

FCC TEST REPORT	
FCC 47 CFR Part 15C ISED RSS-210	
Periodic operation in the 40.66-40.70 MHz and above 70 MHz	
Report Reference No.	G0M-1709-6887-TFC231PT-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	  FCC Test Firm Designation Number: DE0008 IC Testing Laboratory site: 3470A-2
Applicant's name	Marantec America Corp.
Address	5705 Centerpoint Court 60031 Gurnee USA
Test specification:	
Standard.....	47 CFR Part 15C RSS-210, Issue 9, 2016-08
Test scope.....	complete Radio compliance test
Equipment under test (EUT):	
Product description	Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
Model No.	Command 133
Additional Model(s)	None
Brand Name(s)	Marantec
Hardware version	Test Hardware
Firmware / Software version	Test Software
	FCC-ID: NKPC133315 IC: N/A
Test result	Passed

Possible test case verdicts:

- neither assessed nor tested : N/N
- required by standard but not appl. to test object : N/A
- required by standard but not tested : N/T
- not required by standard for the test object : N/R
- test object does meet the requirement : P (Pass)
- test object does not meet the requirement : F (Fail)

Testing:

Test Lab Temperature : 20 – 23 °C

Test Lab Humidity : 32 – 38 %

Date of receipt of test item : 2017-06-11

Date (s) of performance of tests : 2017-06-11 - 2018-06-04

Compiled by : Burkhard Pudell

Tested by (+ signature) : Burkhard Pudell *B. Pudell*

(Responsible for Test)

Approved by (+ signature) : Christian Weber *C. Weber*

(Head of Lab)

Date of issue : 2018-06-20

Total number of pages : 40

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Additional comments:

Version History

Version	Issue Date	Remarks	Revised by
01	2018-06-20	Initial Release	

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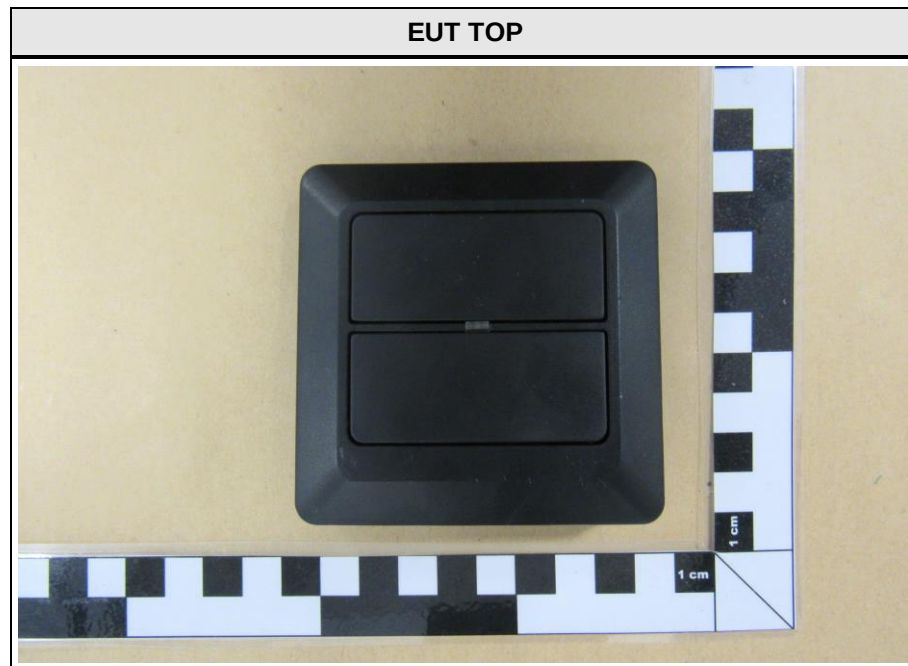
1 Equipment (Test item) Description

Description	Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC	
Model	Command 133	
Additional Model(s)	None	
Brand Name(s)	Marantec	
Serial number	None	
Hardware version	Test Hardware	
Software / Firmware version	Test Software	
PMN	N/A	
HVIN	Command 133	
FVIN	N/A	
HMN	N/A	
FCC-ID	NKPC133315	
IC	N/A	
Equipment type	End product	
Radio type	Transceiver	
Radio technology	custom	
Operating frequency range	315 MHz	
Frequency range	F _{MID}	315 MHz
Spreading	None	
Modulations	ASK	
Number of channels	1	
Channel spacing	N/A	
Number of antennas	1	
Antenna	Type	integrated
	Model	pcb antenna
	Manufacturer	ELDAT GmbH
	Gain	ca. 0 dBi (declared by the customer)
Manufacturer	ELDAT GmbH Im Gewerbepark 14 15711 Königs Wusterhausen GERMANY	
Power supply	V _{NOM}	3.0 VDC (Lithium-Battery)
	V _{MAX}	3.2 VDC
	V _{MIN}	1.8 VDC
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

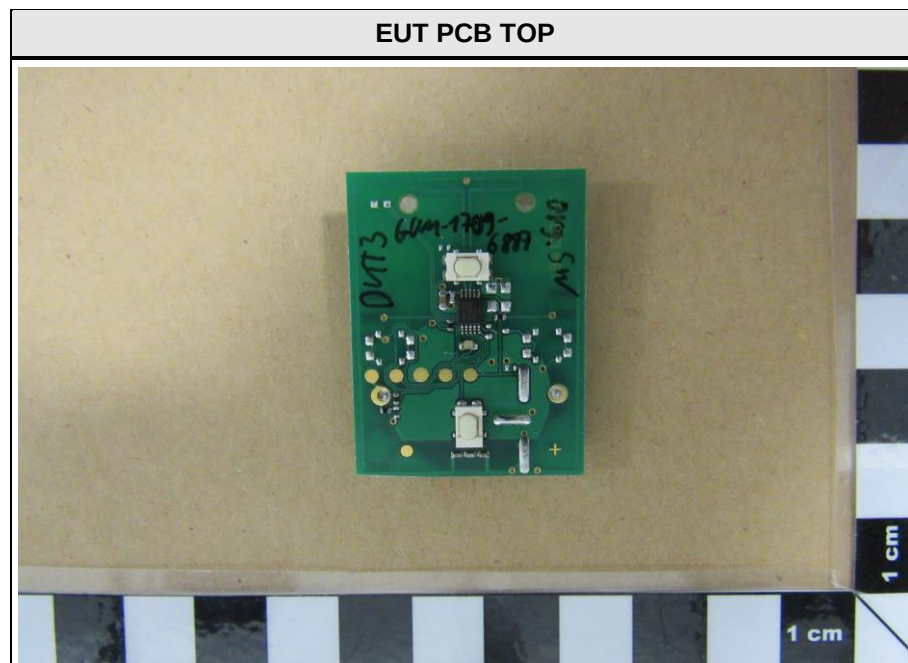
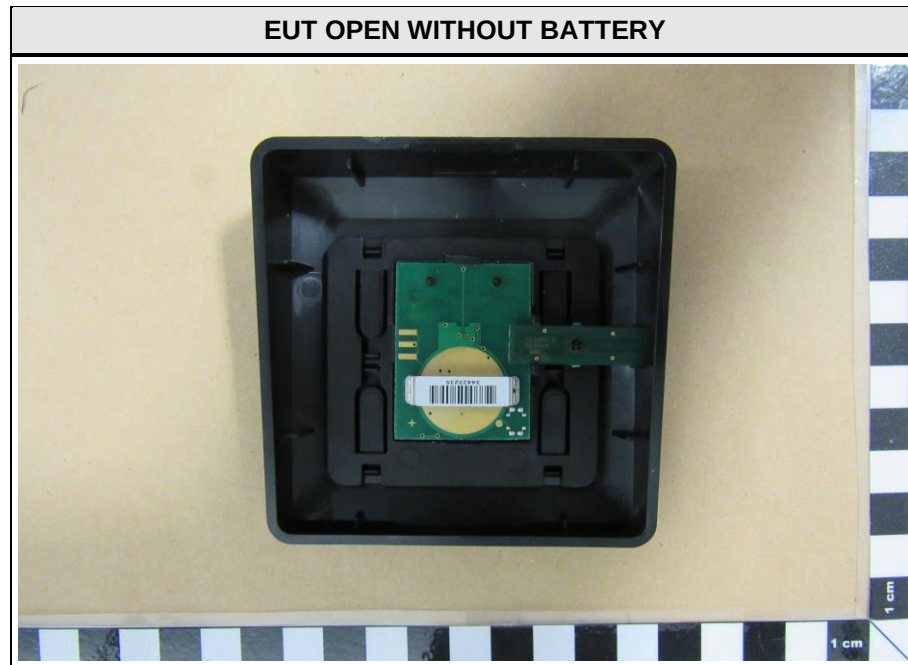
Test Report No.: G0M-1709-6887-TFC231PT-V01

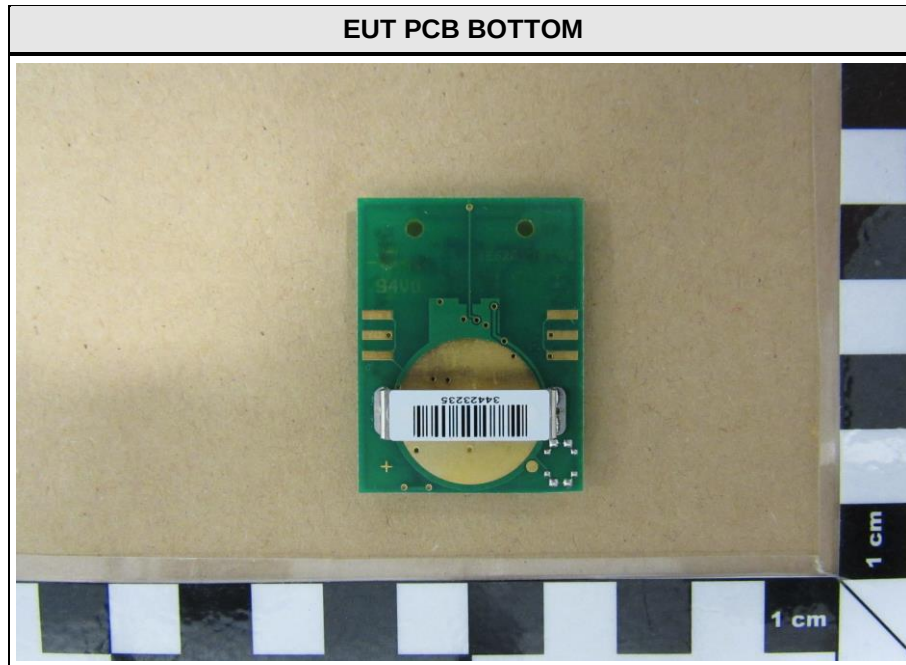
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

