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FCC PART 95C TEST REPORT

APPLICANT	TAIYO CO., LTD.
	FUKOKUSEIMEI BLDG. 6F, NO. 1-2-11 KAMINARIMON, TAITO-KU TOKYO 111-0034 JAPAN
FCC ID	AEKA54095
MODEL NUMBERS	A540 (3 CHANNEL) 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	☒ PASS ☐ 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.	
DUT Description	REMOTE CONTROL TRANSMITTER
FCC ID	AEKA54095
Model Numbers	A540 (3 CHANNEL) A541 (2 CHANNEL)
Operating Frequency	26.995 MHz, 27.045 MHz, 27.095 MHz, 27.145 MHz, 27.195 MHz, 27.255 MHz
Type of Emission	8K0A1D
Modulation	FM
DUT Power Source	☐ 110-120Vac/50- 60Hz
	☐ DC Power
	☒ Battery Operated
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☐ Mobile
	☒ Portable
Antenna	Fixed
Test Facility	Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA.
Modifications	None
Test Exercise	The DUT was placed in continuous transmit mode of operation
Applicable Standards	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

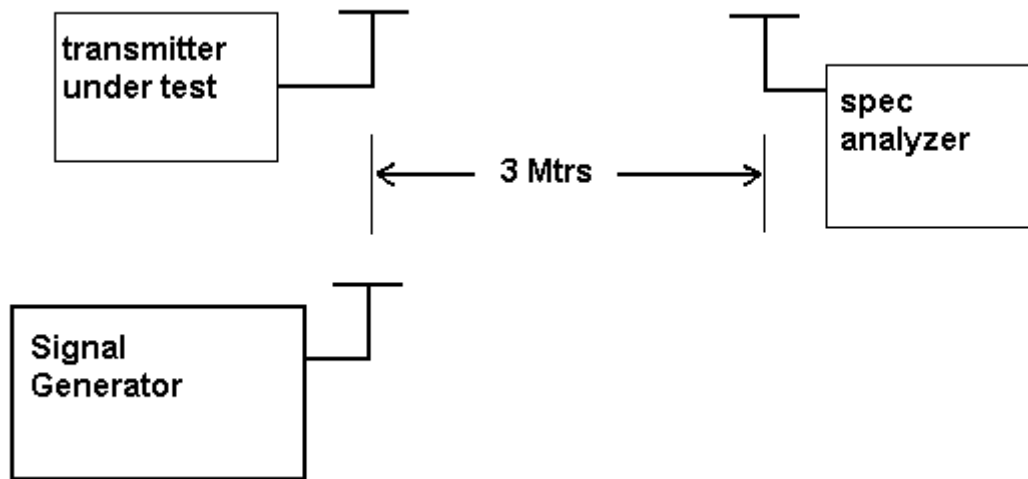
Rule Part No.: 2.1033(c)(6)(7), 2.1046(a), Part 95

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: 8K0A1D
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.

