FCC Part 1 Subpart I
FCC Part 2 Subpart J
ISED RSS-102 ISSUE 6

RF EXPOSURE REPORT

FOR

Signo V2 Reader

MODEL NUMBER: 40TCV2

FCC ID: JQ6-SIGNO40TCV2

IC: 2236B-SIGNO40TCV2

REPORT NUMBER: R15701621-E7f

ISSUE DATE: 2025-06-12

Prepared for
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611 Center Ridge Dr
Austin, TX USA

Prepared by
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CERT #0751.06

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-06-11	Initial Issue	Manish Baral
V2	2025-06-12	Updated Report Number	Manish Baral
V3	2025-06-12	Updated Model Number	Manish Baral

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HID Global Corporation
611 Center Ridge Dr
Austin, TX USA

EUT DESCRIPTION: Signo V2 Reader

MODEL: 40TCV2

SERIAL NUMBER: H250013339

SAMPLE RECEIPT DATE: 2025-03-10, 2025-03-17

DATE TESTED: 2025-03-19

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies
RSS 102 ISSUE 6	Complies

UL LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:

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2. TEST METHODOLOGY

All calculations were made in accordance with FCC Parts 1.1310, 2.1091, 2.1093, KDB 447498 D01 v06, KDB 447498 D03 V01, IEEE Std C95.1-2005, and IEEE Std C95.3-2002, IC Safety Code 6, and ISED RSS-102.

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer. Data provided by the customer includes:

1.) Maximum Declared Output Power (See section 7)
2.) Separation Distance (See section 7)
3.) Antenna Gain (See section 7.2)

3. REFERENCES

Refer to UL Report R15701621-E2f, R15701621-E8f, R15701621-E9f for the BLE, 125 kHz, and 13.56 MHz RF Exposure test results.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, 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
☐	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. DECISION RULES

For all tests where the applicable U_{LAB} <= U_{MAX} the Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2, where U_{MAX} = 30% (0.3) for RF Exposure evaluations. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

For all tests where the applicable U_{LAB} > U_{MAX} the Decision Rule is based on Guarded Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.3.2, with a guard band equal to (U_{LAB} – U_{MAX}), where U_{MAX} = 30% (0.3) for RF Exposure evaluations. (Test results are adjusted by the value of the guard band to determine conformity with a specified requirement.)

6. DEVICE UNDER TEST

The EUT is a RFID card reader capable of reading 125 kHz and 13.56 MHz credentials at various data-rates. In addition, the EUT contains a BLE radio. For the 125 kHz radio, the desfire tag was used, while for the 13.56 radio a 106 kbps tag was used as it was declared the worst case by manufacturer.

Separation distances, maximum average output power, and antenna gain have been declared by the manufacturer and can be found in documentation provided.

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7. MAXIMUM PERMISSIBLE EXPOSURE (LIMITS AND EQUATIONS)

7.1. FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f^2	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Notes:

(1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

(2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

7.2. ISED RULES

For the purpose of this standard, Innovation, Science and Economic Development (ISED) has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6.

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m^2)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/ f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21\times10^{-4} f^{0.5}$	$6.67\times10^{-5} f$	$616000/ f^{1.2}$

Note: f is frequency in MHz.

Table 8: RF field strength and power density limits for controlled-use devices (controlled environment)

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m^2)	Reference period (minutes)
10-20	61.4	0.163	10	6
20-48	$129.8 / f^{0.25}$	$0.3444 / f^{0.25}$	$44.72 / f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	$15.60 f^{0.25}$	$0.04138 f^{0.25}$	$0.6455 f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	$616000 / f^{1.2}$
150000-300000	$0.354 f^{0.5}$	$9.40\times10^{-4} f^{0.5}$	$3.33\times10^{-4} f$	$616000 / f^{1.2}$

Note: f is frequency in MHz.

7.3. EQUATIONS

POWER DENSITY

Power density is given by:

S = EIRP / (4 * Pi * D^2)

Where

S = Power density in mW/cm^2
EIRP = Equivalent Isotropic Radiated Power in mW
D = Separation distance in cm

Power density in units of mW/cm^2 is converted to units of W/m^2 by multiplying by 10.

