P_D = 2 W
Transient Voltage Suppressor
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 1-3)
- High Reliability and Automotive Requirement
- High Surge Capability
- Flammability UL94V-0 (Equivalent)
- Bare Lead Frame: Pb-free (RoHS Compliant)

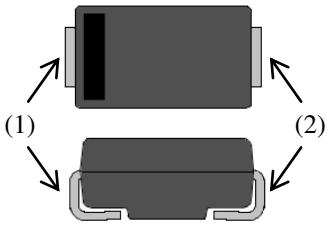
Applications

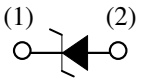
Protection of sensitive electronic equipment in passenger cars, trucks, vans, and buses:

- Engine Control Units
- Electric Control Units
- Braking System
- Power Steering System
- Airbag System
- Audio System
- Infotainment System

Package

SJP





(1) Cathode
(2) Anode

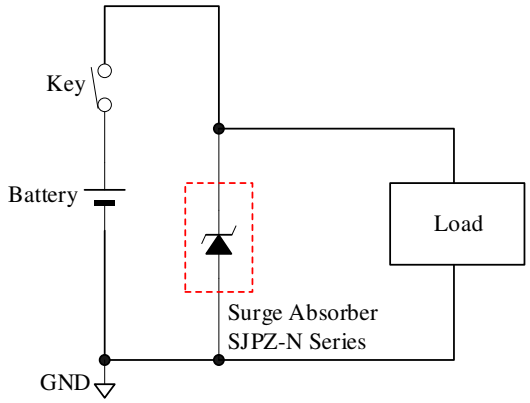
Not to scale

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		
SJPZ-N40	37.8 V	42.2 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
			30		SJPZ-N40
Peak 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	

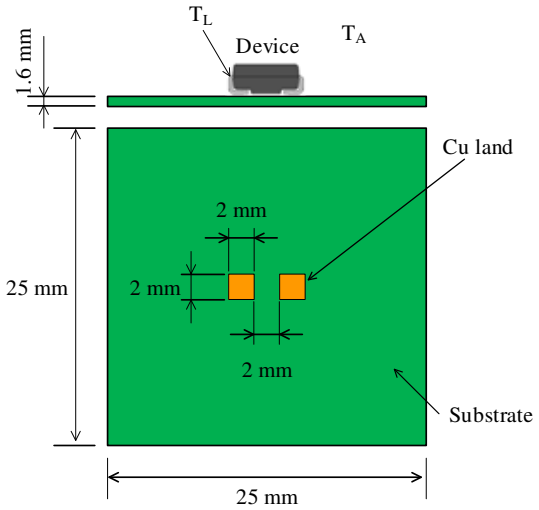


Figure 1. Lead Temperature Measurement Conditions

[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
		V_R = 30 V	—	—	1		SJPZ-N40
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
			37.8	—	42.2		SJPZ-N40
Breakdown Voltage Temperature Coefficient	r_Z	I_Z = 1 mA	—	13	—	mV/°C	SJPZ-N18
			—	23	—		SJPZ-N27
			—	29	—		SJPZ-N33
			—	35	—		SJPZ-N40
Breakdown Region Equivalent Resistance	R_Z	I_Z = 10 mA to 20 mA	—	2	—	Ω	
			—	4	—		
			—	5	—		
			—	7	—		
Thermal Resistance	$R_{th(J-L)}$	(3)	—	20	—	°C/W	

(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

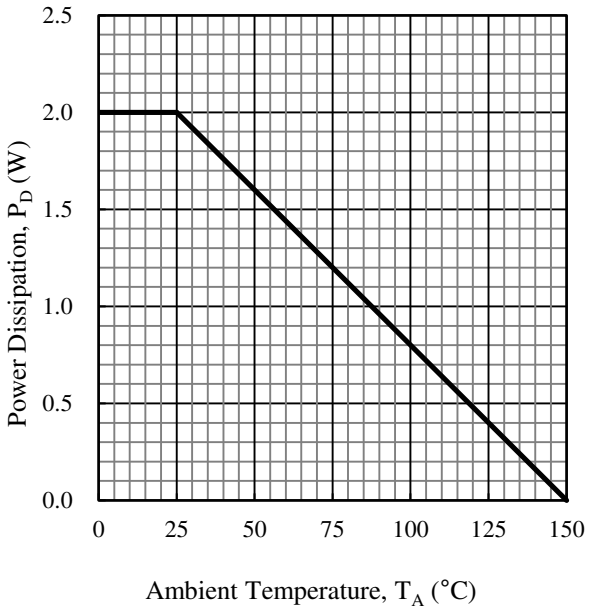


Figure 2. SJPZ-N18 Power Dissipation Curves[4]

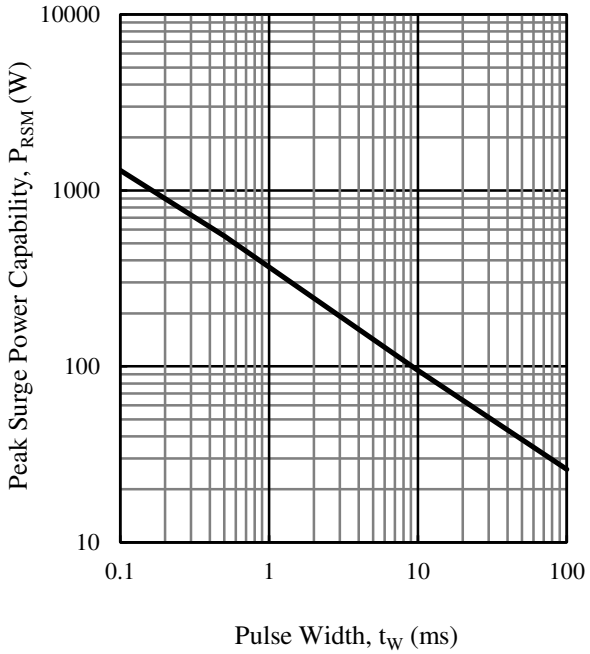


Figure 3. SJPZ-N18 Peak Surge Reverse Power Capability[5]

