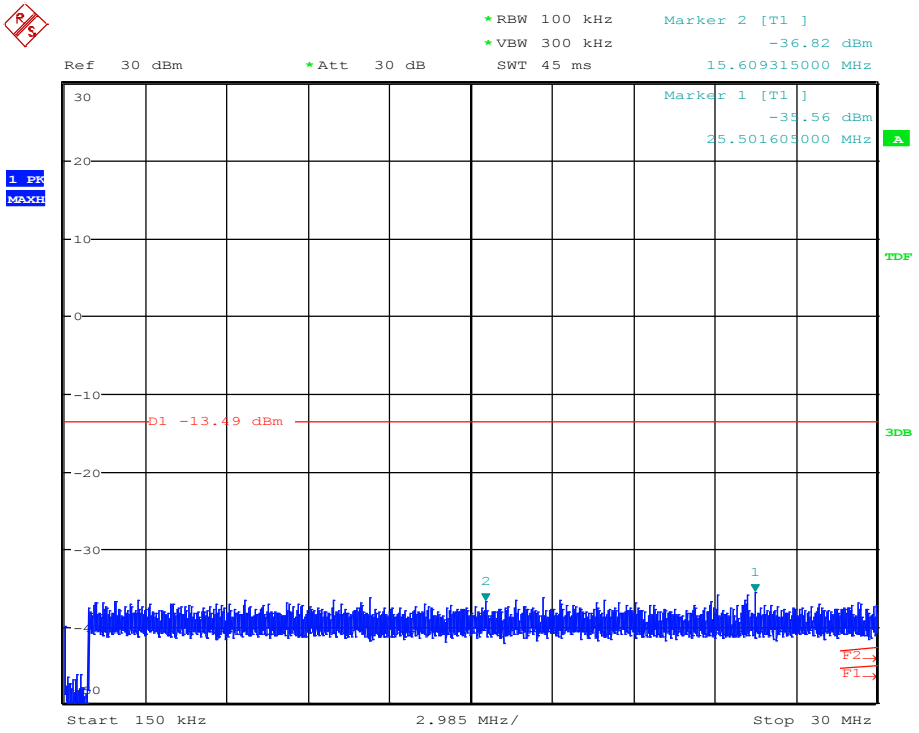
WLAN2.4GHz-g Mode-12MBit-20dBc-30 MHz-2.8GHz-CH1-20dBm



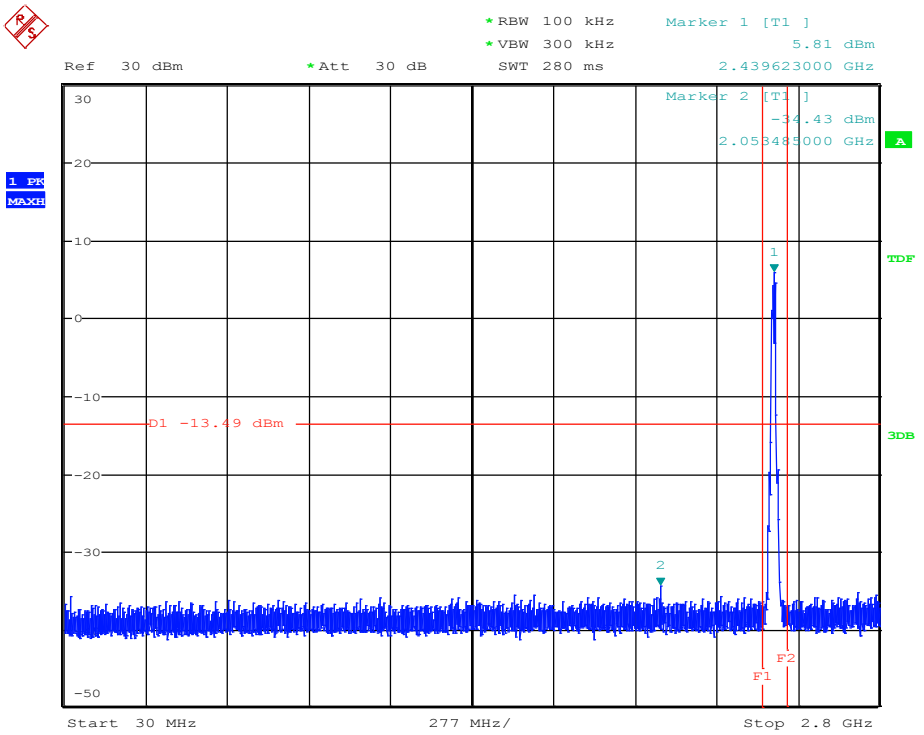
WLAN2.4GHz-g Mode-12MBit-20dBc-2.8GHz-25GHz-CH1-20dBm



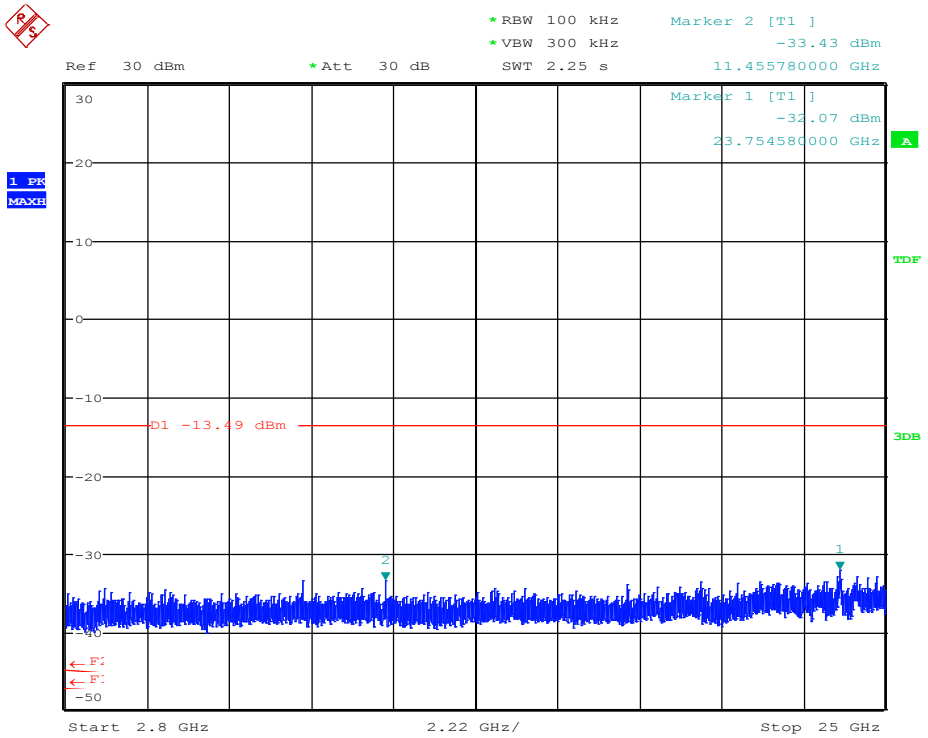
WLAN2.4GHz-g Mode-12MBit-20dBc-Ref-CH6-20dBm



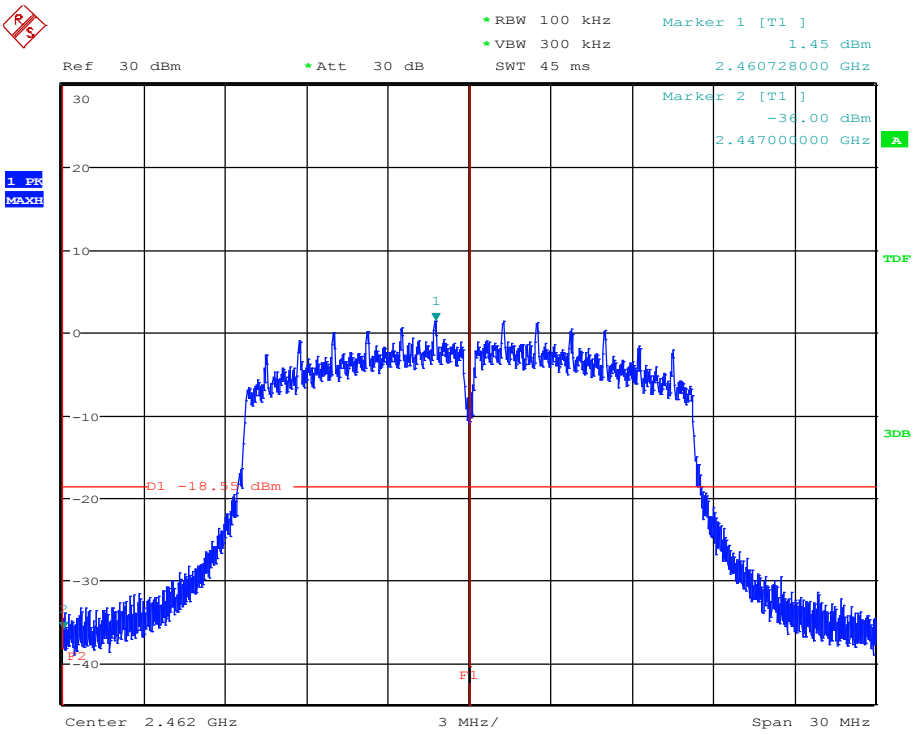
WLAN2.4GHz-g Mode-12MBit-20dBc-0.15 MHz-30MHz-CH6-20dBm



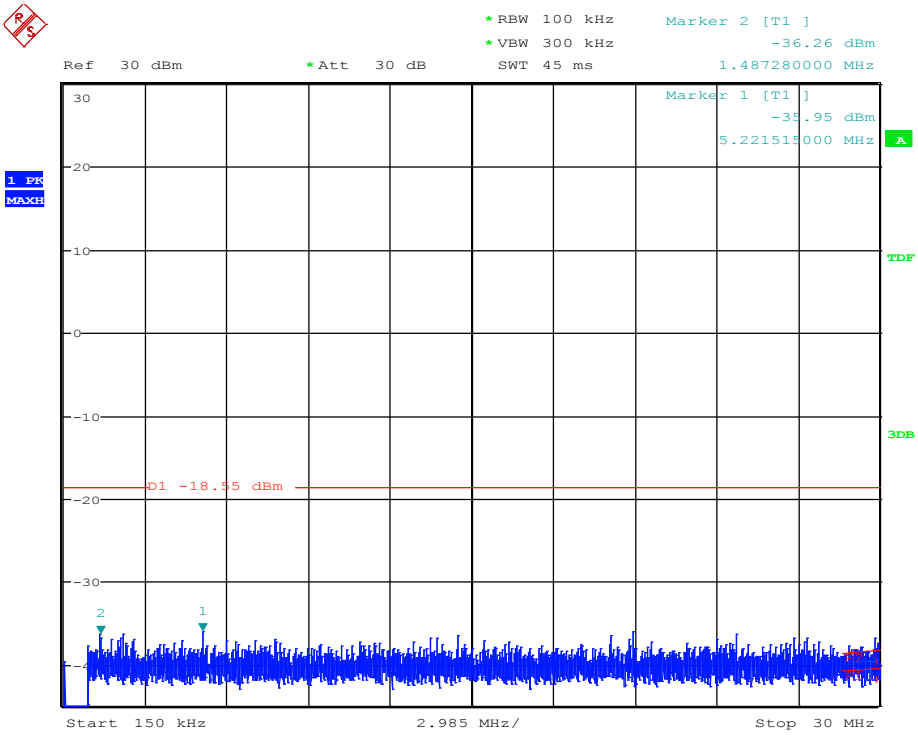
WLAN2.4GHz-g Mode-12MBit-20dBc-30 MHz-2.8GHz-CH6-20dBm



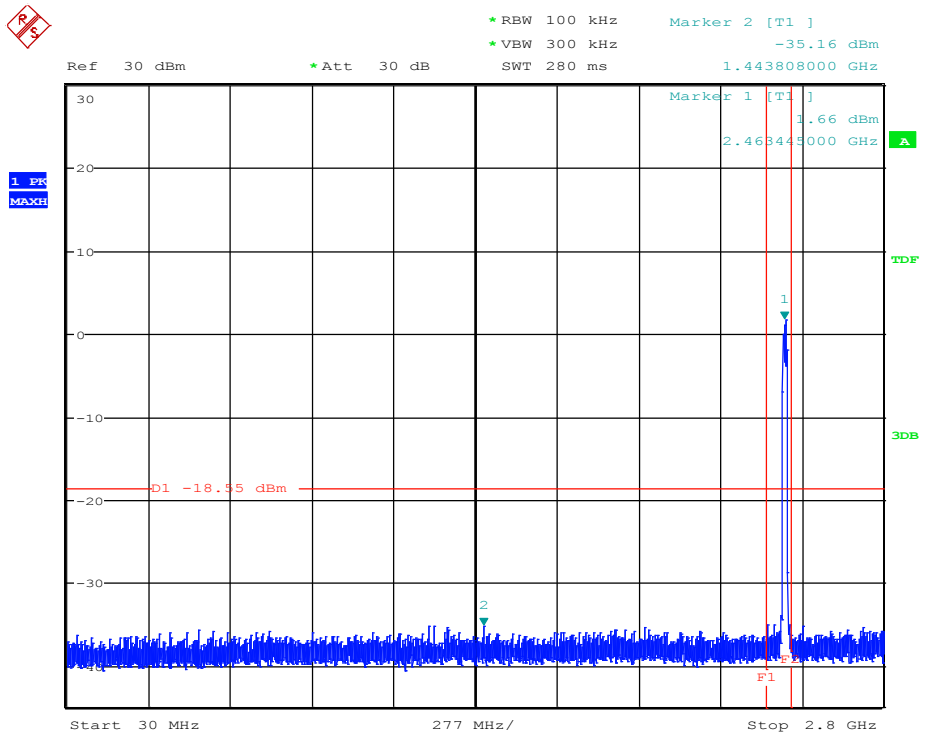
WLAN2.4GHz-g Mode-12MBit-20dBc-2.8GHz-25GHz-CH6-20dBm



