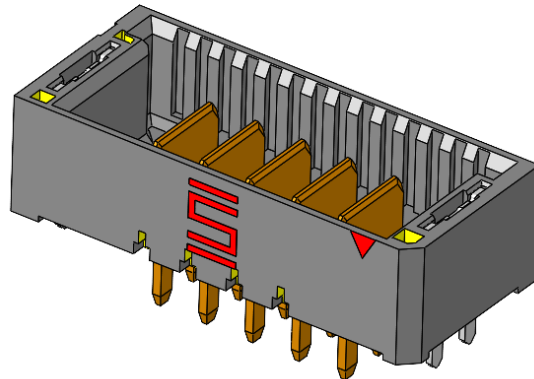
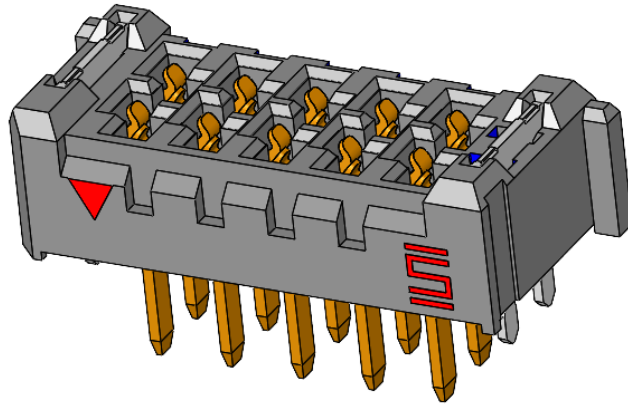




Project Number: Design Qualification Test Report	Tracking Code: CR-1347802_Report_Rev_1
Requested by: Andy Chen	Date: 1/30/2026
Part #: UMPT-05-01.5-G-V-2-W-TR /UMPS-05-03.5-G-V-2-W-TR	
Part description: UMPT/UMPS	Tech: Danton Gan
Test Start: 10/13/2025	Test Completed: 12/04/2025



DESIGN QUALIFICATION TEST REPORT
UMPT/UMPS
UMPT-05-01.5-G-V-2-W-TR /UMPS-05-03.5-G-V-2-W-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
12/25/2025	1	Initial Issue	DG

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to ISO 10012-1 and ANSI/NCSL 2540-1, as applicable.

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SCOPE

To perform the following tests: Design Qualification test. Please see test plan.

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for DWV/IR testing were cleaned according to TLWI-0001.
- 4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead free
- 9) Samtec Test PCBs used: PCB-114486-TST-XX/PCB-114521-TST-XX/ PCB-115164-TST-XX

FLOWCHARTS

Mating/Unmating/Durability

Group 1

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

8 Assemblies

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (1)
3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (1)
5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (1)
7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (1)
9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (1)

(1) Mating/Unmating Force = EIA-364-13

FLOWCHARTS Continued**IR/DWV****Pin-to-Pin****Group 1**

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

2 Assemblies

Group 2

UMPS-05-03.5-G-V-2-W-TR

2 Assemblies

Group 3

UMPT-05-01.5-G-V-2-W-TR

2 Assemblies

Group 4

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Step	Description
1.	DWV Breakdown (2)

Step	Description
1.	DWV Breakdown (2)

Step	Description
1.	IR (4)
2.	DWV at Test Voltage (1)
3.	Thermal Shock (5)
4.	IR (4)
5.	DWV at Test Voltage (1)
6.	Humidity (3)
7.	IR (4)
8.	DWV at Test Voltage (1)

(1) DWV at Test Voltage = EIA-364-20

Test Condition = 1 (Sea Level)

DWV test voltage is equal to 75% of the lowest breakdown voltage

Test voltage applied for 60 seconds

(2) DWV Breakdown = EIA-364-20

Test Condition = 1 (Sea Level)

DWV test voltage is equal to 75% of the lowest breakdown voltage

Test voltage applied for 60 seconds

(3) Humidity = EIA-364-31

Test Condition = B (240 Hours)

Test Method = III (+25°C to +65°C @ 90% RH to 98% RH)

Test Exceptions: ambient pre-condition and delete steps 7a and 7b

(4) IR = EIA-364-21

Test Condition = 500 Vdc, 2 Minutes Max

(5) Thermal Shock = EIA-364-32

Exposure Time at Temperature Extremes = 1/2 Hour

Method A, Test Condition = I (-55°C to +85°C)

Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued**Current Carrying Capacity**Group 1

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

1 Pins Powered

Power

Step Description

1. CCC ⁽¹⁾
Number of Positions = 1
Rows = 1

Group 2

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

2 Pins Powered

Power

Step Description

1. CCC ⁽¹⁾
Number of Positions = 2
Rows = 1

Group 3

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

3 Pins Powered

Power

Step Description

1. CCC ⁽¹⁾
Number of Positions = 3
Rows = 1

Group 4

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

4 Pins Powered

Power

Step Description

1. CCC ⁽¹⁾
Number of Positions = 4
Rows = 1

Group 5

UMPS-05-03.5-G-V-2-W-TR

UMPT-05-01.5-G-V-2-W-TR

5 Pins Powered

Power

Step Description

1. CCC ⁽¹⁾
Rows = 1
Number of Positions = 5

(1) CCC = EIA-364-70

Method 2, Temperature Rise Versus Current Curve

(TIN PLATING) - Tabulate calculated current at RT, 65°C, 75°C and 95°C after derating 20% and based on 105°C

(GOLD PLATING) - Tabulate calculated current at RT, 85°C, 95°C and 115°C after derating 20% and based on 125°C

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

- 1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors*.
- 2) Test Condition 1: -55°C to +85°C
- 3) Test Time: ½ hour dwell at each temperature extreme
- 4) Number of Cycles: 100
- 5) All test samples are pre-conditioned at ambient.
- 6) All test samples are exposed to environmental stress in mated conditions.

