Measurement Results

1-7959/19-01-07_log1_conducted

Test logging

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Document authorized:

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2019.08.09 11:03:28 +02'00'

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Table of Content

IUT Summary

IUT DEFINITION	
Manufacturer	Sphinx Electronics GmbH &Co. KG
Type	FT 200 / FT 200 CAP
Serial No.	NI
Setup No.	NI
SW Version	NI
HW Version	NI
Comment 1	NI
Comment 2	NI

IUT Common Settings	
Tlow [°C]	-20
Tmid [°C]	20
Thigh [°C]	55
Vlow [V]	3.3
Vmid [V]	3.8
Vhigh [V]	4.2
Imax [A]	1
Auto Control enabled Power Supply | Climatic Box	No | No
Antenna Gain [dBi]	0
Additional Path Loss [dB]	0.7

IUT Common Settings BT Low Energy	
Intermodulation Value N	3
Image Freq. Low | Mid | High [MHz]	0 | 0 | 0
Power Class	2
1 Mbps supported	True | TXpayload 255 | RXpayload 255
2 Mbps supported	False | TXpayload 255 | RXpayload 255
Longrange S8 supported	False | TXpayload 255 | RXpayload 255
Longrange S2 supported	False | TXpayload 255 | RXpayload 255
Signaling Settings	None | HCI | 1 | B24K | None | S1 | None | On
Signaling RF Settings	RF1com | 0 | 0 | On |
User Interaction	Yes
Switch Matrix & Pathcompensation enabled	Yes

1. Common2G4 Peak Output Power conducted 3MHz_3MHz ~ BT LE 1 Msps

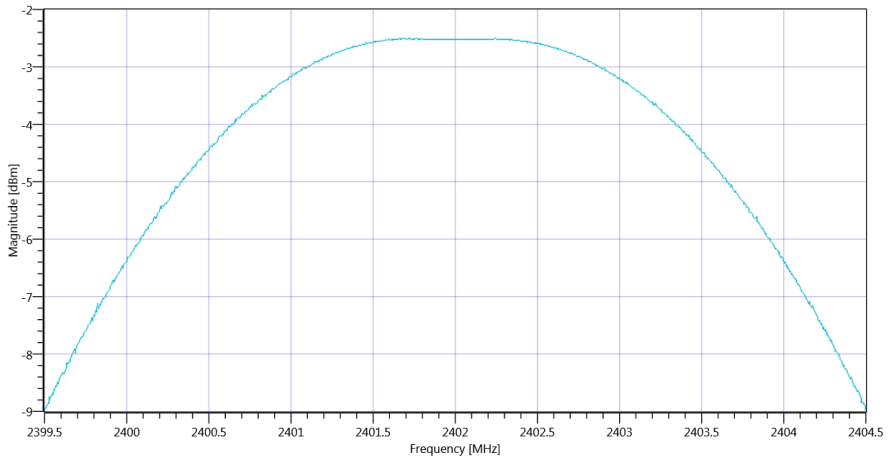
Test References	
TC Start	08.08.2019 15:39:17
System Version	1.0.0.16
Test Specification	None
Test Method	
Class / TC Version / TC ID	TC_VM_Common2G4_Peak_Output_Power_Conducted_3MHz_3MHz_V01 Version: 0.0.1 | TCID_Common2G4_1
My Description	Peak Output Power conducted 3MHz/3MHz - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	7.71
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	15
Freq. Start [MHz]	2399.500
Freq. Stop [MHz]	2404.500
Resolution BW. [MHz]	3.000000
Video BW. [MHz]	3.000000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	10
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_Common2G4_Peak_Output_Power_Conducted_3MHz_3MHz_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-2.5	dBm	Information
Peak Power	---	1000	0.562341	mW	Information
Frequency at Peak	---	---	2401.66	MHz	Information

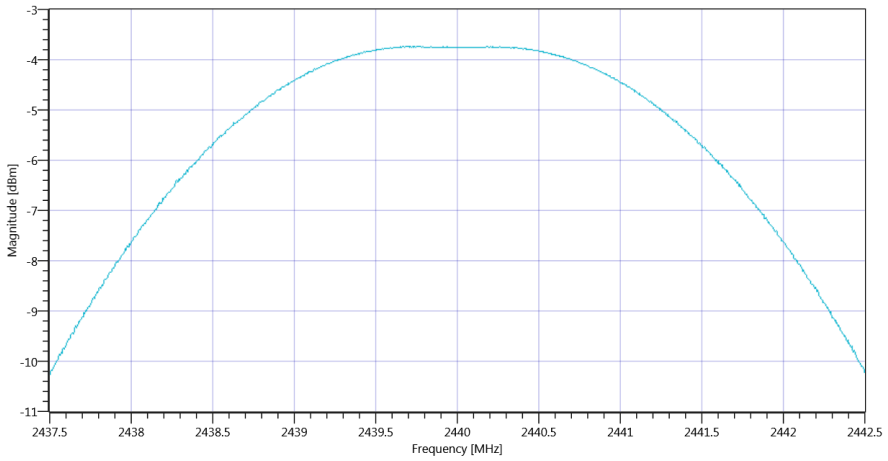


Plot_Common2G4 Peak Output Power conducted 3MHz_3MHz ~ BT LE 1 Msps_08082019_153943.png

Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	6.44
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	15
Freq. Start [MHz]	2437.500
Freq. Stop [MHz]	2442.500
Resolution BW. [MHz]	3.000000
Video BW. [MHz]	3.000000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	10
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_Common2G4_Peak_Output_Power_Conducted_3MHz_3MHz_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-3.74	dBm	Information
Peak Power	---	1000	0.422669	mW	Information
Frequency at Peak	---	---	2439.705	MHz	Information



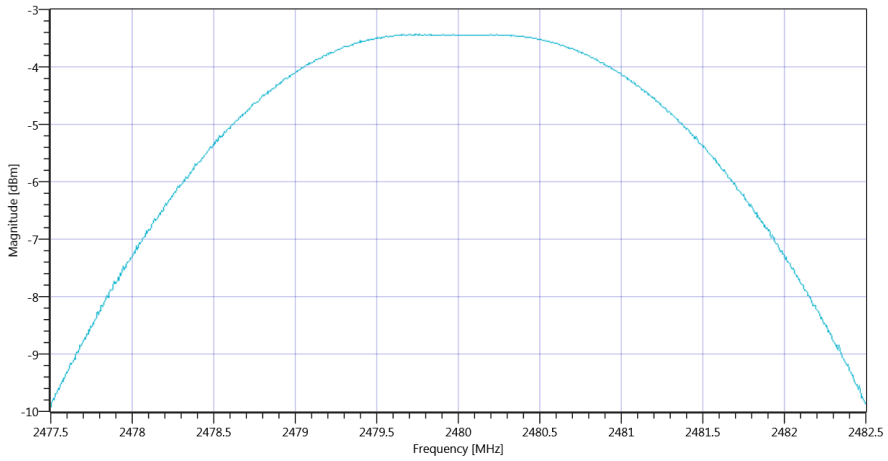
Plot_Common2G4 Peak Output Power conducted 3MHz_3MHz ~ BT LE 1 Msps_08082019_154029.png

Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	6.61
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	15
Freq. Start [MHz]	2477.500
Freq. Stop [MHz]	2482.500
Resolution BW. [MHz]	3.000000
Video BW. [MHz]	3.000000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	10
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_Common2G4_Peak_Output_Power_Conducted_3MHz_3MHz_V01

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-3.43	dBm	Information
Peak Power	---	1000	0.453942	mW	Information
Frequency at Peak	---	---	2480.235	MHz	Information



Plot_Common2G4 Peak Output Power conducted 3MHz_3MHz ~ BT LE 1 Msps_08082019_154111.png

