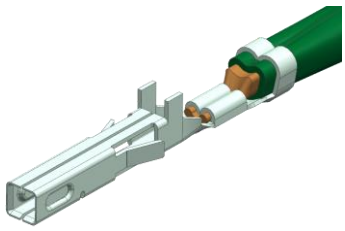
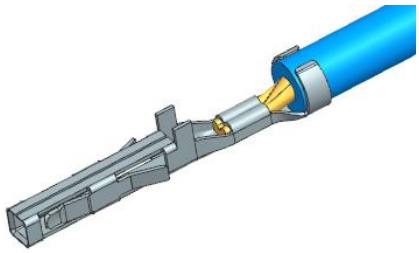
TEST SUMMARY

Mini-fit TPA2, Wire to Board

INTERCONNECT SYSTEMS

See section 2.1 for series numbers

Female terminal	LMF female terminal
	
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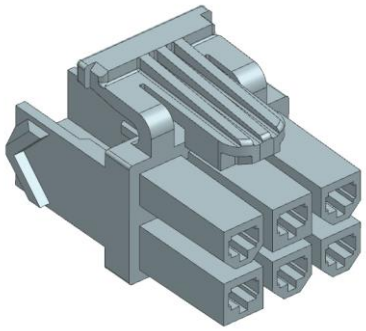	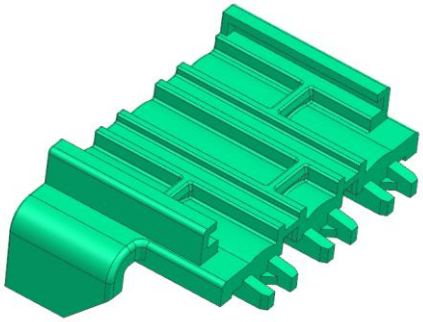
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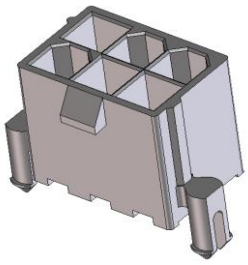
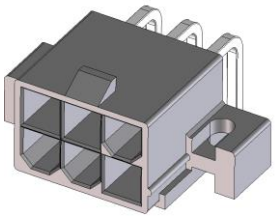
	

REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: **783855** DATE: **2024/04/24**	**TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY**	**1** of **26**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	**GLLI**	**XQZHANG**	**XQZHANG**

TEST SUMMARY

1.0 SCOPE

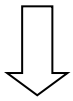
This Test Summary covers the performance results for the **MINI-FIT TPA2 Wire-To-Board**, 4.20mm pitch dual row and single row connector series using brass and phos bronze terminals with Tin plating terminated with 16 to 24 AWG wire using Molex crimp technology. The TPA Retainer (terminal position assurance) is intended to ensure the crimp terminals are fully seated and to prevent incidence of terminal back-out due to partially seated terminals.

2.0 PRODUCT DESCRIPTION

2.1 NAMES AND SERIES NUMBER(S)

WIRE-TO-BOARD				
Description	Series Number	UL (600 V)	CSA (250 V)	IEC (250 V)
Mini-Fit TPA2, Receptacle Hsg, Dual Row	**172708**	**Yes**	**Yes**	**Yes**
Mini-Fit TPA2, Receptacle Hsg, Single Row	**200453**	**Yes**	**Yes**	**Yes**
Mini-Fit TPA2, Female Crimp Terminal	**172718**	**Yes**	**Yes**	**Yes**
LMF MINI-FIT SIGMA FEMALE TERMINAL	**221442**	**Yes**	**Yes**	**Yes**
Mini-Fit TPA2, TPA Retainer	**172709**	**Yes**	**Yes**	**Yes**

MATES TO



Right Angle Hdr, Dual Row	35318	Yes	Yes	Yes
Right Angle Hdr, Dual Row	44130	Yes	Yes	Yes
Right Angle Hdr, Dual Row	87427	Yes	Yes	Yes
Right Angle Hdr, Dual Row, Glow Wire Capable	172448	Yes	Yes	Yes
Right Angle Hdr, Dual Row, Reflow Capable	46991	Yes	Yes	Yes
Right Angle Hdr, Single and Dual Row	5569	Yes	Yes	Yes
Right Angle Hdr, Single Row, Reflow Capable	172648	Yes	Yes	Yes
Test Plug	44281	n/a	n/a	n/a
Vertical Hdr, Dual Row	5566	Yes	Yes	Yes
Vertical Hdr, Dual Row	35317	Yes	Yes	Yes
Vertical Hdr, Dual Row	36633	Yes	Yes	Yes
Vertical Hdr, Dual Row	43460	Yes	Yes	Yes
Vertical Hdr, Dual Row	44482	Yes	Yes	Yes
Vertical Hdr, Dual Row	47254	Yes	Yes	Yes
Vertical Hdr, Dual Row	47256	Yes	Yes	Yes
Vertical Hdr, Dual Row	67120	Yes	Yes	Yes
Vertical Hdr, Dual Row	87427	Yes	Yes	Yes
Vertical Hdr, Dual Row Glow Wire Capable	172447	Yes	Yes	Yes
Vertical Hdr, Dual Row Reflow Capable	46207	Yes	Yes	Yes
Vertical Hdr, Single Row	172647	Yes	Yes	Yes

2.2 DIMENSIONS, MATERIALS, PLATING AND MARKINGS

See the appropriate sales drawings for the information on dimensions, materials, plating and markings.

2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179
CSA: LR19980
*IEC 61984 Certification: Tested to and found in compliance with IEC 61984. NRTL type examination certificate available from Molex upon requ*est. Contact Molex Safety Agency team for questions regarding certification on specific part numbers.

2.4 PRODUCT SPECIFICATION TITLE AND DOCUMENT NUMBER

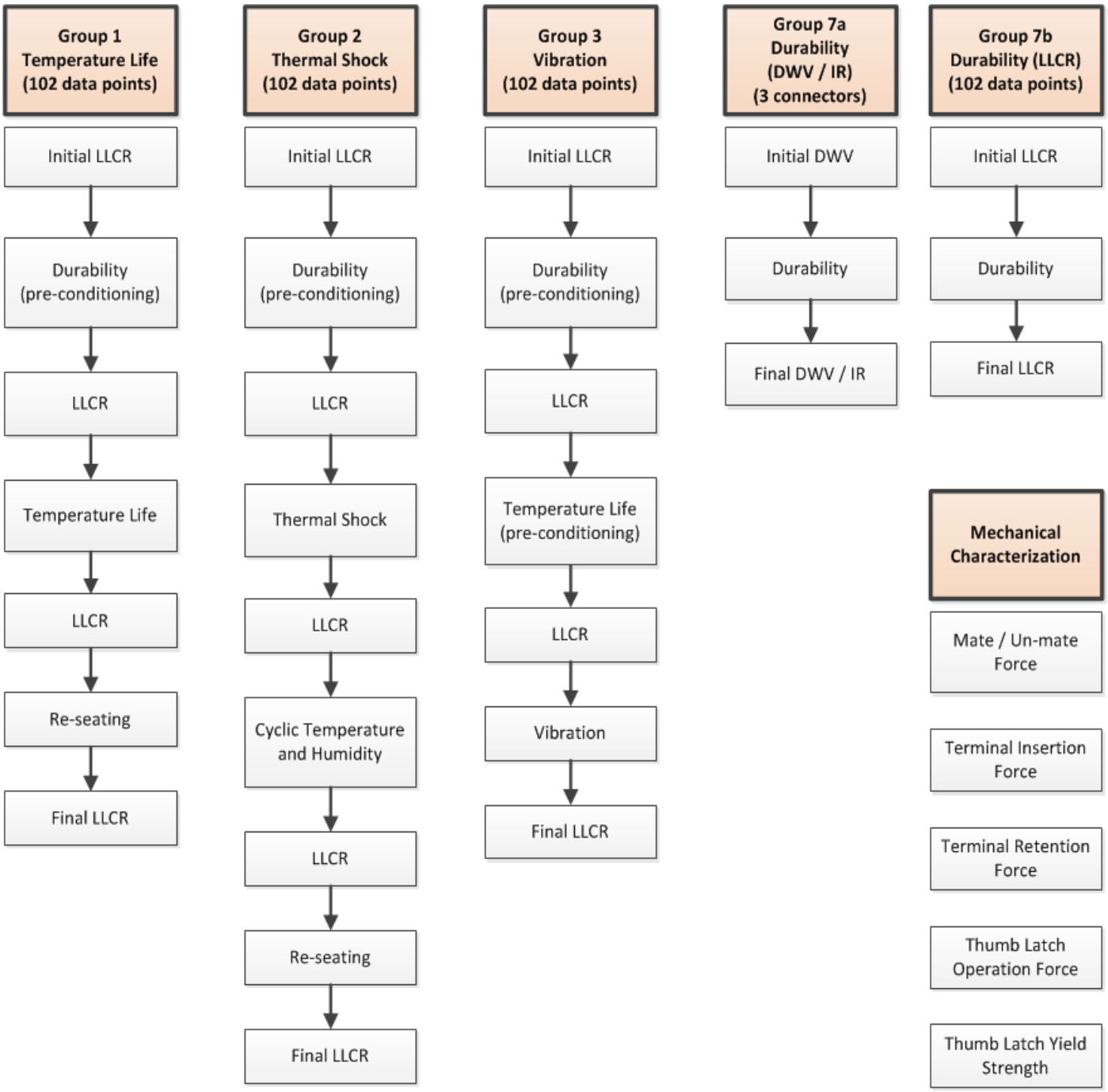
Title: Product Specification Mini-Fit TPA2 Connector System
Document No: PS-172718-0000

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and the other sections of this specification for the necessary referenced documents and specifications.

4.0 TEST SEQUENCES

Laboratory conditions, test sequences and sample selection are in accordance with EIA-364.