HUMIDITY:

- 1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*.
- 2) Test Condition B, 240 Hours.
- 3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
- 4) All samples are pre-conditioned at ambient.
- 5) All test samples are exposed to environmental stressing in mated conditions.

MATING/UNMATING:

- 1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
- 2) The full insertion position was to within 0.003” to 0.004” of the plug bottoming out in the receptacle to prevent damage to the system under test.
- 3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
- 2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
- 3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
- 4) The size of the temperature probe can affect the measured temperature.
- 5) Copper traces on PC boards will contribute to temperature rise:
 - a. Self-heating (resistive)
 - b. Reduction in heat sink capacity affecting the heated contacts
- 6) A de-rating curve, usually 20%, is calculated.
- 7) Calculated de-rated currents at three temperature points are reported:
 - a. Ambient
 - b. 85° C
 - c. 95° C
 - d. 115° C
- 8) Typically, neighboring contacts (in close proximity to maximize heat buildup) are energized.
- 9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
- 10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
- 11) Hook-up wire cross section is larger than the cross section of any connector that leads/PC board traces, jumpers, etc.
- 12) Hook-up wire length is longer than the minimum specified in the referencing standard.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

INSULATION RESISTANCE (IR):

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Adjacent Contacts or Signal-to-Ground
 - ii. Electrification Time 2.0 minutes
 - iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
- 2) MEASUREMENTS:
- 3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potential due to switching, surges, and another similar phenomenon. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Adjacent Contacts or Signal-to-Ground
 - ii. Barometric Test Condition 1
 - iii. Rate of Application 500 V/Sec
 - iv. Test Voltage (VAC) until breakdown occurs
- 2) MEASUREMENTS/CALCULATIONS
 - a. The breakdown voltage shall be measured and recorded.
 - b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
 - c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

RESULTS

Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise-----20.4 A per contact with 1 contact (1 x 1) powered
- CCC for a 30°C Temperature Rise-----17.1 A per contact with 2 contacts (1 x 2) powered
- CCC for a 30°C Temperature Rise-----15.7 A per contact with 3 contacts (1 x 3) powered
- CCC for a 30°C Temperature Rise-----14.3 A per contact with 4 contacts (1 x 4) powered
- CCC for a 30°C Temperature Rise-----14.5 A per contact with 5 contacts (1 x 5) powered

Mating/Unmating Forces

Mating-Unmating Durability

- **Initial**
 - **Mating**
 - **Min** ----- 3.63 Lbs
 - **Max** ----- 4.18 Lbs
 - **Unmating**
 - **Min** ----- 1.97 Lbs
 - **Max** ----- 3.27 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 4.07 Lbs
 - **Max** ----- 4.63 Lbs
 - **Unmating**
 - **Min** ----- 3.01 Lbs
 - **Max** ----- 4.76 Lbs
- **After 50 Cycles**
 - **Mating**
 - **Min** ----- 4.23 Lbs
 - **Max** ----- 5.34 Lbs
 - **Unmating**
 - **Min** ----- 3.51 Lbs
 - **Max** ----- 5.68 Lbs
- **After 75 Cycles**
 - **Mating**
 - **Min** ----- 4.53 Lbs
 - **Max** ----- 6.02 Lbs
 - **Unmating**
 - **Min** ----- 4.14 Lbs
 - **Max** ----- 6.28 Lbs
- **After 100 Cycles**
 - **Mating**
 - **Min** ----- 4.79 Lbs
 - **Max** ----- 6.20 Lbs
 - **Unmating**
 - **Min** ----- 4.76 Lbs
 - **Max** ----- 6.41 Lbs

RESULTS Continued**Insulation Resistance minimums, IR****Pin to Pin**

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated ----- 45000 Meg Ω ----- Passed
- **Thermal Shock**
 - Mated----- 45000 Meg Ω ----- Passed
 - Unmated ----- 45000 Meg Ω ----- Passed
- **Humidity**
 - Mated-----20000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - Breakdown Voltage----- 1867 VAC
 - Test Voltage ----- 1400 VAC
 - Working Voltage -----467 VAC