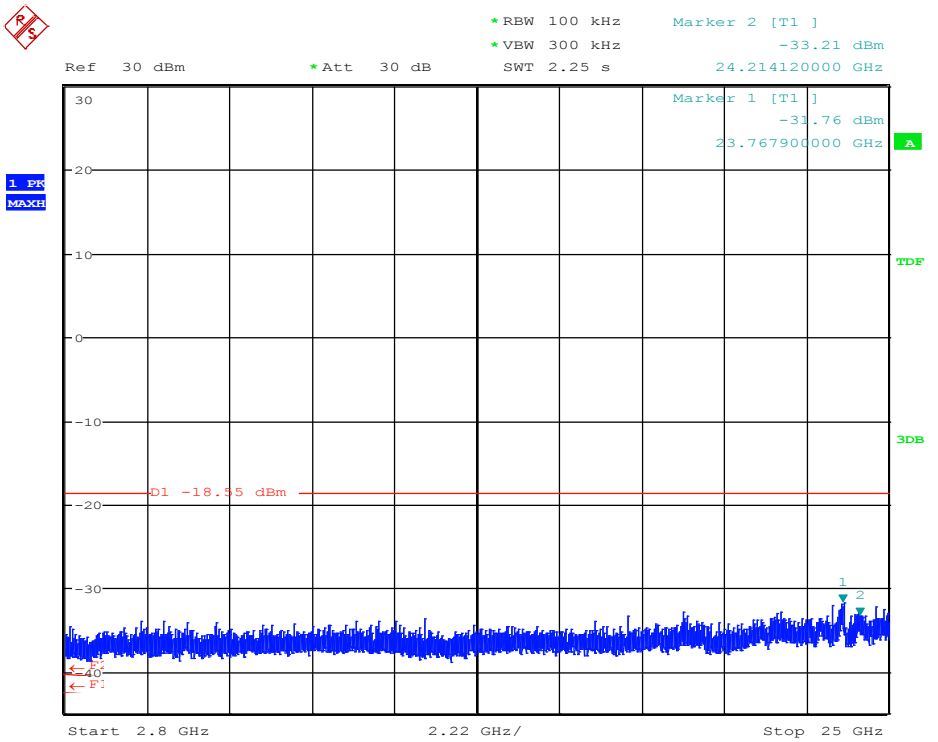
WLAN2.4GHz-g Mode-12MBit-20dBc-Ref-CH11-20dBm



WLAN2.4GHz-g Mode-12MBit-20dBc-0.15 MHz-30MHz-CH11-20dBm

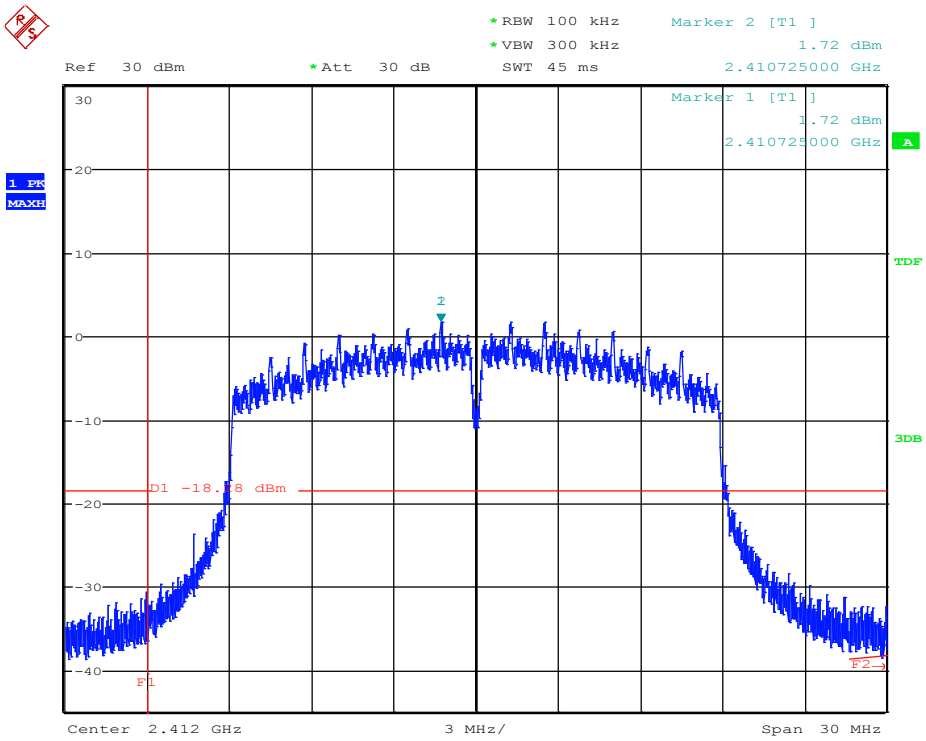


WLAN2.4GHz-g Mode-12MBit-20dBc-30 MHz-2.8GHz-CH11-20dBm

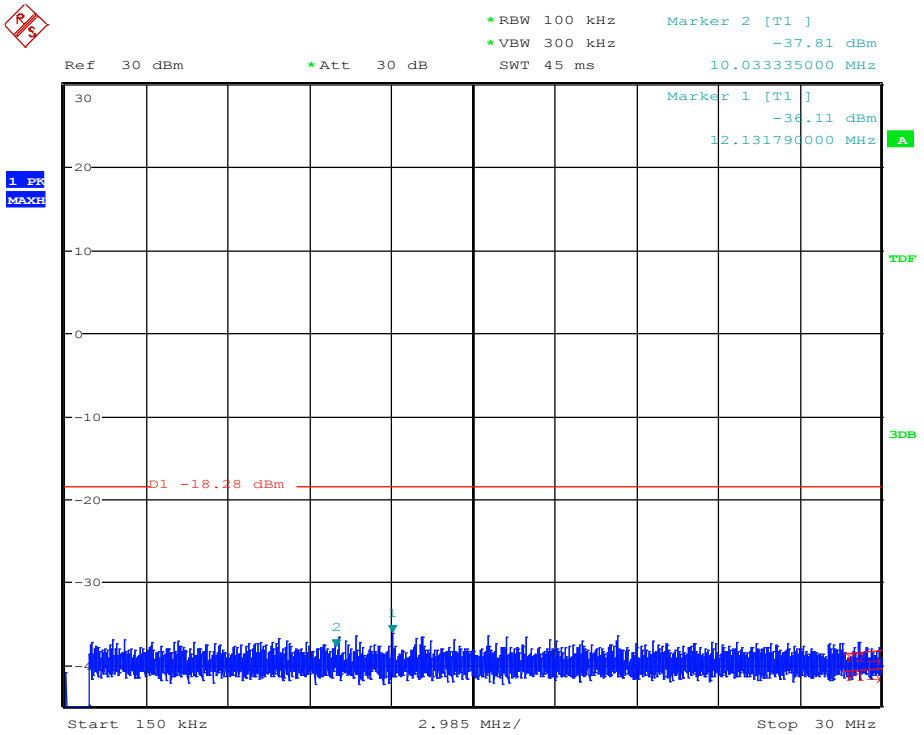


WLAN2.4GHz-g Mode-12MBit-20dBc-2.8GHz-25GHz-CH11-20dBm

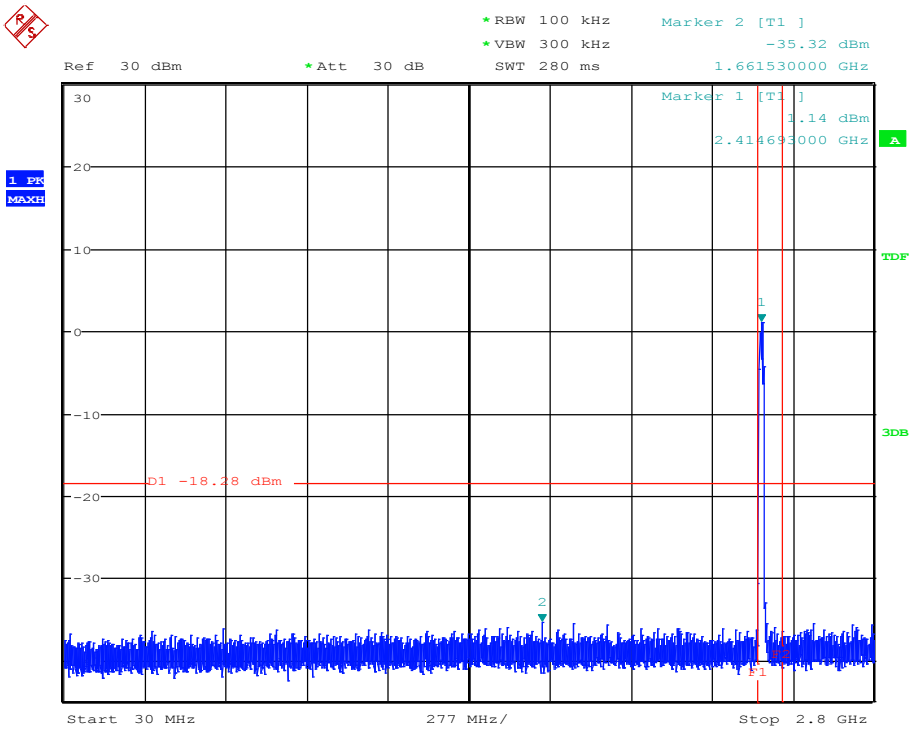
1.6.3. 20 dBc - WLAN2.4GHz-n(HT20) Mode-MCS2



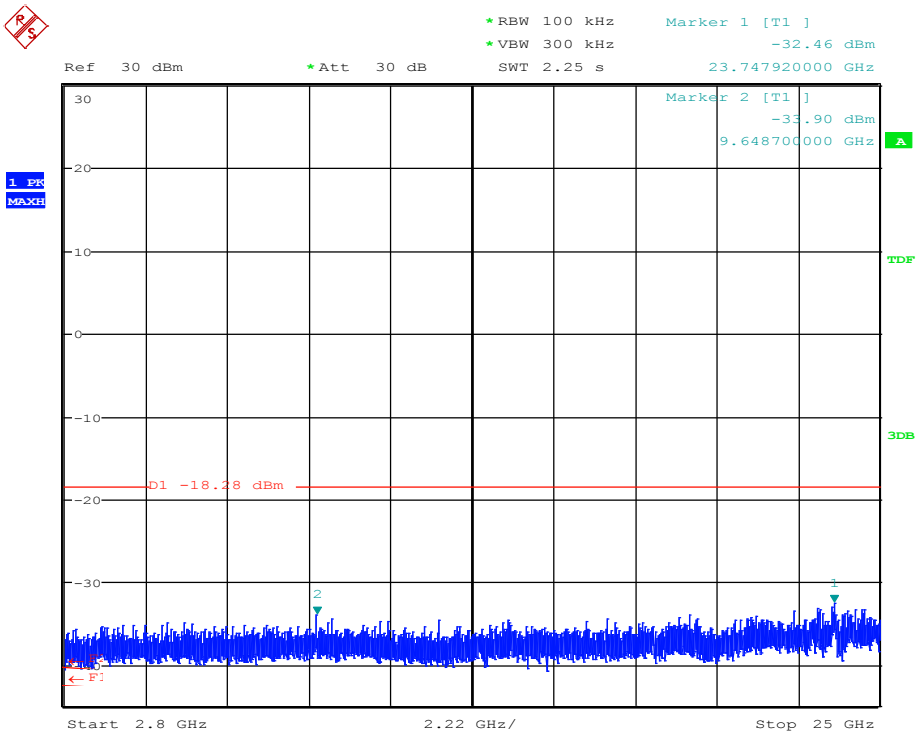
WLAN2.4GHz-n(HT20) Mode-MCS2-20dBc-Ref-CH1-20dBm



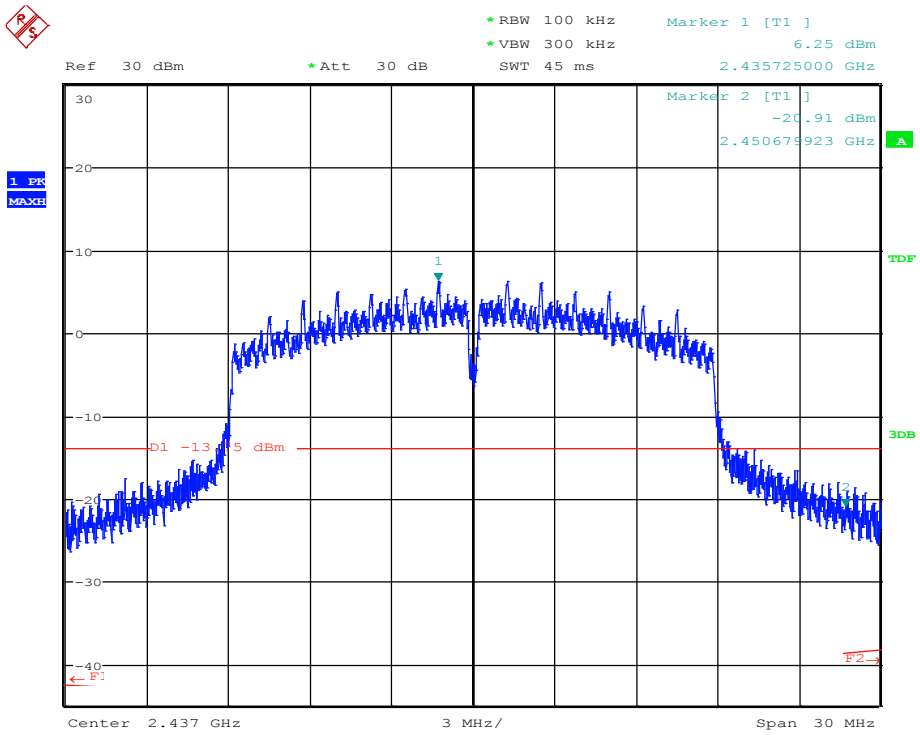
WLAN2.4GHz- n(HT20) Mode MCS2-20dBc-0.15 MHz-30MHz-CH1-20dBm



