

Electromagnetic Compatibility Test Report

**Model: 5290
(Analog STL Transmitter)**

EMCE Test Report Number: ER050412-1

Dated: 4/12/05

**Prepared for:
TFT, Inc.
1330 Concourse Drive
San Jose, CA 95131**

**Prepared by:
EMCE Engineering
44366 South Grimmer Blvd
Fremont, Ca 94538**

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1.0 PURPOSE

Measurements were performed on the TFT, Inc. Analog STL Transmitter Model 5290 (hereinafter referred to as the “EUT”) to determine the electromagnetic emissions as they relate to Part 74 of CFR 47. Measurements were performed at the test facilities of:

EMCE Engineering
44366 S. Grimmer Blvd
Fremont, Ca 94538

See appendix D for list of laboratory accreditations.

2.0 DESCRIPTION OF TEST SAMPLE

Testing was conducted to determine the individual EMC characteristics of the Analog STL Transmitter (Model 5290, no S/N).

The TFT 5290 Analog STL Transmitter transmits on one RF channel between 944.0 MHz and 952.0 MHz per CFR 47, 74.502(b).

3.0 DISPOSITION OF TEST SPECIMEN

Upon completion of the specified EMC tests the EUT was returned to TFT, Inc. in San Jose, CA, by TFT personnel.

4.0 NARRATIVE ABSTRACT

4.1 Conclusions

After completion of all EMC measurements, all measured data was reviewed and compared with the applicable sections from CFR 47, Part 74 (i.e., Applicable sections of 47CFR 74: 74.1 and Subpart E which consists of: 74.501, 74.502, 74.503, 74.531, 74.532, 74.533, 74.534, 74.535, 74.536, 74.537, 74.550, 74.551, 74.561, 74.562, 74.564, and 74.582), and test methods described in CFR 47, Parts 2 and 74. Individual test results will be presented in this section of the report. Table 1 summarizes the test results.

TABLE 1: SUMMARY OF TEST RESULTS

CFR Section	Title	Comments	Results
2.1046, 74.534	RF Power Output		PASSED
2.1047, 74.535	Modulation Characteristics		PASSED
2.1049, 74.535	Occupied Bandwidth		PASSED
2.1051	Spurious Emissions		PASSED
2.1055, 74.561	Frequency Stability		PASSED
2.1057	Investigation of Frequency Spectrum		PASSED

4.2 EMC Testing Summary

4.2.1 RF Power Output (CFR 2.1046, 74.534)

Test results may be found in Appendix A.

4.2.2 Modulation Characteristics (CFR 2.1047, 74.535)

Test results may be found in Appendix A

4.2.3 Occupied Bandwidth (CFR 2.1049, 74.535)

Test results may be found in Appendix A.

4.2.4 Spurious Emissions (CFR 2.1051)

Test results may be found in Appendix A.

4.2.5 Frequency Stability (CFR 2.1055, 74.561)

Test results may be found in Appendix A

4.2.6 Radiated Spurious Emissions / Investigation of Frequency Spectrum (CFR 2.1053, 2.1057)

Test results may be found in Appendix A

APPENDIX A

Test Data
For
Analog STL Transmitter
M/N: 5290

RF Power Output (CFR 2.1046, 74.534), Occupied Bandwidth (CFR 2.1049, 74.535)

Operating Mode: MONO

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**
 Specification: **TFT 460 Analog Mask**
 Work Order #: **2413** Date: 4/27/2005
 Test Type: **Antenna Conducted Emissions** Time: 2:49:44 PM
 Equipment: **Analog STL Transmitter** Sequence#: 2
 Manufacturer: **TFT, Inc.** Tested By: **Bob Cole**
 Model: **5290** 120V 60Hz
 S/N: **N/A**

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

Mono				
Spectrum analyzer Settings:				
Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

T1=30 dB Attenuator

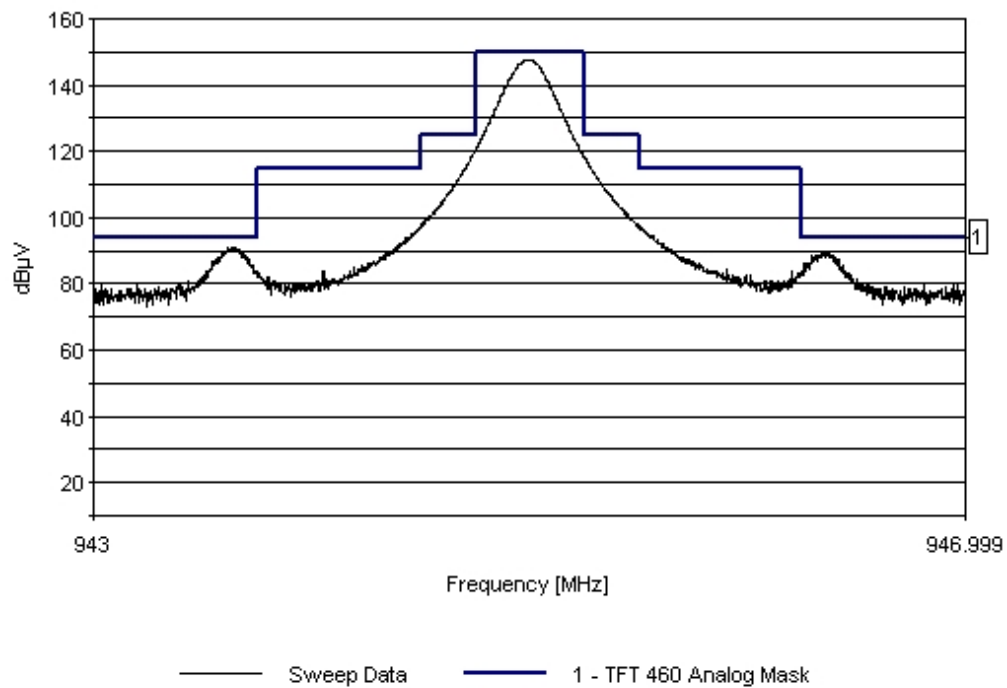
Measurement Data: Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	945.005M	117.7	+30.0				+0.0	147.7	150.0	-2.3	None
2	943.640M	61.0	+30.0				+0.0	91.0	94.0	-3.0	None
3	946.341M	59.7	+30.0				+0.0	89.7	94.0	-4.3	None
4	943.434M	51.0	+30.0				+0.0	81.0	94.0	-13.0	None
5	943.386M	50.4	+30.0				+0.0	80.4	94.0	-13.6	None

