P_D = 2 W
Transient Voltage Suppressor Diodes
SJPZ-N Series

Data Sheet

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 Standrard (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)

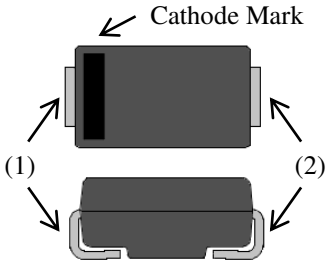
Applications

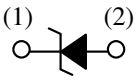
Protection of sensitive electronic equipment in passenger cars, trucks, vans, and buses:

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

Package

SJP





(1) Cathode
(2) Anode

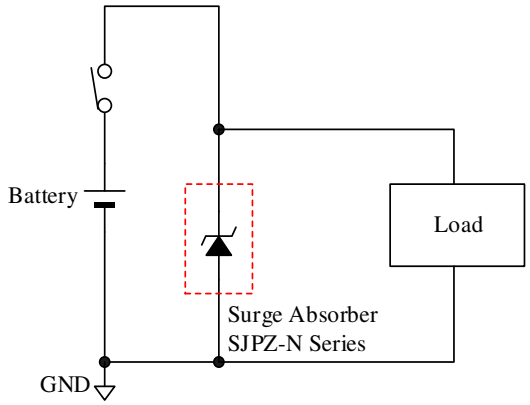
Not to scale

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 µs, single block pulse

Typical Application



Contents

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Rating	Unit	Remarks
Power Dissipation[1]	P_D	Lead temperature[2]	2	W	
DC Blocking Voltage	V_{DC}	—	13	V	SJPZ-N18
			20		SJPZ-N27
			25		SJPZ-N33
Peak Pulse Reverse Power	P_{RSM}	500 µs, single block pulse	500	W	
Junction Temperature	T_J	—	−55 to 150	°C	
Storage Temperature	T_{STG}	—	−55 to 150	°C	

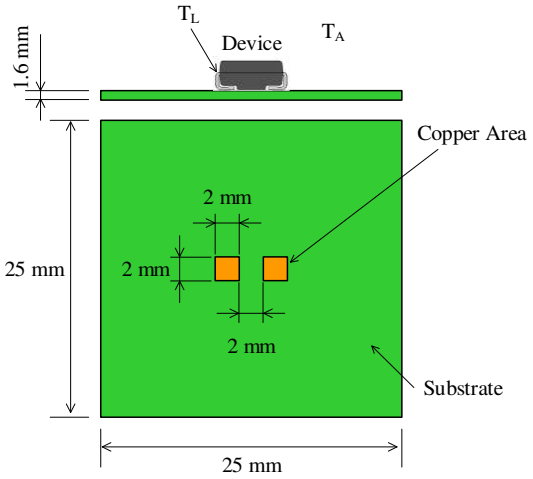


Figure 1. Lead Temperature Measurement Conditions

[1] See Figure 2.
[2] See Figure 1.

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	Remarks
Forward Voltage Drop	V_F	I_F = 2 A	—	—	1.20	V	
Reverse Leakage Current	I_R	V_R = 13 V	—	—	1	μA	SJPZ-N18
		V_R = 20 V	—	—	1		SJPZ-N27
		V_R = 25 V	—	—	1		SJPZ-N33
Breakdown Voltage	V_Z	I_Z = 1 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 mA	—	13	—	mV/°C	SJPZ-N18
			—	23	—		SJPZ-N27
			—	29	—		SJPZ-N33
Breakdown Region Equivalent Resistance	R_Z	I_Z = 10 mA to 20 mA	—	2	—	Ω	SJPZ-N18
			—	4	—		SJPZ-N27
			—	5	—		SJPZ-N33
Thermal Resistance	$R_{th(J-L)}$	(3)	—	—	20	°C/W	

Mechanical Characteristics

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

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

SJPZ-N18 Rating and Characteristic Curves

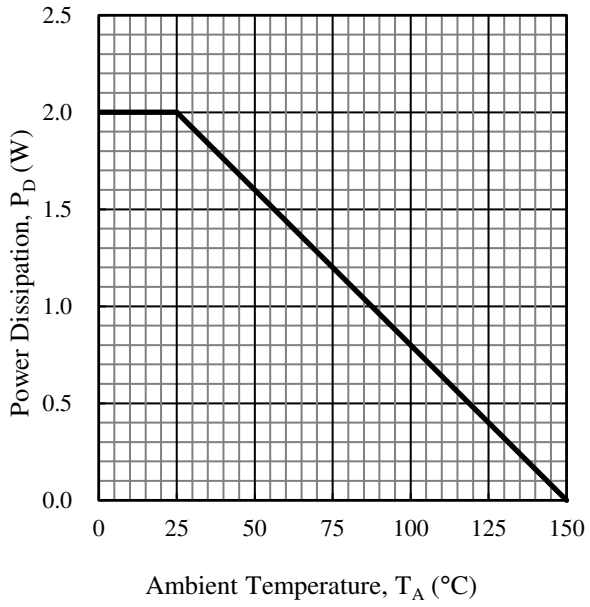


Figure 2. SJPZ-N18 Power Dissipation Curve[4]

