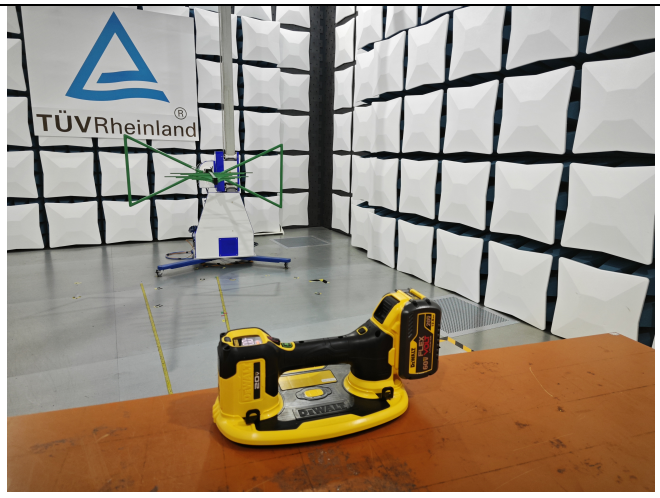
Prüfbericht-Nr.: *Test report no.*:	**CN24VD3G 001**	**Auftrags-Nr.:** *Order no.*:	180287141	Seite 1 von 14 *Page 1 of 14*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024.02.20	
Auftraggeber: *Client*:	Nemo Power Tools Limited 21st Floor, CMA Building 64 Connaught Road Central Hong Kong			
Prüfgegenstand: *Test item*:	Cordless lifting tool			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	DCE592			
Auftrags-Inhalt: *Order content*:	TÜV Rheinland – EMC Service			
Prüfgrundlage: *Test specification*:	**FCC Part 15, Subpart B:2023**			

Wareneingangsdatum: *Date of sample receipt*:	2024.02.28
Prüfmuster-Nr.: *Test sample no:*	A003643496-030
Prüfzeitraum: *Testing period*:	2024.03.06-2024.03.08
Ort der Prüfung: *Place of testing*:	Refer to section 1.1
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result**:	Pass



geprüft von: *tested by:*	Bingbing Li	**genehmigt von:** *authorized by*:	Shey Zheng
Datum: *Date:* 2024.06.27		**Ausstellungsdatum:** *Issue date:* 2024.06.27	
Stellung / *Position*:	Bingbing Li/PE	**Stellung** / *Position*:	Shey Zheng/Authorizer

Sonstiges /
Other:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*:	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

Test Summary

5.1 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE
Result:
N/A

5.2 RADIATED DISTURBANCE
Result:
Pass

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1 Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC(Ningbo) Co., Ltd.

1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China.

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment of Laboratory

No.	Equipment	Model	Serial no.	Last cal. date	Cal. due date
1.	EMI test receiver	ESR7	101929	2023.10.30	2024.10.29
2.	Bilog Antenna	CBL6112D	49033	2024.03.17	2027.03.16

1.3 Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	3.70dB
Conducted Emission (150k-30MHz)	3.30dB
Disturbance Power	4.27dB
Radiated Emission (30-1000MHz)	4.39dB
Radiated Emission (1-18GHz)	4.67dB
Radiated Emission (CDNE method)	4.05dB

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary Cordless lifting tool. It belongs to Class B category according to FCC Part 15. For the further information, refer to the user's manual.

2.2 Ratings and System Details

System input	:	DC 20V
Protection class	:	III
Highest clock frequency F_x	:	＜ 108 MHz

Refer to the user's manual for further information.

2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off", without power regulation means.

Refer to the user's manual for further information.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram for more information.

2.5 Submitted Documents

Circuit diagram, PCB layout, user's manual etc.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to related paragraph of this report. Software EMC32 V10.30 was used.

3.4 Special Accessories and Auxiliary Equipment

None.

3.5 Countermeasures to achieve EMC Compliance

The tested sample contained noise suppression components to achieve EMC compliance. No other special measure is employed to achieve the requirement.

4 Conformity Decision Rule

For all EMI tests (when included in this report), as measurement uncertainties are less than the values U_{CISPR} given in CISPR 16-4-2, compliance with the limits is determined by comparing measurement results directly with corresponding limits without taking into consideration of measurement uncertainties. For all EMS tests (when included in this report), measurement uncertainties are not considered as well according to corresponding test standards.

5 Test Results E M I S S I O N

5.1 Mains Terminal Continuous Disturbance Voltage

Result:	**N/A**

Test procedure : FCC Part 15, Subpart B:2023
Frequency range : 0.15 – 30MHz

The EUT is powered by built-in batteries, and cannot be connected to the mains supply. Therefore, no disturbance voltage test is performed.