TEST FINISHED		
General Verdict	08.08.2019 15:41:11 / RT: 114 s	PASS

2. FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps

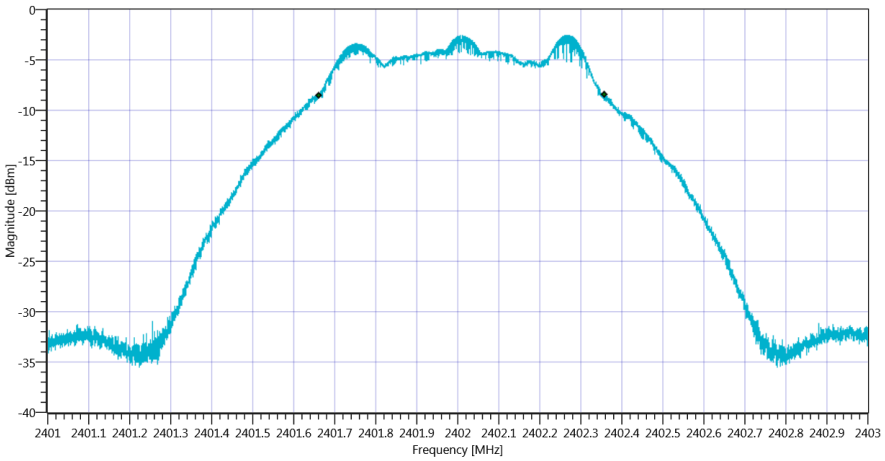
Test References	
TC Start	08.08.2019 15:41:15
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	DTS: KDB 558074 D01 V05 - Chapter 8.3.1.1 RBW ≥ DTS Bandwidth
Class / TC Version / TC ID	TC_VM_FCC15247_Maximum_Peak_Conducted_Output_Power_DTS_V01 Version: 0.0.1 | TCID_FCC15247_3
My Description	FCC 15.247 Maximum Peak Output Power Conducted DTS - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.65
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	10
Freq. Start [MHz]	2401.000
Freq. Stop [MHz]	2403.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: DTS Bandwidth					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	---	---	698	kHz	Information

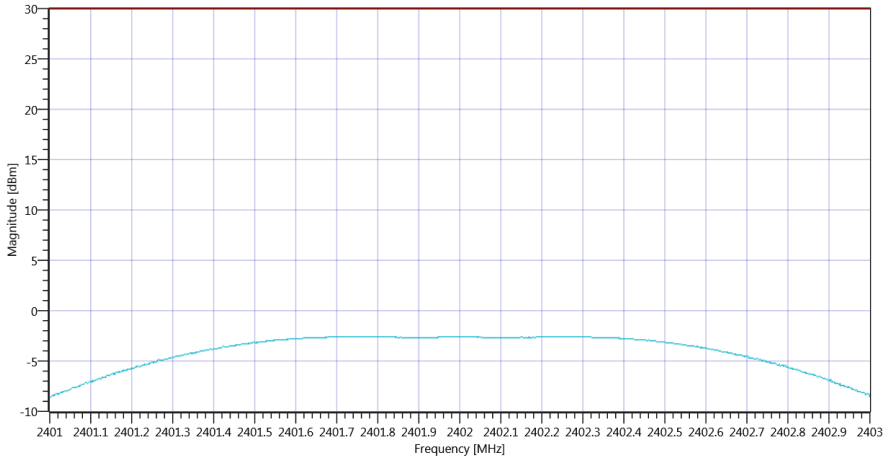


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps DTS BW _08082019_154153.png

READ SA SETTINGS:	
Ref. Level [dBm]	7.65
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	15
Freq. Start [MHz]	2401.000
Freq. Stop [MHz]	2403.000
Resolution BW. [MHz]	1.000000
Video BW. [MHz]	5.000000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	1001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Maximum_Peak_Conducted_Output_Power_DTS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-2.6	dBm	PASS
Peak Power	---	1000	0.549541	mW	PASS

Frequency at Peak	---	---	2401.742	MHz	Information

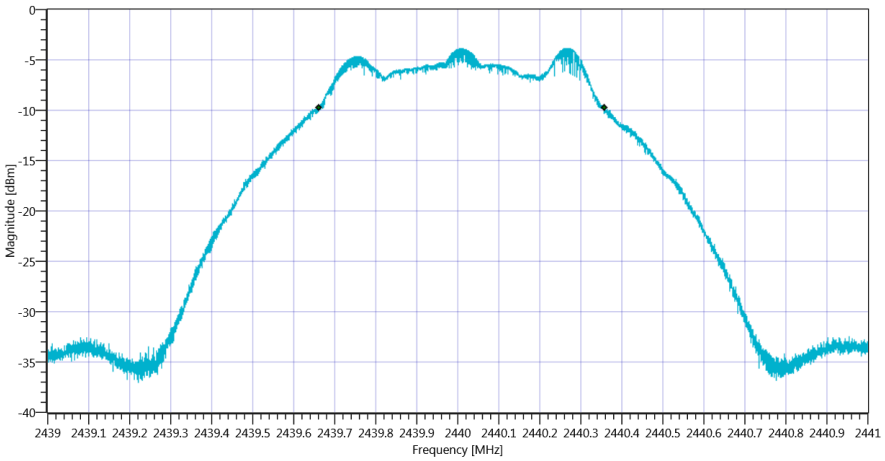


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps_08082019_154208.png

Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.52
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	10
Freq. Start [MHz]	2439.000
Freq. Stop [MHz]	2441.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: DTS Bandwidth					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	---	---	697	kHz	Information

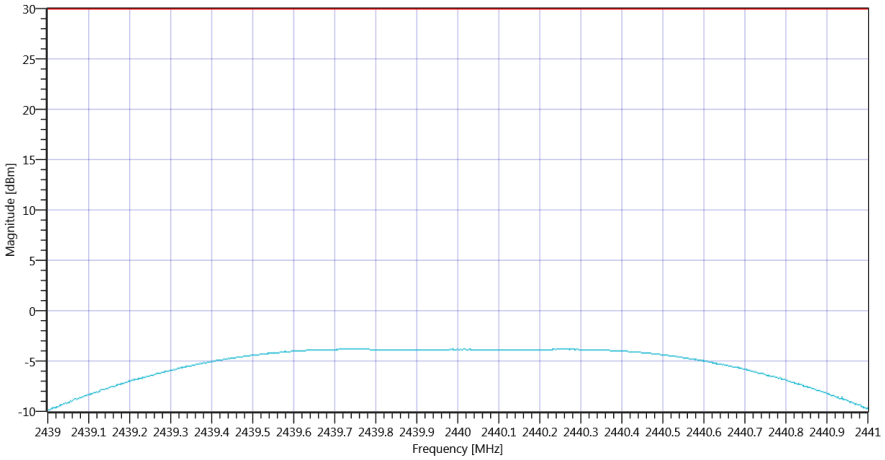


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps DTS BW _08082019_154258.png

READ SA SETTINGS:	
Ref. Level [dBm]	6.52
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	15
Freq. Start [MHz]	2439.000
Freq. Stop [MHz]	2441.000
Resolution BW. [MHz]	1.000000
Video BW. [MHz]	5.000000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	1001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Maximum_Peak_Conducted_Output_Power_DTS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-3.84	dBm	PASS
Peak Power	---	1000	0.413048	mW	PASS

Frequency at Peak	---	---	2439.726	MHz	Information

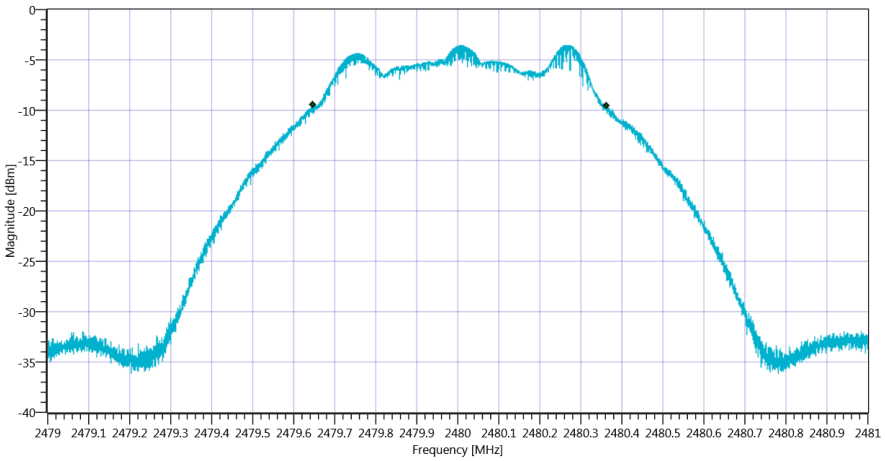


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps_08082019_154313.png

Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.62
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	10
Freq. Start [MHz]	2479.000
Freq. Stop [MHz]	2481.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: DTS Bandwidth					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	---	---	716	kHz	Information

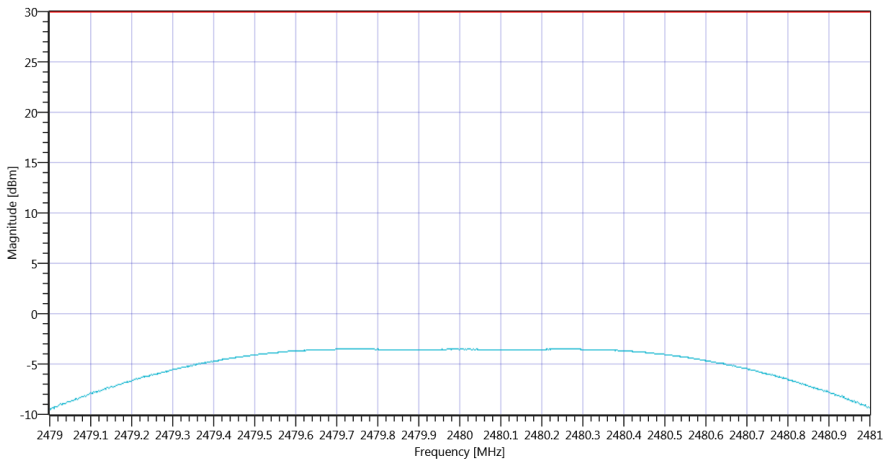


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps DTS BW _08082019_154348.png

