EUROCARD CONNECTORS
TYPES B, C, C-SWITCH, M, R, D, F AND G.

1. SCOPE.

1.1. Content.

This specification covers the performance, test and quality requirements for the AMP* EUROCARD connectors.
They are receptacle and pin 2-piece connectors, which provide a connection method on 2,54 mm centerline (type B, C, C-Switch, M and R) and 5,08 mm centerline (type D, F and G).
Connectors are available in 2 row and 3 row fully loaded or selective loaded configurations.
Switching positions type C-Switch connector are according VME bus J1/P1 connector pin assignments. Switching positions row a21-22, row b 4-5, 6-7, 8-9 and 10-11.

1.2. Qualification.

If tests are performed on the product line, the procedures specified in IEC publication 512 shall be used unless otherwise specified. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS.

This product specification is based upon DIN 41612 part 5 dated 1987 / IEC 603-2 dated 1995.
The following documents form a part of this specification to the extent specified herein.
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.

IEC Publication 603-2	Connectors for frequencies below 3 MHz
IEC Publication 512	Test Specification
DIN 41612 part 1/IEC 603-2	Common mounting features, survey of types.
DIN 41612 part 2/IEC 603-2	Dimensions of type B, C, M and D.
DIN 41612 part 3/IEC 603-2	Dimensions of type F and G.
DIN 41612 part 5/IEC 603-2	Rating, requirements and tests.
DIN 41612 part 6/IEC 603-2	Dimensions of type R.

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3.0 REQUIREMENTS.

3.1. Design and Constructions.

Connectors shall be of the design, construction and physical dimensions specified on the applicable product drawing and DIN 41612 part 2/IEC 603-2 (for type B, C and D) part 3 (for type F and G) part 6 (for type R) and part 8 (for type M).

3.2. Materials.

a. Terminals:
Receptacle : Phosphor Bronze
Pin : Brass of Phosphor Bronze
Clip for C-Switch : Brass

b. Housing : Thermoplastic, glassfilled, UL94V0/UL94V1.

3.3. Ratings.

a1. Type B, C, C-Switch, M and R.
Current 1,5 A max. per contact at 20° and 1,0 A max. per contact at 75°.

a1. Type D, F and G.
Current 5,5 A max. per contact at 20° and 4,0 A max. per contact at 75°.

b1. Operating temperature : -55°C to 125°C.

3.4. Ratings addendum for C-Switch.

a1. Switching under power 5 V 100 mA min. 500 switching cycles.

b1. Capacity switching contacts ≤ 10 pF.

c1. Normal force switch contact ≥ 0,1 N.

d1. Retention force for displacement of jumper clip ≥ 4 N.

NOTE:

The continuous current rating for the individual contacts cannot be applied directly to the number of contacts as they depend on the thermal and physical properties of the materials.
System design shall assure that continuous current rating does not create internal hot spots that exceed the temperature designated by the connector specifications, during steady-state or transient conditions.

3.4. Performance and Test Description.

Connectors shall be designed to meet the electrical, mechanical and environmental performance requirements specified in group A till group E.

4.0 QUALITY ASSURANCE PROVISIONS.

4.1. Qualification Testing.

A. Sample Selection
Connector housing and contacts shall be selected at random from current production.

B. Test Sequence
Qualification inspection shall be verified by testing samples specified in group A till E.

C. Acceptance.

a. All samples tested in accordance with this specification shall meet the stated tolerance limit.

b. Failures attributed to equipment, test set-up, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and sample resubmitted for qualification.

