3P, RAST5 P-LOCK HSG, INNER SLOT

1. INTRODUCTION

1.1 Purpose

This is product qualification test. The purpose of this test is to evaluate the performance of 3P, RAST5 P-LOCK HSG, INNER SLOT. Testing was performed on below products to determine its compliance with the requirements of 108-143029, C1.

1.2 Scope

This report covers the Electrical, Mechanical, Environment performance of the 3P, RAST5 P-LOCK HSG, INNER SLOT. Testing was performed at TE Connectivity Shanghai Electrical Test Laboratory (Building ID 554) between 2023-04-20 and 2023-06-26.
The associated test number is TP-23-03063.

1.3 Conclusion

Based on the test results, all samples meet the requirement according to customer requirement.
The testing results are only responsible for the specimens tested.

1.4 Test Specimens

Specimens with the following part numbers were used for test:

Test Group	Part No.	Rev.	Description	Qty. (pcs)	Comments
1	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	5	50% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	5	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	15	/
	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	5	25% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	5	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	15	/
2	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	10	50% Regrind

Test Group	Part No.	Rev.	Description	Qty. (pcs)	Comments
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	10	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	30	/
	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	10	25% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	10	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	30	/
3	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	5	50% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	5	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	15	/
	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	5	25% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	5	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	15	/
4	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	10	50% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	10	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	30	/
	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	10	25% Regrind
	2292457-3	/	3P, RAST 5 HEADER, PL, SHROUDED	10	/
	2238136-2	/	RECEPTACLE, POSITIVE-LOCK, RAST 6.35	30	/
5	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	6	50% Regrind
	2371464-3	/	3P, RAST5 P-LOCK HSG, INNER SLOT	6	25% Regrind

1.5 Test Sequence

Test Item	Test Group [a]				
	1	2	3	4	5
	Test Sequence [b]				
GWEPT					2
Temperature Rise		3,10			
Examination of Product	1,7	1,11	1,8	1,3	1
Random Vibration	4	8			
Mechanical Shock	5				
Thermal Shock			4		
Low Level Contact Resistance	2,6	2,5,7,9			
Insulation Resistance			2,6		
Retention Force				2	
Durability	3				
Dielectric Withstanding Voltage			3,7		
Temperature Life		6			
Temperature Cycling		4	5		

Note: a). Test group defined per customer requirement.
b). Numbers indicate sequence in which tests are performed.

1.6 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C
Relative Humidity: 25% to 75%

2. Test Procedures and Requirements

No.	Test Item	Requirement	Procedure	Method
2.1	GWEPT	750 ℃: No flame or t_E-t_i≤2 s 850 ℃: no flame or $t_E \leqslant t_A$ + 30 s and no ignition of wrap tissue	Subject completely assembled specimen to the temperature of 750 ℃ and 850 ℃, duration of glow-wire applied is 30 seconds. Perform a visual check and take picture after the test	IEC 60695-2-11-2021
2.2	Temperature Rise	Delta 30 ℃ Max	Apply 11 A for mated samples. Measure the temperature rise above ambient created by the energizing current.	EIA-364-70C-2021
2.3	Examination of Product	No physical damage.	No physical damage.	EIA-364-18B-2007
2.4	Random	No electrical discontinuity	Subject mated connectors to 0.02 g^2/Hz between 20 and	EIA-364-28F-

