

# **Product Specification**

108-99020

15AUG'11 Rev. A3

LCD Coaxial Embedded Display Interface (LCEDI) SR series

1 Scope:

#### 1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of LCEDI wire to board connector.

This specification is adapted for all of the Pb free production of LCEDI wire to board connector,

### 2. Applicable Documents:

**Tyco Electronics** 

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

## 2.1 TE specifications

A. 109-5000 Test Specification, General Requirements for Test Methods

B. 501-99020 Test Report

C. 114-99000 Application specification

## 2.2 Commercial Standards and Specifications:

A. MIL-STD-202

B. EIA-364



### 3. Requirements:

## 3.1 Design and Construction:

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

#### 3.2 Materials:

### A. Plug

1. Contact:

Material :Copper Alloy

Finish:

Contact area : Gold Plating solder area : Gold Plating Underplate : Nickel Plating

2. Plastic parts:

housing:

Material: High Temperature Thermo plastic

Flammability: UL94V-0

3. Metal parts:

Upper Shield, Lower Shield

Material: Brass

Finish:

Sn Plating all over.

**Underplate: Nickel Plating** 

## B. Receptacle

1. Contact:

Material: Copper Alloy

Finish:

Contact area: Gold Plating solder area: Gold Plating Underplate: Nickel Plating

2. Plastic parts:

housing:

Material: High Temperature Thermo plastic

Flammability: UL94V-0

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## 3. Metal parts:

Solder Peg

Material: Brass

Finish:

Sn Plating all over.

**Underplate: Nickel Plating** 

\*Discoloration or changing to bright may happen during reflow process. However it's no impact for mechanical/electrical performance

## 3.3 Ratings:

A. Voltage Rating: 100 VAC

B. Current Rating: 0.3 A AC/DC[AWG#40](per a contact)

0.6 A AC/DC[AWG#38](per a contact)0.8 A AC/DC[AWG#36](per a contact)

1.0 A AC/DC[AWG#28~34#](per a contact)

C. Temperature Rating: −20°C to 85°C

D. Reflow Peak Temperature: 260°C MAX.

## 3.4 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements .All tests shall be performed in the room temperature, unless otherwise specified.

### 3.5 Test Requirements and Procedures Summary

Para.	Test Items	Requirements	Procedures				
3.5.1	Examination of Product	Meets requirements of product	Visual inspection				
		drawing	No physical damage				
3.5.2	Termination Resistance	Initial	Subject mated contacts assembled in				
	(Low Level)	Contact	housing to closed circuit current of 10 mA				
		Contact 40 m Ω Max	Max. at open circuit voltage of 20mV Max.				
		Ground 50 m Ω Max.	EIA-364-23				
			LLCR of wire should be deducted.				
		After testing					
		Contact 40 m $\Omega$ Max ( $\Delta$ R)	As shown in Fig 1.				
		Ground 40 m Ω Max (ΔR)					
3.5.3	Dielectric withstanding	No creeping discharge nor	250VAC for 1 minute.				
	Voltage	flashover shall occur.	Test between adjacent circuits of unmated				
		Current leakage: 1 mA Max.	connectors.				
			MIL-STD-202 Method 301				