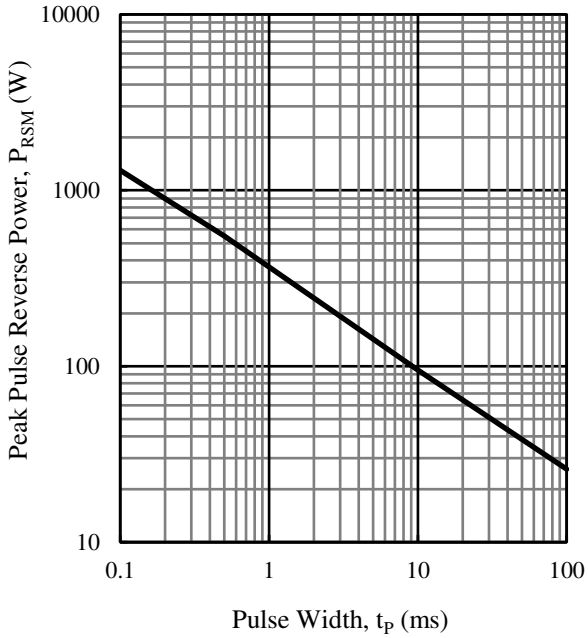


Figure 3. SJPZ-N18 Peak Pulse Reverse Power[5]

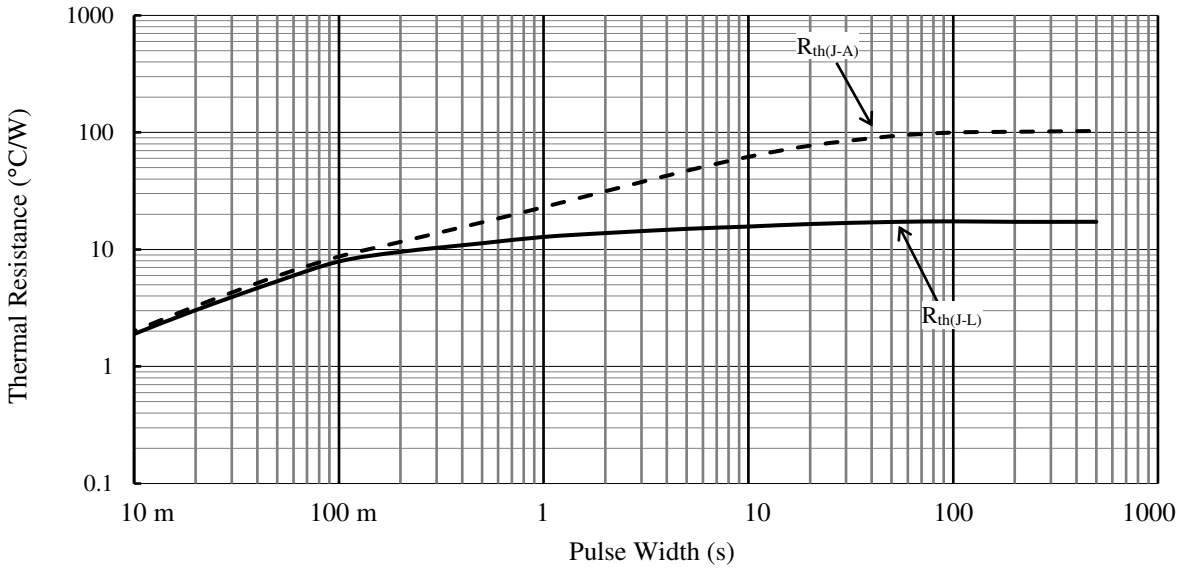


Figure 4. SJPZ-N18 Typical Transient Thermal Resistance Characteristics [6]

[4] See Figure 1 for the measurement conditions of the lead temperature.
[5] t_P is single block pulse.
[6] See Figure 1 for the measurement conditions of the lead temperature.

