



Superfly Ochito Mating Durability Testing

Date

04/13/18

GT-18-060

Rev. 2

Qualification Test Report

Conducted by:	Denver Smith
Approved by:	Itzetzl Frausto

1. Scope

The intention of this testing is to verify functionality of El Ochito Superfly connector after 2000 mating cycles. Resistance across each contact was measured to verify the functionality after every 250 cycles.

2. Summary of Results

The table below contains a chronological summary of all testing and their results:

QUALIFICATION TEST

Nature of the test	RESULT		
	Completed	WAIVE	FAIL
Visual Inspection: EIA-364-09C	X		
Contact Resistance: EIA-364-06C	X		

3. Description of Samples

- Superfly Plug: 887-441-02
- Superfly Receptacle: 887-442-02

Test Report: 18112R1DS0413V2

Glenair Test Report: GT-18-060

El Ochito Mating Durability

Version 2

April 13, 2018

Prepared By: Denver Smith
Test Engineer

Reviewed By: Kelly Kimball
Test Engineer

Approved By: Preston Clover
Laboratory Director



Vertical Laboratories, LLC.
1805 Flower St · Glendale, CA · 91201
Telephone: 818-858-1982
www.verticallaboratories.com



TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 2 of 18
------------------------	-----------------------------	---

List of Tables

Table 1: Report Version History	4
Table 2: Test Deviations	4
Table 3: Test Item Identification	7
Table 4: Contact Resistance Test Equipment List	7
Table 5: Contact Identification	8
Table 6: Contact Resistance Measurements (Post 0, 250, and 500 cycles)	9
Table 7: Contact Resistance Measurements (Post 750, 1000, and 1250 cycles)	10
Table 8: Contact Resistance Measurements (Post 1500, 1750, and 2000 cycles)	11
Table 9: Mating Durability Test Equipment List	13

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 3 of 18
------------------------	-----------------------------	---

List of Figures

Figure 1: Glenair El Ochito Superfly conector drawing (Male)	5
Figure 2: Glenair El Ochito Superfly connector drawing (Female)	6
Figure 3: Contact Resistance Test Setup	12
Figure 4: Contact Resistance Test Setup (Detailed View)	13
Figure 5: Mating Durability Test Plot (2000 Cycles)	15
Figure 6: Mating Durability Test Setup	16
Figure 7: Mating Durability Test Setup (Detailed View)	17

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 4 of 18
------------------------	-----------------------------	---

Table 1: Report Version History

Date	Version	Notes	Prepared By	Reviewed By	Approved By
4/11/2018	1	Initial Test Report	DS	KK	PC
4/13/2018	2	Part numbers corrected (-01 to -02)	DS	KK	PC

Table 2: Test Deviations

Test	Description
-	-

1.0 Summary of Testing

All testing in this report was conducted in accordance with EIA-364-06C “Contact Resistance Test Procedure for Electrical Connectors” and EIA-364-09C “Durability Test Procedure for Electrical Connectors and Contacts”. The intent of this testing is to verify that the El Ochito Superfly Connector is able to function properly after enduring 2000 mating cycles. The functionality of the test samples was verified by measuring the resistance across each contact after every 250 cycles and comparing it to the initial measurement. After completion of 2000 cycles, no visual damage was observed on the test samples and the resistance across each contact remained the same.

2.0 General Information

2.1 References

- **EIA-364-06C:** “Contact Resistance Test Procedure for Electrical Connectors”
- **EIA-364-09C:** “Durability Test Procedure for Electrical Connectors and Contacts”

TEST REPORT

Glenair No.: GT-18-060	El Ocho Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 5 of 18
------------------------	---------------------------	---

2.2 Test Samples

887-441

THIS COPYRIGHTED DOCUMENT IS THE PROPERTY OF GLENAIR, INC. AND IS FURNISHED ON THE CONDITION THAT IT IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED TO SOLICIT QUOTATIONS FROM COMPETITIVE SOURCES, OR USED FOR MANUFACTURE BY ANYONE OTHER THAN GLENAIR, INC. WITHOUT WRITTEN PERMISSION FROM GLENAIR, INC. THE INFORMATION HEREIN HAS BEEN DEVELOPED AT GLENAIR'S EXPENSE AND MAY BE USED FOR ENGINEERING EVALUATION AND INCORPORATION INTO TECHNICAL SPECIFICATIONS AND OTHER DOCUMENTS WHICH SPECIFY PROCUREMENT OF PRODUCTS FROM GLENAIR, INC.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
1	PRELIMINARY RELEASE	08/27/15	HTN
2	ADD REAR GROMMET, SIZE 24 AWG CABLES	01/08/16	HTN

Labels in drawing: GROMMET, 1.50 MAX, POLARIZATION KEY, CABLE JACKET SHOWN FOR REFERENCE ONLY, .375 HEX, FULLY ASSEMBLED CONTACT SHOWN FOR REFERENCE ONLY, Ø.227, Ø.415.

