ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

TOY PLAYSET WITH AN RFID LOCATING & RECOGNITION DEVICE

MODEL NO: 55790

BRAND NAME: HE-MAN CASTLE GRAYSKULL

FCC ID NO: APB55790-02A1X

REPORT NO: 02U1323-1

ISSUE DATE: JUNE 4, 2002

Prepared for
MATTEL, INC
333 CONTINENTAL BLVD.
EL SEGUNDO, CA 90245
USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

TABLE OF CONTENTS

1. VERIFICATION OF COMPLIANCE

COMPANY NAME	:	MATTEL, INC. 333 CONTINENTAL BLVD. EL SEGUNDO, CA 90245 USA
CONTACT PERSON	:	JIM ZIELINSKI
TELEPHONE NO.	:	310-252-3955
EUT DESCRIPTION	:	TOY PLAYSET WITH AN RFID LOCATING & RECOGNITION DEVICE
MODEL NAME/NUMBER	:	55790
BRAND NAME	:	HE-MAN CASTLE GRAYSKULL
SERIAL NUMBER	:	N/A
FCC ID	:	APB55790-02A1X
DATE TESTED	:	5/30/2002, 5/31/2002
REPORT NUMBER	:	02U1323-1

EQUIPMENT TYPE	13.56 MHz TRANSCEIVER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15.225

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in CFR 47, PART 15. This said equipment in the configuration described in this report shows that maximum emission levels emanating from equipment are within the compliance requirements. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

Tested By:

FRANK IBRAHIM
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Approved & Released For CCS By:

THU CHAN
SENIOR EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

CHASSIS TYPE	**PLASTIC**
Fundamental Frequency	**13.56 MHz**
Power Source	**FOUR 1.5 VDC BATTERIES**
Tyep of Transmission	**DATA CONTINUOUS**
Type of Modulation	**AMPLITUDE**
Channel Bandwidth & Number of Channels	**1**
Antenna Requirement	**EMBEDDED**
Power Requirement	**4 "AA" BATTERIES**
Describe Intended Use	**TOY**
Local Osc.	**13.56 MHz**

3. TEST FACILITY

The 3/10/30 meter open area test site and conducted measurement facility used to collect the radiated data is located at 561F Monterey Road, Morgan Hill, California, U.S.A. A detailed description of the test facility was submitted to the Commission on May 27,1994.

4. MEASUREMENT STANDARDS

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

5. MEASUREMENT EQUIPMENT USED

TEST EQUIPMENTS LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Spectrum Analyzer	HP100Hz - 1.5GHz	8568B	2841A04227	4/15/03
Quasi-Peak Detector	HP9K - 1GHz	85650A	2521A01038	4/15/03
Spectrum Analyzer	HP100Hz - 1.5GHz	8568A	101236	4/15/03
Pre-Amplifier,25 dB	HP0.1 - 1300MHz	8447D (P5)	2944A06550	8/10/02
Active Loop Antenna, (10K - 30MHz)	EMCO	6502	9202-2722	4/20/03
Antenna, Bicon	Eaton30 - 200MHz	94455-1	1214	8/2/02
Antenna, LP	EMCO200 - 2000MHz	3146	9107-3163	8/2/02
Spectrum Analyzer	HP	8593EM	3710A00205	6/20/02
DC Power Supply	HP	6235A	2450A-08312	N.C.R
Temp Chamber	Thermotron Industries	SE-600-10-10	29800	3/18/03

6. POWERLINE RFI LIMIT

CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 KHz TO 30MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NOT REQUIRED.

7. RADIATED EMISSION LIMITS

GENERAL REQUIREMENTS	SECTION 15.209
OPERATION WITHIN THE BAND 13.553 – 13.567 MHZ	SECTION 15.225 (a) and (b)

8. FREQUENCY STABILITY LIMITS

OPERATION WITHIN THE BAND 13.553 – 13.567 MHZ	SECTION 15.225 (c)

9. EQUIPMENT MODIFICATION

To achieve compliance to FCC Section 15.225 technical limits, the following change(s) were made during compliance testing:

No changes were required in order to achieve compliance to FCC Section 15.225.

10. TEST PROCEDURE AND RESULT

10.1 Radiated Emission Test Procedure and Result

For frequencies above 30 MHz, the EUT was placed on a wooden table on the outdoor ground plane, biconical and a log periodic antennas were used The search antenna was placed 3 meter from the EUT, emissions were maximized by rotating the turn table 360 degrees and raising the antenna from 1m to 4m high in both vertical and horizontal polarizations.