DISTANCE

Distance is given by:

D = SQRT (EIRP / (4 * Pi * S))

Where

D = Separation distance in cm
EIRP = Equivalent Isotropic Radiated Power in mW
S = Power density in mW/cm^2

SOURCE-BASED DUTY CYCLE

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

Source-based time-averaged EIRP = (DC / 100) * EIRP

Where

DC = Duty Cycle in %, as applicable
EIRP = Equivalent Isotropic Radiated Power in mW

DISTANCE CORRECTION

Distance correction factor to scale E-field reading from x meters to y meters is as follows:

Correction Factor = 20log(x/y)

Where x is the initial measurement distance and y is the desired distance.

MAXIMUM E-FIELD STRENGTH (dBuV/m to V/m)

To convert from dBuV/m to V/m, the following equation was used:

V/m = 10^[(dBuv/m -120) / 20].

MIMO AND COLOCATED TRANSMITTERS (IDENTICAL LIMIT FOR ALL TRANSMITTERS)

For multiple chain devices, and colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the EIRP (in linear units) of each transmitter.

Total EIRP = (EIRP1) + (EIRP2) + ... + (EIRPn)

where

EIRPx = Source-based time-averaged EIRP of chain x or transmitter x

The total EIRP is then used to calculate the Power Density or the Distance as applicable.

MIMO AND COLOCATED TRANSMITTERS (NON-IDENTICAL LIMIT FOR ALL TRANSMITTERS)

For multiple colocated transmitters operating simultaneously in frequency bands where different limits apply:

The Power Density at the specified separation distance is calculated for each transmitter chain or transmitter.

The fraction of the exposure limit is calculated for each chain or transmitter as
(Power Density of chain or transmitter) / (Limit applicable to that chain or transmitter).

The fractions are summed.

Compliance is established if the sum of the fractions is less than or equal to one.

PD Ratio Sample Calculation:

PD Ratio Radio A (%) = (100 * PD Radio A / PD Limit Radio A)
PD Ratio [All Radios] (%) = PD Ratio Radio A + PD Ratio Radio B + PD Ratio Radio c/d/e/etc.

Ex:
BLE FCC PD: 0.00011 mW/cm^2.
BLE FCC PD Limit 1 mW/cm^2

BLE FCC PD Ratio (%) = 100 * 0.00011 / 1 = 0.011%

Total PD Radio (%) = 0.011% [BLE] + 12.5% [13.56 MHz] = 12.511 %

8. RF EXPOSURE RESULTS

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

Below is a list of the data provided by the customer:

1.) Antenna gain and type (See section 3)
2.) Maximum output power (See section 3)

Single Chain and non-colocated transmitters

Band	Mode	Separ. Dist. (cm)	Output AVG Power (dBm)	Ant. Gain (dBi)	Duty Cycle (%)	EIRP (mW)	FCC PD (mW/cm^2)	ISED PD (W/m^2)	FCC PD Limit (mW/cm^2)	ISED PD Limit (W/m^2)
2.4 GHz	BLE	20	0.500	-1.04	100.0	0.883	0.00018	0.0018	1.000	5.350

Multiple chain or colocated transmitters

Band	Mode	Separ. Dist. (cm)	FCC PD Ratio (%)	ISED PD Ratio (%)	FCC PD Limit (%)	ISED PD Limit (%)
2.4 GHz	BLE		0.00015	0.0015		
125 kHz	NFC		5.520	6.87		
13.56 MHz	NFC		26.150	57.47		
TER		20	31.670	64.342	100.000	100.000

Notes:

1. 100% duty cycle for BLE was used to represent the absolute worst-case.
2. Output power for BLE was declared by customer to account for a manufacturing tolerance as a worst-case result.
3. Simultaneous transmit was investigated additionally as a worst-case scenario.
4. For the ratio calculations, the FCC PD and ISED PD were divided by their respective PD Limits to achieve a ratio of the PD limit for each of the radios. These ratios were then added a worst-case simultaneous transmission scenario. A sample calculation of how this was performed can be found above in section 6.3

END OF TEST REPORT