Pin to Pin

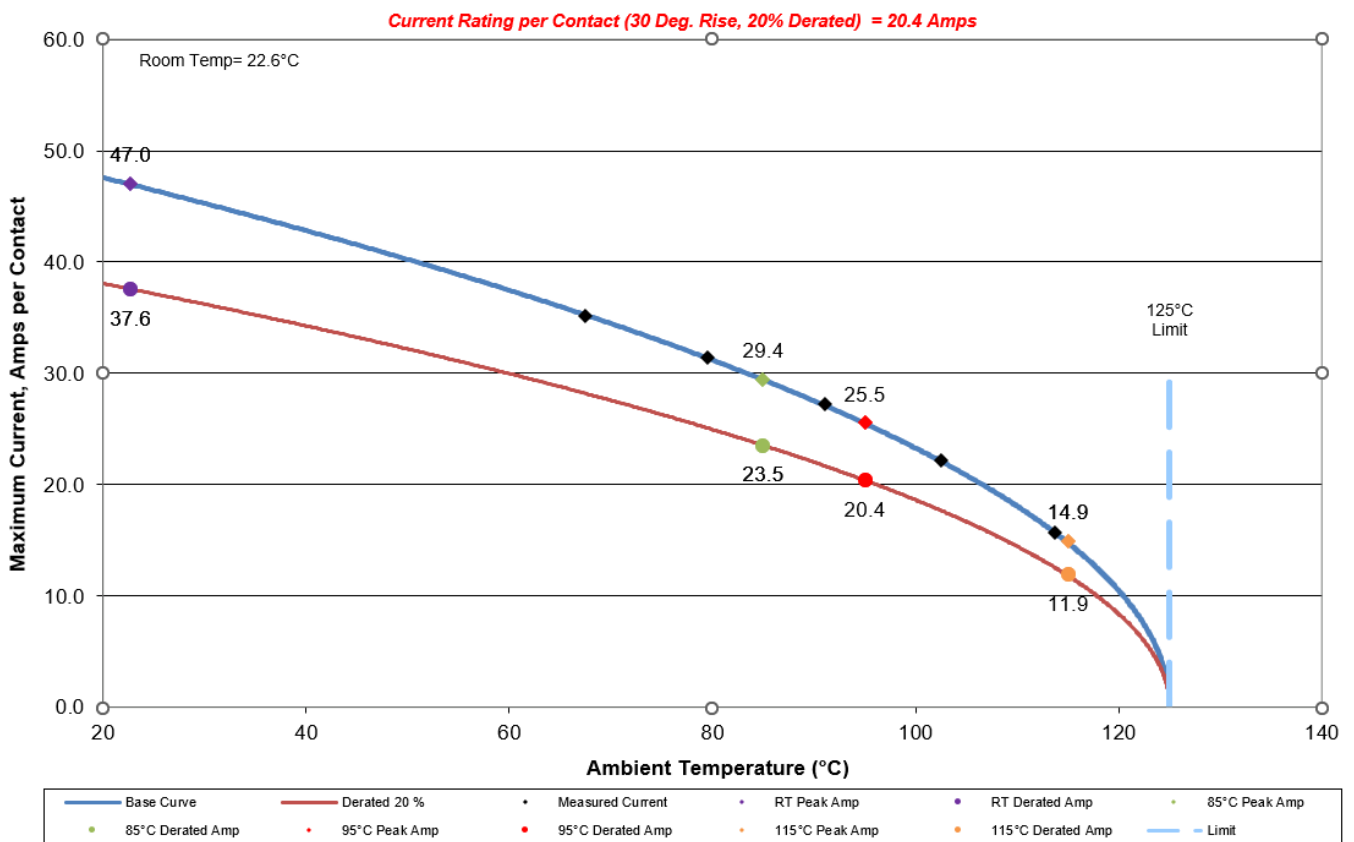
- **Initial DWV**-----Passed
- **Thermal DWV**-----Passed
- **Humidity DWV**-----Passed

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

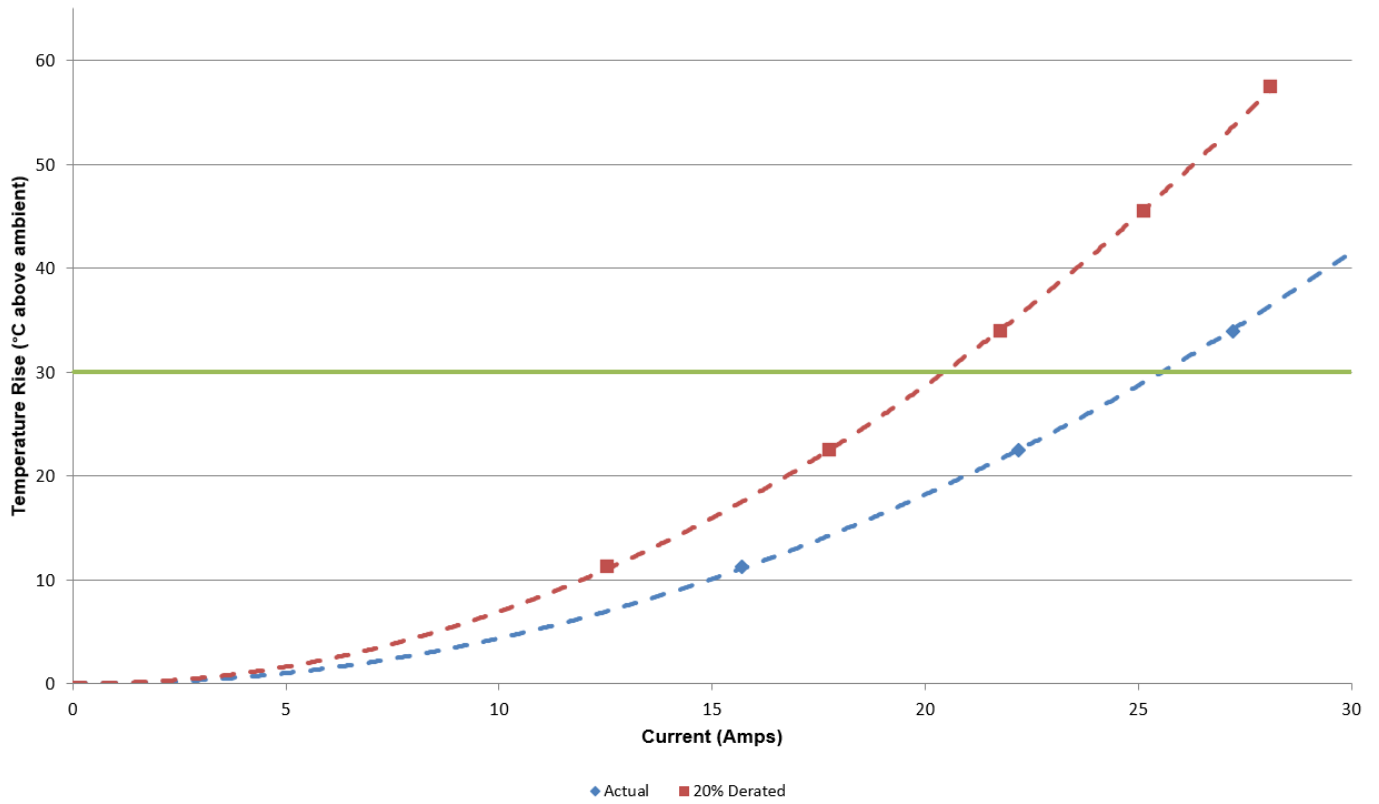
- 1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
- 2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
- 3) Temperature readings are recorded for which three successive readings, 15 minutes apart, differ less than 1° C (computer-controlled data acquisition).
- 4) Adjacent contacts were powered:
 - a. Linear configuration with 1 adjacent power contacts powered