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3.5.4	Inculation Designation	1000MO Min (Initial)	Improceed voltege FOO V DC				
3.5.4	Insulation Resistance	1000MΩ Min.(Initial)	Impressed voltage 500 V DC.				
		500MΩ Min.(Final)	Test between adjacent circuits of unmated				
			connectors.				
			EIA-364-21				
3.5.5	Temperature Rising	ΔT:30 °C Max. under loaded	Mate the plug and receptacle connector				
			together, then apply rating current per				
			contact.				
			EIA-364-70 Test method 2				
		Mechanical Requirements	<b>;</b>				
Para.	Test Items	Requirements	Procedures				
3.5.6	Vibration	No electrical discontinuity	Subject mated connectors				
	(Random)	greater than 1 $\mu$ sec. shall	Vibration Frequency: 20 to 500 Hz				
		occur.	Accelerated Velocity: 30.38m/s <sup>2</sup>				
		Contact resistance.	(3.1G), rms.				
		$\Delta R = 40 \text{ m}\Omega$ Max.	Vibration Direction: In each of 3 mutually				
			perpendicular planes.				
			Duration: 15 minutes each				
			100 mA applied.				
			connector should be fixed on the test jig.				
			EIA-364-28 Method VII condition D				
0.5.7	DI : 101 1		.—				
3.5.7	Physical Shock	No electrical discontinuity	Accelerated Velocity: 490 m/s <sup>2</sup> (50 G)				
	(Normal test)	greater than 1 $\mu$ sec.	Waveform: Semi-Sine wave				
		shall occur.	Duration: 11 m sec.				
		$\Delta R$ =40 m $\Omega$ Max. (Final)	Number of Drops: 3 drops each to normal				
			and reversed directions of X, Y and Z				
			axes, totally 18 drops.				
			EIA-364-27 Condition A				
3.5.8	Mating/Un-mating Force	Mating Force	Operation Speed: 25±3 mm/min.				
		30P5.10 kgf Max	Solder the receptacle connector to the				
		40P6.12 kgf Max	Test board, measure Mating/un-mating				
			Force.				
		Un-mating Force	EIA-364-13				
		30P0.51 kgf Min					
		40P0.61 kgf Min					
		_					
3.5.9	Durability	$\Delta R$ =40 m $\Omega$ Max. (Final)	Repeated mating and un-mating of the				
			connector for 30 cycles.				
			EIA-364-9				
3.5.10	Solder peg retention	Initial	Operation Speed: 25±3 mm/min.				
	Force	204 gf Min	Apply Force on solder peg along the				
		After testing	direction opposite to the solder peg				
		153 gf Min	insertion.				
3.5.11	Cable Retention Force	3.06 kgf Min	Operation Speed: 25±3 mm/min.				
			Apply force on the cable along the				
			direction, measure the force when the				
			cable dislodges the plug connector.				
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pad.  Pre-Heat150~200°C: 60~180sec.  Heat 217°C Min.: 60~150sec.  Heat Peak 260+0/-5°C  IPC/JEDEC J-STD-020C  3.5.14 Thermal Shock  ΔR=40 mΩ Max. (Final)  Mated connector	3.5.12	Solderability	Wet Solder Coverage:	Solder Temperature : 245± 5 °C					
Para.   Test   Items   Requirements   Procedures			95 % Min.	Immersion Duration : 3±0.5 seconds					
Para.   Test   Items   Requirements   Procedures									
$ \begin{array}{ c c c c c } \hline Para. & Test Items & Requirements & Procedures \\ \hline 3.5.13 & Resistance to Reflow Soldering Heat & No physical damage shall occur & Test connector on P.C.B Temperature is measured on a solder pad. & Pre-Heat150 $\sim$200 °C: 60 $\sim$180 sec. & Heat 217 °C Min.: 60 $\sim$150 sec. & Heat 217 °C Min.: 60 $\sim$150 sec. & Heat Peak 260 + 0/-5 °C & IPC/JEDEC J-STD-020 C & IPC/JEDEC J-$	Environmental Requirements								
Soldering Heat $ \begin{array}{c} \text{Soldering Heat} \\ S$	Para.	Test Items							
pad.     Pre-Heat150~200°C: 60~180sec.     Heat 217°C Min.: 60~150sec.     Heat Peak 260+0/-5°C     IPC/JEDEC J-STD-020C     3.5.14   Thermal Shock   ΔR=40 mΩ Max. (Final)   Mated connector     -55 +0/-3°C /30 min., 85 +3/-0°C /5 min.     Making this a cycle, repeat 5 cycles.     3.5.15   Humidity   Insulation resistance   Mated connector,     (Steady State)   500 MΩ Min. (Final)   40±2°C, 90~95 R.H.     ΔR=40 mΩ Max. (Final)   240 hours.     Dielectric withstanding Voltage   Shall meet 3.5.3     3.5.16   Humidity   Insulation resistance   Mated connector,     (Cycling)   500 MΩ Min. (Final)   -10~65°C,90~95 R.H.     ΔR=40 mΩ Max. (Final)   10 Cycle(240 hours.)     Dielectric withstanding Voltage   Shall meet 3.5.3     3.5.17   High Temperature Life   ΔR=40 mΩ Max. (Final)   Mated connector     85±2°C, Duration: 250 hours   MIL-STD-202, Method 108, Condition B.     3.5.18   Gas   ΔR=40 mΩ Max.   Mated connector     S°C±2°C, 75% R.H., 24hours   Mated connector     25°C±2°C, 75% R	3.5.13	Resistance to Reflow	No physical damage shall	Test connector on P.C.B					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Soldering Heat	occur	Temperature is measured on a soldering pad.					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				Pre-Heat150~200°C: 60~180sec.					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				Heat 217°C Min.: 60~150sec.					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				Heat Peak 260+0/-5°C					