6	946.964M	50.3	+30.0	+0.0	80.3	94.0	-13.7	None
7	943.037M	49.7	+30.0	+0.0	79.7	94.0	-14.3	None
8	943.197M	49.5	+30.0	+0.0	79.5	94.0	-14.5	None
9	946.604M	48.7	+30.0	+0.0	78.7	94.0	-15.3	None
10	943.053M	48.6	+30.0	+0.0	78.6	94.0	-15.4	None

EMCE Engineering Date: 4/27/2005 Time: 2:49:44 PM TFT, Inc. WVO#: 2413
TFT 460 Analog Mask Test Lead: Black 120V 60Hz Sequence#: 2



Operating Mode: FM

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**Specification: **TFT 460 Analog Mask**Work Order #: **2413**Test Type: **Antenna Conducted Emissions**Equipment: **Analog STL Transmitter**Manufacturer: **TFT, Inc.**Model: **5290**S/N: **N/A**

Date: 4/27/2005

Time: 2:27:26 PM

Sequence#: 6

Tested By: Bob Cole

120V 60Hz

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

FM

Spectrum analyzer Settings:

Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

T1=30 dB Attenuator

Measurement Data:

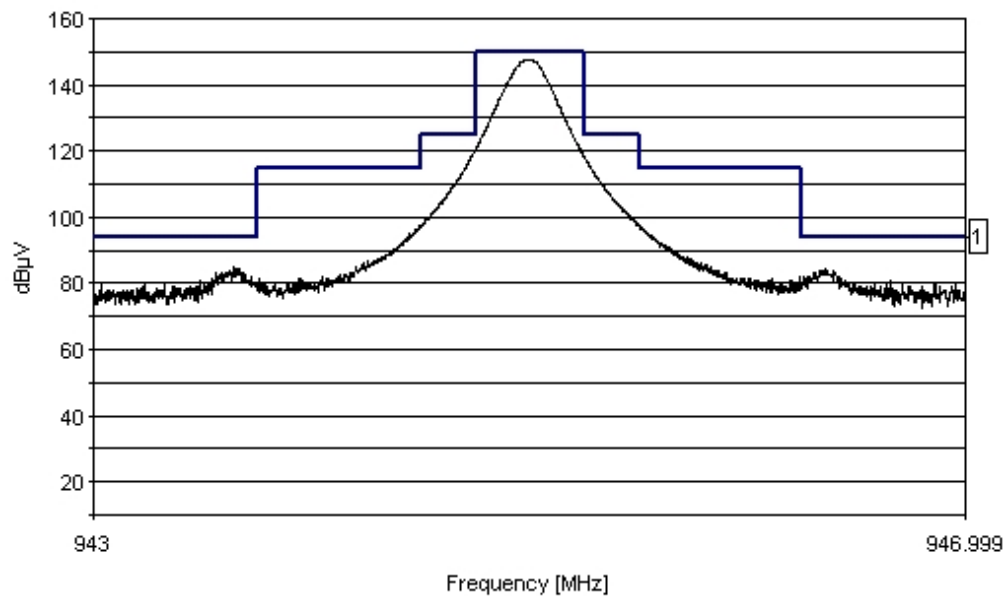
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBμV	T1 dB	dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	944.986M	117.7	+30.0				+0.0	147.7	150.0	-2.3	None
2	943.639M	54.9	+30.0				+0.0	84.9	94.0	-9.1	None
3	946.360M	54.3	+30.0				+0.0	84.3	94.0	-9.7	None
4	943.559M	53.4	+30.0				+0.0	83.4	94.0	-10.6	None
5	946.257M	52.0	+30.0				+0.0	82.0	94.0	-12.0	None
6	946.423M	51.5	+30.0				+0.0	81.5	94.0	-12.5	None

7	943.487M	50.9	+30.0	+0.0	80.9	94.0	-13.1	None
8	946.657M	50.9	+30.0	+0.0	80.9	94.0	-13.1	None
9	943.506M	50.3	+30.0	+0.0	80.3	94.0	-13.7	None
10	946.850M	50.0	+30.0	+0.0	80.0	94.0	-14.0	None

EMCE Engineering Date: 4/27/2005 Time: 2:27:26 PM TFT, Inc. WFO#: 2413
TFT 460 Analog Mask Test Lead: Black 120V 60Hz Sequence#: 6



— Sweep Data — 1 - TFT 460 Analog Mask

Operating Mode: FM with 152 kHz MUX

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**Specification: **TFT 460 Analog Mask**Work Order #: **2413**

