

SPECIFICATION AND PERFORMANCE

Series	229 SERIES	File	229 SERIES_SPEC_1	Date	2024/02/02
--------	------------	------	-------------------	------	------------

Scope:

This specification covers the requirements for product performance, test methods and quality assurance provisions of SPE connector

Performance and Descriptions:

The product is designed to meet the electrical, mechanical and environmental performance requirements specification. Unless otherwise specified, all tests are performed at ambient environmental conditions.

RoHS:

All material in according with the RoHS environment related substances list controlled.

MATERIALS		
NO.	PART NAME	DESCRIPTION
1	Insulator	LCP, UL94V-0, Black
2	Contact	Brass, 30u" Gold under Nickel plating
3	Shell	Brass, Nickel plated
4	Shield	Phosphor Bronze, nickel plating
5	Ground	Phosphor Bronze, nickel plating
6	Nut	Brass, Nickel plated
7	O-RING	Silicone

RATING	
Rated voltage	60 VDC
Rated current	2-way: data 4A 4-way: data 4A/ power 8A
Operating and Storage temperature	-40°C to +85°C
Durability	100 cycles

ELECTRICAL		
Item	Requirement	Test Condition
Temperature rise test	30°C max. change allowed at rated current	Sample mated, to measure the current when the temperature rise of the terminal within 30°C
Voltage proof	1000 VDC; one contact to all other contacts connected together	IEC 60512-4-4, Test 4a, Method A Standard atmospheric conditions Mated connectors



	2250 VDS; all contacts connected together to shield	
Voltage rating	Intended for a voltage less or equal 60V DC	
Dielectric withstanding voltage	No breakdown or flashover	IEC 60512-4-1, Test 4a Standard atmospheric conditions Mated connectors 1000 VDC; one contact to all other contacts connected together 2250 VDC; all contacts connected together to shield
Contact resistance	20mΩ max.	IEC 60512-2-1, Test 2a Standard atmospheric conditions Mated connectors Measuring points according to 6.3.2
Shield resistance	100mΩ max.	
Input to output DC resistance	50mΩ max.	IEC 60512-2-1, Test 2a Mated connectors Measuring points according to 6.3.2
Input to output DC resistance unbalanced	25mΩ max.	IEC 60512-2-1, Test 2a Mated connectors Measuring points according to 6.3.2 Among all signal conductors, maximum difference between maximum and minimum.
Insulation resistance	500MΩ min.	IEC 60512-3-1, Test 3a, Method A Standard atmospheric conditions Mated connectors Measuring points according to 6.3.2 Test voltage 500VDC
Impedance	100Ω	

MECHANICAL

Item	Requirement	Test Condition
Durability	100cycles no evidence of physical damage.	IEC 60512-9-1, Test 9a Standard atmospheric conditions Max. speed of operations = 10 mm/s Rest: 5s, unmated
Insertion and withdrawal forces	2 way: 20N maximum 4 way: 50N maximum.	IEC 60512-13-2, test 13b Standard atmospheric conditions Speed: maximum rate of 10 mm/s