$-55 + 0/-3^{\circ}C /30 \text{ min., } 85 + 3/-0^{\circ}C /5 \text{ min } Making \text{ this a cycle, repeat 5 cycles.}$ $3.5.15  \text{Humidity} \qquad \text{Insulation resistance} \qquad \text{Mated connector,} \\ 500 \text{ M}\Omega \text{ Min. (Final)} \qquad 40 \pm 2^{\circ}C, 90 \sim 95 \text{ R.H.} \\ 240 \text{ m}\Omega \text{ Max. (Final)} \qquad 240 \text{ hours.} \\ MIL-STD-202, \text{ Method } 103, \text{Condition A.} \\ 3.5.16  \text{Humidity} \qquad \text{Insulation resistance} \qquad \text{Mated connector,} \\ (\text{Cycling}) \qquad 500 \text{ M}\Omega \text{ Min. (Final)} \qquad -10 \sim 65^{\circ}C, 90 \sim 95 \text{ R.H.} \\ \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \qquad 10 \text{ Cycle}(240 \text{ hours.)} \\ \text{Dielectric withstanding Voltage} \qquad \text{Shall meet } 3.5.3 \\ 3.5.17  \text{High Temperature Life} \qquad \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \qquad \text{Mated connector} \\ 85 \pm 2^{\circ}C, \text{ Duration: } 250 \text{ hours} \\ \text{MIL-STD-202, Method } 108, \text{Condition B.} \\ 3.5.18  \text{Gas} \qquad \Delta R = 40 \text{ m}\Omega \text{ Max.} \qquad \text{Mated connector} \\ 25^{\circ}C \pm 2^{\circ}C, 75^{\circ}R \text{ R.H., } 24 \text{ hours} \\ \text{Mated connector} \\ 25^{\circ}C \pm 2^{\circ}C, 75^{\circ}R \text{ R.H., } 24 \text{ hours} \\ \text{Mated connector} \\ 25^{\circ}C \pm 2^{\circ}C, 75^{\circ}R \text{ R.H., } 24 \text{ hours} \\ \text{Mated connector} \\ 25^{\circ}C \pm 2^{\circ}C, 75^{\circ}R \text{ R.H., } 24 \text{ hours} \\ \text{Mated connector} \\ 25^{\circ}C \pm 2^{\circ}C, 75^{\circ}R \text{ R.H., } 24 \text{ hours} \\ \text{Mated connector} \\ M$				IPC/JEDEC J-STD-020C					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	3.5.14	Thermal Shock	$\Delta R$ =40 m $\Omega$ Max. (Final)	Mated connector					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$				-55 + 0/-3°C /30 min., 85 +3/-0°C /5 min.					
$(Steady  State) \qquad 500  M\Omega  Min.  (Final) \\ \Delta R=40  m\Omega  Max.  (Final) \\ Dielectric  with standing  Voltage \\ Shall  meet  3.5.3 \qquad MIL-STD-202,  Method  103, Condition  A.$ $3.5.16  Humidity \qquad Insulation  resistance \\ (Cycling) \qquad 500  M\Omega  Min.  (Final) \\ \Delta R=40  m\Omega  Max.  (Final) \\ Dielectric  with standing  Voltage \\ Shall  meet  3.5.3 \qquad MIL-STD-202,  Method  106.$ $3.5.17  High  Temperature  Life \qquad \Delta R=40  m\Omega  Max.  (Final) \qquad Mated  connector \\ 85\pm 2^{\circ}C,  Duration:  250  hours \\ MIL-STD-202,  Method  108, Condition  B.$ $3.5.18  Gas \qquad \Delta R=40  m\Omega  Max. \qquad Mated  connector \\ 25^{\circ}C\pm 2^{\circ}C,  75\%  R.H.,  24hours$				Making this a cycle, repeat 5 cycles.					
$(Steady  State) \qquad 500  M\Omega  Min.  (Final) \\ \Delta R=40  m\Omega  Max.  (Final) \\ Dielectric  with standing  Voltage \\ Shall  meet  3.5.3 \qquad MIL-STD-202,  Method  103, Condition  A.$ $3.5.16  Humidity \qquad Insulation  resistance \\ (Cycling) \qquad 500  M\Omega  Min.  (Final) \\ \Delta R=40  m\Omega  Max.  (Final) \\ Dielectric  with standing  Voltage \\ Shall  meet  3.5.3 \qquad MIL-STD-202,  Method  106.$ $3.5.17  High  Temperature  Life \qquad \Delta R=40  m\Omega  Max.  (Final) \qquad Mated  connector \\ 85\pm 2^{\circ}C,  Duration:  250  hours \\ MIL-STD-202,  Method  108, Condition  B.$ $3.5.18  Gas \qquad \Delta R=40  m\Omega  Max. \qquad Mated  connector \\ 25^{\circ}C\pm 2^{\circ}C,  75\%  R.H.,  24hours$									