READ SA SETTINGS:	
Ref. Level [dBm]	6.62
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	15
Freq. Start [MHz]	2479.000
Freq. Stop [MHz]	2481.000
Resolution BW. [MHz]	1.000000
Video BW. [MHz]	5.000000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	1001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Maximum_Peak_Conducted_Output_Power_DTS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30.00	-3.53	dBm	PASS
Peak Power	---	1000	0.443609	mW	PASS

Frequency at Peak	---	---	2479.746	MHz	Information



Plot_FCC Part 15.247 Maximum Peak Conducted Output Power DTS ~ BT LE 1 Msps_08082019_154403.png

TEST FINISHED		
General Verdict	08.08.2019 15:44:03 / RT: 168 s	PASS

3. FCC Part 15.247 Bandwidth 6dB DTS ~ BT LE 1 Msps

Test References	
TC Start	08.08.2019 15:44:07
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	99
Class / TC Version / TC ID	TC_VM_FCC15247_Bandwidth_6dB_DTS_V01 Version: 0.0.1 | TCID_FCC15247_1
My Description	FCC 15.247 Bandwidth 6dB DTS - BT LE 1 Msps
Add. Information	

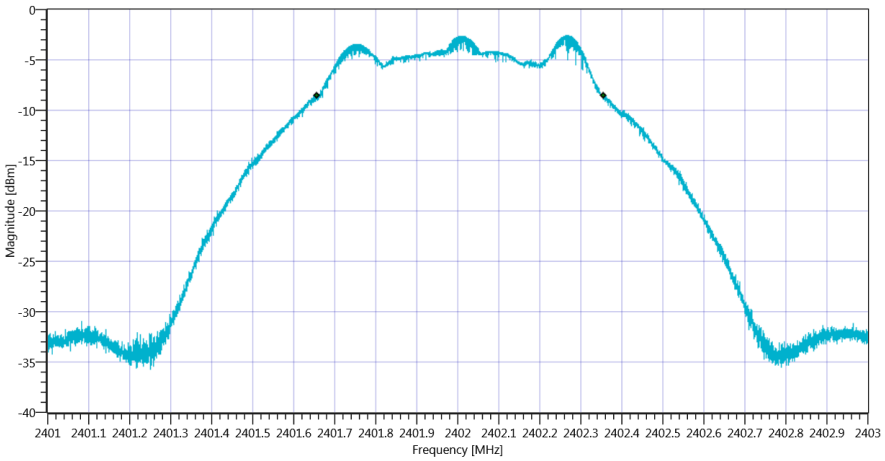
Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.61
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	10
Freq. Start [MHz]	2401.000
Freq. Stop [MHz]	2403.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_6dB_DTS_V01

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	500	---	701	kHz	PASS



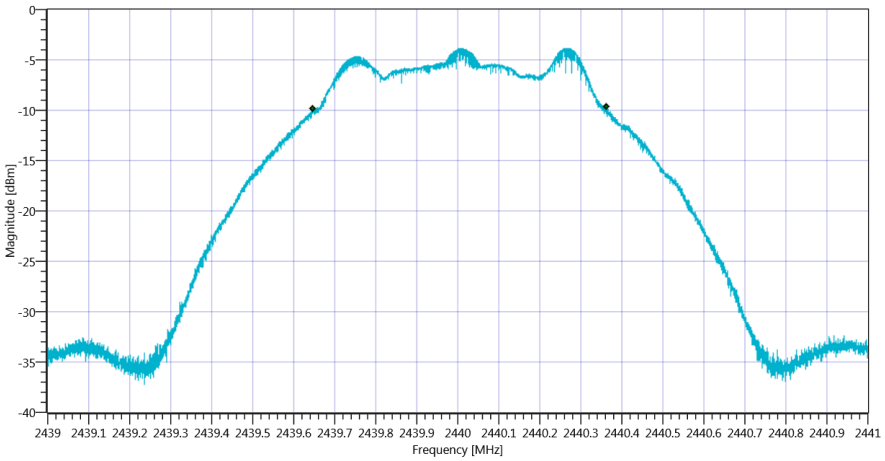
Plot_FCC Part 15.247 Bandwidth 6dB DTS ~ BT LE 1 Msps_08082019_154447.png

Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.40
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	10
Freq. Start [MHz]	2439.000
Freq. Stop [MHz]	2441.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_6dB_DTS_V01

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	500	---	717	kHz	PASS



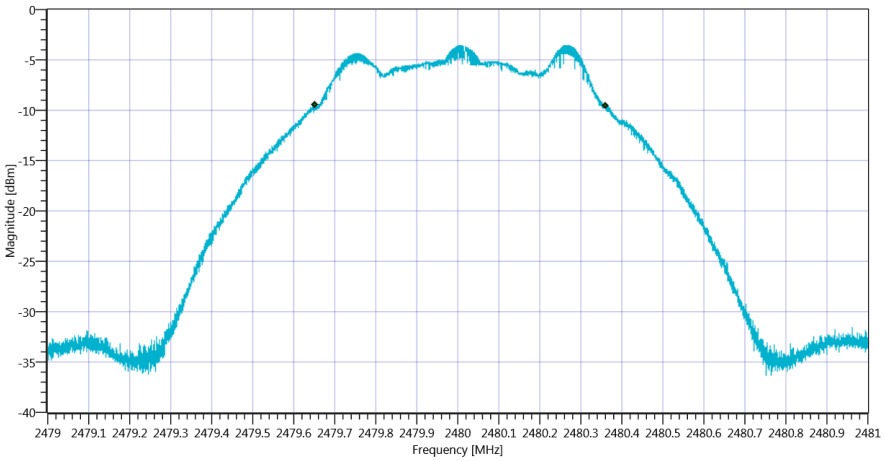
Plot_FCC Part 15.247 Bandwidth 6dB DTS ~ BT LE 1 Msps_08082019_154657.png

Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.58
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	10
Freq. Start [MHz]	2479.000
Freq. Stop [MHz]	2481.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_6dB_DTS_V01

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
DTS Bandwidth (6dB)	500	---	710	kHz	PASS



Plot_FCC Part 15.247 Bandwidth 6dB DTS ~ BT LE 1 Msps_08082019_155011.png

TEST FINISHED		
General Verdict	08.08.2019 15:50:11 / RT: 363 s	PASS

4. FCC Part 15.247 Peak Power Spectral Density DTS ~ BT LE 1 Msps

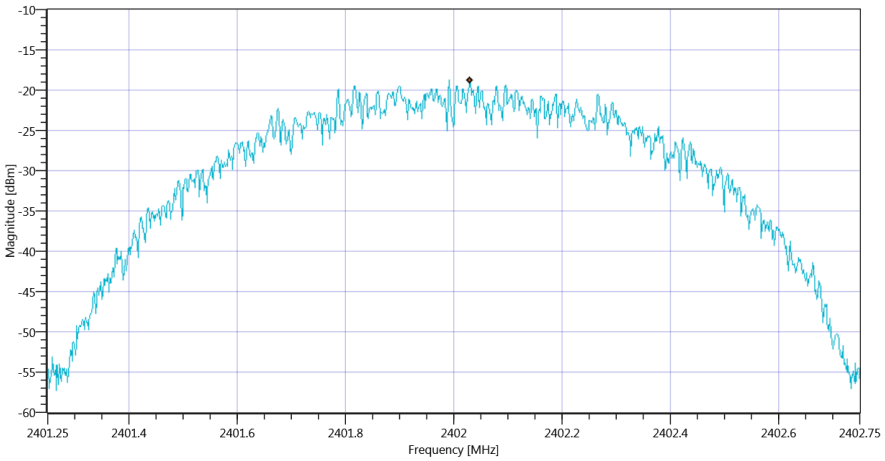
Test References	
TC Start	08.08.2019 15:50:15
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	DTS: KDB 558074 D01 V05 - Chapter 8.4 DTS maximum power spectral density level in the fundamental emission
Class / TC Version / TC ID	TC_VM_FCC15247_Peak_Power_Spectral_Density_DTS_V01 Version: 0.0.1 | TCID_FCC15247_6
My Description	FCC 15.247 Peak Power Spectral Density DTS - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.68
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	10
Freq. Start [MHz]	2401.250
Freq. Stop [MHz]	2402.750
Resolution BW. [MHz]	0.003000
Video BW. [MHz]	0.010000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	20
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Peak_Power_Spectral_Density_DTS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Max Peak power Density	---	8	-18.76	dBm/3KHz	PASS