5.0 MECHANICAL PERFORMANCE RESULTS

RIGHT ANGLE					
DESCRIPTION	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MIN.**	**MAX.**
Mate Force Per Circuit (brass)	Initial	**14.7** N MAX	**2.45** N	**2.06** N	**3.80** N
Unmate Force Per Circuit (brass)	Initial	**1.0** N MIN	**3.51** N	**2.90** N	**4.67** N
Mate Force Per Circuit (phos bronze)	Initial	**14.7** N MAX	**3.39** N	**2.42** N	**4.79** N
Unmate Force Per Circuit (phos bronze)	Initial	**1.0** N MIN	**4.67** N	**3.25** N	**6.46** N

VERTICAL					
DESCRIPTION	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MIN.**	**MAX.**
Mate Force Per Circuit (brass)	Initial	**14.7** N MAX	**4.64** N	**3.46** N	**6.34** N
Unmate Force Per Circuit (brass)	Initial	**1.0** N MIN	**5.41** N	**4.03** N	**7.23** N
Mate Force Per Circuit (phos bronze)	Initial	**14.7** N MAX	**6.11** N	**4.66** N	**7.84** N
Unmate Force Per Circuit (phos bronze)	Initial	**1.0** N MIN	**7.25** N	**5.89** N	**9.60** N

For LMF female terminal					
DESCRIPTION	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MIN.**	**MAX.**
Mate Force Per Circuit	Initial	**7.0** N MAX	**3.89** N	**3.38** N	**5.13** N
Unmate Force Per Circuit	Initial	**1.0** N MIN	**3.98** N	**3.55** N	**4.72** N

5.0 MECHANICAL PERFORMANCE RESULTS (cont.)

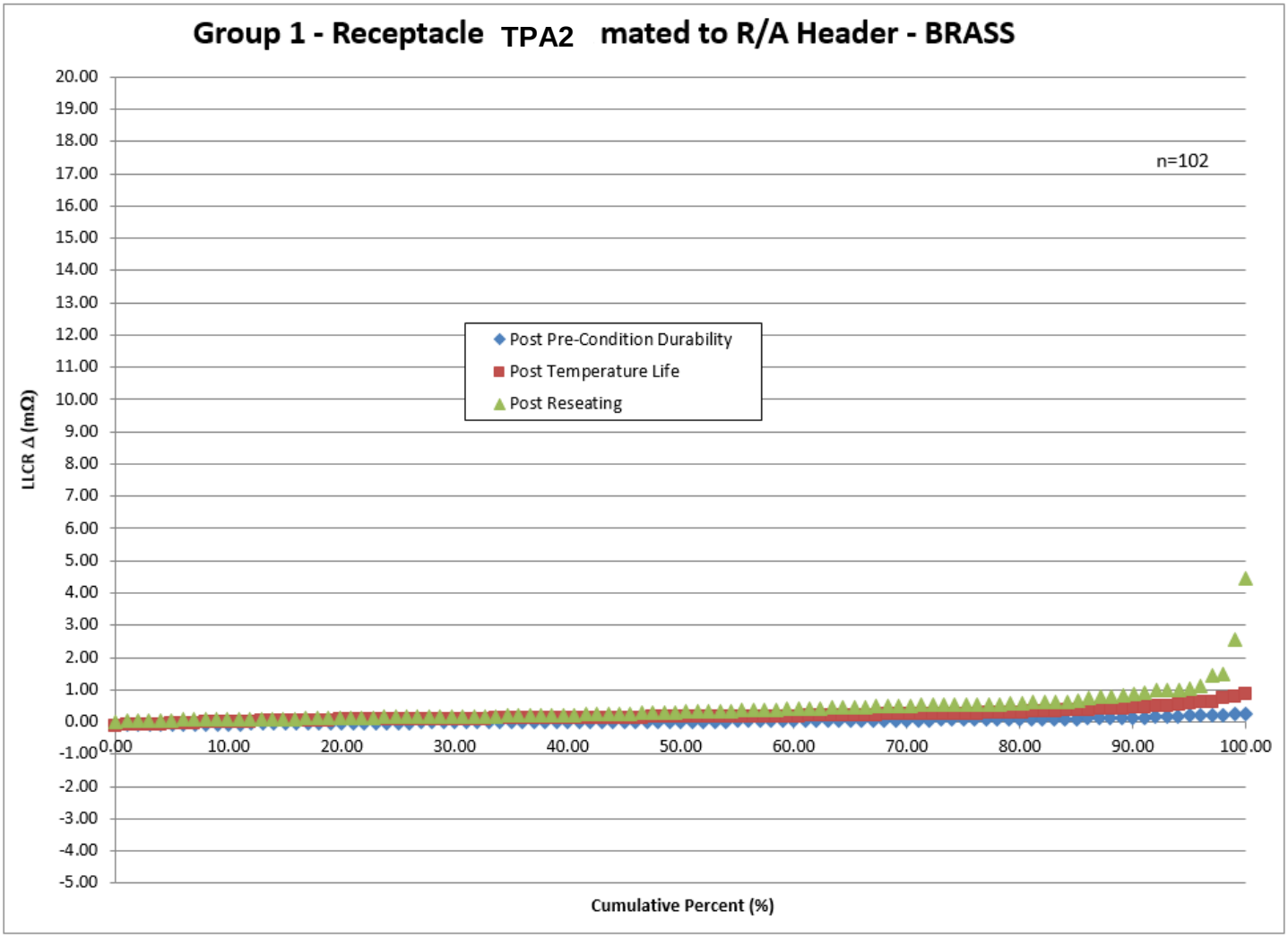
DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MIN.	MAX.
Terminal Insertion Force (brass)	Initial	**15** N MAX	**2.35** N	**1.75** N	**3.73** N
Terminal Insertion Force (phos bronze)	Initial	**15** N MAX	**2.71** N	**2.38** N	**3.35** N
Terminal Retention Force (brass)	Initial	**30** N MIN	**60.84** N	**54.93** N	**63.38** N
Terminal Retention Force (phos bronze)	Initial	**30** N MIN	**64.89** N	**59.84** N	**70.19** N
Thumb Latch Operation Force (V-0)	Initial	**16** N MAX	**10.51** N	**9.14** N	**11.70** N
Thumb Latch Operation Force (V-2)	Initial	**16** N MAX	**8.02** N	**7.23** N	**8.78** N
Thumb Latch Yield Strength (V-0)	Initial	**60** N MIN	**72.88** N	**69.03** N	**75.67** N
Thumb Latch Yield Strength (V-2)	Initial	**45** N MIN	**53.61** N	**50.63** N	**55.45** N

6.0 ELECTRICAL / ENVIRONMENTAL PERFORMANCE RESULTS

(Note that measured LLCR values are for one mated interface minus bulk resistance)

		RIGHT ANGLE – BRASS				
ITEM	**DESCRIPTION**	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MINIMUM**	**MAXIMUM**
GROUP 1	Contact Resistance (Low Level)	Initial	10 mΩ MAX	**2.55** mΩ	**2.19** mΩ	**2.96** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.04** mΩ	**-0.10** mΩ	**0.31** mΩ
		After Temp Life	20 mΩ Δ MAX	**0.20** mΩ	**-0.12** mΩ	**0.86** mΩ
		After Reseating	20 mΩ Δ MAX	**0.44** mΩ	**0.01** mΩ	**4.46** mΩ
		RIGHT ANGLE – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.73** mΩ	**2.36** mΩ	**3.14** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.01** mΩ	**-0.17** mΩ	**0.27** mΩ
		After Temp Life	20 mΩ MAXIMUM	**0.09** mΩ	**-0.10** mΩ	**0.52** mΩ
		After Reseating	20 mΩ MAXIMUM	**0.27** mΩ	**-0.05** mΩ	**1.21** mΩ
		VERTICAL – BRASS				
		Initial	10 mΩ MAX	**2.25** mΩ	**2.15** mΩ	**2.35** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.08** mΩ	**-0.06** mΩ	**0.47** mΩ
		After Temp Life	20 mΩ Δ MAX	**0.19** mΩ	**0.01** mΩ	**0.65** mΩ
		After Reseating	20 mΩ Δ MAX	**0.29** mΩ	**0.01** mΩ	**0.95** mΩ
		VERTICAL – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.39** mΩ	**2.26** mΩ	**2.48** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.07** mΩ	**-0.09** mΩ	**0.31** mΩ
		After Temp Life	20 mΩ Δ MAX	**0.18** mΩ	**-0.06** mΩ	**0.54** mΩ
		After Reseating	20 mΩ Δ MAX	**0.15** mΩ	**-0.04** mΩ	**0.84** mΩ

TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	8 of 26

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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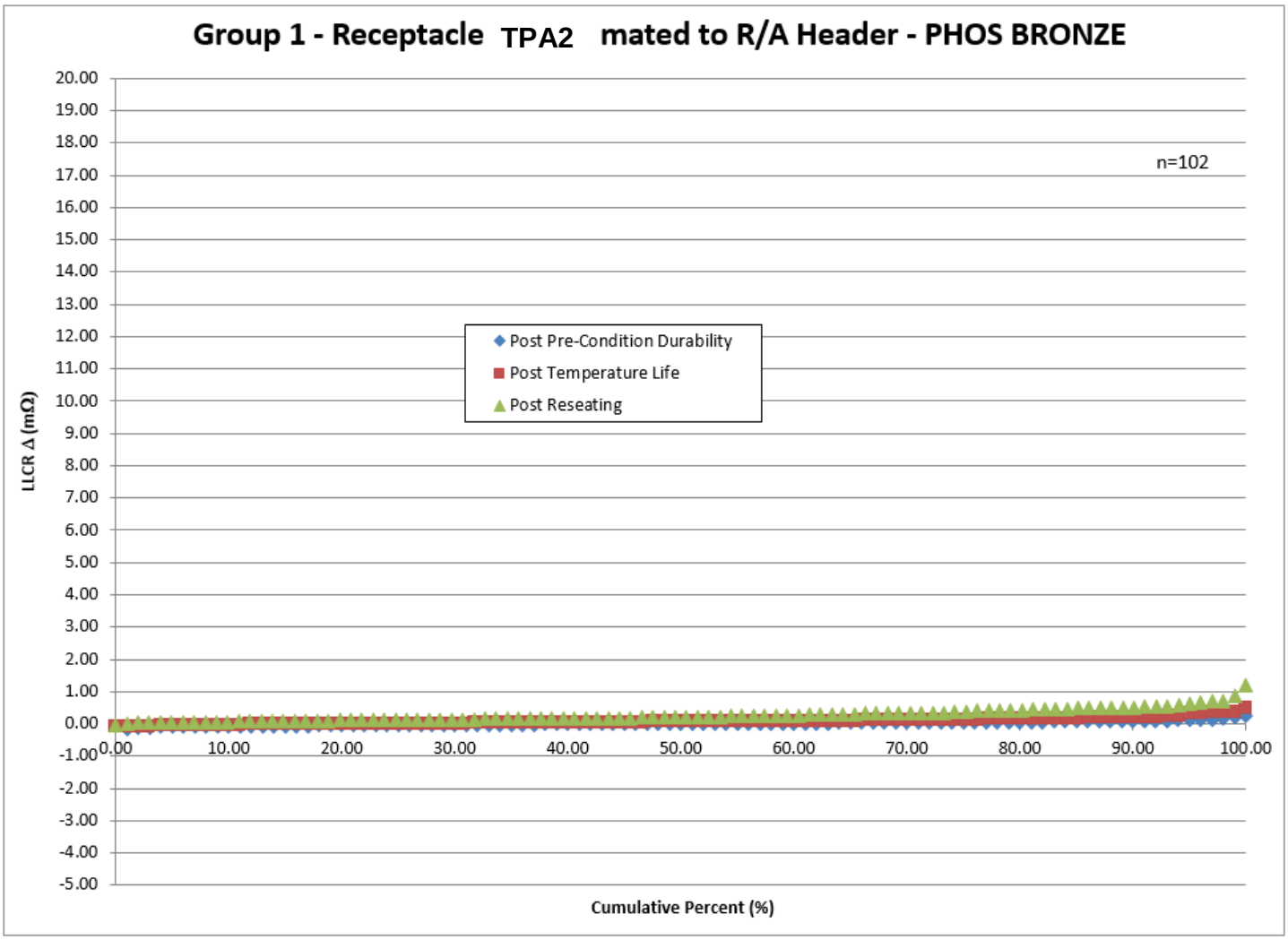
TEST SUMMARY