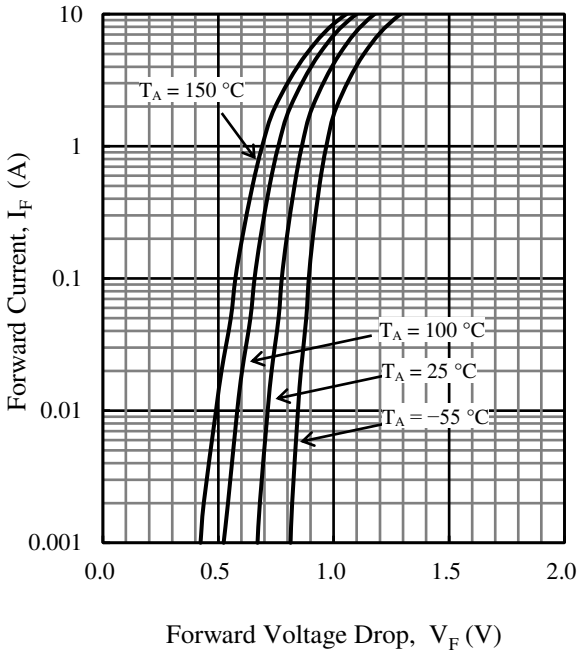


Figure 5. SJPZ-N18 Typical Characteristics: I_F vs. V_F

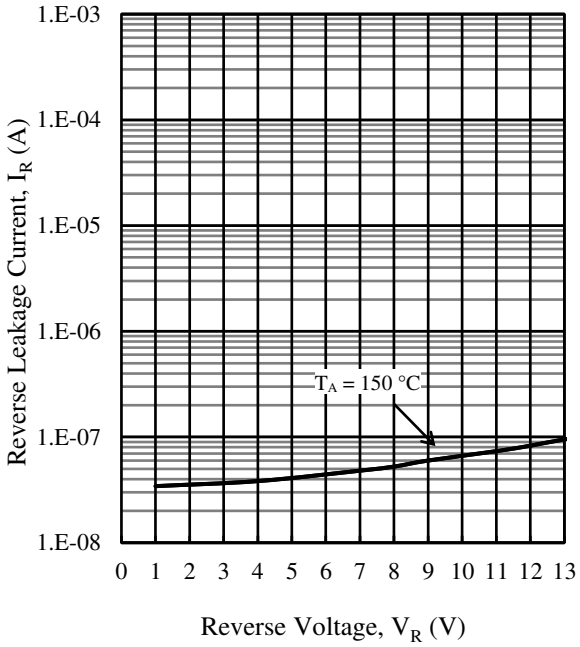


Figure 6. SJPZ-N18 Typical Characteristics: I_R vs. V_R

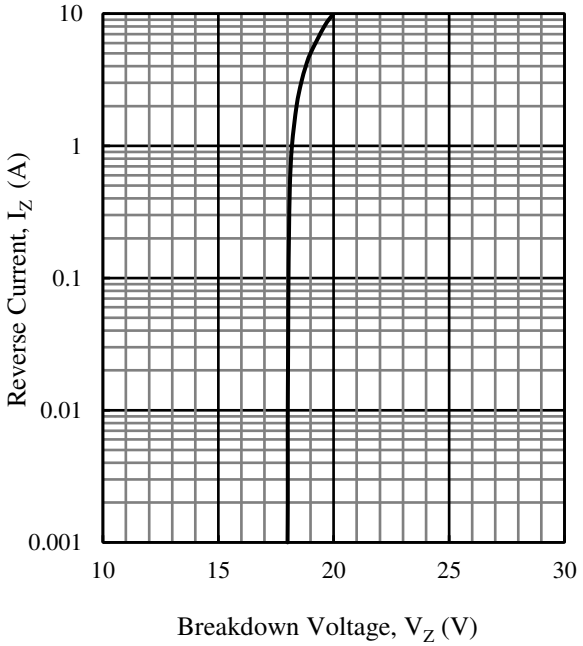


Figure 7. SJPZ-N18 Typical Characteristics: I_Z vs. V_Z
(T_J = 25 °C, t = 0.4 ms)

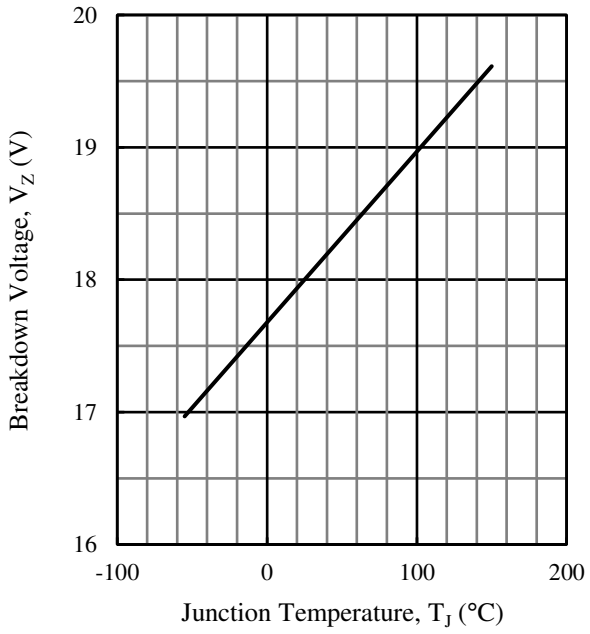


Figure 8. SJPZ-N18 Typical Characteristics: V_Z vs. T_J
(I_Z = 1 mA)

