

Project No: TM-2405000384P
Report No.: TMWK2405001754KS

FCC ID: 2AWUU6099001

Page: 1 / 13
Rev.: 01

SAR TEST REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

for
Video Intercom

Model Name.: TD63-HW / TD53-HW

Prepared for:

Verkada Inc
405 E. 4th Ave. San Mateo California United States 94401

Prepared by

Compliance Certification Services Inc.
Wugu Lab.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan.
Issue Date: October 28, 2024

Note: This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, A2LA, NIST or any government agencies. The test results in the report only apply to the tested sample.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Project No: TM-2405000384P
Report No.: TMWK2405001754KS

Page: 2 / 13
Rev.: 01

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 22, 2024	Initial Issue	ALL	Peggy Tsai
01	October 28, 2024	See the following Note Rev. (01)	P.7, 12	Peggy Tsai

Note:

Rev. (01)

1. Modify BLE Parts Number in section 3.2.
2. Added Estimated independent SAR value formula in section 5.

Table of Contents



1	ATTESTATION OF TEST RESULTS	4
2	TEST SPECIFICATION, METHODS AND PROCEDURES	5
3	DEVICE UNDER TEST (DUT) INFORMATION	6
3.1	DUT DESCRIPTION	6
3.2	WIRELESS TECHNOLOGIES	7
4	RF EXPOSURE CONDITIONS	8
4.1	STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	8
5	SIMULTANEOUS TRANSMISSION SAR ANALYSIS	11
5.1	SUM OF THE BLE + NFC +RFID	12
6	FACILITIES	13



Project No: TM-2405000384P
Report No.: TMWK2405001754KS

Page: 4 / 13
Rev.: 01

1 Attestation of Test Results

Applicant Name	Verkada Inc
Model Name	TD63-HW / TD53-HW
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013
Receive EUT Date:	May 31, 2024
Date Tested	July 16, 2024
Test Results	Exempt
<p>Compliance Certification Services Inc. , tested the above equipment in accordance with the requirements set forth in the above standards. Determination of compliance is based on the results of the compliance measurement,not taking into account measurement instrumentation uncertainty.All indications of Pass/Fail in this report are opinions expressed by Compliance Certification Services Inc, based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p>	
Approved & Released By:	Tested by:
	
Sky Zhou Asst. Section Manager Compliance Certification Services Inc.	Jack Yang Engineer Compliance Certification Services Inc.



Project No: TM-2405000384P
Report No.: TMWK2405001754KS

Page: 5 / 13
Rev.: 01

2 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure [KDB](#) procedures:

- 447498 D01 General RF Exposure Guidance v06
- 865664 D02 RF Exposure Reporting v01r02

3 Device Under Test (DUT) Information

3.1 DUT Description

Applicant Name	Verkada Inc
Applicant Address	405 E. 4th Ave. San Mateo California United States 94401
Manufacturer Name	CHICONY ELECTRONICS (THAILAND) CO., LTD
Manufacturer Address	82 MOO 4 T. THAKHAM A. BANGPAKONG, CHACHOENGSAO, THAILAND 24130
Product	Video Intercom
Trade Name	Verkada
Model No.	TD63-HW / TD53-HW
Model Discrepancy	Difference of the model number (list on this report) is just with or without keypad and corresponding housing. All the other HW and FW features are all the same.
Hardware Version	B02
Software Version	v259
Sample Stage	PVT

3.2 Wireless Technologies

Wireless technologies	Frequency bands	Peak Antenna Gain (dBi)	Operating mode	Duty Cycle used for SAR testing
Bluetooth	2.4 GHz	1.9	BLE	63.2%
Antenna Specification	Brand Name	SPEED		
	Type	PIFA Antenna		
	Parts Number	F-0Q-51-6009-001-00		
NFC	13.56MHz			N/A
Antenna Specification	Type	PCB Antenna		
	Parts Number	F-OW-51-6008-001-00		
RFID	125kHz			N/A ⁴
Antenna Specification	Type	Coil Antenna		
	Parts Number	F-OW-51-6008-001-00		

Notes:

- Duty cycle for BLE is referenced from the BLE reports.
- The sample selected for test was prototype that representative to production product and was provided by manufacturer
- Variant information between/among model numbers / trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.
- Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received
- SAR test exemption.

4 RF Exposure Conditions

Evaluated with a minimum test separation distance of 5 mm.

