



Measurement of RF Emissions from a TM100 & TM110 Remote Control Transmitter

For	The Chamberlain Group 845 Larch Ave Elmhurst, IL 60126
P.O. Number	4900037120
Date Tested	May 3, 2016 through June 27, 2016
Test Personnel	Richard King
Test Specification	FCC "Code of Federal Regulations" Title 47 Part15, Subpart C Industry Canada RSS-GEN Industry Canada RSS-210

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REVISION HISTORY

Revision	Date	Description
—	04 Aug 2016	Initial release

Measurement of RF Emissions from a Remote Control, Model No. TM100 & TM110 Transmitter

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on several Remote Control transmitters. Each transmitter has two Model Nos. TM100 & TM110, no serial numbers are assigned (hereinafter referred to as the Equipment Under Test (EUT)). The EUTs were designed to transmit at a frequency which was between the 300 to 390MHz using an integral antenna. The EUTs were manufactured and submitted for testing by The Chamberlain Group located in Elmhurst, IL.

Each EUT was programmed to a different button on one of seven different EUT housings. The EUTs were identified by the button number supplied per paragraph 3.3.

1.2. Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.231 for Intentional Radiators. Testing was performed in accordance with ANSI C63.4-2014.

The test series was also performed to determine if the EUT meets the conducted RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.4 and the radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-210, Annex 1 for transmitters. Testing was performed in accordance with ANSI C63.4-2014.

1.3. Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series.

1.4. EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by The American Association for Laboratory Accreditation (A2LA). A2LA Certificate Number: 1786.01.

1.5. Laboratory Conditions

The temperature at the time of the test was 25.3°C and the relative humidity was 36%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C, dated 1 October 2015
- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
- Industry Canada Radio Standards Specification, RSS-Gen, "General Requirements and Information for the Certification of Radiocommunication Equipment", Issue 4, November 2014
- Industry Canada Radio Standards Specification, RSS-210, "Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment", Issue 8, May 2015

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a The Chamberlain Group, Remote Control , Model No. TM100 & TM110. A block diagram of the EUT setup is shown as Figure 1.

3.1.1.Power Input

The EUT obtained 3V from a 3V Lithium battery.

3.1.2.Peripheral Equipment

No peripheral equipment was submitted with the EUT.

3.1.3.Signal Input/Output Leads

No interconnect cables were submitted with the EUT.

3.1.4.Grounding

The EUT was ungrounded during the tests.

3.2. Software

For all tests the EUT had Firmware Version FCC_TEST_20160607 loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

For all tests the EUTs were placed on an 80cm high non-conductive stand when testing below 1GHz. Above 1GHz the EUTs were placed on a 150cm high non-conductive stand. The EUTs' transmit button was held down to transmit continuously.

The EUTs were energized and tested according to the following:

DUT (button)	Manufacturer	Frequency	Code Format	Duty Cycle (Theoretical)	Field Strength Correction Factor (dB)
1	Genie	315MHz	IntelliCode (Keeloq based)	24.1%	-10.25
2	Genie	390MHz	IntelliCode (Keeloq based)	24.1%	-10.25
3	Linear	318MHz	Mega-Code	17.0%	-15.39
4	Chamberlain	390MHz	Rolling Code (D Code)	31.0%	-10.17
5	Chamberlain	315MHz	Rolling Code (D Code)	31.0%	-10.17
6	Chamberlain	390MHz	Billion Code (A Code)	46.0%	-3.8
7	Stanley	310MHz	Secure Code (Keeloq based)	24.1%	-10.25
8	Chamberlain	310/315/390MHz	Rolling Code (E Code)	21.5%	-13.35
9	Wayne Dalton	372.5MHz	Rolling Code (Keeloq Based)	24.1%	-10.25
10	Linear/Moore-o-Matic	310MHz	8 Position DIP Switch	24.5%	-12.20
11	Chamberlain	315MHz	9 Position DIP Switch	35.0%	-9.13
12	Stanley	310MHz	10 Position DIP Switch	39.4%	-8.10
13	Genie	390MHz	12 Position DIP Switch	50.1%	-6.00
14	Chamberlain	390MHz	7 Position DIP Switch	30.2%	-10.40
15	Chamberlain	390MHz	8 Position DIP Switch	32.5%	-9.75

16	Linear	300MHz	Multicode	39.4%	-8.10
17	Chamberlain	390MHz	9 Position DIP Switch	35.0%	-9.13
18	Genie	390MHz	9 Position DIP Switch	50.1%	-6.00
19	Extreme	303MHz	OOK		-8.0

3.4. EUT Modifications

No modifications were required for compliance to the requirements.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1. Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

Radiated emission measurements were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths and detector functions specified by the FCC. The receiver bandwidth was 120kHz for the 30MHz to 1000MHz radiated emissions data and 1MHz for the 1000MHz to 5000MHz radiated emissions data.

4.3. Calibration Traceability

Test equipment is maintained and calibrated on a regular basis. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4. Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

The measurement uncertainty for these tests is presented below:

Conducted Emissions Measurements		
Combined Standard Uncertainty	1.06	-1.06
Expanded Uncertainty (95% confidence)	2.12	-2.12

Radiated Emissions Measurements		
Combined Standard Uncertainty	2.09	-2.09
Expanded Uncertainty (95% confidence)	4.19	-4.19

5. TEST PROCEDURES

5.1. Powerline Conducted Emissions

5.1.1. Requirements

Since the EUT was powered by internal batteries and has no connections to AC power, no conducted emissions tests are required.

5.2. Periodic Operation Measurements

5.2.1. Requirements

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. Also, a transmitter activated automatically shall cease transmission within 5 seconds after activation.

5.2.2. Procedures

The spectrum analyzer was setup to display the time domain trace. The EUT was set to transmit normally. The spectrum analyzer was used to record the amount of time that the EUT remained active following activation.

5.2.3. Results

The plot of the periodic timing is shown on data pages 18 through 38. The data shows that the EUTs cease operation within the allotted time.

5.3. Duty Cycle Factor Measurements

5.3.1. Procedures

The duty cycle factor is used to convert peak detected readings to average readings. This factor is computed from the time domain trace of the pulse modulation signal.

The duty cycle factor was calculated from information supplied by the manufacturer. Since this EUT utilizes a rolling code modulation, the duty is calculated based on the worst case. The following procedure was used to measure a representative sample:

- a) With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer.
- b) The pulse width is measured and a plot of this measurement is recorded.
- c) Next the number of pulses in the word period is measured and a plot is recorded.
- d) Finally the length of the word period is measured and a third plot is recorded. If the word period exceeds 100 msec, the word period is limited to 100 msec.
- e) The pulse width and number of pulses for the word period are used to compute the on-time. The duty cycle is then computed as the (on-time/ word period).
- f) The duty cycle factor is computed from the duty cycle.

5.3.2. Results

Plots of the duty cycle factors used for each transmitter are shown on data pages 39 through 83.

The duty cycle factors were computed per the following:

Rolling Code "E Code" or 'F Code"

Pay Load 00- $20\log(15.5/100) = -16.19\text{dB}$

Pay Load 01- $20*\text{LOG}(21.5\text{ms}/100\text{ms}) = -13.35\text{ dB}$

Pay Load 10- $20 \times \text{LOG}(21.5\text{ms}/100\text{ms}) = -13.35 \text{ dB}$
 *Payload 11- $20 \times \text{LOG}(25.9\text{mS}/100\text{mS}) = -11.73 \text{ dB}$

Rolling Code "D Code"

Rolling Code D consists of the following: First Sync (0.5msec), 20 trinary bits (2msec each), Blank Time (59.5msec), Second Sync (1.5msec), 20 Trinary bits (2msec each) and blank time (58.5msec).

The trinary bits change and roll over time via a proprietary coding scheme. Since the bits will change on a key press, a best and worst case situation is looked at. The best and worst case is then averaged.

Worst Case- 31msec ON time over 100msec
 Best Case- 11 msec ON time over 100msec
 Average- 21 msec over 100msec

$20 \log(31/100) = -10.17\text{dB}$. (ROLLING CODE MODULATION FACTOR)

Billion Code A

Billion Code A consists of a sync pulse (1msec), 10 trinary numbers (4msec each), blank time (39msec each), synch pulse (3msec), 10 trinary numbers (4msec each) & blank time (37 msec). Looking at a worst case coding scheme, the worst case ON time over 100msec is 64mSec.

$20 \log(64/100) = -3.8\text{dB}$. (BILLION CODE MODULATION FACTOR)

Keeloq (Genie Intellicode, Wayne Dalton & Stanley Secure Code)

See HCS 201 document for detailed timings.

Keeloq Packet Over 100msec

Preamble	Header	Encrypted	Fixed	Blank	Total	Partial Preamble	Total	
4.6	2	19.2	20.4	50	96.2	4	100.2	Total Time
0.5	0	0.666667	0.666667	0		0.5		Duty Worst
0.5	0	0.333333	0.333333	0		0.5		Duty Best
2.3	0	12.8	13.6	0	0	2	30.7	ON TIME WORST
2.3	0	6.4	6.8	0	0	2	17.5	ON TIME BEST
							24.1	AVG ON TIME
							-12.35966	dB MOD FACTOR

$20 \times \text{LOG}(30.7\text{mS}/100\text{mS}) = -10.25 \text{ dB}$

Linear Megacode

MOD FACTOR: $20 \log(17/100) = -15.39\text{dB}$

Stanley & MultiCode 10 Position DIP

There are 10, 2msec bits with maximum of 1.5msec ON time per bit and 18msec blank time. So the maximum ON time over a complete message would be 15msec ON/38msec

MOD FACTOR: $20 \log(15/38) = -8.1\text{dB}$

9 Position DIP C-Code

There are 10 trits made up of 4msec time blocks with a 1msec sync pulse and 39msec blank time. The last trit is always fixed to be 1msec ON/4msec OFF time. Therefore, 1 frame equals (on time/off time) $\frac{1}{4} + (3/4) \times 9$
 $+1/4 + 0/39 = 29\text{msec ON}/83 \text{ msec off}$

MOD FACTOR: $20 \log(29/83) = -9.13\text{dB}$ (worst case assuming all – DIP positions)

Stanley & MultiCode 10 Position DIP

There are 10, 2msec bits with maximum of 1.5msec ON time per bit and 18msec blank time. So the maximum ON time over a complete message would be 15msec ON/38msec
MOD FACTOR: $20\log(15/38) = -8.1\text{dB}$ (worst case assuming all – DIP positions)

Genie 12 Position DIP

This code is a pseudo FSK signal implemented with 50% duty cycle OOK.
MOD FACTOR: $20\log(50/100) = -6.02\text{dB}$

7 Position DIP C-Code

Same as above except there are 3 fixed 1msec ON/4msec OFF trits. (on time/off time)
 $\frac{1}{4} + (3/4)*7 + (1/4)*3 + 0/39 = 25\text{msec ON}/83\text{ msec off}$
MOD FACTOR: $20\log(25/83) = -10.4\text{dB}$ (worst case assuming all – DIP positions)

8 Position DIP C-Code

Same as above except there are 2 fixed 1msec ON/4msec OFF trits. (on time/off time)
 $\frac{1}{4} + (3/4)*8 + (1/4)*2 + 0/39 = 27\text{msec ON}/83\text{ msec off}$
MOD FACTOR: $20\log(27/83) = -9.75\text{dB}$ (worst case assuming all – DIP positions)

Genie 9 Position DIP

This code is a pseudo FSK signal implemented with 50% duty cycle OOK.
MOD FACTOR: $20\log(50/100) = -6.02\text{dB}$

Extreme

Modulation is OOK with each bit a triplet of 0, bit, 1. Off is 1, on is 0. Thus a 0 is 2/3 duty cycle per bit and a 1 is 1/3 duty cycle per bit.

Each code transmission is 36 bits: 1 start bit, 24 data bits, 4 stop bits (0101), 7 bit dead period.

Avg duty cycle = $20*\log[(1/3+24/2+6/3)/36] = -8\text{ dB}$.

5.4. Radiated Measurements

5.4.1. Requirements

The EUT must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.205 et seq.

Paragraph 15.231(b) has the following radiated emission limits:

Fundamental Frequency MHz	Field Intensity uV/m @ 3 meters	Field Strength Harmonics and Spurious @ 3 meters
260 to 470	3,750 to 12,500*	375 to 1,250*

* - Linear Interpolation

For 300MHz, the limit at the fundamental is 5416.7uV/m @ 3m and the limit on the harmonics is 541.7uV/m @ 3m.

For 303MHz, the limit at the fundamental is 5541.7uV/m @ 3m and the limit on the harmonics is 554.2uV/m @ 3m.

For 310MHz, the limit at the fundamental is 5833.3uV/m @ 3m and the limit on the harmonics is 583.3uV/m @ 3m.

For 315MHz, the limit at the fundamental is 6041.7uV/m @ 3m and the limit on the harmonics is 604.2uV/m @ 3m.

For 318MHz, the limit at the fundamental is 6166.7uV/m @ 3m and the limit on the harmonics is 616.7uV/m @ 3m.

For 372.5MHz, the limit at the fundamental is 8437.5uV/m @ 3m and the limit on the harmonics is 843.8uV/m @ 3m.

For 390MHz, the limit at the fundamental is 9166.7uV/m @ 3m and the limit on the harmonics is 916.7uV/m @ 3m.

In addition, emissions appearing in the Restricted Bands of Operation listed in paragraph 15.205(a) shall not exceed the general requirements shown in paragraph 15.209.

5.4.2.Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

A preliminary radiated emissions test was performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 5.0GHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity. * Replace with the proper frequency range.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 4000MHz. Between 30MHz and 1000MHz, a tuned dipole antenna was used as the pick-up device. A broadband double ridged waveguide antenna was used as the pick-up device for all frequencies above 1GHz. All significant broadband and narrowband signals were measured and recorded. The peak detected levels were converted to average levels using a duty cycle factor which was computed from the pulse train.

To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

- 1) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
- 2) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
- 3) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
- 4) For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.

5.4.3.Results

The preliminary plots, with each EUT transmitting at its designated frequency, are presented on data pages 84 through 162. The plots are presented for a reference only, and are not used to determine compliance.

The final radiated levels, with each EUT transmitting at its designated frequency, are presented on data pages 163 through 184. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest or worst case radiated emission levels are shown on Figure 2 and 3.

5.5. Occupied Bandwidth Measurements

5.5.1. Requirement

In accordance with paragraph 15.231(c), all emissions within 20dB of the peak amplitude level of the center frequency are required to be within a band less than 0.25% of the center frequency wide.

5.5.2. Procedures

The EUT was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With an antenna positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 50 kHz and span was set to 2 MHz. The frequency spectrum near the fundamental was plotted.

5.5.3. Results

The plot of the emissions near the fundamental frequency for each of the EUT frequencies are presented on data pages 185 through 205. As can be seen from this data page, each transmitter met the occupied bandwidth requirements. See below for 99% bandwidth measurements:

DUT (button)	Manufacturer	Frequency	Code Format	99% BW
1	Genie	315MHz	IntelliCode (Keeloq based)	300.6kHz
2	Genie	390MHz	IntelliCode (Keeloq based)	324.6kHz
3	Linear	318MHz	Mega-Code	276.5kHz
4	Chamberlain	390MHz	Rolling Code (D Code)	300.6kHz
5	Chamberlain	315MHz	Rolling Code (D Code)	268.5kHz
6	Chamberlain	390MHz	Billion Code (A Code)	264.5kHz
7	Stanley	310MHz	Secure Code (Keeloq based)	296.6kHz
8	Chamberlain	310MHz	Rolling Code (E Code)	304.6kHz
8	Chamberlain	315MHz	Rolling Code (E Code)	308.6kHz
8	Chamberlain	390MHz	Rolling Code (E Code)	332.66kHz
9	Wayne Dalton	372.5MHz	Rolling Code (Keeloq Based)	248.5kHz
10	Linear/Moore-o-Matic	310MHz	8 Position DIP Switch	280.6kHz
11	Chamberlain	315MHz	9 Position DIP Switch	300.6kHz
12	Stanley	310MHz	10 Position DIP Switch	284.6kHz
13	Genie	390MHz	12 Position DIP Switch	316.6kHz
14	Chamberlain	390MHz	7 Position DIP Switch	276.5kHz
15	Chamberlain	390MHz	8 Position DIP Switch	288.6kHz
16	Linear	300MHz	Multicode	292.6kHz
17	Chamberlain	390MHz	9 Position DIP Switch	288.6kHz
18	Genie	390MHz	9 Position DIP Switch	278.6kHz
19	Extreme	303MHz	OOK	284.5kHz

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated. The test series

was witnessed by The Chamberlain Group personnel.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to The Chamberlain Group upon completion of the tests.

7. CONCLUSIONS

It was determined that The Chamberlain Group Remote Control transmitters, Model Nos. TM100 & TM110, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.205 et seq. for Intentional Radiators, when tested per ANSI C63.4-2014.

It was also determined that The Chamberlain Group Remote Control , Model No. TM100 & TM110, transmitter, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen Section 7.2.4 and RSS-210 Annex 1, for transmitters, when tested per ANSI C63.4-2014.

8. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date as operated by The Chamberlain Group personnel. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	4/18/2016	4/18/2017
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
MPW0	POWER METER	KEYSIGHT	8990B	MY51000388		2/5/2016	2/5/2017
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	10/27/2015	10/27/2016
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	3/23/2016	3/23/2017
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/4/2016	4/4/2018
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	3/2/2016	3/2/2018
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	2/22/2016	2/22/2017
RAKH	RF FILTER SECTION	HEWLETT PACKARD	85460A	3448A00324	---	2/22/2016	2/22/2017
RBA1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100146	20HZ-26.5GHZ	2/12/2016	2/12/2017
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	2/16/2016	2/16/2017
T1P0	10dB ATTENUATOR (40GHz)	WEINSCHEL	89-10-12	254	DC-40GHZ	3/3/2016	3/3/2018
T2D5	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-43	AY9244	DC-18GHZ	7/7/2016	7/7/2018
T2DE	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BN1032	DC-18GHZ	10/19/2015	10/19/2016
T2Q1	20DB/20W ATTENUATOR	AEROFLEX/WEINSCHEL	89-20-21	335	DC-40GHZ	8/20/2015	8/20/2017
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
WQC0	HF_8546A						
XOB2	ADAPTER	HEWLETT PACKARD	K281C,012	09407	18-26.5GHZ	NOTE 1	
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000	001	4.8-20GHZ	9/22/2015	9/22/2016

I/O: Initial Only

N/A: Not Applicable

Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

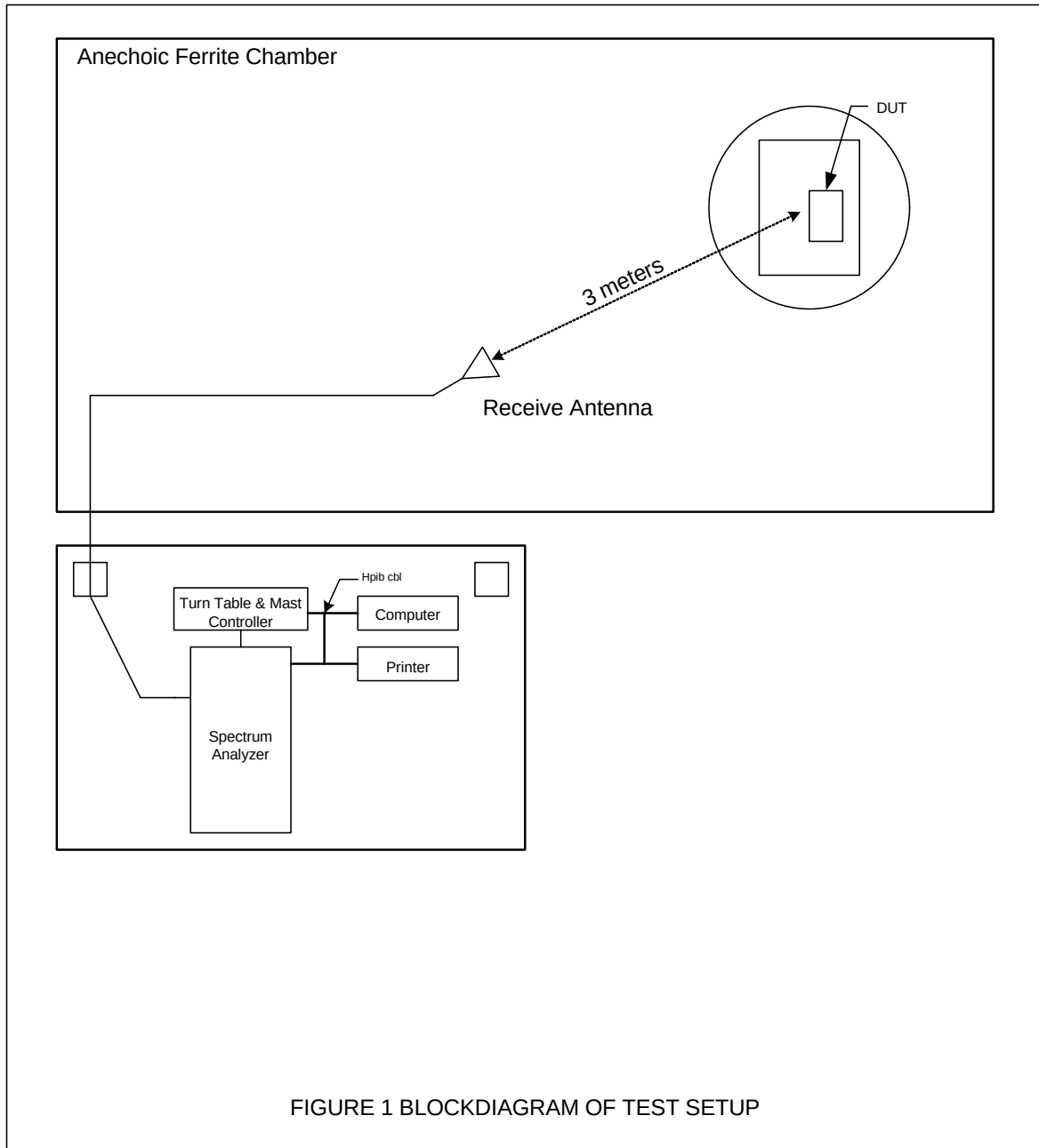
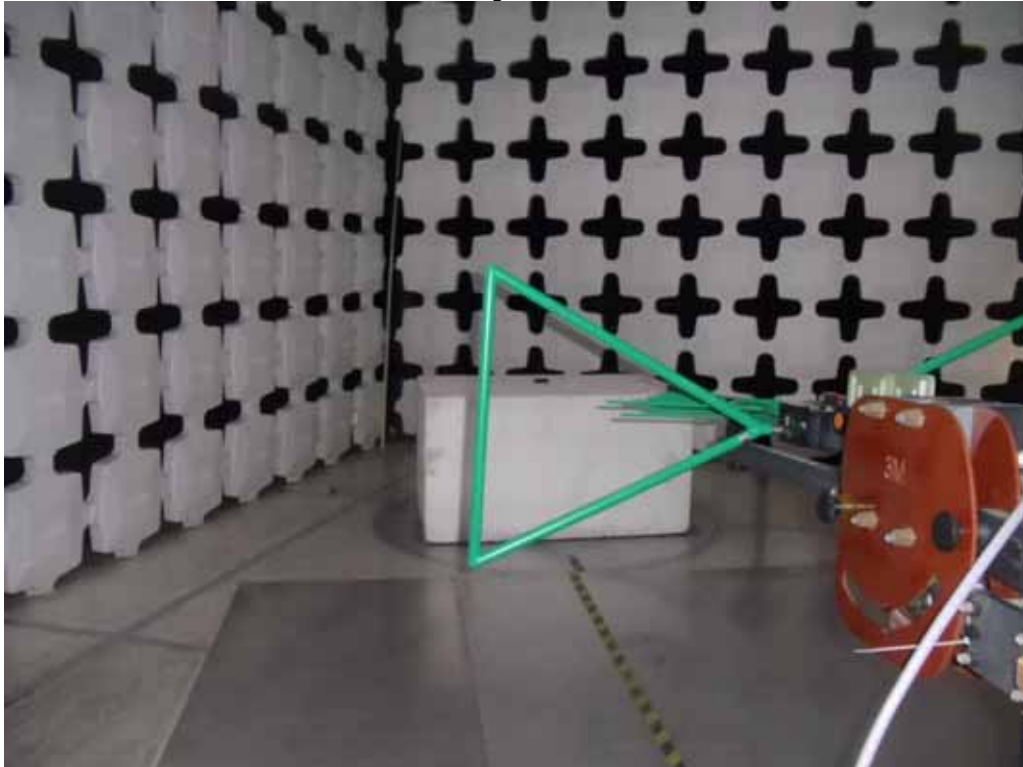
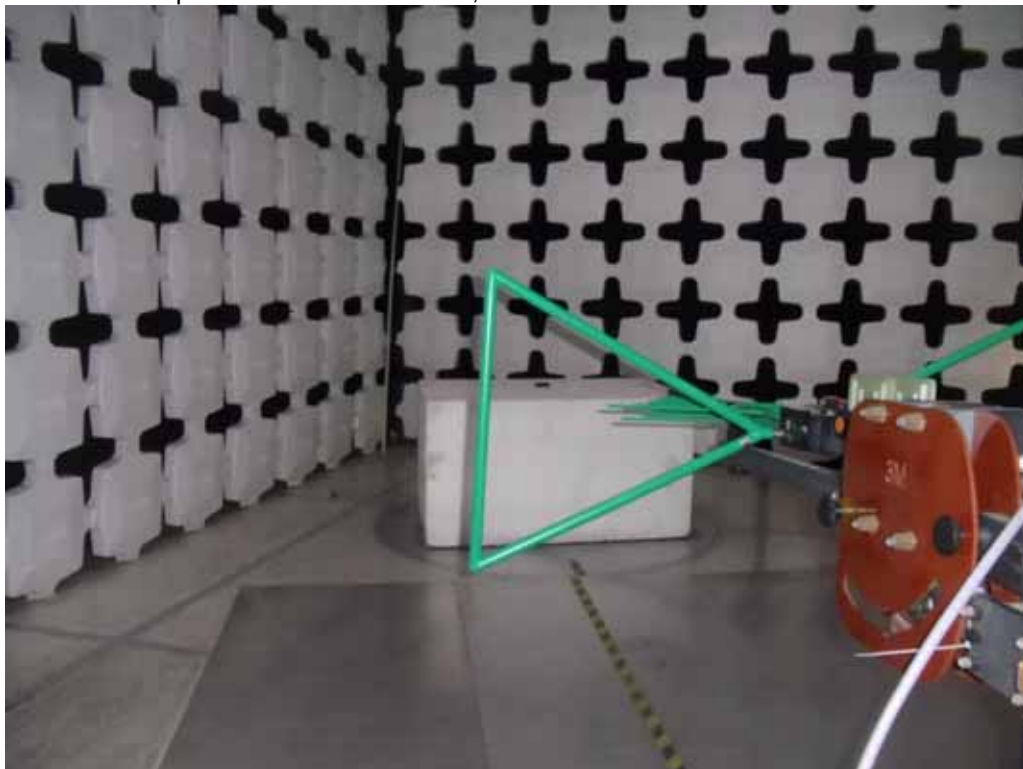


Figure 2



Test Setup for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization



Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 3



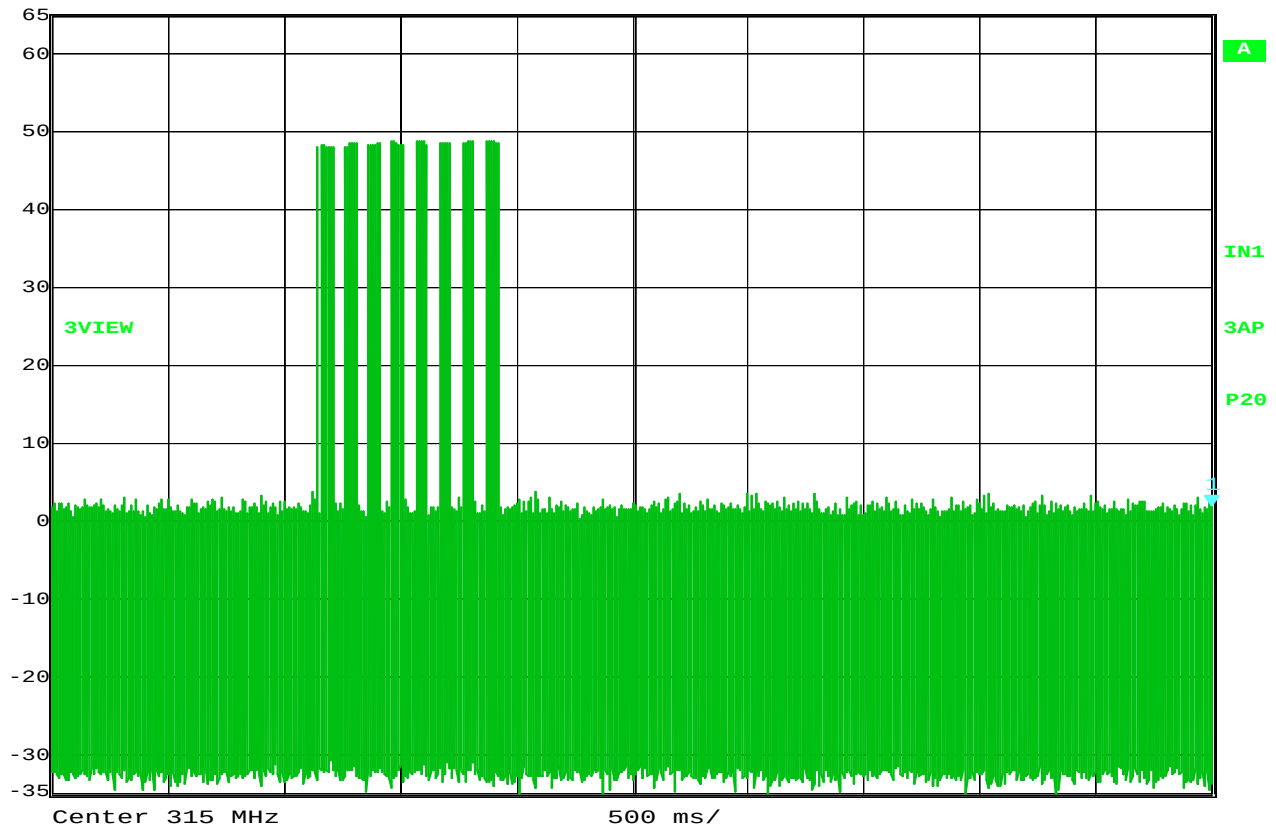
Test Setup for Radiated Emissions, Above 1GHz – Horizontal Polarization



Test Setup for Radiated Emissions, Above 1GHz – Vertical Polarization



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.87 dBμV
5.000000 s VBW 1 MHz
65 dBμV Ref Lvl 65 dBμV Unit dBμV
SWT 5 s



Date: 21.JUN.2016 15:56:23

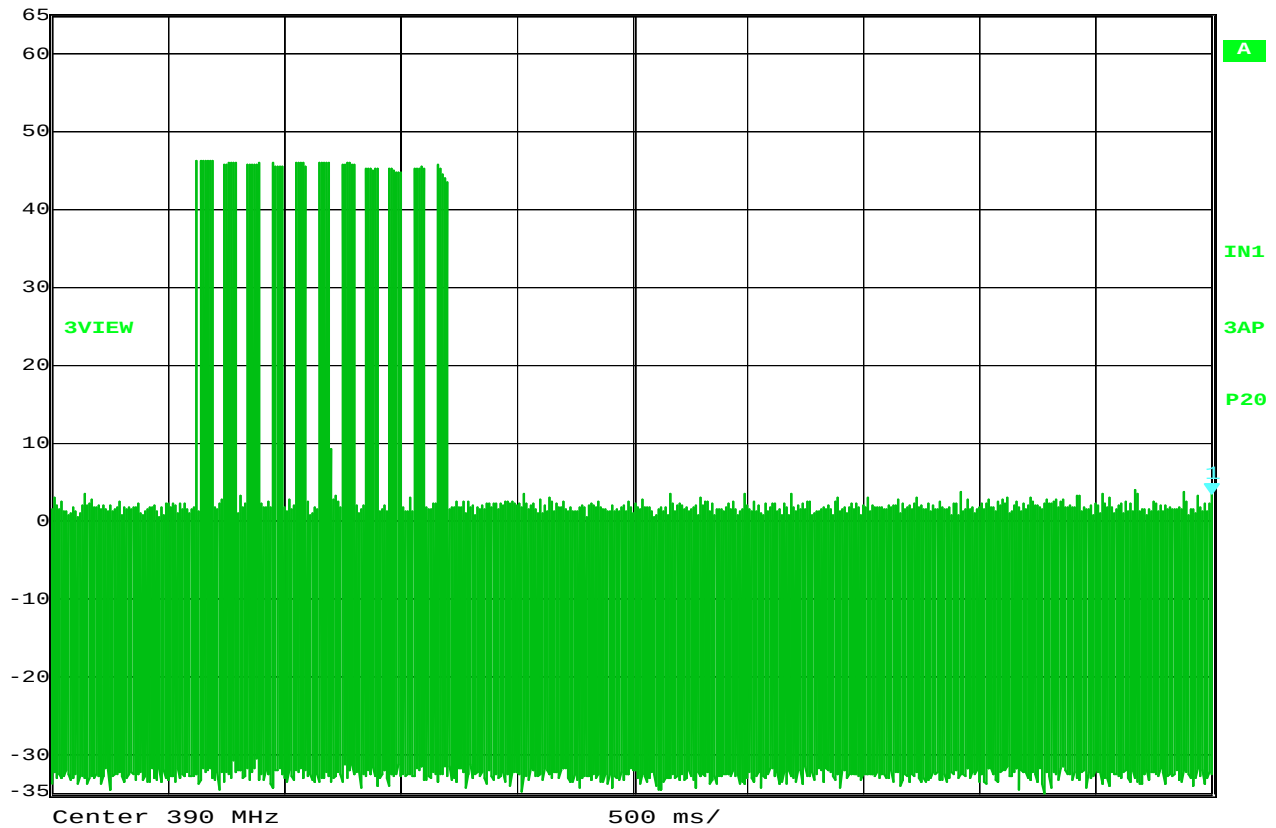
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 315MHz
: PEAK DETECTOR
NOTES: : Button 1

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
3.44 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:05:43

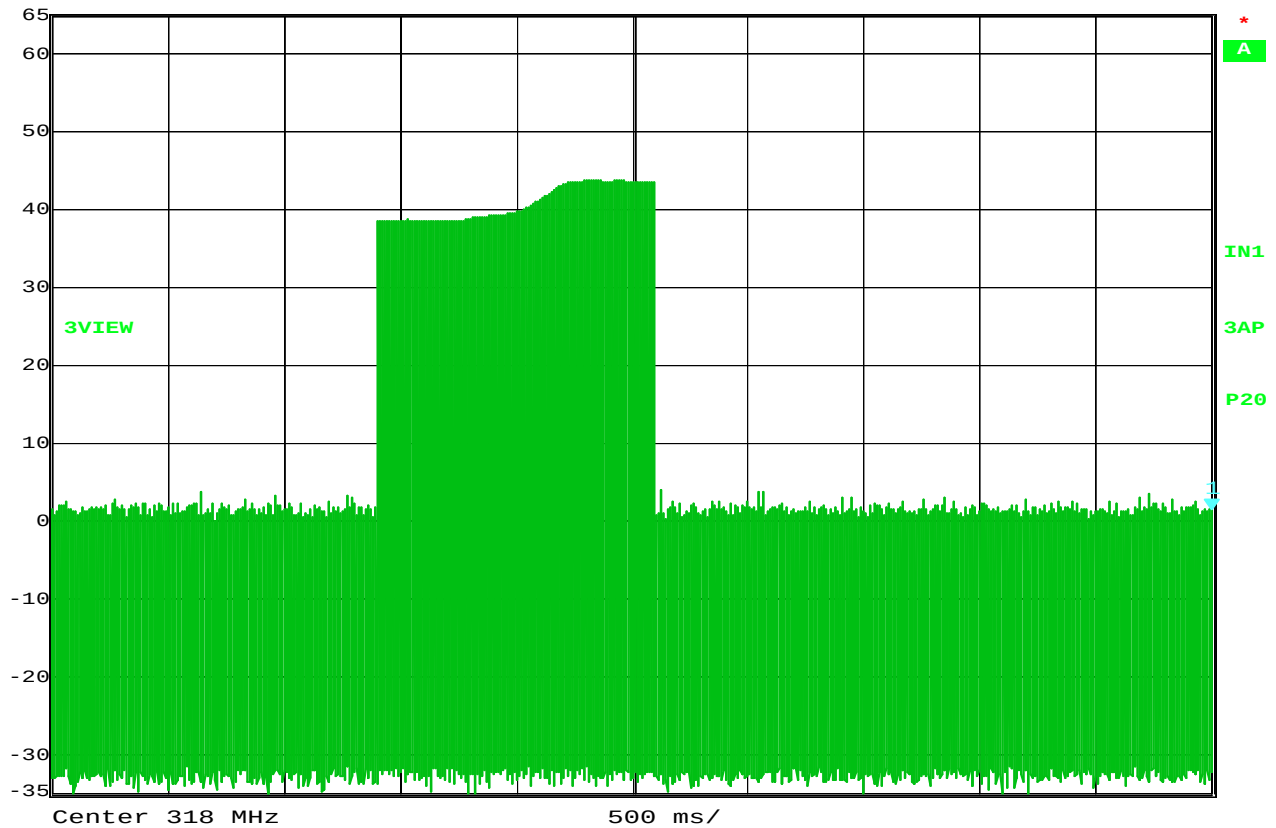
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 2

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.37 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:12:06

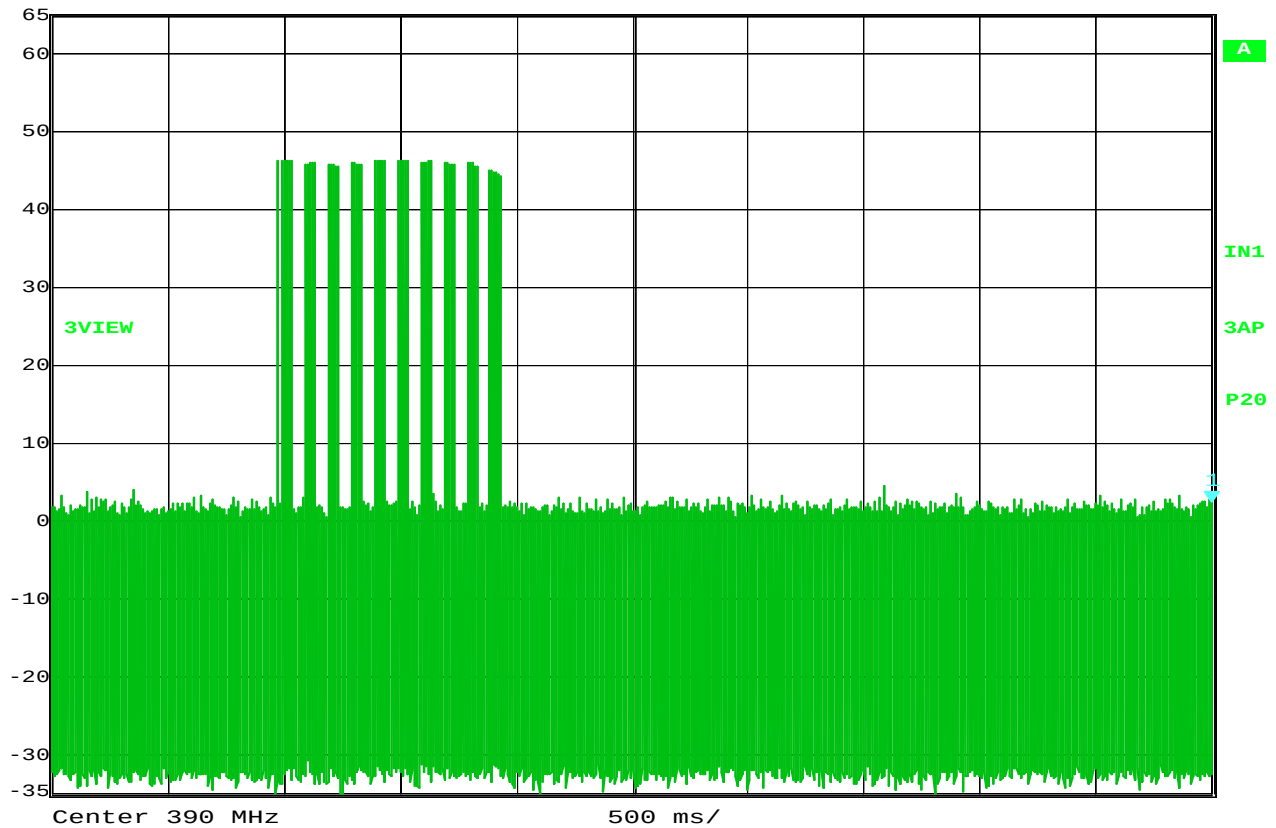
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 318MHz
: PEAK DETECTOR
NOTES: : Button 3

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.25 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:14:22

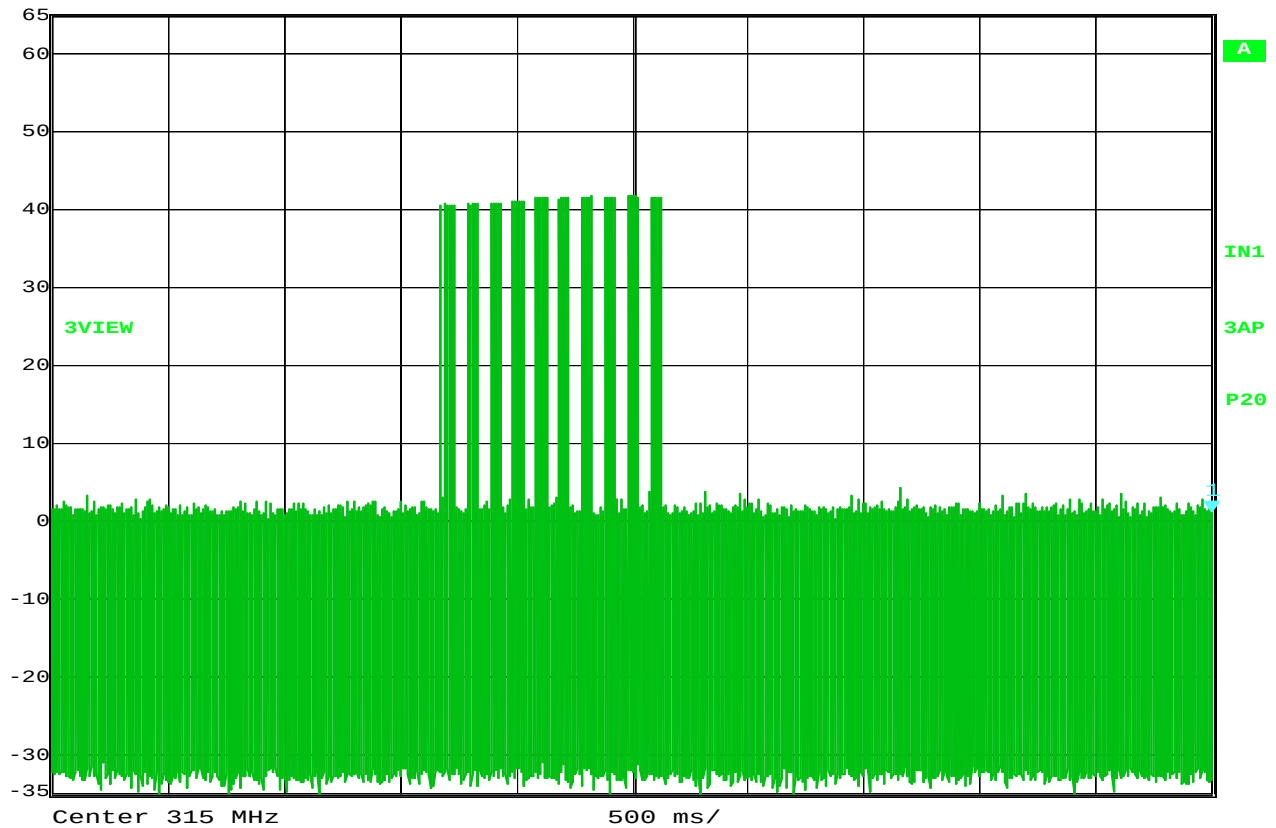
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 4

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.19 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:18:00

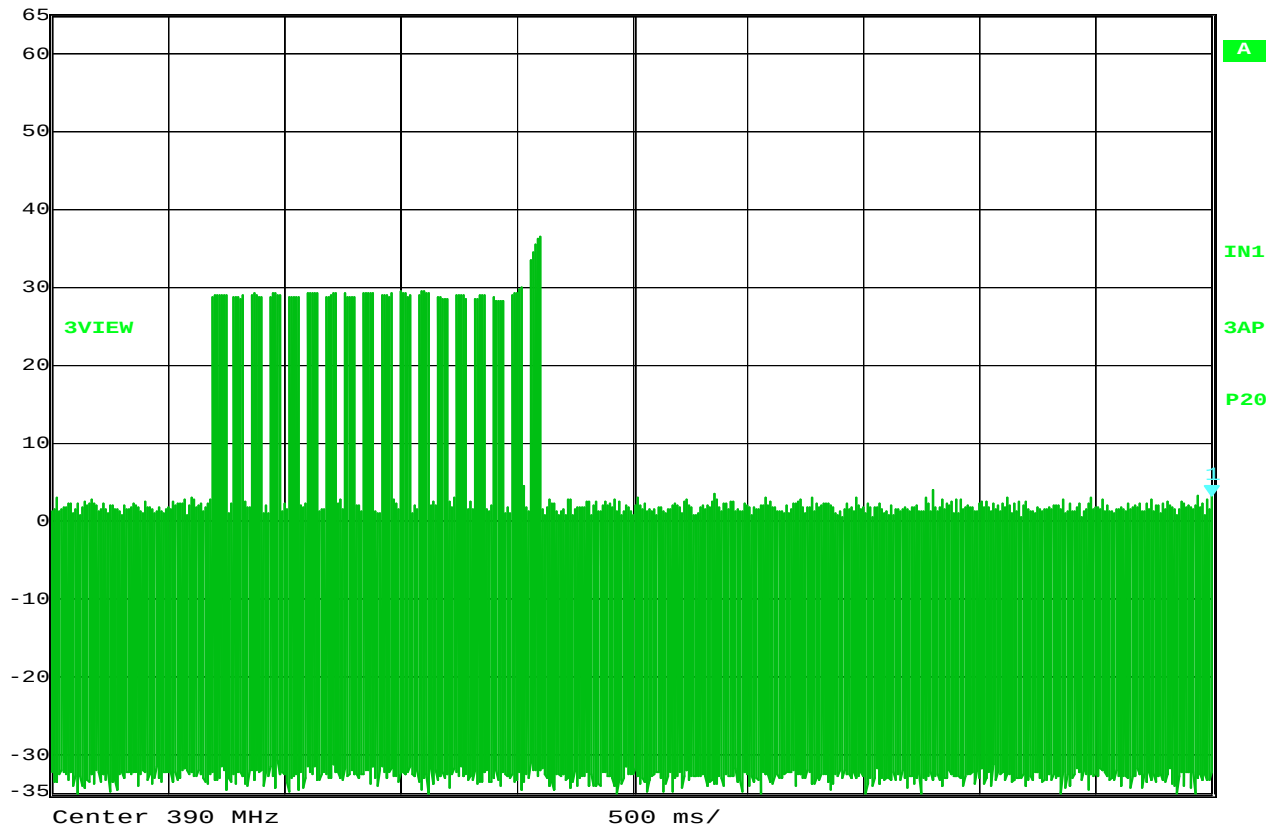
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 315MHz
: PEAK DETECTOR
NOTES: : Button 5

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
3.03 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:19:57

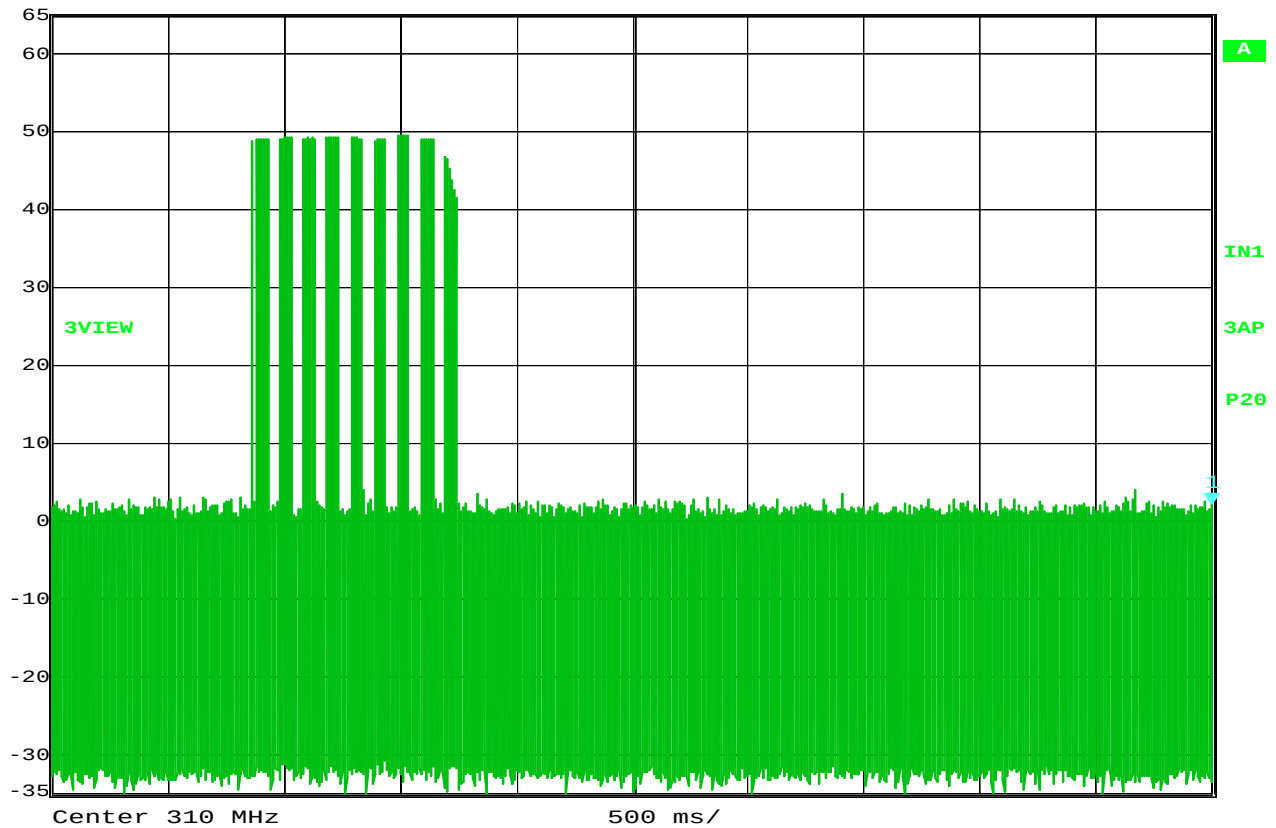
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 6

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.10 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:22:41

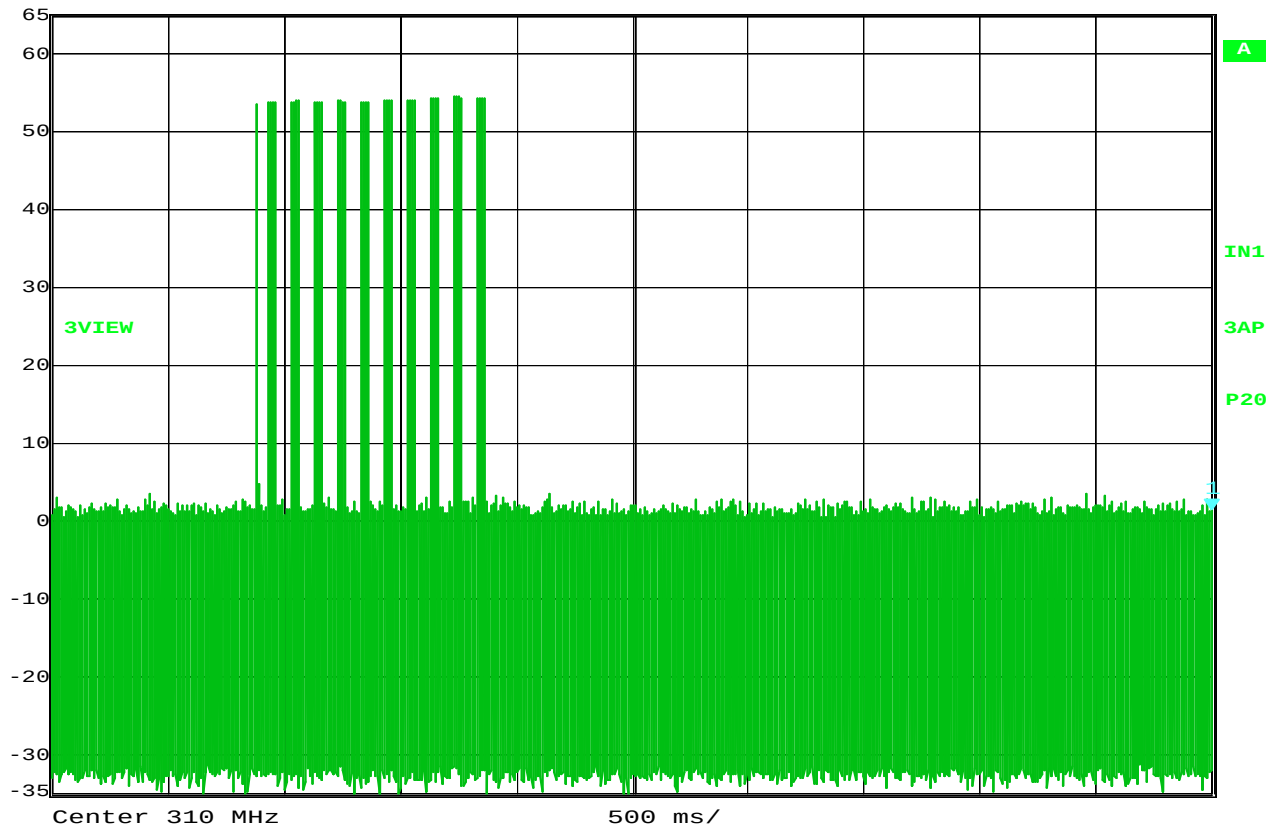
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 310MHz
: PEAK DETECTOR
NOTES: : Button 7

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.41 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:24:04

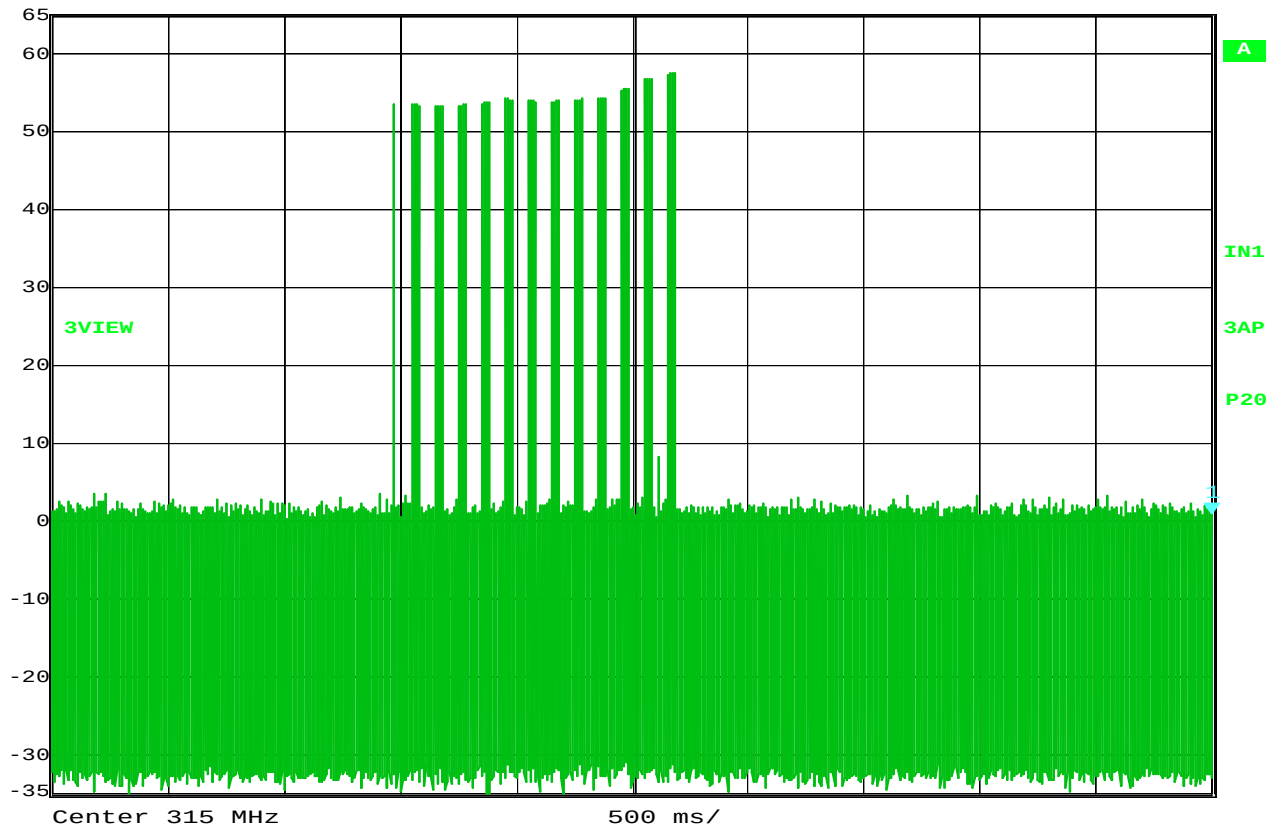
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 310MHz
: PEAK DETECTOR
NOTES: : Button 8

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
0.98 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:25:27

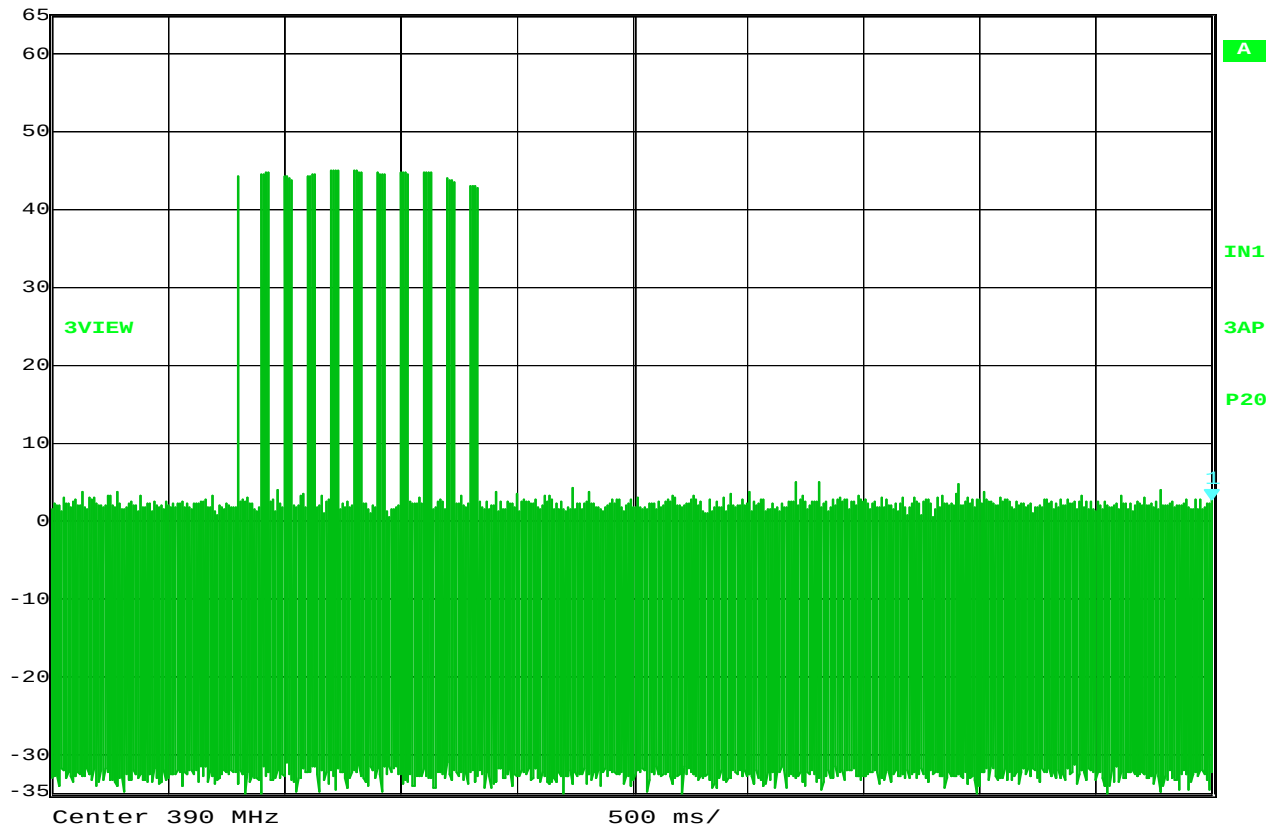
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 315MHz
: PEAK DETECTOR
NOTES: : Button 8

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.65 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:30:25

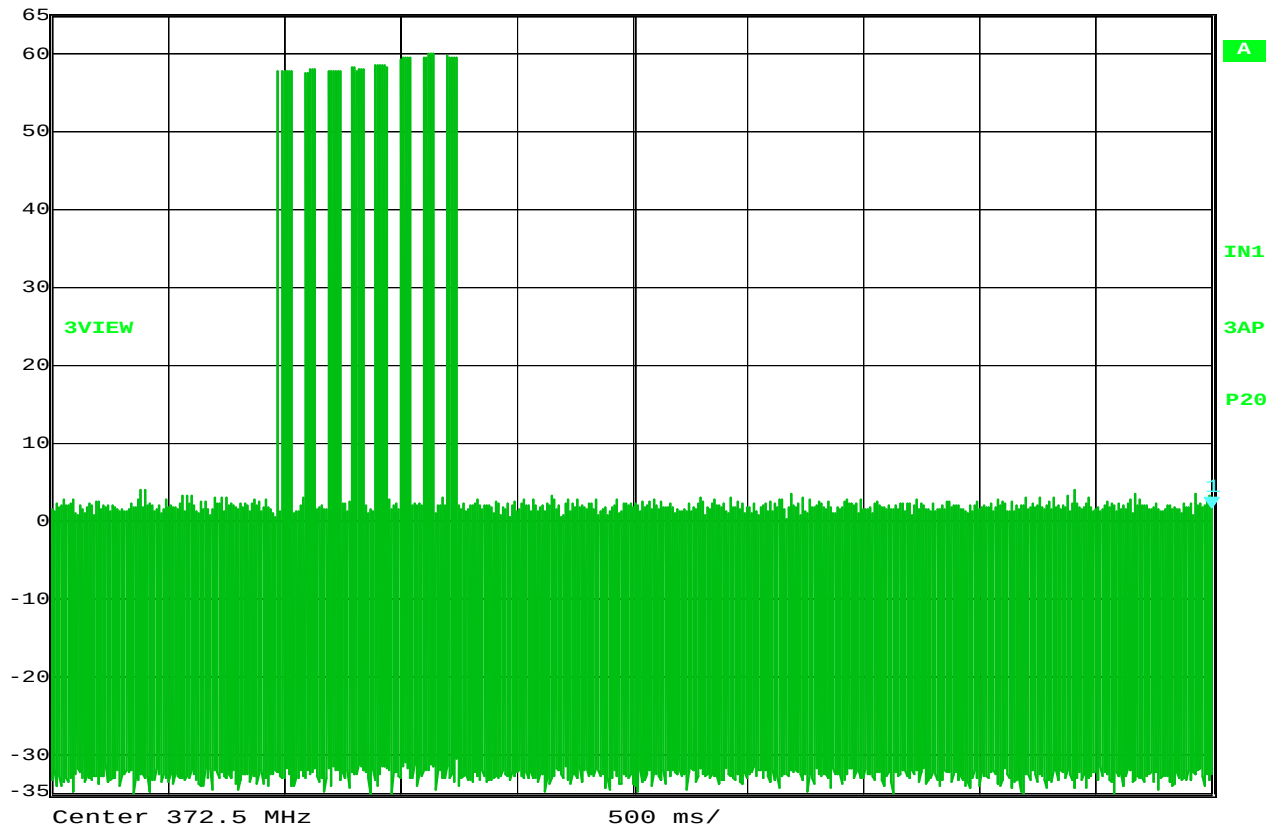
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 8

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.73 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:31:49

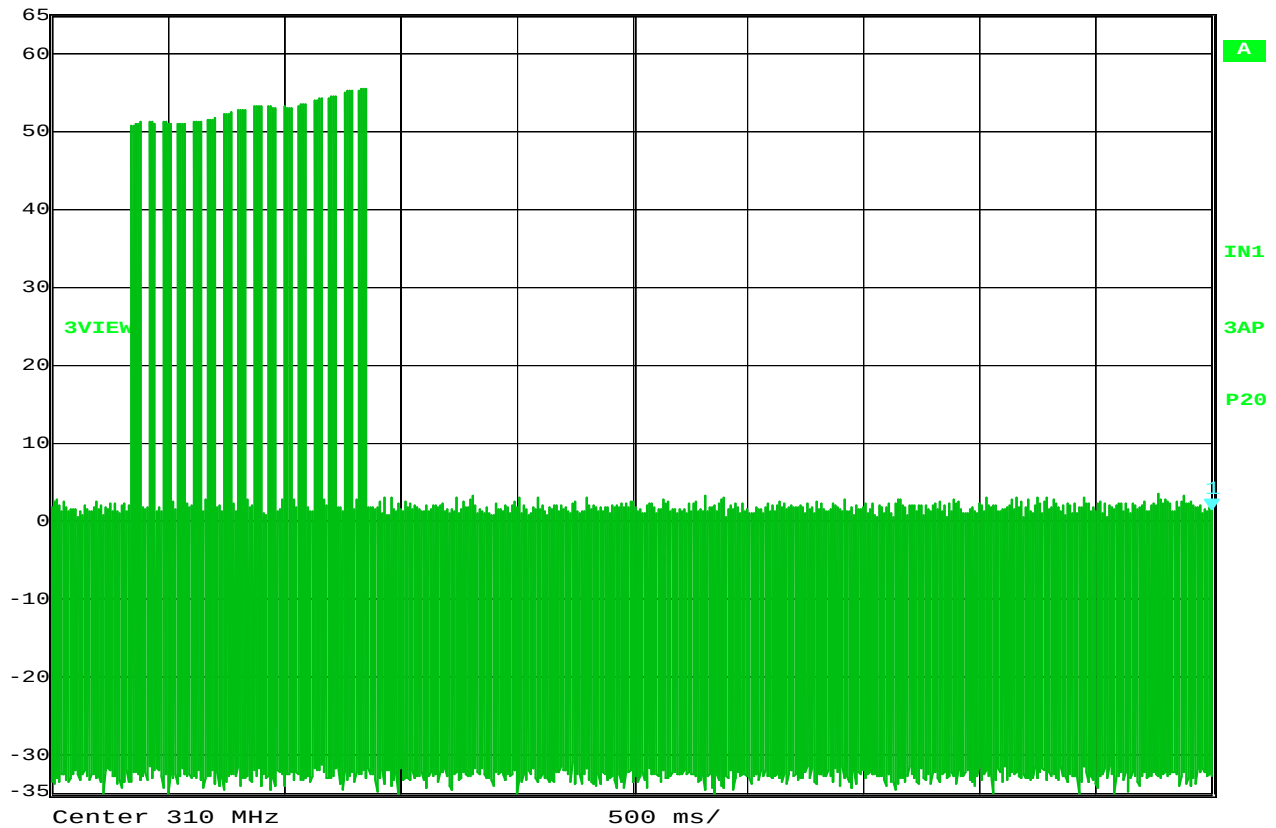
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 372.5MHz
: PEAK DETECTOR
NOTES: : Button 9

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.29 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:33:47

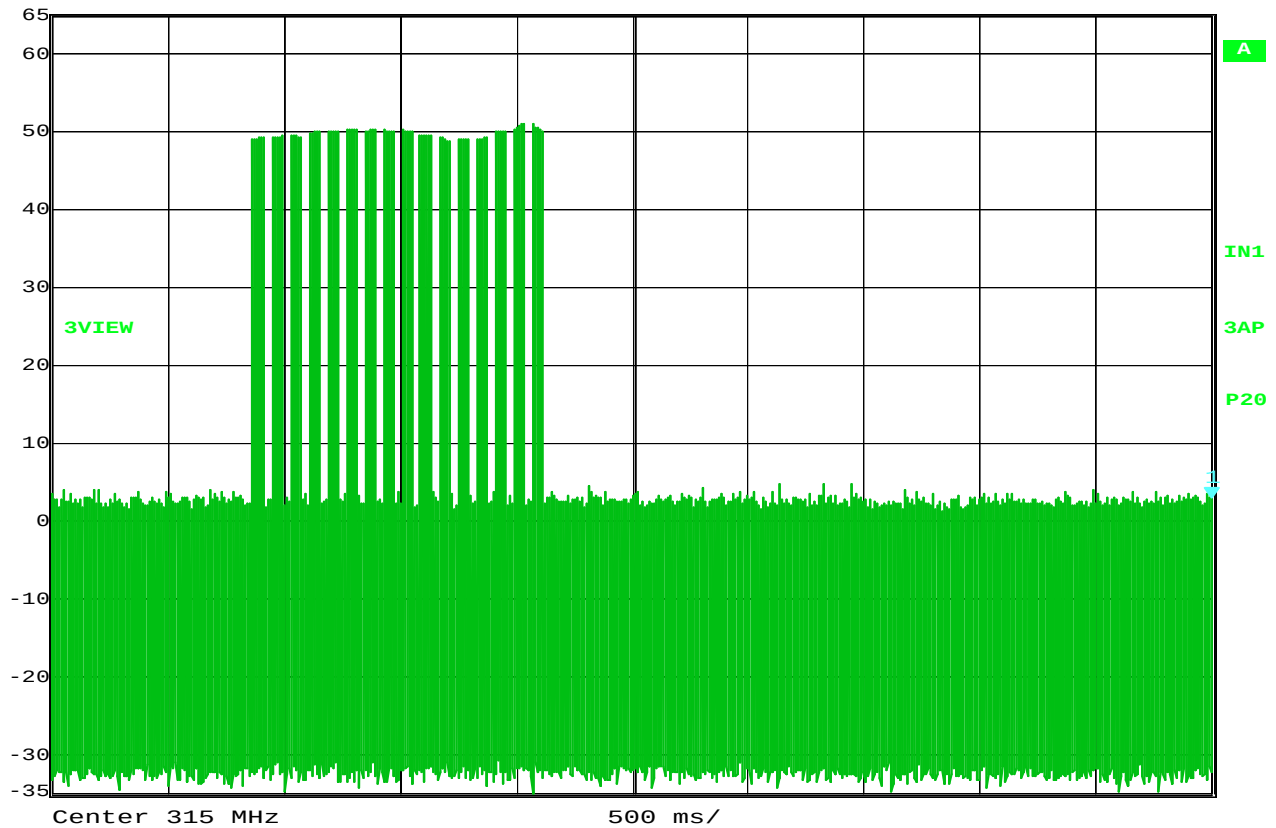
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 310MHz
: PEAK DETECTOR
NOTES: : Button 10

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.94 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:36:23

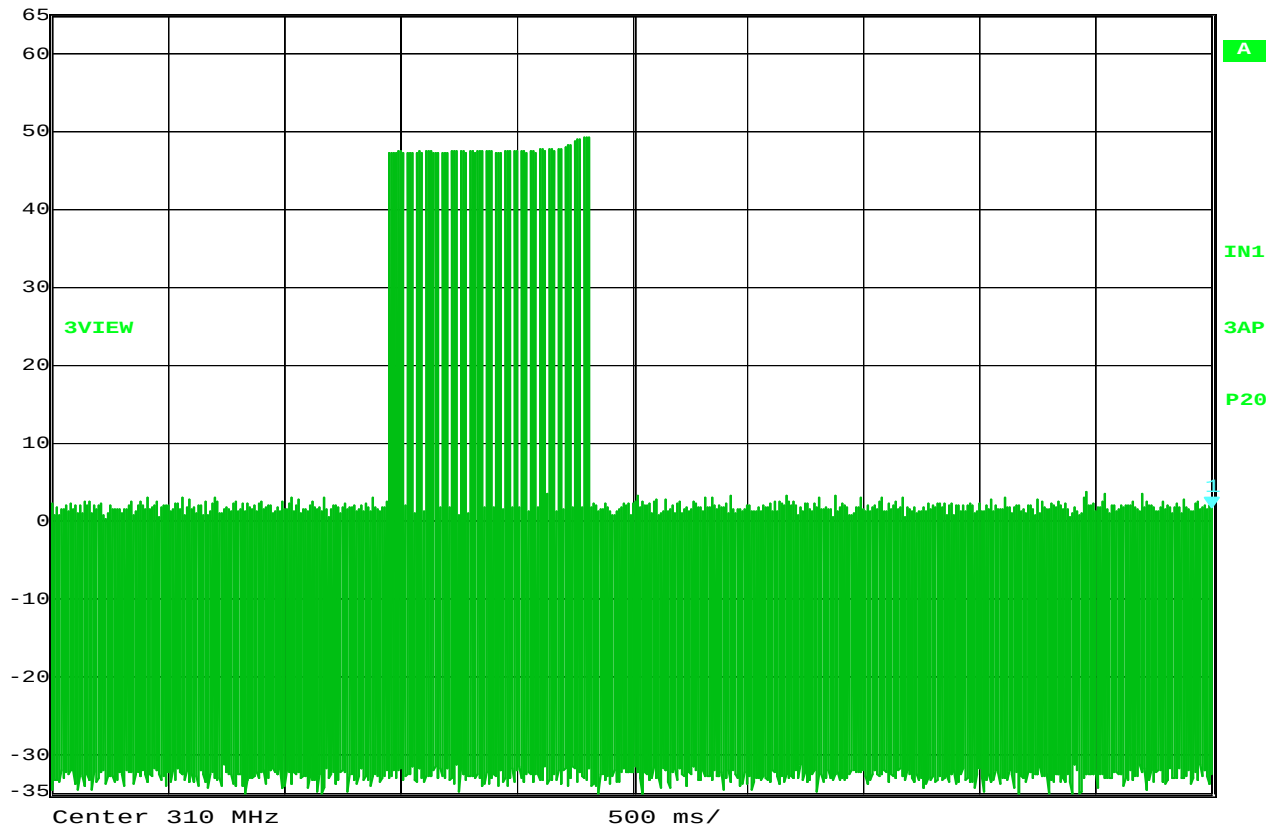
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 315MHz
: PEAK DETECTOR
NOTES: : Button 11

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.56 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:37:58

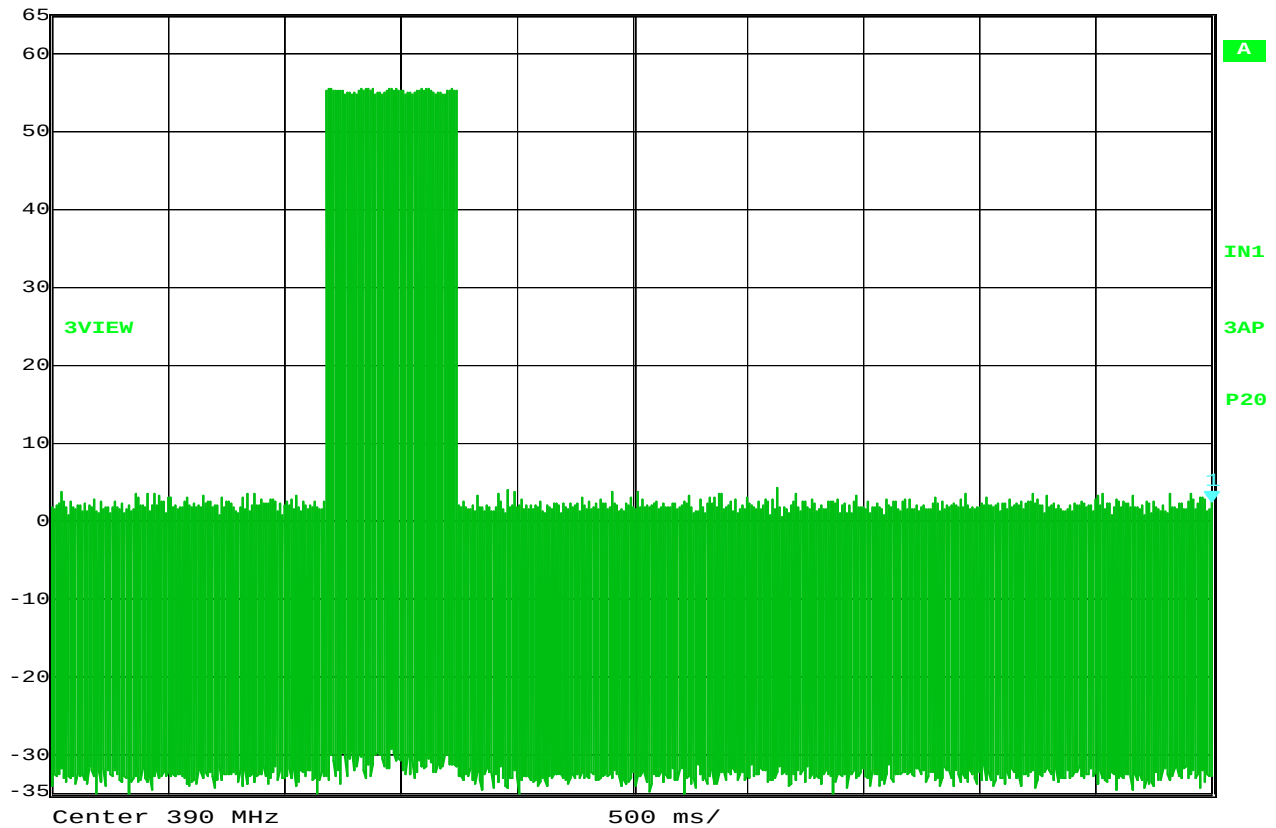
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 310MHz
: PEAK DETECTOR
NOTES: : Button 12

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.39 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:39:37

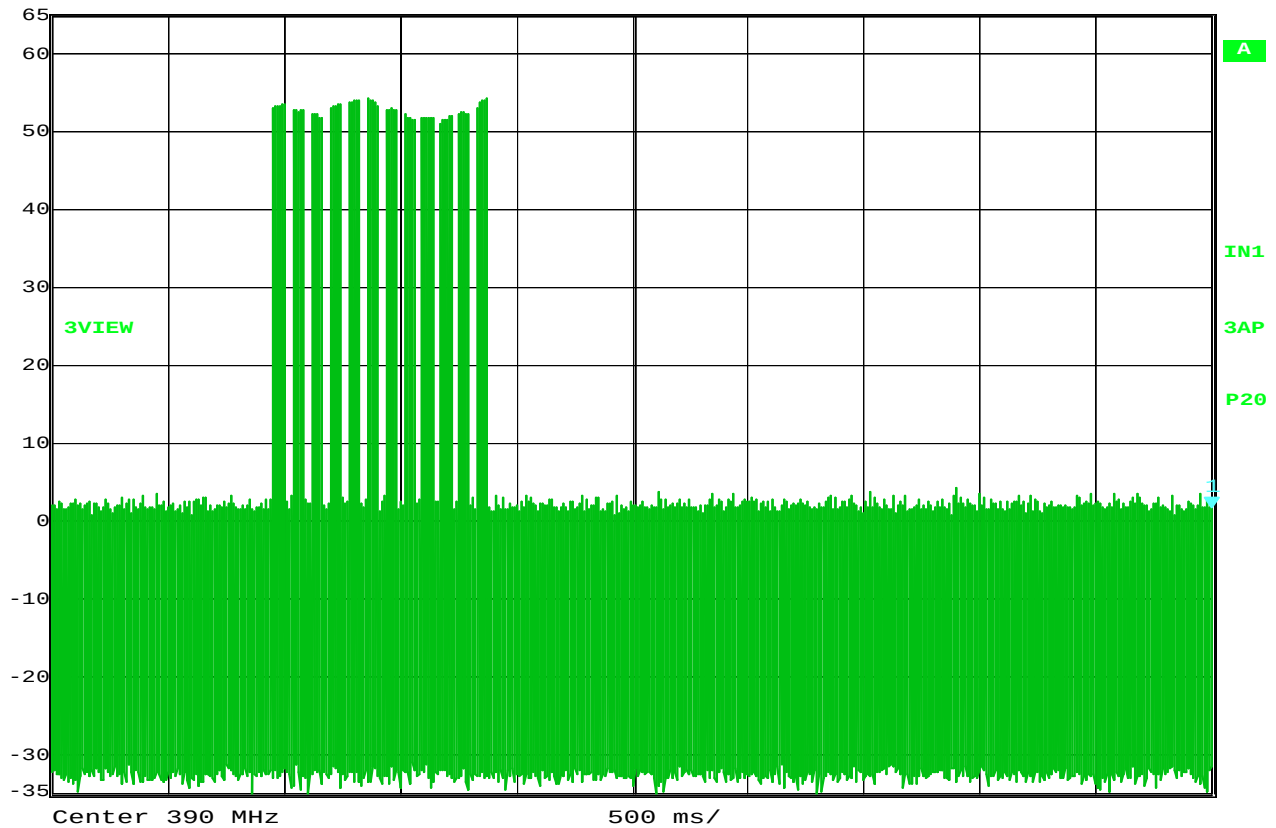
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 13

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.62 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:40:36

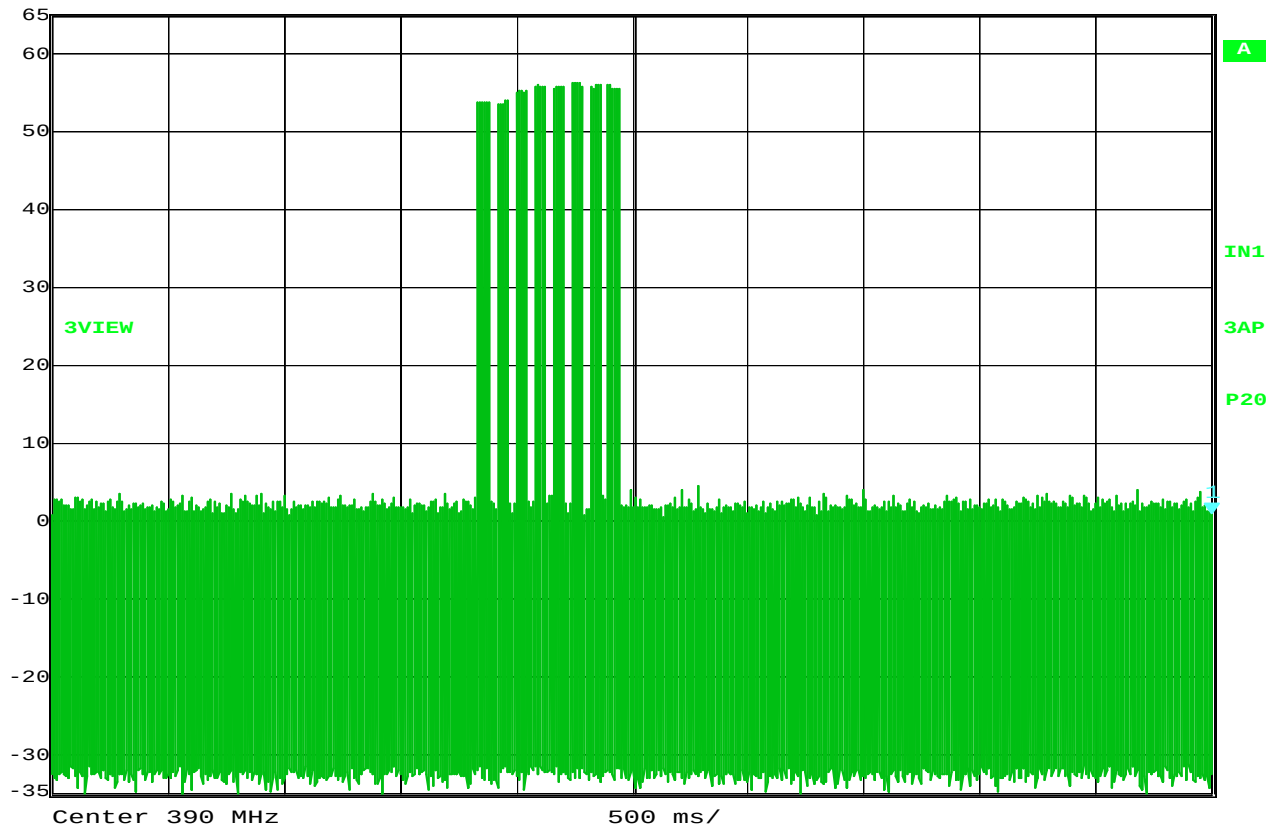
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 14

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
0.77 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:41:29