SJPZ-N27 Rating and Characteristic Curves

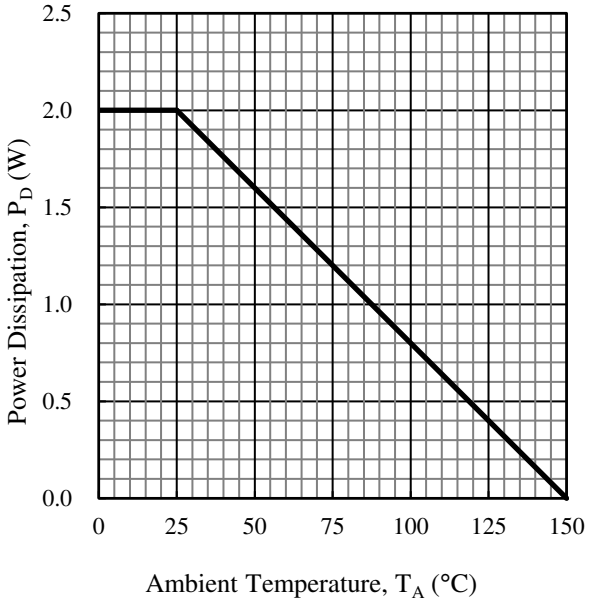


Figure 9. SJPZ-N27 Power Dissipation Curve[7]

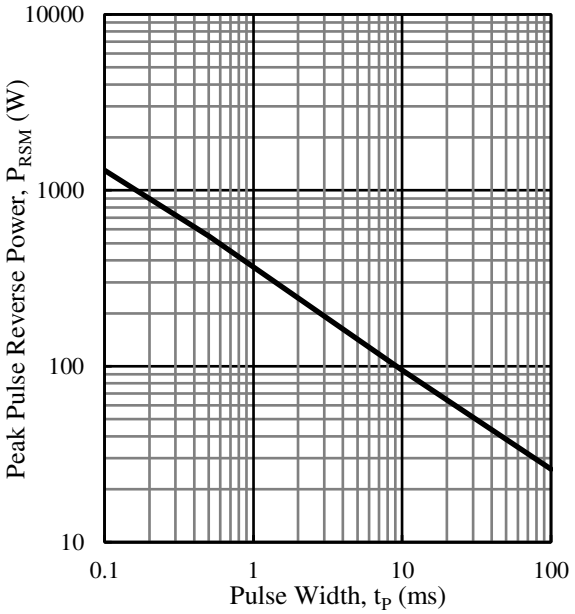


Figure 10. SJPZ-N27 Peak Pulse Reverse Power[8]

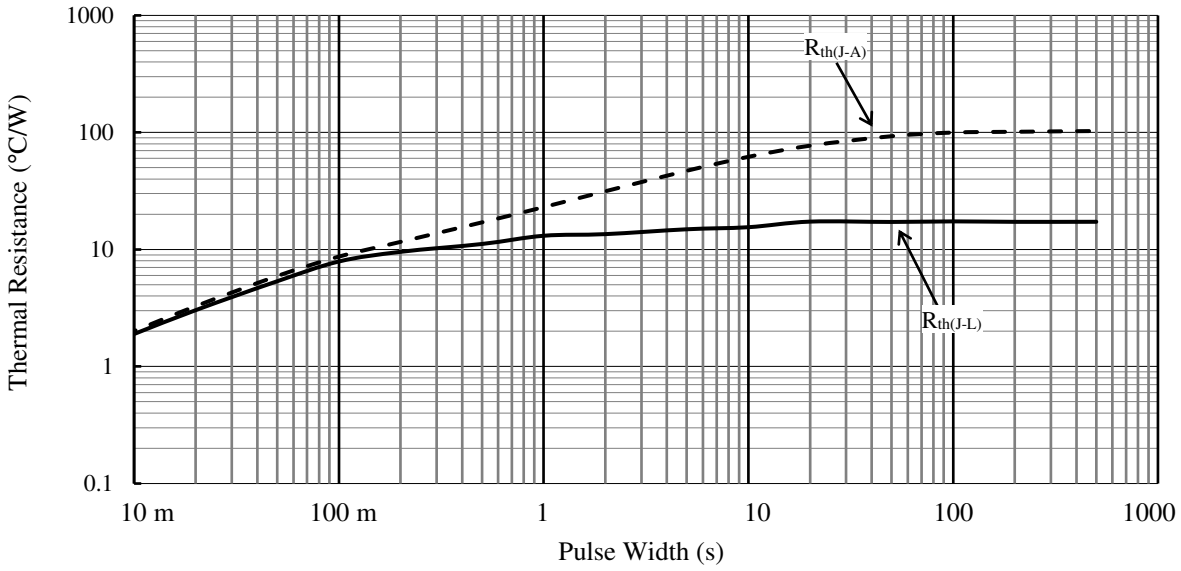


Figure 11. SJPZ-N27 Typical Transient Thermal Resistance Characteristics [9]

[7] See Figure 1 for the measurement conditions of the lead temperature.
[8] t_P is single block pulse.
[9] See Figure 1 for the measurement conditions of the lead temperature.