5.2 Radiated disturbance

Result:	**Pass**

Date of testing	:	2024.03.06
Test procedure	:	ANSI C63.4:2014 and CISPR 16-1 series standards
Frequency range	:	30 – 1000MHz
Limits	:	FCC Part 15, Subpart B:2023
Kind of test site	:	Semi-anechoic chamber
Operation modes	:	Normal working
Ambient Condition	:	Temperature: 21 ºC ; Relative Humidity: 63 %

The radiated disturbance test was carried out in a semi-anechoic chamber. The test distance from the receiving antenna to the EUT is 3m. The normalized site attenuation of the semi-anechoic chamber is regularly calibrated to ensure the radiated disturbance test results are valid. During the test, the EUT was placed on a wooden table, which is 0.8m high. The wooden table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

According to the clause 15.33 “Frequency range of radiated measurements” of FCC Part 15, Subpart B:2023, The highest frequency in the EUT is below 108 MHz, therefore the EUT’s upper frequency of measurement range is 1000MHz.

The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak at those critical frequencies during the preview test. In the following figures, “♦” mean final measurement results with quasi-peak detector.

The test was performed on the input voltage DC 20V.

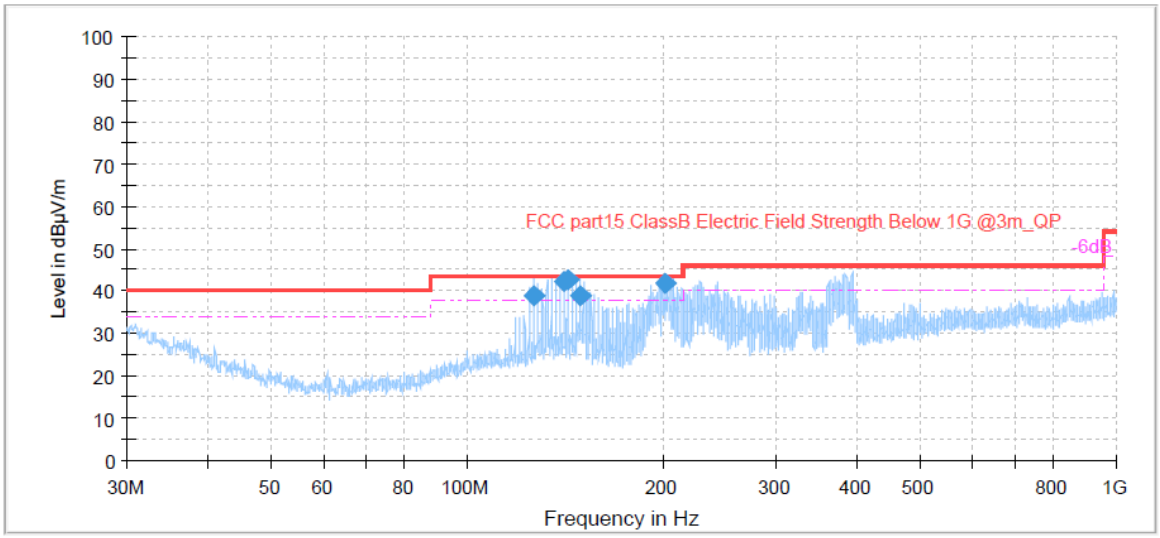
Before measurement, a survey was made to determine in which state the maximum disturbance was obtained. And the measurement was made in the state the maximum disturbance was obtained.

The following figures were those measured and recorded by a test receiver. Peak Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, “♦” means Quasi-Peak Value which were measured in final measurement.

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (Antenna factor + Cable loss - preamplifier factor(if used))

