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## **FCC PART 95C TEST REPORT**

|                      |                                                                                       |
|----------------------|---------------------------------------------------------------------------------------|
| APPLICANT            | TAIYO CO., LTD.                                                                       |
|                      | FUKOKUSEIMEI BLDG. 6F, NO. 1-2-11<br>KAMINARIMON, TAITO-KU<br>TOKYO 111-0034<br>JAPAN |
| FCC ID               | AEKA54095                                                                             |
| MODEL NUMBERS        | A540 (3 CHANNEL)<br>A541 (2 CHANNEL)                                                  |
| PRODUCT DESCRIPTION  | REMOTE CONTROL TRANSMITTER                                                            |
| DATE SAMPLE RECEIVED | 9/10/2007                                                                             |
| DATE TESTED          | 9/14/2007                                                                             |
| TESTED BY            | NAM NGUYEN                                                                            |
| APPROVED BY          | NAM NGUYEN                                                                            |
| TIMCO REPORT NO.     | 3024JT7TestReport.doc                                                                 |
| TEST RESULTS         | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL                |

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



Certificate # 0955-01

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## GENERAL REMARKS

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

## Summary

The device under test does:

- ☒ fulfill the general approval requirements as identified in this test report  
☐ not fulfill the general approval requirements as identified in this test report

## Attestations

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

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



Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, Fl 32669

**Authorized Signatory Name:** *Mario de Aranzeta*

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date:** 9/14/2007

## GENERAL INFORMATION

### DUT Specification

|                                                   |                                                                                |
|---------------------------------------------------|--------------------------------------------------------------------------------|
| The test results relate only to the items tested. |                                                                                |
| <b>DUT Description</b>                            | REMOTE CONTROL TRANSMITTER                                                     |
| <b>FCC ID</b>                                     | AEKA54095                                                                      |
| <b>Model Numbers</b>                              | A540 (3 CHANNEL)<br>A541 (2 CHANNEL)                                           |
| <b>Operating Frequency</b>                        | 26.995 MHz, 27.045 MHz, 27.095 MHz,<br>27.145 MHz, 27.195 MHz, 27.255 MHz      |
| <b>Type of Emission</b>                           | 8K0F1D                                                                         |
| <b>Modulation</b>                                 | FM                                                                             |
| <b>DUT Power Source</b>                           | <input type="checkbox"/> 110-120Vac/50- 60Hz                                   |
|                                                   | <input type="checkbox"/> DC Power                                              |
|                                                   | <input checked="" type="checkbox"/> Battery Operated                           |
| <b>Test Item</b>                                  | <input type="checkbox"/> Prototype                                             |
|                                                   | <input checked="" type="checkbox"/> Pre-Production                             |
|                                                   | <input type="checkbox"/> Production                                            |
| <b>Type of Equipment</b>                          | <input type="checkbox"/> Fixed                                                 |
|                                                   | <input type="checkbox"/> Mobile                                                |
|                                                   | <input checked="" type="checkbox"/> Portable                                   |
| <b>Antenna</b>                                    | Fixed                                                                          |
| <b>Test Facility</b>                              | Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA. |
| <b>Modifications</b>                              | None                                                                           |
| <b>Test Exercise</b>                              | The DUT was placed in continuous transmit mode of operation                    |
| <b>Applicable Standards</b>                       | TIA 603 , FCC CFR 47 Part 2 and Part 95                                        |

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## TEST PROCEDURES

**Bandwidth:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

**Power Output:** RF power was conducted per TIA/EIA STANDARD 603 using the substitution method

**Radiation Interference:** The test procedure used was TIA 603 using a spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum TIA 603 receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the DUT was 76°F with a humidity of 55%.