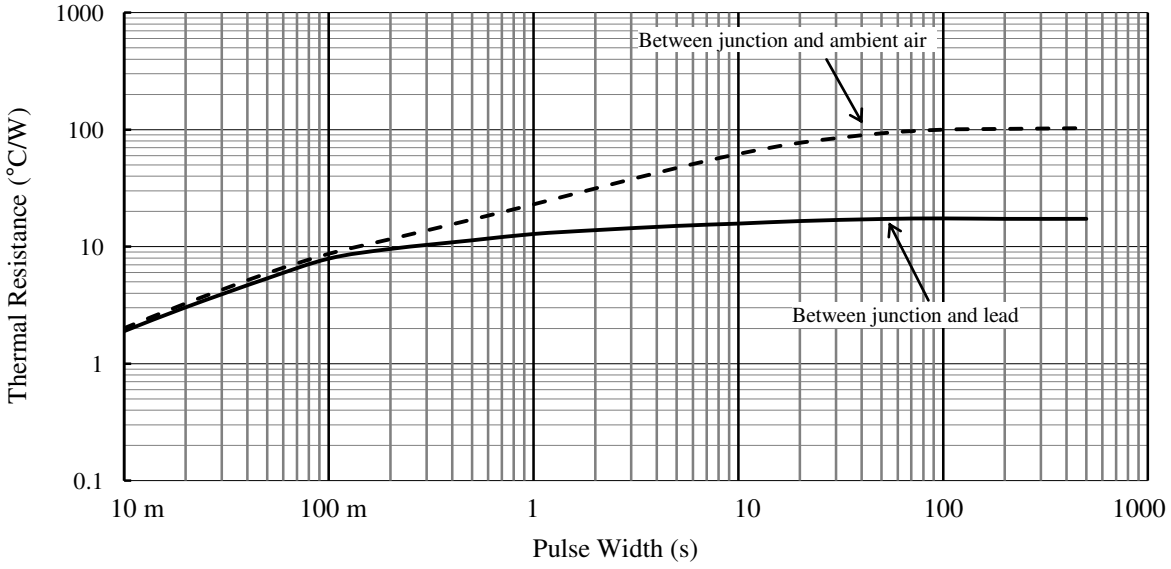


Figure 4. SJPZ-N18 Typical Transient Thermal Resistance[6]