CR-1347802
1(1X1) Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



DATA SUMMARIES Continued

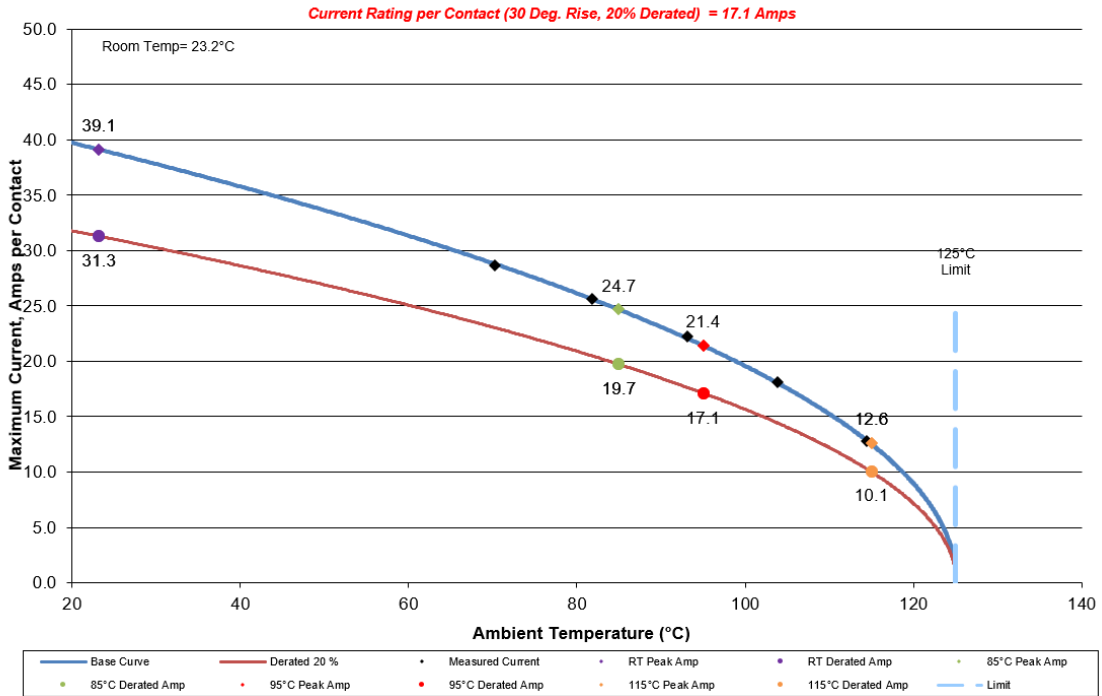
CR-1347802
1(1X1) Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



