

**DEUTSCH\* DRC23-64P Series Connector System**

**1. INTRODUCTION**

1.1. Purpose

This report summarizes the results of testing performed on DEUTSCH DRC23-60P series connector system to determine conformance to the requirements of product specification 108-151029.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the DEUTSCH DRC23-64P series connector system. Testing was performed at the DEUTSCH Industrial Products Division Laboratory in 1997. The test file numbers for this testing are listed in Figure 1. This documentation is on file at, and available from Product Engineering, Industrial Commercial Transportation (ICT) Laboratory.

Test Group	Test Report
1	IPD970403-01
2	IPD970403-02
3	IPD970403-03
4	IPD970403-04
5	IPD970403-05
6	IPD970403-06
7	IPD970403-07
8	IPD970403-08
9	IPD970403-09
10	IPD970403-10

Figure 1

1.3. Conclusion

The DEUTSCH DRC23-64P series connector system products listed in Paragraph 1.4 conform to the electrical, mechanical, and environmental performance requirements given in product specification 108-151029.

1.4. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the part numbers given in Figure 2 were used for testing.

DEUTSCH PART NUMBER	DESCRIPTION	TEST GROUP
DRC23-64PAA	64-pin, Receptacle, Key AA, Black	1-10
DRC23-64PBB-E009	64-pin, Receptacle, Key BB, Gray	
DRC26-24SA	24-pin Plug, A-Key	
DRC26-40SA	40-pin Plug, A-Key	
DRC26-24SB	24-pin Plug, B-Key	
DRC26-40SB	40-pin Plug, B-Key	
0462-201-2031	Size 20 Solid Socket, Gold	

Figure 2

1.5. Environmental Conditions

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

Temperature: 15° to 35°C

Relative humidity: 25 to 75%

1.6. Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)									
	1	2	3	4	5	6	7	8	9	10
	TEST SEQUENCE (b)									
Visual Inspection	1,6	1,6	1,6	1,6	1,4	1,5	1,5	1,5	1,5	1,3
Dry Circuit	2,4	2,4	2,4	2,4						
Voltage Drop	5	5	5	5						
Isolation Resistance					3	3	3	3	3	
Vibration/Mechanical Shock	3					2				
High Temperature Exposure				3					2	
Thermal Shock		3					2			
Temperature/Humidity Cycling			3					2		
Immersion						4	4	4	4	
Fluid Resistance					2					
Solderability										2

(a) Specimens were prepared in accordance production drawings and were selected at random from current production.

- Groups 1-10 specimens consisted of 64-position connectors with DEUTSCH solid terminal system size 20 gold sockets with 20 AWG wire.

(b) Numbers indicate sequence that tests were performed.

**Figure 3**

**2. TEST METHODS AND RESULTS**

2.1. Visual Inspection (Groups 1-10)

- A. Procedure: SAE USCAR-2
- B. Method: Visually examine each test specimen prior to testing and/or conditioning noting any manufacturing or material defects such as cracks, tarnishing, flash, etc.
- C. Requirement: No physical defects detrimental to product performance.
- D. Result: **PASSED**

2.2. Dry Circuit (Groups 1-4)

- A. Procedure: SAE USCAR-2
- B. Method: Test with applied voltage not exceeding 20 mV open circuit and the test current shall be limited to 100 mA.
- C. Requirement:  $\leq 20 \text{ m}\Omega$
- D. Result: **PASSED**

2.3. Voltage Drop (Groups 1-4)

- A. Procedure: SAE USCAR-2
- B. Method: Using 7.5A test current, the resistance of an equal length wire shall be subtracted from the actual readings to determine the added resistance of the terminal.
- C. Requirement:  $\leq 10 \text{ mV/A}$
- D. Result: **PASSED**

2.4. Isolation Resistance (Groups 5-9)

- A. Procedure: SAE USCAR-2
- B. Method: Using a 500 VDC megohmmeter check the isolation resistance between each contact to each adjacent contact or housing edge.
- C. Requirement:  $\geq 20 \text{ M}\Omega$
- D. Result: **PASSED**

2.5. Vibration/Mechanical Shock (Group 6)

- A. Procedure: SAE USCAR-2
- B. Method:
  - a. Vibration: See Figure 4 for vibration profile. 8 hours per X,Y,Z axis.
  - b. Mechanical Shock:  $\frac{1}{2}$  sine wave, 10-20 ms, 35G, room temperature, 10 shocks per X,Y,Z axis.