1.1 Photos – Equipment External

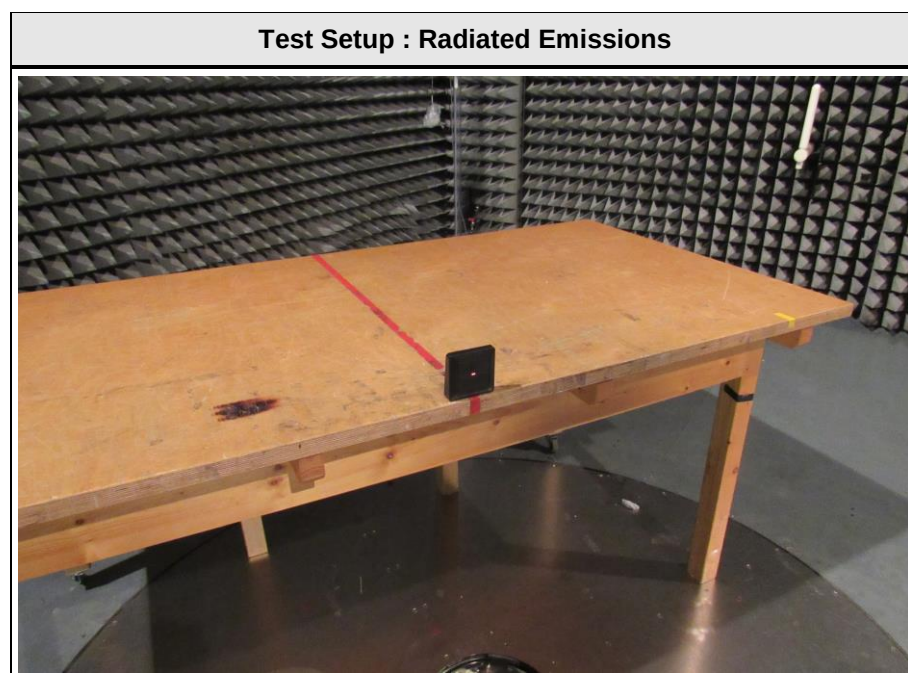
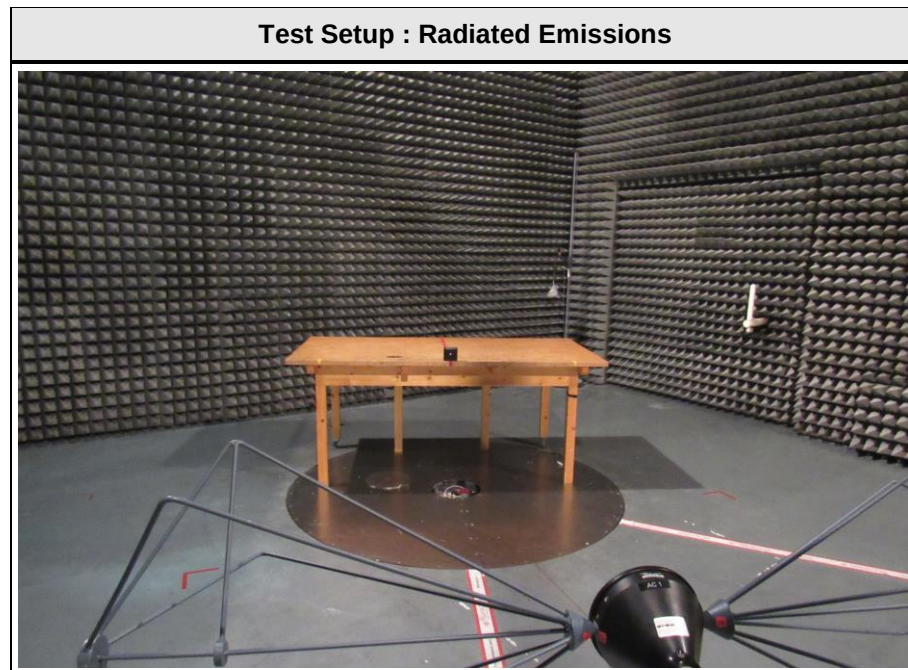


1.2 Photos – Equipment internal





1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
None				
*Note: Use the following abbreviations: AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test) CABL : Connecting cables				

1.5 Test Modes

Mode #	Description	
Transmit	General conditions:	EUT powered by fully battery
	Radio conditions:	Mode = manual transmit Modulation = On Power level = Maximum
Receive	General conditions:	EUT powered by fully battery
	Radio conditions:	Mode = stand-by

1.6 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2015.2.4

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2017-07	2018-07

Emission Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2017-07	2018-07

Automatic deactivation of transmitter					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2017-07	2018-07

Duty Cycle					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2017-07	2018-07

Field strength emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSIQ26	EF00151	2017-07	2018-07
Biconical Antenna	R&S	HK 116	EF00202	2018-03	2020-03
LPD Antenna	R&S	HL 223	EF00186	2018-03	2020-03
LPD Antenna	R&S	HL 025	EF00327	2015-10	2018-10

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log (\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading	+	AF	=	Net Reading	:	Net reading - FCC limit	=	Margin
21.5 dBμV	+	26 dB	=	47.5 dBμV/m	:	47.5 dBμV/m - 57.0 dBμV/m	=	-9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-210				
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks
RSS-Gen 6.6	Occupied Bandwidth	RSS-Gen 6.6	N/R	Informational only
FCC 15.231(a)(1) ISED RSS-210 A1.1.1(a)	Deactivation of manually operated transmitter	non specific	PASS	
FCC 15.231(a)(2) ISED RSS-210 A1.1.1(b)	Cease of transmission of automatically operated transmitter	non specific	N/R	manually operated transmitter
FCC 15.231(a)(3) ISED RSS-210 A1.1.1(c)	Total transmission time	non specific	PASS	manually operated transmitter
FCC 15.231(a)(4) ISED RSS-210 A1.1.1(d)	Radio control during emergencies	non specific	N/R	EUT not for emergencies
FCC 15.231(a)(5)	Transmission of set-up information for security systems	non specific	N/R	EUT not for security systems
FCC 15.249(b) FCC 15.205 ISED RSS-210 A1.1.2(1)	Field strength of fundamental and spurious emissions	ANSI C63.10	PASS	
FCC 15.231(b)(2) FCC 15.205 ISED RSS-210 A1.1.2(2)	Duty cycle	non specific	N/R	for duty cycle correction only
FCC 15.231(c) ISED RSS-210 A1.1.3	Emission bandwidth	non specific	PASS	
FCC 15.231(d) ISED RSS-210 A1.1.3	Emission bandwidth for the 40.66-40.70 MHz band	non specific	N/R	EUT is not operating in the 40.66-40.70 MHz band
FCC 15.231(d) ISED RSS-210 A1.1.4	Frequency Stability for the 40.66-40.70 MHz band	non specific	N/R	EUT is not operating in the 40.66-40.70 MHz band
FCC 15.231(e) ISED RSS-210 A1.1.5	Reduced field strength and spurious emissions of radiators operating at a rate exceeding 15.231(a)	ANSI C63.10	N/R	Not reduction used
ISED RSS-210 Section 2.3 ISED RSS-Gen 7.1	Receiver radiated spurious emissions	ANSI C63.10	PASS	
FCC § 15.107 FCC § 15.207 ISED RSS-Gen 8.8	AC power line conducted emissions	ANSI C63.10	N/R	EUT exclusively battery powered
Remarks: The spurious emissions according to 15.231 also fulfills the general emission limits according to 15.109.				

3 Test Conditions and Results

3.1 Test Conditions and Results – Occupied Bandwidth

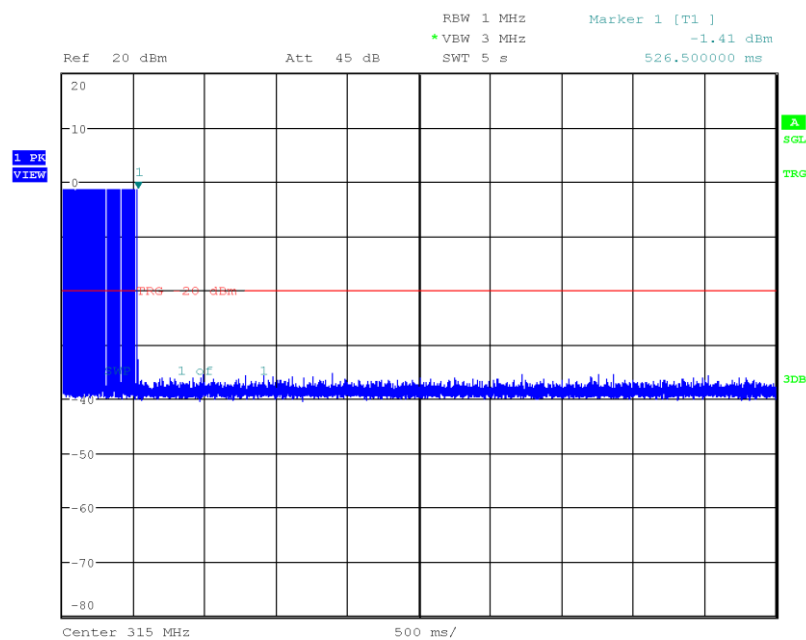
Occupied Bandwidth acc. to ISED RSS-Gen			Verdict: PASS
Test according to measurement reference	Reference Method		
	RSS-Gen 6.6		
Test frequency range	Tested frequencies		
	F _{MID}		
EUT test mode	Transmit		
Limits			
None (Informational only)			
Test setup			
Spectrum Analyzer EUT			
Test procedure			
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to at least twice the emission spectrum 3. Resolution bandwidth set to 1% of span 4. Occupied Bandwidth (99%) measurement with spectrum analyzer built in measurement function			
Test results			
Channel	Frequency [MHz]	Occupied Bandwidth [kHz]	
F _{MID}	315	639.0	
Comments: Measurement plot at subclause 3.5			

3.2 Test Conditions and Results – Deactivation of manually operated Transmitter

Deactivation of manually operated transmitter acc. to FCC 47 CFR 15.231 / ISED RSS-210				Verdict: PASS
Test according referenced standards	Reference Method			
	FCC 15.231(a)(1) / ISED RSS-210 A1.1.1(a)			
Test according to measurement reference	Reference Method			
	non specific			
Test frequency range	Tested frequencies			
	F _{MID}			
EUT test mode	Transmit			
Limits				
Manually operated transmitter shall employ a switch that will automatically cease transmission within 5 seconds after activation				
Test setup				
Spectrum Analyzer EUT				
Test procedure				
1. EUT set to test mode 2. Center frequency is set to test frequency 3. Span it set to zero span 4. Resolution bandwidth is set large enough to accurately capture transmission burts 5. Transmission time after activation is measured				
Test results				
Channel	Frequency [MHz]	Transmission time [s]	Limit [s]	Margin [s]
F _{MID}	315	0.526	5	-4.474
Comments:				

