SPECIFICATION		Specification No.	T-110580C11~14				
		Drawing No.	T-110580C11	Revision		Page	1/4
Product Name	SPD for solar power MZSR-「」PV「」	Enactment Date	20.Jan.2025	Revision Date			
		Drawing Section	Sales Engineering Department				

1. General

This product is a photovoltaic power generation SPD with deterioration indicator to protect DC power equipment from abnormal voltages induced in photovoltaic power generation systems.

This product consists of an SPD plug and a jack board, and the plug has a deterioration indicator function, and a deterioration indicator-linked DC fuse built in, so it safely cuts off the current from the photovoltaic power generation system that flows through the SPD in the event of an SPD failure.

2. Service Condition

2.1 Install Location : Indoor
2.2 Ambient Temperature : -40°C ~ +80°C
2.3 Relative Humidity : ≤90%(non-condensing)
2.4 Storage Temperature : -40°C ~ +80°C
2.5 Storage Humidity : ≤90%(non-condensing)
2.6 Altitude : ≤2000m

3. Appearance, Dimensions and Marking

3.1 Appearance and Dimensions.

Table 1

	Model number	Product configuration	Drawing number (Appearance)
1	MZSR-600PV	SPD plug	T-110580A61
2	MZSR-600	SPD plug	T-110580A62
3	MZSR-1000PV	SPD plug	T-110580A63
4	MZSR-1000	SPD plug	T-110580A64
5	MZSR-JK2(600PVI)	Jack board	T-120250A55
6	MZSR-JK3(600PVY)	Jack board	T-120250A56
7	MZSR-JK2(1000PVI)	Jack board	T-120250A57
8	MZSR-JK3(1000PVY)	Jack board	T-120250A58
9	MZSR-600PVI	SPD plug + jack board	T-110580A65
10	MZSR-600PVY	SPD plug + jack board	T-110580A66
11	MZSR-1000PVI	SPD plug + jack board	T-110580A67
12	MZSR-1000PVY	SPD plug + jack board	T-110580A68

Note 1) Installation method: The jack board is standardly installed on a DIN rail (width 35 mm).

3.2 Marking

Following particulars are marked on the body of this product.

(1) Manufacture's name or trademark
(2) Maximum continuous operation voltage U_{cpv}
(3) Test classification and discharge parameter (I_{max})
(4) Voltage protection level U_P
(5) Protection classification IP
(6) Type of current
(7) Identification of terminals (Jack Edition)

4. Characteristics

4.1 SPD electrical and protection performance is shown in Table 2.

Table2

Item		Measurement condition		Characteristics	
				MZSR-600PV「」	MZSR-1000PV「」
1. Comply with standard				Class Ⅱ	
2. PV rated application voltage				DC600V	DC1000V
3. Maximum continuous operation voltage U_{CPV}				DC720V	DC1200V
4. Short-circuit current rating I_{SCPV}				1000A	
5. Leakage current I_{PE}/ Continuous DC current I_{CPV}		DC350V	DC600V	≤1mA	
		Plug Part			
6. Maximum discharge current I_{max}		8/20μs		40kA	
7. Impulse discharge current I_{imp}		10/350μs		1.8kA	
8. Nominal discharge current I_n		8/20μs		20kA	
9. Total discharge current I_{Total}		8/20μs		40kA	
10. Voltage protection level U_p		8/20μs		3.0kV	4.0kV
11. Voltage protection level U_p(5kA)		8/20μs		2.5kV	3.5kV
12. Failure mode (Note 5)				SCFM	
13. Jack pressure resistance				1.2/50μs･10kV	
14.Fault indicator		Operating state / Fault indication		Green/Red	
15. Remote contact	Normal	11-12		Short	
		11-14		Open	
	Fault	11-12		Open	
		11-14		Short	
	Maximum operation voltage/current			AC250V/1.5A	

Note 1) The temperature and humidity during performance measurement are based on JIS Z 8703 (standard conditions at the test site) standard temperature of 20±15°C and standard humidity of 65±20%.

Note 2) Each item will be tested based on the provisions of IEC 61643-31 : 2018.

Note 3) The performance of the deterioration identification terminal is measured when it is attached to the jack board.

Note 4) Cannot be used if the open circuit voltage (V_{oc}) exceeds U_{cpv}.

Note 5) Cannot be installed on transformers less PCE (power conversion equipment).

