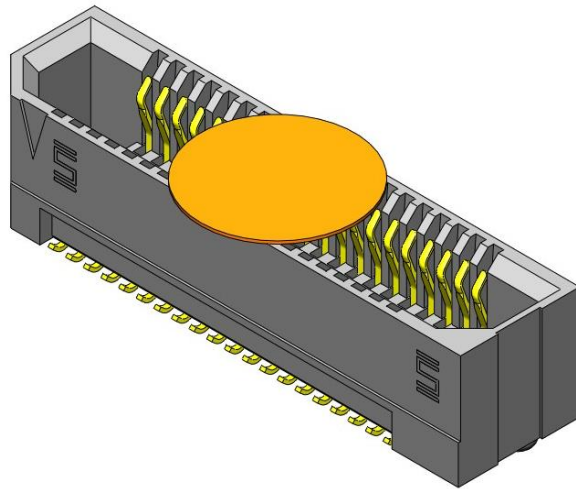
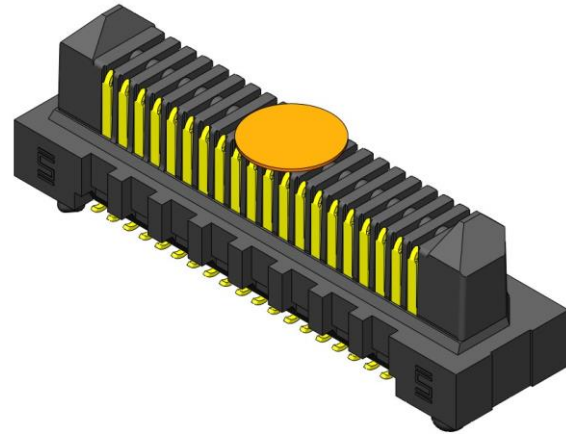




Project Number: Design Qualification Test Report	Tracking Code: CR-946801_Report_Rev_1
Requested by: Mark Shireman	Date: 8/18/2023
Part #: ERF8-020-05.0-L-DV-K-TR / ERM8-020-03.0-L-DV-K-TR	
Part description: ERF8/ERM8	Tech: Daniel Haydon
Test Start: 7/21/2023	Test Completed: 8/7/2023



DESIGN QUALIFICATION TEST REPORT
ERF8/ERM8
ERF8-020-05.0-L-DV-K-TR / ERM8-020-03.0-L-DV-K-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
8/18/2023	1	Initial Issue	KH

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 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) Parts not intended for testing DWV 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-113032-TST

FLOWCHARTS

IR/DWV

Note: No IR - Just DWV

Pin-to-Pin P1 and P3 (Pull others to match PCB)

Group 1

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 2

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

Pin-to-Pin P1 and P5 (Pull others to match PCB)

Group 3

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 4

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

Pin-to-Pin P1 and P7 (Pull others to match PCB)

Group 5

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 6

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

Pin-to-Pin P1 and P9 (Pull others to match PCB)

Group 7

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 8

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

FLOWCHARTS Continued**Pin-to-Pin P1 and P11 (Pull others to match PCB)**Group 9

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 10

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

Pin-to-Pin P1 and P13 (Pull others to match PCB)Group 11

ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 12

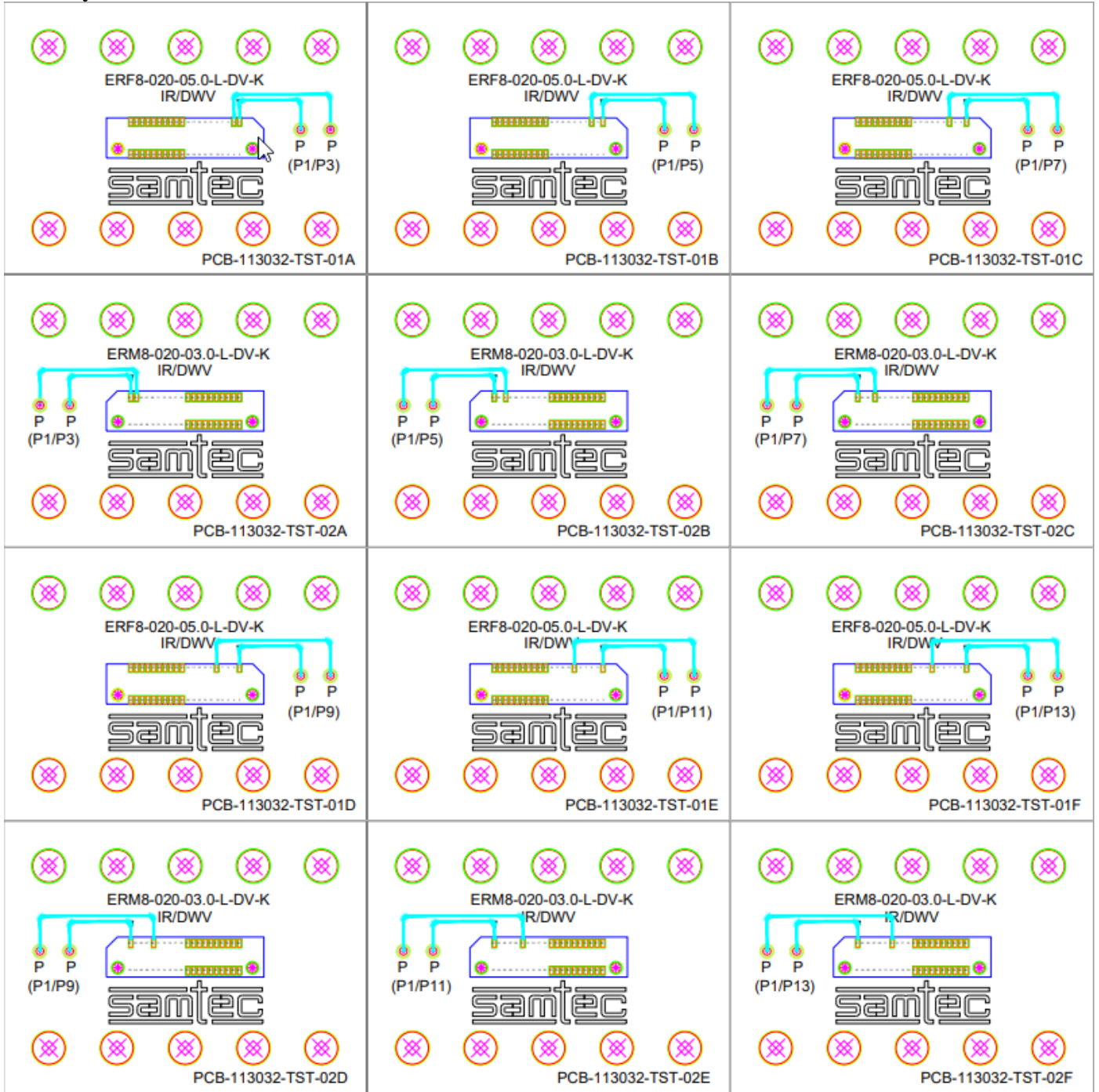
ERF8-020-05.0-L-DV-K-TR
ERM8-020-03.0-L-DV-K-TR
2 Assemblies

