

Product/Process Change Notifications



PCN - 15 107

Release Date: October 07 2015

Product Name:	Delta-D			
	Male Straight spill solder(STD & PIP)			
Product Manager:	Vicy Pulayath			
Subject:	Notification of Planned Change			
Distribution:	Global			
Type of Change:	Materials Change			
Change Description:	<p>The intended change to use Brass also as a material in Delta-D male contacts, which now use only Phosphorous Bronze.</p> <p>Depending upon the availability, FCI will have the flexibility of using either of these.</p> <p>This change will have no impact on the fit, form, function or the performance of the connector and required tests on all the relevant connector parameters have been successfully completed.</p>			
Reason for Change:	This change will help to reduce the lead time in procuring the Phosphorus bronze strips.			
Affected Parts:	Attached list			
Effective Date of Change:	April 15, 2016			
Last Time Buy Date:	NA			
Last Disty Return Date:	NA			
Last Time Shipment Date	NA			
Datasheet Attached?	NA			
Qual/Test Data Attached?	Yes			
Samples Availability Date:	Oct	7	2015	
Available Alternatives?	N/A			
Questions?	<i>Contact your local FCI Representative, or Product Manager</i>			
	Vicy Pulayath			
	Vicy.pulayath@fci.com			

Note:
 Customer shall intimate the product Manager any Concern regarding the PCN within 3 weeks of the release date.
 PCN is considered approved by the customer if no communication is received within 3 weeks

PCN	Item Number	Change	Effective Date	Last Time Buy Date	Last Disty return date	Replacement Part	Alternate Part	Comments
PCN15107	D09P24A4GI00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4GL00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4GV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4GX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4PA00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4PL00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4PV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A4PX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6GL00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6GV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6GX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6PA00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6PA12LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6PH22LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6PV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6PX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RL09LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RL12LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RL22LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RV09LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RV12LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RV22LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RX019LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RX09LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RX12LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24A6RX22LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B4GV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B4GX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B4PA00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B4PL00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B4PV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B6GI00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B6GV00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B6GX00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B6PA00LF	MATERIAL CHANGE	30-Mar-16					
PCN15107	D09P24B6PV00LF	MATERIAL CHANGE	30-Mar-16					

PCN15107	D09P24B6RV22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D09P34A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D09P34A6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4GI00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A4PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6PX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RL09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RL12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RL22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RV12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RV22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RX09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RX12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24A6RX22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B4PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6GI00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P24B6PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D15P34A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4GI00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4PA00LF	MATERIAL CHANGE	30-Mar-16

PCN15107	D25P24A4PA3FLF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A4PX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6PA3FLF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RL09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RL12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RL22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RV12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RV22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RX09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RX12LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24A6RX22LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B4PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B4PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D25P24B6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A4PX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6GL00LF	MATERIAL CHANGE	30-Mar-16

PCN15107	D37P24A6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6PX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6RL09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24A6RX09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B4GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6GI00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6PV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D37P24B6RX09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4GL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4PL00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A4PX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6RL09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6RV09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24A6RX09LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24B4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24B6GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	D50P24B6PA00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD09P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD09P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD15P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD15P24A4GX00LF	MATERIAL CHANGE	30-Mar-16

PCN15107	LD25P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD25P24A4GX00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD37P24A4GV00LF	MATERIAL CHANGE	30-Mar-16
PCN15107	LD37P24A4GX00LF	MATERIAL CHANGE	30-Mar-16

LABORATORY TEST REPORT



REPORT NO. ELX-11-14-001-PB	DATE OF REPORT 03/10/15	DATES TESTED 01/11/14 – 10/12/14	TESTED BY Bindu S Nair
REQUESTOR Mithun Paul	TITLE Delta-D Male Connector		Prepared By/Title Bindu S Nair Approved By/Title Lisy.T.C Engineer - Lab

PURPOSE

To evaluate the Delta D male connector with Phosphor Bronze material as per CECC 75301-802 & C01-8646-0001 Specification

CONCLUSIONS

Tested samples met the specified requirements for the tests conducted as per CECC 75301-802 & C01-8646-0001 Specification

SAMPLE DESCRIPTION

Part Number	Description
D37P82C6GX00LF	Delta D 37 Psn male connector

DOCUMENT REFERENCE

Document Description	Revision/Issue	Date/Year
CECC 75301-802	Issue 1	1994
C01-8646-0001	N	2011

