

**$P_D = 2\text{ W}$**   
**Transient Voltage Suppressor Diodes**  
**SJPZ-N Series**

**Description**

The SJPZ-N series are power Zener diodes designed for the protection of automotive electronic units, especially from the surge generated during load dump conditions and voltage transients induced by inductive loads. The package of the IC has high dissipation and high surge capability.

**Features**

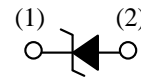
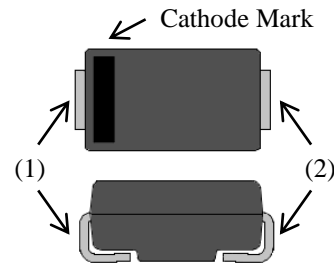
- AEC-Q101 Qualified
- Meets the Surge Protection Requirements in ISO7637-2 Standard (Pulse 1 to 3)
- Suitable for High Reliability and Automotive Requirement
- High Surge Capability
- Flammability: Equivalent to UL94V-0
- Bare Lead Frame: Pb-free (RoHS Compliant)

**Applications**

Protection of sensitive electronic equipment in passenger cars, trucks, vans, and buses:

- Engine Control Units
- Electric Control Units
- Braking System
- Power Steering System
- Airbags
- Audio/Infotainment Equipment

**Package**  
SJP



(1) Cathode  
(2) Anode

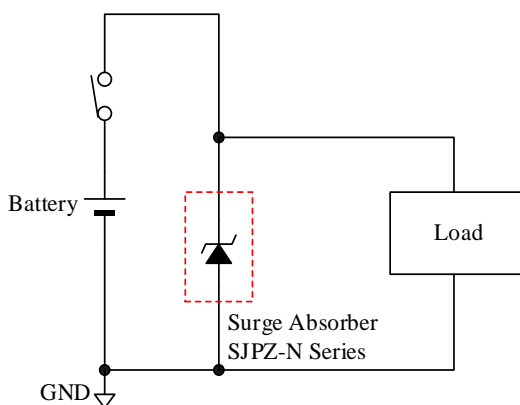
Not to scale

**Selection Guide**

Part Number	$V_Z$		$P_{RSM}^*$	$P_D$
	Min.	Max.		
SJPZ-N18	16.8 V	19.1 V	500 W	2 W
SJPZ-N27	25.1 V	28.9 V		
SJPZ-N33	31.0 V	35.0 V		

\*500  $\mu$ s, single block pulse

**Typical Application**



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## SJPZ-N Series

### Absolute Maximum Ratings

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Rating	Unit	Remarks
Power Dissipation <sup>(1)</sup>	$P_D$	Lead temperature <sup>(2)</sup>	2	W	
DC Blocking Voltage	$V_{DC}$	—	13	V	SJPZ-N18
			20		SJPZ-N27
			25		SJPZ-N33
Peak Pulse Reverse Power	$P_{RSM}$	500 $\mu\text{s}$ , single block pulse	500	W	
Junction Temperature	$T_J$	—	-55 to 150	$^\circ\text{C}$	
Storage Temperature	$T_{STG}$	—	-55 to 150	$^\circ\text{C}$	

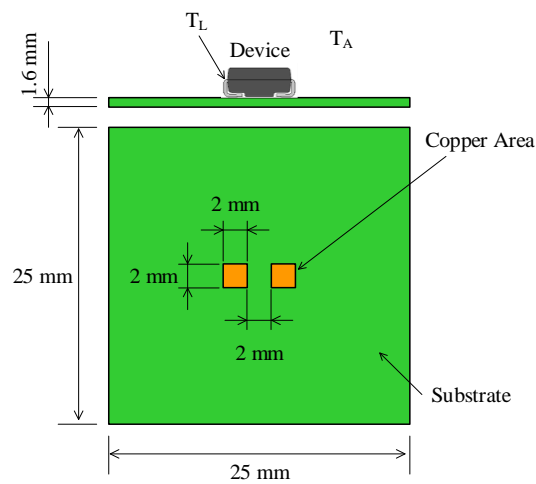


Figure 1. Lead Temperature Measurement Conditions

<sup>(1)</sup> See Figure 2.

<sup>(2)</sup> See Figure 1.

## SJPZ-N Series

### Electrical Characteristics

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	Remarks
Forward Voltage Drop	$V_F$	$I_F = 2\text{ A}$	—	—	1.20	V	
Reverse Leakage Current	$I_R$	$V_R = 13\text{ V}$	—	—	1	$\mu\text{A}$	SJPZ-N18
		$V_R = 20\text{ V}$	—	—	1		SJPZ-N27
		$V_R = 25\text{ V}$	—	—	1		SJPZ-N33
Breakdown Voltage	$V_Z$	$I_Z = 1\text{ mA}$	16.8	—	19.1	V	SJPZ-N18
			25.1	—	28.9		SJPZ-N27
			31.0	—	35.0		SJPZ-N33
Breakdown Voltage Temperature Coefficient	$r_Z$	$I_Z = 1\text{ mA}$	—	13	—	$\text{mV}/^\circ\text{C}$	SJPZ-N18
			—	23	—		SJPZ-N27
			—	29	—		SJPZ-N33
Breakdown Region Equivalent Resistance	$R_Z$	$I_Z = 10\text{ mA to } 20\text{ mA}$	—	2	—	$\Omega$	SJPZ-N18
			—	4	—		SJPZ-N27
			—	5	—		SJPZ-N33
Thermal Resistance	$R_{th(J-L)}$	<sup>(3)</sup>	—	—	20	$^\circ\text{C}/\text{W}$	

### Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Package Weight		—	0.072	—	g

<sup>(3)</sup>  $R_{th(J-L)}$  is thermal resistance between junction and lead. Lead temperature is measured as shown in Figure 1.