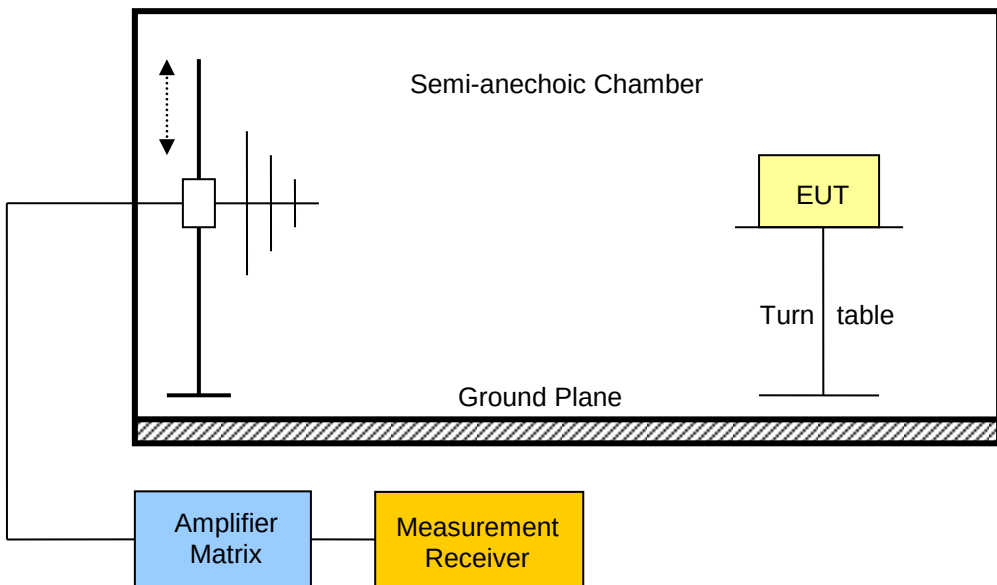
Deactivation of manually operated transmitter - F_{MID}
Transmitter deactivation

Project Number: G0M-1709-6887
 Applicant: Marantec America Corp.
 Model Description: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Sample ID: DUT3
 Reference Standards: FCC 15.231, RSS-210
 Reference Method: ANSI C63.10:2013, Section 7.4
 Operating Frequency: 315 MHz
 Operating Conditions: Tnom/Vnom
 Operator: B. Pudell
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-06-07
 Transmission end time [s]: 0.526
 Transmission time limit [s]: 5.000



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3.3 Test Conditions and Results – Field strength of fundamental and spurious emissions

Field strength of fundamental and spurious emissions acc. to FCC 47 CFR 15.231 / ISED RSS-210				Verdict: PASS
Test according referenced standards	Reference Method			
	FCC 15.231(b) / ISED RSS-210 A1.1.2(b)			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 10 th hamonic			
EUT test mode	Transmit			
Limits				
Fundamental Frequency [MHz]	Fundamental Limit [μV/m]	Fundamental Limit [dBμV/m]	Spurious Limit [dBμV/m]	Limit Distance [m]
40.66-40.70	2250	66.95	46.95	3
70-130	1250	61.94	41.94	3
130-174	1250-3750	61.94 – 71.48	41.94 – 51.48	3
174-260	3750	71.48	51.48	3
260-470	3750-12500	71.48 – 81.94	51.48 – 61.94	3
> 470	12500	81.94	61.94	3
Detector = Quasi-Peak or Average				
Test setup				
				

Test procedure								
1. EUT set to test mode 2. Span it set according to measurement range 3. Resolution bandwidth below 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz 4. Markers are set to maximum emission levels								
Test results								
EUT Fundamental frequency			315 MHz					
EUT Fundamental Limit			Average = 75.62 dbμV/m / Peak = 95.62 dbμV/m					
Duty Cycle correction			-10.00 dB					
Channel	Frequency [MHz]	Emission [MHz]	Level [dbμV/m]	Detector	Pol.	Limit [dbμV/m]	Limit distance [m]*	Margin [dB]
F _{MID}	315	315	83.82	pk	ver	95.62	3	-11.80
F _{MID}	315	315	73.82	av	ver	75.62	3	-1.80
F _{MID}	315	315	69.38	pk	hor	95.62	3	-26.24
F _{MID}	315	315	59.38	av	hor	75.62	3	-16.24
Comments: * Physical distance between EUT and measurement antenna. ** Average value determined by duty cycle correction from subclause 3.4								

Test results								
EUT Fundamental frequency			315 MHz					
EUT Spurious Limit			Average = 55.62 dBµV/m / Peak = 75.62 dBµV/m					
Duty Cycle correction			-10.00 dB					
Channel	Frequency [MHz]	Emission [MHz]	Level [dBµV/m]	Detector	Pol.	Limit [dBµV/m]	Limit distance [m]*	Margin [dB]
F _{MID}	315	630.021	43.04	pk	ver	75.62	3	-32.58
F _{MID}	315	630.021	33.04	av	ver	55.62	3	-22.58
F _{MID}	315	630.021	44.51	pk	hor	75.62	3	-31.11
F _{MID}	315	630.021	34.51	av	hor	55.62	3	-21.11
F _{MID}	315	945.062	37.76	pk	hor	75.62	3	-37.86
F _{MID}	315	945.062	27.76	av	hor	55.62	3	-27.86
F _{MID}	315	1575	48.73	pk	hor	75.62	3	-26.89
F _{MID}	315	1575	38.73	av	hor	55.62	3	-16.89
F _{MID}	315	1890	48.51	pk	ver	75.62	3	-27.11
F _{MID}	315	1890	38.51	av	ver	55.62	3	-17.11
F _{MID}	315	1890	52.25	pk	hor	75.62	3	-23.37
F _{MID}	315	1890	42.25	av	hor	55.62	3	-13.37
F _{MID}	315	3150	48.16	pk	ver	75.62	3	-27.46
F _{MID}	315	3150	38.16	av	ver	55.62	3	-17.46
F _{MID}	315	3465	47.93	pk	ver	75.62	3	-27.69
F _{MID}	315	3465	37.93	av	ver	55.62	3	-17.69
F _{MID}	315	3465	46.50	pk	hor	75.62	3	-29.12
F _{MID}	315	3465	36.50	av	hor	55.62	3	-19.12
Comments: * Physical distance between EUT and measurement antenna. ** Average value determined by duty cycle correction from subclause 3.4 *** General 15.209 emission limits used as spurious emission limit. (Hence the requirements of 15.109 are also fulfilled)								

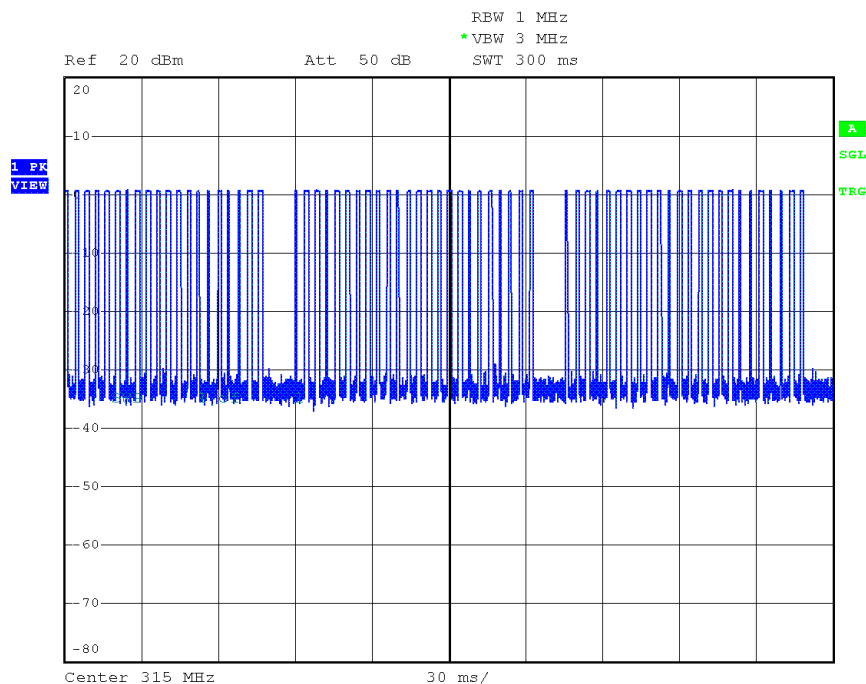
3.4 Test Conditions and Results – Duty Cycle

Total transmission time acc. to FCC 47 CFR 15.231 / ISED RSS-210			Verdict: PASS
Test according referenced standards	Reference Method		
	FCC 15.231(a)(3) / ISED RSS-210 A1.1.1(c)		
Test according to measurement reference	Reference Method		
	non specific		
Test frequency range	Tested frequencies		
	F _{MID}		
EUT test mode	Transmit		
Limits			
None (only for peak to average correction, 20dB max)			
Test setup			
Spectrum Analyzer EUT			
Test procedure			
1. EUT set to test mode 2. Center frequency is set to test frequency 3. Span it set to zero span 4. Resolution bandwidth is set large enough to accurately capture transmission bursts 5. Total transmission time is measured			
Test results			
Channel	Frequency [MHz]	Duty Cycle [% @ 100ms]	Duty Cycle correction [dB]
F _{MID}	315	32	-10
Comments:			

Duty Cycle - F_{MID}

Duty Cycle

Project Number: G0M-1709-6887
 Applicant: Marantec America Corp.
 Model Description: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Sample ID: DUT3
 Reference Standards: FCC 15.231, RSS-210
 Reference Method: ANSI C63.10:2013, Section 7.5
 Operating Frequency: 315 MHz
 Operating Conditions: Tnom/Vnom
 Operator: B. Pudell
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-06-04
 Maximum Duty Cycle: 0.32
 Maximum Duty Cycle [%]: 32
 Duty Cycle Correction [dB]: -10.00



