



849 NW STATE ROAD 45
NEWBERRY, FL 32669 USA

PH: 888.472.2424 OR
352.472.5500

EMAIL: INFO@TIMCOENGR.COM

[HTTP://WWW.TIMCOENGR.COM](http://WWW.TIMCOENGR.COM)

FCC PART 90 & IC RSS 119 UHF MOBILE TEST REPORT

APPLICANT	CATTRON NORTH AMERICA INC.
ADDRESS	655 N. RIVER ROAD NW SUITE A WARREN, OH 44483-2254 USA
FCC ID	CN290273
IC	1007A-90273
MODEL NUMBER	90273 TRX
PRODUCT DESCRIPTION	IR LRM2 450/2400 MHz MODULE
DATE SAMPLE RECEIVED	6/3/2020
DATE TESTED	6/8/2020
TESTED BY	Tim Royer
APPROVED BY	Franklin Rose
TEST RESULTS	☒ PASS ☐ FAIL

Report Number	Version Number	Description	Issue Date
1704-20_TestReport		Initial Issue	06/8/2020
	Rev1	Clerical Updates	07/27/2020

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

TABLE OF CONTENTS

GENERAL REMARKS	2
GENERAL INFORMATION	3
TEST RESULTS SUMMARY	4
RF POWER OUTPUT	5
MODULATION CHARACTERISTICS	6
TEST FREQ. 450 MHz	6
TEST FREQ. 460 MHz	7
TEST FREQ. 470 MHz	8
OCCUPIED BANDWIDTH	9
Part 90.210(c) Emission Mask D - 12.5 kHz channel	10
Part 90.210(b) Emission Mask D - 12.5 kHz channel	11
Part 90.210(b) Emission Mask D - 12.5 kHz channel	12
SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)	13
Test Data: 450MHz Below 1GHz	14
Test Data: 450MHz Above 1GHz	15
Test Data: 460MHz Below 1GHz	16
Test Data: 460MHz Above 1GHz	17
Test Data: 470MHz Below 1GHz	18
Test Data: 470MHz Above 1GHz	19
FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS	20
Test Data: 450MHz	21
Test Data: 460MHz	22
Test Data: 470MHz	23
FREQUENCY STABILITY	24
Test Data: 450-470 MHz Band Table	24
Test Data: 450-470 MHz Band Plot	25
TRANSIENT FREQUENCY RESPONSE	26
MEASUREMENT UNCERTAINTY	29
EQUIPMENT LIST	30

GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- ☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Tested by:



Sr. EMC Engineer
EMC-003838-NE



Name and Title: Tim Royer, Project Manager/Testing Engineer

Date: 06/8/2020

Reviewed and approved by:



Name and Title: Franklin Rose, Project Manager/EMC Specialist

Date: 06/8/2020

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

GENERAL INFORMATION

EUT Specification

EUT Description	LRMII TRANSCEIVER MODULE
FCC ID	CN290273
IC	1007A-90273
Model Number	90273 TRX
Operating Frequency	450-470MHz
Test Frequencies	450,460 & 470 MHz
Type of Emission	10K8F1D/ F1W/ F1X
Modulation	FSK
EUT Power Source	☐ 110-120Vac/50- 60Hz
	☒ DC Power 5V
	☐ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☒ Fixed
	☐ Mobile
	☐ Portable
Test Conditions	The temperature was 24-26°C with a relative humidity of 50 - 65% & Barometric Pressure: 1019 - 1022 mb
Modification to the EUT	None
Test Exercise	The RF Module (EUT) was operated in a normal mode while connected to a test jig during testing.
Applicable Standards	ANSI/TIA 603-D:2010, FCC CFR 47 Part 90, & IC RSS 119 i12 2015
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

TEST RESULTS SUMMARY

Test Description	FCC RULE PART NO.	RESULT
Modulation Characteristics	2.1047(a)(b)	Pass
RF Power Output	2.1046(a), 90.205, IC RSS 119	Pass
Occupied Bandwidth	2.1049(c)(h), 90.210, IC RSS 119	Pass
Spurious Emissions at Antenna Terminal	2.1051(a), 90.210(b)(g)(h), 90.691, 90.543(c)	Pass
Field Strength of Spurious Radiation	2.1053, 90.210, IC RSS 119	Pass
FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS	Part 2.1053, 90.210, 90.543(c)(f)	Pass
FREQUENCY STABILITY	Part 2.1055, Part 90.213, IC RSS 119	Pass
TRANSIENT FREQUENCY RESPONSE	90.214, IC RSS 119	N/A

RF POWER OUTPUT

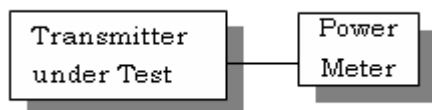
Rule Part No.: Part 2.1046(a), Part 90, RSS-119

Requirements: For IC the power output must be within $\pm 1.0\text{dB}$ of the manufacturer's rating.

Method of Measurement: RF power is measured by using a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage (if battery operated), or a properly adjusted power supply (if not battery operated), and the transmitter properly adjusted the RF output measures:

For the device with a fixed or integral antenna, the RF power is measured as ERP. The substitution method was used. The RF output measures:

Test Setup Diagram:



Test Data:

Tuned Frequency MHz	RF Power (High)	
	dBm	W
450	18.64	0.073
460	18.55	0.071
470	18.26	0.069

Part 2.1033 (C)(8) DC Input into the final amplifier

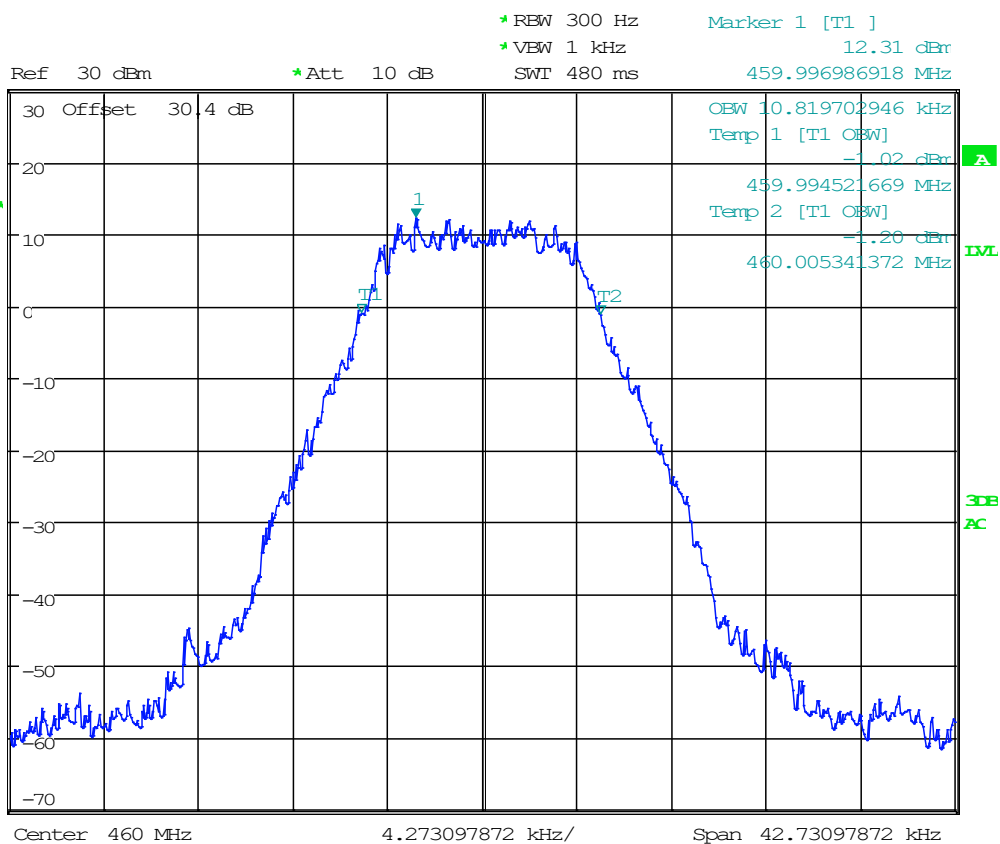
INPUT POWER: (5V) (40mA) = 0.2 Watts

MODULATION CHARACTERISTICS

Requirements: Part 2.1033(c), 2.1033(c) (4), 2.1047(a) (b), 90.209, 90.207, IC RSS 119