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

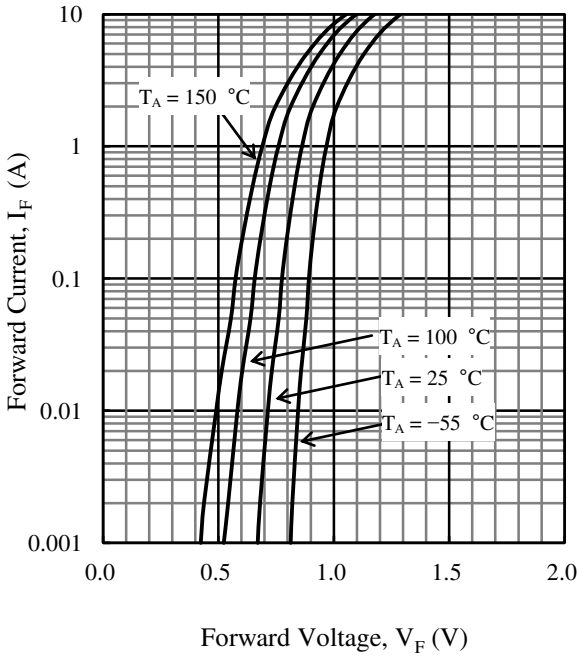


Figure 5. SJPZ-N18 Typical Characteristics: I_F vs. V_F

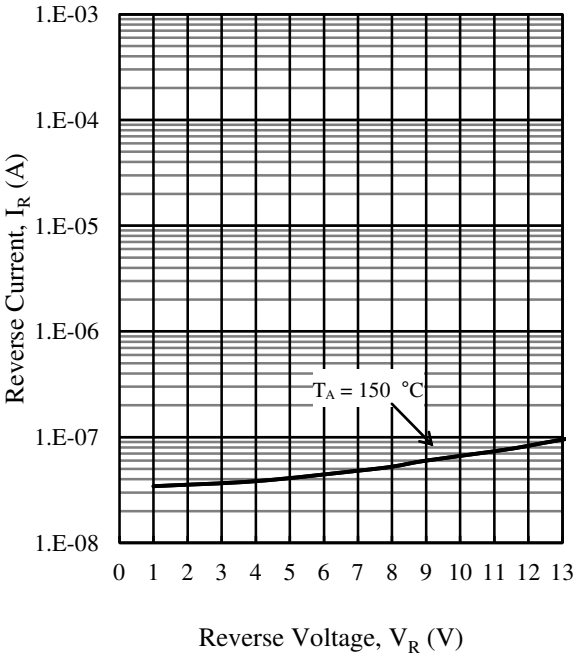


Figure 6. SJPZ-N18 Typical Characteristics: I_R vs. V_R

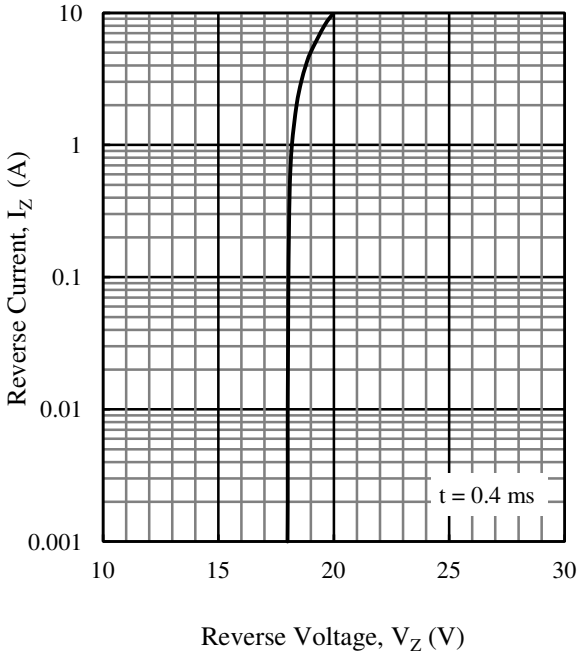


Figure 7. SJPZ-N18 Typical Characteristics: I_Z vs. V_Z

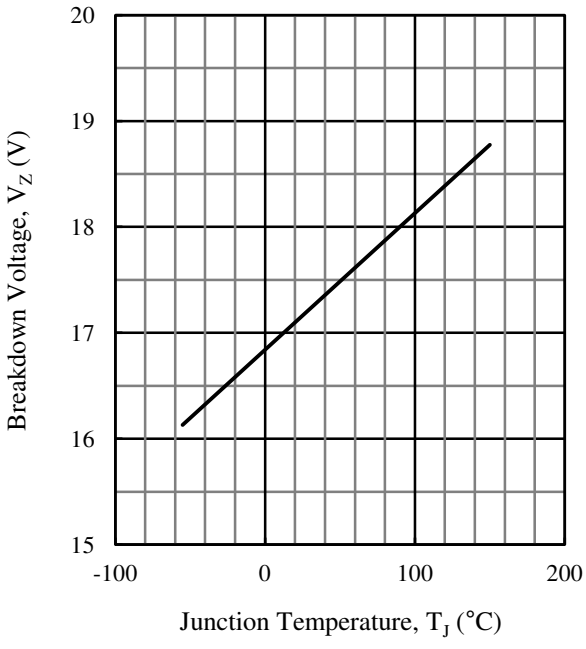


