

EMC - TEST REPORT

UNITED STATES STANDARD FCC PART 15, Paragraph 15.231

Test Report File No. : **SC401730-06A** Date of Issue: 06 May 2004

Model / Serial No. : 547T / --

Product Type : 2 Way LED

Applicant : DIRECTED ELECTRONICS INCORPORATED

Manufacturer : DIRECTED ELECTRONICS INCORPORATED

License holder : DIRECTED ELECTRONICS INCORPORATED

Address : 1 Viper Way
: Vista, CA 92081

Test Result : **Positive*** **Negative**

Test Project Number Reference(s) : SC401730-06A

Total pages - Test Report : 22

(*) See General Remarks.

NOTE: All test equipment used during testing is calibrated and traceable to NIST.

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Environmental Conditions In The Laboratory:

| | <u>Actual</u> |
|----------------------|---------------|
| Temperature | : 23 °C |
| Relative Humidity | : 50 % |
| Atmospheric Pressure | : 100.0 kPa |

Power Supply Utilized:

Power supply system : 5 V External

Symbol Definitions:

- - Applicable
- - Not Applicable

**Test Conditions: Part 15.231(a) Deactivation
 Part 15.231(b) Radiated Spurious Emissions
 Part 15.231(c) Emissions Bandwidth**

The measurements were performed in the following location at the San Diego Testing Facility:

- Test not applicable

- - SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber
- - Roof (Small Open Area Test Site), 3 meters
 (Date of listing April 20, 2004. Site Verification Valid for 3 years from listing.)

Test Equipment Used:

| | Model No. | Prop. No. | Description | Manufacturer | Serial No. | Date Cal'ed |
|---------------------|--------------------------|-----------|----------------------|-------------------|------------|-------------|
| Equipment List SR-3 | | | | | | |
| 1 | 8566B | 823 | Spectrum Analyzer | Hewlett Packard | 2332A02751 | 09/03 |
| 2 | CBL6111 | 460 | Bilog Antenna | Chase Electronics | 1013 | NCR* |
| Equipment List Roof | | | | | | |
| 3 | 3115 | 453 | Double Ridge Antenna | EMCO | 9412-4364 | 02/04 |
| 4 | 8566B | 744 | Spectrum Analyzer | Hewlett Packard | 2618A02913 | 01/04 |
| 5 | AMF-5D- 010180-35-10P | 719 | Preamplifier | Miteq | 549460 | NCR* |
| 6 | FF6549-1 | 778 | High Pass Filter | Sage | 005 | NCR* |

Remarks: One year calibration cycle for all test equipment and sites. (*) No Calibration Required.
 No emissions detected between 30 MHz to 1 GHz. See Appendix D for prescans.

Equipment Under Test (EUT) Test Operation Mode:

The equipment under test was operated under the following conditions during testing:

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Practice Operation
- Normal Operating Mode
- Transmit

Configuration of the equipment under test:

- See Constructional Data Form in Appendix B
- See Product Information Form(s) in Appendix B

The following peripheral devices and interface cables were connected during the testing:

- | | |
|----------------------------------|-------------|
| <input type="checkbox"/> - _____ | Type: _____ |
| <input type="checkbox"/> - _____ | Type: _____ |
| <input type="checkbox"/> - _____ | Type: _____ |
| <input type="checkbox"/> - _____ | Type: _____ |
| <input type="checkbox"/> - _____ | Type: _____ |
| <input type="checkbox"/> - _____ | Type: _____ |

- Unshielded power cable
- Unshielded cables
- Shielded cables

MPS. No.: _____

- Customer specific cables
- _____
- _____

GENERAL REMARKS:

NOTE: All photographs are representative of setup for maximum emissions.

(*) No emissions detected between 30 MHz to 1 GHz. See Appendix D for prescans.

SUMMARY:

All tests according to the regulations cited on page 3 were

■ - **Performed**

□ - Performed with the following **exceptions**

The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.*

□ - **Does not** fulfill the general approval requirements cited on page 3.

Statement of Measurement Uncertainty

The data and results referenced in this document are true and accurate. The measurement uncertainty is calculated to be ± 2 dB for conducted emissions and ± 4 dB for radiated emissions.