4.2. Quality Conformance Inspection.

The applicable AMP* inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

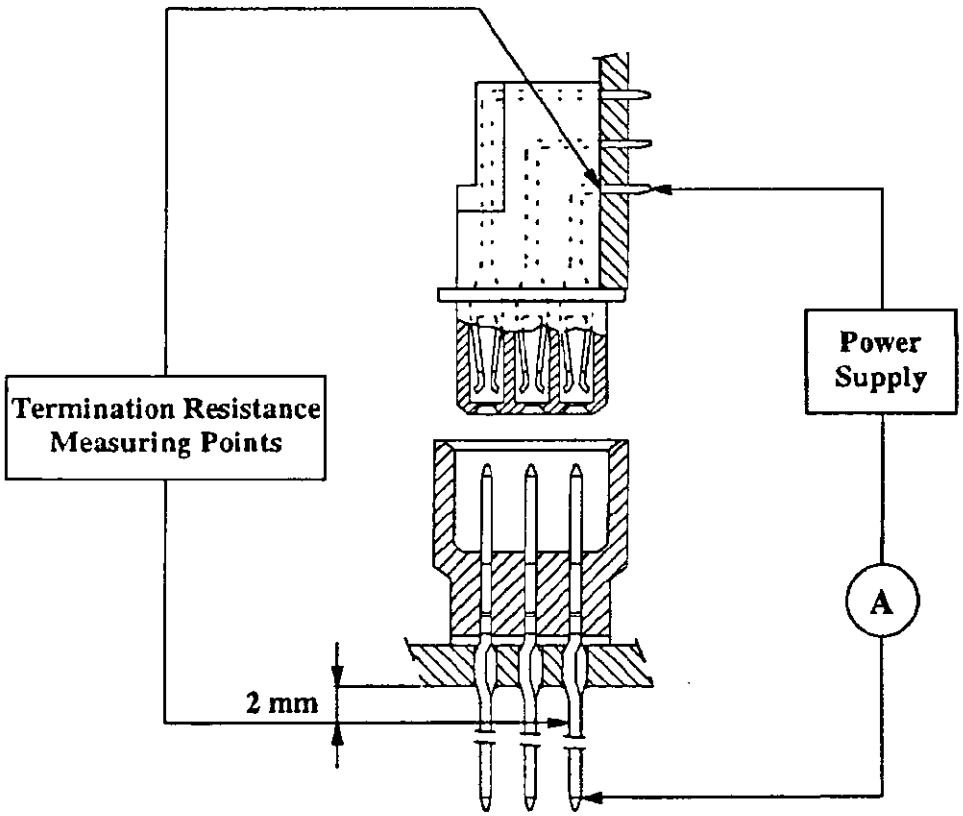
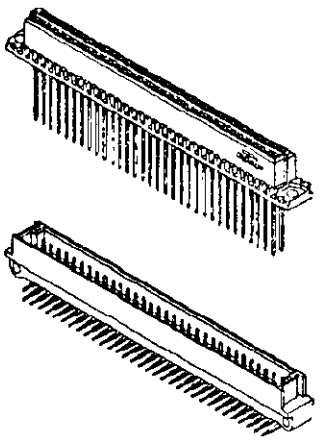


Figure 1

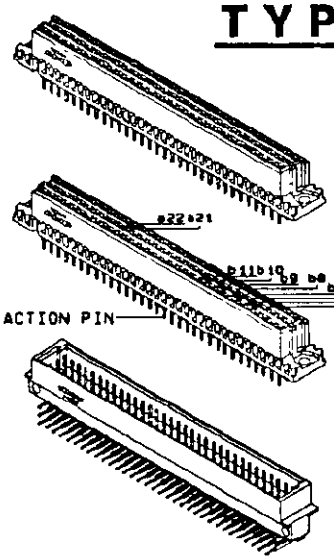
TYPE B



FEMALE

MALE

TYPE C

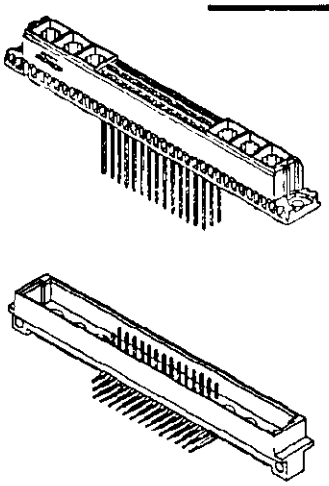


FEMALE

FEMALE C-SWITCH

MALE

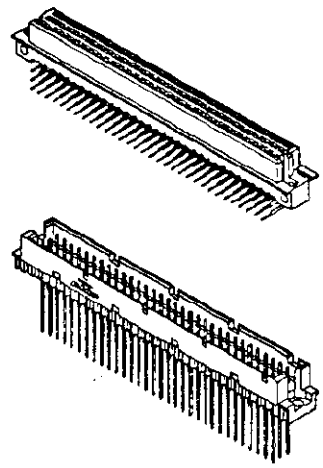
TYPE M



FEMALE

MALE

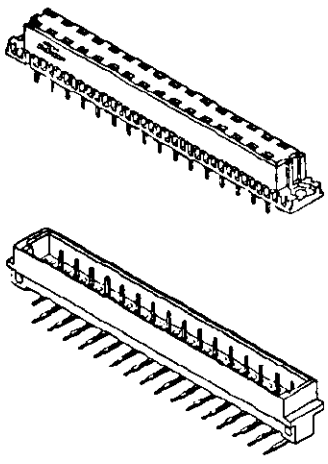
TYPE R



FEMALE

MALE

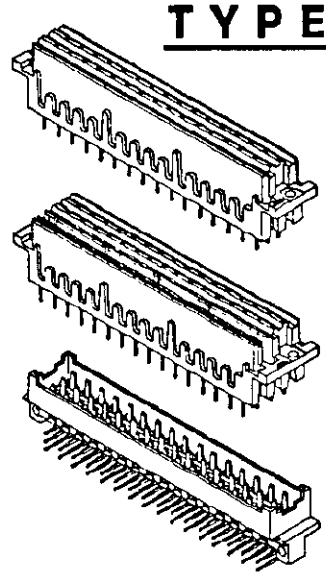
TYPE D



FEMALE

MALE

TYPE F/G



F-FEMALE

G-FEMALE

F-MALE

All specimen shall be subjected to the following tests:

26 samples of Class I connectors
20 samples of Class II connectors
8 samples of Class III connectors

The specimens shall be divided into five groups.
All connectors in each group shall undergo the tests specified for the relevant group.

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
P1	General examination		Unmated connectors	Visual examination Dimensional examination	-2 Test 1a Test 1b	The dimensions including creepage distance and clearance shall comply with those specified in Sub-clause 4.2 to 4.4 and 6.2.1. of IEC 603-2. There shall be no defects that would impair normal operation							
P2	Polarization method	-7 Test 13e				It shall be possible to correctly align and mate the appropriate mating connectors. It shall not be possible to mate the connectors in any other than the correct manner.							
P3			Connection points as in Figure 1 6 contacts/specimen	Contact resistance	-2 Test 2a	20 mΩ max				15 mΩ max.			
P4	For Class I and II		Test voltage 100 ±15 V Method A 3 contacts	Insulation resistance	-2 Test 3a	10^6 MΩ min							
	For Class III					10^5 MΩ min.							
P5			Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		

Group A 6 samples of Class I connectors
4 samples of Class II connectors
4 samples of Class III connectors

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
AP1	Gauge retention force for Class I and II	-8 Test 16e	Female contacts only 5 contacts/ specimen Sizing tool P11 Gauge P12 per IEC 603 par 5.1			X	X	X	X				
						0,15 N min.							
			Sizing tool P21 Gauge P22 per IEC 603-2 par. 5.1.							X 0,15N min.			
			Sizing tool P31 Gauge P33 per IEC 603-2 par 5.1								X	X	X
											0,2 N min.		
AP2	Insertion and withdrawal force	-7 Test 13b				60N max.	90N max.	60N max.	30N max	30N max.	75N max.	50N max.	100N max.
AP3	Soldering	-6 Test 12a	(under consideration)			X	X	X	X	X	X	X	X
AP4			Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/ test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
AP5						Not applicable							
AP6	Vibration Class I	-4 Test 6d	10Hz-2000Hz 1,5 mm or 20g Duration: 6 h	Variation of contact resistance: connection points as in Subclause 7.1	-2 Test 2c	40 mΩ max.				30 mΩ max.			
	Vibration Class II		10Hz-500 Hz 0,35 mm or 5 g Duration: 6 h										

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
AP7	Shock for Class I	-4 Test 6c	50g (490 m/s^2) half sine shape 11 millisecond, 3 shocks in each direction, applied along 3 mutually perpendicular planes	Variation of contact resistance. Same connection points as in P3.	-2 Test 2c	≤ 40 mΩ					≤ 30 mΩ		
AP8						not applicable							
AP9	Rapid change of temperature for Class I and II	-6 Test 11d	-55°C + 125°C 0,5 hr each temp. 5 cycles			X	X	X	X	X	X	X	X
AP 10	For Class I and II		100 ± 15V Method A 3 contacts	Insulation resistance	-2 Test 3a	≥ 10^6 MΩ min.							
AP 11	For Class I and II		contact/contact	Voltage proof	-2 Test 1a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
AP 12	For Class I and II		Unmated	Visual examination	-2 Test 1a	No damage due to conditioning							
AP 13	Climatic sequence	-6 Test 11a	+ 125°C. unloaded duration 16 hrs Recovery time: 2 hrs	Insulation resistance at high temperature	-2 Test 3a								
AP 13.1	Dry heat Class I and II					≥ 10^5 MΩ							
	Class III					≥ 10^4 MΩ							
AP 13.2	Damp heat, accel. First cycle Class I and II		Upper temp.: Recovery time: 2 hrs	Class I + 55°C. Class II + 40°C		X	X	X	X	X	X	X	X
AP 13.3	Cold		-55°C Recovery time: 2 hrs			X	X	X	X	X	X	X	X
AP 13.4	Low air pressure Class I and II		300 mbar + 15°C to 35°C	Voltage proof Contact/ contact	-2 Test 4a	300 V (r.m.s.)			500 V (r.m.s.)				