TEST FREQ. 460 MHz

99% dB OCC BW =10.81kHz



Date: 1.JUN.2020 18:18:12

Results Meet Requirements

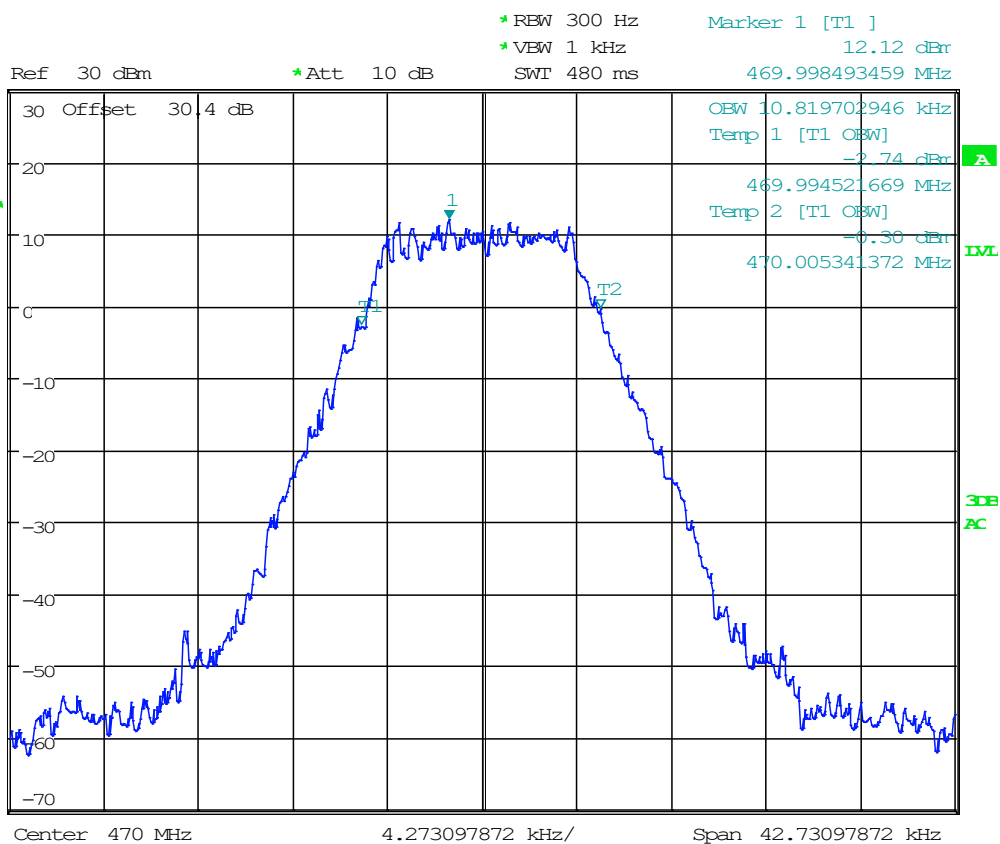
Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

MODULATION CHARACTERISTICS

Requirements: Part 2.1033(c), 2.1033(c) (4), 2.1047(a) (b), 90.209, 90.207, IC RSS 119

TEST FREQ. 470 MHz

99% dB OCC BW =10.81kHz



Date: 1.JUN.2020 18:12:29

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

OCCUPIED BANDWIDTH

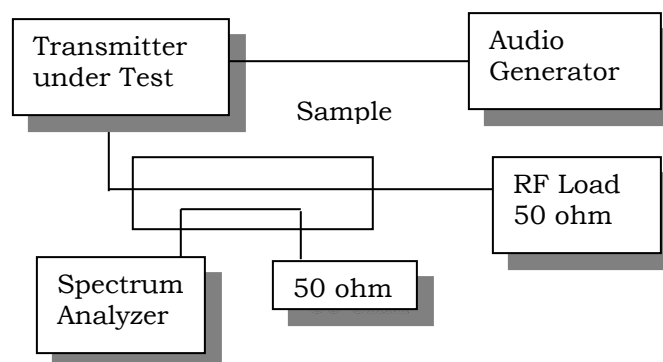
Requirements: Part 2.1049(c), Part 90.210(d), IC RSS 119

For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10\log(P)$ dB or 70 dB, whichever is the lesser attenuation.

Method of Measurement: Was in accordance with test procedures detailed in the standard list above.

Test Setup Diagram:



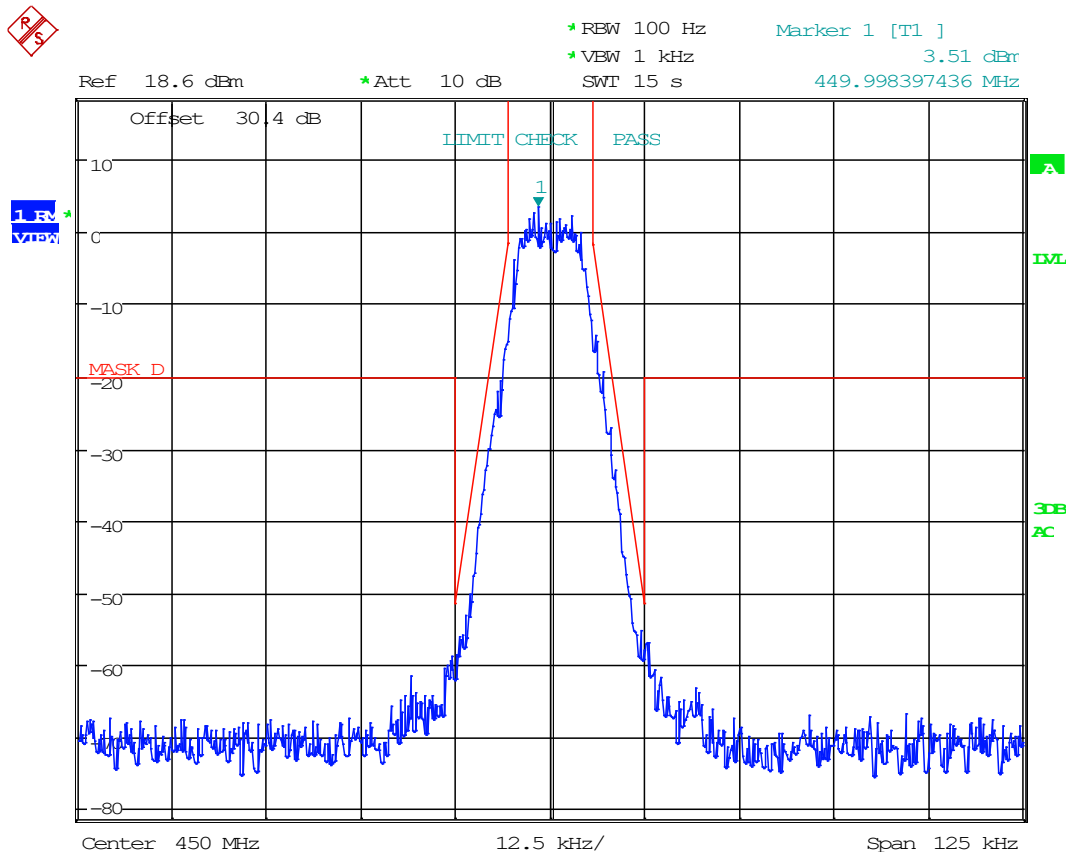
Test Data: See the plots below

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

OCCUPIED BANDWIDTH

Part 90.210(c) Emission Mask D – 12.5 kHz channel



Date: 1.JUN.2020 18:22:43

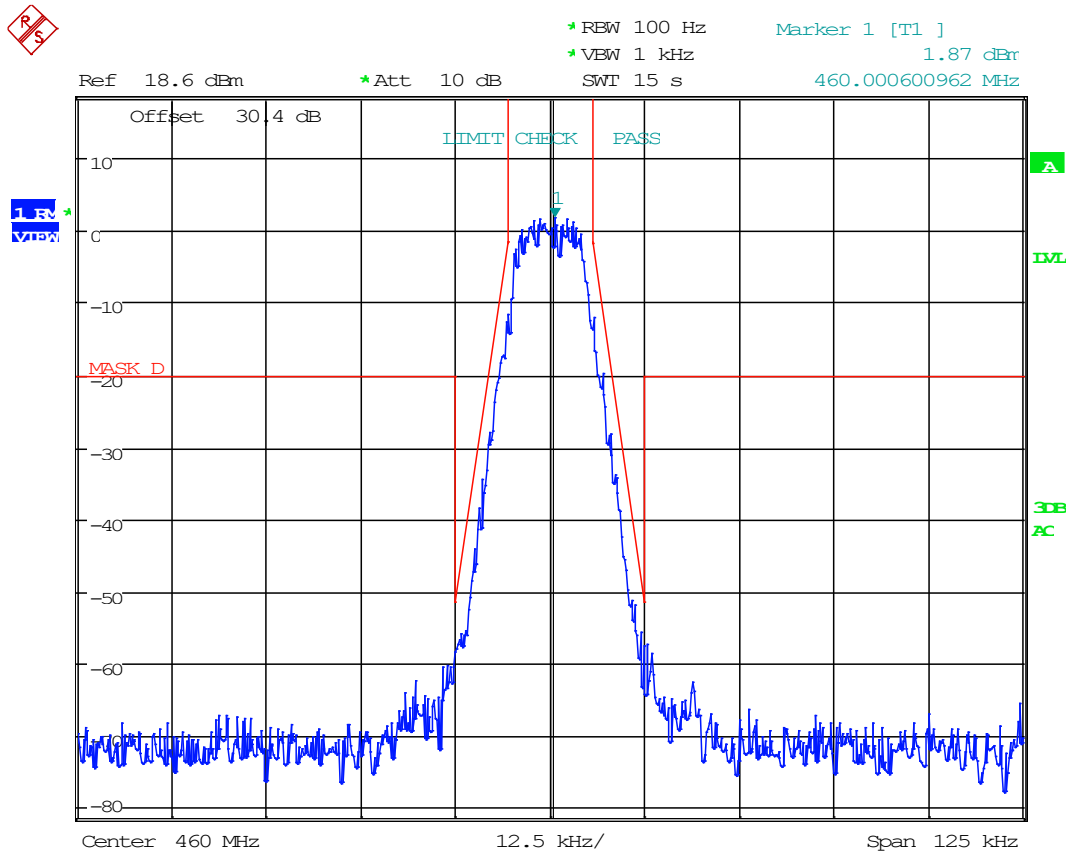
Figure 1: Occupied bandwidth 450MHz

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

OCCUPIED BANDWIDTH

Part 90.210(b) Emission Mask D – 12.5 kHz channel



Date: 1.JUN.2020 18:24:28

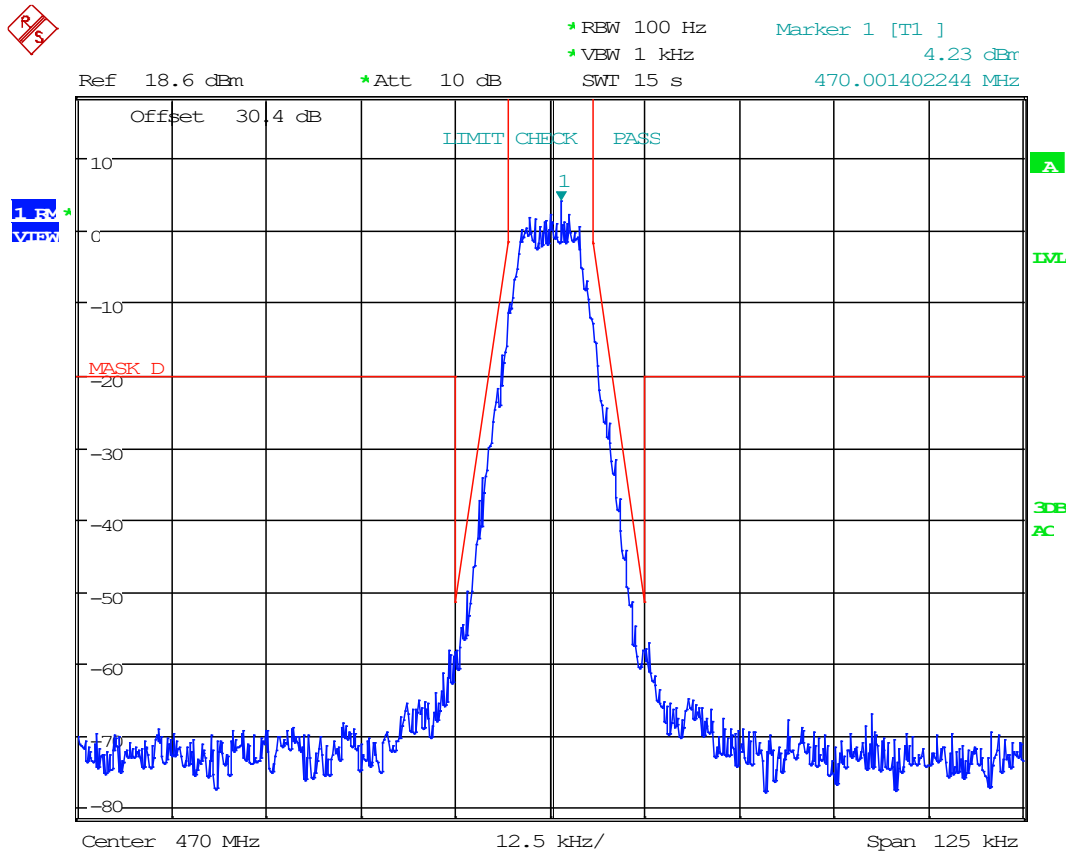
Figure 2: Occupied bandwidth 460MHz

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

OCCUPIED BANDWIDTH

Part 90.210(b) Emission Mask D – 12.5 kHz channel



Date: 1.JUN.2020 18:26:46

Figure 3: Occupied bandwidth 470MHz

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

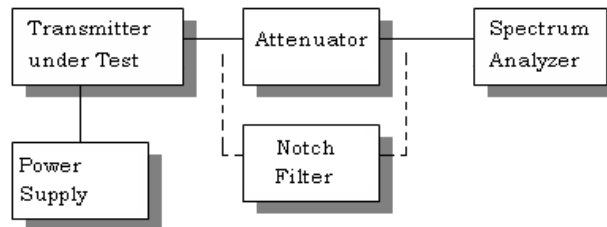
SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Rule Part No.: Part 2.1051(a)

