
**.060 TAB / Recep. Contacts
(Wire to Wire Type)****1. SCOPE****1.1 Content**

This specification covers performance, tests and quality requirements for the .060 Tab/Recep contacts.

1.2 Qualification

When testing the .060 Tab/Recep products the following specified specifications and standards shall be used. All tests have to be done using the applicable inspection plan and product.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 Tyco Electronics Documents

- A. 109-1: General Requirements for Test Specifications
- B. Customer Drawings and Description;
 - 2109005: .060 Tab Contacts (SS, S, M)
 - 2109006: .060 Recep Contacts (SS, S, M)
- C. 114-61036: Application Specification

2.2 Customer Documents & Industry Standard

- | | | |
|----|--------------|---|
| A. | ES91500-00 | Connector General (Hyundai Motor Company) |
| B. | ES91101-00 | Electric Wiring (Hyundai Motor Company) |
| C. | GMW3191 | General Specification Electr./Electronics (GM) |
| D. | SAE/USCAR-2 | Performance Specification For Automotive Electrical Connector Systems |
| E. | SAE/USCAR-21 | Performance Specification For Cable-toTerminal Electrical Crimps |

3. REQUIREMENTS

3.1 Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3 Ratings

Temperature shall be within a range of -40°C to +105°C.

The rating includes ambient temperature.

Voltage: 14.0 ± 0.1 VDC

3.4 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Table 1.

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5 Test Requirements and Procedures Summary

Test Description	Requirement	Procedure																
TERMINAL MECHANICAL																		
1. Visual Inspection	Assure parts used for testing are Free of damage and obvious defects. Application spec: 114-61036	Visually, dimensionally and functionally inspected per applicable qualify inspection plan.																
2. Terminal/Terminal Cycling	Preconditioning	Completely mate and un-mate each connector or terminal pair 10 times.																
3. Terminal-to-Terminal Engaging Force	2 ~ 5N	Operation speed: 50mm/min. Measure the force required to mate contact Initial.																
4. Terminal-to-Terminal Disengaging Force	1.5 ~ 5N	Operation speed: 50mm/min. Measure the force required to un-mate contact. 10 times.																
5. Terminal Bend Resistance	Terminal shall not be damaged by a 10N load	Operation speed: 50mm/min. Original position, the terminal rotated 90° and 180° from the position shown in Fig. 1																
6. Terminal Crush Resistance	Withstand a crush load of 70N without visible fracture or degradation of electrical performance, terminal insertion, or terminal cavity lockup.	Operation speed: 50mm/min. To top and side of terminal box Fig. 2																
7. Terminal Retention Force *	Initial: 50N min. (Primary lock only) Final: 85N min. (Secondary lock)	Operation speed: 50mm/min. Fix the housing after inserting crimped terminals. Extend one line of cable in axial direction at a position 50~100 mm away from crimped part																
8. Crimp Tensile Strength	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Wire Size (mm²)</td> <td style="text-align: center;">Strength (N)</td> </tr> <tr> <td style="text-align: center;">0.22</td> <td style="text-align: center;">40N min</td> </tr> <tr> <td style="text-align: center;">0.3/0.35</td> <td style="text-align: center;">60N min</td> </tr> <tr> <td style="text-align: center;">0.5</td> <td style="text-align: center;">90N min</td> </tr> <tr> <td style="text-align: center;">0.75</td> <td style="text-align: center;">110N min</td> </tr> <tr> <td style="text-align: center;">0.85</td> <td style="text-align: center;">130N min</td> </tr> <tr> <td style="text-align: center;">(1.0)</td> <td style="text-align: center;">(150N min)</td> </tr> <tr> <td style="text-align: center;">1.25</td> <td style="text-align: center;">170N min</td> </tr> </table>	Wire Size (mm ²)	Strength (N)	0.22	40N min	0.3/0.35	60N min	0.5	90N min	0.75	110N min	0.85	130N min	(1.0)	(150N min)	1.25	170N min	Operation speed: 50mm/min. Apply an axial pull-off load to crimped wire of contact secured on the tester.
Wire Size (mm ²)	Strength (N)																	
0.22	40N min																	
0.3/0.35	60N min																	
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0.75	110N min																	
0.85	130N min																	
(1.0)	(150N min)																	
1.25	170N min																	