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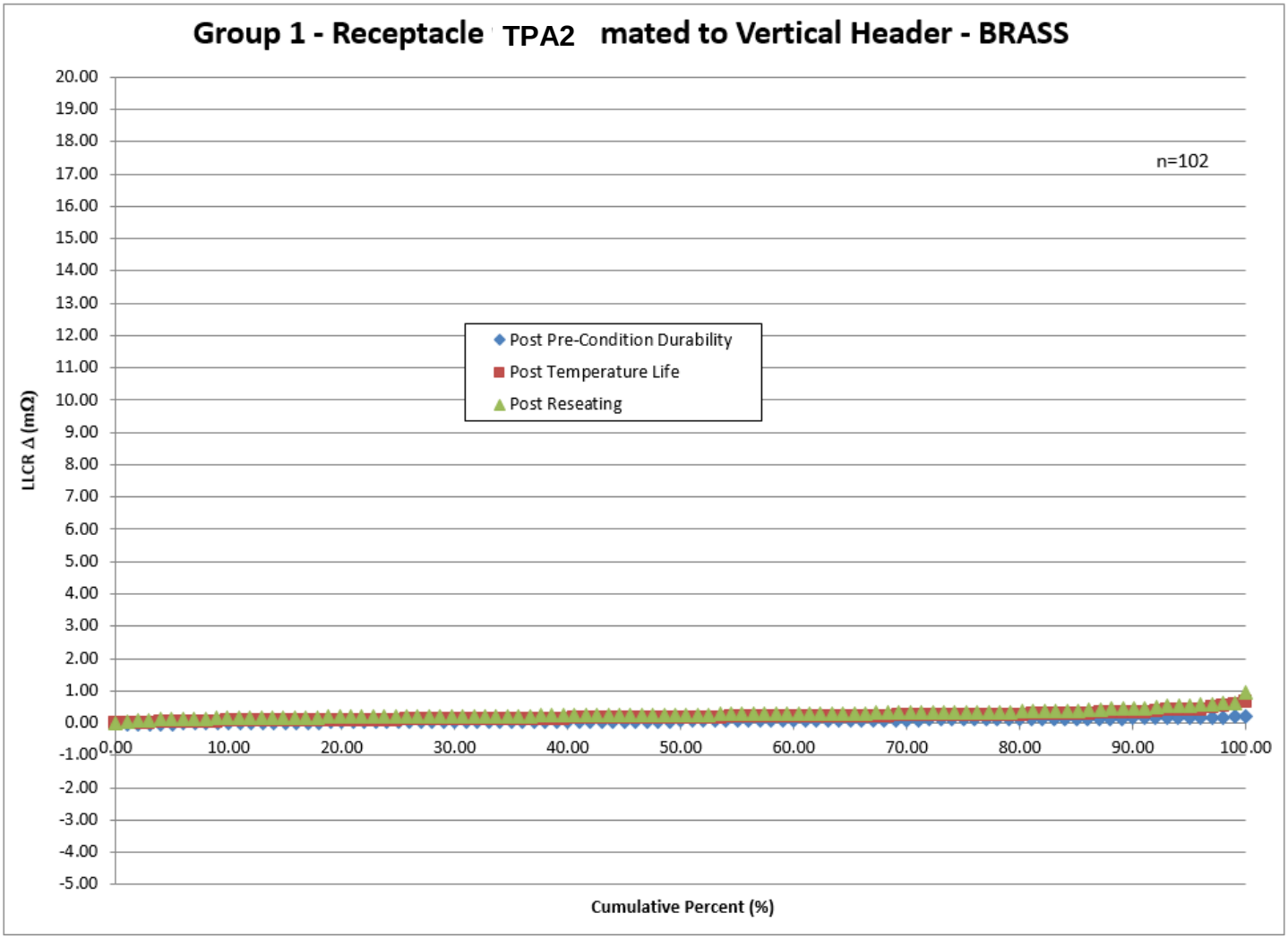
TEST SUMMARY



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A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	10 of 26

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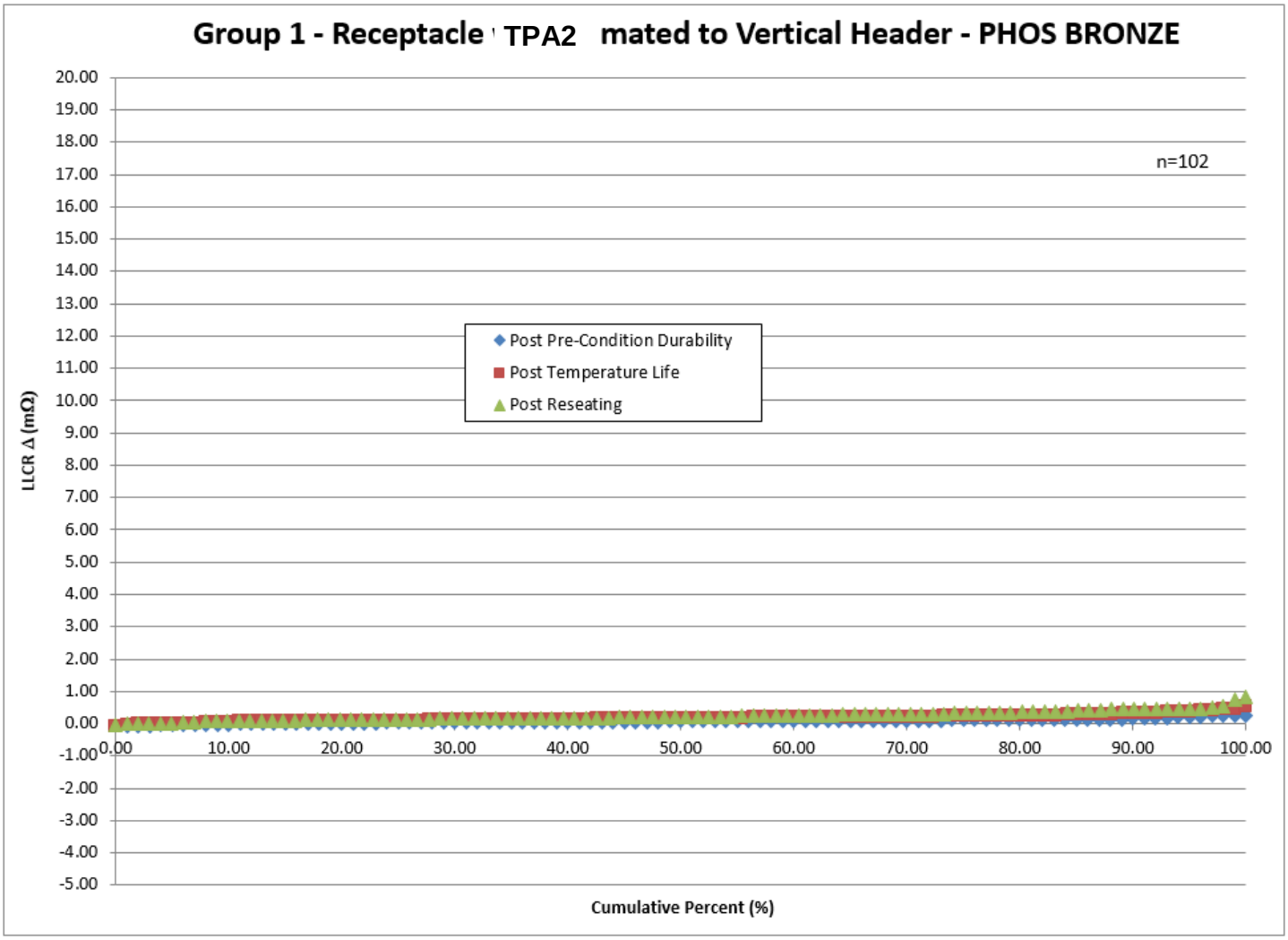
TEST SUMMARY



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A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	11 of 26

