Measurement Results

1-0597/20-03-02_log1_conducted

Test logging

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2020.12.14 13:19:48 +01'00'

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Table of Content

IUT Summary

IUT DEFINITION & Common settings	
Manufacturer	ifm electronic gmbh Essen
Type	DTE904 (TR10)
Serial No. | Setup No.	NI | 1.0
SW Version | HW Version	NI | NI
Comment 1 | 2	|
Tlow | Tmid | Thigh [°C]	-20 | 20 | 60
Vlow | Vmid | Vhigh [V] @Imax [A]	24.0 | 24.0 | 24.0 @1
Auto Control enabled Power Supply | Climatic Box	No | No
Antenna Gain [dBi]	0
Additional Path Loss [dB]	0.5

1. FCC Part 15.247 Maximum Peak Conducted Output Power ~ Generic 0G9 hopp

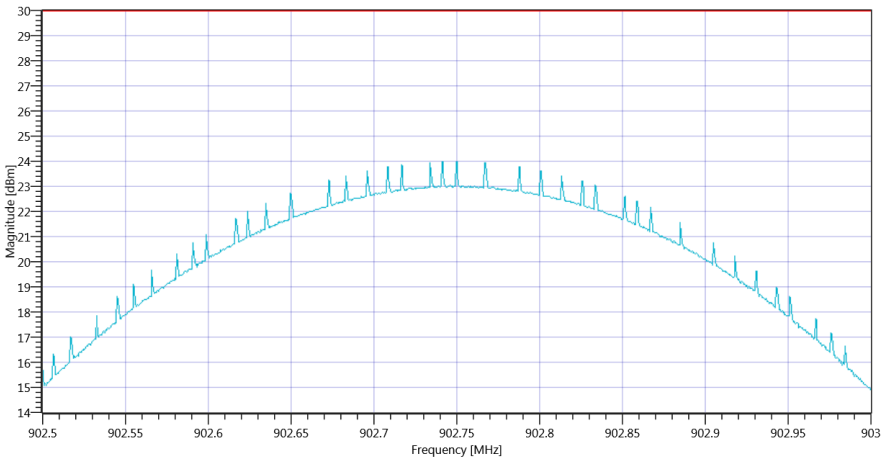
Test References	
TC Start	07.07.2020 13:54:14
Ambit Temp [°C] | Humidity [rel%]	not enabled | not enabled
System Version	1.0.0.45
Test Specification	FCC Part 15.247
Test Method	
Class / TC Version	TC_VM_FCC15247_0G9_Maximum_Peak_Conducted_Output_Power_V01 Version: 0.0.1
My Description	FCC 15.247 Maximum Peak Output Power Conducted FHSS
Add. Information	

Test Parameter	
Technology to test	Generic 0G9 hopp
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 902.75
Frequency mid to test	True | Freq [MHz] 915.25
Frequency high to test	True | Freq [MHz] 927.25
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.60

Test at TX 902.75 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	28.05 | 8.67 | 35
Start [MHz] | Stop [MHz]	902.500 | 903.000
RBW [MHz] | VBW [MHz]	0.300000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 50 | 1001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30	23.97	dBm	PASS
Frequency at Peak	---	---	902.75	MHz	INFO

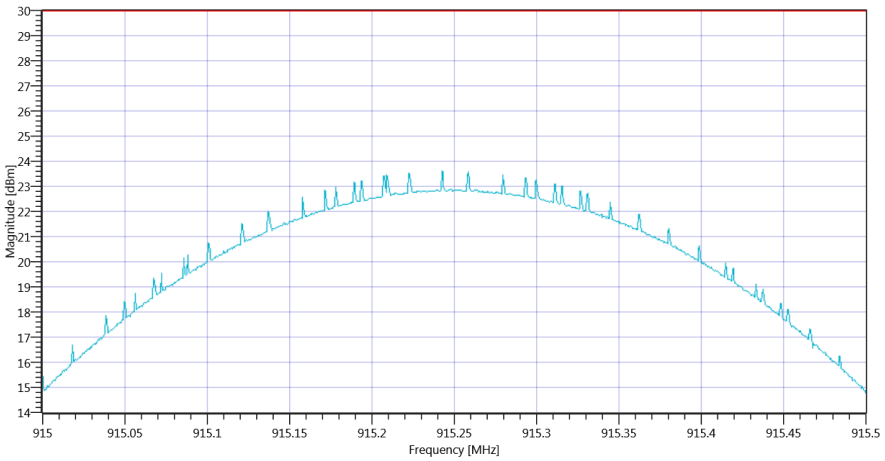


Plot_FCC Part 15.247 Maximum Peak Conducted Output Power ~ Generic 0G9 hopp_07072020_135442.png

Test at TX 915.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	28.10 | 8.68 | 35
Start [MHz] | Stop [MHz]	915.000 | 915.500
RBW [MHz] | VBW [MHz]	0.300000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 50 | 1001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30	23.59	dBm	PASS
Frequency at Peak	---	---	915.243	MHz	INFO