PIN NUMBERS SHOWN SHALL NOT BE MARKED.

5. INNER CONTACT'S CRIMP TOOL:
BASIC TOOL M2520/2-01 (GLENAIR P/N 809-015)
POSITIONER DANIELS P/N K1906 (GLENAIR P/N 859-101)

△ GLENAIR'S 887-441 PLUG CONNECTOR IS DESIGNED TO ACCOMMODATE CABLE WIRE SIZE 26 AWG AND 24 AWG OR EQUIVALENT (SEE TABLE 1 FOR CABLE PART NUMBER). IT SHALL MATE WITH GLENAIR'S RECEPTACLE CONNECTOR PART NUMBER 887-442 ONLY.

3. ELECTRICAL PARAMETERS:
DIFFERENTIAL IMPEDANCE: 100 OHMS NOMINAL
DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS
INSULATION RESISTANCE: 1,000 MEGOHMS MIN AT 500 VAC

2. MATERIAL / FINISH:
SHELL, BACKSHELL - ALUMINUM ALLOY / ELECTROLESS NICKEL PLATED
INNER CONTACTS - COPPER ALLOY / GOLD PLATED
INNER BUSHING, RETAINING CLIP, EMI SHIELDS - COPPER ALLOY / ELECTROLESS NICKEL PLATED
INSULATOR - PPS / N.A.
O-RING, GROMMET - FLUOROSILICONE OR EQUIV.

△ CONNECTOR COMPONENTS SHALL BE KITTED, BAGGED AND TAGGED WITH GLENAIR'S NAME, PART NUMBER AND DATE CODE.

NOTES: UNLESS OTHERWISE SPECIFIED

PART NUMBER DEVELOPMENT
EXAMPLE 887 - 441 - 01
BASIC NO. _____
CABLE DASH NO. _____
(SEE TABLE 1)

DASH NUMBER	CABLES ACCOMMODATED	REF CABLE O.D.	ASSEMBLY INSTRUCTION
-01	963-003-26	.220	TBD
-02	963-033-26	.220	TBD
-03	963-003-24	.260	TBD
-04	963-033-24	.260	TBD

DRAWN HTN	08/27/15	GLENAIR, INC. CAD 1887 [®] 1211 AIR WAY - GLENDALE - CALIFORNIA 91201
CHECK HTN	08/27/15	
ENGR HTN	08/27/15	
DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED		SUPER FLY PLUG, HIGH SPEED ETHERNET, 100 OHMS, CAT6 / CAT6A
TOLERANCES:		
FRACTIONS	± 1/16	CODE IDENT. NO. SIZE REV. 06324 887-441 2
DECIMALS	.XX ±.030 .XXX ±.015	
ANGLES	± 1°	
DO NOT SCALE THIS DRAWING		SCALE N/A WEIGHT N/A SHEET 1 OF 1
B/P 354172 P/C 887		
NON REPAIRABLE COMMERCIAL ITEM		

Figure 1: Glenair El Ocho Superfly conector drawing (Male)

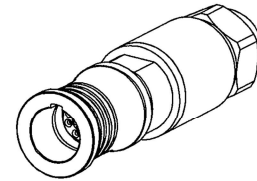
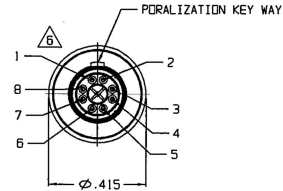
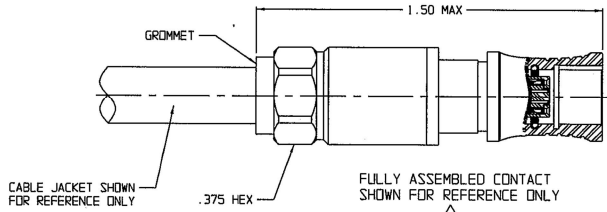
TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 6 of 18
------------------------	-----------------------------	---