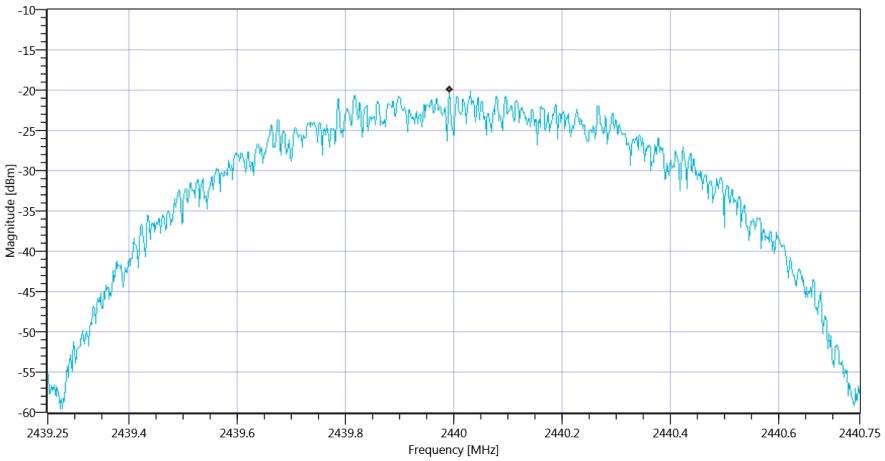


Plot_FCC Part 15.247 Peak Power Spectral Density DTS ~ BT LE 1 Msps_08082019_155115.png

Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.45
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	10
Freq. Start [MHz]	2439.250
Freq. Stop [MHz]	2440.750
Resolution BW. [MHz]	0.003000
Video BW. [MHz]	0.010000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	20
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Peak_Power_Spectral_Density_DTS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Max Peak power Density	---	8	-19.92	dBm/3KHz	PASS



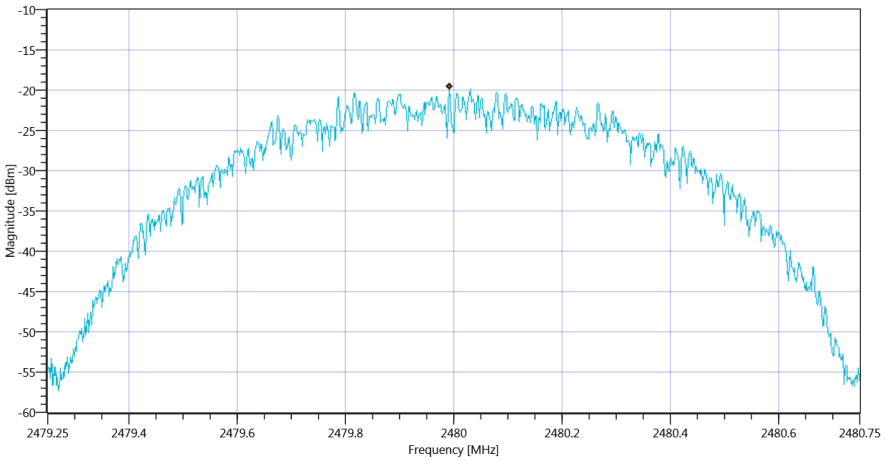
Plot_FCC Part 15.247 Peak Power Spectral Density DTS ~ BT LE 1 Msps_08082019_155251.png

Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.59
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	10
Freq. Start [MHz]	2479.250
Freq. Stop [MHz]	2480.750
Resolution BW. [MHz]	0.003000
Video BW. [MHz]	0.010000
Detector	POS
Sweep Time [ms]	1000
Sweep Points/Section	1001
Sweep Count	20
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Peak_Power_Spectral_Density_DTS_V01

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Max Peak power Density	---	8	-19.52	dBm/3KHz	PASS



Plot_FCC Part 15.247 Peak Power Spectral Density DTS ~ BT LE 1 Msps_08082019_155352.png

TEST FINISHED		
General Verdict	08.08.2019 15:53:52 / RT: 217 s	PASS

5. FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps

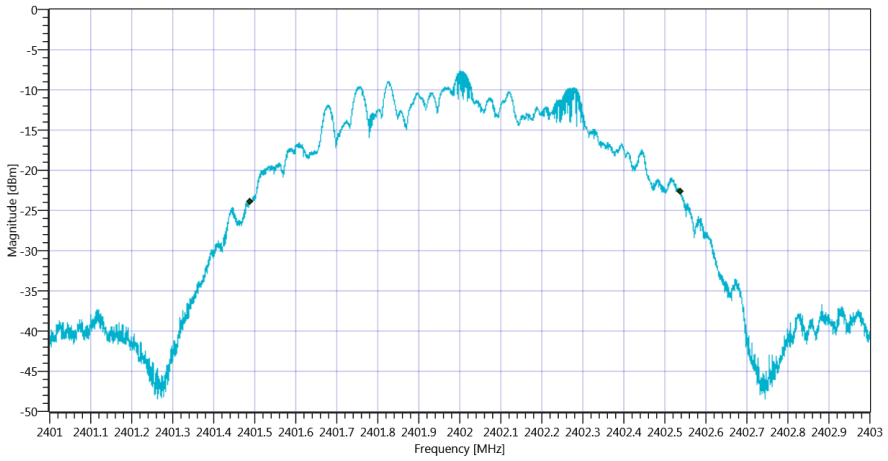
Test References	
TC Start	08.08.2019 15:53:56
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	
Class / TC Version / TC ID	TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01 Version: 0.0.2 | TCID_FCC15247_2
My Description	FCC 15.247 Bandwidth 99PCT-20dB DTS - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

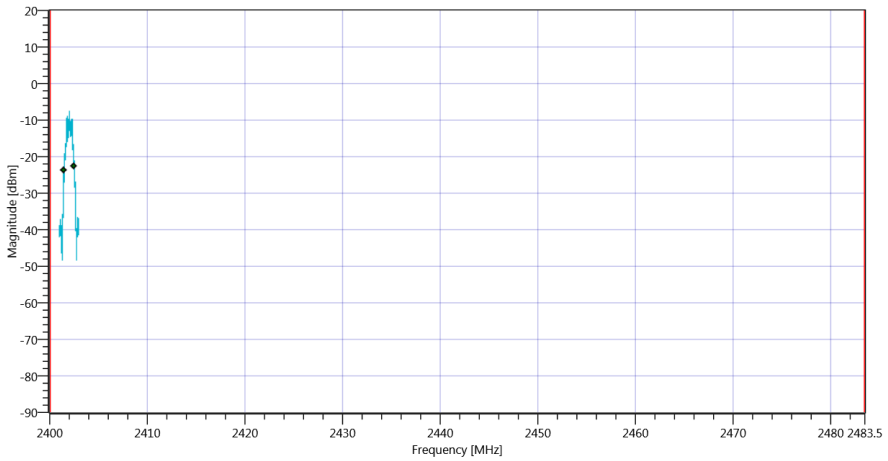
Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.62
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	10
Freq. Start [MHz]	2401.000
Freq. Stop [MHz]	2403.000
Resolution BW. [MHz]	0.020000
Video BW. [MHz]	0.050000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	1049	kHz	Information
T1 99%	2400.000000	---	2401.4889	MHz	PASS
T2 99%	---	2483.500000	2402.5383	MHz	PASS