Equipment Received Date: 22 April 2004
Testing Start Date: 22 April 2004
Testing End Date: 22 April 2004

- TÜV AMERICA, INC. -

Reviewing Engineer:



Jim Owen
(EMC Chief Engineer)

Test Engineer:



Alan Laudani
(EMC Engineer)

Technical Documentation

**Test Data Sheets
and
Test Setup Drawing(s)**

In Vehicle Transceiver 547T

SC401730

Directed Electronics

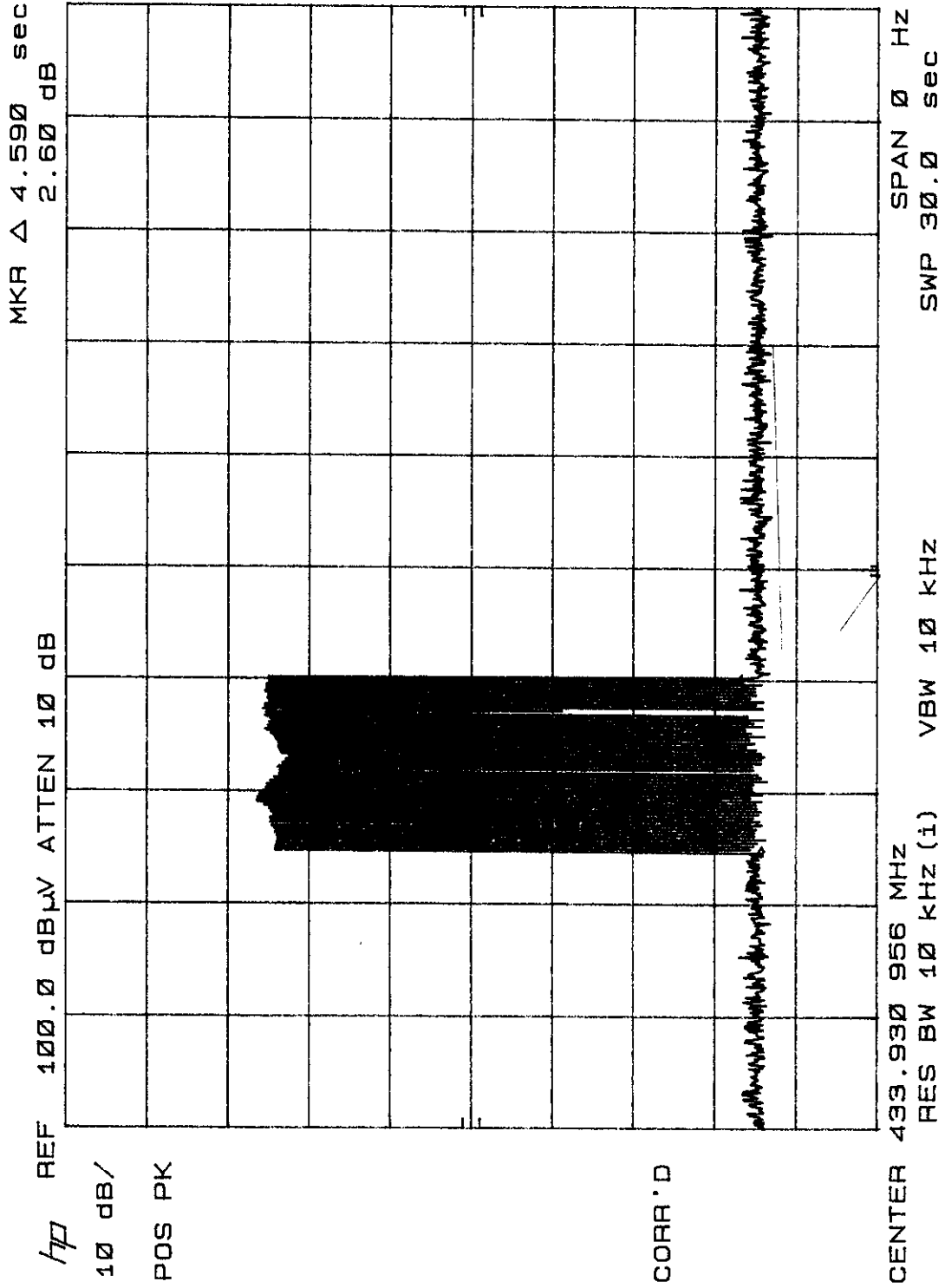
CFR 47 Part 15.231(a) (2) Deactivation

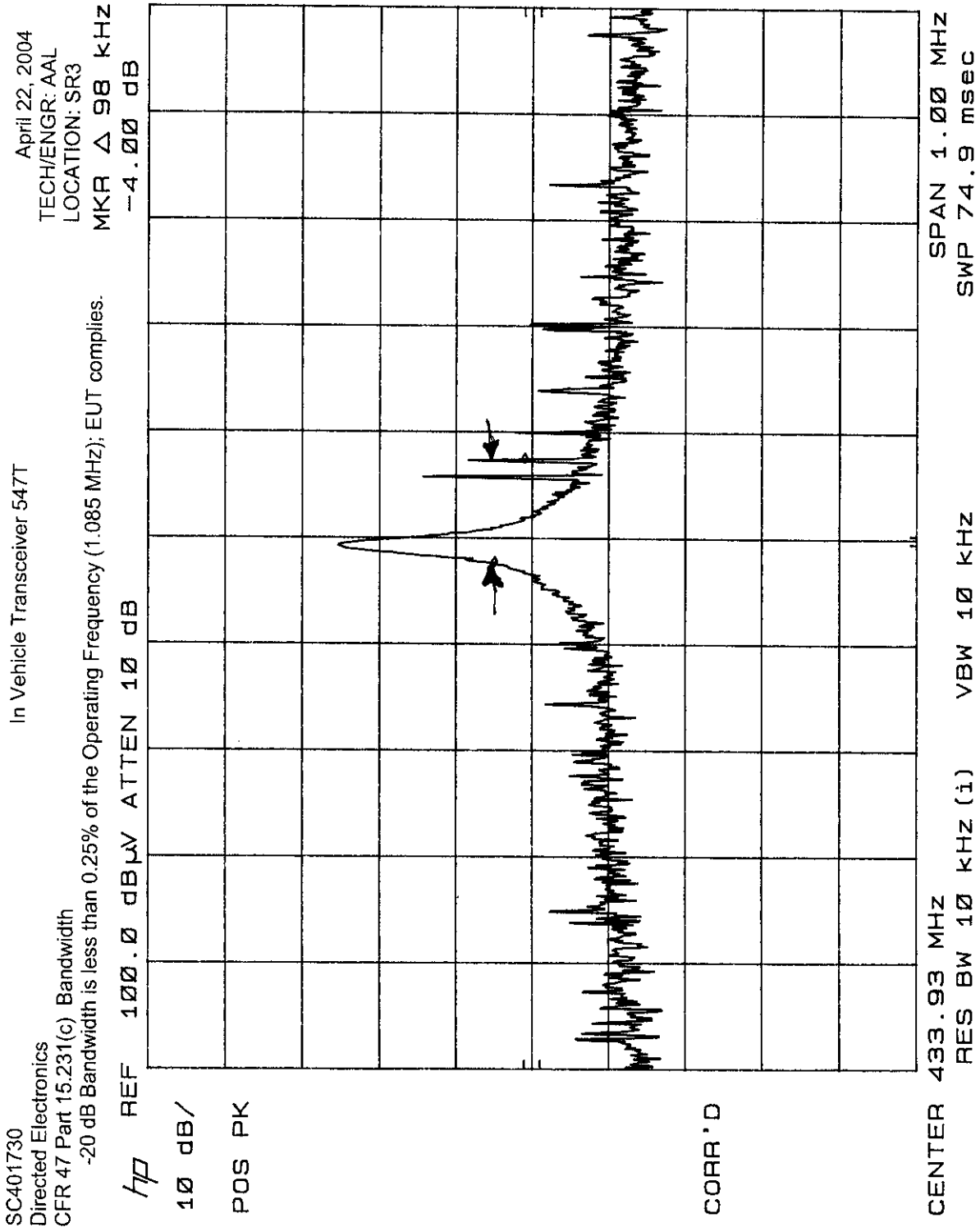
Deactivation occurs as one releases the transmit button of the Hand Held Unit, IVT answers back.