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
AP 13.5	Damp heat accel. Remaining cycles Class I and II		upper temp. Recovery time 2 hrs	Class I +55°C. Class II +40°C		X	X	X	X	X	X	X	X
AP 14	Class I and II		100 ±15 V Method A 3 contacts	Insulation resistance	-2 Test 2a	$\geq 10^4$ MΩ min							
	Class III					$\geq 10^3$ MΩ min.							
AP 15			Connection points as in P3 6 contacts/ specimen	Contact resistance	-2 Test 2a	≤ 20 mΩ				≤ 15 mΩ			
AP 16	Class I and II		Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
AP 17				Insertion and withdrawal force	-7 Test 13b	60N max	90N max	60N max	30N max	30N max	75N max	50N max	100N max
AP 18			Unmated	Visual examination	-2 Test 1a	No damage due to conditioning							

Group B 8 samples of Class I connectors
4 samples of Class II connectors
4 samples of Class III connectors

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
BP1	Insertion and withdrawal force	-7 Test 13b				60N max	90N max	60N max	30N max	30N max	75N max	50N max	100N max
	Gauge retention force	-8 Test 16e				≥ 0,15N				≥ 0,20N			
BP2	Mechanical endurance	-5 Test 9a	250 operations for Class I 200 operations for Class II 25 operations for Class III Speed 10 mm/s (0.4 in/s) Rest 30 s (when unmated)			X	X	X	X	X	X	X	X
BP3	Industrial atmosphere (other half of group): half mated: half unmated for Class I and II	-6 Test 11g	IEC 68-2-42 except 10 ppm SO_2			Class I 21 days				Class II 4 days			
BP4			Connection points as in P3 6 contacts/ specimen	Contact resistance	-2 Test 2a	20 mΩ max.				15 mΩ max.			
BP5	Mechanical endurance	-5 Test 9a	250 operations for Class I 200 operations for Class II 25 operations for Class III Speed 10 mm/s (0.4 in/s) Rest 30 s (when unmated)			X	X	X	X	X	X	X	X

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
BP6	For Class I and II		100 ±15 V Method A 3 contacts	Insulation resistance	-2 Test 3a	10^6 MΩ min.							
BP7	For Class I and II		Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
BP8						Not applicable							
BP9			Gauge P12	Gauge retention force	-8 Test 16e	0.15 N min							
			Gauge P22							0.15N min.			
			Gauge P32								0.2 N min.		
BP 10			Unmated	Visual examination	-2 Test 1a	No damage due to conditioning							
BP 11	Static load axial	-5 Test 8b	Force increase 10N/sec max.			60N	90N				100N		

Group C 4 samples of Class I connectors
4 samples of Class II connectors

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
CP1	Damp heat steady state	-6 Test 11c	56 days			X	X	X	X	X	X	X	X
CP2			100 ±15V Method A 3 contacts	Insulation resistance	-2 Test 3a	10^4 MΩ min.							
CP3			Connection points as in P3 6 contacts/ specimen	Contact resistance	-2 Test 2a	20 mΩ max.				15 mΩ max.			
CP4			Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
CP5				Visual examination	-2 Test 1a	No damage due to conditioning							

Group D 4 samples of Class I connectors
4 samples of Class II connectors

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
DP1	Mechanical endurance		as in P3 250 operations for Class I 200 operations for Class II										
DP2	Electrical endurance	-5 Test 9b	1000 h + 70°C			1 A				4 A			
DP3			Connection points as in P3 6 contacts/ specimen	Contact resistance	-2 Test 2a	20 mΩ max				15 mΩ max.			
DP4			Contact/contact	Voltage proof	-2 Test 4a	1 000 V (r.m.s.)			1 550 V (r.m.s.)				
			Contact/test panel			1 550 V (r.m.s.)					2 500 V (r.m.s.)		
DP5			Contact/contact	Partial discharge	-2 Test 4b	1 000 V min.							
			Contact/test panel										
DP7				Visual examination	-2 Test 1a	No damage due to conditioning							

Group E 4 samples of Class I connectors
4 samples of Class II connectors

Test phase	IEC Test			Measurement to be performed		Requirements							
	Title	Publ. 512 part	Severity or condition of test	Title	Publ. 512 part	B64	C96 R96 M42 M60 M78	C64 R64	C32 R32	D32	F48	F32	G64
EP1	Robustness of terminations	-8 Test 16f	Test Ua			20N min.							
EP2	Contact retention	-8 Test 15a				10N				5N	10N		
EP3	Mold growth	-6 Test 11e	28 days			Certification by plastic material supplier							
EP 3.1				Visual examination	-2 Test 1a	No damage due to conditioning							