	Vibration	greater than 1 us and No damage which could impair normal usage.	500 Hz. Apply 15 minutes in each axis. Test to be performed at the 18°C temperature rise current level.	2011 (R2017)
2.5	Mechanical Shock	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.	Accelerated Velocity: 30 g. Waveform: Half-sin wave. Duration: 11 milliseconds. Number of drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops.	EIA-364-27C-2011 (R2017)
2.6	Thermal Shock	No evidence of physical damage is visible.	Subject mated specimens to 25 cycles between -40 ℃ and 105 ℃ with 30 minutes dwell time at temperature extremes and 5 minutes maximum transition between temperatures.	EIA-364-32G-2014
2.7	Low Level Contact Resistance	Initial: 2 mΩ Max. Final: 4 mΩ Max.	Subject mated contact assembled in housing to 20 mV maximum open circuit at 100 mA maximum.	EIA-364-23D-2022
2.8	Insulation Resistance	5000 MΩ Min.	The insulation resistance shall be measured with a test voltage of 500 V dc for 2 minutes between adjacent contacts for un-mated samples	TE Spec 109-28-4 & EIA-364-21F-2020
2.9	Retention Force	60 N Min.	Measure the axial force required to remove contact from the housing at a rate of 25mm/min	EIA-364-05C-2020
2.10	Durability	No physical damage.	Specimens were mated and unmated 10 times by manual	EIA-364-09D-2018
2.11	Dielectric Withstanding Voltage	No breakdown or flashover.	Hold at 3 kV AC at sea level for 1 minute. Current Leakage: 0.5 mA maximum Test between contacts in adjacent circuits and between housing and all contacts in a un-mated connector.	EIA-364-20F-2019
2.12	Temperature Life	No physical damage.	Subject connector mated with header to 105 ℃ for 500 hours.	EIA-364-17C-2011
2.13	Temperature Cycling	No physical damage.	Subject mated specimen to 10 cycles, each one cycle is 10h contain 7 steps. 1st: ramp from 25℃ to 55℃ for 1h. 2nd: hold 55℃ for 1.25h. 3rd: ramp from 55℃ to 25℃ for 1h. 4th: ramp from 25℃ to 55℃ for 1h. 5th: hold 55℃ for 1.25h. 6th: ramp from 55℃ to 25℃ for 1h. 7th: hold 25℃ for 3.5h.	EIA-364-31F-2019

3. SUMMARY OF TEST

Group	SN	Description	Test Item	Qty (pcs)	Test Result				Requirement	Conclusion
					Max.	Min.	Avg.	Unit		
1	1	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
	2	2371464-3 with 50% Regrind	Low Level Contact Resistance	5	0.72	0.63	0.67	mΩ	2 mΩ Max.	Meet Spec.
	2	2371464-3 with 25% Regrind	Low Level Contact Resistance	5	0.69	0.63	0.66	mΩ	2 mΩ Max.	Meet Spec.
	3	2371464-3 with 50% Regrind & 25% Regrind	Durability	10	No physical damage.			/	No physical damage.	Meet Spec.
	4	2371464-3 with 50% Regrind & 25% Regrind	Random Vibration	10	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.			/	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.	Meet Spec.
	5	2371464-3 with 50% Regrind & 25% Regrind	Mechanical Shock	10	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.			/	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.	Meet Spec.
	6	2371464-3 with 50% Regrind	Low Level Contact Resistance	5	0.87	0.68	0.76	mΩ	4 mΩ Max.	Meet Spec.
	6	2371464-3 with 25% Regrind	Low Level Contact Resistance	5	0.84	0.67	0.74	mΩ	4 mΩ Max.	Meet Spec.
	7	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
2	1	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	20	No physical damage.			/	No physical damage.	Meet Spec.
	2	2371464-3 with 50% Regrind	Low Level Contact Resistance	10	0.92	0.69	0.81	mΩ	2 mΩ Max.	Meet Spec.

	2	2371464-3 with 25% Regrind	Low Level Contact Resistance	10	0.83	0.66	0.76	mΩ	2 mΩ Max.	Meet Spec.
	3	2371464-3 with 50% Regrind	Temperature Rise	10	24.7	18.9	21.9	℃	Delta 30 ℃ Max	Meet Spec.
	3	2371464-3 with 25% Regrind	Temperature Rise	10	22.6	18.5	20.5	℃	Delta 30 ℃ Max	Meet Spec.
	4	2371464-3 with 50% Regrind & 25% Regrind	Temperature Cycling	20	No physical damage.			/	No physical damage.	Meet Spec.
	5	2371464-3 with 50% Regrind	Low Level Contact Resistance	10	0.86	0.64	0.77	mΩ	4 mΩ Max.	Meet Spec.
	5	2371464-3 with 25% Regrind	Low Level Contact Resistance	10	0.88	0.58	0.75	mΩ	4 mΩ Max.	Meet Spec.
	6	2371464-3 with 50% Regrind & 25% Regrind	Temperature Life	20	No physical damage.			/	No physical damage.	Meet Spec.
	7	2371464-3 with 50% Regrind	Low Level Contact Resistance	10	1.33	0.87	1.04	mΩ	4 mΩ Max.	Meet Spec.
	7	2371464-3 with 25% Regrind	Low Level Contact Resistance	10	1.27	0.86	1.03	mΩ	4 mΩ Max.	Meet Spec.
	8	2371464-3 with 50% Regrind & 25% Regrind	Random Vibration	20	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.			/	No electrical discontinuity greater than 1 us and No damage which could impair normal usage.	Meet Spec.
	9	2371464-3 with 50% Regrind	Low Level Contact Resistance	10	1.41	0.89	1.03	mΩ	4 mΩ Max.	Meet Spec.
	9	2371464-3 with 25% Regrind	Low Level Contact Resistance	10	1.17	0.86	1.02	mΩ	4 mΩ Max.	Meet Spec.
	10	2371464-3 with 50% Regrind	Temperature Rise	10	24.7	19.7	22.3	℃	Delta 30 ℃ Max	Meet Spec.
	10	2371464-3 with 25% Regrind	Temperature Rise	10	24.0	17.9	21.4	℃	Delta 30 ℃ Max	Meet Spec.