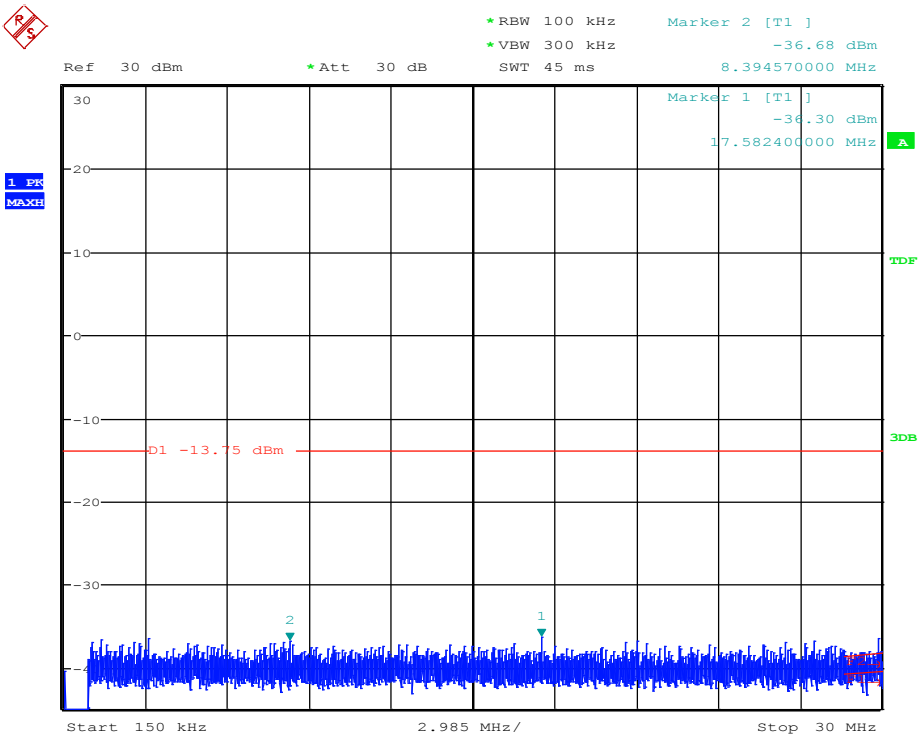
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-30 MHz-2.8GHz-CH1-20dBm



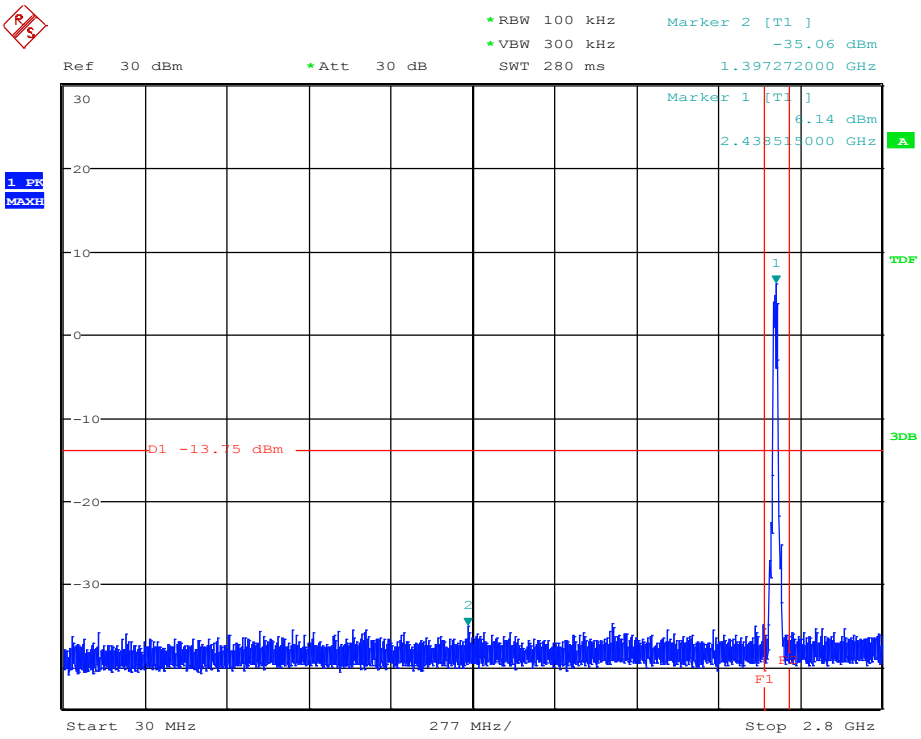
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-2.8GHz-25GHz-CH1-20dBm



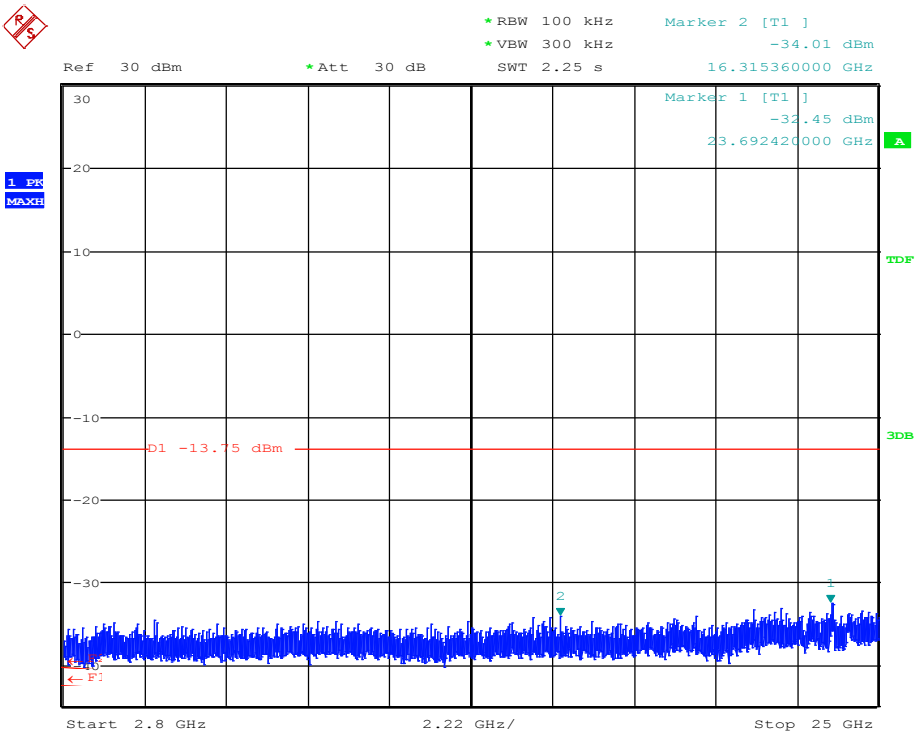
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-Ref-CH6-20dBm



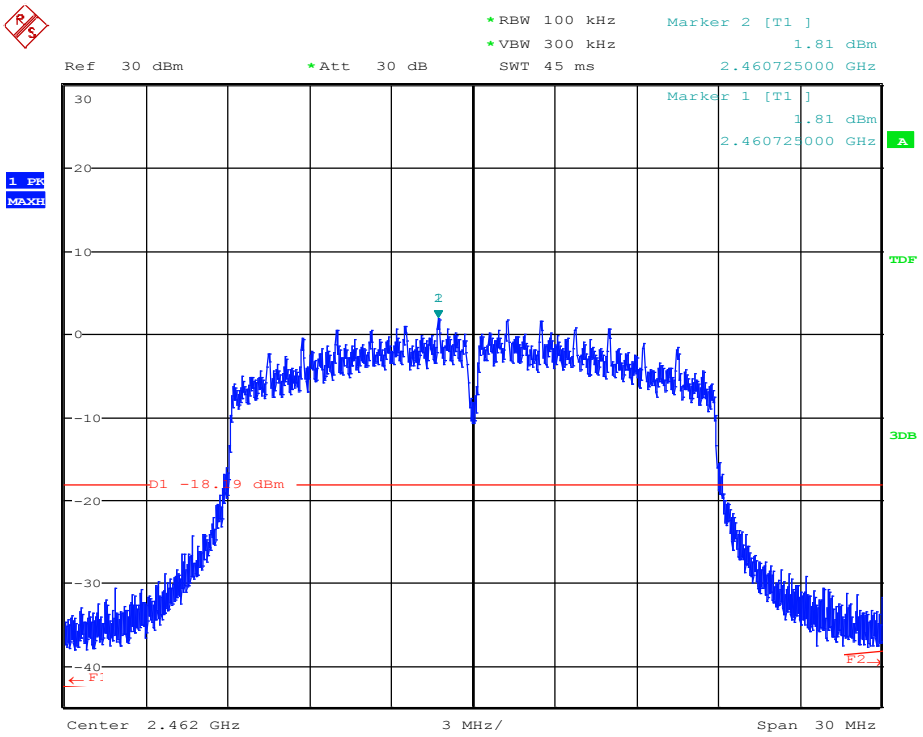
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-0.15 MHz-30MHz-CH6-20dBm



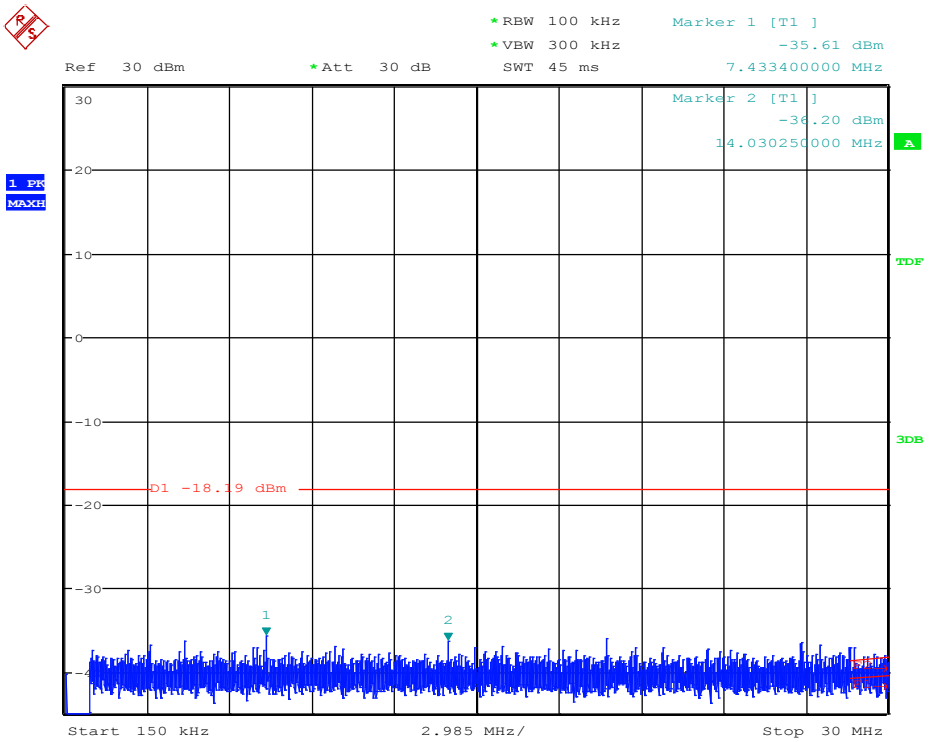
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-30 MHz-2.8GHz-CH6-20dBm



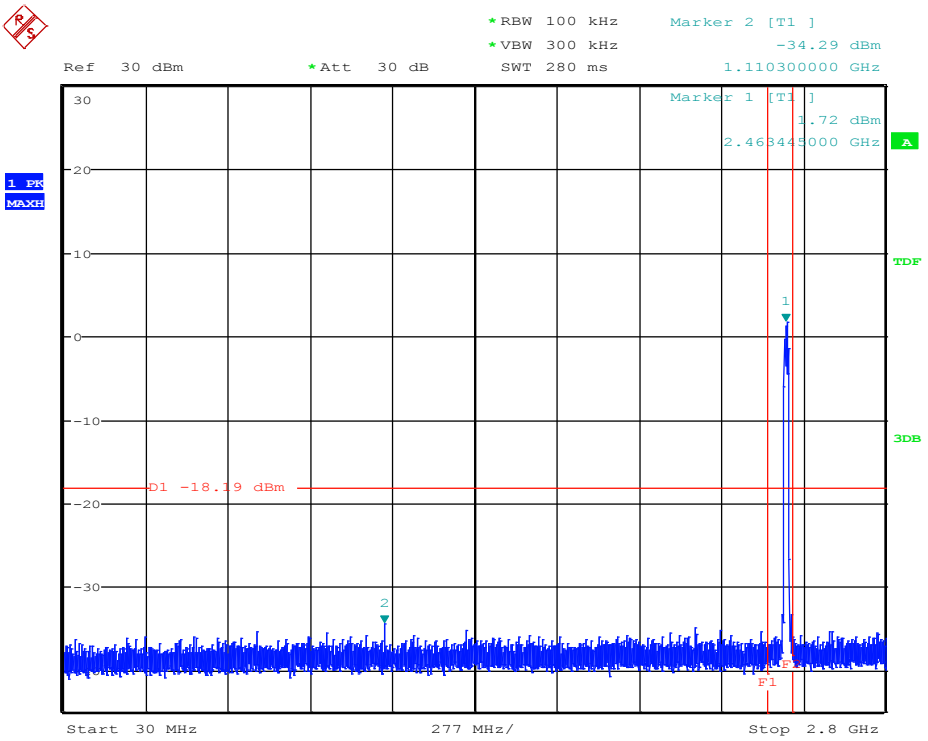
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-2.8GHz-25GHz-CH6-20dBm



