

Mattel Asia Pacific Sourcing Ltd. (MAPS)

Application
For
Certification

IM-me (Handset)

(FCC ID: PIYL7281H1)

0713245
KL/at
July 20, 2007

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MEASUREMENT/TECHNICAL REPORT

Mattel Asia Pacific Sourcing Ltd. (MAPS)
- MODEL: L7281
FCC ID: PIYL7281H1

This report concerns (check one) Original Grant ☒ Class II Change ☐

Equipment Type: DTS - Digital Transmission System

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional Radiator - the new 47 CFR [05-04-07 Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	filename
Cover Letter	Confidentiality Request	request.pdf
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radicated Emission	config photos.doc
Test Report	Maximum Output Power Plot	maxop.pdf
Test Report	6 dB Bandwidth Plot	6dB.pdf
Test Report	Maximum Power Density Reading	maxpd.pdf
Test Report	Out Band Antenna Conducted Emission Plot	obantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	dcc.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
RF Exposure Info	RF Safety	RF exposure info.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

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1.0 Summary of Test

Mattel Asia Pacific Sourcing Ltd. (MAPS) - MODEL: L7281
FCC ID: PIYL7281H1

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	N/A
Radiated Emission from Digital Part	15.109	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses a permanently attached antenna, which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

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EXHIBIT 2
GENERAL DESCRIPTION

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2.0 **General Description**

2.1 Product Description

The model L7281, handset and USB unit are 900 MHz, 16 Channels digitally modulated transceivers for wireless message system. They operate in the frequency range 908.45 MHz to 920.60 MHz with 810 kHz channel spacing.

The Equipment Under Test (EUT) is the handset and it is powered by 3 AA batteries.

Features:

- LC Display with backlight
- Keyboard
- Status lights

This product consists of a handset and a USB unit. Each USB unit can maximum support 4 handsets in operation. The users must have PC with internet connection in order to use this product. To operate this product, the users need to execute the provided program and do the registration with the unique code provided before the first time login according to the user manual. After the login, the users can send text message between the handset and PC (USB unit), and handset to handset via USB unit as handset cannot send message to other handset directly. The users can also send message across the world through the internet.

The antenna used in handset is an integral antenna.

The circuit description is saved with filename: descri.pdf

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2.2 Related Submittal(s) Grants

This is an application for Certification of a DTS - Digital Transmission System for the handset. The USB unit for this handset is authorized by Certification procedure with FCC ID: PIYL7281D1.

The receiver portion for this handset is authorized by Verification procedure (Refer to report number 0713364).

2.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the Radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

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3.0 **System Test Configuration**

3.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously to transmission mode to simplify the measurement methodology. The EUT was powered by 3 new AA batteries during the test.

For the measurements, the EUT is placed in the center on the wooden turntable.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are measured in three meter. The spectrum analyzer resolution bandwidth is 200 Hz for emissions from 9 kHz to 150 kHz, 9 kHz for emissions from 150 kHz to 30 MHz, 120 kHz for emissions from 30 MHz to 1 GHz and 1 MHz for emissions greater than 1 GHz.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

There was no special software to exercise the device.

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3.3 Support Equipment List and Description

This product was tested in a standalone configuration.

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3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

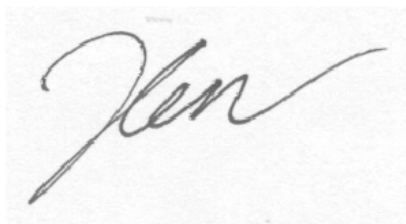
Any modifications installed previous to testing by Mattel Asia Pacific Sourcing Ltd. (MAPS) will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 3.0 of this report are confirmed by:

Confirmed by:

*Lam Chun Cheong, Kenneth
Assistant Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for Mattel Asia Pacific Sourcing Ltd. (MAPS)*



Signature

July 20, 2007 _____
Date

EXHIBIT 4
MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.0 **Measurement Results**

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

- ☐ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.
- ☒ The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW> 6dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using to OFFSET function of the analyzer.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

Antenna Gain = 0 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	908.45	9.75	9.44
Middle Channel:	914.12	9.90	9.77
High Channel:	920.60	9.94	9.86

Cable loss : 0.2 dB External Attenuation : N/A dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

EUT dBm max. output level = 9.94 dBm (30 dBm or less)