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TEST DESCRIPTION

Test Group P

CI No.	Test Description	Test Phase
P1	General examination (Visual examination)	P1
P2	Polarization method	P2
P3	Contact resistance	P3
P4	Insulation resistance	P4
P5	Voltage proof	P5

Test Group AP

CI No.	Test Description	Test Phase
1	Insertion & Withdrawal forces	AP2
2	Solder ability	AP3.1
3	Voltage proof	AP4
4	Rapid change of temperature	AP9
5	Insulation resistance	AP10
6	Voltage proof	AP11
7	Visual examination	AP12
8	Climatic sequence	AP13
9	Dry Heat	AP13.1
10	Damp Heat cyclic, 1 st cycle	AP13.2
11	Cold	AP13.3
12	Damp Heat cyclic, remaining cycles	AP 13.5
13	Insulation resistance	AP14
14	Contact resistance	AP15
15	Voltage proof	AP16
16	Insertion force / Withdrawal forces	AP17
17	Visual examination	AP18

Test Group BP

CI No.	Test Description	Test Phase
1	Mechanical operation	BP2
2	Contact resistance	BP4
3	Mechanical operation	BP5
4	Insulation resistance	BP6
5	Voltage proof	BP7
6	Visual examination	BP10
7	Static load axial	BP11

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Test Group DP

Cl. No.	Test Description	Test Phase
1	Mechanical operation	DP1
2	Electrical Load and temperature	DP2
3	Contact resistance	DP3
4	Voltage proof	DP4
5	Visual examination	DP5

Test Group EP

Cl. No.	Test Description	Test Phase
1	Contact retention in insert	EP2
2	Visual examination	EP7

TEST METHODS/REQUIREMENTS

Test phase	Item	Test Method	Condition	Requirement								
P1	General examination (Visual examination)	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation.								
P2	Polarization method	IEC 512-13e	Mated	It shall not be possible to mate in any other than correct manner								
P3	Contact resistance	IEC 512-2b	Mated condition	25mΩ max								
P4	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
P5	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP2	Insertion & Withdrawal forces	IEC 512-13b	Mated/unmated	<table border="1"> <thead> <tr> <th rowspan="2">Ins force max</th> <th colspan="2">Withdrawal Force</th> </tr> <tr> <th>min</th> <th>max</th> </tr> </thead> <tbody> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </tbody> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP3.1	Solder ability	IEC 512-12a	Solder bath method, Temperature -245 ± 5 °C	Continuous flow of bright solder coating, unwetted areas or pin holes shall not be concentrated in one area								
AP4	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP9	Rapid change of temperature	IEC 512-11d	-55°C /+125°C	5 cycles								
AP10	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
AP11	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP12	Visual examination	IEC 512-1a	Unmated	No damage likely to impair normal operation								
AP13	Climatic sequence	IEC 512-11a	-	-								
AP13.1	Dry Heat	IEC 512-11i	Mated	+125°C, 12 hrs								
AP13.1.1	Insulation resistance at high temp	IEC 512-3a	Mated condition, at 100Vdc	1GΩ min								
AP 13.2	Damp Heat Cyclic, first cycle	IEC 512-11m	Mated	1 cycle								
AP 13.3	Cold	IEC 512-11j	Mated	-55°C, 2 hrs								
AP13.5	Damp Heat cyclic, remaining cycles	IEC 512-11m	Mated	5 cycles								
AP14	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
AP15	Contact resistance	IEC 512-2b	Mated condition	25mΩ max								
AP16	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP17	Insertion force / Withdrawal force	IEC 512-13b	Mated/unmated	<table border="1"> <thead> <tr> <th rowspan="2">Ins force max</th> <th colspan="2">Withdrawal Force</th> </tr> <tr> <th>min</th> <th>max</th> </tr> </thead> <tbody> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </tbody> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP18	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation								
BP2	Mechanical operation (Half of the specified number of operation)	IEC 512-9a	Speed 10mm/s	250 operations								
BP4	Contact resistance	IEC 512-2b	Mated condition	25mΩ max								