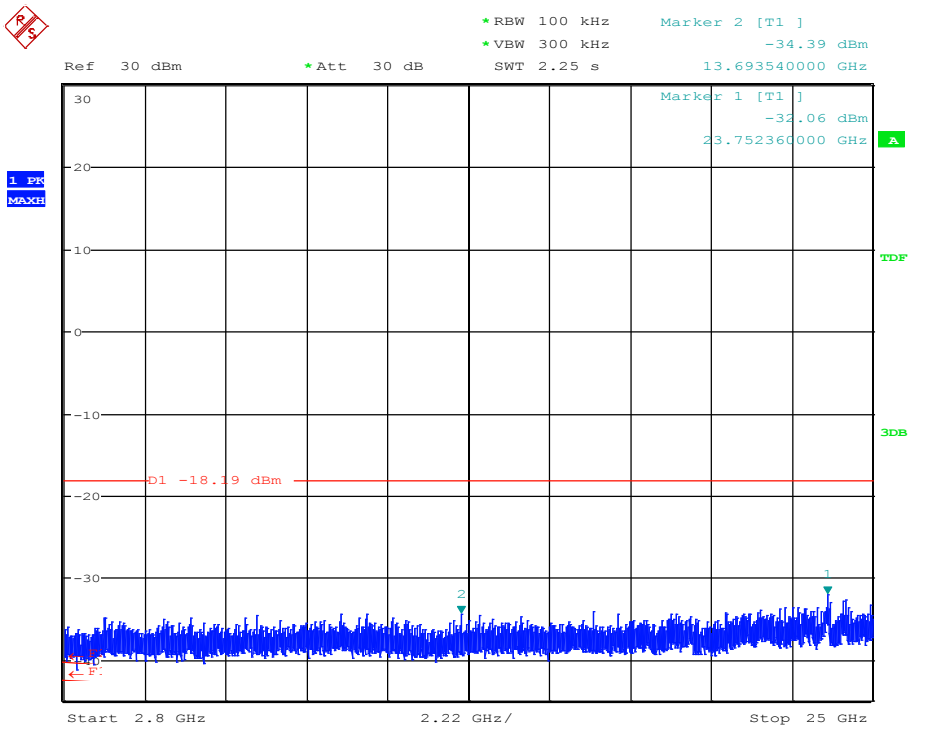
WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-Ref-CH11-20dBm



WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-0.15 MHz-30MHz-CH11-20dBm



WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-30 MHz-2.8GHz-CH11-20dBm



WLAN2.4GHz- n(HT20) Mode -MCS2-20dBc-2.8GHz-25GHz-CH11-20dBm

2. Radiated Field Strength Measurements

2.1. Radiated Field Strength Emissions – 9 kHz to 30 MHz

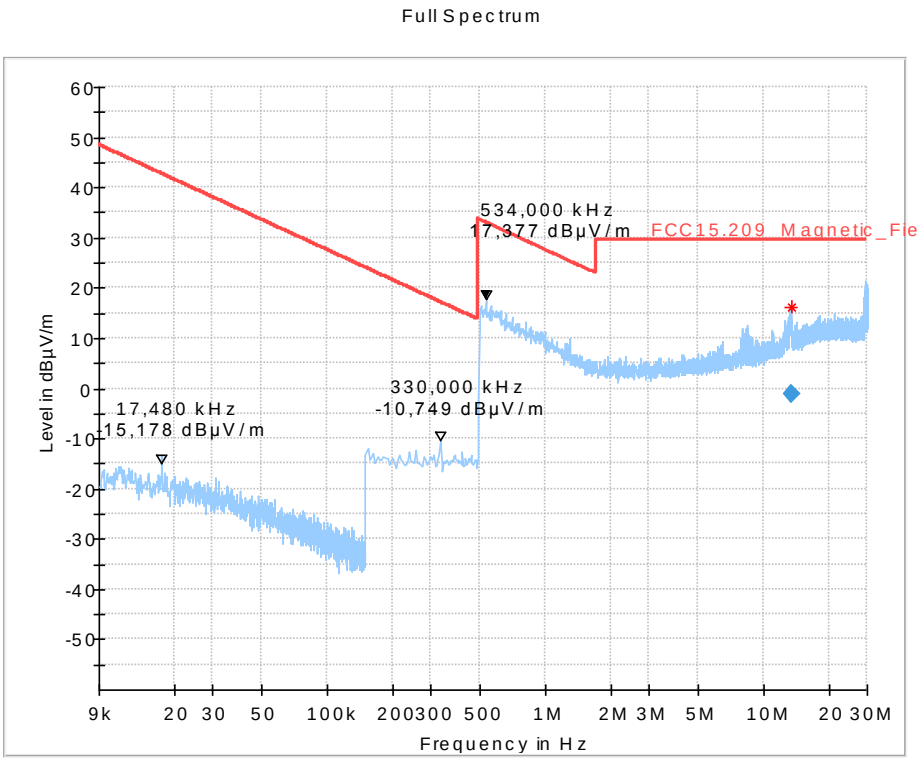
Diagram No. 2.11_ ViCare Thermostat -WLAN2.4 GHz-TX- bMode-B.W.20MHz-11Mbps-Ch1-20dBm

Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test specification:	FCC 15.205 § 15.209
Operator:	APh
Operating conditions:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 1 (2412 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A



Final_Result

Frequency (MHz)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
13.402000	-1.25	29.54	30.79	1000.0	10.000	100.0	V	144.0	0.0	-1.6

Diagram No. 2.12_ ViCare Thermostat-WLAN2.4 GHz-TX- gMode-B.W.20MHz-12Mbps-Ch6-20dBm

Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test specification:	FCC 15.205 § 15.209
Operator:	APh
Operating conditions:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6 (2437 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

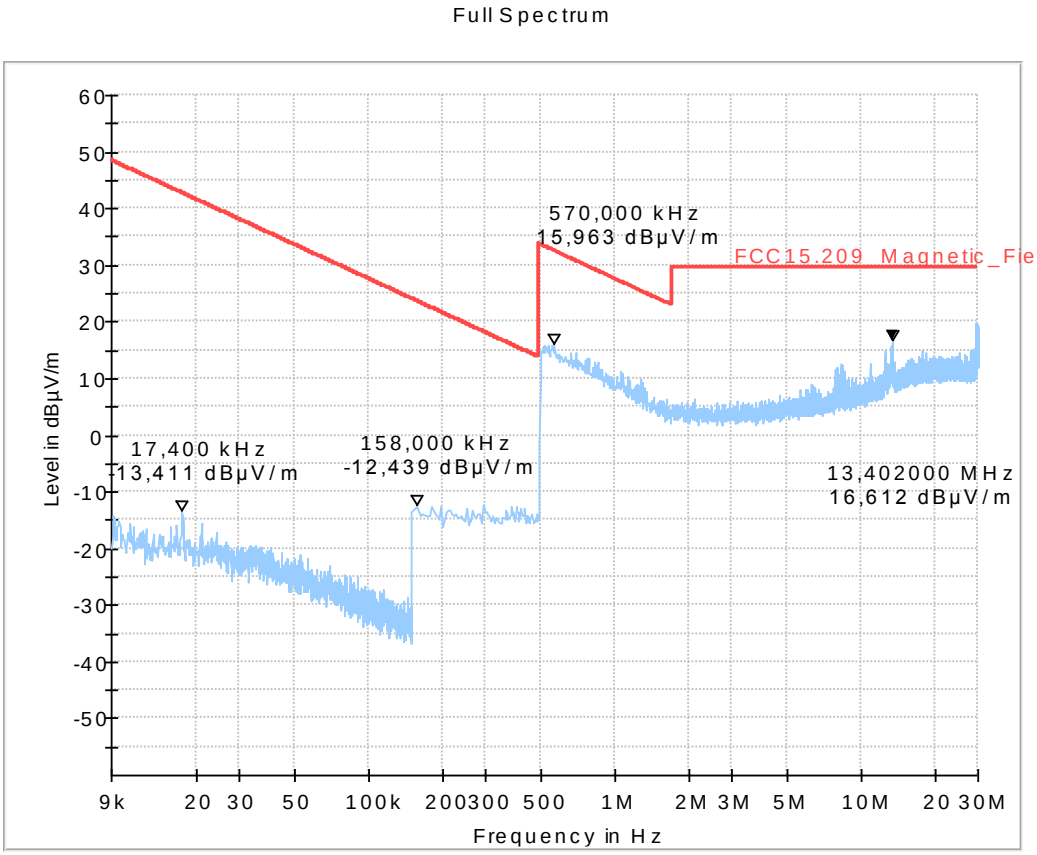


Diagram No. 2.13_ ViCare Thermostat-WLAN2.4 GHz-TX- nMode-B.W.20MHz-MCS2-Ch11-20dBm

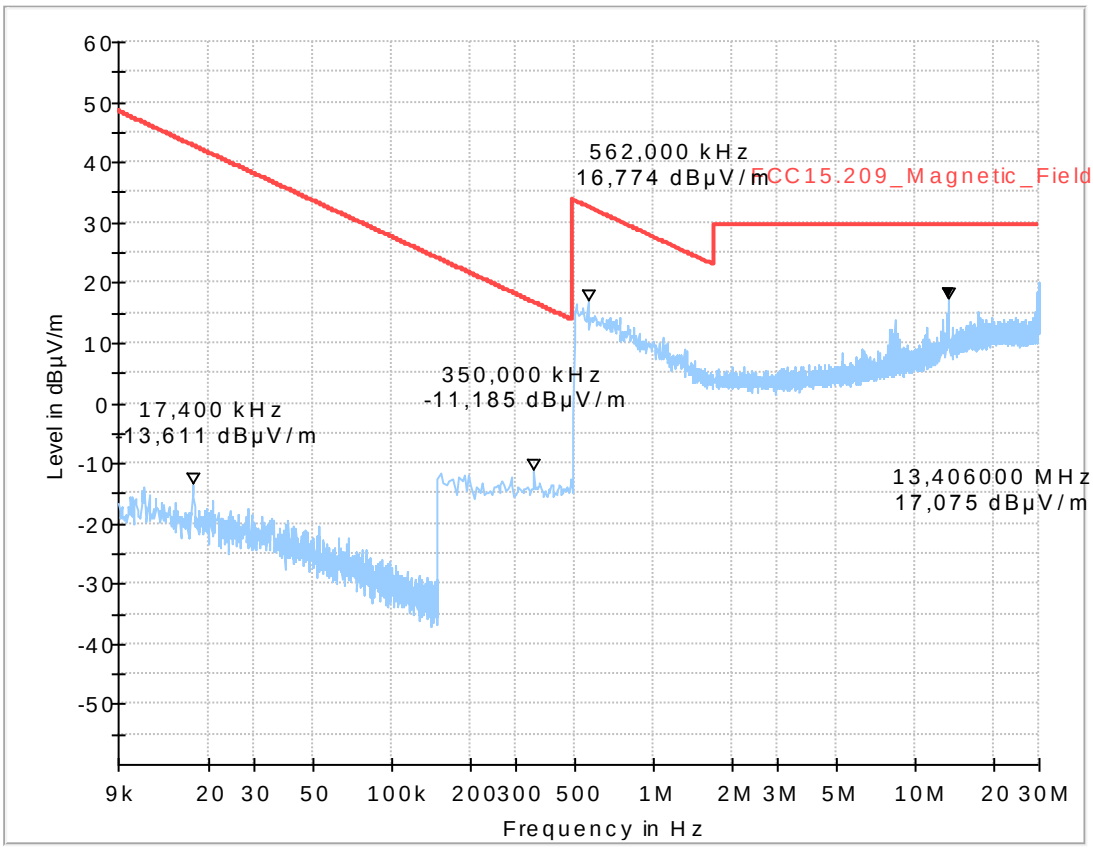
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test specification:	FCC 15.205 § 15.209
Operator:	APh
Operating conditions:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 11 (2462 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Full Spectrum



2.2. Radiated Field Strength Emissions – 30 MHz to 1 GHz

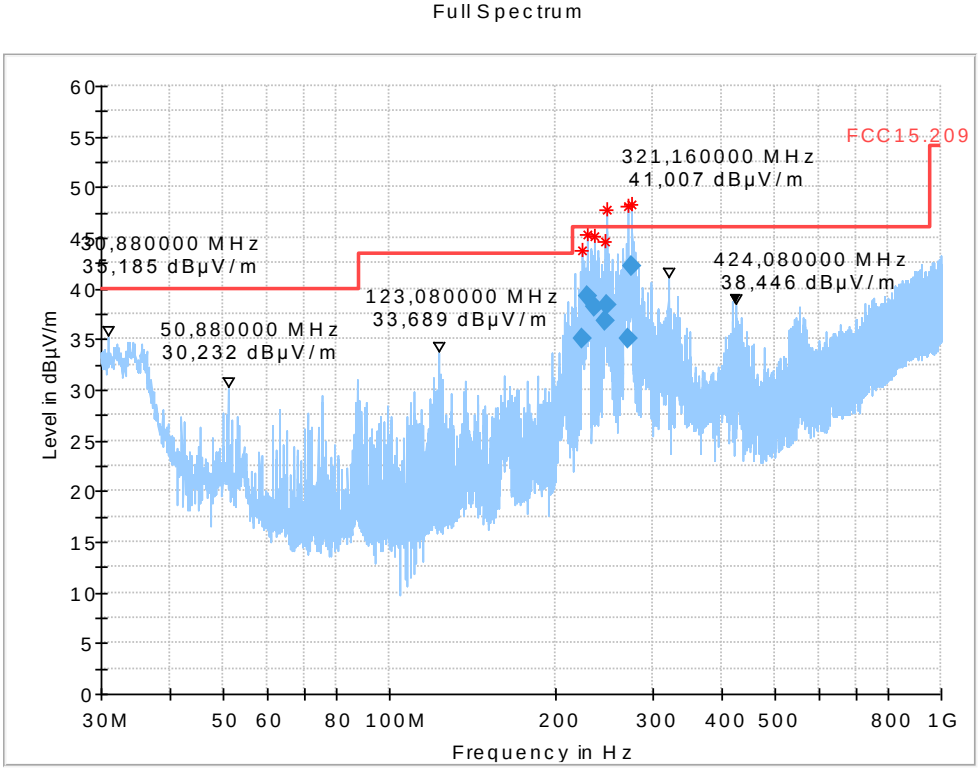
Diagram No. 3.11b_ ViCare Thermostat-WLAN2.4 GHz-TX- bMode-B.W.20MHz-11Mbps-Ch1-20dBm