## RF POWER OUTPUT

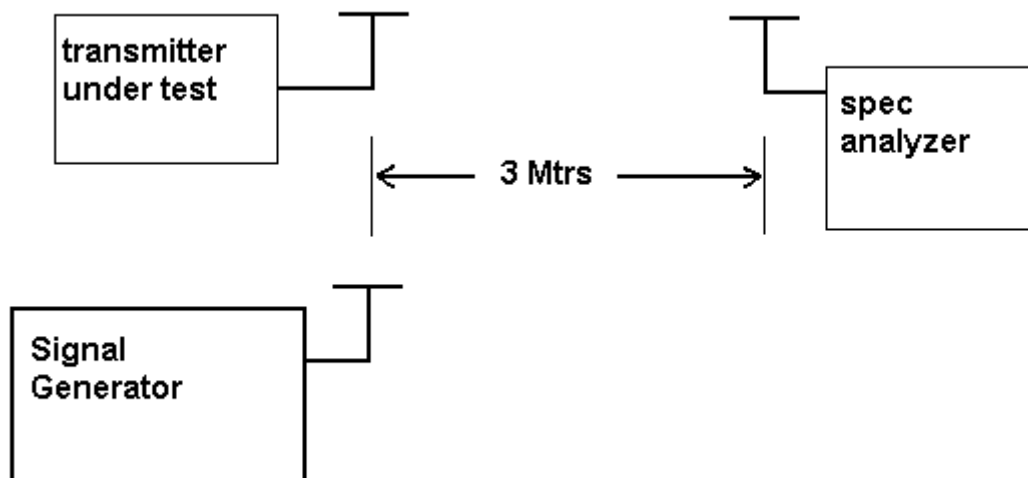
**Rule Part No.:** 2.1033(c)(6)(7), 2.1046(a), Part 95

**Requirements:** Power output shall not exceed:

|                   |            |
|-------------------|------------|
| 27.255 MHz        | 25 Watts   |
| 26.995-27.195 MHz | 4 Watts    |
| 72-76 MHz         | 0.75 Watts |

**Method of Measurement:** RF power is measured as ERP as the antenna is permanently attached. The substitution method was used. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

**Test Setup Diagram:**



**Test Data:**

OUTPUT POWER: 0.3 Watts

**Rule Part No.:** 2.1033 (C)(8) DC Input into the final amplifier

INPUT POWER:  $(12.0\text{VDC})(.08\text{A}) = 0.96 \text{ Watts}$

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## **MODULATION CHARACTERISTICS**

**Rule Part No.:** Part 2.1047(a)(b)

**AUDIO FREQUENCY RESPONSE** Voice is NOT allowed in this band.

## EMISSION DESIGNATOR AND FREQUENCIES

Type of Emission: 8K0F1D  
95.631 (b)(5)

$$B_n = 2M + 2DK$$

$$M = 4,800 \text{ Bits per second}$$

$$D = 1600 \text{ Hz (Peak Deviation)}$$

$$K = 1$$

$$B_n = 2(4.8/2) + 2(1600)(1) = 4.8K + 3.2K = 8.0k$$

ALLOWED AUTHORIZED BANDWIDTH = 8.00 kHz.



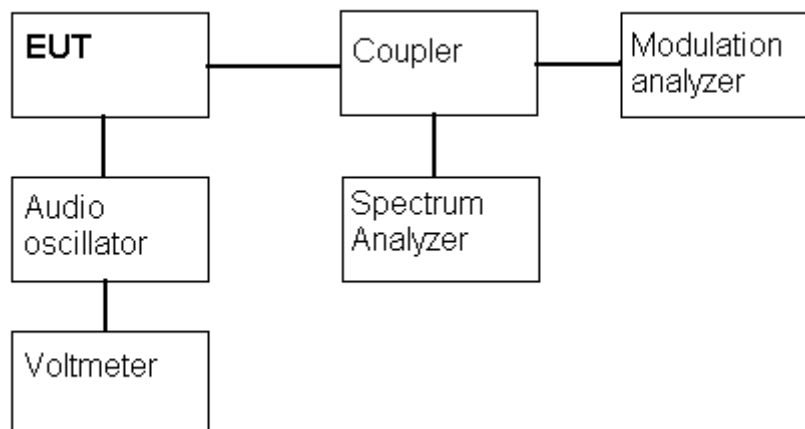
## OCCUPIED BANDWIDTH

**Part 2.1049(c)** EMISSION BANDWIDTH:  
95.635 (b)

- (1) At least 25dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.
- (2) At least 45 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 125% of the authorized bandwidth.
- (3) At least 55 dB on any frequency removed from the center of the authorized bandwidth by more than 125% up to and including 250% of the authorized bandwidth.
- (4) At least  $56 + 10 \log_{10} (T)$  dB on any frequency removed from the center of the authorized bandwidth by more than 250%