For frequencies below 30 MHz a loop antenna was used, it was placed 30m far from the EUT without using a ground plane, three different orientation for the EUT were tried to find out which orientation produces the worst emissions, the loop antenna was also moved around to find out worst position for the emissions.

COMPLIANCE Certification Services
FCC. VCCI. CISPR. CE. AUSTEL. NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP
561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #: 02U1323-1
Report #: 020530C01
Date& Time: 05/30/02 11:17 AM
Test Engr: Frank Ibrahim

Company: Mattel El Segundo
EUT Description: 13.56 MHz RF tags for toy transceivers, model: HE-MAN Castle Grayskull SKU 55790
Test Configuration : Stand alone EUT
Type of Test: FCC 15.225
Mode of Operation: EUT transmitting at 13.56 MHz continuously

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
13.5671	27.30	10.20	0.76	27.54	10.72	29.54	-18.82	30mV	0.00	1.00	P
13.5529	13.90	10.20	0.76	27.54	-2.68	29.54	-32.22	30mV	0.00	1.00	P
14.3000	8.50	10.20	0.76	27.54	-8.08	29.54	-37.62	30mV	0.00	1.00	P
13.5600	28.60	10.20	0.76	27.54	12.02	80.00	-67.98	30mV	0.00	1.00	P

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PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #: 02U1323-1
Report #: 020531C01
Date& Time: 05/31/02 3:12 PM
Test Engr: Frank Ibrahim

Company: Mattel El Segundo
EUT Description: 13.56 MHz RF tags for toy transceiver, model: HE-MAN Castle Grayskull SKU 55790
Test Configuration : Stand Alone EUT
Type of Test: FCC 15.225
Mode of Operation: EUT transmitting at 13.56 MHz

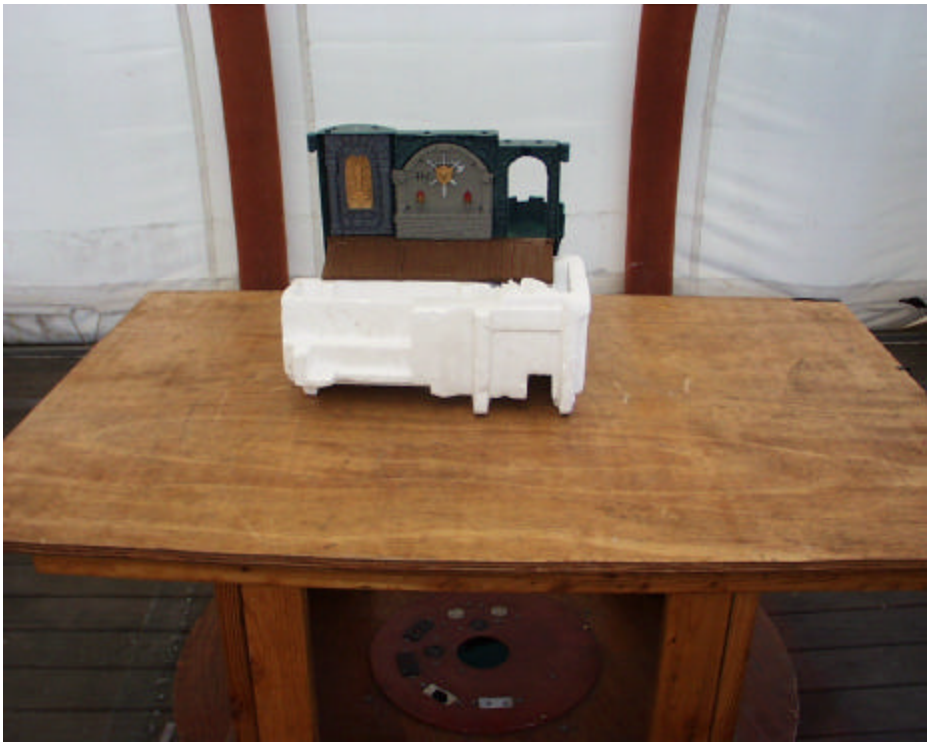
A-Site | B-Site | C-Site | F-Site | 6 Worst Data | Descending