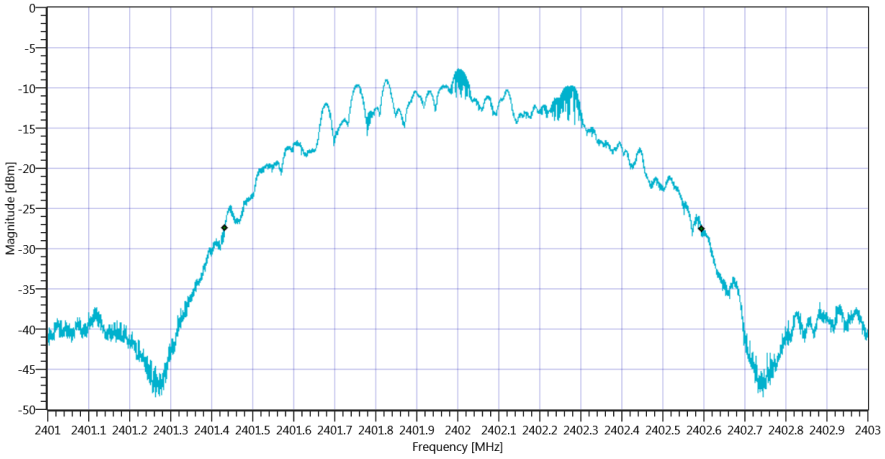


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 99PCT_08082019_155438.png

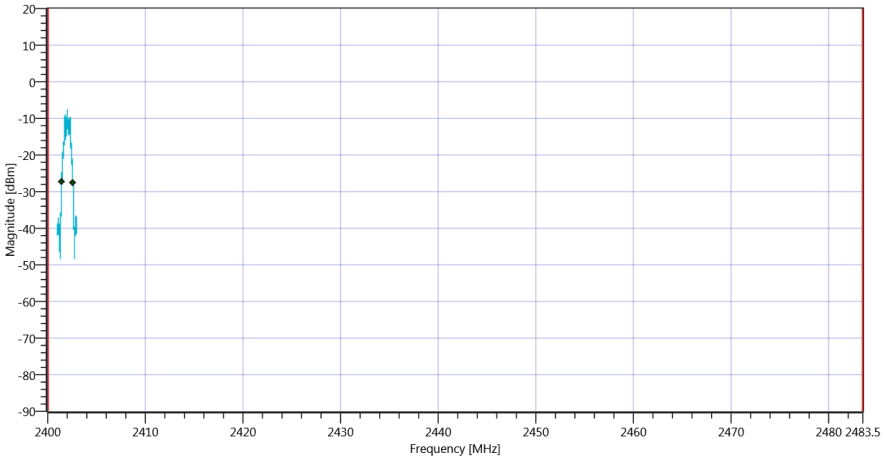


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155441.png

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 20dB	---	---	1165	kHz	Information
T1 20dB	2400.000000	---	2401.4312	MHz	PASS
T2 20dB	---	2483.500000	2402.5958	MHz	PASS



Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 20dB_08082019_155445.png

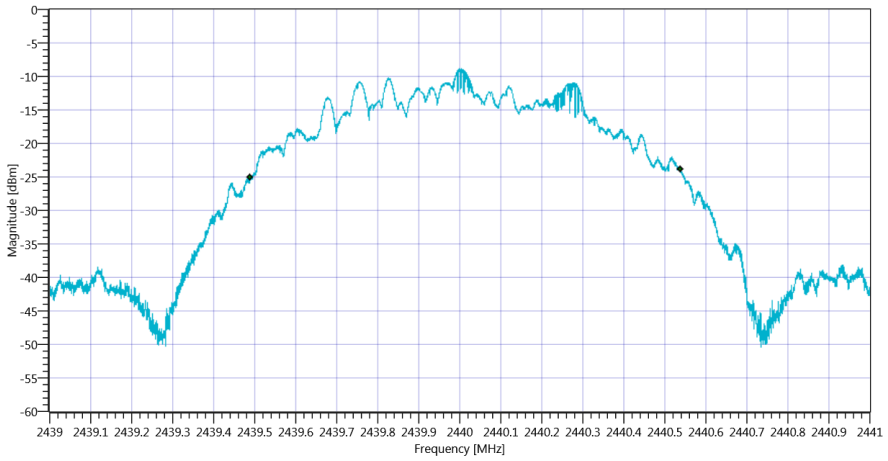


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155449.png

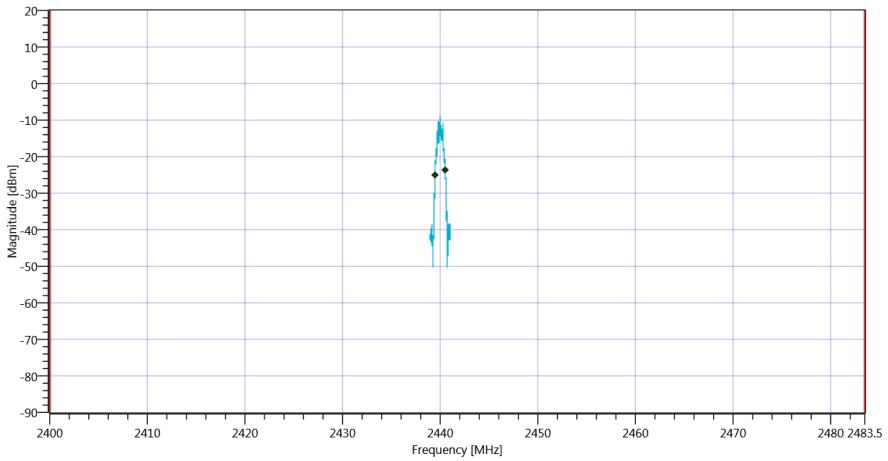
Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.45
Ref. Lev. offs [dB]	10.6
Input Attenuation [dB]	10
Freq. Start [MHz]	2439.000
Freq. Stop [MHz]	2441.000
Resolution BW. [MHz]	0.020000
Video BW. [MHz]	0.050000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	1050	kHz	Information
T1 99%	2400.000000	---	2439.4885	MHz	PASS
T2 99%	---	2483.500000	2440.5387	MHz	PASS

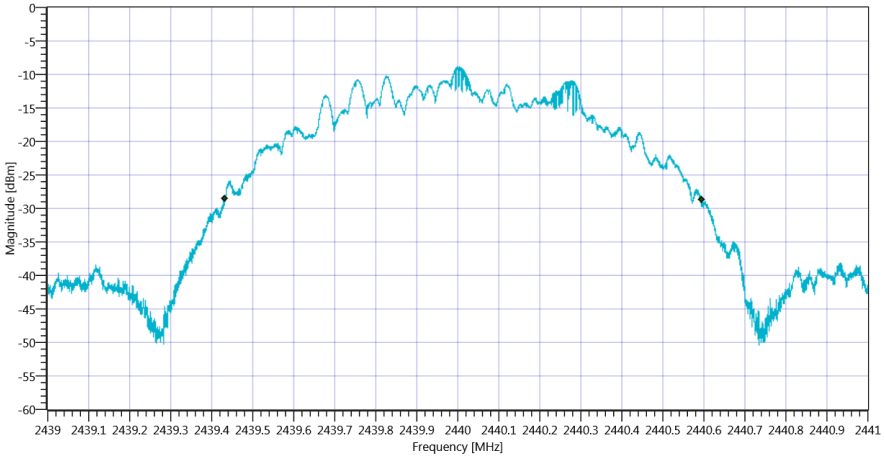


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 99PCT_08082019_155524.png

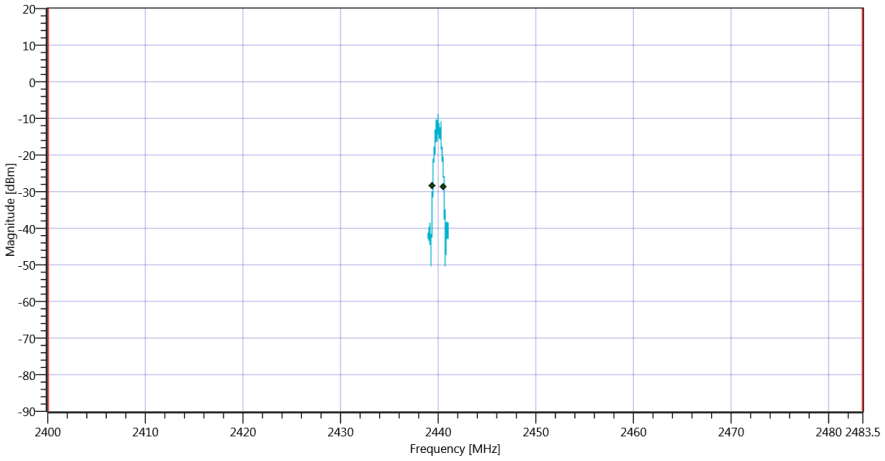


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155528.png

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 20dB	---	---	1163	kHz	Information
T1 20dB	2400.000000	---	2439.4324	MHz	PASS
T2 20dB	---	2483.500000	2440.5958	MHz	PASS



Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 20dB_08082019_155532.png

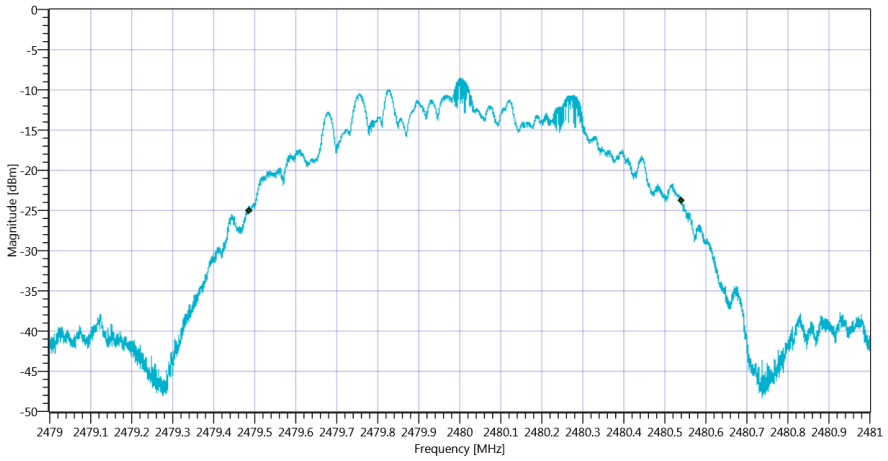


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155535.png

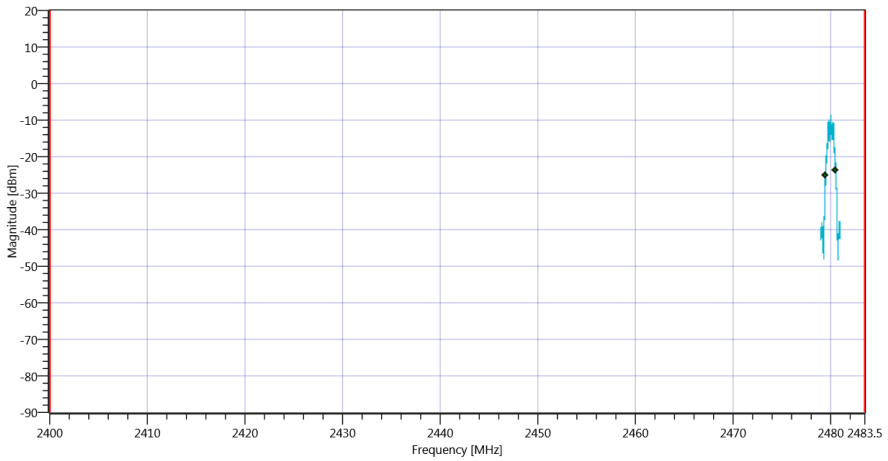
Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	1.62
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	10
Freq. Start [MHz]	2479.000
Freq. Stop [MHz]	2481.000
Resolution BW. [MHz]	0.020000
Video BW. [MHz]	0.050000
Detector	POS
Sweep Time [ms]	50
Sweep Points/Section	10001
Sweep Count	200
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	1053	kHz	Information
T1 99%	2400.000000	---	2479.4871	MHz	PASS
T2 99%	---	2483.500000	2480.5399	MHz	PASS

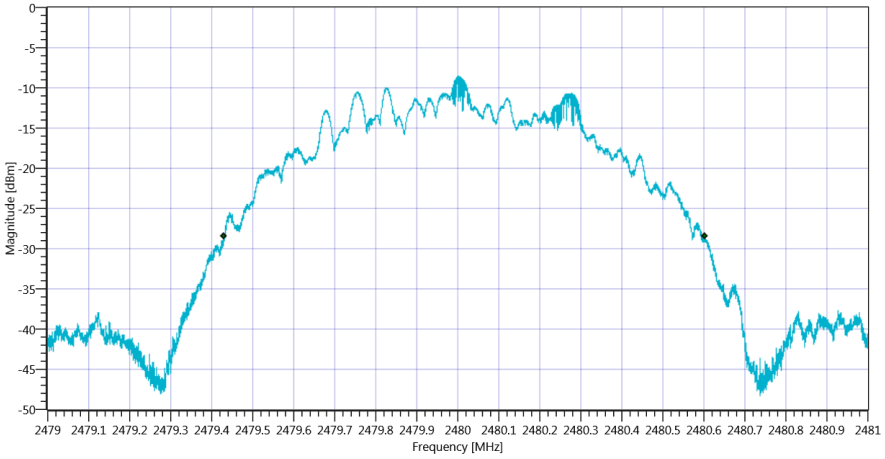


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 99PCT_08082019_155643.png

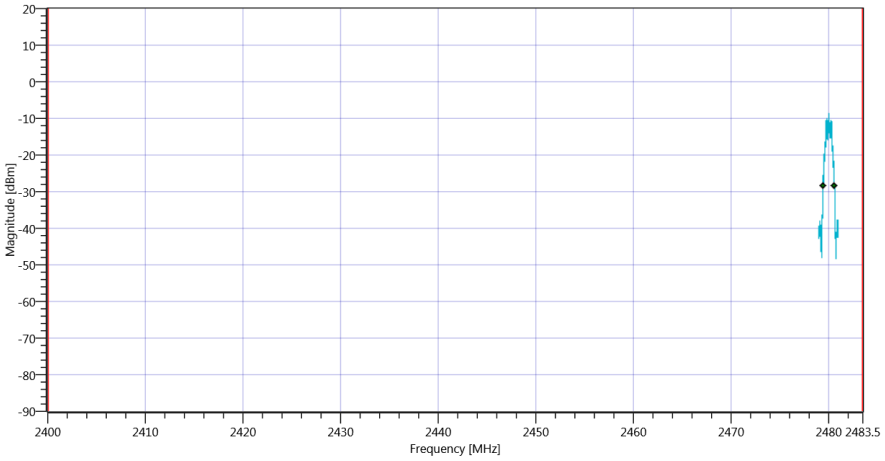


Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155646.png

RESULT: TC_VM_FCC15247_Bandwidth_99PCT_20dB_DTS_FHSS_V01					
Test Description	**Lower Limit**	**Upper Limit**	**Measured**	**Unit**	**Verdict**
Bandwidth 20dB	---	---	1173	kHz	Information
T1 20dB	2400.000000	---	2479.4302	MHz	PASS
T2 20dB	---	2483.500000	2480.6028	MHz	PASS



Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps 20dB_08082019_155651.png



Plot_FCC Part 15.247 Bandwidth 99PCT-20dB ~ BT LE 1 Msps_08082019_155655.png

TEST FINISHED		
General Verdict	08.08.2019 15:56:55 / RT: 178 s	PASS

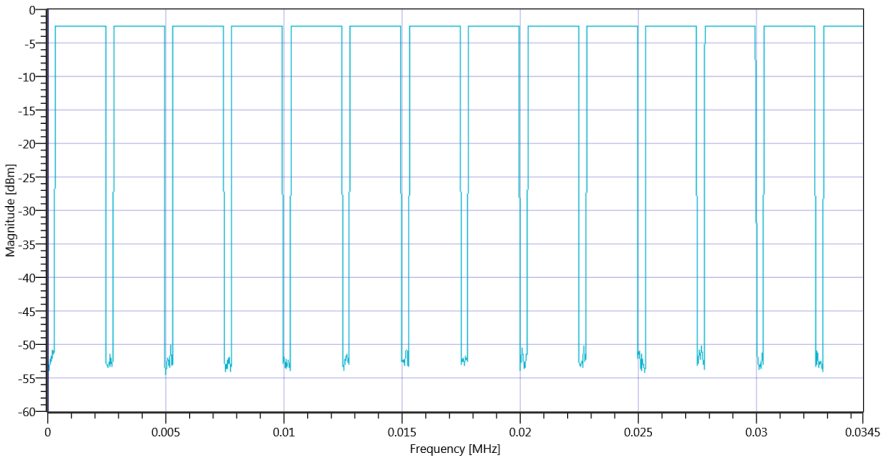
6. FCC Part 15.247 Restricted Band Edge Conducted Avg DC corrected DTS ~ BT LE 1 Msps

Test References	
TC Start	08.08.2019 15:56:59
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	DTS: KDB 558074 D01 V05 - 8.7.3 Integration Method; ANSI C63.10-2013 11.13.3.4 Trace averaging across on- and off-times of the EUT transmissions followed by duty cycle correction
Class / TC Version / TC ID	TC_VM_FCC15247_Restricted_Band_Edge_Conducted_Avg_DC_corrected_V01 Version: 0.0.1 | TCID_FCC15247_7
My Description	FCC 15.247 Restricted Band Edge Cond. Avg DC corrected DTS - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	False | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

Test at TX 2402 MHz

RESULT: Duty Cycle evaluation					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Result Duty Cycles					
Duty Cycle (Burst Ratio) 1	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 2	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 3	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 4	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 5	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 6	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 7	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 8	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 9	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 10	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 11	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) max	---	---	0.847	---	Information
Duty Cycle max	---	---	0.721	dB	Information
Duty Cycle (Burst Ratio) min	---	---	0.836	---	Information
Duty Cycle min	---	---	0.778	dB	Information

