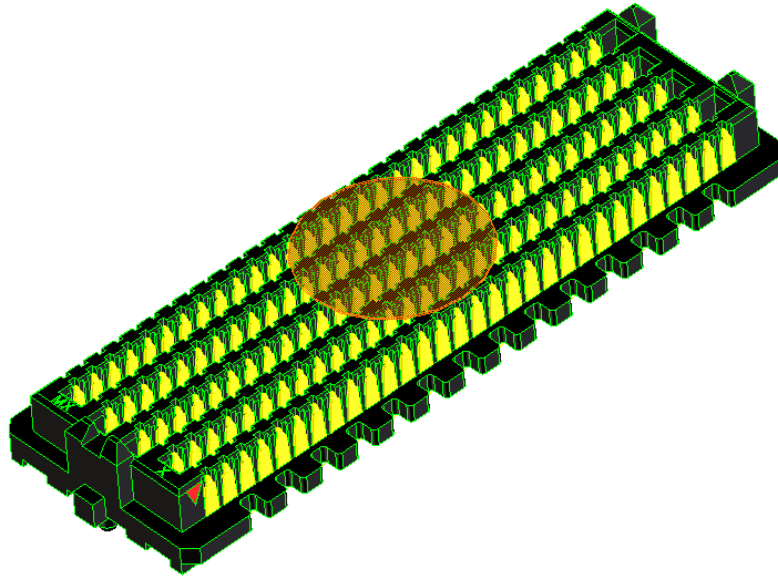




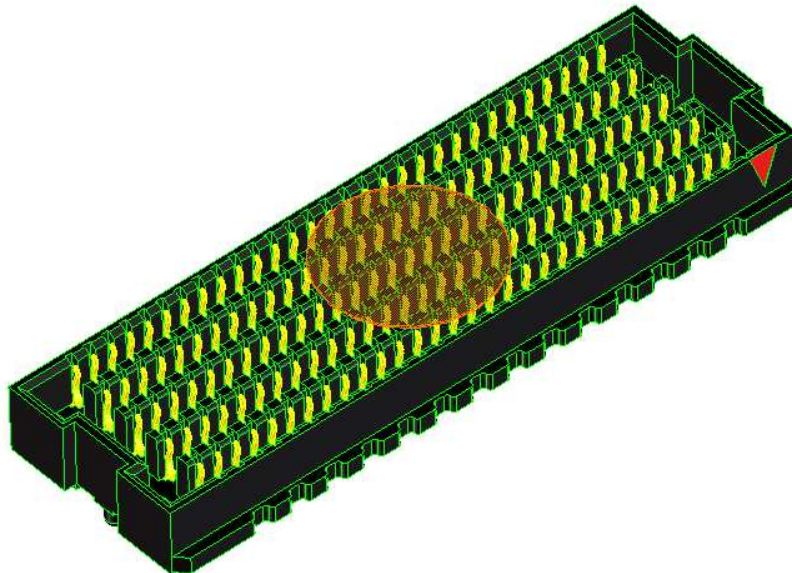
PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

SEARAY PLUG CONNECTOR



SEARAY RECEPTACLE CONNECTOR



| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

1.0 SCOPE

This Product Specification covers the 1.27 mm (.050 inch) centerline (pitch) SEARAY printed circuit board connector series. The SEARAY connect system consists of a plug and receptacle connector in various stack heights and circuit sizes.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAMES

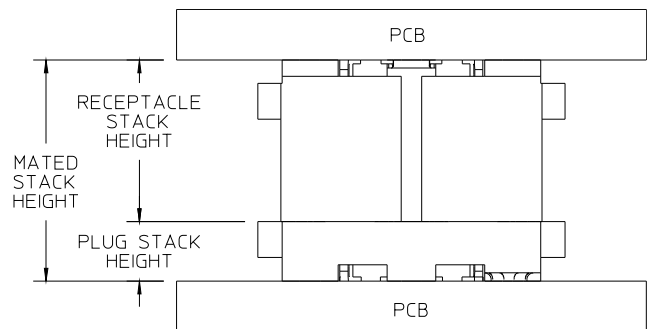
- 45970 SEARAY Plug Connector
- 45971 SEARAY Receptacle Connector
- 46556 SEARAY Slim Plug Connector
- 46557 SEARAY Slim Receptacle Connector

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Refer to the appropriate sales drawings for information on dimensions, materials, platings and markings.

