



RF Exposure Evaluation

For

TownSteel Inc.

Aegis Programmer

Test Model: DLP7

Prepared for : TownSteel Inc.
Address : 17901 Railroad Street, City of Industry, California, United States

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : March 24, 2025
Number of tested samples : 2
Sample No. : A071223098-1, A071223098-2
Serial number : Prototype
Date of Test : March 24, 2025 ~ March 27, 2025
Date of Report : March 27, 2025



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**RF Exposure Evaluation****Report Reference No.** : LCSA071223098EC**Date of Issue** : March 27, 2025**Testing Laboratory Name** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Address** : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China**Testing Location/ Procedure** : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name** : TownSteel Inc.**Address** : 17901 Railroad Street, City of Industry, California, United States**Test Specification****Standard** : FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06
FCC CFR 47 part1 1.1310
FCC CFR 47 part2 2.1093**Test Report Form No.** : TRF-4-E-215 A/0**TRF Originator** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF** : Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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EUT Description : Aegis Programmer**Trade Mark** : N/A**Test Model** : DLP7**Ratings** : DC 3.0V by 2*AA Batteries**Result** : Positive**Compiled by:**

Kevin Huang/ Administrator

Supervised by:

Jack Liu / Technique principal

Approved by:

Gavin Liang/ Manager



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**TEST REPORT**

Test Report No. :	LCSA071223098EC	<u>March 27, 2025</u> Date of issue
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Test Model.....	: DLP7
EUT.....	: Aegis Programmer
Applicant.....	: TownSteel Inc.
Address.....	: 17901 Railroad Street, City of Industry, California, United States
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: TownSteel Inc.
Address.....	: 17901 Railroad Street, City of Industry, California, United States
Telephone.....	: /
Fax.....	: /
Factory.....	: TownSteel Inc.
Address.....	: 17901 Railroad Street, City of Industry, California, United States
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	March 27, 2025	Initial Issue	---



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1. Product Information

Product name	:	Aegis Programmer
Test Model	:	DLP7
Ratings	:	DC 3.0V by 2*AA Batteries
Hardware Version	:	BLE_HANDSET_X1 V10
Software Version	:	01000448
Bluetooth Frequency Range	:	2402MHz~2480MHz
Channel Number	:	40 channels for Bluetooth V4.2 (DTS)
Channel Spacing	:	2MHz for Bluetooth V4.2 (DTS)
Modulation Type	:	GFSK for Bluetooth V4.2 (DTS)
Bluetooth Version	:	V4.2
Antenna Type	:	PCB Antenna
Antenna Gain	:	-7.09dBi
NFC Operating Frequency	:	13.56MHz
Modulation Type	:	ASK
Antenna Type	:	PCB Antenna
Antenna Gain	:	0dBi
Exposure category	:	General population/uncontrolled environment
EUT Type	:	Production Unit
Device Type	:	Portable Device



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2. Evaluation method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.²² The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where:}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C)

1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$

2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c)

1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	< 50	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	mm
100	237	474	481	487	494	501	507	514	521	527	534	541	547	554	561	567	mW
50	308	617	625	634	643	651	660	669	677	686	695	703	712	721	729	738	
10	474	948	961	975	988	1001	1015	1028	1041	1055	1068	1081	1095	1108	1121	1135	
1	711	1422	1442	1462	1482	1502	1522	1542	1562	1582	1602	1622	1642	1662	1682	1702	
0.1	948	1896	1923	1949	1976	2003	2029	2056	2083	2109	2136	2163	2189	2216	2243	2269	
0.05	1019	2039	2067	2096	2125	2153	2182	2211	2239	2268	2297	2325	2354	2383	2411	2440	
0.01	1185	2370	2403	2437	2470	2503	2537	2570	2603	2637	2670	2703	2737	2770	2803	2837	



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When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

a) The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg}] + [\sum \text{ of MPE ratios}] \leq 1.0$.

b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04 , and the $[\sum \text{ of MPE ratios}] \leq 1.0$.

3. Refer Evaluation Method

[ANSI C95.1–1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1093](#): Radiofrequency radiation exposure evaluation: portable devices

4. Conducted Power Results

<BT LE>

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	-0.58
	19	2440	1.6
	39	2480	0.55

<NFC>

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
ASK	13.56	-58.77

Note:

TX frequency range: 13.56MHz

Device category: Portable device (Distance: 5mm) Max. Field Strength: 36.49dBuV/m @3m

EIRP=E-104.8+20logD=36.49-104.8+20log3=-58.77dBm

Maximum Conducted Output Power: -58.77dBm

5. Manufacturing Tolerance

<BT LE>

GFSK (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	0	1.0	0
Tolerance $\pm$ (dB)	1.0	1.0	1.0



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<NFC>

ASK (Peak)	
Frequency (MHz)	13.56
Target (dBm)	-58
Tolerance $\pm$ (dB)	1.0

6. Evaluation Results

6.1 Standalone Evaluation (BLE)

Mode	f (GHz)	Antenna Distance (mm)	Ant Gain	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion	Max MPE (Ratio)
				dBm	mW			
GFSK	2.440	5	-7.09	2.0	1.5849	0.4951 < 3.0	Yes	0.0413

Remark:

1. Output power including tune up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

6.2 Standalone Evaluation (NFC)

Mode	f (MHz)	Antenna Distance (mm)	Max. Field Strength (dBuV/m @3m)	Max. Conducted Output Power (dBm)	Output power (Max. Turn-up Procedure) (mW)	Limit P_{th} (mW)
ASK	13.56	5	36.49	-57	0.0000002	442.64

6.3 Simultaneous Transmission for SAR Exclusion

BLE Ant Max MPE (Ratio)	NFC Ant Max MPE (Ratio)	simultaneous MPE (Ratio)	MPE Limits (Ratio)
0.0413	0.0000002	0.0413002	1.0000



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7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

8. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.

9. Measurement Uncertainty

BLE:

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	$\pm 3.10\text{dB}$	(1)
	:	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
	:	200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
	:	1GHz~26.5GHz	$\pm 3.80\text{dB}$	(1)
	:	26.5GHz~40GHz	$\pm 3.90\text{dB}$	(1)
Conduction Uncertainty	:	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	:	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)
Output power	:	1GHz-40GHz	$\pm 0.57\text{dB}$	(1)
Power Spectral Density	:	1GHz-40GHz	$\pm 1.2\text{dB}$	(1)
Occupied Channel Bandwidth	:	1GHz-40GHz	$\pm 5\%$	(1)
Conducted RF Spurious Emission	:	9kHz-40GHz	$\pm 1.80\text{dB}$	(1)
Emissions in Restricted Bands	:	1GHz-40GHz	$\pm 2.47\text{dB}$	(1)
Frequency Stability	:	1GHz-40GHz	$\pm 25\text{Hz}$	(1)

NFC:

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	$\pm 3.10\text{dB}$	(1)
	:	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
	:	200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
	:	1GHz~26.5GHz	$\pm 3.80\text{dB}$	(1)
	:	26.5GHz~40GHz	$\pm 3.90\text{dB}$	(1)
Conduction Uncertainty	:	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	:	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

.....THE END OF REPORT.....



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