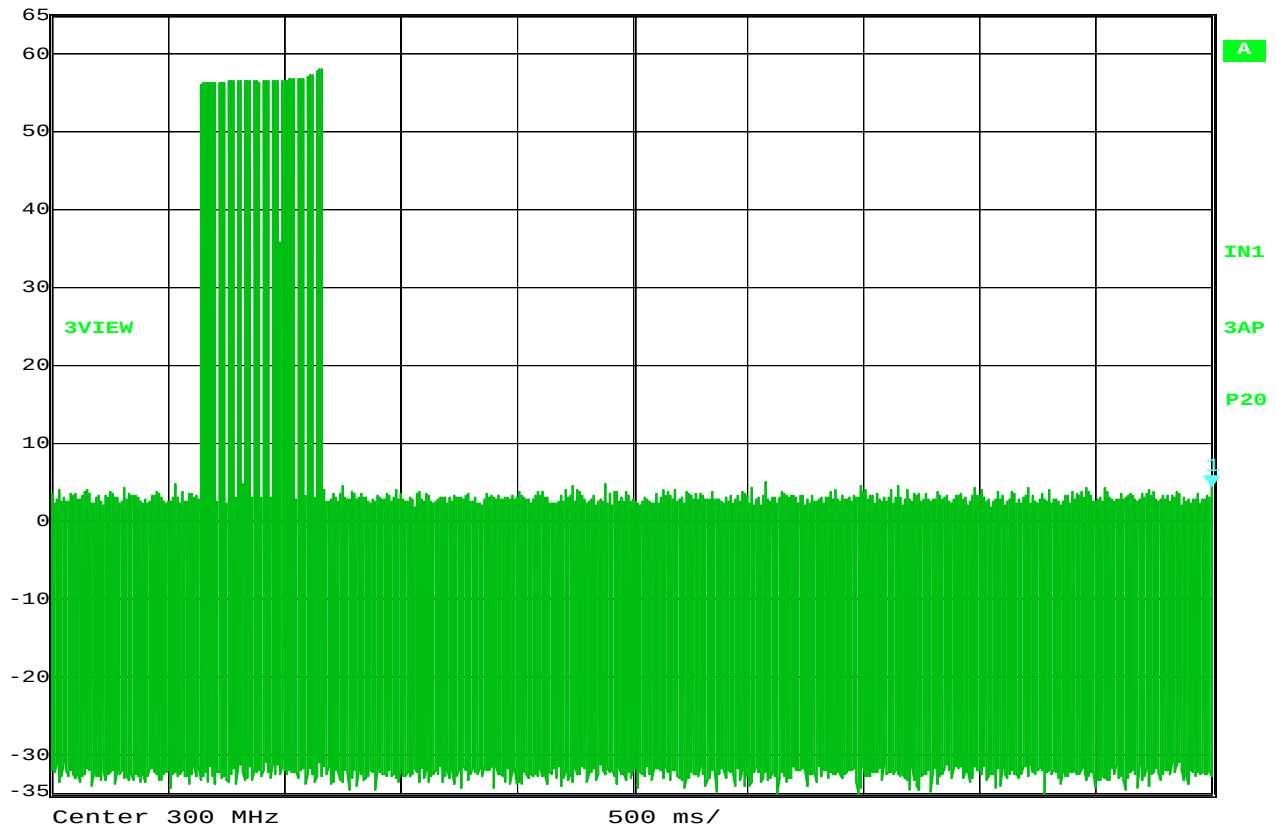
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 15

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
4.31 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:43:42

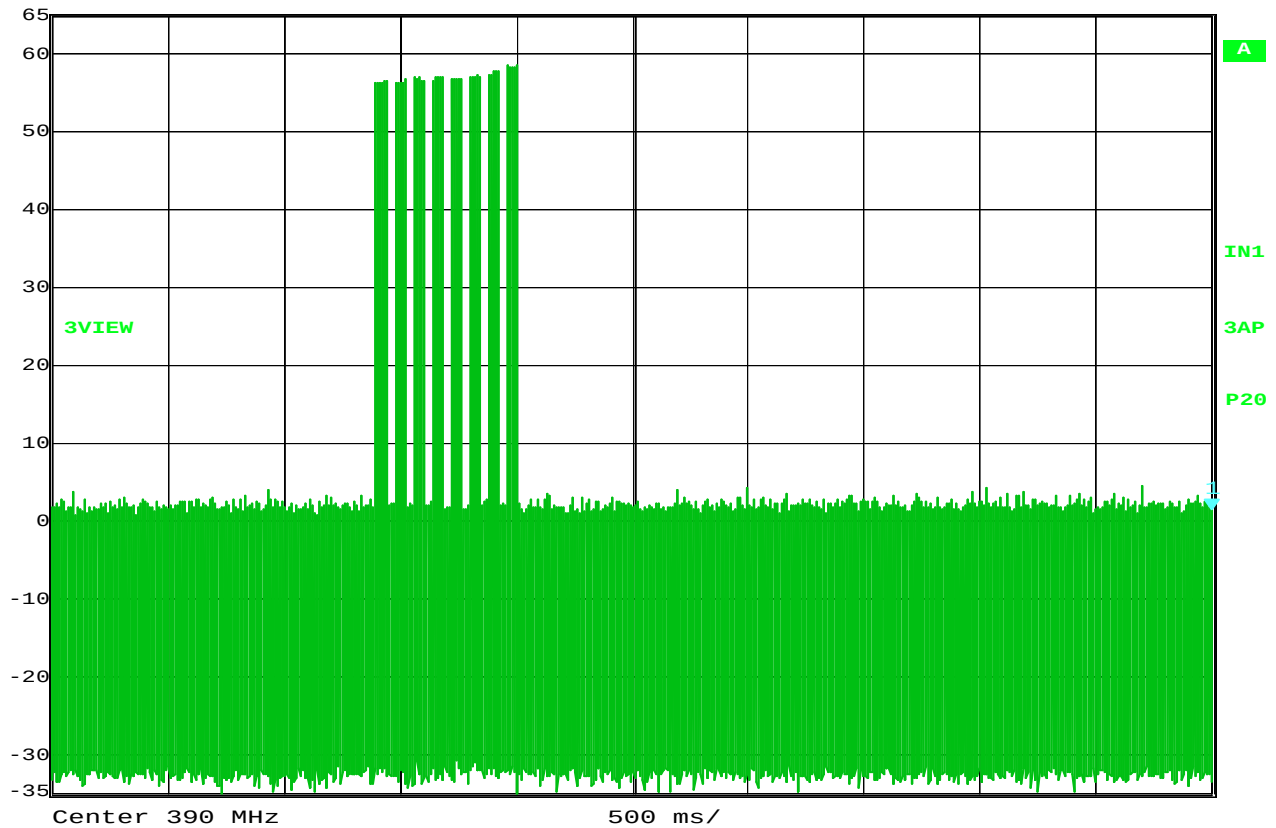
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 300MHz
: PEAK DETECTOR
NOTES: : Button 16

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
1.49 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:44:50

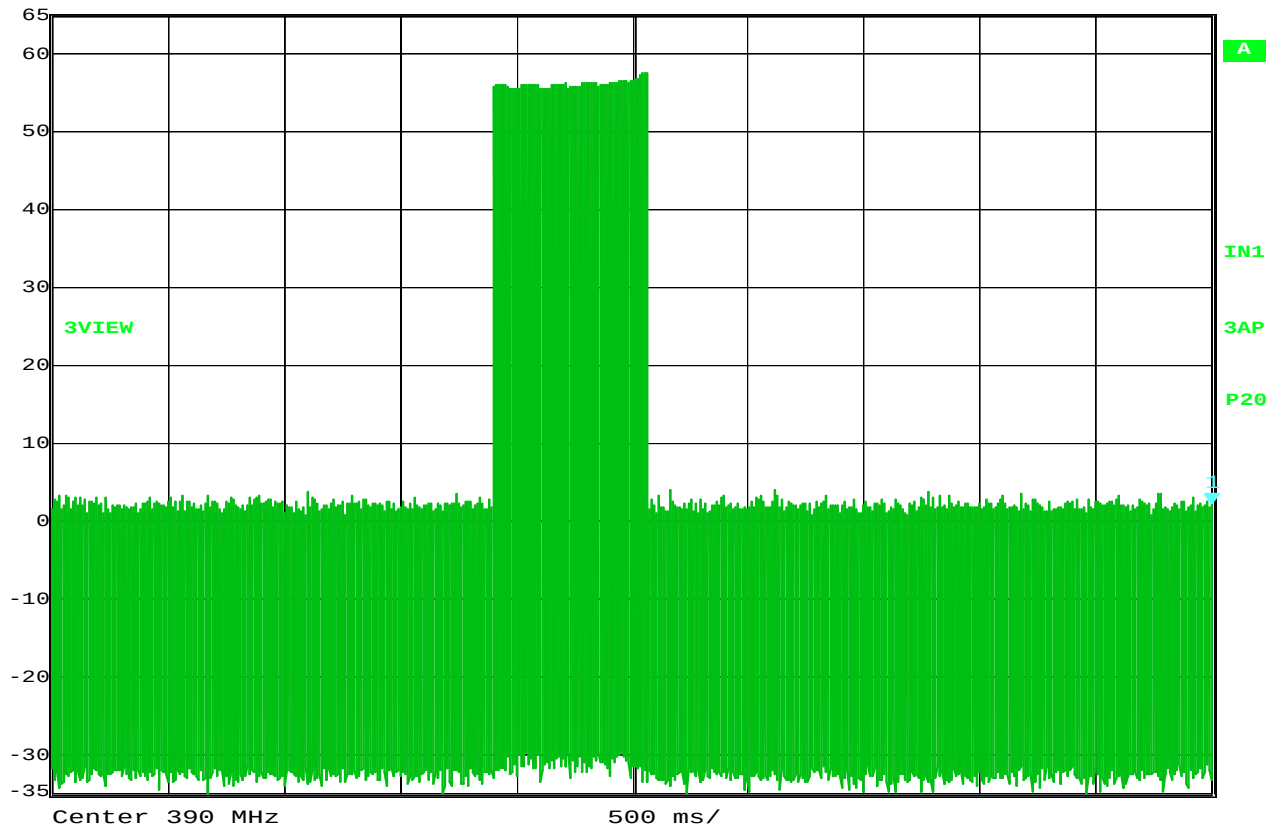
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 17

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.21 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:46:10

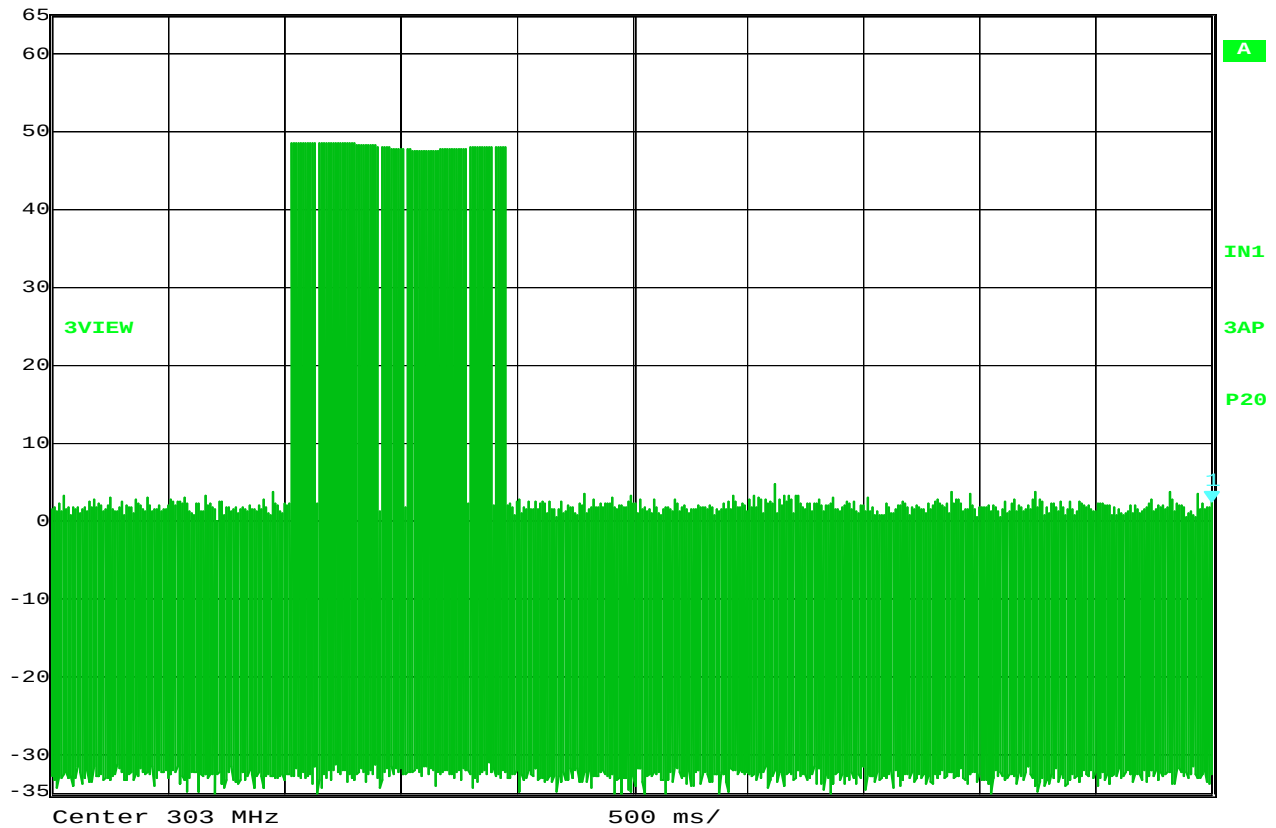
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 18

NOTES



Marker 1 [T3] RBW 100 kHz RF Att 0 dB
2.29 dBμV VBW 1 MHz
5.000000 s SWT 5 s Unit dBμV
Ref Lvl 65 dBμV



Date: 21.JUN.2016 16:47:12

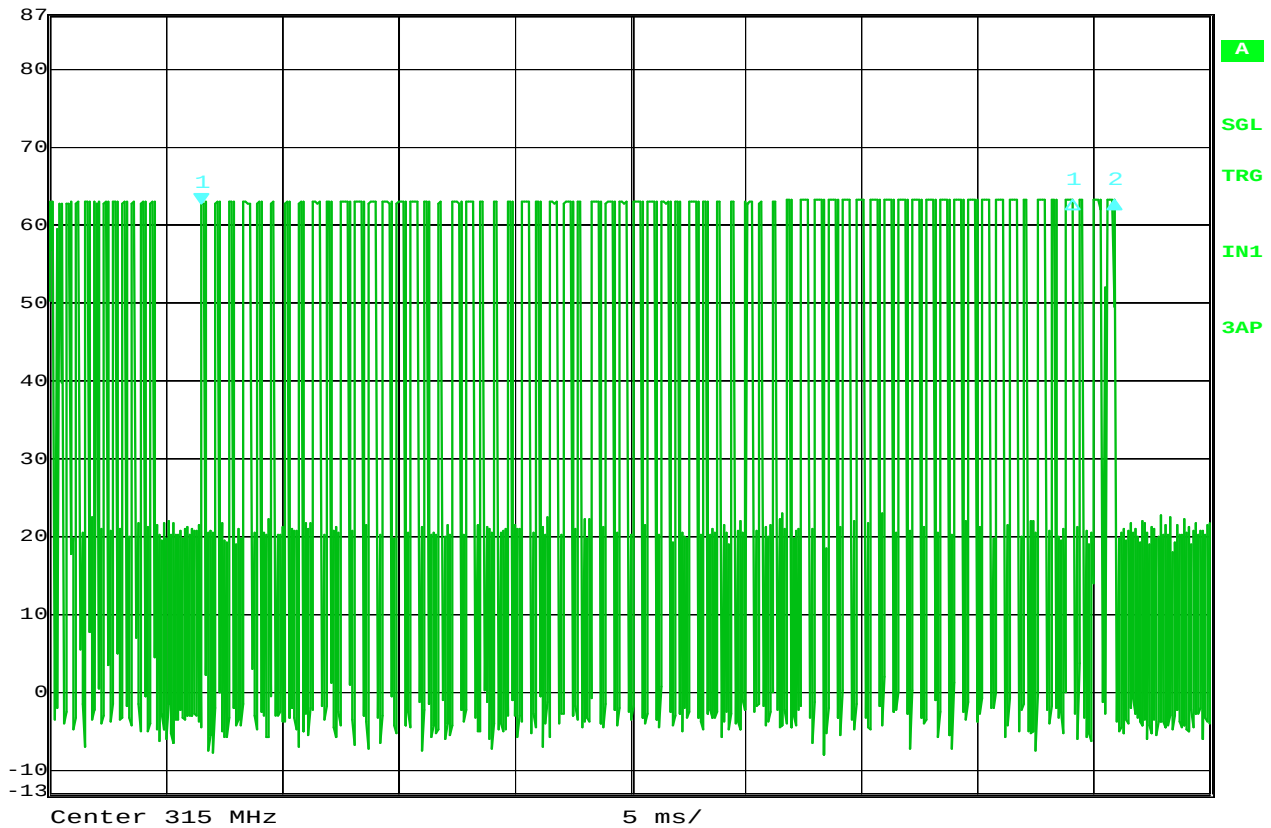
FCC 15C 15.231 / Periodic Operation

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 303MHz
: PEAK DETECTOR
NOTES: : Button 19

NOTES



Delta 2 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.30 dB VBW 1 MHz
87 dBμV 39.378758 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 10:06:39

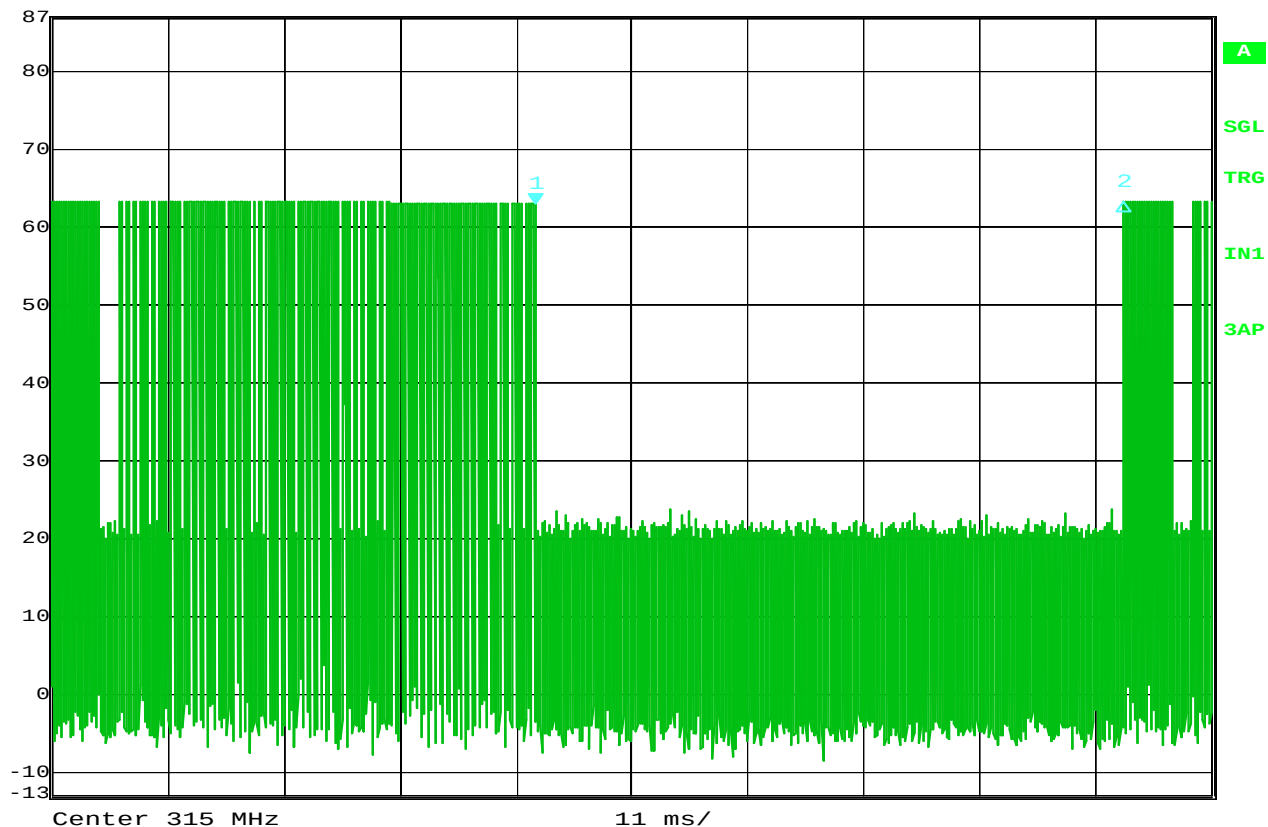
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315, 372.5 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Genie Intellicode, Stanley Secure Code and Wayne Dalton Rolling Code
NOTES : Encrypted + Fixed portion = 39.3 mS
NOTES : Button 1, Button 2, Button 7 and Button 9

NOTES



Marker 1 [T3] RBW 1 MHz RF Att 0 dB
62.89 dBμV VBW 1 MHz
45.851703 ms SWT 110 ms Unit dBμV
Ref Lvl 87 dBμV



Date: 2.MAY.2016 10:11:57

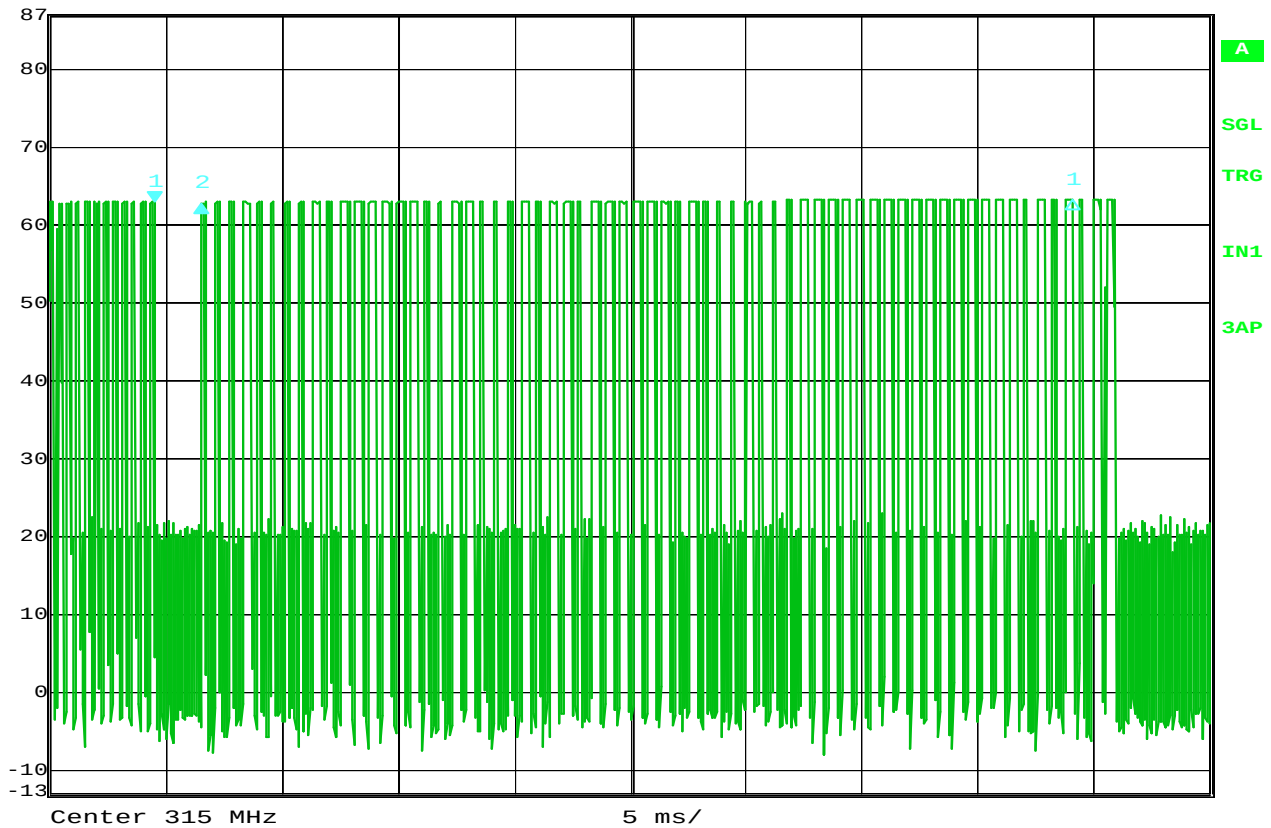
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315, 372.5 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Genie Intellicode, Stanley Secure Code and Wayne Dalton Rolling Code
NOTES : Guard Time $T_G = 45.8$ mS
NOTES : Button 1, Button 2, Button 7 and Button 9

NOTES



Delta 2 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -0.03 dB VBW 1 MHz
87 dBμV 2.004008 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 10:04:18

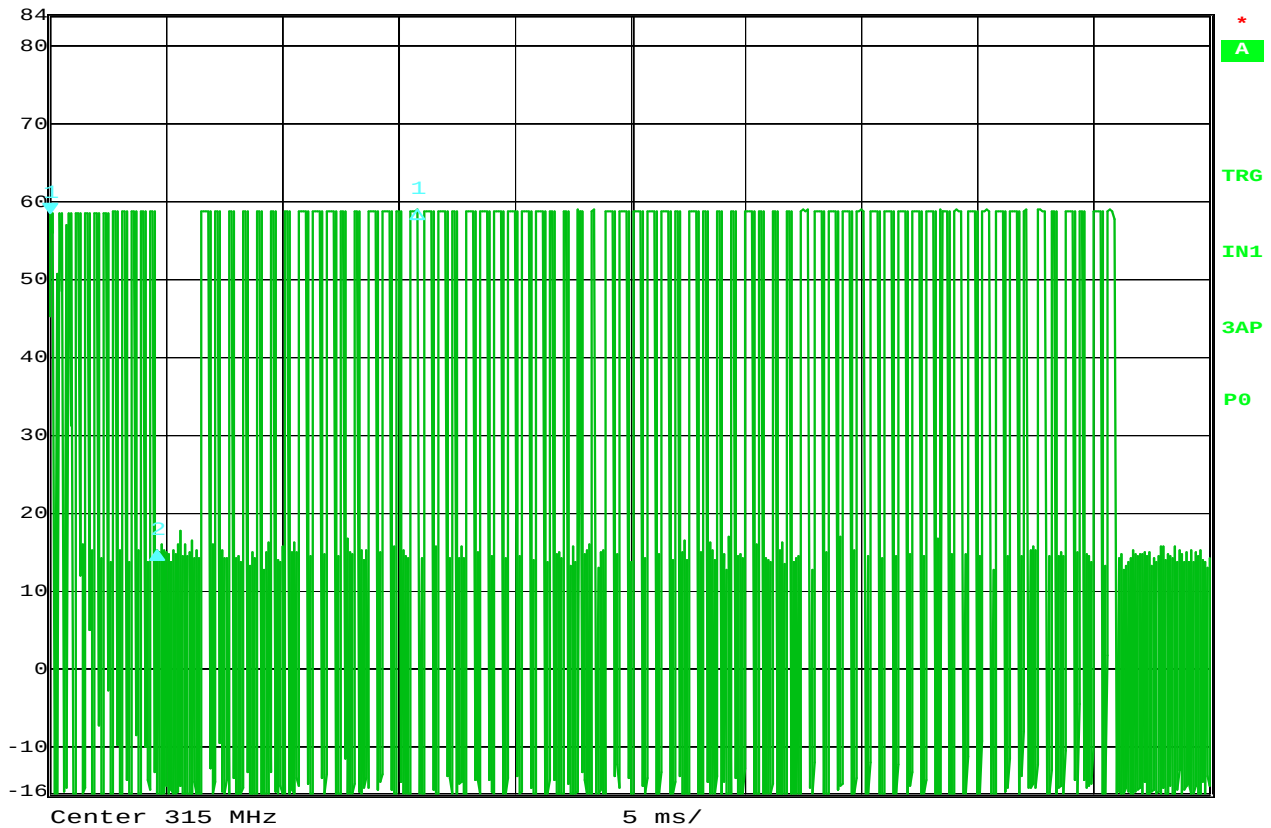
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315, 372.5 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Genie Intellicode, Stanley Secure Code and Wayne Dalton Rolling Code
NOTES : Header $T_H = 2$ mS
NOTES : Button 1, Button 2, Button 7 and Button 9

NOTES



Delta 2 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl -43.39 dB VBW 10 MHz
 84 dBμV 4.609218 ms SWT 50 ms Unit dBμV

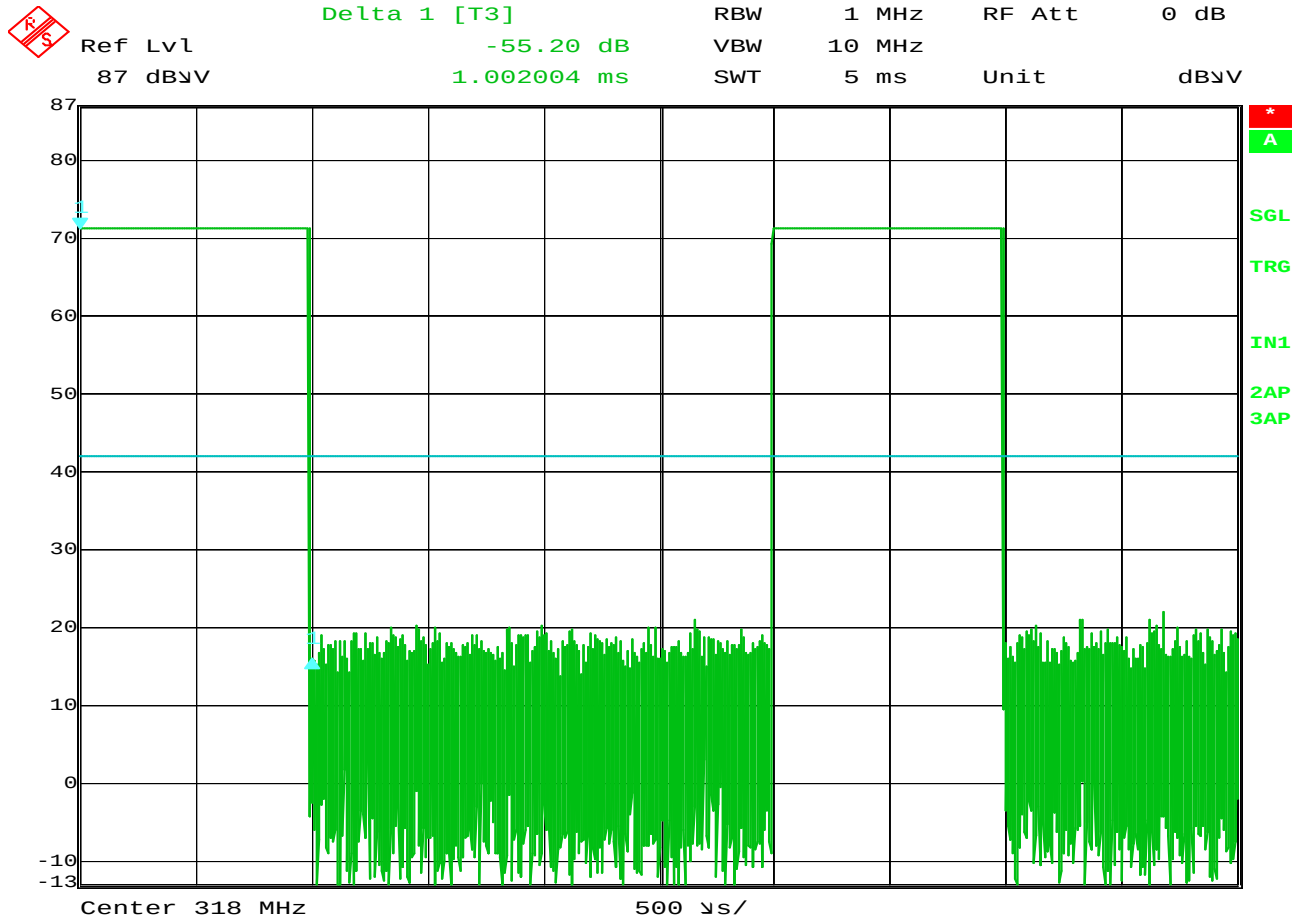


Date: 2.MAY.2016 09:54:35

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 310, 315, 372.5 and 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Genie Intellicode, Stanley Secure Code and Wayne Dalton Rolling Code
 NOTES : Pre-Amble = 4.6 mS
 NOTES : $20 \cdot \log(30.7\text{mS}/100\text{mS}) = -10.25 \text{ dB}$
 NOTES : Button 1, Button 2, Button 7 and Button 9

NOTES



Date: 2.MAY.2016 10:43:36

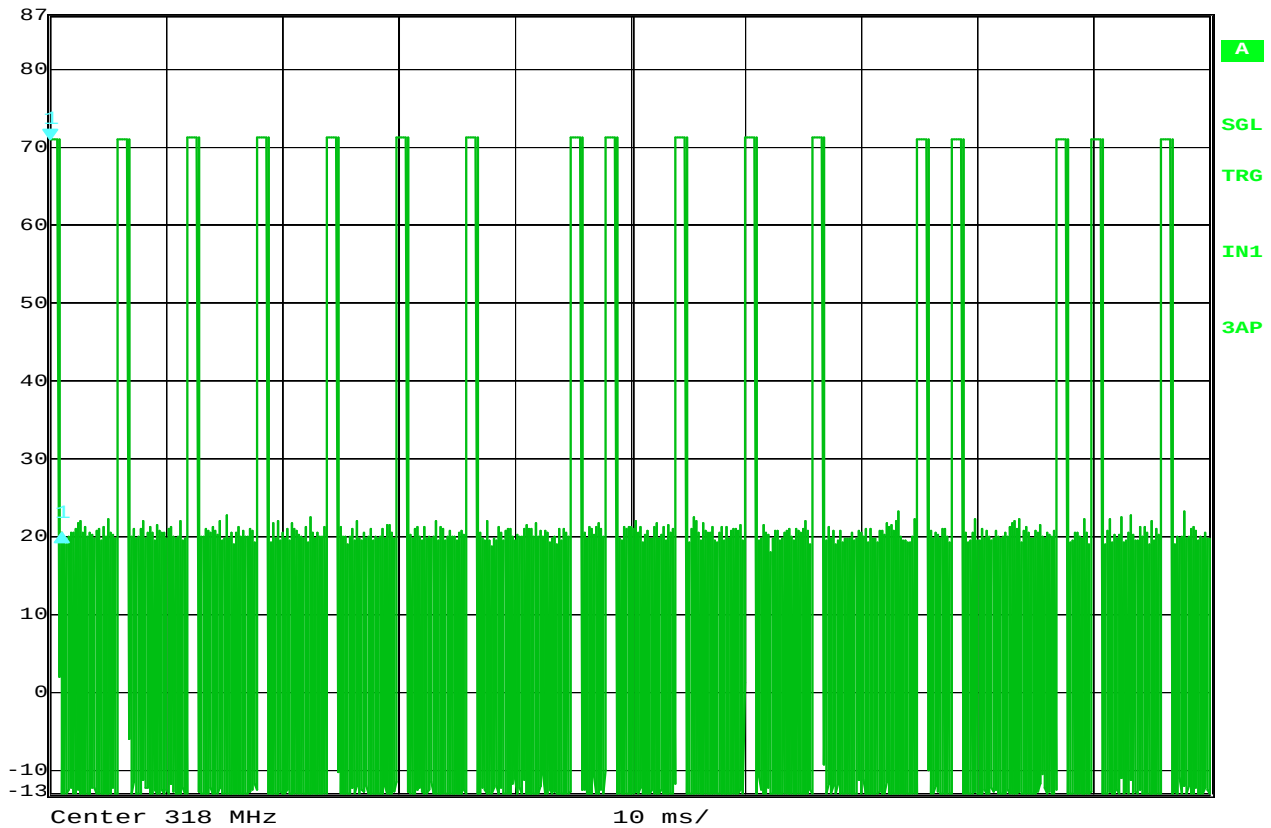
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 318MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Linear Mega Code
 NOTES : ON pulse = 1 mS
 NOTES : Button 3

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl -50.49 dB VBW 10 MHz
 87 dBμV 1.002004 ms SWT 100 ms Unit dBμV



Date: 2.MAY.2016 10:46:52

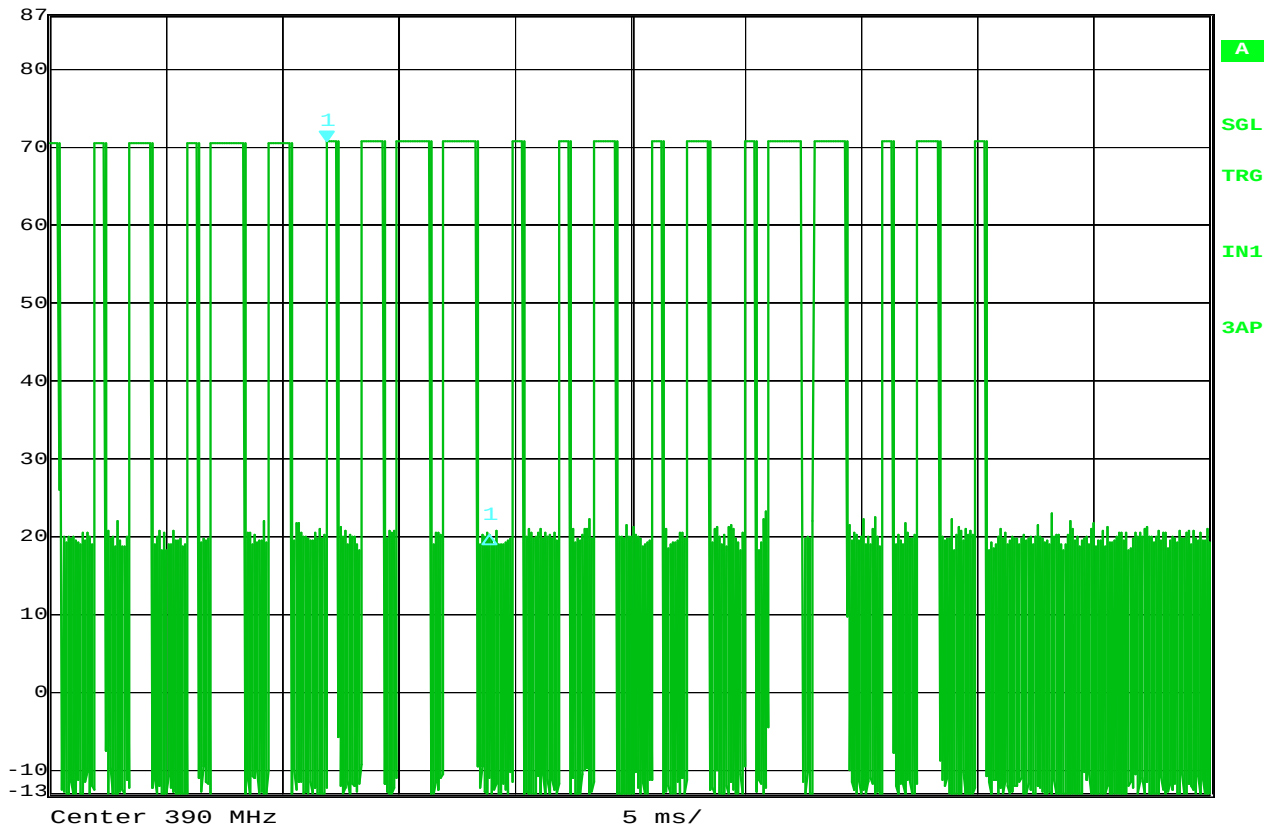
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 318MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Mega Code
 NOTES : Number of Pulses = 17
 NOTES : $20 \cdot \text{LOG}(17\text{mS}/100\text{mS}) = -15.39 \text{ dB}$
 NOTES : Button 3

NOTES



Marker 1 [T3] RBW 1 MHz RF Att 0 dB
70.61 dBμV VBW 10 MHz
11.923848 ms SWT 50 ms Unit dBμV
Ref Lvl 87 dBμV



Date: 2.MAY.2016 10:59:45

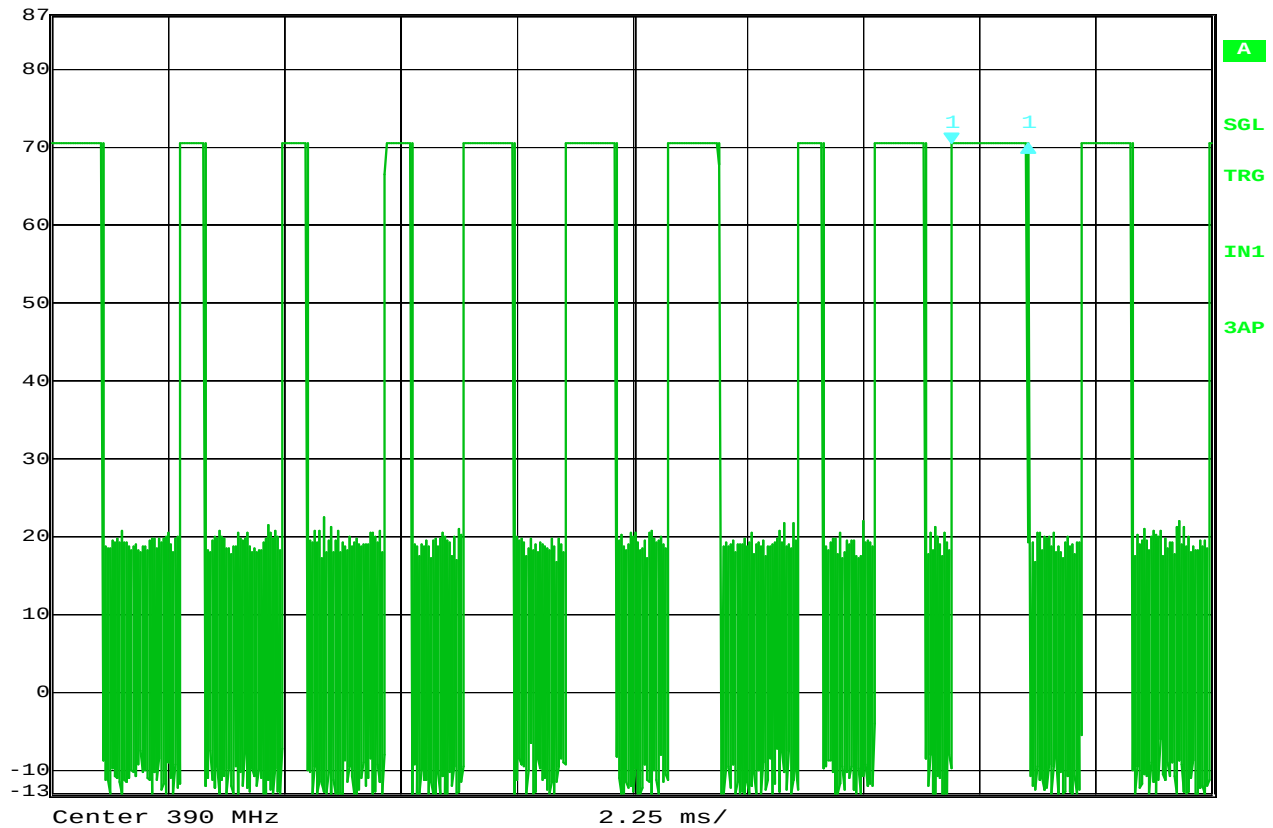
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain Rolling Code D
NOTES : Number of Pulses = 21
NOTES : Pulse Width (1.49 mS) * 21 pulses = 31.29 mS
NOTES : Button 4 and Button 5
NOTES : Plots representative of Rolling Code D which is used for multiple frequencies.

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 1.492986 ms SWT 22.5 ms Unit dBμV



Date: 2.MAY.2016 10:57:26

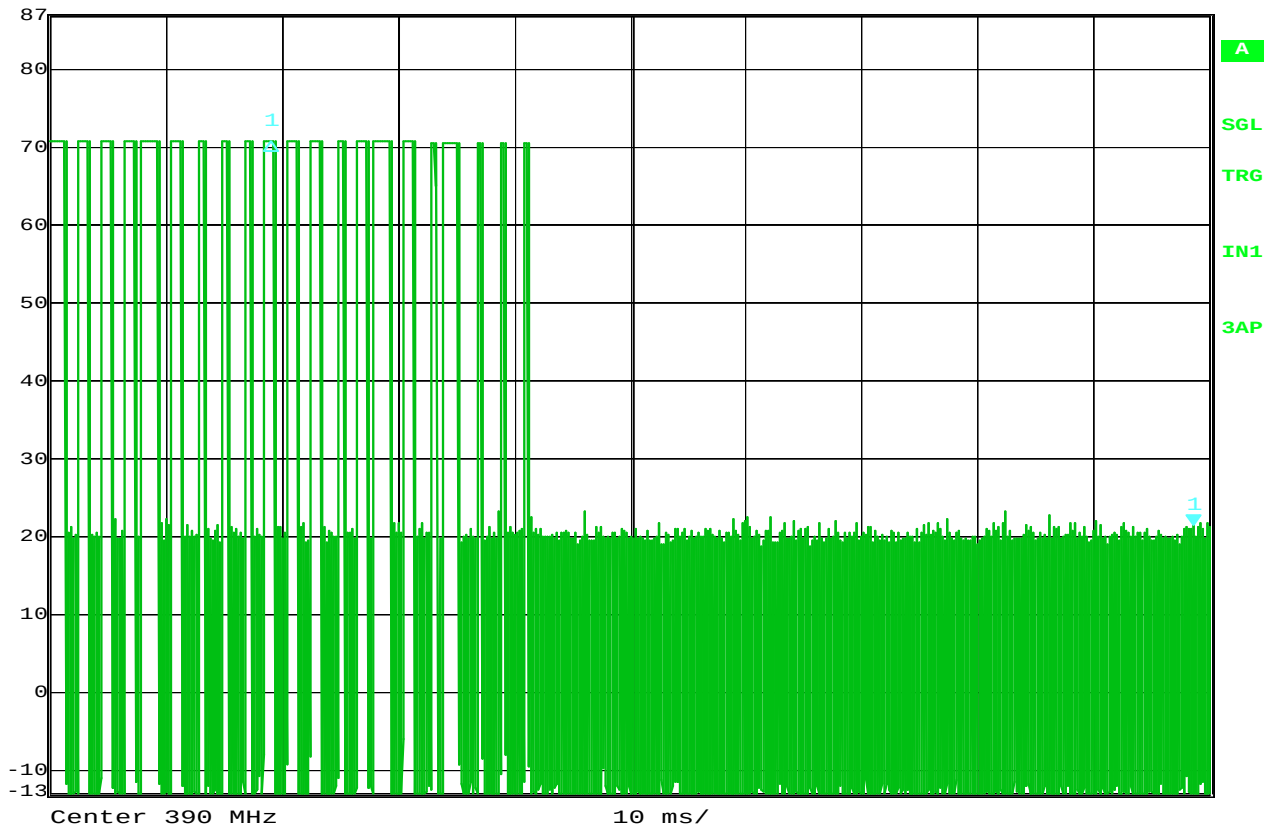
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain D
NOTES : Pulse Width (Widest worst case) = 1.49 mS
NOTES : Button 4 and Button 5
NOTES : Plots representative of Rolling Code D which is used for multiple frequencies.

NOTES



Marker 1 [T3] RBW 1 MHz RF Att 0 dB
21.38 dBμV
98.597194 ms VBW 10 MHz
87 dBμV Ref Lvl 87 dBμV Unit dBμV
SWT 100 ms

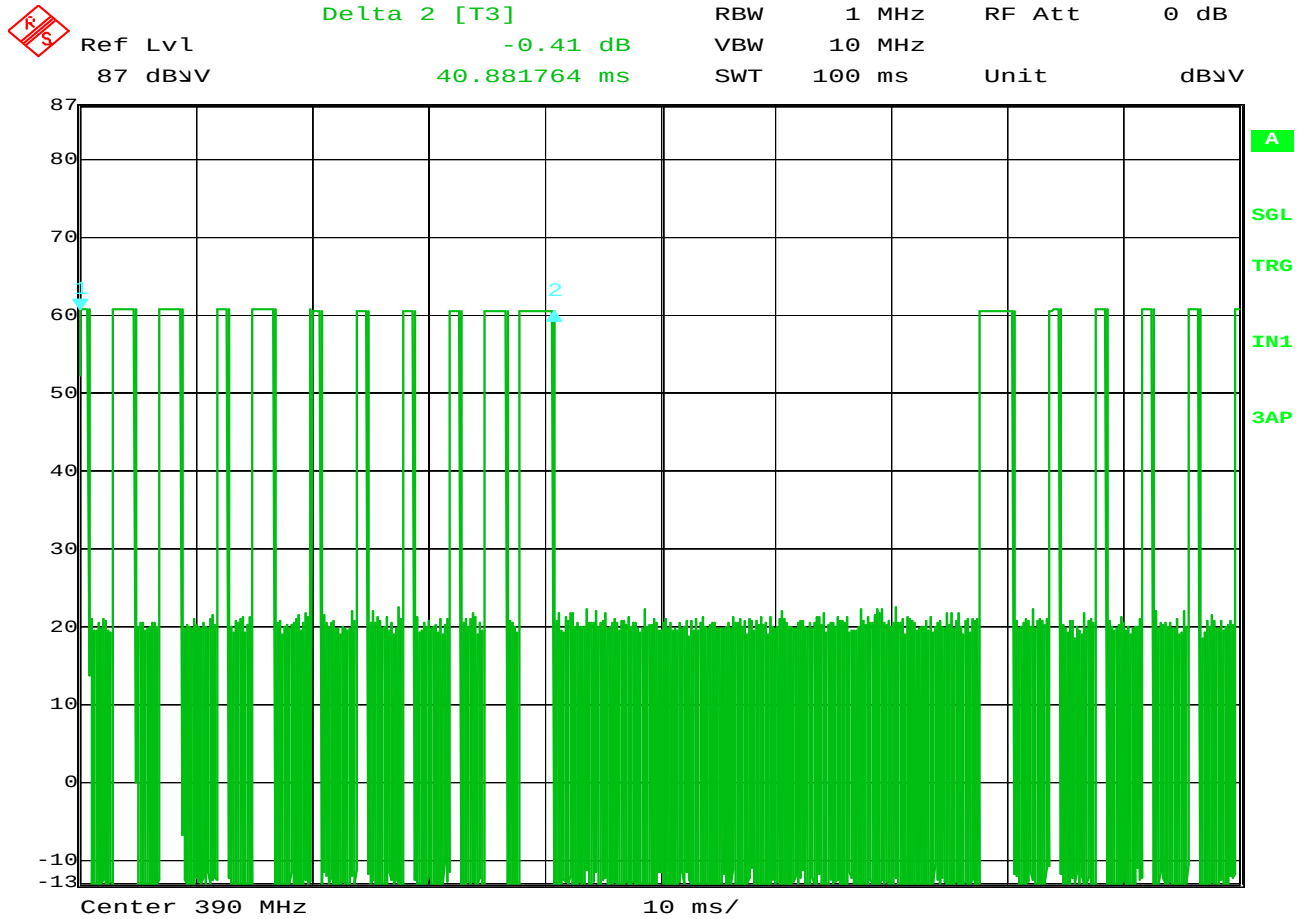


Date: 2.MAY.2016 11:04:06

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315 and 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain Rolling D
NOTES : Pulse train over 100mS
NOTES : Duty Cycle = $20 * ((21 * 1.49 \text{mS}) / 100 \text{mS}) = -10.09 \text{dB}$
NOTES : Button 4 and Button 5
NOTES : Plots representative of Rolling Code D which is used for multiple frequencies.

NOTES



Date: 2.MAY.2016 11:22:25

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz

: Peak detector

NOTES : Duty Cycle

NOTES : Chamberlain Billion Code A

NOTES : Sync Pulse (1mS) + 10 Trinary pulses worst case (4mS each) + Sync Pulse (3mS) +

NOTES : 5 Trinary pulses worst case (4mS) = 64mS ON Time in 100 mS

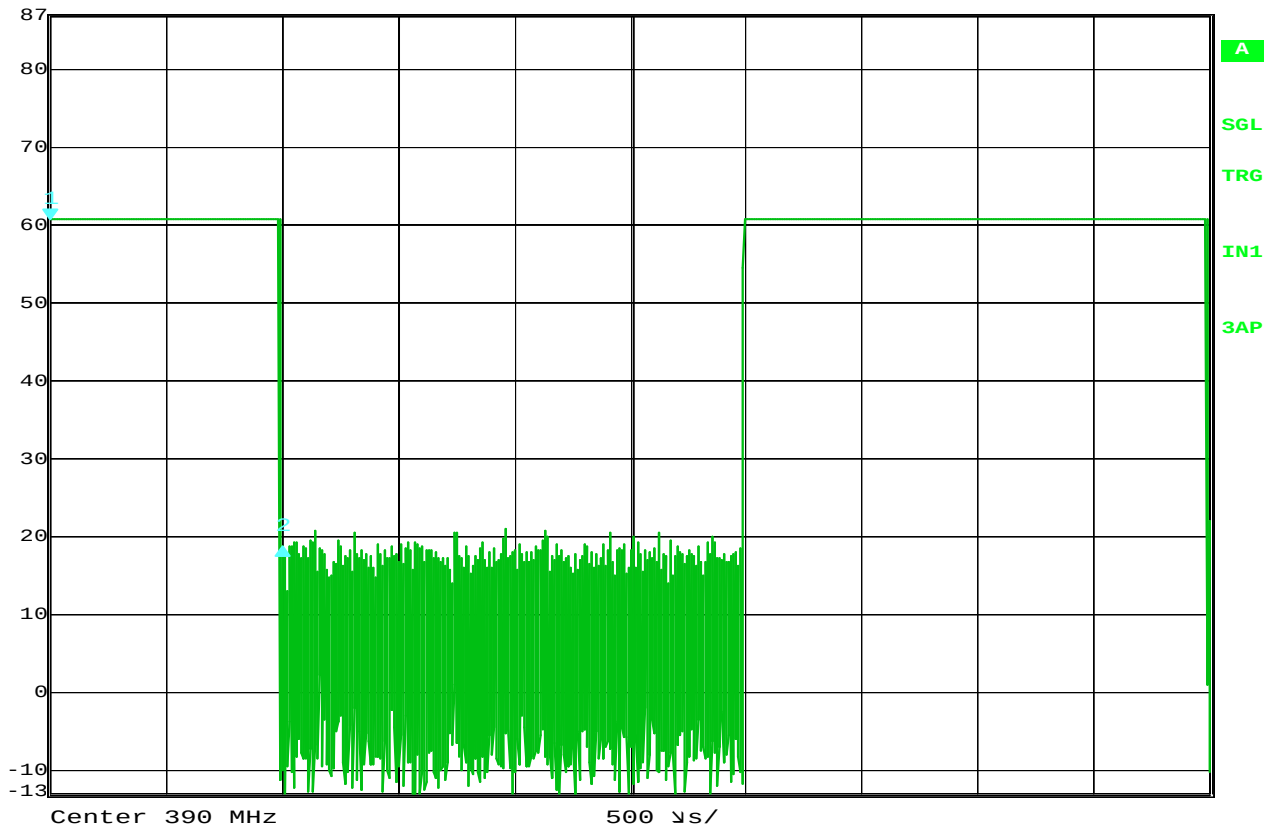
NOTES : $20 \cdot \log(64\text{mS}/100\text{mS}) = -3.87\text{dB}$

NOTES : Button 6

NOTES



Delta 2 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -42.19 dB VBW 10 MHz
87 dBμV 1.002004 ms SWT 5 ms Unit dBμV



Date: 2.MAY.2016 11:18:58

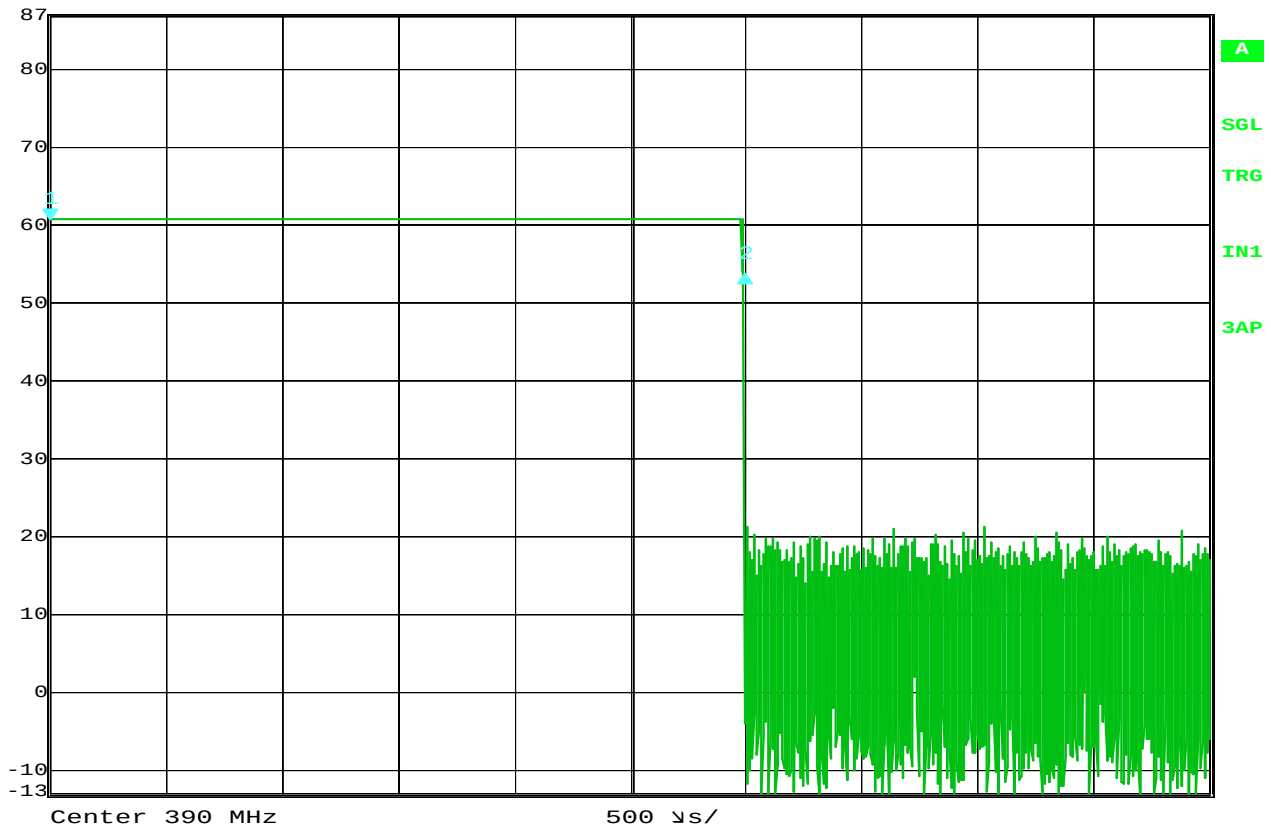
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain Billion Code A
NOTES : Sync Pulse (1mS) + 10 Trinary pulses worst case (4mS each) + Sync Pulse (3mS) +
NOTES : 5 Trinary pulses worst case (4mS) = 64mS ON Time in 100 mS
NOTES : $20 \cdot \log(64\text{mS}/100\text{mS}) = -3.87\text{dB}$
NOTES : Button 6

NOTES



Delta 2 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -7.01 dB VBW 10 MHz
87 dBμV 2.995992 ms SWT 5 ms Unit dBμV

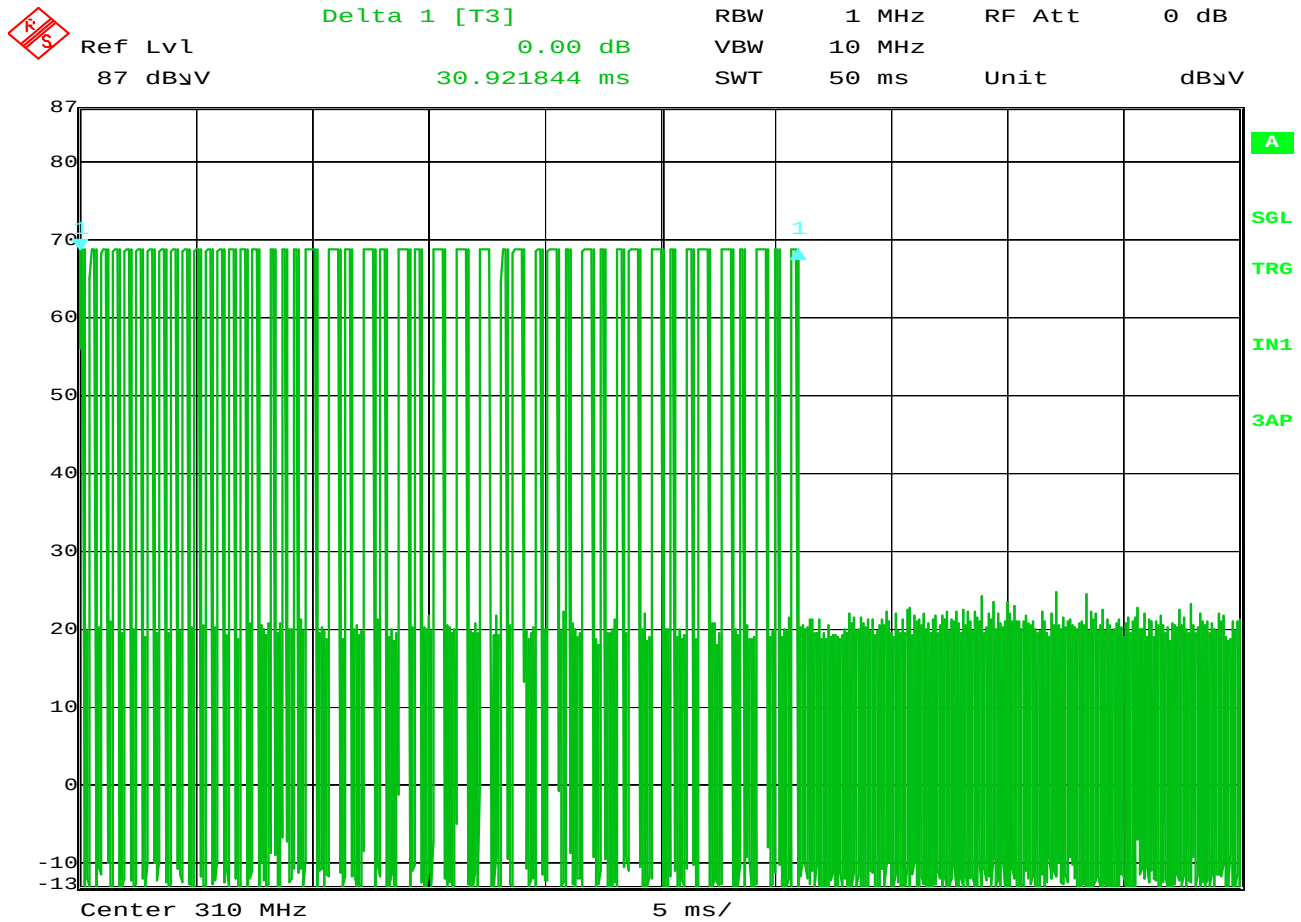


Date: 2.MAY.2016 11:16:47

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain Billion Code A
NOTES : Sync Pulse (1mS) + 10 Trinary pulses worst case (4mS each) + Sync Pulse (3mS) +
NOTES : 5 Trinary pulses worst case (4mS) = 64mS ON Time in 100 mS
NOTES : $20 \cdot \log(64\text{mS}/100\text{mS}) = -3.87\text{dB}$
NOTES : Button 6

NOTES



Date: 2.MAY.2016 11:35:11

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group

MODEL NUMBER : TM100 & TM110

TEST MODE : Tx @ 310, 315 and 390MHz

: Peak detector

NOTES : Duty Cycle

NOTES : Chamberlain Rolling E Code

NOTES : Pulses in 100mS = 51

NOTES : Pulse width worst case = 509uS

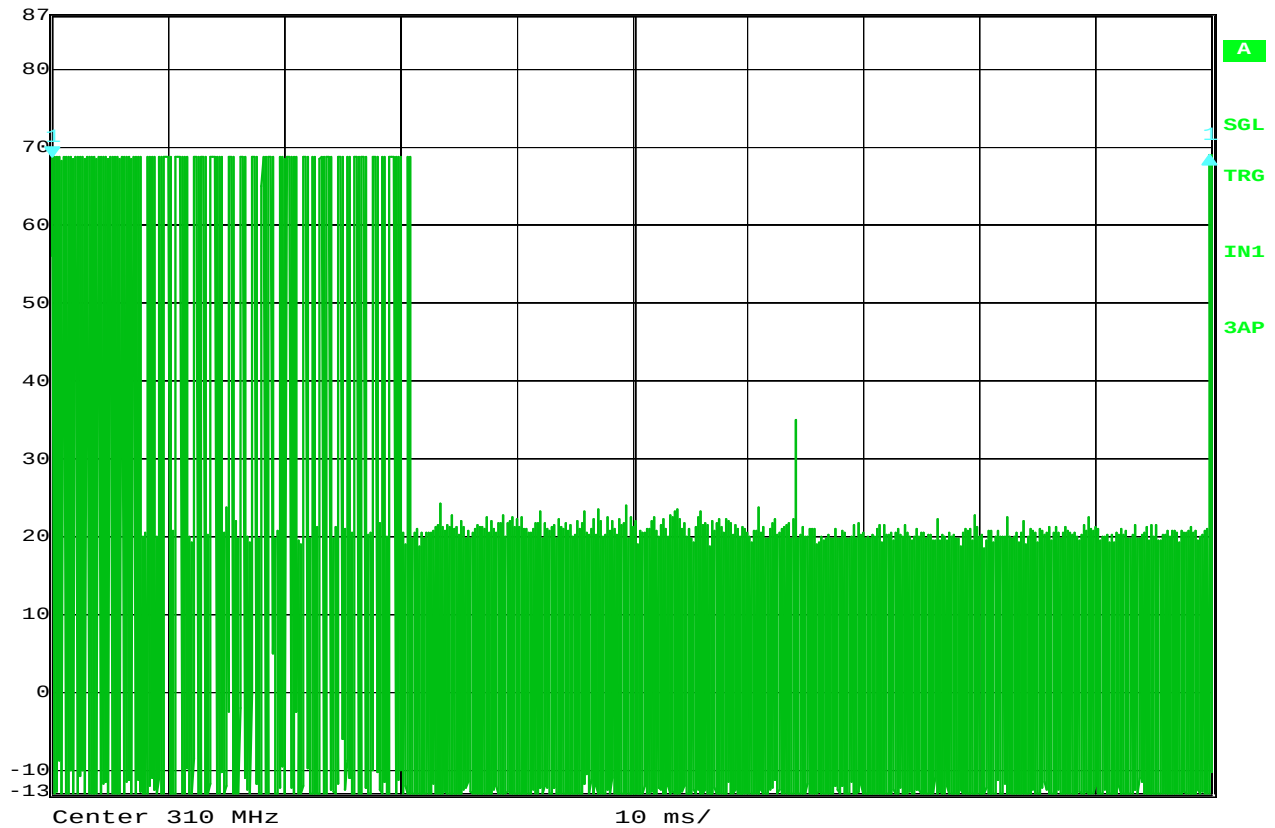
NOTES : Duty Cycle (worst case Payload 11) = $20 \cdot \log((51 \cdot 509\mu S) / 100\text{mS}) = -11.73\text{dB}$

NOTES : Button 8

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.27 dB VBW 10 MHz
87 dBμV 99.799599 ms SWT 100 ms Unit dBμV



Date: 2.MAY.2016 11:32:21

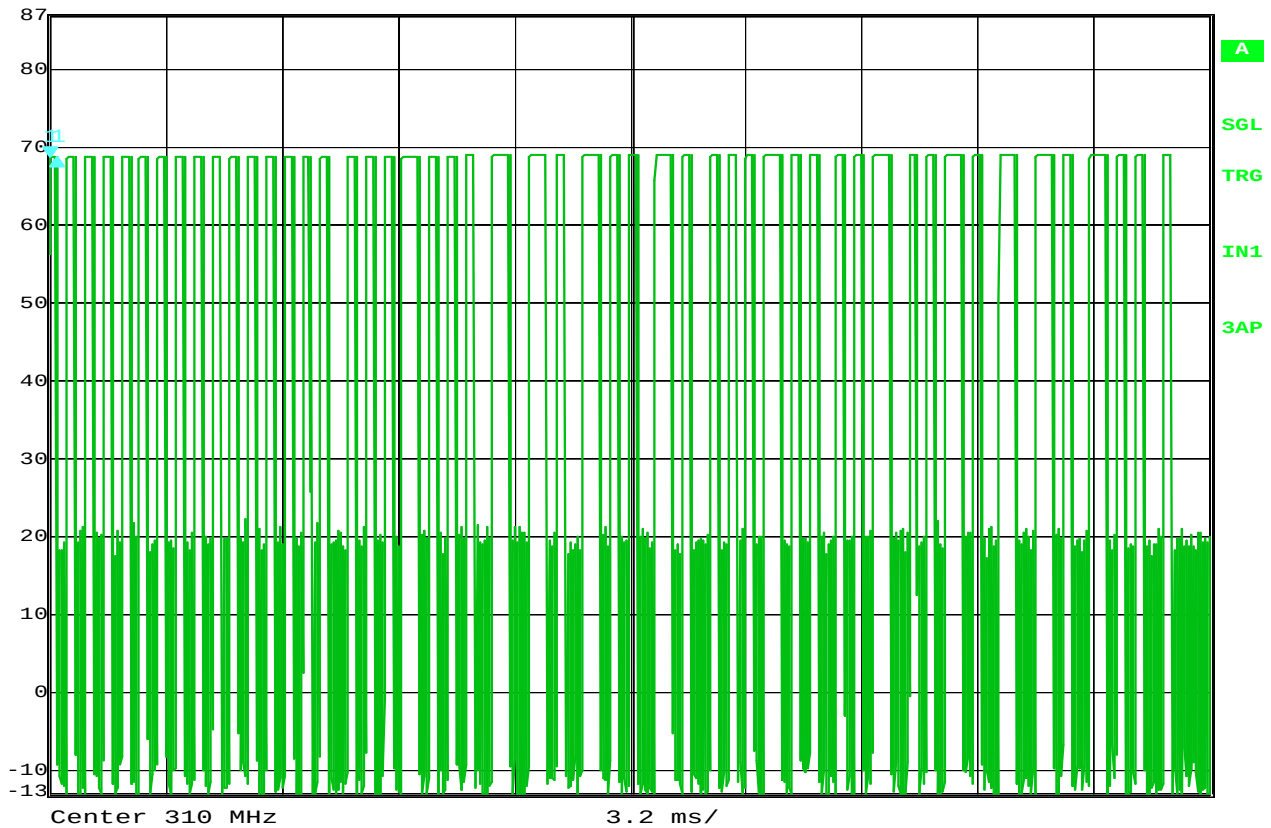
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315 and 390MHz
: Peak detector
NOTES : Chamberlain Rolling E Code
NOTES : Pulses in 100mS = 51
NOTES : Pulse width worst case = 509uS
NOTES : Duty Cycle (worst case Payload 11) = $20 \cdot \log((51 \cdot 509 \mu\text{S}) / 100 \text{mS}) = -11.73 \text{dB}$
NOTES : Button 8

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -0.13 dB VBW 10 MHz
87 dBμV 188.376754 μs SWT 32 ms Unit dBμV



Date: 2.MAY.2016 11:38:56

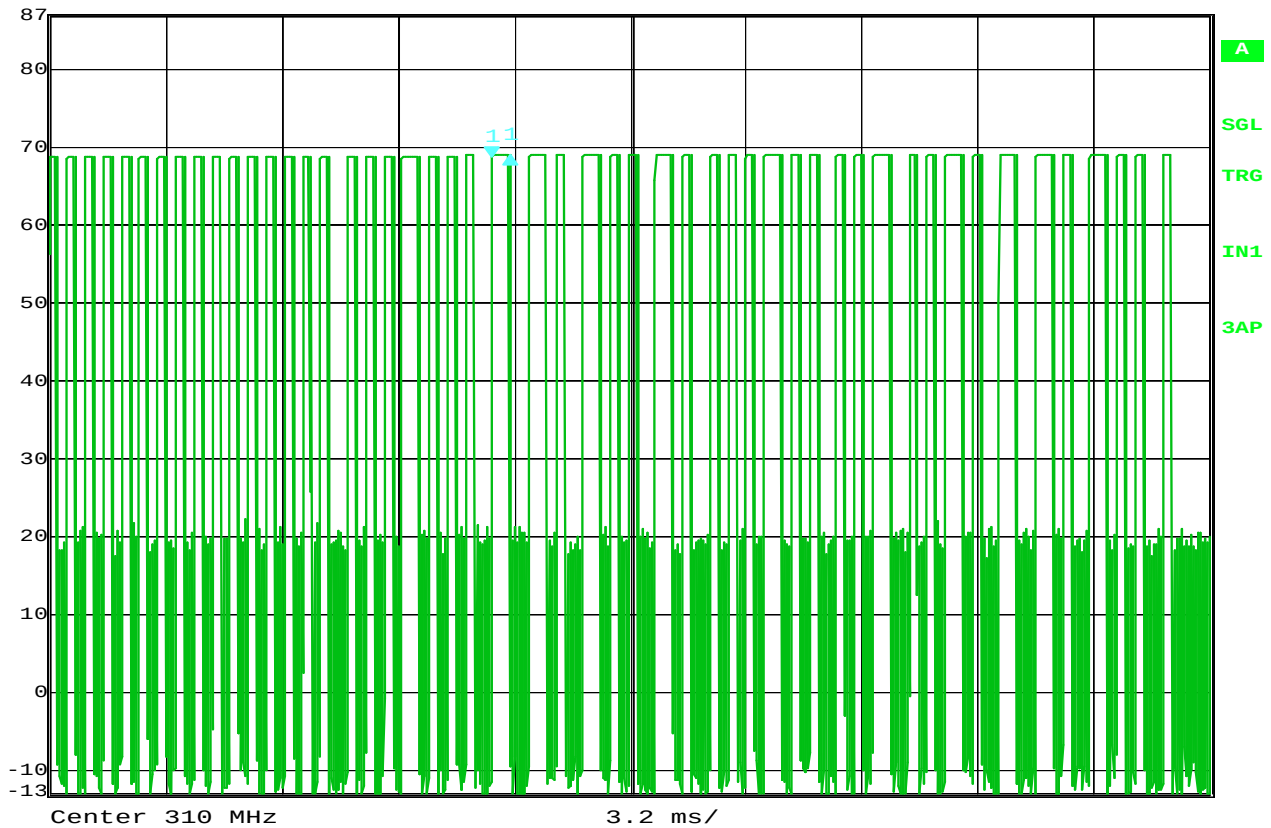
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315 and 390MHz
: Peak detector
NOTES : Chamberlain Rolling E Code
NOTES : Pulses in 100mS = 51
NOTES : Pulse width worst case = 509uS
NOTES : Duty Cycle (worst case Payload 11) = $20 \cdot \log((51 \cdot 509 \mu\text{S}) / 100 \text{mS}) = -11.73 \text{dB}$
NOTES : Button 8

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.27 dB VBW 10 MHz
87 dBμV 509.018036 μs SWT 32 ms Unit dBμV

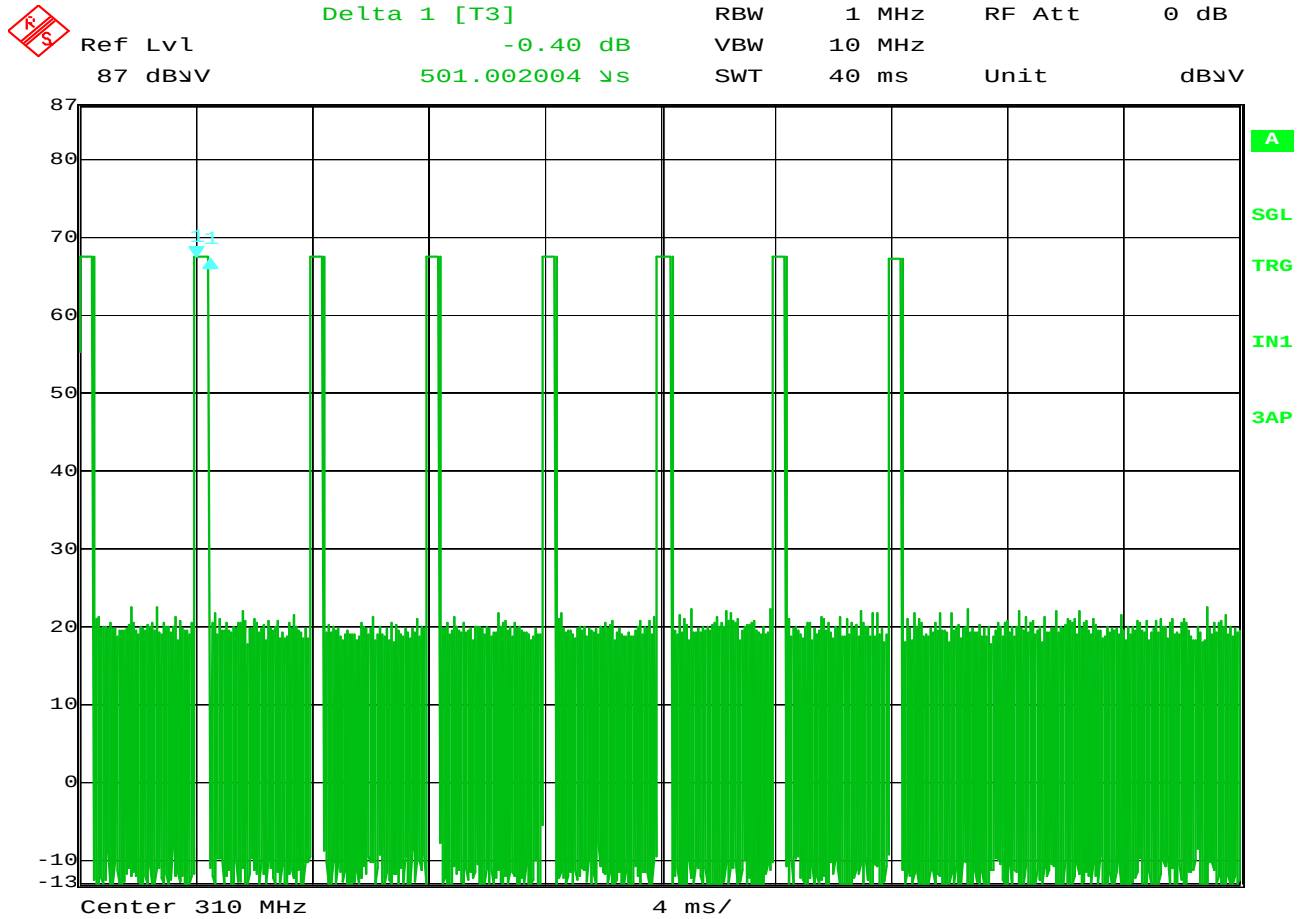


Date: 2.MAY.2016 11:40:39

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310, 315 and 390MHz
: Peak detector
NOTES : Chamberlain Rolling E Code
NOTES : Pulses in 100mS = 51
NOTES : Pulse width worst case = 509uS
NOTES : Duty Cycle (worst case Payload 11) = $20 \cdot \log((51 \cdot 509\mu\text{S}) / 100\text{mS}) = -11.73\text{dB}$
NOTES : Button 8

NOTES



Date: 2.MAY.2016 11:56:56

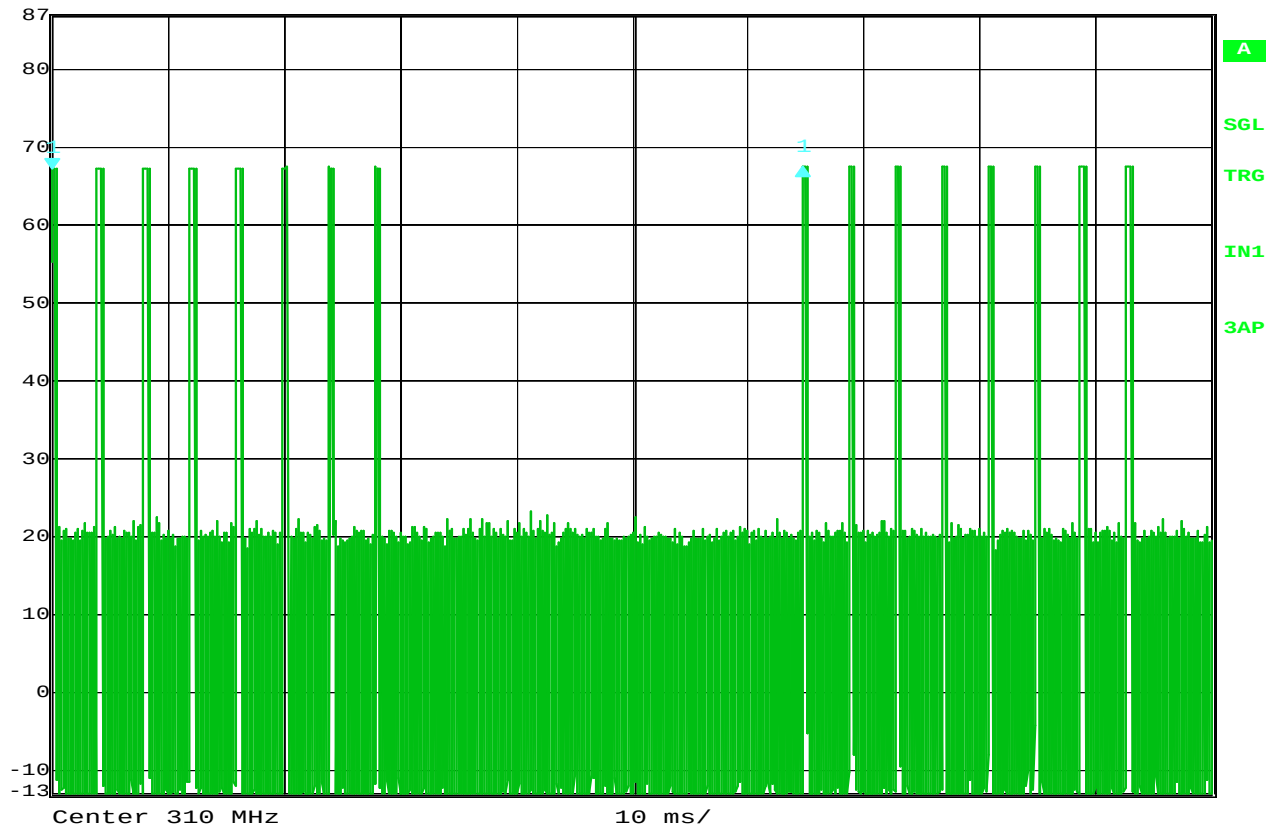
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 310MHz
 : Peak detector
 NOTES : Linear Moore-O-Matic
 NOTES : ON Pulse Width = 500uS (Worst Case is a 2mS on time)
 NOTES : OFF pulse width = 3.5mS
 NOTES : DC = 20* LOG(16/65) = 12.2dB
 NOTES : Button 10

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.26 dB VBW 10 MHz
87 dBμV 64.741483 ms SWT 100 ms Unit dBμV



Date: 2.MAY.2016 11:50:10

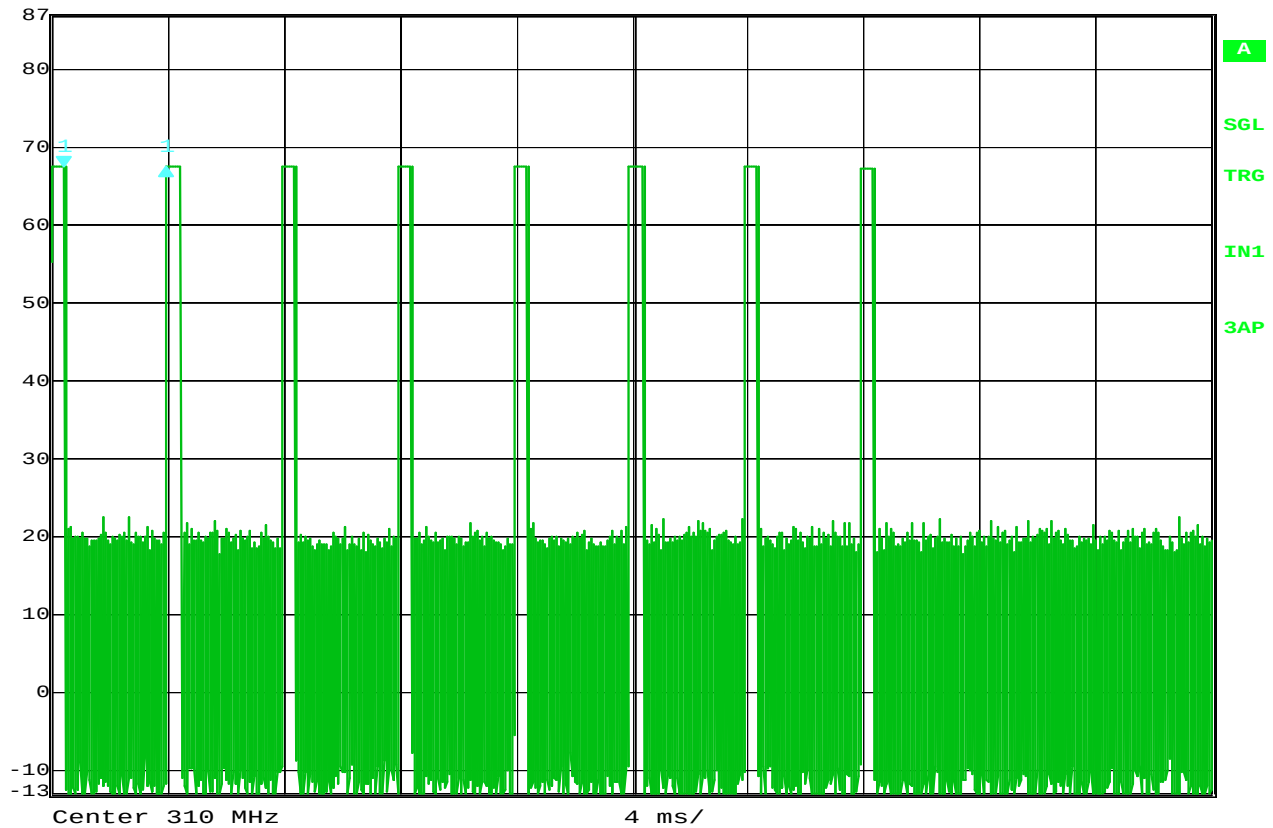
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Linear Moore-O-Matic
NOTES : ON Pulse Width = 500uS (Worst Case is a 2mS on time)
NOTES : OFF pulse width = 3.5mS
NOTES : DC = 20* LOG(16/65) = 12.2dB
NOTES : Button 10

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 3.527054 ms SWT 40 ms Unit dBμV



