

# **TEST REPORT**

**Report Number:** R15701621-E5b

**Applicant :** HID Global Corporation  
611 Center Ridge Dr  
Austin, TX 78753 USA

**Model :** 20KV2

**FCC ID :** JQ6-SIGNO20KV2

**IC :** 2236B-SIGNO20KV2

**EUT Description :** Smartcard Reader

**Test Standard(s) :** FCC 47 CFR PART 1 SUBPART I  
FCC 47 CFR PART 2 SUBPART J  
OET BULLETIN NO. 65  
IEEE C95.3 – 2021  
ISED RSS-102 Issue 6

**Date Of Issue:**

2025-07-02

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-06-02	Initial Issue	Noah Bennett
V2	2025-06-24	Editorial Revisions to Section 8	Charles Moody
V3	2025-07-02	Revisions to Section 8 Calculations	Charles Moody

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## 1. ATTESTATION OF TEST RESULTS

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

**EUT DESCRIPTION:** Smartcard Reader

**MODEL NUMBER:** 20KV2

**SERIAL NUMBER:** Non-Serialized

**SAMPLE RECEIPT DATE:** 2025-03-10

**DATE TESTED:** 2025-03-17

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
IEEE C95.3-2021	Complies
OET BULLETIN NO. 65	Complies
FCC 47 CFR PART 1 SUBPART I & PART 2 SUBPART J	Complies
ISED 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:

Prepared By:



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Engineer Project Associate  
Consumer, Medical and IT Segment  
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## 2. TEST METHODOLOGY

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for correctly integrating customer-provided data with measurements performed by UL LLC.

All testing / calculations were made in accordance with.

- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 447498 D03 Supplement C Cross-Reference v01
- FCC KDB 680106 D01 Wireless Power Transfer v04
- FCC Parts 1.1310, 2.1091, 2.1093, IEEE Std C95.1-2005, IEEE Std C95.3-2021
- RSS-102 Issue 6
- IC Safety Code 6

## 3. 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
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY (RF EXPOSURE)

### 4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

### 4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	$U_{Lab}$
Magnetic Field Reading (A/m)	+/-0.3 dB
Electric Field Reading (V/m)	+/-0.3 dB

Uncertainty figures are valid to a confidence level of 95.45%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The Signo Reader is a smartcard reader typically installed near doorway as part of physical access system, to control access to that door. A user will approach the door and present a BLE or RFID credentials to the reader with intention of entering the door. The reader will read the credential and send its data to a connected access control panel, which determine whether or not grant the user access to the door. Optionally, a personal identification number (PIN) may also be required, in which case the user will enter the PIN on the reader's keypad.

The EUT supports the following technologies:

Wireless technologies	Frequency Band(s)	Operating mode(s)
NFC	13.56MHz	Type A 106, 212, 424 & 848 Kbps
	125KHz	4 Kbps
Bluetooth	2.4 GHz	LE 1 & 2 Mbps
Notes: 1) The EUT operated in a 1x1 SISO mode. 2) The EUT only supports 1 types of NFC/HF tag.		

This report covers the RF exposure testing of the 13.56 MHz NFC/HF radio.

### 5.2. SOFTWARE AND FIRMWARE

EUT FW Version: 10.1

EUT HW Version: Rev H

### 5.3. WORST-CASE CONFIGURATION AND MODE

The following configurations were tested as worst-case position:

Config	Descriptions	Frequency
1	Tag Off	13.56 MHz
2	Tag On (Centered)	
3	(Offset to WC Positioning)	

Additionally, testing in five orientations at each of the three configurations were performed. These include edge top, edge right, edge left, edge bottom and front. Only the worst-case data per configuration is included in the report.

## 5.4. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Badge 13.56MHz	NXP Semiconductors	NA	NA	NA

### I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	1	Type C	Unshielded	<6m	Programing cable

## 5.5. MEASUREMENT SETUP

The measurements were taken using a probe placed 20 cm surrounding the device for all configurations per KDB 680106 D01.

20cm distance E-field and H-field are evaluated from the center of the Narda probe.