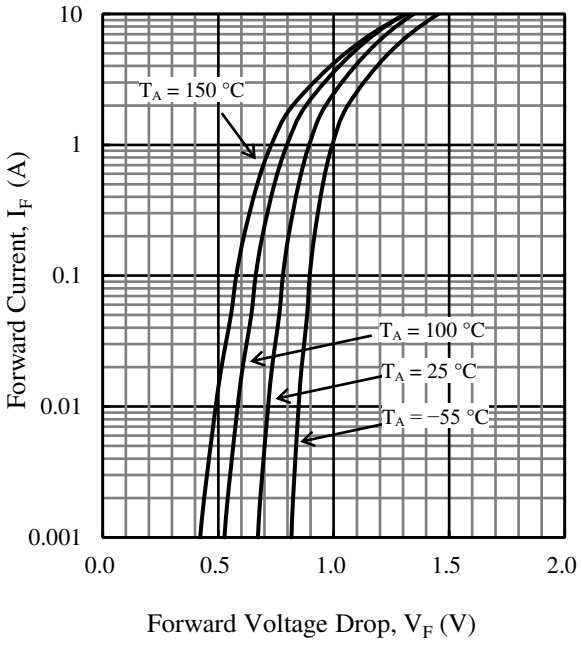


Figure 12. SJPZ-N27 Typical Characteristics: I_F vs. V_F

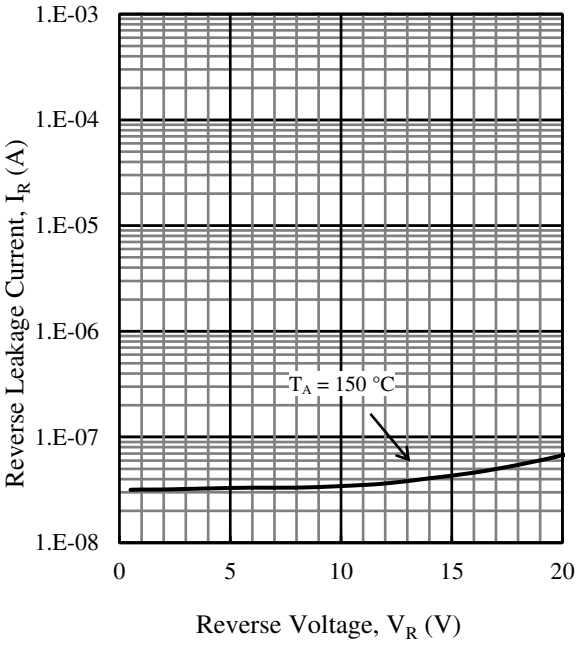


Figure 13. SJPZ-N27 Typical Characteristics: I_R vs. V_R

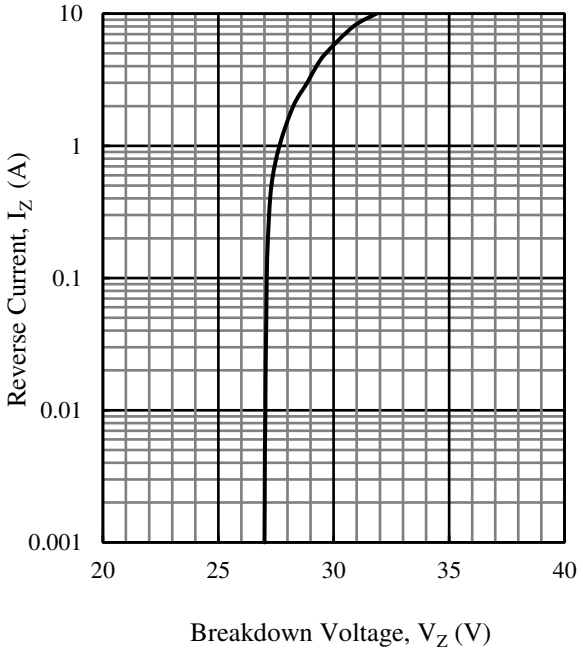


Figure 14. SJPZ-N27 Typical Characteristics: I_Z vs. V_Z
(T_J = 25 °C, t = 0.4 ms)