Date: 2.MAY.2016 11:58:48

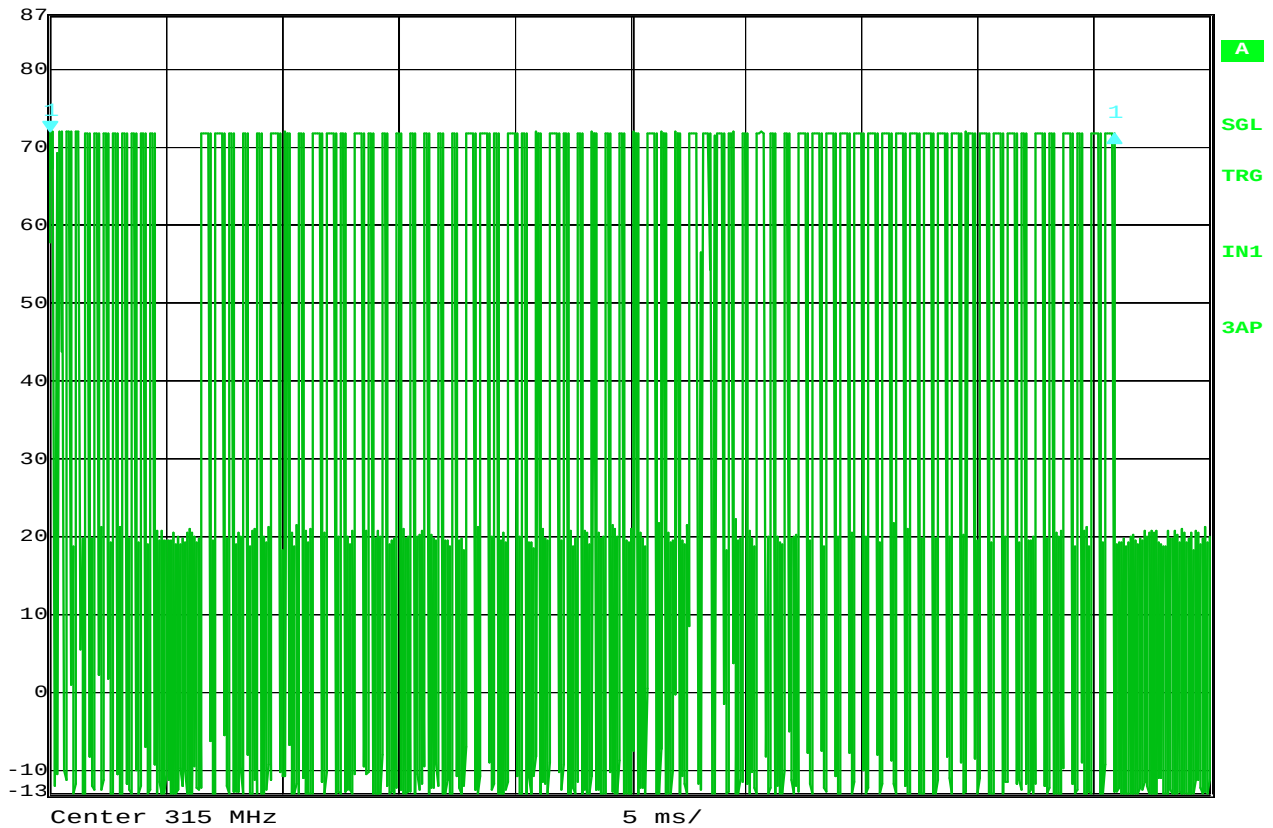
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Linear Moore-O-Matic
NOTES : ON Pulse Width = 500uS (Worst Case is a 2mS on time)
NOTES : OFF pulse width = 3.5mS
NOTES : DC = 20* LOG(16/65) = 12.2dB
NOTES : Button 10

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -0.25 dB VBW 10 MHz
87 dBμV 45.911824 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 13:37:49

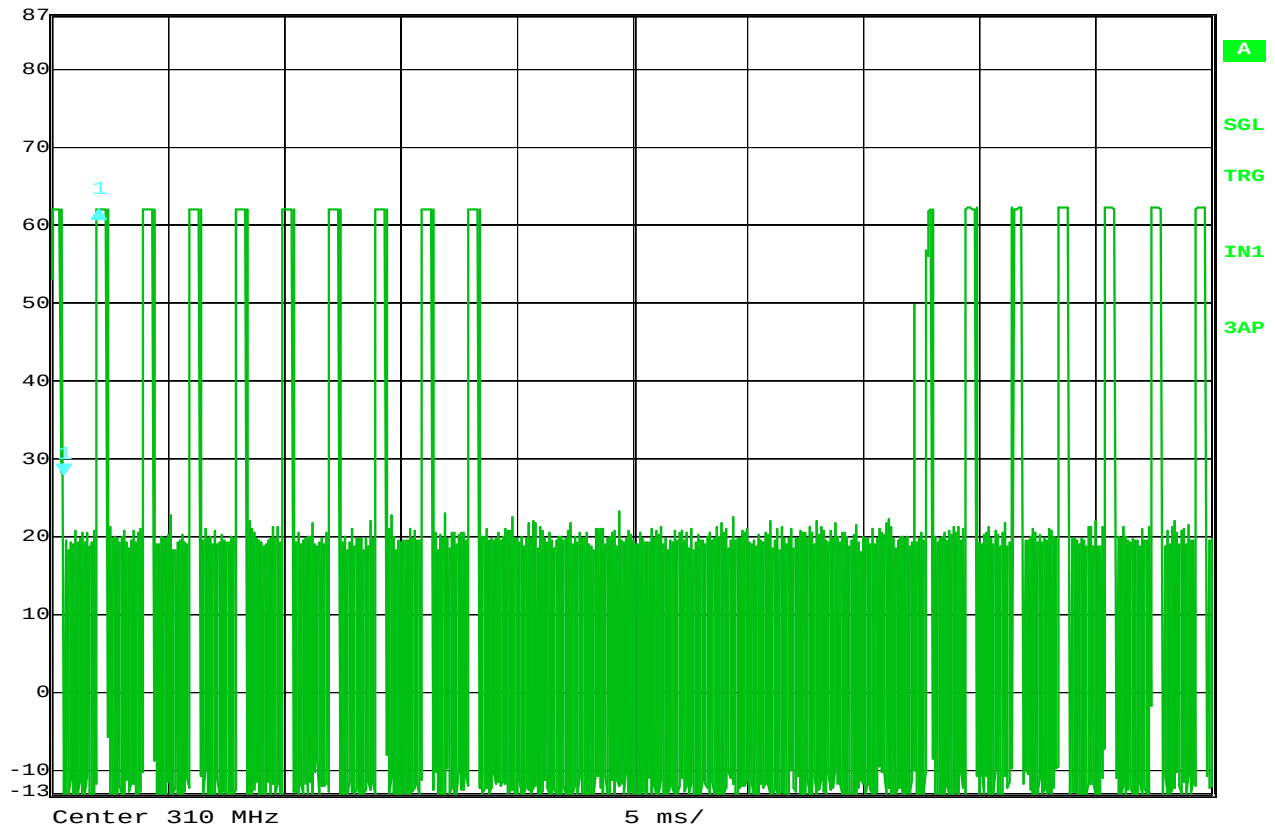
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315MHz
: Peak detector
NOTES : Duty Cycle
NOTES : 9 Position DIP Switch
NOTES : $20 \cdot \log(29/83) = -9.13\text{dB}$
NOTES : Button 11

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 34.06 dB VBW 10 MHz
87 dBμV 1.505010 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 13:59:13

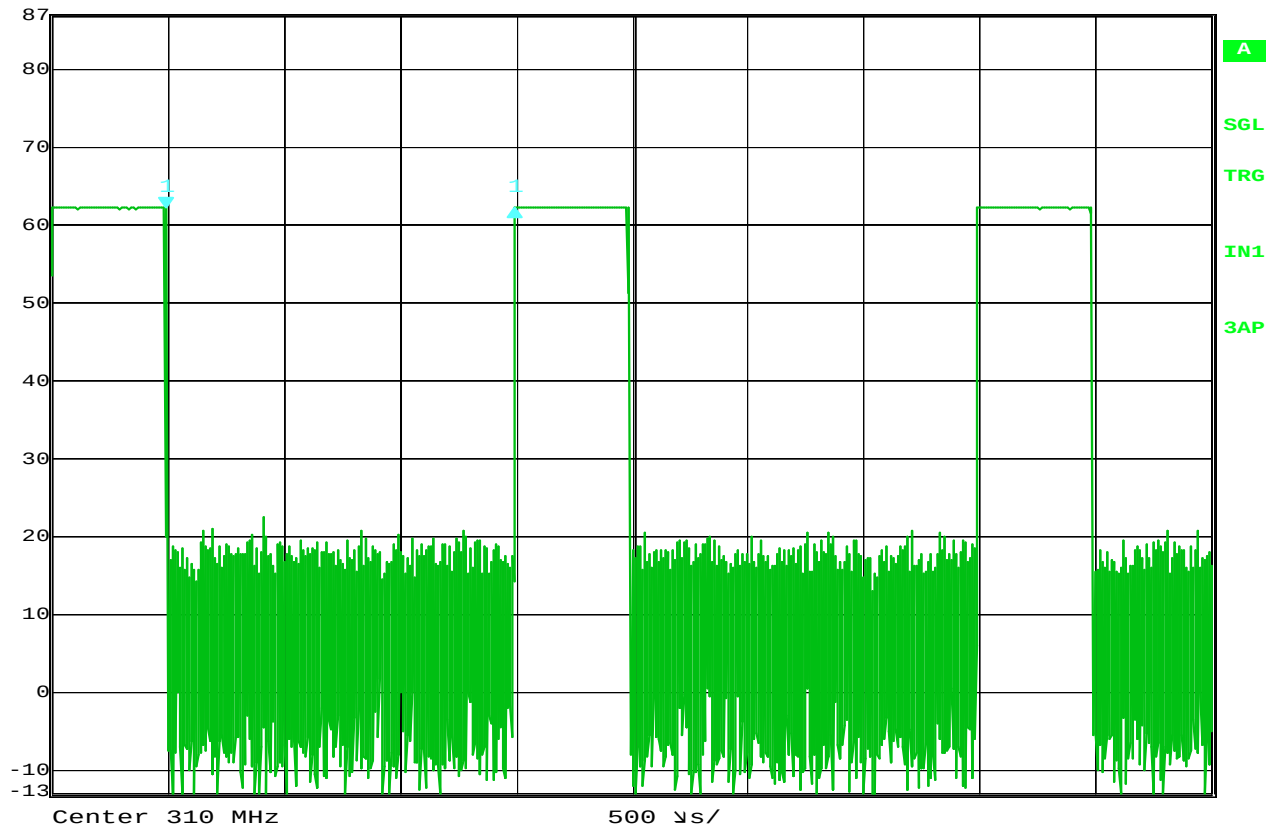
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Stanley 10 Position DIP Switch
NOTES : $DC = 20\log(15/38) = -8.1\text{dB}$
NOTES : Number of Pulses = 10
NOTES : Button 12

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 1.505010 ms SWT 5 ms Unit dBμV



Date: 2.MAY.2016 13:57:55

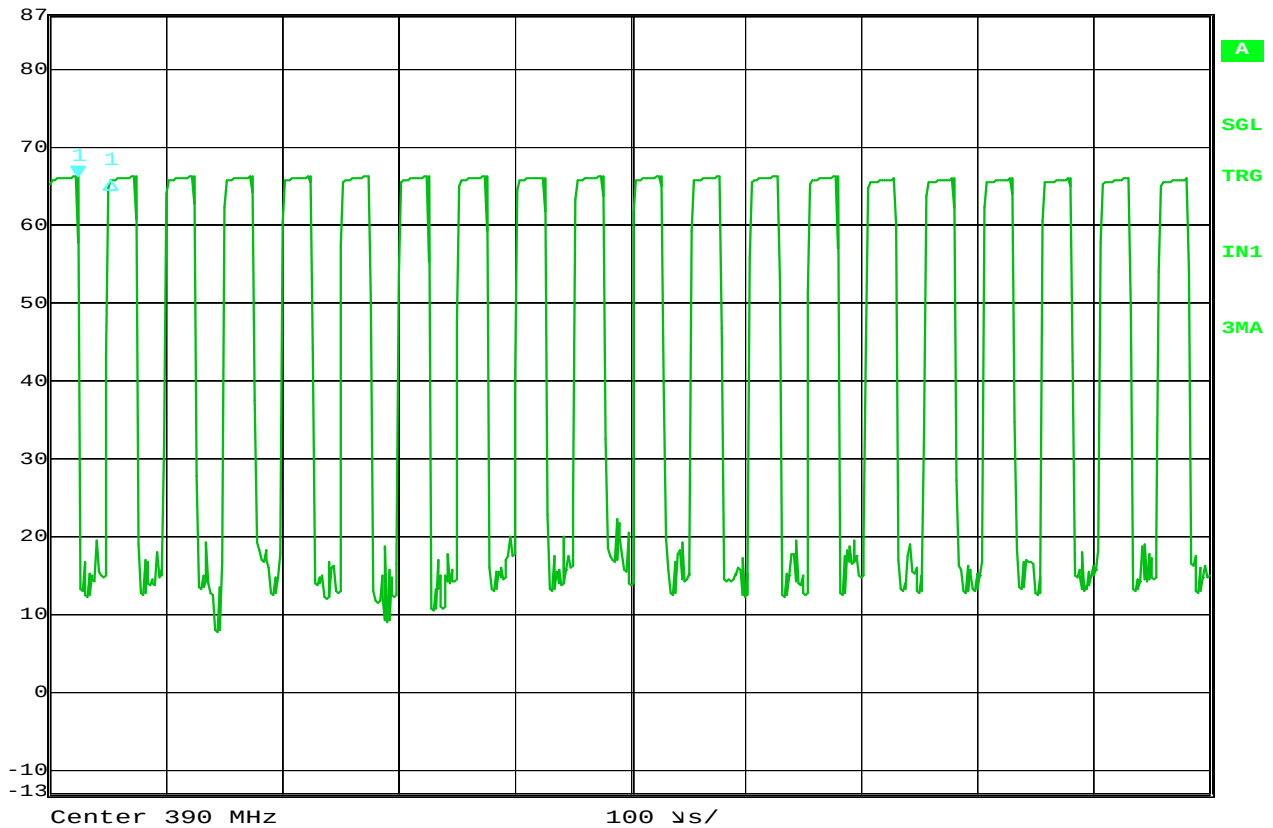
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Stanley 10 Position DIP Switch
NOTES : $DC = 20\log(15/38) = -8.1\text{dB}$
NOTES : OFF Pulse Width = 1.5ms
NOTES : Button 12

NOTES



Marker 1 [T3] RBW 1 MHz RF Att 0 dB
66.05 dBμV
24.048096 μs
Ref Lvl 87 dBμV VBW 10 MHz Unit dBμV
SWT 1 ms



Date: 2.MAY.2016 14:07:09

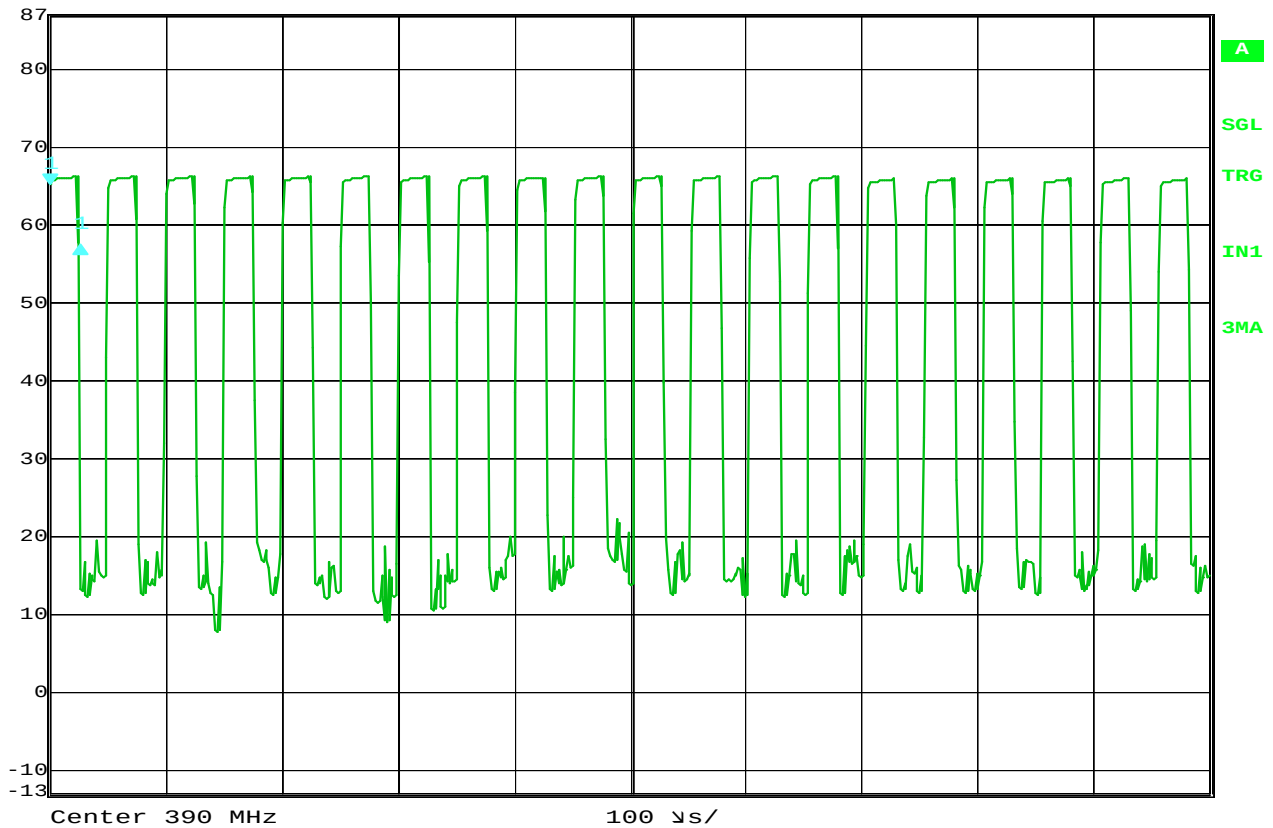
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Genie 12 Position DIP Switch
NOTES : $DC = 20\log(50/100) = -6.0\text{dB}$
NOTES : OFF Pulse = 24μs
NOTES : Button 13

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -7.72 dB VBW 10 MHz
87 dBμV 25.050100 μs SWT 1 ms Unit dBμV



Date: 2.MAY.2016 14:03:37

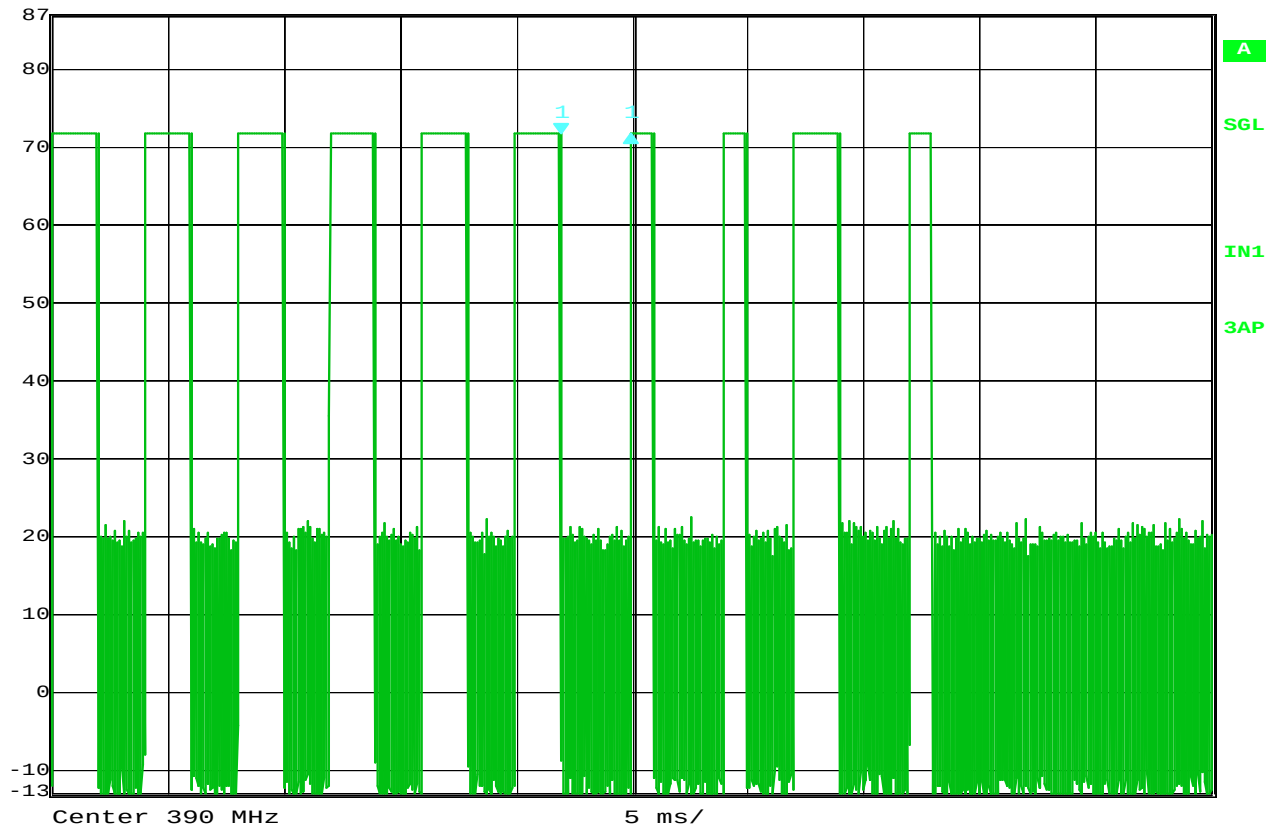
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Genie 12 Position DIP Switch
NOTES : $DC = 20\log(50/100) = -6.0\text{dB}$
NOTES : ON Pulse = 25μs
NOTES : Button 13

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 3.005862 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:25:25

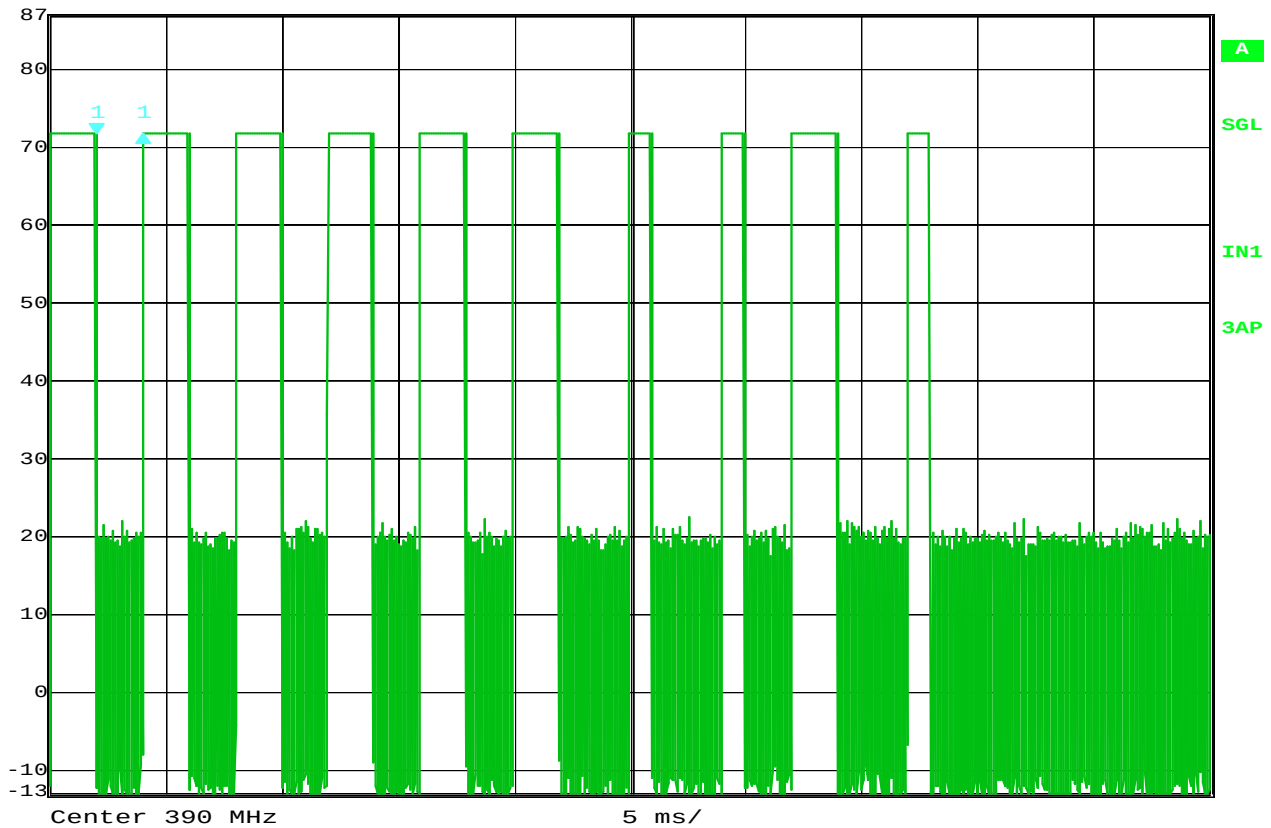
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : OFF Pulse = 3ms
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 2.003858 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:23:56

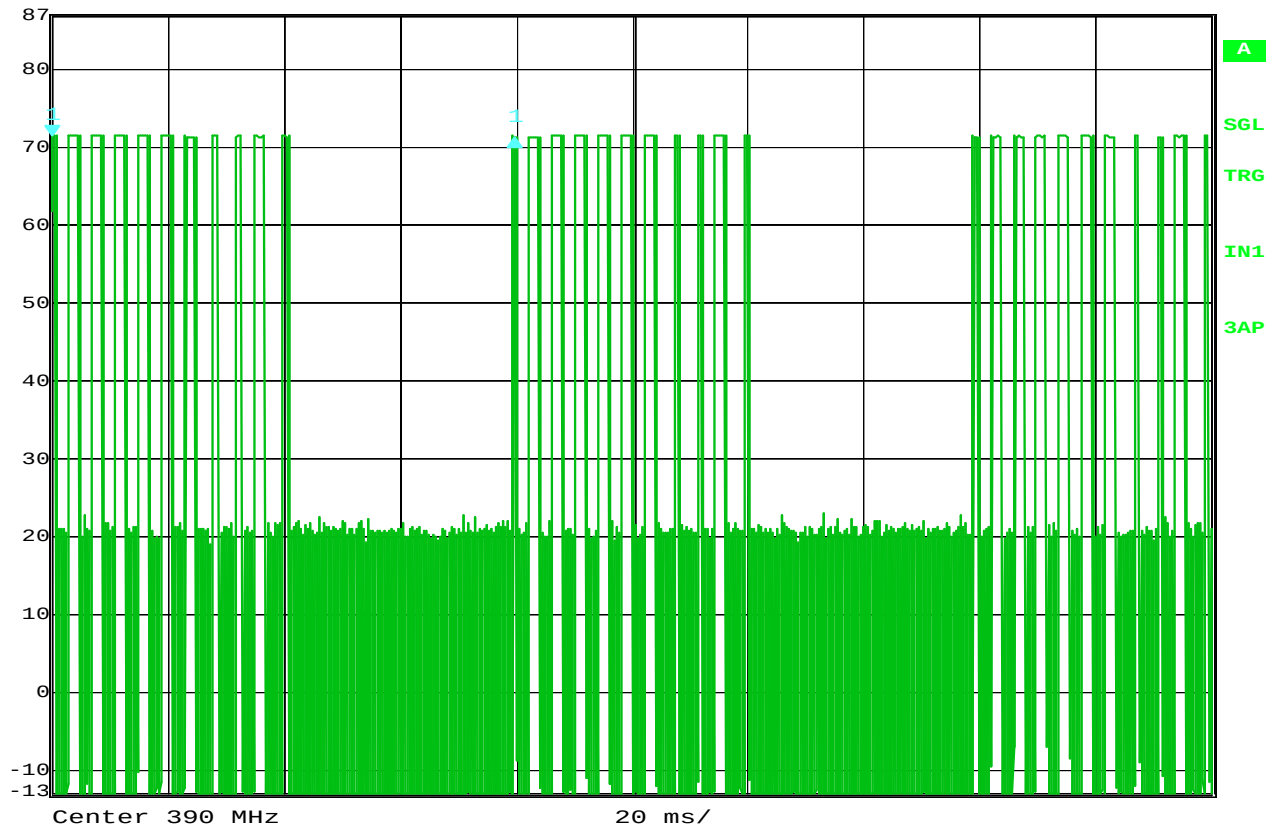
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : OFF Pulse = 2ms
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -0.25 dB VBW 10 MHz
87 dBμV 79.659169 ms SWT 200 ms Unit dBμV



Date: 2.MAY.2016 14:30:19

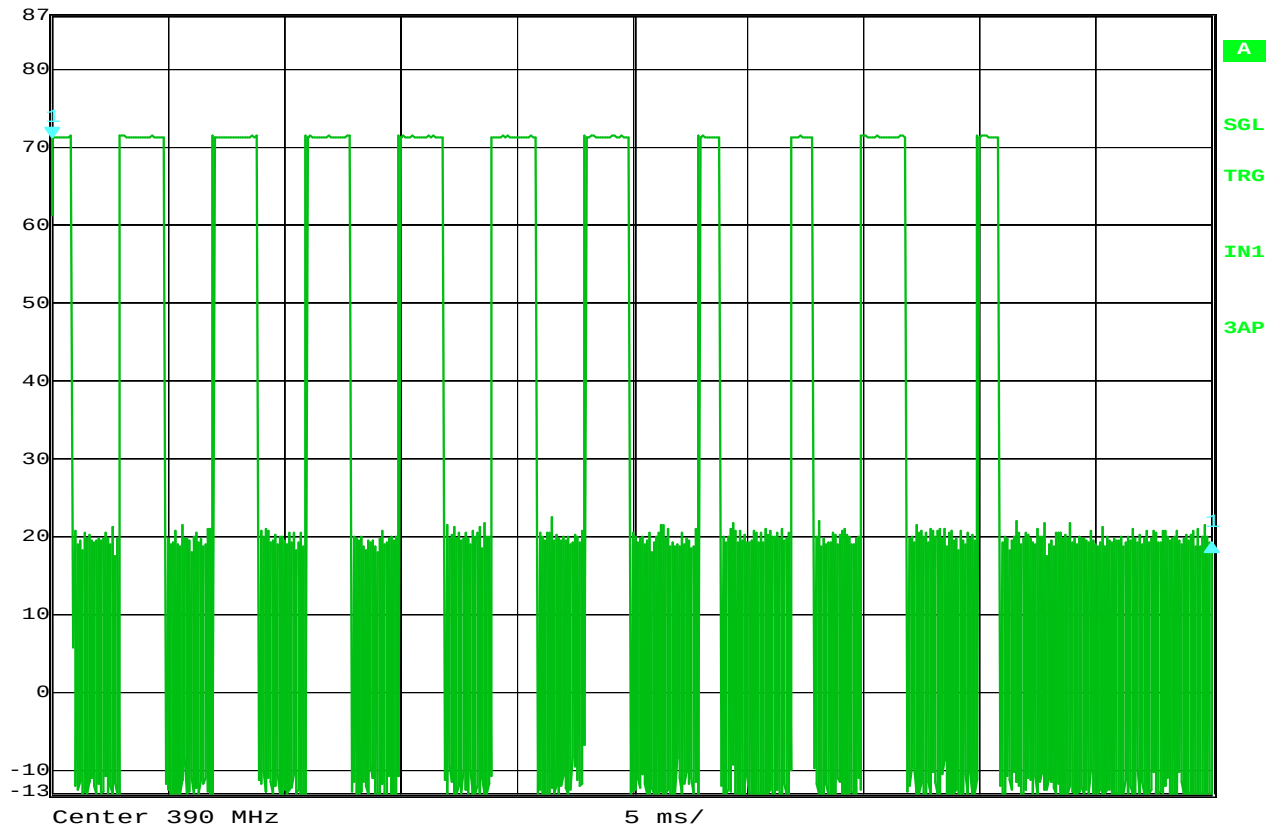
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : pulse train over 1 word
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -51.96 dB VBW 10 MHz
87 dBμV 50.000000 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:31:25

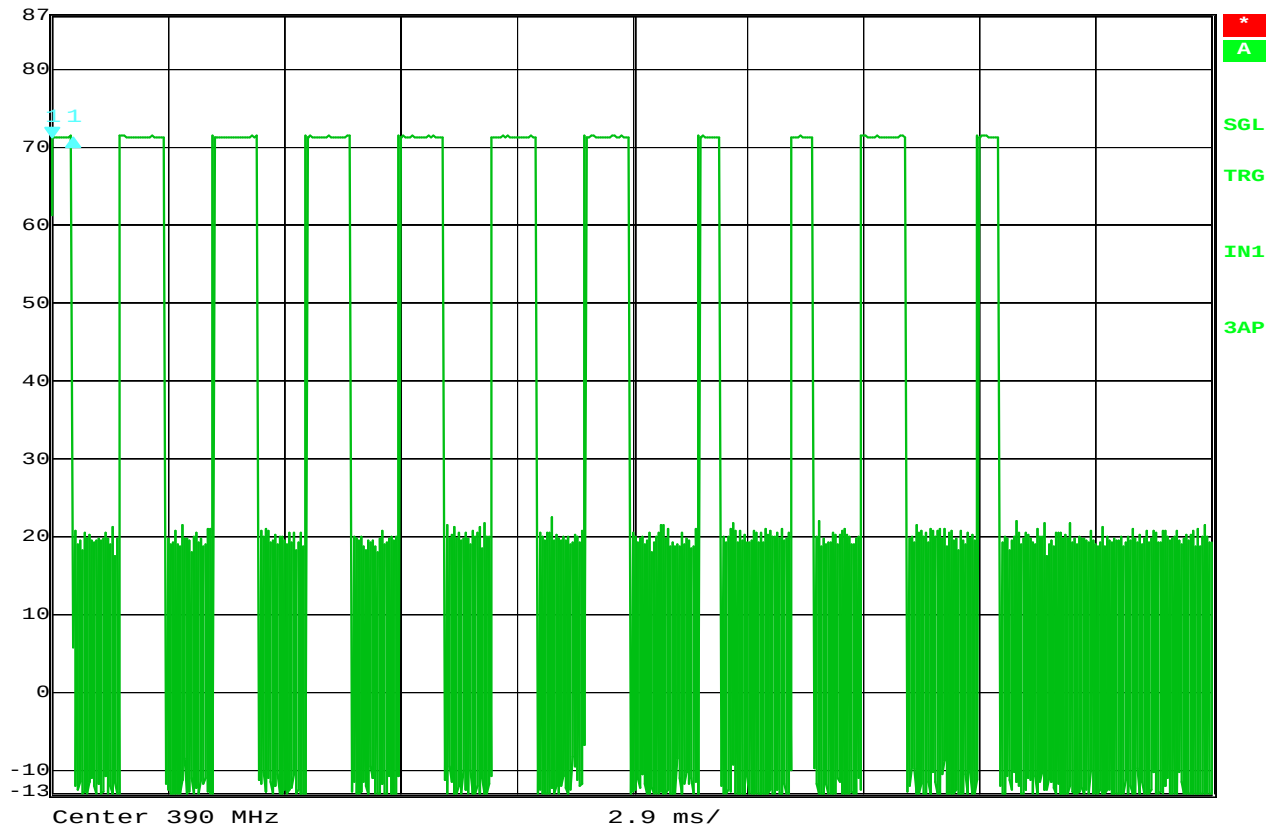
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : Pulse Train shows sync pulse and 10 trits
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 496.993988 μs SWT 29 ms Unit dBμV



Date: 2.MAY.2016 14:33:27

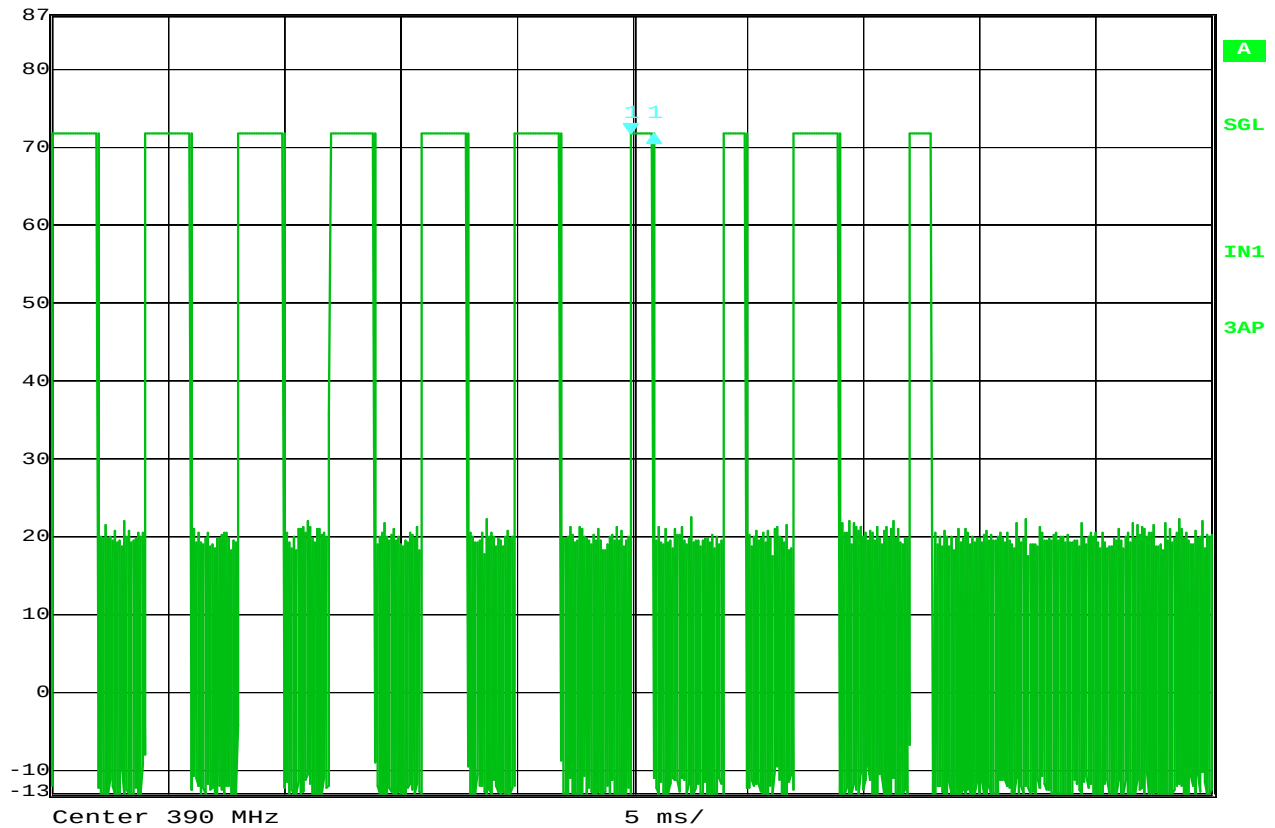
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : Sync pulse = 496.9μs
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 1.001854 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:26:22

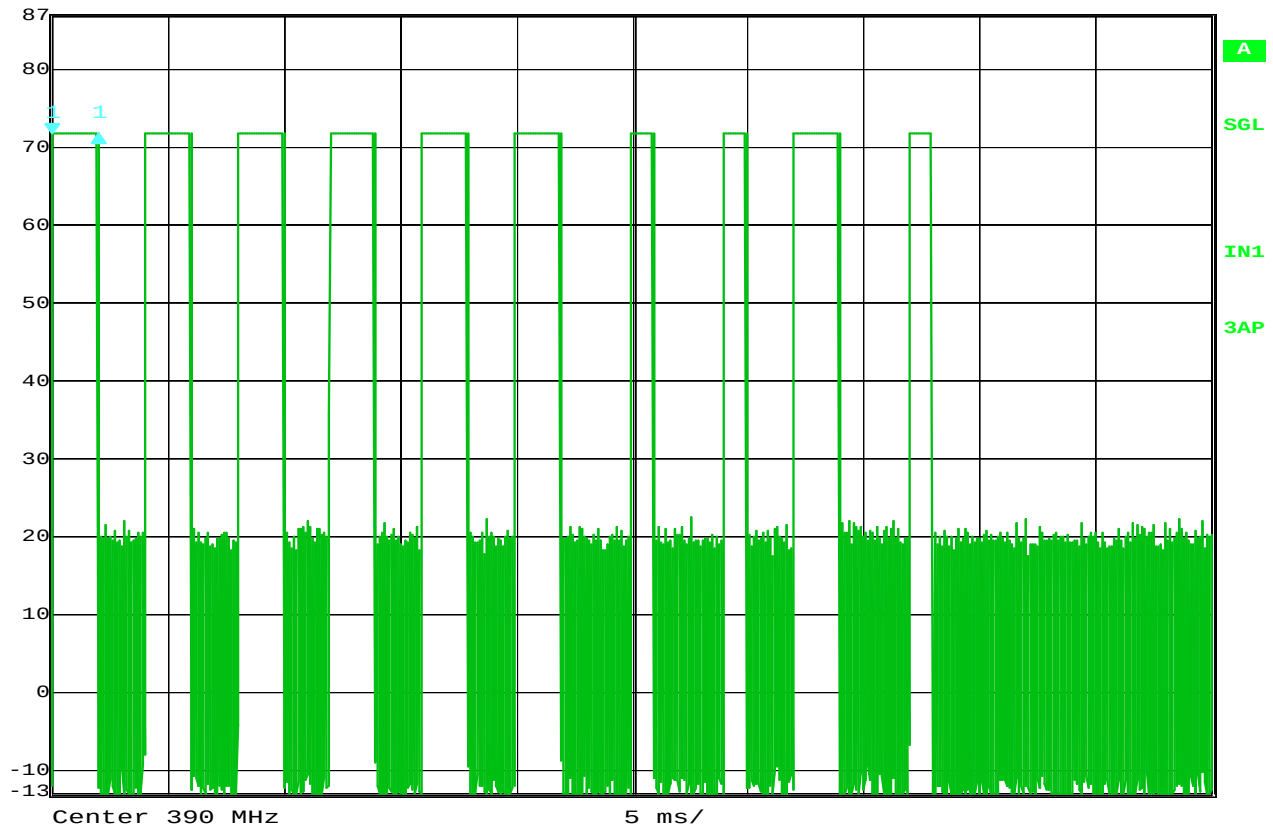
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : ON Pulse = 1mS
NOTES : Button 14

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 2.003858 ms SWT 50 ms Unit dBμV

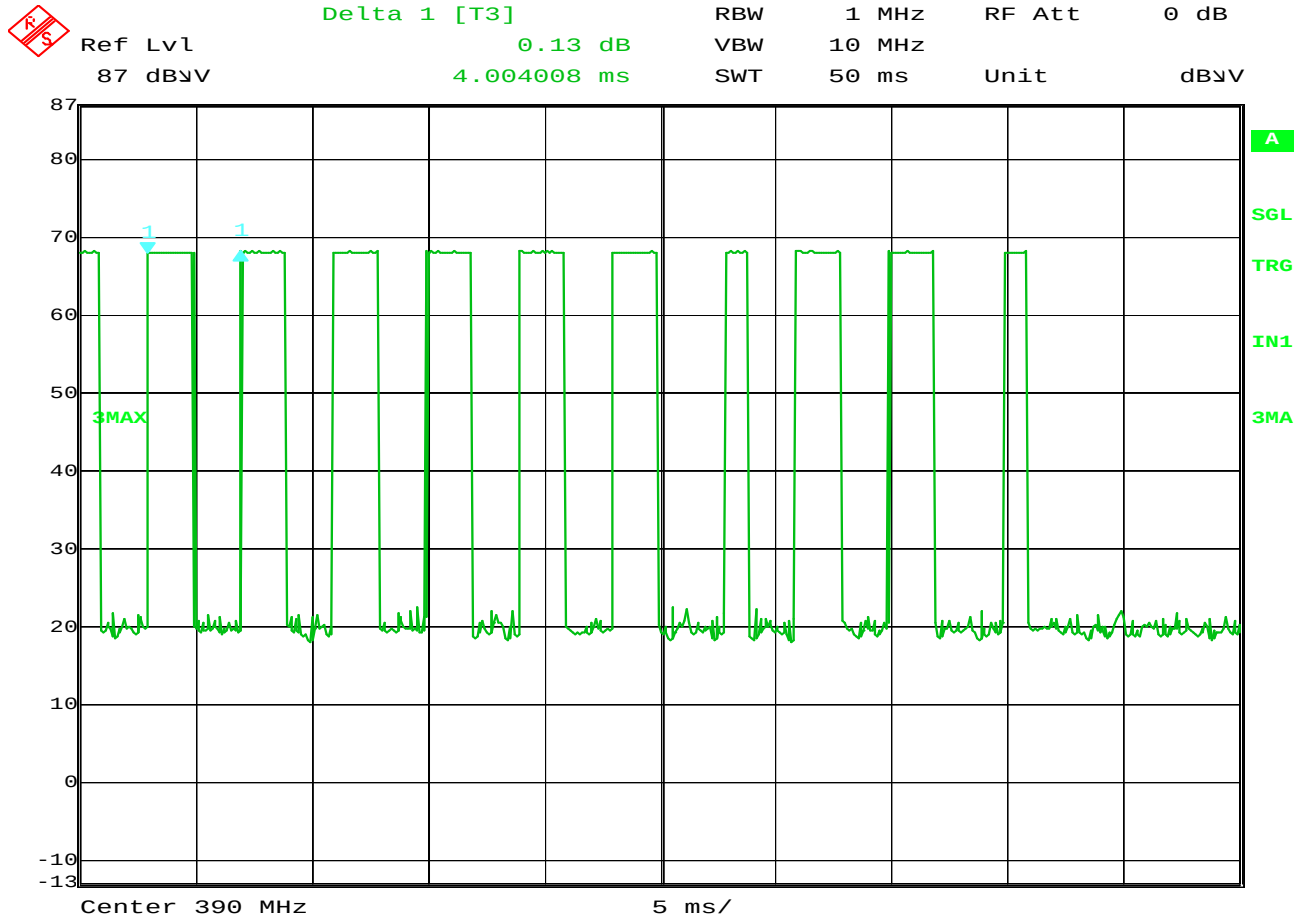


Date: 2.MAY.2016 14:20:57

FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 7 Position DIP Switch
NOTES : $DC = 20\log(25/83) = -10.4\text{dB}$
NOTES : ON Pulse = 2mS
NOTES : Button 14

NOTES



Date: 2.MAY.2016 14:49:01

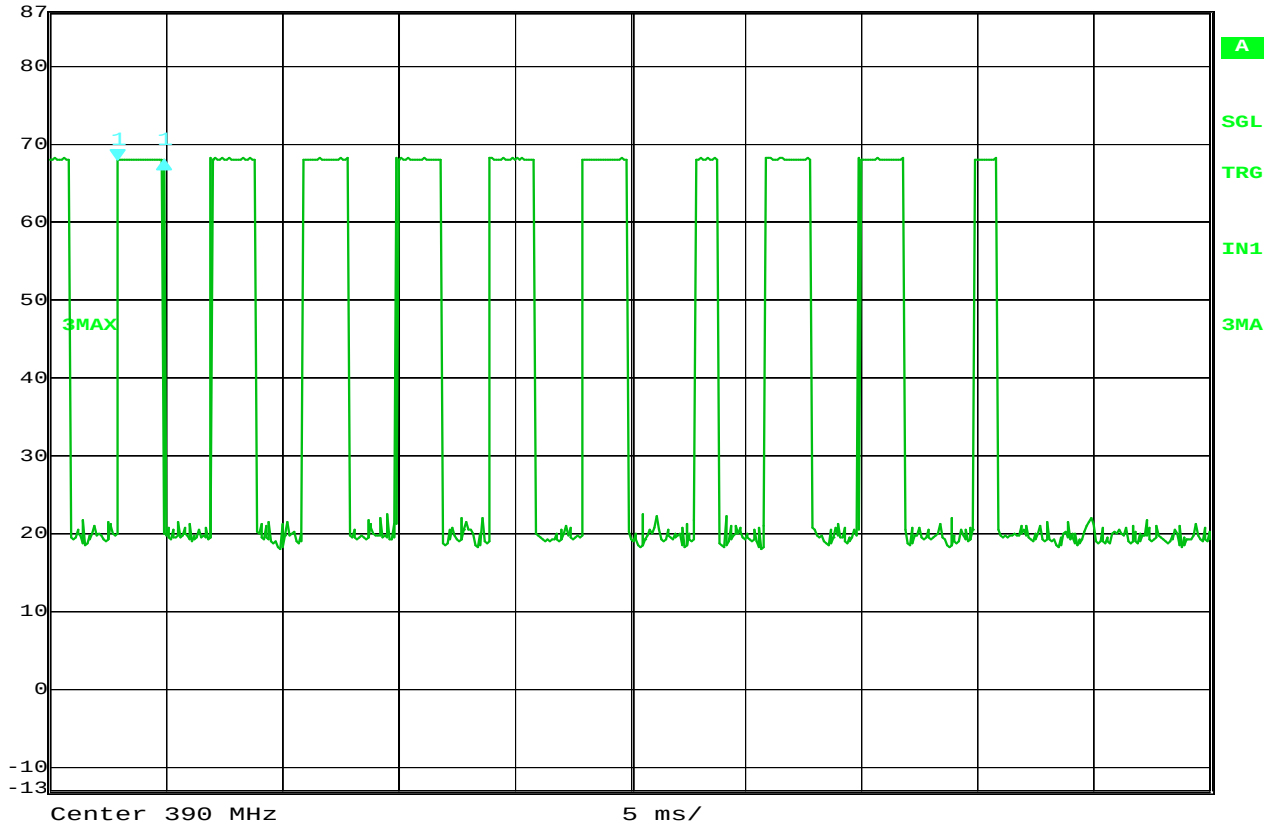
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 8 Position DIP Switch
 NOTES : $DC = 20\log(27/83) = -9.75\text{dB}$
 NOTES : ON + OFF pulse = 4mS
 NOTES : Button 15

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl 0.00 dB VBW 10 MHz
 87 dBμV 2.000000 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:43:37

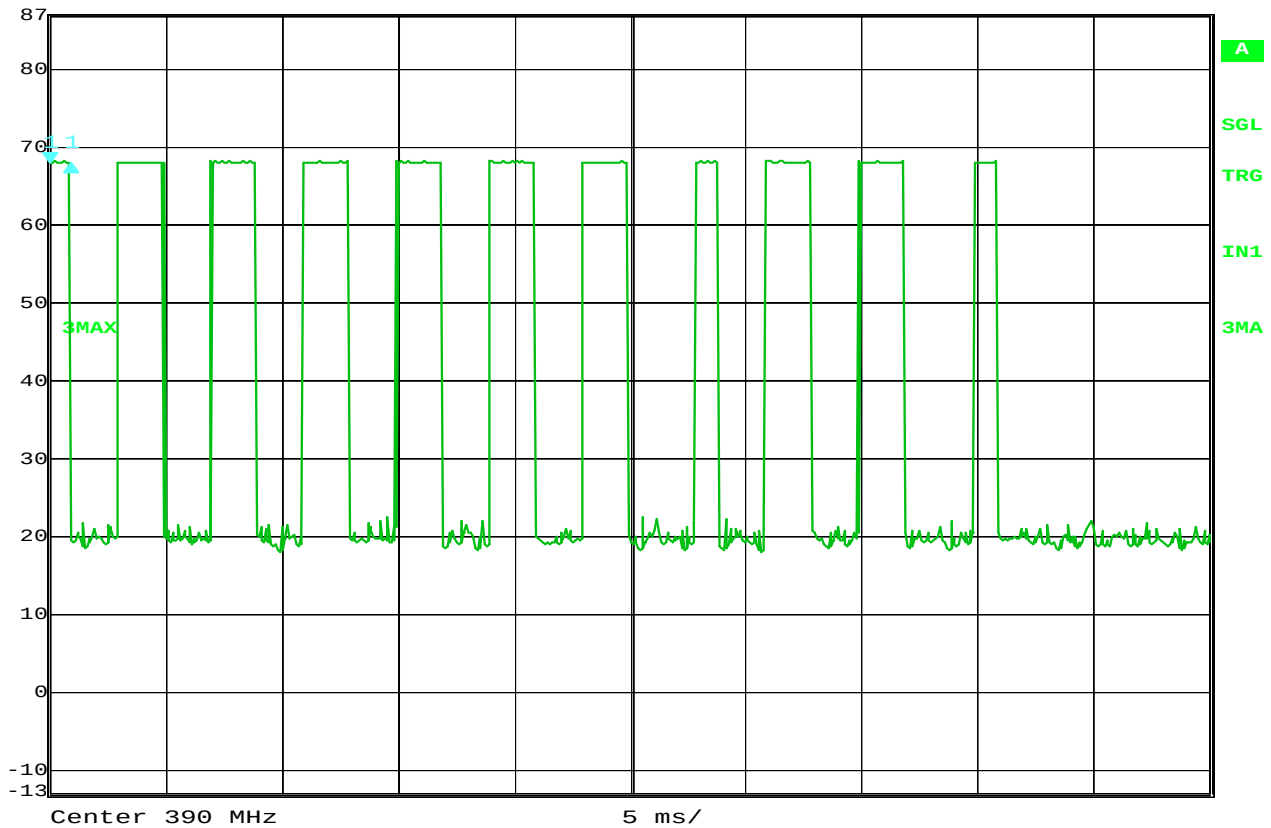
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 8 Position DIP Switch
 NOTES : $DC = 20\log(27/83) = -9.75\text{dB}$
 NOTES : ON pulse = 2mS
 NOTES : Button 15

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl 0.00 dB VBW 10 MHz
 87 dBμV 897.795591 μs SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:39:56

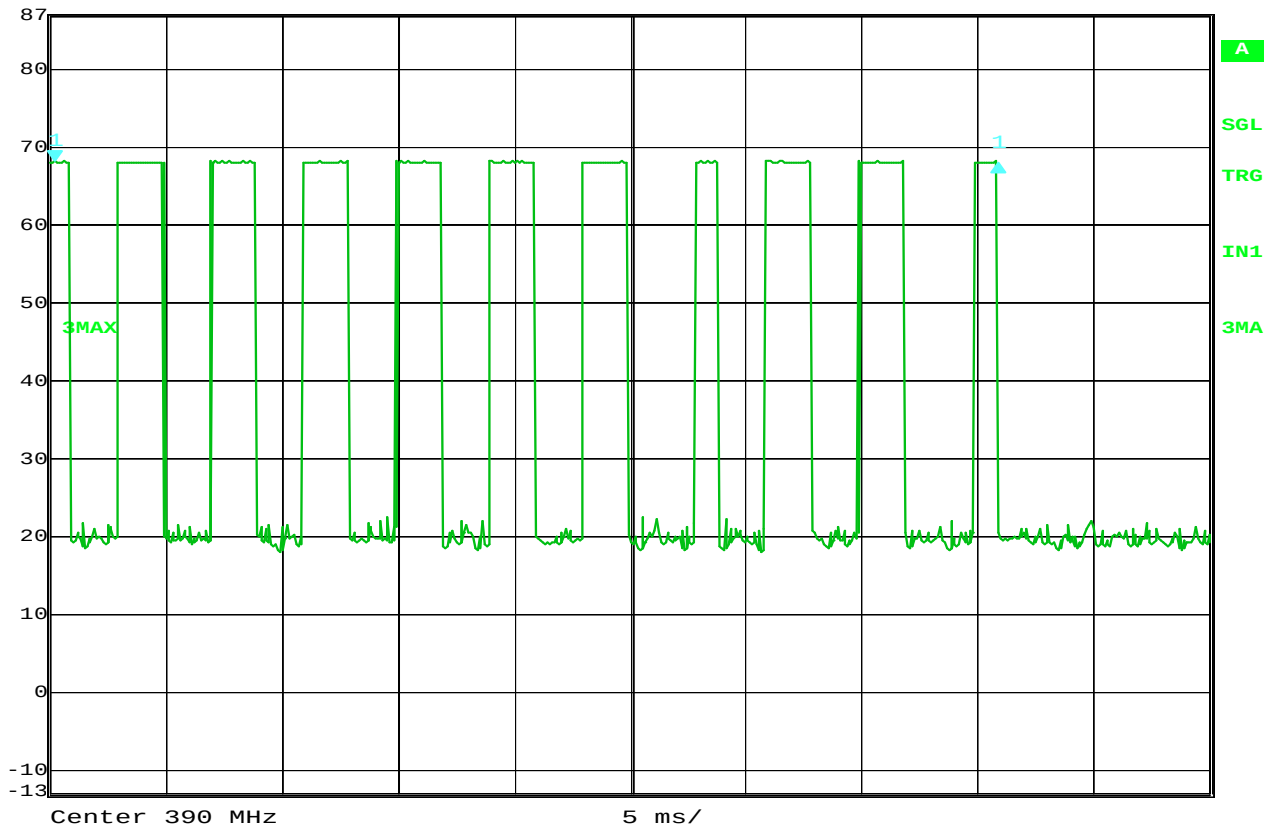
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 8 Position DIP Switch
 NOTES : $DC = 20\log(27/83) = -9.75\text{dB}$
 NOTES : Sync pulse = 897.8μs
 NOTES : Button 15

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl -0.13 dB VBW 10 MHz
 87 dBμV 40.677355 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 14:51:41

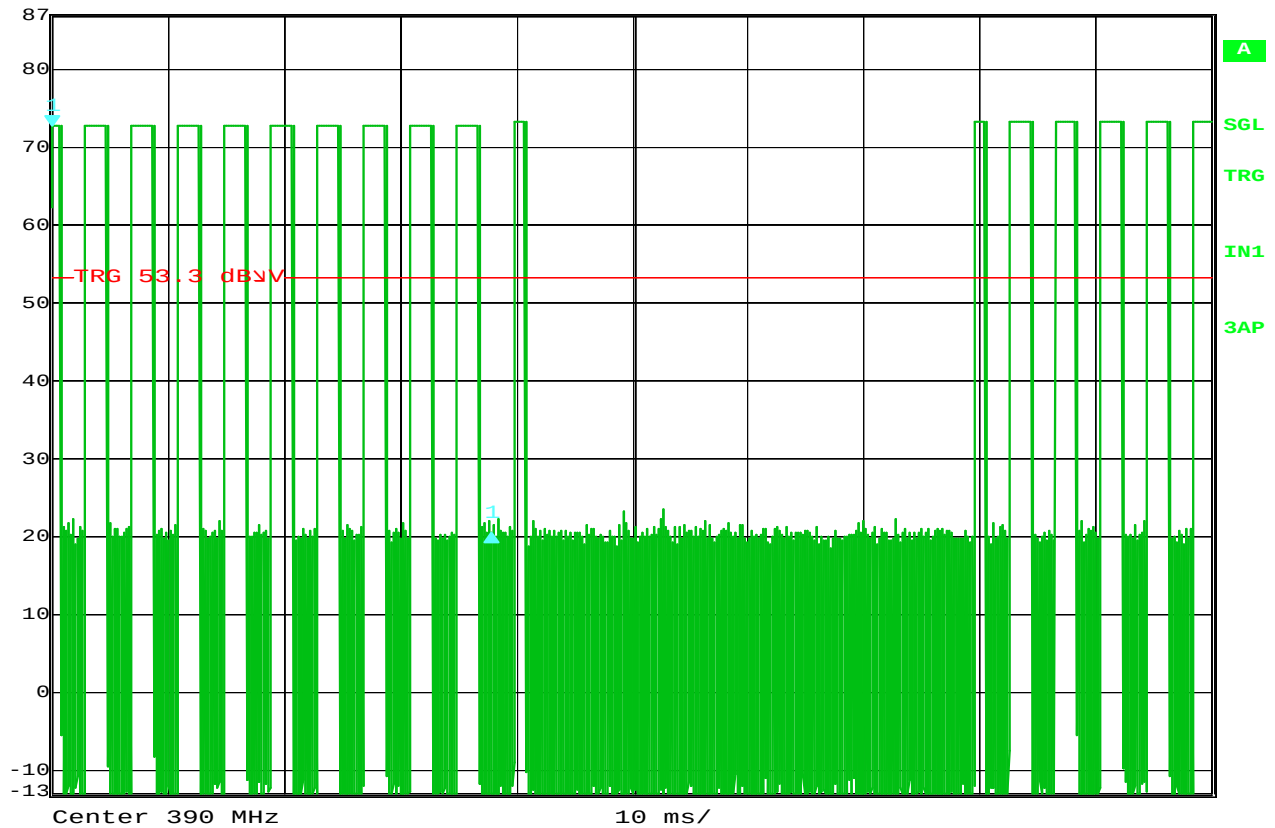
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 8 Position DIP Switch
 NOTES : $DC = 20\log(27/83) = -9.75\text{dB}$
 NOTES : pulse train = 40.6ms
 NOTES : Button 15

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl -52.33 dB VBW 10 MHz
87 dBμV 37.855711 ms SWT 100 ms Unit dBμV



Date: 2.MAY.2016 15:07:01

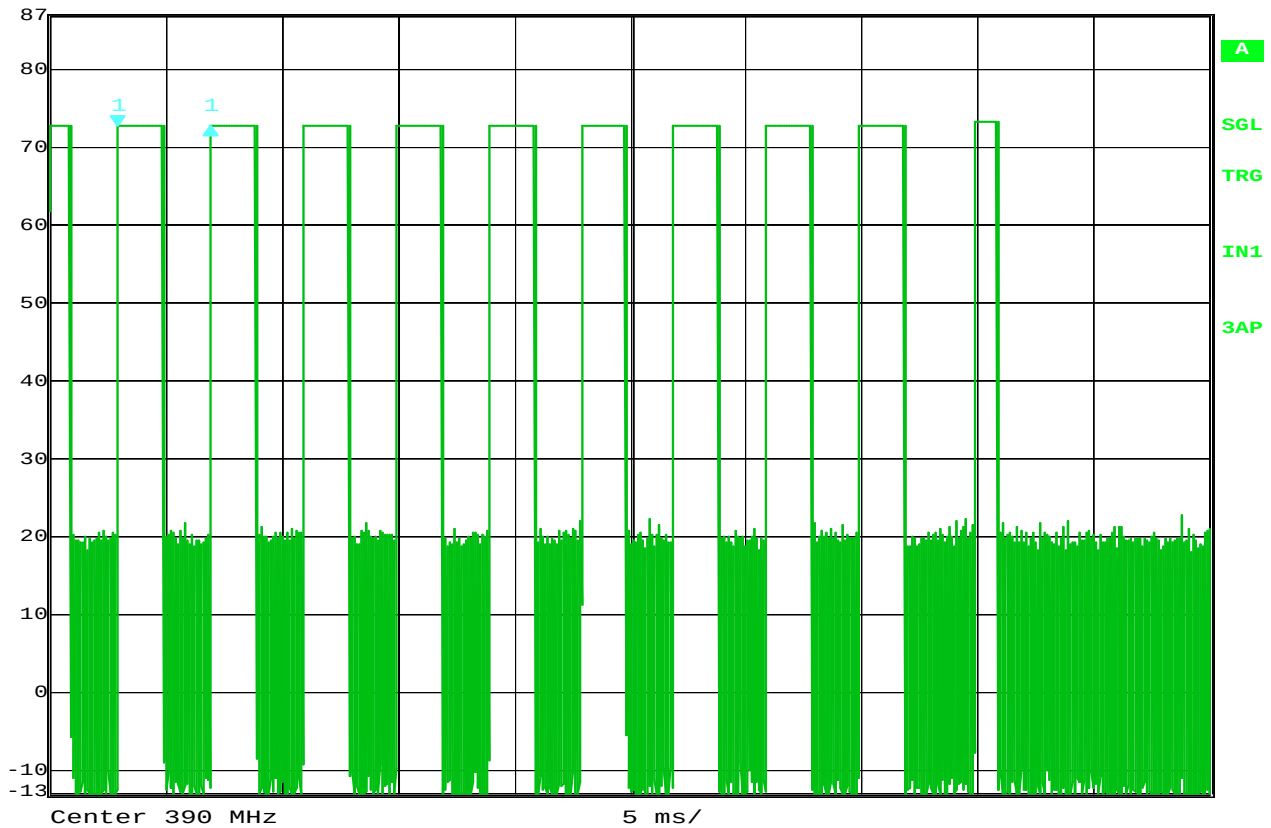
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 9 Position DIP Switch
NOTES : $DC = 20\log(29/83) = -9.13\text{dB}$
NOTES : Number of bits
NOTES : Button 17

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl 0.00 dB VBW 10 MHz
 87 dBμV 3.967936 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 15:12:01

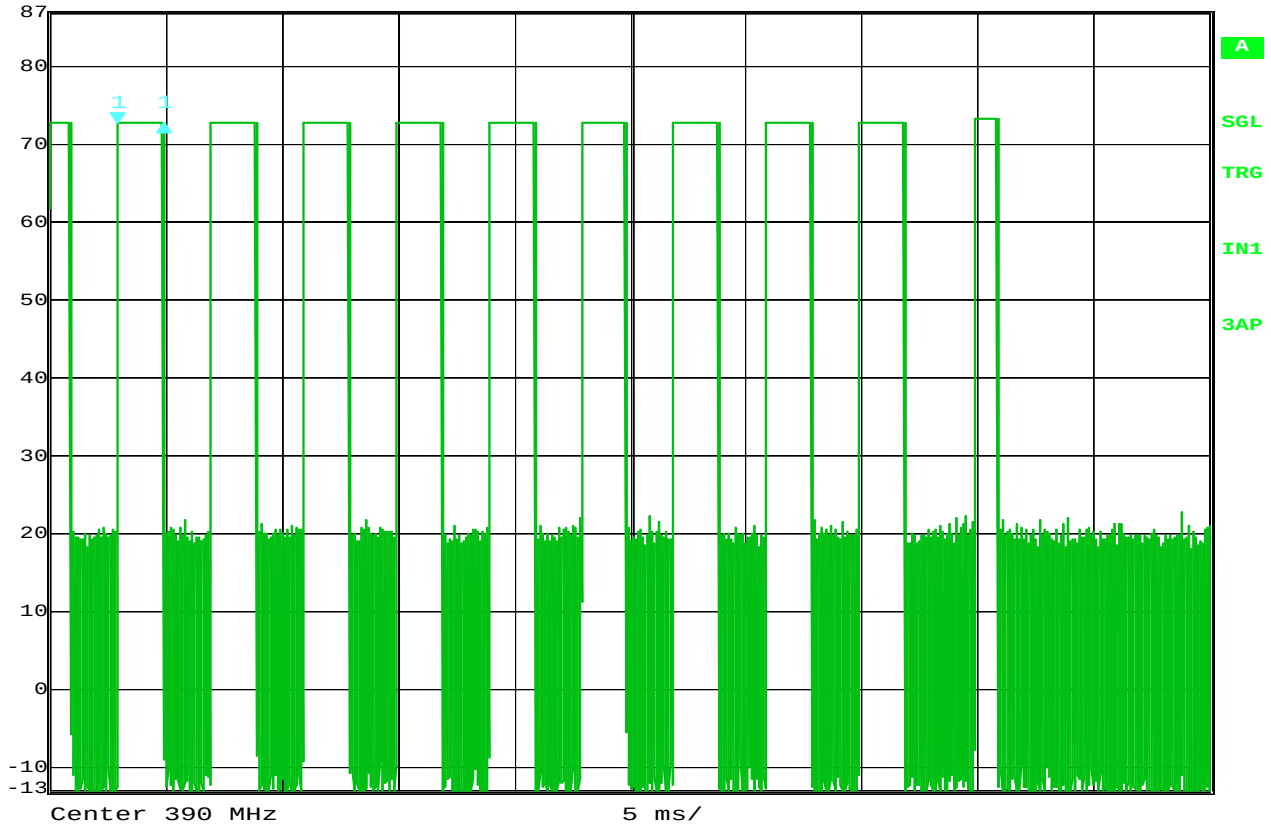
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 9 Position DIP Switch
 NOTES : $DC = 20\log(29/83) = -9.13\text{dB}$
 NOTES : ON + OFF bit = 3.96ms
 NOTES : Button 17

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.00 dB VBW 10 MHz
87 dBμV 1.963928 ms SWT 50 ms Unit dBμV



Date: 2.MAY.2016 15:15:12

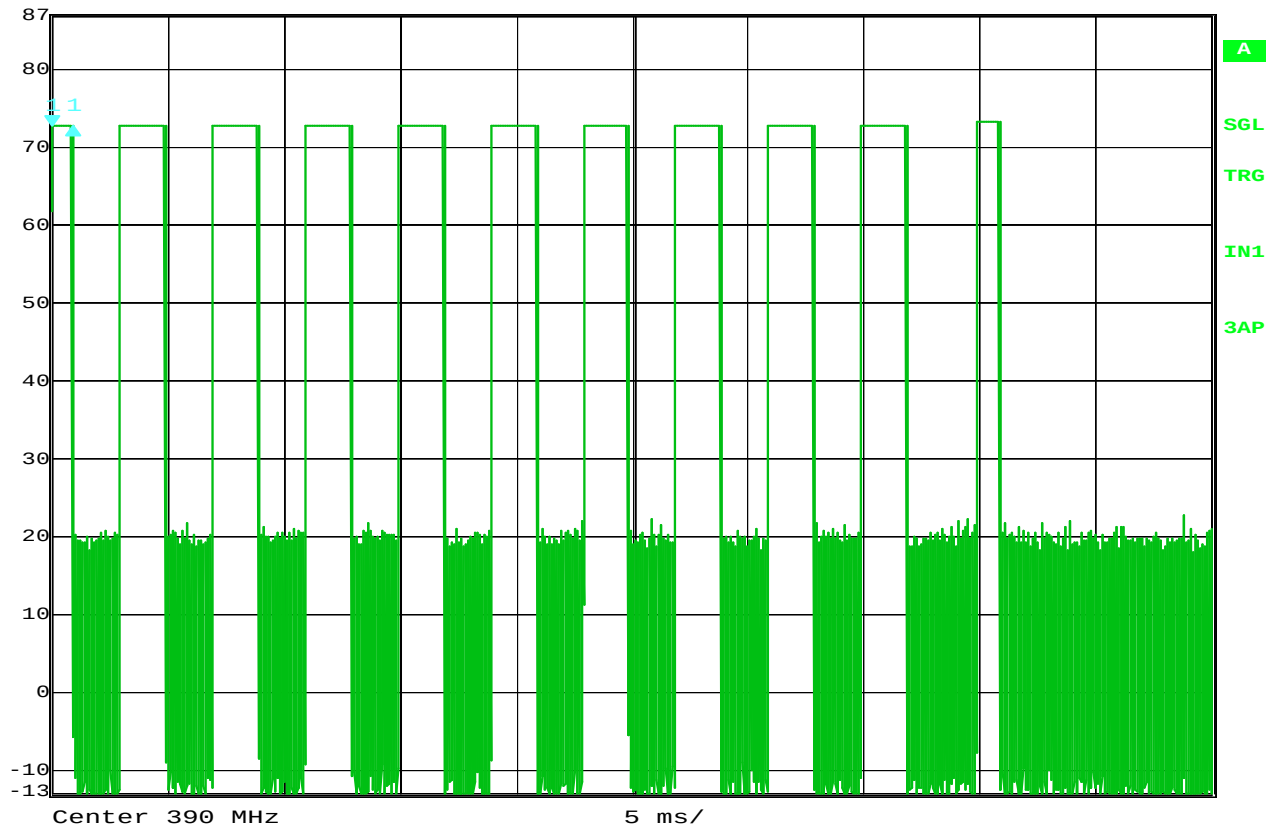
FCC 15C 15.35 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 9 Position DIP Switch
NOTES : $DC = 20\log(29/83) = -9.13\text{dB}$
NOTES : ON Pulse = 1.9mS
NOTES : Button 17

NOTES



Delta 1 [T3] RBW 1 MHz RF Att 0 dB
 Ref Lvl 0.00 dB VBW 10 MHz
 87 dBμV 861.723447 μs SWT 50 ms Unit dBμV



Date: 2.MAY.2016 15:10:41

FCC 15C 15.35 / Duty Cycle

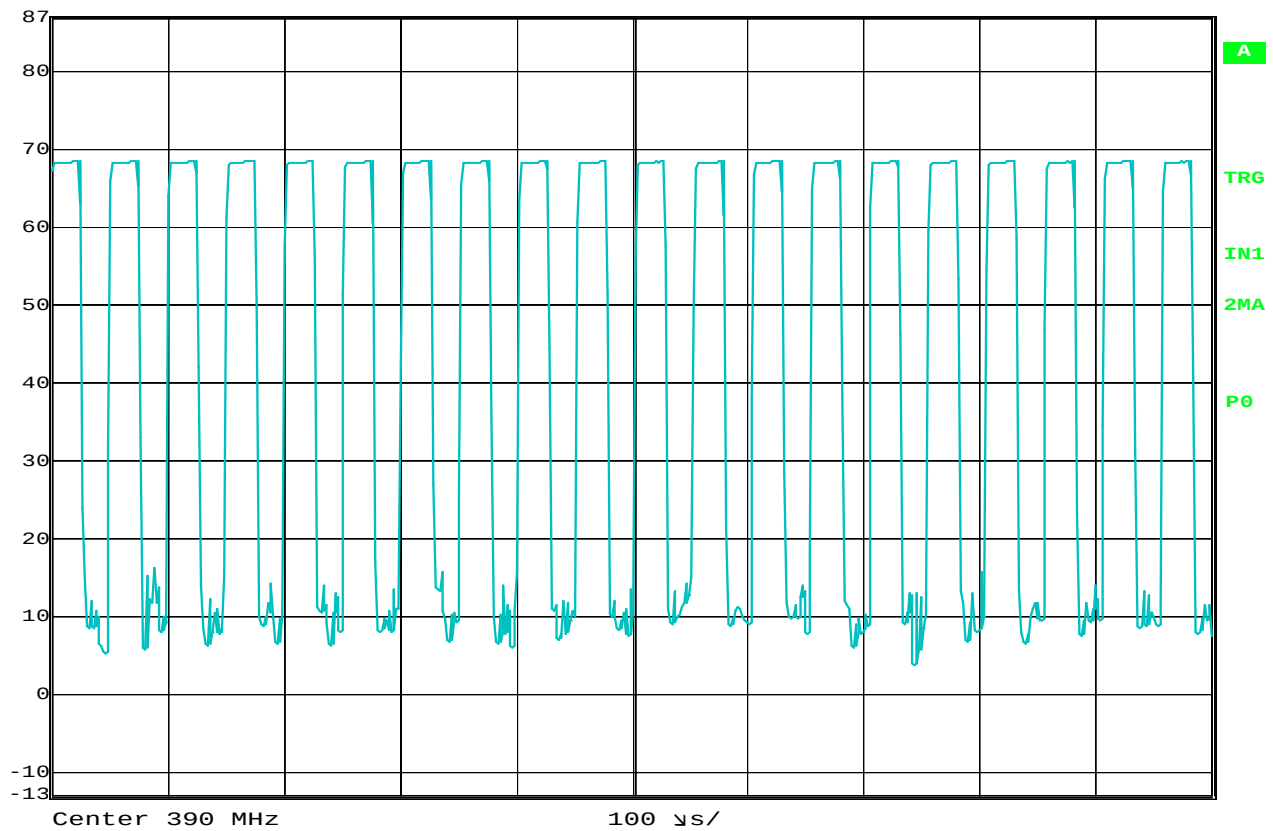
MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 390MHz
 : Peak detector
 NOTES : Duty Cycle
 NOTES : Chamberlain 9 Position DIP Switch
 NOTES : $DC = 20\log(29/83) = -9.13\text{dB}$
 NOTES : Sync bit = 861.7μs
 NOTES : Button 17

NOTES



Ref Lvl
87 dBμV

RBW 1 MHz RF Att 0 dB
VBW 10 MHz
SWT 1 ms Unit dBμV



Date: 23.JUN.2016 16:16:52

FCC 15C 15.231 / Duty Cycle

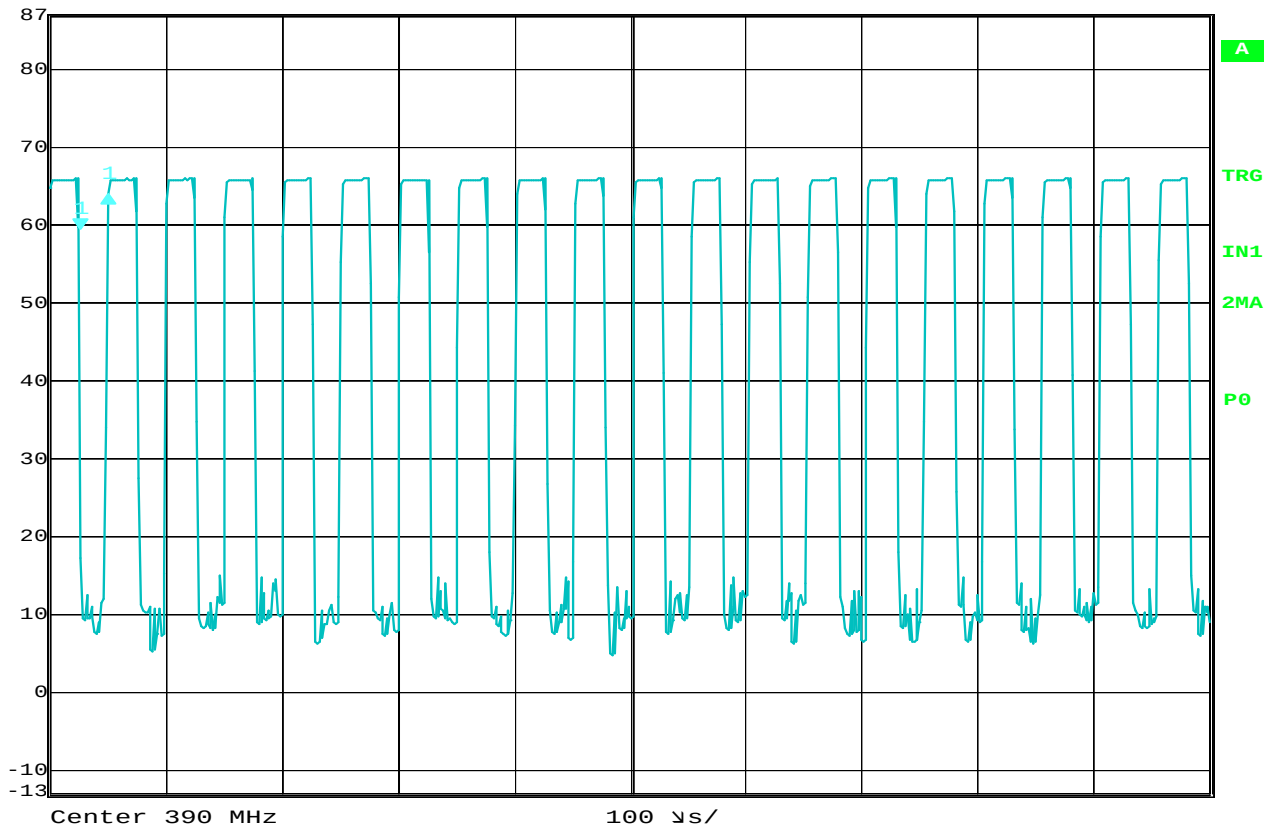
MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
NOTES: : PEAK DETECTOR
: Button 18

NOTES



Delta 1 [T2]
Ref Lvl 4.45 dB
87 dBμV 24.048096 μs

RBW 1 MHz RF Att 0 dB
VBW 10 MHz
SWT 1 ms Unit dBμV



Date: 23.JUN.2016 16:45:42

FCC 15C 15.231 / Off Time

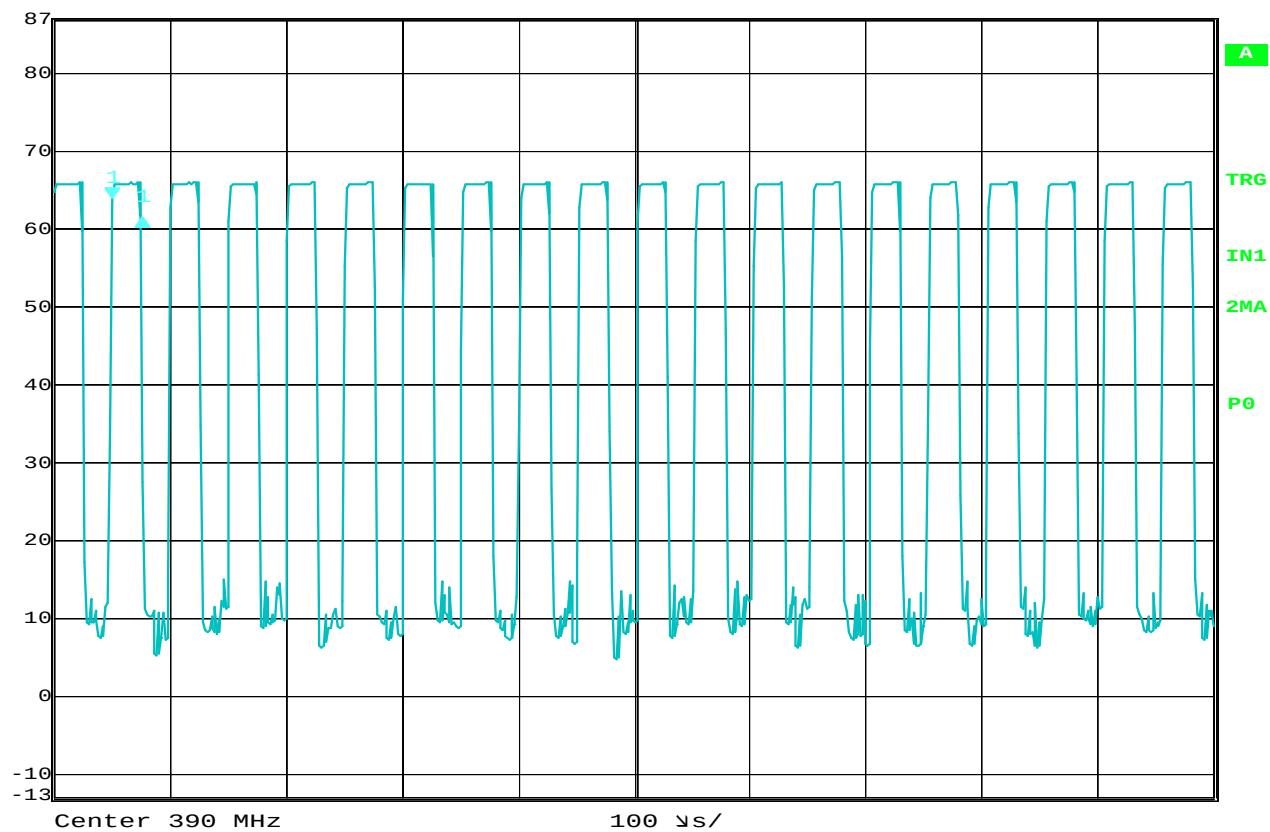
MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 18

NOTES



Delta 1 [T2]
Ref Lvl -2.44 dB
87 dBμV 26.052104 μs

RBW 1 MHz RF Att 0 dB
VBW 10 MHz
SWT 1 ms Unit dBμV



Date: 23.JUN.2016 16:48:19

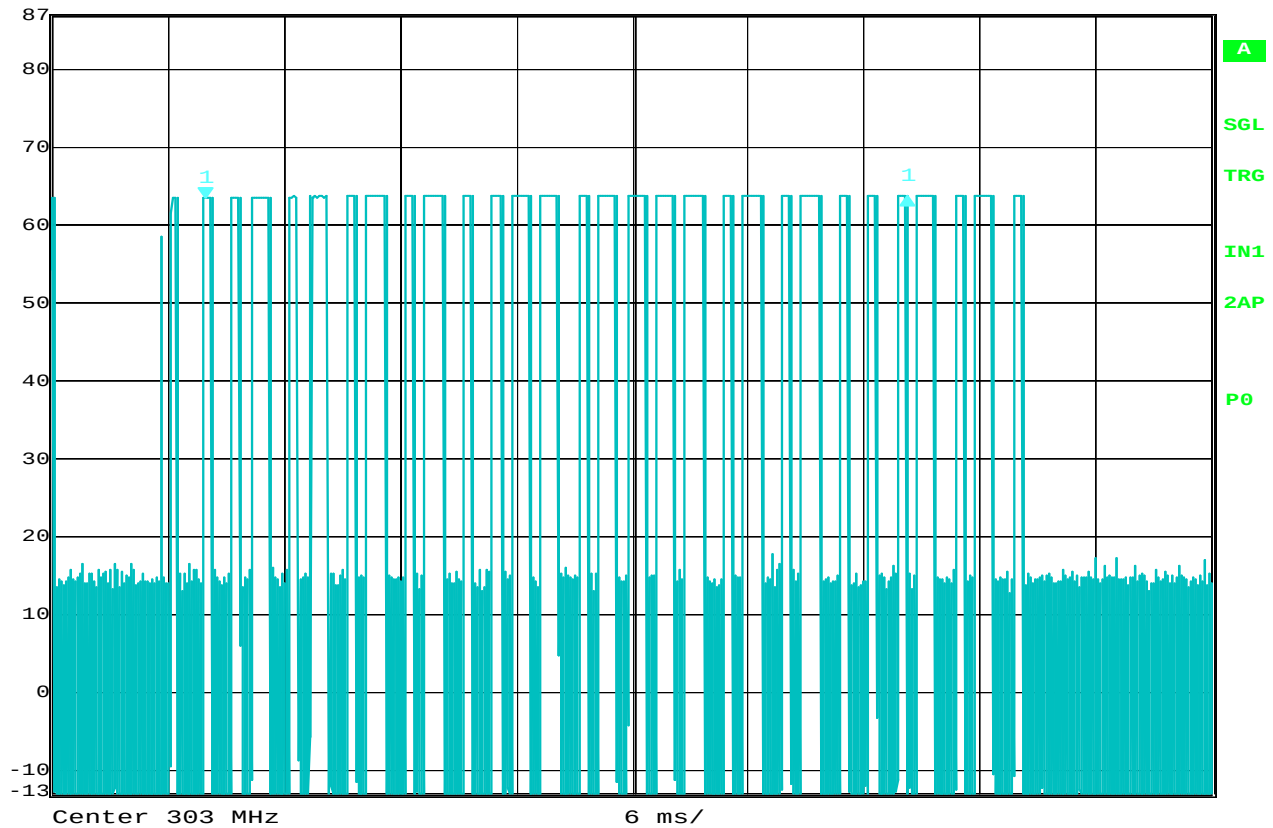
FCC 15C 15.231 / Pulse Width

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 390MHz
: PEAK DETECTOR
NOTES: : Button 18

NOTES



Delta 1 [T2] RBW 1 MHz RF Att 0 dB
Ref Lvl 0.26 dB VBW 10 MHz
87 dBμV 36.312625 ms SWT 60 ms Unit dBμV



Date: 23.JUN.2016 17:29:20

FCC 15C 15.231 / Pulse Width

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 303MHz
: PEAK DETECTOR
NOTES: : Button 19

