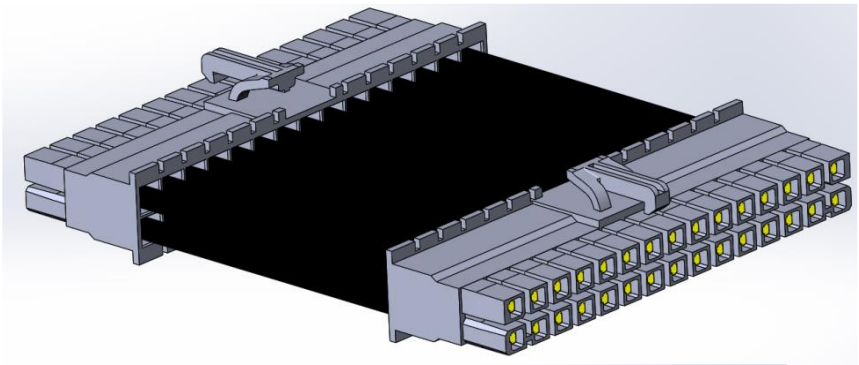
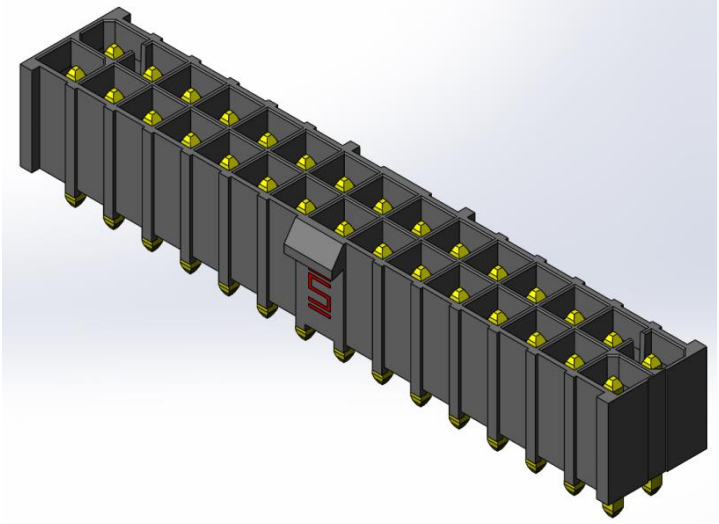
Project Number: Design Qualification Test Report	Tracking Code: CR-687202_Report_Rev_1
Requested by: Kaelin Love	Date: 3/30/2022
Part #: PMSD-15-16-K-12.00-D-LUS/IPBT-115-H1-T-D-K	
Part description: PMSD/IPBT	Tech: Tony Wagoner
Test Start: 3/1/2022	Test Completed: 3/3/2022





DESIGN QUALIFICATION TEST REPORT

PMSD/IPBT
PMSD-15-16-K-12.00-D-LUS/IPBT-115-H1-T-D-K

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
3/29/2022	**1**	**Initial Issue**	**KH**

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

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 testing were cleaned according to CO-SC-WI-3029.
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) Any additional preparation will be noted in the individual test sequences.
7) Solder Information: Lead Free
8) Samtec Test PCBs used: PCB-109949-TST

FLOWCHARTS

Current Carrying Capacity

Group 1
PMSD-15-16-K-12.00-D-LUS
IPBT-115-H1-T-D-K
2 Pins Powered
Signal

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

Group 2
PMSD-15-16-K-12.00-D-LUS
IPBT-115-H1-T-D-K
4 Pins Powered
Signal

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

Group 3
PMSD-15-16-K-12.00-D-LUS
IPBT-115-H1-T-D-K
6 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 3

Group 4
PMSD-15-16-K-12.00-D-LUS
IPBT-115-H1-T-D-K
8 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 4

Group 5
PMSD-15-16-K-12.00-D-LUS
IPBT-115-H1-T-D-K
30 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 15

(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.