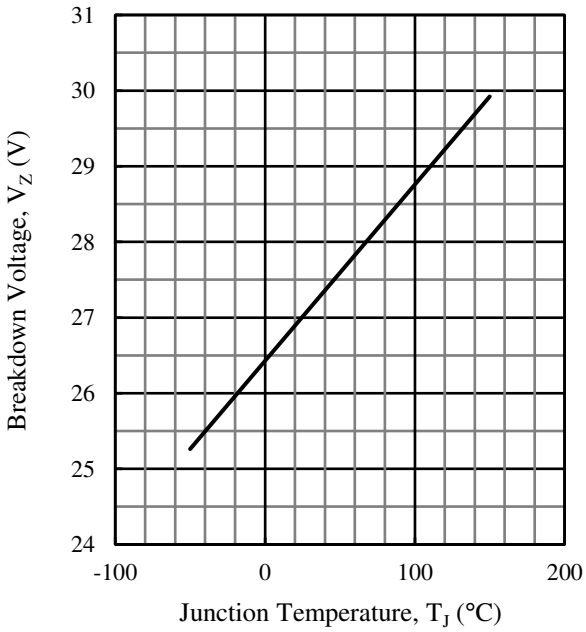


Figure 15. SJPZ-N27 Typical Characteristics: V_Z vs. T_J
(I_Z = 1 mA)

SJPZ-N33 Rating and Characteristic Curves

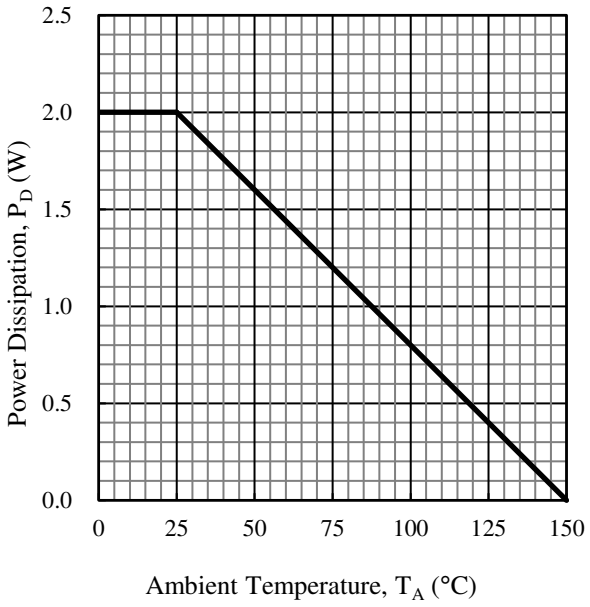


Figure 16. SJPZ-N33 Power Dissipation Curve[10]

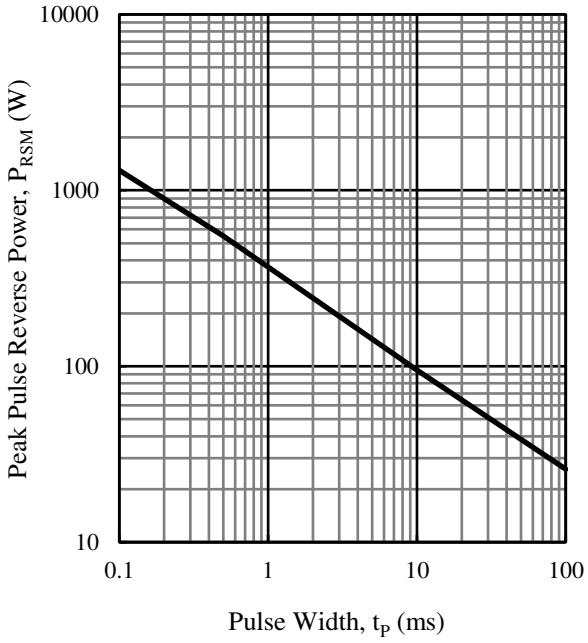


Figure 17. SJPZ-N33 Peak Pulse Reverse Power[11]