For measurement setup and all testing photos, refer to external photos exhibit R15701621-EP2b

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was used for the tests documented in this report:

RTP probe

Test Equipment List					
Description	Manufacturer	Model	Label ID	Cal Due	Cal Date
Electric and Magnetic Field Probe	Narda	EHP-200AC	FA0001	2025-08-19	2024-08-19
Thermometer - Digital	Control Company	14-650-118	168574	2026-05-31	2024-05-23



## 7. DUTY CYCLE

### LIMITS

None; for reporting purposes only.

### PROCEDURE

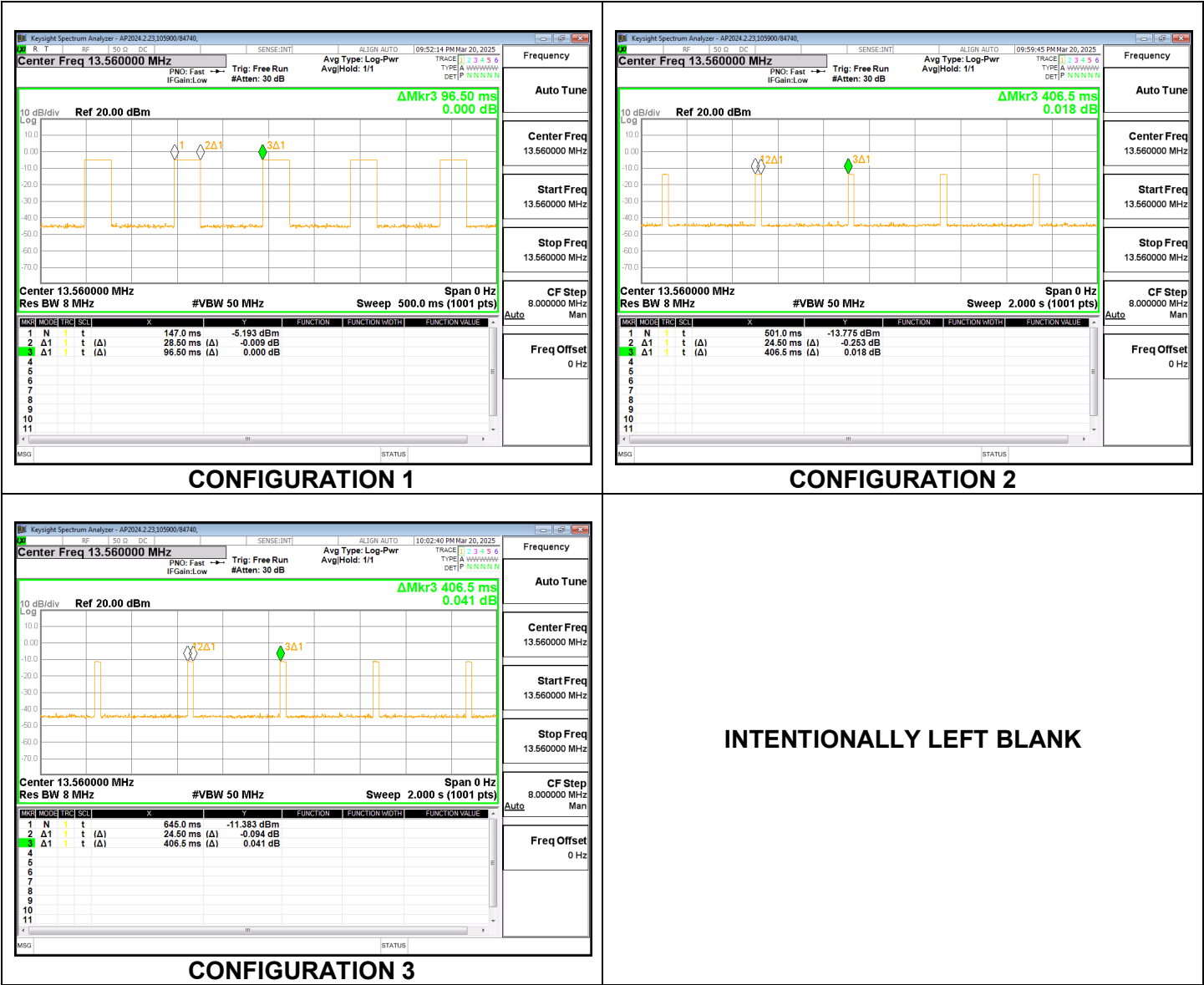
Zero-Span Spectrum Analyzer Method.