887-442

THIS COPYRIGHTED DOCUMENT IS THE PROPERTY OF GLENAIR, INC. AND IS FURNISHED ON THE CONDITION THAT IT IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED TO SOLICIT QUOTATIONS FROM COMPETITIVE SOURCES, OR USED FOR MANUFACTURE BY ANYONE OTHER THAN GLENAIR, INC. WITHOUT WRITTEN PERMISSION FROM GLENAIR, INC. THE INFORMATION HEREIN HAS BEEN DEVELOPED AT GLENAIR'S EXPENSE AND MAY BE USED FOR ENGINEERING EVALUATION AND INCORPORATION INTO TECHNICAL SPECIFICATIONS AND OTHER DOCUMENTS WHICH SPECIFY PROCUREMENT OF PRODUCTS FROM GLENAIR, INC.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
1	PRELIMINARY RELEASE	08/27/15	HTN
2	ADD REAR GROMMET, SIZE 24 AWG CABLES	01/08/16	HTN



PART NUMBER DEVELOPMENT
 EXAMPLE 887 - 442 - 01
 BASIC NO. _____
 CABLE DASH NO. _____
 (SEE TABLE 1)

△ PIN NUMBERS SHOWN SHALL NOT BE MARKED.

- 5. INNER CONTACT'S CRIMP TOOL:
 BASIC TOOL M22520/2-01 (GLENAIR P/N 809-015)
 POSITIONER DANIELS P/N K1906 (GLENAIR P/N 859-101)
- △ GLENAIR'S 887-442 RECEPTACLE CONNECTOR IS DESIGNED TO ACCOMMODATE CABLE WIRE SIZE 26 AWG AND 24 AWG OR EQUIVALENT (SEE TABLE 1 FOR CABLE PART NUMBER). IT SHALL MATE WITH GLENAIR'S PLUG CONNECTOR PART NUMBER 887-441 ONLY.
- 3. ELECTRICAL PARAMETERS:
 DIFFERENTIAL IMPEDANCE: 100 OHMS NOMINAL
 DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS
 INSULATION RESISTANCE: 1,000 MEGOHMS MIN AT 500 VAC

DASH NUMBER	CABLES ACCOMMODATED	REF CABLE O.D.	ASSEMBLY INSTRUCTION
-01	963-003-26	.220	TBD
-02	963-033-26	.220	TBD
-03	963-003-24	.260	TBD
-04	963-033-24	.260	TBD

- 2. MATERIAL / FINISH:
 SHELL, BACKSHELL - ALUMINUM ALLOY / ELECTROLESS NICKEL PLATED
 INNER CONTACTS - COPPER ALLOY / GOLD PLATED
 INNER BUSHING, RETAINING CLIP, EMI SHIELDS - COPPER ALLOY / ELECTROLESS NICKEL PLATED
 INSULATOR - PPS / N.A.
 O-RING, GROMMET - FLUOROSILICONE OR EQUIV.
 LATCHING EMI SPRING - SST / GOLD PLATED
 - △ CONNECTOR COMPONENTS SHALL BE KITTED, BAGGED AND TAGGED WITH GLENAIR'S NAME, PART NUMBER AND DATE CODE.
- NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED	DRAWN HTN	08/27/15	GLENAIR, INC. CAD 18979 1211 AIR WAY - GLENDALE - CALIFORNIA 91201
	CHECK HTN	08/27/15	
	ENGR HTN	08/27/15	
TOLERANCES:	 SUPER FLY RECEPTACLE, HIGH SPEED ETHERNET, 100 OHMS, CAT6/ CAT6A		
DO NOT SCALE THIS DRAWING	RELEASE DATE	06324	CODE IDENT. NO. / SIZE
B/P 354172 P/C 887	RELEASE DATE	887-442	REV. 2
	NON REPAIRABLE COMMERCIAL ITEM	SCALE N/A	WEIGHT N/A
		SHEET 1 OF 1	

Figure 2: Glenair El Ochito Superfly connector drawing (Female)

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 7 of 18
------------------------	-----------------------------	---

3.0 Test Item Identification

Table 3: Test Item Identification

Test Type	Specification	Part Name	Part No.	Test Sample
Contact Resistance	EIA-364-06C	El Ochito Superfly Connector	887-441-02 (Male) / 887-442-02 (Female)	001 / 001
Mating Durability	EIA-364-09C			