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

PCB Layout



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: -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 stressing in the mated condition.

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 the mated condition.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other 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**Dielectric Withstanding Voltage minimums, DWV****Pin to pin P1 and P3 (Pull others to match PCB)**

- **Minimums**
 - Breakdown Voltage----- 1031 VAC
 - Test Voltage -----773 VAC
 - Working Voltage -----258 VAC

Pin to Pin

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

Pin to pin P1 and P5 (Pull others to match PCB)

- **Minimums**
 - Breakdown Voltage----- 2409 VAC
 - Test Voltage -----1807 VAC
 - Working Voltage -----602 VAC

Pin to Pin

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

Pin to pin P1 and P7 (Pull others to match PCB)

- **Minimums**
 - Breakdown Voltage----- 2786 VAC
 - Test Voltage -----2090 VAC
 - Working Voltage -----697 VAC

Pin to Pin

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

Pin to pin P1 and P9 (Pull others to match PCB)

- **Minimums**
 - Breakdown Voltage----- 3052 VAC
 - Test Voltage -----2289 VAC
 - Working Voltage -----763 VAC

Pin to Pin

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

Pin to pin P1 and P11 (Pull others to match PCB)

- **Minimums**
 - Breakdown Voltage----- 3371 VAC
 - Test Voltage -----2528 VAC
 - Working Voltage -----843 VAC

Pin to Pin

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

RESULTS Continued

Pin to pin P1 and P13 (Pull others to match PCB)

- **Minimums**

- Breakdown Voltage ----- 3636 VAC
- Test Voltage ----- 2727 VAC
- Working Voltage ----- 909 VAC

Pin to Pin

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

DATA SUMMARIES**DIELECTRIC WITHSTANDING VOLTAGE (DWV):****Pin to pin P1 and P3 (Pull others to match PCB)**

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	1031
Test Voltage	773
Working Voltage	258

Pin to Pin (P1 and P3)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Pin to pin P1 and P5 (Pull others to match PCB)

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	2409
Test Voltage	1807
Working Voltage	602

Pin to Pin (P1 and P5)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Pin to pin P1 and P7 (Pull others to match PCB)

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	2786
Test Voltage	2090
Working Voltage	697

Pin to Pin (P1 and P7)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

DATA SUMMARIES Continued**Pin to pin P1 and P9 (Pull others to match PCB)**

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	3052
Test Voltage	2289
Working Voltage	763

Pin to Pin (P1 and P9)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Pin to pin P1 and P11 (Pull others to match PCB)

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	3371
Test Voltage	2528
Working Voltage	843

Pin to Pin (P1 and P11)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Pin to pin P1 and P13 (Pull others to match PCB)

Voltage Rating Summary	
Minimum	ERF8/ERM8
Break Down Voltage	3636
Test Voltage	2727
Working Voltage	909

Pin to Pin (P1 and P13)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** THC-05**Description:** Temperature/Humidity Chamber (Chamber Room)**Manufacturer:** Thermotron**Model:** SM-8-3800**Serial #:** 05 23 00 02**Accuracy:** See Manual

... Last Cal: 11/14/2022, Next Cal: 11/14/2023

Equipment #: TSC-01**Description:** Vertical Thermal Shock Chamber**Manufacturer:** Cincinnati Sub Zero**Model:** VTS-3-6-6-SC/AC**Serial #:** 10-VT14993**Accuracy:** See Manual

... Last Cal: 06/30/2023, Next Cal: 06/30/2024

Equipment #: HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 019808**Accuracy:**

... Last Cal: 05/15/2023, Next Cal: 05/15/2024