Figure 8. SJPZ-N18 Typical Characteristics: V_Z vs. T_J

SJPZ-N27 Rating and Characteristic Curves

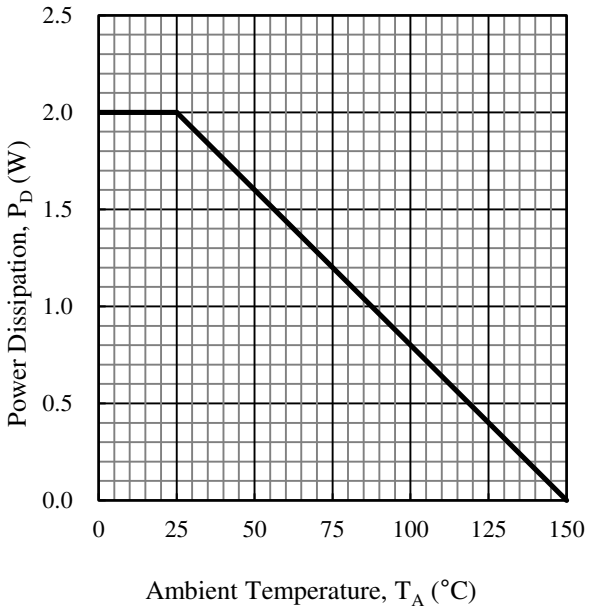


Figure 9. SJPZ-N27 Power Dissipation Curves[7]

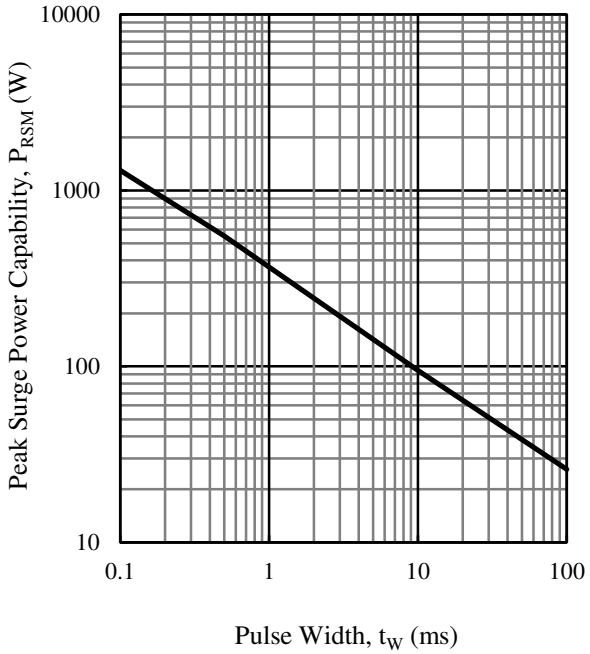


Figure 10. SJPZ-N27 Peak Surge Reverse Power Capability[8]

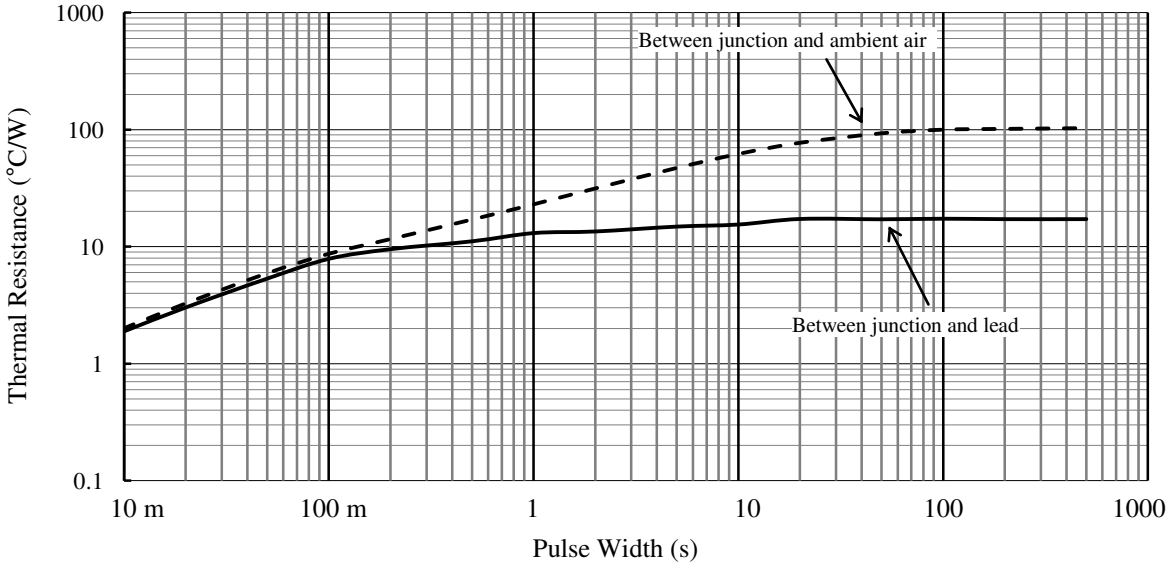


Figure 11. SJPZ-N27 Typical Transient Thermal Resistance[9]