Common Information

Test description:	Electric Field Strength Measurement
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.205 § 15.209
Operator:	AFr
Operating conditions:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 1 (2412 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
223.188000	34.98	46.00	11.02	1000.0	120.000	136.0	H	291.0	90.0	12.5
229.108000	39.25	46.00	6.75	1000.0	120.000	124.0	H	114.0	90.0	12.8
235.104000	38.19	46.00	7.81	1000.0	120.000	110.0	H	118.0	90.0	13.1
246.000000	36.72	46.00	9.28	1000.0	120.000	105.0	H	136.0	0.0	13.1
247.212000	38.36	46.00	7.64	1000.0	120.000	105.0	H	104.0	90.0	13.1
271.016000	35.07	46.00	10.93	1000.0	120.000	108.0	H	118.0	0.0	14.6
275.580000	42.21	46.00	3.79	1000.0	120.000	108.0	H	121.0	0.0	14.7

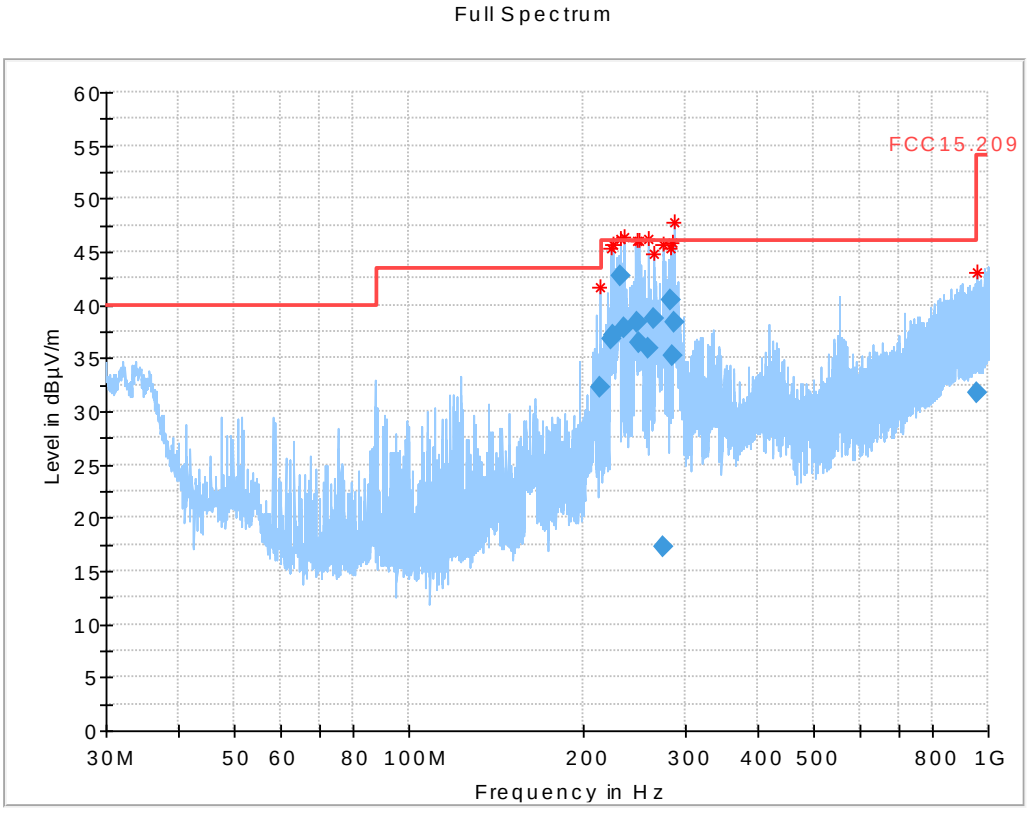
Diagram No. 3.12_ ViCare Thermostat-WLAN2.4 GHz-TX- gMode-B.W.20MHz-12Mbps-Ch6-20dBm

Common Information

Test description:	Electric Field Strength Measurement
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.205 § 15.209
Operator:	AFr
Operating conditions:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6 (2437 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
213.832000	32.19	43.50	11.31	1000.0	120.000	150.0	H	243.0	0.0	11.7
223.808000	36.85	46.00	9.15	1000.0	120.000	118.0	H	271.0	0.0	12.6
225.352000	37.09	46.00	8.91	1000.0	120.000	126.0	H	263.0	0.0	12.7
231.456000	42.73	46.00	3.27	1000.0	120.000	117.0	H	100.0	90.0	12.9
235.116000	37.91	46.00	8.09	1000.0	120.000	105.0	H	130.0	90.0	13.1
247.140000	38.34	46.00	7.66	1000.0	120.000	107.0	H	124.0	90.0	13.1
249.236000	36.43	46.00	9.57	1000.0	120.000	107.0	H	100.0	90.0	13.0
259.212000	35.95	46.00	10.05	1000.0	120.000	105.0	H	253.0	0.0	13.6
264.576000	38.74	46.00	7.26	1000.0	120.000	118.0	H	272.0	0.0	14.1
275.556000	17.19	46.00	28.81	1000.0	120.000	132.0	H	118.0	90.0	14.7
282.408000	40.39	46.00	5.61	1000.0	120.000	111.0	H	302.0	0.0	14.6
285.316000	35.26	46.00	10.74	1000.0	120.000	105.0	H	294.0	0.0	14.6
286.248000	38.37	46.00	7.63	1000.0	120.000	105.0	H	315.0	0.0	14.6
954.820000	31.72	46.00	14.28	1000.0	120.000	314.0	H	51.0	0.0	27.3

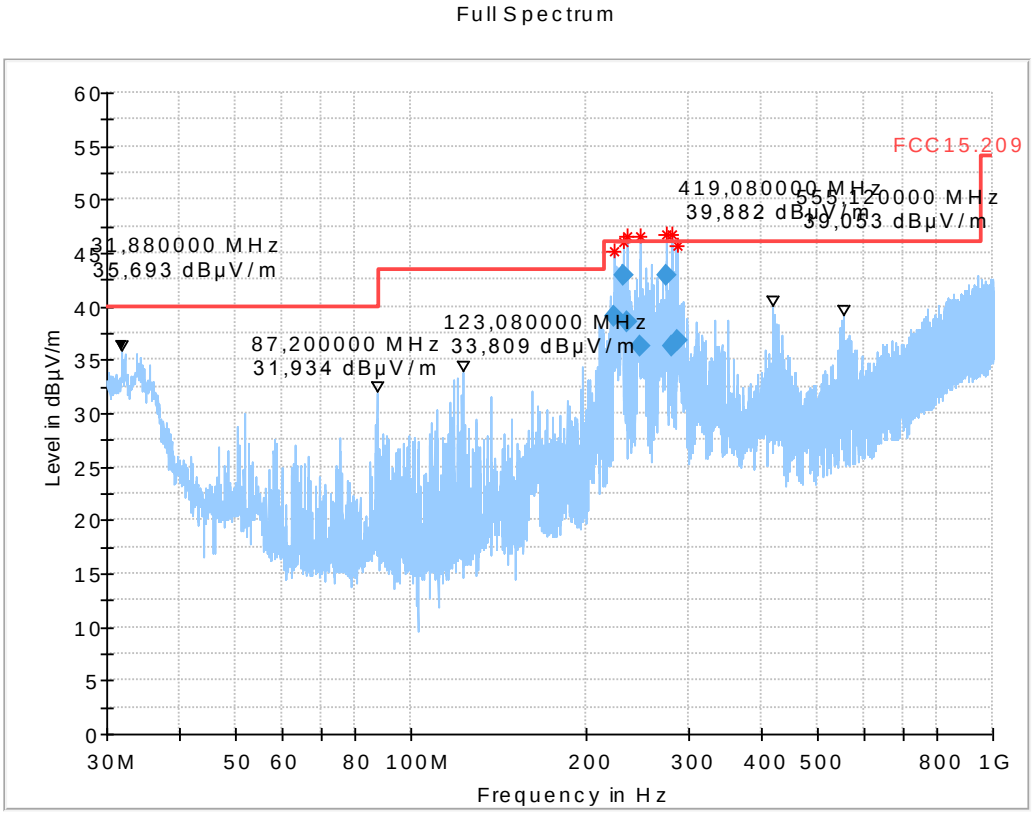
Diagram No. 3.13_ ViCare Thermostat-WLAN2.4 GHz-TX- nMode-B.W.20MHz-MCS2-Ch11-20dBm

Common Information

Test description:	Electric Field Strength Measurement
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
Distance correction:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.205 § 15.209
Operator:	AFr
Operating conditions:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 11 (2462 MHz)-PWR+20dBm

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
223.148000	39.08	46.00	6.92	1000.0	120.000	144.0	H	263.0	0.0	12.5
231.460000	42.83	46.00	3.17	1000.0	120.000	108.0	H	115.0	90.0	12.9
235.248000	38.47	46.00	7.53	1000.0	120.000	120.0	H	118.0	90.0	13.1
247.100000	36.21	46.00	9.79	1000.0	120.000	133.0	H	279.0	0.0	13.1
275.616000	42.98	46.00	3.02	1000.0	120.000	119.0	H	112.0	90.0	14.7
280.372000	36.33	46.00	9.67	1000.0	120.000	108.0	H	308.0	0.0	14.6
286.296000	36.80	46.00	9.20	1000.0	120.000	110.0	H	276.0	0.0	14.6

2.3. Radiated Field Strength Emissions – 1 GHz to 18 GHz

Diagram No.: 4.11_ ViCare Thermostat-WLAN2.4 GHz-TX- bMode-B.W.20MHz-11Mbps-Ch1-20dBm

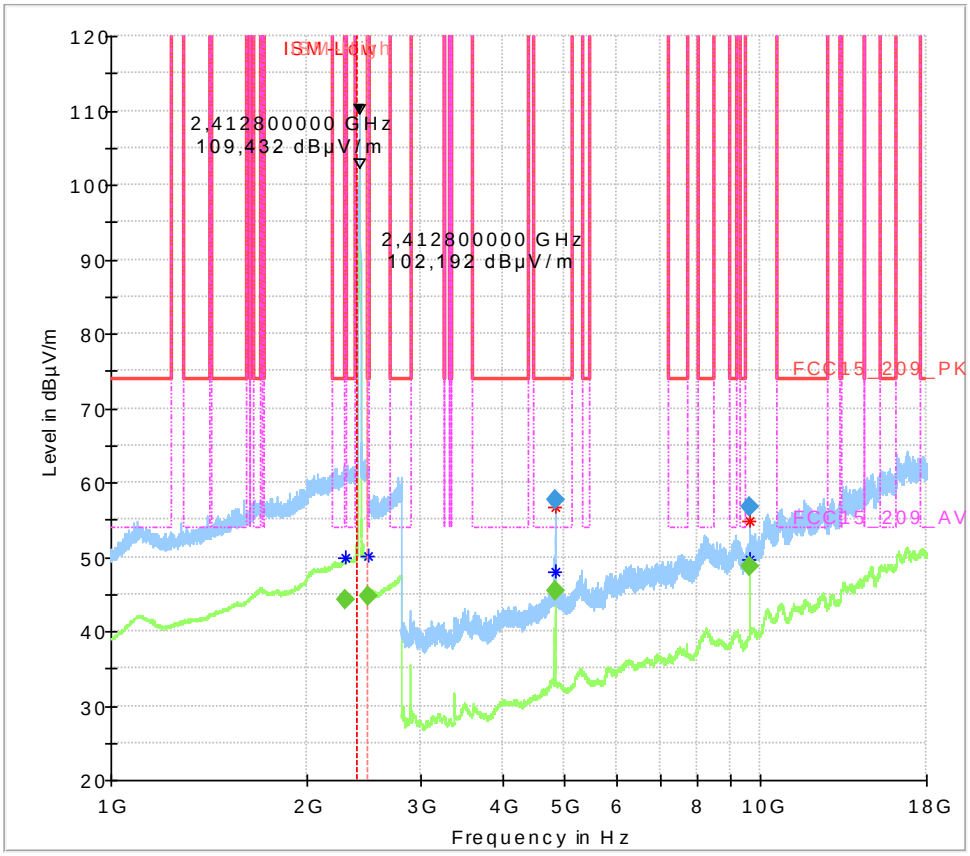
Common Information

Test Description:	Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 1 (2412 MHz)-PWR+20dBm
Operator Name:	AFr

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m) With Duty Cycle Correction-Factor	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2294.920000	---	45.18	54.00	8.82	100.0	1000.000	H	244.0	0.0	35.6
2483.500000	---	45.65	54.00	8.35	100.0	1000.000	V	311.0	0.0	35.9
4823.960000	57.59	---	74.00	16.41	100.0	1000.000	V	93.0	90.0	4.8
4823.960000	---	46.16	54.00	7.84	100.0	1000.000	H	155.0	0.0	4.8
9647.880000	---	49.46	150.00	100.54	100.0	1000.000	H	90.0	90.0	14.8
9647.920000	56.72	---	150.00	93.28	100.0	1000.000	H	90.0	90.0	14.8

Diagram No.: 4.12_ ViCare Thermostat-WLAN2.4 GHz-TX- gMode-B.W.20MHz-12Mbps-Ch6-20dBm