Date: 4/27/2005

Test Type: **Antenna Conducted Emissions**

Time: 2:31:10 PM

Equipment: **Analog STL Transmitter**

Sequence#: 7

Manufacturer: **TFT, Inc.**Tested By: **Bob Cole**Model: **5290**

120V 60Hz

S/N: **N/A****Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

FM with 152 kHz MUX

Spectrum analyzer Settings:

Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

T1=30 dB Attenuator

Measurement Data:

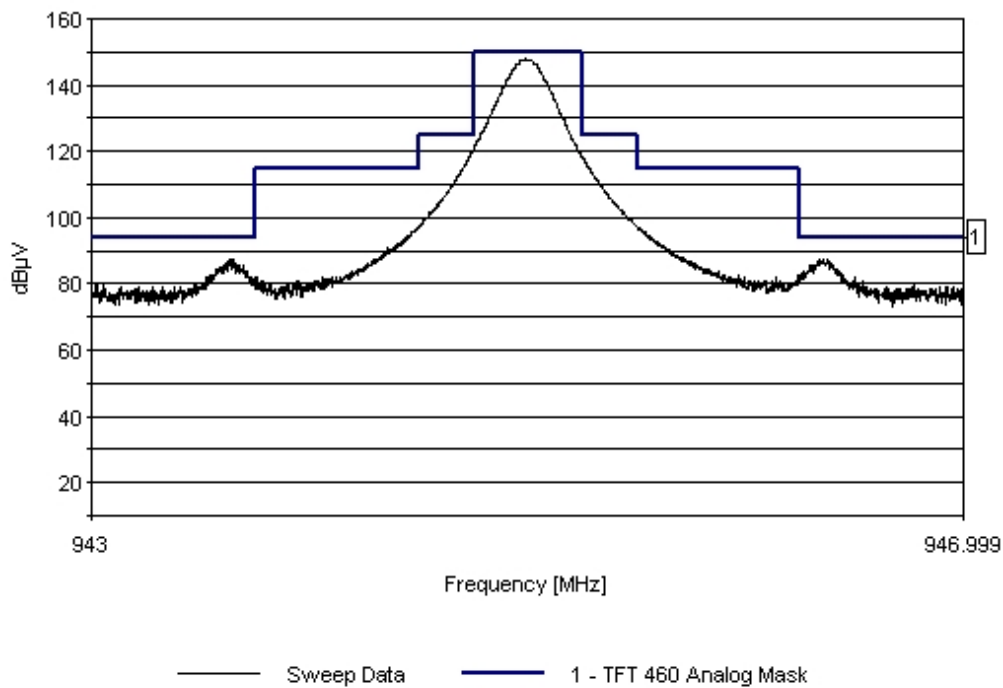
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	944.993M	117.8	+30.0				+0.0	147.8	150.0	-2.2	None
2	943.652M	57.6	+30.0				+0.0	87.6	94.0	-6.4	None
3	946.339M	57.4	+30.0				+0.0	87.4	94.0	-6.6	None
4	946.537M	50.8	+30.0				+0.0	80.8	94.0	-13.2	None
5	946.775M	50.4	+30.0				+0.0	80.4	94.0	-13.6	None
6	943.474M	49.6	+30.0				+0.0	79.6	94.0	-14.4	None
7	943.021M	49.5	+30.0				+0.0	79.5	94.0	-14.5	None
8	943.051M	49.5	+30.0				+0.0	79.5	94.0	-14.5	None

9	946.951M	49.3	+30.0	+0.0	79.3	94.0	-14.7	None
10	946.916M	48.9	+30.0	+0.0	78.9	94.0	-15.1	None

EMCE Engineering Date: 4/27/2005 Time: 2:31:10 PM TFT, Inc. WVO#: 2413
TFT 460 Analog Mask Test Lead: Black 120V 60Hz Sequence#: 7



Modulation Characteristics (CFR 2.1047, 74.535)

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**Specification: **TFT 5290 Analog Mask - 1 kHz**

Work Order #:

Date: 5/6/2005

Test Type: **Antenna Conducted Emissions**

Time: 1:39:42 PM

Equipment: **Analog STL Transmitter**

Sequence#: 6

Manufacturer: TFT, Inc.

Tested By: Test Engineer

Model: 5290

120V 60Hz

S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

Mono with 15 kHz modulation, 24 kHz deviation 1.35 Vpp input level
1 kHz

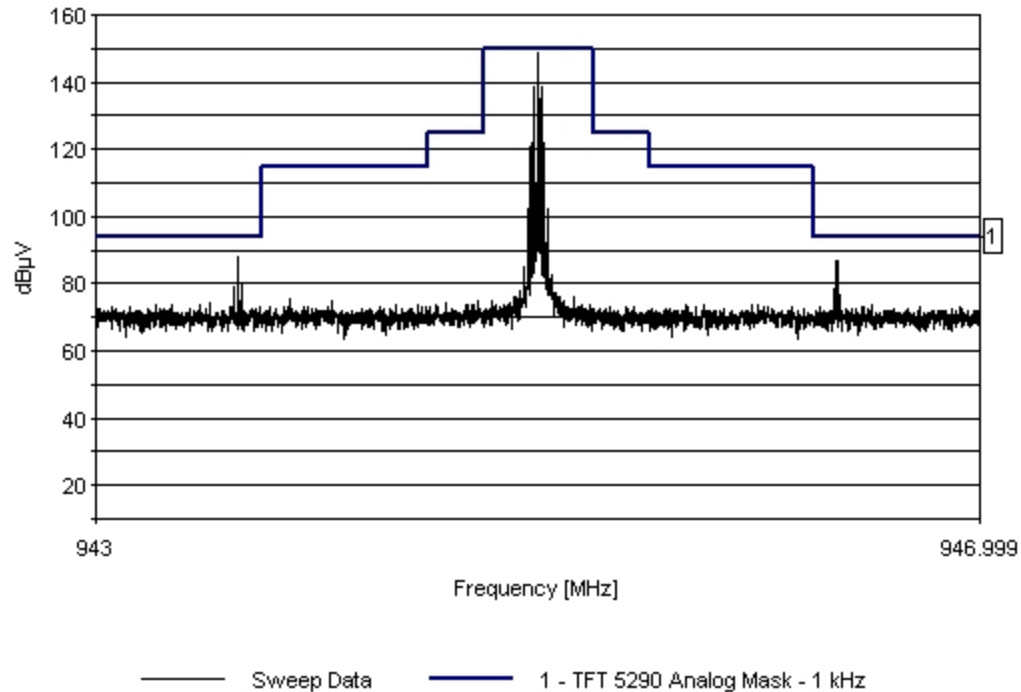
Transducer Legend:

T1=30 dB Attenuator	T2=Chamber Receive Cable to 1 GHz
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Measurement Data: Reading listed by margin. Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	944.996M	115.2	+30.0	+3.2			+0.0	148.4	150.0	-1.6	Anten
2	943.641M	54.9	+30.0	+3.2			+0.0	88.1	94.0	-5.9	Anten
3	946.352M	53.8	+30.0	+3.2			+0.0	87.0	94.0	-7.0	Anten
4	944.981M	105.2	+30.0	+3.2			+0.0	138.4	150.0	-11.6	Anten
5	945.011M	105.2	+30.0	+3.2			+0.0	138.4	150.0	-11.6	Anten
6	943.656M	46.4	+30.0	+3.2			+0.0	79.6	94.0	-14.4	Anten
7	943.626M	45.7	+30.0	+3.2			+0.0	78.9	94.0	-15.1	Anten
8	946.336M	45.3	+30.0	+3.2			+0.0	78.5	94.0	-15.5	Anten
9	946.367M	43.3	+30.0	+3.2			+0.0	76.5	94.0	-17.5	Anten
10	943.512M	40.8	+30.0	+3.2			+0.0	74.0	94.0	-20.0	Anten

EMCE Engineering Date: 5/6/2005 Time: 1:39:42 PM TFT, Inc. WVO#:
TFT 5290 Analog Mask - 1 kHz Test Lead: Antenna Terminal 120V 60Hz Sequence#: 6



Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**

Specification: **TFT 5290 Analog Mask - 3 kHz**

Work Order #:

Date: 5/6/2005

Test Type: **Antenna Conducted Emissions**

Time: 1:43:02 PM

Equipment: **Analog STL Transmitter**

Sequence#: 8

Manufacturer: TFT, Inc.

Tested By: Test Engineer

Model: 5290

120V 60Hz

S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

Composite with 50 kHz modulation, 50 kHz deviation 1.35 Vpp input level
3 kHz RBW

Transducer Legend:

T1=30 dB Attenuator

T2=Chamber Receive Cable to 1 GHz

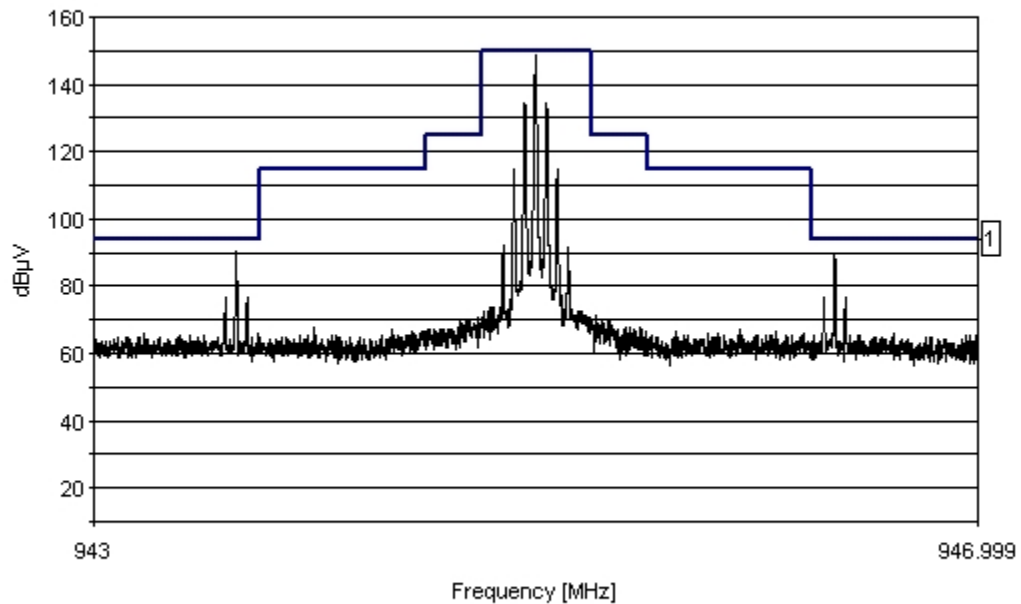
Measurement Data:

Reading listed by margin.