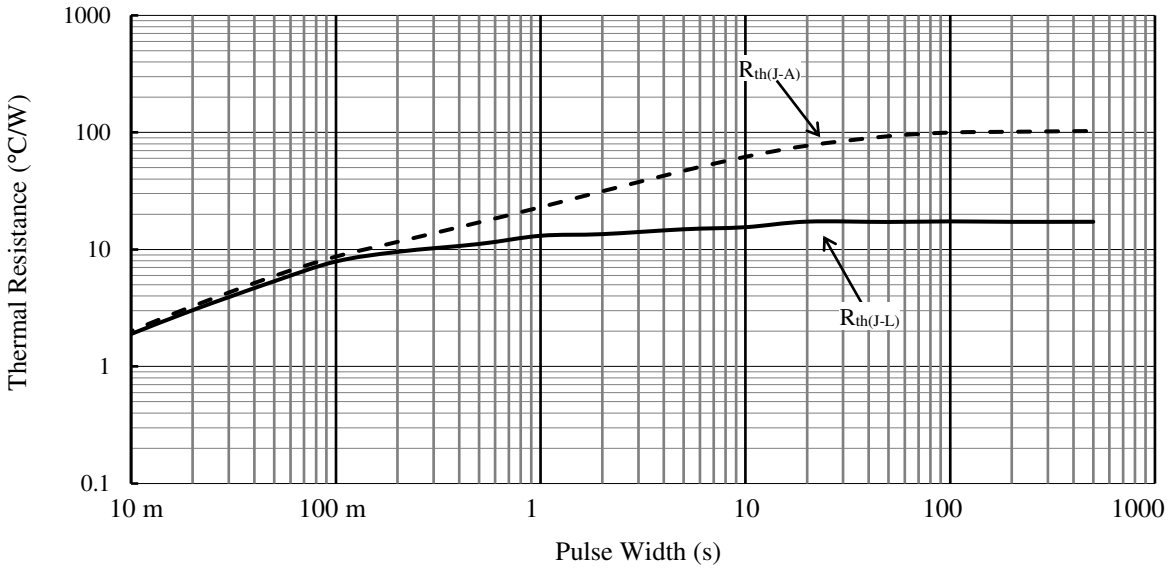


Figure 18. SJPZ-N33 Typical Transient Thermal Resistance Characteristics[12]

[10] See Figure 1 for the measurement conditions of the lead temperature.
[11] t_P is single block pulse.
[12] See Figure 1 for the measurement conditions of the lead temperature.