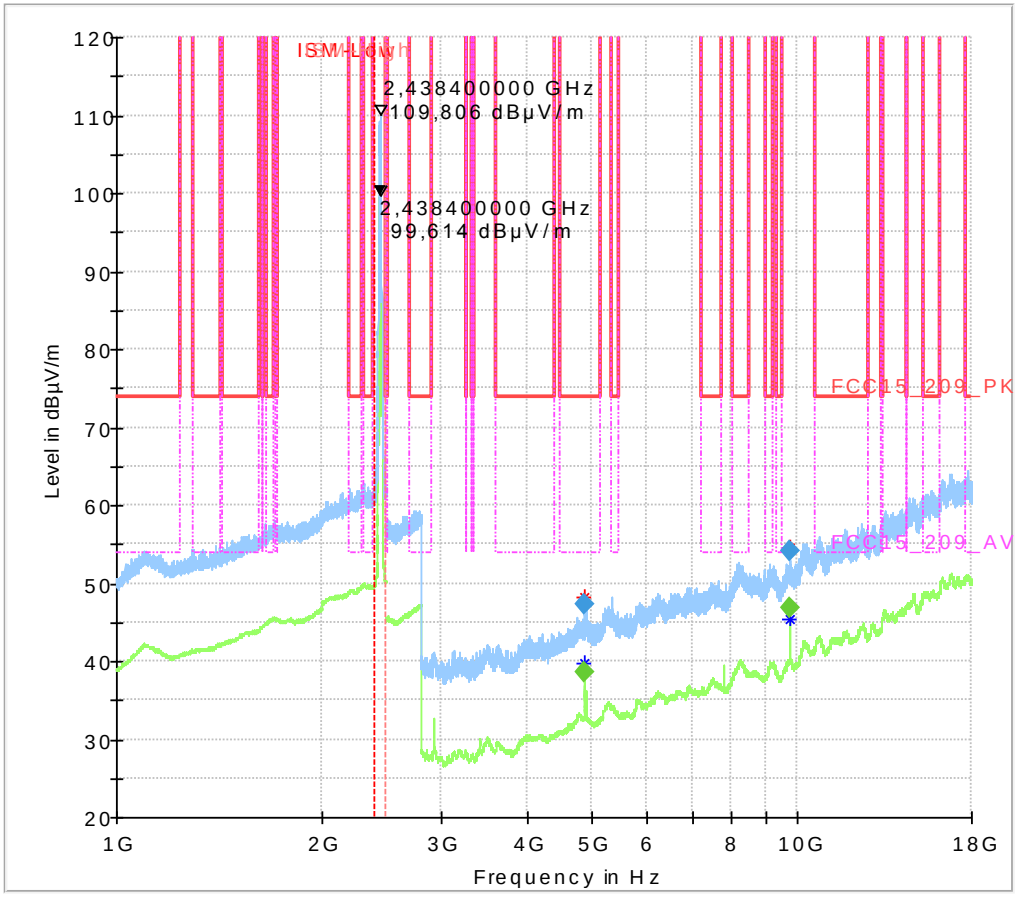
Common Information

Test Description:	Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6 (2437 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m) With Duty Cycle Correction-Factor	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
4869.640000	47.18	---	74.00	26.82	100.0	1000.000	155.0	V	231.0	0.0
4873.920000	---	40.21	54.00	13.79	100.0	1000.000	155.0	H	135.0	0.0
9747.880000	---	48.30	150.00	101.70	100.0	1000.000	155.0	H	79.0	90.0
9747.880000	54.05	---	150.00	95.95	100.0	1000.000	155.0	V	317.0	90.0

Frequency (MHz)	Corr. (dB)
4869.640000	4.7
4873.920000	4.7
9747.880000	14.8
9747.880000	14.8

Diagram No.: 4.13_ ViCare Thermostat-WLAN2.4 GHz-TX- nMode-B.W.20MHz-MCS2-Ch11-20dBm

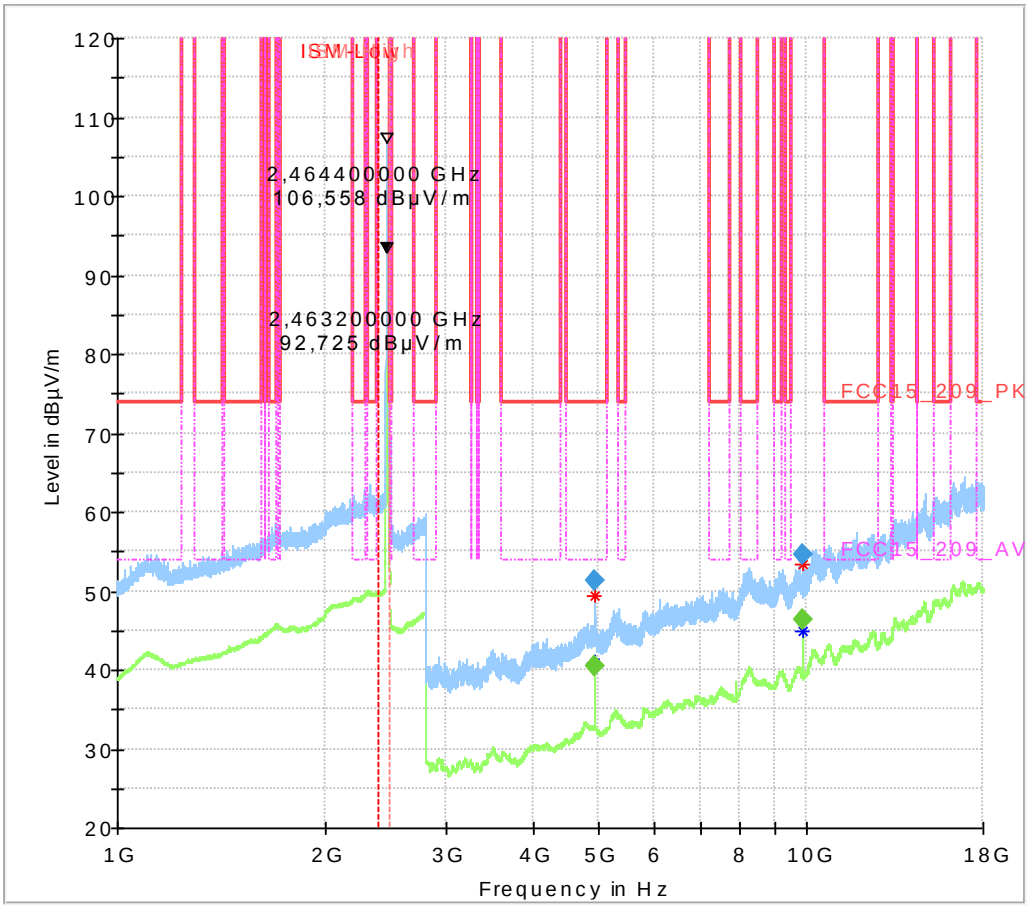
Common Information

Test Description:	Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 11 (2462 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m) With Duty Cycle Correction-Factor	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
4923.920000	---	42.47	54.00	11.53	100.0	1000.000	155.0	H	136.0	0.0
4923.920000	51.21	---	74.00	22.79	100.0	1000.000	155.0	H	163.0	0.0
9847.880000	---	48.24	150.00	101.76	100.0	1000.000	155.0	H	78.0	90.0
9847.880000	54.54	---	150.00	95.46	100.0	1000.000	155.0	H	78.0	90.0

Frequency (MHz)	Corr. (dB)
4923.920000	4.5
4923.920000	4.5
9847.880000	14.4
9847.880000	14.4

2.3.1. Radiated Field Strength Emissions – 18 GHz to 25 GHz

Diagram No.: 4.11a_ViCare Thermostat-WLAN2.4GHz-TX-bMode-B.W.20MHz-11Mbps-CH1-20dBm

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 1 (2412 MHz)-PWR+20dBm
Operator Name:	TFr

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers

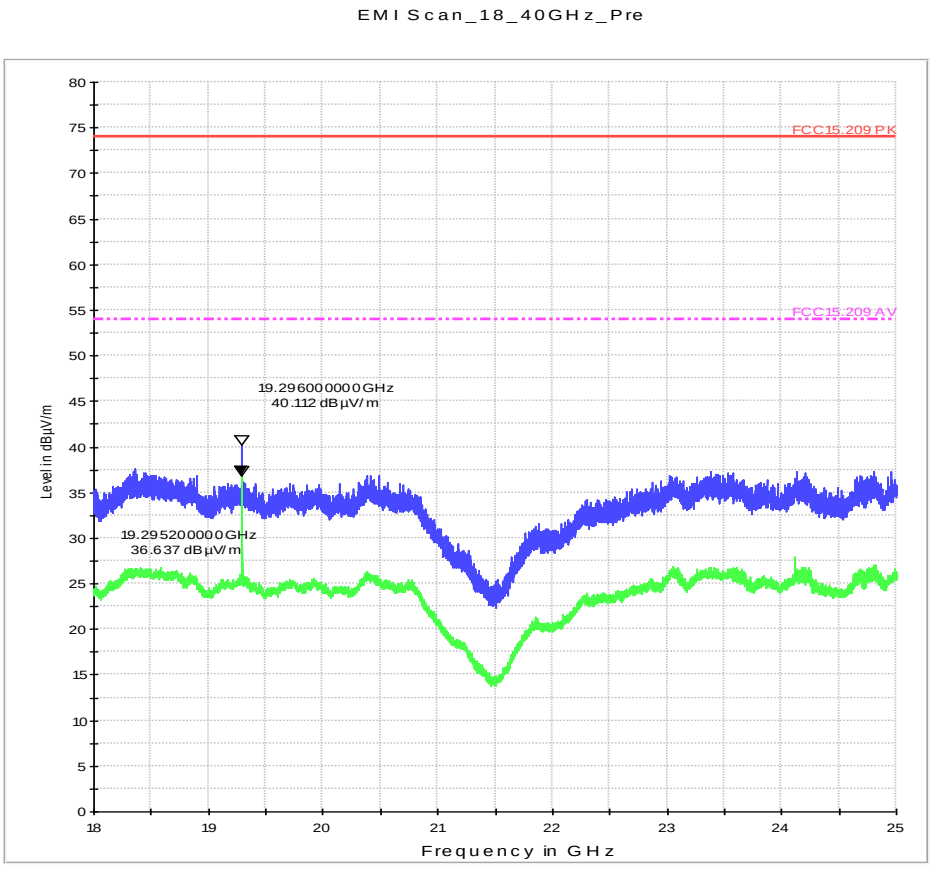


Diagram No.: 4.12a_ViCare Thermostat-WLAN2.4GHz-TX-gMode-B.W.20MHz-12Mbps-CH1-20dBm

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6 (2437 MHz)-PWR+20dBm
Operator Name:	TFr

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers

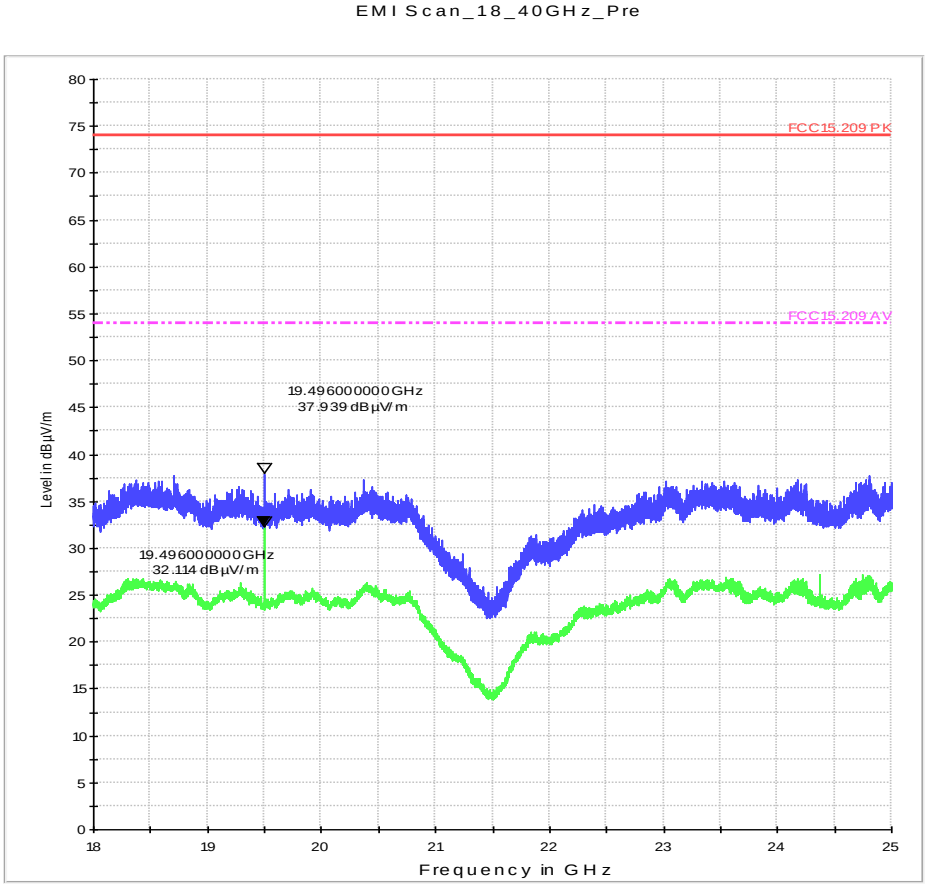


Diagram No.: 4.13a_ViCare Thermostat-WLAN2.4GHz-TX-nMode-B.W.20MHz-MCS2-CH11-20dBm

Common Information

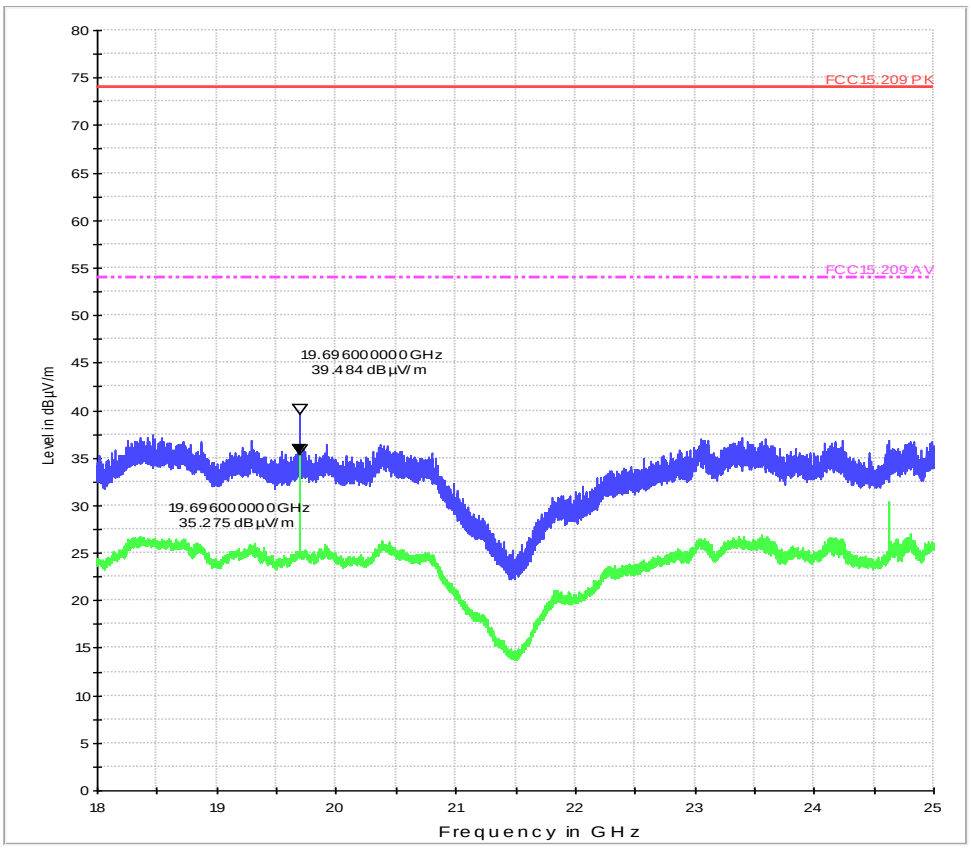
Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 11 (2462 MHz)-PWR+20dBm
Operator Name:	TFr