Test Lead: Antenna Terminal

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB			Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	944.997M	115.6	+30.0	+3.2			+0.0	148.8	150.0	-1.2	Anten
2	943.643M	57.0	+30.0	+3.2			+0.0	90.2	94.0	-3.8	Anten
3	946.349M	56.4	+30.0	+3.2			+0.0	89.6	94.0	-4.4	Anten
4	944.947M	101.5	+30.0	+3.2			+0.0	134.7	150.0	-15.3	Anten
5	945.045M	101.5	+30.0	+3.2			+0.0	134.7	150.0	-15.3	Anten
6	946.301M	43.6	+30.0	+3.2			+0.0	76.8	94.0	-17.2	Anten
7	943.594M	43.5	+30.0	+3.2			+0.0	76.7	94.0	-17.3	Anten
8	943.692M	43.5	+30.0	+3.2			+0.0	76.7	94.0	-17.3	Anten
9	946.399M	43.4	+30.0	+3.2			+0.0	76.6	94.0	-17.4	Anten
10	943.225M	32.6	+30.0	+3.2			+0.0	65.8	94.0	-28.2	Anten

EMCE Engineering Date: 5/6/2005 Time: 1:43:02 PM TFT, Inc. WFO#:
TFT 5290 Analog Mask - 3 kHz Test Lead: Antenna Terminal 120V 60Hz Sequence#: 8



— Sweep Data

— 1 - TFT 5290 Analog Mask - 3 kHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT. Inc.**

Specification: **TFT 5290 Analog Mask - 10 kHz**

Work Order #:

Date: 5/6/2005

Test Type: **Antenna Conducted Emissions**

Time: 1:49:52 PM

Equipment: **Analog STL Transmitter**

Sequence#: 9

Manufacturer: TFT, Inc.

Tested By: Test Engineer

Model: 5290

120V 60Hz

S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

Composite with 50 kHz modulation, 1.35 Vpp input level, 50 kHz deviation MUX modulation 152 kHz , 1.35 Vpp input level - 12 kHz deviation
10 kHz RBW

Transducer Legend:

T1=30 dB Attenuator	T2=Chamber Receive Cable to 1 GHz
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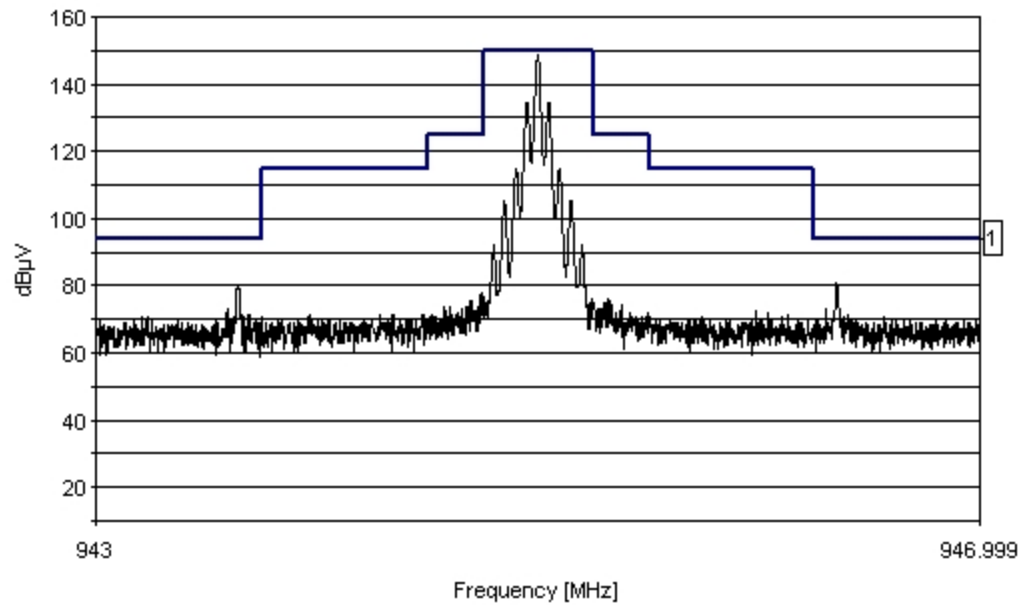
Measurement Data:

Reading listed by margin.

Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	944.997M	115.5	+30.0	+3.2		+0.0	148.7	150.0	-1.3	Anten
2	946.351M	47.4	+30.0	+3.2		+0.0	80.6	94.0	-13.4	Anten
3	943.644M	47.1	+30.0	+3.2		+0.0	80.3	94.0	-13.7	Anten
4	944.947M	101.5	+30.0	+3.2		+0.0	134.7	150.0	-15.3	Anten
5	945.045M	101.5	+30.0	+3.2		+0.0	134.7	150.0	-15.3	Anten
6	946.303M	39.7	+30.0	+3.2		+0.0	72.9	94.0	-21.1	Anten
7	943.597M	39.6	+30.0	+3.2		+0.0	72.8	94.0	-21.2	Anten
8	943.691M	38.0	+30.0	+3.2		+0.0	71.2	94.0	-22.8	Anten
9	946.401M	37.9	+30.0	+3.2		+0.0	71.1	94.0	-22.9	Anten
10	943.746M	37.6	+30.0	+3.2		+0.0	70.8	94.0	-23.2	Anten

EMCE Engineering Date: 5/6/2005 Time: 1:49:52 PM TFT, Inc. WFO#:
TFT 5290 Analog Mask - 10 kHz Test Lead: Antenna Terminal 120V 60Hz Sequence#: 9



— Sweep Data — 1 - TFT 5290 Analog Mask - 10 kHz

Spurious Emissions (CFR 2.1051, 74.535)**Operating Mode: MONO**

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**
 Specification: **TFT 5290 Spurious Conducted**
 Work Order #: **2413**
 Test Type: **Antenna Conducted Emissions**
 Equipment: **Analog STL Transmitter**
 Manufacturer: **TFT, Inc.**
 Model: **5290**
 S/N: **N/A**