Figure 1: Spectral Diagrams, Radiated Emission, 30MHz-1000MHz

Full Spectrum

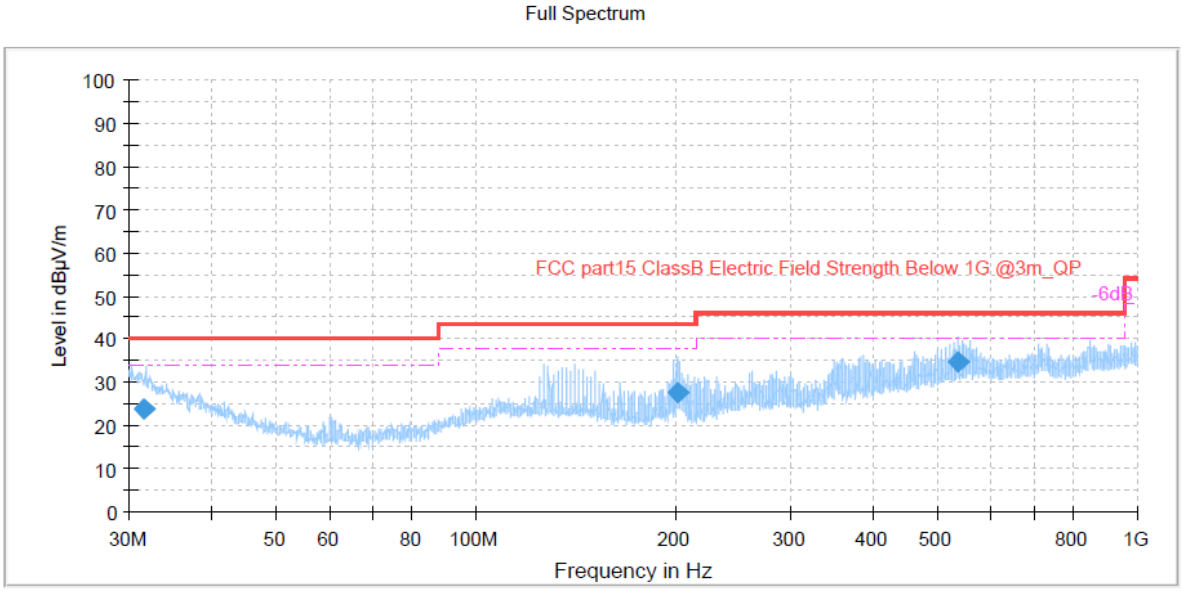


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
126.764444	38.71	43.50	4.79	1000.0	120.000	193.0	H	4.0	19.1
140.885000	42.19	43.50	1.31	1000.0	120.000	160.0	H	9.0	18.5
142.932778	42.61	43.50	0.89	1000.0	120.000	241.0	H	26.0	18.4
149.170000	38.93	43.50	4.57	1000.0	120.000	161.0	H	9.0	17.9
202.789444	42.03	43.50	1.47	1000.0	120.000	114.0	H	351.0	17.0

Figure 2: Spectral Diagrams, Radiated Emission, 30MHz-1000MHz

Full Spectrum

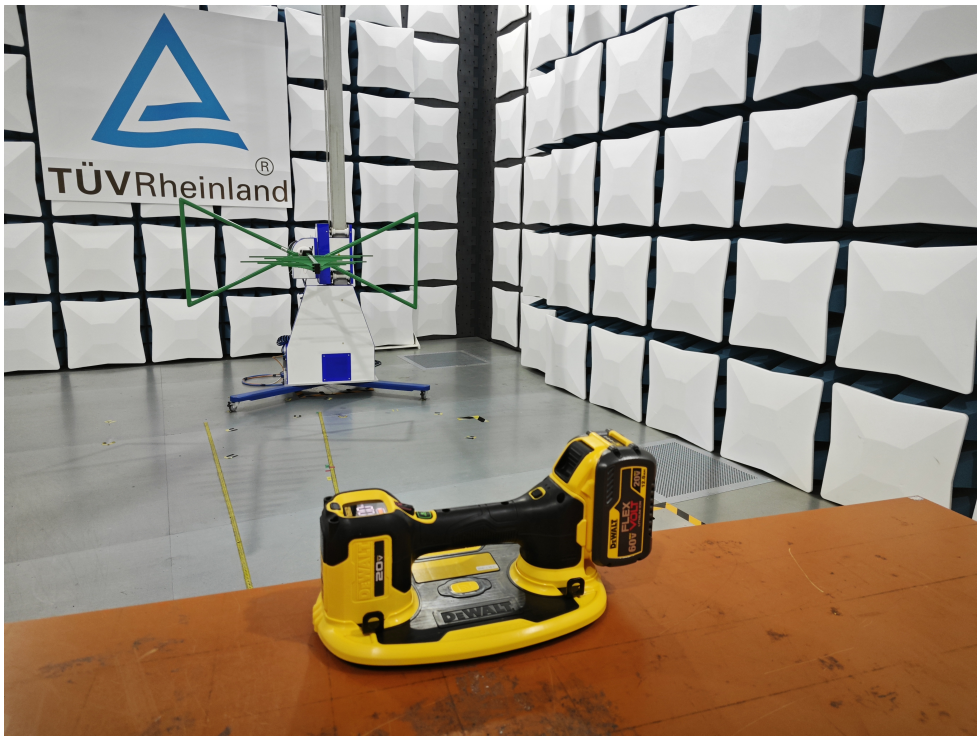


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.504444	23.95	40.00	16.05	1000.0	120.000	104.0	V	66.0	24.9
201.480556	27.57	43.50	15.93	1000.0	120.000	226.0	V	298.0	16.9
534.449444	34.90	46.00	11.10	1000.0	120.000	114.0	V	42.0	26.2

6 Photographs of the Test Set-Up

Photograph 1: Set-up for Disturbance Radiation



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-- The END --