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

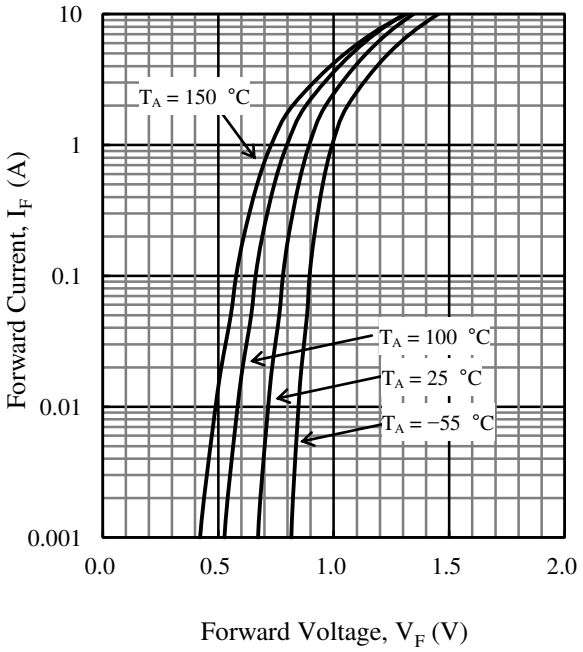


Figure 12. SJPZ-N27 Typical Characteristics: I_F vs. V_F

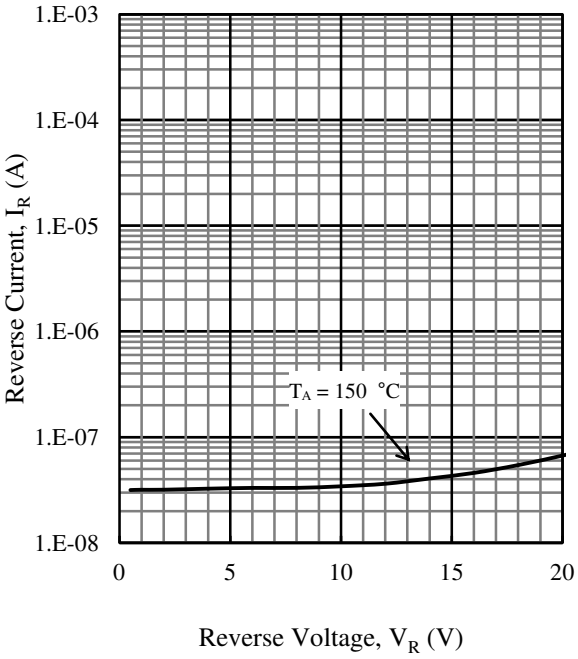


Figure 13. SJPZ-N27 Typical Characteristics: I_R vs. V_R

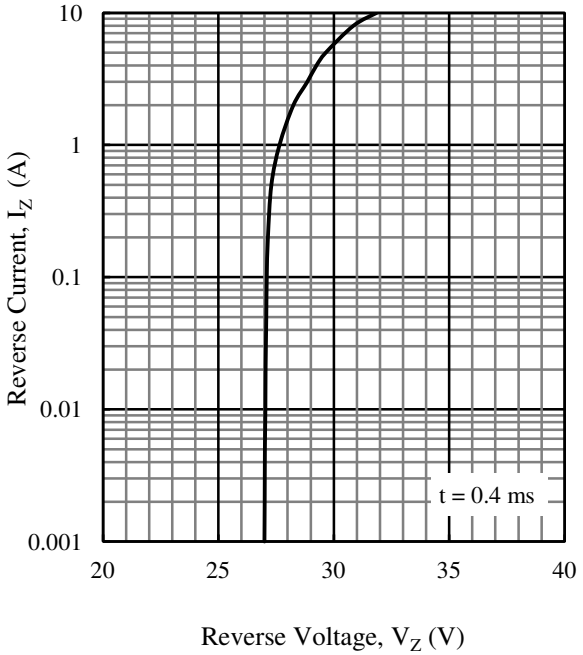


Figure 14. SJPZ-N27 Typical Characteristics: I_Z vs. V_Z

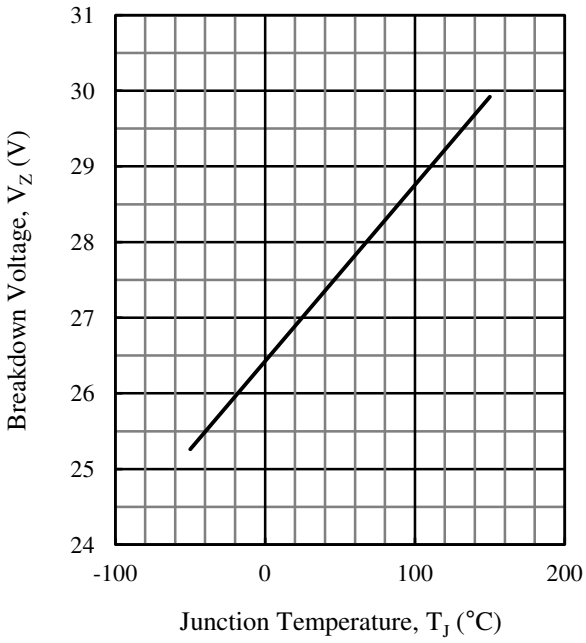


Figure 15. SJPZ-N27 Typical Characteristics: V_Z vs. T_J

SJPZ-N33 Rating and Characteristic Curves

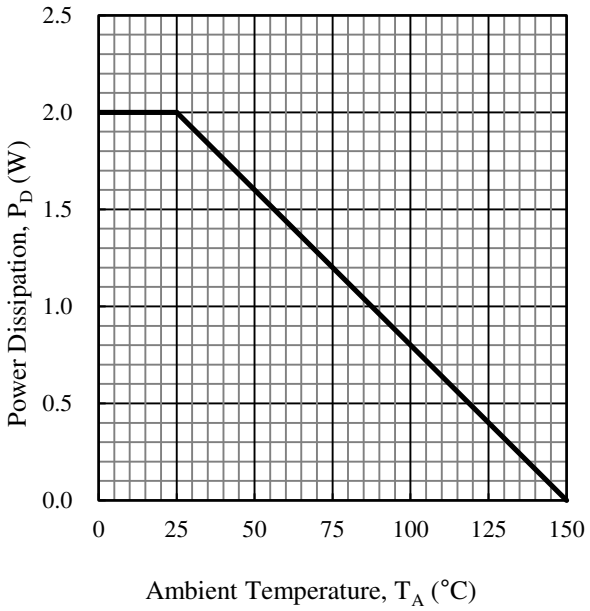


Figure 16. SJPZ-N33 Power Dissipation Curves[10]

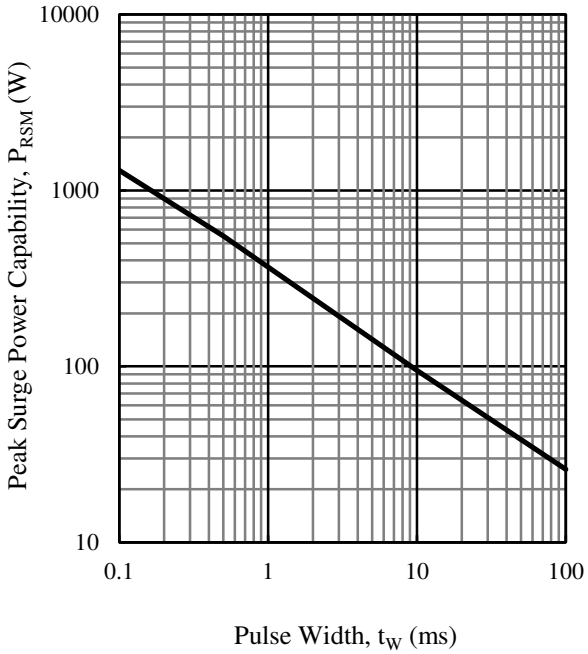


Figure 17. SJPZ-N33 Peak Surge Reverse Power Capability[11]

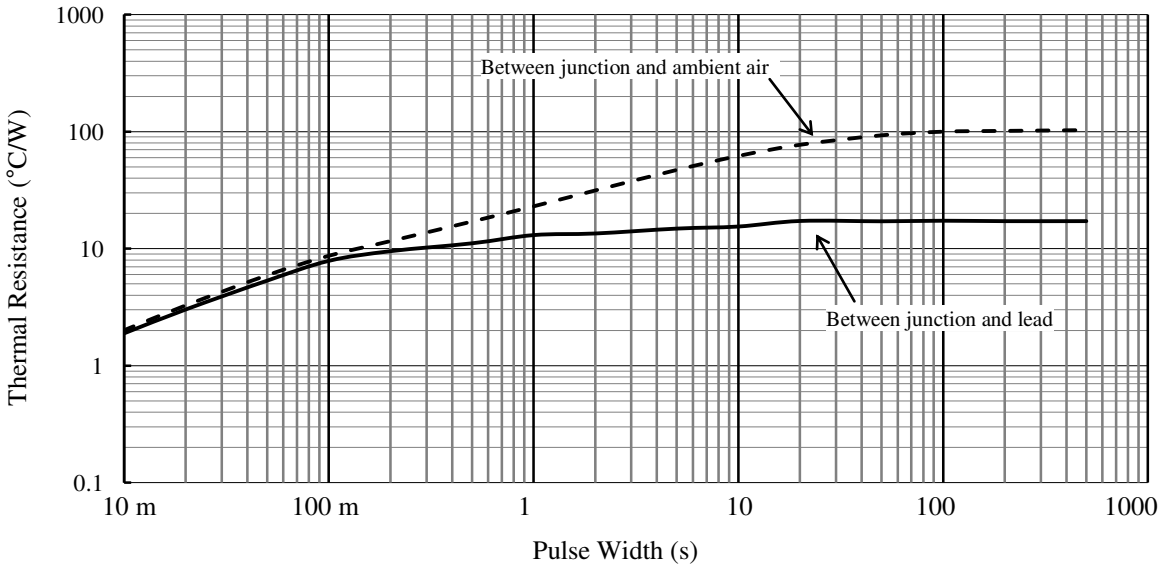


Figure 18. SJPZ-N33 Typical Transient Thermal Resistance[12]