4.1 Standalone SAR Test Exclusion Considerations

Since the *Dedicated Host Approach* is applied, the standalone SAR test exclusion procedure in KDB 447498 is applied in conjunction with KDB 616217 § 4.3 to determine the minimum test separation distance:

- When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion.

SAR Test Exclusion Calculations

BLE

4.3.1 a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g SAR test exclusion thresholds are determined by the following:

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

f(GHz)	2.48
max. tune up power (dBm)	4
max. power (mW)	2.51
min. test separation distance (mm)	5
SAR test exclusion power (mW)	0.79
SAR test exclusion Limit (1-g SAR test exclusion thresholds)	≤ 3
Result	Pass

NFC

4.3.1 b) 1.

{[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

f(GHz)	0.1
min. test separation distance (mm)	5
Threshold at 50 mm	474
b) 1. SAR test exclusion thresholds (mW)	444

4.3.1 C) 1.

the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/f(MHz))]

f(GHz)	0.01356
b) 1. SAR test exclusion thresholds (mW)	444
c) 1. SAR test exclusion thresholds (mW)	830

4.3.1 C) 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 ½

f(GHz)	0.01356
max. Electric field strength (dBuV/m @3m)	59.86
max. EIRP power (dBm)	-35.37
max. EIRP Tune up power (dBm)	-34.5
max. EIRP power (mW)	0
min. test separation distance (mm)	5
b) 1. SAR test exclusion thresholds (mW)	830
c) 2. SAR test exclusion thresholds (mW)	415
Result	Pass

RFID

4.3.1 b) 1.

{[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

f(GHz)	0.1
min. test separation distance (mm)	5
Threshold at 50 mm	474
b) 1. SAR test exclusion thresholds (mW)	444

4.3.1 C) 1.

the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/f(MHz))]

f(GHz)	0.000125
b) 1. SAR test exclusion thresholds (mW)	444
c) 1. SAR test exclusion thresholds (mW)	1734

4.3.1 C) 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 ½

f(GHz)	0.000125
max.Electric field strength (dBuV/m @3m)	74.36
max. EIRP power (dBm)	-20.87
max. EIRP Tune up power (dBm)	-20
max.EIRP power (mW)	0.01
min. test separation distance (mm)	5
c) 1. SAR test exclusion thresholds (mW)	1734
c) 2. SAR test exclusion thresholds (mW)	867
Result	Pass

Note(s):

1. The BLE tune up power referred the AVG power of the test report TMWK2405001753KR for RF Exposure assessment purpose.
2. The NFC tune up power referred the Field strength of the test report TMWK2405001751KR for RF Exposure assessment purpose.
3. The RFID tune up power referred the Field strength of the test report TMWK2405001752KR for RF Exposure assessment purpose.

5 Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$\text{SPLSR} = (\text{SAR}_1 + \text{SAR}_2)^{1.5} / R_i$$

Where:

SAR₁ is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR₂ is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

R_i is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(\text{SAR}_1 + \text{SAR}_2)^{1.5} / R_i \leq 0.04$$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest reported SAR for the frequency bands should be used to determine SAR₁.or SAR₂. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

**Estimated SAR for Simultaneous Transmission SAR Analysis
 Considerations for SAR estimation**

1. When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
2. Dedicated Host Approach criteria for SAR test exclusion is likewise applied to SAR estimation, with certain distinctions between test exclusion and SAR estimation:
 - o When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied for SAR estimation; this is the same between test exclusion and SAR estimation calculations.
 - o When the separation distance from the antenna to an adjacent edge is > 5 mm but ≤ 50 mm, the actual antenna-to-edge separation distance is applied for SAR estimation.
 - o When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg
3. Please refer to Estimated SAR Tables to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values < 1.2 W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.
4. Estimated independent SAR value formula:
 - 1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}]$ W/kg, for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.
 - 2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.

Estimated SAR for BLE & NFC & RFID

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)	Estimated 1-g SAR Value (W/kg)
		dBm	mW		
BLE	2480	4.00	3	5	0.126
NFC	13.56	-34.50	0	5	0.000
RFID	0.125	-20.00	0	5	0.000

5.1 Sum of the BLE + NFC +RFID

0.126+0+0=0.126

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.



Project No: TM-2405000384P
Report No.: TMWK2405001754KS

Page: 13 / 13
Rev.: 01

6 Facilities

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan.

END OF REPORT