SJPZ-N18 Rating and Characteristic Curves

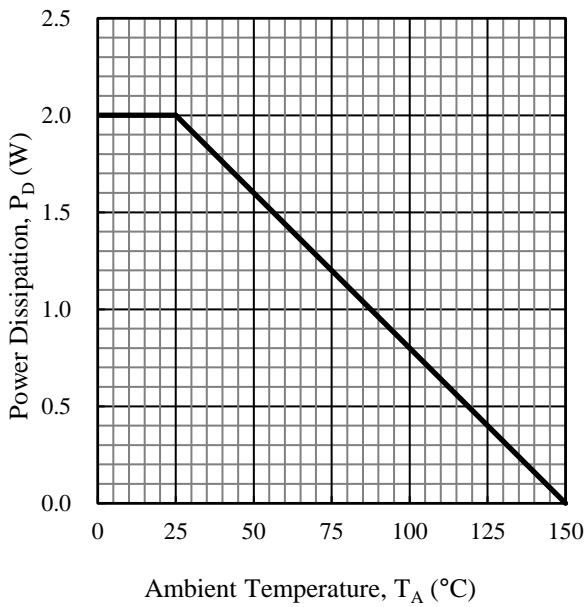


Figure 2. SJPZ-N18 Power Dissipation Curve<sup>(4)</sup>

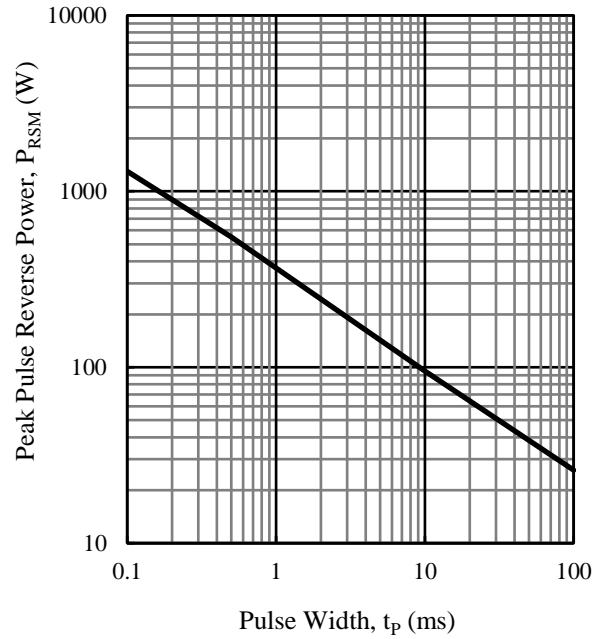


Figure 3. SJPZ-N18 Peak Pulse Reverse Power<sup>(5)</sup>

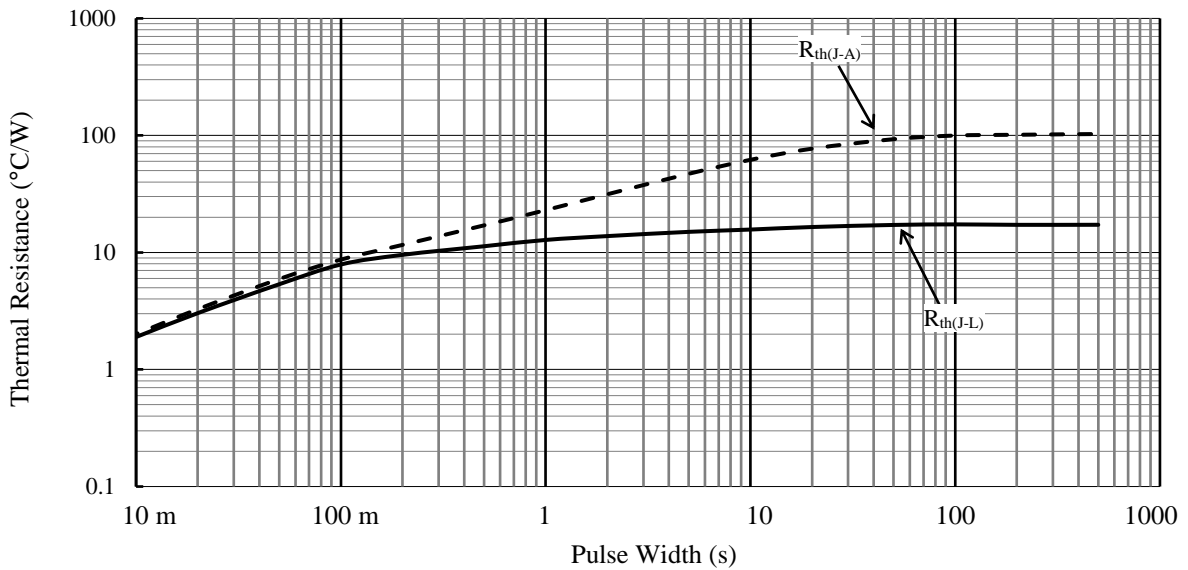


Figure 4. SJPZ-N18 Typical Transient Thermal Resistance Characteristics<sup>(6)</sup>

<sup>(4)</sup> See Figure 1 for the measurement conditions of the lead temperature.