Requirements: 12.5 kHz Channel Spacing = $50 + 10 \log(p)$ = dBc

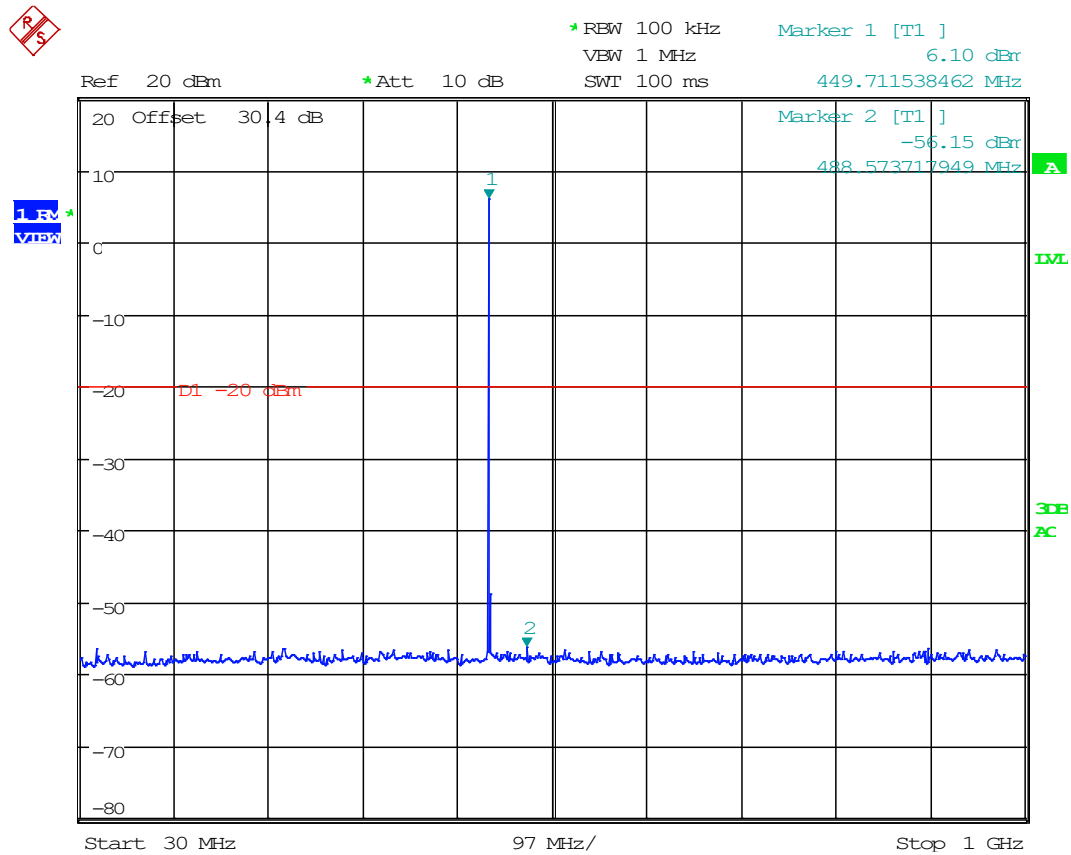
Method of Measurement: The EUT was transmitting in a normal operational mode

Test Setup:



SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Test Data: 450MHz Below 1GHz



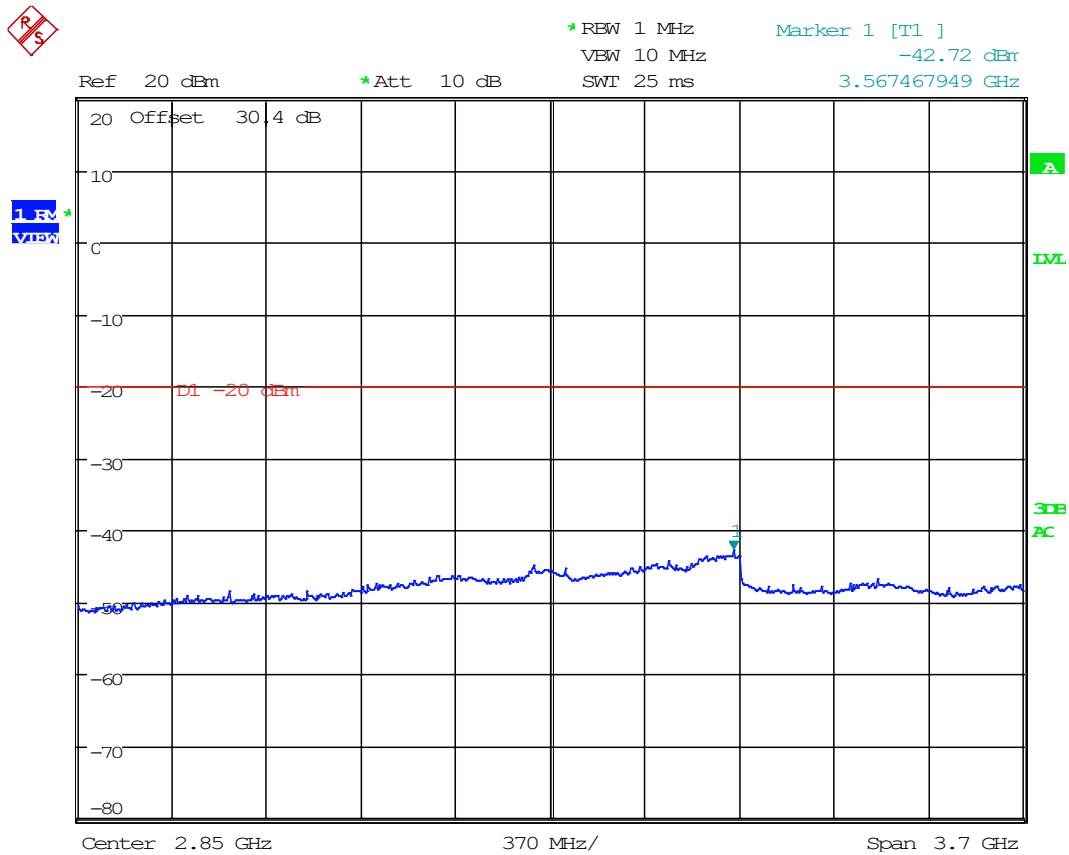
Date: 1.JUN.2020 18:30:42

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Test Data: 450MHz Above 1GHz