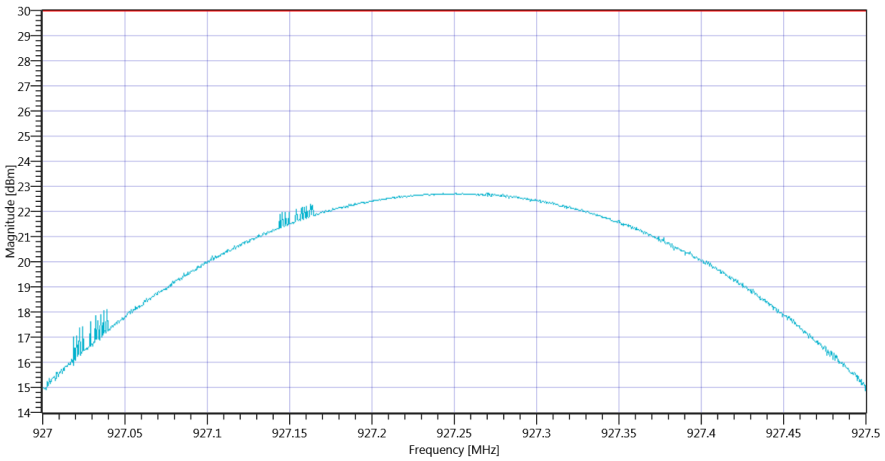
Plot_FCC Part 15.247 Maximum Peak Conducted Output Power ~ Generic 0G9 hopp_07072020_135516.png

Test at TX 927.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	27.85 | 8.7 | 35
Start [MHz] | Stop [MHz]	927.000 | 927.500
RBW [MHz] | VBW [MHz]	0.300000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 50 | 1001 | SWE

RESULT

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Peak Power	---	30	22.72	dBm	PASS
Frequency at Peak	---	---	927.271	MHz	INFO



Plot_FCC Part 15.247 Maximum Peak Conducted Output Power ~ Generic 0G9 hopp_07072020_135544.png

TEST FINISHED		
General Verdict	07.07.2020 13:55:45 / RT: 90 s	PASS

2. FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp

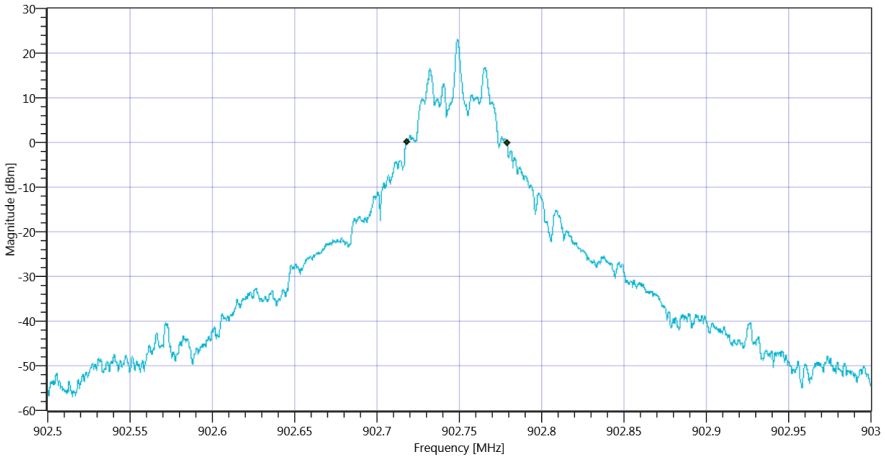
Test References	
TC Start	07.07.2020 13:56:01
Ambit Temp [°C] | Humidity [rel%]	not enabled | not enabled
System Version	1.0.0.45
Test Specification	FCC Part 15.247
Test Method	
Class / TC Version	TC_VM_FCC15247_0G9_Bandwidths_V01 Version: 0.0.1
My Description	FCC 15.247 Bandwidths FHSS
Add. Information	

Test Parameter	
Technology to test	Generic 0G9 hopp
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 902.75
Frequency mid to test	True | Freq [MHz] 915.25
Frequency high to test	True | Freq [MHz] 927.25
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.60

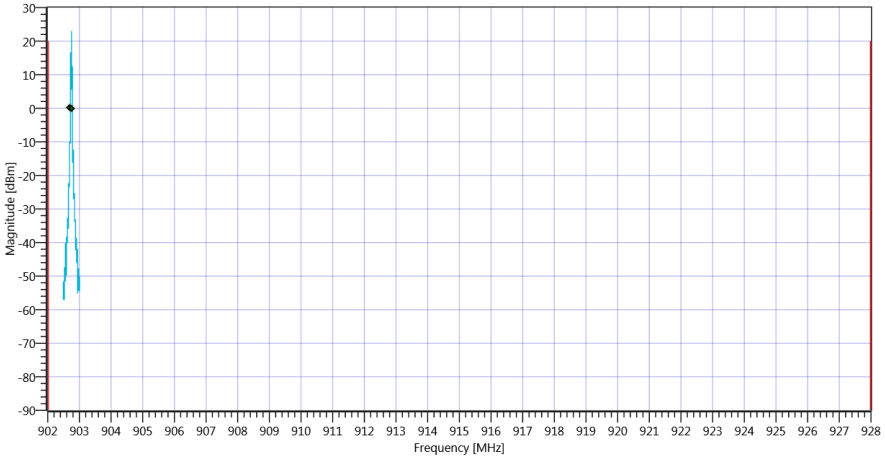
Test at TX 902.75 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	28.31 | 8.67 | 35
Start [MHz] | Stop [MHz]	902.500 | 903.000
RBW [MHz] | VBW [MHz]	0.002000 | 0.005000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	50 | 200 | 10001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	61	kHz	INFO
T1 99%	902.000000	---	902.7183	MHz	PASS
T2 99%	---	928.000000	902.7791	MHz	PASS

