Mini50 Unseal Gen II series Connector Testing

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Note: Marked * test items were tested in environment test

Test Plan Header

Test Plan Number: 4255 Test Plan Level: PV - Production Validation/PTV

Objective: Mini50 unseal Gen II RCPT Connector System

Product Description: Mini50 unseal Gen II RCPT Connector System

Customer: General Market Product (Vehicle(s)): N/A Year of Introduction (Model Year(s)): N/A

Customer Approval: General Market Engineering Manager Approval: Deng Jun Reliability Engineering Lab Manager: Wang DingQiang

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UUT Table

	Unit Under Test Type	Test Sample Description	Manufacturer	Part Number	Part Rev.	Customer Part #
	Units Under Test	Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	Molex	2065230121	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 12CKT Pol A(With CPA,HB)	Molex	2065232121	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 12CKT Pol B(HB)	Molex	2065230122	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 12CKT Pol C(HB)	Molex	2065230123	NA	NA
	Units Under Test	Mini50 12 ckt R/A Header Assembly - Pol A	Molex	348260120	NA	NA
	Units Under Test	Mini50 12 ckt R/A Header Assembly - Pol B	Molex	348260121	NA	NA
	Units Under Test	Mini50 12 ckt R/A Header Assembly - Pol C	Molex	348260122	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	Molex	2065230161	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 16CKT Pol A(With CPA,HB)	Molex	2065232161	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 16CKT Pol B(HB)	Molex	2065230162	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 16CKT Pol C(HB)	Molex	2065230163	NA	NA
	Units Under Test	Mini50 16 ckt R/A Header Assembly - Pol A	Molex	348260160	NA	NA
	Units Under Test	Mini50 16 ckt R/A Header Assembly - Pol B	Molex	348260161	NA	NA
	Units Under Test	Mini50 16 ckt R/A Header Assembly - Pol C	Molex	348260162	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	Molex	2065230201	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 20CKT Pol A (With CPA,HB)	Molex	2065232202	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 20CKT Pol B(HB)	Molex	2065230202	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 20CKT Pol C(HB)	Molex	2065230203	NA	NA
	Units Under Test	Mini50 20 ckt R/A Header Assembly - Pol A	Molex	348260200	NA	NA
	Units Under Test	Mini50 20 ckt R/A Header Assembly - Pol B	Molex	348260201	NA	NA
	Units Under Test	Mini50 20 ckt R/A Header Assembly - Pol C	Molex	348260202	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	Molex	2065230241	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 24CKT Pol A(With CPA,HB)	Molex	2065232241	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 24CKT Pol B(HB)	Molex	2065230242	NA	NA
	Units Under Test	Mini50 Gen II RCPT CONN 24CKT Pol C(HB)	Molex	2065230243	NA	NA
	Units Under Test	Mini50 24 ckt R/A Header Assembly - Pol A	Molex	348260240	NA	NA

	Unit Under Test Type	Test Sample Description	Manufacturer	Part Number	Part Rev.	Customer Part #
	Units Under Test	Mini50 24 ckt R/A Header Assembly - Pol B	Molex	348260241	NA	NA
	Units Under Test	Mini50 24 ckt R/A Header Assembly - Pol C	Molex	348260242	NA	NA
	Units Under Test	CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	Molex	5600230448	NA	NA
	Units Under Test	CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² smallest wire	Molex	5600230448	NA	NA
	Surrogate	All Part Number for MiniI50 Unsealed Header Connector Series Listed On SD-34825-001 & SD-34826-001 & SD-34792-001 & SD-34793-001 & SD-34912-001 & SD-34897-002 & SD-34897-003	Molex	34825-XXXX / 34826-XXXX / 34792-XXXX / 34793-XXXX / 34912-XXXX / 34897-XXXX	NA	NA
	Surrogate	All Part Number for MiniI50 Unsealed RCPT Connector Series Listed On 2065230000	Molex	205623XXXX	NA	NA

Test Plan and Report

Note: Performance results meet uscar-2 Rev6 requirements unless otherwise specified

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
General Notes USCAR-2 REV6, February 2013 + Change Letters General Notes				General Notes	Following topics are in the Source Standard General Notes: **5.1.1 Performance Requirements:** Meet all test requirements for appropriate Class listed in Section 5.1.4. **5.1.2 Dimensional Characteristics:** Part construction must conform to the dimensions, shape, and detail attributes specified in the latest revision of the applicable part drawing(s). **5.1.3 Material Characteristics:** Parts are intended to be in "as furnished for vehicle assembly" condition when testing begins. **5.1.4 Classifications:** 5.1.4.1 Temperature Classification, refer to Table 5.1.4.1. 5.4.4.2 Sealing Classification, refer to Table 5.1.4.2. 5.1.4.3 Vibration Classification, Refer to Table 5.1.4.3. 5.1.4.4 Ergonomic Classification; Components to be tested must be assigned an Ergonomic class from the requirements in SAE/USCAR 25. This Class designation shall be documented in the test plan and listed on the component drawing. **5.1.5 Testing Headers & Direct Connect Components:** Modifications for testing are allowed, but must be documented in the test report. Frequently only one half of a connector, usually the female half, is available and mates directly to a Header or to a receptacle in an electrical component or device. This presents special problems for testing. In order to completely test the electrical connection, access must be gained to the terminals in the device or header. Great care must be taken in these cases so as not to introduce leak paths that are not present in the vehicle application. Where this risk is unacceptable, or if making the necessary electrical connections is not feasible, the tests normally required to verify connection integrity must be modified. When attaching millivolt leads, make certain the applied heat does not damage plating or cause stress relaxation in any connection component. Application of an appropriate heat sink may be advisable, see Figure 5.1.5. **NOTE:** Placement of the T1 lead in Figure 5.1.5 may be modified as necessary to fit the application. When using a dimension other than the 75 +/- 3 mm, it is important to measure the resistance of a sample with an equal length of the same wire type and use that result as the deduct value. **5.1.6 Terminal Sample Preparation:** Terminals used for testing must be crimped to requirements as defined in SAE/USCAR 21. Performance Specification for Cable to Terminal Electrical Crimps. Crimp dimension physical characteristics and mechanical pull strength must be within tolerances, as applies to the respective terminal and	5.1										