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. 65^{o} C
    c. 75^{o} C
    d. 95^{o} C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) 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 leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

RESULTS

Temperature Rise, CCC at a 20% de-rating

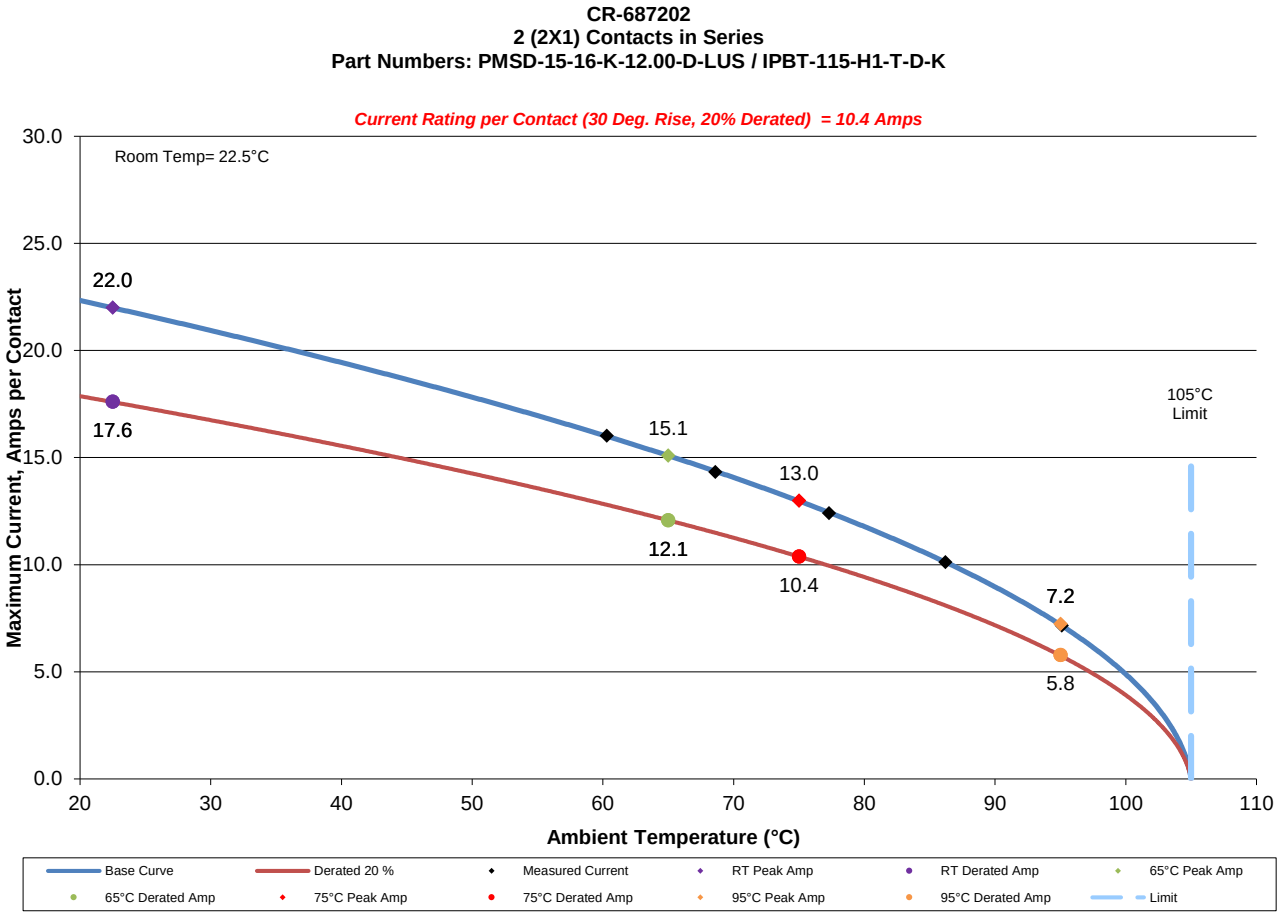
- **CCC for a 30°C Temperature Rise----------10.4 A per contact with 2 contacts (2 x 1) powered**
- **CCC for a 30°C Temperature Rise----------9.2 A per contact with 4 contacts (2 x 2) powered**
- **CCC for a 30°C Temperature Rise----------7.9 A per contact with 6 contacts (2 x 3) powered**
- **CCC for a 30°C Temperature Rise----------7.3 A per contact with 8 contacts (2 x 4) powered**
- **CCC for a 30°C Temperature Rise----------6.2 A per contact with 30 contacts (2 x 15) powered**

