Class 1

PRODUCT SPECIFICATION

ACTION PIN CONTACTS

STOCK THICKNESS	***0.8MM***
PLATED THROUGH HOLE CLASS	***1.35MM***
ACTION PIN ZONES	***3***

LTR	REVISION RECORD	DWN	APP	DATE
B	Editorial rework & translation	T. Callies	M. Porte	26NOV2015
C	Editorial correction	T. Callies	M. Porte	26NOV2015

© 2015 TE Connectivity family of companies
All Rights Reserved
| Indicates Change

*Trademark. TE Connectivity, TE connectivity (logo), and TE (logo) are trademarks. Other logos, product, and/or company names may be trademarks of their respective owners.

1. AREAS OF APPLICATION

1.1 Contents

The present specification describes the design, characteristics, types, tests and quality requirements of ACTION PIN contacts. The press-fit region of the ACTION PIN contacts is designed for a PCB with plated through hole diameter of 1.35 mm (nominal) and a circuit board thickness of 1.6 mm. A mating contact (i.e. SPT or MCP 4.8) for blade terminals with 4.8 x 0.8 mm tabs shall be used to contact the mating side region of the ACTION PIN contact.

1.2 General conditions

All tests which are implemented with the contact system, the must correspond with the test guidelines listed in this specification.

- Circuit board thickness: 1.6 ± 0.2 mm
- Material quality: min. FR4
- Circuit board hold design based on DIN EN 60 352-5; 2.4
- Storage temperature: -40℃ to 125℃
- Maximum authorized voltage according to IEC 664 / IEC 664A (DIN VDE 0110)

2. ADDITIONAL DOCUMENTS

2.1 General documents

AK test guidelines for vehicle plugs (1996-04 edition)

Other standards:

A DIN 17 666/12.83
Low alloy copper-wrought alloy

B DIN 17 670/06.69
Technical delivery conditions

C DIN 40 802/02.76 part 2
Metal clad base materials for pressed circuits

D DIN EN 60 352-5
Non-soldered electrical connection

E DIN 41 640
Measuring and testing procedures for electrical – mechanical elements

F DIN 40 046
Environmental testing for electronics

G DIN 41 639/03.76 part 1
(IEC 50 part 581) Electrical – mechanical elements

H DIN 50 15/10.73
Climates and their technical application, constant test climates