4.0 Tests

4.1 Contact Resistance

4.1.1 References

- EIA-364-06C: “Contact Resistance Test Procedure for Electrical Connectors”

4.1.2 Test Equipment

Table 4: Contact Resistance Test Equipment List

ID No.	Equipment Name	Manufacturer	Model No.	Cal. Date	Cal. Due
-	DC Power Supply	Sorensen	XHR 40-25	-	-
EM00011	Digital Multimeter	Fluke	233	11/14/2017	11/30/2018
EM00003	Digital Multimeter	Fluke	287	11/14/2017	11/30/2018

4.1.3 Test Method and Setup

Contact resistance testing shall be performed on the test samples in accordance with EIA-364-06C using the test setup shown in Figures 3-4. The test shall be performed by connecting the test samples and measuring the voltage across each of the eight contacts when a 2 A test current is applied. See Table 5 for contact identification. The voltage measurements shall be recorded in both directions and averaged in order to calculate the resistance across each contact. The contact resistance shall be performed on the test samples before starting the mating durability test and again after every 250 cycles up to 2000 cycles.

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 8 of 18
------------------------	-----------------------------	---

Table 5: Contact Identification

Contact No.	Wire Color
1	Brown
2	Brown/White
3	Blue
4	Blue/White
5	Orange
6	Orange/White
7	Green
8	Green/White

4.1.4 Test Results

The contact resistance test was performed on the test samples in accordance with EIA-364-06C before beginning the mating durability test and after every 250 cycles for a total of 2000 cycles. See Tables 6-8 for test results. After performing the mating durability test for 2000 cycles there were no signs of visual damage on the test samples and the resistance measurement for each of the eight contacts remained the same.

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 9 of 18
------------------------	-----------------------------	---

Table 6: Contact Resistance Measurements (Post 0, 250, and 500 cycles)

No. of Mating Cycles	Contact No.	Current	$\Delta V+$ [mv]	$\Delta V-$ [mv]	Resistance [$m\Omega$]
0	1	2.00	58.5	58.5	29.3
	2	2.00	58.7	58.2	29.2
	3	2.00	58.5	58.3	29.2
	4	2.00	59.4	58.9	29.6
	5	2.00	59.2	58.3	29.4
	6	2.00	59.3	58.9	29.6
	7	2.00	59.4	58.8	29.6
	8	2.00	58.4	59.4	29.5
250	1	2.00	58.4	58.6	29.3
	2	2.00	58.9	57.8	29.2
	3	2.00	59.0	58.9	29.5
	4	2.00	59.1	59.4	29.6
	5	2.00	59.8	59.3	29.8
	6	2.00	59.6	59.4	29.8
	7	2.00	59.4	59.3	29.7
	8	2.00	59.5	59.0	29.6
500	1	2.00	29.9	59.6	22.4
	2	2.00	60.0	59.7	29.9
	3	2.00	60.2	59.9	30.0
	4	2.00	60.3	60.0	30.1
	5	2.00	60.5	60.1	30.2
	6	2.00	60.6	60.3	30.2
	7	2.00	60.8	60.4	30.3
	8	2.00	61.0	60.6	30.4

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 10 of 18
------------------------	-----------------------------	--

Table 7: Contact Resistance Measurements (Post 750, 1000, and 1250 cycles)

No. of Mating Cycles	Contact No.	Current	$\Delta V+$ [mv]	$\Delta V-$ [mv]	Resistance [m Ω]
750	1	2.00	59.6	59.6	29.8
	2	2.00	59.2	59.2	29.6
	3	2.00	58.9	58.8	29.4
	4	2.00	59.2	59.5	29.7
	5	2.00	59.4	59.2	29.7
	6	2.00	59.0	59.7	29.7
	7	2.00	59.2	59.3	29.6
	8	2.00	60.4	60.0	30.1
1000	1	2.00	59.2	59.5	29.7
	2	2.00	58.5	58.3	29.2
	3	2.00	59.8	59.1	29.7
	4	2.00	59.9	59.5	29.9
	5	2.00	59.9	60.0	30.0
	6	2.00	60.0	59.7	29.9
	7	2.00	59.1	58.8	29.5
	8	2.00	59.5	59.6	29.8
1250	1	2.00	58.5	58.4	29.2
	2	2.00	57.7	57.7	28.9
	3	2.00	58.7	58.8	29.4
	4	2.00	59.2	58.8	29.5
	5	2.00	59.4	58.9	29.6
	6	2.00	59.9	59.8	29.9
	7	2.00	59.4	59.4	29.7
	8	2.00	59.4	58.5	29.5