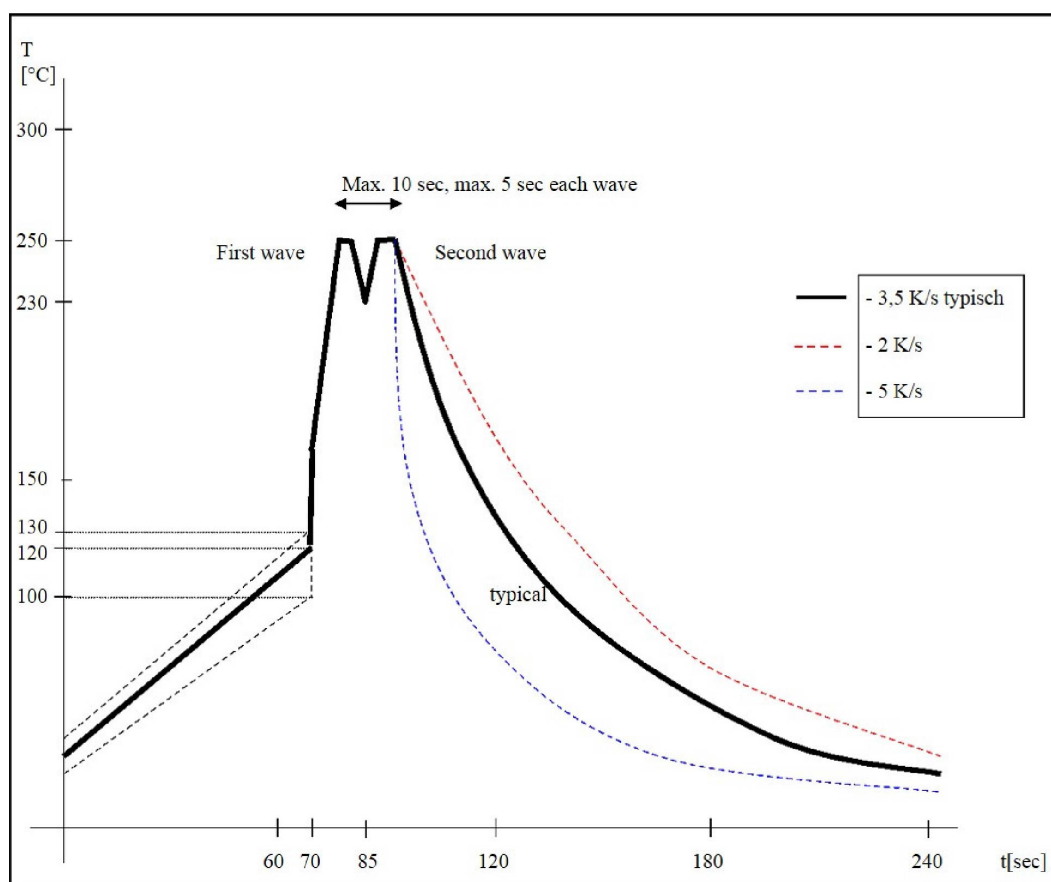


ENVIRONMENTAL		
Item	Requirement	Test Condition
Vibration resistance	Discontinuity < 1ms	IEC 60512-6-4, test 6d Frequency range: 10 Hz-500 Hz Amplitude: 0.35mm Sweep rate 1 octave/min Acceleration: 50 m/s ² Duration: 2h per axis, total 6h Axes: x,y,z Standard atmospheric conditions Connectors in mated and locked position Arrangement per 6.3.3
Mechanical shock resistance	Discontinuity < 1ms	IEC 60512-6-3, test 6c Acceleration: 300 m/s ² Half-sine shock pulses of 11 ms duration 3 shocks in both directions of 3 mutually perpendicular directions (totally 18 shocks) Standard atmospheric conditions Connectors in mated and locked position
IP degree of protection (Waterproof item only)	IP67	Connectors in mated and locked position IEC60529 Immersion tank: Water-level on enclosure: 0.15m above top 1m above bottom, 30 minute Leaking test: Test pressure: 13kPa Test duration: 10 second No significant change in pressure < 50 Pa
Humidity cycling test	Meet visual requirements, show no physical damage	Sample condition: mated Low temp. 25°C, high temp. 65°C, cold sub-cycle -10°C, humidity 93%, duration 24h/cycles, 10 cycles
Dry Heat	Rise in relation to initial value 20 mΩ maximum	Sample condition: mated Temperature: 85°C Duration: 96hours
Cold	Rise in relation to initial value 20 mΩ maximum	Sample condition: mated Temperature: -40°C Duration: 2hours



SOLDER ABILITY		
Item	Requirement	Test Condition
Solder ability	95%of immersed area must show no voids, pin holes.	DIP solder tails into the molten solder (held at $230\pm5^{\circ}\text{C}$) up to 0.5mm from the tip of tails for 3 ± 0.5 seconds.

Wave Soldering Profile



Preheating temperature: $25 \sim 140^{\circ}\text{C}$

Preheat Time: 80 seconds

Solder temperature: $245^{\circ}\text{C} +5/-0^{\circ}\text{C}$

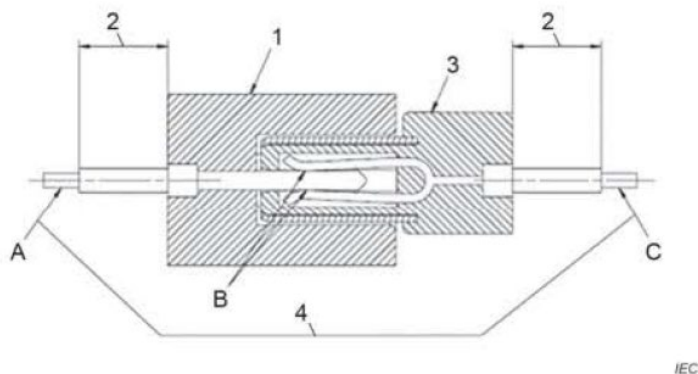
Solder Immersion Time: Single Wave Simulation 5 ± 1 seconds

Dual Wave Simulation First Wave - 5 ± 1 seconds Second Wave - 5 ± 1 seconds



6.3.2 Arrangement for contact resistance measurement

- The measurement of contact resistance shall be carried out on the number of contacts specified.
 - Any subsequent measurements of contact resistance shall be made on the same contacts.
- Figure 28 shows a contact resistance arrangement.



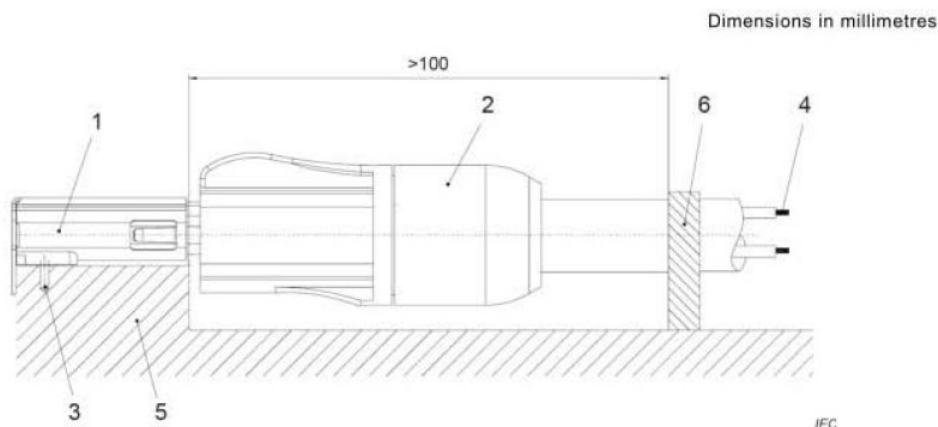
Key

- 1 Fixed connector
- 2 Attached wires: as short as practical
- 3 Free connector
- 4 Contact resistance measuring points
- A Measuring point A
- B Measuring points B (one on the male contact, one on the female contact)
- C Measuring point C

Figure 28 – Contact resistance arrangement



6.3.3 Arrangement for dynamic stress tests



Key

- 1 Fixed connector vibration feature
- 2 Free connector
- 3 Contact resistance measuring point, fixed connector
- 4 Contact resistance measuring point, cable end
- 5 Mounting plate
- 6 Cable clamp

Figure 29 – Arrangement for vibration and mechanical shock tests