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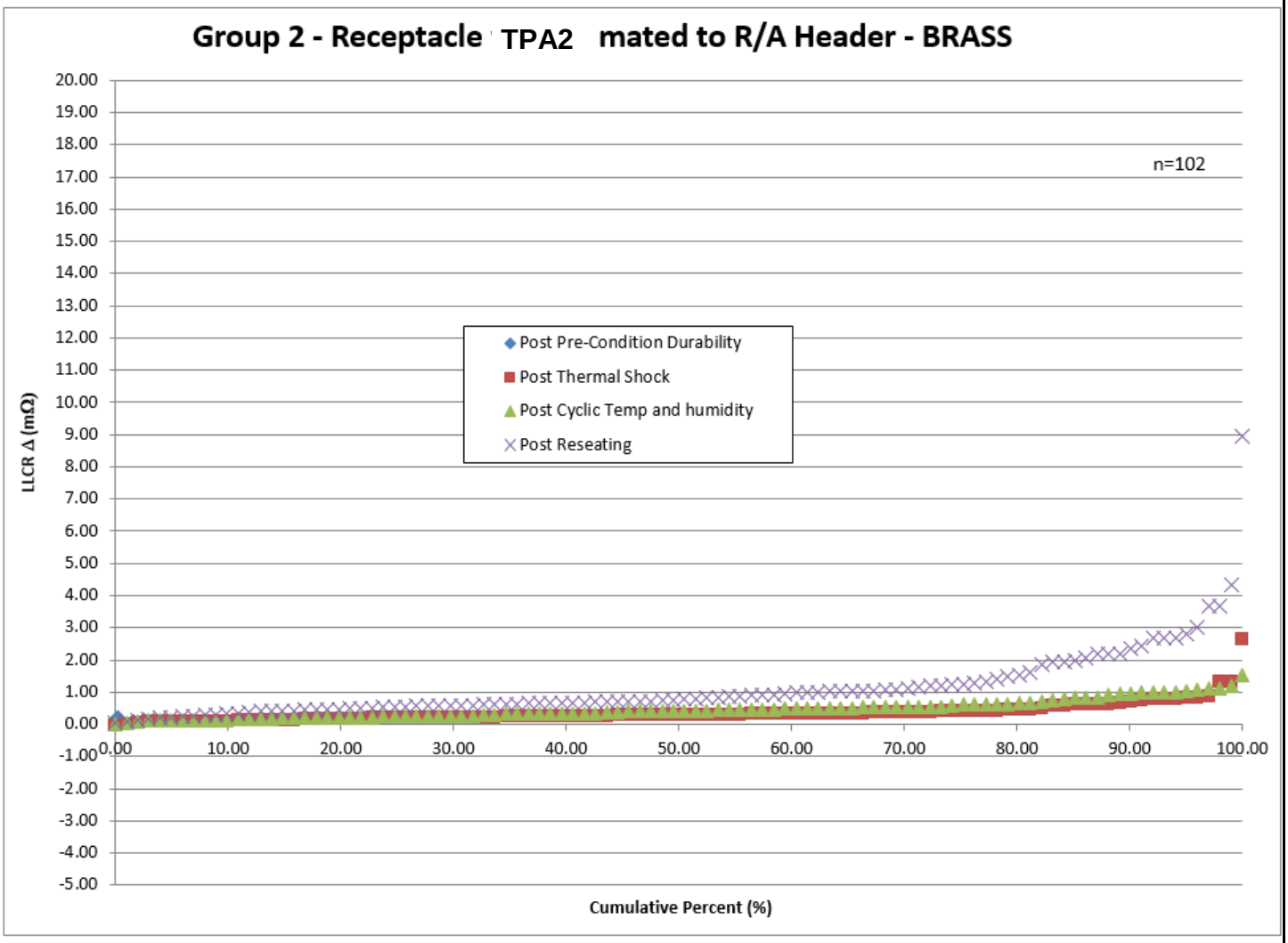
6.0 ELECTRICAL / ENVIRONMENTAL PERFORMANCE RESULTS (cont.)

(Note that measured LLCR values are for one mated interface minus bulk resistance)

		RIGHT ANGLE – BRASS				
ITEM	**DESCRIPTION**	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MINIMUM**	**MAXIMUM**
GROUP 2	Contact Resistance (Low Level)	Initial	10 mΩ MAX	**2.52** mΩ	**2.12** mΩ	**2.97** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.05** mΩ	**-0.13** mΩ	**0.13** mΩ
		After Thermal Shock	20 mΩ Δ MAX	**0.36** mΩ	**-0.05** mΩ	**2.26** mΩ
		After Humidity	20 mΩ Δ MAX	**0.47** mΩ	**-0.02** mΩ	**1.54** mΩ
		After Reseating	20 mΩ Δ MAX	**1.13** mΩ	**0.04** mΩ	**8.94** mΩ
		RIGHT ANGLE – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.68** mΩ	**2.29** mΩ	**3.08** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.07** mΩ	**-0.11** mΩ	**0.34** mΩ
		After Thermal Shock	20 mΩ Δ MAX	**0.23** mΩ	**-0.02** mΩ	**0.77** mΩ
		After Humidity	20 mΩ Δ MAX	**0.34** mΩ	**-0.03** mΩ	**1.97** mΩ
		After Reseating	20 mΩ Δ MAX	**0.64** mΩ	**0.08** mΩ	**4.38** mΩ
		VERTICAL – BRASS				
		Initial	10 mΩ MAX	**2.18** mΩ	**2.04** mΩ	**2.36** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.12** mΩ	**-0.04** mΩ	**0.39** mΩ
		After Thermal Shock	20 mΩ Δ MAX	**0.33** mΩ	**0.08** mΩ	**1.00** mΩ
		After Humidity	20 mΩ Δ MAX	**0.50** mΩ	**0.12** mΩ	**1.71** mΩ
		After Reseating	20 mΩ Δ MAX	**0.60** mΩ	**0.08** mΩ	**9.59** mΩ
		VERTICAL – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.36** mΩ	**2.21** mΩ	**2.52** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.10** mΩ	**-0.07** mΩ	**0.28** mΩ
		After Thermal Shock	20 mΩ Δ MAX	**0.26** mΩ	**-0.05** mΩ	**0.68** mΩ
		After Humidity	20 mΩ Δ MAX	**0.42** mΩ	**0.04** mΩ	**1.67** mΩ
		After Reseating	20 mΩ Δ MAX	**0.37** mΩ	**0.00** mΩ	**1.14** mΩ

TEST SUMMARY



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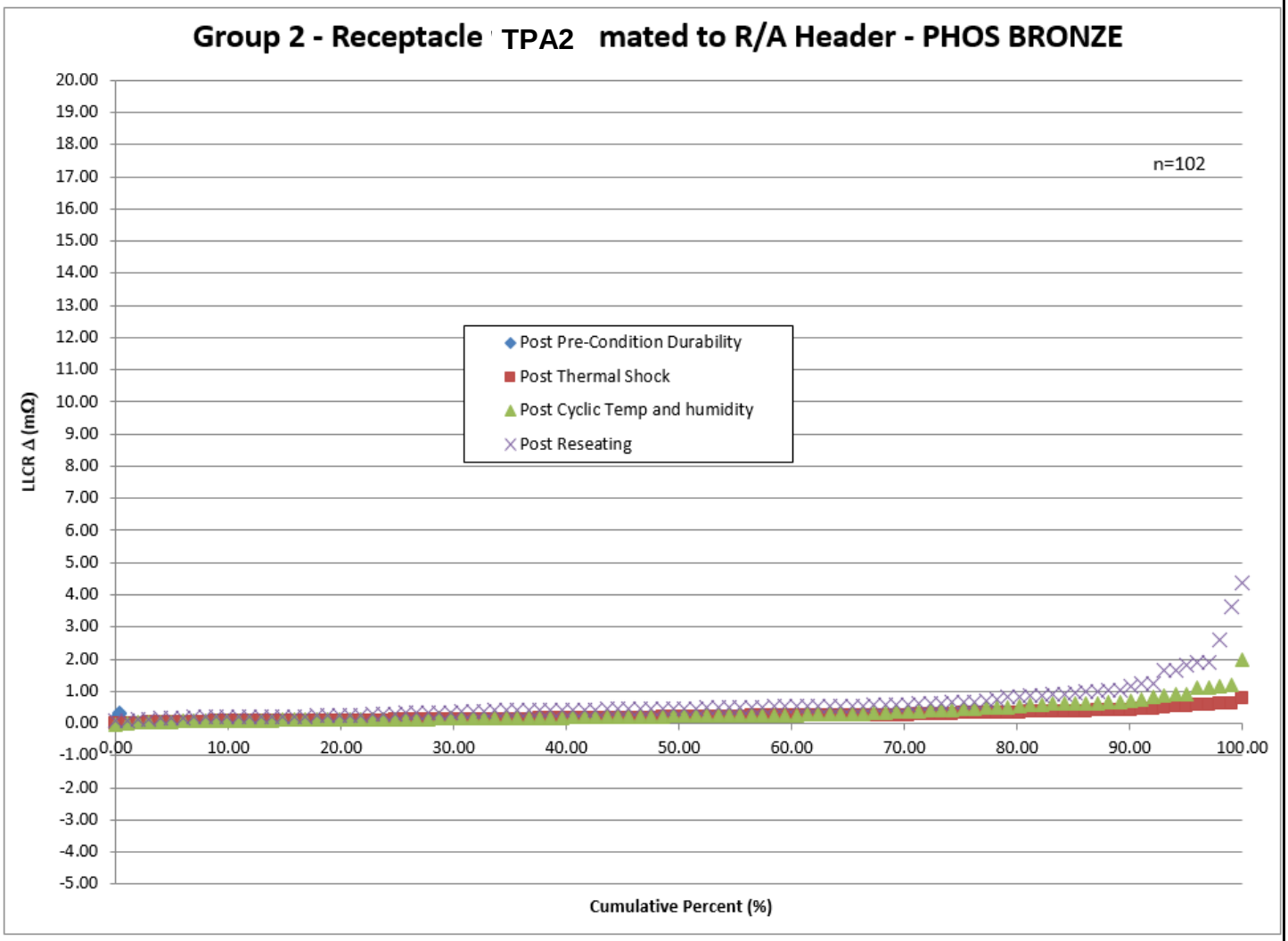
TEST SUMMARY