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 11 of 18
------------------------	-----------------------------	--

Table 8: Contact Resistance Measurements (Post 1500, 1750, and 2000 cycles)

No. of Mating Cycles	Contact No.	Current	$\Delta V+$ [mv]	$\Delta V-$ [mv]	Resistance [$m\Omega$]
1500	1	2.00	58.40	58.0	29.1
	2	2.00	58.70	58.6	29.3
	3	2.00	59.30	59.5	29.7
	4	2.00	59.40	59.3	29.7
	5	2.00	59.30	59.3	29.7
	6	2.00	60.30	59.8	30.0
	7	2.00	59.10	58.8	29.5
	8	2.00	59.90	59.3	29.8
1750	1	2.00	59.40	59.0	29.6
	2	2.00	59.20	59.2	29.6
	3	2.00	59.20	59.1	29.6
	4	2.00	59.60	59.3	29.7
	5	2.00	60.30	60.2	30.1
	6	2.00	59.50	59.0	29.6
	7	2.00	59.40	59.6	29.8
	8	2.00	59.90	60.3	30.1
2000	1	2.00	58.70	58.5	29.3
	2	2.00	58.60	58.2	29.2
	3	2.00	59.10	58.9	29.5
	4	2.00	60.60	59.8	30.1
	5	2.00	60.20	59.4	29.9
	6	2.00	59.40	59.3	29.7
	7	2.00	59.30	58.8	29.5
	8	2.00	59.80	59.7	29.9

TEST REPORT

Glenair No.: GT-18-060	El Ocho Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 12 of 18
------------------------	---------------------------	--

4.1.5 Deviation of Test

No test deviations were present during contact resistance test.