Date: 4/27/2005
 Time: 2:53:36 PM
 Sequence#: 11
 Tested By: Bob Cole
 120V 60Hz

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

Mono - Harmonics				
Spectrum analyzer Settings:				
Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

T1=30 dB Attenuator

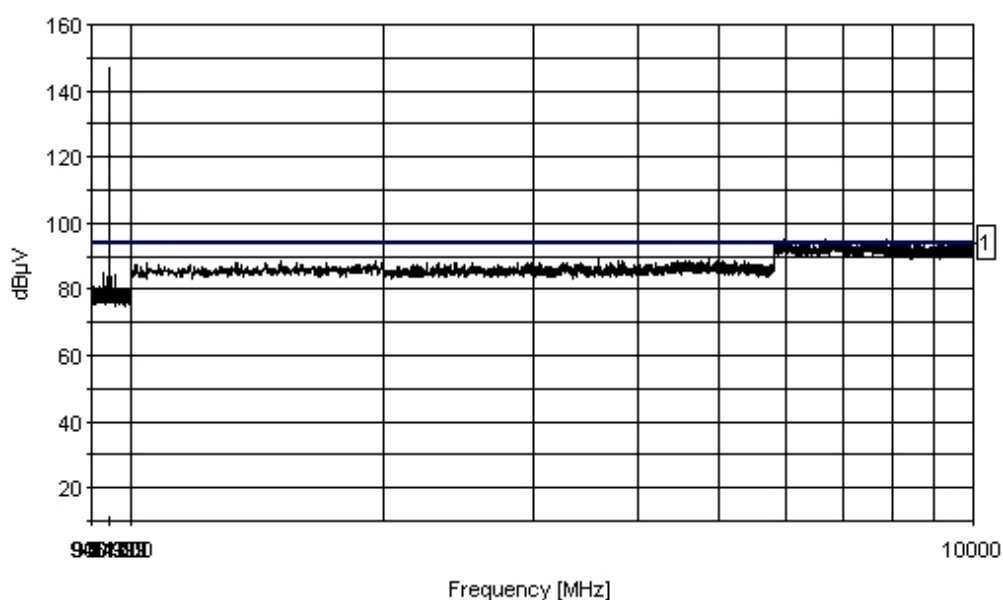
Measurement Data: Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB				Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	944.900M	117.0	+30.0				+0.0	147.0	94.0	+53.0	Fundam ental Freq.
2	4855.852M	59.4	+30.0				+0.0	89.4	94.0	-4.6	None
3	3588.586M	59.3	+30.0				+0.0	89.3	94.0	-4.7	None
4	5342.338M	58.8	+30.0				+0.0	88.8	94.0	-5.2	None

5	4455.452M	58.7	+30.0	+0.0	88.7	94.0	-5.3	None
6	1950.950M	58.6	+30.0	+0.0	88.6	94.0	-5.4	None
7	3824.822M	58.6	+30.0	+0.0	88.6	94.0	-5.4	None
8	5052.048M	58.6	+30.0	+0.0	88.6	94.0	-5.4	None
9	5210.206M	58.4	+30.0	+0.0	88.4	94.0	-5.6	None
10	1508.508M	58.3	+30.0	+0.0	88.3	94.0	-5.7	None

EMCE Engineering Date: 4/27/2005 Time: 2:53:36 PM TFT, Inc. W/O#: 2413
TFT 5290 Spurious Conducted Test Lead: Black 120V 60Hz Sequence#: 11



— Sweep Data — 1 - TFT 5290 Spurious Conducted

Operating Mode: FM

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**
 Specification: **TFT 5290 Spurious Conducted**
 Work Order #: **2413**
 Test Type: **Antenna Conducted Emissions**
 Equipment: **Analog STL Transmitter**
 Manufacturer: **TFT, Inc.**
 Model: **5290**
 S/N: **N/A**

Date: 4/27/2005
 Time: 2:55:36 PM
 Sequence#: 12
 Tested By: Bob Cole
 120V 60Hz

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

FM – Harmonics				
Spectrum analyzer Settings:				
Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