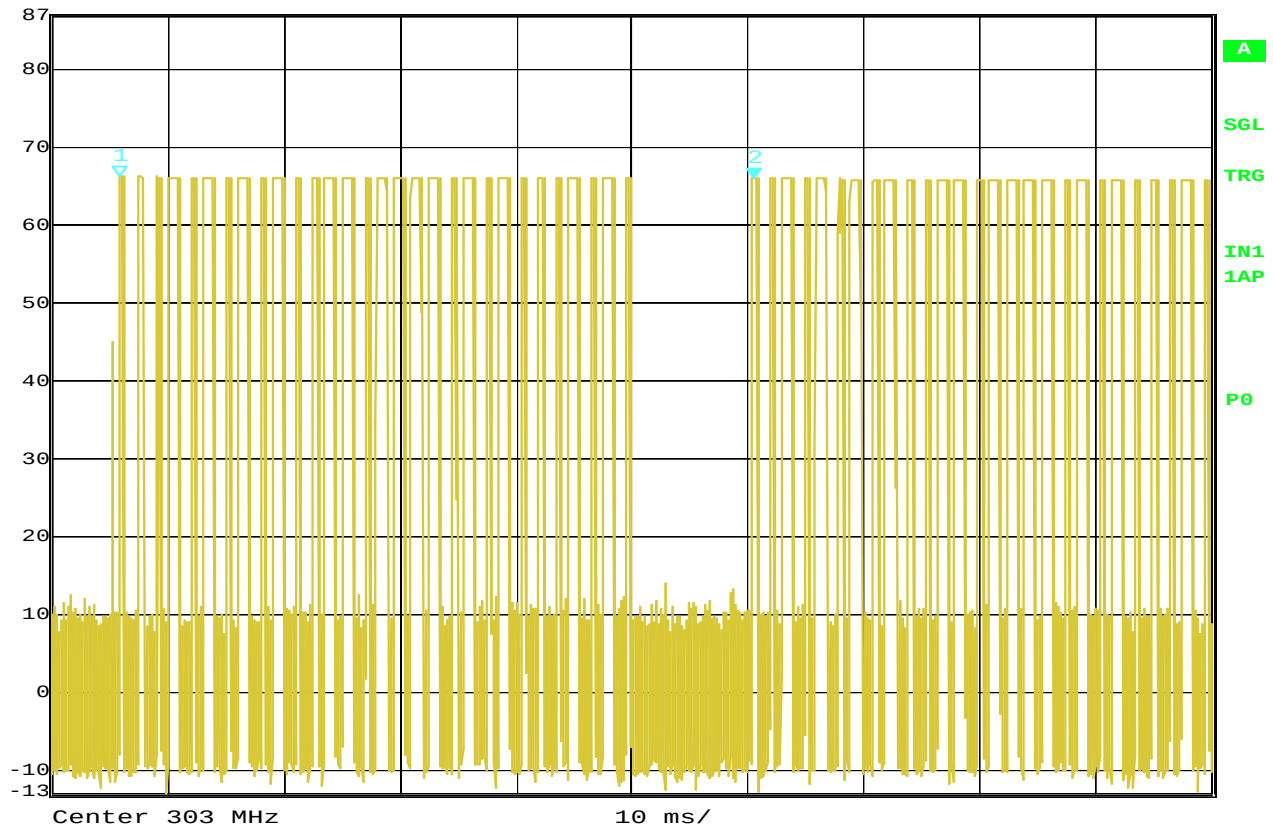
NOTES



Ref Lvl
87 dBμV

Marker 2 [T1]
65.99 dBμV
60.521242 ms

RBW 100 kHz RF Att 0 dB
VBW 1 MHz
SWT 100 ms Unit dBμV



Date: 21.JUN.2016 17:54:08

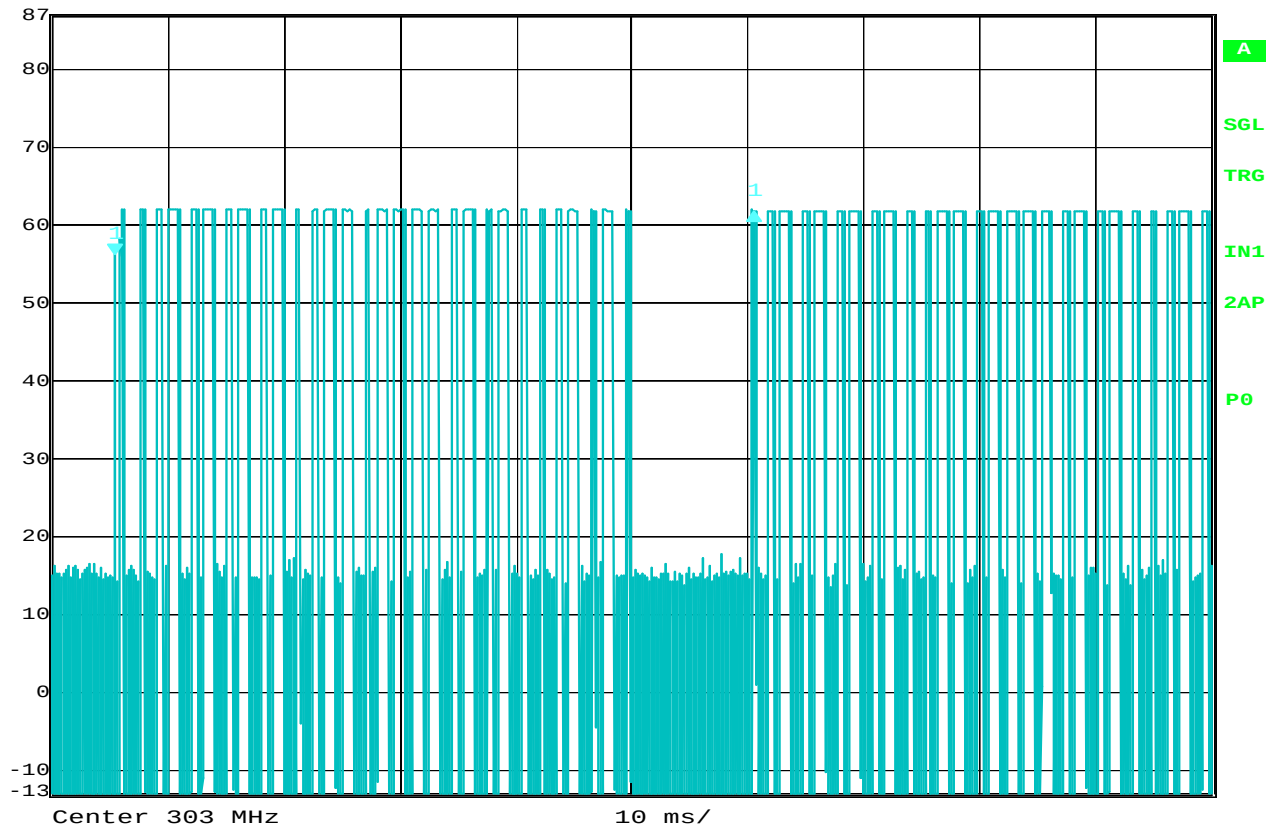
FCC 15C 15.231 / Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 303MHz
: PEAK DETECTOR
NOTES: : Button 19

NOTES



Delta 1 [T2] RBW 1 MHz RF Att 0 dB
Ref Lvl 5.49 dB VBW 10 MHz
87 dBμV 55.110220 ms SWT 100 ms Unit dBμV

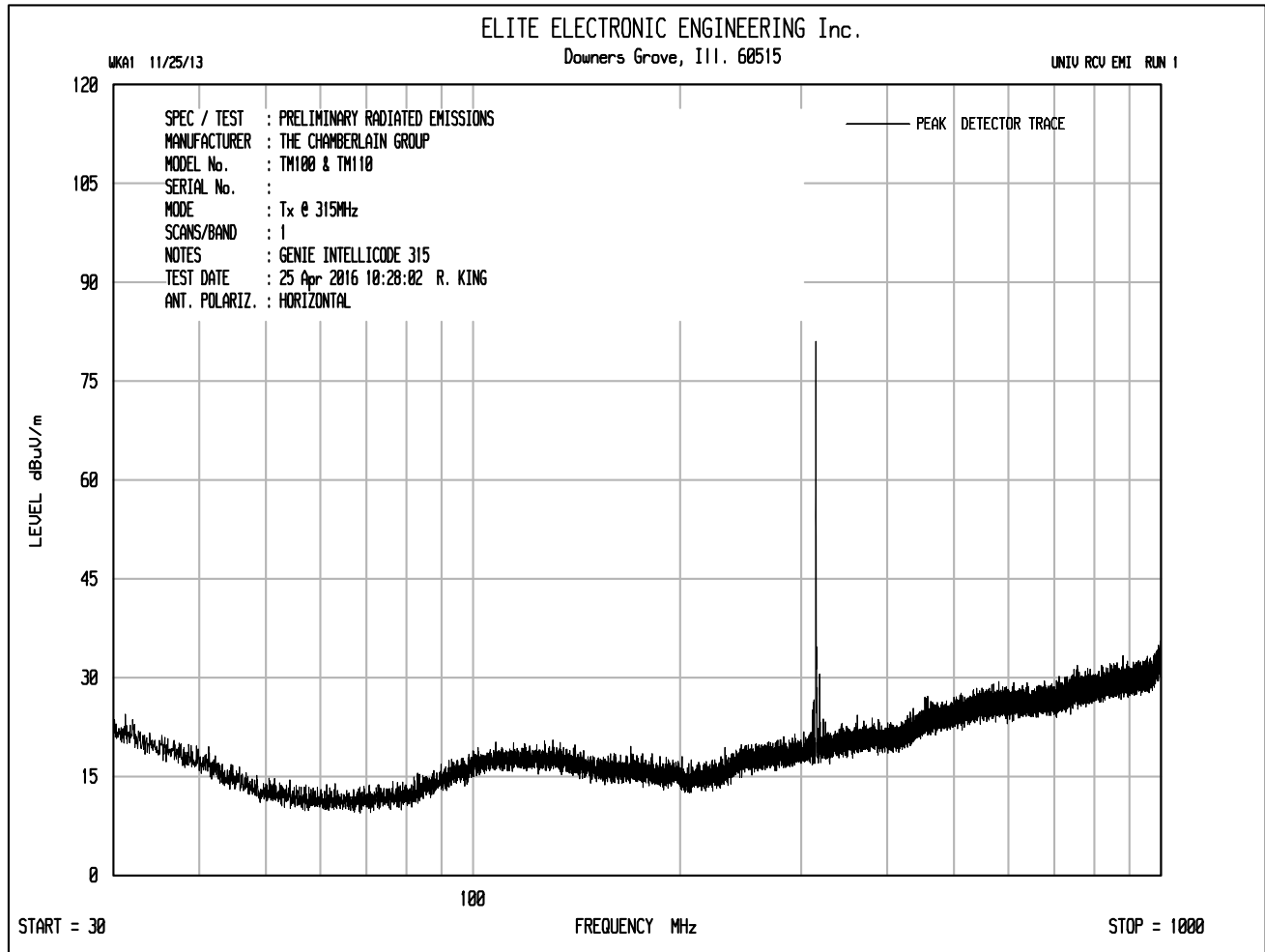


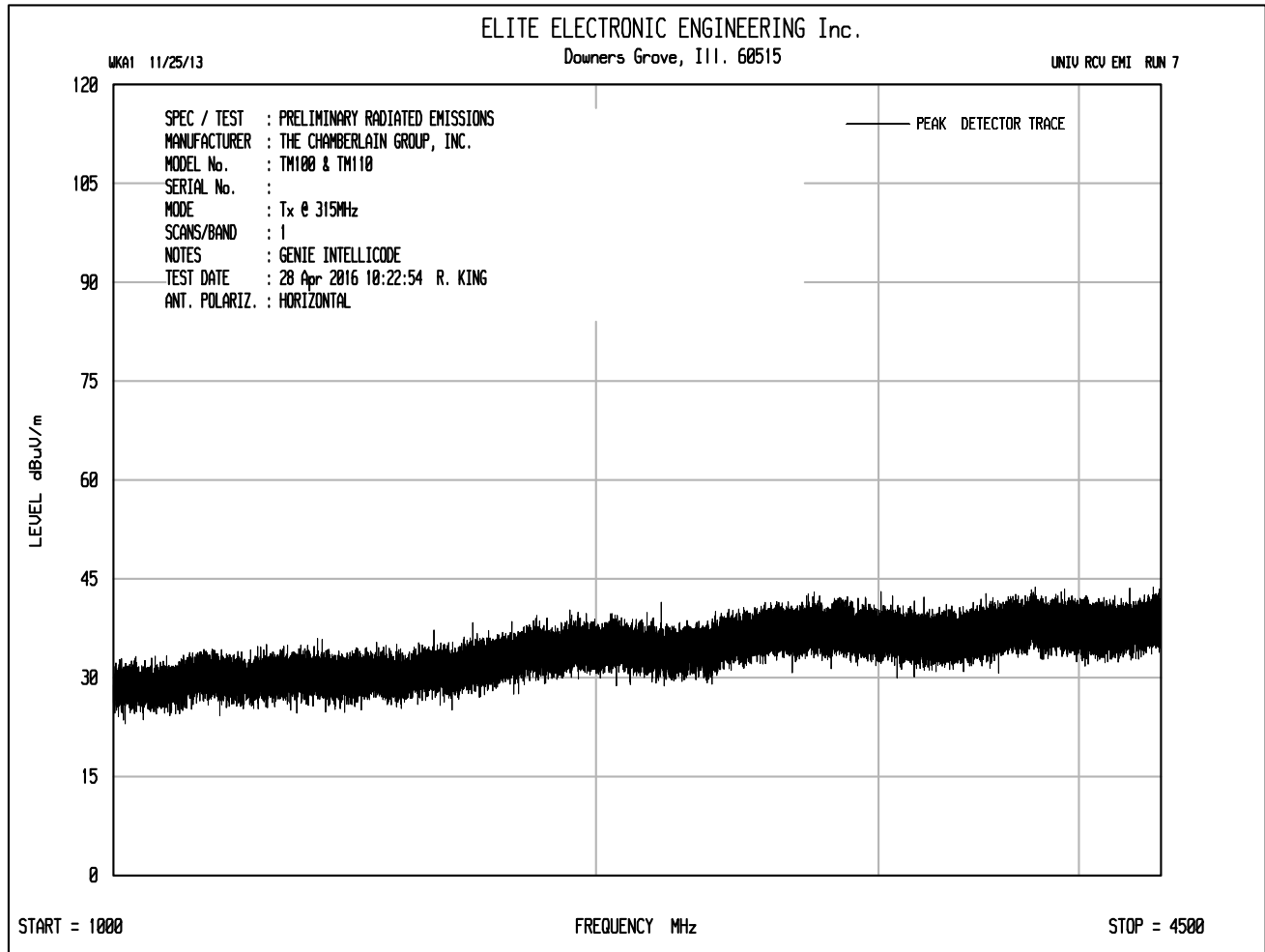
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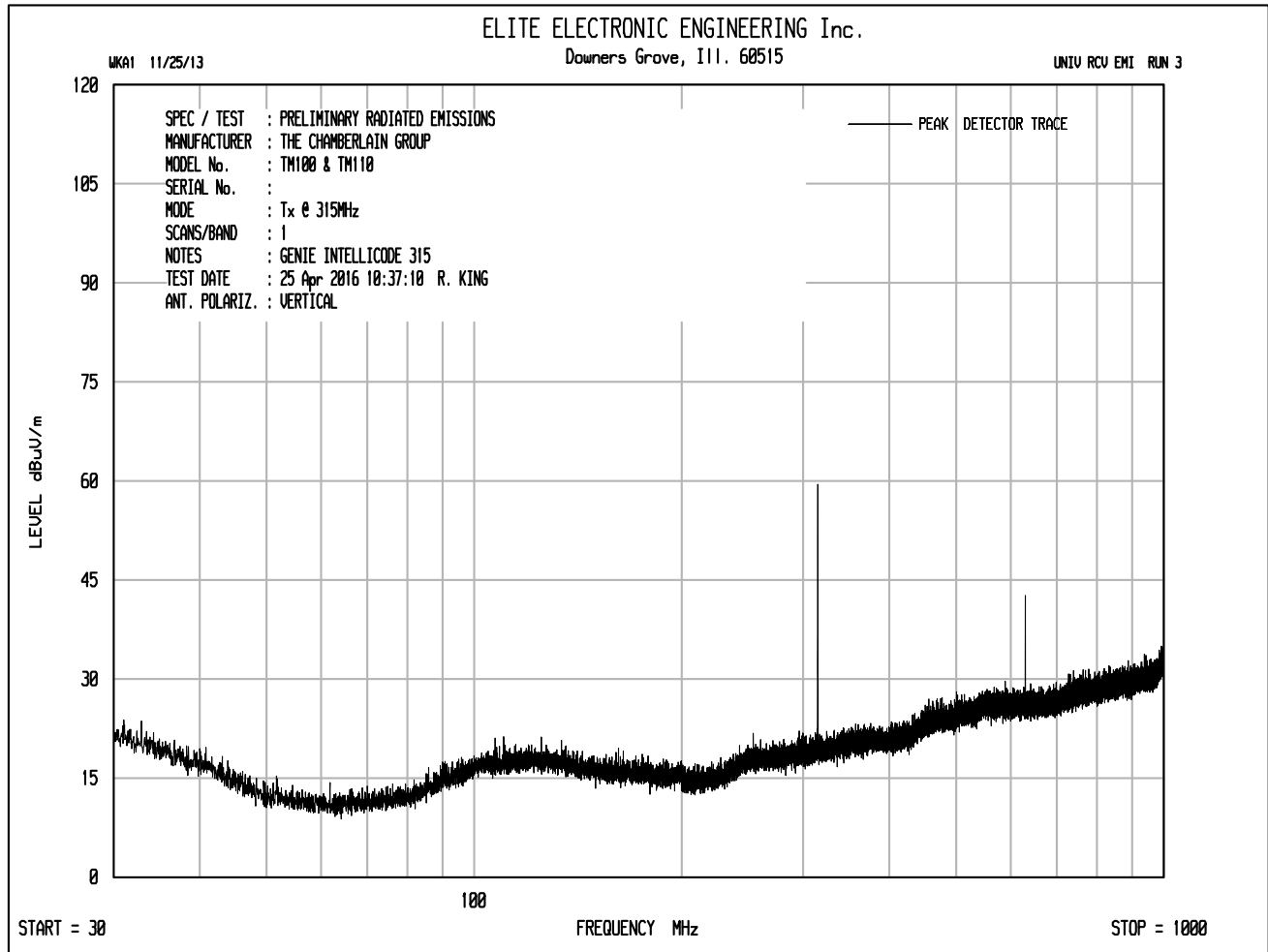
FCC 15C 15.231 / Pulse Width

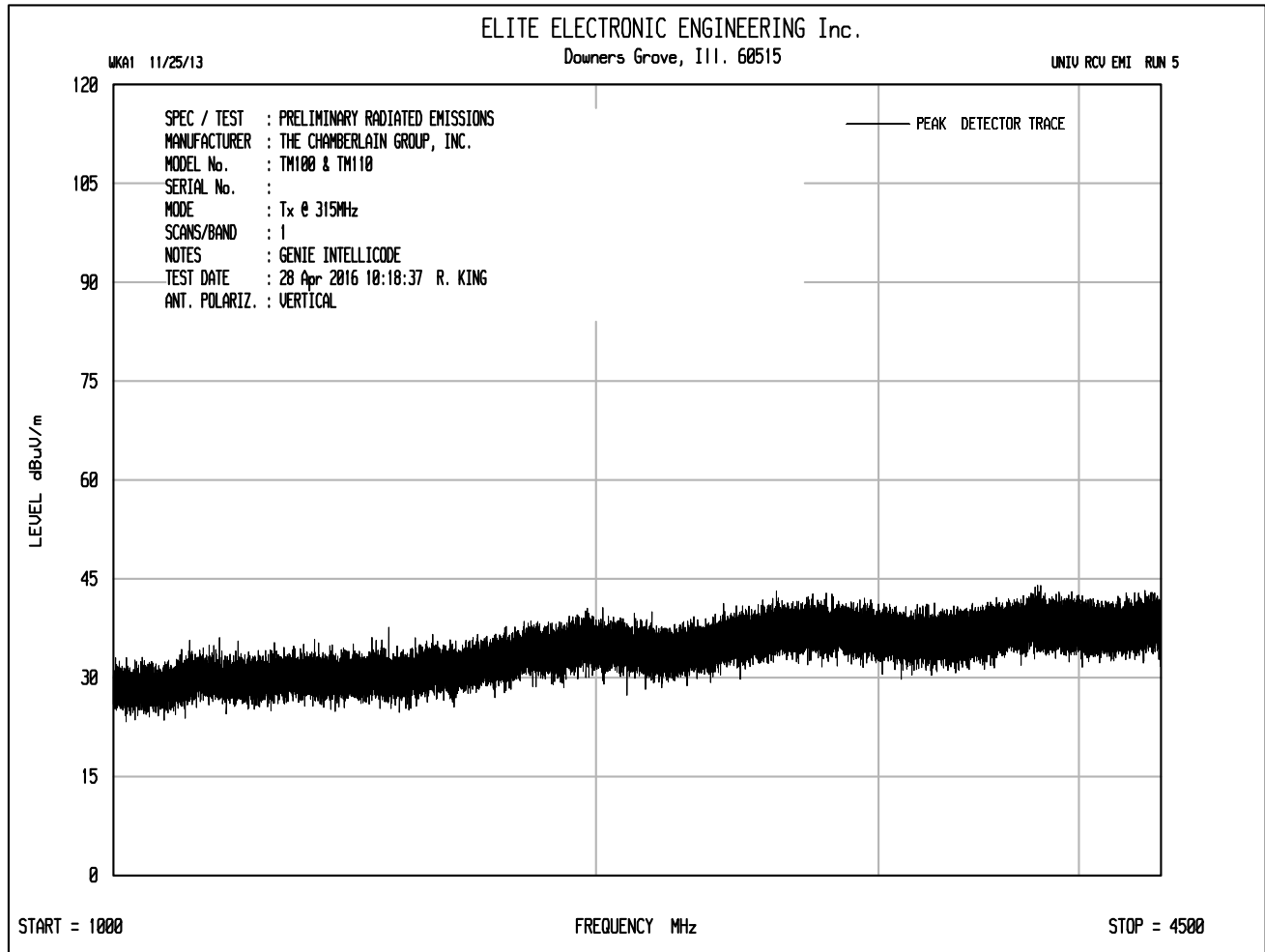
MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 303MHz
: PEAK DETECTOR
NOTES: : Button 19

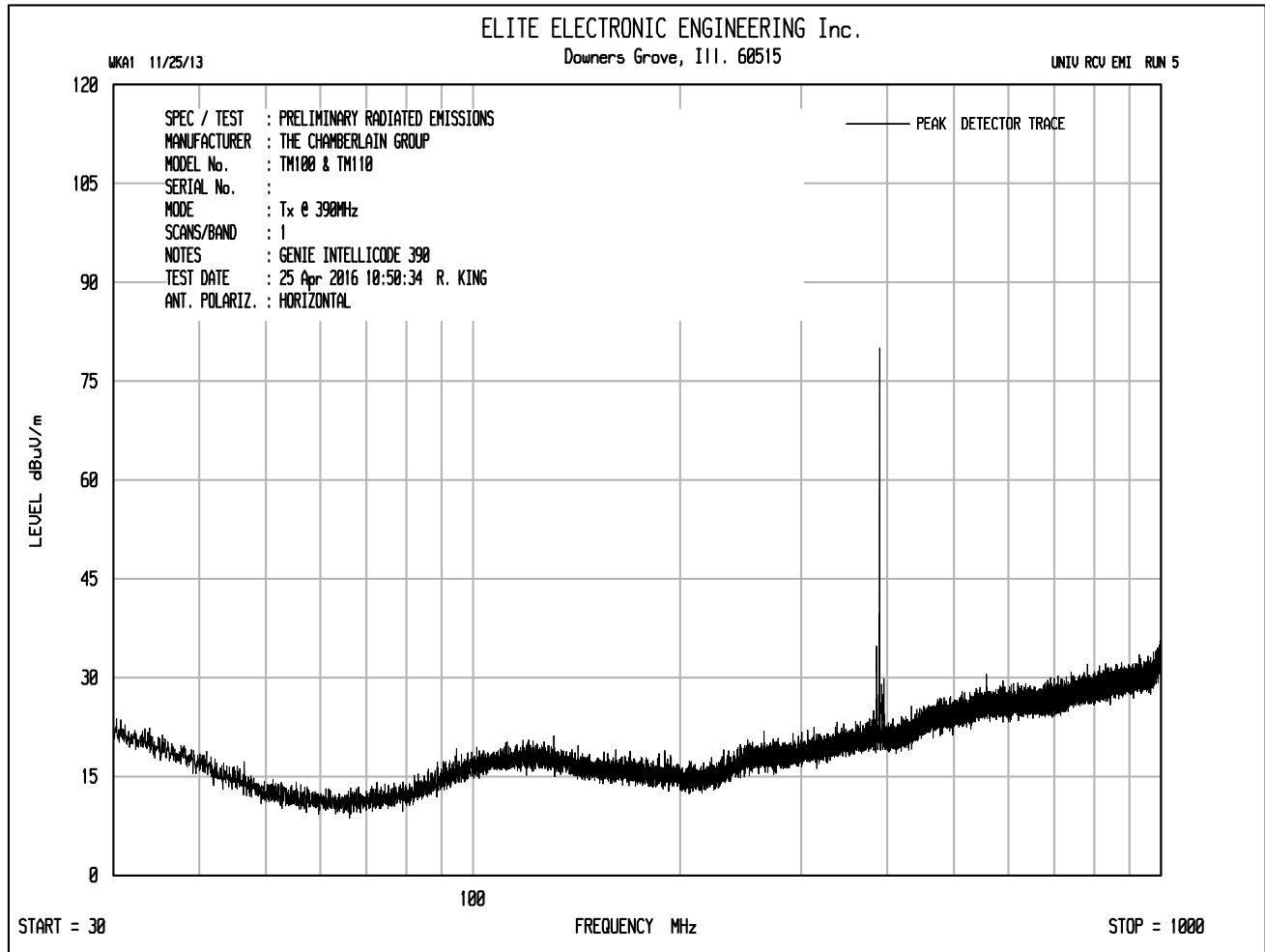
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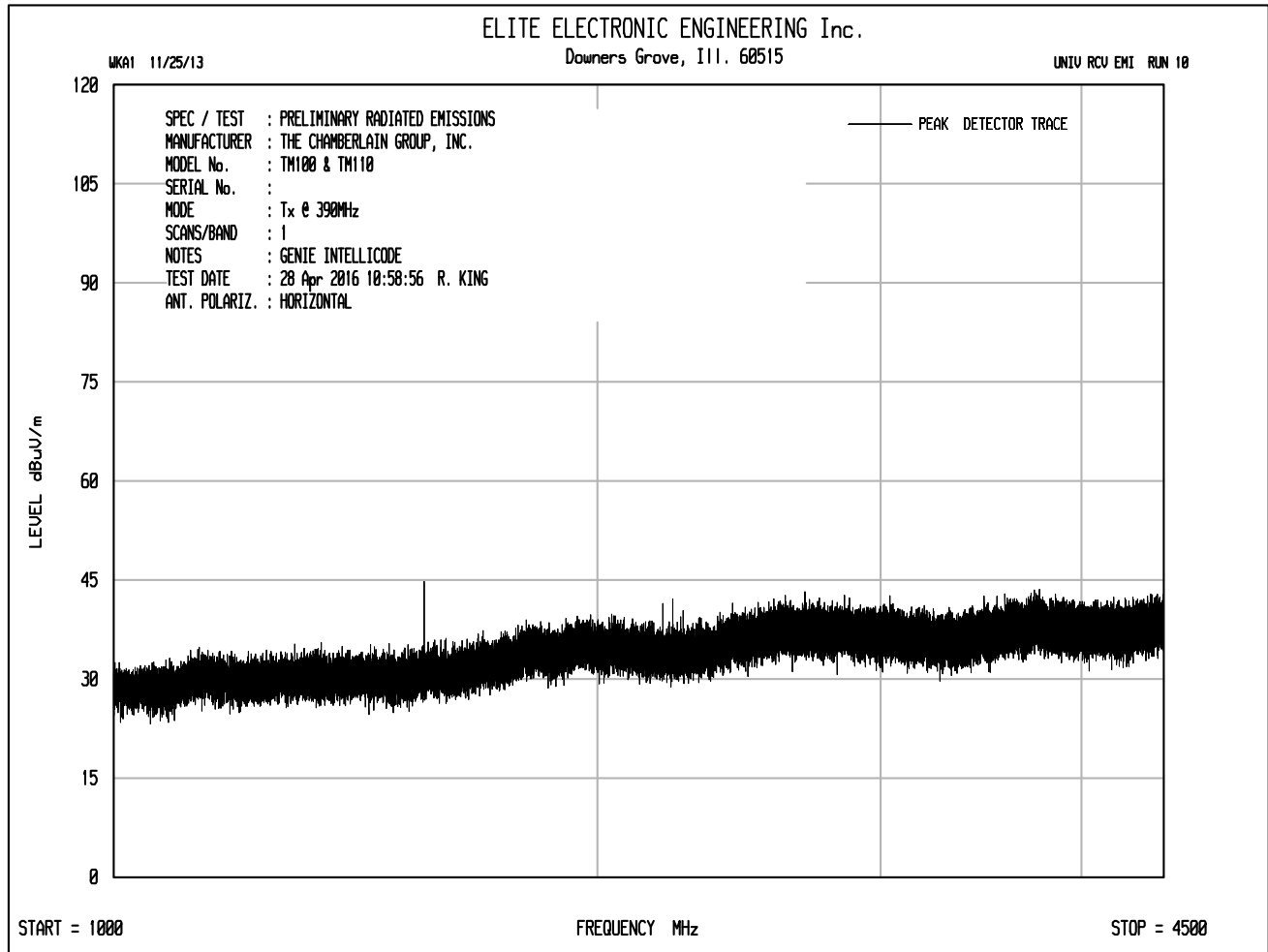