4.1.6 Photographs

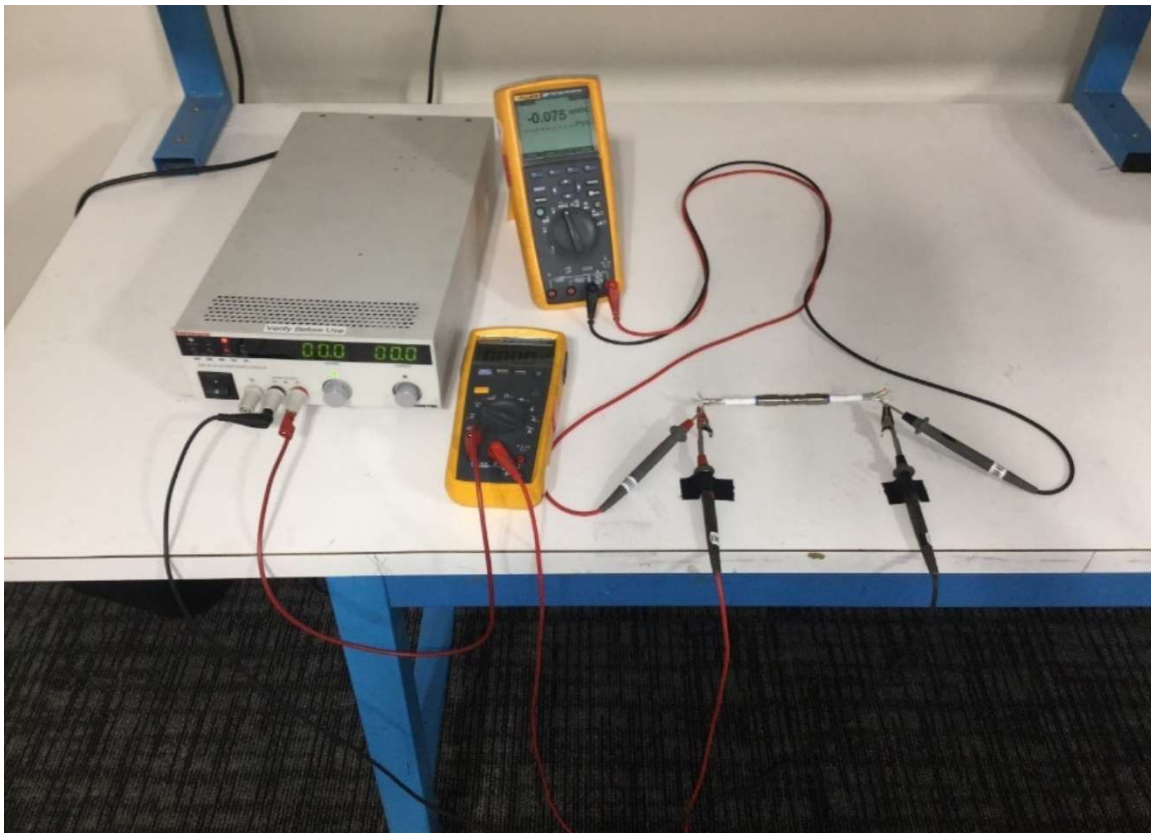


Figure 3: Contact Resistance Test Setup

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 13 of 18
------------------------	-----------------------------	--

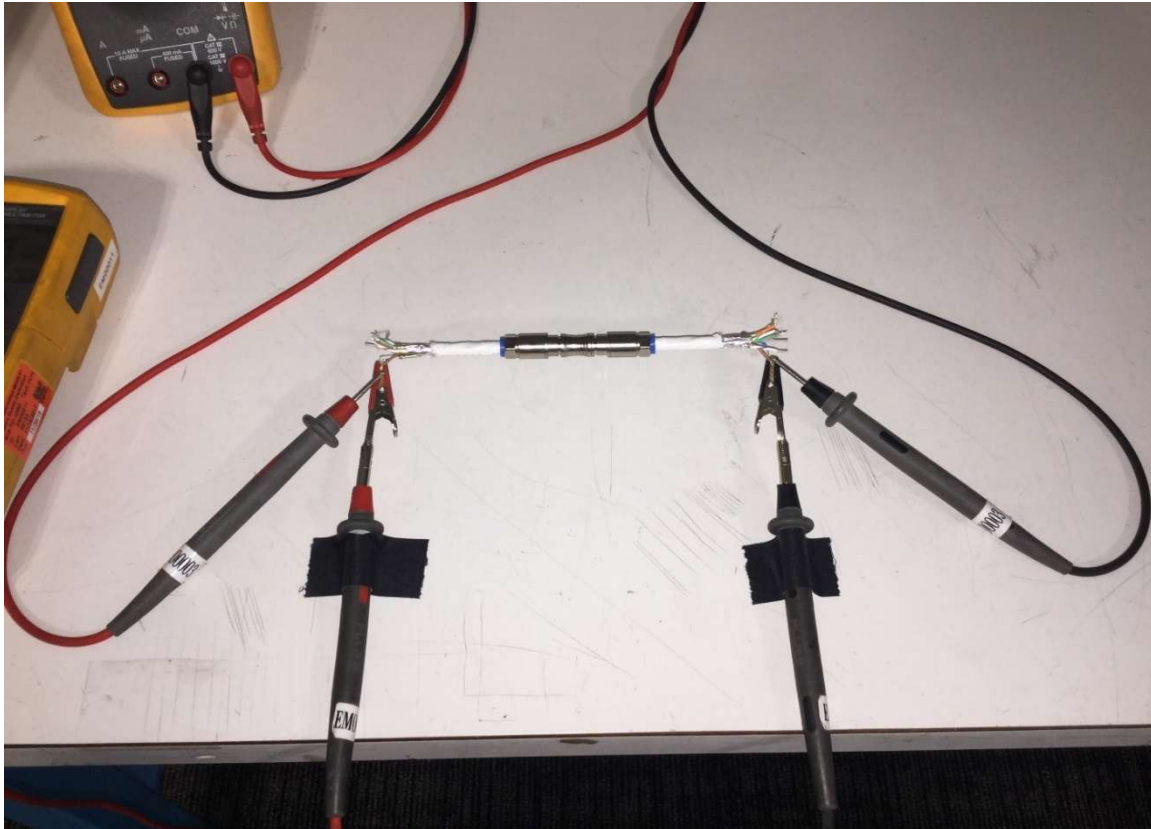


Figure 4: Contact Resistance Test Setup (Detailed View)

4.2 Mating Durability

4.2.1 References

- EIA-364-09C: “Durability Test Procedure for Electrical Connectors and Contacts”