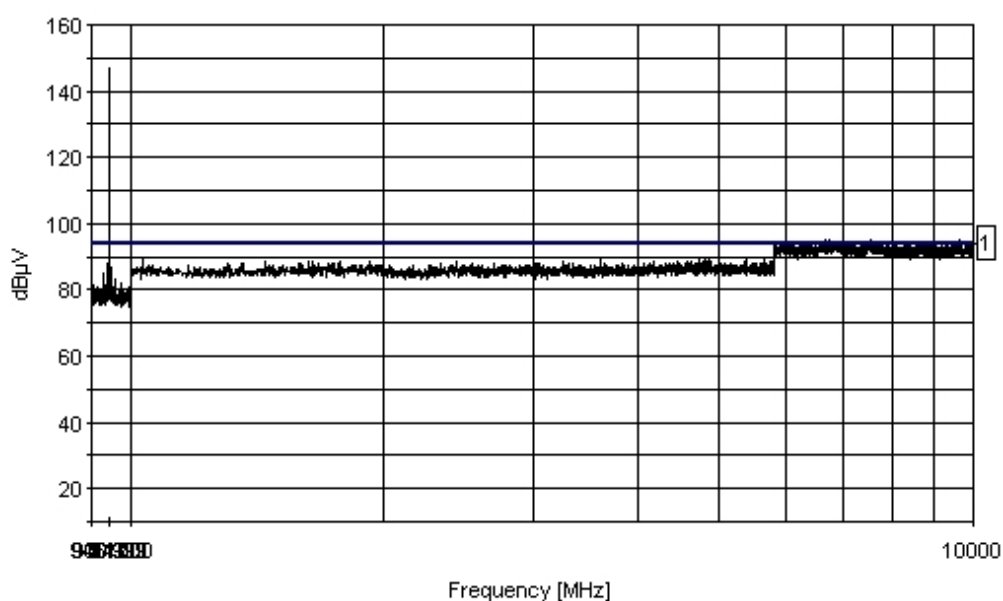
T1=30 dB Attenuator

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 dB				Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	944.900M	117.2	+30.0				+0.0	147.2	94.0	+53.2	Fundam ental Freq
2	4723.720M	59.7	+30.0				+0.0	89.7	94.0	-4.3	None
3	1036.036M	59.0	+30.0				+0.0	89.0	94.0	-5.0	None
4	1998.998M	58.9	+30.0				+0.0	88.9	94.0	-5.1	None
5	3616.614M	58.9	+30.0				+0.0	88.9	94.0	-5.1	None

6	4445.442M	58.7	+30.0	+0.0	88.7	94.0	-5.3	None
7	1770.770M	58.5	+30.0	+0.0	88.5	94.0	-5.5	None
8	4173.170M	58.5	+30.0	+0.0	88.5	94.0	-5.5	None
9	2439.438M	58.4	+30.0	+0.0	88.4	94.0	-5.6	None
10	1442.442M	58.3	+30.0	+0.0	88.3	94.0	-5.7	None

EMCE Engineering Date: 4/27/2005 Time: 2:55:36 PM TFT, Inc. WO#: 2413
TFT 5290 Spurious Conducted Test Lead: Black 120V 60Hz Sequence#: 12



— Sweep Data — 1 - TFT 5290 Spurious Conducted

Operating Mode: FM with 152 kHz MUX

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**
 Specification: **TFT 5290 Spurious Conducted**
 Work Order #: **2413**
 Test Type: **Antenna Conducted Emissions**
 Equipment: **Analog STL Transmitter**
 Manufacturer: **TFT, Inc.**
 Model: **5290**
 S/N: **N/A**

Date: 4/27/2005
 Time: 2:57:13 PM
 Sequence#: 13
 Tested By: Bob Cole
 120V 60Hz

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B S/A	3014A06947	12/04	12/05	328

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
Attenuator	MCE/Weinshel	40-30-33	N/A

Test Conditions / Notes:

FM - Harmonics 152 kHz MUX - Harmonics

Spectrum analyzer Settings:

Freq Range (MHz)	RBW	VBW	Sweep Time	QP Setting
30-1000	100 kHz	1 MHz	Auto	Bypass
1000-10000	1 MHz	1 MHz	Auto	Bypass

Transducer Legend:

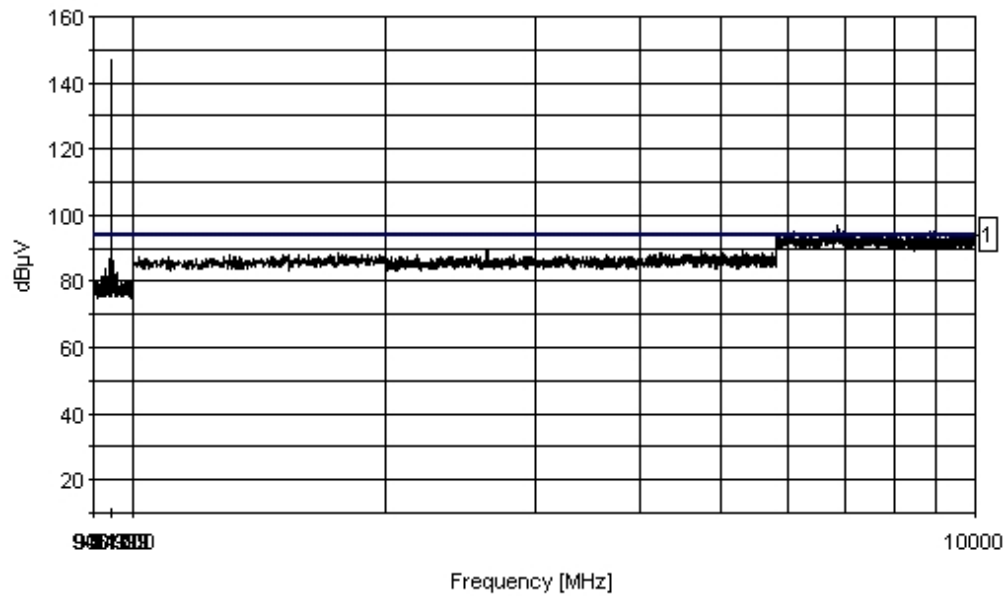
T1=30 dB Attenuator

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 dB				Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	944.900M	117.1	+30.0				+0.0	147.1	94.0	+53.1	Fundamental Xmit Freq
2	5286.282M	59.7	+30.0				+0.0	89.7	94.0	-4.3	None
3	4723.720M	59.3	+30.0				+0.0	89.3	94.0	-4.7	None
4	2635.634M	58.9	+30.0				+0.0	88.9	94.0	-5.1	None
5	4221.218M	58.6	+30.0				+0.0	88.6	94.0	-5.4	None
6	1758.758M	58.3	+30.0				+0.0	88.3	94.0	-5.7	None

7	1512.512M	58.2	+30.0	+0.0	88.2	94.0	-5.8	None
8	1578.578M	58.1	+30.0	+0.0	88.1	94.0	-5.9	None
9	3276.274M	58.1	+30.0	+0.0	88.1	94.0	-5.9	None
10	1870.870M	58.0	+30.0	+0.0	88.0	94.0	-6.0	None

EMCE Engineering Date: 4/27/2005 Time: 2:57:13 PM TFT, Inc. WO#: 2413
TFT 5290 Spurious Conducted Test Lead: Black 120V 60Hz Sequence#: 13



Radiated Spurious Emissions (CFR 74,535)

Operating Mode: Mono (Worst Case)

Note: Substitution Method

The following Radiated Spurious Emissions readings were determined by first identifying the frequencies using the test methods from ANSI 63.4. The signal amplitudes were then verified using the “substitution method” detailed in TIA 603-2004, section 2.2.12.2, and the results included here.