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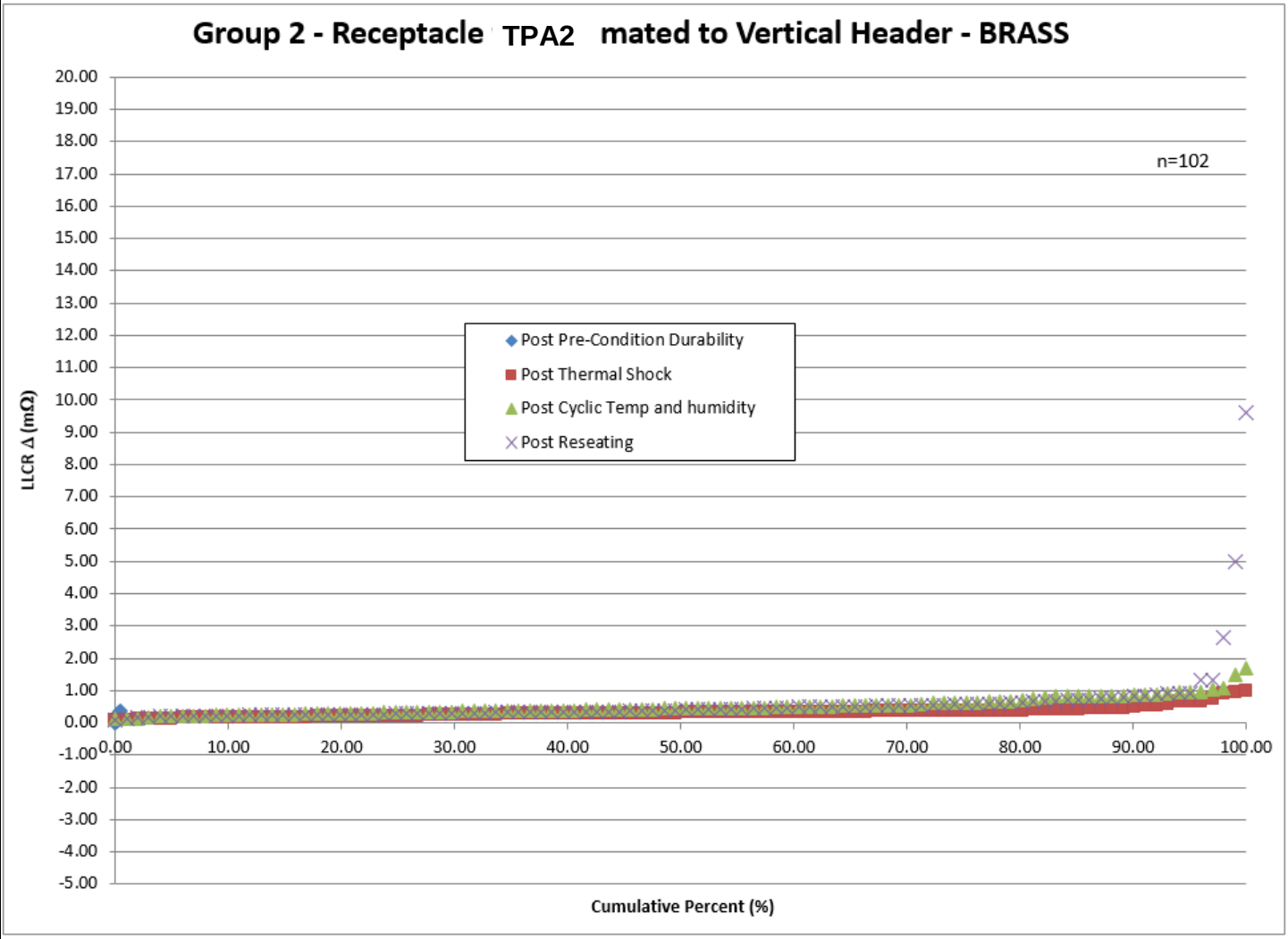
TEST SUMMARY



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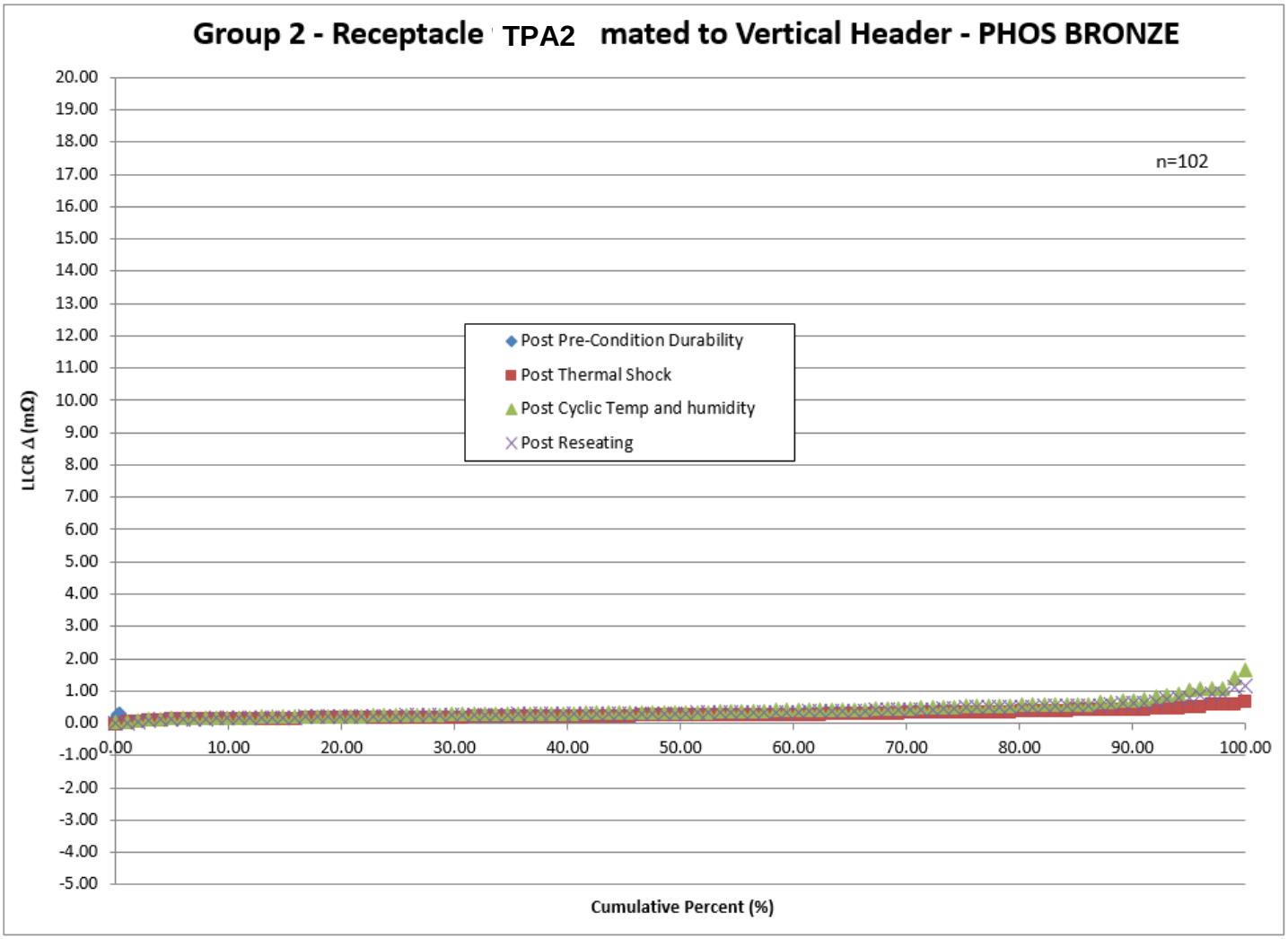
TEST SUMMARY



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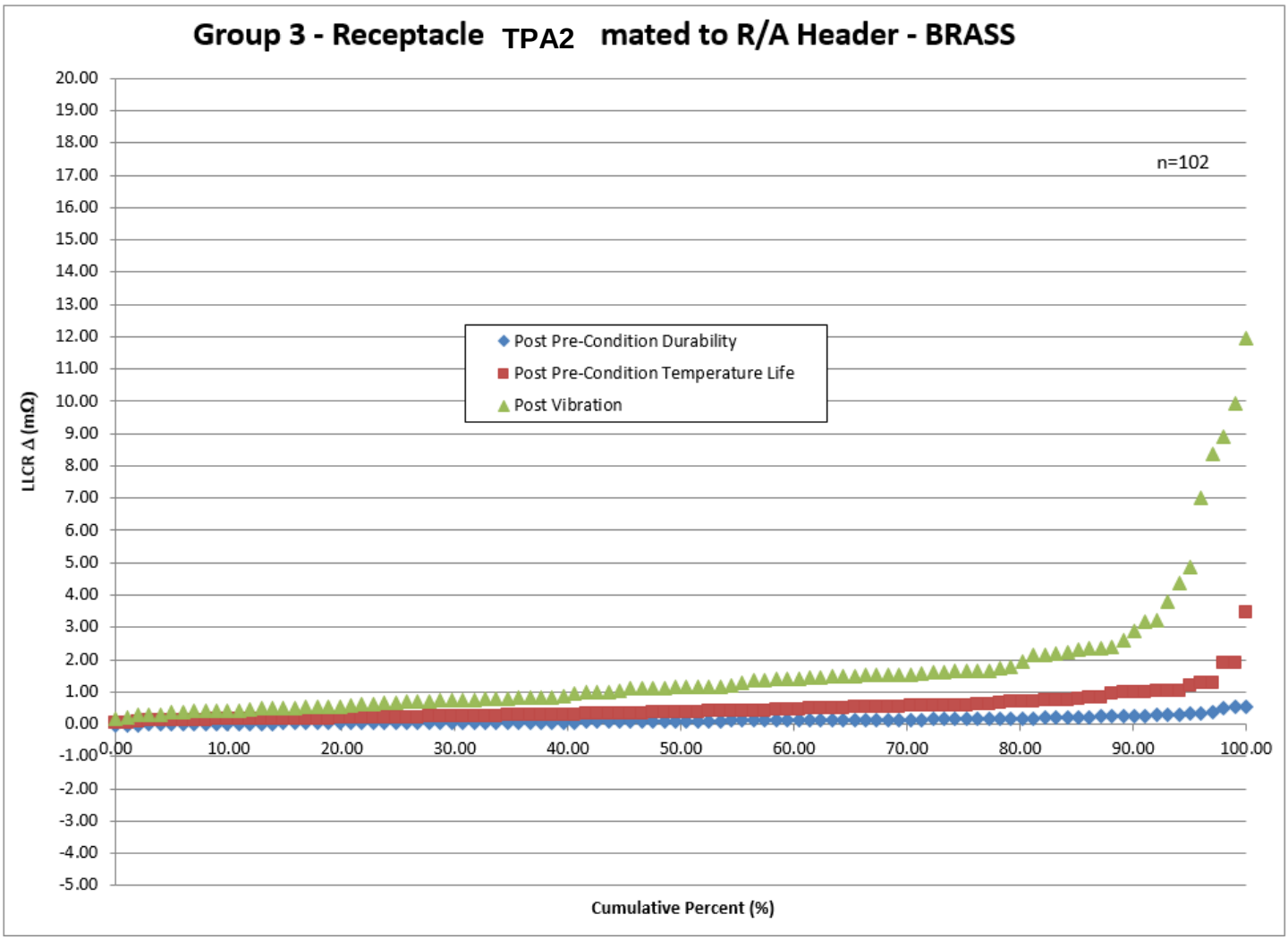
6.0 ELECTRICAL / ENVIRONMENTAL PERFORMANCE RESULTS (cont.)

