

$P_D = 1\text{ W}$
Transient Voltage Suppressor Diode
SJPZ-E20

Description

The SJPZ-E20 is a power Zener diode designed for the protection of automotive electronic units, especially from the surge generated during load dump conditions and voltage transients induced by inductive loads.

Features

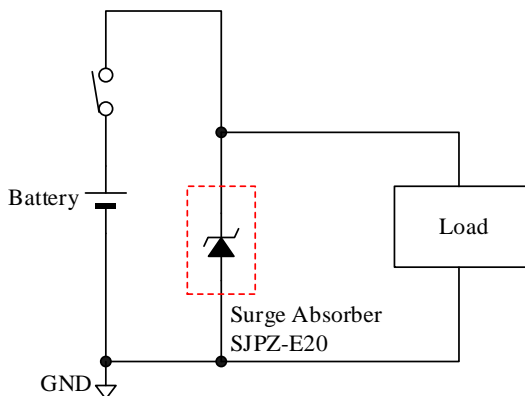
- V_Z ----- 25 V to 31 V
- P_{RSM} ----- 50 W (0.5 ms, single block pulse)
- P_D ----- 1 W
- AEC-Q101 Qualified
- Meets the Surge Protection Requirements in ISO7637-2 Standard (Pulse 1 to 3)
- Suitable for High Reliability and Automotive Requirement
- High Surge Capability
- Flammability UL94V-0 (Equivalent)
- Bare Lead Frame: Pb-free (RoHS Compliant)

Applications

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

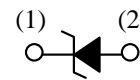
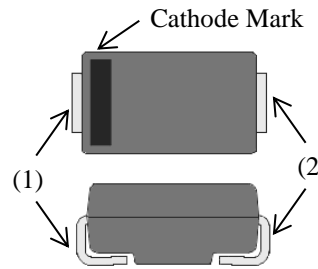
- Engine Control Units
- Electric Control Units
- Braking System
- Power Steering System
- Airbags
- Audio/Infotainment Equipment

Typical Application



Package

SJP



(1) Cathode
 (2) Anode

Not to scale

Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Power Dissipation ⁽¹⁾	P_D	Lead temperature, T_L ⁽²⁾	1	W
Peak Pulse Reverse Power	P_{RSM}	0.5 ms, single block pulse	50	W
Junction Temperature	T_J		-55 to 150	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to 150	$^\circ\text{C}$

Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse Leakage Current	I_R	$V_R = 15\text{ V}$	—	—	10	μA
Breakdown Voltage	V_Z	$I_Z = 1\text{ mA}$	25	—	31	V
Breakdown Voltage Temperature Coefficient	r_Z	$I_Z = 1\text{ mA}$	—	16	—	$\text{mV}/^\circ\text{C}$
Breakdown Region Equivalent Resistance	R_Z	$I_Z = 10\text{ mA to } 20\text{ mA}$	—	4	—	Ω
Thermal Resistance	$R_{th(J-L)}$	⁽³⁾	—	—	20	$^\circ\text{C}/\text{W}$

Mechanical Characteristics

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

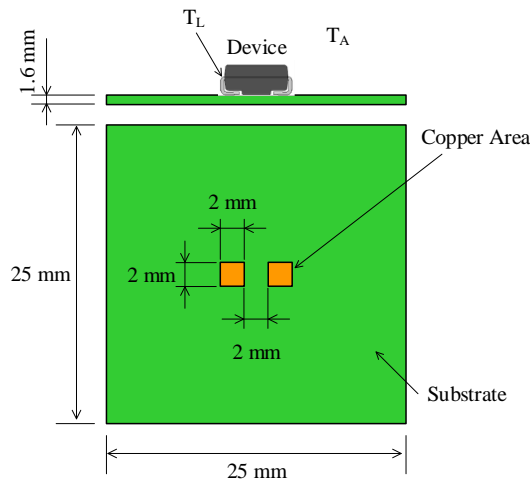


Figure 1. Lead Temperature Measurement Conditions

⁽¹⁾ See Figure 2.

⁽²⁾ See Figure 1.