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BP5	Mechanical operation (Remaining number of operation)	IEC 512-9a	Speed 10mm/s	250 operations
BP6	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min
BP7	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed
BP10	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation
BP11	Static load axial	IEC 512-8b	Unmated	180 N No damage to be observed after application of load
DP1	Mechanical operation	IEC 512-9a	Speed 10mm/s	250 operations
DP2	Electrical Load and temperature	IEC 512-9b	Mated	70°C , 1.7Amps -500 hrs
DP3	Contact resistance	IEC 512-2b	Mated condition	25mΩ max
DP4	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed
DP5	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation
EP2	Contact retention in insert	IEC 512-15a	Axial force from mating side 20 N min	Displacement 0.30mm max
EP7	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation

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TEST RESULTS

GROUP P

Test phase	Test	Requirement	Result	Comments
P1	General examination	There shall be no defects that would impair normal operation	No defect observed	Passed
P2	Polarization method	It shall not be possible to mate in any other than correct manner	Not possible to mate other than correct manner	Passed
P3	Contact resistance	25mΩ max	9.15 – 11.81 mΩ	Passed
P4	Insulation resistance at 100 Vdc	5GΩmin	> 5GΩ	Passed
P5	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed

GROUP AP

Test phase	Test	Requirement	Result	Comments									
AP2	Insertion & Withdrawal force	<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;">Ins force max</td> <td colspan="2" style="width: 67%;">Withdrawal Force</td> </tr> <tr> <td></td> <td style="width: 33%;">min</td> <td style="width: 34%;">max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force			min	max	123 N	11 N	82 N	Insertion force – 50.1 – 58.5 N Withdrawal force – 41.6 – 44.1 N	Passed
Ins force max	Withdrawal Force												
	min	max											
123 N	11 N	82 N											
AP3.1	Solder ability	Continuous flow of bright solder coating, unwetted areas or pin holes shall not be concentrated in one area	Solder coating ok	Passed									
AP4	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed									
AP9	Rapid change of temperature	-55°C / +125°C , 5 cycles	OK	Passed									
AP10	Insulation resistance	5GΩmin	> 5GΩ	Passed									
AP11	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed									
AP12	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed									
AP13	Climatic sequence	-											
AP13.1	Dry Heat	+125°C, 12 hrs	OK	Passed									
AP13.1.1	Insulation resistance at high temperature	1GΩmin	> 1GΩ	Passed									
AP13.2	Damp Heat cyclic, 1st cycle	1cycle	OK	Passed									
AP13.3	Cold	-55°C	OK	Passed									
AP13.5	Damp Heat cyclic, remaining cycle	5 cycles	OK	Passed									
AP14	Insulation resistance	5GΩmin	> 5GΩ	Passed									
AP15	Contact resistance	25mΩ max	8.91 – 12.10 mΩ	Passed									
AP16	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed									
AP17	Insertion force / Withdrawal force	<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;">Ins force max</td> <td colspan="2" style="width: 67%;">Withdrawal Force</td> </tr> <tr> <td></td> <td style="width: 33%;">min</td> <td style="width: 34%;">max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force			min	max	123 N	11 N	82 N	Insertion force – 52.6 – 57.8 N Withdrawal force – 42.1 – 43.6 N	Passed
Ins force max	Withdrawal Force												
	min	max											
123 N	11 N	82 N											
AP18	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed									

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GROUP BP

Test phase	Test	Requirement	Result	Comments
BP2	Mechanical operation	250 operations	OK	Passed
BP4	Contact resistance	25mΩ max	8.29 – 13.06 mΩ	Passed
BP5	Mechanical operation	250 operations	OK	Passed
BP6	Insulation resistance	5GΩ min	> 5GΩ	Passed
BP7	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed
BP10	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed
BP11	Static load axial	180 N No damage to be observed after application of load	No damage observed	Passed

GROUP DP

Test phase.	Test	Requirement	Result	Comments
DP1	Mechanical operation	250 operations	OK	Passed
DP2	Electrical Load and temperature	1.7 Amps 70°C - 500 hrs	OK	Passed
DP3	Contact resistance	25mΩ max	8.97 – 12.30 mΩ	Passed
DP4	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed
DP5	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed

GROUP EP

Test phase .	Test	Requirement	Result	Comments
EP2	Contact retention in insert	0.30 mm max	< 0.30mm	Passed
EP7	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed

EQUIPMENT USED

Item	Manufacturer	ID Number	Last Cal.	Cal. Due
Microscope	-	--	N/C	-
Dielectric meter	Sefelec	QA/149.1	18/4/2015	18/4/2016
Million Megohmmeter	Sivananda	QA/179	12/07/15	12/07/16
Keith ely2400 source meter	Kiethely	2400	13/06/15	13/06/16
Humidity chamber	Votsch	MVL/CHB01	19/04/15	19/04/16
Thermal shock chamber	Votsch	MVL/CHB02	10/05/15	10/05/16
Dry heat chamber	MPC	QA/177	29/09/15	29/09/16
Tension/compression force gauge	Chatillon	IQATFG1	30/06/15	30/06/16
Solder bath	Heatech	QA/167	24/06/15	24/06/16
Life Testing Machine	FCI	QA/190	N/C	-
Power supply	Aplab	PS 2	VBU	-
N/C = Not calibrated VBU = Verified before use				

REVISION RECORD

Revision Level	Affected Pages	Description	Revision Date
A	All	Original Release	11/12/14
B	All	Calibration status updated	03/10/15

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LABORATORY TEST REPORT



REPORT NO. ELX-11-14-001-B	DATE OF REPORT 03/10/15	DATES TESTED 01/11/14 – 10/12/14	TESTED BY Bindu S Nair
REQUESTOR Mithun Paul	TITLE Delta-D Male Connector		Prepared By/Title Bindu S Nair Approved By/Title Lisy.T.C Engineer - Lab

PURPOSE

To evaluate the Delta D male connector with brass material as per CECC 75301-802 & C01-8646-0001 Specification

CONCLUSIONS

Tested samples met the specified requirements for the tests conducted as per CECC 75301-802 & C01-8646-0001 Specification

SAMPLE DESCRIPTION

Part Number	Description
D37P82C6GX00LF	Delta D 37 Psn male connector

DOCUMENT REFERENCE

Document Description	Revision/Issue	Date/Year
CECC 75301-802	Issue 1	1994
C01-8646-0001	N	2011

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TEST DESCRIPTION:

Test Group P

CI No.	Test Description	Test Phase
1	General examination (Visual examination)	P1
2	Polarization method	P2
2	Contact resistance	P3
4	Insulation resistance	P4
5	Voltage proof	P5

Test Group AP

CI No.	Test Description	Test Phase
1	Insertion & Withdrawal forces	AP2
2	Solder ability	AP3.1
3	Voltage proof	AP4
4	Rapid change of temperature	AP9
5	Insulation resistance	AP10
6	Voltage proof	AP11
7	Visual examination	AP12
8	Climatic sequence	AP13
9	Dry Heat	AP13.1
10	Damp Heat cyclic, 1 st cycle	AP13.2
11	Cold	AP13.3
12	Damp Heat cyclic, remaining cycles	AP 13.5
13	Insulation resistance	AP14
14	Contact resistance	AP15
15	Voltage proof	AP16
16	Insertion force / Withdrawal forces	AP17
17	Visual examination	AP18

Test Group BP

CI No.	Test Description	Test Phase
1	Mechanical operation	BP2
2	Contact resistance	BP4
3	Mechanical operation	BP5
4	Insulation resistance	BP6
5	Voltage proof	BP7
6	Visual examination	BP10
7	Static load axial	BP11

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Test Group DP

Cl. No.	Test Description	Test Phase
1	Mechanical operation	DP1
2	Electrical Load and temperature	DP2
3	Contact resistance	DP3
4	Voltage proof	DP4
5	Visual examination	DP5

Test Group EP

Cl. No.	Test Description	Test Phase
1	Contact retention in insert	EP2
2	Visual examination	EP7