2.3 SYSTEM MATED STACK HEIGHTS (IN MILLIMETERS)

| | | Receptacle Stack Height | | | | |
|--------------------|-----|-------------------------|------|------|------|------|
| | | 5.1 | 6.1 | 6.6 | 7.6 | 8.1 |
| Plug Stack Heights | 1.9 | 7.0 | 8.0 | 8.5 | 9.5 | 10.0 |
| | 2.9 | 8.0 | 9.0 | 9.5 | 10.5 | 11.0 |
| | 3.4 | 8.5 | 9.5 | 10.0 | 11.0 | 11.5 |
| | 2.4 | 7.5 | 8.5 | 9.0 | 10.0 | 10.5 |
| | 4.4 | 9.5 | 10.5 | 11.0 | 12.0 | 12.5 |
| | 4.9 | 10.0 | 11.0 | 11.5 | 12.5 | 13.0 |
| | 6.9 | 12.0 | 13.0 | 13.5 | 14.5 | 15.0 |



2.4 SAFETY AGENCY APPROVALS

UL File Number: TBD
 CSA File Number: TBD

| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 MOLEX DOCUMENTS

SD-45970-001
SD-45971-001
SD-46556-001
SD-46557-001
AS-45970-001

3.2 INDUSTRY DOCUMENTS

IPC-9701
EIA TS-1000
TELCORDIA GR1217

4.0 RATINGS

4.1 CURRENT

Signal Contact: 2.7 Amps

4.2 VOLTAGE

Signal Contact: 240 VAC

4.3 TEMPERATURE RANGE:

Operating: -55°C to +125°C
Non-Operating: -55°C to +125°C

4.4 CHARACTERISTIC IMPEDANCE:

100 Ω - differential signal pairs
50 Ω - single ended signals

4.5 DIGITAL BANDWIDTH:

Differential signal pairs: 0 to 10 Gbps

| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

5.0 PERFORMANCE

5.1 ELECTRICAL PERFORMANCE

| ITEM | TEST CONDITION | REQUIREMENT |
|---|---|---|
| LOW LEVEL CONTACT RESISTANCE (LLCR) | EIA-364-TP-23 | Δ 10 m Ω maximum |
| INSULATION RESISTANCE (IR) | EIA-364-TP-21 | > 25,000 M Ω minimum |
| DIELECTRIC WITHSTANDING VOLTAGE (DWV) | EIA-364-TP-20 | 900 VAC maximum |
| SIGNAL CONTINUITY | EIA-364-TP-87 | No interrupts greater than 1 microsecond |
| CAPACITANCE | Test per EIA-364-30, All lines switching, with one victim bit. | Not to exceed 1.0 picofarad |
| CHARACTERISTIC IMPEDANCE | Test at 100ps RT(10%-90%) | 100 +/-10% ohms - Diff 50 +/- 10% ohms - SE |
| CROSSTALK | Test at 100ps RT (10%-90%) All lines switching, with one victim bit. | 5% of signal swing |
| PROPAGATION DELAY | Measurement made on line while others floating on mated connector | 7mm stack - 67 ps 13mm stack - 158 ps |
| INSERTION LOSS (7 mm stack height rated @ - 3 dB) | Mated Connectors Only (not including launches) | Single Ended - 4 GHz Differential Pair - 9 GHz |

| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

5.2 MECHANICAL PERFORMANCE

| ITEM | TEST CONDITION | REQUIREMENT |
|-------------------------|--|---|
| INITIAL MATING FORCE | EIA-364-TP-13 | 0.11 lb (0.50 N) maximum per pin |
| INITIAL UN-MATING FORCE | EIA-364-TP-13 | 0.03 lb (0.13 N) minimum per pin |
| DURABILITY | EIA-364-TP-09 (100 Cycles) | Δ 10 m Ω maximum |
| RANDOM VIBRATION | EIA-364-TP-28 Test Cond. V, letter "B" Frequency: 50 to 2000 Hz Duration: 2 hrs/axis (3 axis total) g's: 7.56 g rms | Inspection: No Damage LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω Discont/logic events > 50nS: None |
| MECHANICAL SHOCK | EIA-364-TP-27 Peak Value: 100 G Duration: 6 mSec. Waveform: Half Sine No. of Shocks / Direction: 3 shocks / 3 axes (18 total) | Inspection: No Damage LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω Discont / logic events > 50nS: None |
| NORMAL FORCE | EIA-364-04 | > 0.11 lb (50 g) minimum @ .009" (0.23 mm) deflection |
| SOLDERABILITY | IPC-9701 | 6,000 cycles |

| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

5.3 ENVIRONMENTAL PERFORMANCE

| ITEM | TEST CONDITION | REQUIREMENT |
|---------------------------|---|---|
| THERMAL SHOCK | EIA-364-TP-32 Thermal Cycles: 100 Hot Temp: +85°C +3°/-0°C Cold Temp: -55°C +3°/-0°C Dwell/Config: 30 min./extreme Hot/Cold Transition: Immediate | Inspection: No Damage LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω |
| THERMAL AGING (Temp life) | EIA-364-TP-17 Test Cond. 4 @ 105°C Test Time Cond. B for 250 hrs. | Inspection: No Damage LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω |
| CYCLIC HUMIDITY | EIA-364-TP-31 Test Temp: +25°C to +65°C Relative Humidity: 90 to 95% Test Duration: 10 days | Inspection: No Damage LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω |
| DUST | EIA-364-TP-91 Benign Dust Composition Unmated | LLCR: Δ 10 m Ω maximum |
| MIXED FLOWING GAS (MFG) | EIA-364-TP-65 Temperature: 30°C Relative Humidity: 70% Chlorine: 10 ppb Nitrogen Oxide: 200 ppb Hydrogen Sulfide: 10 ppb Sulfur Dioxide: 100 ppb Exposure Time: 20 days (Unmated: day 1-10) (Mated: day 11-20) | (Unmated): LLCR: Δ 10 m Ω maximum (Mated): LLCR: Δ 10 m Ω maximum (Disturbance): LLCR: Δ 10 m Ω maximum (Final Durability): LLCR: Δ 10 m Ω maximum |
| GAS TIGHT | EIA-364-36 Gas Exposure: Nitric Acid Vapor Exp. Duration: 60 min. +/- 5 min. Drying Temp: 50°C +/- 3°C Measurements: Within 1 hr of Exp. | LLCR: Δ 10 m Ω maximum DWV: 900 VAC IR: > 25,000 M Ω |

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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

6.0 TEST SEQUENCES

6.1 TELCORDIA GR-1217-CORE TEST PLAN

| GROUP 1 | GROUP 2 | GROUP 3 | GROUP 4 |
|---------------------|--------------------|---------------------------|---|
| Visual Exam | Visual Exam | Visual Exam | Visual Exam |
| Mate/Unmate Forces | Mate/Unmate Forces | Mate/Unmate Forces | LLCR |
| LLCR | LLCR | LLCR | Durability (25 cycles) |
| Durability | Durability | Thermal Aging (Temp Life) | LLCR |
| LLCR | LLCR | LLCR | Thermal Aging (Temp Life) (300hrs. @ 105°C) |
| Dust | Thermal Shock | Mate/Unmate Forces | Mate/Unmate Forces |
| LLCR | LLCR | Visual Exam | LLCR |
| Vibration | Dust | | MFG (10 days Unmated) |
| LLCR (in each axis) | LLCR | | LLCR After 5th & 10th days |
| Mechanical Shock | Cyclic Humidity | | (10 days Mated) |
| LLCR (in each axis) | LLCR | | LLCR (After 5th & 10th day) |
| Durability | Durability | | Thermal Disturbance |
| LLCR | Mate/Unmate Forces | | LLCR |
| Mate/Unmate Forces | LLCR | | Durability (25 cycles) |
| Visual Exam | | | LLCR |
| | | | Visual Exam |

| | | | |
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PRODUCT SPECIFICATION

SEARAY CONNECTOR SYSTEM

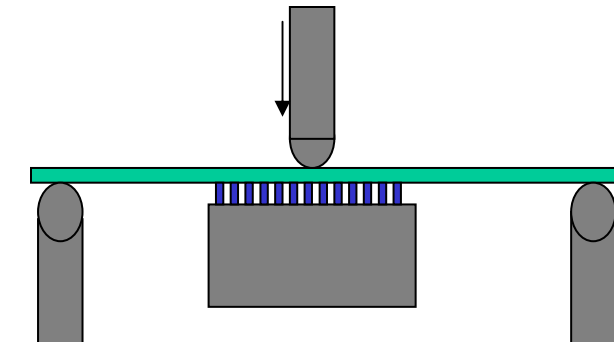
6.2 IPC-9701 – Temperature Cycling For Solder Joint Reliability

TEST CONDITIONS

- Cycle Condition TC1: 0° C to 100° C
- Test Duration (whichever occurs first)
 - 63.2% cumulative failure or....
 - 6,000 cycles
- Temperature Profile
 - Low Temperature Dwell: 10 minutes +0 / -5° C
 - High Temperature Dwell: 10 minutes +5 / -0° C
 - Temperature Ramp Rate: Less than or equal to 20° C / minute
- Sample Size
 - 33 mated sets (using one sample for cross sectioning)
- Package Condition
 - Daisy Chain
- Monitoring
 - Event Detection

6.3 THREE POINT BEND TEST (Reference)

With connector soldered to 1/16 inch thick PCB and supported as shown, deflect the board 0.5mm for every 25.4mm of support span. Visually inspect solder joints for cracks after applying dye penetrant.



| | | | |
|---------------------|--------------------------------|--|-------------------|
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| DOCUMENT NUMBER: | CREATED / REVISED BY: | CHECKED BY: | APPROVED BY: |
| PS-45970-001 | T. GREGORI | J. COMERCI | J. COMERCI |