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

EMI Scan_18_40GHz_Pre



3. Radiated Band-Edge Measurements

Diagram No.: 9.11_BE Low- ViCare Thermostat-
WLAN2.4 GHz-TX- bMode-B.W.20MHz-11Mbps-Ch1-20dBm

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 1 (2412 MHz)-PWR+20dBm
Operator Name:	AFr

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

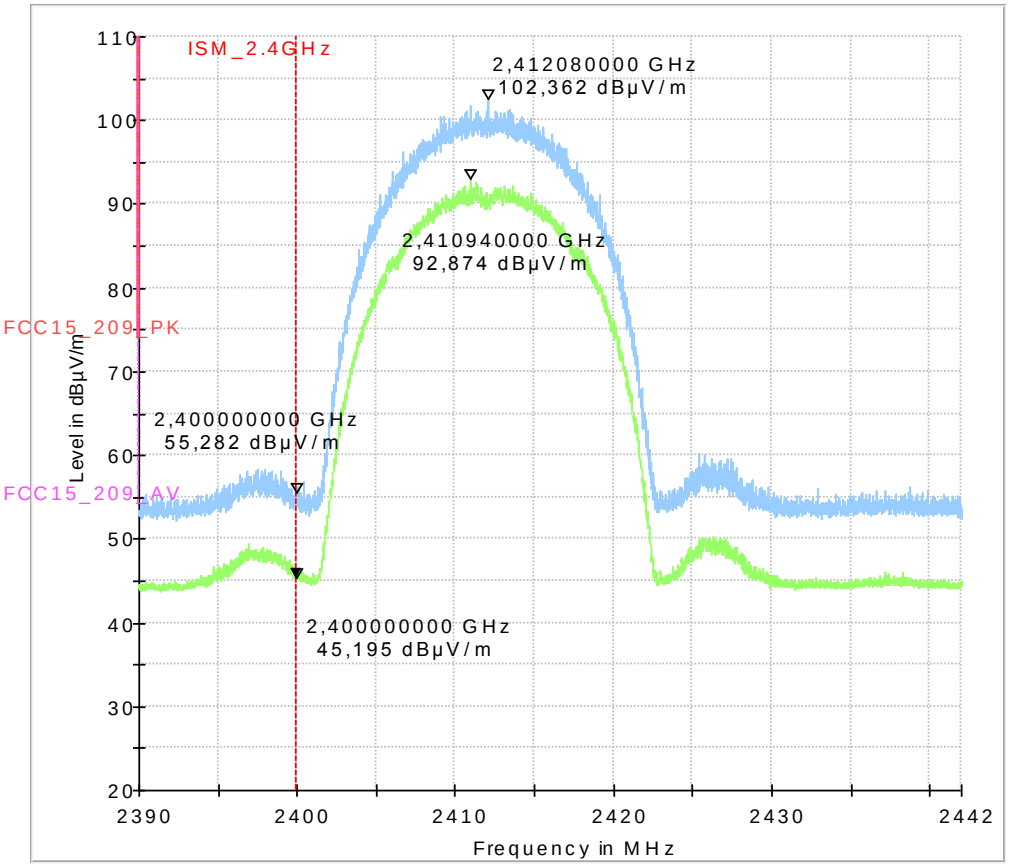


Diagram No.: 9.12_BE High- ViCare Thermostat- WLAN2.4 GHz-TX- bMode-B.W.20MHz-11Mbps-Ch11-20Bm

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- b Mode-B.W. 20 MHz-11Mbps-Ch 11 (2462 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

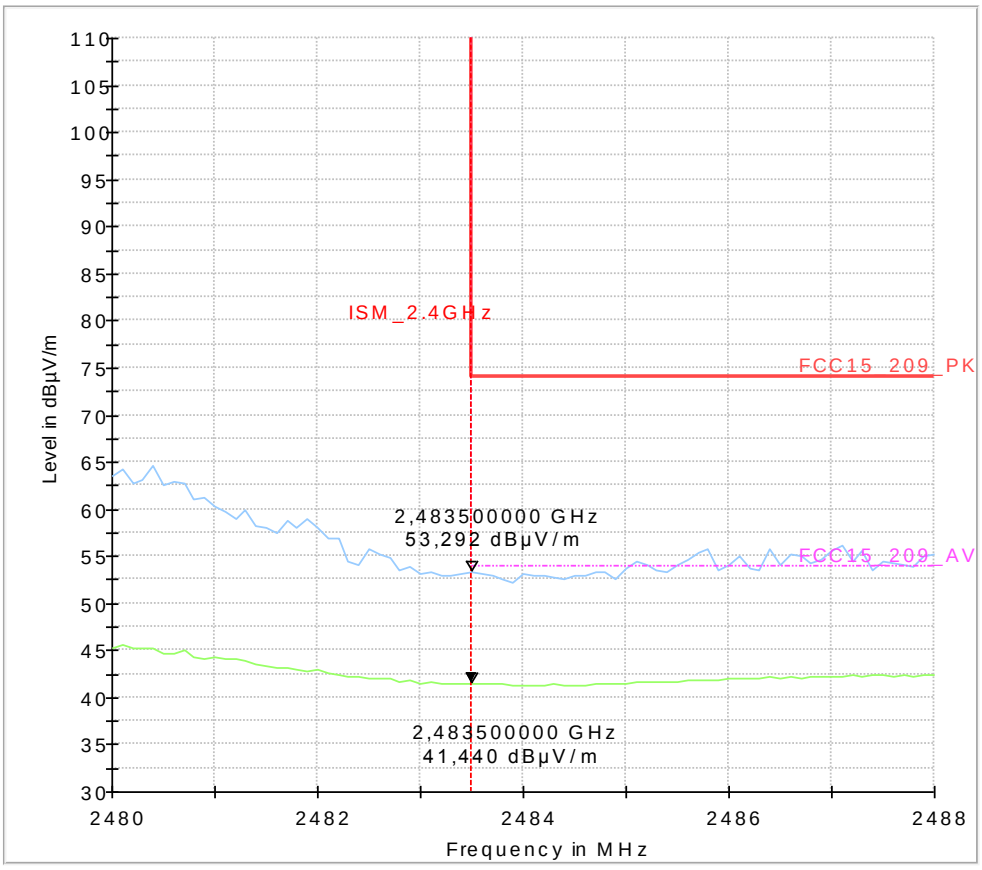


Diagram No.: 9.13_BE Low- ViCare Thermostat-
WLAN2.4 GHz-TX- gMode-B.W.20MHz-12Mbps-Ch1-20dBm

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 1 (2412 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

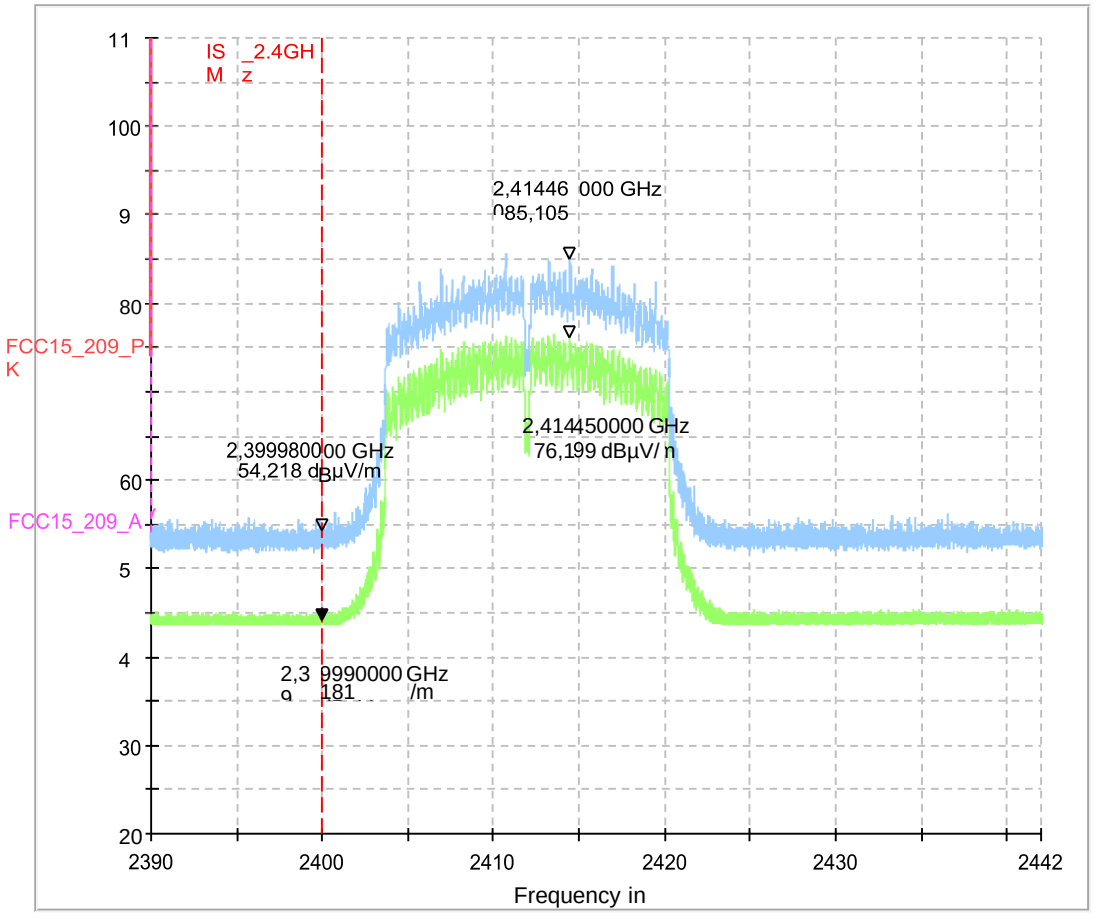


Diagram No.: 9.14_BE High- ViCare Thermostat-
WLAN2.4 GHz-TX- gMode-B.W.20MHz-12Mbps-Ch11-20dBm

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 11 (2462 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

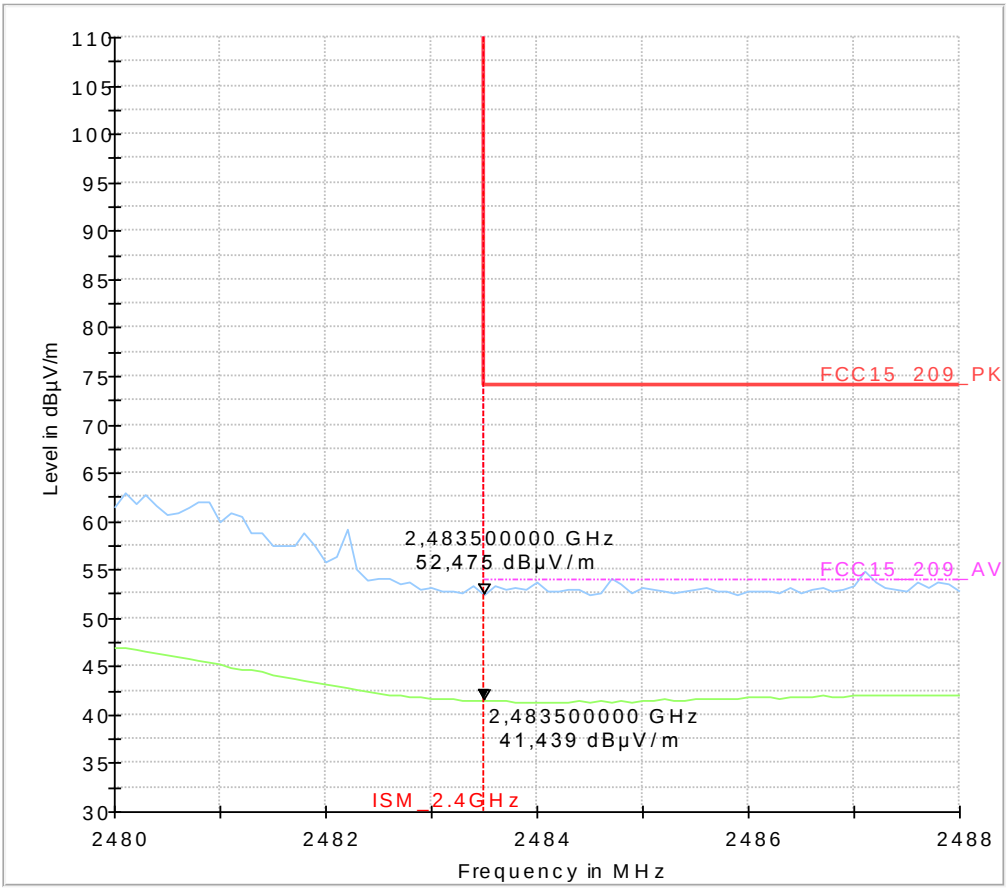


Diagram No.: 9.15_BE Low- ViCare Thermostat-
WLAN2.4 GHz-TX- nMode-B.W.20MHz-MCS2-Ch1-20dBm

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 1 (2412 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.