Table 1 (Continued)

TERMINAL ELECTRICAL		
9. Termination Resistance * (Low Level)	Initial: 5 mΩ Max. Final: 10 mΩ Max.	Subject mated contacts assembled in housing to 20±5mV open circuit at 100 mA Max. Fig. 3
10. Maximum Current Rating	Satisfy requirements of test item on the "3.6 sequence."	Max terminal current measurements are done. Temp rising 40°C Max. Refer to SAE/USCAR-2 5.3.3.3 Fig. 4
11. Current Cycling	40°C maximum temperature rise Over ambient. No ignition is allowed during the test.	Only perform the mate/unmate conditioning on a mated pair only once if the pair is used in multiple tests. 45 minutes "ON", 15 minutes "OFF" 1008 Hours
12. Instant Cutoff *	No electrical discontinuity exceeds 4.3V for more than 10 usec shall occur.	Connect in series. Apply power with a waveform recorder and check. 5V, 100mA Fig. 5
TERMINAL ENVIRONMENTAL		
13. Vibration *	Satisfy requirements of test item on the "3.6 sequence."	Frequency: 20-200 Sweep time: 3min Max. Acceleration: 4.4G Direction: X, Y, Z Duration: 40hours per each direction
14. Thermal Shock *	Satisfy requirements of test item on the "3.6 sequence."	-40°C/60 min. 105°C/60min. Temp transfer time: 5min. Max. Making this a cycle, repeat 200 cycles Fig. 6
15. Temp/Humidity *	Satisfy requirements of test item on the "3.6 sequence."	5cycle Fig. 7
16. Temp Rising *	Satisfy requirements of test item on the "3.6 sequence."	Measure temperature rising at wire crimped by applied current to all positions.

Table 1 (End)

* The test is required with applicable housing.

3.6 Product Qualification Test Sequence

Test Examination	Test Group (sample quantity: 10 EA min)									
	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG8	TG9	TG10
	Test Sequence*									
1. Visual Inspection	1,4	1,3	1,3	1,3	1,3	1,3	1,6	1,4	1,4	1,5
2. Connector/Terminal Cycling	2									
3. Terminal-to-Terminal Engaging Force	2									
4. Terminal-to-Terminal Disengaging Force	3									
5. Terminal Bend Resistance		2								
6. Terminal Crush Resistance			2							
7. Terminal Retention Force				2						4
8. Crimp Tensile Strength					2					
9. Voltage Drop						2	5	3	3	3
10. Maximum Current Rating							2			
11. Current Cycling							3			
12. Instant Cutoff								2		
13. Vibration								2		
14. Thermal Shock									2	
15. Temp/Humidity										2
16. Temp Rising							2,4			

* Numbers indicated sequence in which tests are performed.