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

Derating Curves

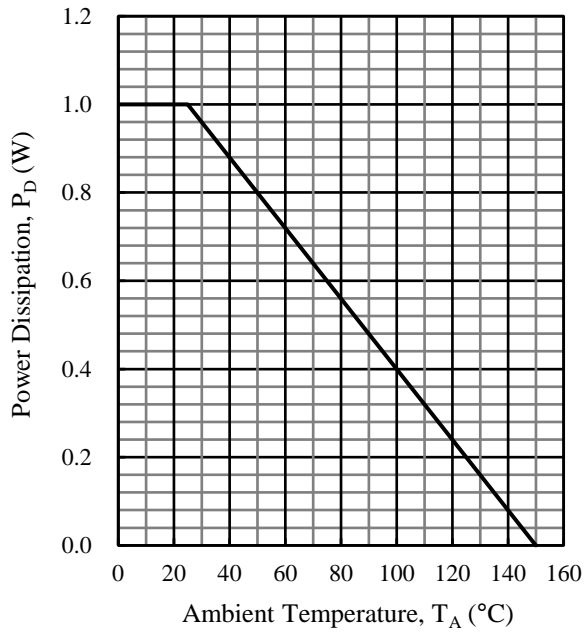


Figure 2. Power Dissipation Curve⁽⁴⁾

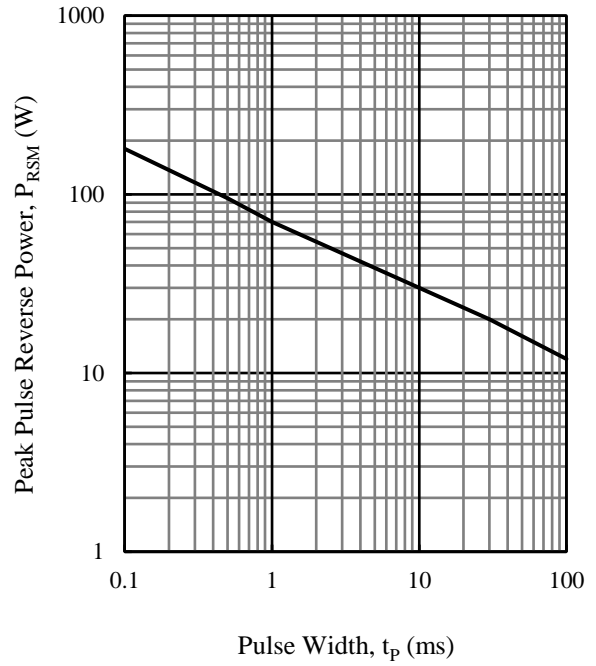


Figure 3. Peak Pulse Reverse Power⁽⁵⁾

⁽⁴⁾ See Figure 1 for the measurement conditions.

⁽⁵⁾ The pulse is single block pulse.