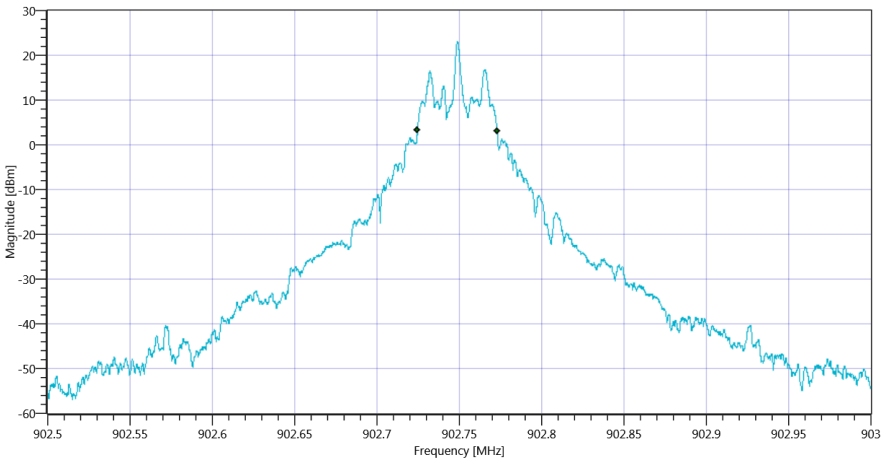


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp 99PCT_07072020_135631.png

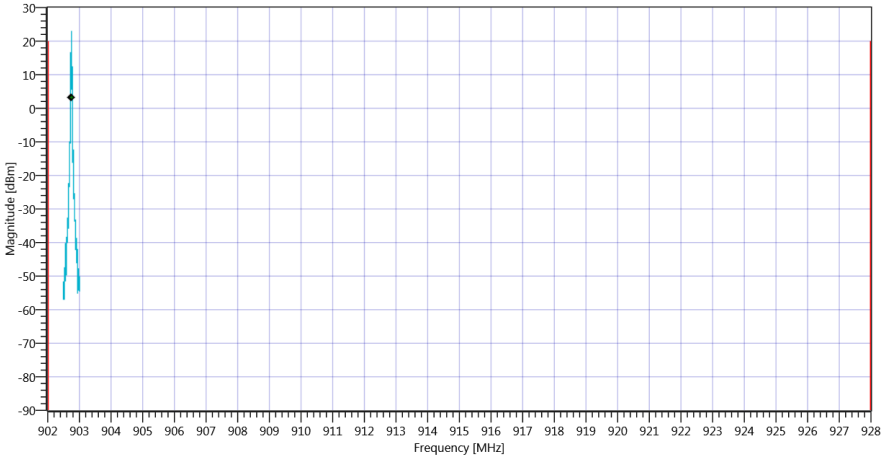


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135635.png

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 20dB	---	1500	48	kHz	PASS
T1 20dB	902.000000	---	902.7247	MHz	PASS
T2 20dB	---	928.000000	902.7729	MHz	PASS



Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp20_07072020_135641.png

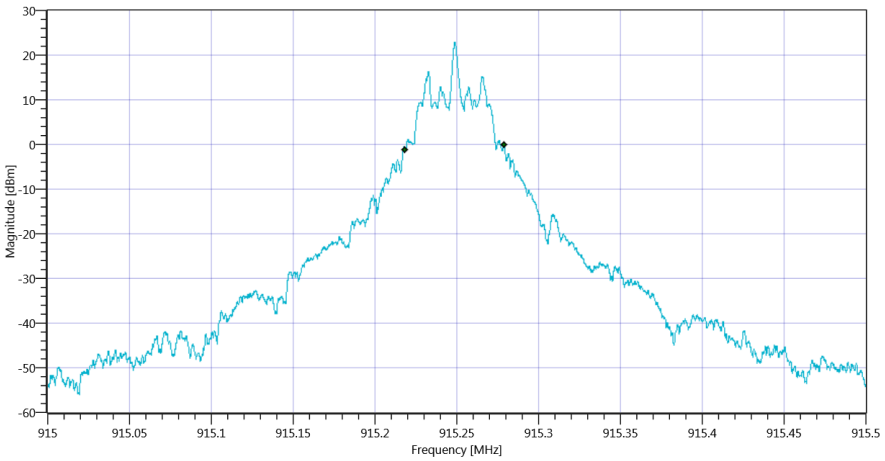


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135645.png

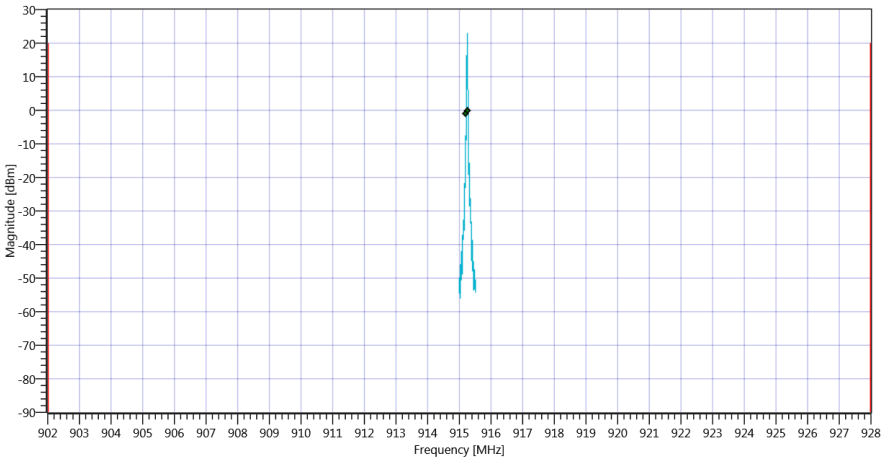
Test at TX 915.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	28.19 | 8.68 | 35
Start [MHz] | Stop [MHz]	915.000 | 915.500
RBW [MHz] | VBW [MHz]	0.002000 | 0.005000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	50 | 200 | 10001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	61	kHz	INFO
T1 99%	902.000000	---	915.2184	MHz	PASS
T2 99%	---	928.000000	915.2790	MHz	PASS