3.7 Test Reference / Appendix

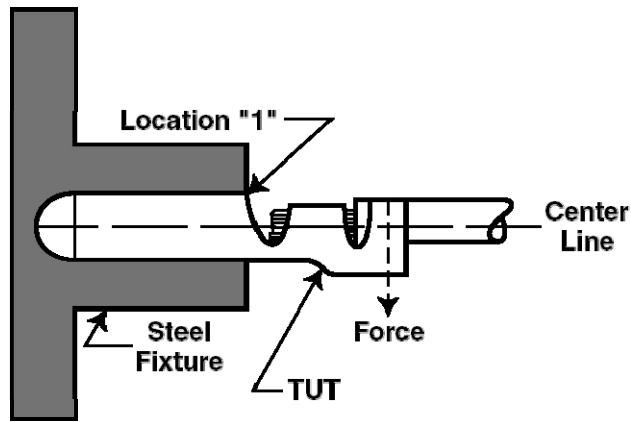


Fig. 1 Terminal Bend Resistance

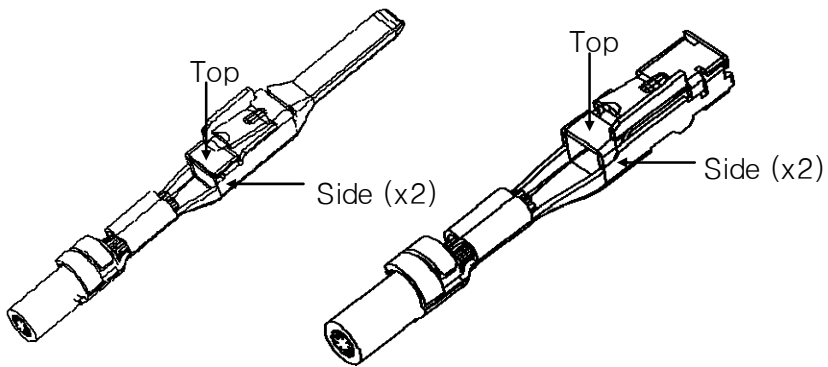


Fig.2 Terminal Crush Resistance

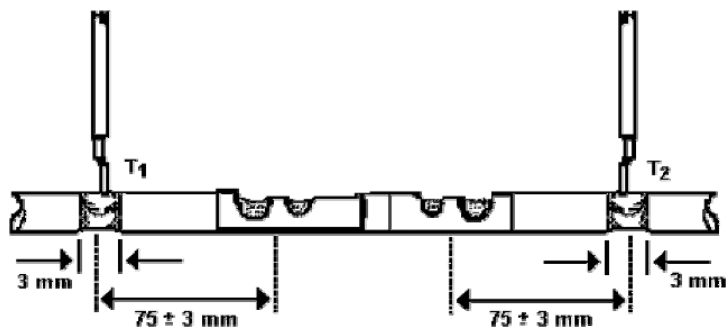


Fig. 3 Voltage Drop