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

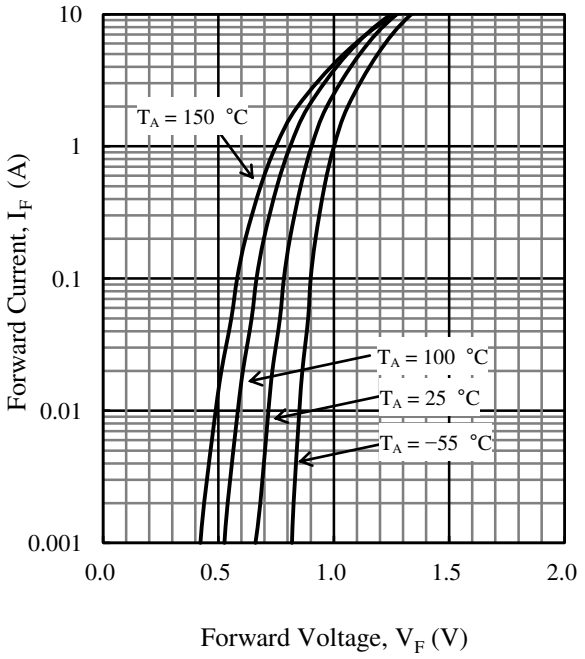


Figure 19. SJPZ-N33 Typical Characteristics: V_F vs. I_F

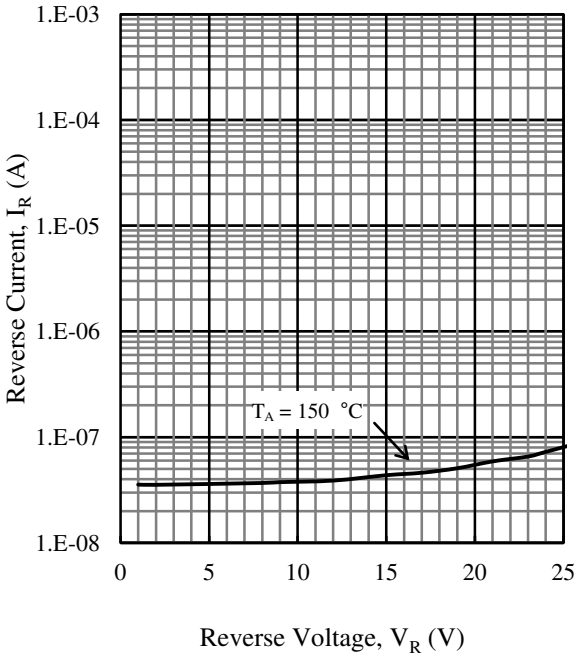


Figure 20. SJPZ-N33 Typical Characteristics: V_R vs. I_R

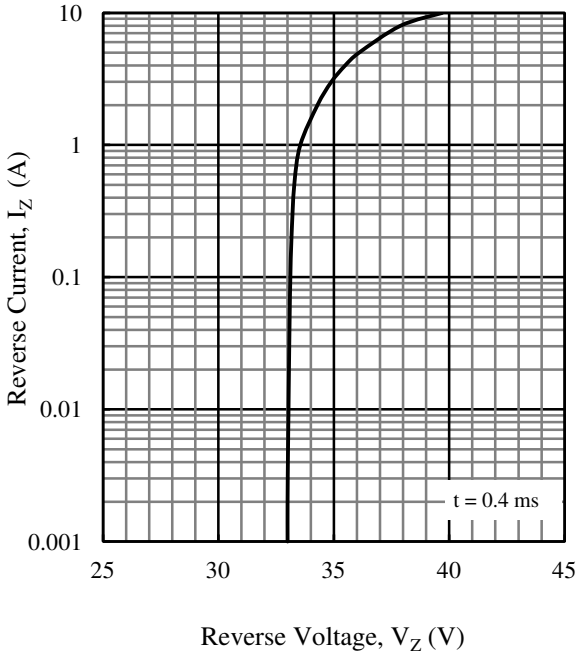


Figure 21. SJPZ-N33 Typical Characteristics: I_Z vs. V_Z

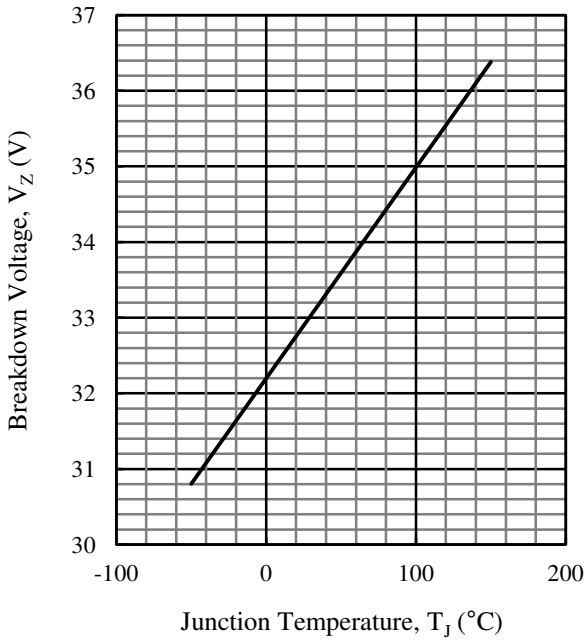


Figure 22. SJPZ-N33 Typical Characteristics: V_Z vs. T_J

SJPZ-N40 Rating and Characteristic Curves

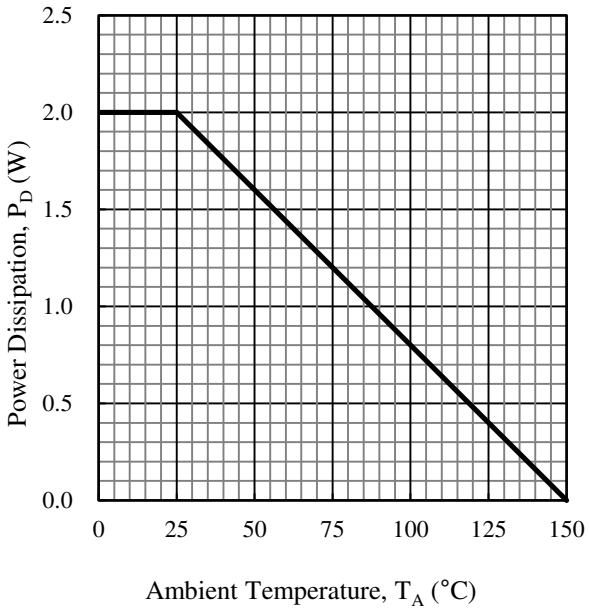


Figure 23. SJPZ-N40 Power Dissipation Curves[13]