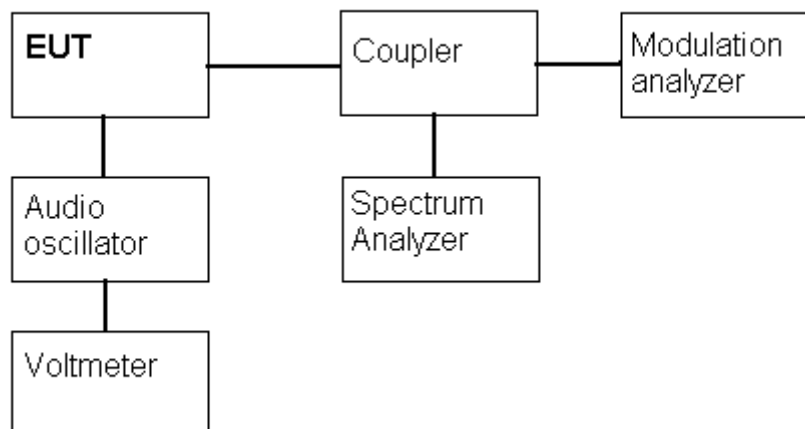
OCCUPIED BANDWIDTH

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

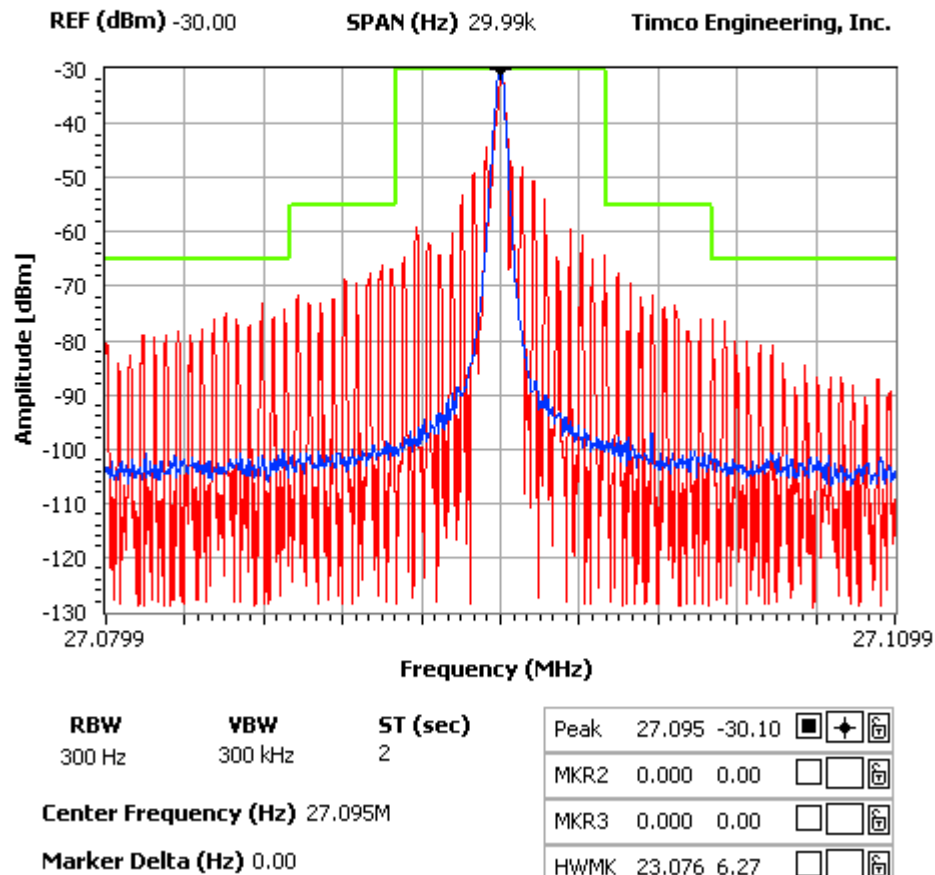


OCCUPIED BANDWIDTH PLOT

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.

FIELD STRENGTH OF SPURIOUS EMISSIONS - TX

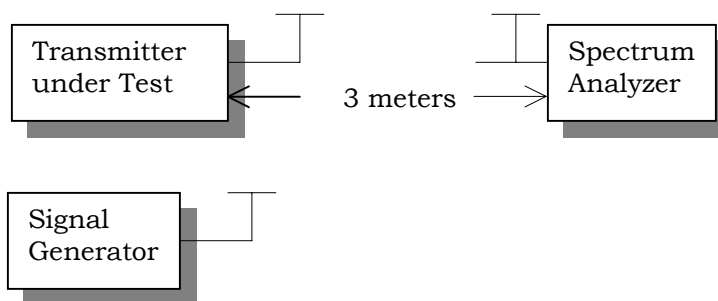
Rule Parts. No.: Part 2.1053
95.635

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 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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