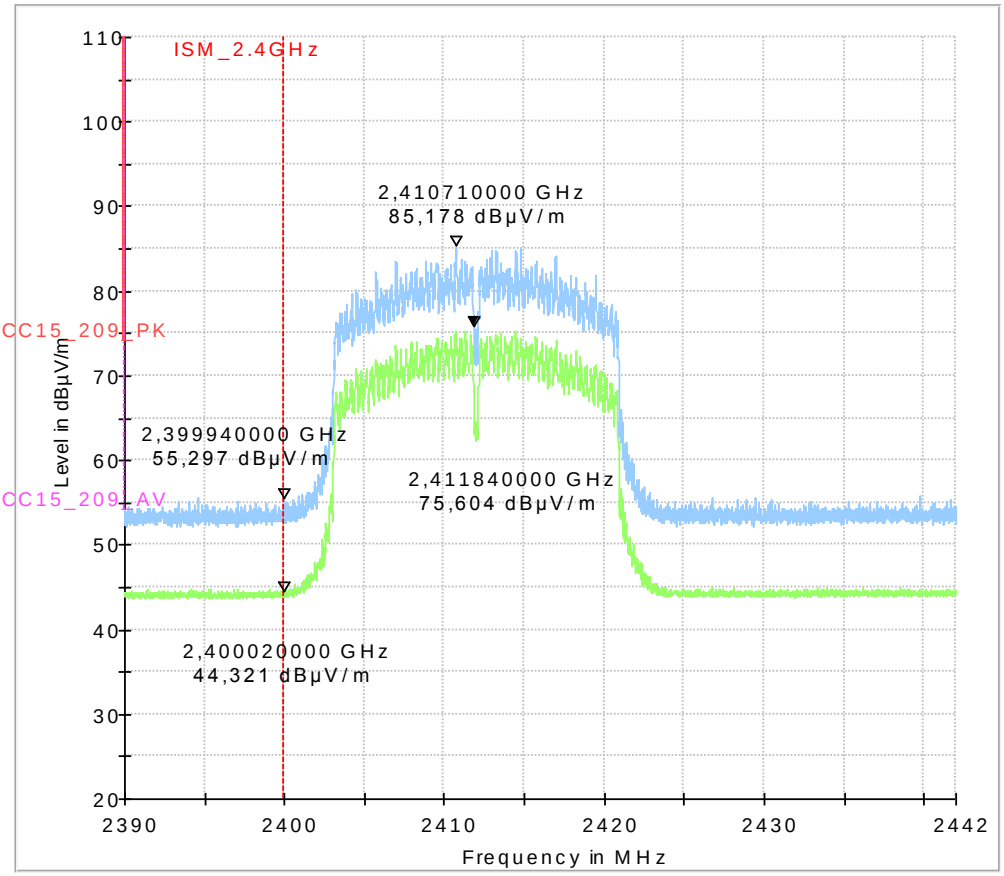


Diagram No.: 9.16_BE High- ViCare Thermostat-
WLAN2.4 GHz-TX- nMode-B.W.20MHz-MCS2-Ch11-20dBm

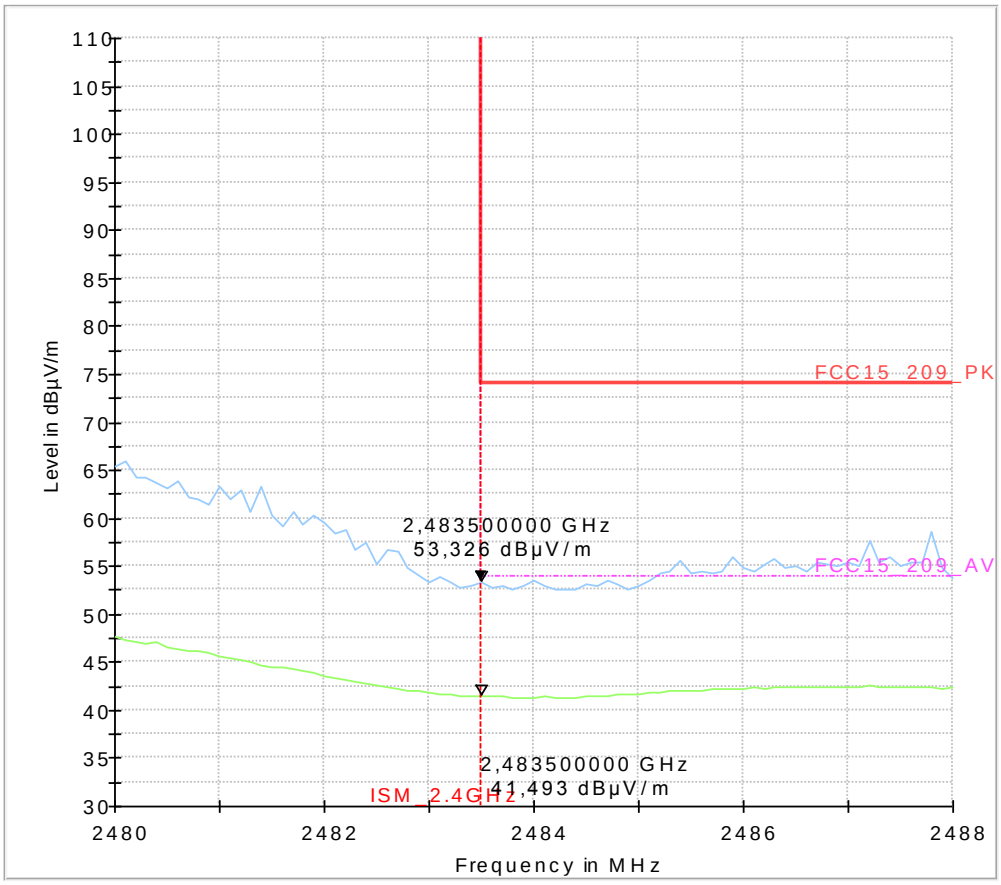
Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205,15.209 & FCC 15.247 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	Continuous TX-WLAN 2.4GHz- n Mode-B.W. 20 MHz-MCS2-Ch 11 (2462 MHz)-PWR+20dBm
Operator Name:	RIs

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
---	---
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Duty Cycle Correction Factors are applicable to Average Values indicated by Markers.



4. AC Power Lines Conducted Emissions Measurements

Diagram No.: 1.01 - ViCare Thermostat-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6-20dBm

Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site & Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Specification:	FCC 15.207
Operating Mode:	TX-WLAN 2.4GHz- g Mode-B.W. 20 MHz-12Mbps-Ch 6 (2437 MHz)- PWR+20dBm
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Humidity: 47%rH; Temperature: 21°C
Operator:	HLa
Comments:	

EUT Information

Applicant:	Viessmann Werke GmbH & Co. KG
Model:	ViCare Thermostat
Type:	N/A-
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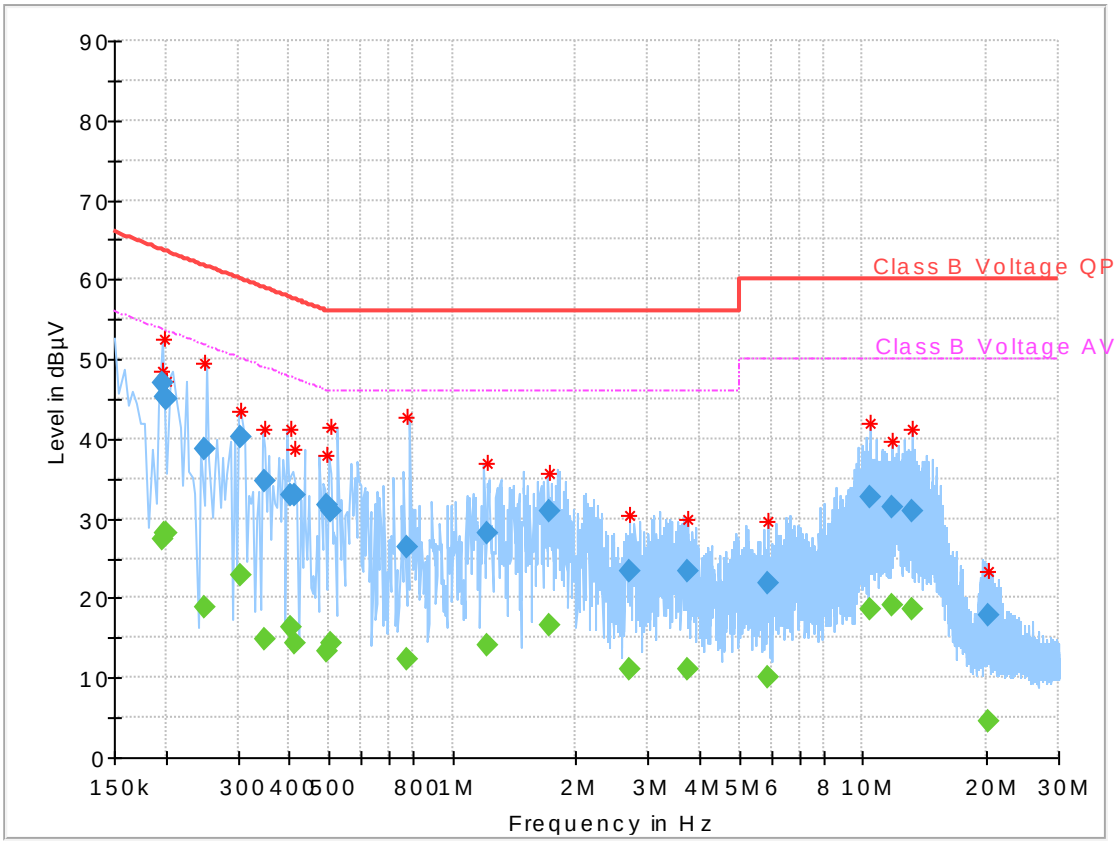
EUT:	ViCare Thermostat
HW version:	Rev.C
SW version:	STM32: (V1.40.09), EFR32:(Nodetest) Linux: (V0.1.7)
Test Application:	Smart Thermostat WiFi & ZigBee Test V1.2
Serial number:	#22
Connected Interfaces:	Open Therm Cable 12 meters + DC Power Cable 2 meters
Test Mode Configurations:	ViCare Thermostat WiFi & ZigBee Test Software
Power Supply:	12 VDC using Laboratory Power Supply +
Power Supply:	5 VDC using AC/DC Adapter
AC/DC Adapter Details:	PHIHONG Technology|Model:PSM10R-050|Input:Ac120V 60Hz 0.3A

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.196094	---	27.48	53.77	26.29	1000.0	9.000	L1	GND	0.1
0.196094	47.11	---	63.77	16.66	1000.0	9.000	L1	GND	0.1
0.199375	45.25	---	63.64	18.39	1000.0	9.000	N	GND	0.1
0.199375	---	28.21	53.64	25.43	1000.0	9.000	N	GND	0.1
0.201719	45.03	---	63.54	18.51	1000.0	9.000	N	GND	0.1
0.201719	---	28.15	53.54	25.39	1000.0	9.000	N	GND	0.1
0.249063	38.74	---	61.79	23.05	1000.0	9.000	N	GND	0.1
0.249063	---	18.94	51.79	32.85	1000.0	9.000	N	GND	0.1
0.304844	---	22.79	50.11	27.32	1000.0	9.000	L1	GND	0.1
0.304844	40.17	---	60.11	19.94	1000.0	9.000	L1	GND	0.1
0.347813	34.78	---	59.01	24.23	1000.0	9.000	L1	GND	0.1
0.347813	---	14.78	49.01	34.23	1000.0	9.000	L1	GND	0.1
0.403594	32.93	---	57.78	24.85	1000.0	9.000	N	GND	0.1
0.403594	---	16.30	47.78	31.48	1000.0	9.000	N	GND	0.1
0.412656	32.94	---	57.59	24.65	1000.0	9.000	L1	GND	0.1
0.412656	---	14.43	47.59	33.16	1000.0	9.000	L1	GND	0.1
0.496719	31.75	---	56.05	24.30	1000.0	9.000	N	GND	0.1
0.496719	---	13.42	46.05	32.63	1000.0	9.000	N	GND	0.1
0.507500	30.98	---	56.00	25.02	1000.0	9.000	N	GND	0.1
0.507500	---	14.26	46.00	31.74	1000.0	9.000	N	GND	0.1
0.779219	26.43	---	56.00	29.57	1000.0	9.000	N	GND	0.3
0.779219	---	12.44	46.00	33.56	1000.0	9.000	N	GND	0.3
1.210469	---	14.00	46.00	32.00	1000.0	9.000	N	GND	0.3
1.210469	28.22	---	56.00	27.78	1000.0	9.000	N	GND	0.3
1.718281	31.01	---	56.00	24.99	1000.0	9.000	L1	GND	0.3
1.718281	---	16.65	46.00	29.35	1000.0	9.000	L1	GND	0.3
2.703281	---	11.03	46.00	34.97	1000.0	9.000	L1	GND	0.3
2.703281	23.27	---	56.00	32.73	1000.0	9.000	L1	GND	0.3
3.757344	23.28	---	56.00	32.72	1000.0	9.000	N	GND	0.3
3.757344	---	11.12	46.00	34.88	1000.0	9.000	N	GND	0.3
5.883594	---	10.11	50.00	39.89	1000.0	9.000	N	GND	0.4
5.883594	21.92	---	60.00	38.08	1000.0	9.000	N	GND	0.4
10.381875	---	18.58	50.00	31.42	1000.0	9.000	N	GND	0.4
10.381875	32.75	---	60.00	27.25	1000.0	9.000	N	GND	0.4
11.815938	---	19.11	50.00	30.89	1000.0	9.000	L1	GND	0.5
11.815938	31.32	---	60.00	28.68	1000.0	9.000	L1	GND	0.5
13.210625	30.87	---	60.00	29.13	1000.0	9.000	L1	GND	0.7
13.210625	---	18.51	50.00	31.49	1000.0	9.000	L1	GND	0.7
20.289844	---	4.63	50.00	45.37	1000.0	9.000	L1	GND	0.8
20.289844	17.89	---	60.00	42.11	1000.0	9.000	L1	GND	0.8