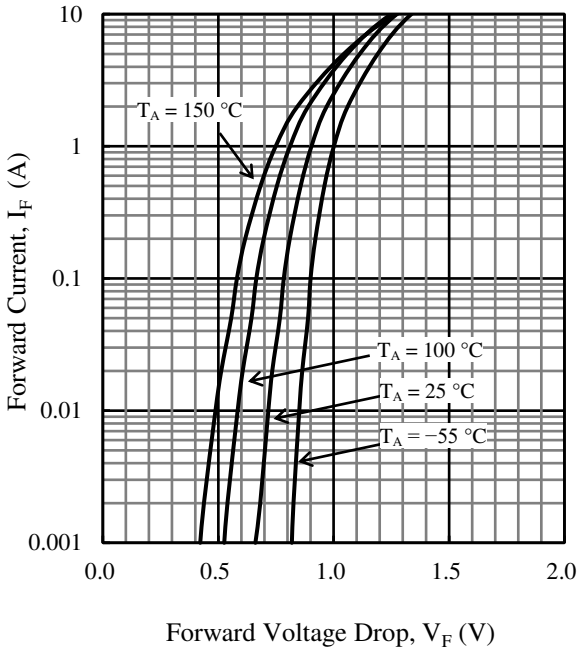


Figure 19. SJPZ-N33 Typical Characteristics: I_F vs. V_F

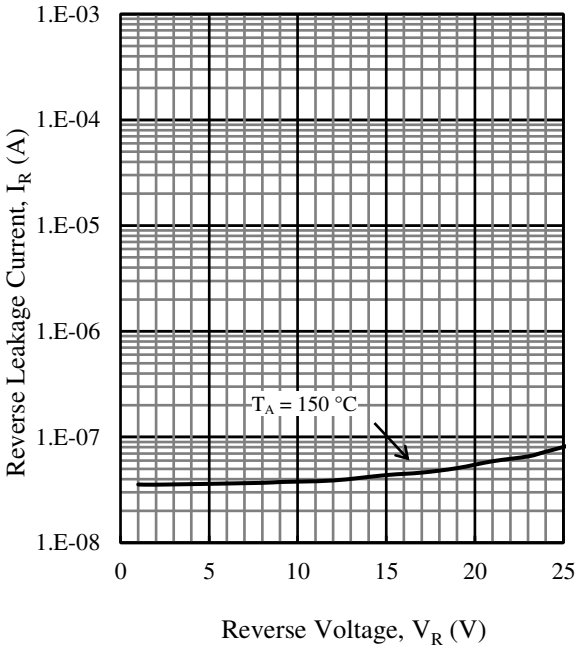


Figure 20. SJPZ-N33 Typical Characteristics: I_R vs. V_R

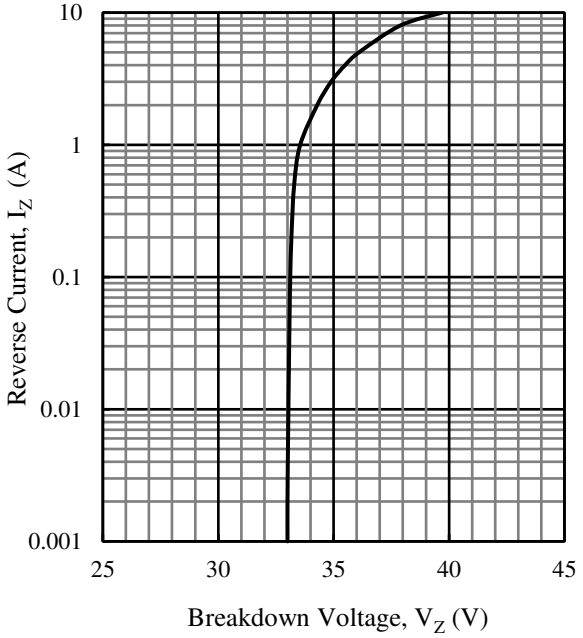


Figure 21. SJPZ-N33 Typical Characteristics: I_Z vs. V_Z
(T_J = 25 °C, t = 0.4 ms)

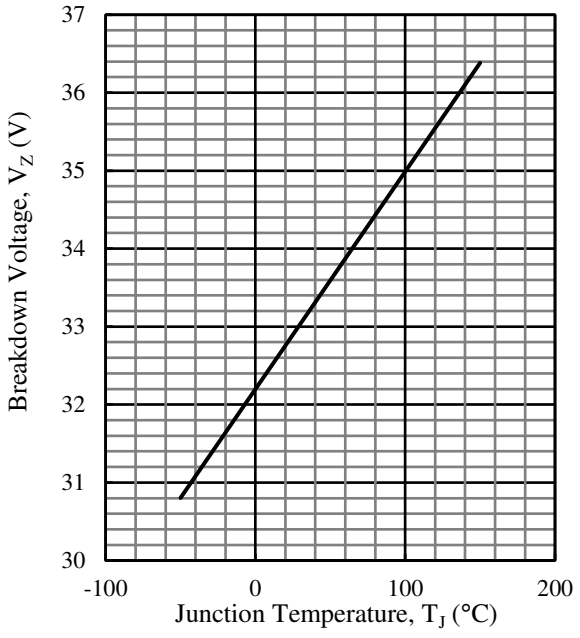
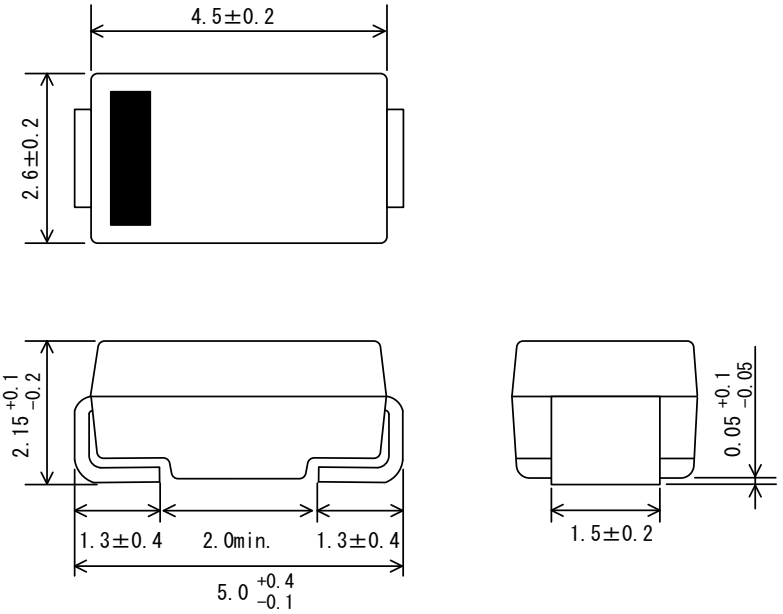


Figure 22. SJPZ-N33 Typical Characteristics: V_Z vs. T_J
(I_Z = 1 mA)

Physical Dimensions

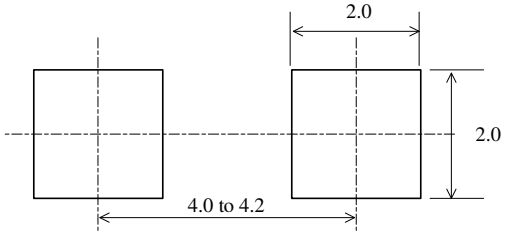
● **SJP Package**



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 °C / 10 s, 1 time
  Reflow:
  Preheat: 150 °C to 200 °C / 60 s to 120 s
  Solder heating: 255 °C / 30s, 3 times (260 °C peak)
  Soldering Iron: 350 °C / 3.5 s, 1 time

● **SJP Land Pattern Example**



NOTE:

- Dimensions in millimeters

Marking Diagram

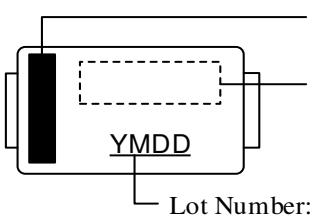


Table 1. Specific Device Code

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

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