<sup>(5)</sup>  $t_p$  is single block pulse.

<sup>(6)</sup> See Figure 1 for the measurement conditions of the lead temperature.

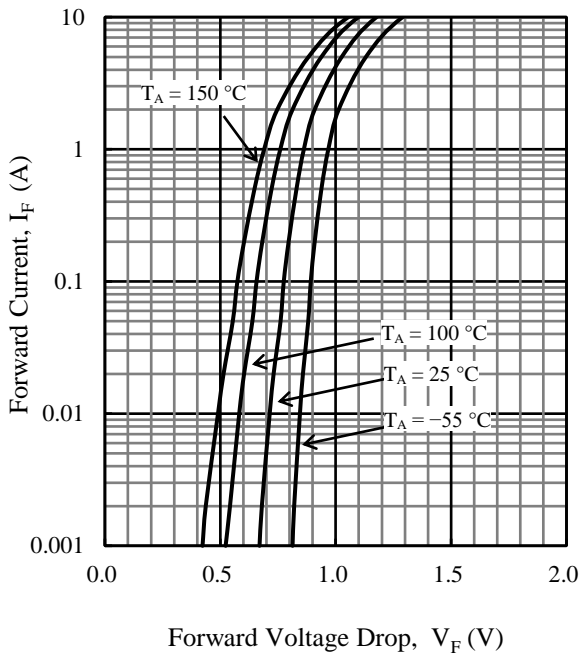


Figure 5. SJPZ-N18 Typical Characteristics:  $I_F$  vs.  $V_F$

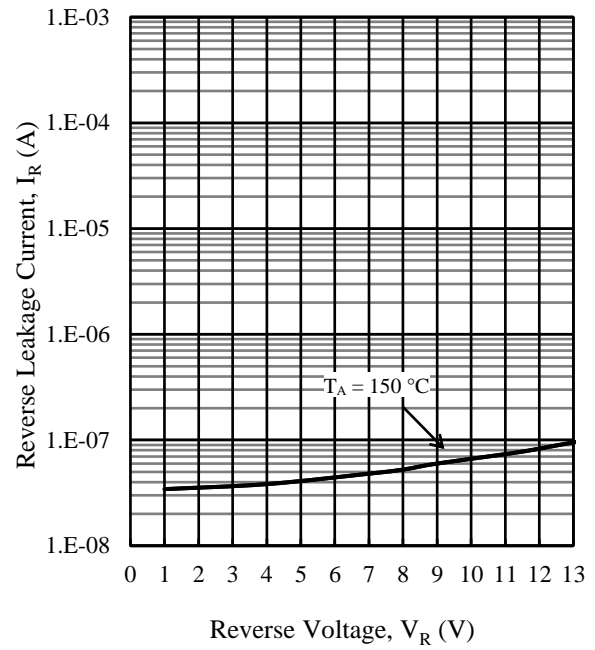


Figure 6. SJPZ-N18 Typical Characteristics:  $I_R$  vs.  $V_R$

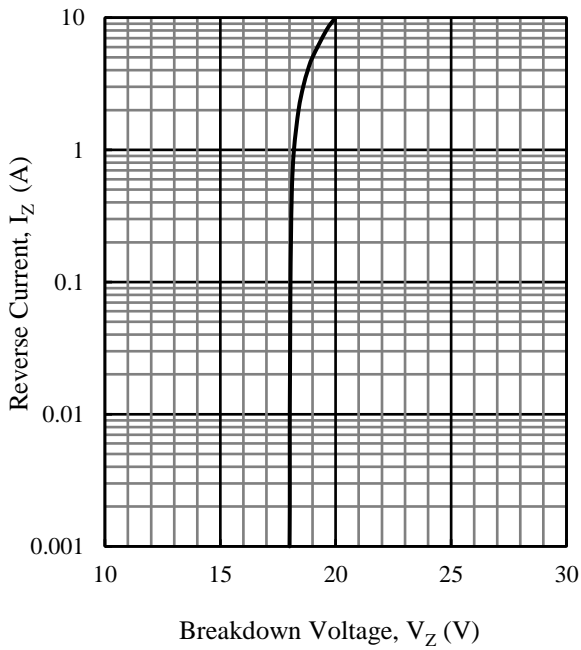


Figure 7. SJPZ-N18 Typical Characteristics:  $I_Z$  vs.  $V_Z$   
( $T_J = 25\text{ °C}$ ,  $t = 0.4\text{ ms}$ )