4.2.2 Test Equipment

Table 9: Mating Durability Test Equipment List

ID No.	Equipment Name	Manufacturer	Model No.	Cal. Date	Cal. Due
CP00011	Digital Force Gauge	Chatillon	DFIS 200	12/19/2017	12/31/2018
CE00025	Tensile Tester	Chatillon	TCD 200	12/12/2017	1/31/2021

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 14 of 18
------------------------	-----------------------------	--

4.2.3 Test Method and Setup

Mating durability testing shall be performed on the test samples in accordance with EIA-364-09C for a total duration of 2000 cycles. The test shall be performed at a rate of 250 cycles per hour and a contact resistance test shall be performed before starting the test and after every 250 cycles. The test setup shall be configured such that each test sample is held securely in place and the bottom half of the system shall be able to free float in order to allow for proper alignment. See Figures 6-7 for test setup.

4.2.4 Test Results

The mating durability test was performed on the test samples in accordance with EIA-364-09C for a total of 2000 cycles. Upon completion of testing there were no signs of physical damage observed on the test units and each contact maintained the same resistance measurement throughout the course of testing. See Figure 5 for mating durability test plot.

TEST REPORT

Glenair No.: GT-18-060

El Ochito Mating Durability

Document No.: 18112R1DS0413V2
Version: 2
Page 15 of 18

Mating Durability Plot (Cycles 0-2000)

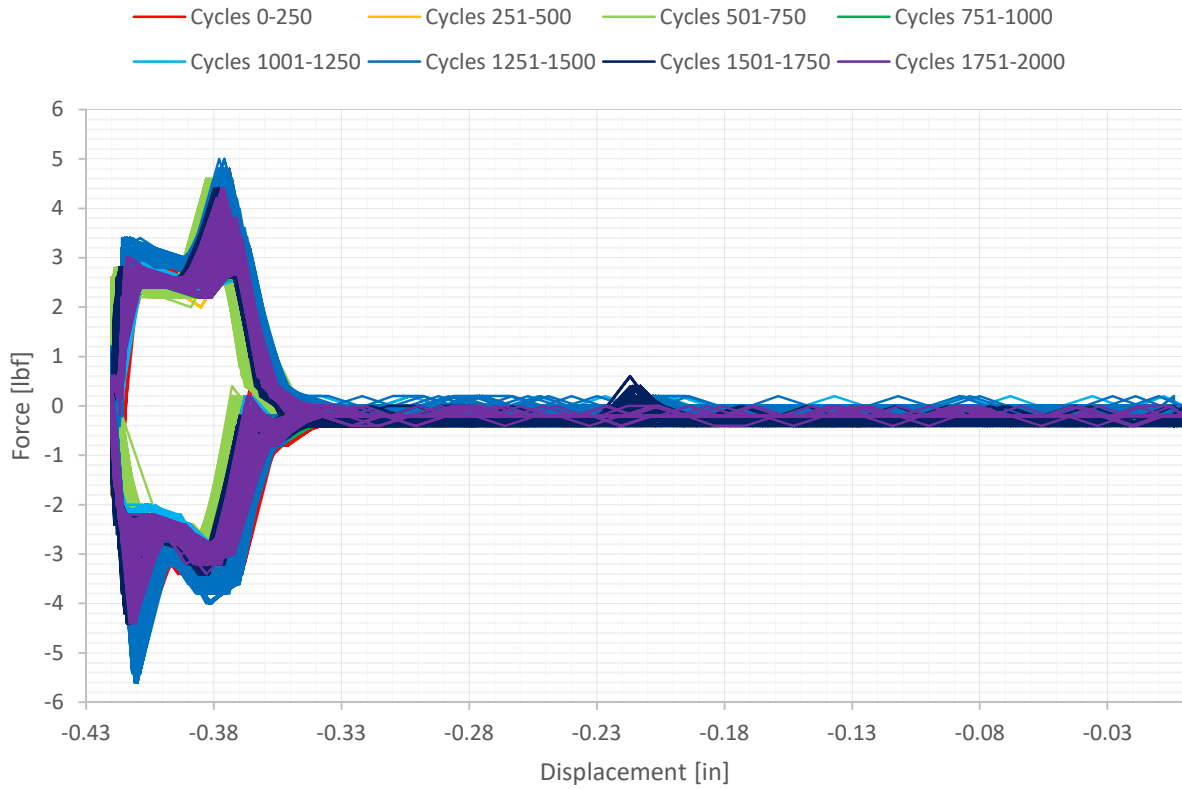


Figure 5: Mating Durability Test Plot (2000 Cycles)

4.2.5 Deviation of Test

No test deviations were present during mating durability test.