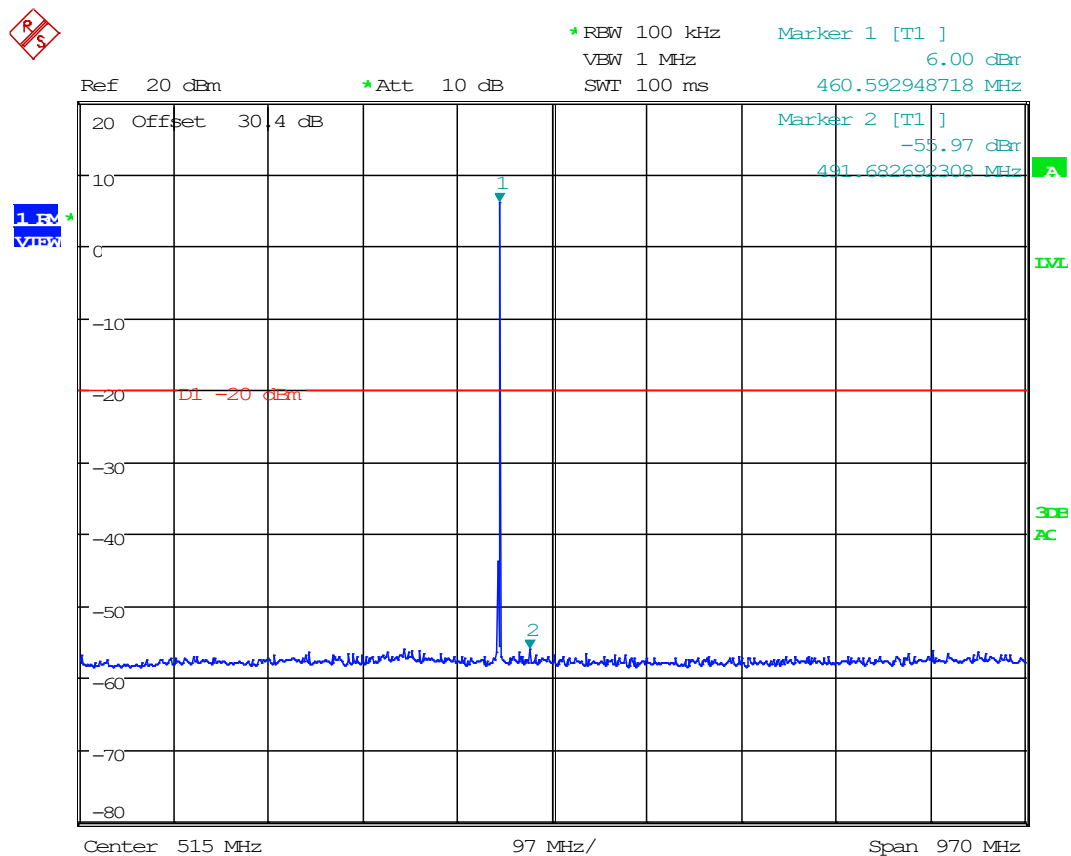
Date: 1.JUN.2020 18:36:38

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Test Data: 460MHz Below 1GHz



Date: 1.JUN.2020 18:32:19

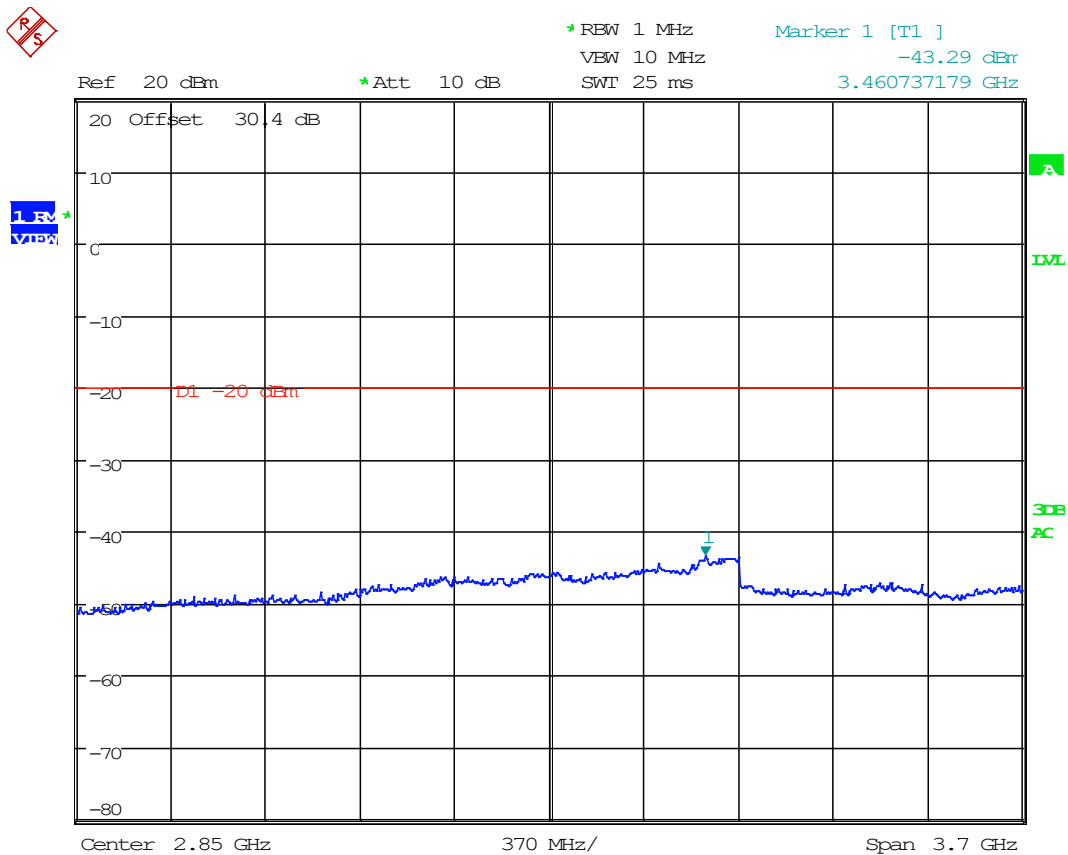
Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Rule Parts. No.: Part 2.1053

Test Data: 460MHz Above 1GHz



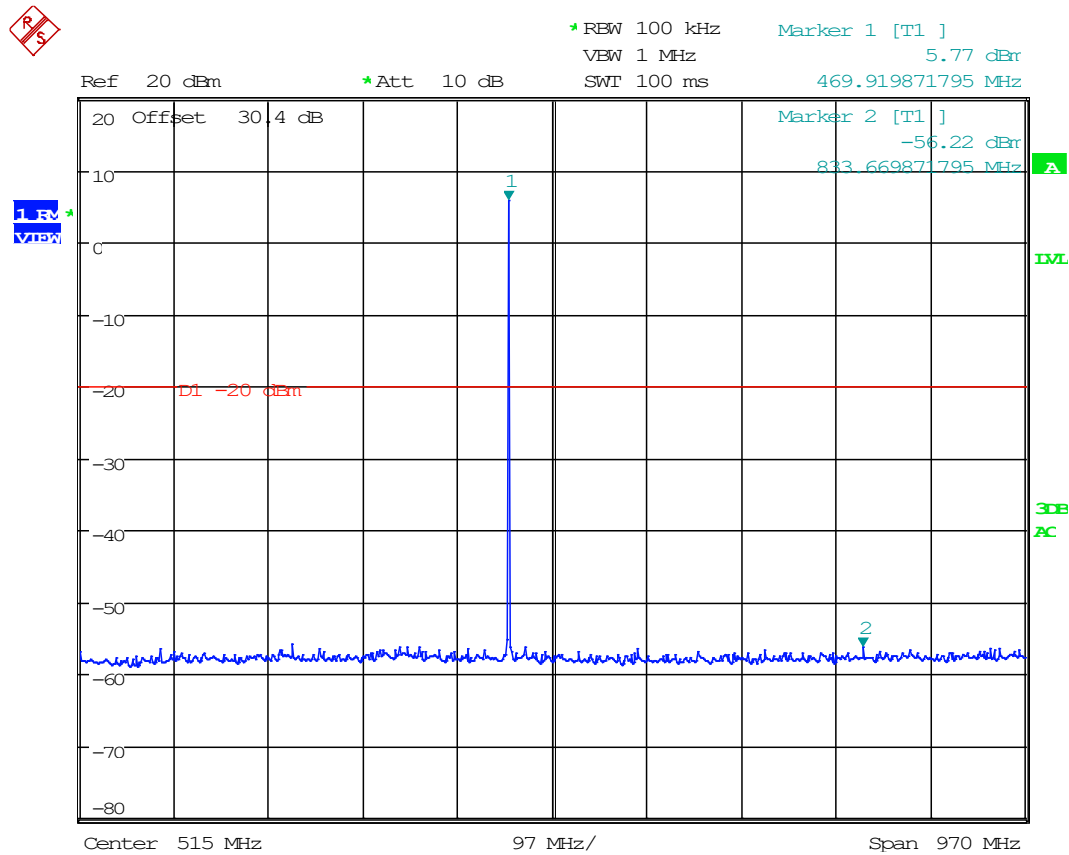
Date: 1.JUN.2020 18:35:17

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Test Data: 470MHz Below 1GHz