TEST METHODS/REQUIREMENTS

Test phase	Item	Test Method	Condition	Requirement								
P1	General examination (Visual examination)	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation.								
P2	Polarization method	IEC 512-13e	Mated	It shall not be possible to mate in any other than correct manner								
P3	Contact resistance	IEC 512-2b	Mated condition	25mΩ max								
P4	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
P5	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP2	Insertion & Withdrawal forces	IEC 512-13b	Mated/unmated	<table border="1"> <tr> <td rowspan="2">Ins force max</td> <td colspan="2">Withdrawal Force</td> </tr> <tr> <td>min</td> <td>max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP3.1	Solder ability	IEC 512-12a	Solder bath method, Temperature -245 ± 5° C	Continuous flow of bright solder coating, un wetted areas or pin holes shall not be concentrated in one area								
AP4	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP9	Rapid change of temperature	IEC 512-11d	-55°C /+125°C	5 cycles								
AP10	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
AP11	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP12	Visual examination	IEC 512-1a	Unmated	No damage likely to impair normal operation								
AP13	Climatic sequence	IEC 512-11a	-	-								
AP13.1	Dry Heat	IEC 512-11i	Mated	+125°C, 12 hrs								
AP13.1.1	Insulation resistance at high temp	IEC 512-3a	Mated condition, at 100Vdc	1GΩ min								
AP 13.2	Damp Heat Cyclic, first cycle	IEC 512-11m	Mated	1 cycle								
AP 13.3	Cold	IEC 512-11j	Mated	-55°C, 2 hrs								
AP13.5	Damp Heat cyclic, remaining cycles	IEC 512-11m	Mated	5 cycles								
AP14	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min								
AP15	Contact resistance	IEC 512-2b	Mated condition	25mΩ max								
AP16	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed								
AP17	Insertion force / Withdrawal force	IEC 512-13b	Mated/unmated	<table border="1"> <tr> <td rowspan="2">Ins force max</td> <td colspan="2">Withdrawal Force</td> </tr> <tr> <td>min</td> <td>max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP18	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation								
BP2	Mechanical operation (Half of the specified number of operation)	IEC 512-9a	Speed 10mm/s	250 operations								

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BP4	Contact resistance	IEC 512-2b	Mated condition	25mΩ max
BP5	Mechanical operation (Remaining number of operation)	IEC 512-9a	Speed 10mm/s	250 operations
BP6	Insulation resistance	IEC 512-3a	Mated condition, at 100Vdc	5GΩ min
BP7	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed
BP10	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation
BP11	Static load axial	IEC 512-8b	Unmated	180 N No damage to be observed after application of load
DP1	Mechanical operation	IEC 512-9a	Speed 10mm/s	250 operations
DP2	Electrical Load and temperature	IEC 512-9b	Mated	70°C , 1.7Amps -500 hrs
DP3	Contact resistance	IEC 512-2b	Mated condition	25mΩ max
DP4	Voltage proof	IEC 512-4a	Mated condition, 1000 Vrms ct/ct & 1200 Vrms ct/test panel	No breakdown or Flash over to be observed
DP5	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation
EP2	Contact retention in insert	IEC 512-15a	Axial force from mating side 20 N min	Displacement 0.30mm max
EP7	Visual examination	IEC 512-1a	Unmated	There shall be no defects that would impair normal operation

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TEST RESULTS

GROUP P

Test Phase	Test	Requirement	Result	Comments
AP1	General examination	There shall be no defects that would impair normal operation	No defect observed	Passed
AP2	Polarization method	It shall not be possible to mate in any other than correct manner	Not possible to mate other than correct manner	Passed
AP3	Contact resistance	25mΩ max	7.14 – 8.91 mΩ	Passed
AP4	Insulation resistance at 100 Vdc	5GΩmin	> 5GΩ	Passed
AP5	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed

GROUP AP

Test phase	Test	Requirement	Result	Comments								
AP2	Insertion & Withdrawal force	<table border="1"> <tr> <td rowspan="2">Ins force max</td> <td colspan="2">Withdrawal Force</td> </tr> <tr> <td>min</td> <td>max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N	Insertion force – 57 – 65.4N Withdrawal Force – 47 – 55.8 N	Passed
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP3.1	Solder ability	Continuous flow of bright solder coating, un wetted areas or pin holes shall not be concentrated in one area	Solder coating ok	Passed								
AP4	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed								
AP9	Rapid change of temperature	-55°C / +125°C , 5 cycles	OK	Passed								
AP10	Insulation resistance	5GΩmin	> 5GΩ	Passed								
AP11	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed								
AP12	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed								
AP13	Climatic sequence	-										
AP13.1	Dry Heat	+125°C, 12 hrs	OK	Passed								
AP13.1.1	Insulation resistance at high temperature	1GΩmin	> 1GΩ	Passed								
AP13.2	Damp Heat cyclic, first cycle	1 cycle	OK	Passed								
AP13.3	Cold	-55°C	OK	Passed								
AP13.5	Damp Heat cyclic, remaining cycle	5 cycles	OK	Passed								
AP14	Insulation resistance	5GΩmin	> 5GΩ	Passed								
AP15	Contact resistance	25mΩ max	7.59 – 9.59 mΩ	Passed								
AP16	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed								
AP17	Insertion force / Withdrawal force	<table border="1"> <tr> <td rowspan="2">Ins force max</td> <td colspan="2">Withdrawal Force</td> </tr> <tr> <td>min</td> <td>max</td> </tr> <tr> <td>123 N</td> <td>11 N</td> <td>82 N</td> </tr> </table>	Ins force max	Withdrawal Force		min	max	123 N	11 N	82 N	Insertion force – 52.6 – 53.9 N Withdrawal Force – 42.3 – 47.1 N	Passed
Ins force max	Withdrawal Force											
	min	max										
123 N	11 N	82 N										
AP18	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed								