4.2 The mechanical performance is shown in Table 3.

Table 3

Item		Characteristics	
1. Classification of protection level for enclosures (IP code)	MZSR-「」PV「」	IP20	
2. Identification of terminals	MZSR-JK「」	Displayed (+/-, PE)	
3. Standard installation method	MZSR-JK「」	DIN rail (width 35 mm)	
4. Connection conditions	MZSR-JK「」	According to item 5	
5. Deterioration display	MZSR-「」	According to operation display	Normal: Display is green
			Fault: Display is red

5. Connection cable

5.1 MZSR-「」PV「」

Connection conditions: The cables that can be connected to the cable entry hole (terminal part) of the jack board are as follows.

Both stranded and solid wire

Cable size : cross-section 1.6~22mm^2(AWG15~4)

Cable stripping length : about 15mm(Figure.1)

The recommended termination method for cables connecting to the jack board is as follows:

Recommended tightening torque : 1.47~1.96Nm(15~20kgf･cm)

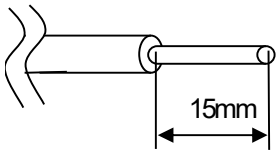


Figure.1

The crimp terminals that can be used in the cable entry holes for open type crimp terminals are open type crimp terminals M5, with a width of less than 12 mm.

5.2 The cables that can be connected to the deterioration identification terminal are as follows:

Cable size : cross section 0.05~2.0mm^2 (AWG30~14)

Cable stripping length : 7~8mm

5.3 Line grounding or not

When line grounded : PYI type

If the line is not grounded: PVY type

6. Inspection Condition

The inspection of electrical characteristics, mechanical characteristics and appearance shall be held as following Table.4

Table.4

Item	Inspection type	Characteristics
1. Leakage current	Sampling	According to Table 2.
2. Voltage protection level	Type	
3. Nominal discharge current	Type	After impulse application testing, leakage current must be within the standard range.
4. Low temperature storage test	Type	After testing under the test conditions in Table 5, leakage current must be within the standard.
5. High temperature storage test	Type	
6. High temperature-humidity test	Type	
7. Temperature cycle test	Type	
8. Vibration test	Type	
9. Appearance, display	Sampling	According to Table 1.
10. Dimension		

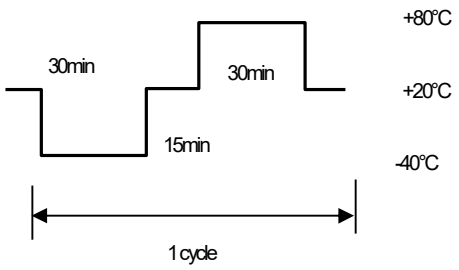
Note 1) In principle, sampling inspection will be a one-time sampling and normal inspection according to ISO 2859 (sampling inspection procedures and sampling by attributes), with AQL=2.5 according to special inspection level S-3. Regarding dimensions, n=5, Ac=0, Re=1 regardless of lot size.

Note 2) Type inspections are carried out on at least one unit of the first lot that goes through the production process when a new product is manufactured or when important materials or manufacturing methods are changed.
However, items that can be confirmed for performance with similar products may be omitted.

7. Environmental Test

Table 5 shows the environmental test conditions for this product.

Table 5

Item	Test Condition	Test Time
1.Low temperature test	Ta=-40±3℃	1000h
2.High temperature test	Ta=+80±2℃	1000h
3.High temperature-humidity test	Ta=+40±2℃ 90~95%	4days
4.Temperature cycle test		30 cycles
5.Vibration test	JIS E 3014 Type 2 Type A Vibration frequency:40(Hz) Acceleration double amplitude:19.6m/s^2(2G)	15min/3axis

After the test, the leakage current performance must be met.

8. Packing and Marking of Wrapping Box

8.1 Packing

Packaging unit 1 piece packed in a box.

8.2 Marking of wrapping box

Following particulars are marking on wrapping box.

(1) Product Name (2) Model number (3) Lot number (4) RoHS (5) Manufacturing date (6) Quantity (Qty)
(7) Company name (8) Test class classification

9. Quality warranty period and warranty details

The warranty period for this product is one year from the date of delivery. Any malfunctions that occur during this period will be replaced with a good product only if the cause is clearly determined to be our responsibility.

10. Environmentally friendly (RoHS compliant)

This product does not contain any substances subject to the EU RoHS Directive (10 substances: lead, mercury, cadmium, hexavalent chromium, PBB, PBDE, DEHP, BBP, DBP, DIBP) in excess of the limits set by the Directive, with the exception of exemptions.

*Directives of the European Parliament and of the Council 2011/65/EU, 2015/863/EU

11. Caution

When using this product, if it is subjected to DC overvoltage, it may cause a short circuit, so please use a fuse or breaker in the PV circuit.

If the solar cell array and SPD are more than 10 m apart, we recommend adding an SPD to the array side.