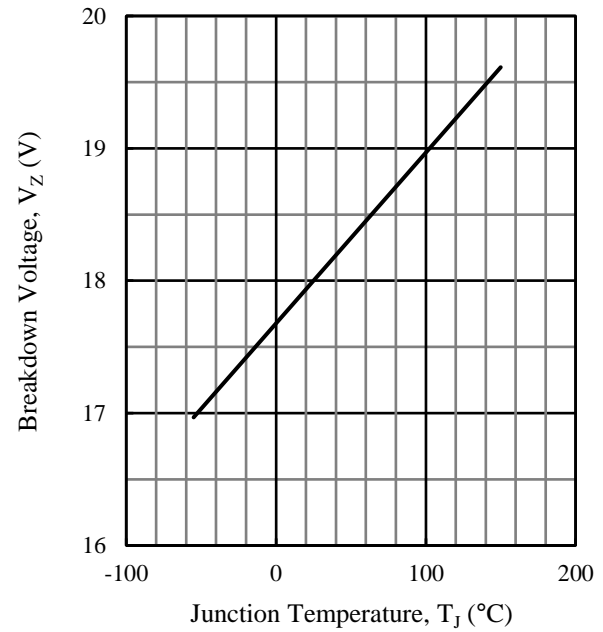


Figure 8. SJPZ-N18 Typical Characteristics:  $V_Z$  vs.  $T_J$   
( $I_Z = 1\text{ mA}$ )

SJPZ-N27 Rating and Characteristic Curves

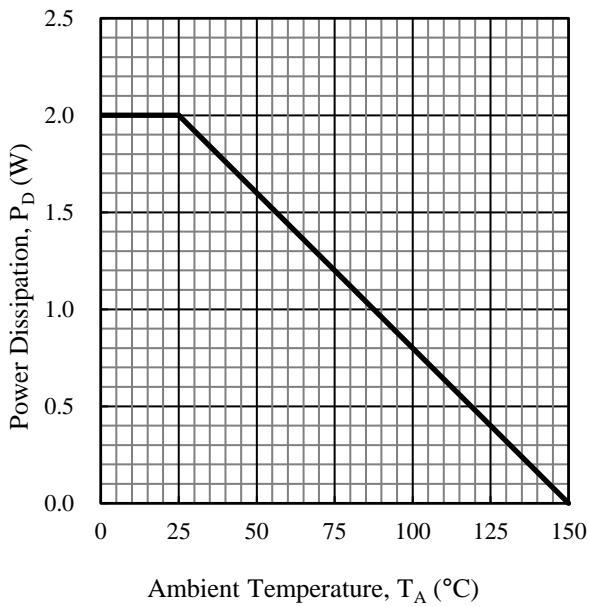


Figure 9. SJPZ-N27 Power Dissipation Curve<sup>(7)</sup>

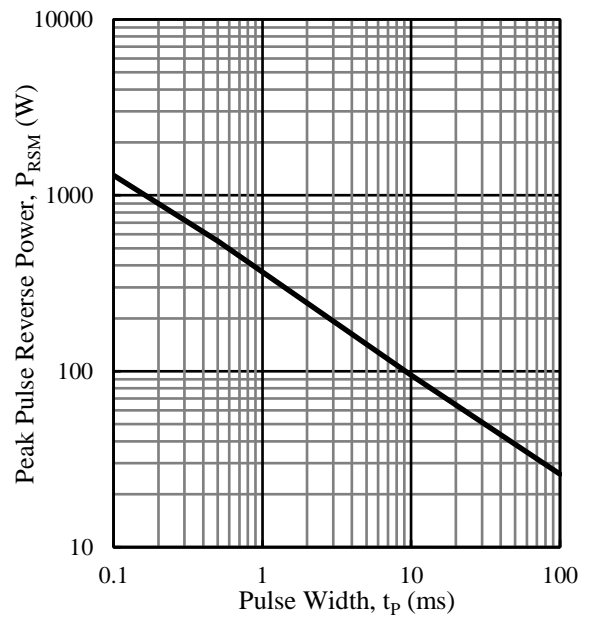


Figure 10. SJPZ-N27 Peak Pulse Reverse Power<sup>(8)</sup>

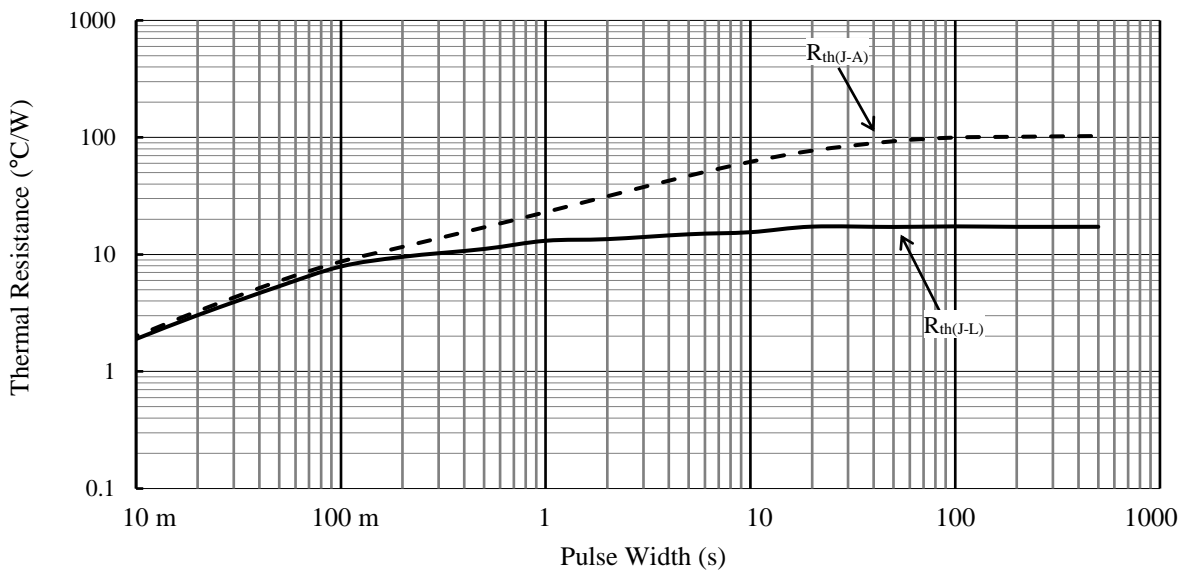


Figure 11. SJPZ-N27 Typical Transient Thermal Resistance Characteristics<sup>(9)</sup>

<sup>(7)</sup> See Figure 1 for the measurement conditions of the lead temperature.