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					wire gage. When testing Header-type connectors with mating connectors, only prepare samples for the mating Female Connector. Test results must be reported in a detailed format, with one summary per test sequence.											
General Notes USCAR-2 REV6, February 2013 + Change Letters Visual Inspection - Pre-Test				Visual Inspection - Pre-Test	Inspect for defects or non-functionality. Visually examine each test specimen prior to testing and/or conditioning, noting in detail any obvious manufacturing or material defects such as cracks, tarnishing, flash, etc. When specified in the test request/order, take photographs and/or video recordings of representative samples to be tested and keep a properly labeled control sample. The device under test must not show, any evidence of defects, deterioration, cracks, deformities, etc. that could affect their functionality. Additional procedure specific criteria may be listed under each test.	5.1.8									The device under test must not show, any evidence of defects, deterioration, cracks, deformities, etc. that could affect their functionality. Additional procedure specific criteria may be listed under each test.		
General Notes USCAR-2 REV6, February 2013 + Change Letters Visual Inspection - Post Test				Visual Inspection - Post Test	After testing and/or conditioning, re-examine each test sample and note in detail any observable changes, such as swelling, corrosion, discoloration, contact plating wear, physical distortions, cracks, loss of mechanical function evident, etc. Compare the tested and/or conditioned samples to the control samples, the videos, and/or the photographs, recording any differences in the test report. For CUTs subjected to Test Sequence Q, see Section 5.9.7, swelling of cable and seals is permissible within the limits of that specific material specification. The device under test must not show, any evidence of deterioration, cracks, deformities, etc. that could affect their functionality. Additional procedure specific criteria may be listed under each test.	5.1.8									The device under test must not show, any evidence of deterioration, cracks, deformities, etc. that could affect their functionality. Additional procedure specific criteria may be listed under each test.		
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5AE / Terminal/ Cavity Polarization	CM1	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	9	9				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	9	9						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	9	9						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	9	9						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	300	300						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Terminal / Cavity Polarization - 90°	Insert terminal at a 90° orientation and apply force equaling 1.5 times maximum force recorded in Step 5.4.1.3-7; or 15N; whichever is	5.4.10		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	0	3				12ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity	MET	Refer to DVPR 3659 CM1a

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					greater. Inserting terminal into cavity until the determined force is reached. Terminals inserted at a force 1.5 times the normal insertion force or 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips) or cable seal (see Figure 5.4.10.5).									beyond the insulation wings (grips)		
														16ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3846 CM1a
														20ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3847 CM1a
														24ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3661 CM1a
				Terminal / Cavity Polarization - 180°	Insert terminal at a 180° orientation and apply force equaling 1.5 times maximum force recorded in Step 5.4.1.3-7; or 15N; whichever is greater. Inserting terminal into cavity until the determined force is reached. Terminals inserted at a force 1.5 times the normal insertion force or 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips) or cable seal (see Figure 5.4.10.5).	5.4.10			0	3				12ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)	MET	Refer to DVPR 3659 CM1a
														16ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3846 CM1a
														20ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3847 CM1a
														24ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3661 CM1a
				Terminal / Cavity Polarization - 270°	Insert terminal at a 270° orientation and apply force equaling 1.5 times maximum force recorded in Step 5.4.1.3-7; or 15N; whichever is greater. Inserting terminal into cavity until the determined force is reached. Terminals inserted at a force 1.5 times the normal insertion force or 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips) or cable seal (see Figure 5.4.10.5).	5.4.10			0	3				12ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)	MET	Refer to DVPR 3659 CM1a
														16ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3846 CM1a
														20ckt(HB): 15N (whichever is greater) in any incorrect orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		Refer to DVPR 3847 CM1a
														24ckt(HB): 15N (whichever is greater) in any incorrect		Refer to DVPR 3661 CM1a

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
														orientation shall not fit or lock into a connector cavity beyond the insulation wings (grips)		
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5D / Terminal - Connector Insertion / Retention - No Conditioning	CM2a	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)		8				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)		8						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)		8						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)		8						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire		216						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² smallest wire		72						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Term to Conn Insertion Force - Large Wire	Adjust the force tester to insert the terminal straight into the connector at a uniform rate not to exceed 50 mm per minute. Insert terminal straight in connector to forward stop position	5.4.1			0	2	1.04	1.35	1.17	12ckt (HB): The maximum Insertion Force for a terminal is 5 N	MET	Refer to DVPR 3659 CM2a-1
											1.00	1.30	1.16	16ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3846 CM2a-1
											1.00	1.29	1.11	20ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3847 CM2a-1
											0.91	1.38	1.10	24ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3661 CM2a-1
				Term to Conn - Insertion Force - Smallest Wire	Adjust the force tester to insert the terminal straight into the connector at a uniform rate not to exceed 50 mm per minute. Insert terminal straight in connector to forward stop position.	5.4.1A			0	2	0.84	1.14	1.01	12ckt (HB): The maximum Insertion Force for a terminal is 5 N	MET	Refer to DVPR 3659 CM2a-1
											0.96	1.18	1.04	16ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3846 CM2a-1
											0.87	1.17	0.97	20ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3847 CM2a-1
											0.94	1.37	1.07	24ckt (HB): The maximum Insertion Force for a terminal is 5 N		Refer to DVPR 3661 CM2a-1
				Term to Conn - Forward Stop Force	After inserting the terminal straight into connector to the forward stop position, continue applying force until the forward stop fails (plastic failure or terminal damage).	5.4.1A			0	2	70.77	80.69	75.61	12ckt (HB): The forward stop push-through force must be > 60N	MET	Refer to DVPR 3659 CM2a-1
											65.63	75.10	70.61	16ckt (HB): The forward stop push-through force must be > 60N		Refer to DVPR 3846 CM2a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
											70.56	76.57	72.79	20ckt (HB): The forward stop push-through force must be > 60N		Refer to DVPR 3847 CM2a-1
											63.47	77.31	72.09	24ckt (HB): The forward stop push-through force must be > 60N		Refer to DVPR 3661 CM2a-1
				Term to Conn - Retention	For sample size and cavity requirement, refer to Table 5.4.1.3.1. Increase the pull-out force until pull-out occurs. Perform the retention test with the TPA, PLR, Wedge, etc. disengaged.	5.4.1			0	2	14.29	19.12	17.54	12ckt(HB): 10N Min. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM2a-1
											11.70	19.50	16.16	16ckt (HB): 10N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM2a-1
											12.00	21.60	16.01	20ckt(HB): 10N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM2a-1
											14.46	20.64	17.21	24ckt(HB): 10N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM2a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5D / Terminal - Connector Insertion / Retention - High Temp Exposure Retention	CM2b	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	2	2				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	2	2						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	72	72						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Term to Conn - Retention, High Temp Exposure Conditioning [1008 Hours]	For sample size and cavity requirement, refer to Table 5.4.1.3.1. At the maximum ambient temperature in Table 5.1.4.1, leave the samples in the chamber for 1008 hours. Perform conditioning and retention test with TPA, PLR, Wedge, etc. engaged.	5.4.1-5.6.3			0	2				None	NA	
				Term to Conn - Retention	For sample size and cavity requirement, refer to Table 5.4.1.3.1. Increase the pull-out force until pull-out occurs.	5.4.1					53.20	56.80	54.80	12ckt (HB): 50N Min.	MET	Refer to DVPR 3659 CM2b-1
											51.61	58.82	56.53	16ckt (HB): 50N Min.		Refer to DVPR 3846 CM2b-1
											53.20	66.50	57.00	20ckt (HB): 50N Min.		Refer to DVPR 3847 CM2b-1
											52.40	56.80	54.70	24ckt (HB): 50N Min.		Refer to DVPR 3661 CM2b-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical	CM2c	Connector	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	2	2				Refer to the General Notes for Pre-Test Information.	NA	