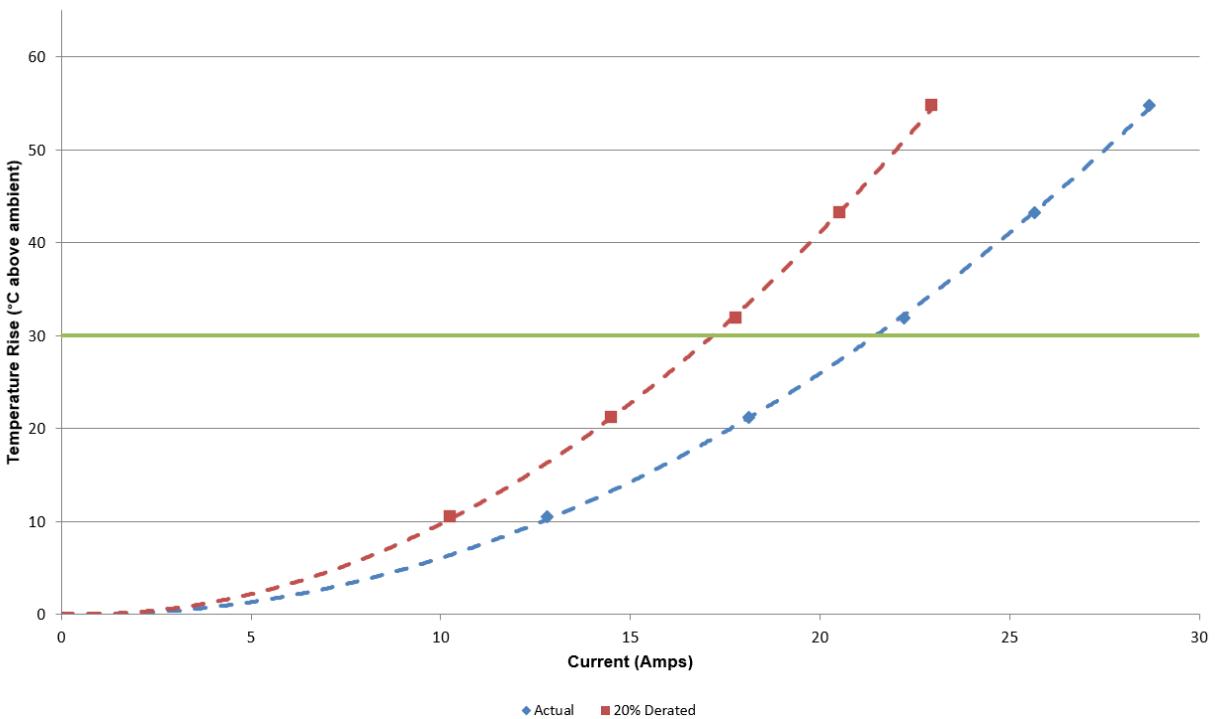
DATA SUMMARIES Continued

b. Linear configuration with 2 adjacent power contacts powered

CR-1347802
2(1X2) Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



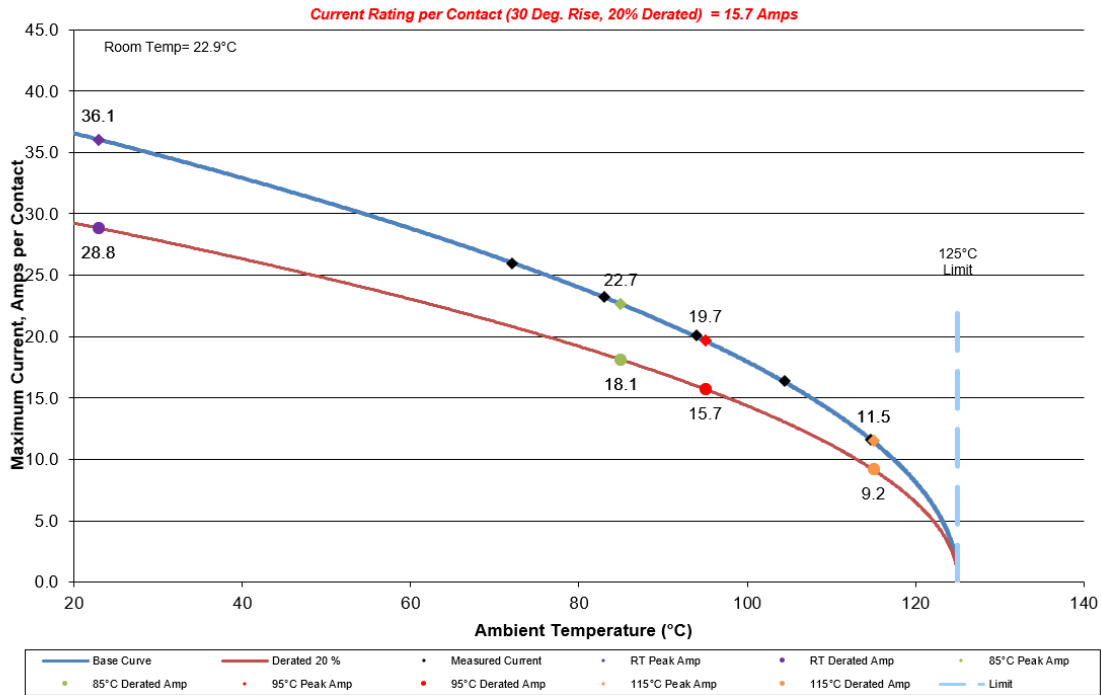
CR-1347802
2(1X2) Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