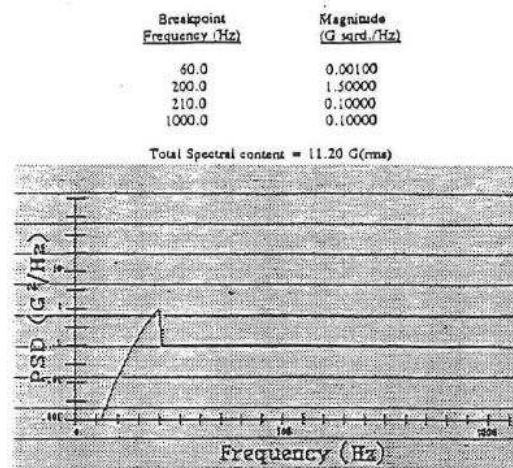


Figure 4

- C. Requirement: Connector and terminal shall not show any evidence of deterioration, cracks, deformities, etc. that could affect their functionality. There shall be no loss of electrical continuity ( $\geq 7 \Omega$ ) for more than 1 microsecond on any terminal pair.
  - D. Result: **PASSED**
- 2.6. High Temperature Exposure (Groups 4, 9)
- A. Procedure: SAE USCAR-2
  - B. Method: The wired mated connectors shall be subjected to 1008 hours at +125°C without current flowing.
  - C. Requirement: Connector and terminal shall not show any evidence of deterioration, cracks, deformities, etc. that could affect their functionality.
  - D. Result: **PASSED**
- 2.7. Thermal Shock (Groups 2, 7)
- A. Procedure: SAE USCAR-2
  - B. Method: Place the assembly in a chamber set to -40°C for 2 hours. In less than 5 minutes transfer the assembly to another chamber set to +125°C for 2 hours. Perform 50 cycles.
  - C. Requirement: Connector and terminal shall not show any evidence of deterioration, cracks, deformities, etc. that could affect their functionality. There shall be no loss of electrical continuity ( $\geq 7 \Omega$ ) for more than 1 microsecond on any terminal pair.
  - D. Result: **PASSED.**
- 2.8. Temperature/Humidity Cycling (Groups 3, 8)
- A. Procedure: SAE USCAR-2
  - B. Method: See Figure 5 for temperature / humidity profile.
    - a. Max class temperature: +125°C
    - b. Min temperature: -20°C
    - c. 40 cycles

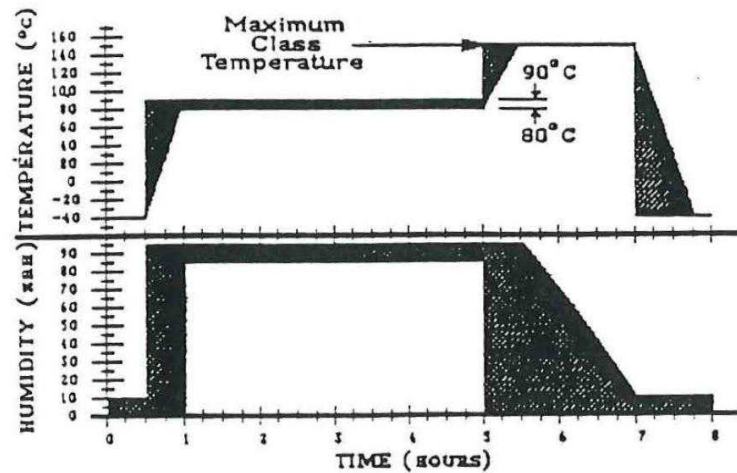


Figure 5

- C. Requirement: Connector and terminal shall not show any evidence of deterioration, cracks, deformities, etc. that could affect their functionality. There shall be no loss of electrical continuity ( $\geq 7 \Omega$ ) for more than 1 microsecond on any terminal pair.
- D. Result: **PASSED.**

2.9. Immersion (Groups 6-9)

- A. Procedure: SAE USCAR-2
- B. Method: Place the test connector in a +125°C thermal chamber for 2 hours. Immediately immerse the samples in a +25°C, 5% salt water solution to a depth of 30-40 cm for 2 hours. A dye may be used to assist visual inspection of water ingress. Test isolation resistance before and after immersion test. Perform 5 cycles.
- C. Requirement: Isolation resistance  $\geq 20 \text{ M}\Omega$  before and after each cycle.
- D. Result: **PASSED.**

2.10. Fluid Resistance (Groups 5)

- A. Procedure: SAE USCAR-2
- B. Method: Completely immerse 3 samples in each fluid listed in Figure 6 for 5 minutes. Samples are to be immersed in one fluid only.

- Brake Fluid	SAE RM66-04	@ 50°C
- Oil	ASTM IRM-902	@ 100°C
- Gasoline	ASTM Ref. Fuel C	@ 25°C
- Engine Coolant	ASTM Serv. Fluid 104	@ 100°C
- Automatic Trans. Fluid	SAE J311	@ 100°C
- Windshield Washer Fluid		@ 25°C
- Power Steering Fluid	ASTM IRM-903	@ 100°C
- Diesel Fuel	ASTM Ref. Fuel F	@ 25°C
- M85 Methanol Fuel	ASTM Ref. Fuel K	@ 25°C

Figure 6

- C. Requirement: Connector and terminal shall not show any evidence of deterioration, cracks, deformities, etc. that could affect their functionality.
- D. Result: **PASSED.**

2.11. Solderability (Group 10)

- A. Procedure: Not Applicable
- B. Method: Coat the solderable are of 15 samples with flux and drain vertically for 60 seconds. Dip the solderable area into a 63/37 solder bath heated to  $+232 \pm 6^\circ\text{C}$  for 3-5 seconds. After removal from the solder bath, allow the samples to solidify by air drying vertically. Remove excess flux with a non-abrasive solvent flux remover.
- C. Requirement: The soldered area shall be at least 95% covered with a smooth, uniform coating when viewed at 10X magnification. The balance shall only show non-concentrated pin-holes or de-wetting spots. J-STD-002 specification was used as a visual inspection guide.
- D. Result: **PASSED.**

**3. REVISION HISTORY**

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	04-Oct-2019	DM	DM