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
USCAR-2 REV6, February 2013 5.9.5D / Terminal - Connector Insertion / Retention - Moisture Conditioning Retention		Mechanical						Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	2	2						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	72	72						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Term to Conn - Retention, Moisture Conditioning [6 Hours]	For sample size and cavity requirement, refer to Table 5.4.1.3.1. Moisture condition parts in 95-98% relative humidity, at 40ºC for 6 hours, then 1 hour at room temperature and humidity. Perform conditioning and retention test with TPA, PLR, Wedge, etc. engaged.	5.4.1			0	2				None	MET	
				Term to Conn - Retention	For sample size and cavity requirement, refer to Table 5.4.1.3.1. Increase the pull-out force until pull-out occurs.	5.4.1					60.81	70.01	64.53	12ckt (HB): 50N Min.	MET	Refer to DVPR 3659 CM2c-1
											61.20	72.50	66.50	16ckt (HB): 50N Min.		Refer to DVPR 3846 CM2c-1
											61.80	73.90	65.32	20ckt (HB): 50N Min.		Refer to DVPR 3847 CM2c-1
											60.20	74.30	65.80	24ckt (HB): 50N Min.		Refer to DVPR 3661 CM2c-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5D / Terminal - Connector Insertion / Retention - Temp/ Humidity Cycling Retention	CM2d	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	2	2				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	2	2						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	2	2						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	72	72						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Term to Conn - Retention, Temp/ Humidity Cycling Conditioning [8 Hours X 40 Cycles]	For sample size and cavity requirement, refer to Table 5.4.1.3.1. The cycle begins at -40°C with uncontrolled relative humidity. Completion of schedule in Figure 5.6.2.3 is one cycle. Use Maximum Ambient Temperature for hours 5 through 7 per table 5.1.4.1. Cycle test 40 times. Perform conditioning and retention test with TPA, PLR, Wedge, etc. engaged.	5.4.1-5.6.2			0	2				None	NA	
				Term to Conn - Retention	For sample size and cavity requirement, refer to Table 5.4.1.3.1.	5.4.1					61.40	67.30	64.69	12ckt (HB): 50N Min.	MET	Refer to DVPR 3659 CM2d-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					Increase the pull-out force until pull-out occurs.						58.26	67.01	64.33	16ckt (HB): 50N Min.		Refer to DVPR 3846 CM2d-1
											59.39	68.56	63.66	20ckt (HB): 50N Min.		Refer to DVPR 3847 CM2d-1
											53.40	70.20	63.90	24ckt (HB): 50N Min.		Refer to DVPR 3661 CM2d-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5E / Misc. Comp. Engage / Disengage - Pre-Staged TPA/ PLR/ ISL (NARROW LEFT)	CM3a	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	40	40				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	40	40						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	140	140						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock with Terminals in all Cavities	Engage each component retaining mechanism(s) TPA/PLR/ISL, moving from Pre-Stage to Locked, with terminals in all cavities.	5.4.5			0	10	5.13	6.11	5.59	12ckt (HB):40N Max.	MET	Refer to DVPR 3659 CM3a-1b
											11.34	13.71	12.22	16ckt (HB):40N Max.		Refer to DVPR 3846 CM3a-1
											11.57	12.99	12.32	20ckt (HB):40N Max.		Refer to DVPR 3847 CM3a-1
											15.53	20.47	17.35	24ckt (HB):40N Max.		Refer to DVPR 3661 CM3a-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock without Terminals	Engage each component retaining mechanism(s) TPA/PLR/ISL, moving from Pre-Stage to Locked, without terminals.	5.4.5			0	10	4.89	5.92	5.56	12ckt (HB):4N Min. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3a-1b
											11.58	14.04	12.38	16ckt(HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3a-1
											11.08	13.33	12.36	20ckt(HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM3a-1
											13.49	16.83	15.26	24ckt(HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM3a-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage with Terminals in all Cavities	With the component TPA/PLR/ISL fully Locked, disengage in reverse axis from Locked to Pre-Stage, with terminals in all cavities.	5.4.5			0	10	12.25	15.50	14.15	12ckt (HB):60N Max.	MET	Refer to DVPR 3659 CM3a-1a
											22.24	39.69	31.15	16ckt (HB):60N Max.		Refer to DVPR 3846 CM3a-1
											28.27	37.76	33.19	20ckt (HB):60N Max.		Refer to DVPR 3847 CM3a-1
											33.51	37.91	35.87	24ckt (HB):60N Max.		Refer to DVPR 3661 CM3a-1
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage after 2 Cycles, without Terminals	With the component TPA/PLR/ISL fully Locked, after 2 cycles, disengage in reverse axis from Locked to Pre-Stage, without terminals.	5.4.5			0	10	23.50	38.87	29.29	16ckt(HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3a-1a
											9.07	16.12	13.05	12ckt(HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3a-1
											25.54	34.42	29.29	20ckt(HB): 8N Min.&60N Max. This criteria is defined		Refer to DVPR 3847 CM3a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
														in 2065230000-PS		
											31.82	40.74	37.16	24ckt(HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM3a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5E / Misc. Comp. Engage / Disengage - Pre-Staged TPA/ PLR/ ISL (NARROW RIGHT)	CM3b	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	40	40				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	40	40						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	140	140						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock with Terminals in all Cavities	Engage each component retaining mechanism(s) TPA/PLR/ISL, moving from Pre-Stage to Locked, with terminals in all cavities.	5.4.5			0	10	4.29	5.65	4.99	12ckt (HB):40N Max.	MET	Refer to DVPR 3659 CM3b-1b
											10.54	12.05	11.39	16ckt (HB):40N Max.		Refer to DVPR 3846 CM3b-1
											14.18	15.08	14.62	20ckt (HB):40N Max.		Refer to DVPR 3847 CM3b-1
											18.09	19.84	18.88	24ckt (HB):40N Max.		Refer to DVPR 3661 CM3b-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock without Terminals	Engaging TPA/PLR/ISL Forces without terminals, from Pre-Stage to Locked, shall meet 15N minimum (see Table 5.4.5.2.4).	5.4.5			0	10	4.83	5.56	5.22	12ckt (HB):4N Min. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3b-1b
											10.16	12.19	11.19	16ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3b-1
											14.16	14.79	14.60	20ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM3b-1
											18.00	19.27	18.64	24ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM3b-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage with Terminals in all Cavities	With the component TPA/PLR/ISL fully Locked, disengage in reverse axis from Locked to Pre-Stage, with terminals in all cavities.	5.4.5			0	10	13.32	17.38	15.50	12ckt (HB):60N Max.	MET	Refer to DVPR 3659 CM3b-1a
											18.11	32.17	24.83	16ckt (HB):60N Max.		Refer to DVPR 3846 CM3b-1
											39.96	48.21	44.24	20ckt (HB):60N Max.		Refer to DVPR 3847 CM3b-1
											33.38	41.61	37.32	24ckt (HB):60N Max.		Refer to DVPR 3661 CM3b-1
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage after 2 Cycles, without Terminals	With the component TPA/PLR/ISL fully Locked, after 2 cycles, disengage in reverse axis from Locked to Pre-Stage, without terminals.	5.4.5			0	10	14.86	17.49	15.79	12ckt (HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3b-1a
											16.59	29.61	23.00	16ckt (HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3b-1
											36.17	43.16	39.33	20ckt (HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM3b-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
											31.76	41.26	37.57	24ckt (HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM3b-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5E / Misc. Comp. Engage / Disengage - Pre-Staged TPA/ PLR/ ISL (WIDE)	CM3c	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	40	40				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	40	40						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	40	40						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	440	440						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock with Terminals in all Cavities	Engage each component retaining mechanism(s) TPA/PLR/ISL, moving from Pre-Stage to Locked, with terminals in all cavities.	5.4.5			10	10	32.46	34.48	33.60	12ckt (HB):40N Max.	MET	Refer to DVPR 3659 CM3c-1b
											24.94	26.48	25.89	16ckt (HB):40N Max.		Refer to DVPR 3846 CM3c-1
											18.96	20.33	19.62	20ckt (HB):40N Max.		Refer to DVPR 3847 CM3c-1
											20.00	23.48	21.65	24ckt (HB):40N Max.		Refer to DVPR 3661 CM3c-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock without Terminals	Engage each component retaining mechanism(s) TPA/PLR/ISL, moving from Pre-Stage to Locked, without terminals.	5.4.5			10	10	32.16	34.53	33.51	12ckt (HB):4N Min. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3c-1b
											25.29	27.45	26.16	16ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3c-1
											19.69	20.17	19.98	20ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM3c-1
											20.48	23.41	21.78	24ckt (HB):4N Min. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM3c-1a
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage with Terminals in all Cavities	With the component TPA/PLR/ISL fully Locked, disengage in reverse axis from Locked to Pre-Stage, with terminals in all cavities.	5.4.5			10	10	36.03	59.02	49.36	12ckt (HB):60N Max.	MET	Refer to DVPR 3659 CM3c-1a
											27.99	42.12	34.84	16ckt (HB):60N Max.		Refer to DVPR 3846 CM3c-1
											27.19	40.02	32.67	20ckt (HB):60N Max.		Refer to DVPR 3847 CM3c-1
											21.02	29.50	23.84	24ckt (HB):60N Max.		Refer to DVPR 3661 CM3c-1
				Misc. Comp. - Pre-Staged TPA/PLR/ISL, Disengage Lock to Pre-Stage after 2 Cycles, without Terminals	With the component TPA/PLR/ISL fully Locked, after 2 cycles, disengage in reverse axis from Locked to Pre-Stage, without terminals.	5.4.5			10	10	32.57	47.43	43.28	12ckt (HB): 8N Min.&60N Max. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM3c-1a
											27.02	35.42	30.79	16ckt (HB):8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM3c-1
											23.80	34.64	28.99	20ckt (HB):8N Min.&60N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM3c-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		Refer to DVPR 3661 CM3c-1
											21.14	31.47	23.39	24ckt (HB):8N Min.&60N Max. This criteria is defined in 2065230000-PS		
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5E / Misc. Comp. Engage / Disengage - Pre-Staged CPA - DAM CPA	CM4	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A (With CPA, HB)	40	40				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A (With CPA, HB)	40	40						
								Mini50 Gen II RCPT CONN 20CKT Pol A (With CPA, HB)	40	40						
								Mini50 Gen II RCPT CONN 24CKT Pol A (With CPA, HB)	40	40						
								Mini50 12 ckt R/A Header Assembly - Pol A	20	20						
								Mini50 16 ckt R/A Header Assembly - Pol A	20	20						
								Mini50 20 ckt R/A Header Assembly - Pol A	20	20						
								Mini50 24 ckt R/A Header Assembly - Pol A	20	20						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Misc. Comp. - Pre-Staged CPA, Engage Pre-Stage to Lock - Unmated Conn	Engage each component, with its retaining mechanism(s) CPA moving from Pre-Stage to Locked using unmated connectors. Engaging CPA Forces from Pre-Stage to Locked, for unmated connectors, see Table 5.4.5.2.4.	5.4.5			0	10	72.70	76.60	74.48	12ckt (HB):60N Min	MET	Refer to DVPR 3659 CM4a-1a
											64.55	68.12	66.49	16ckt (HB):60N Min.		Refer to DVPR 3846 CM4a-1
											62.41	64.96	63.49	20ckt (HB):60N Min.		Refer to DVPR 3847 CM4a-1
											79.45	83.41	81.27	24ckt (HB):60N Min.		Refer to DVPR 3661 CM4a-1
				Misc. Comp. - Pre-Staged CPA, Engage Pre-Stage to Lock - Mated Conn	Engage each component, with its retaining mechanism(s) CPA moving from Pre-Stage to Locked using mated connectors. Engaging CPA Forces from Pre-Stage to Locked, for mated connectors, see Table 5.4.5.2.4.	5.4.5			0	10	10.78	11.75	11.39	12ckt (HB):22N Max.	MET	Refer to DVPR 3659 CM4a-1a
											10.58	12.90	11.21	16ckt (HB):22N Max.		Refer to DVPR 3846 CM4a-1
											10.94	12.76	11.68	20ckt (HB):22N Max.		Refer to DVPR 3847 CM4a-1
											13.63	15.23	14.64	24ckt (HB):22N Max.		Refer to DVPR 3661 CM4a-1
				Misc. Comp. - Pre-Staged CPA, Disengage Lock to Pre-Stage - Mated Conn	Disengaging CPA Forces from Locked to Pre-Stage, for mated connectors, see Table 5.4.5.2.4. With the component CPA fully locked, disengage in reverse axis the CPA from Locked to Pre-Stage using mated connectors.	5.4.5			0	10	12.43	14.01	13.24	12ckt (HB): 10N Min.&30N Max.	MET	Refer to DVPR 3659 CM4a-1a
											11.91	13.21	12.33	16ckt (HB):10N Min.&30N Max.		Refer to DVPR 3846 CM4a-1
											14.22	16.41	15.23	20ckt (HB):10N Min.&30N Max.		Refer to DVPR 3847 CM4a-1
											11.67	14.70	13.08	24ckt (HB):10N Min.&30N Max.		Refer to DVPR 3661 CM4a-1
				Misc. Comp. - Pre-Staged CPA, Disengage Pre-Stage to Removal - Unmated Conn	Disengaging CPA Forces from Pre-Stage to fully Removed, for unmated connectors, see Table 5.4.5.2.4. With the component CPA in pre-stage, disengage in reverse axis the	5.4.5			0	10	65.23	68.22	66.65	12ckt (HB): 50N Min	MET	Refer to DVPR 3659 CM4a-1a
											69.81	71.41	70.58	16ckt (HB):50N Min.		Refer to DVPR 3846 CM4a-1
											69.25	70.85	69.88	20ckt (HB):50N Min.		Refer to DVPR 3847 CM4a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					CPA from Pre-Stage to fully Removed using unmated connectors.						69.60	74.84	71.53	24ckt (HB):50N Min.		Refer to DVPR 3661 CM4a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5F / Audible Click-Connector	CM5	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	16	16				Refer to the General Notes for Pre-Test Information.		
								Mini50 12 ckt R/A Header Assembly - Pol A	16	16						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Conn-to-Conn Audible Click - Unconditioned	Mate the connectors by hand and measure the dB (A) level of the sound generated as the lock engages. The values measured in this test shall be documented in the test report. These values should be considered for information only and are used to compare connector designs or to assist in the connector selection/wire harness design process.	5.4.7			0	8				The values measured in this test shall be documented in the test report. These values should be considered for information only and are used to compare connector designs or to assist in the connector selection/wire harness design process.	MET	Refer to DVPR 3512 CM5a-1
				Conn-to-Conn Audible Click - Moisture Conditioned	After moisture conditioning the parts by exposure to 95-98% relative humidity, at 40ºC for 6 hours minimum. Mate the connectors hand, measure dB (A) level of sound generated as the lock engages. Complete testing within 30 minutes of removing the samples from the conditioning chamber. The values measured in this test shall be documented in the test report. These values should be considered for information only and are used to compare connector designs or to assist in the connector selection/wire harness design process.	5.4.7			0	8				The values measured in this test shall be documented in the test report. These values should be considered for information only and are used to compare connector designs or to assist in the connector selection/wire harness design process.	MET	Refer to DVPR 3661 CM4a-1
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5G / Connector to Connector Mating / Unmating - Non-Assist	CM6	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	30	30				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	30	30						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	30	30						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	30	30						
								Mini50 12 ckt R/A Header Assembly - Pol A	30	30						
								Mini50 16 ckt R/A Header Assembly - Pol A	30	30						
								Mini50 20 ckt R/A Header Assembly - Pol A	30	30						
								Mini50 24 ckt R/A Header Assembly - Pol A	30	30						
								CTX50 Large Grip Unsealed Tin	1440	1440						