Date: 4.JUN.2018 10:21:35

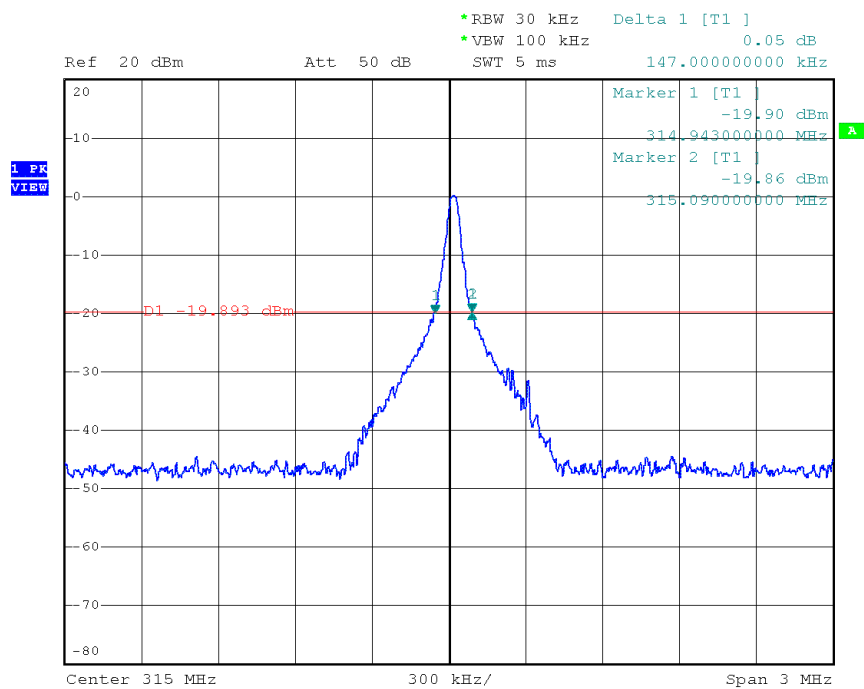
3.5 Test Conditions and Results – Emission Bandwidth

Emission Bandwidth acc. to FCC 15.231 / ISED RSS-210				Verdict: PASS
Test according to measurement reference	Reference Method			
	FCC 15.231(c) / ISED RSS-210 A1.1.3			
Test frequency range	Tested frequencies			
	F _{MID}			
EUT test mode	Transmit			
Limits				
0.25 % of center frequency				
Test setup				
Spectrum Analyzer EUT				
Test procedure				
1. EUT set to test mode (Communication tester is used if needed) 2. Span set to at least twice the emission spectrum 3. Resolution bandwidth set to 1% of span 4. For Industry Canada the occupied bandwidth (99%) is measurement with spectrum analyzer built in measurement function 5. For FCC the 20 dB bandwidth is measurement with spectrum analyzer				
Test results - FCC				
Channel	Frequency [MHz]	Emission Bandwidth [kHz]	Limit [kHz]	Margin [kHz]
F _{MID}	315	147	787.5	-640.5
Test results – ISED				
Channel	Frequency [MHz]	Emission Bandwidth [kHz]	Limit [kHz]	Margin [kHz]
F _{MID}	315	639	787.5	-148.5
Comments: Measurement is applicable to all variants				

FCC Emission Bandwidth - F_{MID}

Emission Bandwidth

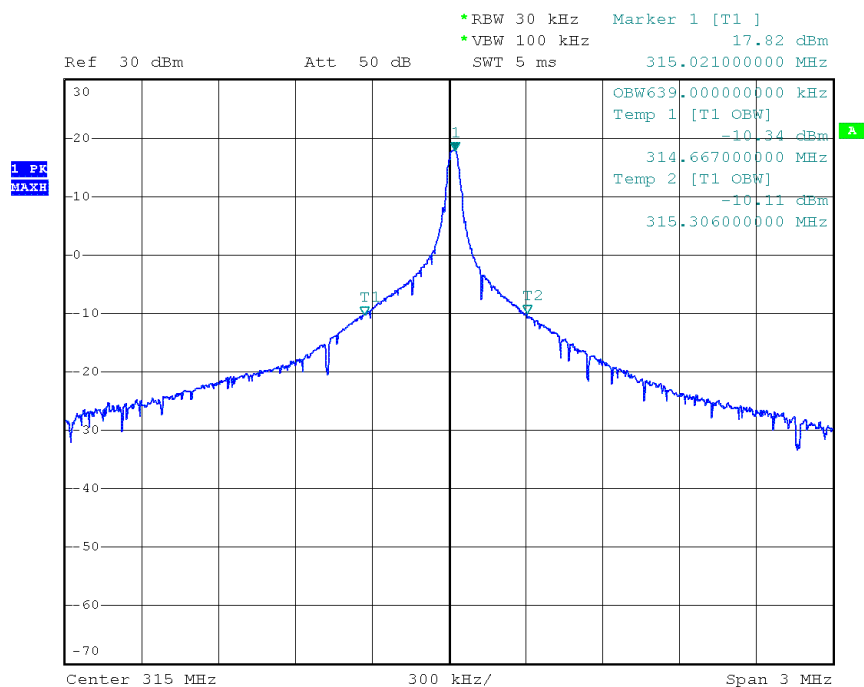
Project Number: G0M-1709-6887
 Applicant: Marantec America Corp.
 Model Description: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Sample ID: DUT3
 Reference Standards: FCC 15.231
 Reference Method: ANSI C63.10:2013, Section 6.9.2
 Operating Frequency: 315 MHz
 Operating Conditions: Tnom/Vnom
 Operator: B. Pudell
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-06-04
 Emission Bandwidth [kHz]: 147.0
 Emission Bandwidth Limit [kHz]: 787.5



Date: 4.JUN.2018 10:42:20

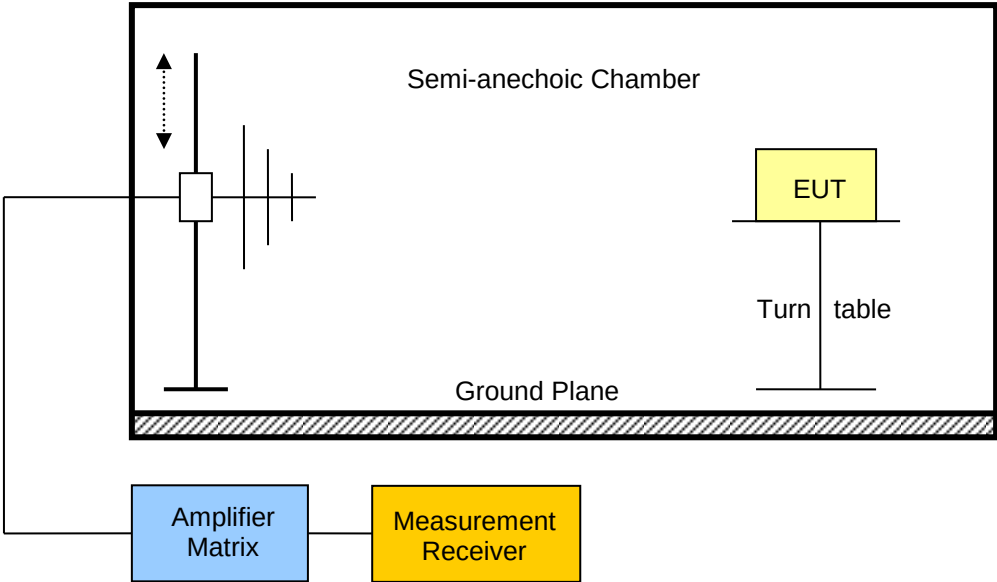
IC Emission Bandwidth - F_{MID}
Occupied Bandwidth

Project Number: G0M-1709-6887
 Applicant: Marantec America Corp.
 Model Description: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Sample ID: DUT3
 Reference Standards: RSS-210
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operating Frequency: 315 MHz
 Operating Conditions: Tnom/Vnom
 Operator: B. Pudell
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-06-04
 Occupied Bandwidth [kHz]: 639.0
 Occupied Bandwidth Limit [kHz]: 787.5



Date: 4.JUN.2018 10:07:02

3.6 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. to ISED RSS-210				Verdict: PASS
Test according referenced standards	Reference Method			
	ISED RSS-210 A8.5			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30MHz – 5 th Harmonic			
EUT test mode	Receive			
Limits				
Frequency range [MHz]	Detector	Limit [μV/m]	Limit [dBμV/m]	Limit Distance [m]
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
Test setup				
				

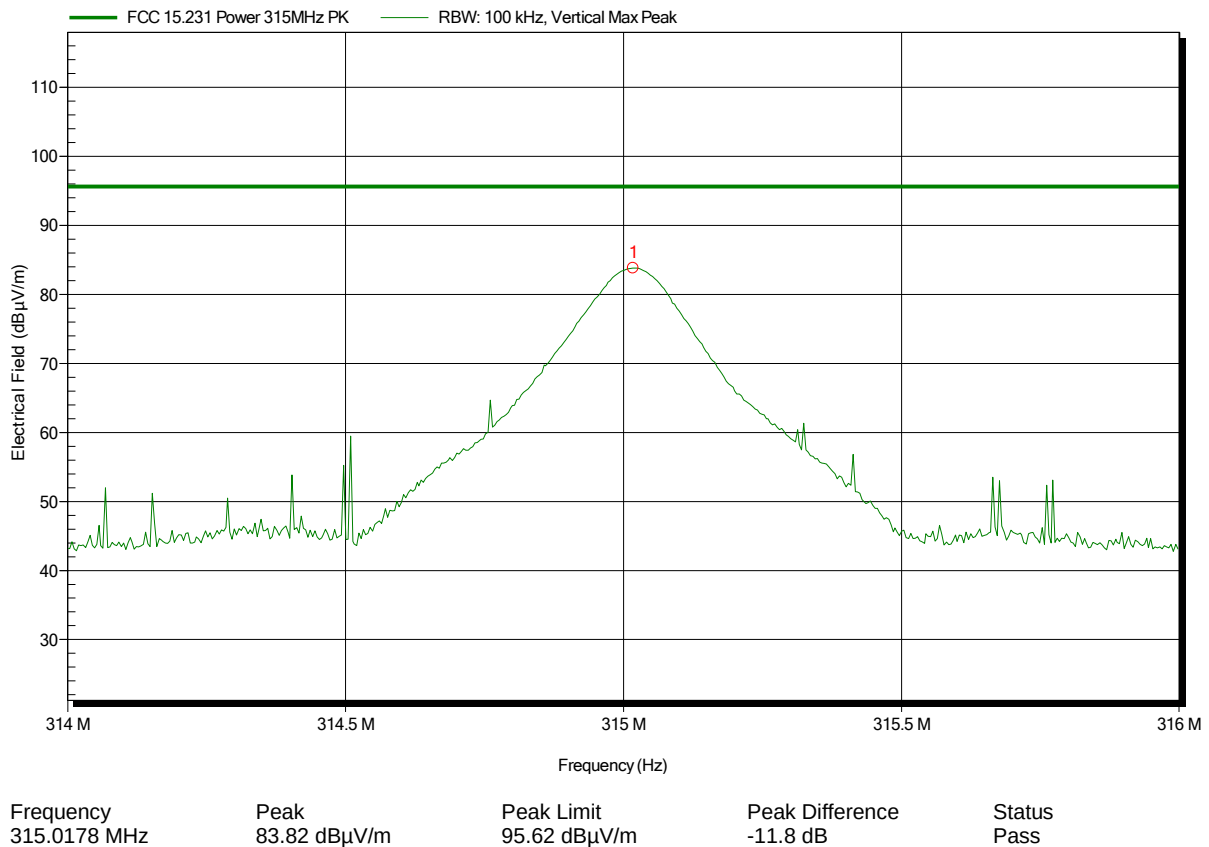
Test procedure							
1. EUT set to receive mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz 4. Markers are set to peak emission levels							
Test results							
Channel	Frequency [MHz]	Emission [MHz]	Emission Level [db μ V/m]	Emission Level [μ V/m]	Det.	Limit [μ V/m]	Margin [μ V/m]
F _{MID}	315	3853	46.89	220	pk	500	280
Comments: * Physical distance between EUT and measurement antenna. The stated emission level corresponds to ambient noise floor. No real spurious emission has been measured.							