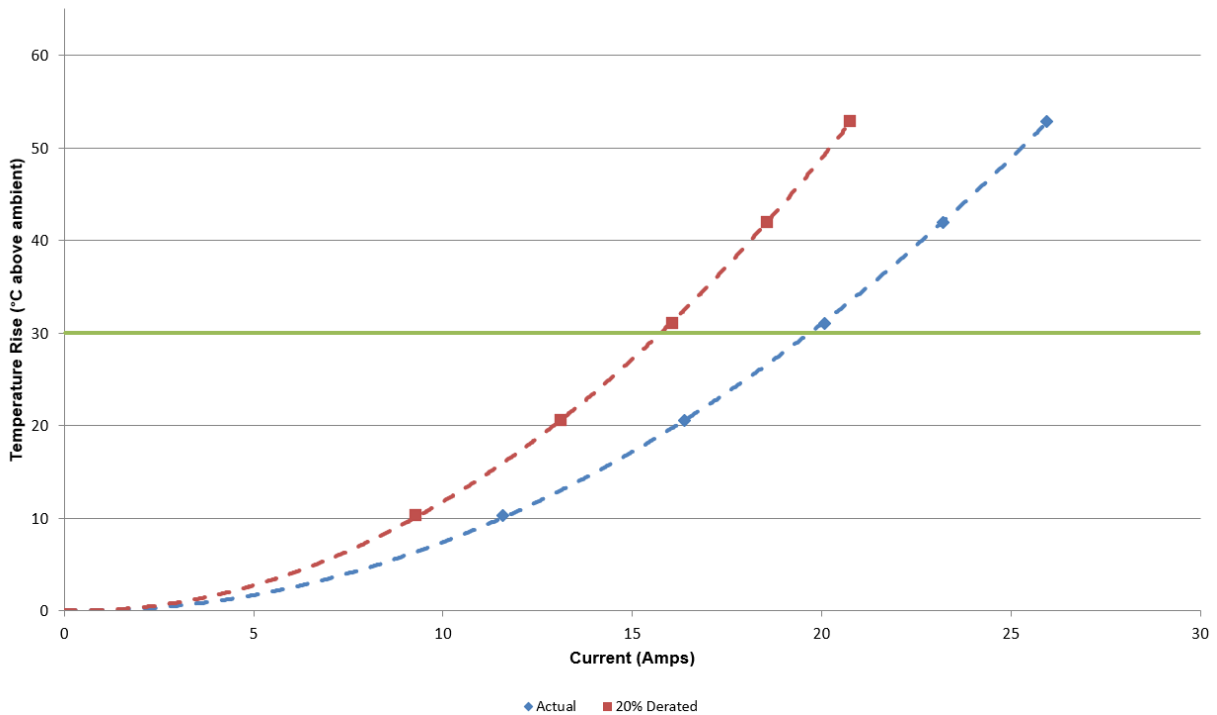
DATA SUMMARIES Continued

c. Linear configuration with 3 adjacent power contacts powered

CR-1347802
 3(1X3) Contacts in Series
 Part Numbers:UMPS-05-03.5-G-V-2-W-TR



CR-1347802
 3(1X3) Contacts in Series
 Part Numbers:UMPS-05-03.5-G-V-2-W-TR

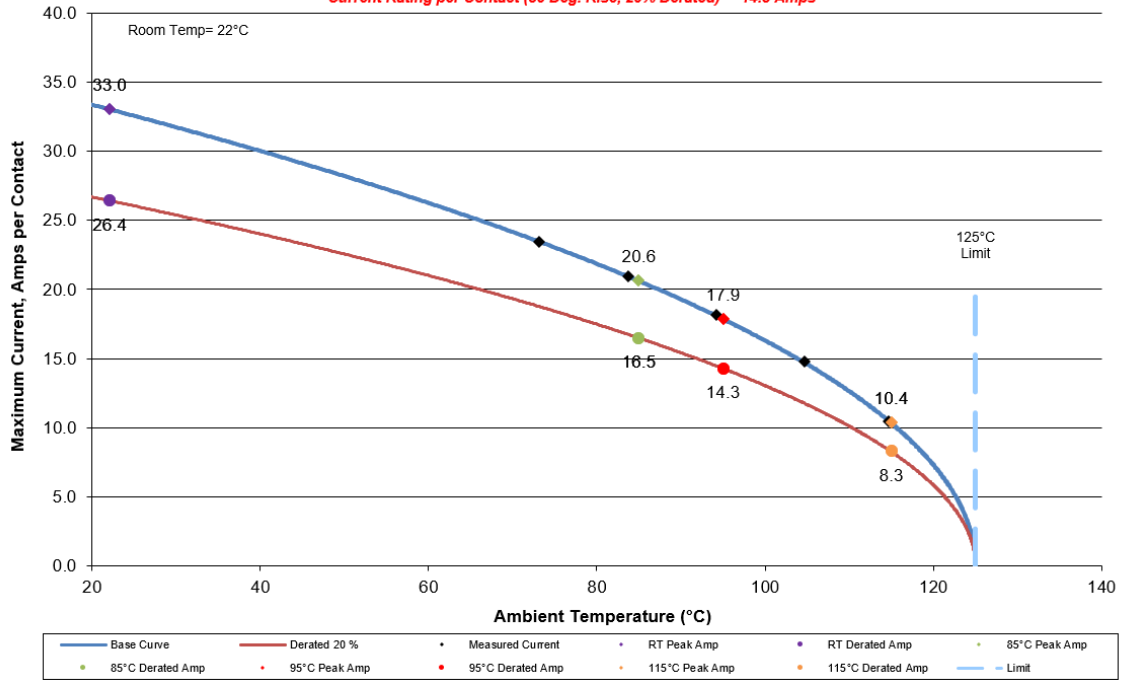


DATA SUMMARIES Continued