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
								(Crimped) _0.35mm² largest wire								
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Conn to Conn (non-assist) - Mating Force	The mating (engage) force of all tested samples shall meet the requirements of SAE/USCAR-25 for the connector in its intended application. (The USCAR-25 value depends on connector push surface area, grasp area, and the ergonomic conditions of the assembly operation involved). If tested values are reported in summary format, the highest reading shall be reported. Refer to Figure 5.4.2.3. Completely assemble (but do not mate) all connector halves (both male and female) using all applicable components such as terminals, wedges, and seals. Increase the connector (Engaging) Mating Force at a uniform rate of 50+/- 10mm/min, until complete mating occurs.	5.4.2			0	15	25.14	28.37	26.90	12ckt (HB):75N Max.	MET	Refer to DVPR 3659 CM6a-1
											31.12	34.05	32.51	16ckt (HB):75N Max.		Refer to DVPR 3846 CM6a-1
											37.48	42.24	40.35	20ckt (HB):75N Max.		Refer to DVPR 3847 CM6a-1
											50.54	56.38	53.07	24ckt (HB):75N Max.		Refer to DVPR 3661 CM6a-1
				Conn to Conn (non-assist) - Retention Force, w/o Terminals	Retention Force must be ≥ 110 Newtons with primary connector lock fully engaged. A CPA device, if provided, must NOT be engaged. With primary connector lock enabled (CPA disabled), increase Retention Force at a uniform rate not to exceed 50mm/min.until complete separation occurs. This test will be conducted without terminals or wires on the samples.	5.4.2			0	5	122.06	125.63	124.19	12ckt (HB): 110N Min	MET	Refer to DVPR 3659 CM6a-1
											133.58	138.48	136.15	16ckt (HB):110N Min.		Refer to DVPR 3846 CM6a-1
											130.72	135.50	133.25	20ckt (HB):110N Min.		Refer to DVPR 3847 CM6a-1
											131.43	133.61	132.72	24ckt (HB):110N Min.		Refer to DVPR 3661 CM6a-1
				Conn to Conn (non-assist) - Unmating Force	Unmating Force must be ≤ 75 Newtons with the primary connector lock completely disengaged/ disabled. With primary connector lock disabled, increase (Disengage) Unmating Force uniformly until complete separation of the connector halves occurs. This test will be conducted with terminals or wires on the 5 samples.	5.4.2			0	5	17.03	18.69	18.02	12ckt (HB):75N Max.	MET	Refer to DVPR 3659 CM6a-1
											22.20	23.46	22.77	16ckt (HB):75N Max.		Refer to DVPR 3846 CM6a-1
											25.85	28.62	27.15	20ckt (HB):75N Max.		Refer to DVPR 3847 CM6a-1
											35.70	38.50	36.89	24ckt (HB):75N Max.		Refer to DVPR 3661 CM6a-1
				Conn to Conn (non-assist) - Lock Deflection Force	he force to completely disengage the primary connector lock must be ≤ 30N in its fully seated position (without the CPA engaged). Gradually apply a force of up to .0N to the lock mechanism until the lock mechanism clears the lock feature on the mating part and attempt to unmate the connection. This test will be conducted without terminals or wires on the 5 samples.*Deviation this item with USCAR-2 Rev 5 criteria*	5.4.2			0	5	4.88	5.12	5.00	12ckt (HB):70N Max. This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM6a-1
											5.35	5.81	5.62	16ckt (HB):70N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM6a-1
											3.56	3.81	3.68	20ckt (HB):70N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM6a-1
											6.12	6.27	6.19	24ckt (HB):70N Max. This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM6a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5H / Polarization Effectiveness - Connector	CM7	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	9	9				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 12CKT Pol B(HB)	9	9						
								Mini50 Gen II RCPT CONN 12CKT Pol C(HB)	9	9						
								Mini50 Gen II RCPT	9	9						

