



TEST REPORT

Report Number. : 14262501-E4V3

Applicant : ENERGOUS CORPORATION
3590 NORTH FIRST STREET,
SUITE 210,
SAN JOSE, CA 95134, U.S.A.

Model : VN55

Brand : ENERGOUS

FCC ID : 2ADNG-VN55

EUT Description : WIRELESS CHARGER

Test Standard(s) : FCC 47 CFR PART 1 SUBPART I
FCC 47 CFR PART 2 SUBPART J

Date Of Issue:

May 05, 2022

Prepared by:

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	4/25/2022	Initial Issue	---
V2	5/4/2022	Updated Section 4 to address TCB's question	Tina Chu
V3	5/5/2022	Updated Section 4 to address TCB's question	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ENERGOUS CORPORATION
3590 NORTH FIRST STREET,
SUITE 210,
SAN JOSE, CA 95134, U.S.A.

EUT DESCRIPTION: WIRELESS CHARGER

MODEL: VN55

BRAND: ENERGOUS

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

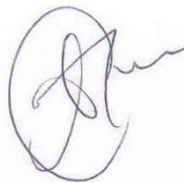
This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



Dan Corona
Operations Leader
UL Verification Services Inc.

Prepared By:



Tina Chu
Senior Project Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC Parts 1.1310, 2.1091, 2.1093, Draft KDB 447498 D01 v07-DR04, KDB 447498 D03 V01, IEEE Std C95.1-2005, IEEE Std C95.3-2002.

3. REFERENCES

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

All measurements were made as documented in test reports;
UL Verification Services Inc. Document 14262501-E1 for WPT operation in the 900 MHz band,
UL Verification Services Inc. Document 14262501-E2 for BLE operation in the 2.4 GHz band,
UL Verification Services Inc. Document 14262501-E3 for Zigbee operation in the 2.4 GHz band.

BLE duty cycle and WPT/BLE/Zigbee output power data are excerpted from the applicable test reports.

WPT and Zigbee duty cycle and antenna gain data are provided by the customer.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, California, USA	US0104	2324A	550739
<input type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	22541	550739
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324B	550739

5. RF EXPOSURE RESULTS

The EUT was assessed against the MPE-based exemption criteria of 447498 D01 General RF Exposure Guidance DR04

The EUT does not qualify for MPE-based exemption per table B.1 of the KDB so was assessed against Formula (B.1) in the KDB:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

Multiple chain or colocated transmitters

Frequency	(GHz)	0.918	2.4
Mode		WPT	BLE
Transmitter		MIMO	MIMO
Separation Distance	(cm)	20	20
Output Power	(dBm)	30	21.49
Antenna Gain	(dBi)	2.5	2.5
Duty Cycle	(%)	90	62.56
Source Based EIRP	(mW)	1600.5	156.8
Source Based ERP	(mW)	976	95.6
P_{th}	(mW)	1873	3060
ERP/ERP _{th}	-	0.52	0.03
Sum of ERP/ERP _{th}	0.55		

Multiple chain or colocated transmitters

Frequency	(GHz)	0.918	2.4
Mode		WPT	Zigbee
Transmitter		MIMO	MIMO
Separation Distance	(cm)	20	20
Output Power	(dBm)	30	21.27
Antenna Gain	(dBi)	2.5	2.5
Duty Cycle	(%)	90	90
Source Based EIRP	(mW)	1600.5	214.4
Source Based ERP	(mW)	976	130.7
P_{th}	(mW)	1873	3060
ERP/ERP _{th}	-	0.521	0.043
Sum of ERP/ERP _{th}	0.56		

Notes:

- 1) The output power in the table above is the maximum declared output power among various channels and various modes within the specific band.
- 2) The antenna gain in the table above is the maximum antenna gain among various channels within the specified band.
- 3) $ERP = EIRP/1.64$

As P_{TH} is greater than the higher of conducted power or ERP the transmitters qualify for standalone MPE-based exemption.

As the SUM of the ERP/ERP_{TH} ratios is <1 the EUT is exempt from further simultaneous transmission RF exposure evaluation.

END OF REPORT