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 16 of 18
------------------------	-----------------------------	--

4.2.6 Photographs

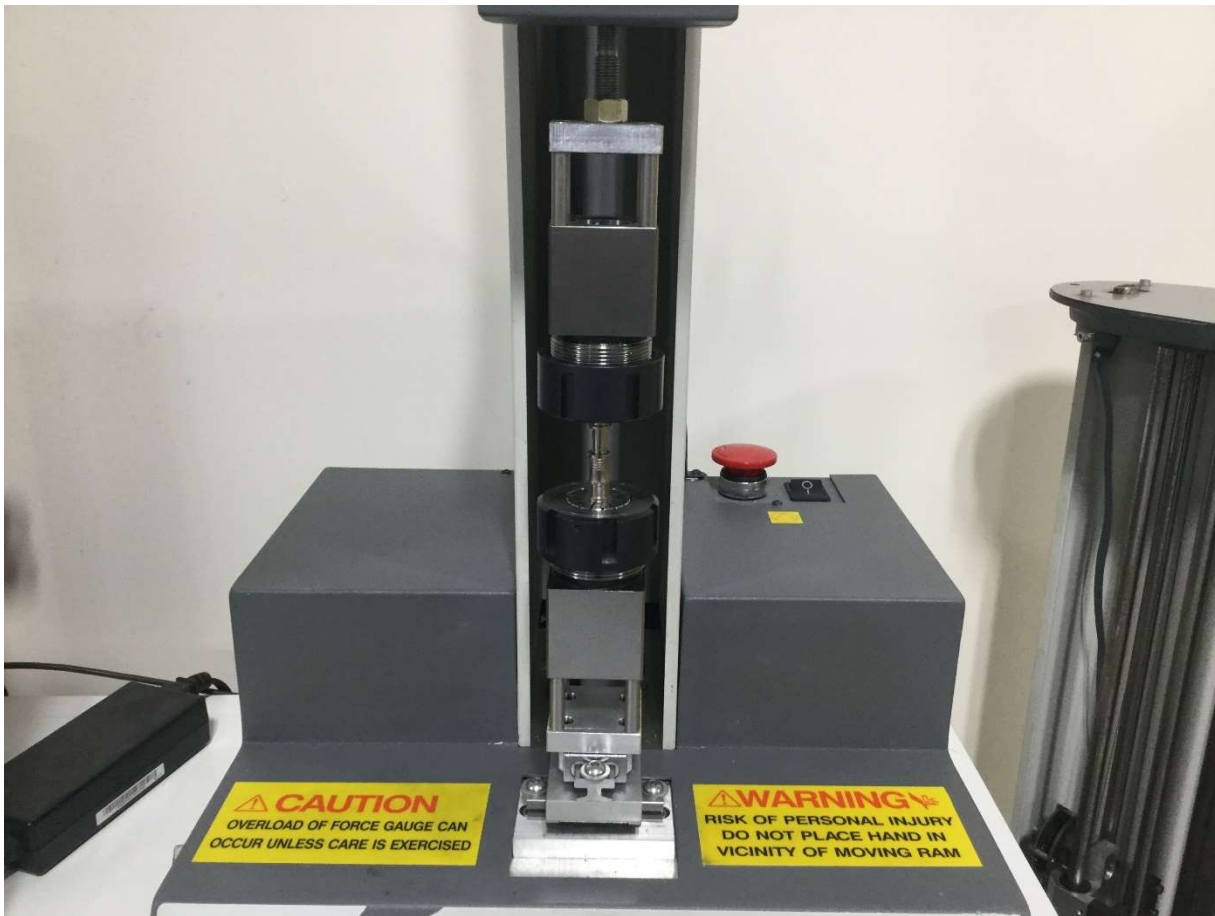


Figure 6: Mating Durability Test Setup

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 17 of 18
------------------------	-----------------------------	--



Figure 7: Mating Durability Test Setup (Detailed View)

TEST REPORT

Glenair No.: GT-18-060	El Ochito Mating Durability	Document No.: 18112R1DS0413V2 Version: 2 Page 18 of 18
------------------------	-----------------------------	--

END OF REPORT