Test Procedure:

1. Radiated Spurious emissions were measured and maximized in both horizontal and vertical polarizations from 1 – 10 GHz to cover the tenth harmonic of the fundamental transmit frequency of 950 MHz.
2. EUT was replaced on the test bench with a signal generator connected to a Horn Antenna.
3. The worst case frequencies and amplitudes were then duplicated and maximized.
4. The signal generator output was then measured.
5. Power radiated from the substitute antenna was calculated as follows:

$$P_a(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss}(\text{dB}) + \text{antenna gain}(\text{dB})$$

Where: P_a = Substitute antenna equivalent power

P_g = Power from Signal Generator

$$\text{Radiated Spurious Emission (dB)} = 10 \log_{10} \left(\frac{20W}{.0001} \right) - P_a$$

$$= 53 - P_a$$

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **TFT, Inc.**
 Specification: **FCC Class A 1 GHz-18 GHz**
 Work Order #: **2413**
 Test Type: **Radiated Scan**
 Equipment: **Analog STL Transmitter**
 Manufacturer: **TFT, Inc.**
 Model: **5290**
 S/N: **N/A**

Date: 4/5/2005
 Time: 3:46:06 PM
 Sequence#: 11
 Tested By: Bob Cole

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B EMI		3/05	3/06	396
Measurement System				
AH Systems DR Horn 1291		08/02/2004	08/02/2006	389
Antenna (Xmit)				
Signal Generator	Hewlett Packard	8350A		32095A119

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Analog STL Transmitter*	TFT, Inc.	5290	N/A

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Mono

Measurement Data: Readings listed by margin. Test Distance: 3 Meter

#	Freq	Rdng	P _g	Cable Loss	Antenna Gain	P _a	EIRP	Limit	Polar
	MHz	dBm	dBm	dB	dB	dBm	dB	(dBm)	Ant
1	2851.617M	-37.1	-78.4	4.3	-30.4	-113.4	-60.4	-13	Vert
2	1901.248M	-45.3	-75.2	3.4	-28.1	-104.7	-51.7	-13	Vert

Frequency Stability (CFR 2.1055)**FCC ID: BIO5290****Frequency Stability (CFR 2.1055)****Frequency vs Temperature**

Temperature (Celcius)	Voltage	Frequency (MHz)	PASS/FAIL
50	115	950.014	PASS
40	115	950.014	PASS
30	115	950.003	PASS
20	115	950.022	PASS
10	115	950.018	PASS
0	115	950.014	PASS
-10	115	950.003	PASS
-20	115	N/A	Non-Op
-30	115	N/A	Non-Op

Frequency vs Voltage

Temperature (Celcius)	Voltage	Frequency (MHz)	PASS/FAIL
20	97	950.005	PASS
20	115	950.022	PASS
20	128	950.016	PASS

Note:

Appendix B

EMCE Laboratory Accreditations



ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation



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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200092-0

UNIVERSAL COMPLIANCE LABS DBA EMCE ENGINEERING

44366 South Grimmer Boulevard

Fremont, CA 94538-6385

Mr. Bob Cole

Phone: 510-490-4307 Fax: 510-490-3441

E-Mail: bob@universalcompliance.com

URL: <http://www.universalcompliance.com>

NVLAP Code Designation / Description

Emissions Test Methods:

12/CIS22	IEC/CISPR 22 (1997) & EN 55022 (1998) + A1(2000): Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22 (1993) and EN 55022 (1994): Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1 (1995) and Amendment 2 (1996)
12/CIS22b	CNS 13438 (1997): Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/FCC15b1	ANSI C63.4 (2003) with FCC Method 47 CFR Part 15, Subpart B: Unintentional Radiators
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

December 31, 2005

Effective through

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For the National Institute of Standards and Technology



ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation



Page: 2 of 2

**ELECTROMAGNETIC COMPATIBILITY
AND TELECOMMUNICATIONS**

NVLAP LAB CODE 200092-0

UNIVERSAL COMPLIANCE LABS DBA EMCE ENGINEERING

NVLAP Code Designation / Description

Immunity Test Methods:

12/I01	IEC 61000-4-2, Ed. 2.1 (2001), A1, A2; EN 61000-4-2: Electrostatic Discharge Immunity Test
12/I03	IEC 61000-4-4(1995), A1(2000), A2(2001); EN 61000-4-4: Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/I04	IEC 61000-4-5, Ed. 1.1 (2001-04); EN 61000-4-5: Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
12/I05	IEC 61000-4-6, Ed. 2.0 (2003-05); EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I06	IEC 61000-4-8, Ed. 1.1 (2001); EN 61000-4-8: Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
12/I07	IEC 61000-4-11, Ed. 1.1 (2001-03); EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

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United States Department of Commerce
National Institute of Standards and Technology



ISO/IEC 17025:1999
ISO 9002:1994



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FREMONT, CA

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for satisfactory compliance with criteria set forth in NIST Handbook 150:2001,
all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994.
Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:*

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

December 31, 2005

Effective through

For the National Institute of Standards and Technology
NVLAP Lab Code: 200092-0