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
								CONN 16CKT Pol A(HB)								
								Mini50 Gen II RCPT CONN 16CKT Pol B(HB)	9	9						
								Mini50 Gen II RCPT CONN 16CKT Pol C(HB)	9	9						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	9	9						
								Mini50 Gen II RCPT CONN 20CKT Pol B(HB)	9	9						
								Mini50 Gen II RCPT CONN 20CKT Pol C(HB)	9	9						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	9	9						
								Mini50 Gen II RCPT CONN 24CKT Pol B(HB)	9	9						
								Mini50 Gen II RCPT CONN 24CKT Pol C(HB)	9	9						
								Mini50 12 ckt R/A Header Assembly - Pol A	9	9						
								Mini50 12 ckt R/A Header Assembly - Pol B	9	9						
								Mini50 12 ckt R/A Header Assembly - Pol C	9	9						
								Mini50 16 ckt R/A Header Assembly - Pol A	9	9						
								Mini50 16 ckt R/A Header Assembly - Pol B	9	9						
								Mini50 16 ckt R/A Header Assembly - Pol C	9	9						
								Mini50 20 ckt R/A Header Assembly - Pol A	9	9						
								Mini50 20 ckt R/A Header Assembly - Pol B	9	9						
								Mini50 20 ckt R/A Header Assembly - Pol C	9	9						
								Mini50 24 ckt R/A Header Assembly - Pol A	9	9						
								Mini50 24 ckt R/A Header Assembly - Pol B	9	9						
								Mini50 24 ckt R/A	9	9						