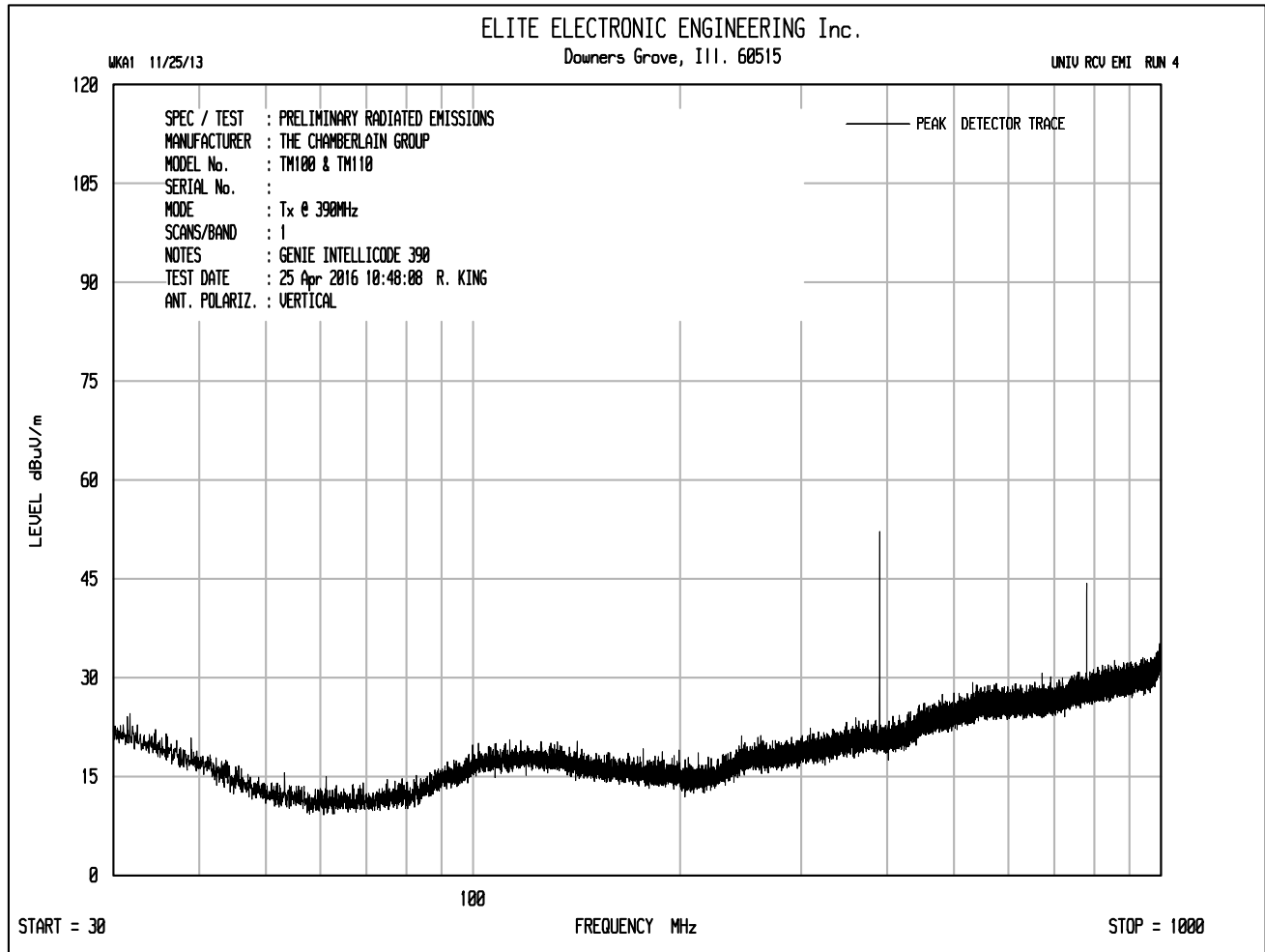


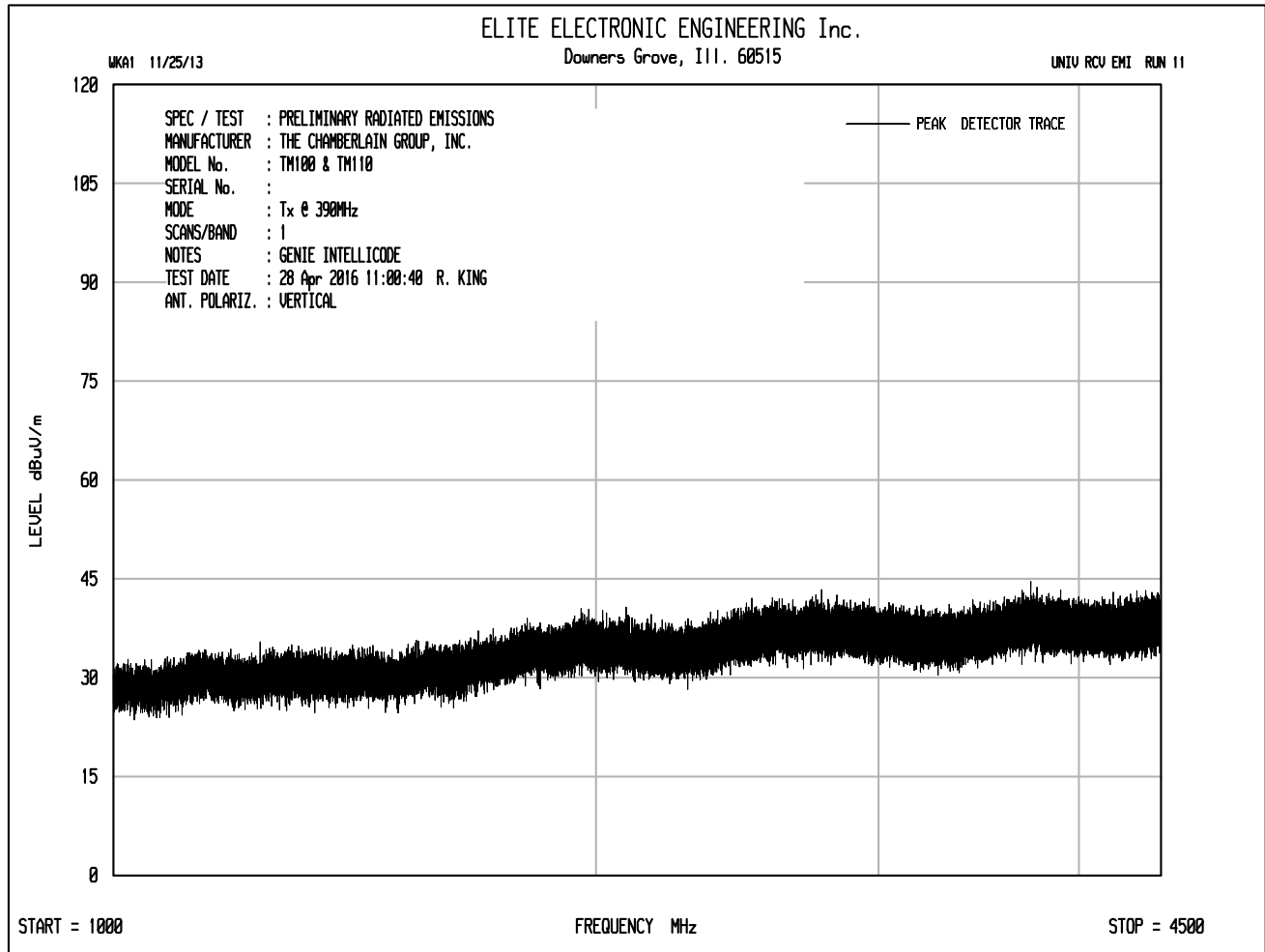


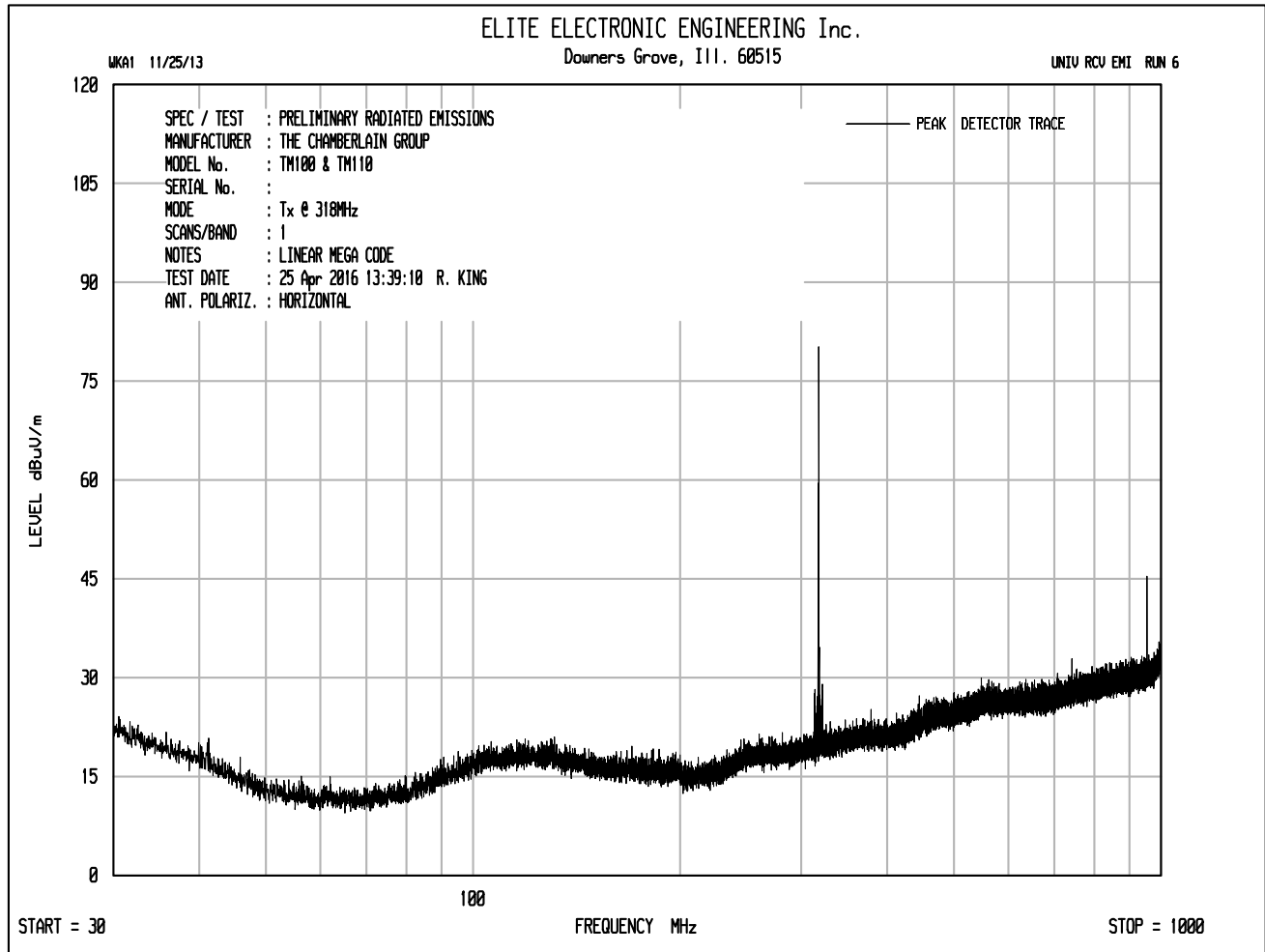


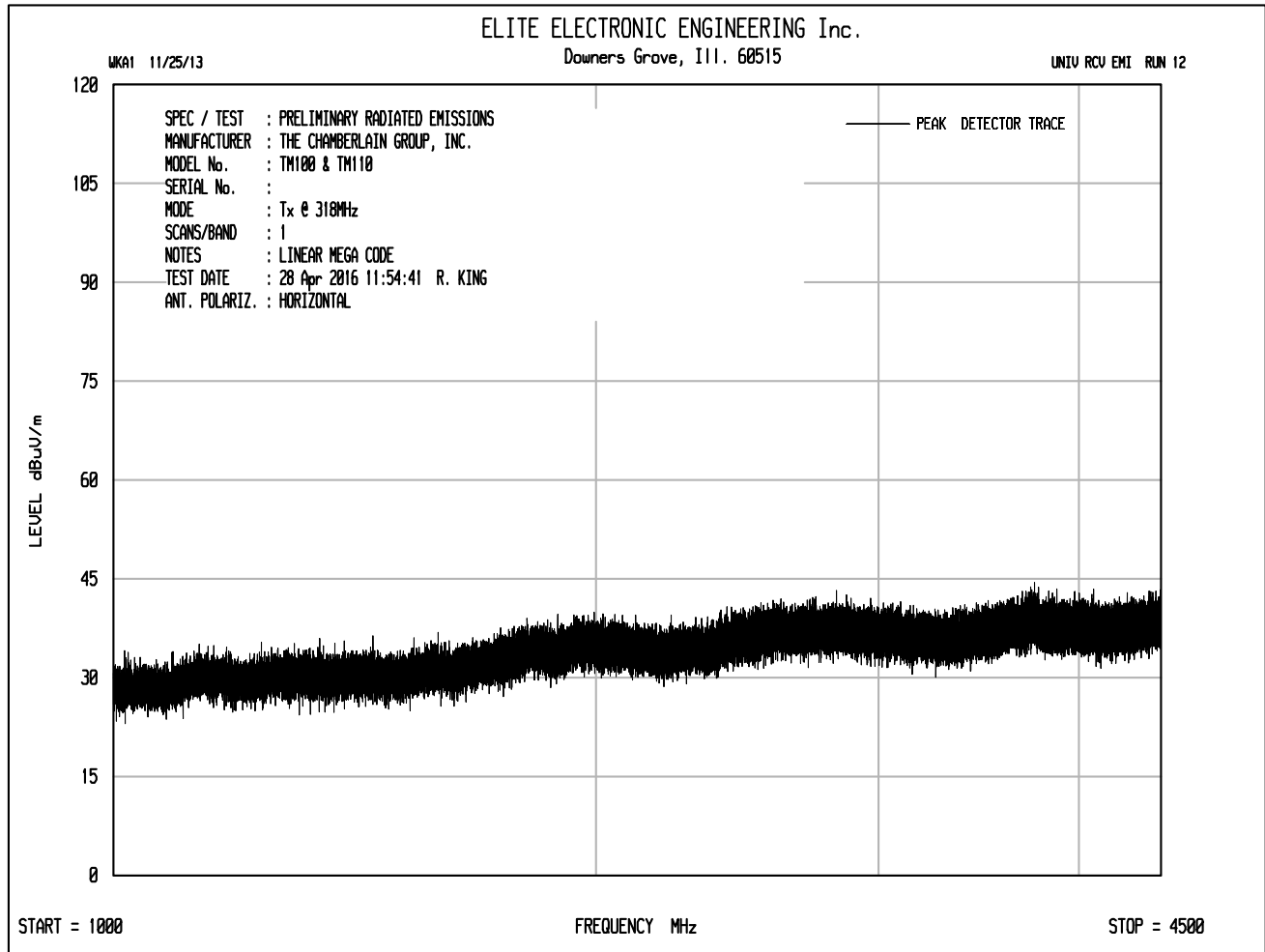


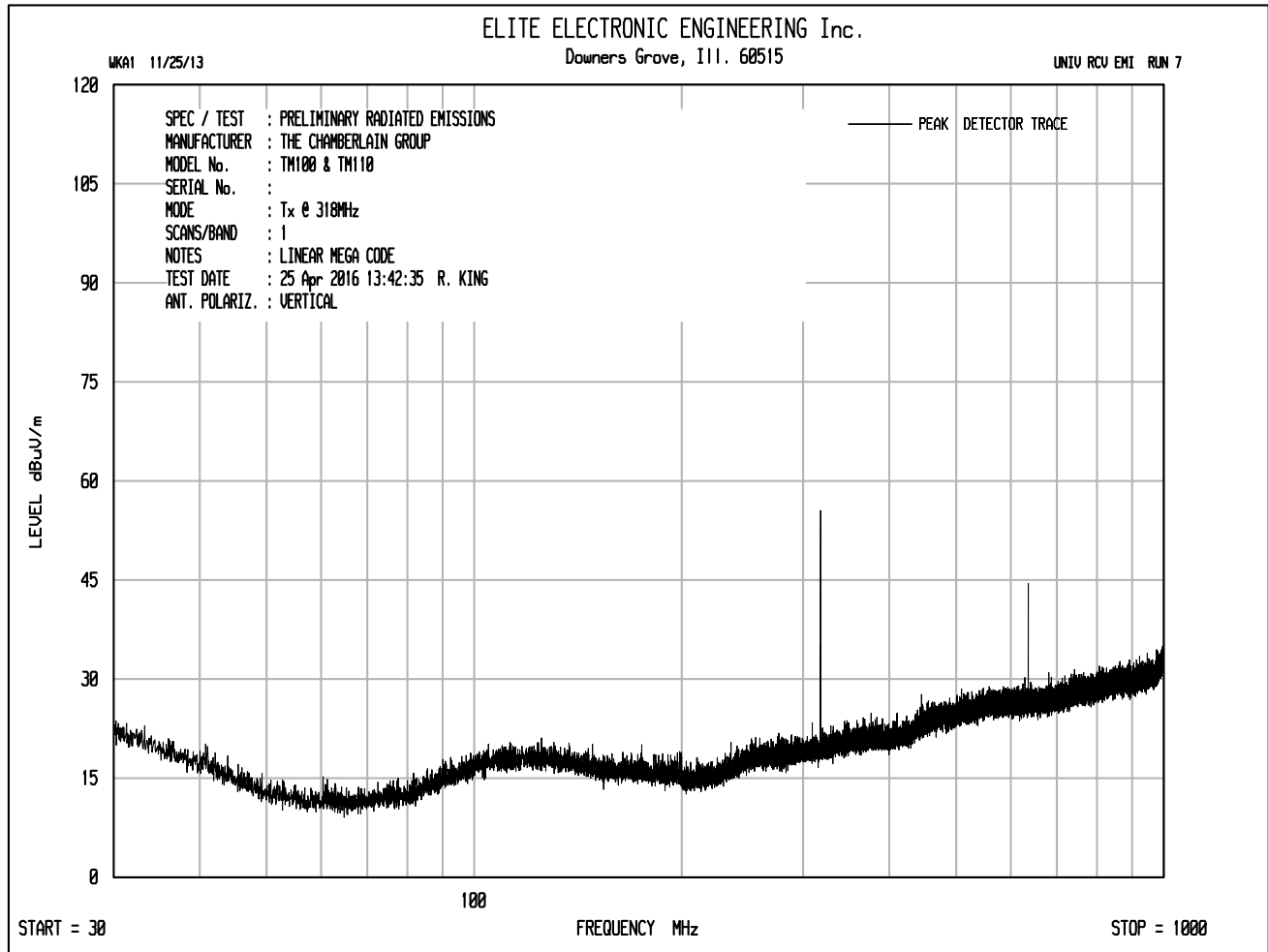


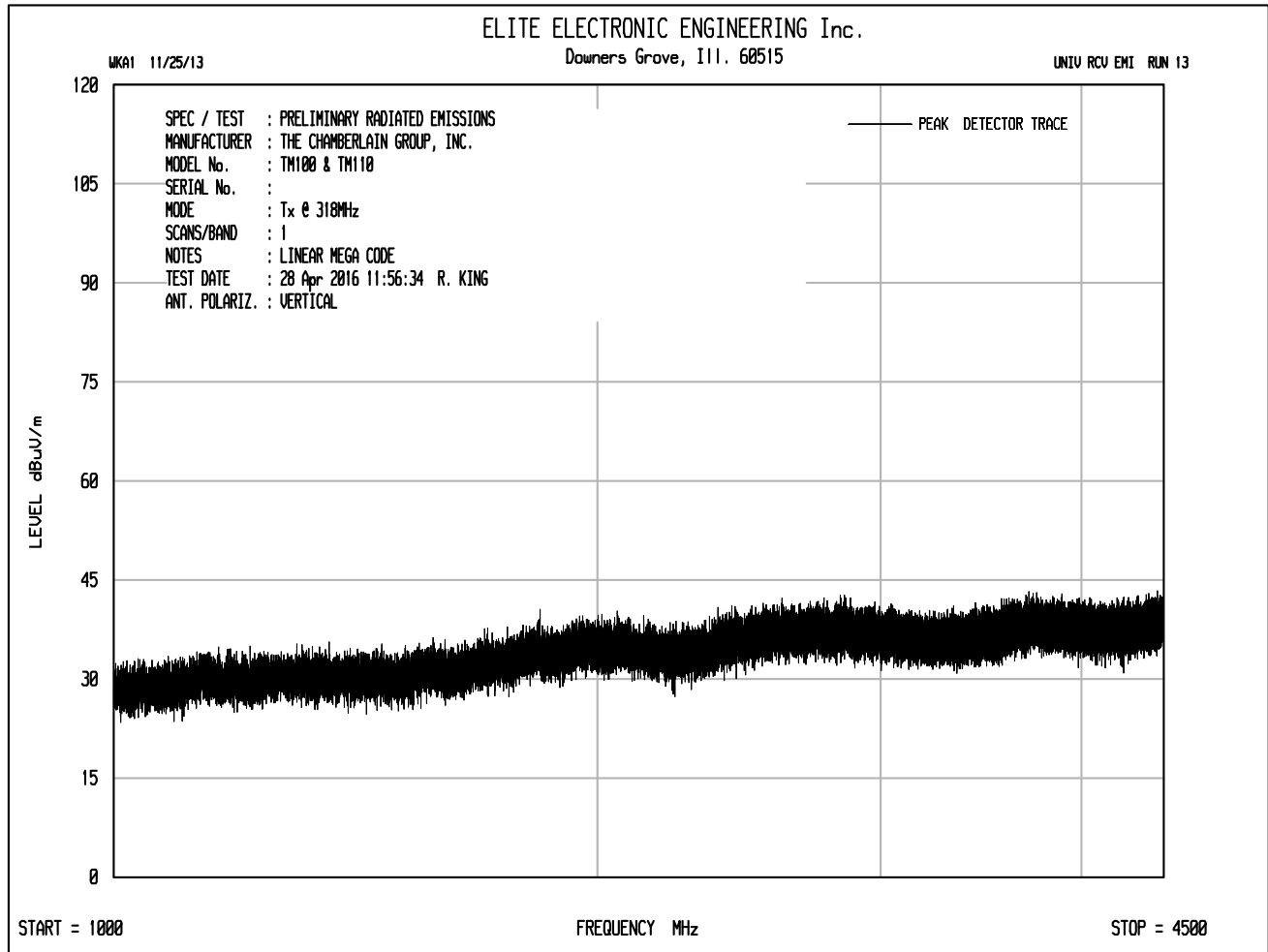


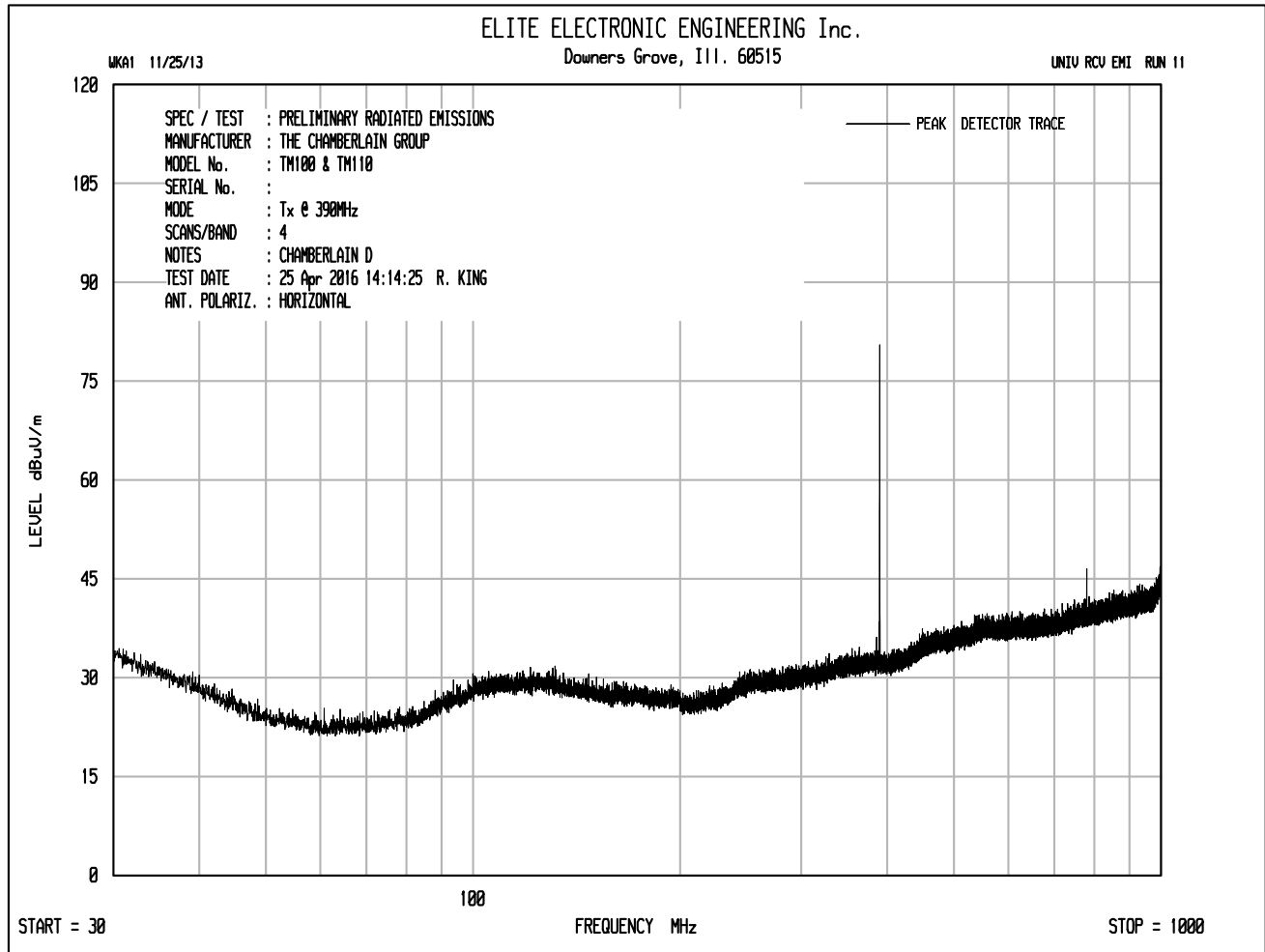


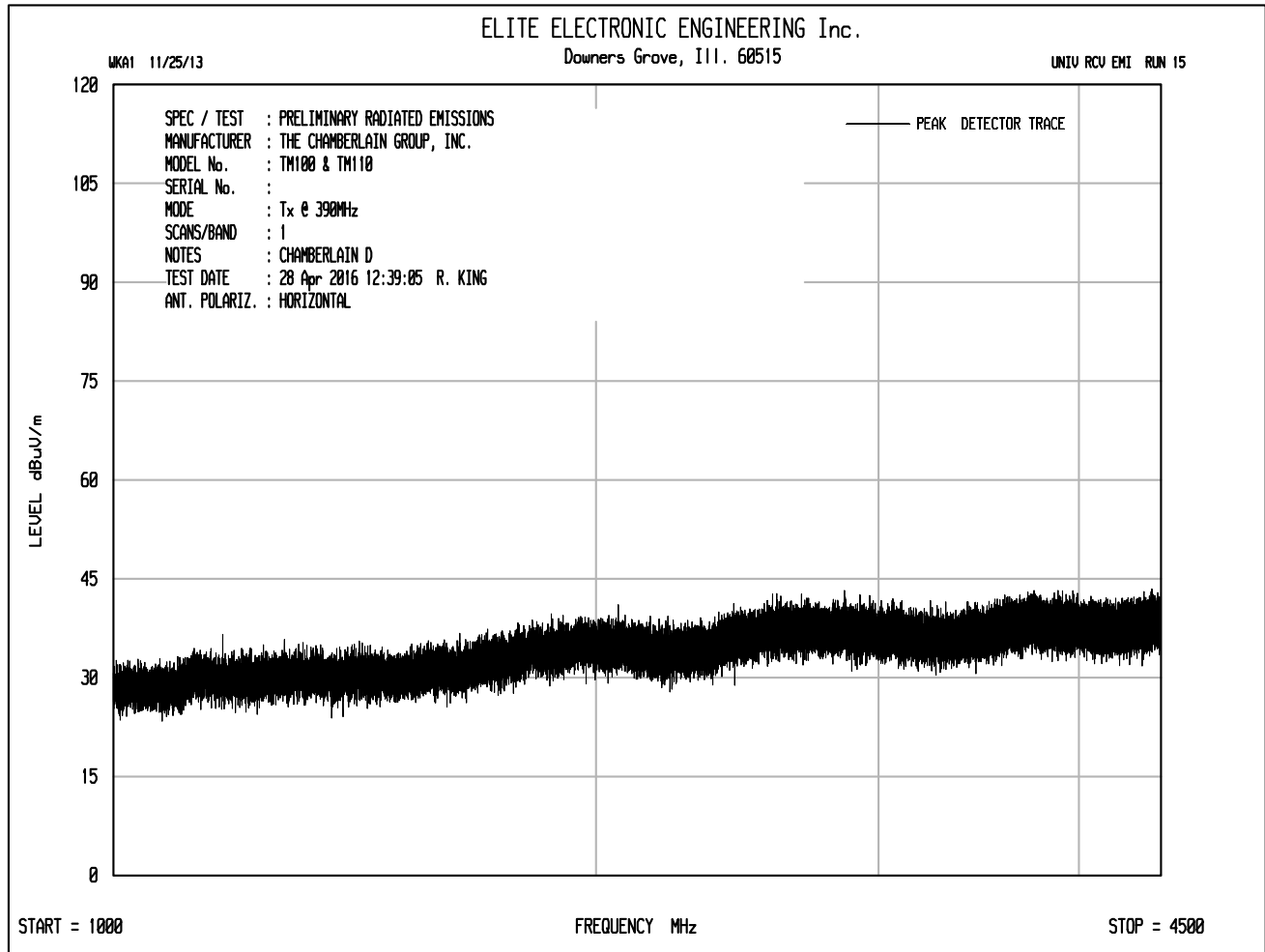


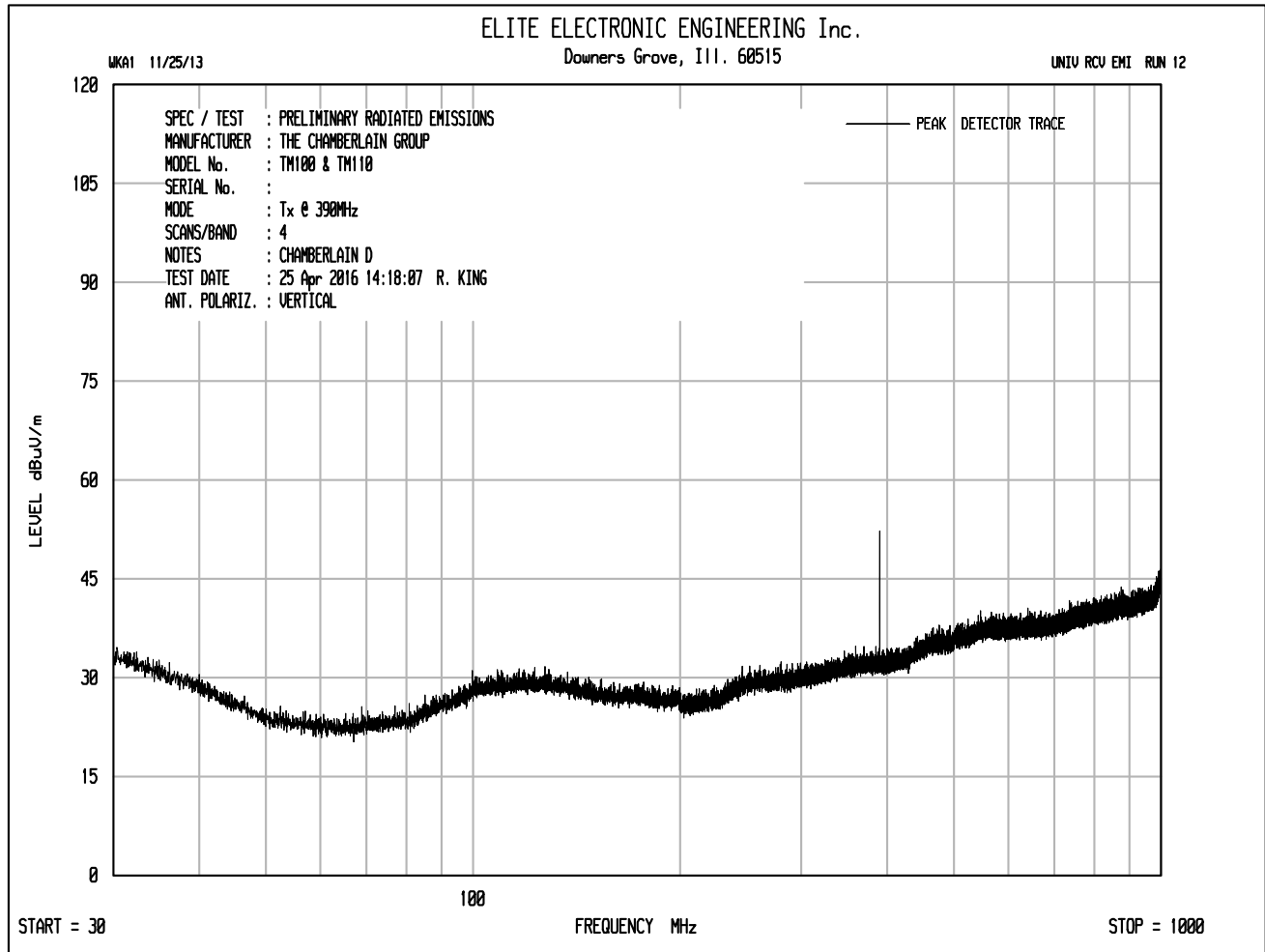


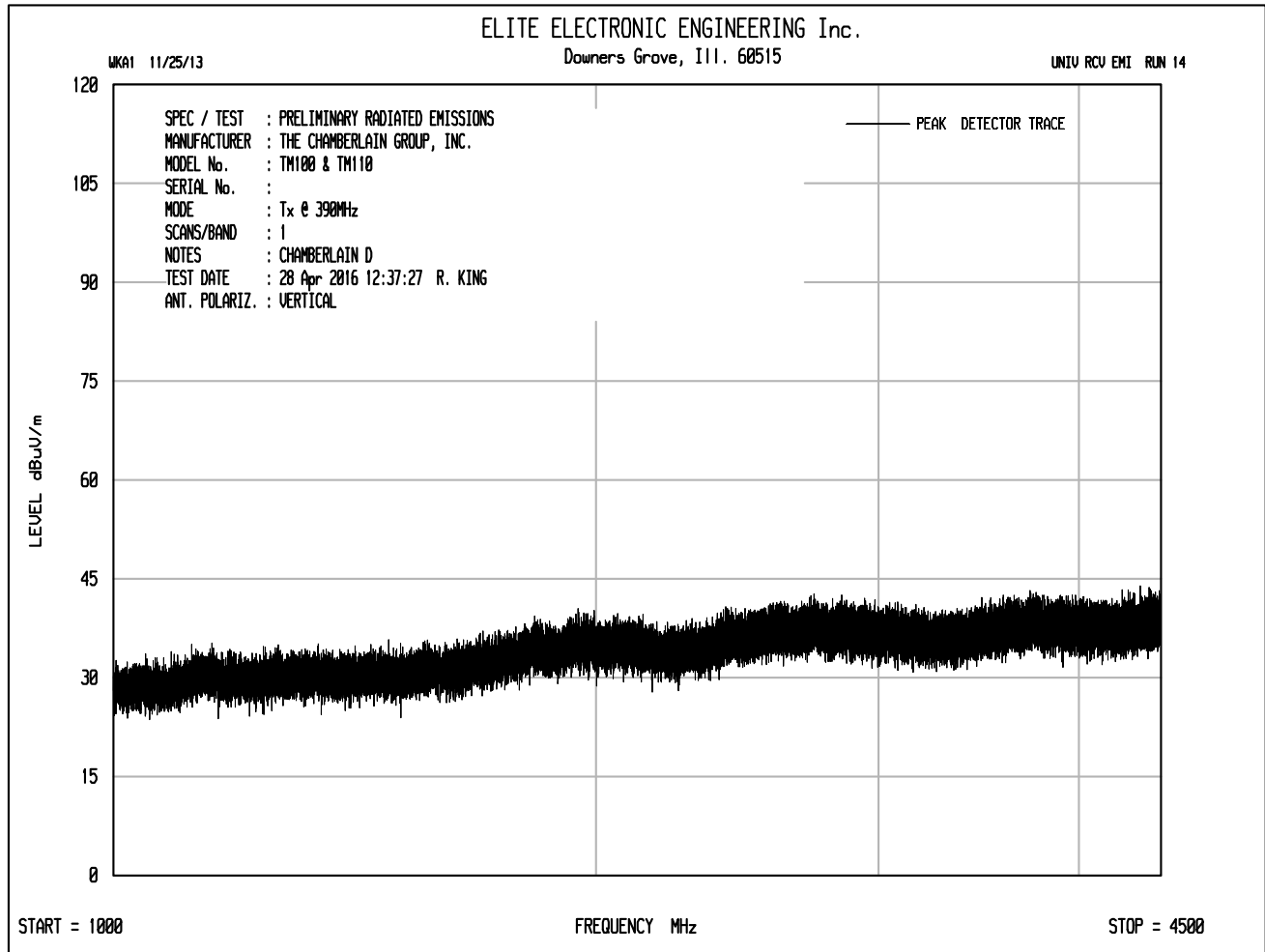


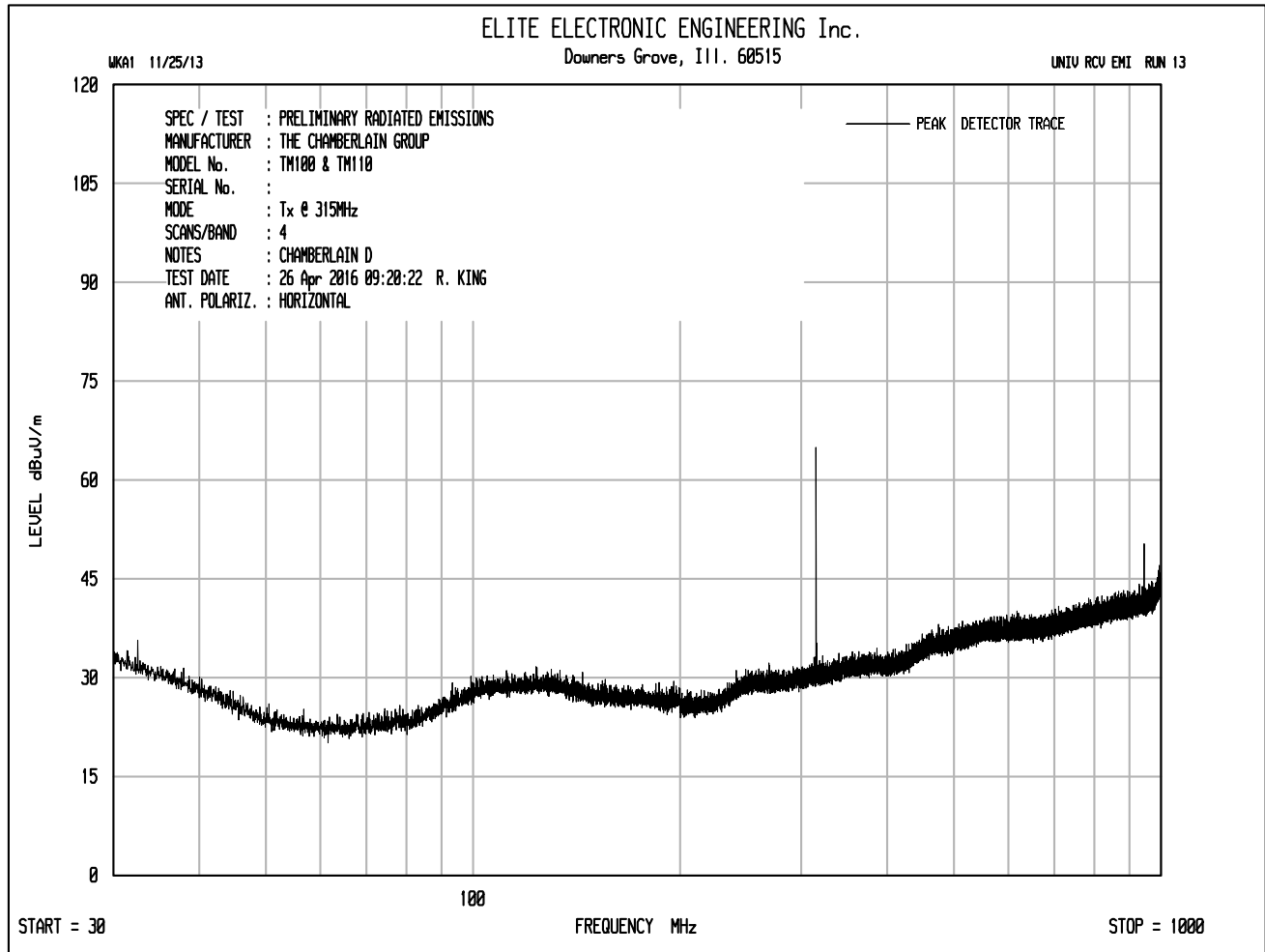


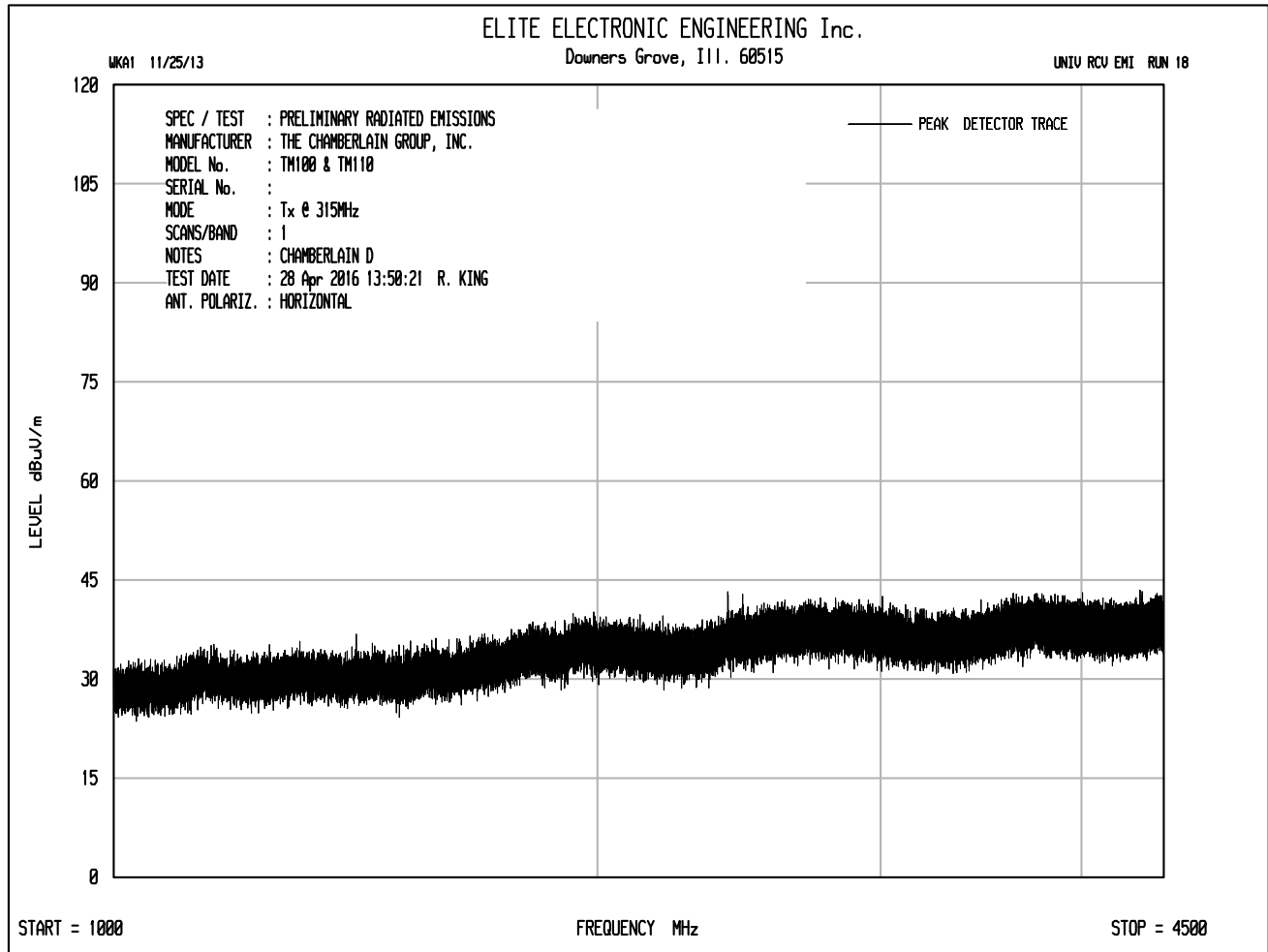


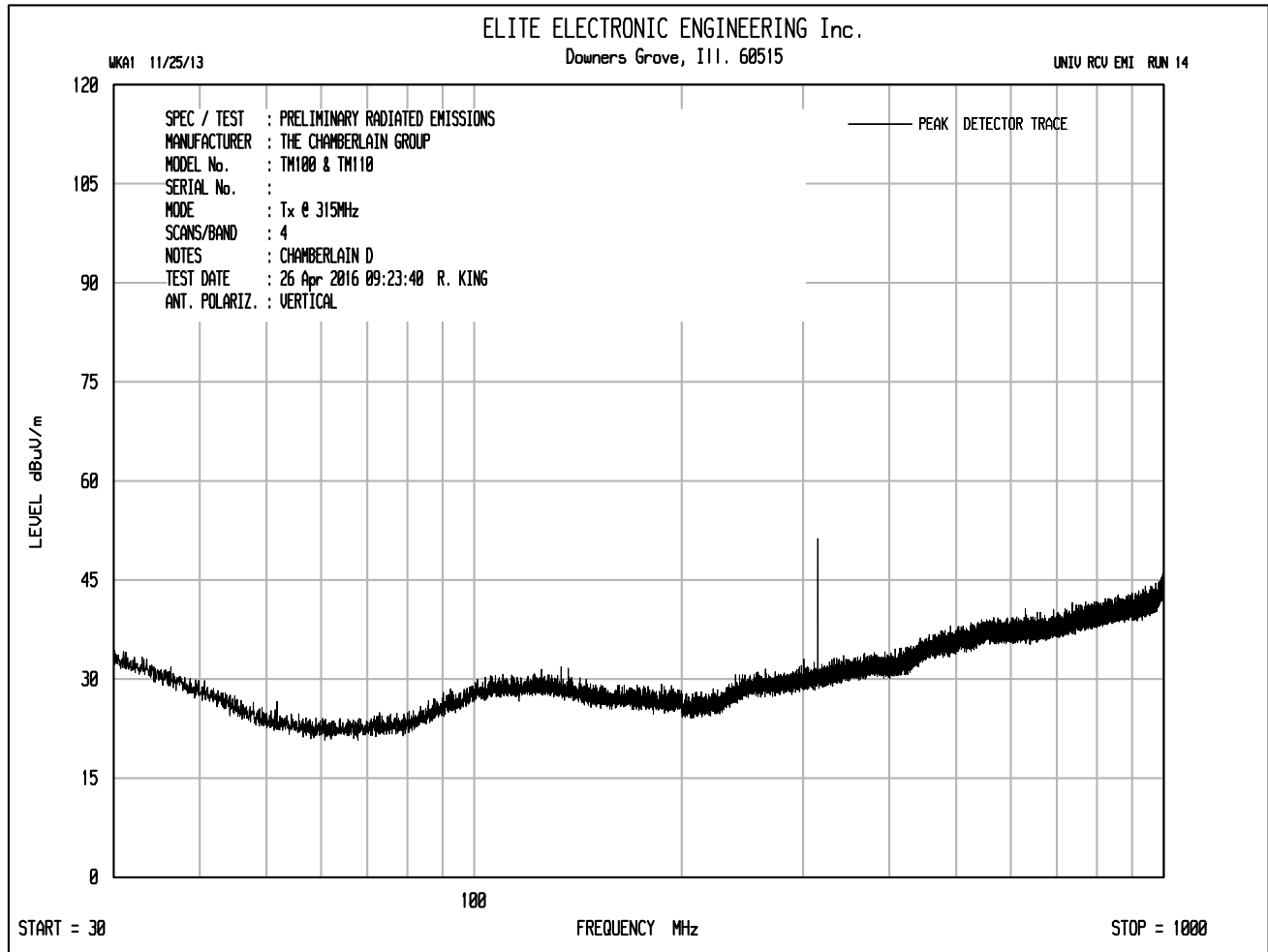


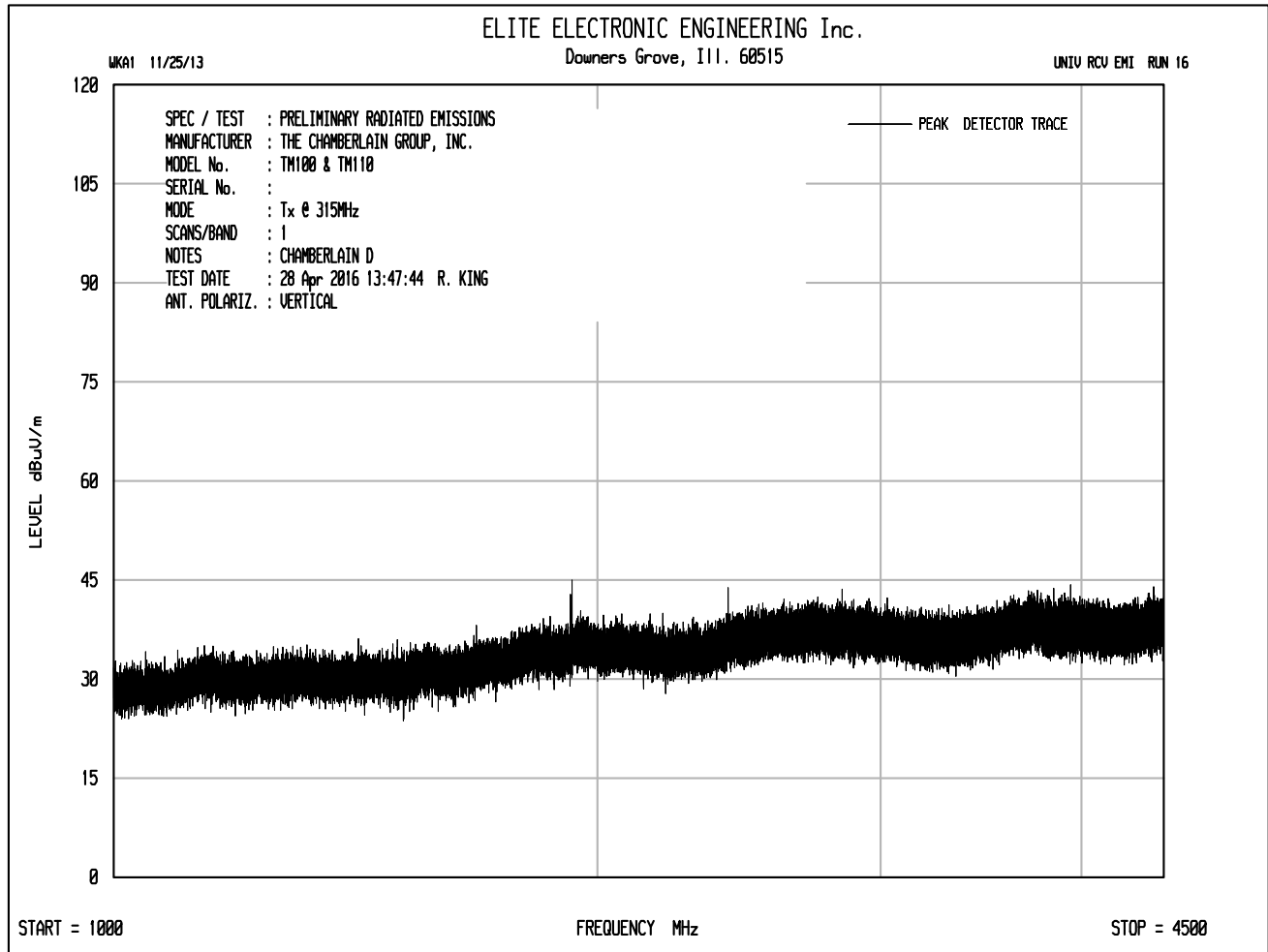


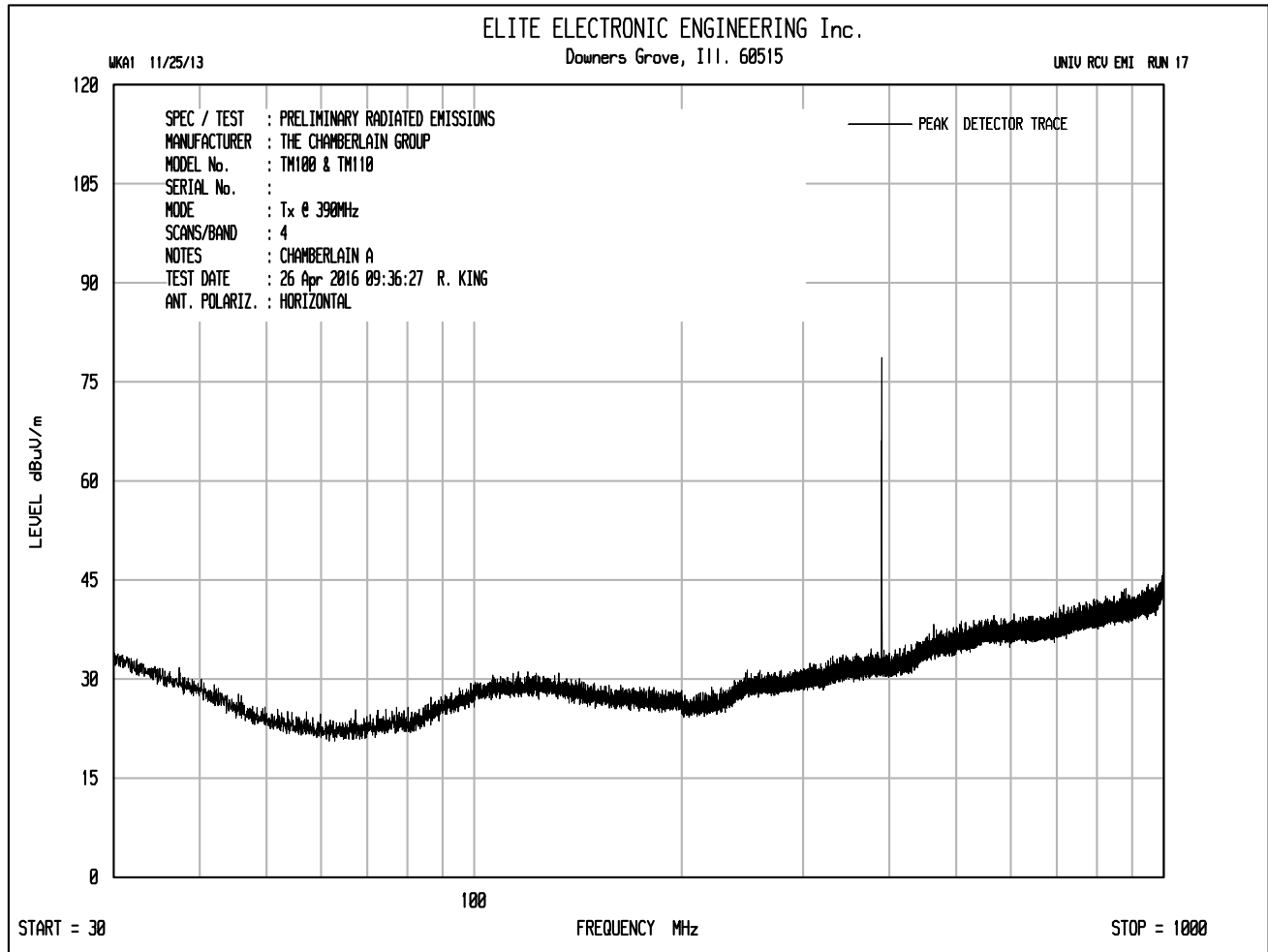


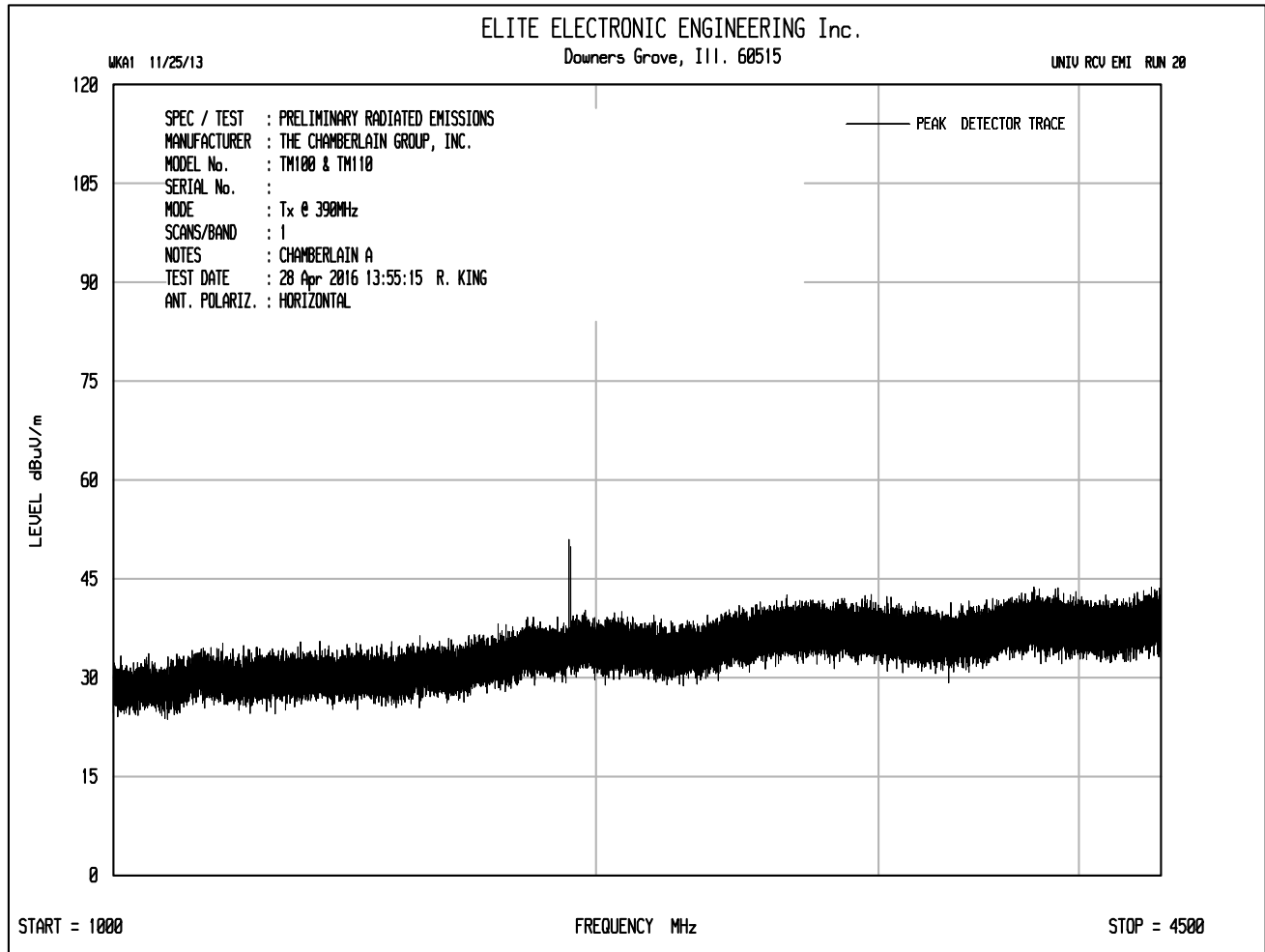


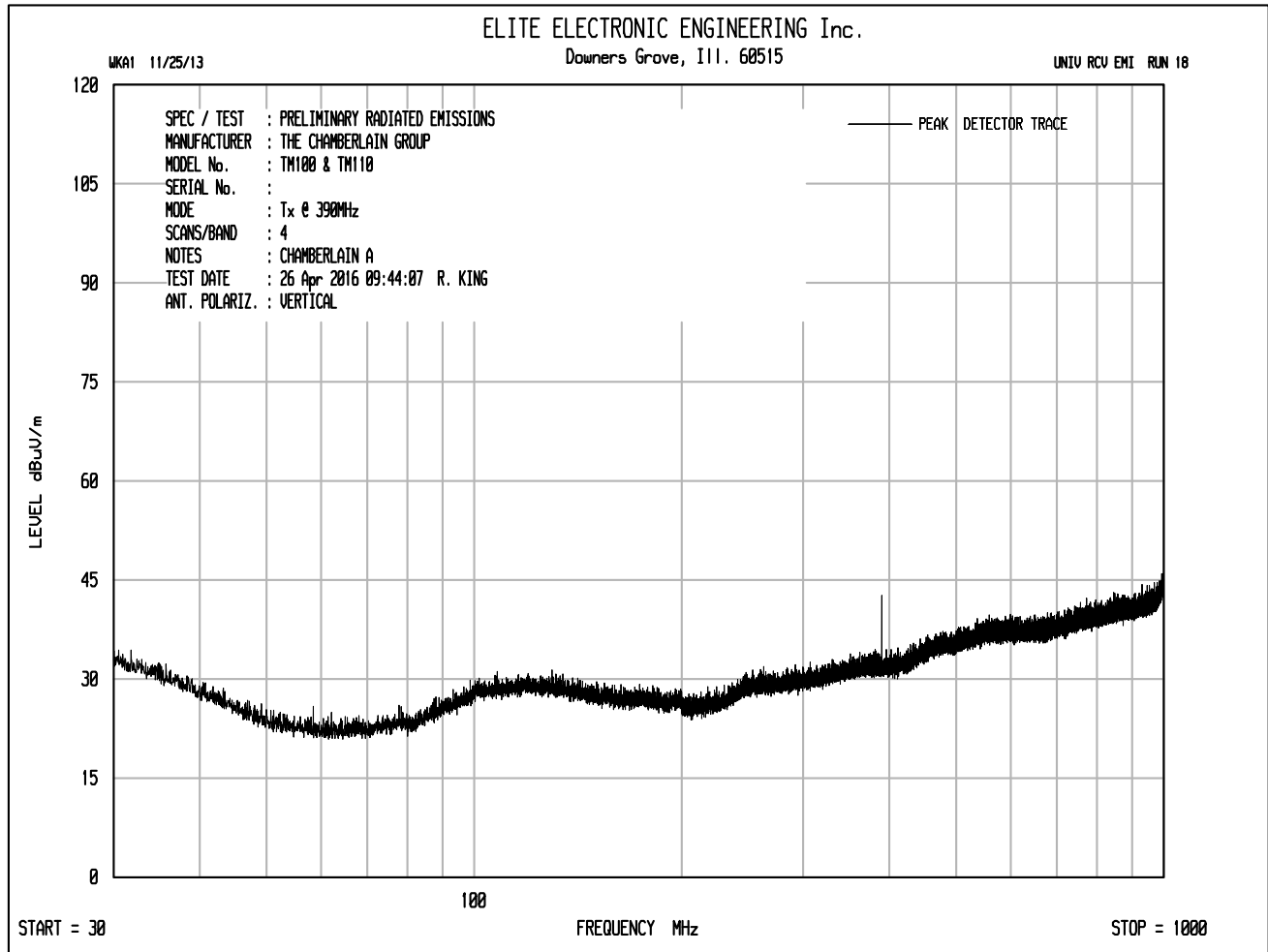


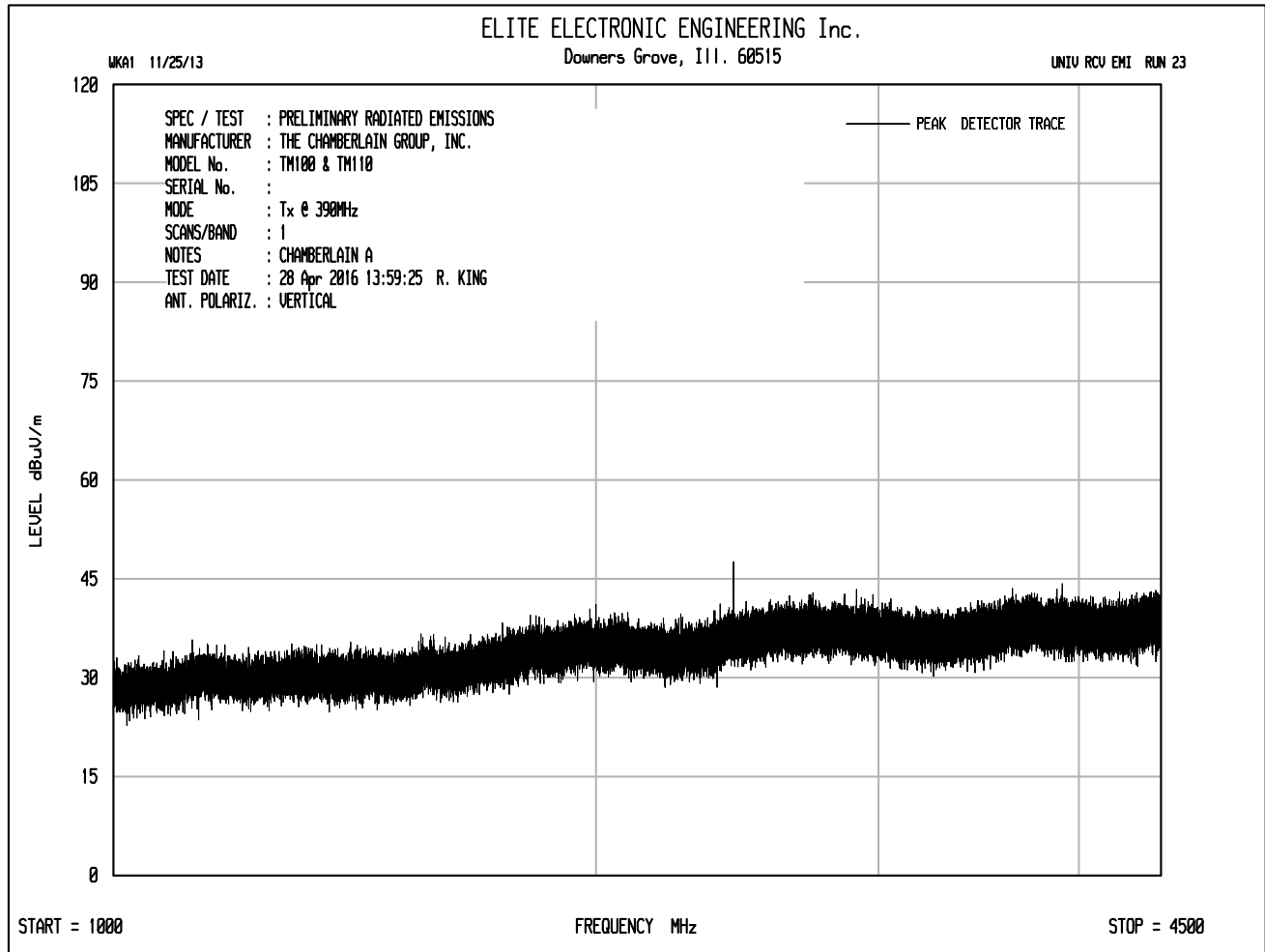


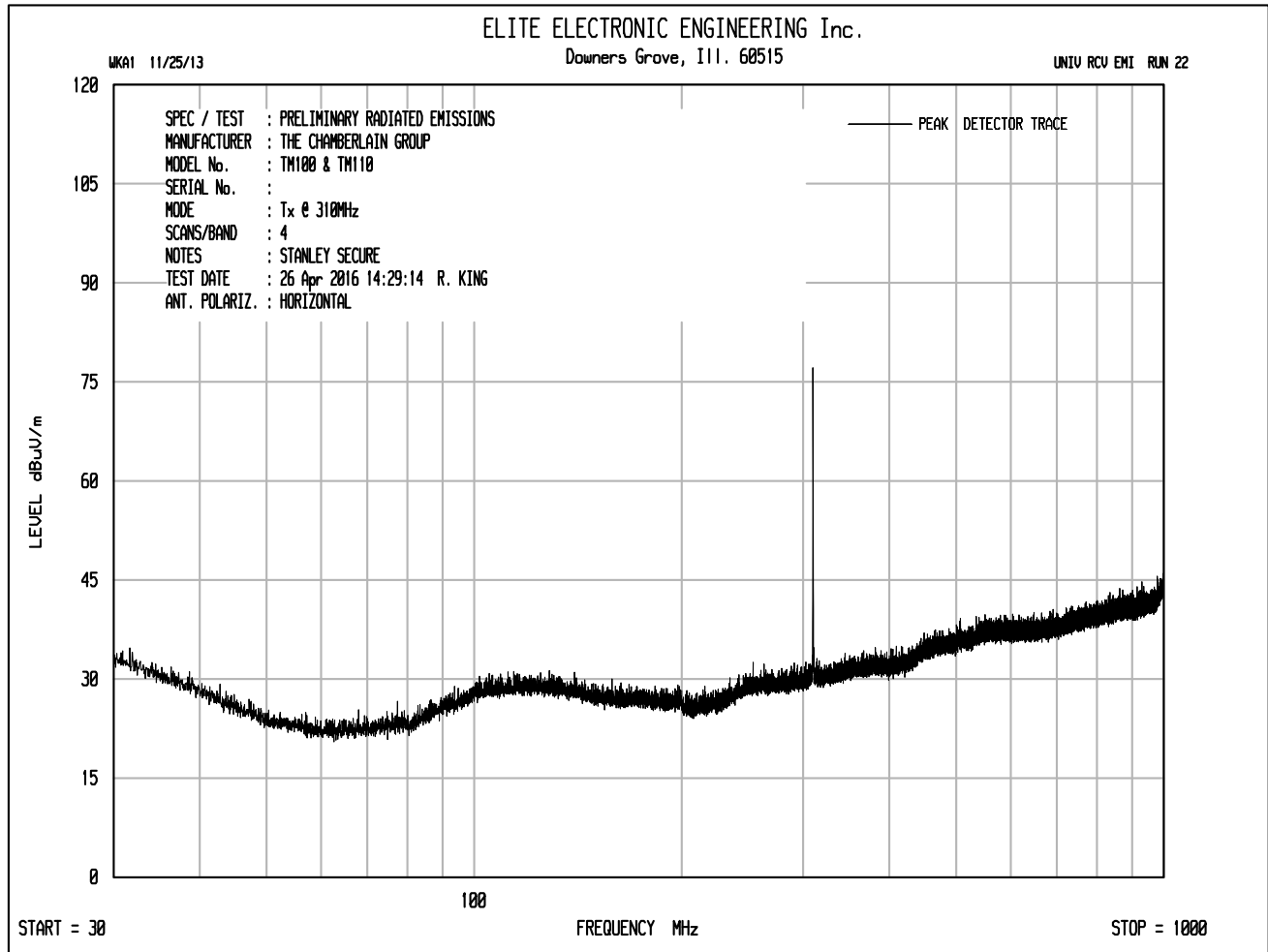


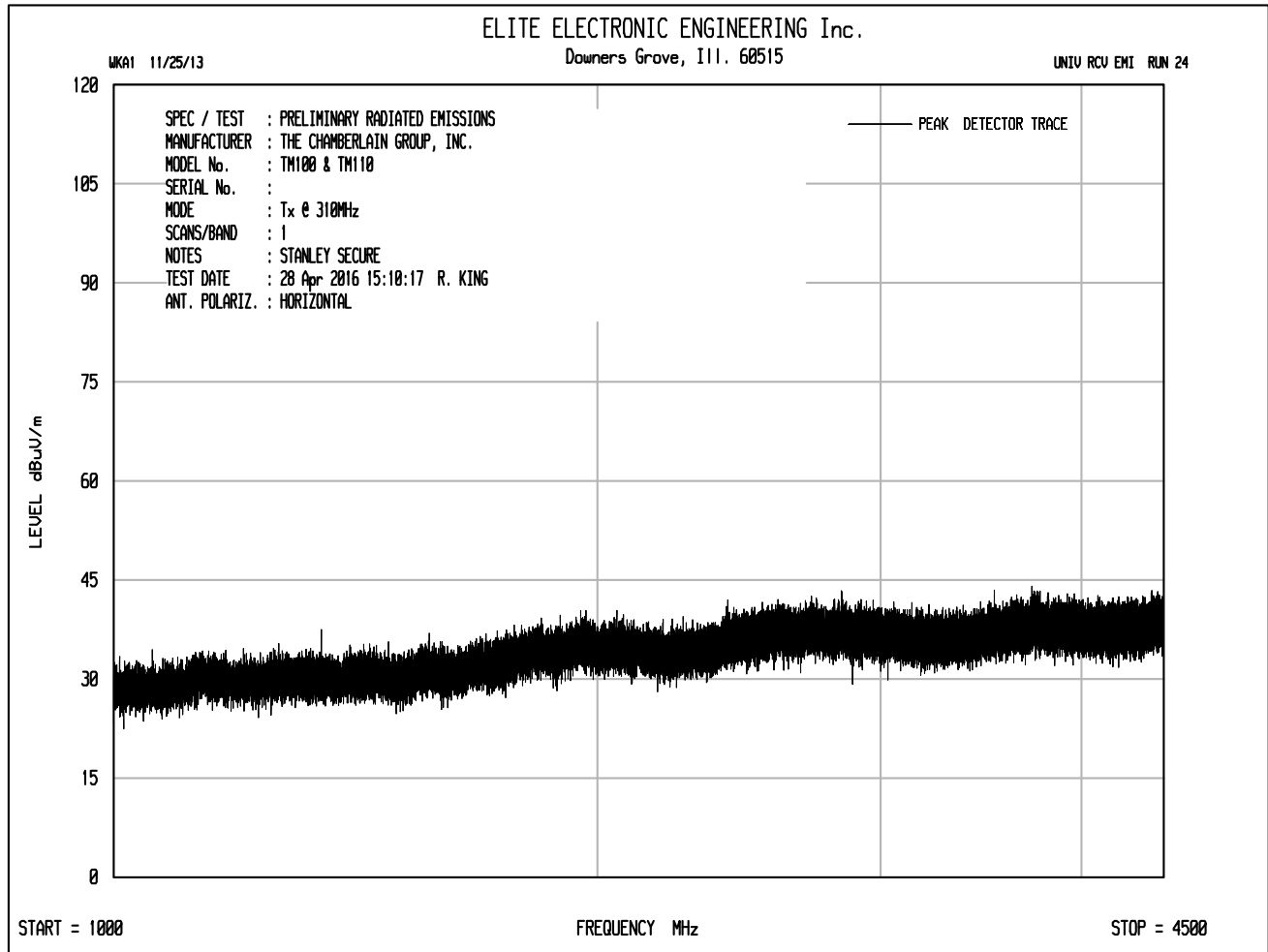


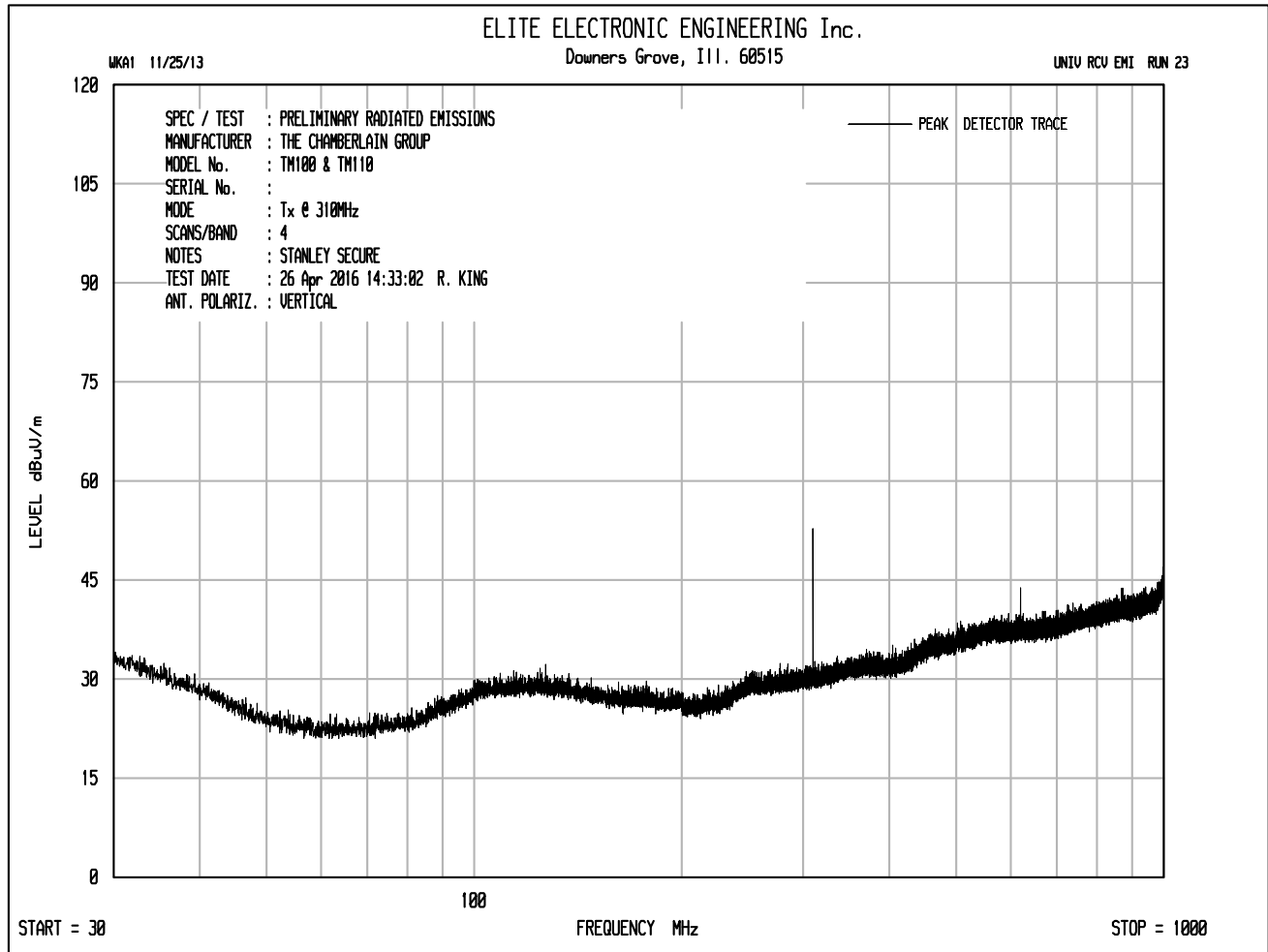


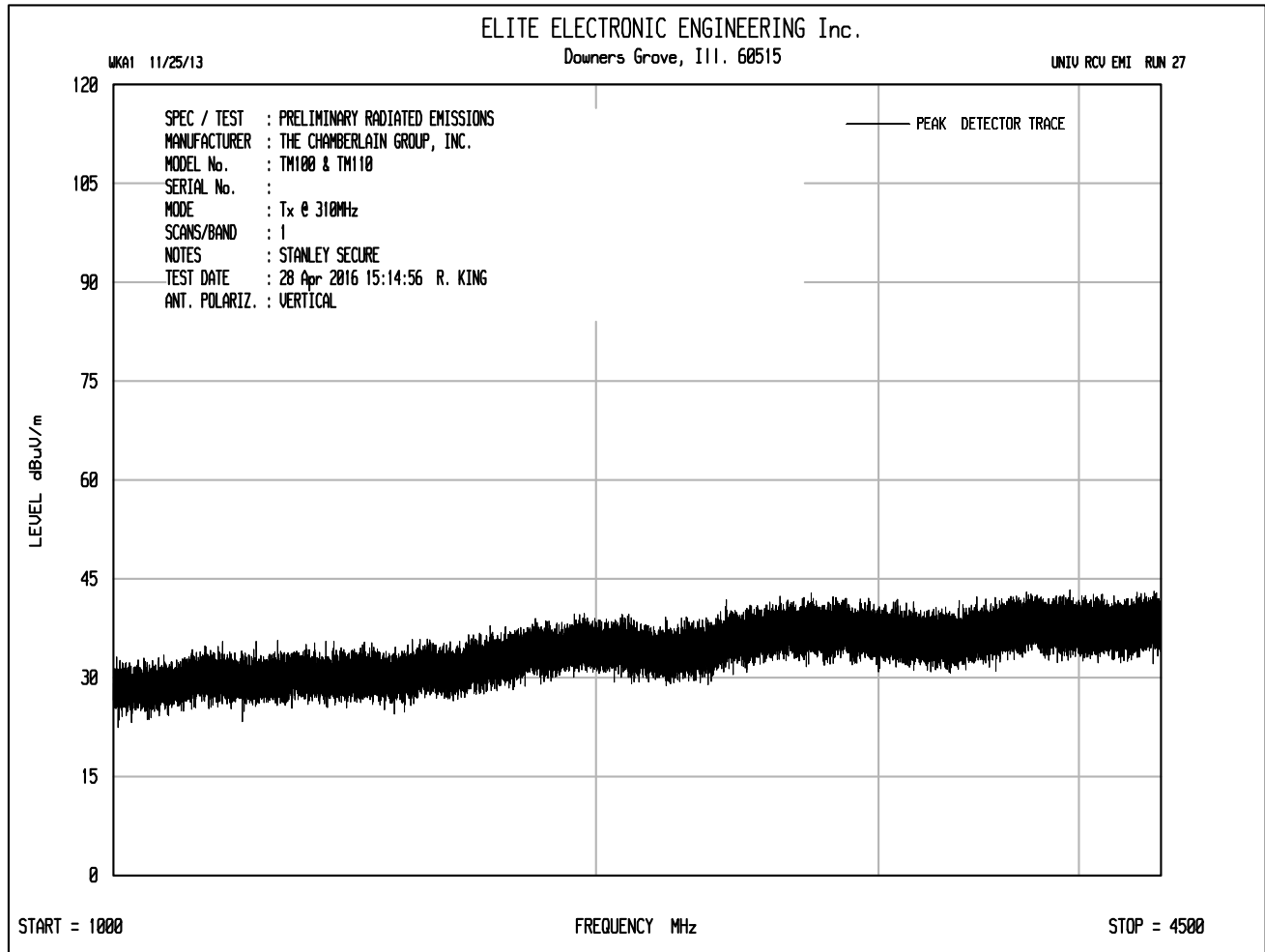


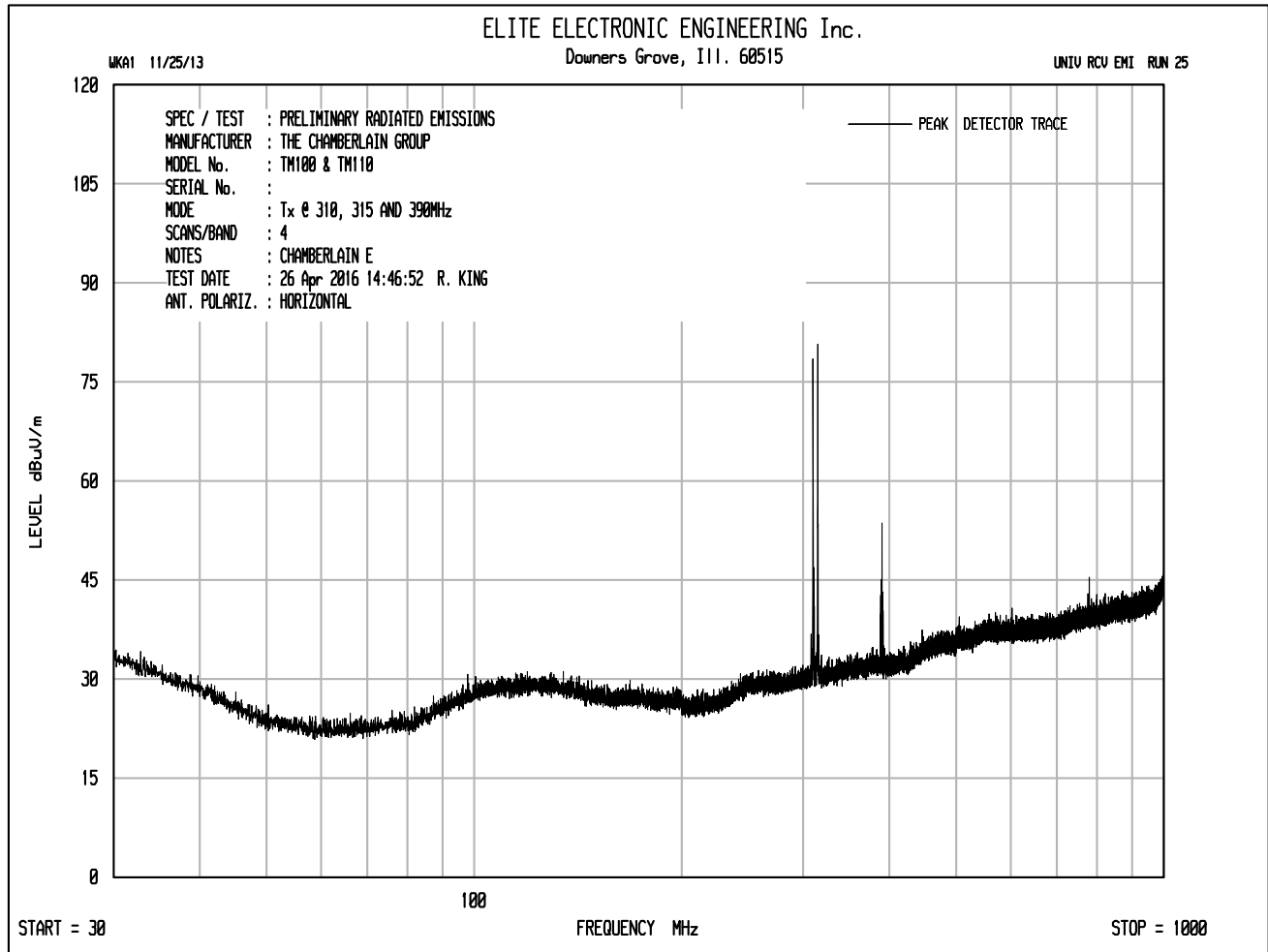


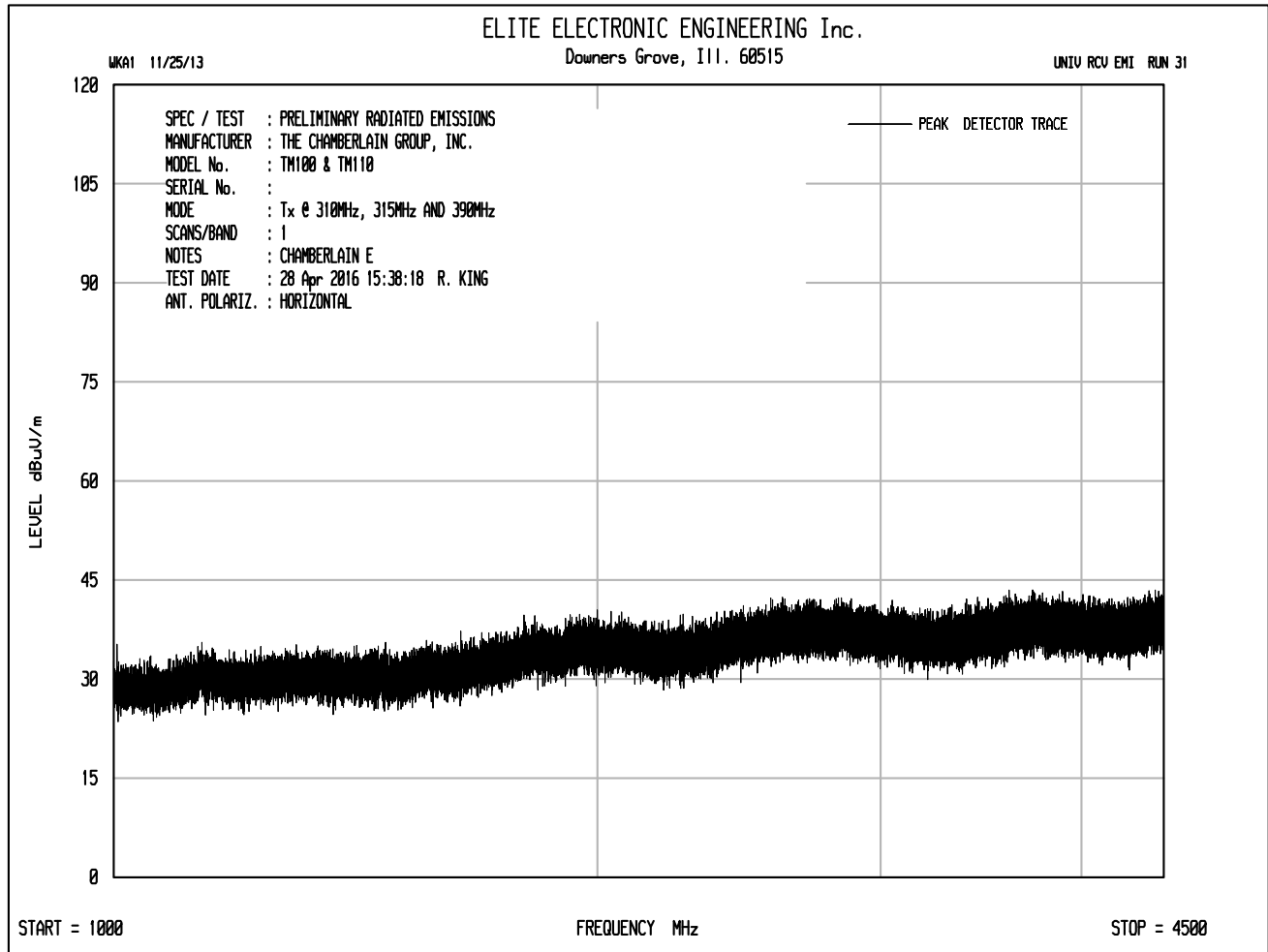


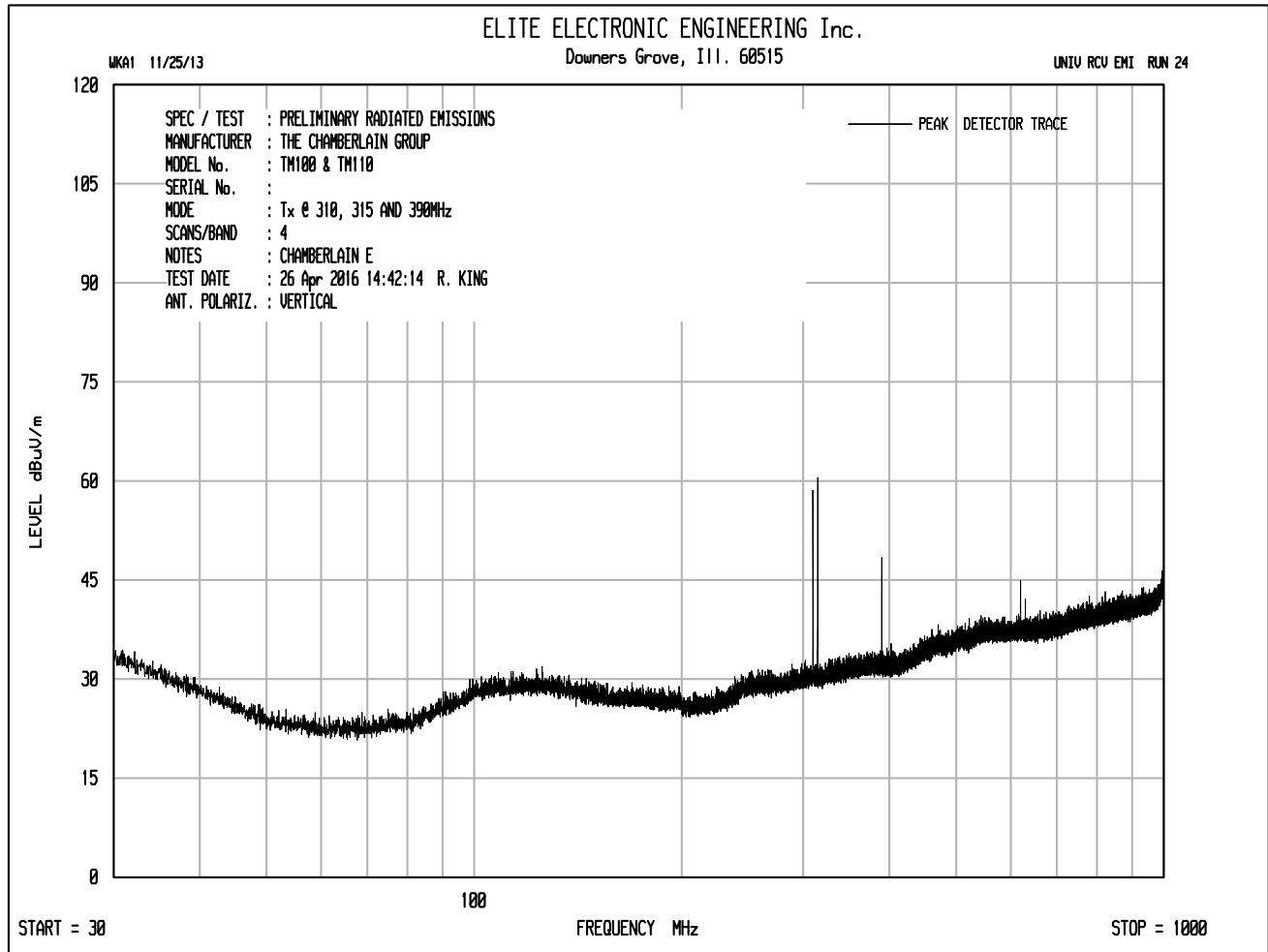


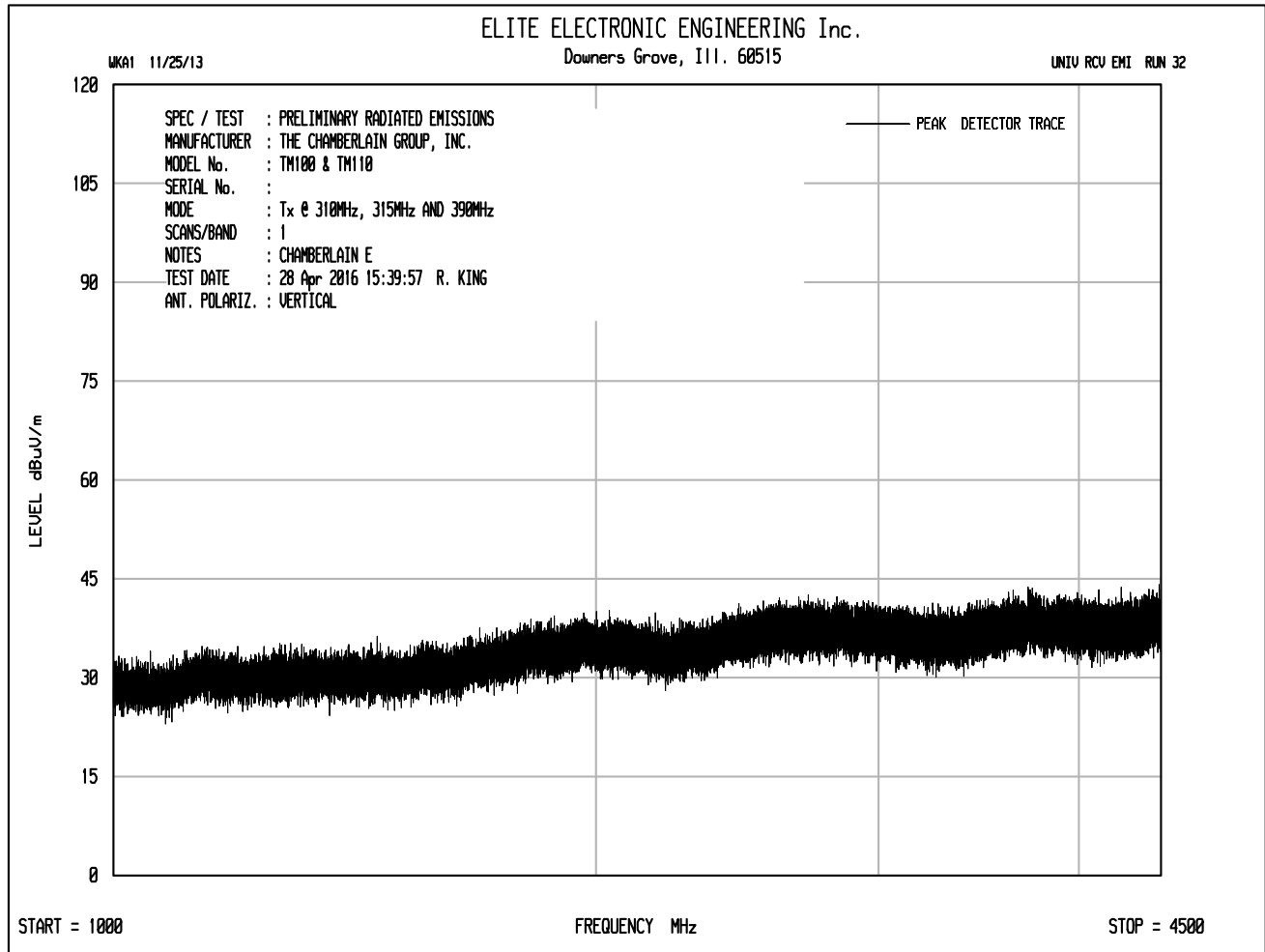


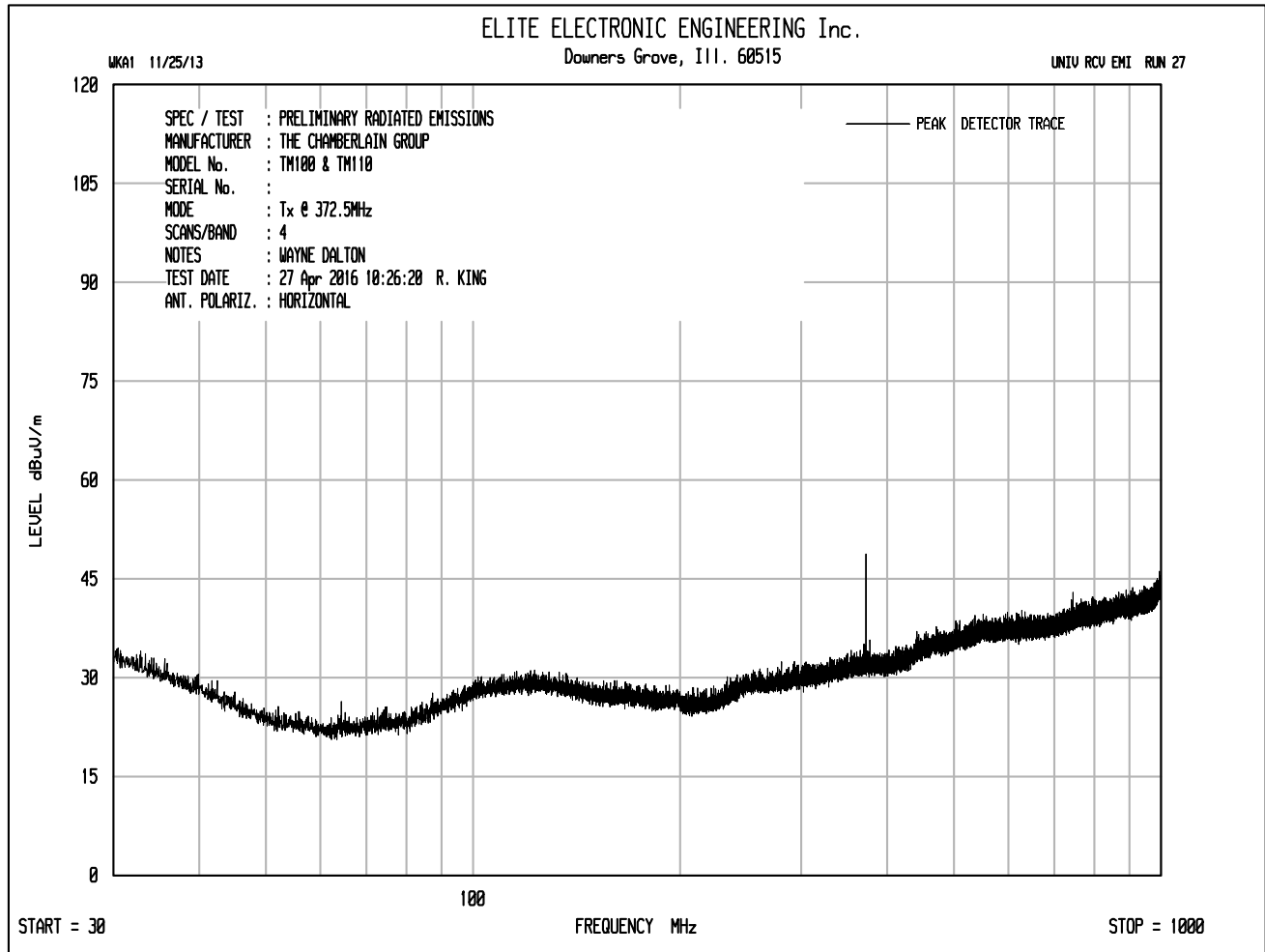


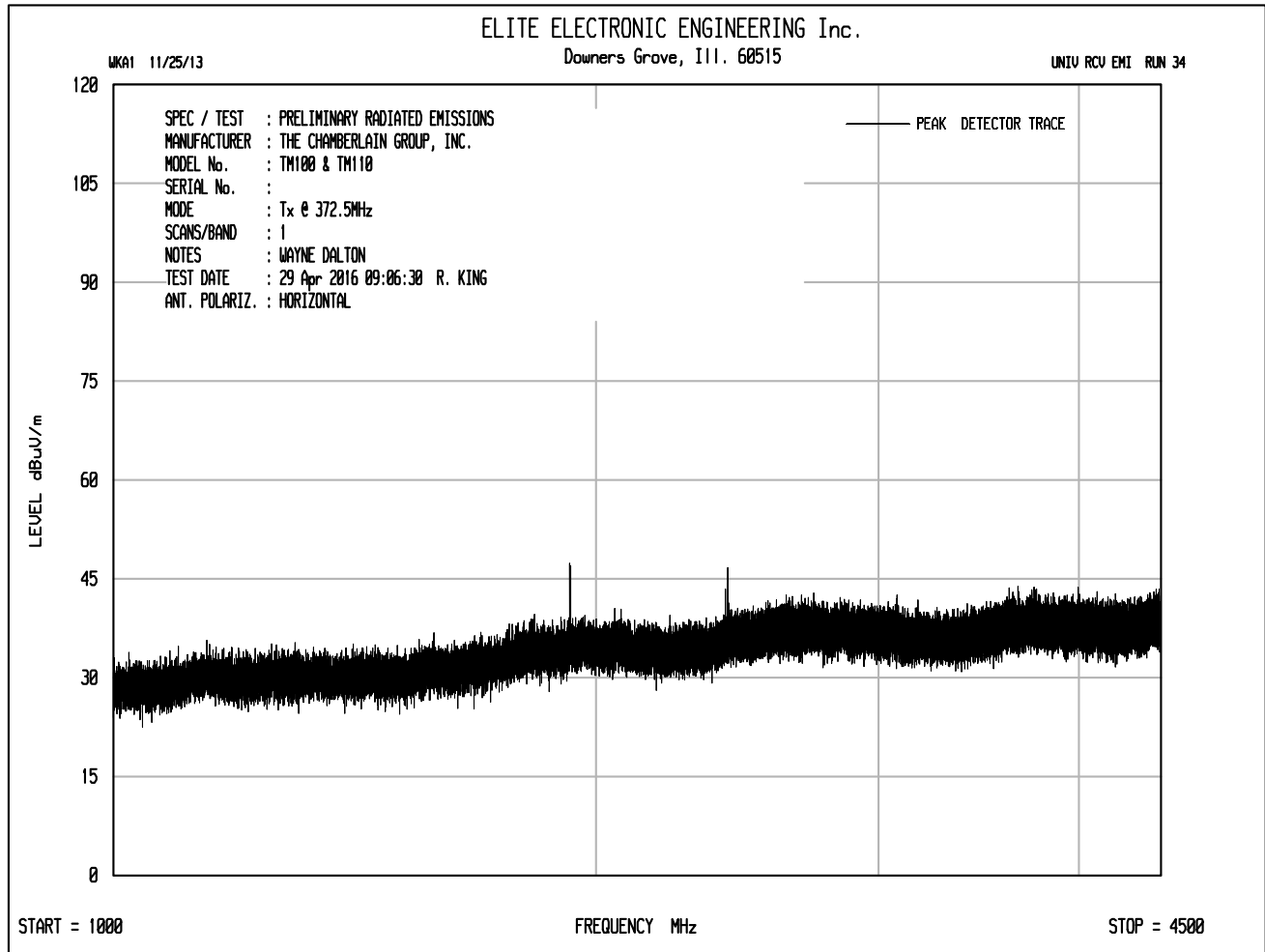


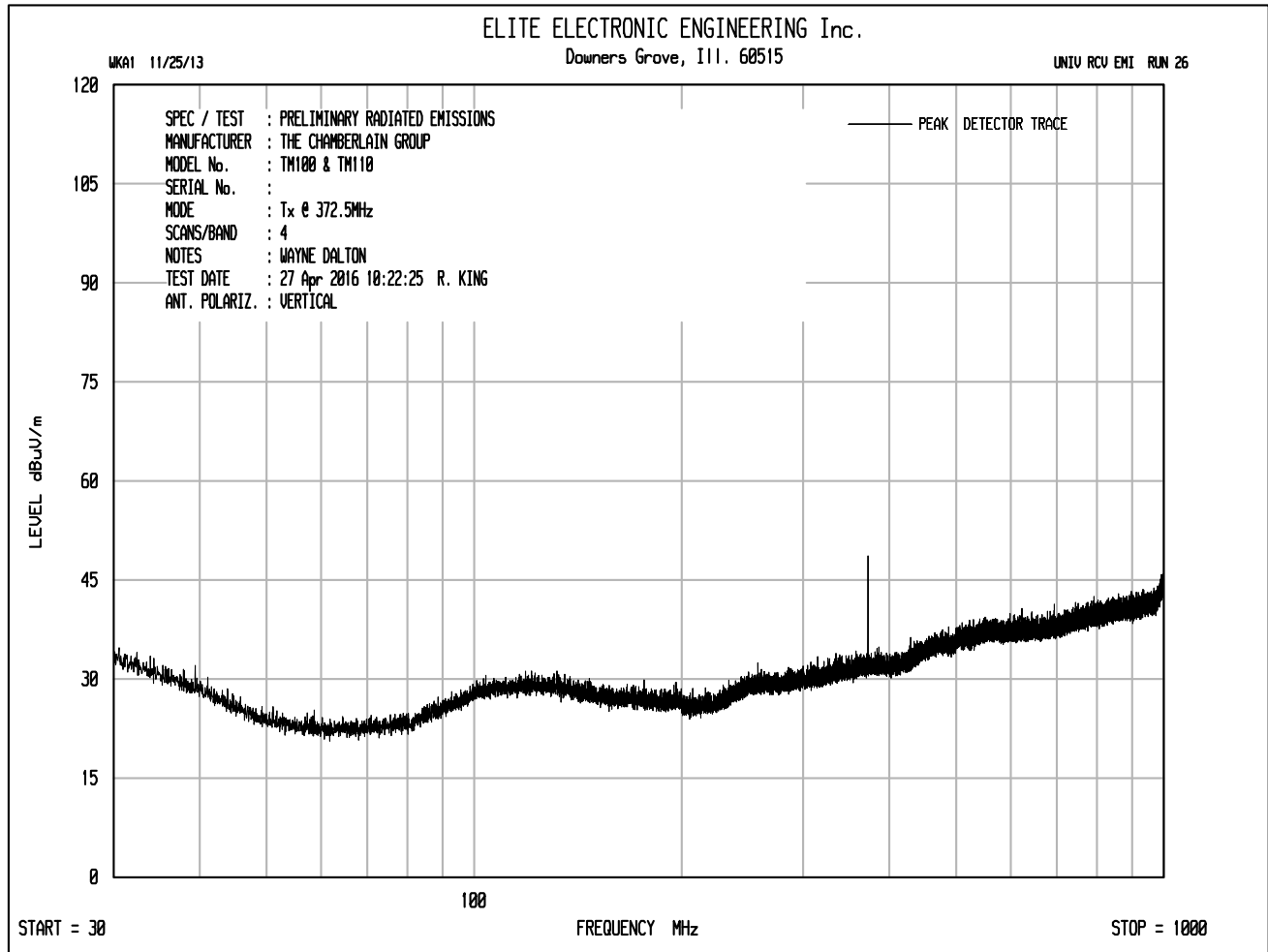


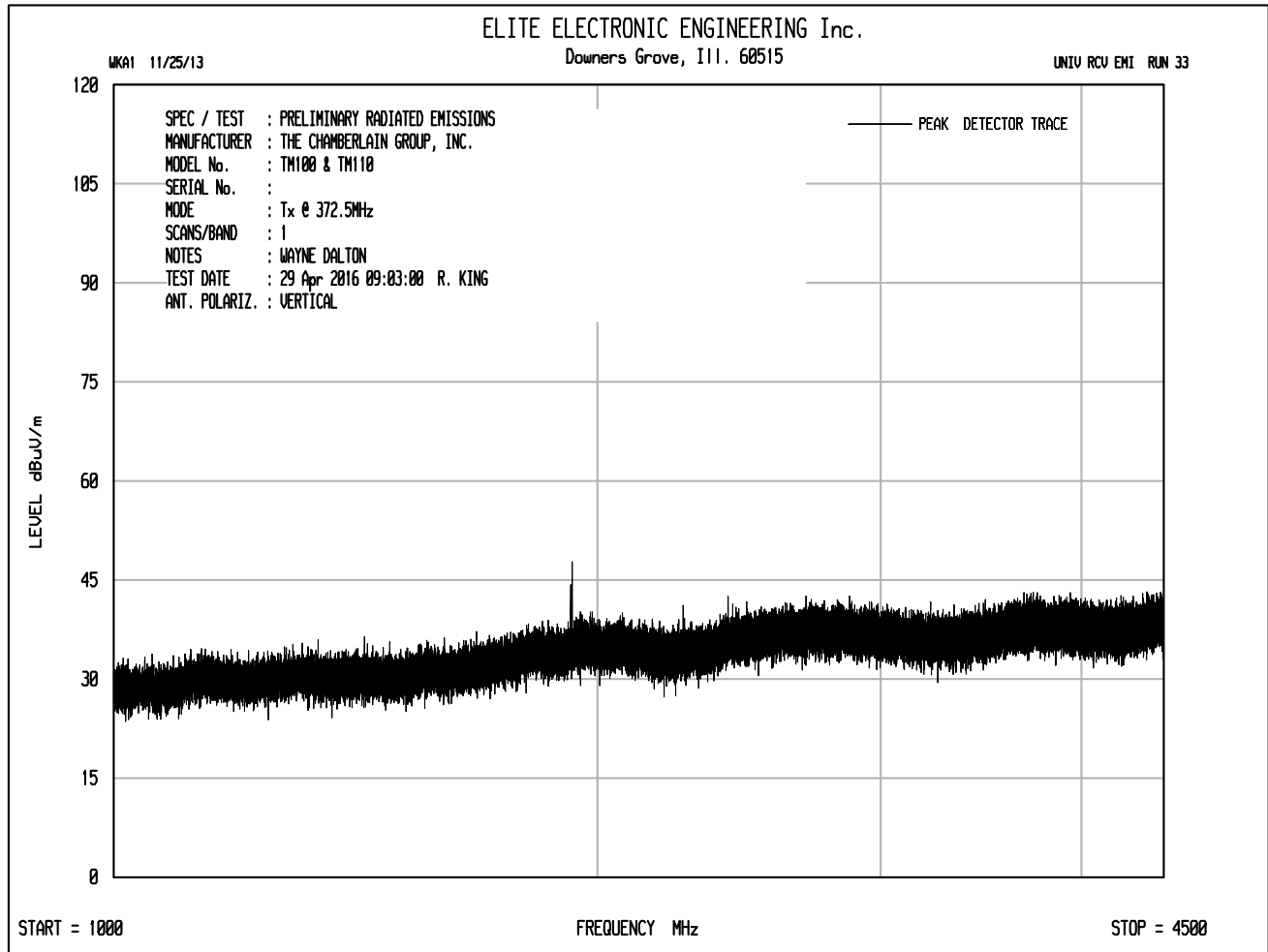


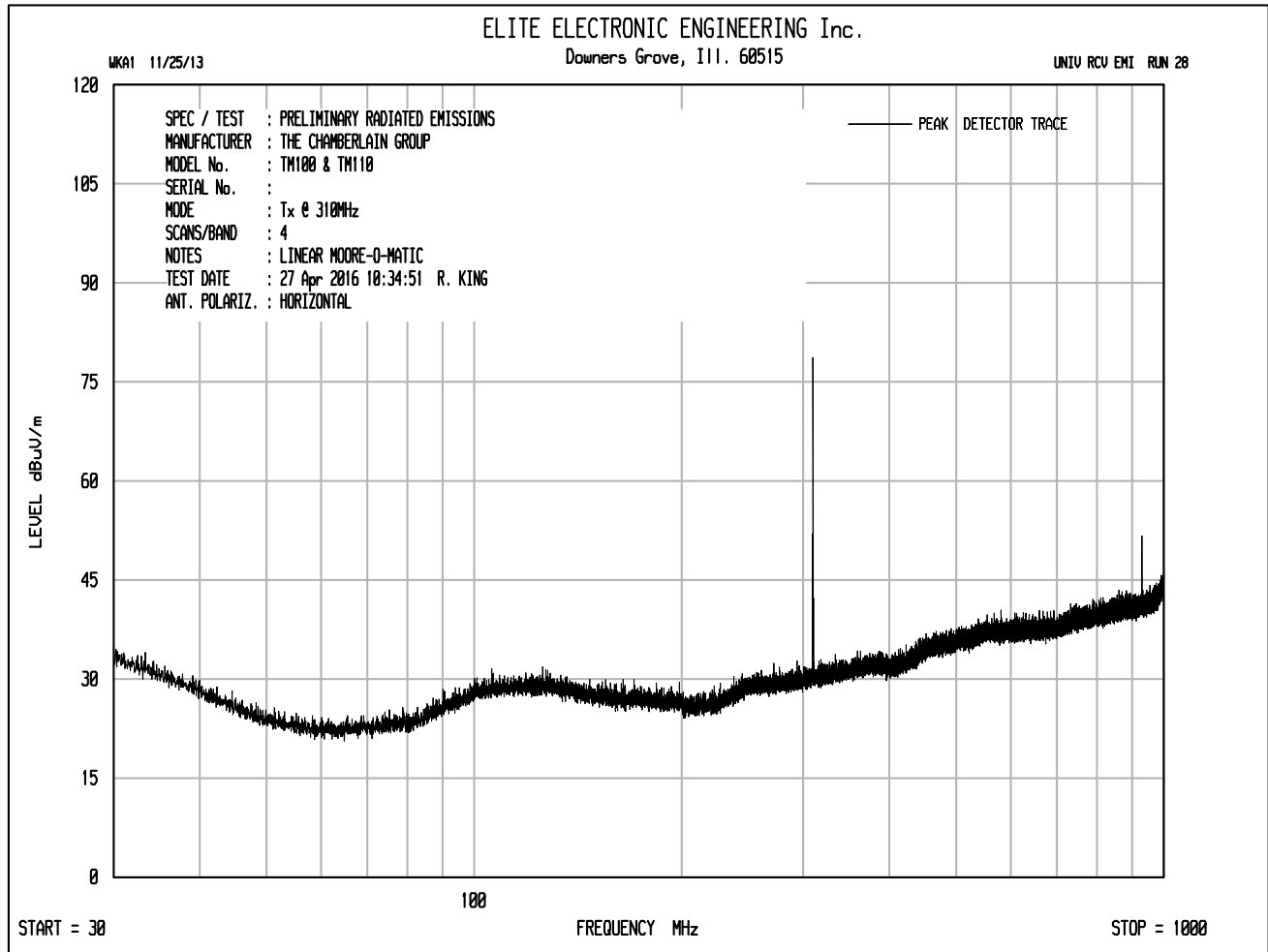


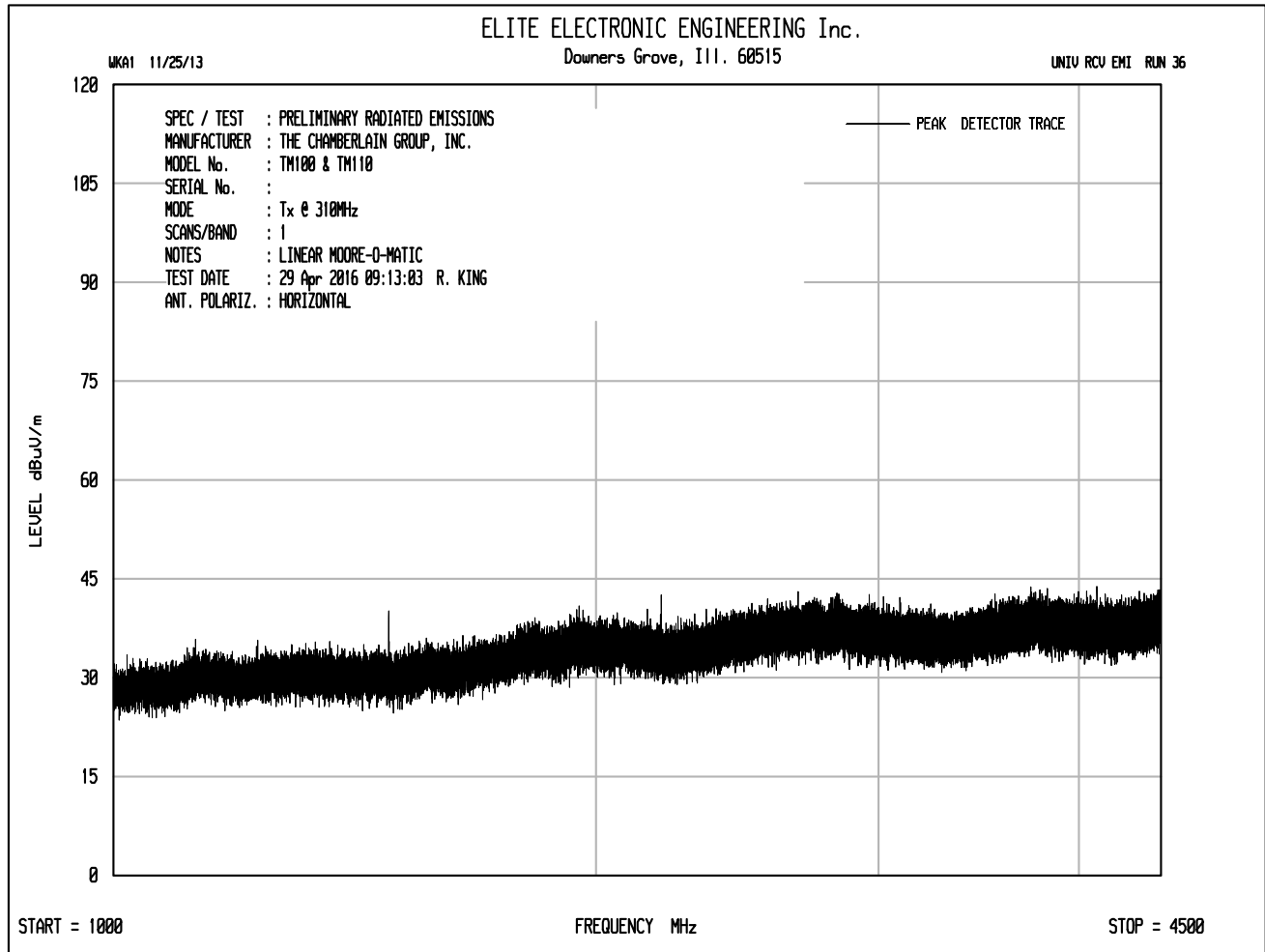


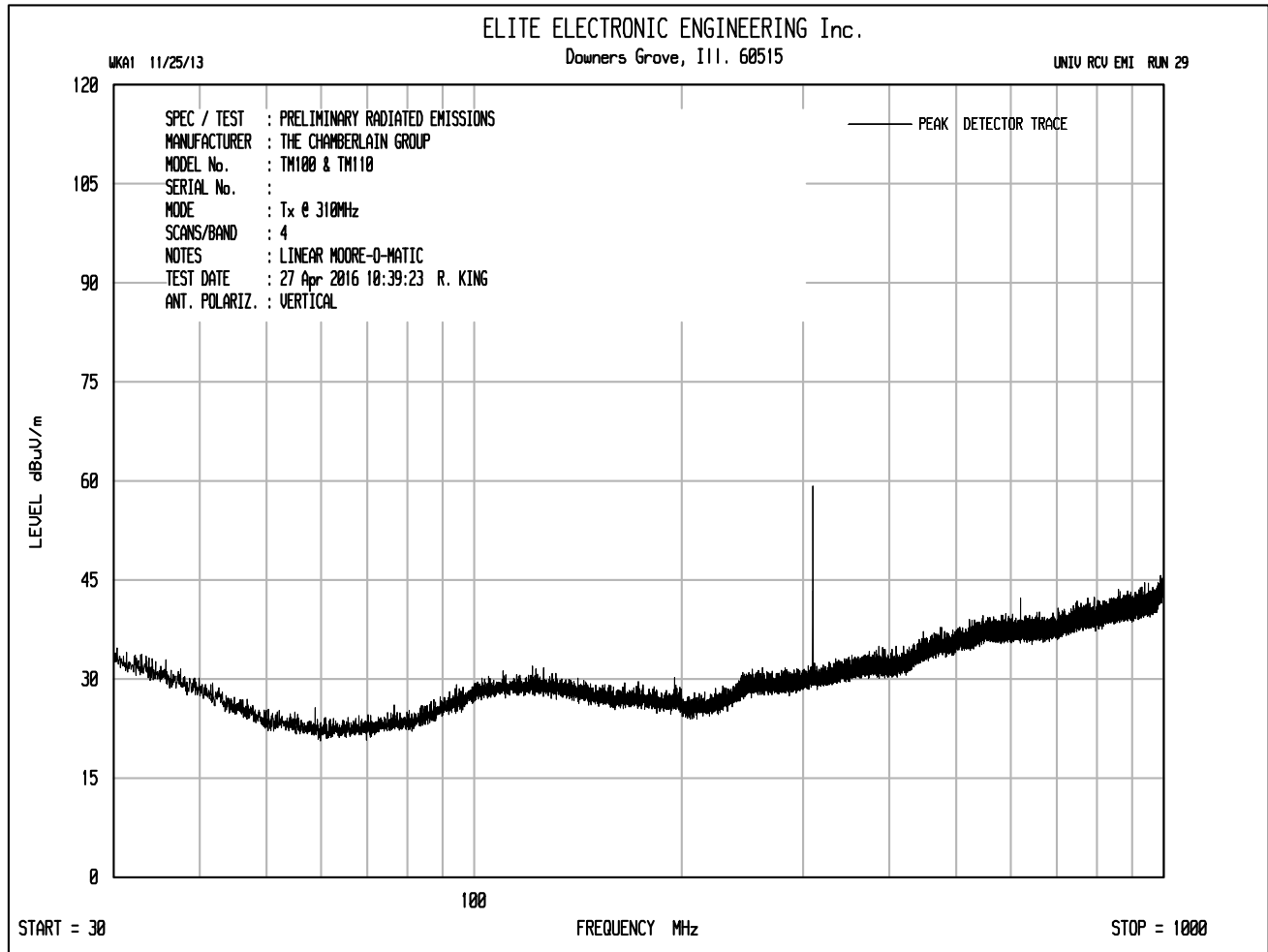


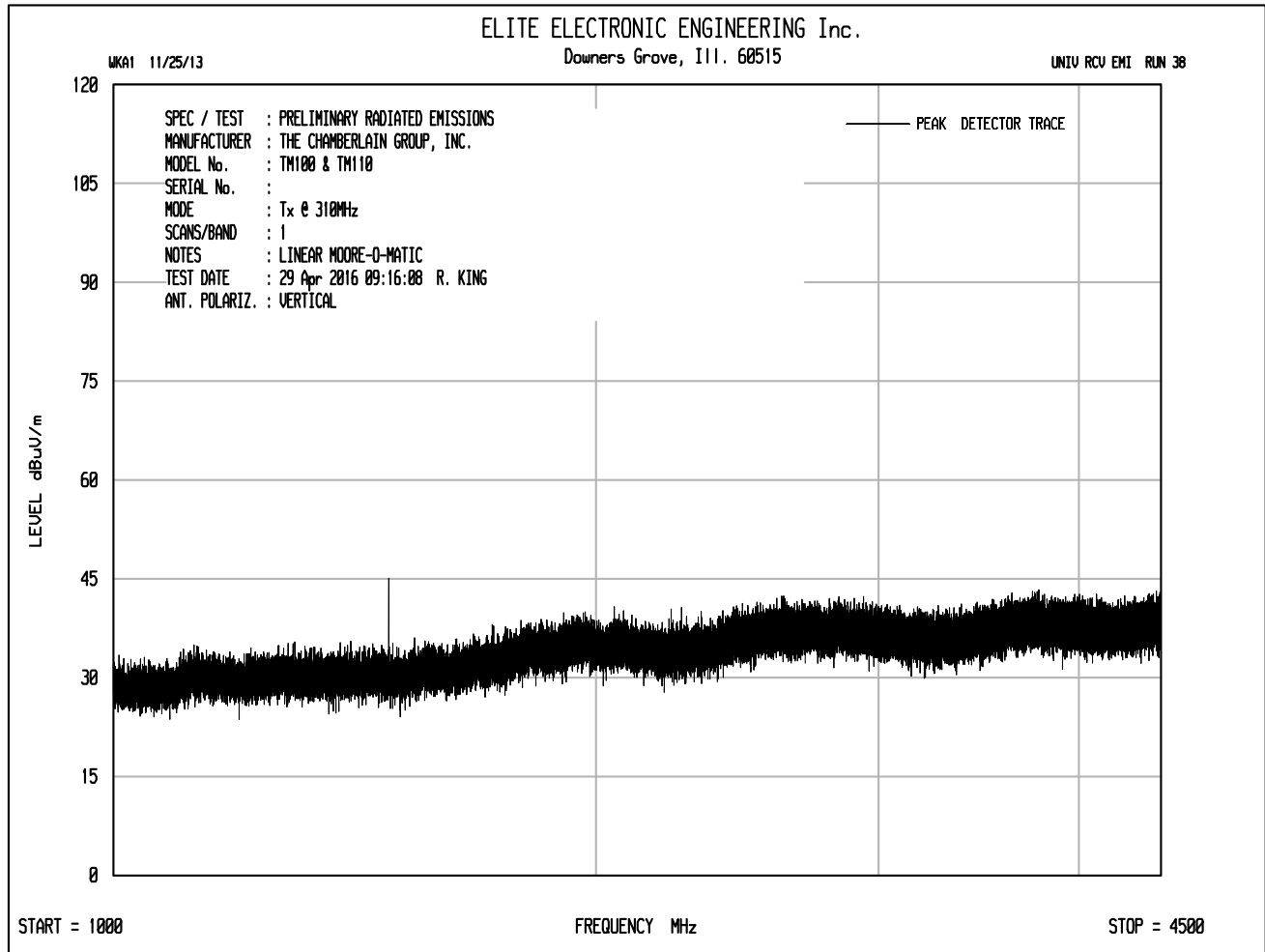


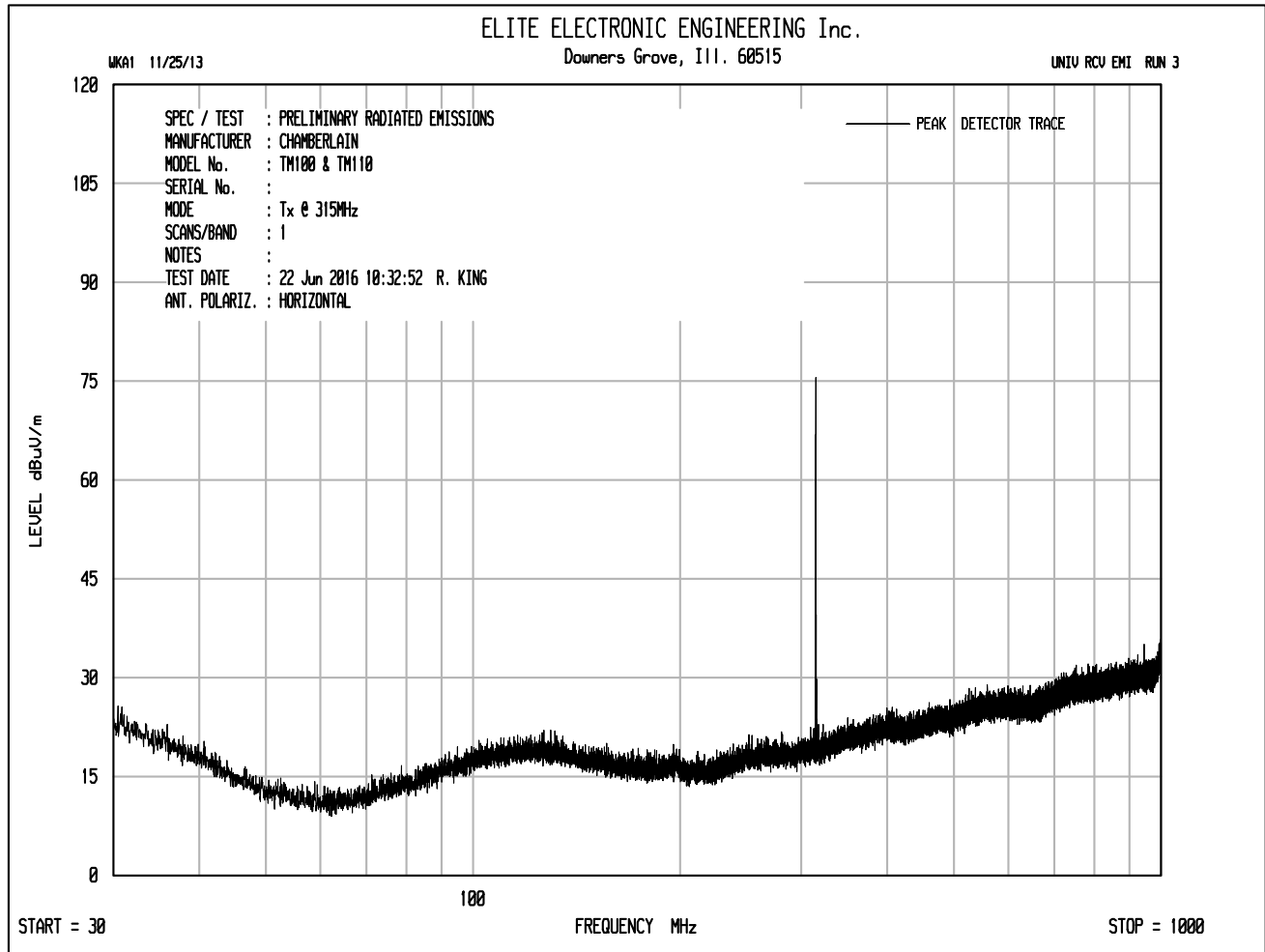


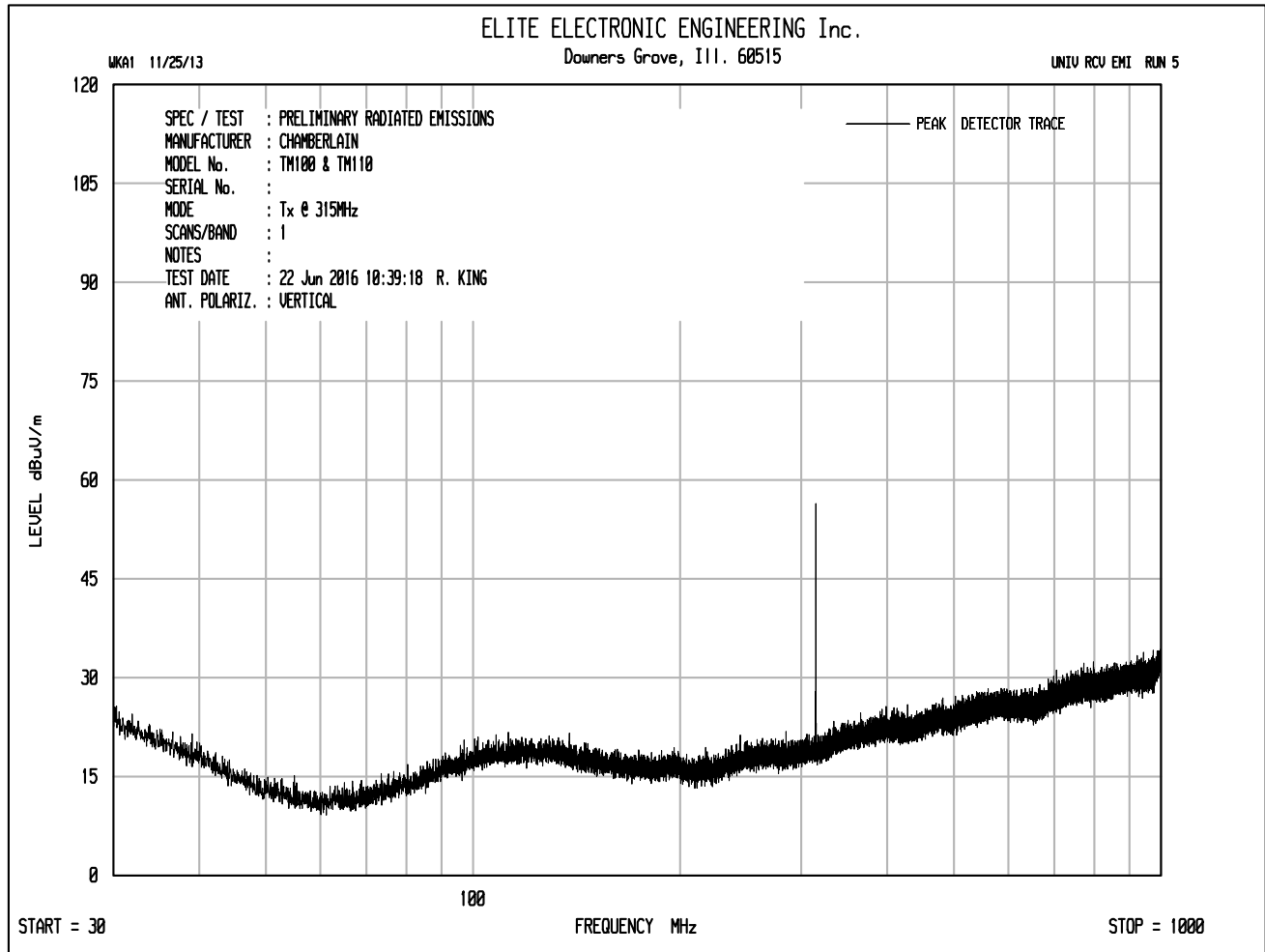


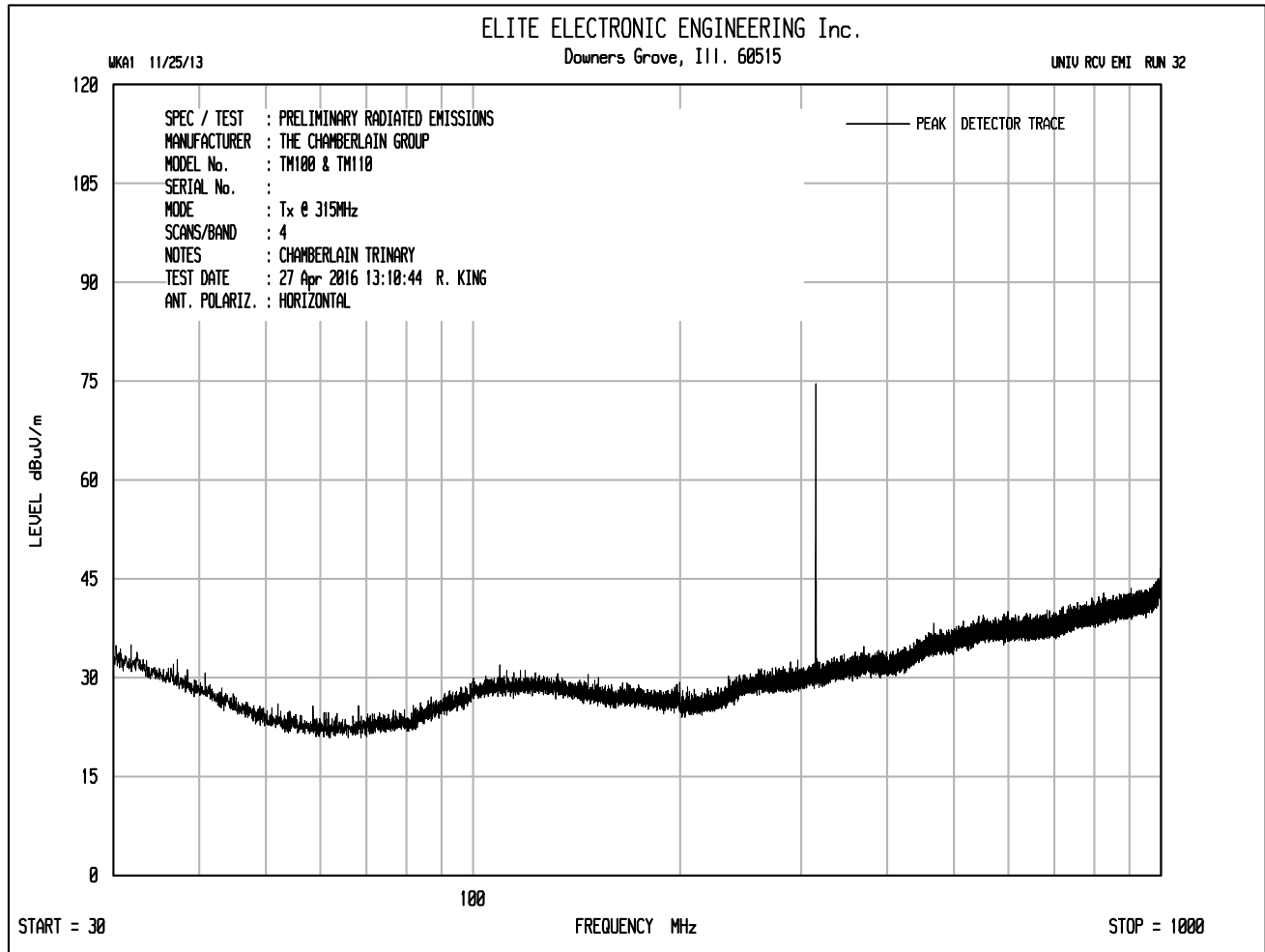


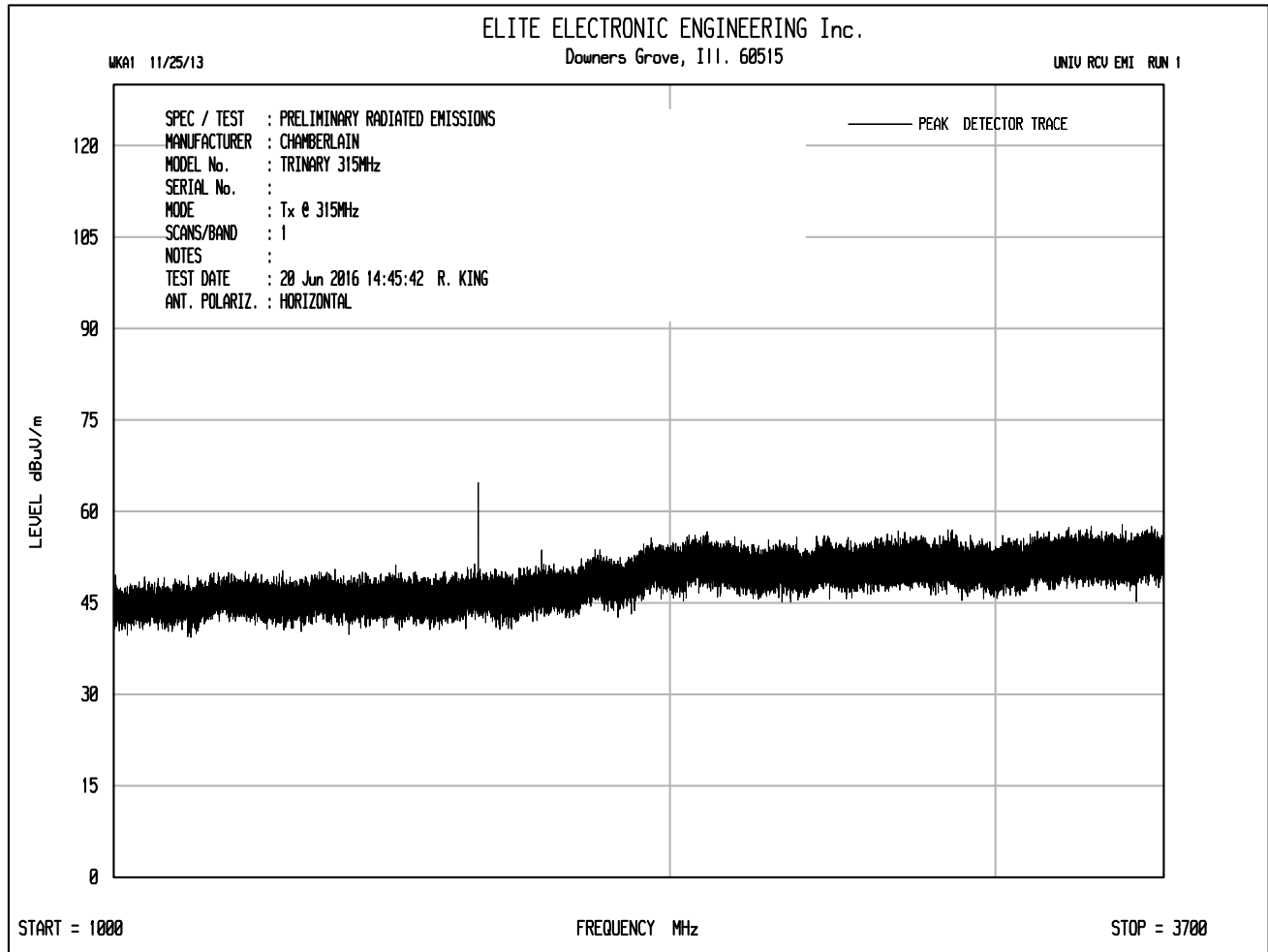


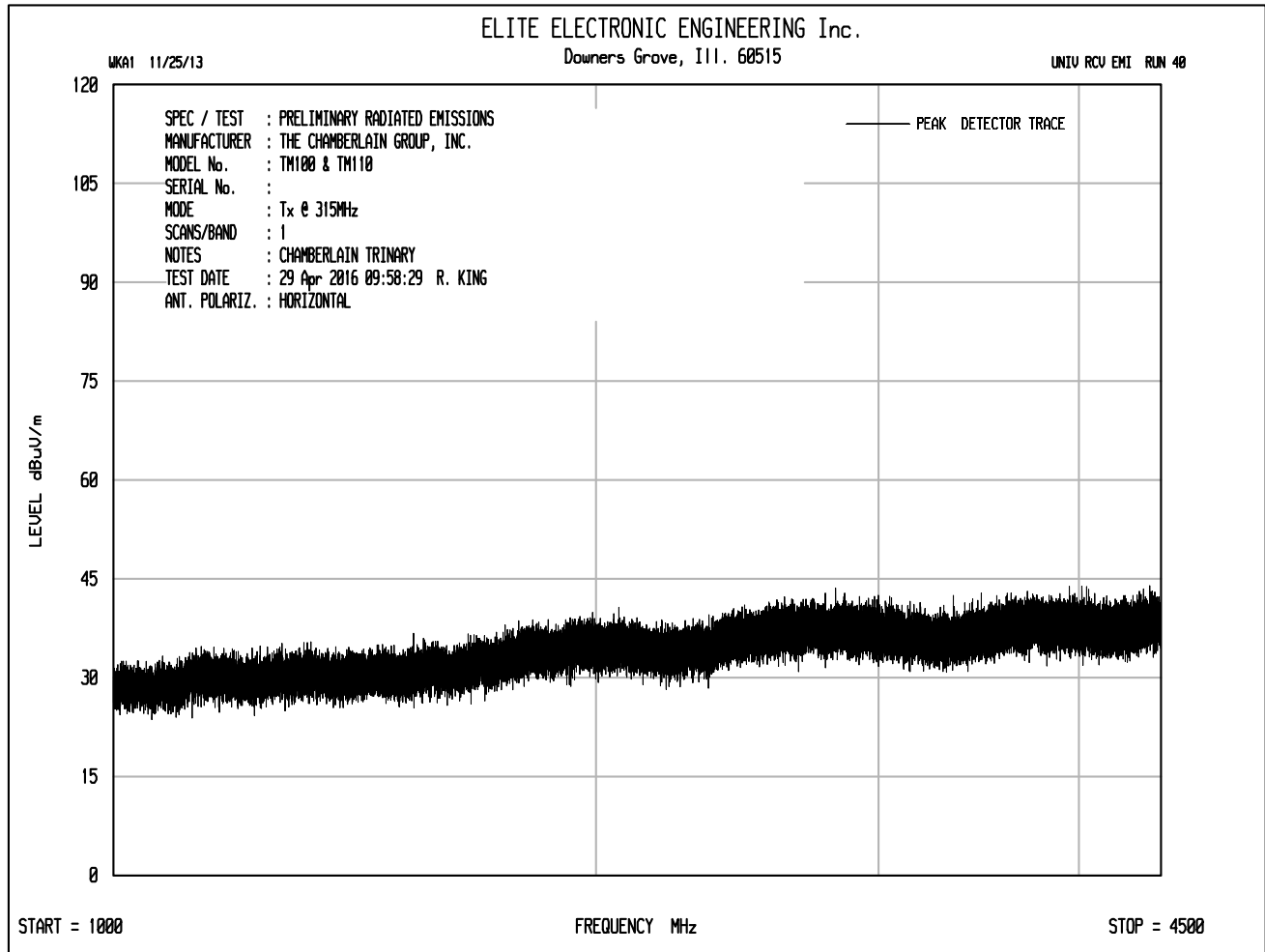


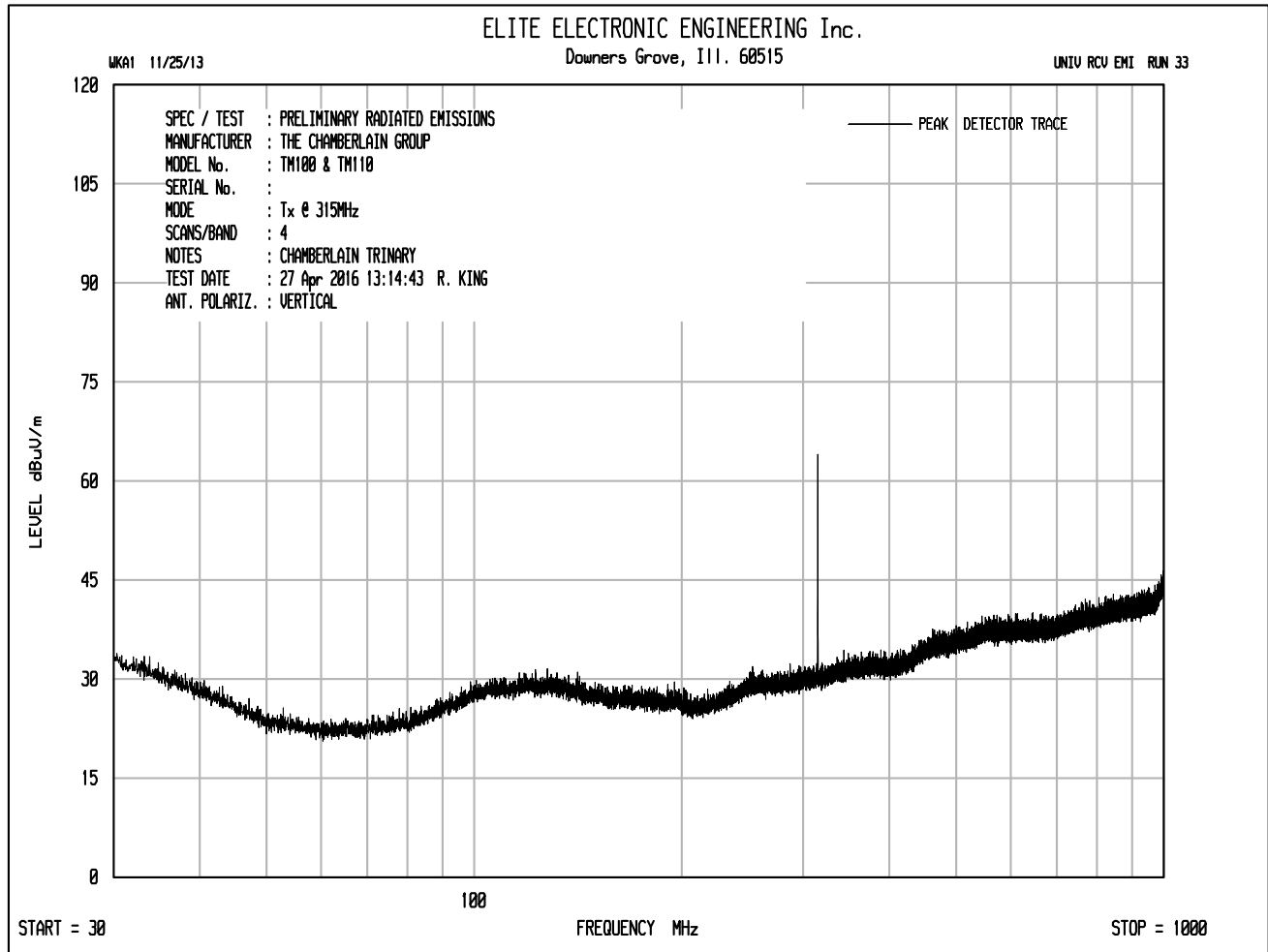


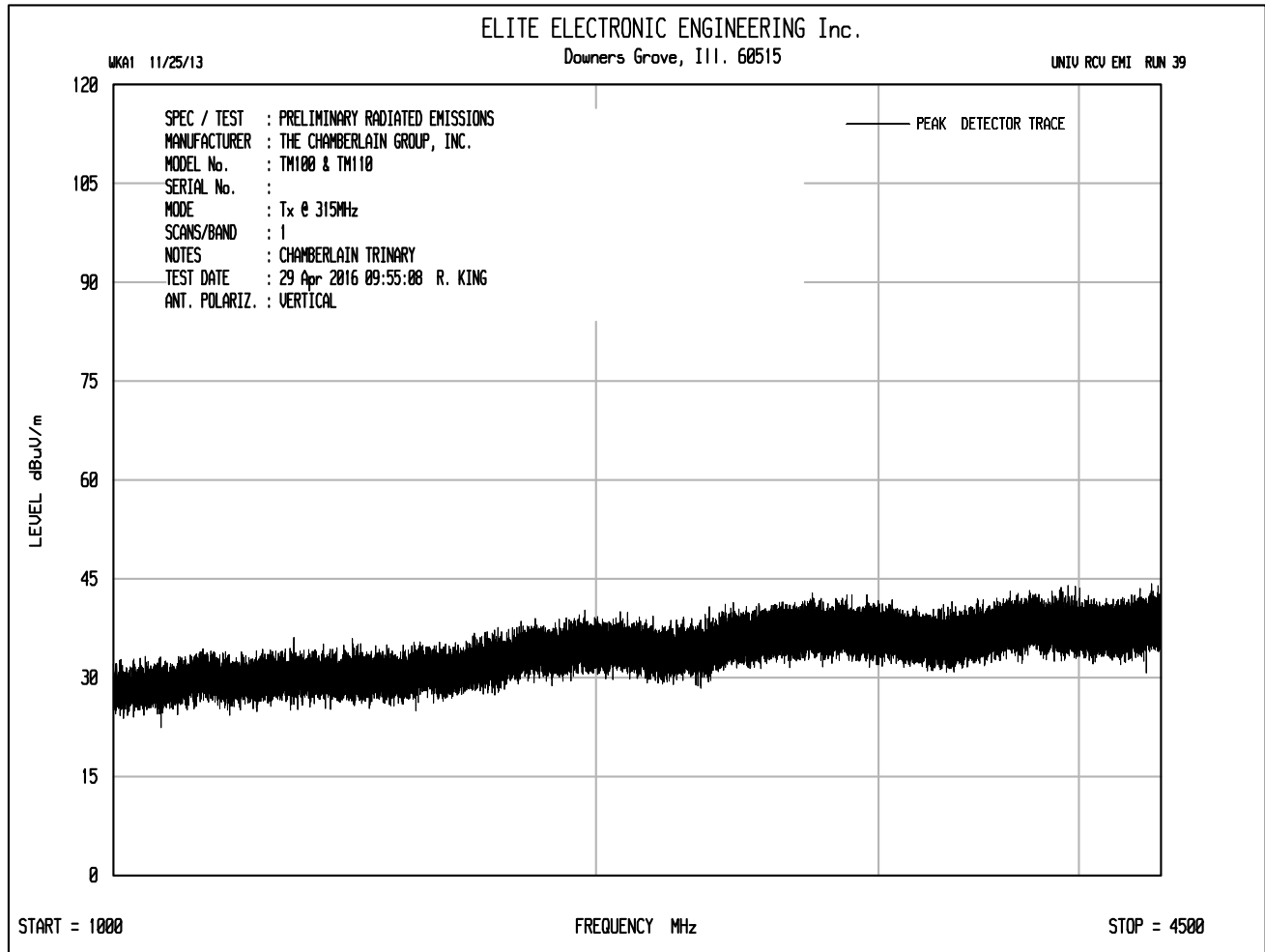


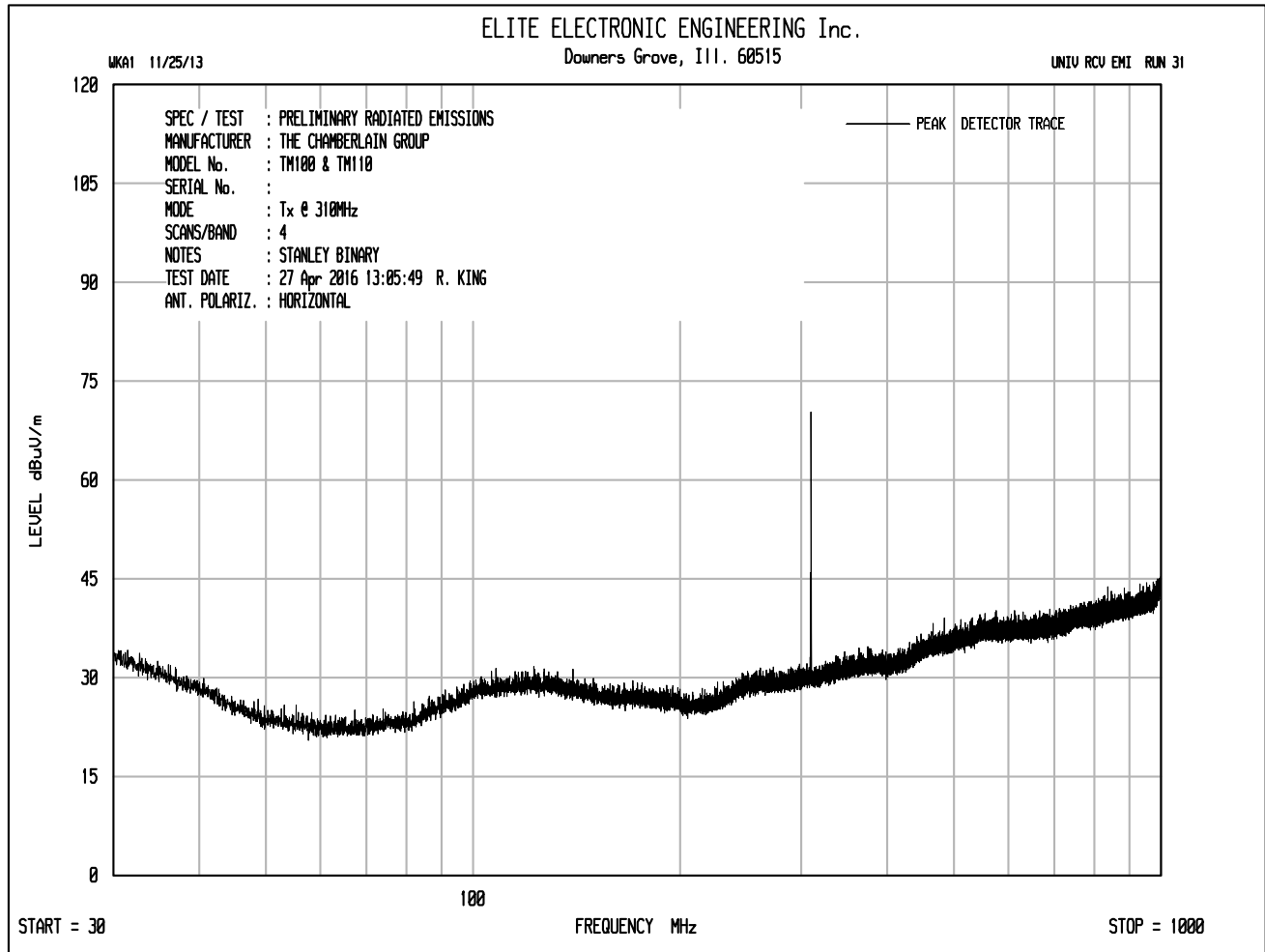


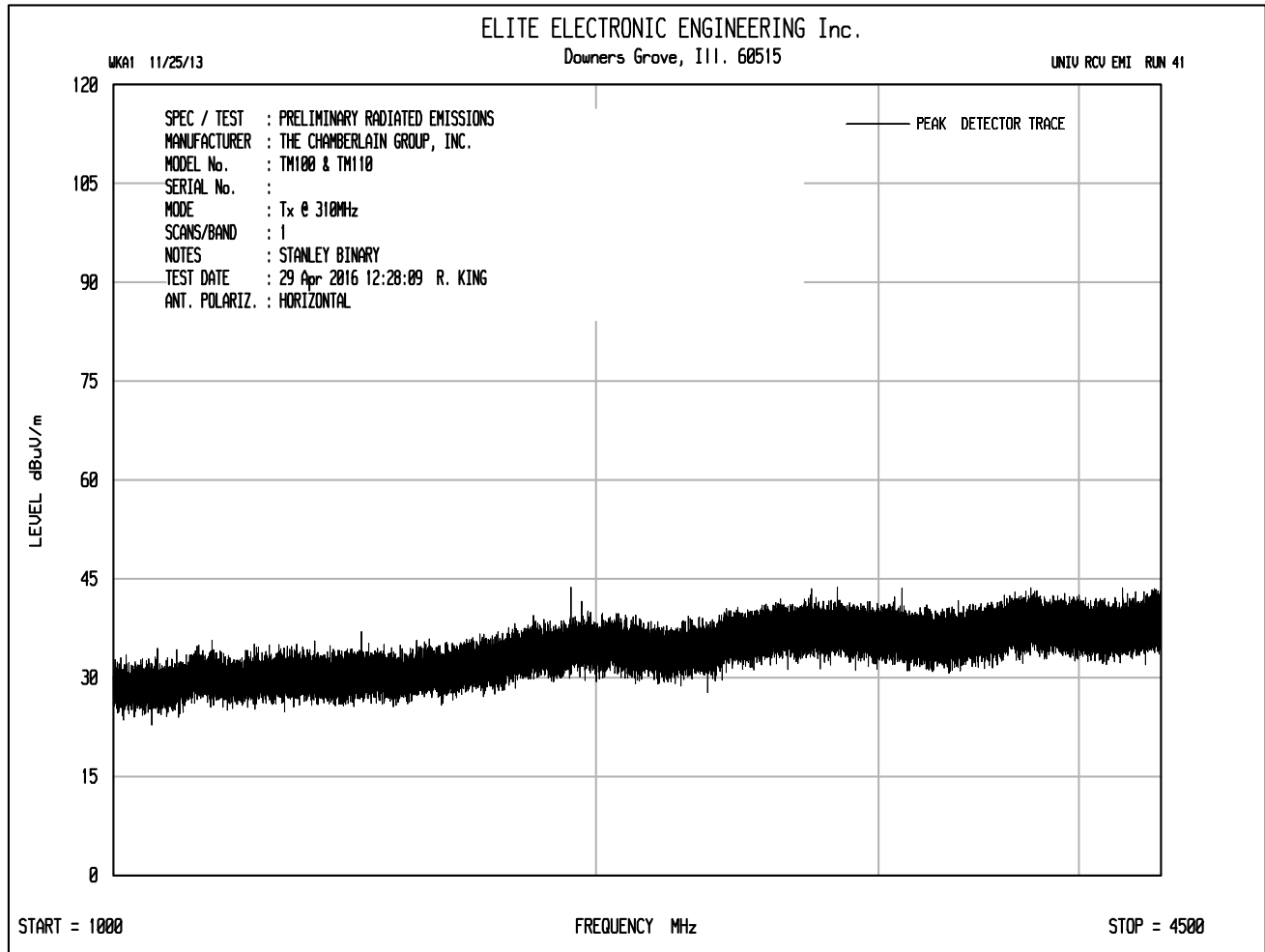


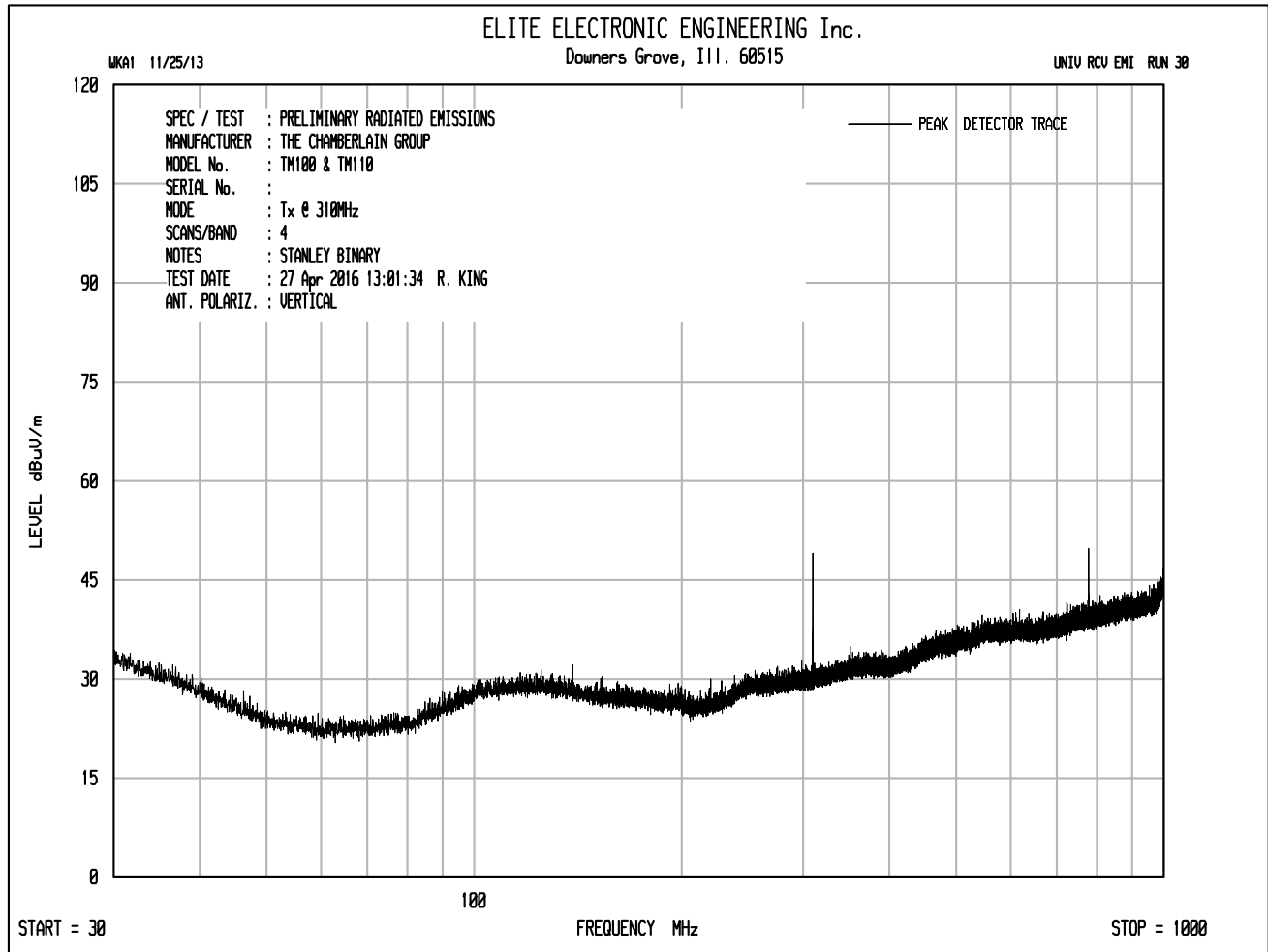


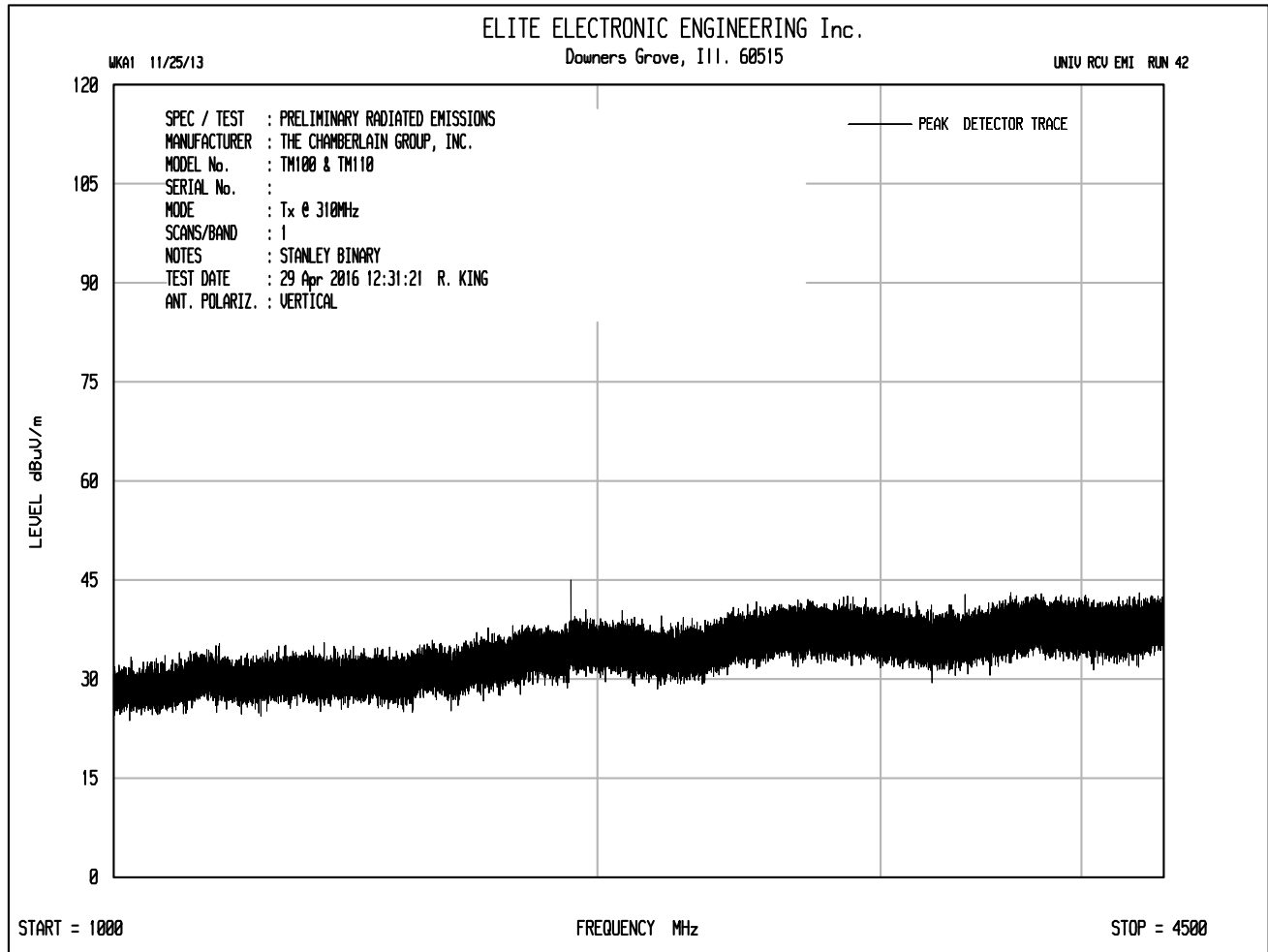


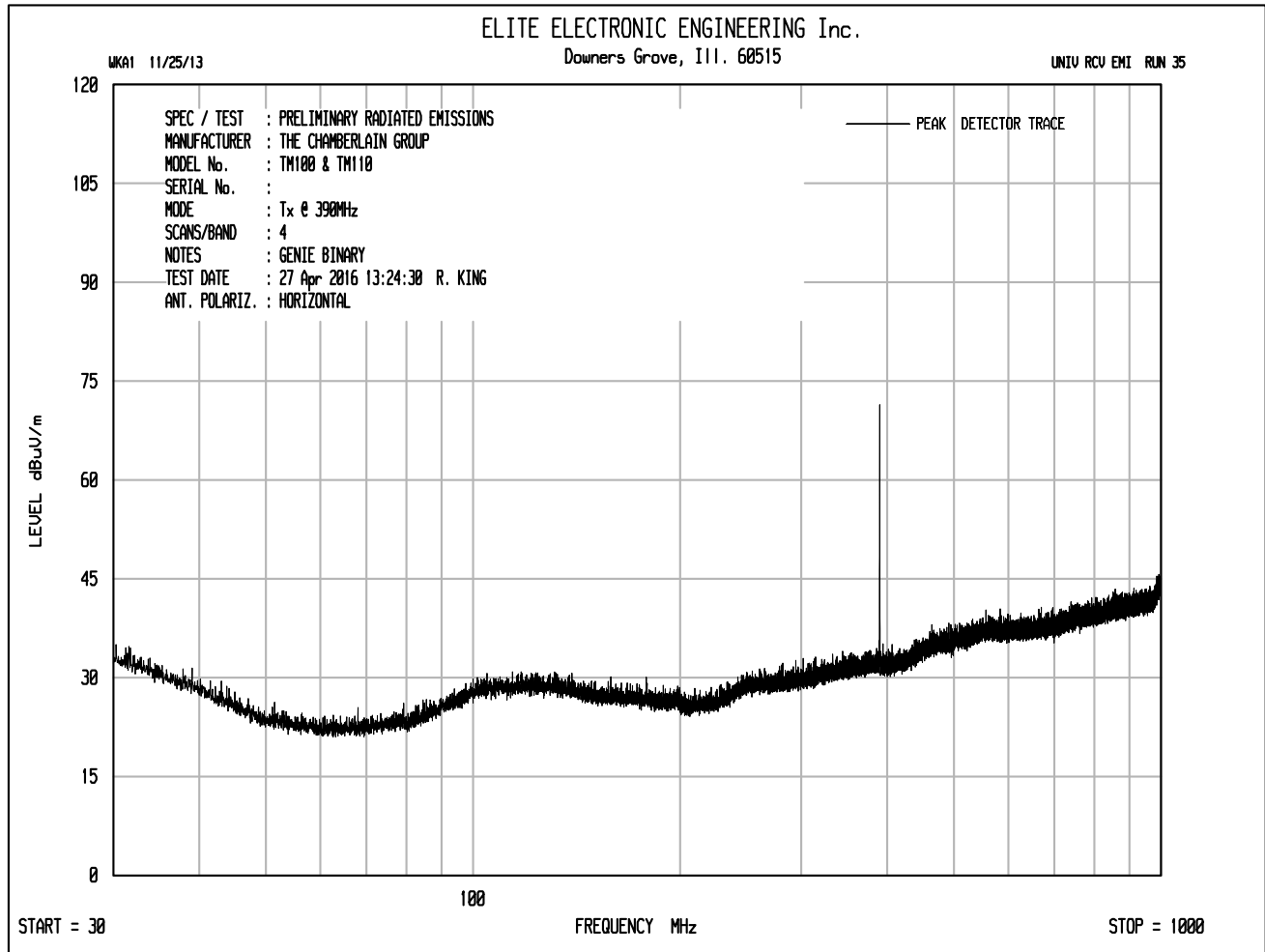


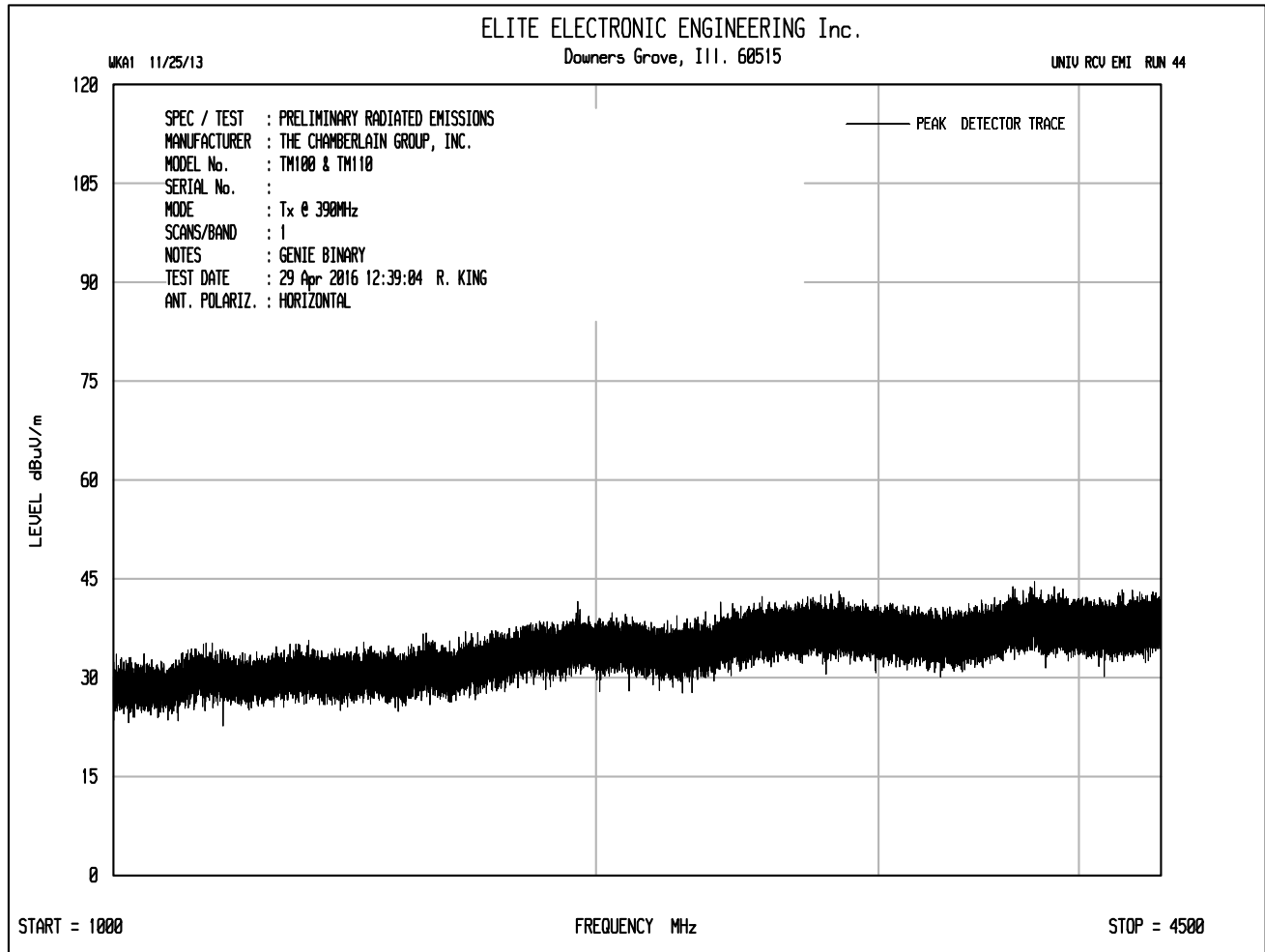


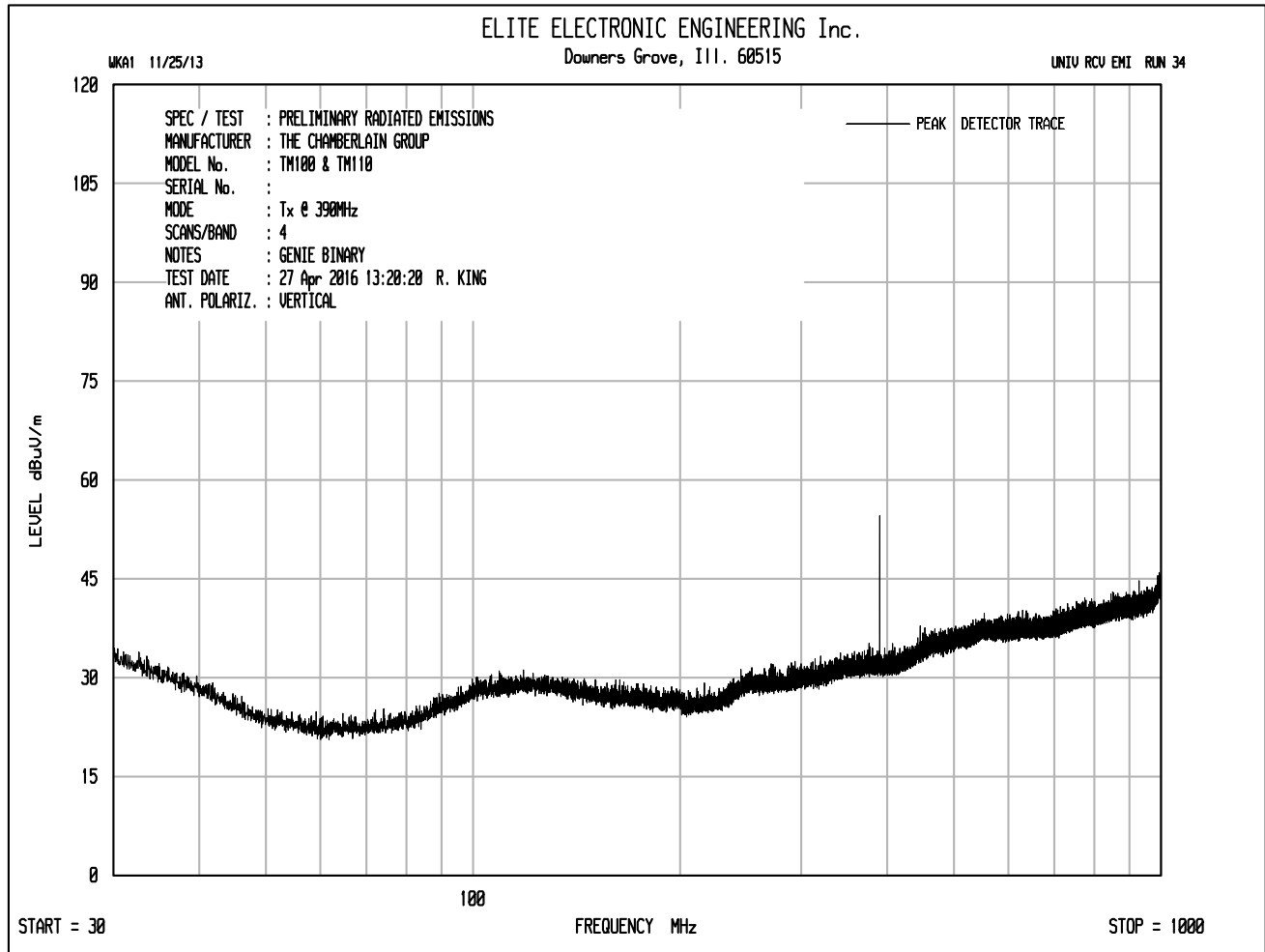


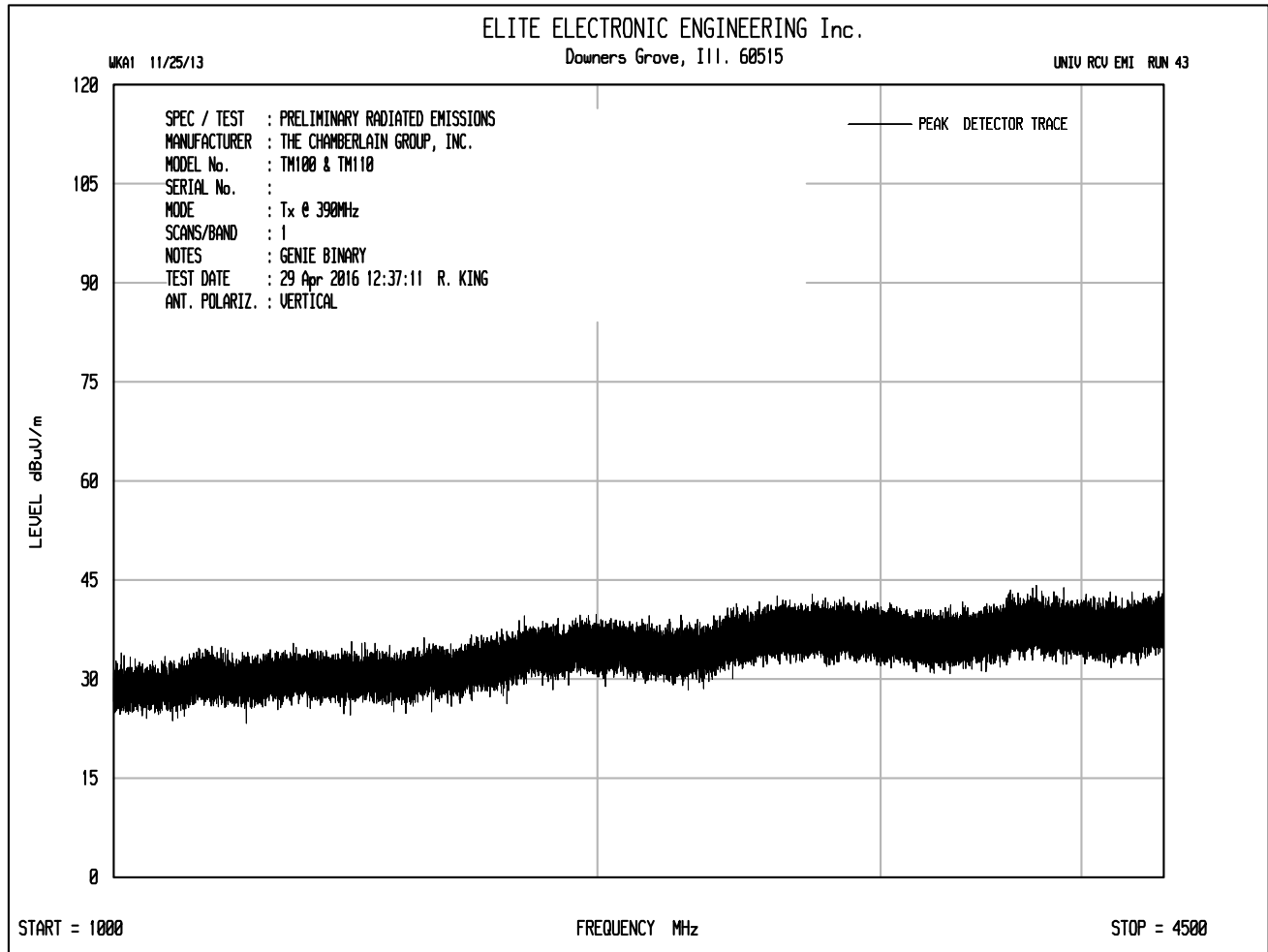


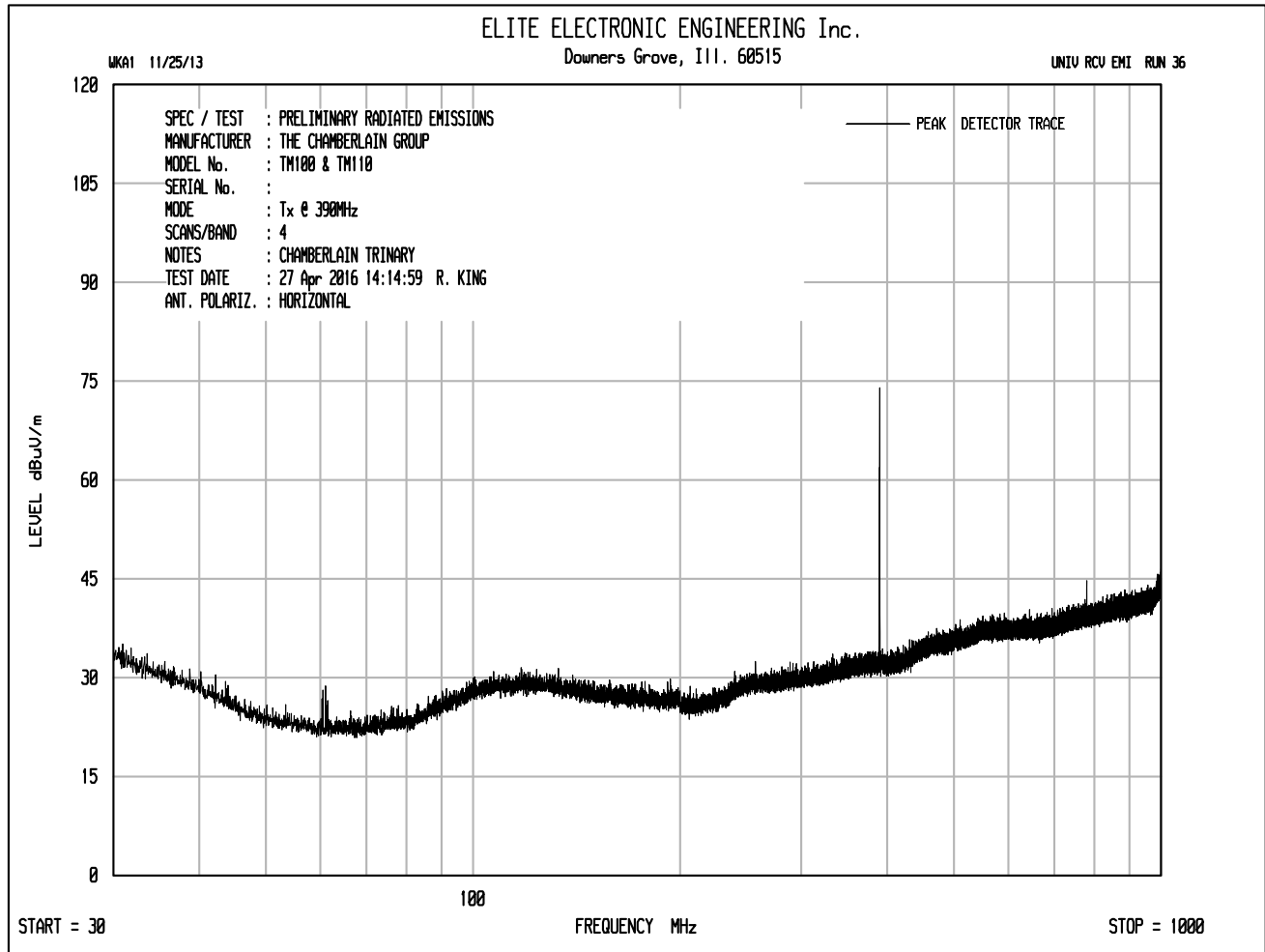


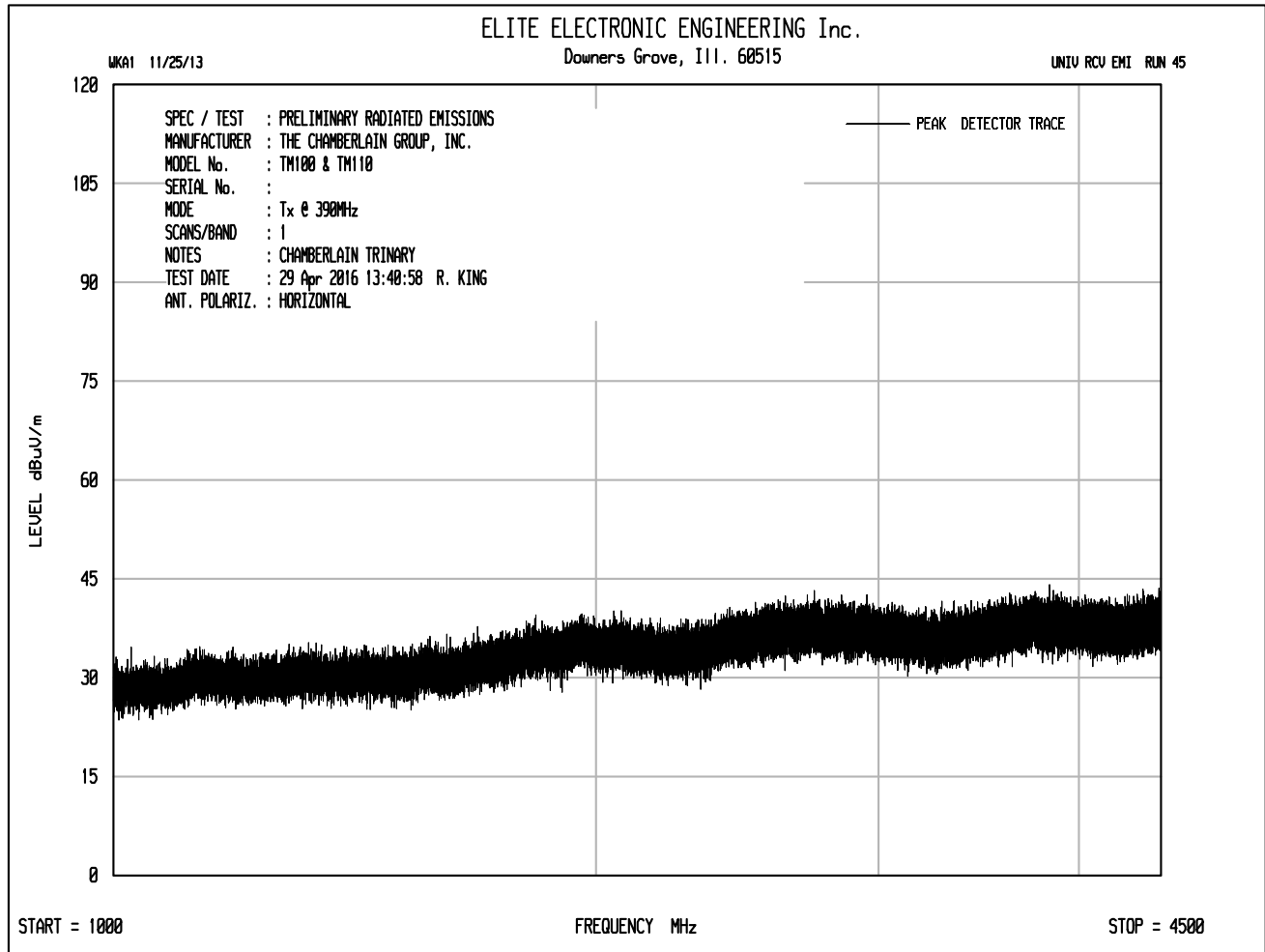


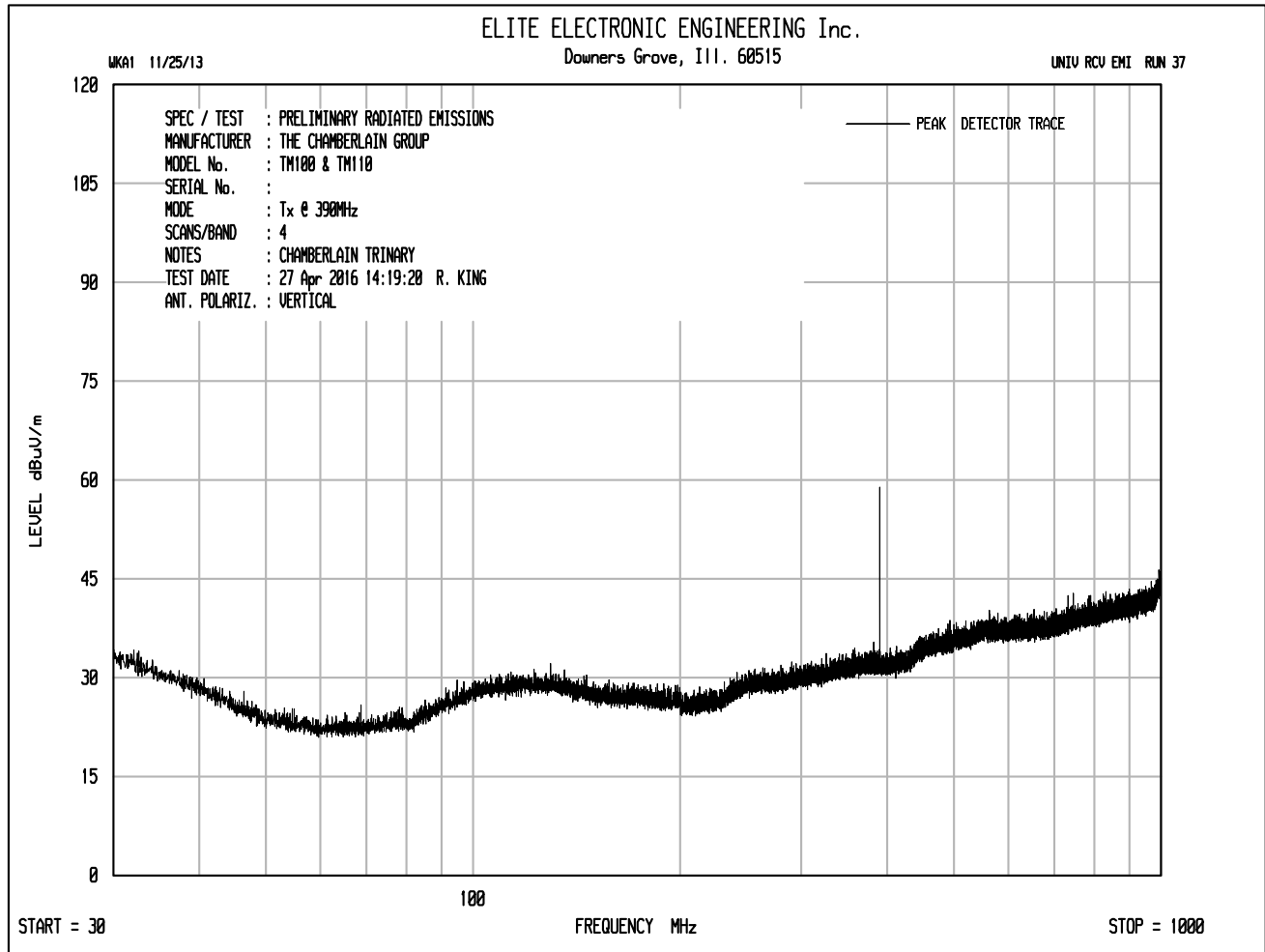


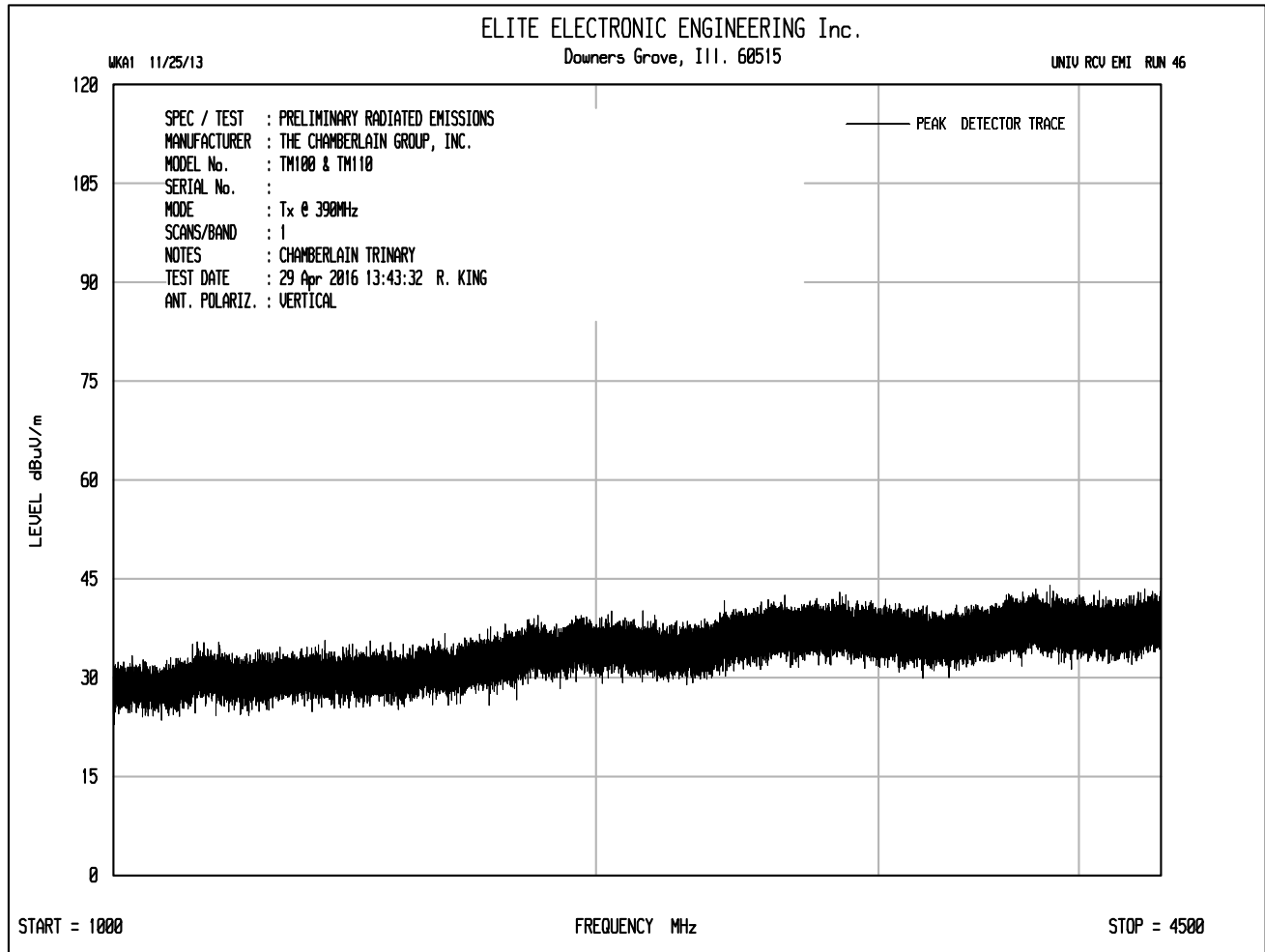


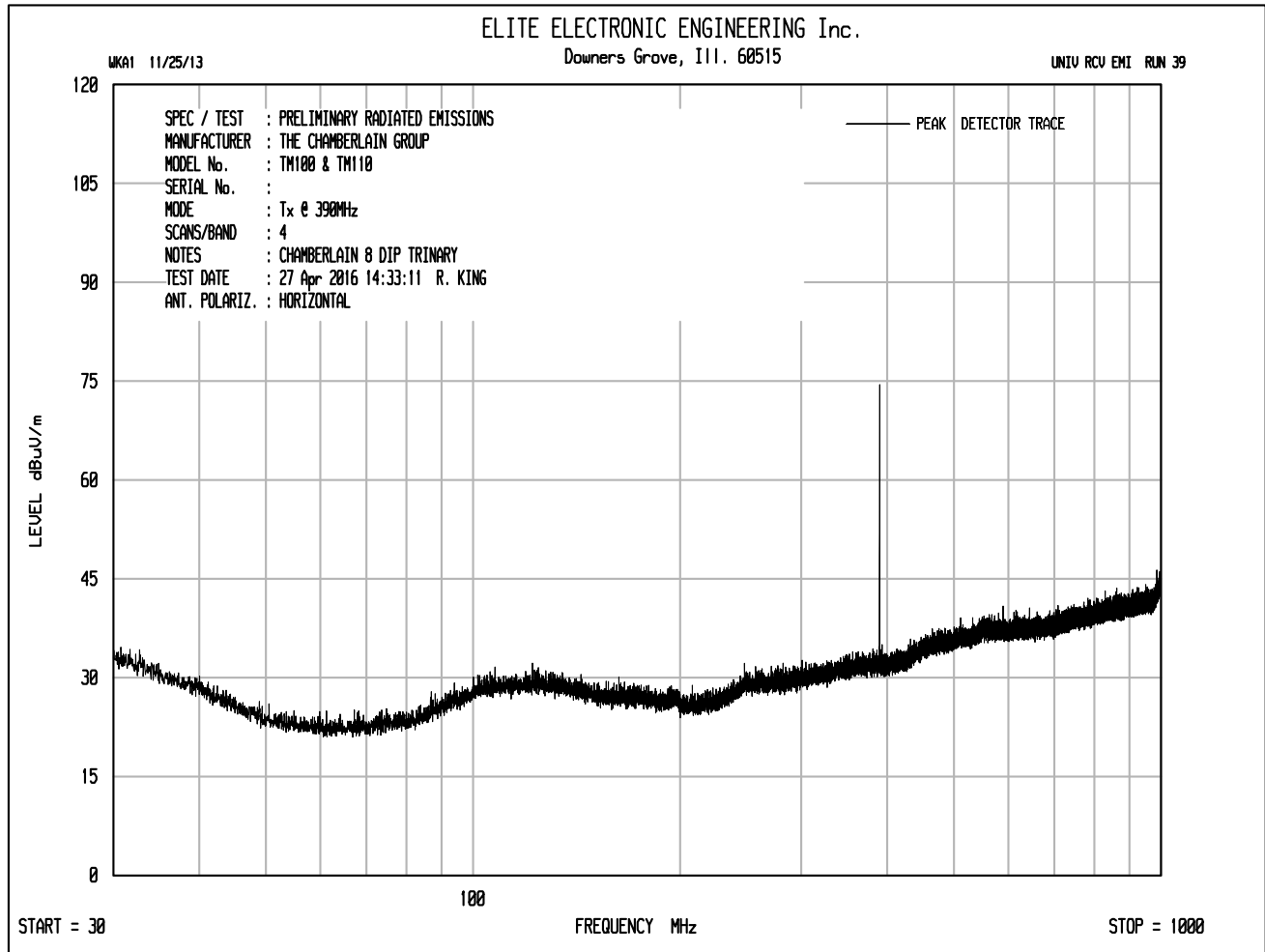


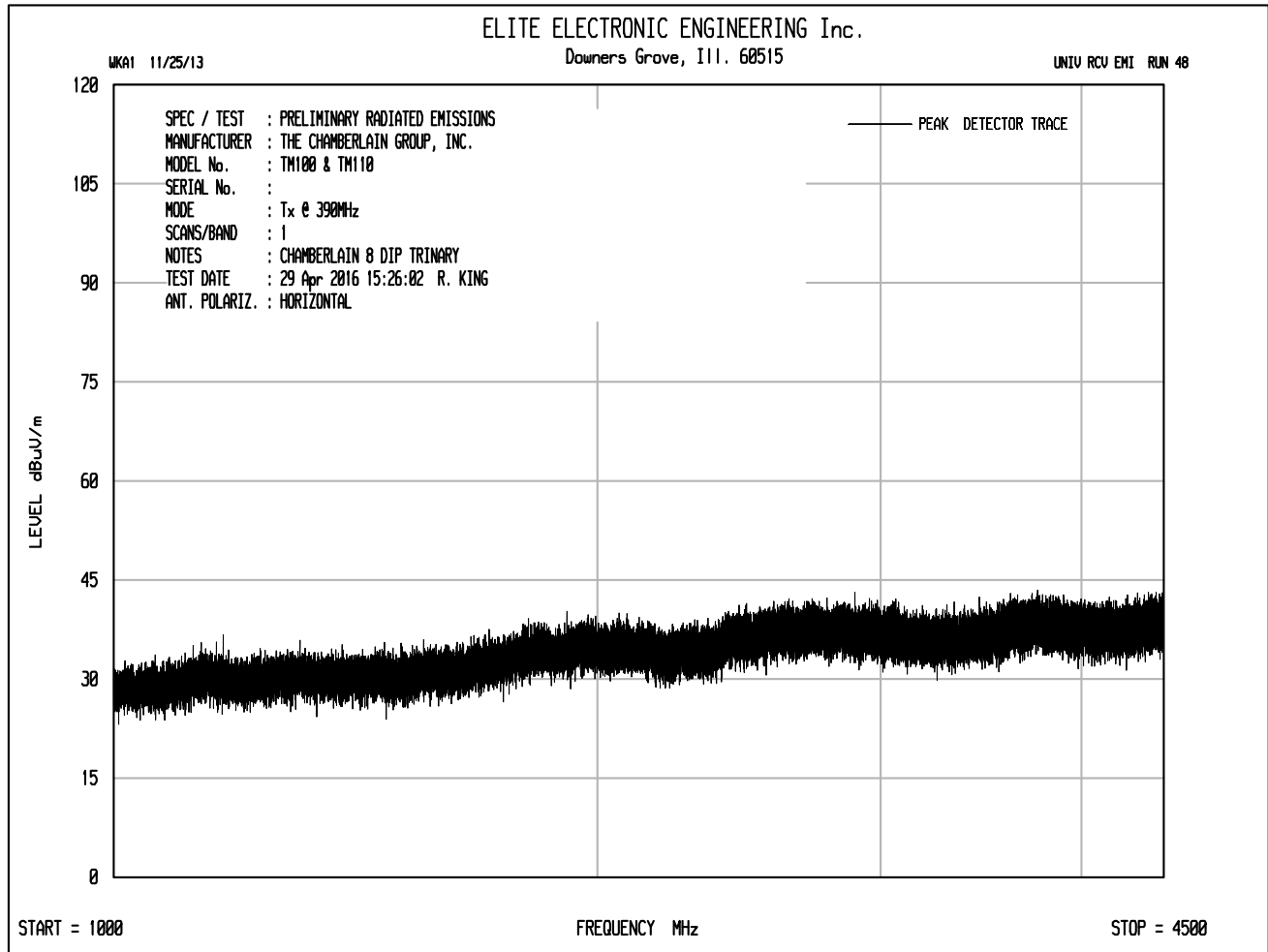


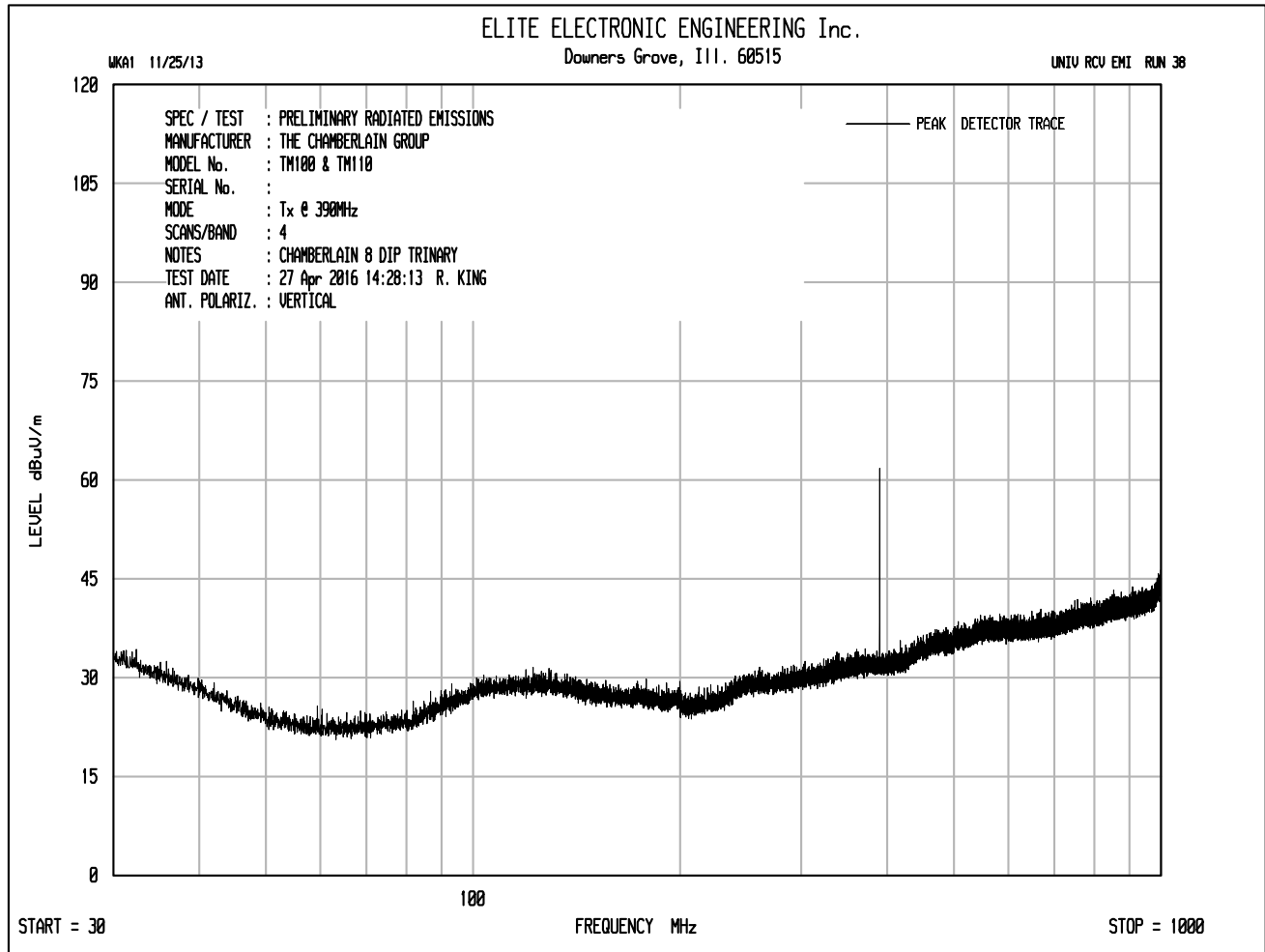


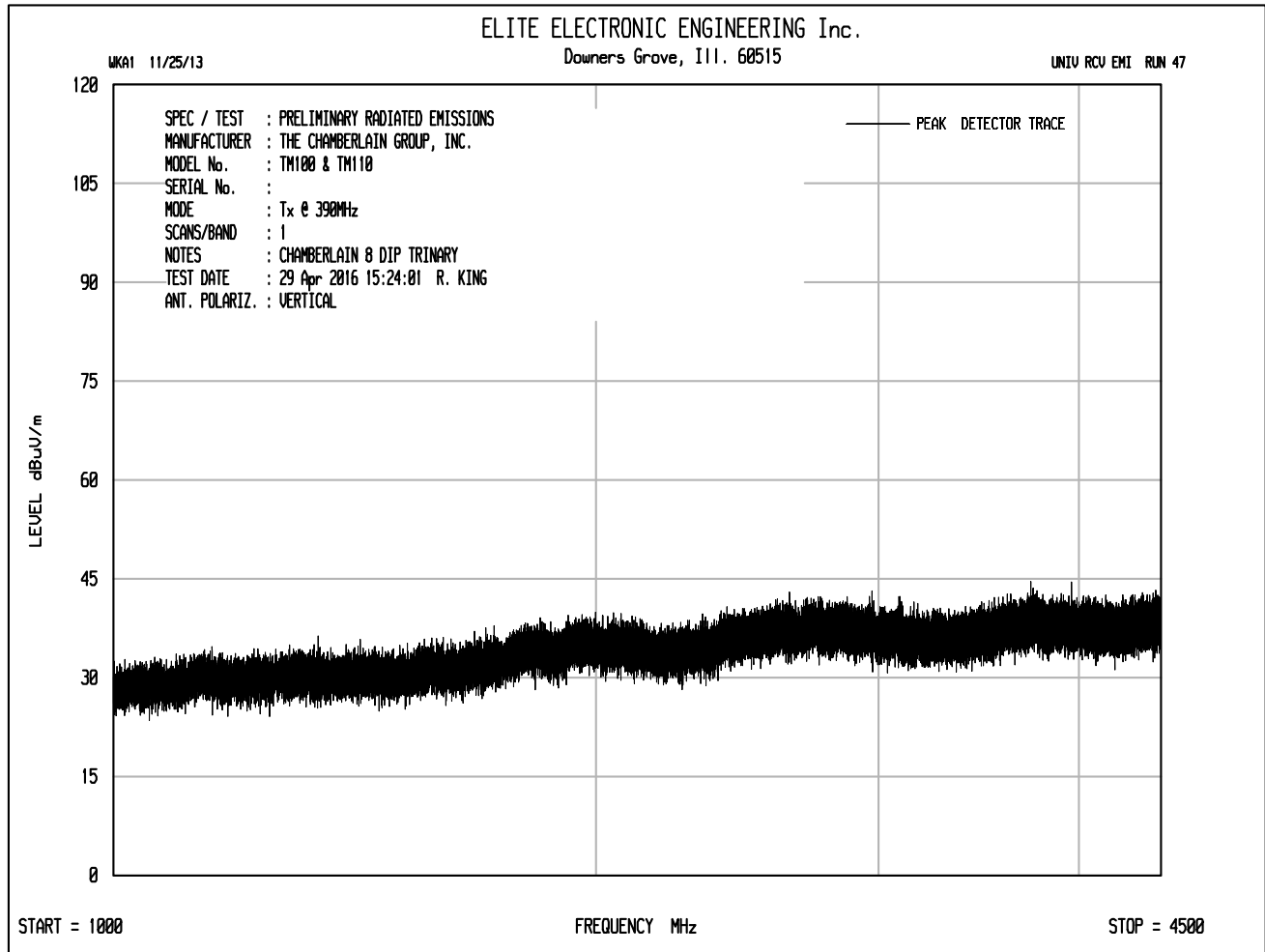


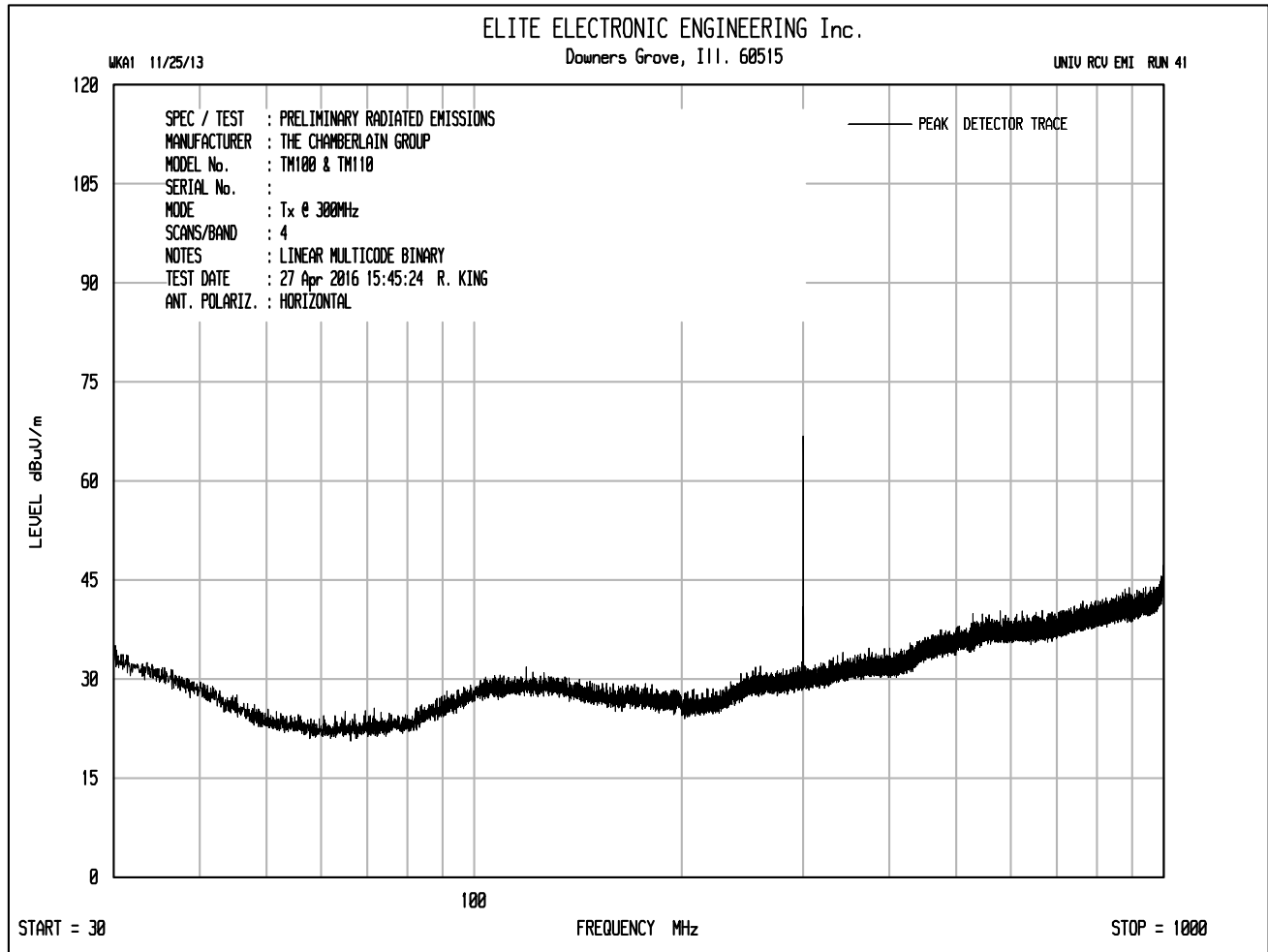


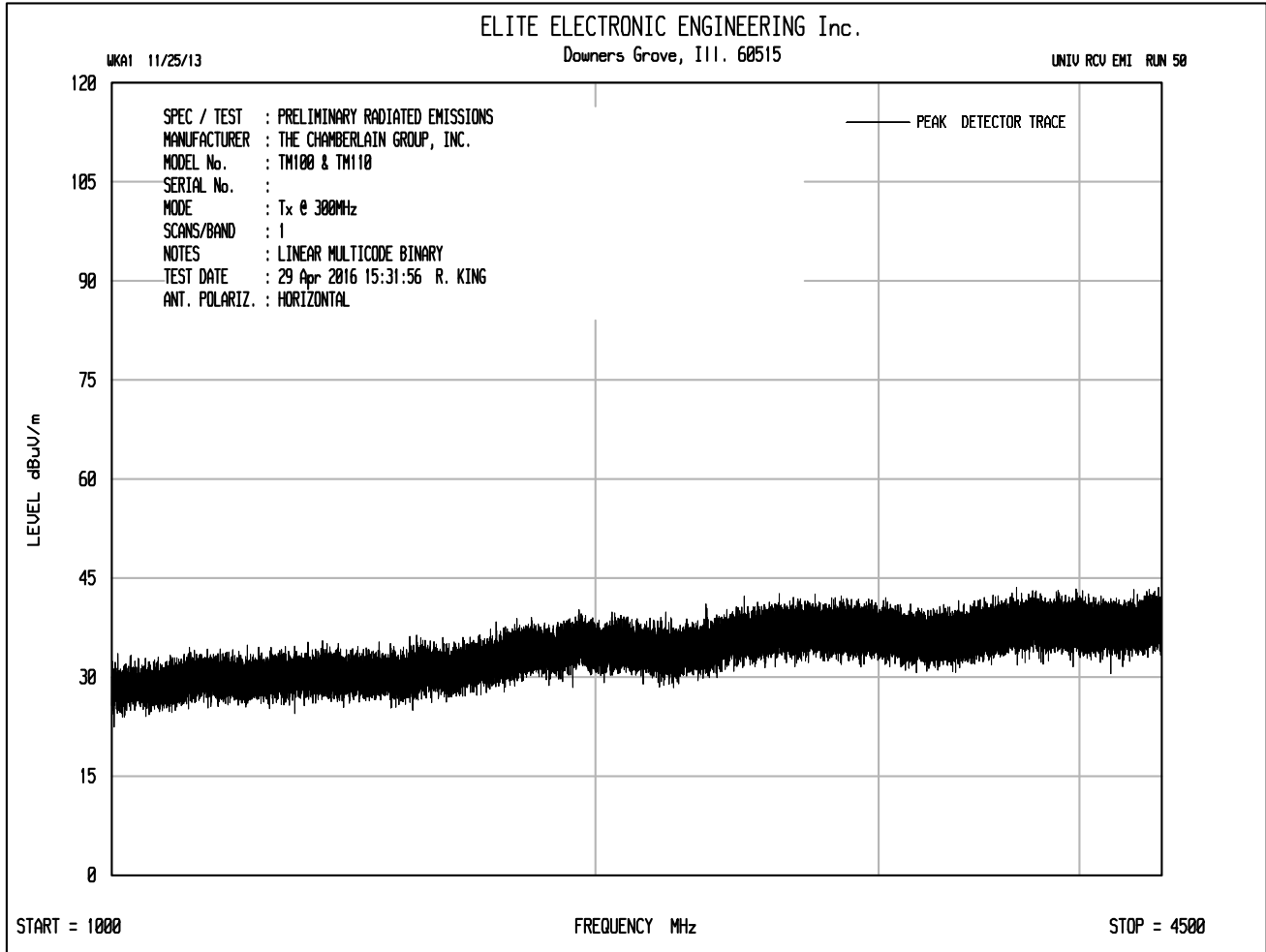


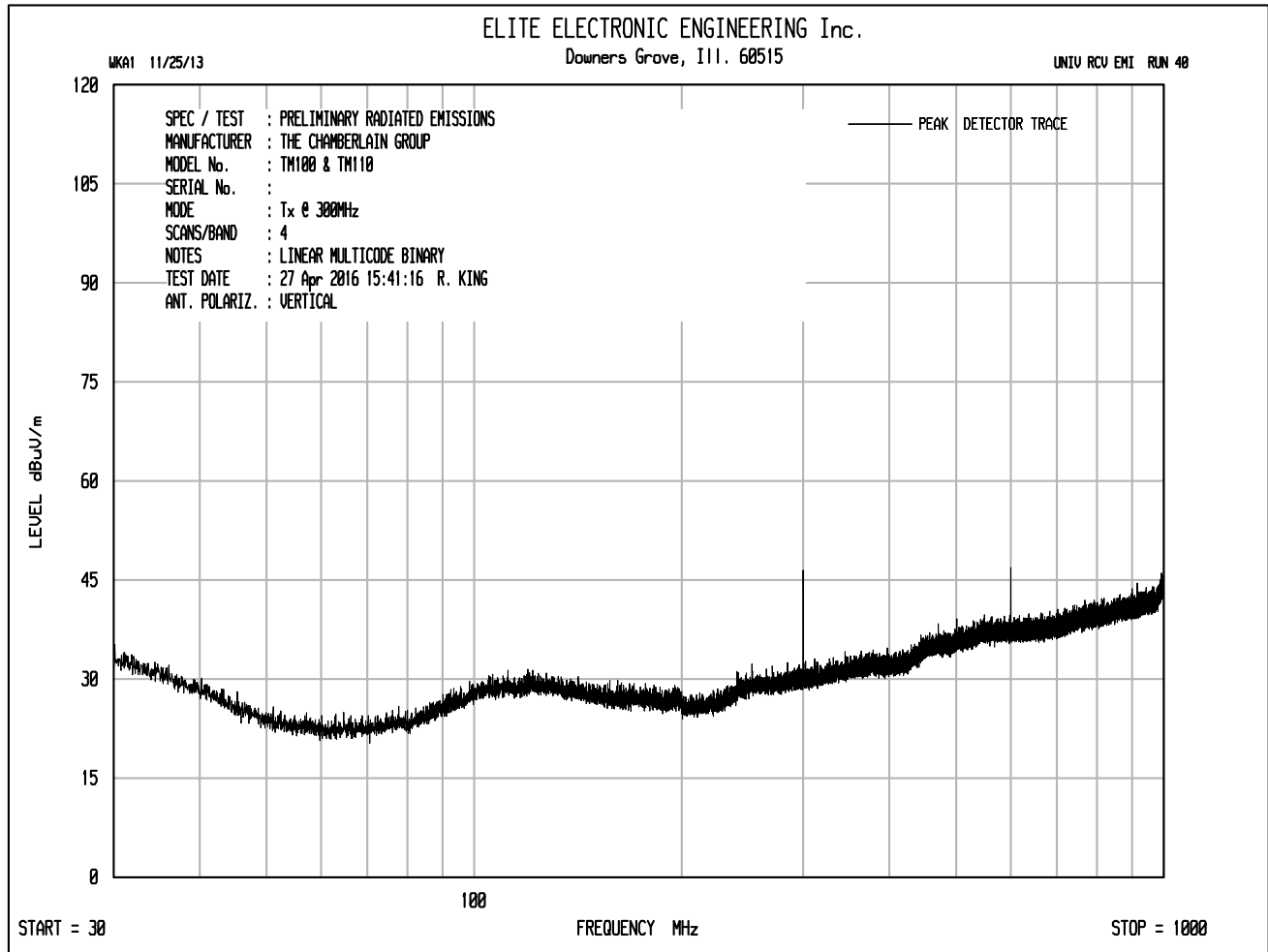


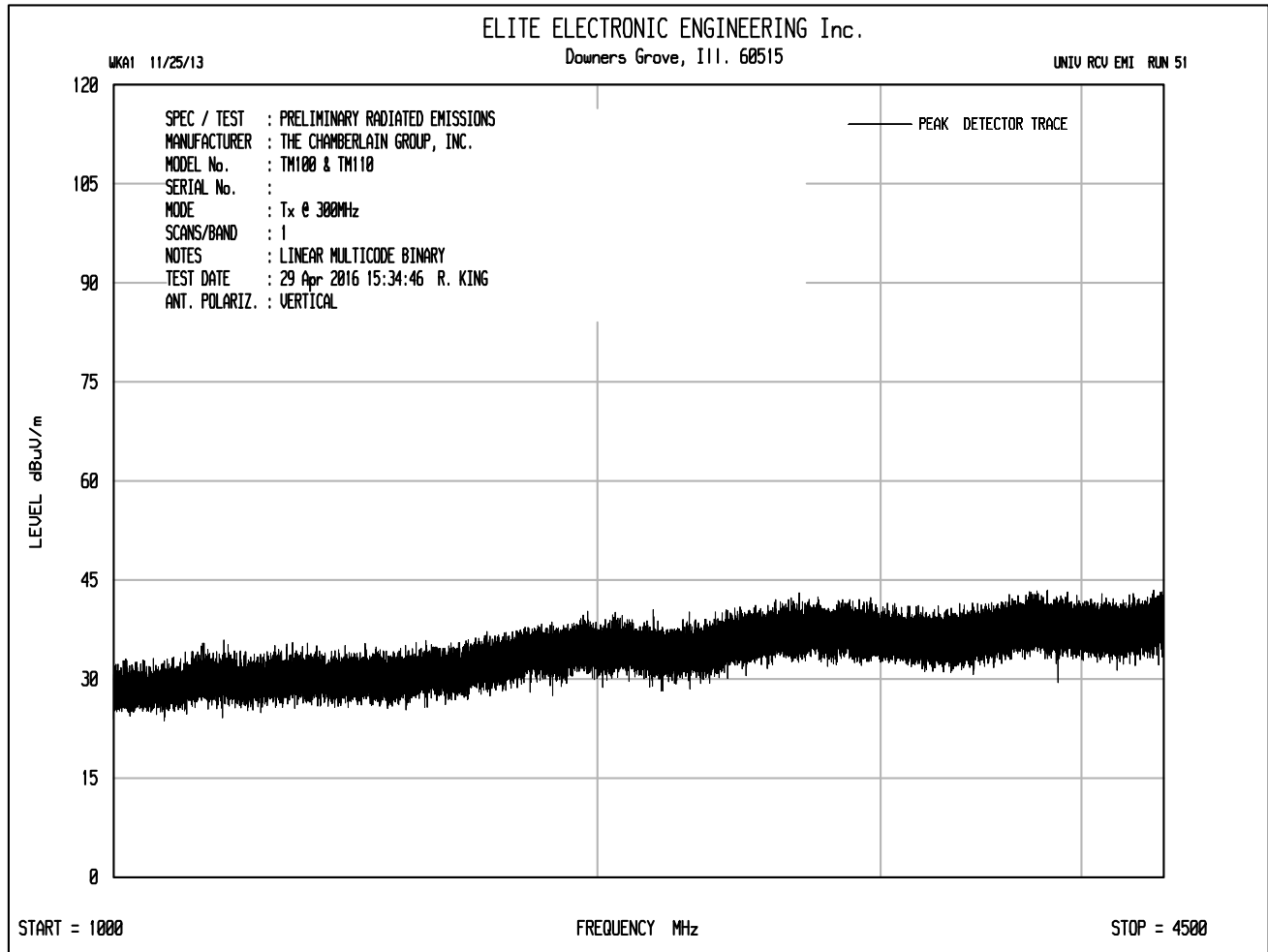


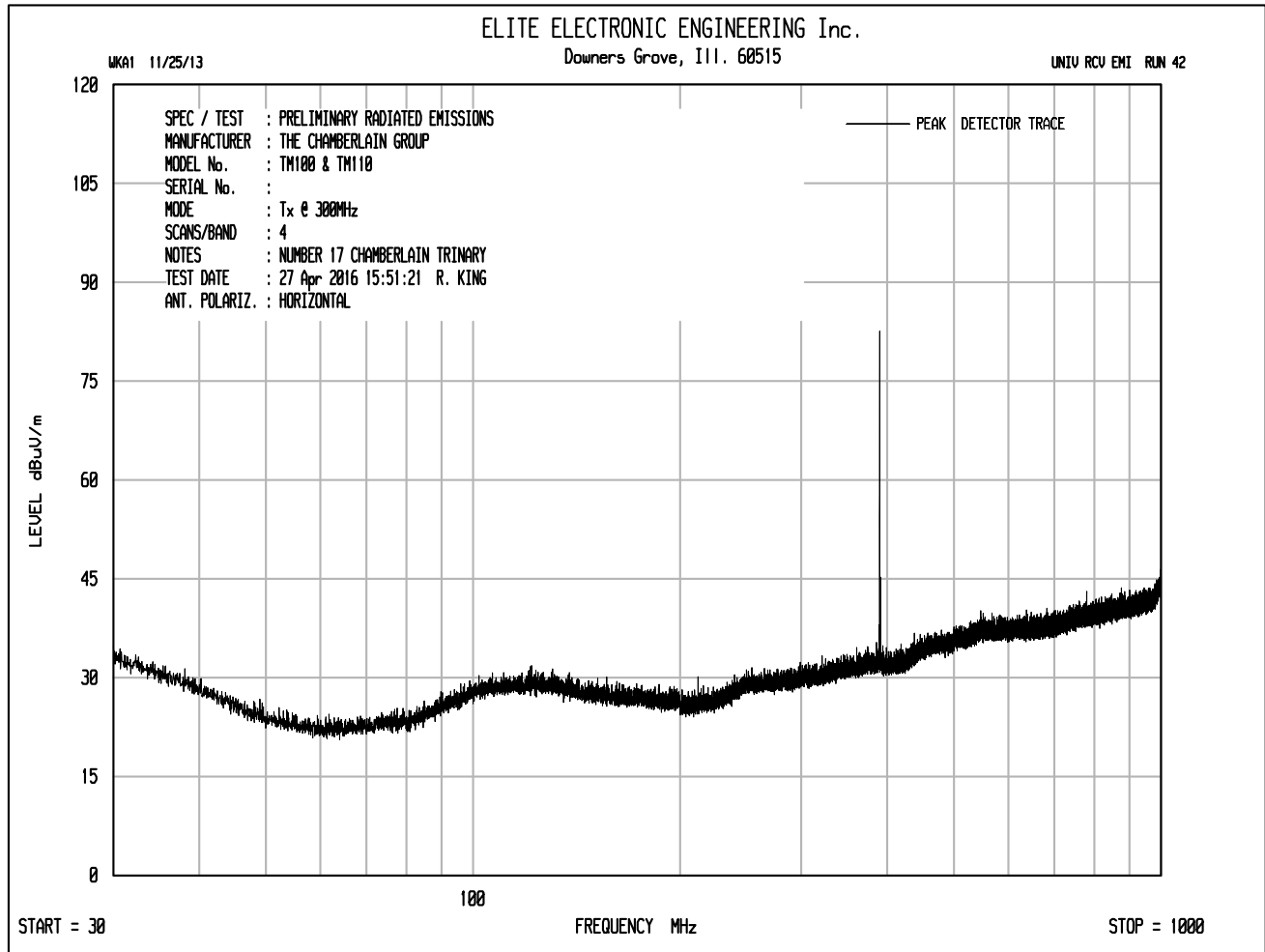


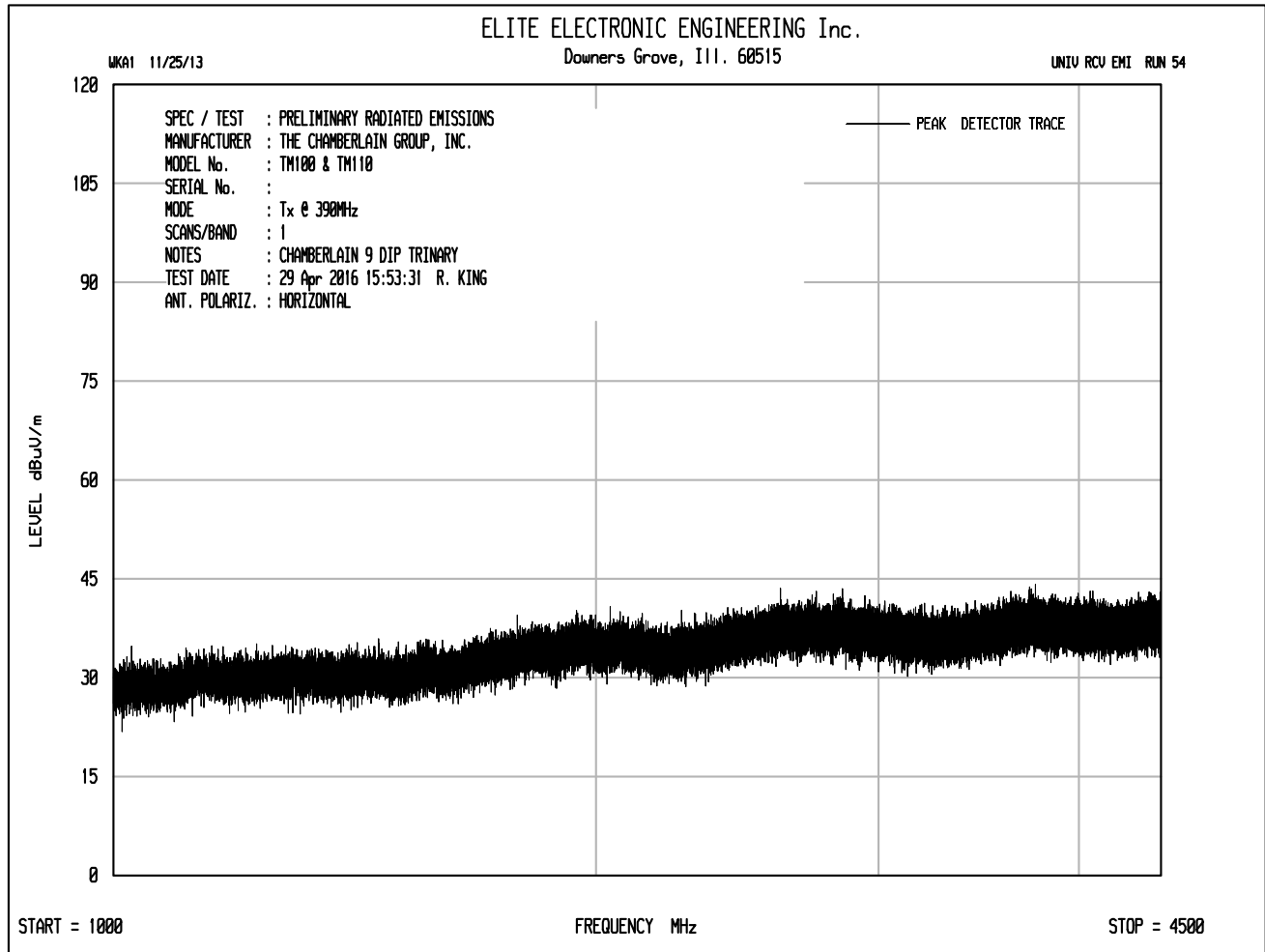


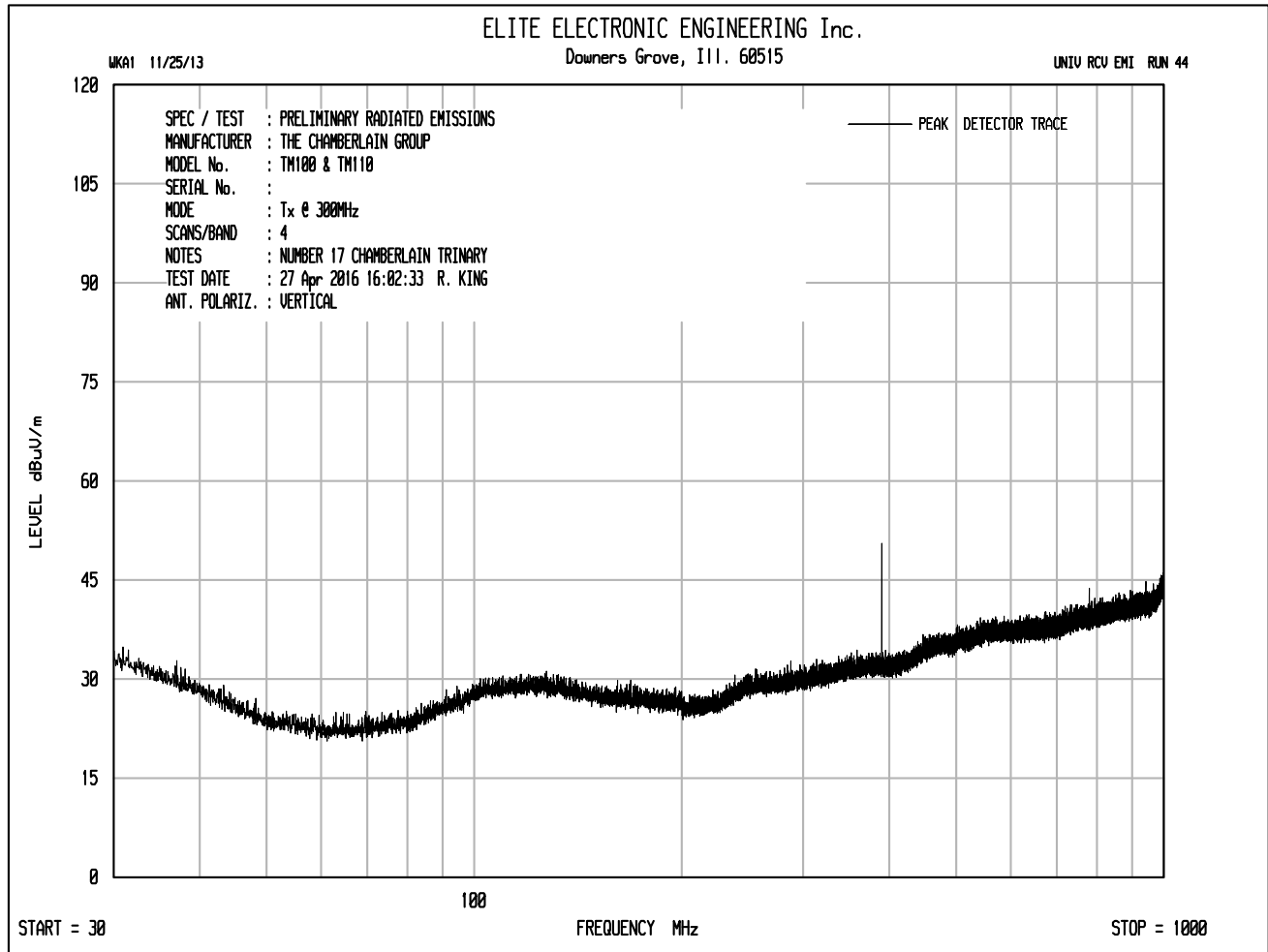


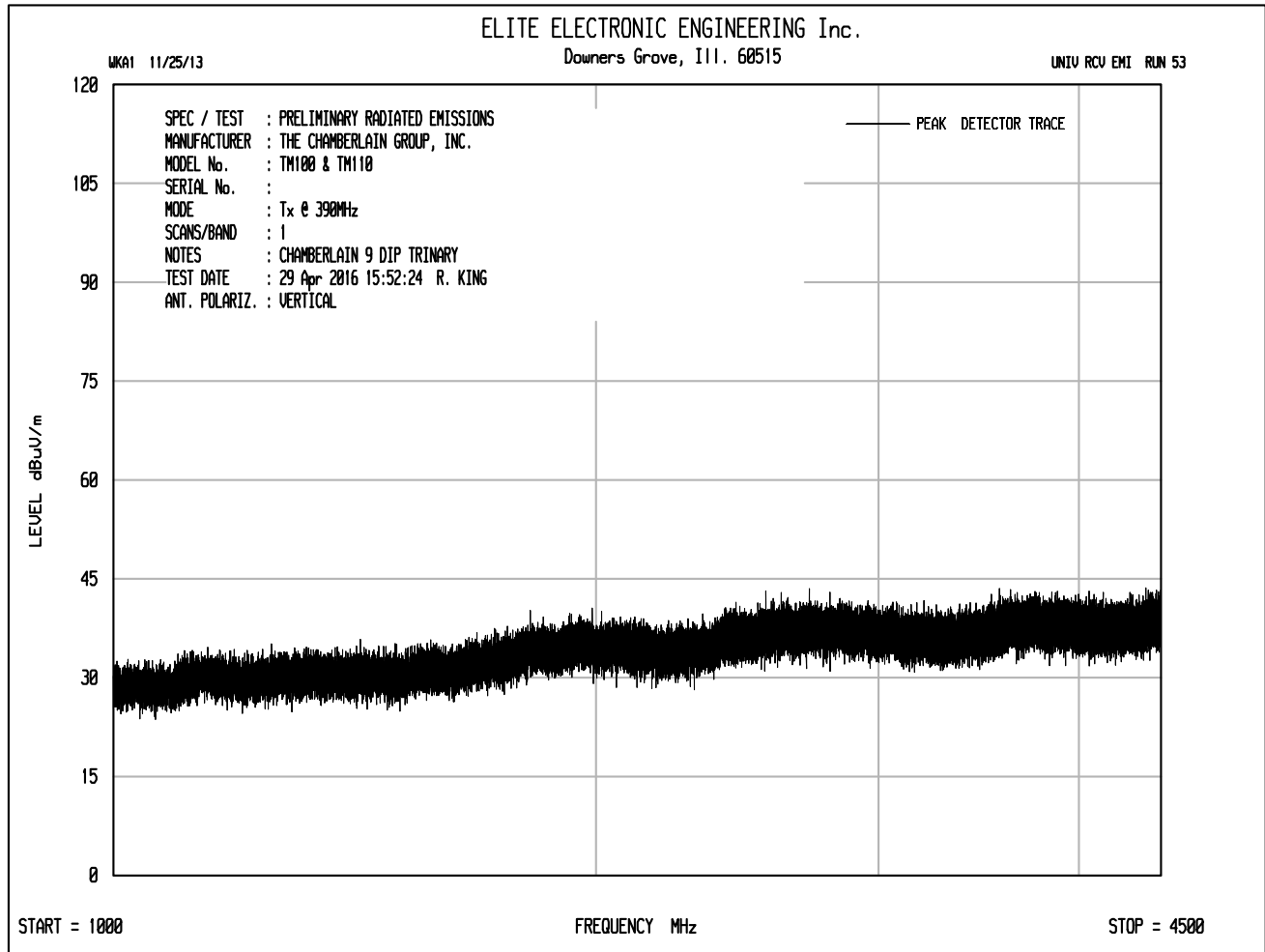


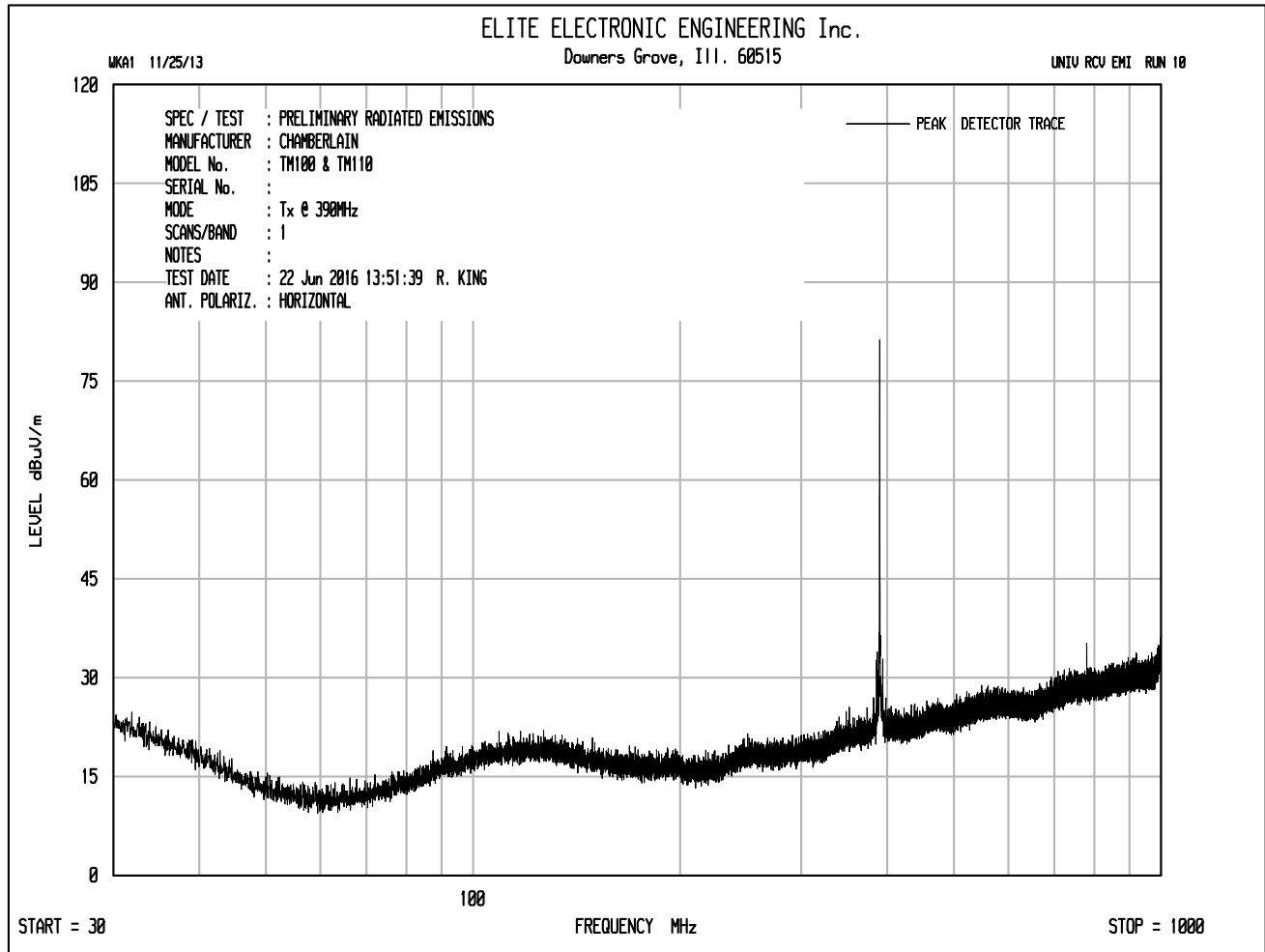


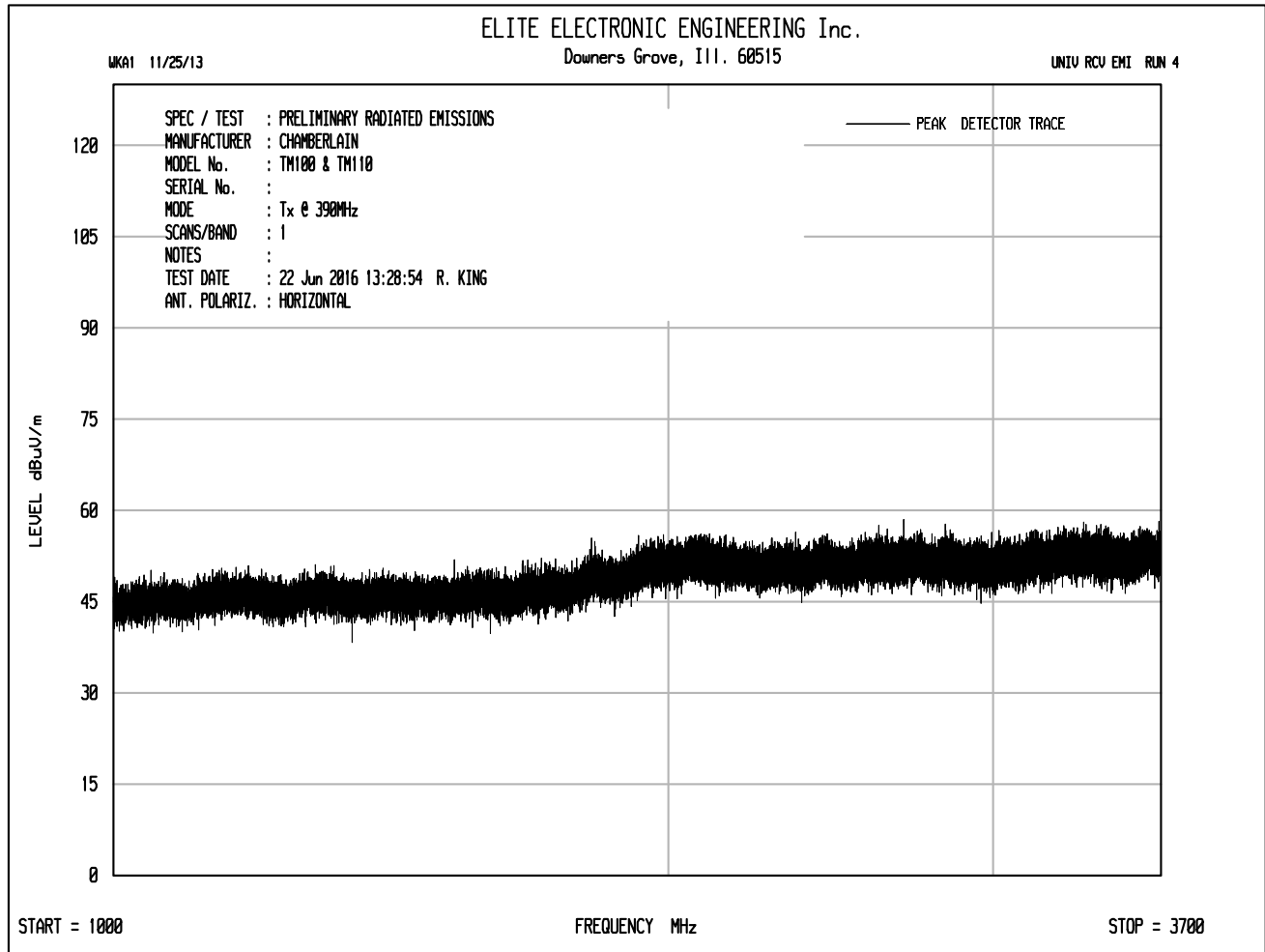


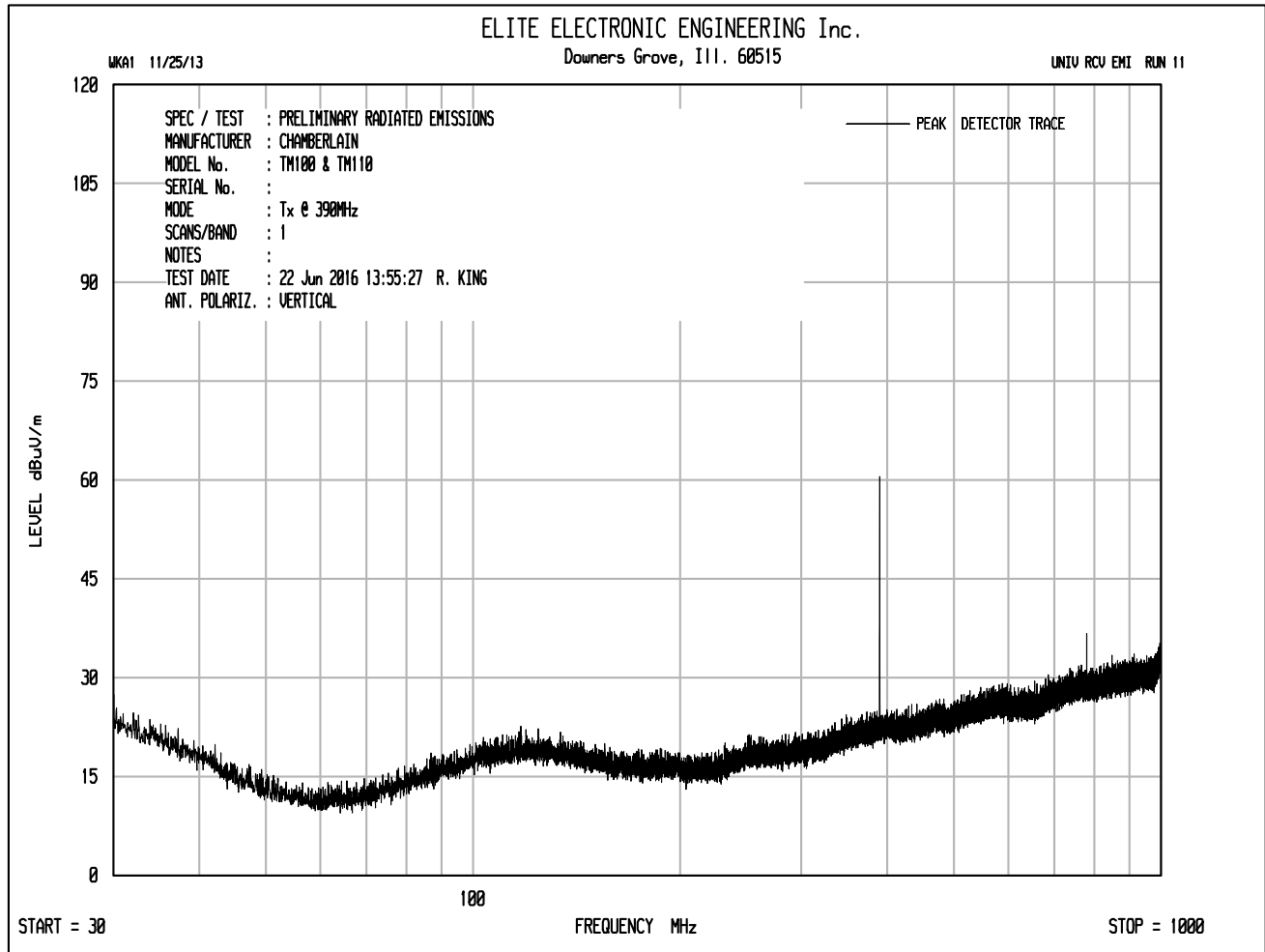


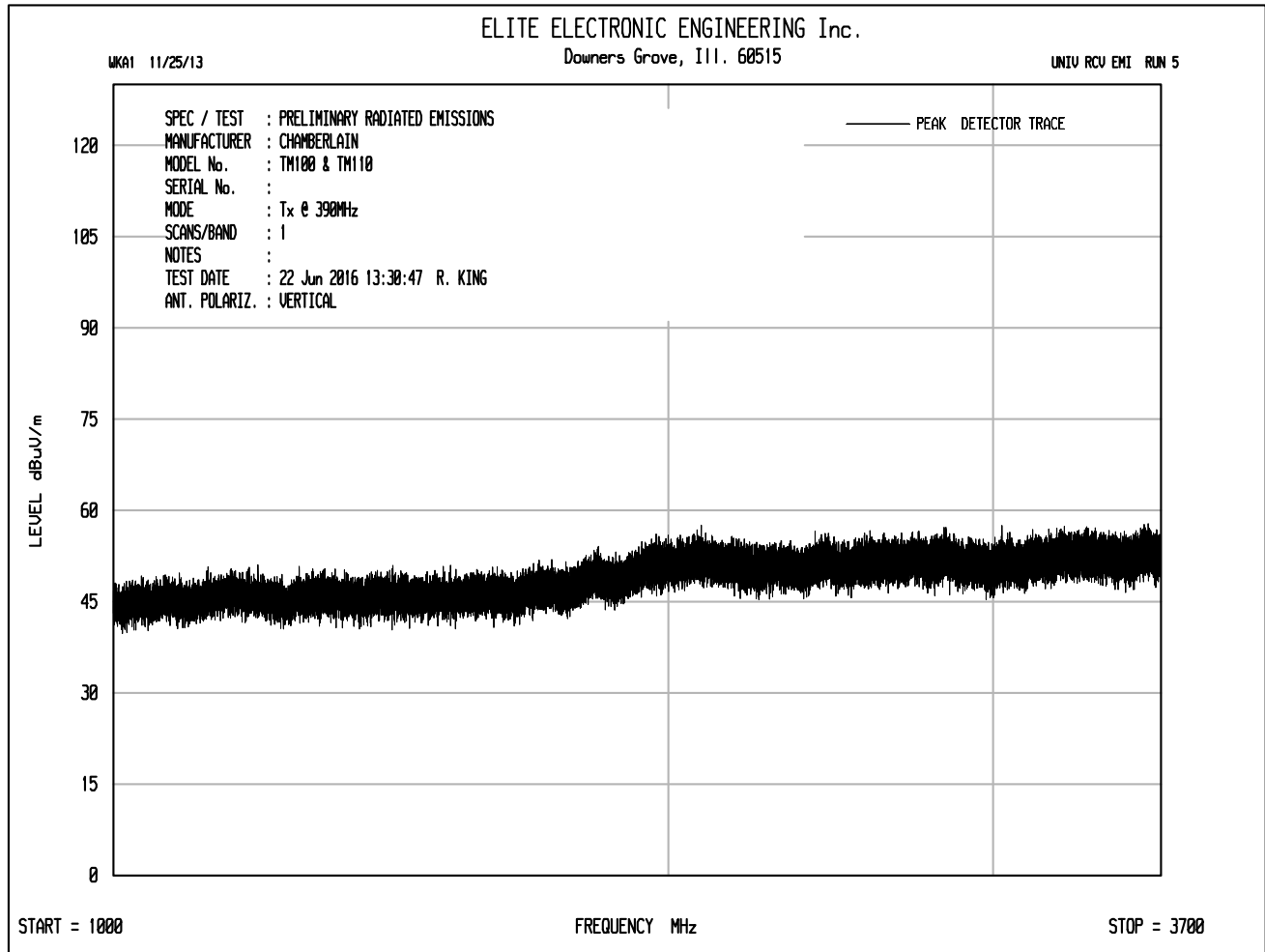


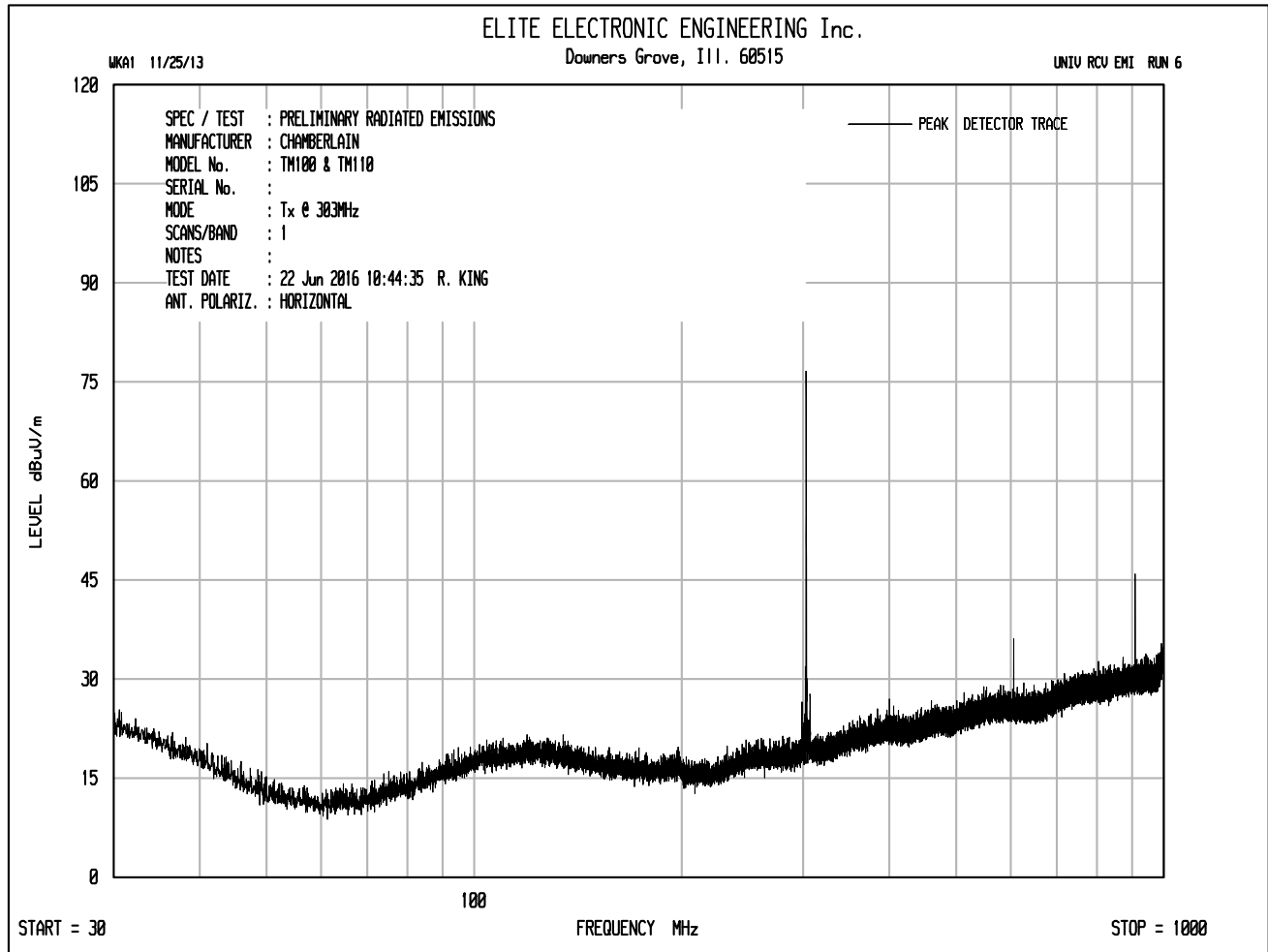


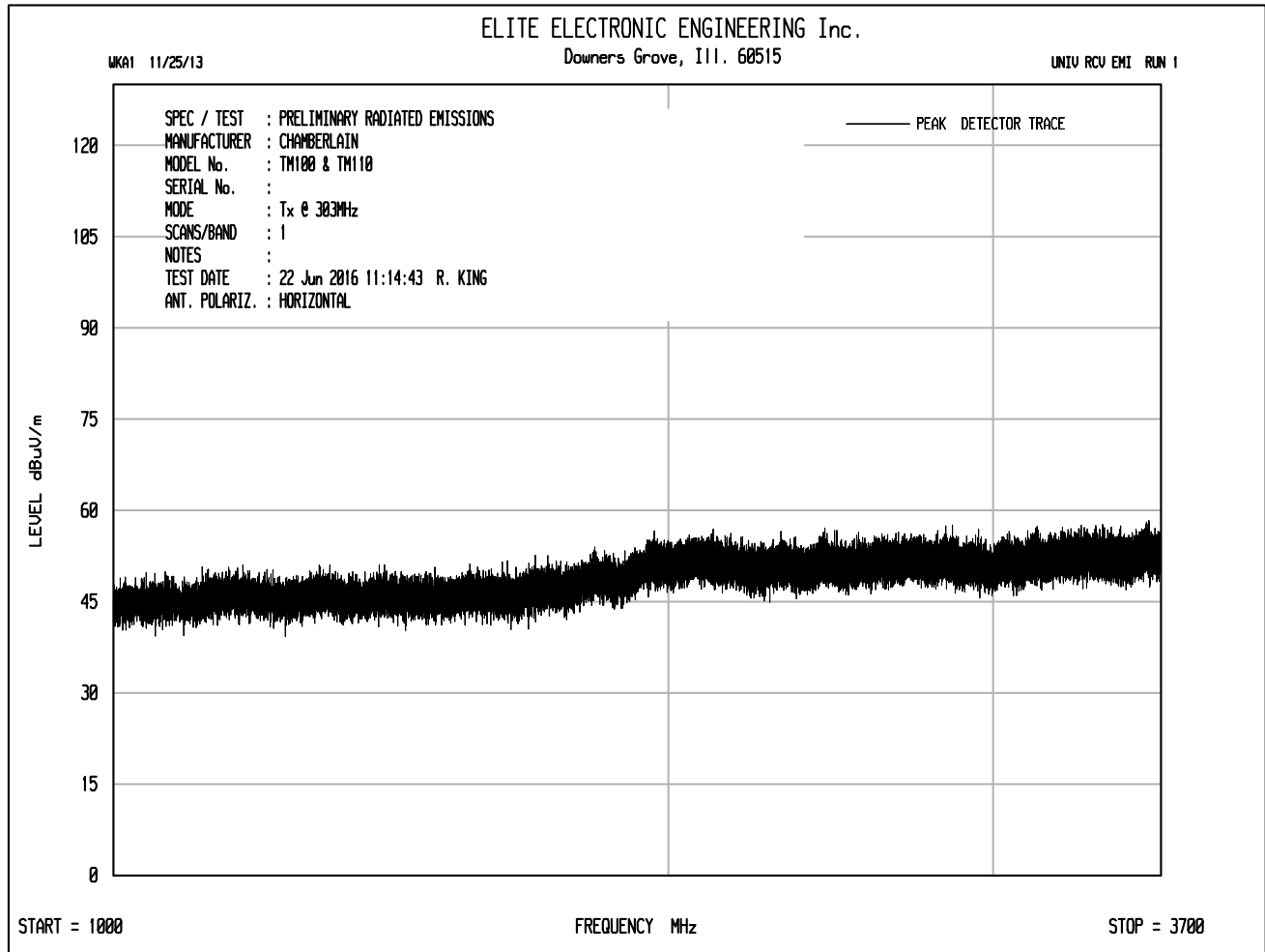


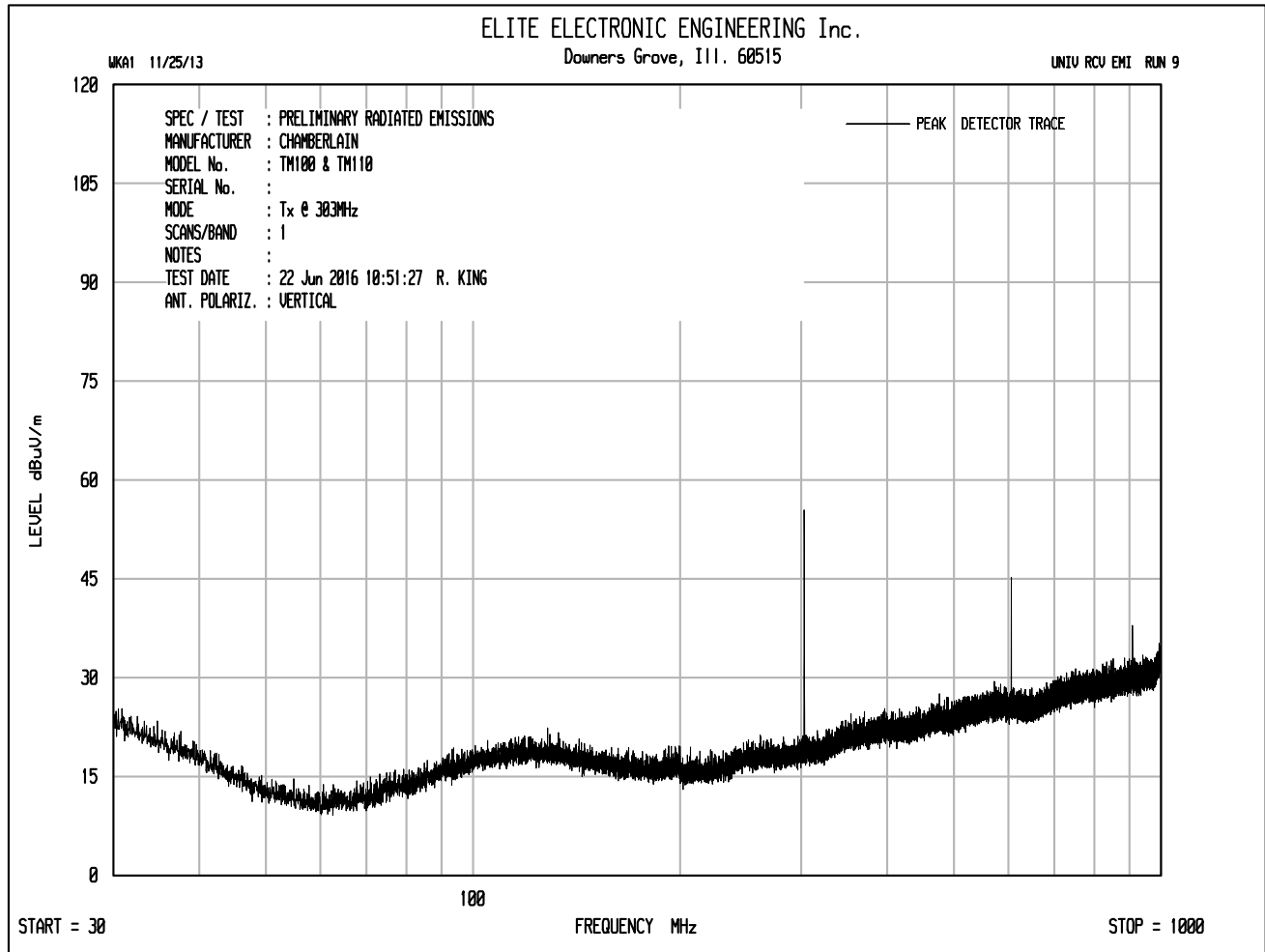


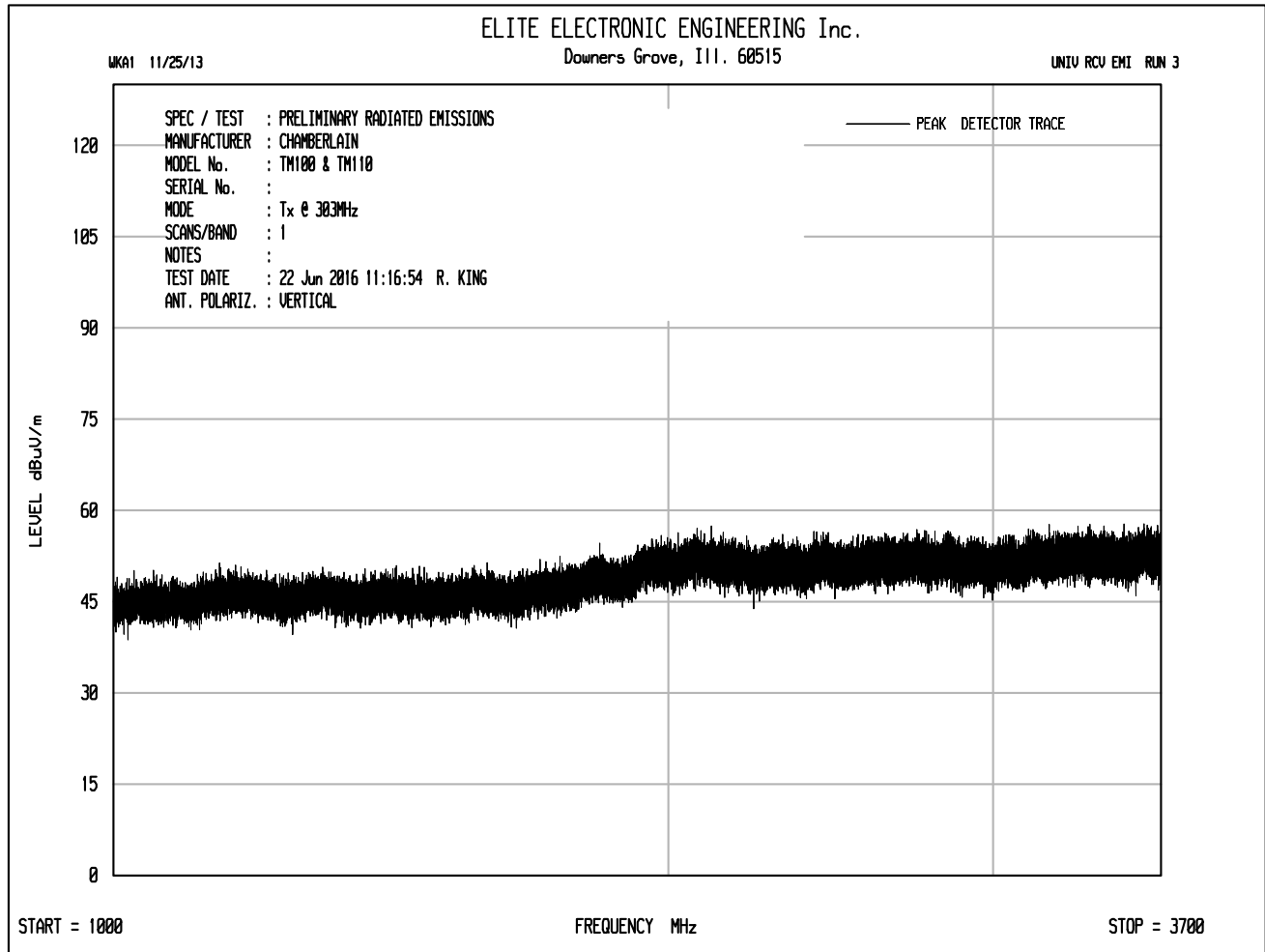












RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 315MHz
NOTES : Genie Intellicode
NOTES : Button 1
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
315.000	H	61.3		1.2	13.3	0.0	-10.3	65.6	1894.5	6041.7	-10.1
315.000	V	55.8		1.2	13.3	0.0	-10.3	60.1	1011.6	6041.7	-15.5
630.000	H	26.5		1.7	19.1	0.0	-10.3	37.1	71.3	604.2	-18.6
630.000	V	22.3		1.7	19.1	0.0	-10.3	32.9	44.0	604.2	-22.8
945.000	H	12.4		2.1	20.8	0.0	-10.3	25.1	17.9	604.2	-30.6
945.000	V	13.1		2.1	20.8	0.0	-10.3	25.8	19.4	604.2	-29.8
1260.000	H	19.2		2.5	28.4	0.0	-10.3	39.8	97.2	604.2	-15.9
1260.000	V	22.6		2.5	28.4	0.0	-10.3	43.2	143.8	604.2	-12.5
1575.000	H	18.7		2.7	29.2	0.0	-10.3	40.3	103.6	500.0	-13.7
1575.000	V	15.5	*	2.7	29.2	0.0	-10.3	37.2	72.3	500.0	-16.8
1890.000	H	15.0	*	3.0	31.6	0.0	-10.3	39.4	92.8	604.2	-16.3
1890.000	V	15.1	*	3.0	31.6	0.0	-10.3	39.5	94.3	604.2	-16.1
2205.000	H	14.6	*	3.3	32.5	0.0	-10.3	40.1	100.8	500.0	-13.9
2205.000	V	14.0	*	3.3	32.5	0.0	-10.3	39.5	94.7	500.0	-14.4
2520.000	H	17.6		3.5	32.6	0.0	-10.3	43.5	150.4	604.2	-12.1
2520.000	V	16.2		3.5	32.6	0.0	-10.3	42.1	127.5	604.2	-13.5
2835.000	H	15.3	*	3.8	33.1	0.0	-10.3	41.9	123.8	500.0	-12.1
2835.000	V	15.4	*	3.8	33.1	0.0	-10.3	42.0	125.8	500.0	-12.0
3150.000	H	16.7		4.0	33.3	0.0	-10.3	43.8	154.8	604.2	-11.8
3150.000	V	16.1	*	4.0	33.3	0.0	-10.3	43.1	143.5	604.2	-12.5

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Genie Intellicode
NOTES : Button 2
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	58.1		1.3	15.6	0.0	-10.3	64.8	1741.4	9166.7	-14.4
390.000	V	63.1		1.3	15.6	0.0	-10.3	69.8	3096.7	9166.7	-9.4
780.000	H	23.9		1.9	19.6	0.0	-10.3	35.1	56.8	916.7	-24.2
780.000	V	25.3		1.9	19.6	0.0	-10.3	36.5	66.8	916.7	-22.8
1170.000	H	22.8		2.4	28.3	0.0	-10.3	43.3	145.5	500.0	-10.7
1170.000	V	20.4		2.4	28.3	0.0	-10.3	40.8	109.6	500.0	-13.2
1560.000	H	20.8		2.7	29.0	0.0	-10.3	42.3	130.1	500.0	-11.7
1560.000	V	16.9		2.7	29.0	0.0	-10.3	38.4	83.0	500.0	-15.6
1950.000	H	14.4	*	3.0	32.1	0.0	-10.3	39.3	92.0	916.7	-20.0
1950.000	V	15.8	*	3.0	32.1	0.0	-10.3	40.6	107.6	916.7	-18.6
2340.000	H	20.8		3.4	32.5	0.0	-10.3	46.4	210.0	500.0	-7.5
2340.000	V	17.2		3.4	32.5	0.0	-10.3	42.9	139.9	500.0	-11.1
2730.000	H	15.0	*	3.7	32.9	0.0	-10.3	41.4	117.0	500.0	-12.6
2730.000	V	15.7	*	3.7	32.9	0.0	-10.3	42.0	126.5	500.0	-11.9
3120.000	H	15.0	*	4.0	33.3	0.0	-10.3	42.0	126.2	916.7	-17.2
3120.000	V	14.2	*	4.0	33.3	0.0	-10.3	41.2	115.0	916.7	-18.0
3510.000	H	15.4	*	4.2	33.4	0.0	-10.3	42.8	137.4	916.7	-16.5
3510.000	V	14.6	*	4.2	33.4	0.0	-10.3	41.9	125.0	916.7	-17.3
3900.000	H	16.2	*	4.4	34.0	0.0	-10.3	44.4	166.3	500.0	-9.6
3900.000	V	16.2	*	4.4	34.0	0.0	-10.3	44.4	166.3	500.0	-9.6

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 318MHz
NOTES : Linear Mega-Code
NOTES : Button 3
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
318.000	H	60.7		1.2	13.4	0.0	-15.4	59.9	992.6	6166.7	-15.9
318.000	V	44.9		1.2	13.4	0.0	-15.4	44.1	159.7	6166.7	-31.7
636.000	H	21.9	*	1.7	19.1	0.0	-15.4	27.3	23.2	616.7	-28.5
636.000	V	19.5	*	1.7	19.1	0.0	-15.4	24.9	17.6	616.7	-30.9
954.000	H	21.3		2.1	20.8	0.0	-15.4	28.8	27.7	616.7	-27.0
954.000	V	19.3		2.1	20.8	0.0	-15.4	26.8	21.9	616.7	-29.0
1272.000	H	15.9		2.5	28.4	0.0	-15.4	31.4	37.0	616.7	-24.4
1272.000	V	14.6		2.5	28.4	0.0	-15.4	30.1	31.8	616.7	-25.7
1590.000	H	15.0		2.8	29.3	0.0	-15.4	31.7	38.3	500.0	-22.3
1590.000	V	14.1		2.8	29.3	0.0	-15.4	30.7	34.4	500.0	-23.2
1908.000	H	14.4		3.0	31.8	0.0	-15.4	33.7	48.5	616.7	-22.1
1908.000	V	14.6		3.0	31.8	0.0	-15.4	34.0	50.0	616.7	-21.8
2226.000	H	15.2		3.3	32.5	0.0	-15.4	35.5	59.8	500.0	-18.5
2226.000	V	14.9		3.3	32.5	0.0	-15.4	35.3	57.9	500.0	-18.7
2544.000	H	15.0		3.6	32.7	0.0	-15.4	35.8	61.9	616.7	-20.0
2544.000	V	14.9		3.6	32.7	0.0	-15.4	35.7	60.9	616.7	-20.1
2862.000	H	14.9		3.8	33.1	0.0	-15.4	36.4	66.0	500.0	-17.6
2862.000	V	14.5		3.8	33.1	0.0	-15.4	36.0	63.0	500.0	-18.0
3180.000	H	13.8		4.0	33.3	0.0	-15.4	35.8	61.3	616.7	-20.0
3180.000	V	15.0		4.0	33.3	0.0	-15.4	36.9	70.2	616.7	-18.9

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain Rolling Code D
NOTES : Button 4
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	62.3		1.3	15.6	0.0	-10.2	69.1	2840.5	9166.7	-10.2
390.000	V	46.4		1.3	15.6	0.0	-10.2	53.2	454.9	9166.7	-26.1
780.000	H	25.6		1.9	19.6	0.0	-10.2	36.9	70.0	916.7	-22.3
780.000	V	22.8		1.9	19.6	0.0	-10.2	34.1	50.8	916.7	-25.1
1170.000	H	20.4		2.4	28.3	0.0	-10.2	40.9	111.2	500.0	-13.1
1170.000	V	17.3		2.4	28.3	0.0	-10.2	37.8	77.5	500.0	-16.2
1560.000	H	20.0		2.7	29.0	0.0	-10.2	41.6	120.2	500.0	-12.4
1560.000	V	17.1		2.7	29.0	0.0	-10.2	38.7	86.2	500.0	-15.3
1950.000	H	15.4	*	3.0	32.1	0.0	-10.2	40.3	103.6	916.7	-18.9
1950.000	V	14.8	*	3.0	32.1	0.0	-10.2	39.8	97.3	916.7	-19.5
2340.000	H	18.4		3.4	32.5	0.0	-10.2	44.2	161.3	500.0	-9.8
2340.000	V	14.7	*	3.4	32.5	0.0	-10.2	40.5	105.5	500.0	-13.5
2730.000	H	15.4	*	3.7	32.9	0.0	-10.2	41.9	124.1	500.0	-12.1
2730.000	V	16.2	*	3.7	32.9	0.0	-10.2	42.7	135.9	500.0	-11.3
3120.000	H	17.3	*	4.0	33.3	0.0	-10.2	44.4	166.4	916.7	-14.8
3120.000	V	15.2	*	4.0	33.3	0.0	-10.2	42.3	130.6	916.7	-16.9
3510.000	H	14.7	*	4.2	33.4	0.0	-10.2	42.2	128.4	916.7	-17.1
3510.000	V	15.2	*	4.2	33.4	0.0	-10.2	42.7	136.2	916.7	-16.6
3900.000	H	15.5	*	4.4	34.0	0.0	-10.2	43.8	154.1	500.0	-10.2
3900.000	V	15.1	*	4.4	34.0	0.0	-10.2	43.4	147.2	500.0	-10.6

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 315MHz
NOTES : Chamberlain Rolling Code D
NOTES : Button 5
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
315.000	H	59.5		1.2	13.3	0.0	-10.2	63.8	1550.6	6041.7	-11.8
315.000	V	42.1		1.2	13.3	0.0	-10.2	46.4	209.9	6041.7	-29.2
630.000	H	10.5		1.7	19.1	0.0	-10.2	21.1	11.4	604.2	-34.5
630.000	V	20.2		1.7	19.1	0.0	-10.2	30.9	35.1	604.2	-24.7
945.000	H	21.5		2.1	20.8	0.0	-10.2	34.2	51.4	604.2	-21.4
945.000	V	13.3		2.1	20.8	0.0	-10.2	26.1	20.2	604.2	-29.5
1260.000	H	16.9		2.5	28.4	0.0	-10.2	37.6	75.7	604.2	-18.0
1260.000	V	19.1		2.5	28.4	0.0	-10.2	39.7	96.9	604.2	-15.9
1575.000	H	16.1		2.7	29.2	0.0	-10.2	37.8	77.7	500.0	-16.2
1575.000	V	13.5	*	2.7	29.2	0.0	-10.2	35.2	57.8	500.0	-18.7
1890.000	H	15.4		3.0	31.6	0.0	-10.2	39.9	98.4	604.2	-15.8
1890.000	V	15.0	*	3.0	31.6	0.0	-10.2	39.5	94.0	604.2	-16.2
2205.000	H	14.4	*	3.3	32.5	0.0	-10.2	40.0	99.7	500.0	-14.0
2205.000	V	14.4	*	3.3	32.5	0.0	-10.2	40.0	99.7	500.0	-14.0
2520.000	H	15.8		3.5	32.6	0.0	-10.2	41.8	123.1	604.2	-13.8