$\Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \text{Dielectric withstanding Voltage} \\ \text{Shall meet } 3.5.3 \\ 3.5.16 \text{ Humidity} \\ \text{(Cycling)} \text{ Insulation resistance} \\ \text{S00 M}\Omega \text{ Min. (Final)} \\ \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \text{Dielectric withstanding Voltage} \\ \text{Shall meet } 3.5.3 \\ 3.5.17 \text{ High Temperature Life}  \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \text{AR} = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \text{Mil-STD-202, Method } 106. \\ \text{Mated connector} \\ \text{85} \pm 2^{\circ}\text{C, Duration: 250 hours} \\ \text{MIL-STD-202, Method } 108, \text{Condition B.} \\ 3.5.18 \text{ Gas}  \Delta R = 40 \text{ m}\Omega \text{ Max.} \\ \text{Mated connector} \\ \text{S} \pm 2^{\circ}\text{C} \pm 2^{\circ}\text{C, 75\% R.H., 24hours} \\ \text{Mated connector} \\ Mated $	3.5.15	Humidity	Insulation resistance	Mated connector,					
Dielectric withstanding Voltage Shall meet 3.5.3  3.5.16 Humidity Insulation resistance $0.00000000000000000000000000000000000$		(Steady State)	500 MΩ Min. (Final)	40±2°C, 90∼95 R.H.					
$Shall meet 3.5.3$ $3.5.16  Humidity \qquad Insulation resistance \\ (Cycling) \qquad 500 \ M\Omega  Min. (Final) \\ \Delta R=40 \ m\Omega  Max. (Final) \\ Dielectric withstanding Voltage \\ Shall meet 3.5.3$ $3.5.17  High Temperature Life \qquad \Delta R=40 \ m\Omega  Max. (Final) \\ MIL-STD-202, Method 106.$ $3.5.18  Gas \qquad \Delta R=40 \ m\Omega  Max. \qquad Mated connector \\ 85\pm 2^{\circ}C, Duration: 250 \ hours \\ MIL-STD-202, Method 108, Condition B.$ $3.5.18  Gas \qquad \Delta R=40 \ m\Omega  Max. \qquad Mated connector \\ 25^{\circ}C\pm 2^{\circ}C, 75\% \ R.H., 24hours$			$\Delta R$ =40 m $\Omega$ Max. (Final)	240 hours.					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			Dielectric withstanding Voltage	MIL-STD-202, Method 103, Condition A.					
$(Cycling) \qquad \qquad 500 \ \text{M}\Omega  \text{Min. (Final)} \qquad \qquad -10 \sim 65^{\circ}\text{C}, 90 \sim 95 \ \text{R.H.} \qquad 10 \ \text{Cycle}(240 \ \text{hours.}) \qquad \text{MIL-STD-202, Method 106.} \qquad \qquad \\ 3.5.17  \text{High Temperature Life} \qquad \Delta R = 40 \ \text{m}\Omega  \text{Max. (Final)} \qquad \qquad \text{Mated connector} \qquad 85 \pm 2^{\circ}\text{C}, \ \text{Duration: 250 hours} \qquad \text{MIL-STD-202, Method 108, Condition B.} \qquad \\ 3.5.18  \text{Gas} \qquad \Delta R = 40 \ \text{m}\Omega  \text{Max.} \qquad \qquad \text{Mated connector} \qquad 25^{\circ}\text{C} \pm 2^{\circ}\text{C}, 75\% \ \text{R.H., 24hours} \qquad \qquad \\ \end{cases}$			Shall meet 3.5.3						
$\Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \text{Dielectric withstanding Voltage} \\ \text{Shall meet 3.5.3} \\ \hline 3.5.17 \text{ High Temperature Life} \\ \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \hline \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \hline \Delta R = 40 \text{ m}\Omega \text{ Max. (Final)} \\ \hline \Delta R = 40 \text{ m}\Omega \text{ Max.} \\ $	3.5.16	Humidity	Insulation resistance	Mated connector,					
Dielectric withstanding Voltage Shall meet 3.5.3		(Cycling)	500 MΩ Min. (Final)	-10~65°C,90~95 R.H.					
Shall meet 3.5.3  3.5.17 High Temperature Life $\Delta R=40 \text{ m}\Omega$ Max. (Final) Mated connector $85\pm2^{\circ}\text{C}$ , Duration: 250 hours MIL-STD-202, Method 108,Condition B.  3.5.18 Gas $\Delta R=40 \text{ m}\Omega$ Max. Mated connector $25^{\circ}\text{C}\pm2^{\circ}\text{C}$ , 75% R.H., 24hours			$\Delta R$ =40 m $\Omega$ Max. (Final)	10 Cycle(240 hours.)					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			Dielectric withstanding Voltage	MIL-STD-202, Method 106.					
$85\pm2^{\circ}\text{C, Duration: 250 hours}\\ \text{MIL-STD-202, Method 108,Condition B.}\\ 3.5.18  \text{Gas} \qquad \qquad \Delta \text{R=40 m}\Omega  \text{Max.} \qquad \qquad \text{Mated connector}\\ 25^{\circ}\text{C}\pm2^{\circ}\text{C},75\% \text{ R.H., 24hours}\\ \end{cases}$			Shall meet 3.5.3						
	3.5.17	High Temperature Life	$\Delta R$ =40 m $\Omega$ Max. (Final)	Mated connector					
3.5.18 Gas $\Delta R = 40 \text{ m}\Omega \text{ Max.}$ Mated connector $25^{\circ}\text{C} \pm 2^{\circ}\text{C}, 75\% \text{ R.H., 24hours}$				85±2°C, Duration: 250 hours					
25°C±2°C,75% R.H., 24hours				MIL-STD-202, Method 108, Condition B.					
	3.5.18	Gas	$\Delta R$ =40 m $\Omega$ Max.	Mated connector					
H₂S: 10 ppm.				25°C±2°C,75% R.H., 24hours					
				H <sub>2</sub> S: 10 ppm.					
3.5.19 Salt Water Spray ΔR=40 m Ω Max. Mated connector	3.5.19	Salt Water Spray	$\Delta R$ =40 m $\Omega$ Max.	Mated connector					
35°C±2°C				35°C±2°C					
Salt water density:5±1% (by weight)				Salt water density:5±1% (by weight)					
Duration:48hours									
MIL-STD-202,Method 101,condition B				MIL-STD-202,Method 101,condition B					