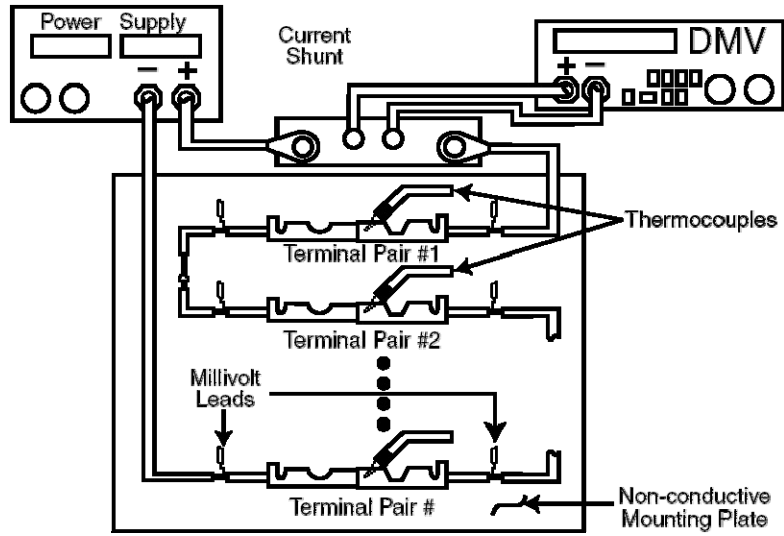


Fig. 4 Maximum Current Rating

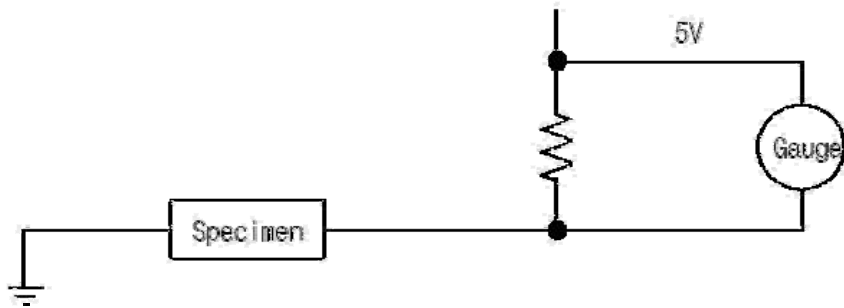


Fig. 5 Instant Cutoff

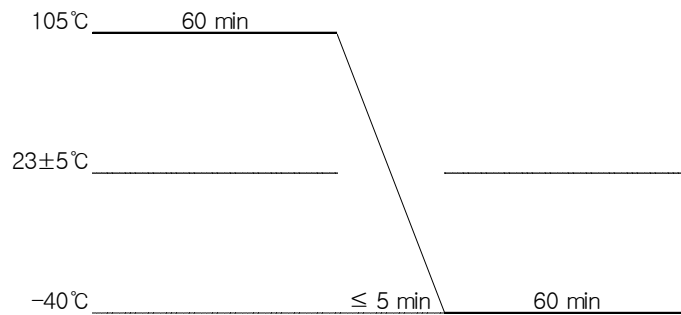


Fig. 6 Thermal Shock

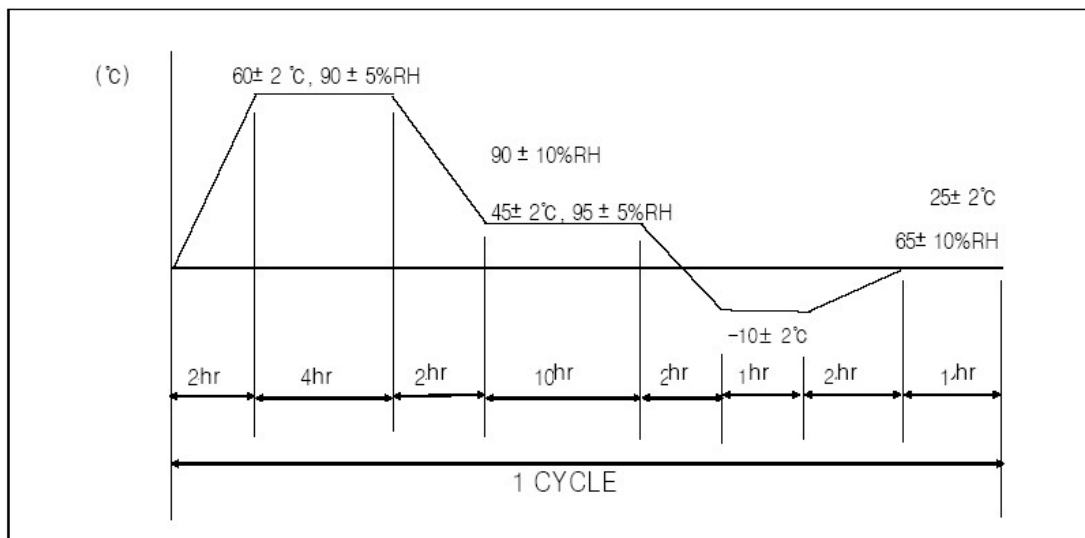
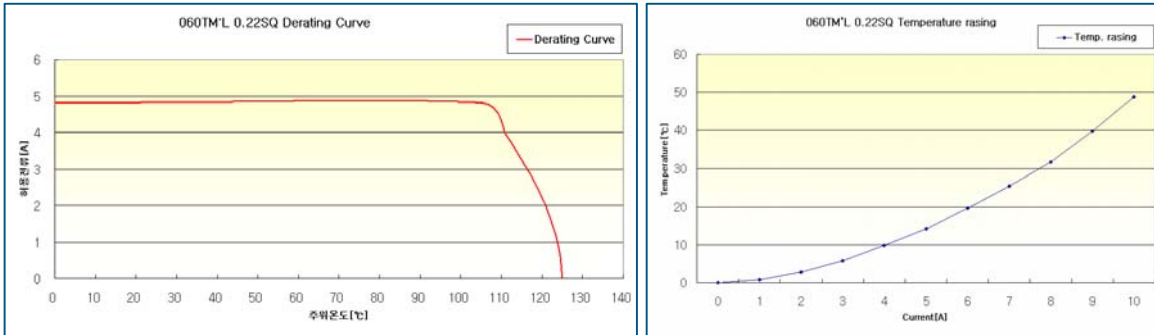