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GROUP BP

Test phase.	Test	Requirement	Result	Comments
BP2	Mechanical operation	250 operations	OK	Passed
BP4	Contact resistance	25mΩ max	7.27 – 9.43 mΩ	Passed
BP5	Mechanical operation	250 operations	OK	Passed
BP6	Insulation resistance	5GΩ min	> 5GΩ	Passed
BP7	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed
BP10	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed
BP11	Static load axial	180 N No damage to be observed after application of load	No damage observed	Passed

GROUP DP

Test phase	Test	Requirement	Result	Comments
DP1	Mechanical operation	250 operations	OK	Passed
DP2	Electrical Load and temperature	1.7 Amps 70°C - 500 hrs	OK	Passed
DP3	Contact resistance	25mΩ max	7.38 – 11.98 mΩ	Passed
DP4	Voltage proof	No breakdown or Flash over to be observed	No break down or flash over observed	Passed
DP5	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed

GROUP EP

Test phase	Test	Requirement	Result	Comments
1	Contact retention in insert	Axial displacement 0.30 mm max Load to be applied – 20N	20 N ok with displacement < 0.30mm	Passed
2	Visual examination	There shall be no defects that would impair normal operation	No defect observed	Passed

EQUIPMENT USED

Item	Manufacturer	ID Number	Last Cal.	Cal. Due
Microscope	-	--	N/C	-
Dielectric meter	Sefelec	QA/149.1	18/4/2015	18/4/2016
Million Megohmmeter	Sivananda	QA/179	12/07/15	12/07/16
Keith ely2400 source meter	Kiethely	2400	13/06/15	13/06/16
Humidity chamber	Votsch	MVL/CHB01	19/04/15	19/04/16
Thermal shock chamber	Votsch	MVL/CHB02	10/05/15	10/05/16
Dry heat chamber	MPC	QA/177	29/09/15	29/09/16
Tension/compression force gauge	Chatillon	IQATFG1	30/06/15	30/06/16
Solderability	Heatech	QA/167	24/06/15	24/06/16
Life Testing Machine	FCI	QA/190	N/C	-
Power supply	Aplab	PS 2	VBU	-
N/C = Not calibrated				
VBU = Verified before use				

REVISION RECORD

Revision Level	Affected Pages	Description	Revision Date
A	All	Original Release	11/12/14
B	All	Calibration status updated	03/10/15

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Material comparison

Mithun Paul/Alias Babu

05/10/2015



Comparison



TEST GROUP P

Parameter	Pb contact	Brass Contact	Requirement	Comments
Contact resistance	9.15 – 11.81 mΩ	7.14 – 8.91 mΩ	25mΩ max	Initial

TEST GROUP AP

Parameter	Pb contact	Brass Contact	Requirement	Comments
Insertion force	50.1 – 58.5 N	57 – 65.4N	123 N max	Initial
Withdrawal Force	41.6 – 44.1 N	47 – 55.8 N	11 - 82N	Initial
Contact resistance	8.91 – 12.10 mΩ	7.59 – 9.59 mΩ	25mΩ max	After Climatic sequence
Insertion force	52.6 – 57.8 N	52.6 – 53.9 N	123 N max	After Climatic sequence
Withdrawal Force	42.1 – 43.6 N	42.3 – 47.1 N	11 - 82N	After Climatic sequence

TEST GROUP BP

Parameter	Pb contact	Brass Contact	Requirement	Comments
Contact resistance	8.29 – 13.06 mΩ	7.27 – 9.43 mΩ	25mΩ max	After 250 Mating Cycles

TEST GROUP DP

Parameter	Pb contact	Brass Contact	Requirement	Comments
Contact resistance	8.97 – 12.30 mΩ	7.38 – 11.98 mΩ	25mΩ max	After 250 Mating Cycles, Electrical Load and temperature