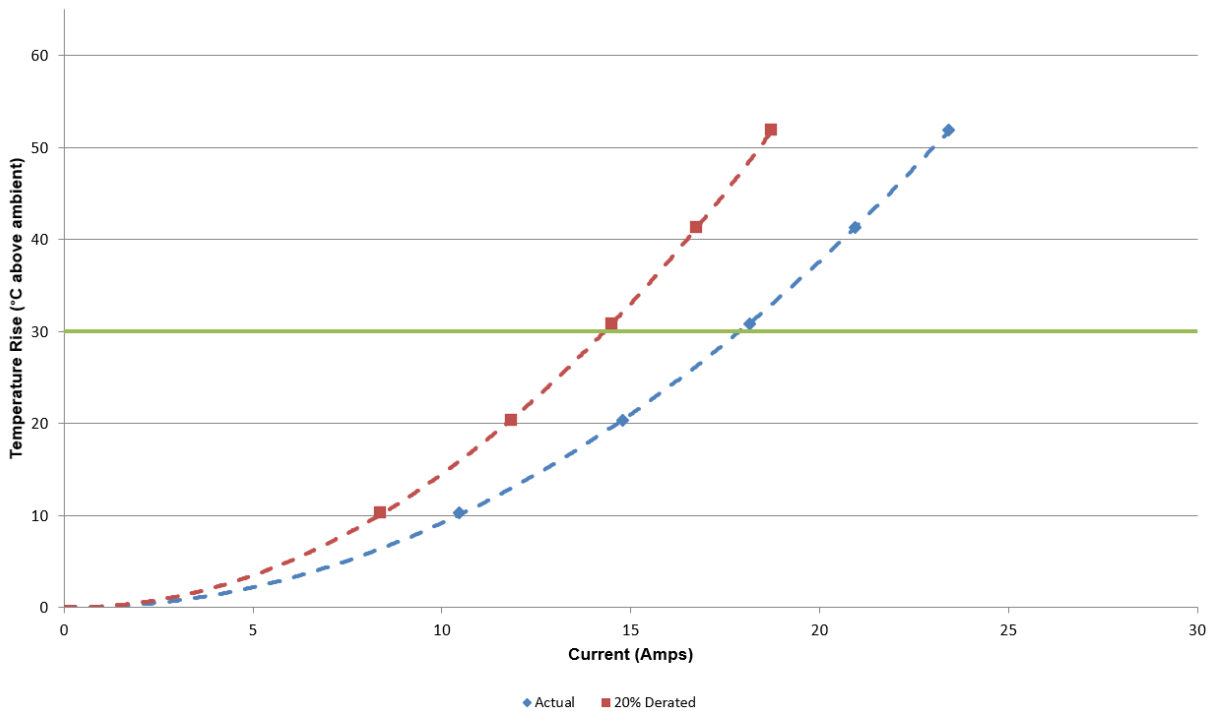
d. Linear configuration with 4 adjacent power contacts powered

CR-1347802
 4(1X4)Contacts in Series
 Part Numbers:UMPS-05-03.5-G-V-2-W-TR

Current Rating per Contact (30 Deg. Rise, 20% Derated) = 14.3 Amps



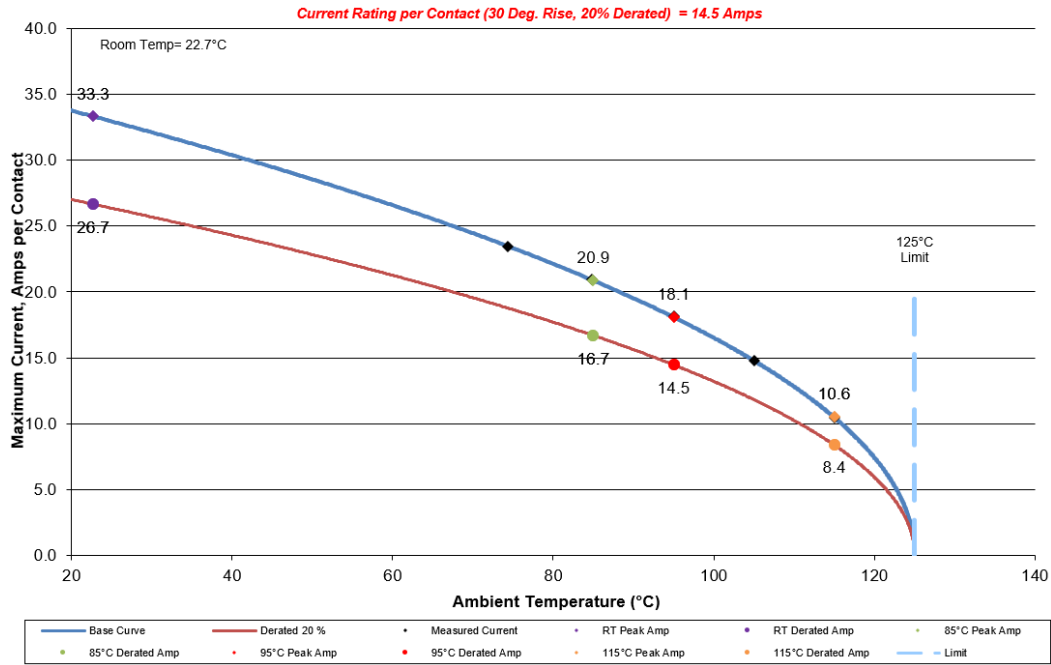
CR-1347802
 4(1X4)Contacts in Series
 Part Numbers:UMPS-05-03.5-G-V-2-W-TR