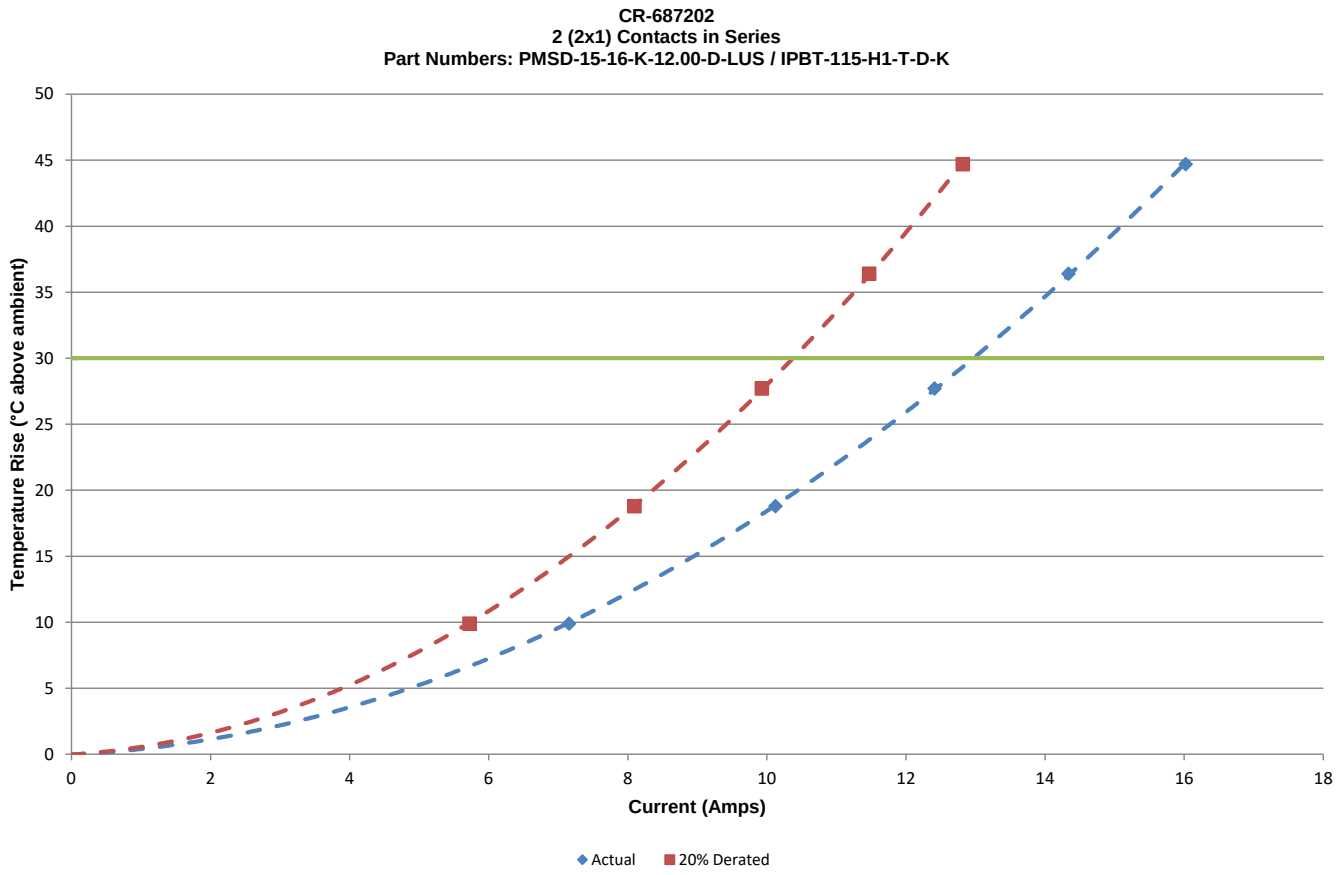
DATA SUMMARIES

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 recorded are those for which three successive readings, 15 minutes apart, differ less than 1° C (computer-controlled data acquisition).
4) Adjacent contacts were powered:

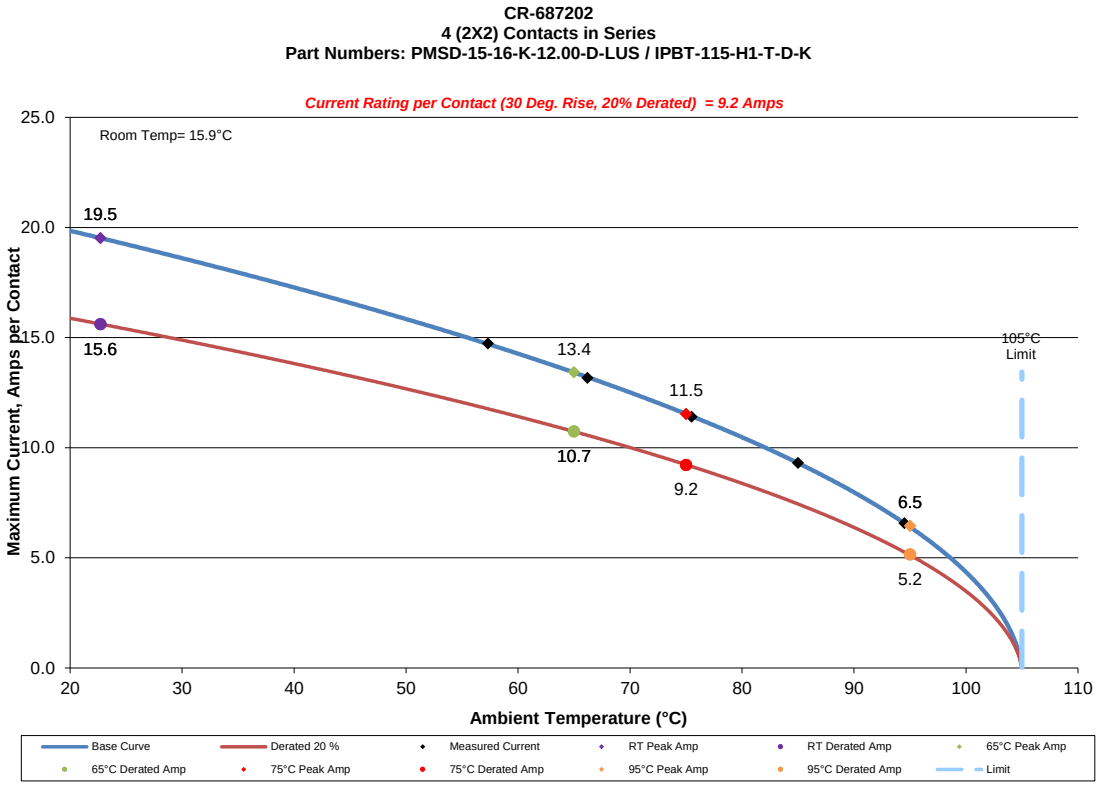
    a. Linear configuration with 2 adjacent conductors/contacts powered

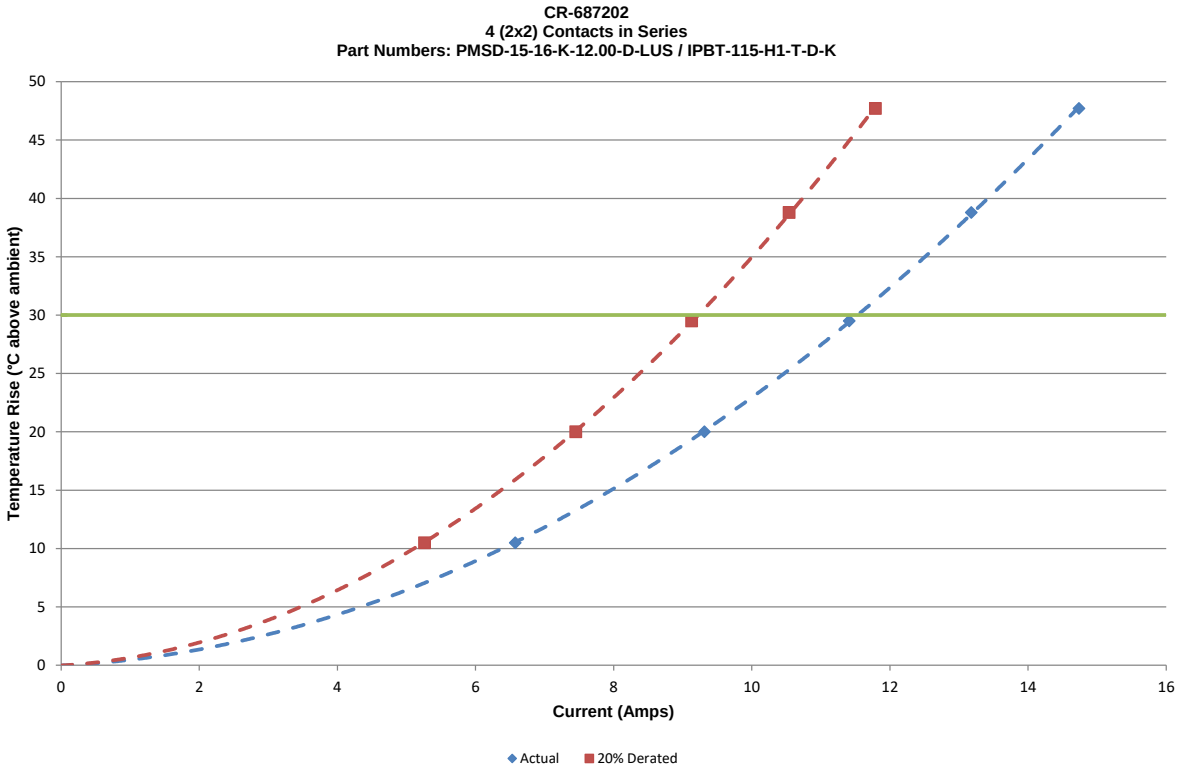



CR-687202
2 (2x1) Contacts in Series
Part Numbers: PMSD-15-16-K-12.00-D-LUS / IPBT-115-H1-T-D-K
Temperature Rise (°C above ambient)
50
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
Current (Amps)
Actual
20% Derated