ANNEX A Transmitter fundamental field strength

Carrier power (Field Strength); according to FCC 15.231, RSS-210

Order number: G0M-1709-6887

Applicant: Marantec America Corp.
EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
Model: Command 133
Test Site: Eurofins Product Service GmbH
Operator: Burkhard Pudell
Test Conditions: Tnom: 22°C, Vnom: 3 VDC
Antenna: Rohde & Schwarz HL 223, Vertical
Mode: Tx; SRD; 315 MHz; ASK
Test Date: 2018-06-04



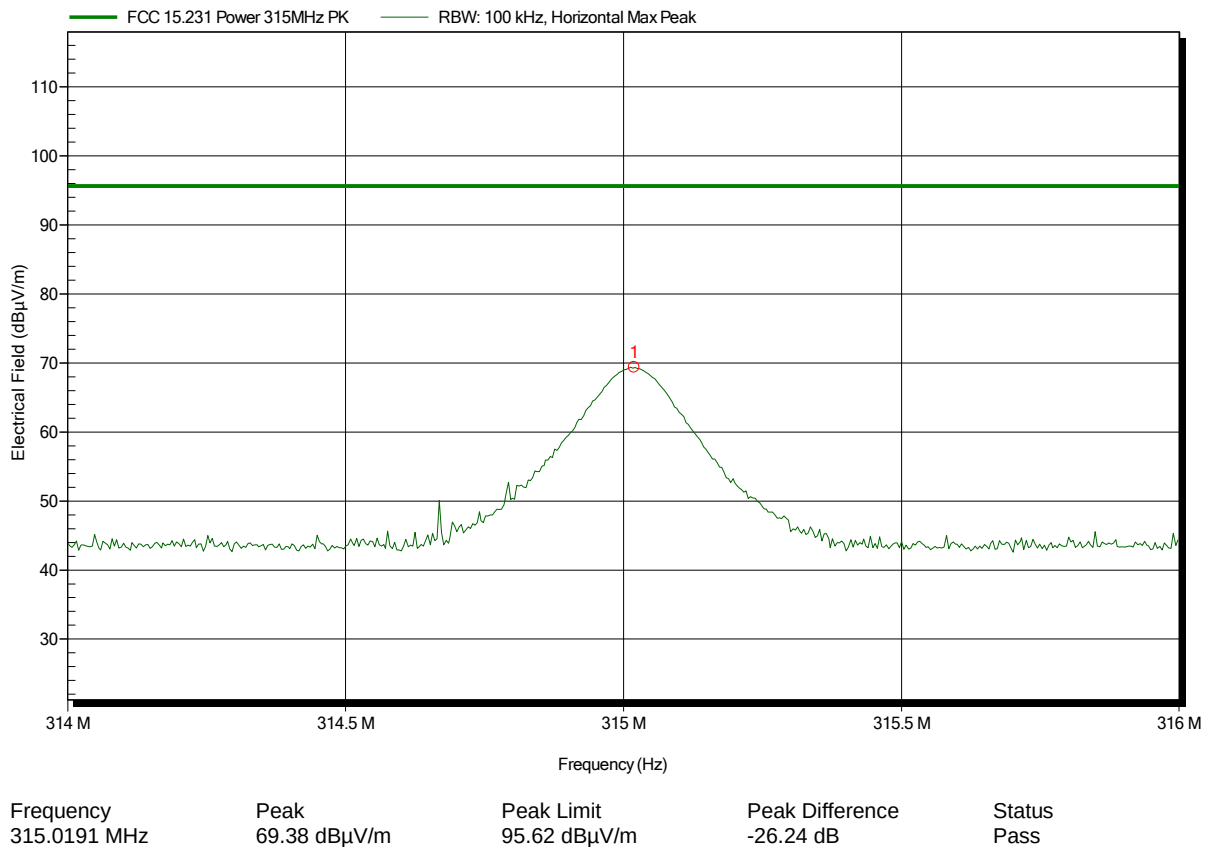
Test Report No.: G0M-1709-6887-TFC231PT-V01

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Carrier power (Field Strength); according to FCC 15.231, RSS-210

Order number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 22°C, Vnom: 3 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Mode: Tx; SRD; 315 MHz; ASK
 Test Date: 2018-06-04



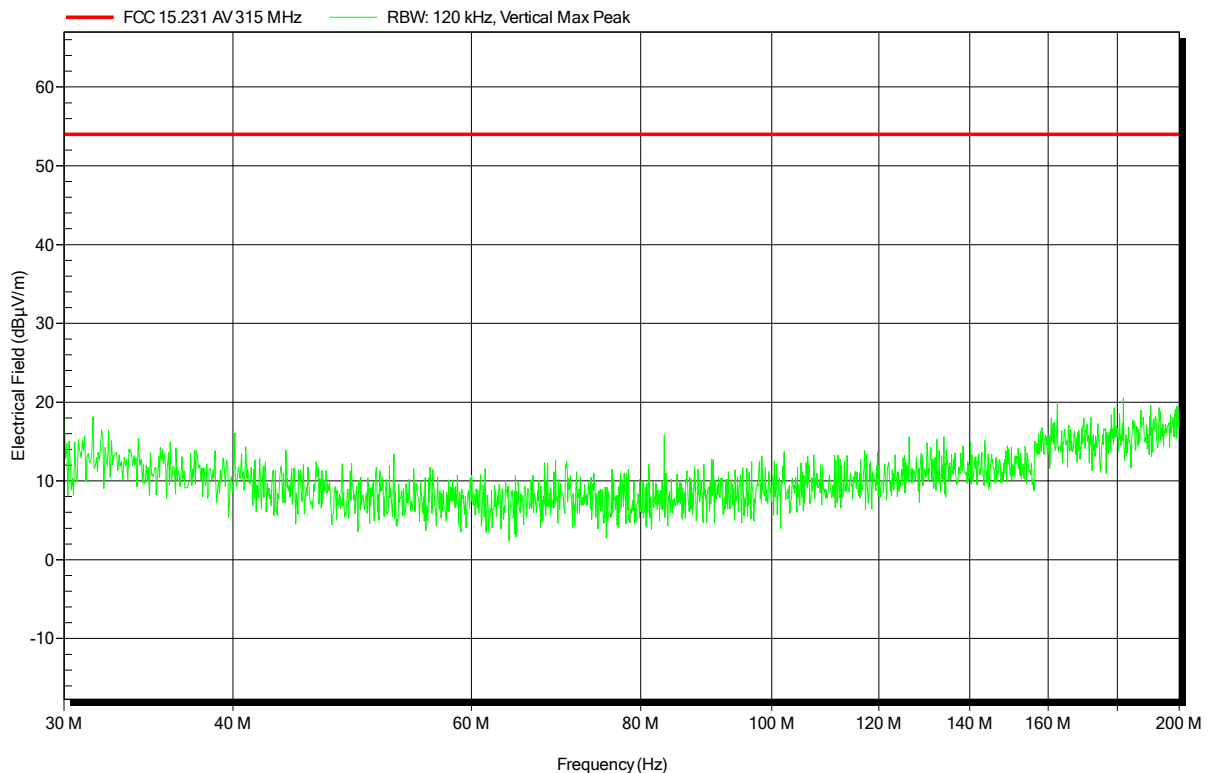
ANNEX B Transmitter radiated spurious emissions

Spurious emissions according to FCC Part 15b

Project number: G0M-1709-6887

Applicant:	Marantec America Corp.
EUT Name:	Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
Model:	Command 133
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 25.1°C, Vnom: 3 VDC (Battery)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; SRD; 315 MHz; ASK
Test Date:	2018-06-05
Note:	

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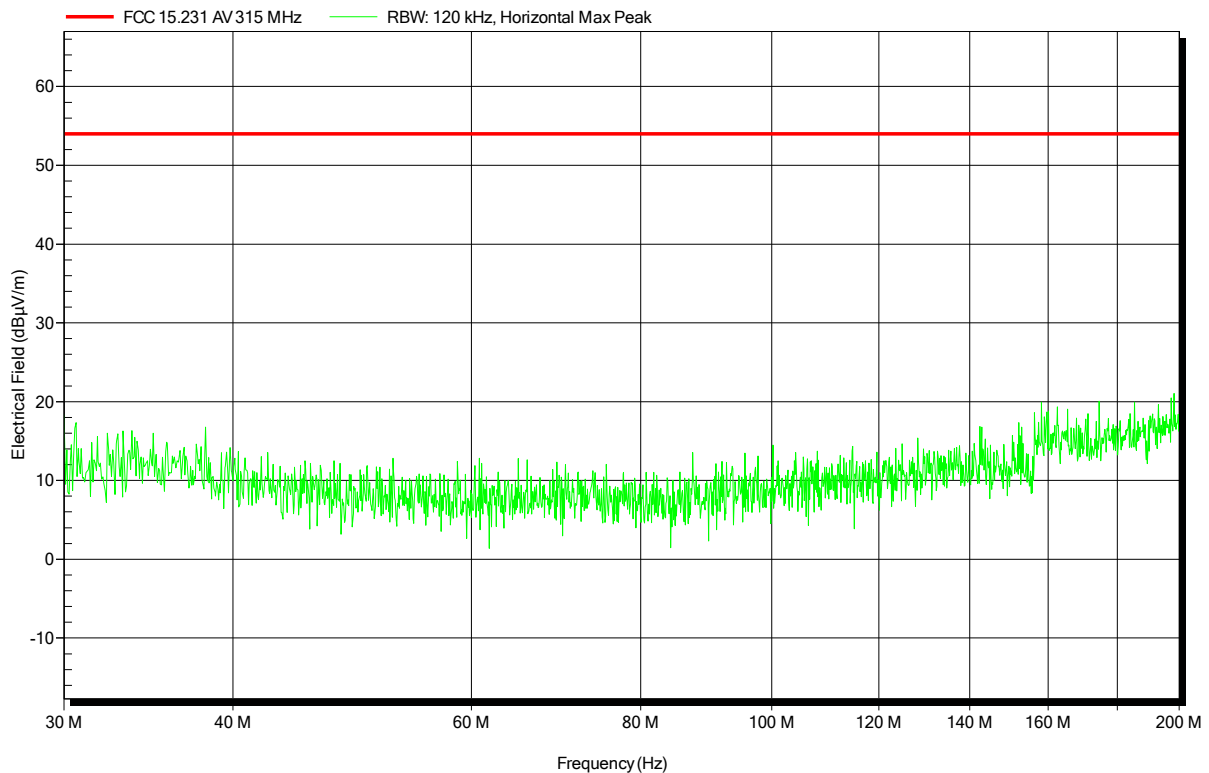