(Note that measured LLCR values are for one mated interface minus bulk resistance)

		RIGHT ANGLE – BRASS				
ITEM	**DESCRIPTION**	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MINIMUM**	**MAXIMUM**
GROUP 3	Contact Resistance (Low Level)	Initial	10 mΩ MAX	**2.48** mΩ	**2.12** mΩ	**2.92** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.12** mΩ	**-0.06** mΩ	**0.55** mΩ
		After Temp Life (pre-conditioning)	20 mΩ Δ MAX	**0.50** mΩ	**0.05** mΩ	**3.45** mΩ
		After Vibration	20 mΩ Δ MAX	**1.66** mΩ	**0.17** mΩ	**11.94** mΩ
		RIGHT ANGLE – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.71** mΩ	**2.35** mΩ	**3.09** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.11** mΩ	**-0.09** mΩ	**0.52** mΩ
		After Temp Life (pre-conditioning)	20 mΩ Δ MAX	**0.41** mΩ	**0.00** mΩ	**2.30** mΩ
		After Vibration	20 mΩ Δ MAX	**1.71** mΩ	**0.10** mΩ	**15.41** mΩ
		VERTICAL – BRASS				
		Initial	10 mΩ MAX	**2.69** mΩ	**2.08** mΩ	**2.23** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.18** mΩ	**-0.04** mΩ	**0.66** mΩ
		After Temp Life (pre-conditioning)	20 mΩ Δ MAX	**0.42** mΩ	**0.01** mΩ	**1.64** mΩ
		After Vibration	20 mΩ Δ MAX	**1.11** mΩ	**0.13** mΩ	**9.43** mΩ
		VERTICAL – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.46** mΩ	**2.31** mΩ	**2.64** mΩ
		After Durability (pre-conditioning)	20 mΩ Δ MAX	**0.13** mΩ	**-0.15** mΩ	**0.63** mΩ
		After Temp Life (pre-conditioning)	20 mΩ Δ MAX	**0.41** mΩ	**-0.02** mΩ	**1.93** mΩ
		After Vibration	20 mΩ Δ MAX	**1.26** mΩ	**0.09** mΩ	**11.86** mΩ

TEST SUMMARY



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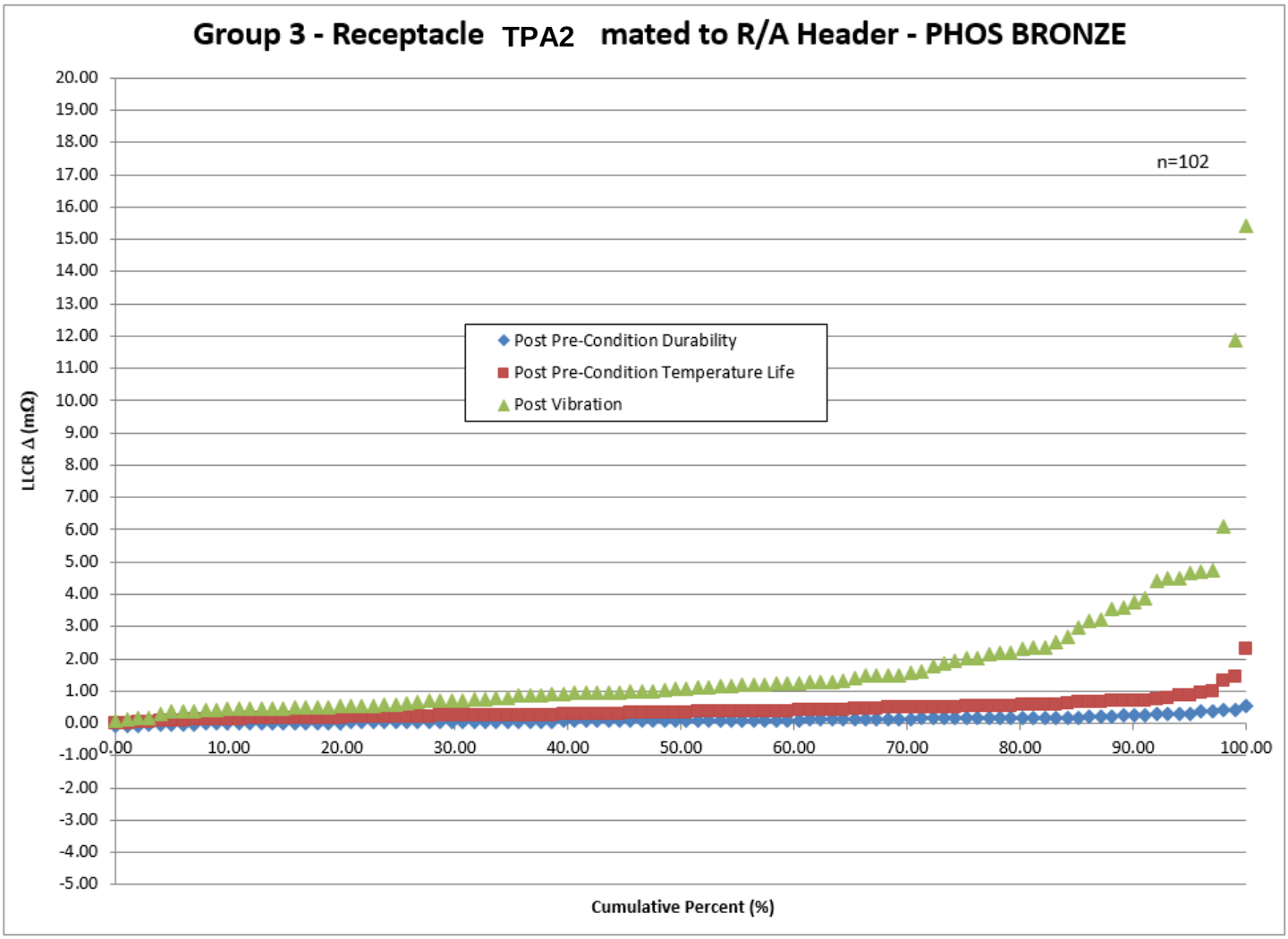
1727180001-TS	GLLI	XQZHANG	XQZHANG

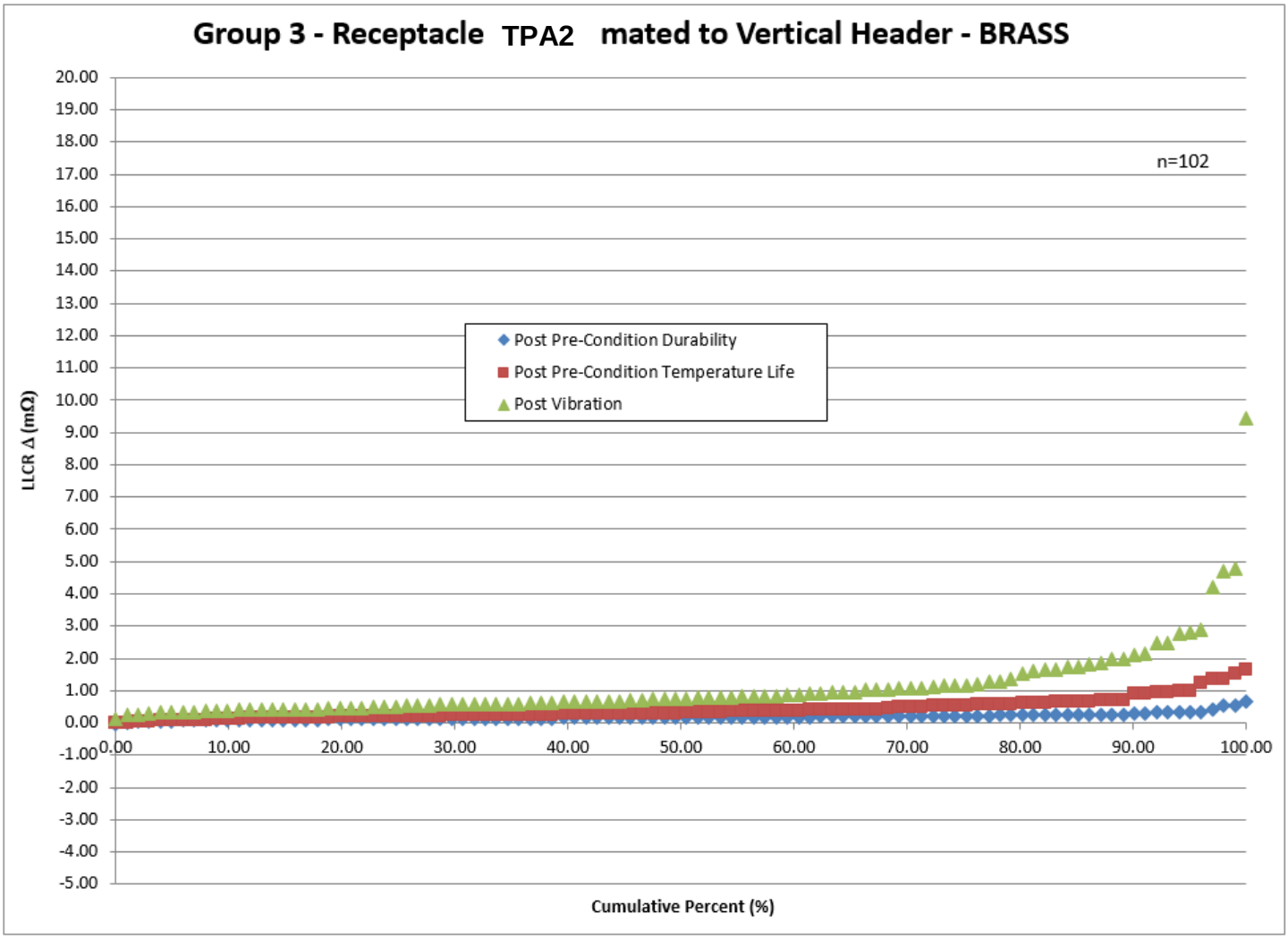
TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	19 of 26