**Test procedure:** TIA/EIA-603 para 2.2.11.

Test procedure diagram

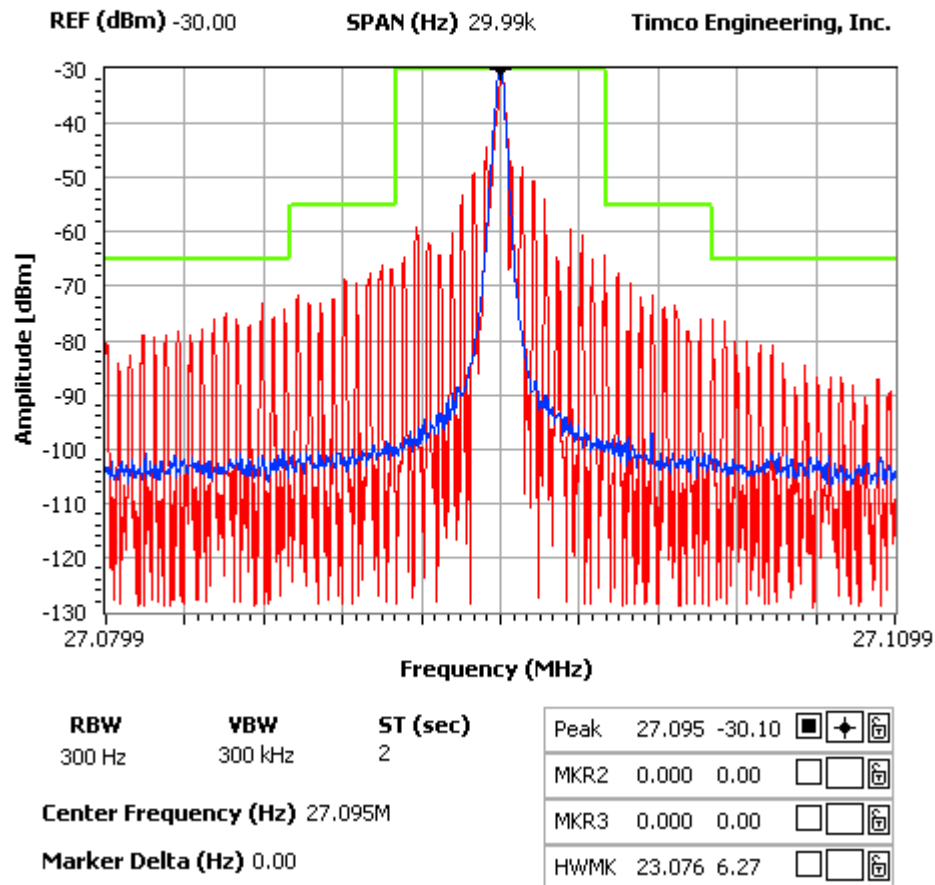


## OCCUPIED BANDWIDTH PLOT

### NOTES:

TAIYO KOGYO CO., LTD. - FCC ID: AEKA54095  
OCCUPIED BANDWIDTH PLOT

### FCC 95.635 Mask (1) (3) (7)



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## **SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)**

NOT APPLICABLE. This DUT has a permanently attached antenna.

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## FIELD STRENGTH OF SPURIOUS EMISSIONS - TX

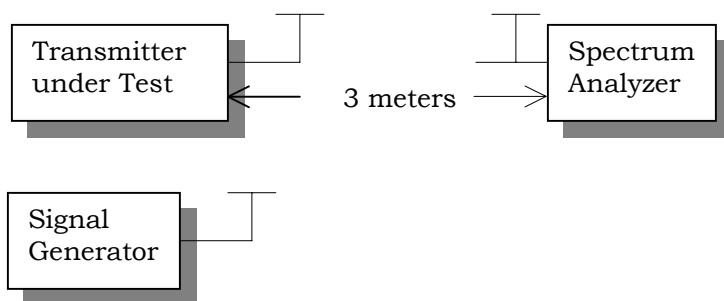
**Rule Parts. No.:** Part 2.1053  
95.635

**Requirements:** At least  $56 + 10\log(T)$  on any frequency removed from the center of the authorized bandwidth by more than 250%.