	11	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	20	No physical damage.			/	No physical damage.	Meet Spec.
3	1	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
	2	2371464-3 with 25% Regrind	Insulation Resistance	5	21.23	9.35	15.06	$10^{11}\Omega$	5000MΩ（=5*$10^{9}\Omega$）Min	Meet Spec.
	2	2371464-3 with 50% Regrind	Insulation Resistance	5	21.16	2.63	12.39	$10^{11}\Omega$	5000MΩ（=5*$10^{9}\Omega$）Min	Meet Spec.
	3	2371464-3 with 25% Regrind	Dielectric Withstanding Voltage	5	No breakdown or flashover.			/	No breakdown or flashover.	Meet Spec.
	3	2371464-3 with 50% Regrind	Dielectric Withstanding Voltage	5	No breakdown or flashover.			/	No breakdown or flashover.	Meet Spec.
	4	2371464-3 with 50% Regrind & 25% Regrind	Thermal Shock	10	No physical damage.			/	No physical damage.	Meet Spec.
	5	2371464-3 with 50% Regrind & 25% Regrind	Temperature Cycling	10	No physical damage.			/	No physical damage.	Meet Spec.
	6	2371464-3 with 25% Regrind	Insulation Resistance	5	20.74	6.96	14.69	$10^{11}\Omega$	5000MΩ（=5*$10^{9}\Omega$）Min	Meet Spec.
	6	2371464-3 with 50% Regrind	Insulation Resistance	5	20.63	7.53	15.07	$10^{11}\Omega$	5000MΩ（=5*$10^{9}\Omega$）Min	Meet Spec.
	7	2371464-3 with 25% Regrind	Dielectric Withstanding Voltage	5	No breakdown or flashover.			/	No breakdown or flashover.	Meet Spec.
	7	2371464-3 with 50% Regrind	Dielectric Withstanding Voltage	5	No breakdown or flashover.			/	No breakdown or flashover.	Meet Spec.
	8	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
4	1	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
	2	2371464-3 with 25% Regrind	Retention Force	5	158.0	102.2	129.0	N	60 N Min.	Meet Spec.
	2	2371464-3 with 50% Regrind	Retention Force	5	160.4	96.0	124.0	N	60 N Min.	Meet Spec.
	3	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	10	No physical damage.			/	No physical damage.	Meet Spec.
5	1	2371464-3 with 50% Regrind & 25% Regrind	Examination of Product	12	No physical damage.			/	No physical damage.	Meet Spec.

	2	2371464-3 with 50% Regrind & 25% Regrind	GWEPT (750 ℃)	6	No flame or t_E-t_i≤2 s	/	No flame or t_E-t_i≤2 s	Meet Spec.
	2	2371464-3 with 50% Regrind & 25% Regrind	GWEPT (850 ℃)	6	No flame or t_E ≤ t_A + 30 s and no ignition of wrap tissue	/	No flame or t_E ≤ t_A + 30 s and no ignition of wrap tissue	Meet Spec.

4. Validation

Requested by:

Li, Teresa

_____ 2023-03-13

TE Connectivity Product Engineering

Prepared by:

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_____ 2023-07-24

TE Connectivity Shanghai Electrical Components Test Lab.

Approved by:

Xu, Coco

_____ 2023-07-28

Test Manager

TE Connectivity Shanghai Electrical Components Test Lab.

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