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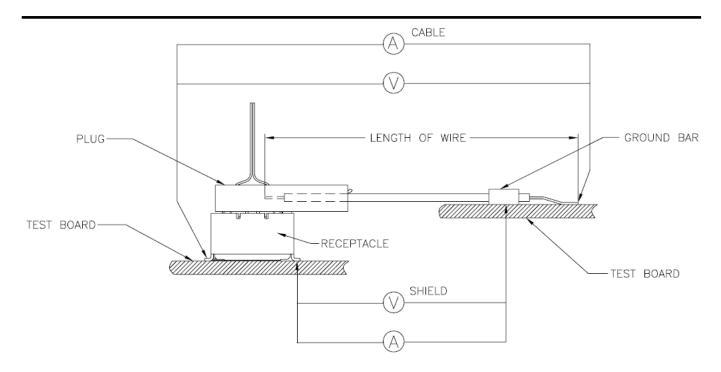


Fig.1 Contact Resistance Measurement

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	Test Group										
Test Examination	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Examination of Product	1, 3	1, 7	1, 5	1, 7	1, 5	1, 5	1, 9	1, 5	1, 5	1, 3	1, 3
Termination Resistance (Low Level)		3, 5		2, 4, 6	2, 4	2, 4	2, 6	2, 4	2, 4		
Dielectric withstanding Voltage							3, 7				
Insulation Resistance							4, 8				
Temperature rising	2										
Vibration (Random)				3							
Physical Shock				5							
Mating/Un-mating Force		2									
Durability		4									
Solder peg retention Force			2, 4								
Cable Retention Force		6									
Solderability										2	
Resistance to Reflow Soldering Heat											2
Thermal Shock					3						
Humidity (Steady state)							5				
Humidity (Cycling)											
HighTemperature Life			3			3					
Gas									3		
Salt Water Spray								3			

Table 1

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<sup>(</sup>a) Numbers indicate sequence in which the tests are performed.

<sup>(</sup>b)No electrical discontinuity shall occur.