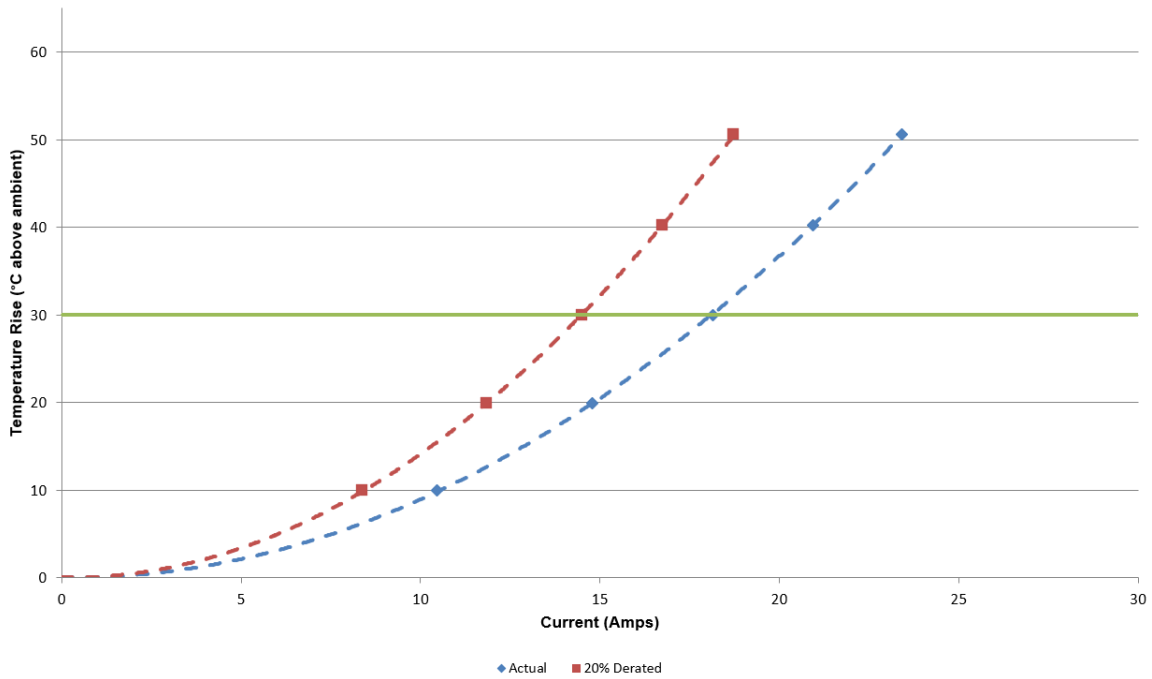
DATA SUMMARIES Continued

e. Linear configuration with all adjacent power contacts powered

CR-1347802
5(1X5)Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



CR-1347802
5(1X5)Contacts in Series
Part Numbers:UMPS-05-03.5-G-V-2-W-TR



DATA SUMMARIES Continued**MATING-UNMATING FORCE:****Mating-Unmating Durability Group**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)
Minimum	16.15	3.63	8.76	1.97	18.10	4.07	13.39	3.01
Maximum	18.59	4.18	14.54	3.27	20.59	4.63	21.17	4.76
Average	17.54	3.94	11.85	2.67	19.54	4.39	17.64	3.97
St Dev	0.86	0.19	1.83	0.41	0.98	0.22	2.83	0.64
Count	8	8	8	8	8	8	8	8
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)
Minimum	18.82	4.23	15.61	3.51	20.15	4.53	18.41	4.14
Maximum	23.75	5.34	25.26	5.68	26.78	6.02	27.93	6.28
Average	20.79	4.68	20.99	4.72	23.11	5.20	23.44	5.27
St Dev	1.67	0.38	3.25	0.73	2.28	0.51	3.24	0.73
Count	8	8	8	8	8	8	8	8
	After 100 Cycles							
	Mating		Unmating					
	Newton	Force (Lbs)	Newton	Force (Lbs)				
Minimum	21.31	4.79	21.17	4.76				
Maximum	27.58	6.20	28.51	6.41				
Average	24.57	5.52	25.14	5.65				
St Dev	2.25	0.51	2.64	0.59				
Count	8	8	8	8				

DATA SUMMARIES Continued**INSULATION RESISTANCE (IR):**

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	UMPS/UMPT	UMPS	UMPT
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	20000	45000	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	UMPS/UMPT
Break Down Voltage	1866
Test Voltage	1400
Working Voltage	467

Pin to Pin	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** HZ-TCT-01**Description:** Normal force analyzer**Manufacturer:** Mecmesin Multitester**Model:** Mecmesin Multitester 2.5-i**Serial #:** 08-1049-04**Accuracy:** Last Cal: 4/25/2025, Next Cal: 4/24/2026**Equipment #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermtron**Model:** SM-8-8200**Serial #:** 38846**Accuracy:** Last Cal: 2/27/2025, Next Cal: 2/26/2026**Equipment #:** DG-HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 025866**Accuracy:** Last Cal: 04/16/2025, Next Cal: 04/15/2026**Equipment #:** HZ-TSC-01**Description:** Vertical Thermal Shock Chamber**Manufacturer:** Cincinnatti Sub Zero**Model:** VTS-3-6-6-SC/AC**Serial #:** 10-VT14994**Accuracy:** Last Cal: 06/26/2025, Next Cal: 06/25/2026