2520.000	V	14.8	*	3.5	32.6	0.0	-10.2	40.8	109.1	604.2	-14.9
2835.000	H	14.6	*	3.8	33.1	0.0	-10.2	41.3	116.5	500.0	-12.7
2835.000	V	15.0	*	3.8	33.1	0.0	-10.2	41.7	121.5	500.0	-12.3
3150.000	H	15.3	*	4.0	33.3	0.0	-10.2	42.4	132.2	604.2	-13.2
3150.000	V	15.0	*	4.0	33.3	0.0	-10.2	42.2	128.2	604.2	-13.5

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain Billion A Code
NOTES : Button 6
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	58.1		1.3	15.6	0.0	-3.8	71.3	3659.3	9166.7	-8.0
390.000	V	41.2		1.3	15.6	0.0	-3.8	54.3	518.7	9166.7	-24.9
780.000	H	13.3		1.9	19.6	0.0	-3.8	31.0	35.3	916.7	-28.3
780.000	V	11.1		1.9	19.6	0.0	-3.8	28.8	27.4	916.7	-30.5
1170.000	H	17.0		2.4	28.3	0.0	-3.8	43.8	155.8	500.0	-10.1
1170.000	V	15.4		2.4	28.3	0.0	-3.8	42.3	130.0	500.0	-11.7
1560.000	H	17.4		2.7	29.0	0.0	-3.8	45.4	185.7	500.0	-8.6
1560.000	V	14.4	*	2.7	29.0	0.0	-3.8	42.4	131.2	500.0	-11.6
1950.000	H	15.4	*	3.0	32.1	0.0	-3.8	46.7	216.2	916.7	-12.5
1950.000	V	14.3	*	3.0	32.1	0.0	-3.8	45.6	189.6	916.7	-13.7
2340.000	H	17.6		3.4	32.5	0.0	-3.8	49.7	304.6	500.0	-4.3
2340.000	V	14.8	*	3.4	32.5	0.0	-3.8	46.9	220.9	500.0	-7.1
2730.000	H	15.7	*	3.7	32.9	0.0	-3.8	48.5	266.2	500.0	-5.5
2730.000	V	15.4	*	3.7	32.9	0.0	-3.8	48.2	258.3	500.0	-5.7
3120.000	H	15.3	*	4.0	33.3	0.0	-3.8	48.8	274.5	916.7	-10.5
3120.000	V	14.6	*	4.0	33.3	0.0	-3.8	48.1	255.0	916.7	-11.1
3510.000	H	15.0	*	4.2	33.4	0.0	-3.8	48.8	276.4	916.7	-10.4
3510.000	V	14.5	*	4.2	33.4	0.0	-3.8	48.3	261.2	916.7	-10.9
3900.000	H	15.5	*	4.4	34.0	0.0	-3.8	50.2	323.8	500.0	-3.8
3900.000	V	15.9	*	4.4	34.0	0.0	-3.8	50.6	339.1	500.0	-3.4

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 310MHz
NOTES : Stanley Secure Code
NOTES : Button 7
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
310.000	H	59.5		1.2	13.3	0.0	-10.3	63.8	1545.3	5833.3	-11.5
310.000	V	44.6		1.2	13.3	0.0	-10.3	48.9	277.7	5833.3	-26.4
620.000	H	14.4		1.7	19.1	0.0	-10.3	24.9	17.6	583.3	-30.4
620.000	V	24.5		1.7	19.1	0.0	-10.3	35.1	56.7	583.3	-20.2
930.000	H	15.2		2.1	20.1	0.0	-10.3	27.1	22.8	583.3	-28.2
930.000	V	10.0		2.1	20.1	0.0	-10.3	21.9	12.5	583.3	-33.4
1240.000	H	18.2		2.4	28.4	0.0	-10.3	38.8	86.9	500.0	-15.2
1240.000	V	18.6		2.4	28.4	0.0	-10.3	39.2	91.0	500.0	-14.8
1550.000	H	14.8	*	2.7	28.9	0.0	-10.3	36.2	64.4	500.0	-17.8
1550.000	V	14.5	*	2.7	28.9	0.0	-10.3	35.9	62.7	500.0	-18.0
1860.000	H	14.8	*	3.0	31.4	0.0	-10.3	38.9	88.1	583.3	-16.4
1860.000	V	14.2	*	3.0	31.4	0.0	-10.3	38.3	82.1	583.3	-17.0
2170.000	H	14.8	*	3.2	32.5	0.0	-10.3	40.2	102.5	583.3	-15.1
2170.000	V	14.3	*	3.2	32.5	0.0	-10.3	39.7	96.9	583.3	-15.6
2480.000	H	15.1	*	3.5	32.6	0.0	-10.3	41.0	112.0	583.3	-14.3
2480.000	V	15.1	*	3.5	32.6	0.0	-10.3	41.0	112.0	583.3	-14.3
2790.000	H	14.6	*	3.7	33.0	0.0	-10.3	41.2	114.2	500.0	-12.8
2790.000	V	15.1	*	3.7	33.0	0.0	-10.3	41.7	120.9	500.0	-12.3
3100.000	H	15.4	*	4.0	33.3	0.0	-10.3	42.4	132.3	583.3	-12.9
3100.000	V	15.0	*	4.0	33.3	0.0	-10.3	42.0	126.4	583.3	-13.3

Checked BY RICHARD E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 310MHz
NOTES : Chamberlain Rolling E
NOTES : Button 8
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
310.000	H	61.4		1.2	13.3	0.0	-11.7	64.2	1614.5	5833.3	-11.2
310.000	V	45.1		1.2	13.3	0.0	-11.7	47.9	247.8	5833.3	-27.4
620.000	H	15.5		1.7	19.1	0.0	-11.7	24.5	16.9	583.3	-30.8
620.000	V	26.2		1.7	19.1	0.0	-11.7	35.3	58.2	583.3	-20.0
930.000	H	17.3		2.1	20.1	0.0	-11.7	27.8	24.5	583.3	-27.5
930.000	V	10.6		2.1	20.1	0.0	-11.7	21.1	11.3	583.3	-34.2
1240.000	H	20.4		2.4	28.4	0.0	-11.7	39.5	94.0	500.0	-14.5
1240.000	V	18.8		2.4	28.4	0.0	-11.7	37.8	77.9	500.0	-16.1
1550.000	H	14.5	*	2.7	28.9	0.0	-11.7	34.5	52.9	500.0	-19.5
1550.000	V	14.4	*	2.7	28.9	0.0	-11.7	34.3	52.1	500.0	-19.6
1860.000	H	15.1	*	3.0	31.4	0.0	-11.7	37.8	77.6	583.3	-17.5
1860.000	V	15.4	*	3.0	31.4	0.0	-11.7	38.1	80.0	583.3	-17.3
2170.000	H	14.3	*	3.2	32.5	0.0	-11.7	38.2	81.7	583.3	-17.1
2170.000	V	14.6	*	3.2	32.5	0.0	-11.7	38.6	85.2	583.3	-16.7
2480.000	H	16.3		3.5	32.6	0.0	-11.7	40.7	108.3	583.3	-14.6
2480.000	V	15.1	*	3.5	32.6	0.0	-11.7	39.5	94.4	583.3	-15.8
2790.000	H	14.9	*	3.7	33.0	0.0	-11.7	39.9	99.1	500.0	-14.1
2790.000	V	14.9	*	3.7	33.0	0.0	-11.7	39.9	99.2	500.0	-14.0
3100.000	H	14.9	*	4.0	33.3	0.0	-11.7	40.4	105.1	583.3	-14.9
3100.000	V	14.6	*	4.0	33.3	0.0	-11.7	40.2	102.1	583.3	-15.1

Checked BY RICHARD E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 315MHz
NOTES : Chamberlain Rolling E
NOTES : Button 8
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
315.000	H	62.1		1.2	13.4	0.0	-11.7	65.0	1782.5	6041.7	-10.6
315.000	V	45.7		1.2	13.4	0.0	-11.7	48.6	269.2	6041.7	-27.0
630.000	H	14.4		1.7	18.6	0.0	-11.7	22.9	14.0	604.2	-32.7
630.000	V	23.9		1.7	18.6	0.0	-11.7	32.5	42.0	604.2	-23.2
945.000	H	15.6		2.1	20.2	0.0	-11.7	26.1	20.3	604.2	-29.5
945.000	V	8.3		2.1	20.2	0.0	-11.7	18.8	8.7	604.2	-36.8
1260.000	H	19.6		2.5	28.4	0.0	-11.7	38.7	85.7	604.2	-17.0
1260.000	V	20.1		2.5	28.4	0.0	-11.7	39.2	91.2	604.2	-16.4
1575.000	H	16.6		2.7	29.2	0.0	-11.7	36.8	68.9	500.0	-17.2
1575.000	V	16.9		2.7	29.2	0.0	-11.7	37.0	71.0	500.0	-17.0
1890.000	H	14.5	*	3.0	31.6	0.0	-11.7	37.4	74.2	604.2	-18.2
1890.000	V	14.9	*	3.0	31.6	0.0	-11.7	37.8	77.5	604.2	-17.8
2205.000	H	14.2	*	3.3	32.5	0.0	-11.7	38.2	81.0	500.0	-15.8
2205.000	V	13.8	*	3.3	32.5	0.0	-11.7	37.8	77.4	500.0	-16.2
2520.000	H	17.0		3.5	32.6	0.0	-11.7	41.4	117.7	604.2	-14.2
2520.000	V	15.1	*	3.5	32.6	0.0	-11.7	39.6	95.2	604.2	-16.0
2835.000	H	15.1	*	3.8	33.1	0.0	-11.7	40.3	103.1	500.0	-13.7
2835.000	V	15.1	*	3.8	33.1	0.0	-11.7	40.3	103.1	500.0	-13.7
3150.000	H	15.4	*	4.0	33.3	0.0	-11.7	41.0	112.2	604.2	-14.6
3150.000	V	15.8	*	4.0	33.3	0.0	-11.7	41.4	117.4	604.2	-14.2

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain Rolling E
NOTES : Button 8
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	63.2		1.3	15.1	0.0	-11.7	67.9	2472.9	9166.7	-11.4
390.000	V	47.3		1.3	15.1	0.0	-11.7	52.0	399.7	9166.7	-27.2
780.000	H	13.7		1.9	20.0	0.0	-11.7	23.8	15.5	916.7	-35.4
780.000	V	20.4		1.9	20.0	0.0	-11.7	30.6	33.9	916.7	-28.6
1170.000	H	21.4		2.4	28.3	0.0	-11.7	40.3	103.5	500.0	-13.7
1170.000	V	20.5		2.4	28.3	0.0	-11.7	39.5	94.2	500.0	-14.5
1560.000	H	20.5		2.7	29.0	0.0	-11.7	40.6	106.9	500.0	-13.4
1560.000	V	15.9		2.7	29.0	0.0	-11.7	36.0	62.9	500.0	-18.0
1950.000	H	15.1	*	3.0	32.1	0.0	-11.7	38.5	84.1	916.7	-20.7
1950.000	V	15.5	*	3.0	32.1	0.0	-11.7	38.9	88.1	916.7	-20.3
2340.000	H	20.8		3.4	32.5	0.0	-11.7	45.0	178.3	500.0	-9.0
2340.000	V	16.6		3.4	32.5	0.0	-11.7	40.8	109.4	500.0	-13.2
2730.000	H	15.4	*	3.7	32.9	0.0	-11.7	40.3	103.7	500.0	-13.7
2730.000	V	14.8	*	3.7	32.9	0.0	-11.7	39.7	96.2	500.0	-14.3
3120.000	H	15.0	*	4.0	33.3	0.0	-11.7	40.6	106.8	916.7	-18.7
3120.000	V	14.6	*	4.0	33.3	0.0	-11.7	40.2	102.3	916.7	-19.0
3510.000	H	14.8	*	4.2	33.4	0.0	-11.7	40.7	107.8	916.7	-18.6
3510.000	V	14.5	*	4.2	33.4	0.0	-11.7	40.4	104.8	916.7	-18.8
3900.000	H	15.8	*	4.4	34.0	0.0	-11.7	42.5	134.0	500.0	-11.4
3900.000	V	15.4	*	4.4	34.0	0.0	-11.7	42.1	128.0	500.0	-11.8

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 372.5MHz
NOTES : Wayne Dalton Rolling Code
NOTES : Button 9
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
372.500	H	61.1		1.3	15.0	0.0	-10.3	67.2	2279.3	8437.5	-11.4
372.500	V	46.4		1.3	15.0	0.0	-10.3	52.4	419.1	8437.5	-26.1
745.000	H	10.8		1.9	19.4	0.0	-10.3	21.8	12.3	843.7	-36.7
745.000	V	13.5		1.9	19.4	0.0	-10.3	24.5	16.9	843.7	-34.0
1117.500	H	15.9		2.3	28.3	0.0	-10.3	36.3	65.0	500.0	-17.7
1117.500	V	16.3		2.3	28.3	0.0	-10.3	36.7	68.0	500.0	-17.3
1490.000	H	16.8		2.7	28.5	0.0	-10.3	37.8	77.3	500.0	-16.2
1490.000	V	14.6	*	2.7	28.5	0.0	-10.3	35.6	60.0	500.0	-18.4
1862.500	H	14.5	*	3.0	31.4	0.0	-10.3	38.7	85.9	843.7	-19.8
1862.500	V	14.2	*	3.0	31.4	0.0	-10.3	38.3	82.3	843.7	-20.2
2235.000	H	15.4	*	3.3	32.5	0.0	-10.3	40.9	111.6	500.0	-13.0
2235.000	V	13.9	*	3.3	32.5	0.0	-10.3	39.4	93.8	500.0	-14.5
2607.500	H	15.1	*	3.6	32.8	0.0	-10.3	41.3	115.5	843.7	-17.3
2607.500	V	15.8	*	3.6	32.8	0.0	-10.3	41.9	124.8	843.7	-16.6
2980.000	H	16.1	*	3.9	33.3	0.0	-10.3	43.0	140.7	843.7	-15.6
2980.000	V	15.0	*	3.9	33.3	0.0	-10.3	41.9	124.5	843.7	-16.6
3352.500	H	14.8	*	4.1	33.4	0.0	-10.3	42.0	125.8	500.0	-12.0
3352.500	V	14.9	*	4.1	33.4	0.0	-10.3	42.1	127.7	500.0	-11.9
3725.000	H	16.2	*	4.3	33.8	0.0	-10.3	44.0	159.4	500.0	-9.9
3725.000	V	15.7	*	4.3	33.8	0.0	-10.3	43.5	149.9	500.0	-10.5

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
 MODEL NO. : TM100 & TM110
 TEST MODE : Tx @ 310MHz
 NOTES : Linear Moore-O-Matic 8 Position DIP Switch
 NOTES : Button 10
 TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
310.000	H	61.0		1.2	13.3	0.0	-12.2	63.3	1455.5	5833.3	-12.1
310.000	V	41.4		1.2	13.3	0.0	-12.2	43.7	153.5	5833.3	-31.6
620.000	H	13.9		1.7	19.1	0.0	-12.2	22.5	13.3	583.3	-32.8
620.000	V	26.5		1.7	19.1	0.0	-12.2	35.1	57.0	583.3	-20.2
930.000	H	16.7		2.1	20.1	0.0	-12.2	26.6	21.5	583.3	-28.7
930.000	V	9.5		2.1	20.1	0.0	-12.2	19.5	9.4	583.3	-35.9
1240.000	H	16.3		2.4	28.4	0.0	-12.2	34.9	55.7	500.0	-19.1
1240.000	V	18.8		2.4	28.4	0.0	-12.2	37.4	73.8	500.0	-16.6
1550.000	H	16.2		2.7	28.9	0.0	-12.2	35.6	60.5	500.0	-18.3
1550.000	V	14.6	*	2.7	28.9	0.0	-12.2	34.0	50.2	500.0	-20.0
1860.000	H	14.8	*	3.0	31.4	0.0	-12.2	37.0	70.9	583.3	-18.3
1860.000	V	14.7	*	3.0	31.4	0.0	-12.2	36.9	69.6	583.3	-18.5
2170.000	H	14.4	*	3.2	32.5	0.0	-12.2	37.9	78.9	583.3	-17.4
2170.000	V	14.6	*	3.2	32.5	0.0	-12.2	38.1	79.9	583.3	-17.3
2480.000	H	16.3		3.5	32.6	0.0	-12.2	40.2	102.3	583.3	-15.1
2480.000	V	15.4	*	3.5	32.6	0.0	-12.2	39.3	92.3	583.3	-16.0
2790.000	H	15.2	*	3.7	33.0	0.0	-12.2	39.7	96.7	500.0	-14.3