Spurious emissions according to FCC Part 15b

Project number: G0M-1709-6887

Applicant:	Marantec America Corp.
EUT Name:	Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
Model:	Command 133
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 25.1°C, Vnom: 3 VDC (Battery)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; SRD; 315 MHz; ASK
Test Date:	2018-06-05
Note:	

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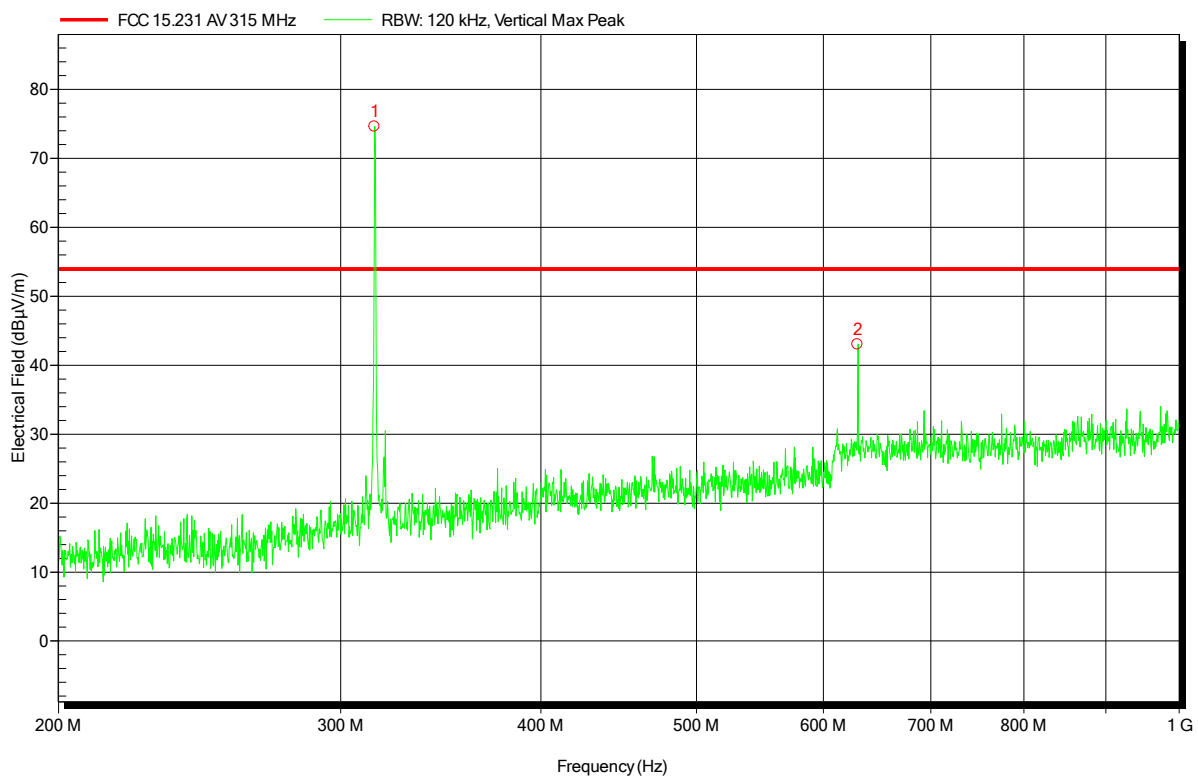


Spurious emissions according to FCC Part 15b

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 25.1°C, Vnom: 3 VDC (Battery)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: TX; SRD; 315 MHz; ASK
 Test Date: 2018-06-05
 Note:

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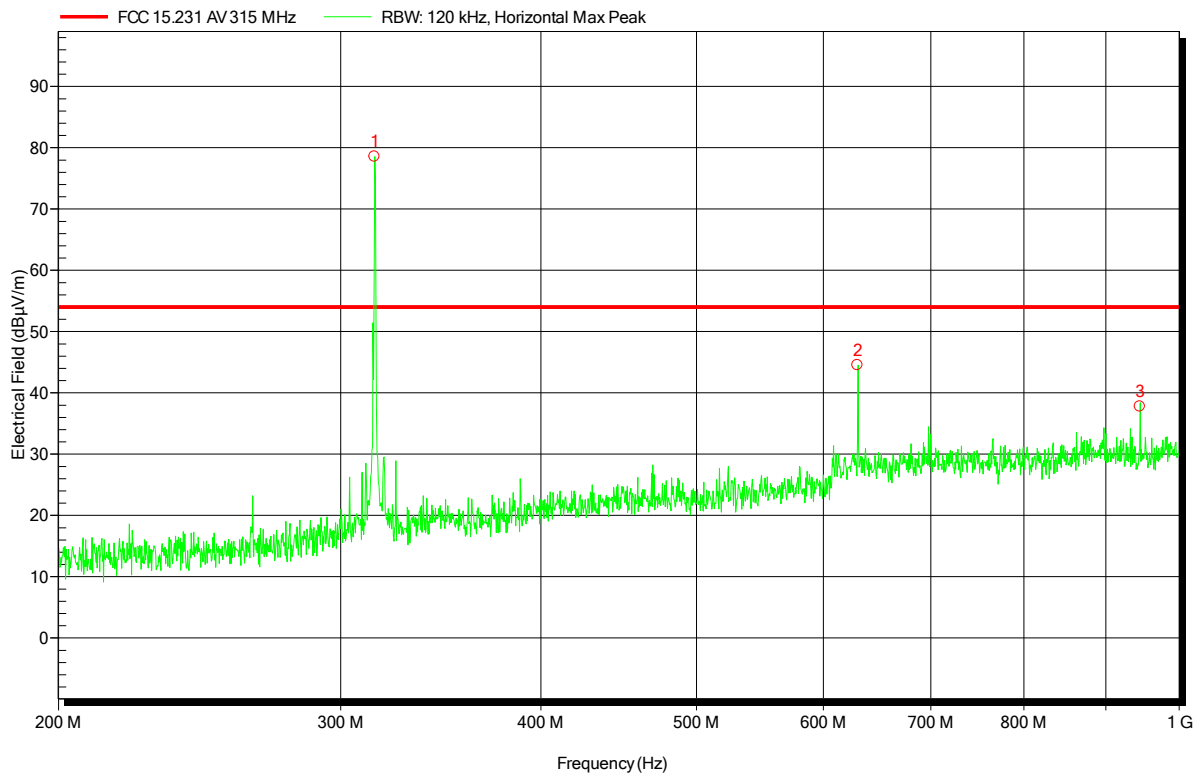
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
315.04 MHz	74.64 dBµV/m	53.98 dBµV/m	-10.94 dB	Carrier
630.021 MHz	43.04 dBµV/m	53.98 dBµV/m	-10.94 dB	Pass

Spurious emissions according to FCC Part 15b

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 25.1°C, Vnom: 3 VDC (Battery)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: TX; SRD; 315 MHz; ASK
 Test Date: 2018-06-05
 Note:

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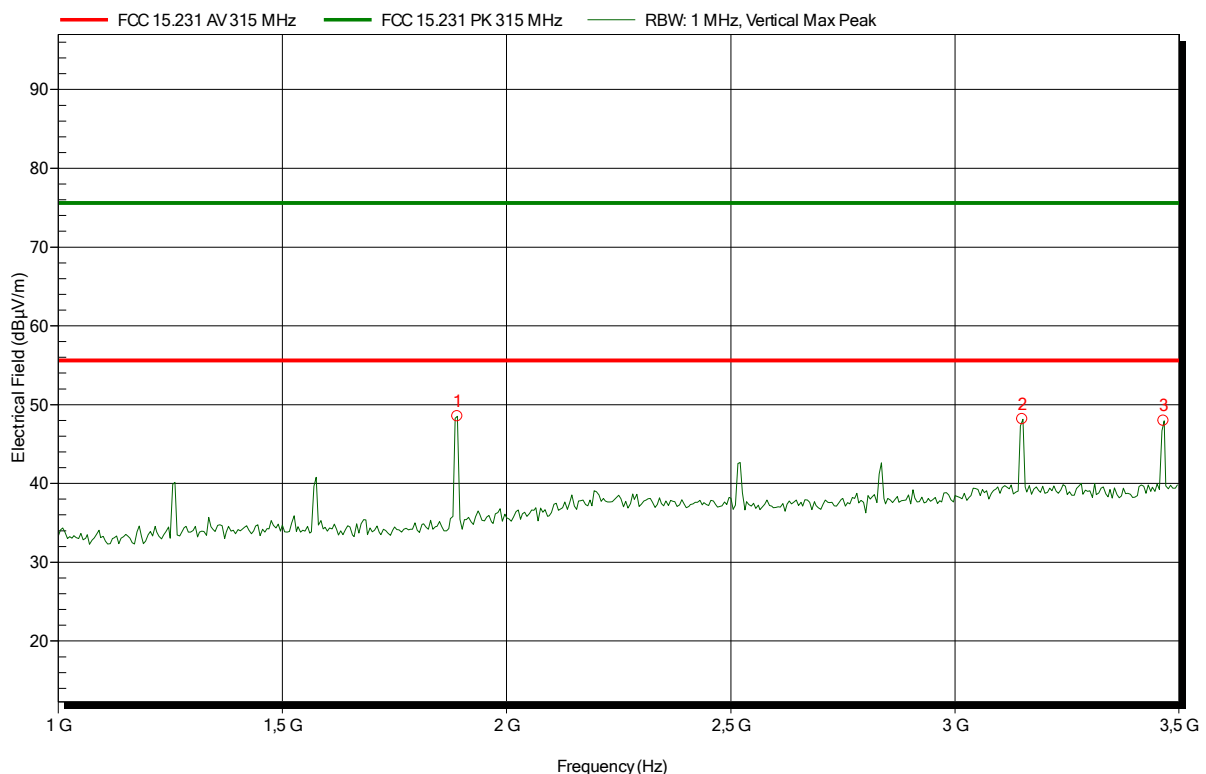
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
315.041 MHz	78.54 dBµV/m			Carrier
630.021 MHz	44.51 dBµV/m	53.98 dBµV/m	-9.47 dB	Pass
945.062 MHz	37.76 dBµV/m	53.98 dBµV/m	-16.22 dB	Pass