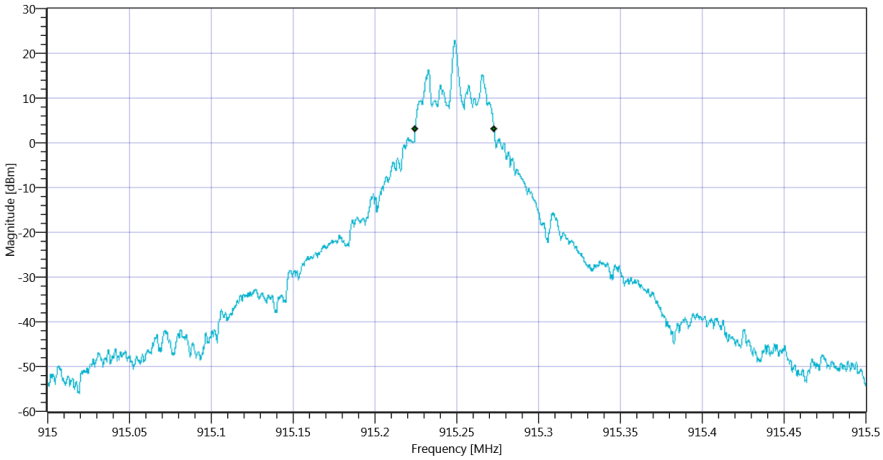


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp 99PCT_07072020_135716.png

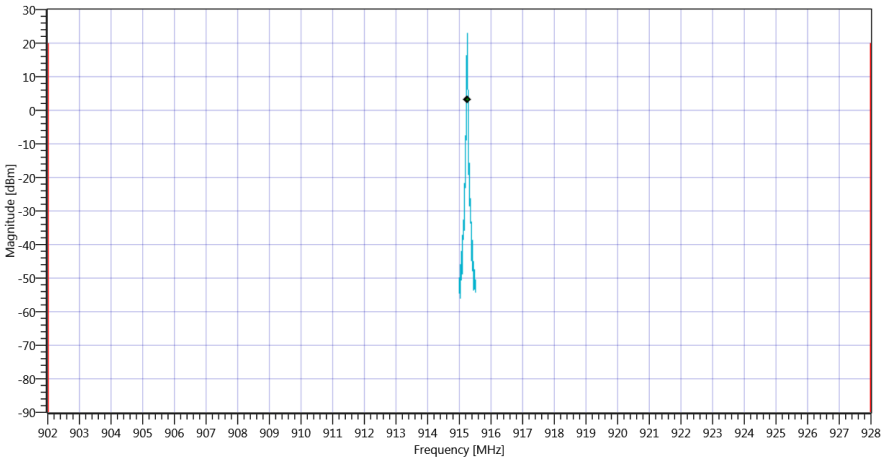


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135720.png

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 20dB	---	1500	48	kHz	PASS
T1 20dB	902.000000	---	915.2246	MHz	PASS
T2 20dB	---	928.000000	915.2727	MHz	PASS



Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp20_07072020_135726.png

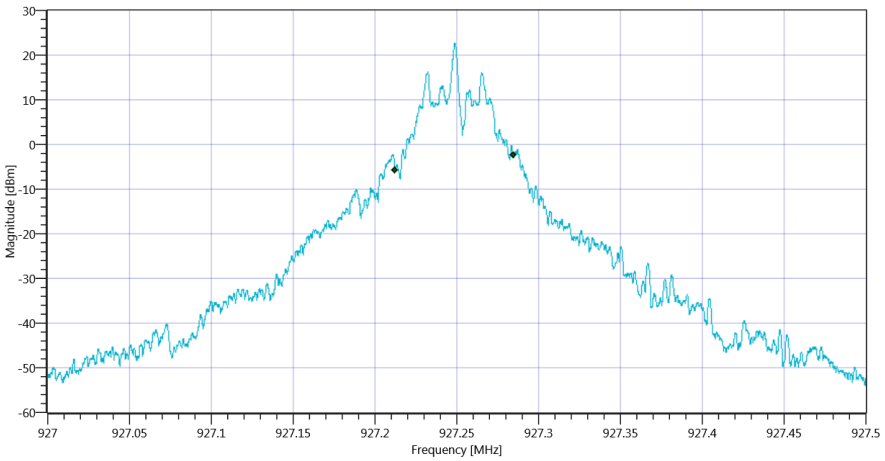


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135730.png

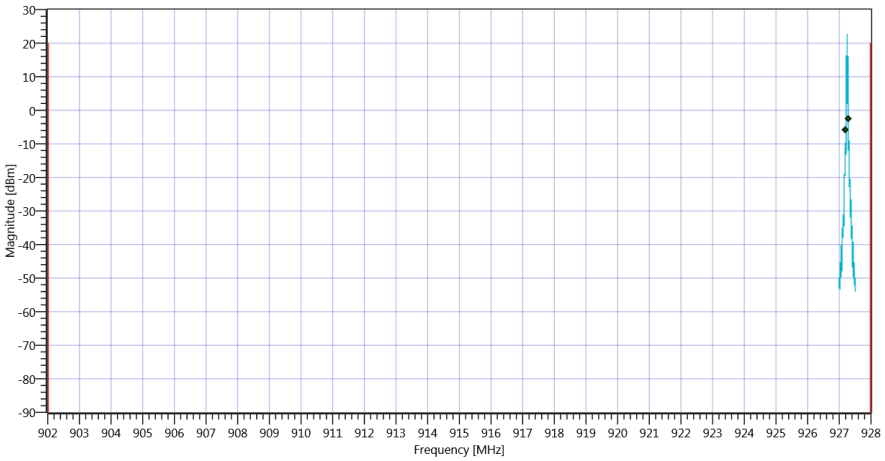
Test at TX 927.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	27.82 | 8.7 | 35
Start [MHz] | Stop [MHz]	927.000 | 927.500
RBW [MHz] | VBW [MHz]	0.002000 | 0.005000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	50 | 200 | 10001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 99%	---	---	72	kHz	INFO
T1 99%	902.000000	---	927.2125	MHz	PASS
T2 99%	---	928.000000	927.2843	MHz	PASS

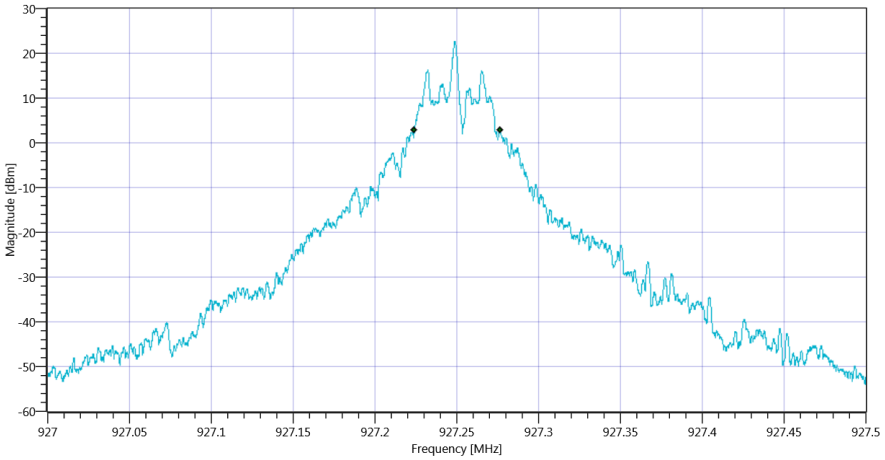


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp 99PCT_07072020_135804.png

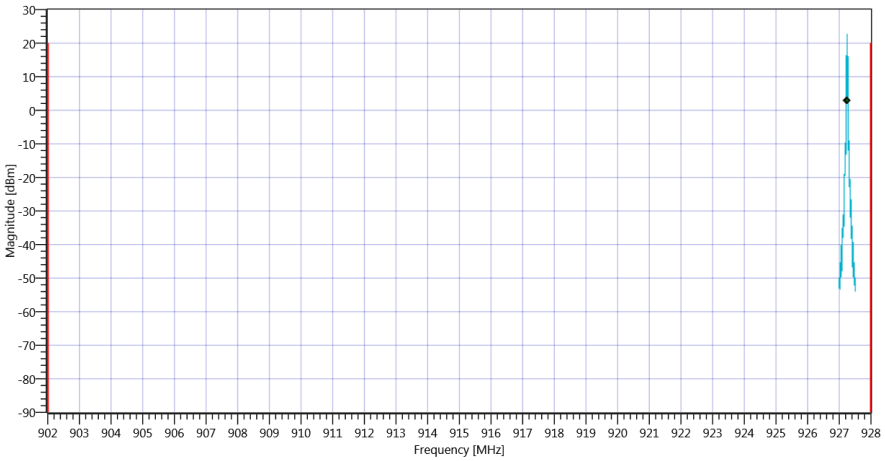


Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135808.png

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Bandwidth 20dB	---	1500	52	kHz	PASS
T1 20dB	902.000000	---	927.2243	MHz	PASS
T2 20dB	---	928.000000	927.2766	MHz	PASS



Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp20_07072020_135814.png



Plot_FCC Part 15.247 Bandwidths ~ Generic 0G9 hopp_07072020_135818.png

TEST FINISHED		
General Verdict	07.07.2020 13:58:19 / RT: 138 s	PASS

3. FCC Part 15.247 TX Spurious Conducted 20 dBc ~ Generic 0G9 hopp

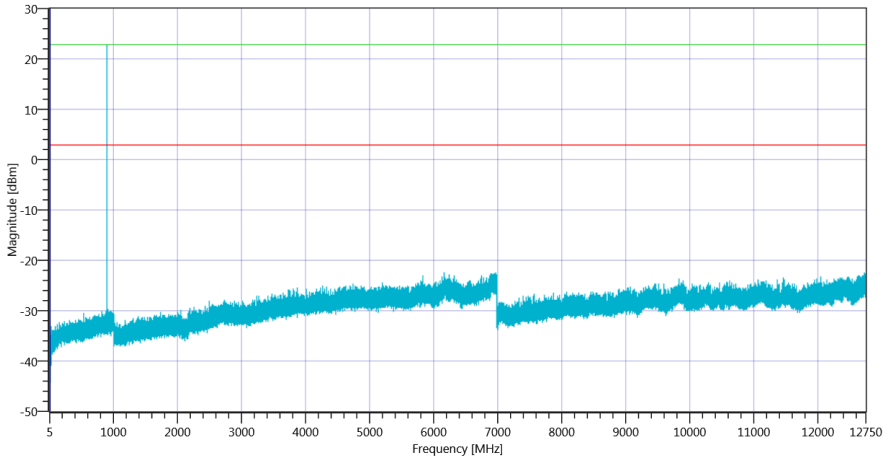
Test References	
TC Start	07.07.2020 13:58:28
Ambit Temp [°C] | Humidity [rel%]	not enabled | not enabled
System Version	1.0.0.45
Test Specification	FCC Part 15.247
Test Method	
Class / TC Version	TC_VM_FCC15247_0G9_TX_Emissions_Conducted_V01 Version: 0.0.1
My Description	FCC 15.247 TX Emissions conducted FHSS
Add. Information	

Test Parameter	
Technology to test	Generic 0G9 hopp
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	True | Freq [MHz] 902.75
Frequency mid to test	True | Freq [MHz] 915.25
Frequency high to test	True | Freq [MHz] 927.25
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.60

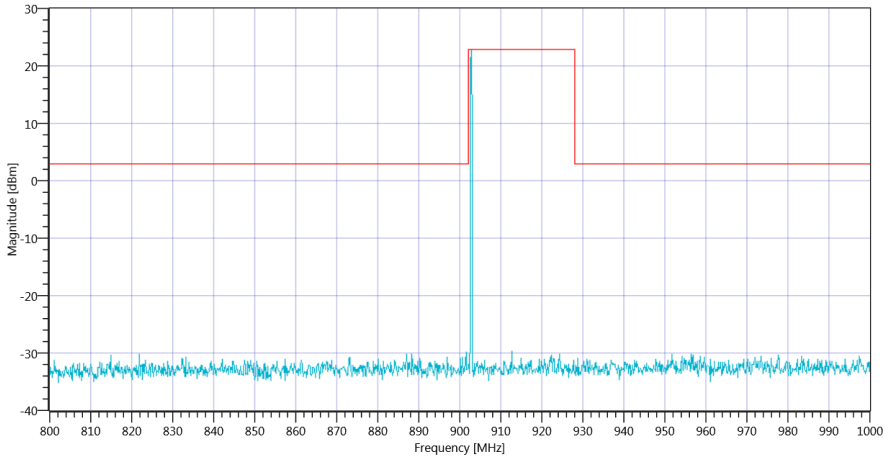
Test at TX 902.75 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	28.18 | 0 | 45
Start [MHz] | Stop [MHz]	12505.000 | 12750.000
RBW [MHz] | VBW [MHz]	0.100000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 20 | 3001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 902.83 MHz	---	---	22.85	dBm	INFO
No peaks detected	---	---			PASS
Lowest margin to limit 12720.927 MHz	0	---	25.26	dB	INFO



Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 902.75_07072020_140114.png

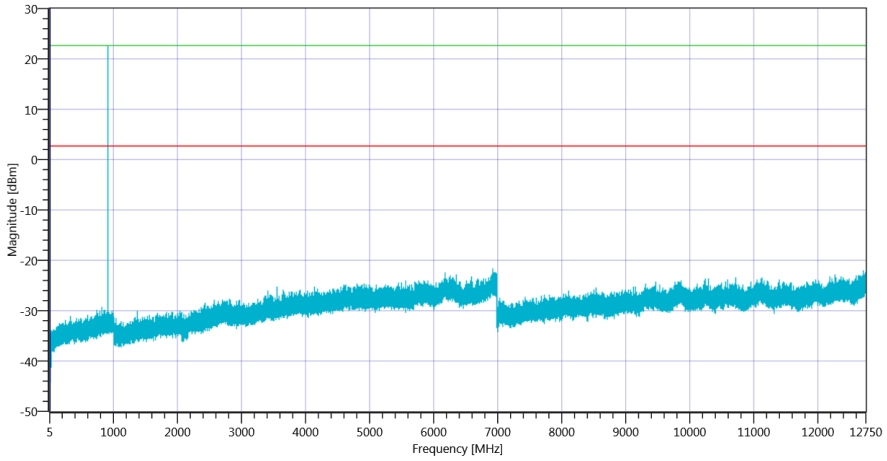


Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 902.75_07072020_140117.png

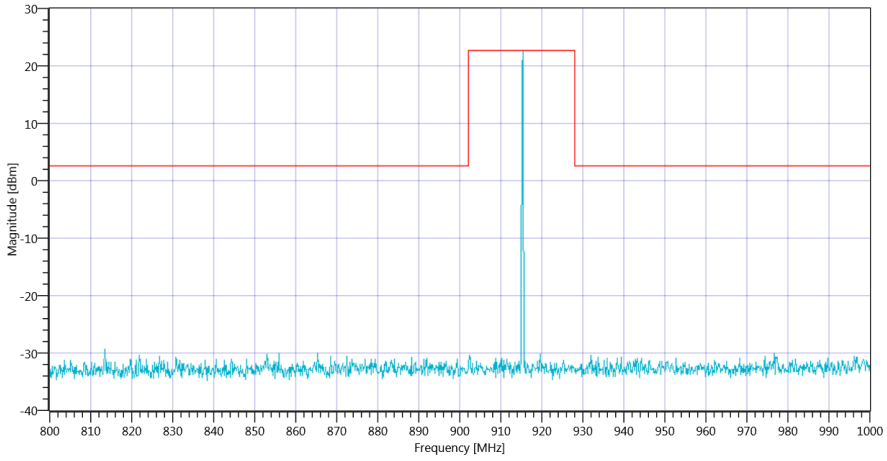
Test at TX 915.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	27.87 | 0 | 45
Start [MHz] | Stop [MHz]	12505.000 | 12750.000
RBW [MHz] | VBW [MHz]	0.100000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 20 | 3001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 915.33 MHz	---	---	22.64	dBm	INFO
No peaks detected	---	---			PASS
Lowest margin to limit 6924 MHz	0	---	24.35	dB	INFO



Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 915.25_07072020_140402.png

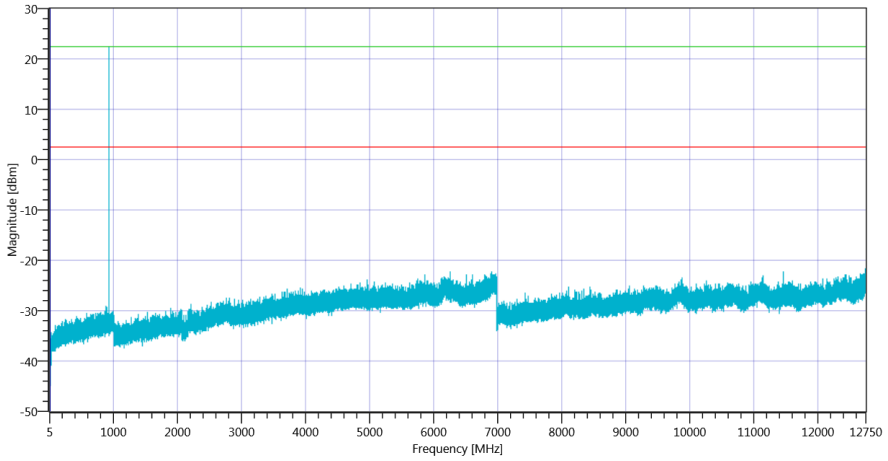


Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 915.25_07072020_140405.png

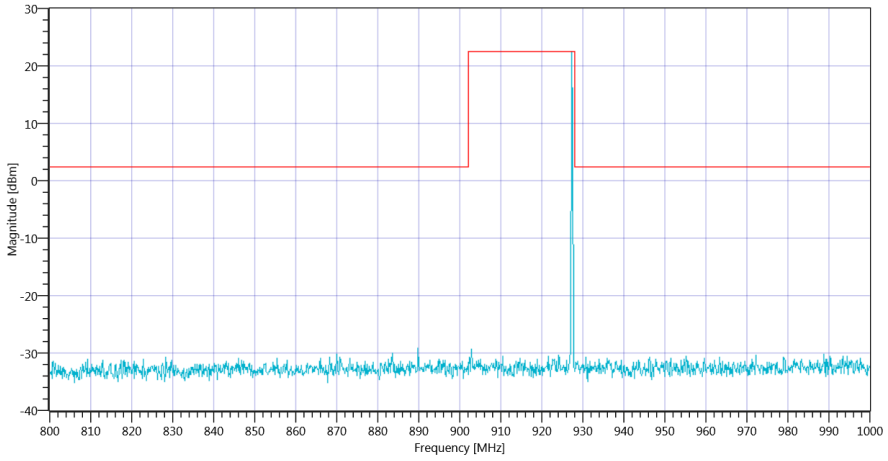
Test at TX 927.25 MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	27.66 | 0 | 45
Start [MHz] | Stop [MHz]	12505.000 | 12750.000
RBW [MHz] | VBW [MHz]	0.100000 | 1.000000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	200 | 20 | 3001 | SWE

RESULT					
Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Reference @ 927.33 MHz	---	---	22.44	dBm	INFO
No peaks detected	---	---			PASS
Lowest margin to limit 12741.098 MHz	0	---	24.6	dB	INFO



Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 927.25_07072020_140651.png



Plot_FCC Part 15.247 TX Spurious Conduced 30 dBc ~ Generic 0G9 hopp 927.25_07072020_140654.png

TEST FINISHED		
General Verdict	07.07.2020 14:06:56 / RT: 507 s	PASS

4. FCC Part 15.247 Number Of Hopping Channels FHSS ~ Generic 0G9 hopp

Test References	
TC Start	08.07.2020 14:48:47
Ambit Temp [°C] | Humidity [rel%]	not enabled | not enabled
System Version	1.0.0.45
Test Specification	FCC Part 15.247
Test Method	
Class / TC Version	TC_VM_FCC15247_0G9_Number_of_hopping_channels_FHSS_V01 Version: 0.0.1
My Description	FCC 15.247 Number of Hopping Channels FHSS
Add. Information	

Test Parameter	
Technology to test	Generic 0G9 hopp
Antenna Port used	1
Temperature	mid
Voltage	mid
Frequency low to test	False | Freq [MHz] 902.75
Frequency mid to test	False | Freq [MHz] 915.25
Frequency high to test	False | Freq [MHz] 927.25
Switched Path	IUT - SignalingUnit - SpectrumAnalyzer
Devices in use	SA: Rohde&Schwarz,FSV-30,1321.3008K30/103170,3.60