<sup>(8)</sup>  $t_p$  is single block pulse.

<sup>(9)</sup> See Figure 1 for the measurement conditions of the lead temperature.

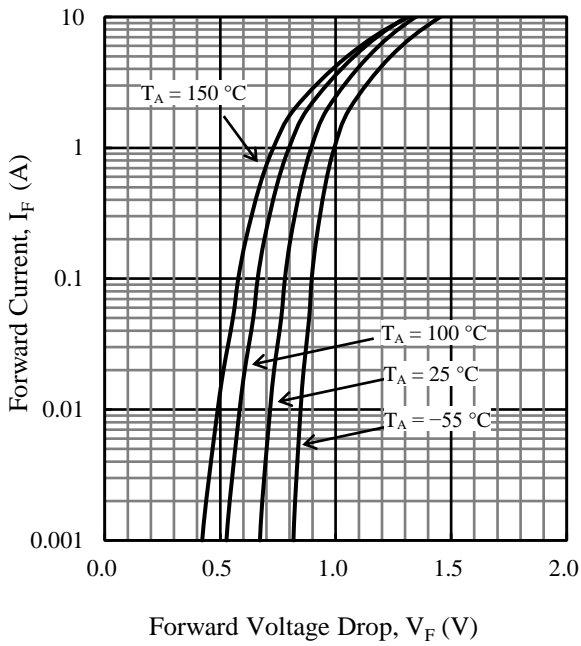


Figure 12. SJPZ-N27 Typical Characteristics:  $I_F$  vs.  $V_F$

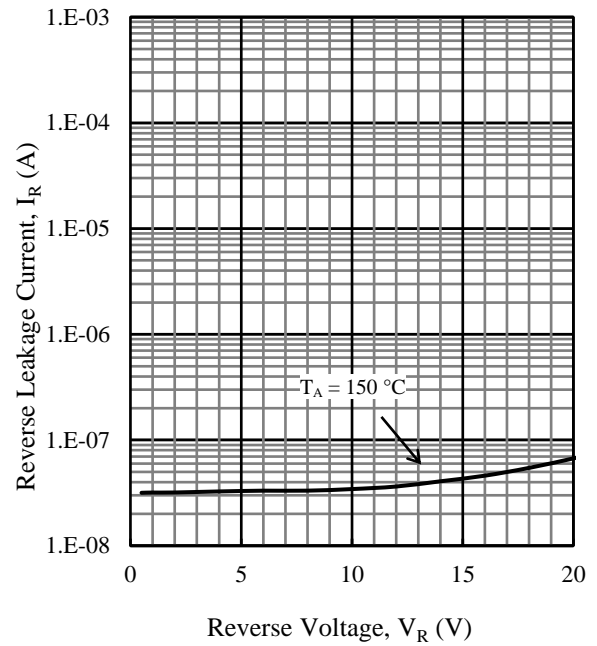


Figure 13. SJPZ-N27 Typical Characteristics:  $I_R$  vs.  $V_R$

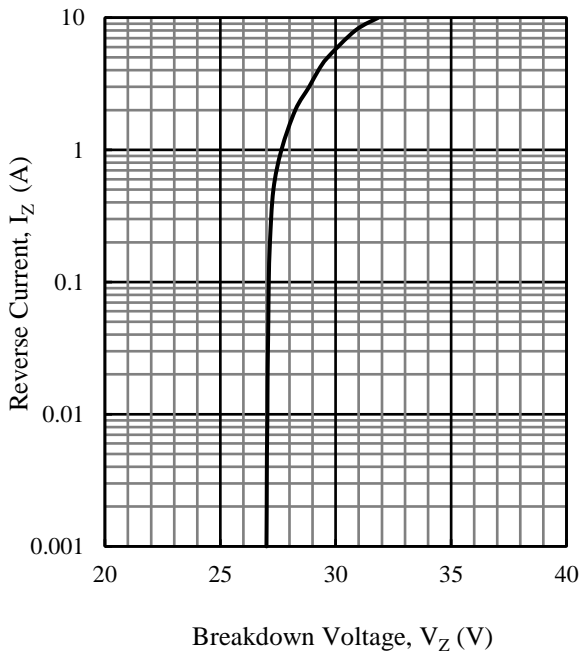


Figure 14. SJPZ-N27 Typical Characteristics:  $I_Z$  vs.  $V_Z$   
( $T_J = 25\text{ °C}$ ,  $t = 0.4\text{ ms}$ )