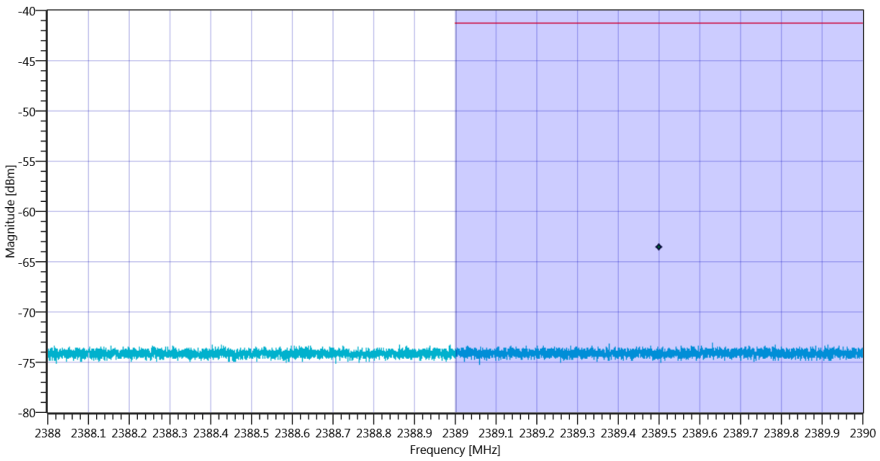


Plot_FCC Part 15.247 Restricted Band Edge Conducted Avg DC corrected DTS ~ BT LE 1 Msps 2402 MHz - Duty Cycle_08082019_155732.png

READ SA SETTINGS:	
Ref. Level [dBm]	7.65
Ref. Lev. offs [dB]	10.51
Input Attenuation [dB]	15
Freq. Start [MHz]	2388.000
Freq. Stop [MHz]	2390.000
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.500000
Detector	RMS
Sweep Time [ms]	32
Sweep Points/Section	32000
Sweep Count	300
Sweep Mode	AVER
Used Sweep Type	SWE
Marker Method	Band Power

RESULT: TC_VM_FCC15247_Restricted_Band_Edge_Conducted_Avg_DC_corrected_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict

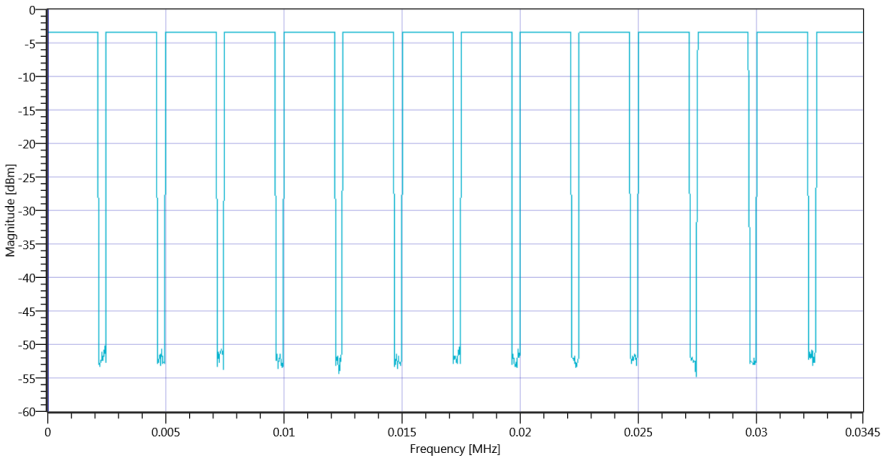
Duty Cylce worst case	---	---	0.778	dB	Information
Band Power without Antenna Gain Avg	---	---	-64.38	dBm	Information
Band Power without Antenna Gain Avg DC corrected	---	---	-63.602	dBm	Information
Band Power incl. Antenna Gain Avg DC corrcted	---	-41.23	-63.602	dBm	PASS



Plot_FCC Part 15.247 Restricted Band Edge Conducted Avg DC corrected DTS ~ BT LE 1 Msps_08082019_155754.png

Test at TX 2480 MHz

RESULT: Duty Cycle evaluation					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Result Duty Cycles					
Duty Cycle (Burst Ratio) 1	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 2	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 3	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 4	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 5	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 6	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 7	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 8	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 9	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) 10	---	---	0.847	---	Information
Duty Cycle (Burst Ratio) 11	---	---	0.836	---	Information
Duty Cycle (Burst Ratio) max	---	---	0.847	---	Information
Duty Cycle max	---	---	0.721	dB	Information
Duty Cycle (Burst Ratio) min	---	---	0.836	---	Information
Duty Cycle min	---	---	0.778	dB	Information

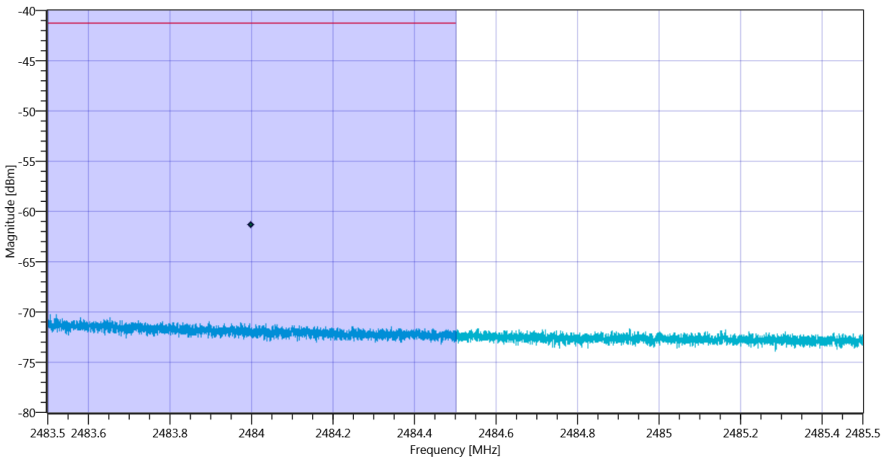


Plot_FCC Part 15.247 Restricted Band Edge Conducted Avg DC corrected DTS ~ BT LE 1 Msps 2480 MHz - Duty Cycle_08082019_155831.png

READ SA SETTINGS:	
Ref. Level [dBm]	6.63
Ref. Lev. offs [dB]	10.65
Input Attenuation [dB]	15
Freq. Start [MHz]	2483.500
Freq. Stop [MHz]	2485.500
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.500000
Detector	RMS
Sweep Time [ms]	32
Sweep Points/Section	32000
Sweep Count	300
Sweep Mode	AVER
Used Sweep Type	SWE
Marker Method	Band Power

RESULT: TC_VM_FCC15247_Restricted_Band_Edge_Conducted_Avg_DC_corrected_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict

Duty Cylce worst case	---	---	0.778	dB	Information
Band Power without Antenna Gain Avg	---	---	-62.17	dBm	Information
Band Power without Antenna Gain Avg DC corrected	---	---	-61.392	dBm	Information
Band Power incl. Antenna Gain Avg DC corrcted	---	-41.23	-61.392	dBm	PASS



Plot_FCC Part 15.247 Restricted Band Edge Conducted Avg DC corrected DTS ~ BT LE 1 Msps_08082019_155853.png

TEST FINISHED		
General Verdict	08.08.2019 15:58:53 / RT: 114 s	PASS

7. FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps

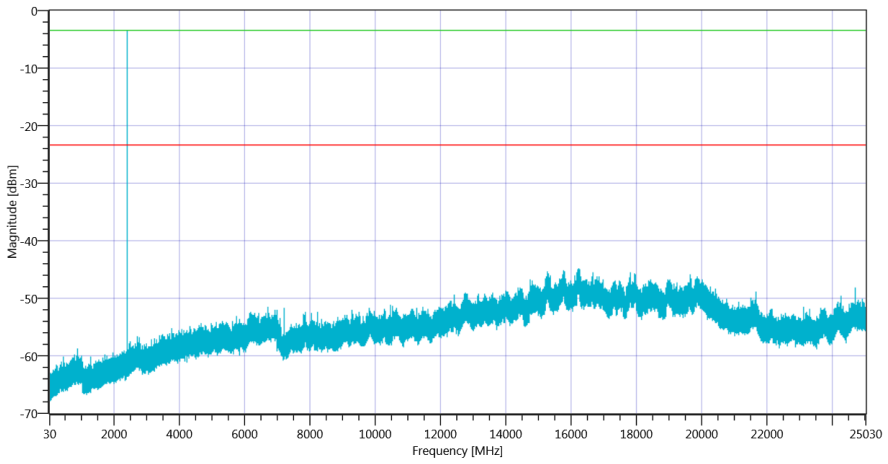
Test References	
TC Start	08.08.2019 15:58:57
System Version	1.0.0.16
Test Specification	FCC Part 15.247
Test Method	IF DTS then 8.5 DTS emissions in non-restricted frequency bands: Subclause 11.11 of ANSI C63.10 is applicable.
Class / TC Version / TC ID	TC_VM_FCC15247_TX_Emissions_Conducted_V01 Version: 0.0.1 | TCID_FCC15247_8
My Description	FCC 15.247 TX Emissions Conducted DTS - BT LE 1 Msps
Add. Information	