I DIN 50 017/10.82
Condensate test climates

2.2 Product overview

All geometric establishments and requirements:
See customer drawings

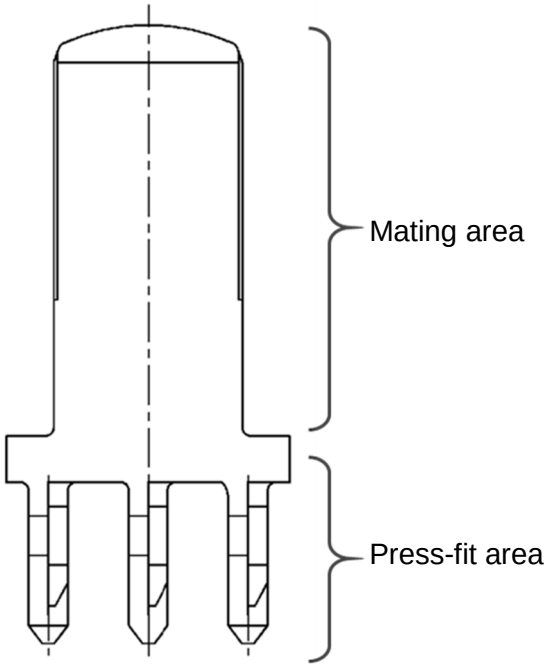
3. REQUIREMENTS

3.1 Contact design

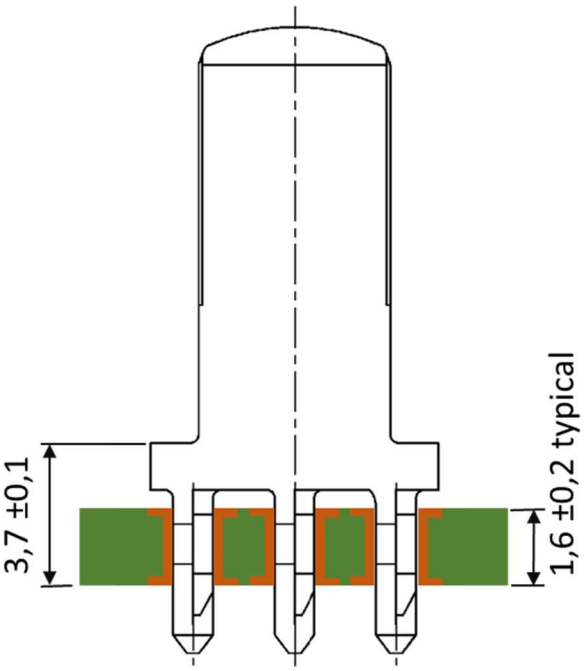
Design, construction and dimensions of ACTION PIN contacts correspond to the drawing documents and are checked in accordance to TE Connectivity quality guidelines. The pin contact is divided into press-fit and mating area.

Press-fit area:
The ACTION PIN press-fit zone shall be pressed into a metallized circuit board hole with 1.35 mm nominal final hole diameter. The press-fit area of the ACTION PIN contact consists of two spring bars, generating an overall cross section larger than the corresponding circuit board holes. When inserting into the circuit board, the press-fit area is elastically deformed and, thus, provides a secure electrical contact and a highly fixed position of the ACTION PIN zone in the circuit board.

Mating area:
The mating area is designed as a contact tab with a cross-section of 4.8 x 0.8 mm. It has a geometrically defined tip to minimize the mating force. The mating connector is a socket contact (i.e. SPT or MCP 4.8) for the tab contact. Contact mating area and socket contact must feature an identical surface plating in the contact area.



Product example



Inserted situation (application)

3.2 Materials

A Basic material copper-coated alloy based on TE connectivity specification:
See drawing
B Coating – press-on area:
See drawing
C Coating – press-in area:
See drawing

3.3 Requirements and tests

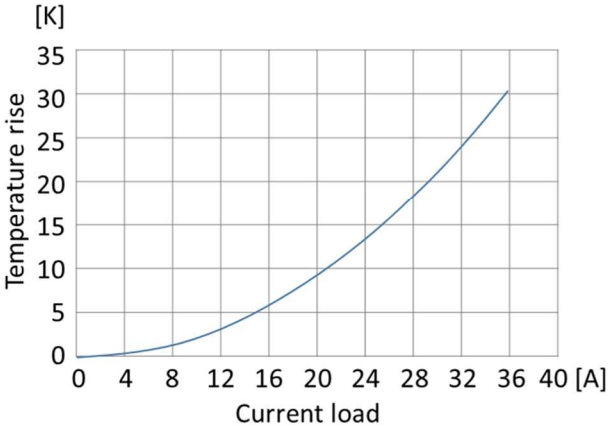
Test description	Requirement	Test
Visual and measurement test	Fulfill requirements according to drawing documents	Based on IEC 512-2, tests 1a and 1b
Electrical tests		
Current capacity Max. current heating Current heating based on environmental simulation	The different values result, dependent on the application and execution; therefore, consider illustration 3.3A. If no comparable examples are contained, the user must have the individual case tested or checked.	

3.3 A

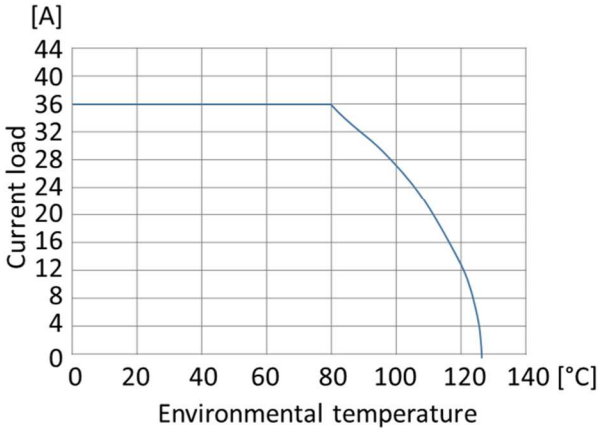
Example:

- pin: 4.8x0.8 terminal with ACTION PIN, PN 1-929451-2, material: CuSn4 tin-plated;
- socket: SPT contact PN 964328-1, material: CuFe tin-plated, 4 mm^2 stranded conductor
- circuit board: PCB Cu thickness: 0.070 mm

Temperature rise



De-rating



Mechanical tests		
Retention force of the ACTION PIN zone in the circuit board in new condition	>= 120 N (contact surface Sn) (circuit board hole Sn)	Based on IEC 5 12-8, test 15a Test velocity: 25 mm/min
Retention forces of the ACTION PIN in the circuit board based after environmental simulation	>=120 N (contact surface Sn) (circuit board hole Sn)	Based on IEC 5 12-8, test 15a Test velocity: 25 mm/min
Insertion forces	180-600 N (contact surface Sn) (circuit board hole Sn)	Test velocity: 25 mm/min

Environmental simulation based on PG 19 / AK test guidelines for vehicle plug connectors (deviation: limit temperature: 125°C, h umidty cycl.: 21 days)		
Temperature shock	The contact resistance must not exceed the following threshold: Resistance change > 1 mOhm In any test If the contacts are loaded for at least 15 minutes thereafter with rated current, the current heating may amount to 20°C more than with a new contact. In the contact zone area, no corrosion may occur. The mechanical function of the plug must be ensured.	Based on IEC 68 T.2-14, duration: 144 cycles, temperature: -40°C / 125°C
Temperature change		Based on IEC 68 T.2-14, duration: 20 cycles / temperature: 40°C / 125°C each 3 h
Dry heat storage		Based on EN 6068-2-2, duration 120 h, temperature 125°C
Industry climate		Based on DIN 41640 T.72 (0.02 ppm SO2, 0.02 ppm H2S,, 0.2 ppm NO2 , 0.01 ppm Cl2, duration: 21 d / 7% r.h. / 25° C flow velocity: 1 m3 /h
Humidity cycling		Based on IEC 68 T.2-30, duration 21 cycles each 24 h / Tu= 25°C, To = 55°C / 95% r.h.
Vibration test 3 room axis		f: 15 – 1000 Hz, a = 10g, duration 6 h each room axis
Mechanical shock 3 room axis		Based on EN 60068-2-27, a=30g, t=6ms, half shaft sinus shaped 50 shocks each room axis

3.4 Test sequence

Test	Test group[1]			
	A	B	C	D
	Test sequence[2]			
Visual and measurement test	1	1	1	
Current capacity			2	
Holding force of the contacts in the circuit board (opposite direction of equipment)	2	3		
Environmental simulation with vibration testing (PG 19)		2		

1) see section 4.1 A
2) the number show the sequence in which the tests occur.

4. QUALITY ASSURANCE MEASURES

4.1 Qualification tests

A Selection of test item

The test samples must correspond to the drawing documents. They should be taken from regular production on a random basis.

Test group A: 20 individual contacts
Test group B: 20 individual contacts
Test group C: 20 individual contacts

B Test groups

The tests must be implemented according to the test groups listed under section 3.4.

4.2 Requalification tests

If significant characteristics of shape, equipment or function of the product or its manufacturing procedure were changed, the responsible development department shall coordinate a requalification test. This consists of a part or the entire original testing group, depending on definitions made by the development and quality assurance department.

4.3 Acceptance

Acceptance is based on the proof that the product satisfies the requirements in section 3.3. Deviations that result from gauges, measuring apparatus or operating deficiency may not result in revocation of qualification. If a deviation occurs, corrective actions must be taken, and the qualification must be newly proven. Before requalification, the success of the corrective action must be confirmed by appropriate tests.

4.4 Testing and conformity

The conformity testing occurs based on the associated quality inspection plan which established the acceptable quality limit based on random sample scopes. Dimensional and functional requirements must correspond to the product drawings and this specification.