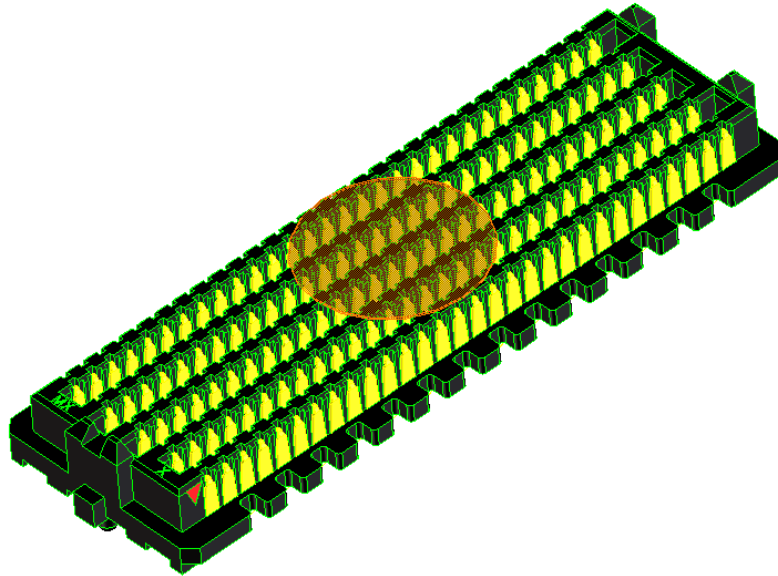




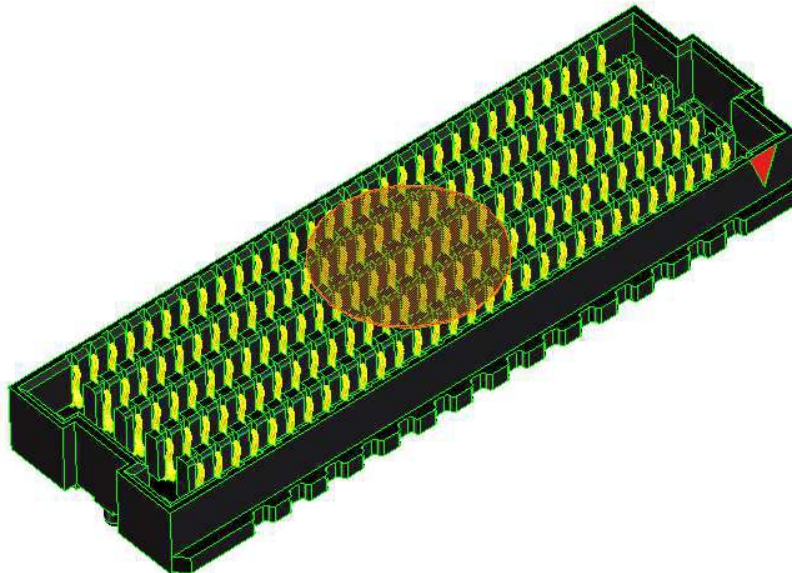
# PRODUCT SPECIFICATION

## SEARAY CONNECTOR SYSTEM

SEARAY PLUG CONNECTOR



SEARAY RECEPTACLE CONNECTOR



REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>1 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# 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

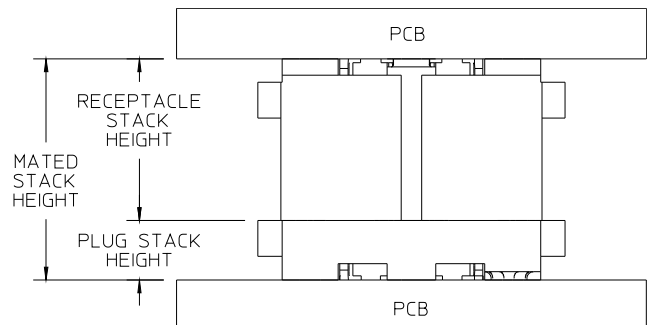
- 45970 SEARAY Plug Connector
- 45971 SEARAY Receptacle Connector
- 46556 SEARAY Slim Plug Connector
- 46557 SEARAY Slim Receptacle Connector