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
								Header Assembly - Pol C								
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Polarization Feature Effectiveness - A Receptacle to A Blade, 180° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt (HB): ≥150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - B Receptacle to B Blade, 180° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt (HB): ≥150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - C Receptacle to C Blade, 180° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt (HB): ≥150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS n	MET	Refer to DVPR 3659 CM7a-1
														16ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt (HB): ⩾150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - A Receptacle to B Blade, 0° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is	5.4.4			0	3				12ckt (HB): ≥150N (for Pol A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt (HB): ⩾150N (for Pol		Refer to DVPR 3846 CM7a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.									A, B), ⩾100N (for Pol C), This criteria is defined in 2065230000-PS		
														20ckt (HB): ⩾150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - A Receptacle to C Blade, 0° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt(HB): ≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - B Receptacle to A Blade, 0° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt(HB): ≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - B Receptacle to C Blade, 0° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt(HB): ≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature	The connection system must withstand a mis-mating force as specified	5.4.4			0	3				12ckt(HB): ≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in	MET	Refer to DVPR 3659 CM7a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results Min	Test Results Max	Test Results Avg	Test Results Acceptance Criteria	Met/Not met	Results Notes
				Effectiveness - C Receptacle to A Blade, 0° Force Test	without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.									2065230000-PS		
														16ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Polarization Feature Effectiveness - C Receptacle to B Blade, 0° Force Test	The connection system must withstand a mis-mating force as specified without damage to the connector; and no electrical contact shall be made between the male/female terminals. If sufficient mis-mating is achieved to allow contact with any properly installed Male Terminal in any position in its connector housing, the polarizing feature(s) is considered to be inadequate.	5.4.4			0	3				12ckt(HB): ≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS	MET	Refer to DVPR 3659 CM7a-1
														16ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3846 CM7a-1
														20ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3847 CM7a-1
														24ckt(HB):≥150N(for Pol A,B),≥100N(for Pol C), This criteria is defined in 2065230000-PS		Refer to DVPR 3661 CM7a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5l / Drop	CM8	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(With CPA,HB)	18	18				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(With CPA,HB)	18	18						
								Mini50 Gen II RCPT CONN 20CKT Pol A (With CPA,HB)	18	18						
								Mini50 Gen II RCPT CONN 24CKT Pol A(With CPA,HB)	18	18						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Connector Drop Test - Axis X1	Components shall not be displaced from their intended shipping position. Drop each sample (once) onto a horizontal concrete surface from 1 meter minimum height. Orienting samples to X1 connector “face” of the rectangular connector.	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their intended shipping position.	MET	Refer to DVPR 3659 CM8a-1
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Connector Drop Test - Axis	Components shall not be displaced from their intended shipping	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their	MET	Refer to DVPR 3659 CM8a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
				X2	position. Drop each sample (once) onto a horizontal concrete surface from 1 meter minimum height. Orienting samples to X2 connector “face” of the rectangular connector.									intended shipping position.		
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Connector Drop Test - Axis Y1	Components shall not be displaced from their intended shipping position. Drop each sample (once) onto a horizontal concrete surface from 1 meter minimum height. Orienting samples to Y1 connector “face” of the rectangular connector.	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their intended shipping position.	MET	Refer to DVPR 3659 CM8a-1
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Connector Drop Test - Axis Y2	Components shall not be displaced from their intended shipping position. Drop each sample (once) onto a horizontal concrete surface from 1 meter minimum height. Orienting samples to Y2 connector “face” of the rectangular connector.	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their intended shipping position.	MET	Refer to DVPR 3659 CM8a-1
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Connector Drop Test - Axis Z1	Components shall not be displaced from their intended shipping position. Drop each sample (once) onto a horizontal concrete surface from 1 meter minimum height. Orienting samples to Z1 connector “face” of the rectangular connector.	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their intended shipping position.	MET	Refer to DVPR 3659 CM8a-1
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Connector Drop Test - Axis Z2	Components shall not be displaced from their intended shipping position. Drop each sample (once) onto a horizontal concrete surface from 1-meter minimum height. Orienting samples to Z2 connector “face” of the rectangular connector.	5.4.8			3	3				12ckt(HB): Components shall not be displaced from their intended shipping position.	MET	Refer to DVPR 3659 CM8a-1
														16ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3846 CM8a-1
														20ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3847 CM8a-1
														24ckt(HB): Components shall not be displaced from their intended shipping position.		Refer to DVPR 3661 CM8a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual	MET	