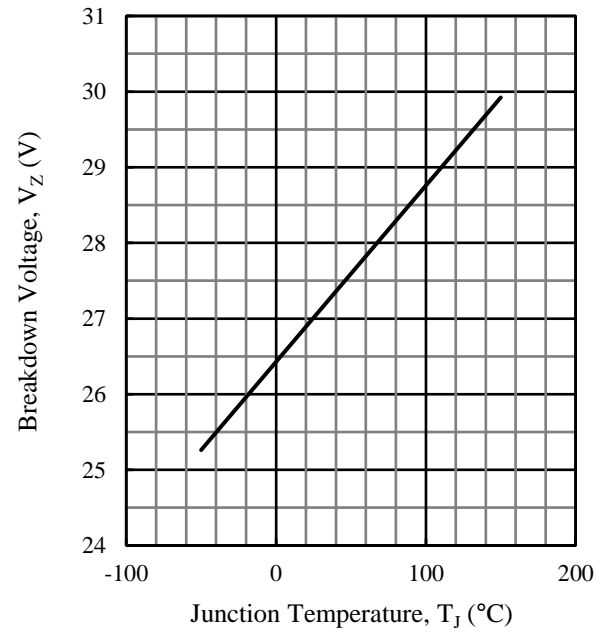


Figure 15. SJPZ-N27 Typical Characteristics:  $V_Z$  vs.  $T_J$   
( $I_Z = 1\text{ mA}$ )