#### 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				
		5.0	6.0	6.5	7.5	8.0
Plug Stack Heights	2.0	7.0	8.0	8.5	9.5	10.0
	3.0	8.0	9.0	9.5	10.5	11.0
	3.5	8.5	9.5	10.0	11.0	11.5
	2.5	7.5	8.5	9.0	10.0	10.5
	4.5	9.5	10.5	11.0	12.0	12.5
	5.0	10.0	11.0	11.5	12.5	13.0
	7.0	12.0	13.0	13.5	14.5	15.0



#### 2.4 SAFETY AGENCY APPROVALS

UL File Number: E29179  
 CSA File Number: 019980

REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>2 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# 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

2.7 Amps  
 (Note: current flow restricted to 6 adjacent circuits in a given row)

#### 4.2 VOLTAGE

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: up to 12.5 Gbps

REVISION:  <b>E</b>	RELEASED <b>UCP2014-1474</b>  10/01/2013	TITLE:  <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No.  <b>3 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>		CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>
		APPROVED BY: <b>Steve Miller</b>	



# 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	$\Delta$ 10 m $\Omega$ maximum
INSULATION RESISTANCE (IR)	EIA-364-TP-21	> 25,000 M $\Omega$ 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

REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>4 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# 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)	$\Delta$ 10 m $\Omega$ 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: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$ 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: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$ 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

REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>5 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# 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: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$
THERMAL AGING (Temp life)	EIA-364-TP-17 Test Cond. 4 @ 105°C Test Time Cond. B for 250 hrs.	Inspection: No Damage LLCR: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$
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: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$
DUST	EIA-364-TP-91 Benign Dust Composition Unmated	LLCR: $\Delta$ 10 m $\Omega$ 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: $\Delta$ 10 m $\Omega$ maximum  (Mated): LLCR: $\Delta$ 10 m $\Omega$ maximum  (Disturbance): LLCR: $\Delta$ 10 m $\Omega$ maximum  (Final Durability): LLCR: $\Delta$ 10 m $\Omega$ 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: $\Delta$ 10 m $\Omega$ maximum DWV: 900 VAC IR: > 25,000 M $\Omega$

REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>6 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# 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

REVISION: <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE: <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No. <b>7 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>	CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>	APPROVED BY: <b>Steve Miller</b>



# PRODUCT SPECIFICATION

## SEARAY CONNECTOR SYSTEM

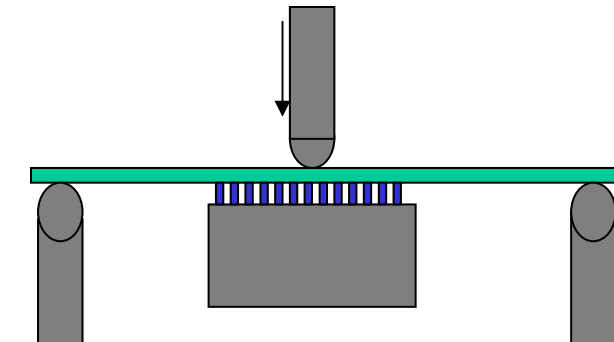
### 6.2 IPC-9701 – Temperature Cycling For Solder Joint Reliability

#### 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.



REVISION:  <b>E</b>	RELEASED UCP2014-1474 10/01/2013	TITLE:  <b>PRODUCT SPECIFICATION SEARAY CONNECTOR SYSTEM</b>	SHEET No.  <b>8 of 8</b>
DOCUMENT NUMBER: <b>PS-45970-001</b>		CREATED / REVISED BY: <b>Robert Barker</b>	CHECKED BY: <b>Donald Morgan</b>
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