### ON TIME AND DUTY CYCLE RESULTS

Test Engineer:	105900/84740
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Configuration	Frequency (MHz)	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
(1) Tag Off	13.56	28.50	96.50	0.30	29.53	NA
(2) Tag On	13.56	24.50	406.50	0.06	6.03	NA
(3) WC Tag On	13.56	24.50	406.50	0.06	6.03	NA

Config	Descriptions	Frequency
1	Tag Off	13.56 MHz
2	Tag On (Centered)	
3	(Offset to WC Positioning)	



## 8. MAXIMUM PERMISSIBLE RF EXPOSURE

### 8.1. FCC LIMITS AND SUMMARY

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (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 to § 1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(i) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
<b>(ii) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<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.

Using the table above, the limits for uncontrolled exposure to 13.56 MHz RFID radio is

- 60.77 V/m and 0.16 A/m.

### **RESULT:**

Test Engineer:	105900/84740	Test Date:	2025-03-17
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### 8.1.1. MAXIMUM RESULT SUMMARY RF EXPOSURE (FCC)

#### CONFIGURATION 1: TAG OFF

Electric Field			Magnetic Field		
FCC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
60.77	2.9323	0.483	0.16	0.0367	22.938

#### CONFIGURATION 2: TAG ON (CENTERED)

Electric Field			Magnetic Field		
FCC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
60.77	1.3135	2.161	0.16	0.0141	8.813

#### CONFIGURATION 3: TAG ON (OFFSET)

Electric Field			Magnetic Field		
FCC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
60.77	1.2487	2.055	0.16	0.0146	9.125

### 8.1.2. E- FIELD AND H- FIELD MEASUREMENTS (FCC)

Note: Peak measurements were performed. RMS values were calculated from the peak measurement. Please refer to the formula for calculating the RMS values:  $[\text{Field Strength} \times \sqrt{\text{Duty Cycle}}]$ .

#### CONFIGURATION 1: TAG OFF

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			FCC	Location	Peak	Duty Cycle %	FCC Average	FCC	Location	Peak	Duty Cycle %	FCC Average
1	NA	20	60.77	Top	4.4598	29.53	2.4235	0.16	Top	0.0234	29.53	0.0127
				Right	5.0878		2.7647		Right	0.0251		0.0136
				Bottom	3.5116		1.9083		Bottom	0.0233		0.0127
				Left	4.7717		2.5930		Left	0.0249		0.0135
				Front	5.3961		2.9323		Front	0.0676		0.0367
				Max	5.3961		2.9323		Max	0.0676		0.0367

#### CONFIGURATION 2: TAG ON (CENTERED)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			FCC	Location	Peak	Duty Cycle %	FCC Average	FCC	Location	Peak	Duty Cycle %	FCC Average
2	NA	20	60.77	Top	4.3481	6.03	1.0677	0.16	Top	0.0232	6.03	0.0057
				Right	4.9453		1.2144		Right	0.0245		0.0060
				Bottom	3.8723		0.9509		Bottom	0.0229		0.0056
				Left	4.8920		1.2013		Left	0.0238		0.0058
				Front	5.3488		1.3135		Front	0.0573		0.0141
				Max	5.3488		1.3135		Max	0.0573		0.0141

#### CONFIGURATION 3: TAG ON (OFFSET)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			FCC	Location	Peak	Duty Cycle %	FCC Average	FCC	Location	Peak	Duty Cycle %	FCC Average
3	NA	20	60.77	Top	4.2524	6.03	1.0442	0.16	Top	0.0230	6.03	0.0056
				Right	4.7130		1.1573		Right	0.0237		0.0058
				Bottom	4.2059		1.0328		Bottom	0.0229		0.0056
				Left	4.8763		1.1974		Left	0.0241		0.0059
				Front	5.0850		1.2487		Front	0.0594		0.0146
				Max	5.0850		1.2487		Max	0.0594		0.0146