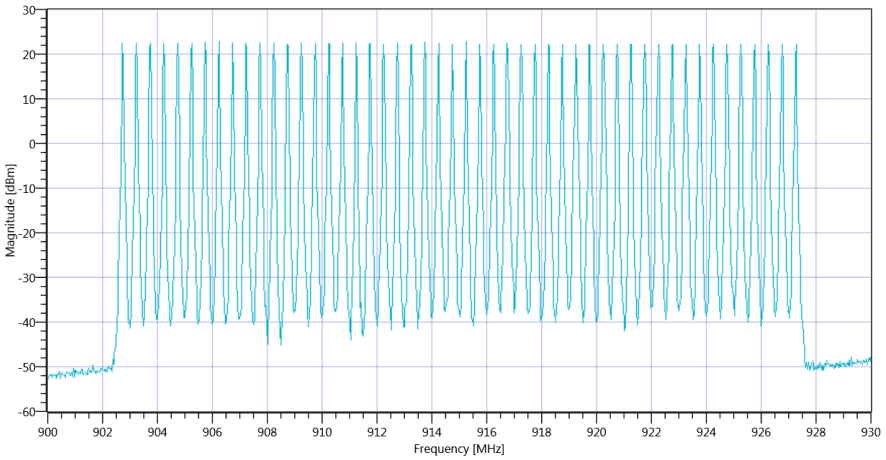
Test at TX hopping MHz

READ SA SETTINGS:	
RefLevel [dBm] | RefLevelOffset [dB] | InpAtt [dB]	27.64 | 8.68 | 35
Start [MHz] | Stop [MHz]	900.000 | 930.000
RBW [MHz] | VBW [MHz]	0.010000 | 0.100000
Detector | TraceMode	POS | MAXH
Sweep: Time [ms] | Count | Points per Section | Type	1 | 5000 | 1001 | FFT

RESULT

Test Description	Lower Limit	Upper Limit	Measured	Unit	Verdict
Hopp channel (rounded)	---	---	903	MHz	INFO
Hopp channel (rounded)	---	---	903	MHz	INFO
Hopp channel (rounded)	---	---	904	MHz	INFO
Hopp channel (rounded)	---	---	904	MHz	INFO
Hopp channel (rounded)	---	---	905	MHz	INFO
Hopp channel (rounded)	---	---	905	MHz	INFO
Hopp channel (rounded)	---	---	906	MHz	INFO
Hopp channel (rounded)	---	---	906	MHz	INFO
Hopp channel (rounded)	---	---	907	MHz	INFO
Hopp channel (rounded)	---	---	907	MHz	INFO
Hopp channel (rounded)	---	---	908	MHz	INFO
Hopp channel (rounded)	---	---	908	MHz	INFO
Hopp channel (rounded)	---	---	909	MHz	INFO
Hopp channel (rounded)	---	---	909	MHz	INFO
Hopp channel (rounded)	---	---	910	MHz	INFO
Hopp channel (rounded)	---	---	910	MHz	INFO
Hopp channel (rounded)	---	---	911	MHz	INFO
Hopp channel (rounded)	---	---	911	MHz	INFO
Hopp channel (rounded)	---	---	912	MHz	INFO
Hopp channel (rounded)	---	---	912	MHz	INFO
Hopp channel (rounded)	---	---	913	MHz	INFO
Hopp channel (rounded)	---	---	913	MHz	INFO
Hopp channel (rounded)	---	---	914	MHz	INFO
Hopp channel (rounded)	---	---	914	MHz	INFO
Hopp channel (rounded)	---	---	915	MHz	INFO
Hopp channel (rounded)	---	---	915	MHz	INFO
Hopp channel (rounded)	---	---	916	MHz	INFO
Hopp channel (rounded)	---	---	916	MHz	INFO
Hopp channel (rounded)	---	---	917	MHz	INFO
Hopp channel (rounded)	---	---	917	MHz	INFO
Hopp channel (rounded)	---	---	918	MHz	INFO
Hopp channel (rounded)	---	---	918	MHz	INFO
Hopp channel (rounded)	---	---	919	MHz	INFO
Hopp channel (rounded)	---	---	919	MHz	INFO
Hopp channel (rounded)	---	---	920	MHz	INFO
Hopp channel (rounded)	---	---	920	MHz	INFO
Hopp channel (rounded)	---	---	921	MHz	INFO
Hopp channel (rounded)	---	---	921	MHz	INFO
Hopp channel (rounded)	---	---	922	MHz	INFO
Hopp channel (rounded)	---	---	922	MHz	INFO
Hopp channel (rounded)	---	---	923	MHz	INFO
Hopp channel (rounded)	---	---	923	MHz	INFO
Hopp channel (rounded)	---	---	924	MHz	INFO
Hopp channel (rounded)	---	---	924	MHz	INFO
Hopp channel (rounded)	---	---	925	MHz	INFO
Hopp channel (rounded)	---	---	925	MHz	INFO
Hopp channel (rounded)	---	---	926	MHz	INFO

Hopp channel (rounded)	---	---	926	MHz	INFO
Hopp channel (rounded)	---	---	927	MHz	INFO
Hopp channel (rounded)	---	---	927	MHz	INFO
Σ Hopping channels	50	---	50	Number	PASS



Plot_FCC Part 15.247 Number Of Hopping Channels FHSS ~ Generic 0G9 hopp_08072020_145021.png

TEST FINISHED		
General Verdict	08.07.2020 14:50:21 / RT: 94 s	PASS

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