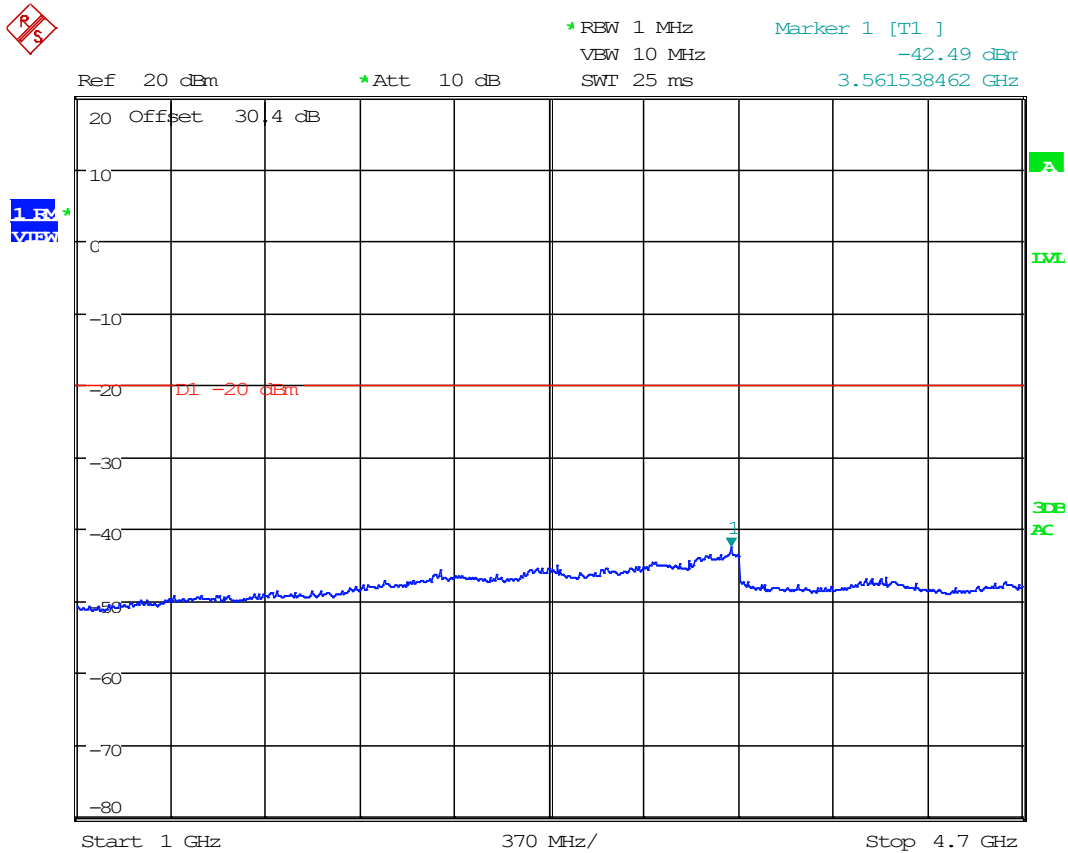
Date: 1.JUN.2020 18:33:17

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Test Data: 470MHz Above 1GHz



Date: 1.JUN.2020 18:34:29

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

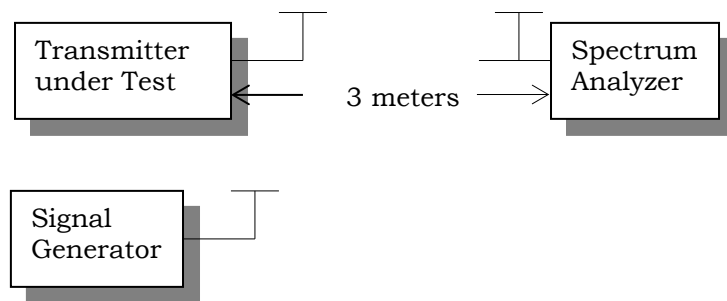
FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

Rule Parts. No.: Part 2.1053, 90.210, 90.543(c)(f), IC RSS 119

Requirements: 12.5 kHz Channel Spacing = $50 + 10 \log(p)$ = dBc

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted in accordance with test procedures detailed in the standard list above using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

Test Setup Diagram:



FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

Rule Parts. No.: Part 2.1053, 90.210

Test Data: 450MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Meter Reading (dBμV)	Antenna Polarity	Coax Loss (dB)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Distance (m)	Field Strength (dBμV/m)	ERP (dBm)	Margin (dB)
450.00	1350.00	16.48	H	4.24	28.76	49.48	3.000	49.480	-47.897	27.90
450.00	1350.00	10.03	H	4.24	28.76	43.03	3.000	43.030	-54.347	34.35
450.00	1800.00	17.62	H	4.91	30.29	52.82	3.000	52.822	-44.555	24.56
450.00	1800.00	17.00	V	4.91	30.29	52.20	3.000	52.202	-45.175	25.18
450.00	2250.00	11.31	V	5.42	31.23	47.96	3.000	47.960	-49.417	29.42
450.00	2250.00	13.00	H	5.42	31.23	49.65	3.000	49.650	-47.727	27.73
450.00	2700.00	12.16	H	5.99	32.51	50.66	3.000	50.660	-46.717	26.72
450.00	2700.00	11.44	H	5.99	32.51	49.94	3.000	49.940	-47.437	27.44
450.00	3150.00	10.85	H	6.50	32.78	50.13	3.000	50.128	-47.249	27.25
450.00	3150.00	10.82	V	6.50	32.78	50.10	3.000	50.098	-47.279	27.28
450.00	3600.00	9.99	V	6.67	33.11	49.77	3.000	49.770	-47.607	27.61
450.00	3600.00	6.89	H	6.67	33.11	46.67	3.000	46.670	-50.707	30.71
450.00	4500.00	10.38	H	7.32	33.89	51.59	3.000	51.590	-45.787	25.79
450.00	4500.00	11.01	V	7.32	33.89	52.22	3.000	52.220	-45.157	25.16
450.00	4050.00	11.08	V	7.18	33.38	51.64	3.000	51.644	-45.733	25.73
450.00	4050.00	10.38	V	7.18	33.38	50.94	3.000	50.944	-46.433	26.43

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

Test Data: 460MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Meter Reading (dBμV)	Antenna Polarity	Coax Loss (dB)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Distance (m)	Field Strength (dBμV/m)	ERP (dBm)	Margin (dB)
460.00	1380.00	13.05	V	4.31	28.58	45.94	3.000	45.938	-51.440	31.44
460.00	1380.00	11.86	H	4.31	28.58	44.75	3.000	44.748	-52.630	32.63
460.00	1840.00	9.94	H	4.97	30.76	45.67	3.000	45.670	-51.708	31.71
460.00	1840.00	8.73	V	4.97	30.76	44.46	3.000	44.460	-52.918	32.92
460.00	2300.00	9.62	V	5.50	31.52	46.64	3.000	46.640	-50.737	30.74
460.00	2300.00	10.58	H	5.50	31.52	47.60	3.000	47.600	-49.777	29.78
460.00	2760.00	11.64	H	6.10	32.41	50.15	3.000	50.149	-47.228	27.23
460.00	2760.00	10.58	V	6.10	32.41	49.09	3.000	49.089	-48.288	28.29
460.00	3220.00	3.83	V	6.60	32.68	43.11	3.000	43.114	-54.263	34.26
460.00	3680.00	-1.40	V	6.54	33.19	38.33	3.000	38.334	-59.043	39.04
460.00	3680.00	0.52	H	6.54	33.19	40.25	3.000	40.254	-57.123	37.12
460.00	4140.00	-0.31	H	7.08	33.42	40.19	3.000	40.193	-57.184	37.18
460.00	4140.00	0.34	V	7.08	33.42	40.84	3.000	40.843	-56.534	36.53
460.00	4600.00	7.72	V	7.51	34.06	49.29	3.000	49.292	-48.085	28.09
460.00	4600.00	6.93	H	7.51	34.06	48.50	3.000	48.502	-48.875	28.88