Spurious emissions according to FCC part 15 Subpart C & 15.231, IC RSS-210 I8 A1

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; SRD; 315 MHz; ASK
 Test Date: Dienstag, 5. Juni 2018
 Note: EUT vertical; ANT integral

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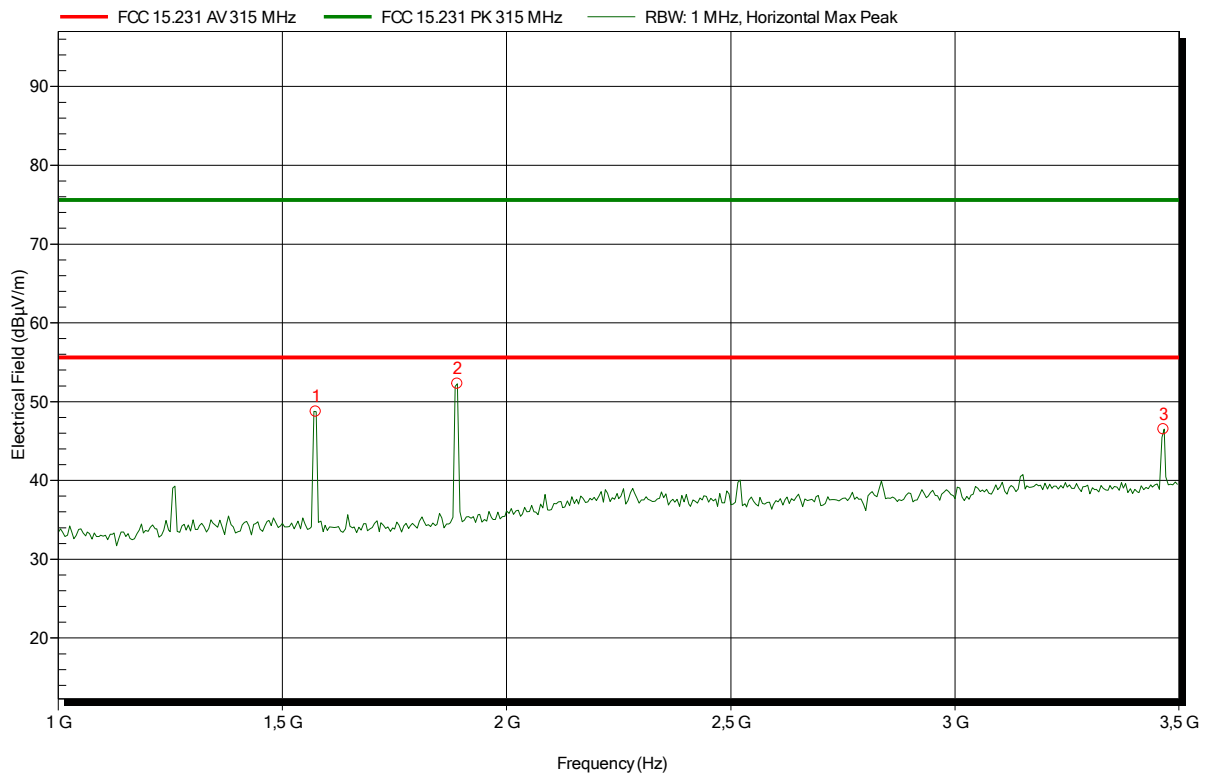
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1,89 GHz	48,51 dBµV/m	75,62 dBµV/m	-27,11 dB	Pass
3,15 GHz	48,16 dBµV/m	75,62 dBµV/m	-27,46 dB	Pass
3,465 GHz	47,93 dBµV/m	75,62 dBµV/m	-27,69 dB	Pass

Spurious emissions according to FCC part 15 Subpart C & 15.231, IC RSS-210 I8 A1

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; SRD; 315 MHz; ASK
 Test Date: Dienstag, 5. Juni 2018
 Note: EUT vertical; ANT integral

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1,575 GHz	48,73 dBµV/m	75,62 dBµV/m	-26,89 dB	Pass
1,89 GHz	52,25 dBµV/m	75,62 dBµV/m	-23,37 dB	Pass
3,465 GHz	46,5 dBµV/m	75,62 dBµV/m	-29,12 dB	Pass

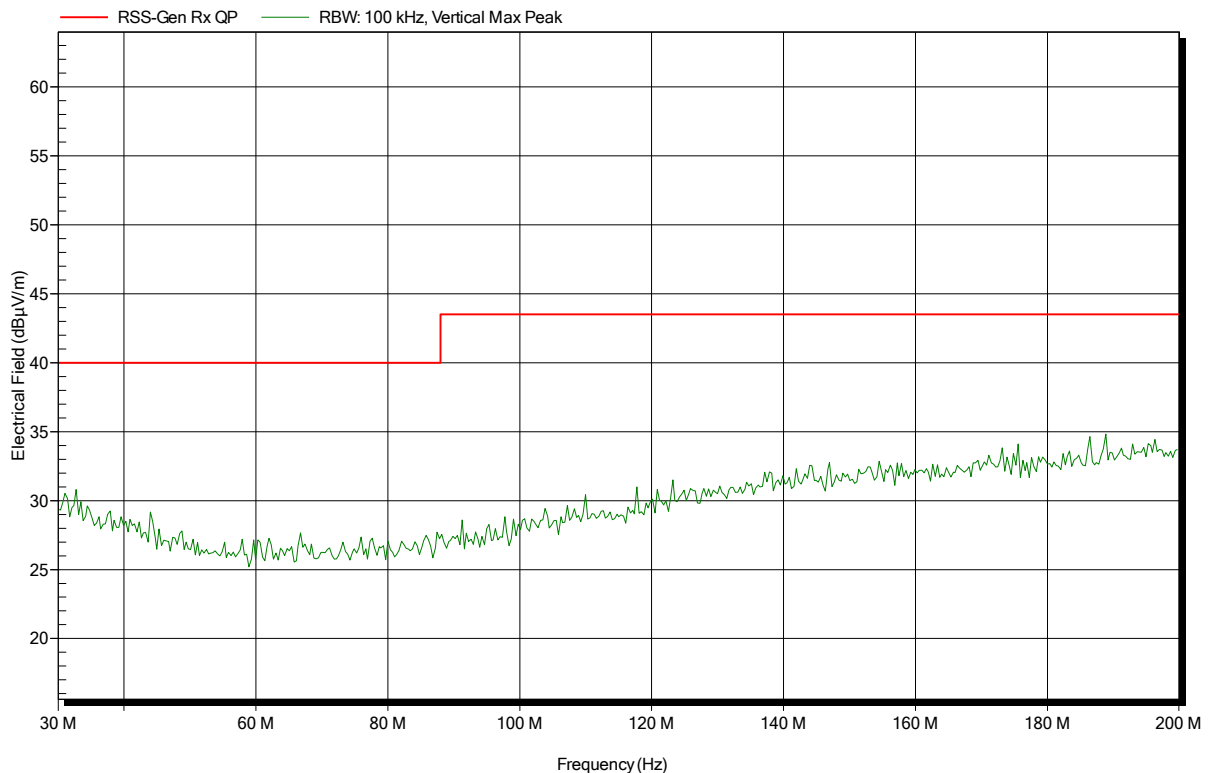
ANNEX C Receiver radiated spurious emissions

Spurious emissions according to RSS-210

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
Model: Command 133
Test Site: Eurofins Product Service GmbH
Operator: Burkhard Pudell
Test Conditions: Tnom: 23°C, Vnom: 3 VDC
Antenna: HK116, Vertical
Measurement distance: 3 m
Mode: RX; SRD; 315 MHz; Stand-by mode
Test Date: Montag, 4. Juni 2018
Note: EUT vertical; ANT integral

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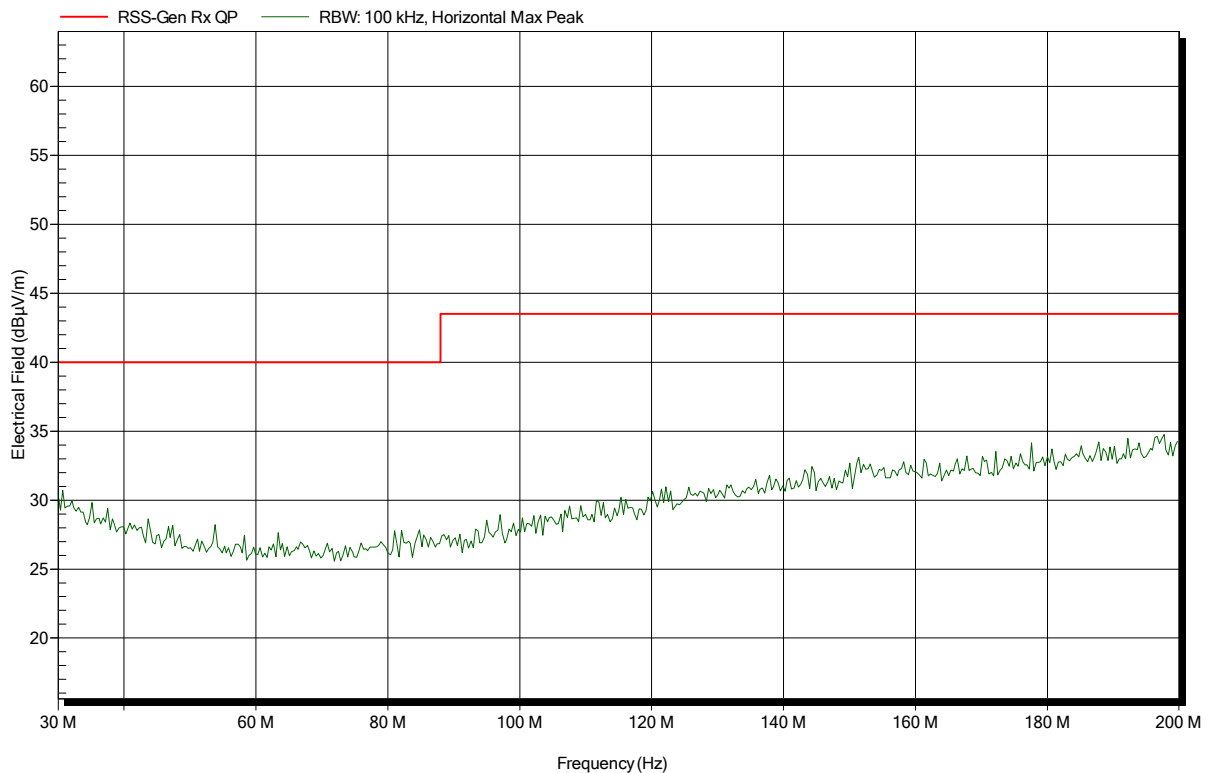