Test Parameter	
Technology to test	BT LE 1 Msps
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 2402
Frequency mid to test	True | Freq [MHz] 2440
Frequency high to test	True | Freq [MHz] 2480
Pattern	PRBS9
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SigBT: Rohde&Schwarz,CBT-1153.9000.35,100185,CBT 6X02.P02 | SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.40

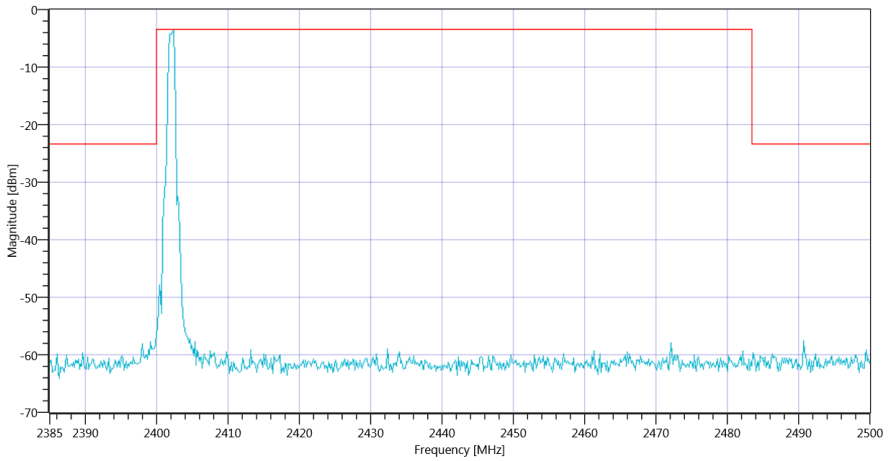
Test at TX 2402 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	3.24
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	500
Sweep Points/Section	3001
Sweep Count	8
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_TX_Emissions_Conducted_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 2402.33 MHz	---	---	-3.44	dBm	Information
No peaks detected	---	---			PASS



Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2402_08082019_160357.png

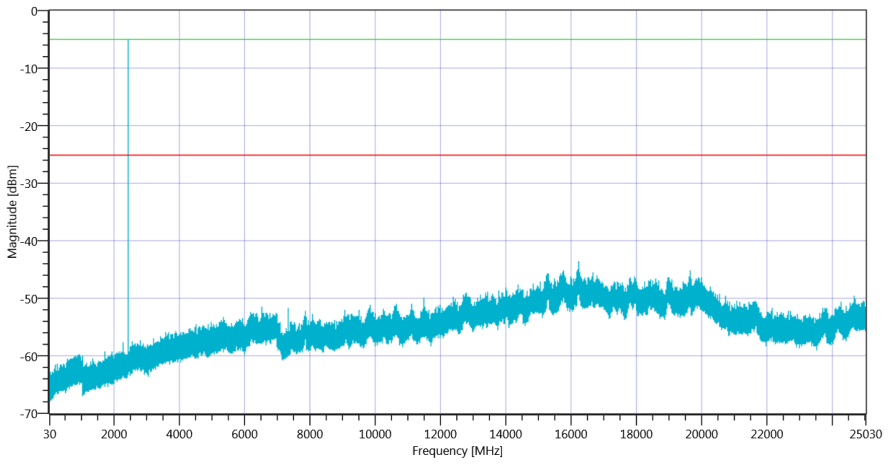


Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2402_08082019_160400.png

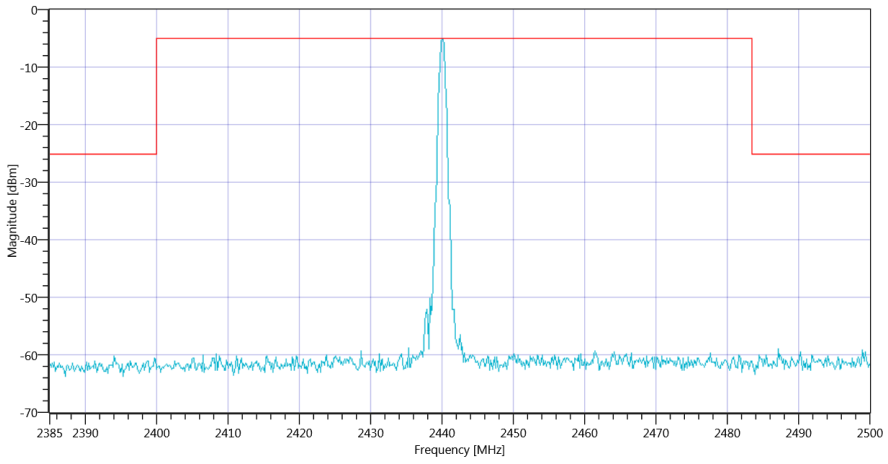
Test at TX 2440 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.21
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	500
Sweep Points/Section	3001
Sweep Count	8
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_TX_Emissions_Conducted_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 2440.00 MHz	---	---	-5.08	dBm	Information
No peaks detected	---	---			PASS



Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2440_08082019_160913.png

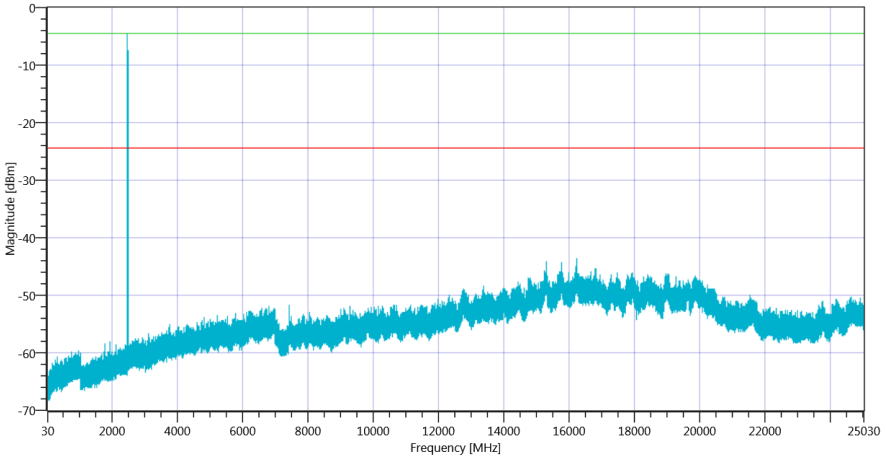


Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2440_08082019_160915.png

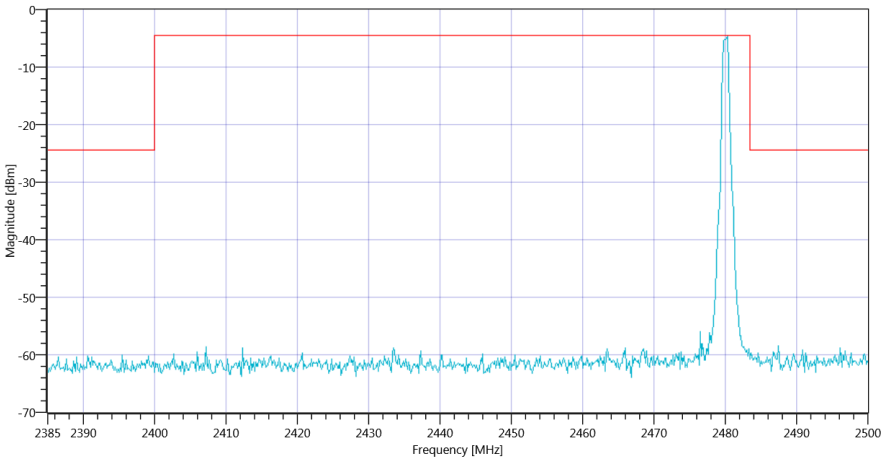
Test at TX 2480 MHz

READ SA SETTINGS:	
Ref. Level [dBm]	2.23
Resolution BW. [MHz]	0.100000
Video BW. [MHz]	0.300000
Detector	POS
Sweep Time [ms]	500
Sweep Points/Section	3001
Sweep Count	8
Sweep Mode	MAXH
Used Sweep Type	SWE

RESULT: TC_VM_FCC15247_TX_Emissions_Conducted_V01					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 2480.33 MHz	---	---	-4.49	dBm	Information
No peaks detected	---	---			PASS



Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2480_08082019_161420.png



Plot_FCC Part 15.247 TX Spurious Conduced ~ BT LE 1 Msps 2480_08082019_161423.png

TEST FINISHED		
General Verdict	08.08.2019 16:14:24 / RT: 926 s	PASS

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