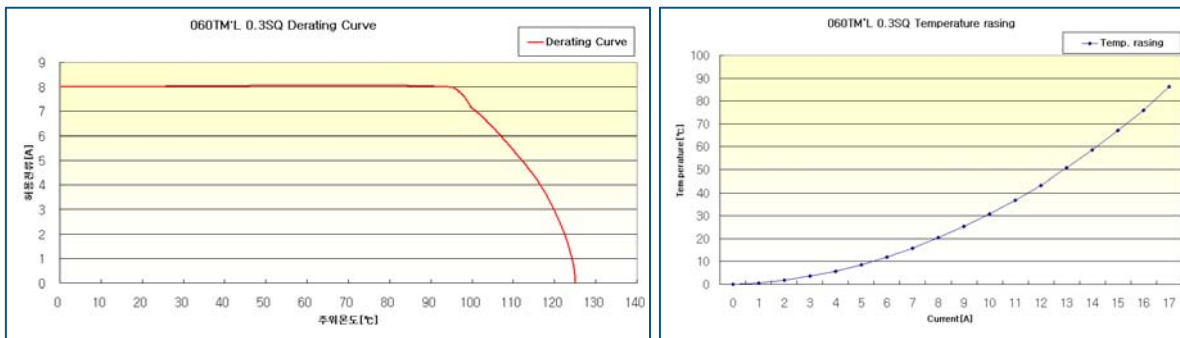
Fig. 7 Temp/Humidity

4. Derating Curve and Temperature Rising

4.1 2109005-1 and 2109006-1 (SS Barrel)

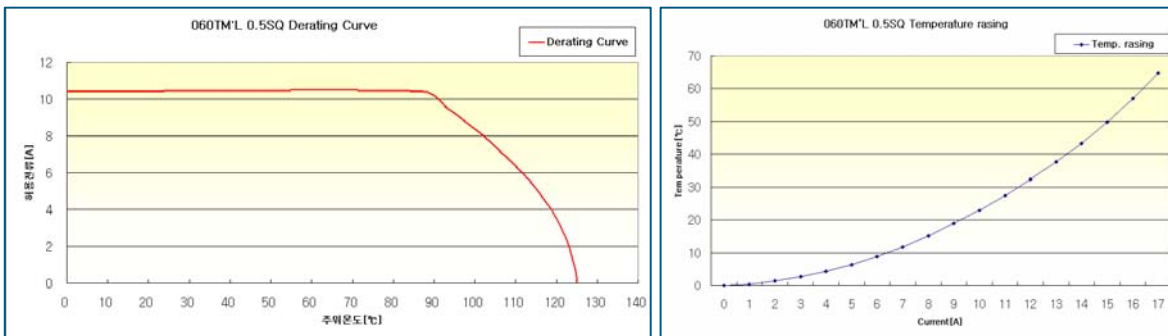


CHFUS 0.22SQ Wire

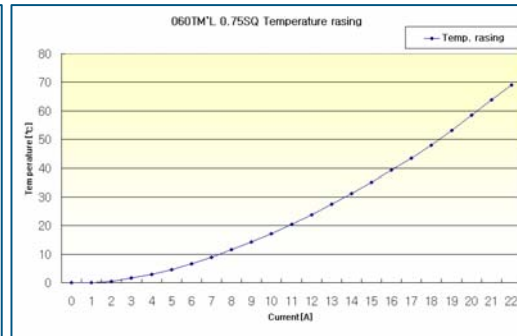
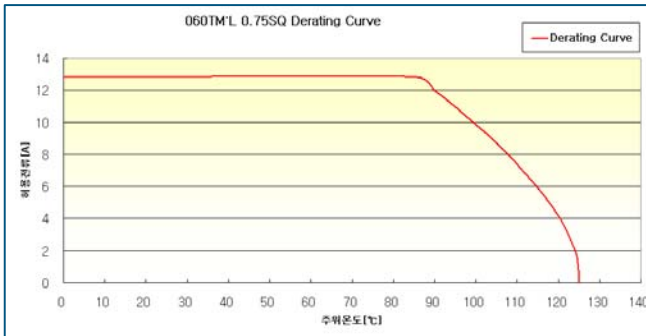