$$56 + 10\log(0.3) = 51 \text{ dB}$$

**METHOD OF MEASUREMENT:** The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

### Test Setup Diagram:



### Test Data:

| Emission Frequency MHz | Ant. Polarity | dB Below Carrier (dBc) |
|------------------------|---------------|------------------------|
| 27.10                  |               | 0                      |
| 54.19                  | V             | 75.62                  |
| 81.29                  | V             | 61.44                  |
| 108.38                 | V             | 67.44                  |
| 135.48                 | V             | 76.84                  |
| 162.57                 | V             | 64.24                  |
| 189.67                 | V             | 71.53                  |
| 216.76                 | V             | 69.48                  |
| 243.86                 | V             | 75.61                  |
| 270.95                 | V             | 65.64                  |

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## FREQUENCY STABILITY

**Rule Parts. No.:** Part 2.1055, Part 95.623(b),

**Requirements:** ) Temperature and voltage tests were performed to verify that the frequency remains within the .002%, 20-ppm specification limit. The test was conducted as follows:

The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one Hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst-case Number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

**Method of Measurements:** TIA/EIA 603.

**Test Data:**

| Assigned Frequency (Ref. Frequency) (MHz) |                 | 27.145000                 |
|-------------------------------------------|-----------------|---------------------------|
| Temperature (°C)                          | Frequency (MHz) | Frequency Stability (PPM) |
| REFERENCE                                 |                 |                           |
| -30                                       | 27.145155       | -0.52                     |
| -20                                       | 27.145280       | 4.09                      |
| -10                                       | 27.145348       | 6.59                      |
| 0                                         | 27.145363       | 7.15                      |
| +10                                       | 27.145329       | 5.89                      |
| +20                                       | 27.145259       | 3.32                      |
| +30                                       | 27.145172       | 0.11                      |
| +40                                       | 27.145106       | -2.32                     |
| +50                                       | 27.145075       | -3.46                     |

| Assigned Frequency (Ref. Frequency) (MHz) |                 |                           |
|-------------------------------------------|-----------------|---------------------------|
| % Battery                                 | Frequency (MHz) | Frequency Stability (PPM) |
| -15%                                      | 27.145177       | 0.29                      |
| 0                                         |                 |                           |
| +15%                                      | 27.145317       | 5.45                      |

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## TEST EQUIPMENT LIST

| Device                                | Manufacturer                | Model         | Serial Number            | Cal/Char Date  | Due Date |
|---------------------------------------|-----------------------------|---------------|--------------------------|----------------|----------|
| 3-Meter OATS                          | TEI                         | N/A           | N/A                      | Listed 1/11/06 | 1/10/09  |
| 3/10-Meter OATS                       | TEI                         | N/A           | N/A                      | Listed 3/20/07 | 3/19/10  |
| 3-Meter Semi-Anechoic Chamber         | Panashield                  | N/A           | N/A                      | Listed 5/11/07 | 5/10/10  |
| Analyzer Tan Tower Spectrum Analyzer  | HP                          | 8566B Opt 462 | 3138A07786<br>3144A20661 | CAL 12/7/05    | 12/7/07  |
| Analyzer Tan Tower RF Preselector     | HP                          | 85685A        | 3221A01400               | CAL 12/7/05    | 12/7/07  |
| Analyzer Tan Tower Quasi-Peak Adapter | HP                          | 85650A        | 3303A01690               | CAL 12/8/05    | 12/8/07  |
| Analyzer Tan Tower Preamplifier       | HP                          | 8449B-H02     | 3008A00372               | CAL 12/8/05    | 12/8/07  |
| Antenna: Biconnical                   | Electro-Metrics             | BIA-25        | 1171                     | CAL 7/18/07    | 7/18/09  |
| Antenna: Log-Periodic                 | Electro-Metrics             | LPA-25        | 1122                     | CAL 12/1/06    | 12/1/08  |
| Antenna: Double-Ridged Horn           | Electro-Metrics             | RGA-180       | 2319                     | CAL 7/18/07    | 7/18/09  |
| LISN                                  | Electro-Metrics             | ANS-25/2      | 2604                     | CAL 10/5/06    | 10/5/08  |
| Termaline Wattmeter                   | Bird Electronic Corporation | 611           | 16405                    | CAL 3/15/07    | 3/15/09  |

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