Please refer to the attached plots for details:

Plot H1A: Low Channel Output Power
Plot H1B: Middle Channel Output Power
Plot H1C: High Channel Output Power

For electronic filing, the above plots are saved with filename: maxop.pdf

For RF safety, the information is saved with filename: RF exposure info.pdf

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Frequency (MHz)	6 dB Bandwidth (kHz)
908.45/914.12	528

Limit: at least 500 kHz

Refer to the following plots for 6 dB bandwidth sharp:

Plot H2A: Low Channel 6 dB RF Bandwidth

Plot H2B: Middle Channel 6 dB RF Bandwidth

Plot H2C: High Channel 6 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: 6dB.pdf

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.3 Maximum Power Density Reading, FCC Rule 15.247(e) :

The spectrum analyzer RES BW was set to 3kHz. In order to look for a peak, the START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Frequency (MHz)	Power Density (dBm/3kHz)
920.447	4.92

Frequency Span = 1.5 MHz

Sweep Time = Frequency Span/3kHz
= 500 seconds

Cable Loss: 0.2 dB

Limit: 8dBm/ 3kHz

Refer to the following plots for power density data :

Plot H3A : Low Channel power density
Plot H3B : Middle Channel power density
Plot H3C : High Channel power density

For electronic filing, the above plots are saved with filename: maxpd.pdf

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for Radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for Radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot H4A1 - H4A2: Low Channel Emissions
Plot H4B1 - H4B2: Middle Channel Emissions
Plot H4C1 - H4C2: High Channel Emissions
Plot H4D1 - H4D2: Modulation Products Emissions

For the electronic filing, the above plots are saved with filename: obantcon.pdf

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, Radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general Radiated emission requirement.

- ☒ Not required, since all emissions are more than 20dB below fundamental
☐ See attached data sheet

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the Radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.8 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
4603.000 MHz

For the electronic filing, the worst case Radiated emission configuration photographs are saved with filename: config photos.doc.

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Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.9 Radiated Emission Data

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 5.1 dB margin compare with peak limit

TEST PERSONNEL:



Tester Signature

Gary M. K. Li, Senior Lead Engineer
Typed/Printed Name

July 20, 2007
Date

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
 Model: L7281
 Mode: TX-Channel 1

Date of Test: July 12, 2007

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	908.450	75.0	16	33.0	92.0	0.0	92.0	NA	NA
H	960.450	18.7	16	33.0	35.7	0.0	35.7	54.0	-18.3
V	2725.350	67.8	34	30.4	64.2	0.0	64.2	74.0	-9.8
V	2725.350	67.8	34	30.4	64.2	20.3	43.9	54.0	-10.1
H	3633.800	59.1	34	31.9	57.0	0.0	57.0	74.0	-17.0
H	3633.800	59.1	34	31.9	57.0	20.3	36.7	54.0	-17.3
V	4542.250	67.4	34	34.9	68.3	0.0	68.3	74.0	-5.7
V	4542.250	67.4	34	34.9	68.3	20.3	48.0	54.0	-6.0
V	5450.700	59.7	34	35.7	61.4	0.0	61.4	74.0	-12.6
V	5450.700	59.7	34	35.7	61.4	20.3	41.1	54.0	-12.9
V	7267.600	50.9	34	37.9	54.8	0.0	54.8	74.0	-19.2
V	7267.600	50.9	34	37.9	54.8	20.3	34.5	54.0	-19.5
V	8176.050	58.5	34	39.5	64.0	0.0	64.0	74.0	-10.0
V	8176.050	58.5	34	39.5	64.0	20.3	43.7	54.0	-10.3
V	9084.500	54.9	34	40.4	61.3	0.0	61.3	74.0	-12.7
V	9084.500	54.9	34	40.4	61.3	20.3	41.0	54.0	-13.0

- NOTES:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other Radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna used for the emission over 1000MHz.

Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Gary M. K. Li

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
 Model: L7281
 Mode: TX-Channel 8

Date of Test: July 12, 2007

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	914.120	75.3	16	33.0	92.3	0.0	92.3	NA	NA
H	965.120	17.8	16	33.0	34.8	0.0	34.8	54.0	-19.2
V	2742.360	65.6	34	30.4	62.0	0.0	62.0	74.0	-12.0
V	2742.360	65.6	34	30.4	62.0	20.3	41.7	54.0	-12.3
H	3656.480	57.1	34	33.3	56.4	0.0	56.4	74.0	-17.6
H	3656.480	57.1	34	33.3	56.4	20.3	36.1	54.0	-17.9
V	4570.600	67.1	34	34.9	68.0	0.0	68.0	74.0	-6.0
V	4570.600	67.1	34	34.9	68.0	20.3	47.7	54.0	-6.3
V	7312.960	52.5	34	37.9	56.4	0.0	56.4	74.0	-17.6
V	7312.960	52.5	34	37.9	56.4	20.3	36.1	54.0	-17.9
V	8227.080	60.8	34	39.0	65.8	0.0	65.8	74.0	-8.2
V	8227.080	60.8	34	39.0	65.8	20.3	45.5	54.0	-8.5
V	9141.200	54.8	34	40.4	61.2	0.0	61.2	74.0	-12.8
V	9141.200	54.8	34	40.4	61.2	20.3	40.9	54.0	-13.1

- NOTES:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other Radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna used for the emission over 1000MHz.

Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Gary M. K. Li

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
 Model: L7281
 Mode: TX-Channel 16

Date of Test: July 12, 2007

Table 3

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	920.600	75.3	16	33.0	92.3	0.0	92.3	NA	NA
H	972.600	18.2	16	33.0	35.2	0.0	35.2	54.0	-18.8
V	2761.800	69.0	34	30.4	65.4	0.0	65.4	74.0	-8.6
V	2761.800	69.0	34	30.4	65.4	20.3	45.1	54.0	-8.9
H	3682.400	57.0	34	33.3	56.3	0.0	56.3	74.0	-17.7
H	3682.400	57.0	34	33.3	56.3	20.3	36.0	54.0	-18.0
V	4603.000	68.0	34	34.9	68.9	0.0	68.9	74.0	-5.1
V	4603.000	68.0	34	34.9	68.9	20.3	48.6	54.0	-5.4
V	7364.800	49.7	34	37.9	53.6	0.0	53.6	74.0	-20.4
V	7364.800	49.7	34	37.9	53.6	20.3	33.3	54.0	-20.7
V	8285.400	58.7	34	39.0	63.7	0.0	63.7	74.0	-10.3
V	8285.400	58.7	34	39.0	63.7	20.3	43.4	54.0	-10.6

- NOTES:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other Radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna used for the emission over 1000MHz.

Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Gary M. K. Li

FCC ID: PIYL7281H1

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.10 AC Line Conducted Emission, FCC Rule 15.207:

☒ Not required; battery operation only

☐ Test data attached

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.11 Radiated Emissions from Digital Section of Transceiver (Transmitter), FCC Ref:
15.109

☐ Not required - No digital part

☒ Test results are attached

☐ Included in the separated DOC report.

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281
Mode: Operation

Date of Test: July 12, 2007

Table 4

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	52.001	34.4	16	11	29.4	40.0	-10.6
H	78.005	40.2	16	6	30.2	40.0	-9.8
H	104.009	33.6	16	13	30.6	43.5	-12.9
H	130.010	32.6	16	14	30.6	43.5	-12.9
H	156.014	29.7	16	16	29.7	43.5	-13.8
H	234.020	26.9	16	19	29.9	46.0	-16.1

- NOTES:
1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other Radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.

Test Engineer: Gary M. K. Li

INTERTEK TESTING SERVICES

Company: Mattel Asia Pacific Sourcing Ltd. (MAPS)
Model: L7281

Date of Test: July 12, 2007

4.12 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

$$\begin{aligned}\text{Duty cycle (DC)} &= \text{Maximum ON time in 100ms/100ms} \\ &= (9.6 \text{ ms})/100\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Duty cycle correction, dB} &= 20 * \log (\text{DC}) \\ &= 20 * \log (0.096) \\ &= -20.3 \text{ dB}\end{aligned}$$

X	See attached spectrum analyzer chart (s) for transmitter timing Plot H5A and Plot H5B
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filename: dcc.pdf

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc.

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8
INSTRUCTION MANUAL

8.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

Please note that the required FCC Information to the User is attached on P.15 of the Instruction Manual.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9
CONFIDENTIALITY REQUEST

9.0 **Confidentiality Request**

For electronic filing, the confidentiality request is saved with filename: request.pdf