2790.000	V	15.5	*	3.7	33.0	0.0	-12.2	40.1	100.8	500.0	-13.9
3100.000	H	15.5	*	4.0	33.3	0.0	-12.2	40.6	106.9	583.3	-14.7
3100.000	V	15.3	*	4.0	33.3	0.0	-12.2	40.4	104.2	583.3	-15.0

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 315MHz
NOTES : Chamberlain 9 Position DIP Switch
NOTES : Button 11
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
315.000	H	57.3		1.2	13.4	0.0	-9.1	62.8	1377.3	6041.7	-12.8
315.000	V	41.4		1.2	13.4	0.0	-9.1	46.9	220.3	6041.7	-28.8
630.000	H	13.1		1.7	18.6	0.0	-9.1	24.2	16.3	604.2	-31.4
630.000	V	19.7		1.7	18.6	0.0	-9.1	30.9	35.1	604.2	-24.7
945.000	H	9.9		2.1	20.2	0.0	-9.1	23.1	14.2	604.2	-32.6
945.000	V	5.4	*	2.1	20.2	0.0	-9.1	18.5	8.4	604.2	-37.1
1260.000	H	15.1		2.5	28.4	0.0	-9.1	36.8	69.3	604.2	-18.8
1260.000	V	17.7		2.5	28.4	0.0	-9.1	39.4	93.4	604.2	-16.2
1575.000	H	20.8		2.7	29.2	0.0	-9.1	43.6	150.6	500.0	-10.4
1575.000	V	16.1		2.7	29.2	0.0	-9.1	38.8	87.5	500.0	-15.1
1890.000	H	15.9	*	3.0	31.6	0.0	-9.1	41.4	117.8	604.2	-14.2
1890.000	V	14.9	*	3.0	31.6	0.0	-9.1	40.3	104.0	604.2	-15.3
2205.000	H	15.4	*	3.3	32.5	0.0	-9.1	42.0	126.0	500.0	-12.0
2205.000	V	15.0	*	3.3	32.5	0.0	-9.1	41.6	120.2	500.0	-12.4
2520.000	H	17.1		3.5	32.6	0.0	-9.1	44.1	160.8	604.2	-11.5
2520.000	V	15.5	*	3.5	32.6	0.0	-9.1	42.6	134.2	604.2	-13.1
2835.000	H	15.8	*	3.8	33.1	0.0	-9.1	43.5	150.0	500.0	-10.5
2835.000	V	15.5	*	3.8	33.1	0.0	-9.1	43.2	145.3	500.0	-10.7
3150.000	H	15.5	*	4.0	33.3	0.0	-9.1	43.7	153.2	604.2	-11.9
3150.000	V	14.6	*	4.0	33.3	0.0	-9.1	42.8	137.5	604.2	-12.9

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
 MODEL NO. : TM100 & TM110
 TEST MODE : Tx @ 310MHz
 NOTES : Stanley 10 Position DIP Switch
 NOTES : Button 12
 TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
310.000	H	58.0		1.2	13.3	0.0	-8.1	64.4	1655.9	5833.3	-10.9
310.000	V	43.0		1.2	13.3	0.0	-8.1	49.4	295.5	5833.3	-25.9
620.000	H	11.8		1.7	19.1	0.0	-8.1	24.5	16.8	583.3	-30.8
620.000	V	20.6		1.7	19.1	0.0	-8.1	33.2	45.9	583.3	-22.1
930.000	H	13.0		2.1	20.1	0.0	-8.1	27.0	22.5	583.3	-28.3
930.000	V	6.8		2.1	20.1	0.0	-8.1	20.9	11.1	583.3	-34.4
1240.000	H	14.4	*	2.4	28.4	0.0	-8.1	37.1	71.4	500.0	-16.9
1240.000	V	16.3		2.4	28.4	0.0	-8.1	39.0	89.3	500.0	-15.0
1550.000	H	15.3		2.7	28.9	0.0	-8.1	38.9	87.6	500.0	-15.1
1550.000	V	14.5	*	2.7	28.9	0.0	-8.1	38.1	80.3	500.0	-15.9
1860.000	H	14.5	*	3.0	31.4	0.0	-8.1	40.8	109.7	583.3	-14.5
1860.000	V	14.5	*	3.0	31.4	0.0	-8.1	40.8	109.7	583.3	-14.5
2170.000	H	14.0	*	3.2	32.5	0.0	-8.1	41.6	120.7	583.3	-13.7
2170.000	V	14.9	*	3.2	32.5	0.0	-8.1	42.5	133.2	583.3	-12.8
2480.000	H	15.5	*	3.5	32.6	0.0	-8.1	43.5	150.2	583.3	-11.8
2480.000	V	15.4	*	3.5	32.6	0.0	-8.1	43.4	148.0	583.3	-11.9
2790.000	H	15.1	*	3.7	33.0	0.0	-8.1	43.8	154.9	500.0	-10.2
2790.000	V	14.9	*	3.7	33.0	0.0	-8.1	43.6	150.5	500.0	-10.4
3100.000	H	14.8	*	4.0	33.3	0.0	-8.1	43.9	157.3	583.3	-11.4
3100.000	V	14.6	*	4.0	33.3	0.0	-8.1	43.8	155.1	583.3	-11.5

Checked BY RICHARD E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Genie 12 Position DIP Switch
NOTES : Button 13
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	59.8		1.3	15.1	0.0	-6.0	70.2	3252.4	9166.7	-9.0
390.000	V	43.0		1.3	15.1	0.0	-6.0	53.4	467.4	9166.7	-25.9
780.000	H	15.7		1.9	20.0	0.0	-6.0	31.6	37.9	916.7	-27.7
780.000	V	12.3		1.9	20.0	0.0	-6.0	28.2	25.8	916.7	-31.0
1170.000	H	18.4		2.4	28.3	0.0	-6.0	43.0	142.1	500.0	-10.9
1170.000	V	16.1		2.4	28.3	0.0	-6.0	40.7	108.9	500.0	-13.2
1560.000	H	17.6		2.7	29.0	0.0	-6.0	43.3	146.5	500.0	-10.7
1560.000	V	14.6	*	2.7	29.0	0.0	-6.0	40.4	104.8	500.0	-13.6
1950.000	H	14.1	*	3.0	32.1	0.0	-6.0	43.2	144.3	916.7	-16.1
1950.000	V	14.6	*	3.0	32.1	0.0	-6.0	43.7	153.6	916.7	-15.5
2340.000	H	16.9		3.4	32.5	0.0	-6.0	46.8	218.1	500.0	-7.2
2340.000	V	14.8	*	3.4	32.5	0.0	-6.0	44.7	171.5	500.0	-9.3
2730.000	H	15.5	*	3.7	32.9	0.0	-6.0	46.2	203.5	500.0	-7.8
2730.000	V	15.4	*	3.7	32.9	0.0	-6.0	46.0	200.5	500.0	-7.9
3120.000	H	14.6	*	4.0	33.3	0.0	-6.0	45.9	197.9	916.7	-13.3
3120.000	V	14.5	*	4.0	33.3	0.0	-6.0	45.8	195.2	916.7	-13.4
3510.000	H	14.8	*	4.2	33.4	0.0	-6.0	46.4	208.5	916.7	-12.9
3510.000	V	14.4	*	4.2	33.4	0.0	-6.0	46.0	199.8	916.7	-13.2
3900.000	H	15.0		4.4	34.0	0.0	-6.0	47.5	236.5	500.0	-6.5
3900.000	V	15.9		4.4	34.0	0.0	-6.0	48.4	263.2	500.0	-5.6

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain 7 Position DIP Switch
NOTES : Button 14
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	62.2		1.3	15.1	0.0	-10.4	68.2	2571.6	9166.7	-11.0
390.000	V	42.8		1.3	15.1	0.0	-10.4	48.8	275.9	9166.7	-30.4
780.000	H	20.8		1.9	20.0	0.0	-10.4	32.3	41.4	916.7	-26.9
780.000	V	17.1		1.9	20.0	0.0	-10.4	28.6	26.9	916.7	-30.7
1170.000	H	19.2		2.4	28.3	0.0	-10.4	39.4	93.8	500.0	-14.5
1170.000	V	20.3		2.4	28.3	0.0	-10.4	40.5	106.5	500.0	-13.4
1560.000	H	20.4		2.7	29.0	0.0	-10.4	41.8	122.4	500.0	-12.2
1560.000	V	16.2		2.7	29.0	0.0	-10.4	37.6	75.9	500.0	-16.4
1950.000	H	15.3	*	3.0	32.1	0.0	-10.4	40.0	99.7	916.7	-19.3
1950.000	V	15.2	*	3.0	32.1	0.0	-10.4	39.8	98.2	916.7	-19.4
2340.000	H	19.2		3.4	32.5	0.0	-10.4	44.7	171.9	500.0	-9.3
2340.000	V	14.7	*	3.4	32.5	0.0	-10.4	40.2	102.0	500.0	-13.8
2730.000	H	15.7	*	3.7	32.9	0.0	-10.4	41.9	124.8	500.0	-12.1
2730.000	V	16.5	*	3.7	32.9	0.0	-10.4	42.8	137.3	500.0	-11.2
3120.000	H	14.9	*	4.0	33.3	0.0	-10.4	41.8	122.8	916.7	-17.5
3120.000	V	14.8	*	4.0	33.3	0.0	-10.4	41.7	121.1	916.7	-17.6
3510.000	H	15.3	*	4.2	33.4	0.0	-10.4	42.5	133.5	916.7	-16.7
3510.000	V	14.8	*	4.2	33.4	0.0	-10.4	42.0	126.3	916.7	-17.2
3900.000	H	17.2	*	4.4	34.0	0.0	-10.4	45.2	182.9	500.0	-8.7
3900.000	V	17.3	*	4.4	34.0	0.0	-10.4	45.4	185.7	500.0	-8.6

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain 8 Position DIP Switch
NOTES : Button 15
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	61.5		1.3	15.1	0.0	-9.8	68.2	2568.7	9166.7	-11.1
390.000	V	48.4		1.3	15.1	0.0	-9.8	55.1	569.1	9166.7	-24.1
780.000	H	18.6		1.9	20.0	0.0	-9.8	30.8	34.6	916.7	-28.5
780.000	V	16.8		1.9	20.0	0.0	-9.8	28.9	27.9	916.7	-30.3
1170.000	H	18.8		2.4	28.3	0.0	-9.8	39.7	96.8	500.0	-14.3
1170.000	V	15.8		2.4	28.3	0.0	-9.8	36.7	68.5	500.0	-17.3
1560.000	H	20.0		2.7	29.0	0.0	-9.8	42.0	125.6	500.0	-12.0
1560.000	V	15.7	*	2.7	29.0	0.0	-9.8	37.7	76.5	500.0	-16.3
1950.000	H	14.4	*	3.0	32.1	0.0	-9.8	39.7	96.8	916.7	-19.5
1950.000	V	14.5	*	3.0	32.1	0.0	-9.8	39.9	98.4	916.7	-19.4
2340.000	H	18.5		3.4	32.5	0.0	-9.8	44.7	171.7	500.0	-9.3
2340.000	V	15.1	*	3.4	32.5	0.0	-9.8	41.3	115.8	500.0	-12.7
2730.000	H	15.5	*	3.7	32.9	0.0	-9.8	42.4	131.7	500.0	-11.6
2730.000	V	15.8	*	3.7	32.9	0.0	-9.8	42.7	136.2	500.0	-11.3
3120.000	H	14.8	*	4.0	33.3	0.0	-9.8	42.4	131.1	916.7	-16.9
3120.000	V	14.7	*	4.0	33.3	0.0	-9.8	42.2	129.0	916.7	-17.0
3510.000	H	15.7	*	4.2	33.4	0.0	-9.8	43.5	150.2	916.7	-15.7
3510.000	V	15.4	*	4.2	33.4	0.0	-9.8	43.3	145.4	916.7	-16.0
3900.000	H	17.6		4.4	34.0	0.0	-9.8	46.3	206.4	500.0	-7.7
3900.000	V	17.2		4.4	34.0	0.0	-9.8	45.9	197.1	500.0	-8.1

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 300MHz
NOTES : Linear Multicode
NOTES : Button 16
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
300.000	H	57.3		1.2	13.0	0.0	-8.1	63.4	1480.8	5416.7	-11.3
300.000	V	41.5		1.2	13.0	0.0	-8.1	47.6	239.3	5416.7	-27.1
600.000	H	12.5		1.7	18.6	0.0	-8.1	24.6	17.1	541.7	-30.0
600.000	V	19.2		1.7	18.6	0.0	-8.1	31.3	36.8	541.7	-23.3
900.000	H	23.6		2.0	20.8	0.0	-8.1	38.3	82.7	541.7	-16.3
900.000	V	12.7		2.0	20.8	0.0	-8.1	27.5	23.6	541.7	-27.2
1200.000	H	16.9		2.4	28.3	0.0	-8.1	39.5	94.6	500.0	-14.5
1200.000	V	16.5		2.4	28.3	0.0	-8.1	39.1	90.3	500.0	-14.9
1500.000	H	14.5	*	2.7	28.5	0.0	-8.1	37.6	75.9	500.0	-16.4
1500.000	V	13.4	*	2.7	28.5	0.0	-8.1	36.5	66.6	500.0	-17.5
1800.000	H	15.2	*	2.9	31.0	0.0	-8.1	41.0	112.7	541.7	-13.6
1800.000	V	15.4	*	2.9	31.0	0.0	-8.1	41.2	114.5	541.7	-13.5
2100.000	H	15.7	*	3.2	32.4	0.0	-8.1	43.2	144.0	541.7	-11.5
2100.000	V	15.4	*	3.2	32.4	0.0	-8.1	42.9	139.4	541.7	-11.8
2400.000	H	15.4	*	3.4	32.6	0.0	-8.1	43.3	145.8	541.7	-11.4
2400.000	V	15.1	*	3.4	32.6	0.0	-8.1	43.0	141.2	541.7	-11.7
2700.000	H	15.7	*	3.7	32.9	0.0	-8.1	44.1	160.8	500.0	-9.9
2700.000	V	15.4	*	3.7	32.9	0.0	-8.1	43.8	155.7	500.0	-10.1
3000.000	H	15.8	*	3.9	33.3	0.0	-8.1	44.9	175.5	541.7	-9.8
3000.000	V	15.2	*	3.9	33.3	0.0	-8.1	44.3	164.5	541.7	-10.3

Checked BY RICHARD E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Chamberlain 9 Position DIP Switch
NOTES : Button 17
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	62.0		1.3	15.1	0.0	-9.1	69.3	2928.9	9166.7	-9.9
390.000	V	45.1		1.3	15.1	0.0	-9.1	52.4	418.5	9166.7	-26.8
780.000	H	19.8		1.9	20.0	0.0	-9.1	32.5	42.3	916.7	-26.7
780.000	V	16.6		1.9	20.0	0.0	-9.1	29.3	29.2	916.7	-29.9
1170.000	H	19.8		2.4	28.3	0.0	-9.1	41.4	117.1	500.0	-12.6
1170.000	V	19.2		2.4	28.3	0.0	-9.1	40.7	108.8	500.0	-13.2
1560.000	H	21.9		2.7	29.0	0.0	-9.1	44.5	168.2	500.0	-9.5
1560.000	V	16.4		2.7	29.0	0.0	-9.1	39.0	89.0	500.0	-15.0
1950.000	H	16.1	*	3.0	32.1	0.0	-9.1	42.0	126.4	916.7	-17.2
1950.000	V	15.7	*	3.0	32.1	0.0	-9.1	41.6	120.5	916.7	-17.6
2340.000	H	19.3		3.4	32.5	0.0	-9.1	46.1	202.2	500.0	-7.9
2340.000	V	15.5		3.4	32.5	0.0	-9.1	42.3	130.4	500.0	-11.7
2730.000	H	15.7	*	3.7	32.9	0.0	-9.1	43.2	143.9	500.0	-10.8
2730.000	V	15.4	*	3.7	32.9	0.0	-9.1	42.9	139.4	500.0	-11.1
3120.000	H	14.8	*	4.0	33.3	0.0	-9.1	43.0	140.8	916.7	-16.3
3120.000	V	15.0	*	4.0	33.3	0.0	-9.1	43.1	143.2	916.7	-16.1
3510.000	H	15.1	*	4.2	33.4	0.0	-9.1	43.6	151.2	916.7	-15.7
3510.000	V	15.8	*	4.2	33.4	0.0	-9.1	44.3	163.9	916.7	-15.0
3900.000	H	16.1	*	4.4	34.0	0.0	-9.1	45.4	186.5	500.0	-8.6
3900.000	V	16.8	*	4.4	34.0	0.0	-9.1	46.1	202.0	500.0	-7.9