SJPZ-N33 Rating and Characteristic Curves

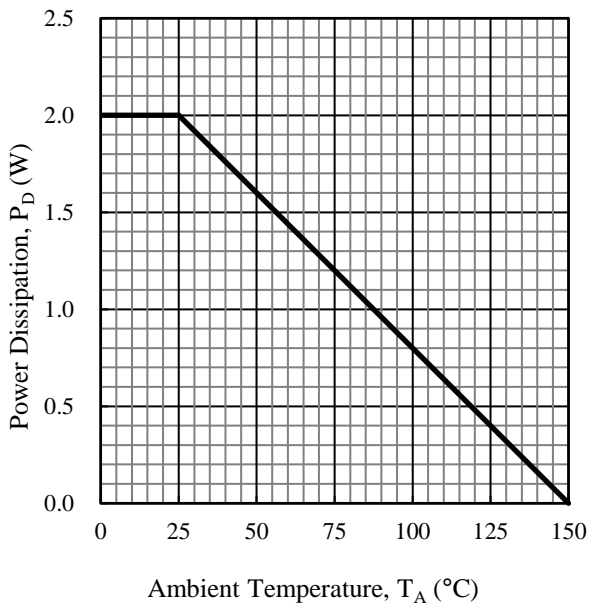


Figure 16. SJPZ-N33 Power Dissipation Curve<sup>(10)</sup>

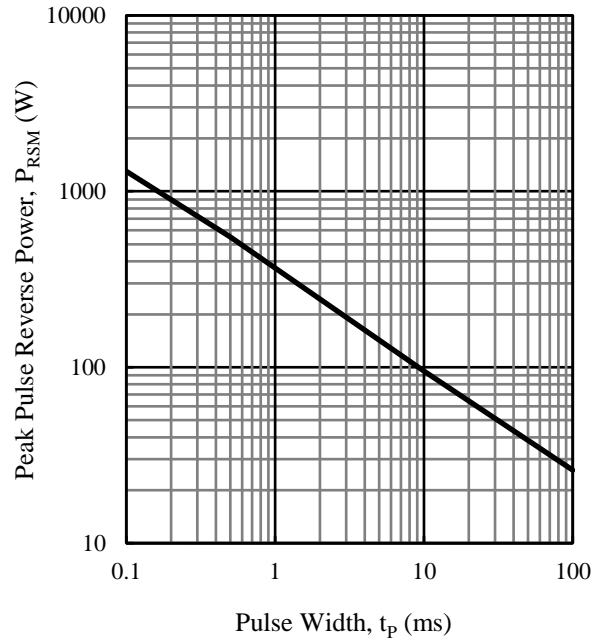


Figure 17. SJPZ-N33 Peak Pulse Reverse Power<sup>(11)</sup>

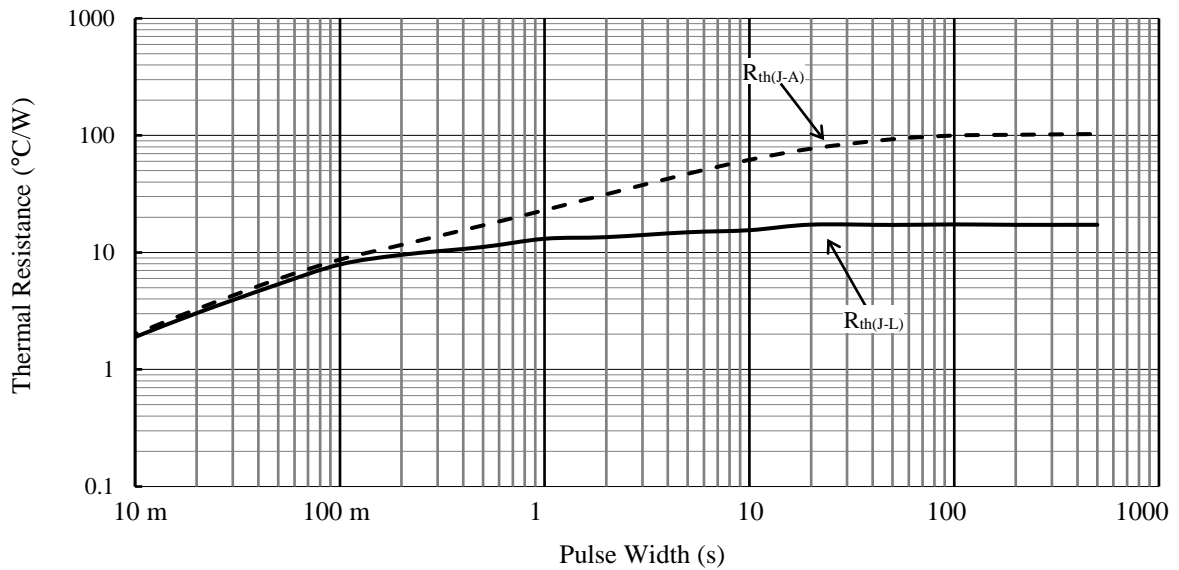


Figure 18. SJPZ-N33 Typical Transient Thermal Resistance Characteristics<sup>(12)</sup>

<sup>(10)</sup> See Figure 1 for the measurement conditions of the lead temperature.

<sup>(11)</sup>  $t_p$  is single block pulse.

<sup>(12)</sup> See Figure 1 for the measurement conditions of the lead temperature.

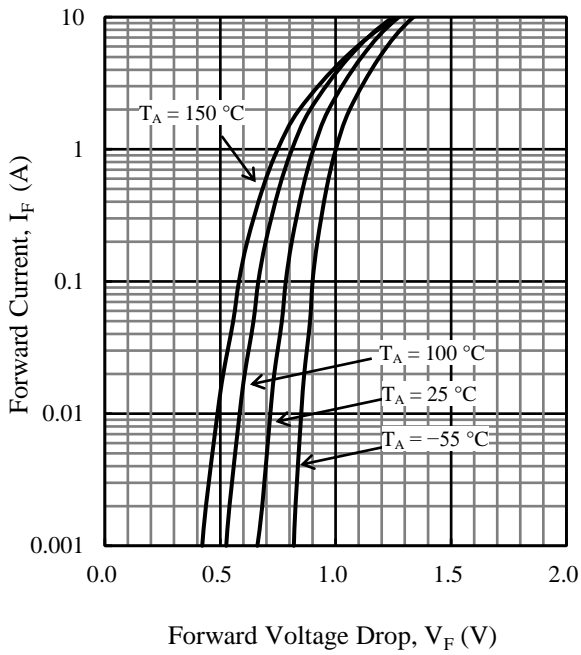


Figure 19. SJPZ-N33 Typical Characteristics:  $I_F$  vs.  $V_F$

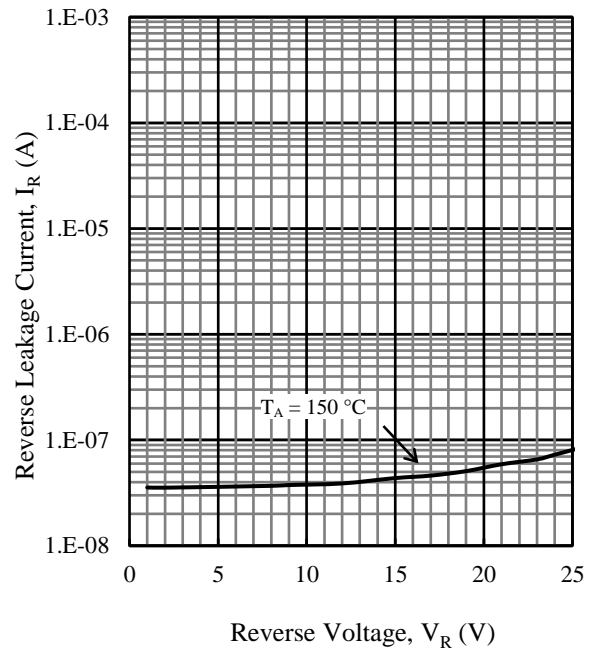


Figure 20. SJPZ-N33 Typical Characteristics:  $I_R$  vs.  $V_R$

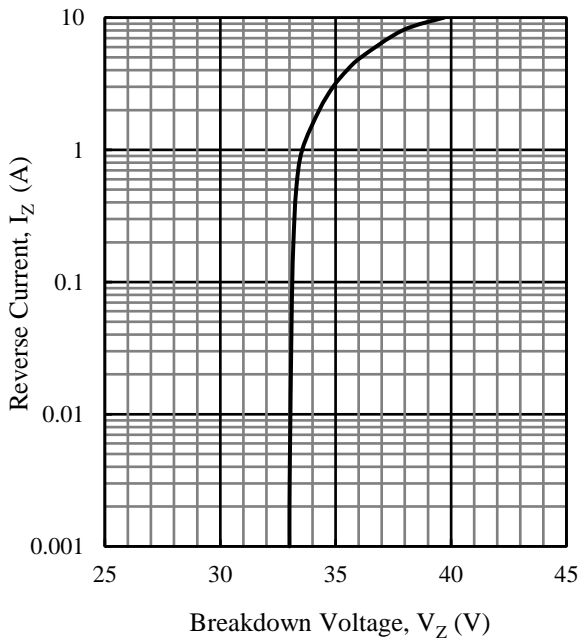


Figure 21. SJPZ-N33 Typical Characteristics:  $I_Z$  vs.  $V_Z$   
( $T_J = 25\text{ °C}$ ,  $t = 0.4\text{ ms}$ )