Spurious emissions according to RSS-210

Project number: G0M-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: HK116, Horizontal
 Measurement distance: 3 m
 Mode: RX; SRD; 315 MHz; Stand-by mode
 Test Date: Montag, 4. Juni 2018
 Note: EUT vertical; ANT integral

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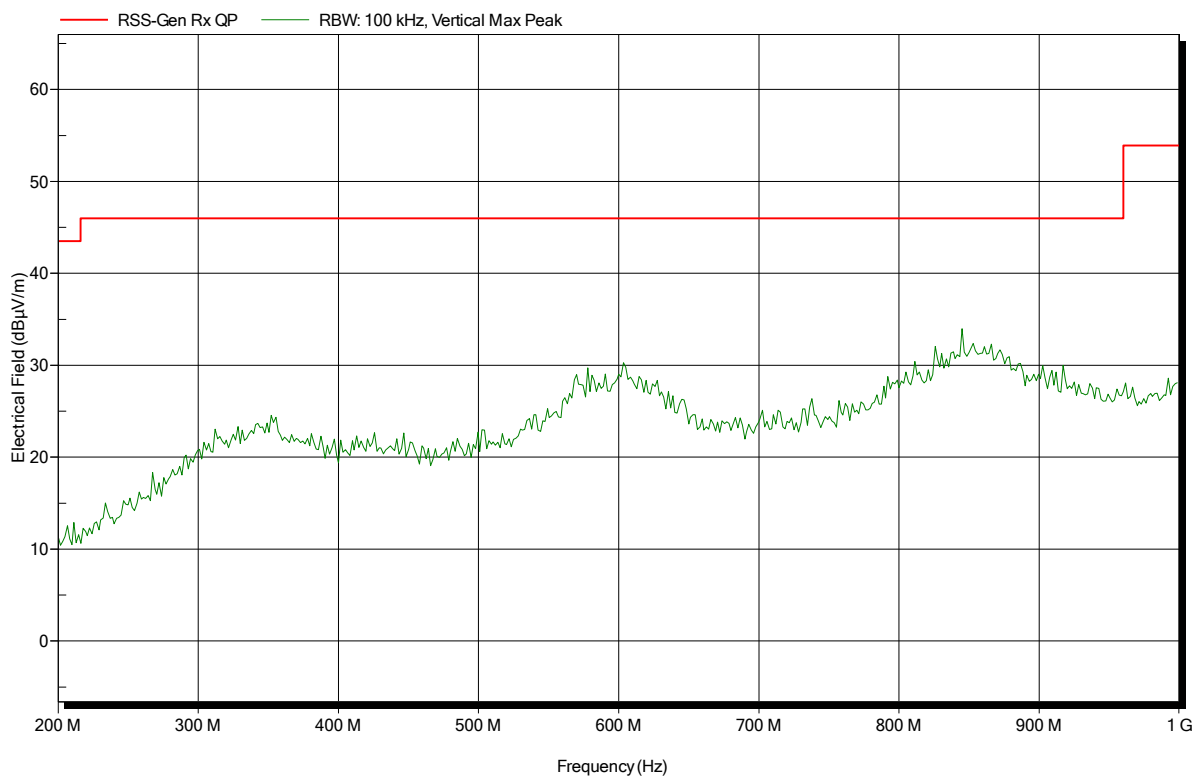


Spurious emissions according to RSS-210

Project number: GOM-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: RX; SRD; 315 MHz; Stand-by mode
 Test Date: Montag, 4. Juni 2018
 Note: EUT vertical; ANT integral

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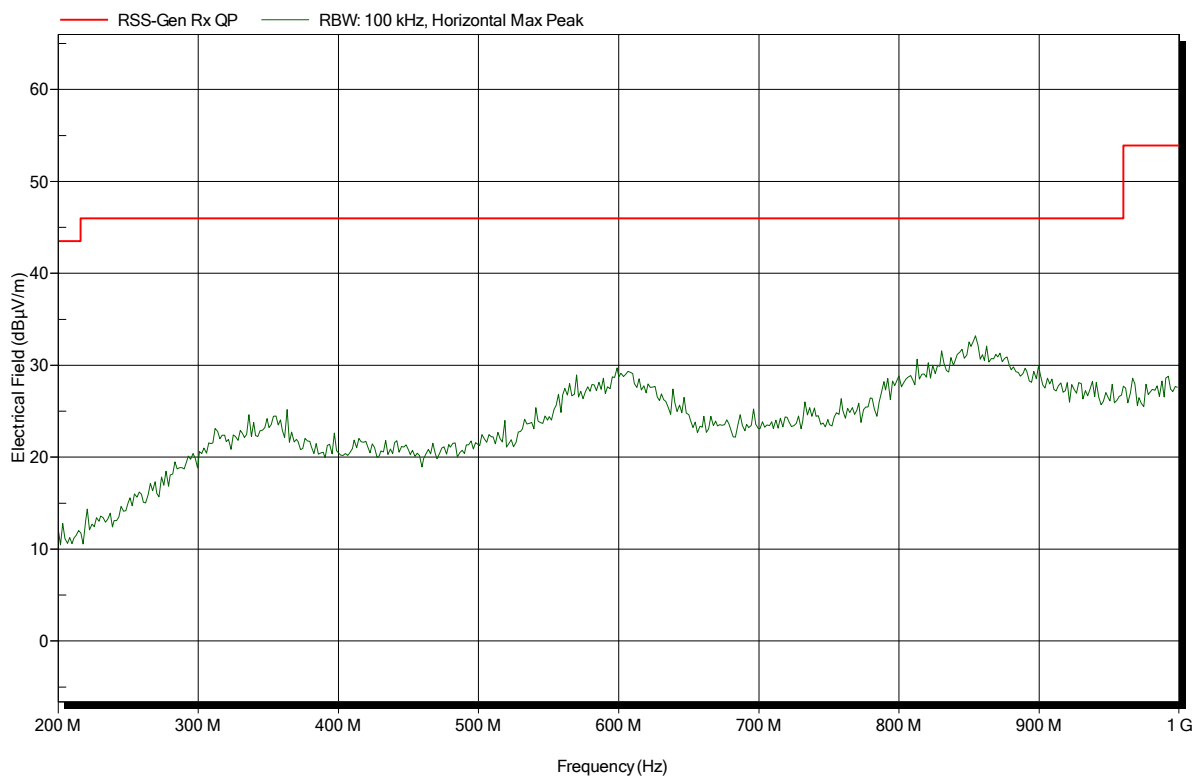


Spurious emissions according to RSS-210

Project number: GOM-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: RX; SRD; 315 MHz; Stand-by mode
 Test Date: Montag, 4. Juni 2018
 Note: EUT vertical; ANT integral

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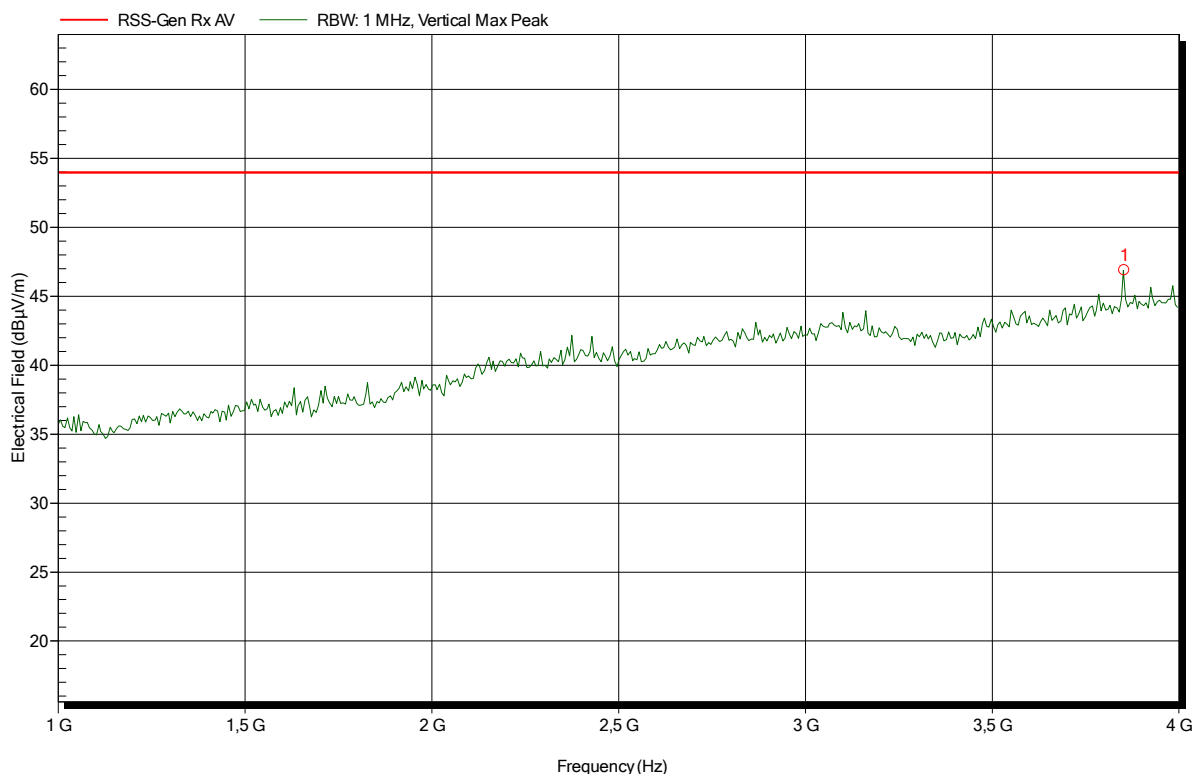


Spurious emissions according to RSS-210

Project number: GOM-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: RX; SRD; 315 MHz; Stand-by mode
 Test Date: Montag, 4. Juni 2018
 Note: EUT vertical; ANT integral

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
3,853 GHz	46,89 dBµV/m	53,98 dBµV/m	-7,09 dB	Pass

Spurious emissions according to RSS-210

Project number: GOM-1709-6887

Applicant: Marantec America Corp.
 EUT Name: Wall transmitter, 315 MHz, ASK, unidirectional, 3 V DC
 Model: Command 133
 Test Site: Eurofins Product Service GmbH
 Operator: Burkhard Pudell
 Test Conditions: Tnom: 23°C, Vnom: 3 VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: RX; SRD; 315 MHz; Stand-by mode
 Test Date: Montag, 4. Juni 2018
 Note: EUT vertical; ANT integral

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