Checked BY Richard E. King :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Genie 9 Position DIP Switch
NOTES : Button 18
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	59.4		1.3	15.1	0.0	-6.0	69.9	3113.2	9166.7	-9.4
390.000	V	43.1		1.3	15.1	0.0	-6.0	53.5	475.6	9166.7	-25.7
780.000	H	12.8		1.9	20.0	0.0	-6.0	28.7	27.1	916.7	-30.6
780.000	V	11.0		1.9	20.0	0.0	-6.0	26.9	22.0	916.7	-32.4
1170.000	H	16.9		2.4	28.3	0.0	-6.0	41.6	119.8	500.0	-12.4
1170.000	V	16.1		2.4	28.3	0.0	-6.0	40.7	109.0	500.0	-13.2
1560.000	H	18.5		2.7	29.0	0.0	-6.0	44.3	163.8	500.0	-9.7
1560.000	V	15.2	*	2.7	29.0	0.0	-6.0	41.0	112.3	500.0	-13.0
1950.000	H	14.7	*	3.0	32.1	0.0	-6.0	43.8	154.1	916.7	-15.5
1950.000	V	15.0	*	3.0	32.1	0.0	-6.0	44.0	159.4	916.7	-15.2
2340.000	H	17.6		3.4	32.5	0.0	-6.0	47.5	237.2	500.0	-6.5
2340.000	V	15.1	*	3.4	32.5	0.0	-6.0	45.0	178.3	500.0	-9.0
2730.000	H	15.5	*	3.7	32.9	0.0	-6.0	46.1	202.8	500.0	-7.8
2730.000	V	15.4	*	3.7	32.9	0.0	-6.0	46.0	199.8	500.0	-8.0
3120.000	H	15.1	*	4.0	33.3	0.0	-6.0	46.4	208.7	916.7	-12.9
3120.000	V	14.0	*	4.0	33.3	0.0	-6.0	45.2	182.8	916.7	-14.0
3510.000	H	15.5	*	4.2	33.4	0.0	-6.0	47.1	227.3	916.7	-12.1
3510.000	V	14.8	*	4.2	33.4	0.0	-6.0	46.4	209.7	916.7	-12.8
3900.000	H	15.8	*	4.4	34.0	0.0	-6.0	48.3	259.0	500.0	-5.7
3900.000	V	14.7	*	4.4	34.0	0.0	-6.0	47.1	227.4	500.0	-6.8

Checked BY RICHARD E. KING :

Richard E. King

RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 390MHz
NOTES : Genie 9 Position DIP Switch
NOTES : Button 18
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	59.4		1.3	15.1	0.0	-6.0	69.9	3113.2	9166.7	-9.4
390.000	V	43.1		1.3	15.1	0.0	-6.0	53.5	475.6	9166.7	-25.7
780.000	H	12.8		1.9	20.0	0.0	-6.0	28.7	27.1	916.7	-30.6
780.000	V	11.0		1.9	20.0	0.0	-6.0	26.9	22.0	916.7	-32.4
1170.000	H	16.9		2.4	28.3	0.0	-6.0	41.6	119.8	500.0	-12.4
1170.000	V	16.1		2.4	28.3	0.0	-6.0	40.7	109.0	500.0	-13.2
1560.000	H	18.5		2.7	29.0	0.0	-6.0	44.3	163.8	500.0	-9.7
1560.000	V	15.2	*	2.7	29.0	0.0	-6.0	41.0	112.3	500.0	-13.0
1950.000	H	14.7	*	3.0	32.1	0.0	-6.0	43.8	154.1	916.7	-15.5
1950.000	V	15.0	*	3.0	32.1	0.0	-6.0	44.0	159.4	916.7	-15.2
2340.000	H	17.6		3.4	32.5	0.0	-6.0	47.5	237.2	500.0	-6.5
2340.000	V	15.1	*	3.4	32.5	0.0	-6.0	45.0	178.3	500.0	-9.0
2730.000	H	15.5	*	3.7	32.9	0.0	-6.0	46.1	202.8	500.0	-7.8
2730.000	V	15.4	*	3.7	32.9	0.0	-6.0	46.0	199.8	500.0	-8.0
3120.000	H	15.1	*	4.0	33.3	0.0	-6.0	46.4	208.7	916.7	-12.9
3120.000	V	14.0	*	4.0	33.3	0.0	-6.0	45.2	182.8	916.7	-14.0
3510.000	H	15.5	*	4.2	33.4	0.0	-6.0	47.1	227.3	916.7	-12.1
3510.000	V	14.8	*	4.2	33.4	0.0	-6.0	46.4	209.7	916.7	-12.8
3900.000	H	15.8	*	4.4	34.0	0.0	-6.0	48.3	259.0	500.0	-5.7
3900.000	V	14.7	*	4.4	34.0	0.0	-6.0	47.1	227.4	500.0	-6.8

Checked BY RICHARD E. KING :

Richard E. King

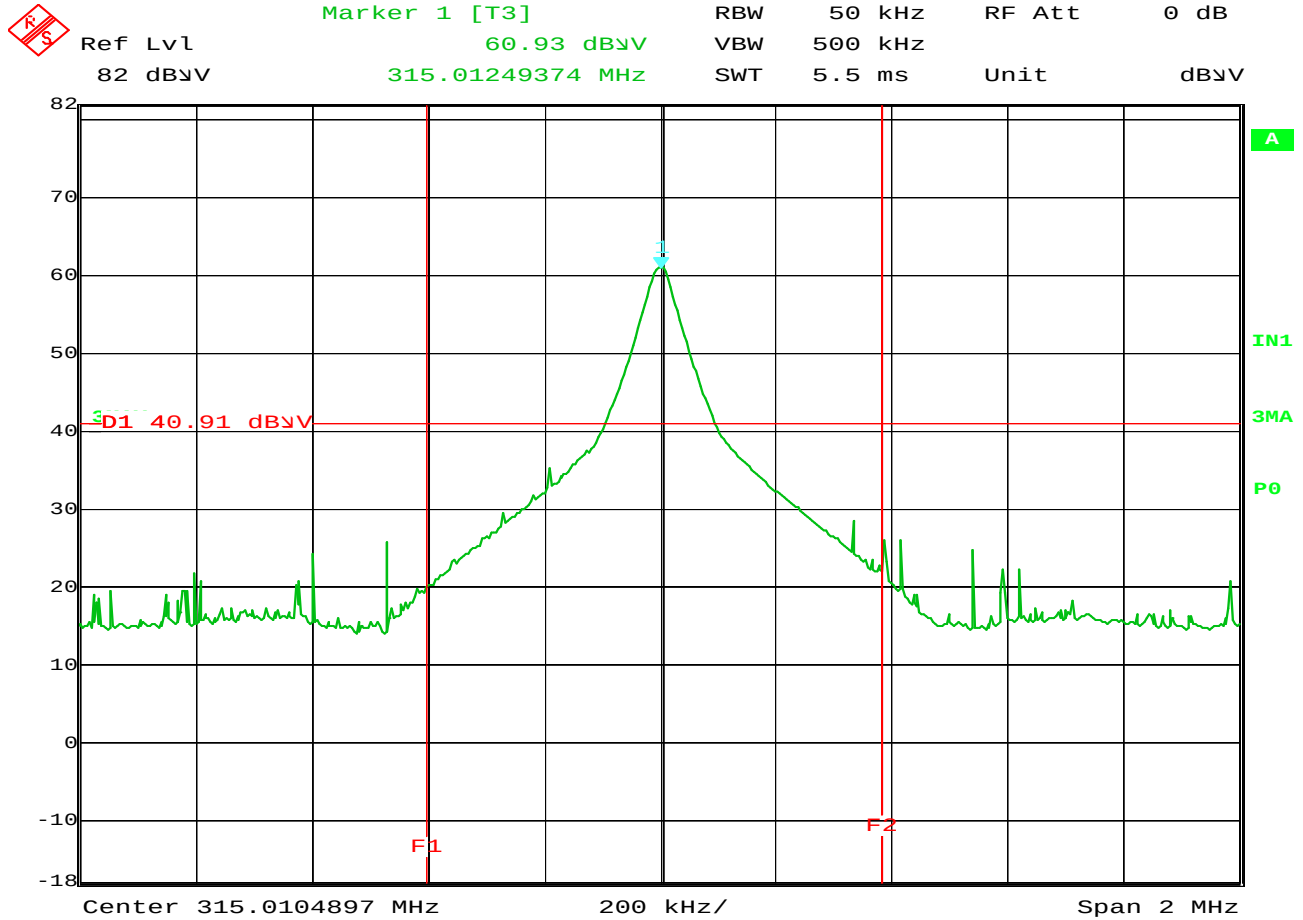
RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER : The Chamberlain Group
MODEL NO. : TM100 & TM110
TEST MODE : Tx @ 303MHz
NOTES : Extreme OOK
NOTES : Button 19
TEST DATE : June 23, 2016

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
303.000	H	59.6		1.2	19.3	0.0	-8.0	72.1	4021.8	5541.7	-2.8
303.000	V	43.4		1.2	19.3	0.0	-8.0	55.8	616.5	5541.7	-19.1
606.000	H	18.1		1.7	24.7	0.0	-8.0	36.5	67.0	554.2	-18.4
606.000	V	24.5		1.7	24.7	0.0	-8.0	42.9	140.0	554.2	-12.0
909.000	H	24.0		2.0	26.6	0.0	-8.0	44.7	170.9	554.2	-10.2
909.000	V	15.3		2.0	26.6	0.0	-8.0	35.9	62.7	554.2	-18.9
1212.000	H	19.6		2.4	28.7	0.0	-8.0	42.6	135.4	500.0	-11.3
1212.000	V	18.8		2.4	28.7	0.0	-8.0	41.8	123.5	500.0	-12.1
1515.000	H	14.0	*	2.7	27.8	0.0	-8.0	36.6	67.3	500.0	-17.4
1515.000	V	13.8	*	2.7	27.8	0.0	-8.0	36.3	65.2	500.0	-17.7
1818.000	H	14.6	*	2.9	30.4	0.0	-8.0	40.0	99.9	554.2	-14.9
1818.000	V	15.0	*	2.9	30.4	0.0	-8.0	40.4	104.3	554.2	-14.5
2121.000	H	14.5	*	3.2	32.2	0.0	-8.0	41.9	123.8	554.2	-13.0
2121.000	V	15.1	*	3.2	32.2	0.0	-8.0	42.5	133.0	554.2	-12.4
2424.000	H	15.8		3.5	32.5	0.0	-8.0	43.7	153.4	554.2	-11.2
2424.000	V	15.1	*	3.5	32.5	0.0	-8.0	43.0	142.0	554.2	-11.8
2727.000	H	14.8	*	3.7	33.0	0.0	-8.0	43.4	148.2	500.0	-10.6
2727.000	V	15.5	*	3.7	33.0	0.0	-8.0	44.2	162.1	500.0	-9.8
3030.000	H	14.9	*	3.9	33.1	0.0	-8.0	43.9	157.1	554.2	-11.0
3030.000	V	15.1	*	3.9	33.1	0.0	-8.0	44.2	161.6	554.2	-10.7

Checked BY Richard E. King :

Richard E. King



Date: 25.APR.2016 11:10:00

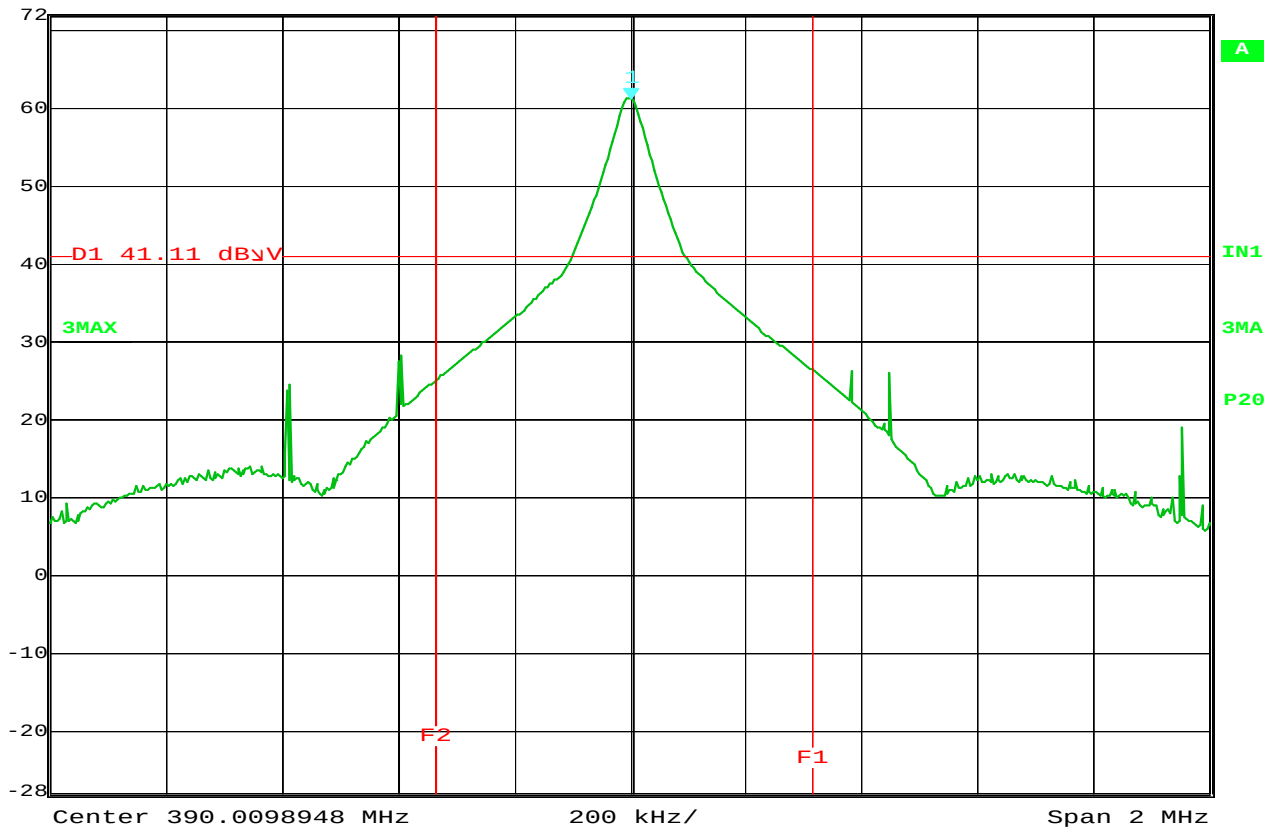
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 315MHz
 : Peak detector
 NOTES : Occupied Bandwidth
 NOTES : Genie Intellicode
 NOTES : Button 1

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
61.13 dBμV
390.01189880 MHz VBW 500 kHz
72 dBμV Ref Lvl 390.01189880 MHz Unit dBμV
SWT 200 ms



Date: 25.APR.2016 12:03:33

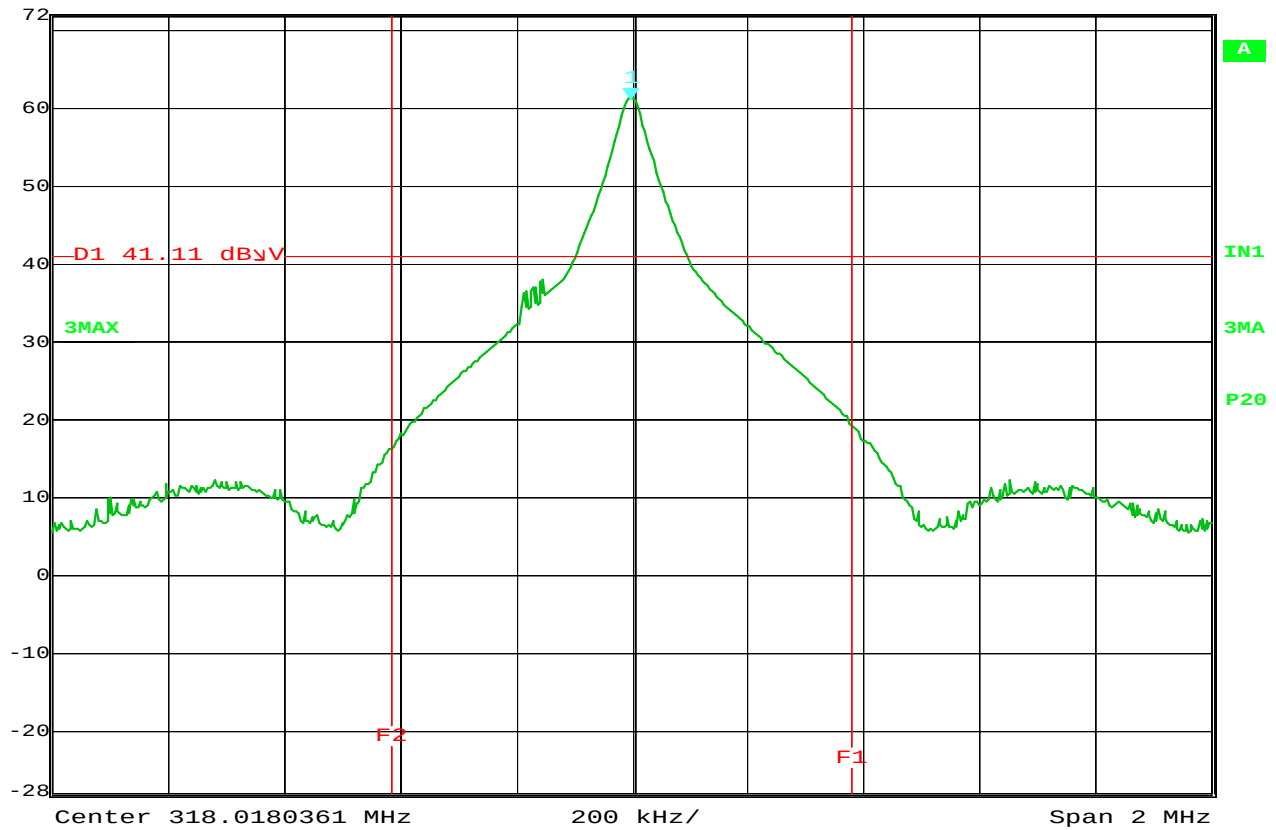
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Genie Intellicode
NOTES : Button 2

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
61.12 dBμV
318.01603206 MHz VBW 500 kHz
72 dBμV Ref Lvl 200 ms Unit dBμV
SWT



Date: 25.APR.2016 14:01:43

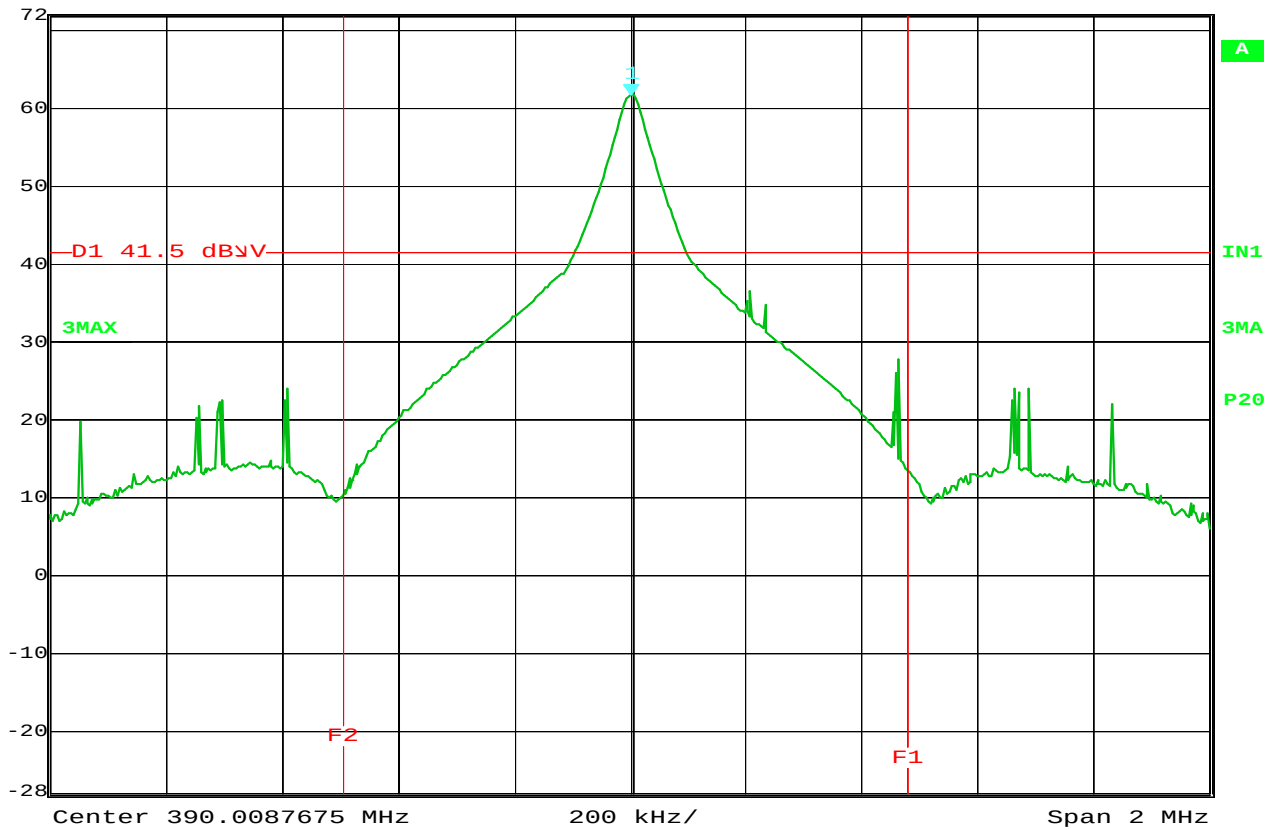
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 318MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Linear Mega-Code
NOTES : Button 3

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
61.51 dBμV
390.01077154 MHz VBW 500 kHz
72 dBμV Ref Lvl 390.01077154 MHz Unit dBμV
SWT 200 ms



Date: 25.APR.2016 15:23:34

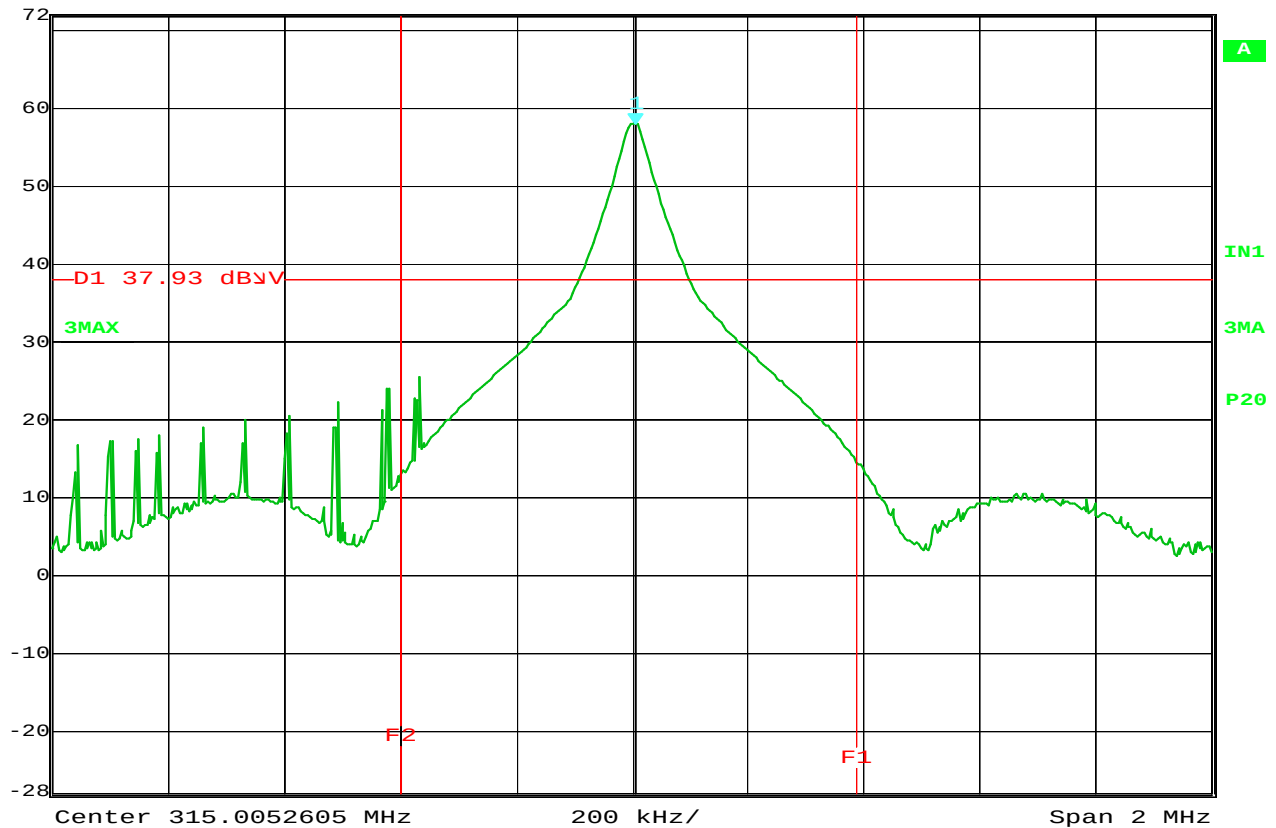
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain Rolling Code D
NOTES : Button 4

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
57.93 dBμV
315.01127255 MHz VBW 500 kHz
72 dBμV Ref Lvl 315.01127255 MHz Unit dBμV
SWT 200 ms



Date: 25.APR.2016 16:04:57

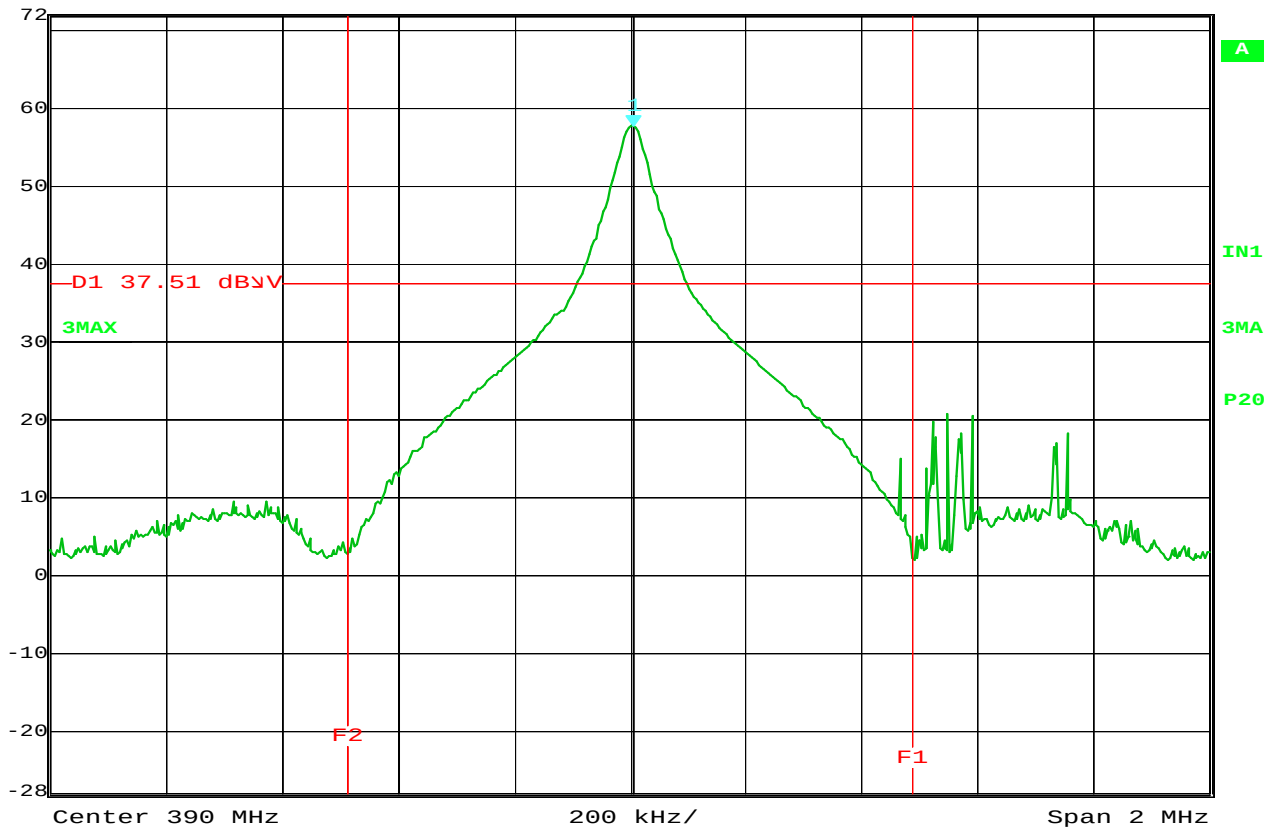
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain Rolling Code D
NOTES : Button 5

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
57.51 dBμV
390.00601202 MHz VBW 500 kHz
72 dBμV Ref Lvl 390.00601202 MHz Unit dBμV
SWT 5.5 ms



Date: 26.APR.2016 11:16:58

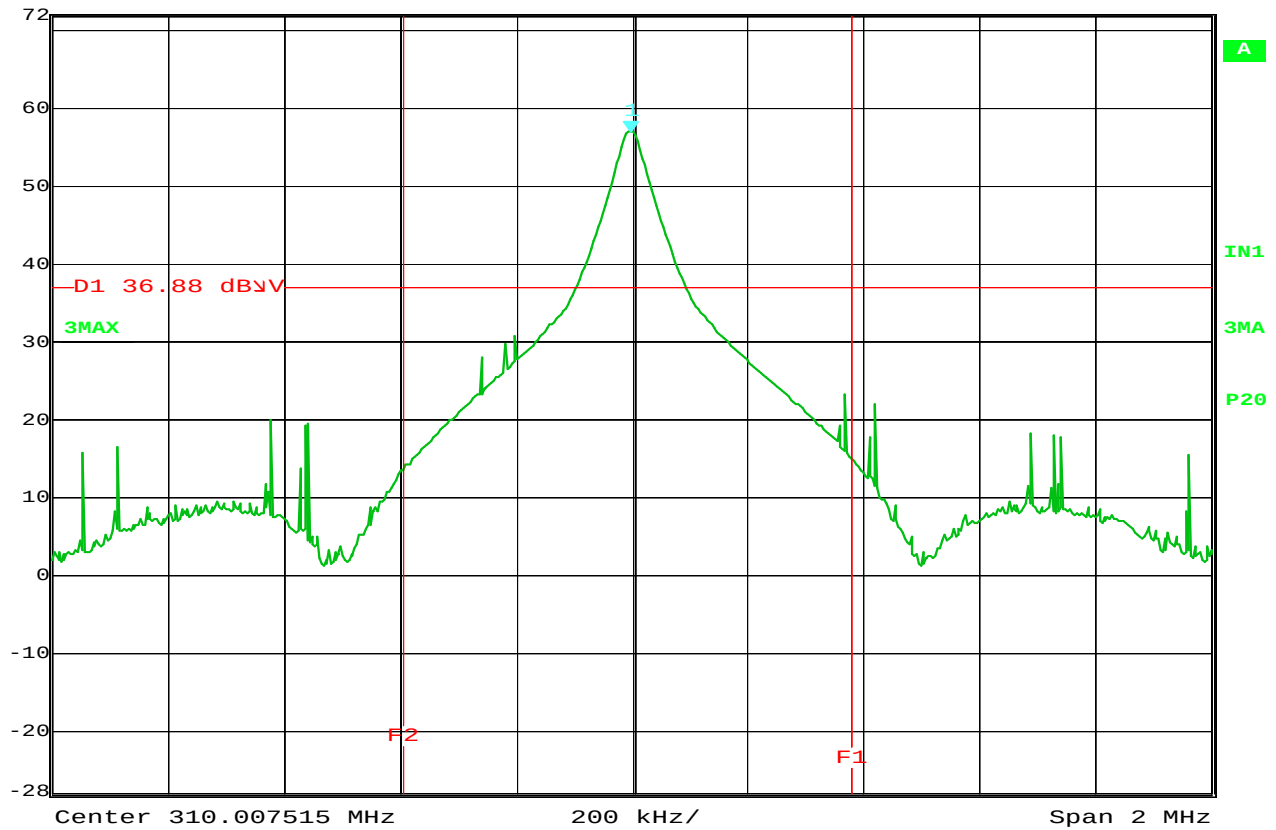
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain Billion Code A
NOTES : Button 6

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
Ref Lvl 56.89 dBμV VBW 500 kHz
72 dBμV 310.00551102 MHz SWT 200 ms Unit dBμV

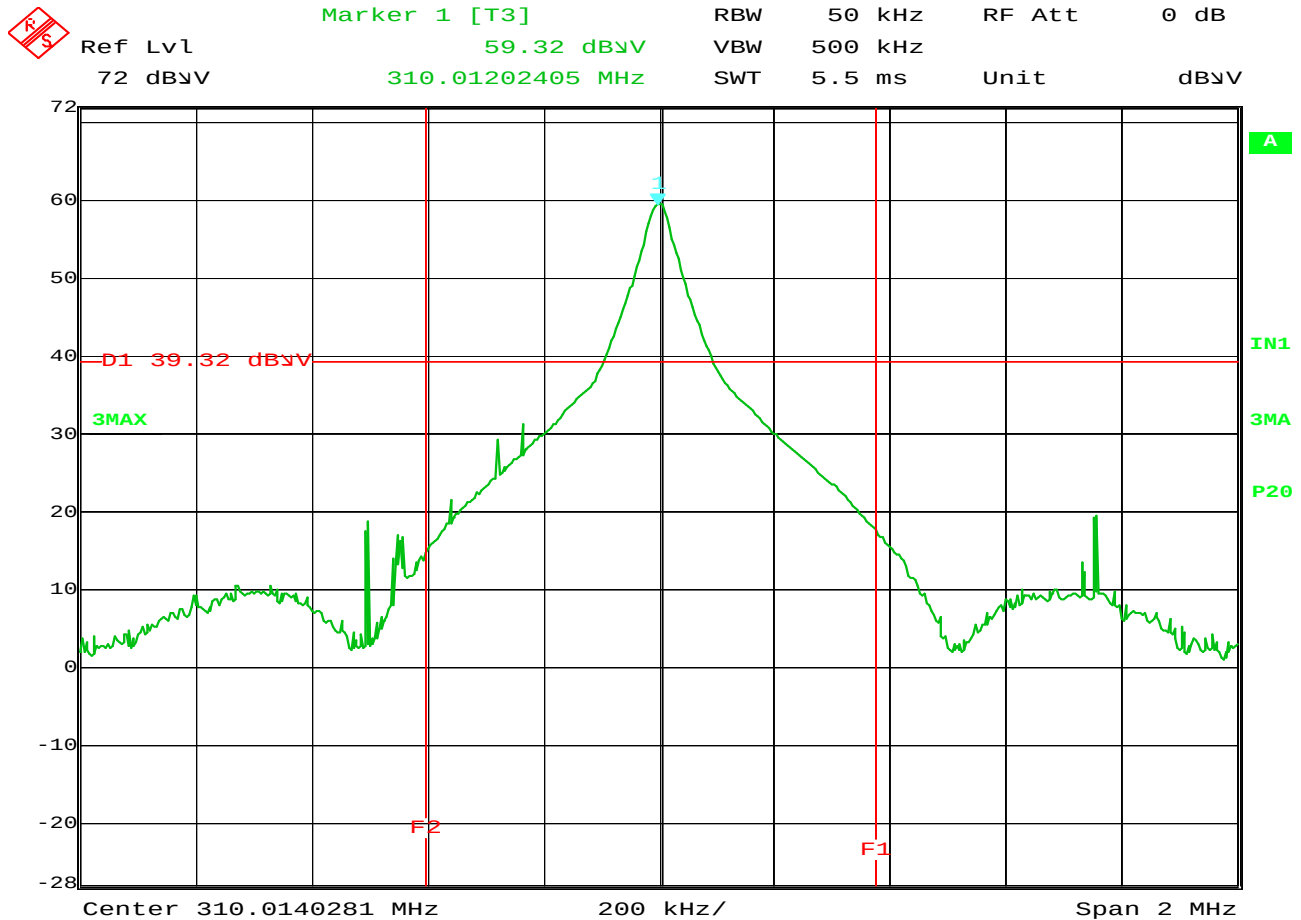


Date: 27.APR.2016 13:31:27

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Stanley Secure Code
NOTES : Button 7

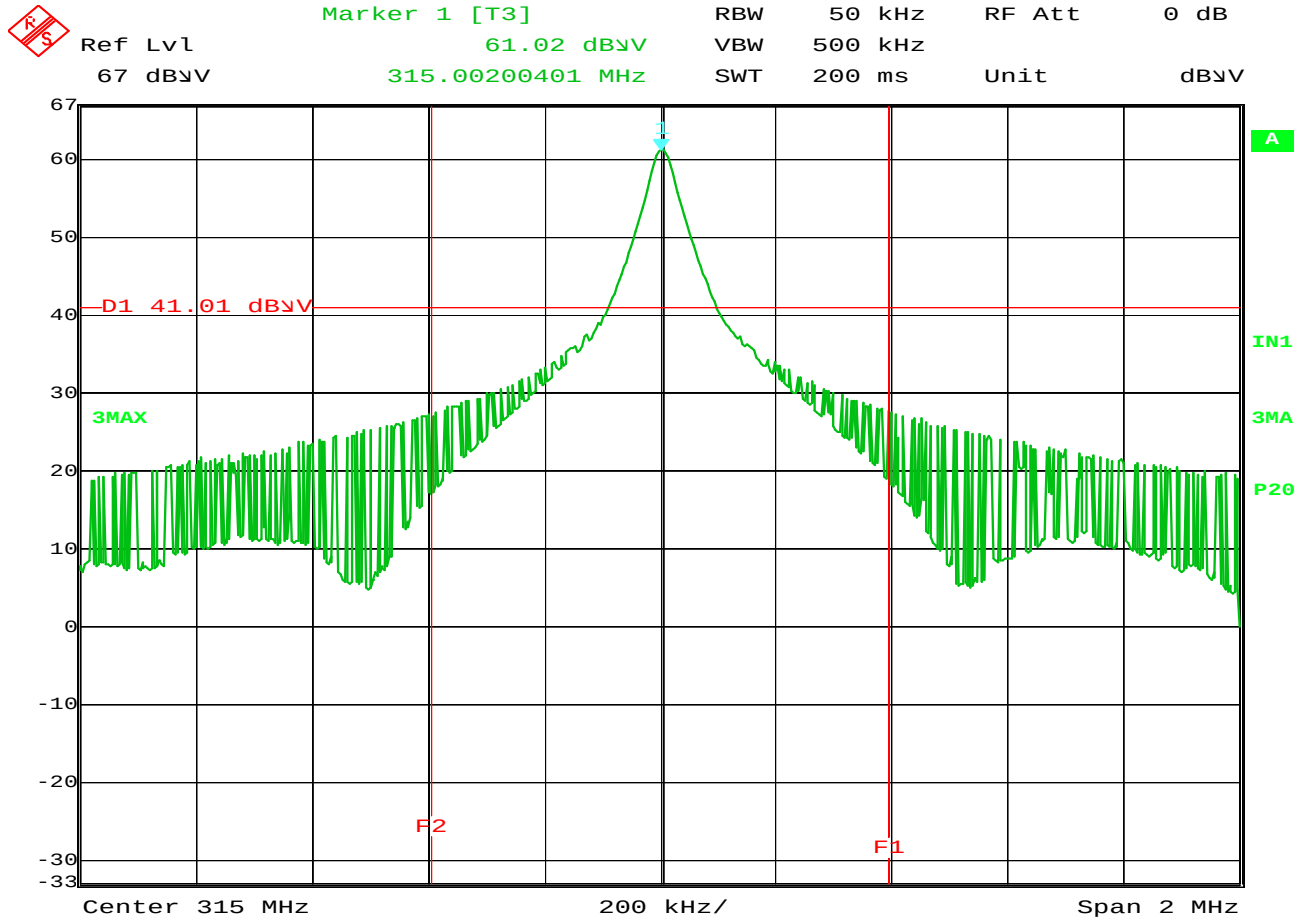
NOTES



Date: 27.APR.2016 11:37:24

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER	: The Chamberlain Group
MODEL NUMBER	: TM100 & TM110
TEST MODE	: Tx @ 310MHz
	: Peak detector
NOTES	: Occupied Bandwidth
NOTES	: Chamberlain Rolling Code E
NOTES	: Button 8

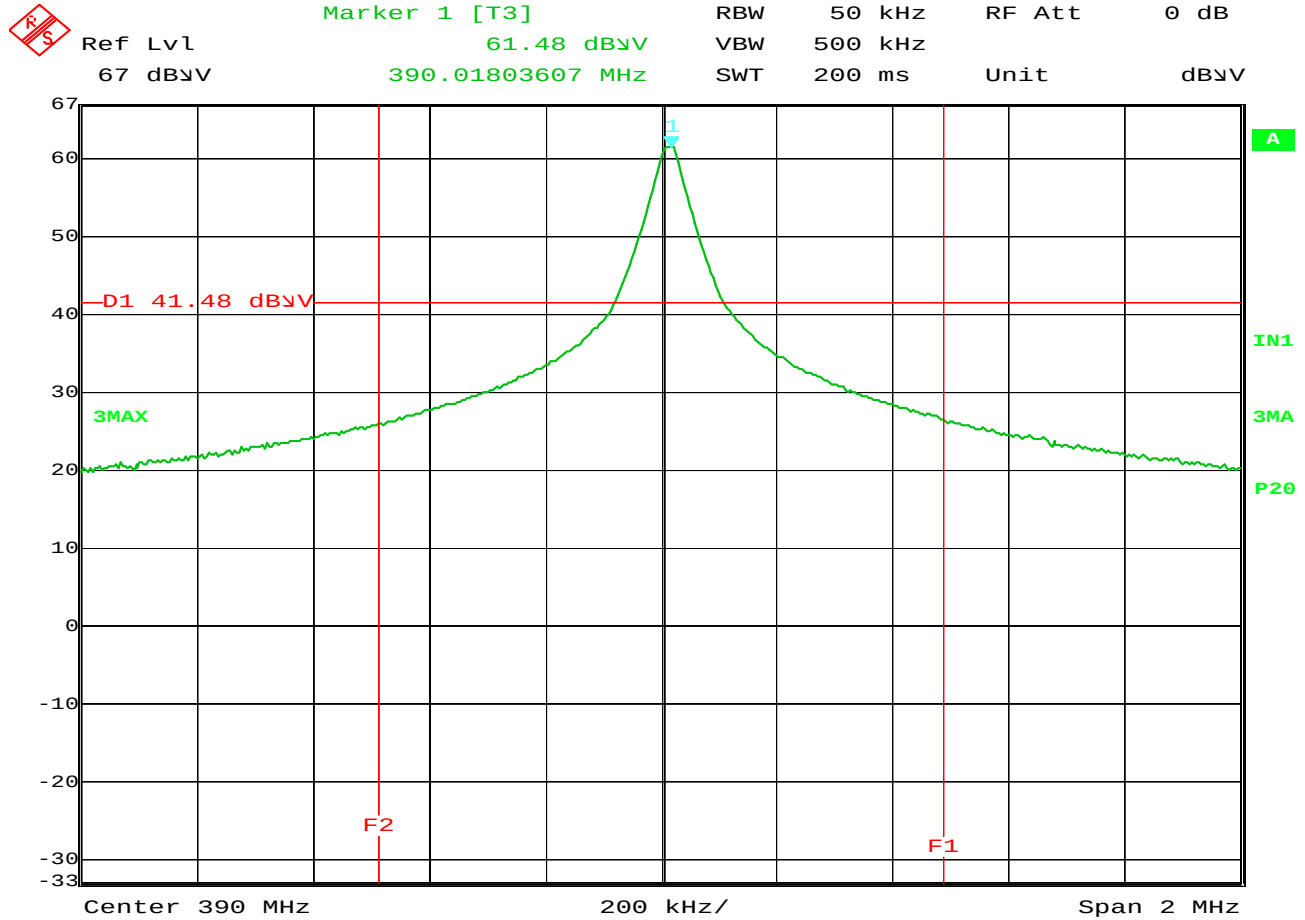


Date: 27.APR.2016 10:11:41

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain Rolling Code E
NOTES : Button 8

NOTES



Date: 27.APR.2016 09:40:36

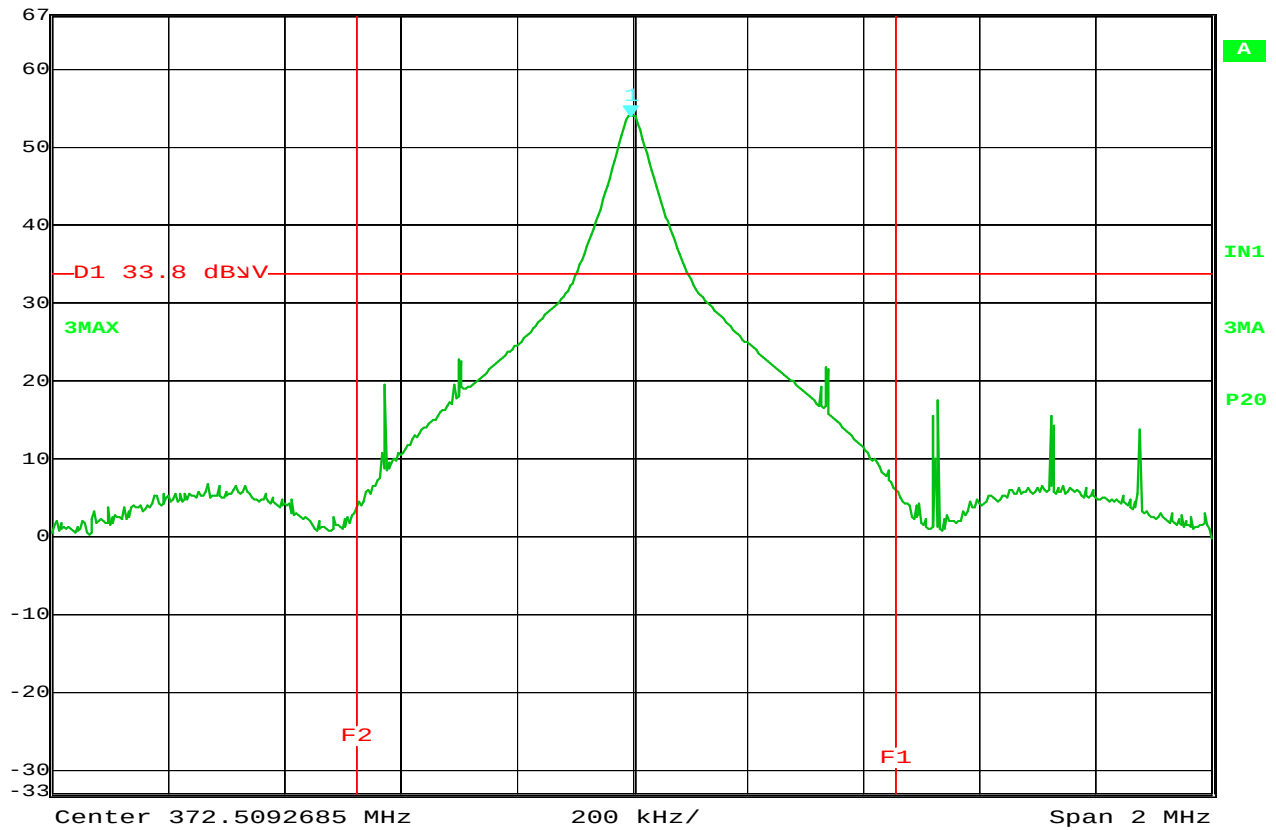
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain Rolling Code E
NOTES : Button 8

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
Ref Lvl 53.92 dBμV VBW 500 kHz
67 dBμV 372.50726453 MHz SWT 200 ms Unit dBμV



Date: 27.APR.2016 10:57:50

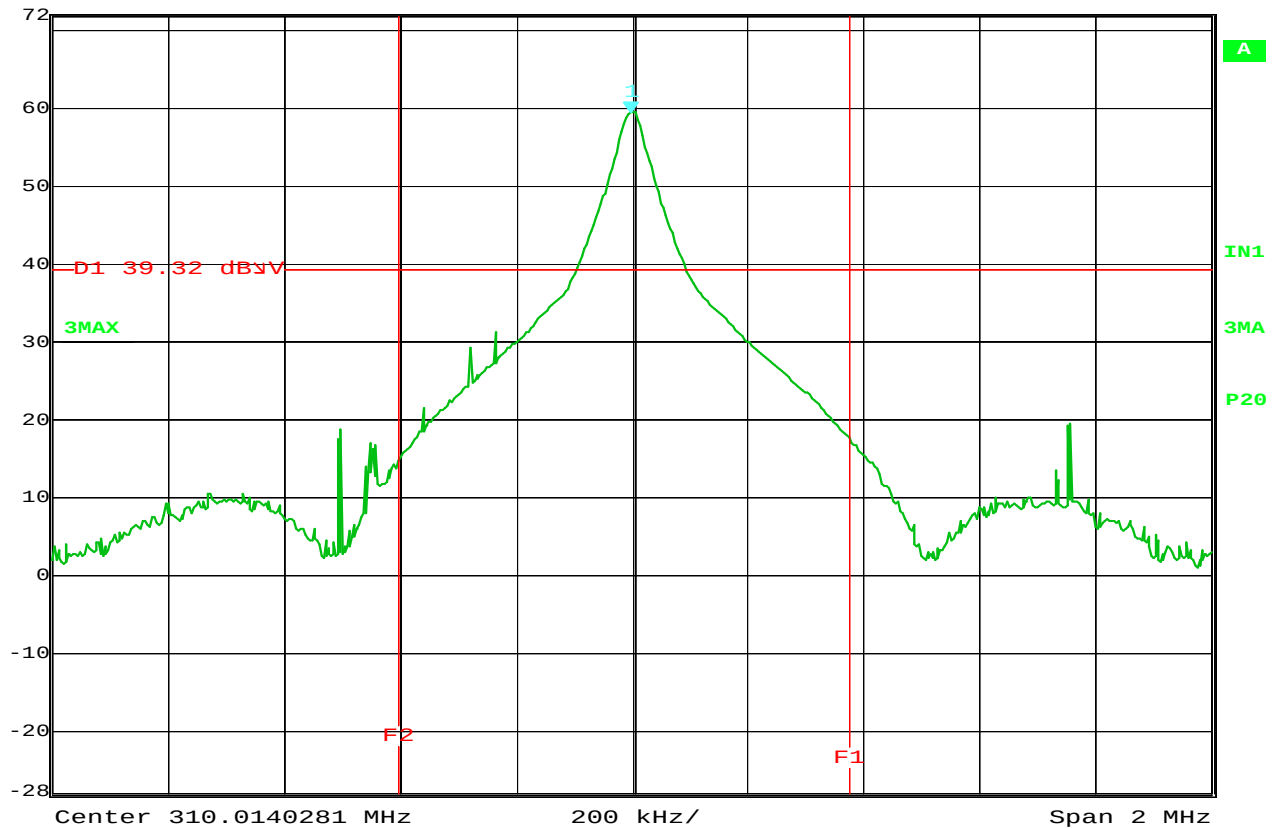
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 372.5MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Wayne Dalton Rolling Code
NOTES : Button 9

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
59.32 dBμV
310.01202405 MHz VBW 500 kHz
72 dBμV Ref Lvl 310.01202405 MHz Unit dBμV
SWT 5.5 ms



Date: 27.APR.2016 11:37:24

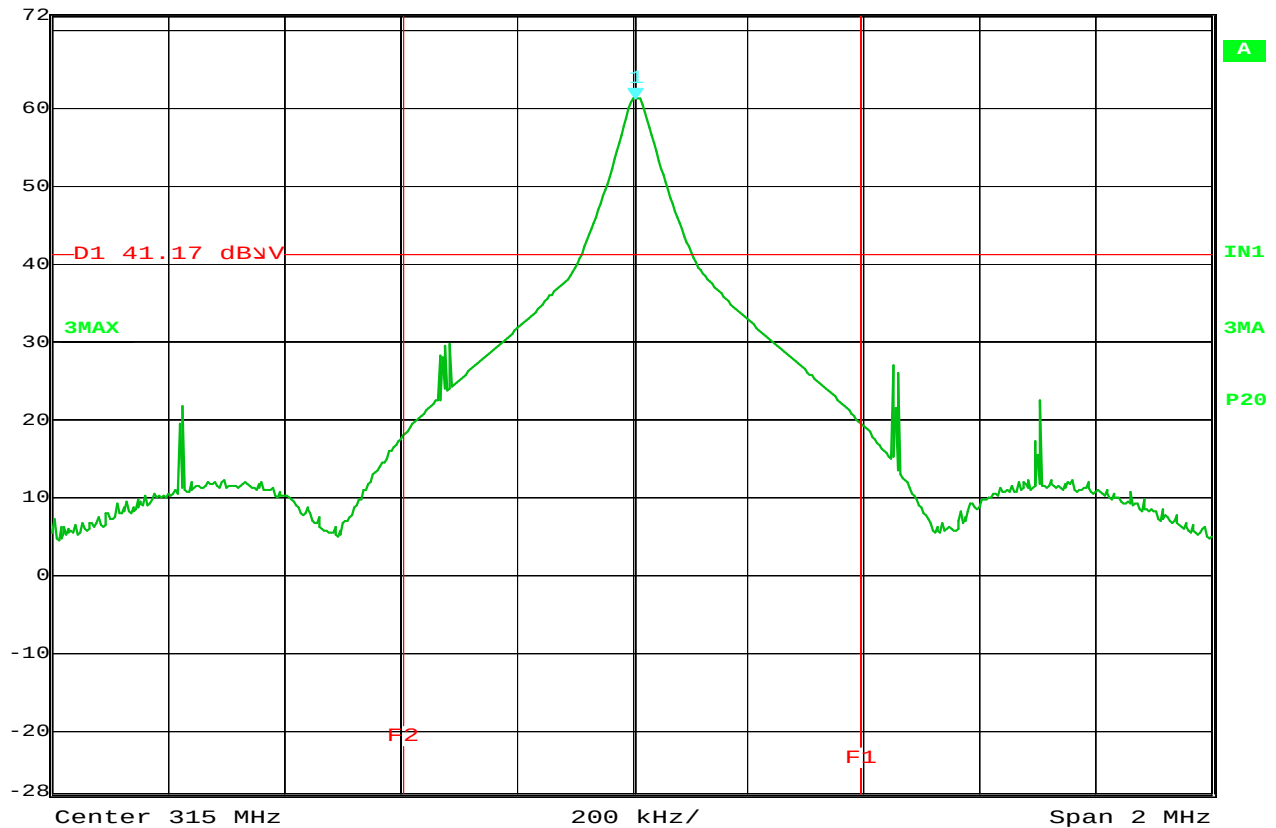
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 310MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Linear Moore-O-Matic 8 Position DIP Switch
NOTES : Button 10

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
61.19 dBμV
315.00601202 MHz VBW 500 kHz
72 dBμV Ref Lvl 315.00601202 MHz Unit dBμV
SWT 200 ms



Date: 27.APR.2016 12:10:59

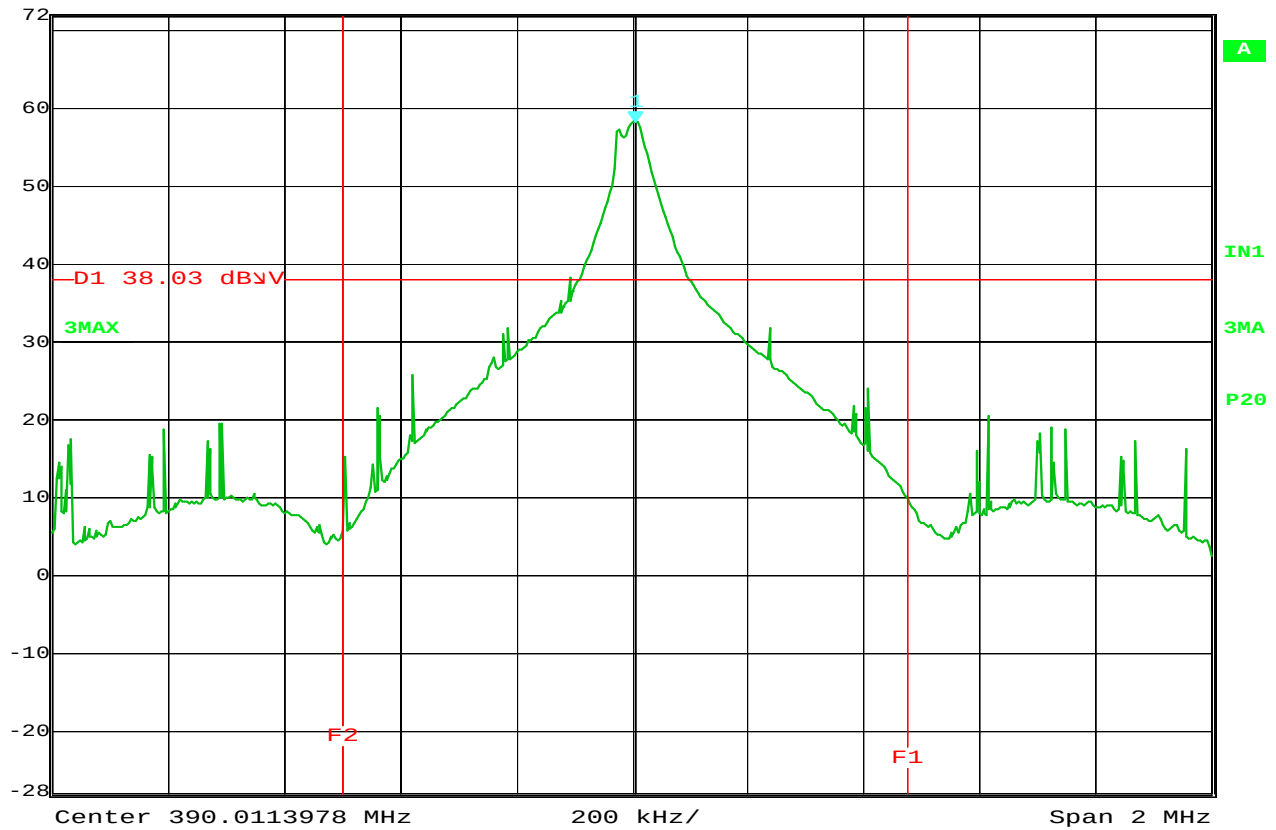
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 315MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Chamberlain 9 Position DIP Switch
NOTES : Button 11

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
Ref Lvl 58.14 dBμV VBW 500 kHz
72 dBμV 390.01740982 MHz SWT 5.5 ms Unit dBμV

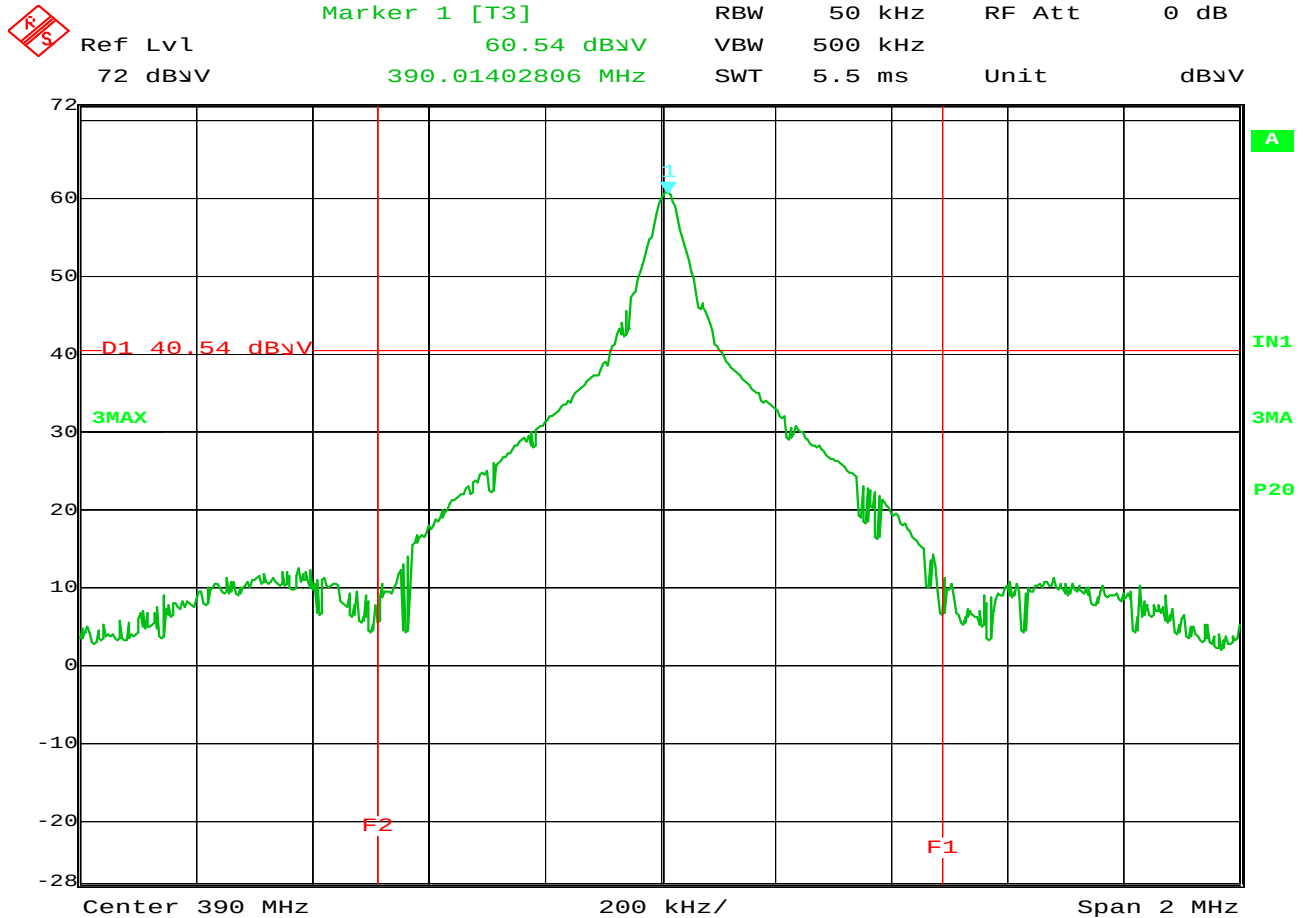


Date: 27.APR.2016 14:24:45

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Stanley 10 Position DIP Switch
NOTES : Button 12

NOTES

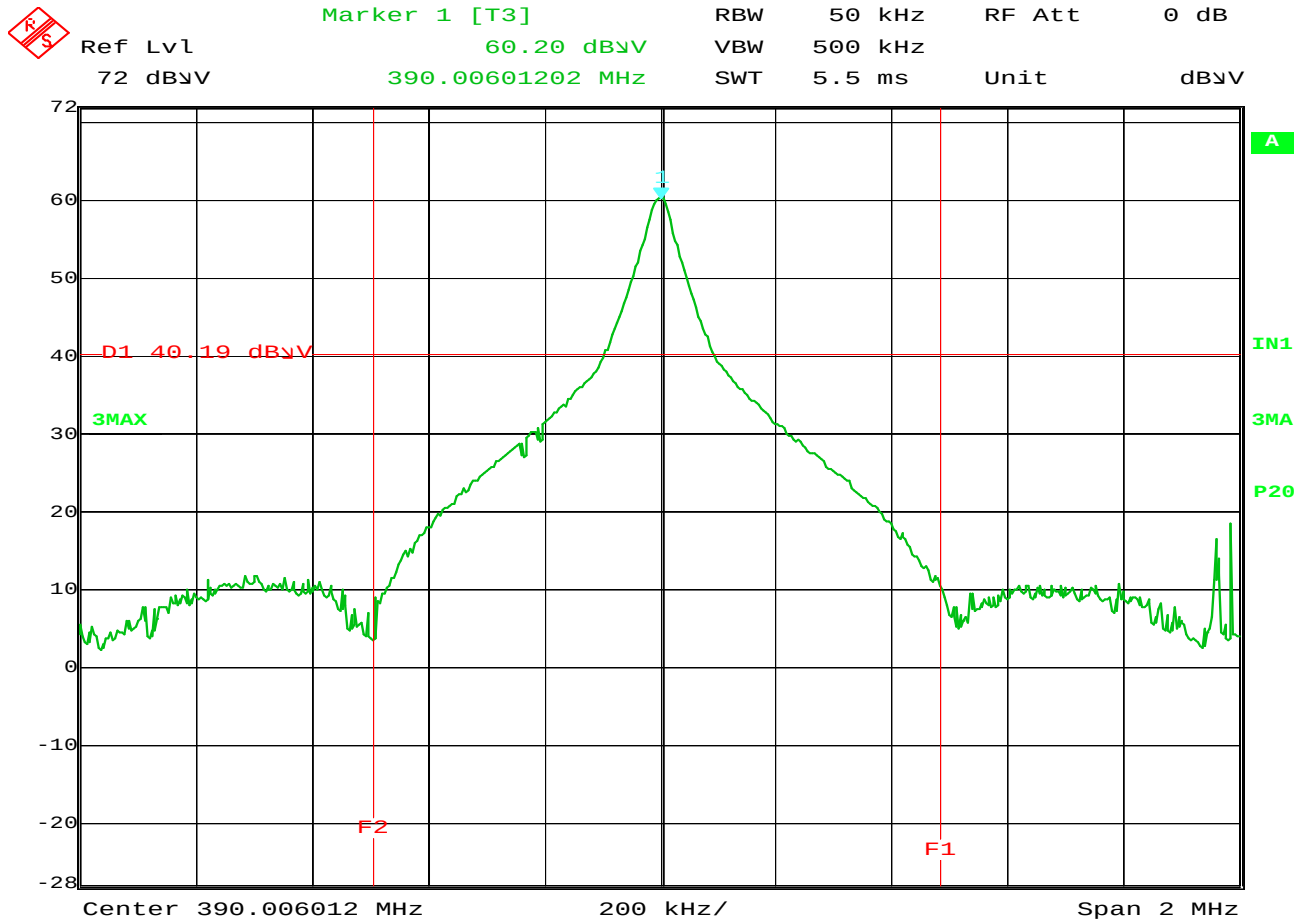


Date: 27.APR.2016 14:44:00

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Genie12 Position DIP Switch
NOTES : Button 13

NOTES

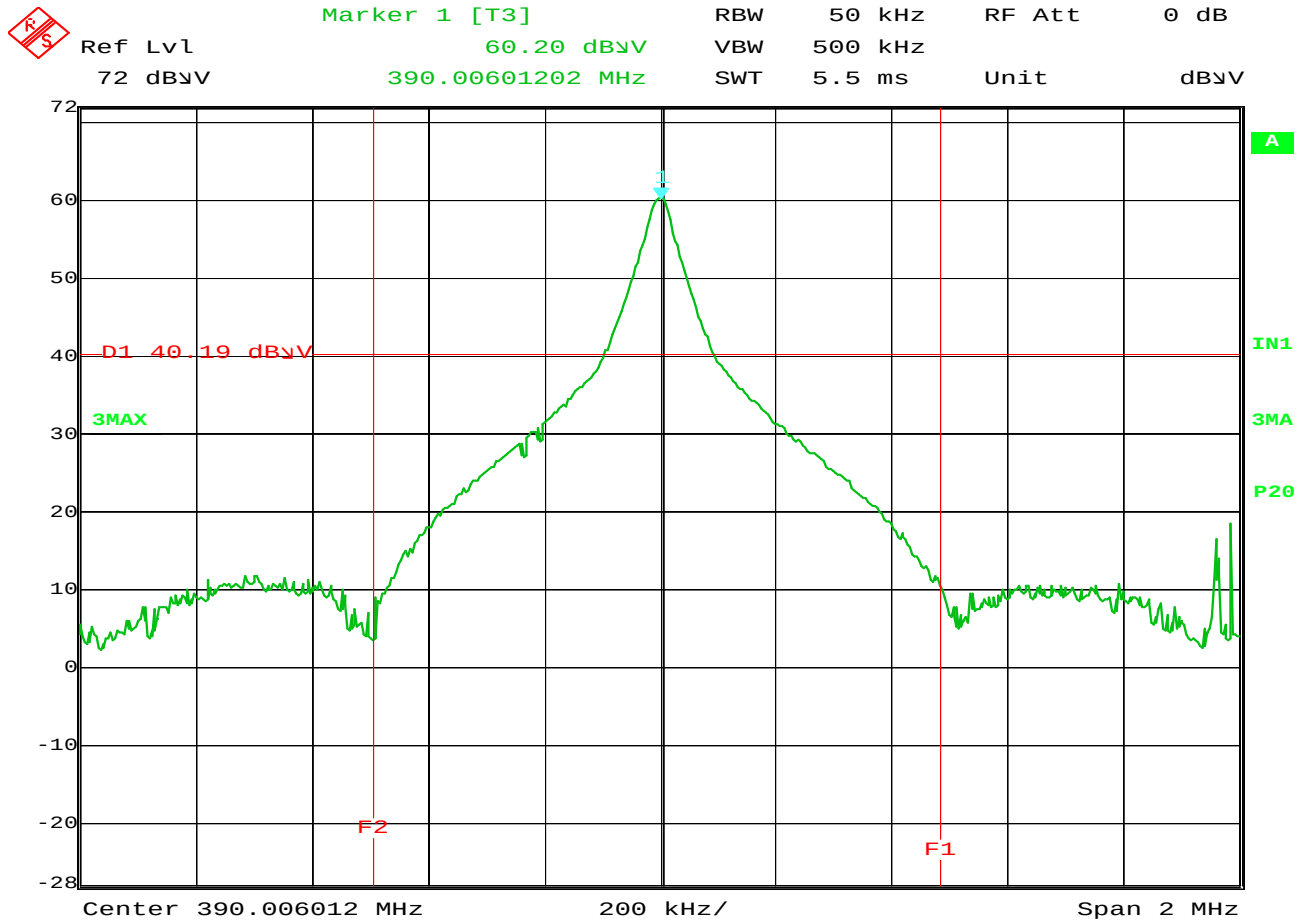


Date: 27.APR.2016 15:27:51

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER	: The Chamberlain Group
MODEL NUMBER	: TM100 & TM110
TEST MODE	: Tx @ 390MHz
	: Peak detector
NOTES	: Occupied Bandwidth
NOTES	: Chamberlain 7 Position DIP Switch
NOTES	: Button 14

NOTES

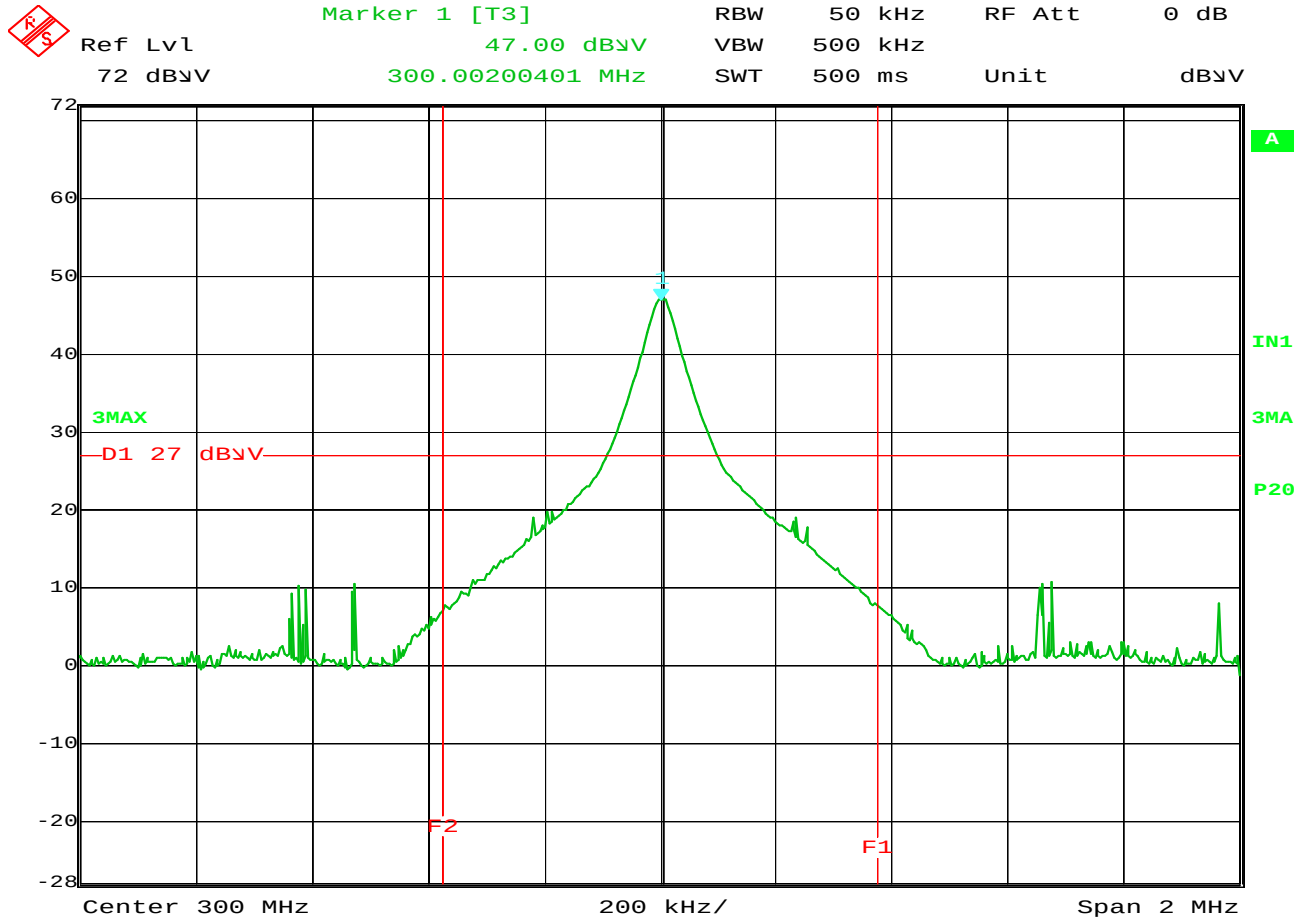


Date: 27.APR.2016 15:27:51

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER	: The Chamberlain Group
MODEL NUMBER	: TM100 & TM110
TEST MODE	: Tx @ 390MHz
	: Peak detector
NOTES	: Occupied Bandwidth
NOTES	: Chamberlain 8 Position DIP Switch
NOTES	: Button 15

NOTES



Date: 27.APR.2016 15:59:09

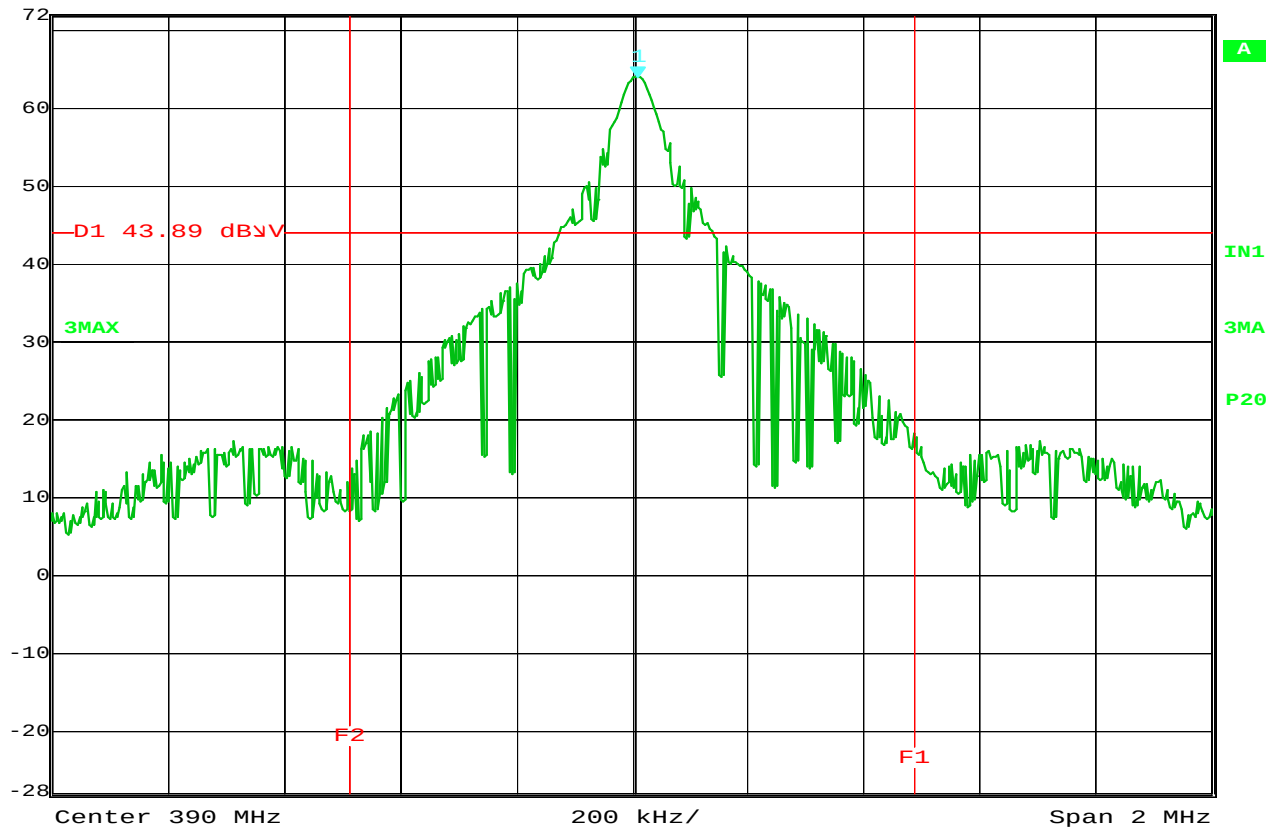
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
 MODEL NUMBER : TM100 & TM110
 TEST MODE : Tx @ 300MHz
 : Peak detector
 NOTES : Occupied Bandwidth
 NOTES : Linear Multicode
 NOTES : Button 16

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
63.89 dBμV
390.01002004 MHz VBW 500 kHz
72 dBμV Ref Lvl 390.01002004 MHz Unit dBμV
SWT 50 ms



Date: 3.MAY.2016 11:08:25

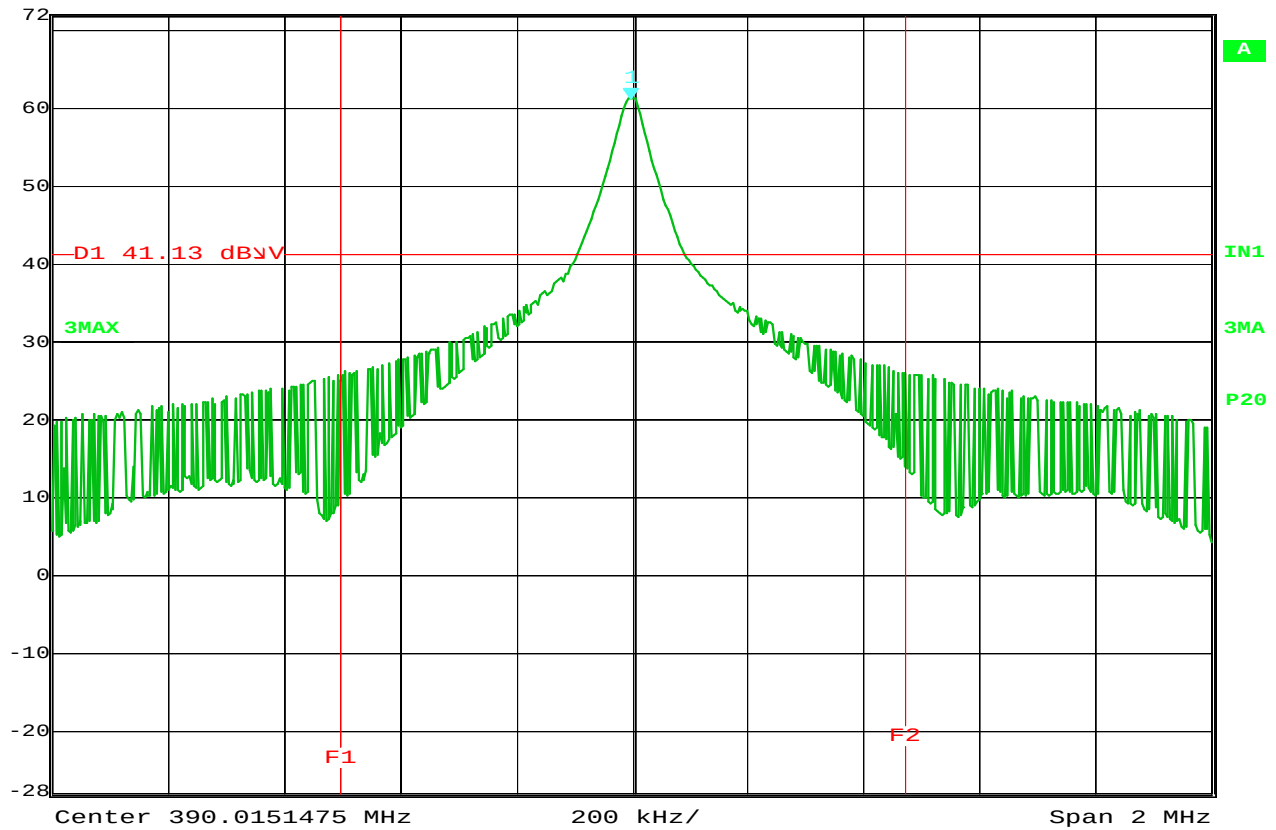
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Duty Cycle
NOTES : Chamberlain 9 Position DIP Switch
NOTES : Button 17

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
61.15 dBμV
390.01314347 MHz VBW 500 kHz
72 dBμV Ref Lvl 100 ms Unit dBμV
SWT



Date: 28.APR.2016 09:25:17

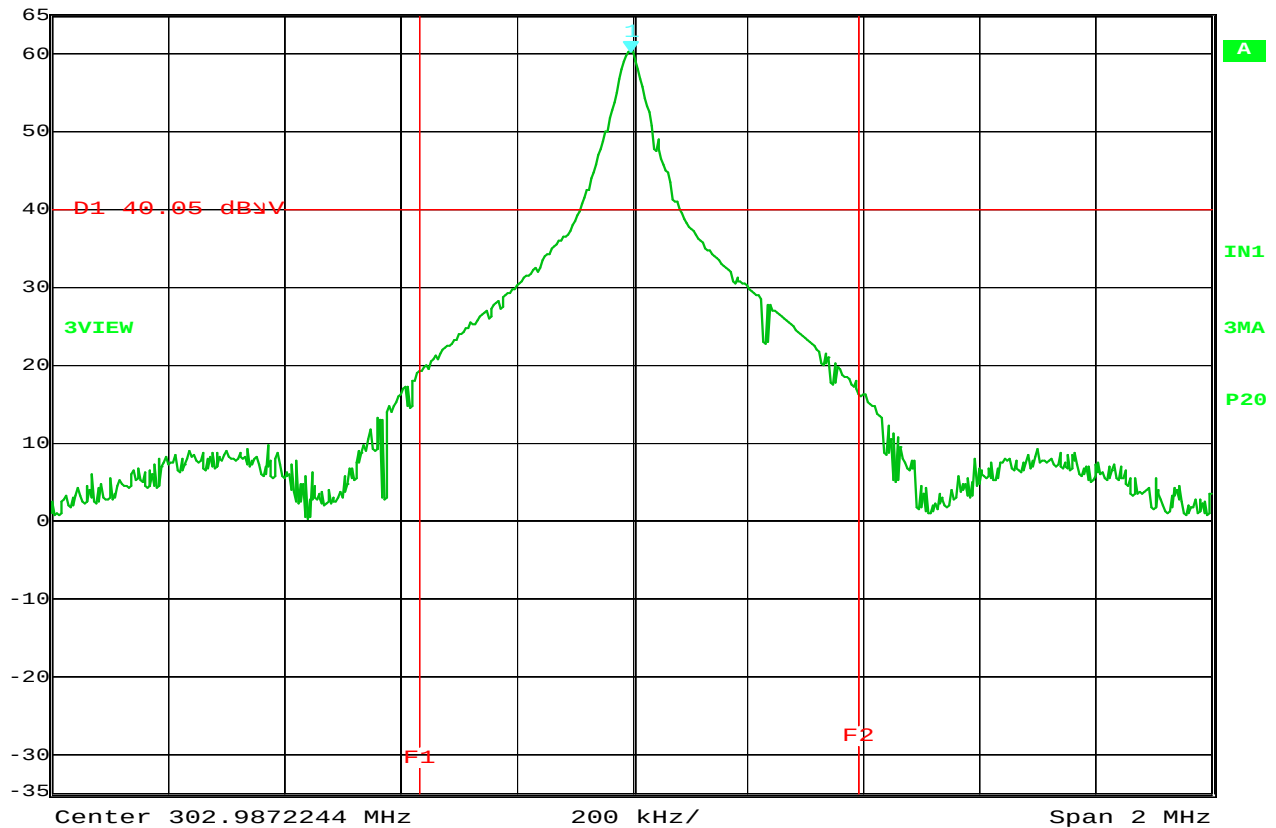
FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : Tx @ 390MHz
: Peak detector
NOTES : Occupied Bandwidth
NOTES : Genie 9 Position DIP Switch
NOTES : Button 18

NOTES



Marker 1 [T3] RBW 50 kHz RF Att 0 dB
60.05 dBμV
302.98522044 MHz VBW 500 kHz
65 dBμV 130 ms Unit dBμV



Date: 21.JUN.2016 13:48:46

FCC 15C 15.231 / Occupied Bandwidth

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : TM100 & TM110
TEST MODE : TX @ 303MHz
: PEAK DETECTOR
NOTES : Extreme OOK
NOTES : Button 19

NOTES