DATA SUMMARIES Continued

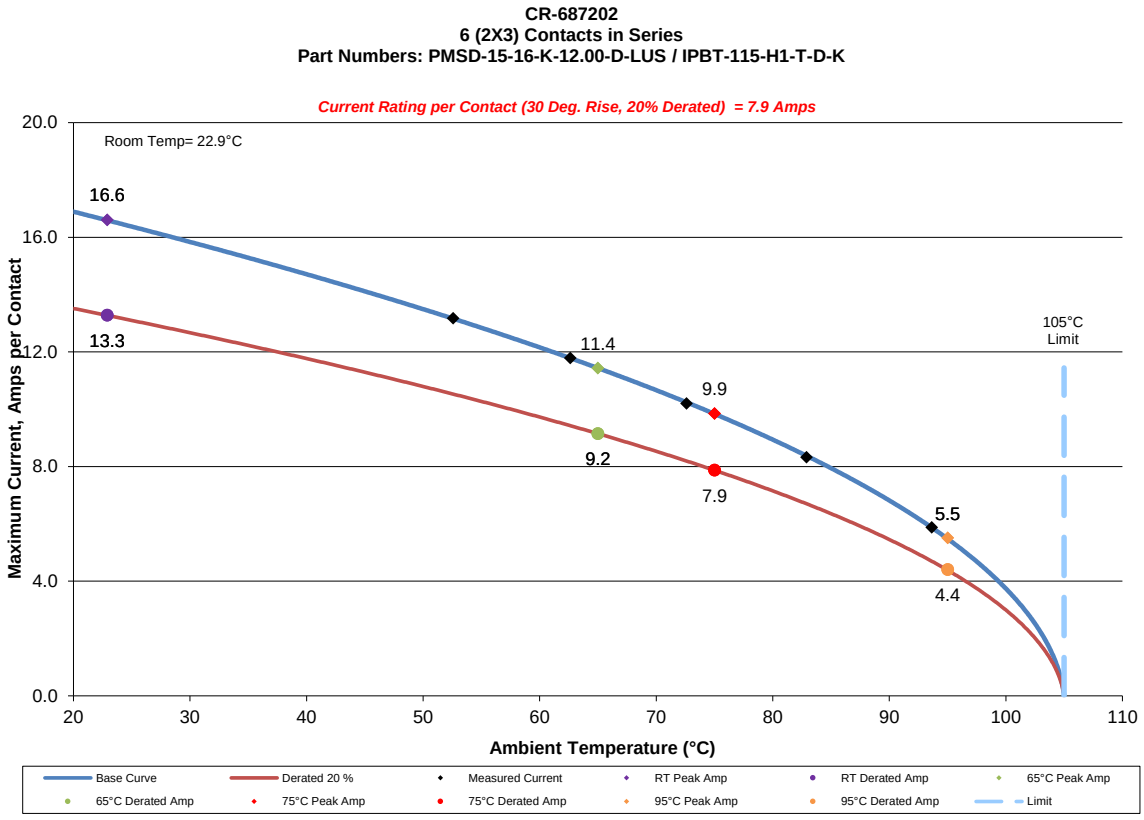
b. Linear configuration with 4 adjacent conductors/contacts powered