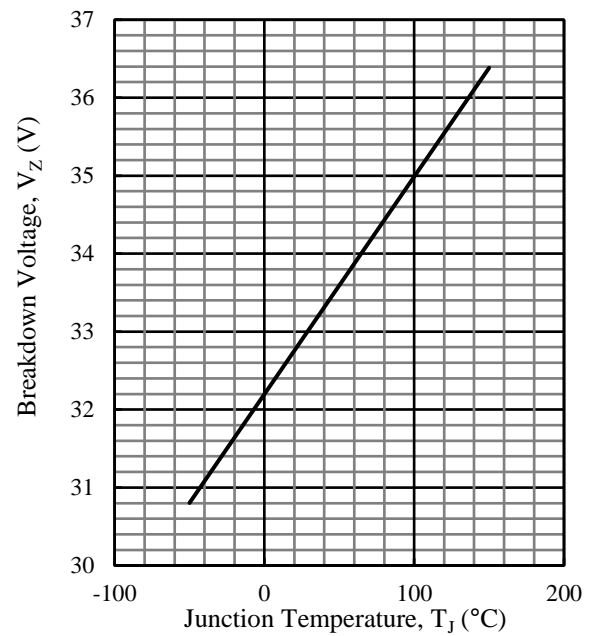
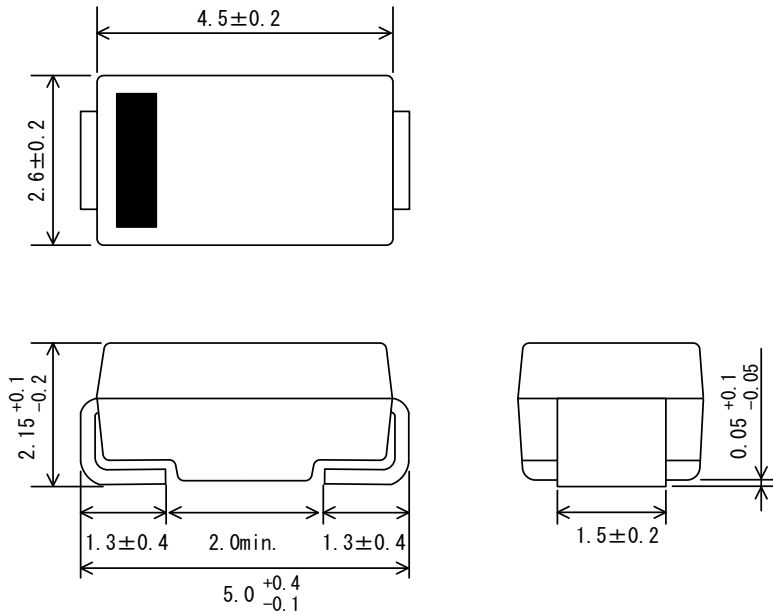


Figure 22. SJPZ-N33 Typical Characteristics:  $V_Z$  vs.  $T_J$   
( $I_Z = 1\text{ mA}$ )

## SJPZ-N Series

### Physical Dimensions

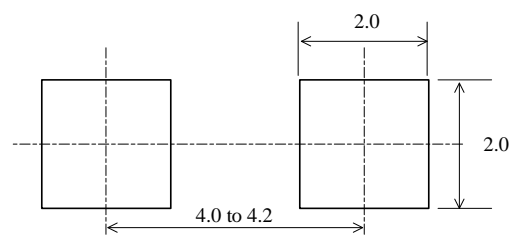
#### • SJP Package



#### NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- Moisture Sensitivity Level 1 (MSL 1)
- When soldering the products, it is required to minimize the working time within the following limits:  
Flow:  $260\text{ }^{\circ}\text{C} / 10\text{ s}$ , 1 time  
Reflow:  
  Preheat:  $150\text{ }^{\circ}\text{C}$  to  $200\text{ }^{\circ}\text{C} / 60\text{ s}$  to  $120\text{ s}$   
  Solder heating:  $255\text{ }^{\circ}\text{C} / 30\text{ s}$ , 3 times ( $260\text{ }^{\circ}\text{C}$  peak)  
  Soldering Iron:  $350\text{ }^{\circ}\text{C} / 3.5\text{ s}$ , 1 time

#### • SJP Land Pattern Example



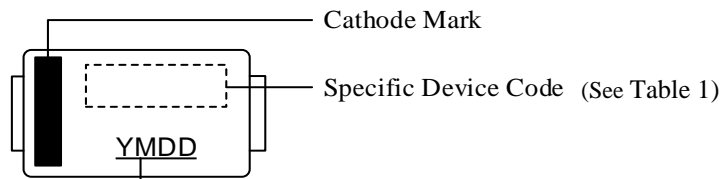
#### NOTE:

- Dimensions in millimeters

## SJPZ-N Series

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### Marking Diagram



Lot Number:

Y is the last digit of the year of manufacture (0 to 9)

M is the month of the year (1 to 9, O, N or D)

DD is the day of the month (01 to 31)

Table 1. Specific Device Code

Specific Device Code	Part Number
ZN18	SJPZ-N18
ZN27	SJPZ-N27
ZN33	SJPZ-N33

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