April 22, 2004

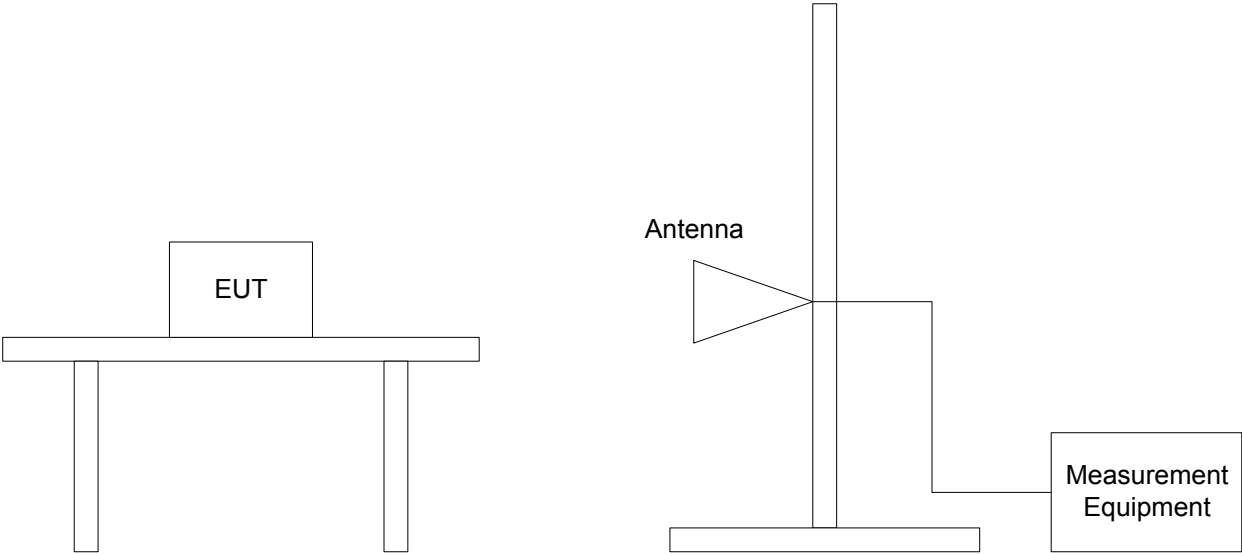
TECH/ENGR: AAL

LOCATION: SR3





**Test Setup for Part 15.231(a) Deactivation, Part 15.231(b) Radiated Spurious Emissions,
and Part 15.231 (c) Emissions Bandwidth**



Appendix A

Test Setups (Photographs)

See Test Setup Exhibit.

NOTE: All photographs are representative of setup for maximum emissions.

Appendix B

Product Information Form(s)

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description: In vehicle transceiver for car alarm and convenience systems.
 EUT Name: 2 Way LED
 Model No.: 547T Serial No.: --
 Product Options: --
 Configurations to be tested: 1

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 5 V (If battery powered, make sure battery life is sufficient to complete testing.)
 # of Phases: --
 Current (Amps/phase(max)): 0.15 mA Current (Amps/phase(nominal)): --
 Other: --

Other Special Requirements

--

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

Automotive

EUT Power Cable

Permanent OR Removable Length (in meters): 3 m
 Shielded OR Unshielded
 Not Applicable

| EUT Interface Ports and Cables | | | | | | | | | | | | |
|--------------------------------|-------------------------------------|-------------------------------------|-----|-------------------------------------|--------------------------|-----------------|-------------|------------------------|--------------------------|--------------------|-------------------------------------|--------------------------|
| Interface | | | | Shielding | | | | | | | | |
| Type | Analog | Digital | Qty | Yes | No | Type | Termination | Connector Type | Port Termination | Length (in meters) | Removable | Permanent |
| EXAMPLE: RS232 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Foil over braid | Coaxial | Metallized 9-pin D-Sub | Characteristic Impedance | 6 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4 Pin Harness | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 0 | <input type="checkbox"/> | <input type="checkbox"/> | -- | -- | 4 Pin | -- | 3 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

EUT Software.

Revision Level: --
 Description: --

EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Continuous modulated transmission
2. Receiver LO re-radiation

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

| Description | Model # | Serial # | FCC # |
|--|---------|----------|-----------|
| Alarm main module and associated harness | 547T | -- | EZSDEI547 |

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

| Description | Model # | Serial # | FCC # |
|-------------|---------|----------|-------|
| -- | | | |

Oscillator Frequencies

| Frequency | Derived Frequency | Component # / Location | Description of Use |
|-------------|-------------------|------------------------|----------------------------------|
| 13.56 MHz | 433.92 MHz | -- | Transmitter RF carrier frequency |
| 13.2256 MHz | 423.22 MHz | -- | Receiver LO frequency |

Power Supply

| Manufacturer | Model # | Serial # | Type | |
|--------------|---------|----------|--|--------------------------------|
| -- | | | <input type="checkbox"/> Switched-mode | (Frequency) |
| | | | <input type="checkbox"/> Linear | <input type="checkbox"/> Other |

Power Line Filters

| Manufacturer | Model # | Location in EUT |
|--------------|---------|-----------------|
| -- | | |

Critical EMI Components (Capacitors, ferrites, etc.)

| Description | Manufacturer | Part # or Value | Qty | Component # / Location |
|-------------|--------------|-----------------|-----|------------------------|
| -- | | | | |

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

--

Appendix C

Change History

Not Applicable

Appendix D

Supplemental Information