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
														Inspections.		
Connector Mechanical USCAR-2 REV6, February 2013 5.9.5J / Cavity Damage	CM9	Connector Mechanical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	14	14				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	18	18						
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	22	22						
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	26	26						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	144	144						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Cavity Damage Susceptibility - Terminal Improper Insertion	Determine the force to be applied to the secondary lock by adding 60N to the maximum force required to seat the TPA/PLR device when all terminals are located properly (Sequence 5.9.5E, Element 5.4.5: Misc. Comp. - Pre-Staged TPA/PLR/ISL, Engage Pre-Stage to Lock with Terminals in all Cavities). The minimum force is 80N for ≥1.5 nominal size terminals and 60N for <1.5 terminals. (Actual measured TPA seating forces are to be used in the calculation, not the criteria from the Table.) When the force is fully applied, the TPA must not seat into final position and terminal retention must meet the forces in table 5.4.1.4. Use the after moisture conditioning values in Table 5.4.1.4 (**NO** moisture conditioning is required for this test).	5.4.9		Mini50 Gen II RCPT CONN 12CKT Pol A(HB)	0	12				12ckt(HB): apply 60N , TPA not inserted	MET	Refer to DVPR 3659 CM9a-1
								Mini50 Gen II RCPT CONN 16CKT Pol A(HB)	0	16				16ckt(HB): apply 60N , TPA not inserted		Refer to DVPR 3846 CM9a-1
								Mini50 Gen II RCPT CONN 20CKT Pol A(HB)	0	20				20ckt(HB): apply 60N , TPA not inserted		Refer to DVPR 3847 CM9a-1
								Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	0	24				24ckt(HB): apply 60N , TPA not inserted		Refer to DVPR 3661 CM9a-1
				Cavity Damage Susceptibility - Terminal Retention force(Final lock)	Apply a 60N force to seat the ISL with one terminal improperly installed. Then remove the force, insert terminal properly and close the ISL, measure the terminal retention force	5.4.9			0	2	63.76	73.92	68.19	12ckt(HB): 40N Min	MET	Refer to DVPR 3659 CM9a-1
											57.90	70.57	64.10	16ckt(HB):40N Min.		Refer to DVPR 3846 CM9a-1
											61.71	72.98	66.22	20ckt(HB):40N Min.		Refer to DVPR 3847 CM9a-1
											53.27	69.25	64.57	24ckt(HB):40N Min.		Refer to DVPR 3661 CM9a-1
Connector Electrical USCAR-2 REV6, February 2013 5.9.6M / Vibration and Mechanical Shock - V1	CE1	Connector Electrical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	10	10				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 24 ckt R/A Header Assembly - Pol A	10	10						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	240	240						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Connector and/or Terminal Cycling	Completely mate and un-mate each connector or terminal pair 10 times. Re-mate connectors or terminals one last time for testing.	5.1.7								None	MET	

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
				Dry Circuit Resistance	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					0.17	2.49	0.80	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE1a-1
				Circuit Continuity Monitoring	Solder the conductors from each terminal in the CUT in series. For the test set-up see Figure 5.1.9.3A and B. Adjust the power supply to provide 100 mA to the circuit. When continuity is monitored during conditioning, there must be no loss of electrical continuity (any instance of the resistor current dropping below 95 mA), for more than 1 microsecond. If one or more terminal pairs are monitored, rather than the series resistor, there must be no instance where the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond. Figure 5.1.9.4 illustrates the acceptance criteria graphically.	5.1.9								There must be no instance where the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond. Figure 5.1.9.4 illustrates the acceptance criteria graphically.	MET	No discontinuities > 7Ω and > 1 µs were obeserved
				Mechanical Shock - V1	Subject class V1 samples to Mechanical Shock testing per Table 5.4.6.3A, in three mutually perpendicular axis.	5.4.6								None	NA	
				Vibration - V1 - Chassis Random	Subject class V1 samples to Vibration testing per schedules in Tables 5.4.6.3B, 5.4.6.3C and 5.4.6.3D. **3 August 2016 Change to USCAR-2, Rev 6 (Letter #9)** Subject the CUT to the appropriate vibration class schedule per Table 5.4.6.3B in each of the three mutually perpendicular axes. NOTE: When identified, Thermal Cycling shall be performed during the vibration schedules with temperatures per the schedule shown in Table 5.4.6.3B. Sine and random profiles shall be run separately (not concurrently).	5.4.6								None	NA	
				Dry Circuit Resistance_1	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					0.33	2.11	0.76	24ckt (HB): 20 mΩ Max.	MET	Refer to DVPR 3661 CE1a-1
				Voltage Drop	Assemble the test circuit shown in Figure 5.3.2.3, Current Resistance Test Set-Up. Adjust power supply to provide required test current of 5A per square millimeter of conductor cross section for selected conductor. Refer to ISO 6722-1, SAE J1127 or SAE J1128.	5.3.2					0.58	3.69	1.34	24ckt (HB): 20 mV/A Max.	MET	Refer to DVPR 3661 CE1a-1
				Visual Inspection - Post-Test Contact Surface	Examine terminals with the aid of 10X magnification looking for any evidence of deterioration, cracks, deformities, excessive plating wear, etc. that could affect functionality. When visual inspection follows Dry Circuit resistance measurement, inspect to the following:	5.1.8.3.1								Examine terminals with the aid of 10X magnification looking for any evidence of deterioration, cracks, deformities, excessive plating wear, etc. that could affect	MET	

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					• Inspect all male terminals. • Inspect all female terminals with resistance over 75% of resistance criteria. • Inspect no fewer than 5 female terminals.									functionality. When visual inspection follows Dry Circuit resistance measurement, inspect to the following: • Inspect all male terminals. • Inspect all female terminals with resistance over 75% of resistance criteria. • Inspect no fewer than 5 female terminals.		
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Electrical USCAR-2 REV6, February 2013 5.9.6N / Thermal Shock	CE2	Connector Electrical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	10	10				Refer to the General Notes for Pre-Test Information.	MET	
								Mini50 24 ckt R/A Header Assembly - Pol A	10	10						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	240	240						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Connector and/or Terminal Cycling	Completely mate and un-mate each connector or terminal pair 10 times. Re-mate connectors or terminals one last time for testing.	5.1.7								None	NA	
				Dry Circuit Resistance	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					1.27	2.99	2.06	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE2a-1
				Circuit Continuity Monitoring	Solder the conductors from each terminal in the CUT in series. For the test set-up see Figure 5.1.9.3A and B. Adjust the power supply to provide 100 mA to the circuit. When continuity is monitored during conditioning, there must be no loss of electrical continuity (any instance of the resistor current dropping below 95 mA), for more than 1 microsecond. If one or more terminal pairs are monitored, rather than the series resistor, there must be no instance where the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond. Figure 5.1.9.4 illustrates the acceptance criteria graphically.	5.1.9								When continuity is monitored during conditioning, there must be no loss of electrical continuity (any instance of the resistor current dropping below 95 mA), for more than 1 microsecond. If one or more terminal pairs are monitored, rather than the series resistor, there must be no instance where the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond. Figure 5.1.9.4 illustrates the acceptance criteria graphically.	MET	
				Thermal Shock	1. Cold soak an extra 30 minutes for specified class, see Table 5.1.4.1. 2. Into ambient temperature chamber in under 30 seconds and heat soak for 30 minutes. 3. Transfer in under 30 seconds to cold chamber for 30 minutes. 4. Repeat 99 times.	5.6.1								None	NA	