AVSS 0.3SQ Wire

4.2 2109005-2 and 2109006-2 (S Barrel)

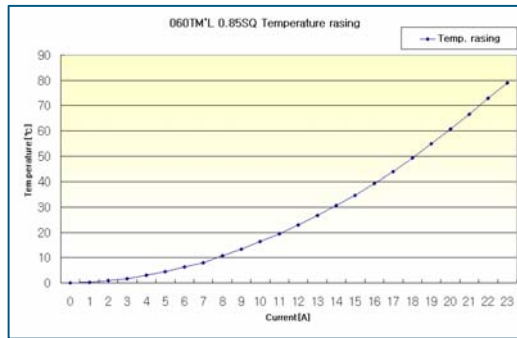
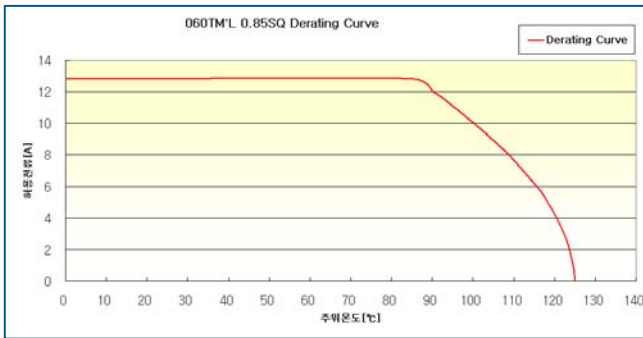


AVSS 0.5SQ Wire

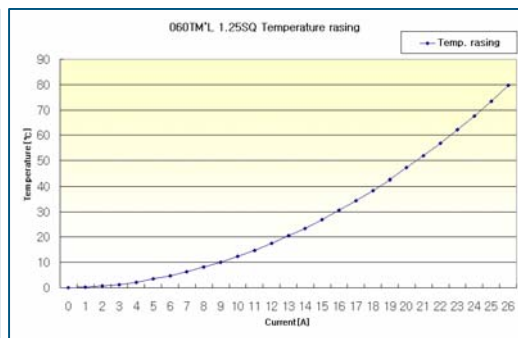
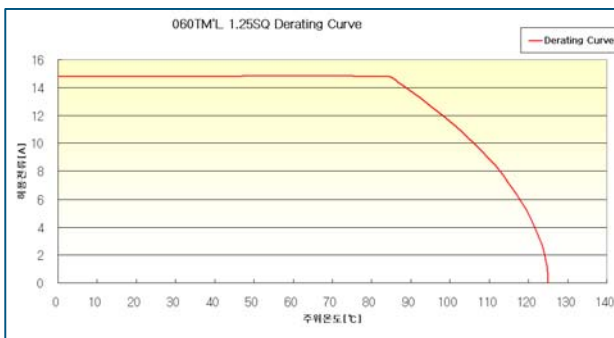


FLRY-B 0.75SQ Wire

4.3 2109005-3 and 2109006-3 (M Barrel)



AVSS 0.85SQ Wire



AVSS 1.25SQ Wire

**** Reduction Factor ****

Number of simultaneous electrode within the same connector	1	2~3	4~5	6~8	9~10	11~25	26 or more
Reduction Factor	1	0.75	0.6	0.55	0.5	0.4	0.3

5. Revision History

A	RELEASED	06.DEC.'10
REV.	REVISION RECORD	DATE

6. Specification Approval

Prepared by,

KT JUNG

Product Engineer

Checked By,

KT LIM

Senior Product Engineer

Approved by,

HG CHO

Product Engineering Manager