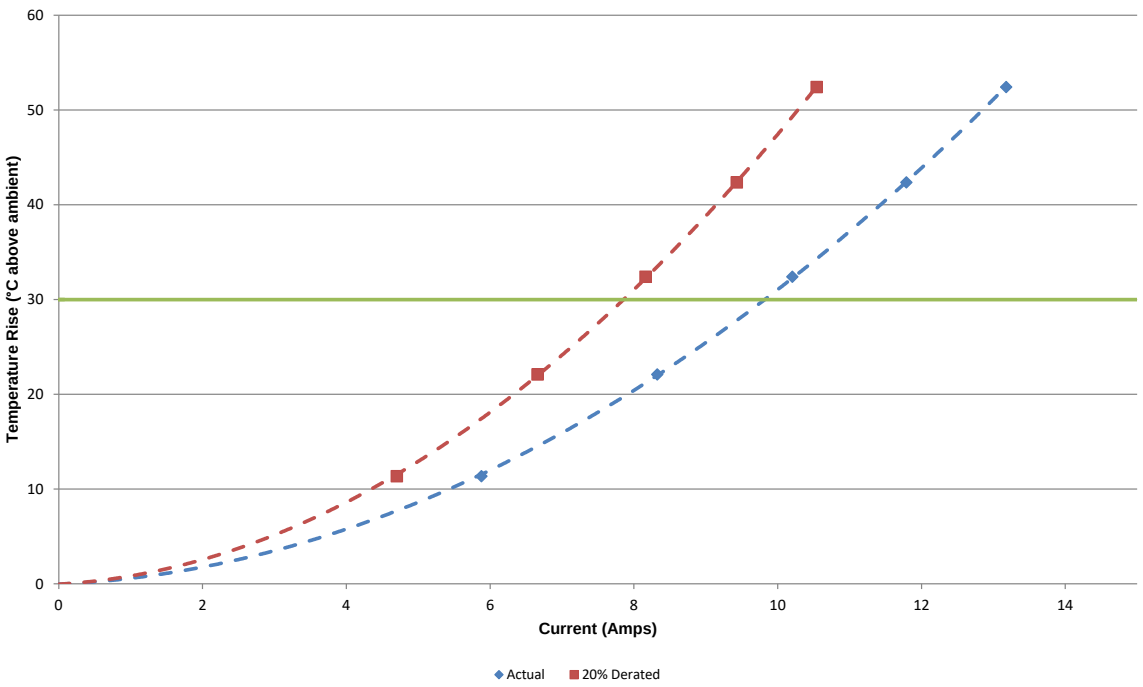




DATA SUMMARIES Continued

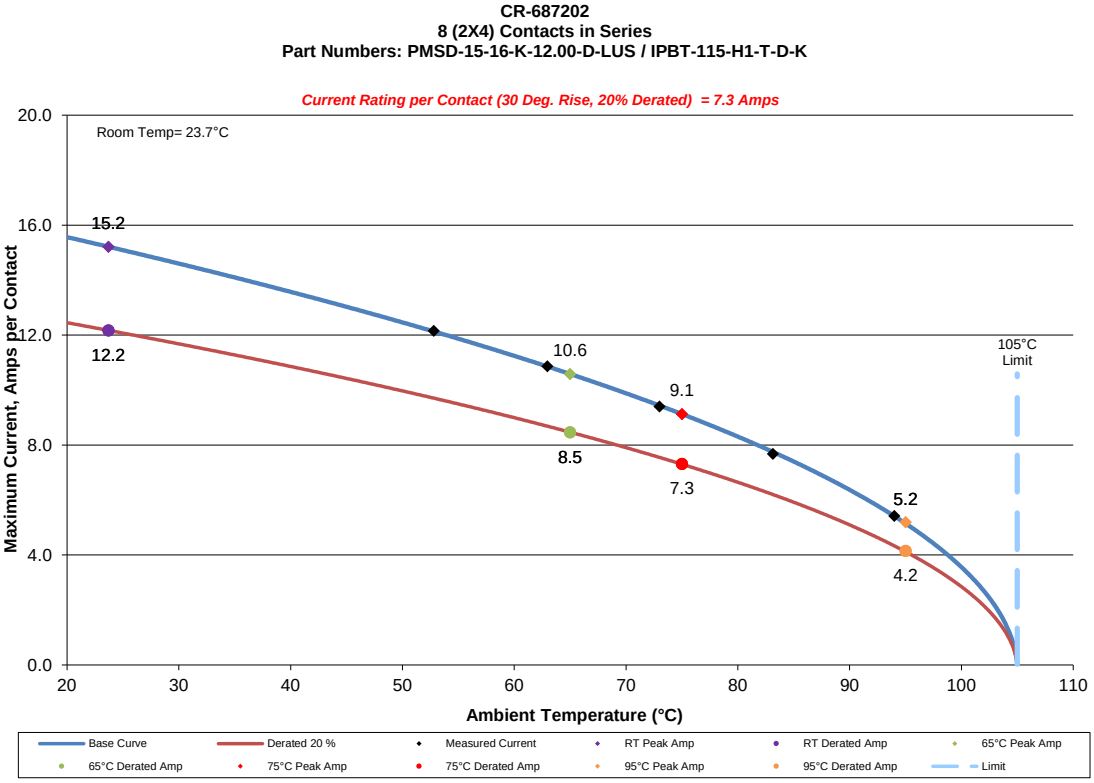
c. Linear configuration with 6 adjacent conductors/contacts powered