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
				Dry Circuit Resistance_1	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					2.09	8.12	3.97	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE2a-1
				Voltage Drop	Assemble the test circuit shown in Figure 5.3.2.3, Current Resistance Test Set-Up. Adjust power supply to provide required test current of 5A per square millimeter of conductor cross section for selected conductor. Refer to ISO 6722-1, SAE J1127 or SAE J1128.	5.3.2					2.28	7.80	4.39	24ckt (HB):20mV/A Max.	MET	Refer to DVPR 3661 CE2a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	
Connector Electrical USCAR-2 REV6, February 2013 5.9.6O / Temperature/Humidity Cycling	CE3a	Connector Electrical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	10	10				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 24 ckt R/A Header Assembly - Pol A	10	10						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	240	240						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Connector and/or Terminal Cycling	Completely mate and un-mate each connector or terminal pair 10 times. Re-mate connectors or terminals one last time for testing.	5.1.7								None	NA	
				Dry Circuit Resistance	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					1.32	3.00	2.19	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE3a-1
				Temperature / Humidity Cycling	The cycle begins at -40°C with uncontrolled relative humidity. Completion of schedule in Figure 5.6.2.3 is one cycle. Use maximum ambient temperature for hours 5 through 7 per Table 5.1.4.1. Cycle test 40 times.	5.6.2								None	NA	
				Dry Circuit Resistance_1	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					2.15	9.93	5.85	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE3a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
				Voltage Drop	Assemble the test circuit shown in Figure 5.3.2.3, Current Resistance Test Set-Up. Adjust power supply to provide required test current of 5A per square millimeter of conductor cross section for selected conductor. Refer to ISO 6722-1, SAE J1127 or SAE J1128.	5.3.2					2.68	15.69	6.86	24ckt (HB):20mV/A Max.	MET	Refer to DVPR 3661 CE3a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	NA	
Connector Electrical USCAR-2 REV6, February 2013 5.5.1 / Isolation Resistance / Post Temperature/Humidity Cycling	CE3b	Connector Electrical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	10	10				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 24 ckt R/A Header Assembly - Pol A	10	10						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	240	240						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	NA	
				Insulation Resistance	- For **un-sealed connector pairs**, the test samples shall rest in ambient environment **for ≥3 hours** prior to measuring insulation resistance after any prior environmental conditioning. - Connect the Megohmeter, set to 500 VDC, to the bare conductor ends as illustrated in Figure 5.5.1.3, so adjacent cavities have opposite polarization. - Test the mated connector assembly for those samples that have been subjected to prior stress testing. - Record the minimum resistance measured. The resistance between every combination of two adjacent terminals in the CUT must exceed 100 MΩ at 500 VDC. This includes terminals that may be separated by one or more vacant terminal cavities.	5.5.1								24ckt (HB): The resistance between every combination of two adjacent terminals in the CUT must exceed 100 MΩ at 500 VDC. This includes terminals that may be separated by one or more vacant terminal cavities.	MET	Refer to DVPR 3661 CE3b-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	NA	
Connector Electrical USCAR-2 REV6, February 2013 5.9.6P / High Temperature Exposure	CE4	Connector Electrical	PV	General Notes	Refer to the General Notes for Pre-Test Information.	5.1 N		Mini50 Gen II RCPT CONN 24CKT Pol A(HB)	10	10				Refer to the General Notes for Pre-Test Information.	NA	
								Mini50 24 ckt R/A Header Assembly - Pol A	10	10						
								CTX50 Large Grip Unsealed Tin (Crimped) _0.35mm² largest wire	240	240						
				Visual Inspection - Pre-Test	Refer to the General Notes for Pre-Test Visual Inspections.	5.1.8								Refer to the General Notes for Pre-Test Visual Inspections.	MET	
				Connector and/or Terminal Cycling	Completely mate and un-mate each connector or terminal pair 10 times. Re-mate connectors or terminals one last time for testing.	5.1.7								None	NA	
				Dry Circuit Resistance	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense	5.3.1					1.29	2.96	2.08	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE4a-1

Test Description	Test Item	Item Description	Test Type	Test Sequence	Test Requirement	¶	Test Remarks	Test Sample Description	Quantity of Samples	Quantity of Results	Test Results				Met/Not met	Results Notes
											Min	Max	Avg	Acceptance Criteria		
					lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.											
				High Temperature Exposure	At the maximum ambient temperature in table 5.1.4.1, leave the samples in the chamber for 1008 hours.	5.6.3								None	NA	
				Dry Circuit Resistance_1	Carefully mate the test terminal pair to the appropriate depth. Choose the preferred method of taking measurements (e.g. soldered sense lead or probe) and document the method chosen. In either case, the sense point T1 (Figure 5.3.1.3) must be soldered for all stranded cable. For Header type connectors, T2 is attached to the Header terminal per Section 5.1.5. Millivolt leads must be no larger than 0.22 mm². Secure the TUT to maintain the correct insertion depth for the test.	5.3.1					1.62	8.99	3.74	24ckt (HB):20mΩ Max.	MET	Refer to DVPR 3661 CE4a-1
				Voltage Drop	Assemble the test circuit shown in Figure 5.3.2.3, Current Resistance Test Set-Up. Adjust power supply to provide required test current of 5A per square millimeter of conductor cross section for selected conductor. Refer to ISO 6722-1, SAE J1127 or SAE J1128.	5.3.2					1.72	9.28	4.03	24ckt (HB):20mV/A Max.	MET	Refer to DVPR 3661 CE4a-1
				Visual Inspection - Post Test	Refer to the General Notes for Post-Test Visual Inspections.	5.1.8								Refer to the General Notes for Post-Test Visual Inspections.	MET	

Test Plan Revision Log

Test Plan Number: 4255

Revision Number	Change	By	Date
A	Initial Release	Wu Shanks	14-Aug-2019