## 8.2. IC LIMITS

Radio Standards Specification 102, Issue 5 Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body

The electric and magnetic field strength reference levels, power density reference levels, and associated reference period for devices employed by the general public (uncontrolled environment) and controlled-use devices (controlled environment) are specified in table 7 and table 8. Note that the power density limits specified in these tables apply to whole body exposure conditions.

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	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000 / f^{1.2}$

**Note:**  $f$  is frequency in MHz.

## 8.2.1. MAXIMUM RESULT SUMMARY RF EXPOSURE (RSS 102)

### CONFIGURATION 1: TAG OFF

Electric Field			Magnetic Field		
IC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	IC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
27.46	2.9323	10.678	0.0728	0.0367	50.412

### CONFIGURATION 2: TAG ON (CENTERED)

Electric Field			Magnetic Field		
IC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	IC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
27.46	1.3135	4.791	0.0728	0.0141	19.368

### CONFIGURATION 3: TAG ON (OFFSET)

Electric Field			Magnetic Field		
IC RF Exposure Limit (V/m)	Maximum Average (V/m)	Percentage (%)	IC RF Exposure Limit (A/m)	Maximum Average (A/m)	Percentage (%)
27.46	1.2487	4.547	0.0728	0.0146	20.055

## 8.2.2. E- FIELD AND H- FIELD MEASUREMENTS (IC)

Note: Peak measurements were performed. RMS values were calculated from the peak measurement. Please refer to the formula for calculating the RMS values:  $[\text{Field Strength} \times \sqrt{\text{Duty Cycle}}]$ .

### CONFIGURATION 1: TAG OFF

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			IC	Location	Peak	Duty Cycle %	IC Average	IC	Location	Peak	Duty Cycle %	IC Average
1	NA	20	27.46	Top	4.4598	29.53	2.4235	0.0728	Top	0.0234	29.53	0.0127
				Right	5.0878		2.7647		Right	0.0251		0.0136
				Bottom	3.5116		1.9083		Bottom	0.0233		0.0127
				Left	4.7717		2.5930		Left	0.0249		0.0135
				Front	5.3961		2.9323		Front	0.0676		0.0367
				Max	5.3961		2.9323		Max	0.0676		0.0367

### CONFIGURATION 2: TAG ON (CENTERED)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			IC	Location	Peak	Duty Cycle %	IC Average	IC	Location	Peak	Duty Cycle %	IC Average
2	NA	20	27.46	Top	4.3481	6.03	1.0677	0.0728	Top	0.0232	6.03	0.0057
				Right	4.9453		1.2144		Right	0.0245		0.0060
				Bottom	3.8723		0.9509		Bottom	0.0229		0.0056
				Left	4.8920		1.2013		Left	0.0238		0.0058
				Front	5.3488		1.3135		Front	0.0573		0.0141
				Max	5.3488		1.3135		Max	0.0573		0.0141

### CONFIGURATION 3: TAG ON (OFFSET)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			IC	Location	Peak	Duty Cycle %	IC Average	IC	Location	Peak	Duty Cycle %	IC Average
3	NA	20	27.46	Top	4.2524	6.03	1.0442	0.0728	Top	0.0230	6.03	0.0056
				Right	4.7130		1.1573		Right	0.0237		0.0058
				Bottom	4.2059		1.0328		Bottom	0.0229		0.0056
				Left	4.8763		1.1974		Left	0.0241		0.0059
				Front	5.0850		1.2487		Front	0.0594		0.0146
				Max	5.0850		1.2487		Max	0.0594		0.0146



## 9. RF EXPOSURE TEST SETUP AND SETUP PHOTO

For measurement setup and all testing photos, refer to external photos exhibit R15701621-EP2b

# END OF REPORT