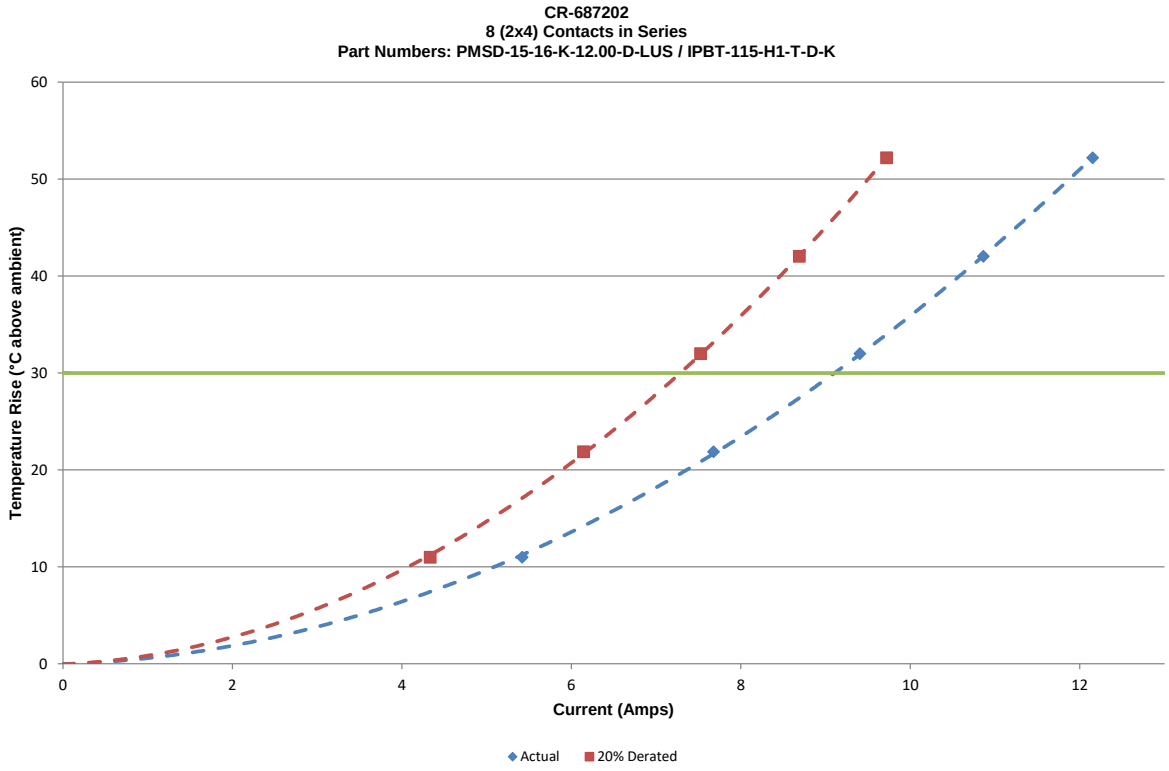




DATA SUMMARIES Continued

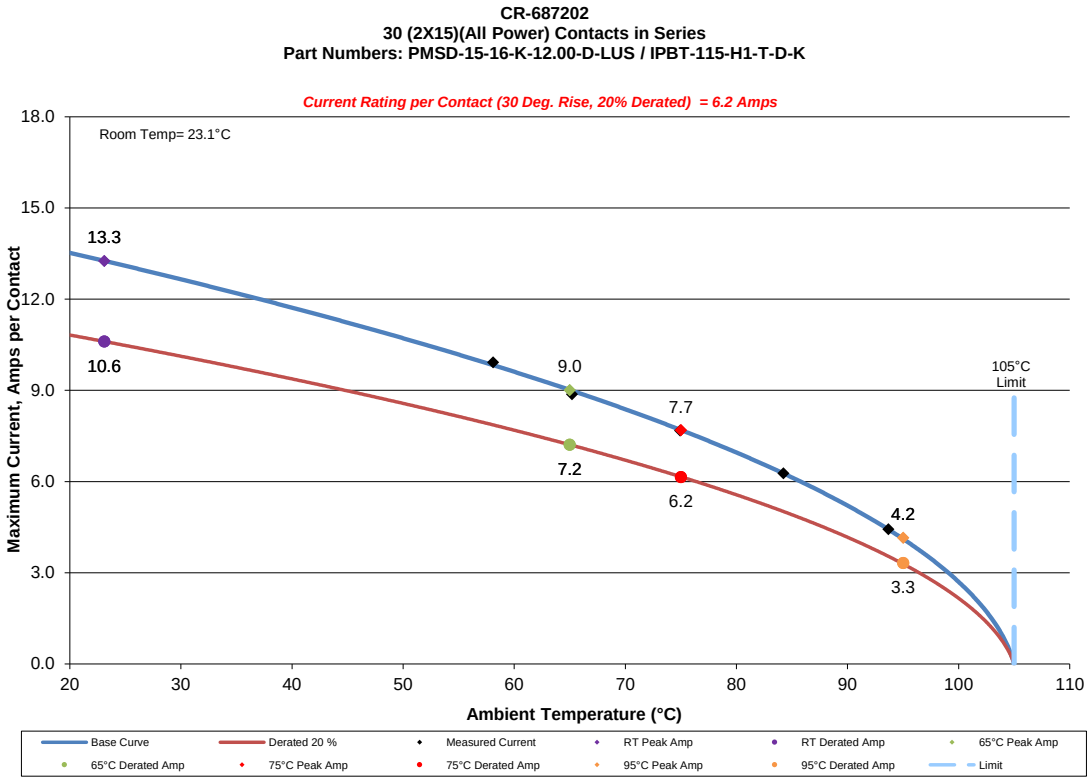
d. Linear configuration with 8 adjacent conductors/contacts powered