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
40.68	38.90	12.72	0.85	27.54	24.93	40.00	-15.07	3mV	0.00	1.00	P
54.24	40.60	9.46	0.89	27.48	23.47	40.00	-16.53	3mV	0.00	1.00	P
40.68	37.20	12.72	0.85	27.54	23.23	40.00	-16.77	3mH	0.00	1.00	P
54.24	39.20	9.46	0.89	27.48	22.07	40.00	-17.93	3mH	0.00	1.00	P
739.25	40.00	21.35	4.37	27.94	37.78	46.00	-8.22	3mV	0.00	1.00	P
581.00	38.60	18.66	3.78	28.09	32.95	46.00	-13.05	3mH	0.00	1.00	P

EUT scanned from 30 - 1000 MHz, no emissions found, all readings are Noise Floor
Total data #: 6
V.2c

Radiated Emissions for freq < 30 MHz Setup Photos:

Radiated Emissions for freq > 30 MHz Setup Photos:



10.2 Frequency Stability Test Procedure and Result

1. The EUT was placed inside a temperature chamber, temperature was changed gradually from –20 to 50 centigrades calcium, the step in temperature changes was 10 centigrade calcium, EUT was left on at each temperature for 20 minutes for the EUT to stabilize and temperature readings were recorded as shown below:

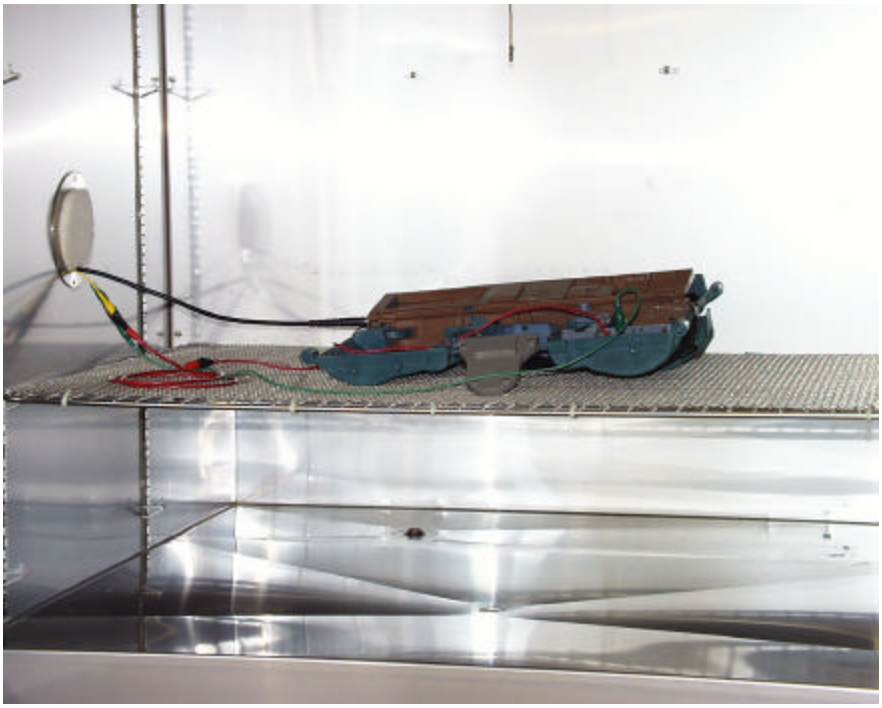
Date : 5/30/2002 Tester : Frank Ibrahim

Company : Mattel El Segundo
EUT : 13.56 MHz RF tags for toy transceivers, model: HE-MAN Castle Grayskull SKU 55790
Test Configuration :Stand alone EUT
Type of test :FCC 15.225
Mode of operation :EUT transmitting at 13.56 MHz continuously

Temp (Celcium Centigrade)	-20	-10	0	10	20	30	40	50
Carrier Freq (MHz)	13.566533	13.566533	13.566583	13.56661	13.566487	13.56652	13.56657	13.56648
Freq drift (MHz)	0.000046	0.000046	0.000096	0.000123	Ref	0.000033	0.000083	-0.000007
Ferq drift %	0.00034	0.00034	0.00071	0.00091	N/A	0.00024	0.00061	-0.000052

Limit : +/- 0.01 %
Result : Pass

Frequency Stability Setup Photos:



END OF REPORT