



SAR Evaluation Report

Application No.: SZEM1912021099CR
Applicant: Arts Electronics Co., Ltd
Address of Applicant: NO. 1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, China
Manufacturer: Makita Corporation
Address of Manufacturer: 3-11-8, Sumiyoshi-cho, Anjo, Aichi 446-8502 Japan
Factory: 1. Arts Electronics Co., Ltd.
2. Tenpao Electronics (Huizhou) Co., LTD.
Address of Factory: 1. NO. 1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA
2. Dongjiang Industrial Estate, Shuikou Street, Huizhou City, Guangdong province China
Equipment Under Test (EUT):
EUT Name: Job Site Charger Radio
Model No.: MR300, DMR300, XRM10 ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark: Makita
FCC ID: TZIXRM10
Standards: 47 CFR Part 1.1307, 47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-12-11
Date of Test: 2019-12-13 to 2020-01-09
Date of Issue: 2020-01-13

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Ken Xu
EMC Laboratory Manager

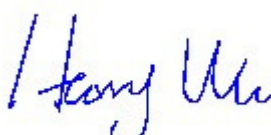


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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-01-13		Original

Authorized for issue by:				
				
		Harry Wu /Project Engineer		
				
		Eric Fu /Reviewer		





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4 General Information

4.1 General Description of EUT

Power Supply:	Li-ion Battery: Model: 1. BL1016, DC10.8V, 1.5Ah 2. BL1021B, DC10.8V, 2.0Ah 3. BL1041B, DC10.8V, 4.0Ah 4. BL1815N, DC18V, 1.5Ah 5. BL1820B, DC18V, 2.0Ah 6. BL1830B, DC18V, 3.0Ah 7. BL1840B, DC18V, 4.0Ah 8. BL1850B, DC18V, 5.0Ah 9. BL1860B, DC18V, 6.0Ah AC/DC Adapter: Input: AC100-240V, 50/60Hz Output: DC24V, 5A
Cable:	AC Cable: 120cm, Unshielded, DC Cable: 180cm, Unshielded
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Remark:	All batteries were pretested, and only the worst case (Model: BL1815N) for final test

Remark:

Model No.: MR300, DMR300, XRM10

Only the model MR300 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, only different on model No..



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4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

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 Exclusion Threshold condition, listed below, is satisfied.

5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

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

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

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 is applied to determine SAR test exclusion

5.1.3 EUT RF Exposure

The Max. power (including tune-up tolerance) is 4.3 dBm on the lowest channel 2.402 GHz (*)
4.30 dBm logarithmic terms convert to numeric result is nearly 2.69 mW

According to the formula. calculate the test exclusion thresholds:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})}$$

$$\text{General RF Exposure} = (2.69 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.402 \text{ GHz}} = 0.83 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

$(1) < (2)$

So the SAR report is not required.

(*) Max. power refer to Report No.:SZEM191202109902

- End of the Report -



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