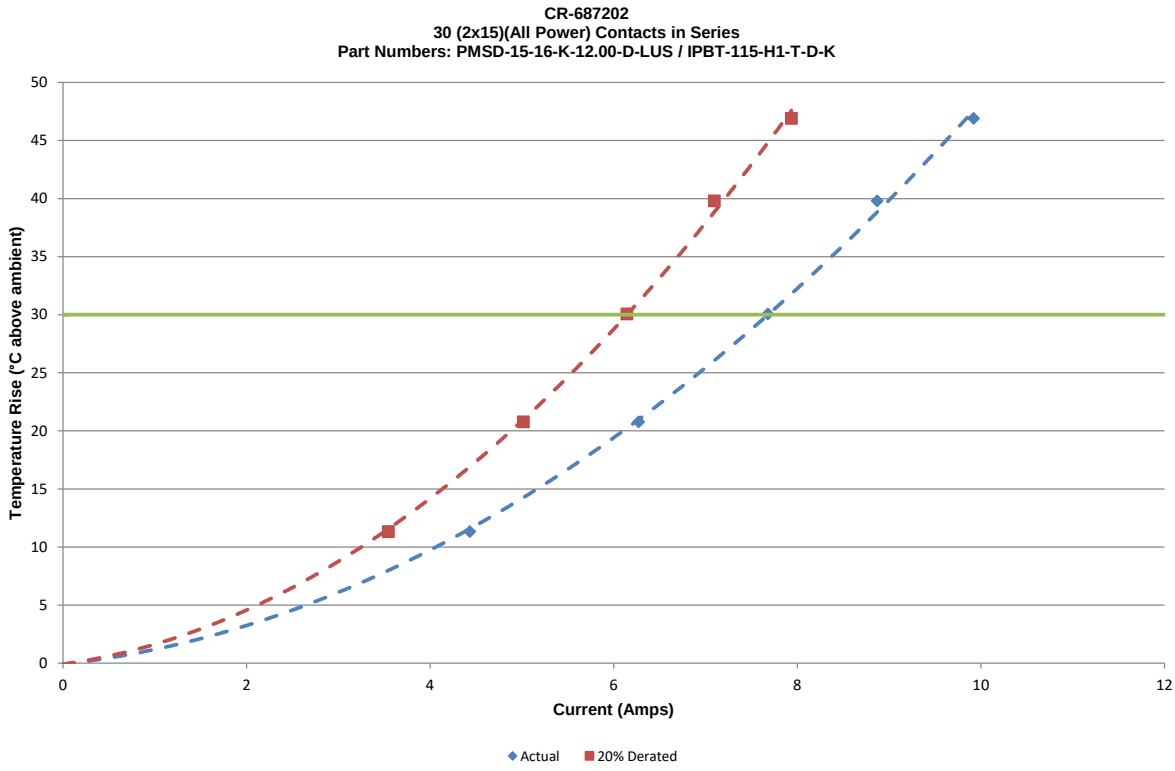




DATA SUMMARIES Continued

e. Linear configuration with 30 adjacent conductors/contacts powered





EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: PS-02
Description: Power Supply
Manufacturer: Hewlett-Packer
Model: 6033A
Serial #: N/A
Accuracy: See Manual
… Last Cal: NOT CALIBRATED

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 09/11/2021, Next Cal: 09/11/2022