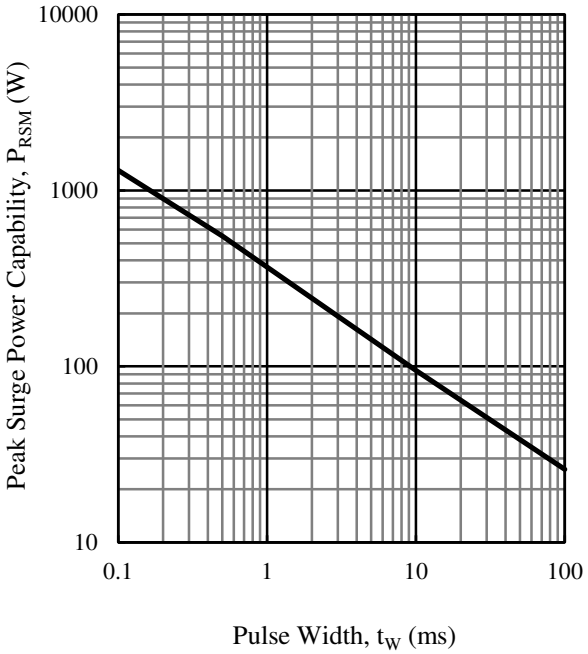


Figure 24. SJPZ-N40 Peak Surge Reverse Power Capability[14]

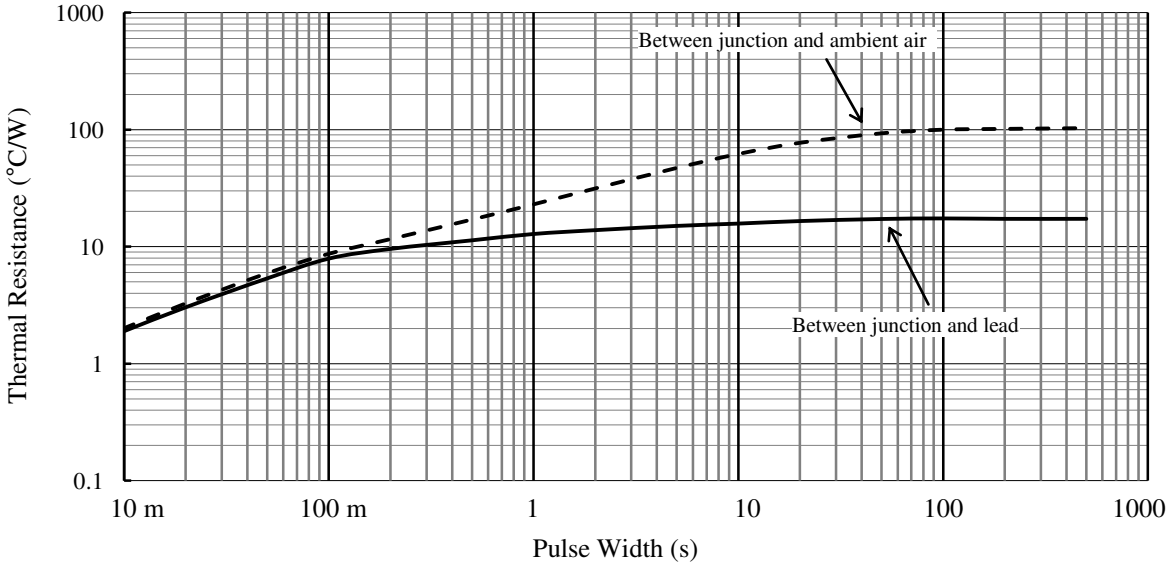


Figure 25. SJPZ-N40 Typical Transient Thermal Resistance[15]

[13] See Figure 1 for the measurement conditions of the lead temperature.
[14] t_W is single block pulse..
[15] See Figure 1 for the measurement conditions of the lead temperature.