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	GLLI	XQZHANG	XQZHANG

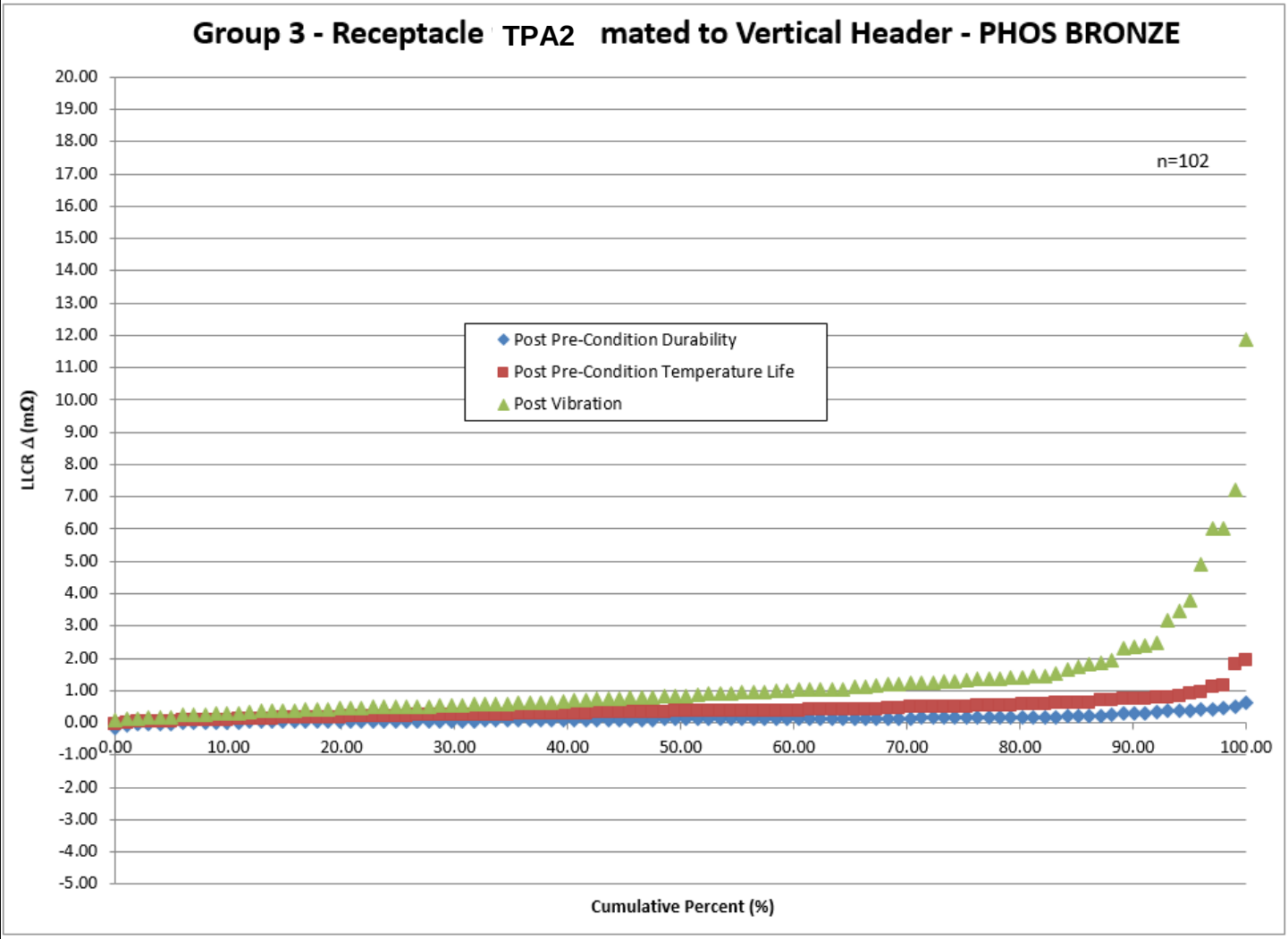
TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	20 of 26

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	GLLI	XQZHANG	XQZHANG

TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: 783855 DATE: 2024/04/24	TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY	21 of 26

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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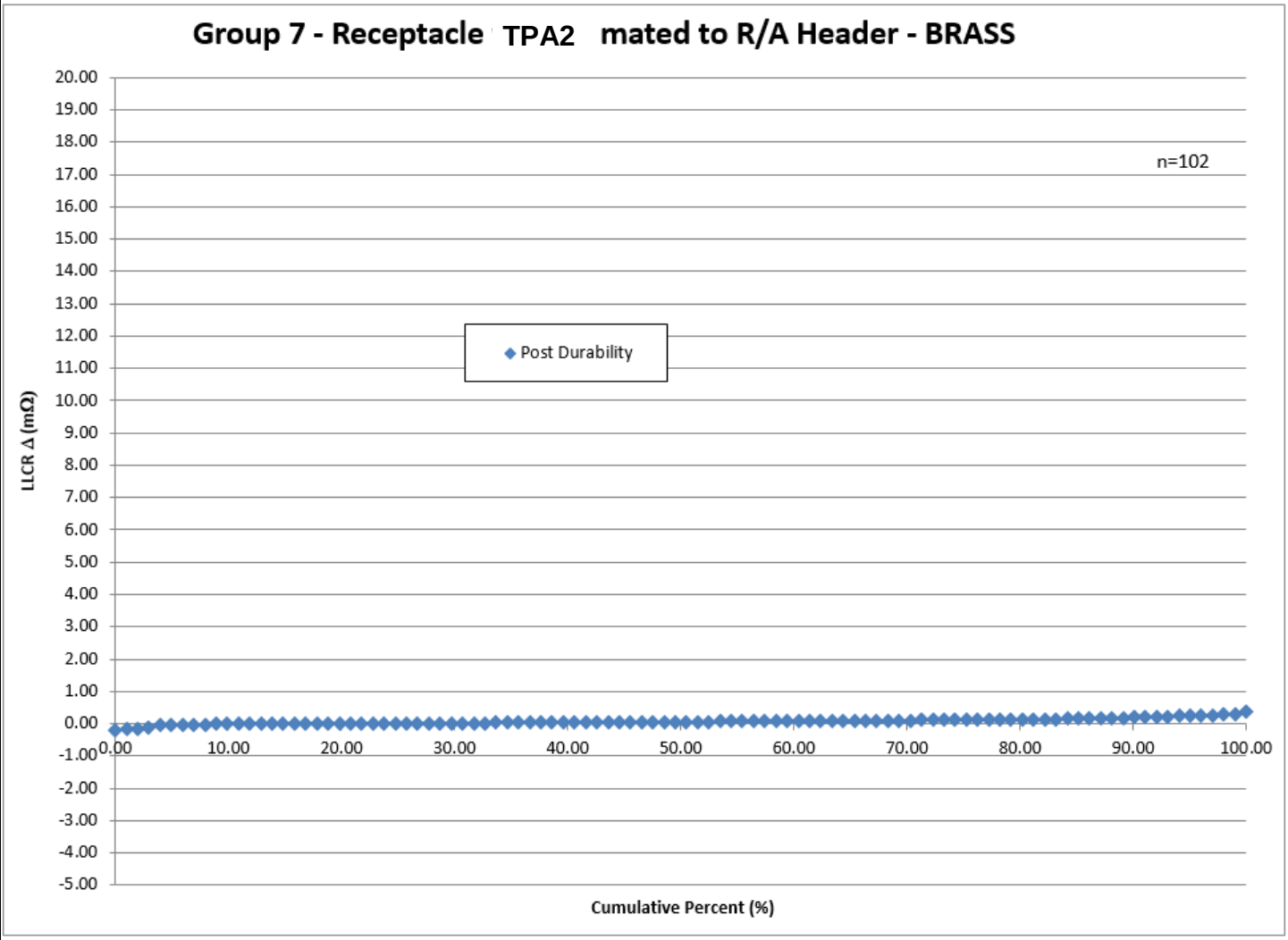
6.0 ELECTRICAL / ENVIRONMENTAL PERFORMANCE RESULTS (cont.)

(Note that measured LLCR values are for one mated interface minus bulk resistance)

		RIGHT ANGLE – BRASS				
ITEM	**DESCRIPTION**	**TREATMENT**	**REQUIREMENT**	**MEAN**	**MINIMUM**	**MAXIMUM**
GROUP 7	Contact Resistance (Low Level)	Initial	10 mΩ MAX	**2.51** mΩ	**2.13** mΩ	**3.23** mΩ
		After Durability	20 mΩ Δ MAX	**0.07** mΩ	**-0.20** mΩ	**0.38** mΩ
		RIGHT ANGLE – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.69** mΩ	**2.24** mΩ	**3.08** mΩ
		After Durability	20 mΩ Δ MAX	**0.07** mΩ	**-0.13** mΩ	**0.39** mΩ
		VERTICAL – BRASS				
		Initial	10 mΩ MAX	**2.26** mΩ	**2.11** mΩ	**2.46** mΩ
		After Durability	20 mΩ Δ MAX	**0.18** mΩ	**-0.02** mΩ	**0.37** mΩ
		VERTICAL – PHOS BRONZE				
		Initial	10 mΩ MAX	**2.37** mΩ	**2.23** mΩ	**2.54** mΩ
		After Durability	20 mΩ Δ MAX	**0.20** mΩ	**-0.05** mΩ	**0.78** mΩ
	Dielectric Withstanding Voltage	2200 VAC	No breakdown or flashover	**PASS**		