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
 FCC ID: CN290273
 IC: 1007A-90273
 Report: 1704-20_TestReport_Rev1

FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

Rule Parts. No.: Part 2.1053

Test Data: 470MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Meter Reading (dBµV)	Antenna Polarity	Coax Loss (dB)	Correction Factor (dB/m)	Field Strength (dBµV/m)	Distance (m)	Field Strength (dBµV/m)	ERP (dBm)	Margin (dB)
470.00	1410.00	11.94	H	4.35	28.39	44.68	3.000	44.683	-52.694	32.69
470.00	1410.00	12.94	V	4.35	28.39	45.68	3.000	45.683	-51.694	31.69
470.00	1880.00	10.20	V	5.03	30.94	46.17	3.000	46.166	-51.211	31.21
470.00	1880.00	7.97	H	5.03	30.94	43.94	3.000	43.936	-53.441	33.44
470.00	2350.00	2.54	H	5.58	31.93	40.05	3.000	40.050	-57.327	37.33
470.00	2350.00	3.47	V	5.58	31.93	40.98	3.000	40.980	-56.397	36.40
470.00	2820.00	3.93	V	6.15	32.43	42.51	3.000	42.512	-54.866	34.87
470.00	2820.00	-0.02	H	6.15	32.43	38.56	3.000	38.562	-58.816	38.82
470.00	3290.00	0.88	H	6.68	32.63	40.19	3.000	40.186	-57.192	37.19
470.00	3290.00	-0.67	V	6.68	32.63	38.64	3.000	38.636	-58.742	38.74
470.00	3760.00	4.92	V	8.77	33.13	46.82	3.000	46.822	-50.555	30.55
470.00	3760.00	2.35	H	8.77	33.13	44.25	3.000	44.252	-53.125	33.12
470.00	4230.00	-0.20	H	7.16	33.33	40.29	3.000	40.292	-57.085	37.08
470.00	4230.00	1.15	V	7.16	33.33	41.64	3.000	41.642	-55.735	35.73
470.00	4700.00	-0.78	V	7.18	33.88	40.28	3.000	40.282	-57.095	37.10
470.00	4700.00	3.21	H	7.18	33.88	44.27	3.000	44.272	-53.105	33.11
470.00	940.00	26.32	H	3.59	23.60	53.51	3.000	53.510	-43.867	23.87
470.00	940.00	25.96	V	3.59	23.60	53.15	3.000	53.150	-44.227	24.23
460.00	920.00	19.28	V	3.58	23.80	46.66	3.000	46.660	-50.717	30.72
460.00	920.00	26.91	H	3.58	23.80	54.29	3.000	54.290	-43.087	23.09
450.00	900.00	29.81	H	3.54	21.80	55.15	3.000	55.150	-42.227	22.23
450.00	900.00	20.11	V	3.54	21.80	45.45	3.000	45.450	-51.927	31.93

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

FREQUENCY STABILITY

Rule Parts. No.: Part 2.1055, Part 90.213, IC RSS 119

Requirements: Temperature range requirements: -30 to +50° C.
Voltage Variation +, -15%
±2.5 PPM

Method of Measurements: Was in accordance with test procedures detailed in the standard list above.

Test Data: 450-470 MHz Band Table

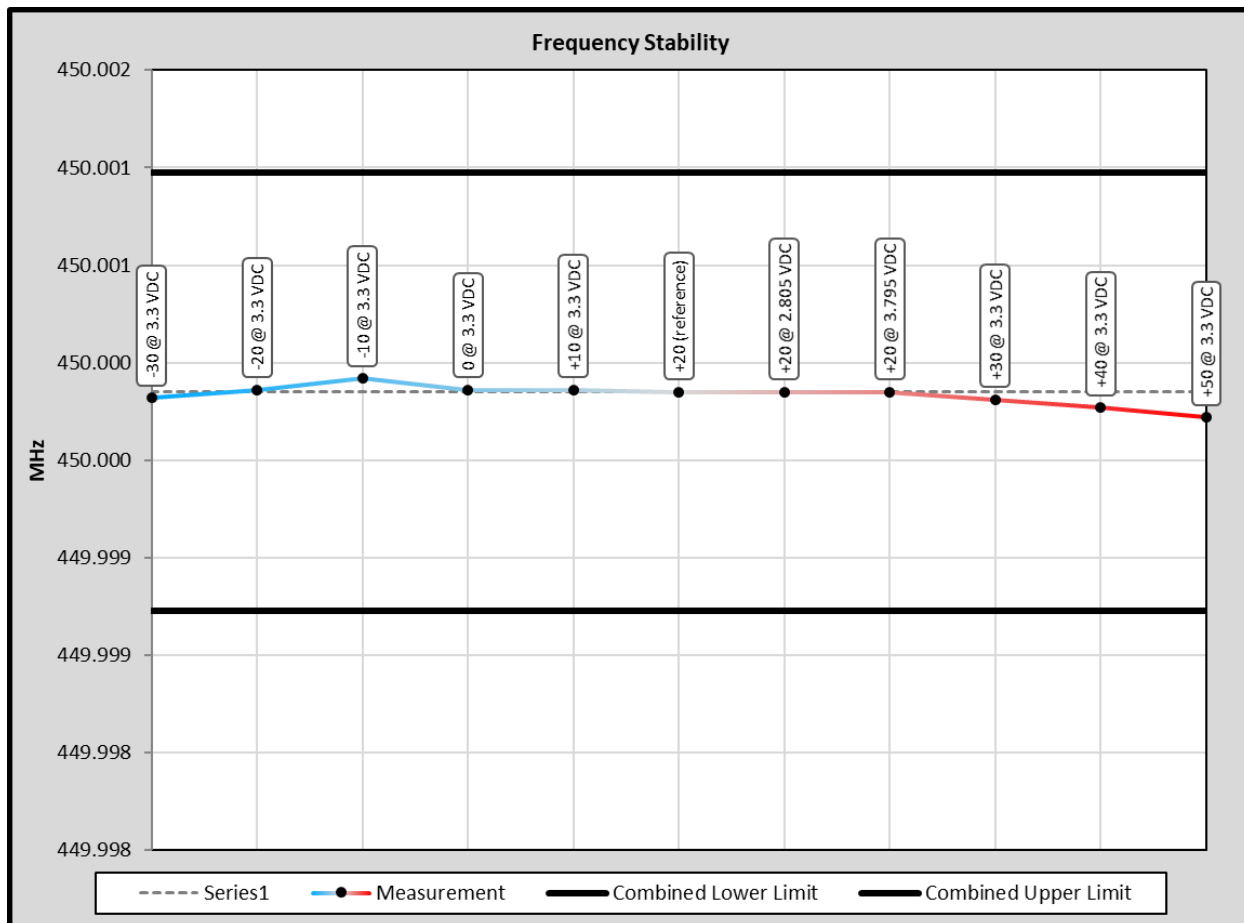
FCC Part 90 Limit	2.5	ppm	
FCC Part 90 Limit, as ppb	2500	ppb (Parts per Billion)	
FCC Part 90 Limit, as %	0.00025	%	
Strictest Combined Limit, as Hz	1125.000	Hz	
Combined Lower Limit	449.998725	MHz	
Combined Upper Limit	450.000975	MHz	
Rated Supply Voltage	3.3	☐ AC ☒ DC	
Temperature / Voltage Variation			
Temperature (°C)	Supplied Voltage (V)	Frequency (MHz)	Deviation (kHz)
-30	3.3	449.999820	0.030
-20	3.3	449.999860	-0.010
-10	3.3	449.999920	-0.070
0	3.3	449.999860	-0.010
+10	3.3	449.999860	-0.010
+20 (reference)	3.3	449.999850	0.000
+20	2.8	449.999850	0.000
+20	3.8	449.999850	0.000
+30	3.3	449.999810	0.040
+40	3.3	449.999770	0.080
+50	3.3	449.999720	0.130

Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

FREQUENCY STABILITY

Test Data: 450-470 MHz Band Plot



Results Meet Requirements

Applicant: CATTRON NORTH AMERICA INC.
FCC ID: CN290273
IC: 1007A-90273
Report: 1704-20_TestReport_Rev1

TRANSIENT FREQUENCY RESPONSE

§90.214 Transient frequency behavior.

Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

421 to 512 MHz, 25 kHz Channel, 12.5 kHz Channel, & 6.25 kHz Channel			
Time intervals ^{1 2}	t_1 ⁴	t_2	t_3 ⁴
Length (ms)	10 ms	25 ms	10ms
Maximum Frequency Difference ³	±1 Ch.	±0.5 Ch.	±1 Ch.

¹ t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on} .

t_2 is the time period immediately following t_1 .

t_3 is the time period from the instant when the transmitter is turned off until t_{off} .

t_{off} is the instant when the 1 kHz test signal starts to rise.

² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in §90.213.

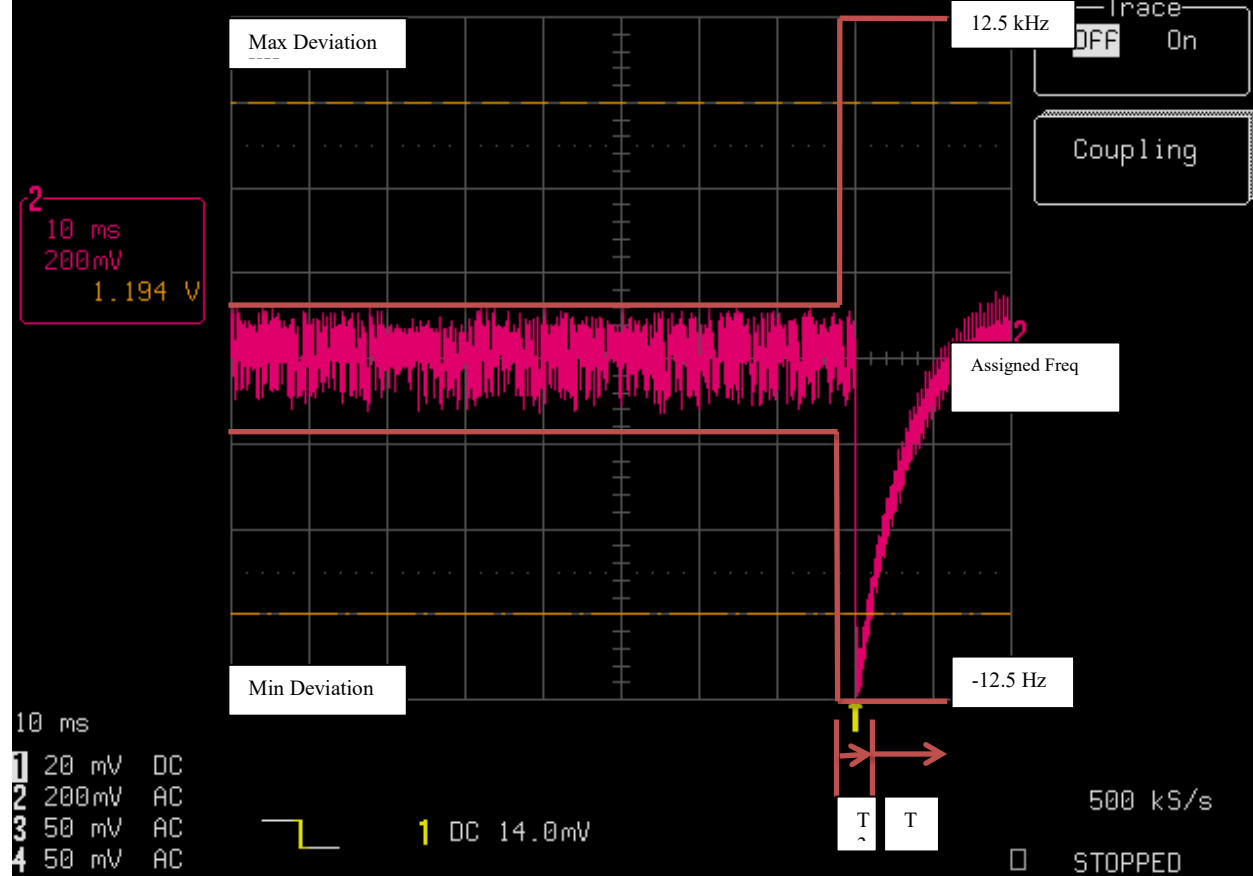
³ Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

[illegible]

Page 27 of 30

CHANNEL 1



MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: “Uncertainty in EMC Measurements” and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

Test Items	Measurement Uncertainty	Notes
RF Frequency Accuracy	± 49.5 Hz	(1)
RF Conducted Power	± 0.93 dB	(1)
Conducted spurious emission of transmitter valid up to 40GHz	± 1.86 dB	
Occupied Bandwidth	$\pm 2.65\%$	
Audio Frequency Response	± 1.86 dB	
Modulation limiting	$\pm 1.88\%$	
Radiated RF Power	± 1.4 dB	
Maximum frequency deviation: Within 300 Hz and 6kHz of audio freq. Within 6kHz and 25kHz of audio Freq.	$\pm 1.88\%$ $\pm 2.04\%$	
Rad Emissions Sub Meth up to 26.5GHz	± 2.14 dB	
Temperature	$\pm 1.0^{\circ}\text{C}$	(1)
Humidity	$\pm 5.0\%$	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconical 1096	Eaton	94455-1	1096	08/01/17	08/01/20
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	07/26/17	07/26/20
Temperature Chamber LARGE	Tenney Engineering	TTRC	11717-7	N/A	N/A
Frequency Counter Small Chamber	HP	5385A	3242A07460	08/22/17	08/22/20
Coaxial Cable - Chamber 3 cable set (backup)	Micro-Coax	Chamber 3 cable set (backup)	KMKM-0244-02 KMKM-0670-01 KFKF-0197-00	N/A	N/A
CHAMBER	Panashield	3M	N/A	12/31/2017	12/31/2020
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	02/25/2020	02/25/2023
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
Antenna: Passive Loop	EMCO	6512	9706-1211	07/26/17	07/26/20
Type K J Thermometer	Martel	303	080504494	11/02/17	11/02/20
EMI Test Receiver R & S ESU 40	Rohde & Schwarz	ESU 40	100320	08/28/18	08/28/20
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Tunable Notch Filter 250-850 MHz	Eagle	TNF-200	250-850 MHz (#19)	N/A	N/A

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

END OF TEST REPORT

Applicant: CATTRON NORTH AMERICA INC.
 FCC ID: CN290273
 IC: 1007A-90273
 Report: 1704-20_TestReport_Rev1