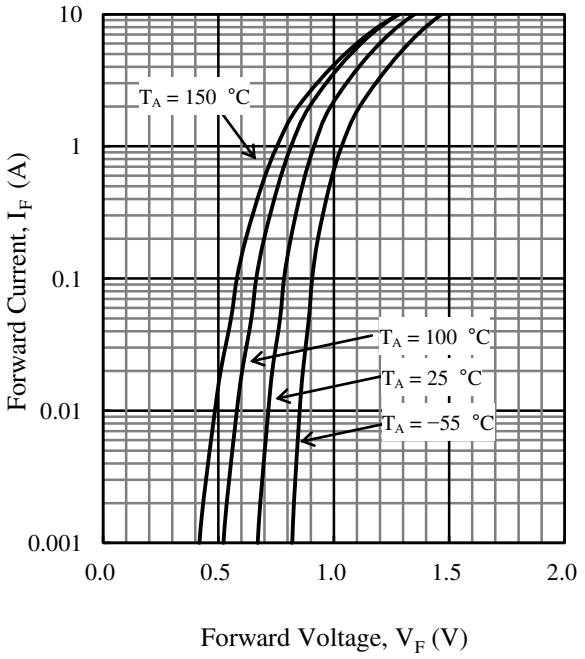


Figure 26. SJPZ-N40 Typical Characteristics: I_F vs. V_F

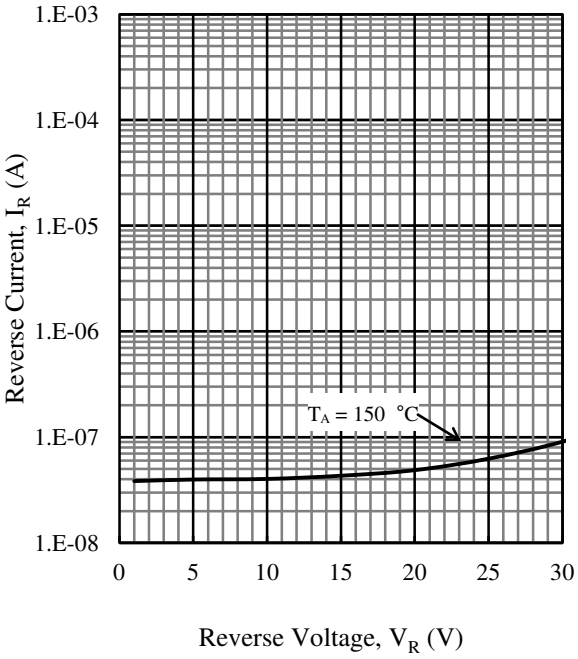


Figure 27. SJPZ-N40 Typical Characteristics: I_R vs. V_R

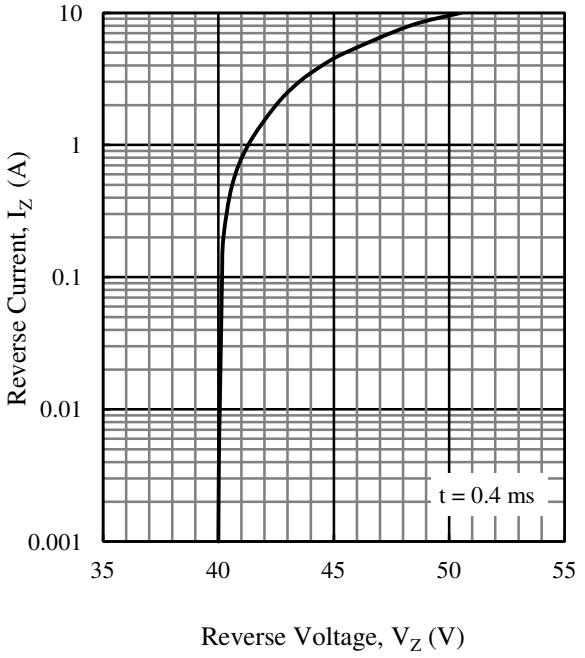


Figure 28. SJPZ-N40 Typical Characteristics: I_Z vs. V_Z

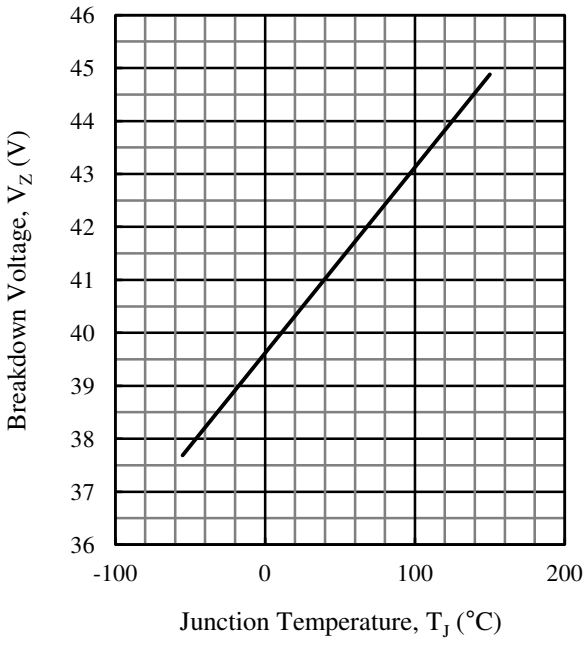
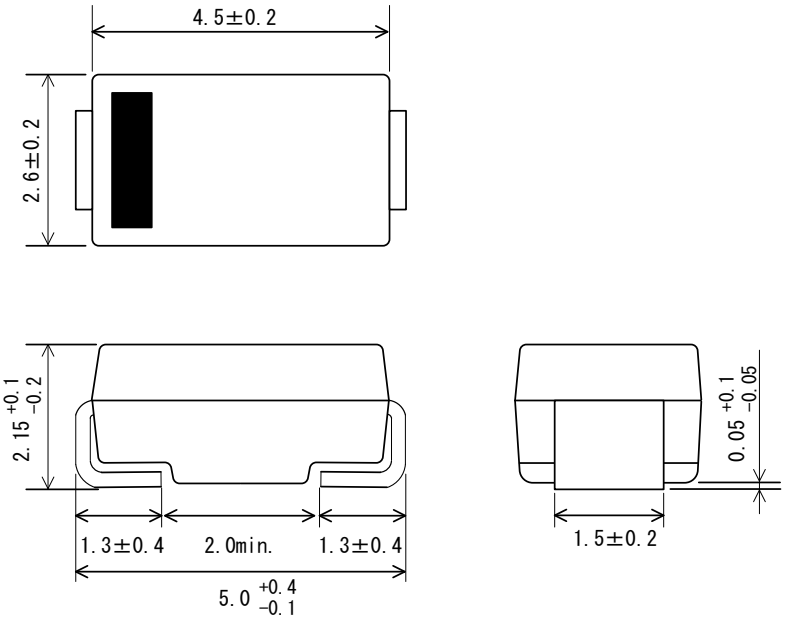


Figure 29. SJPZ-N40 Typical Characteristics: V_Z vs. T_J

Physical Dimensions

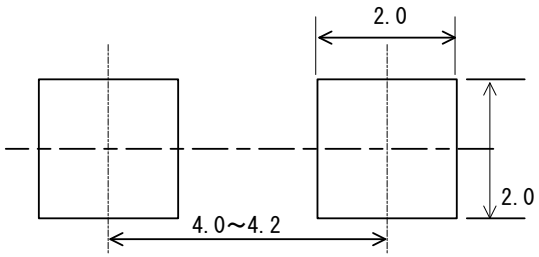
● **SJP**



NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, be sure to minimize the working time, within the following limits:
- MSL: JEDEC LEVEL1
- When soldering the products, it is required to minimize the working time, within the following limits:
  Flow: 260 ± 5 °C / 10 ± 1 s, 2 times
  Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 s, 1 time

● **SJP Land Pattern Example**



NOTE:

- Dimensions in millimeters

Marking Diagram

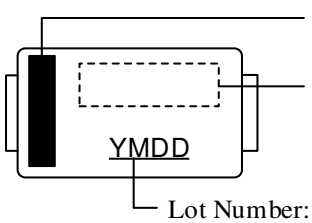


Table 1. Specific Device Code

Specific Device Code	Part Number
ZN18	SJPZ-N18
ZN27	SJPZ-N27
ZN33	SJPZ-N33
ZN40	SJPZ-N40

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