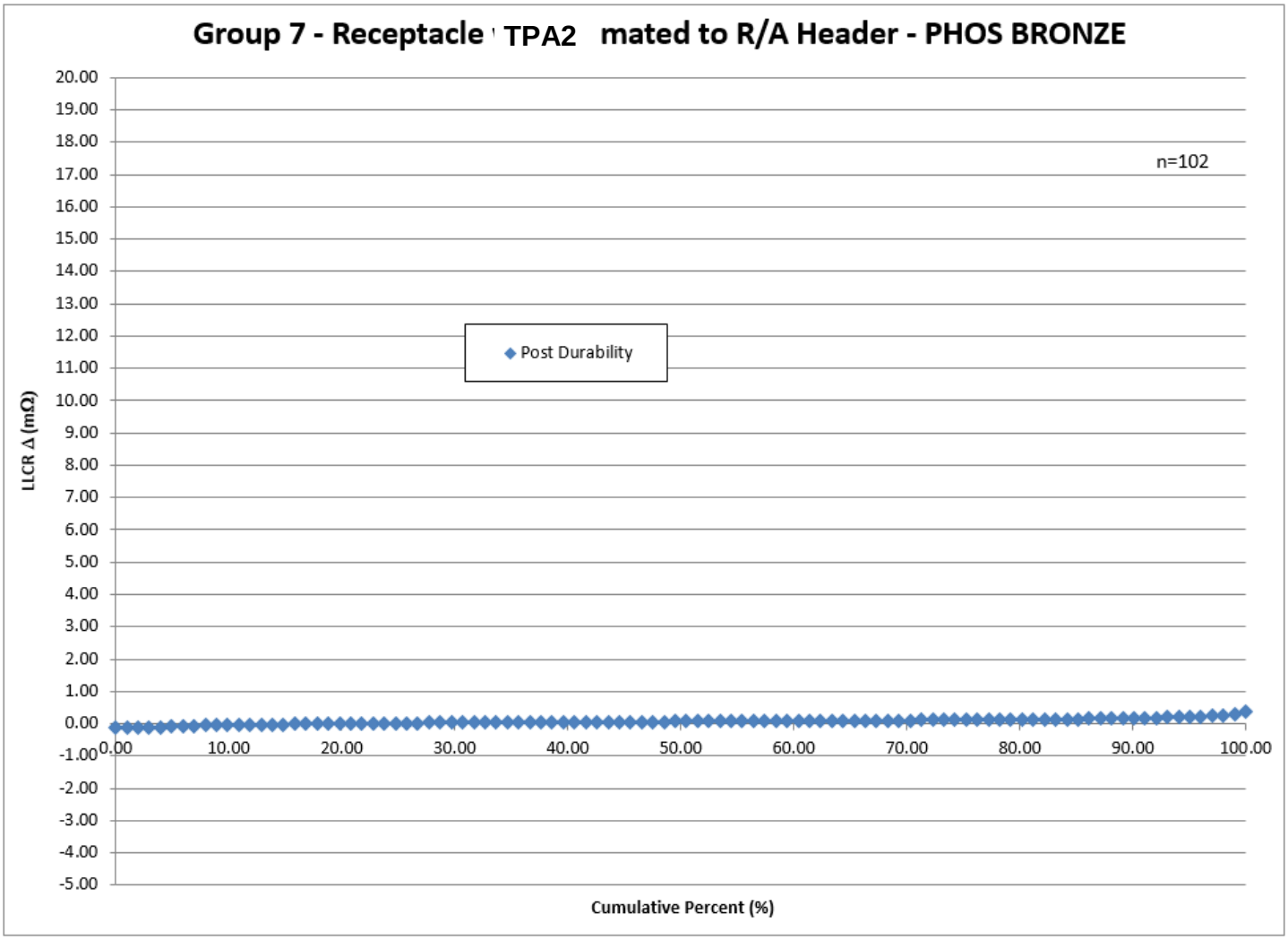
TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: **783855** DATE: **2024/04/24**	**TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY**	**23** of **26**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	**GLLI**	**XQZHANG**	**XQZHANG**

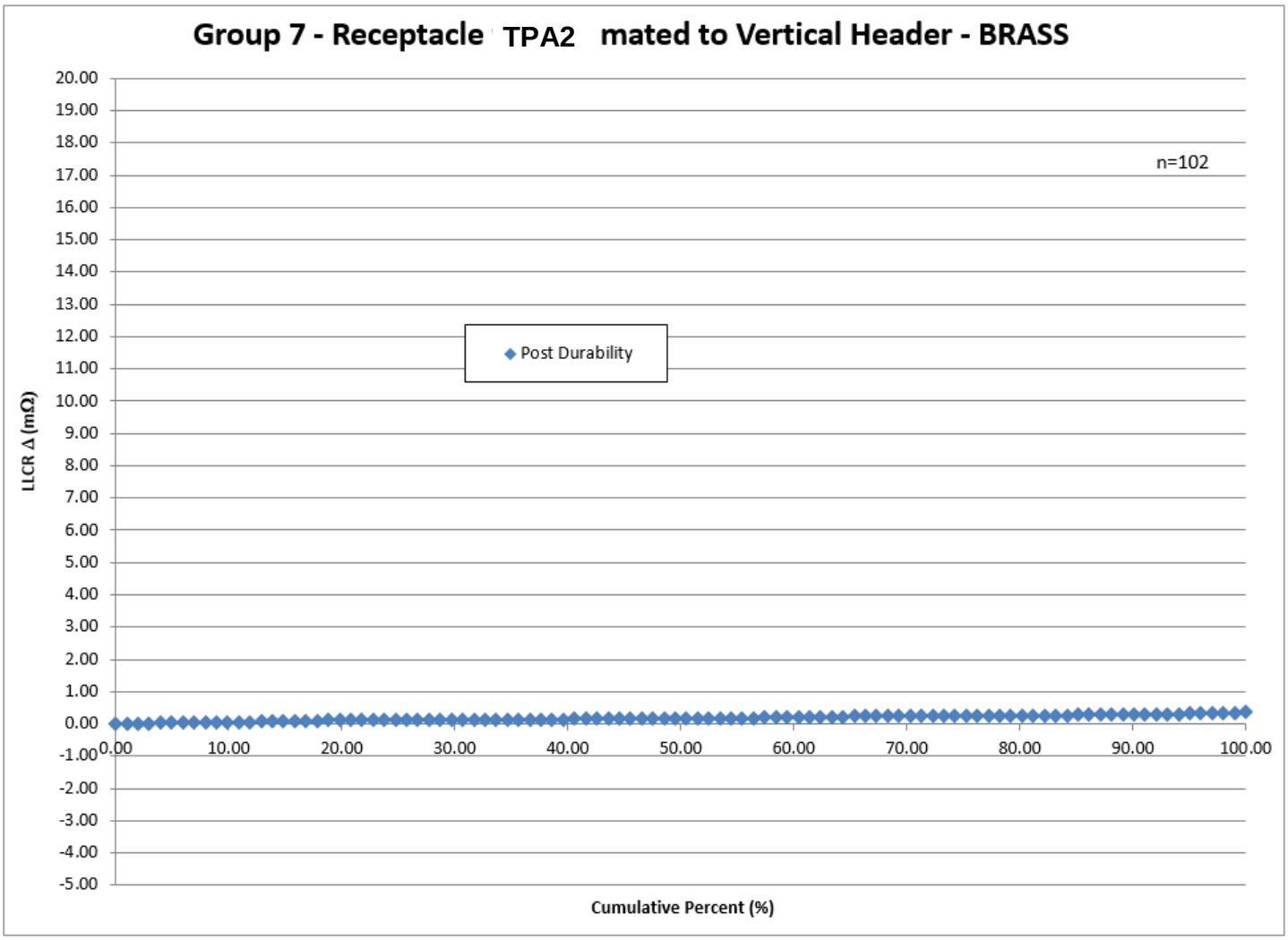
TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: **783855** DATE: **2024/04/24**	**TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY**	**24** of **26**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	**GLLI**	**XQZHANG**	**XQZHANG**

TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: **783855** DATE: **2024/04/24**	**TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY**	**25** of **26**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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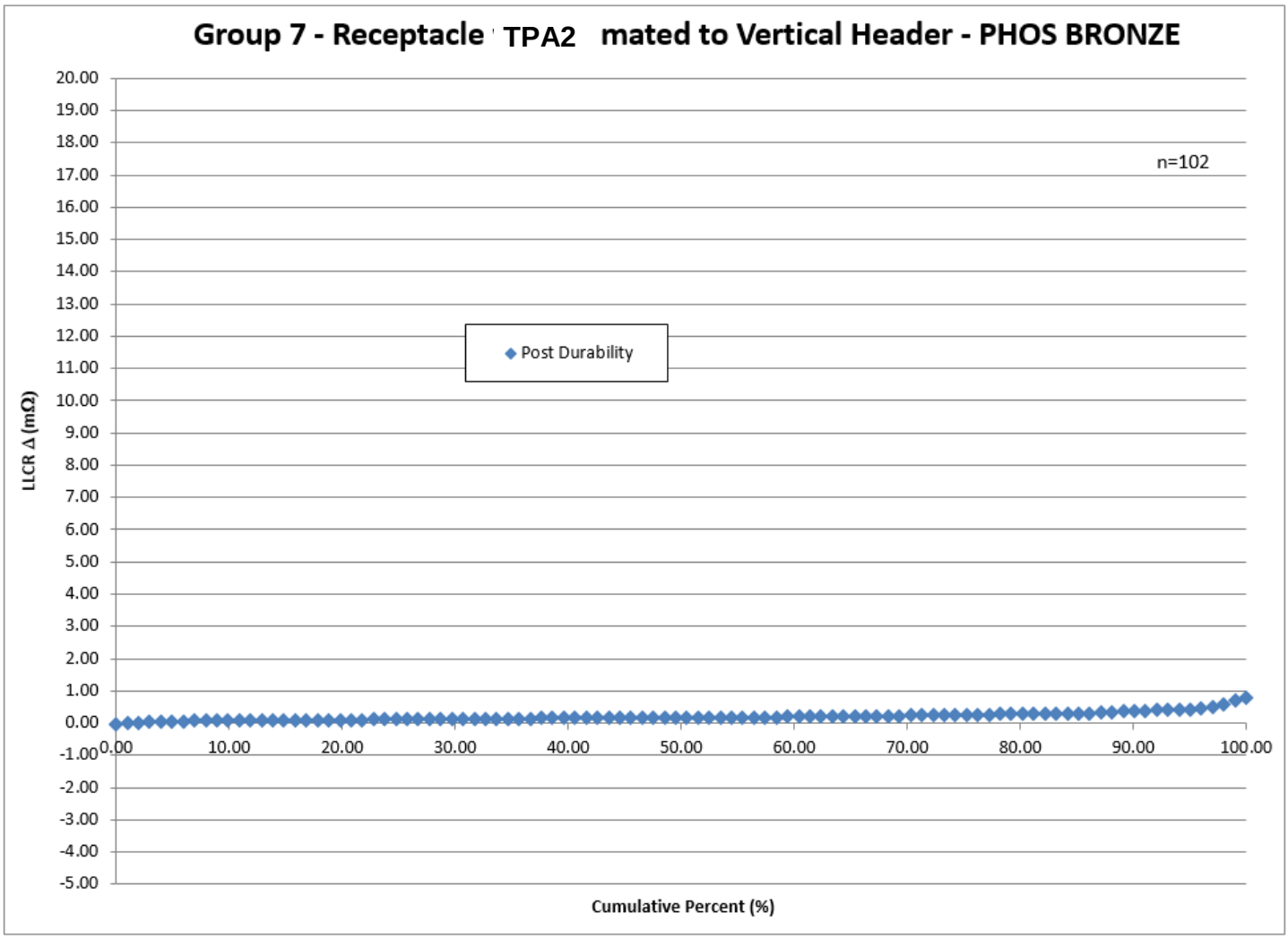
TEST SUMMARY



REVISION	ECR/ECN INFORMATION	TITLE	SHEET No.
A5	EC No: **783855** DATE: **2024/04/24**	**TEST SUMMARY FOR MINI-FIT TPA2 WIRE TO BOARD CONTACT INTERFACE RELIABILITY**	**26** of **26**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1727180001-TS	**GLLI**	**XQZHANG**	**XQZHANG**