Characteristic Curves

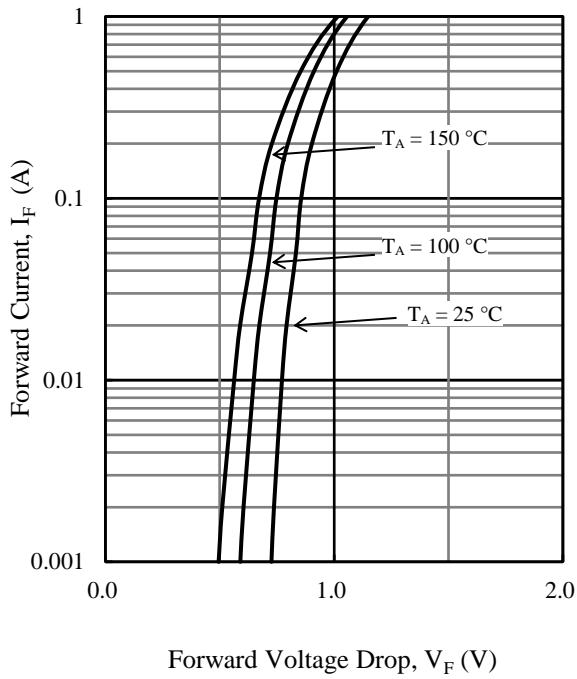


Figure 4. Typical Characteristics: I_F vs. V_F

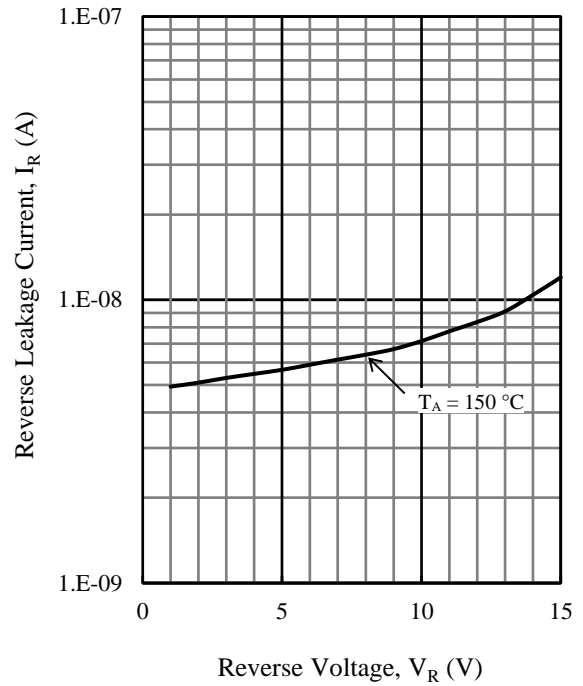


Figure 5. Typical Characteristics: I_R vs. V_R ⁽⁶⁾

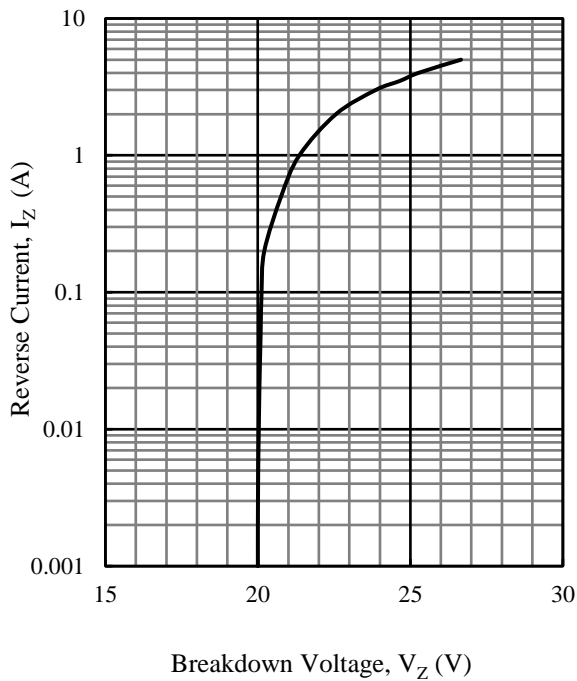


Figure 6. Typical Characteristics: I_Z vs. V_Z
($T_J = 25\text{ °C}$, $t = 0.4\text{ ms}$)

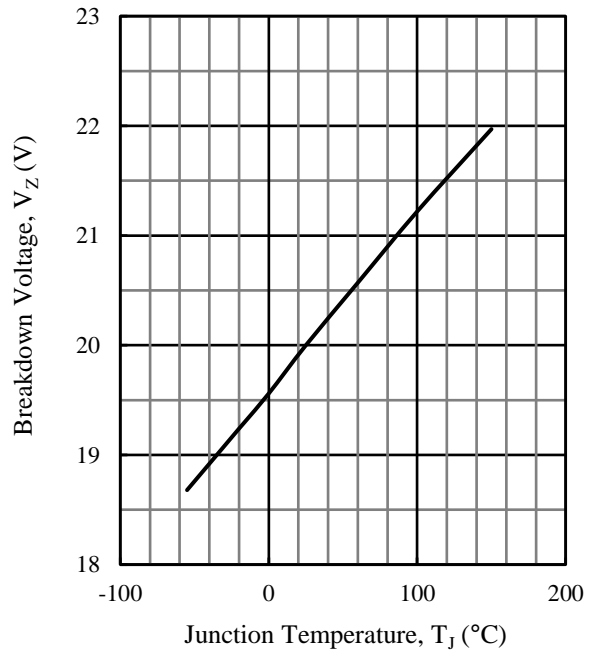


Figure 7. Typical Characteristics: V_Z vs. T_J

⁽⁶⁾ I_R is less than 10 nA at 100 °C or less.

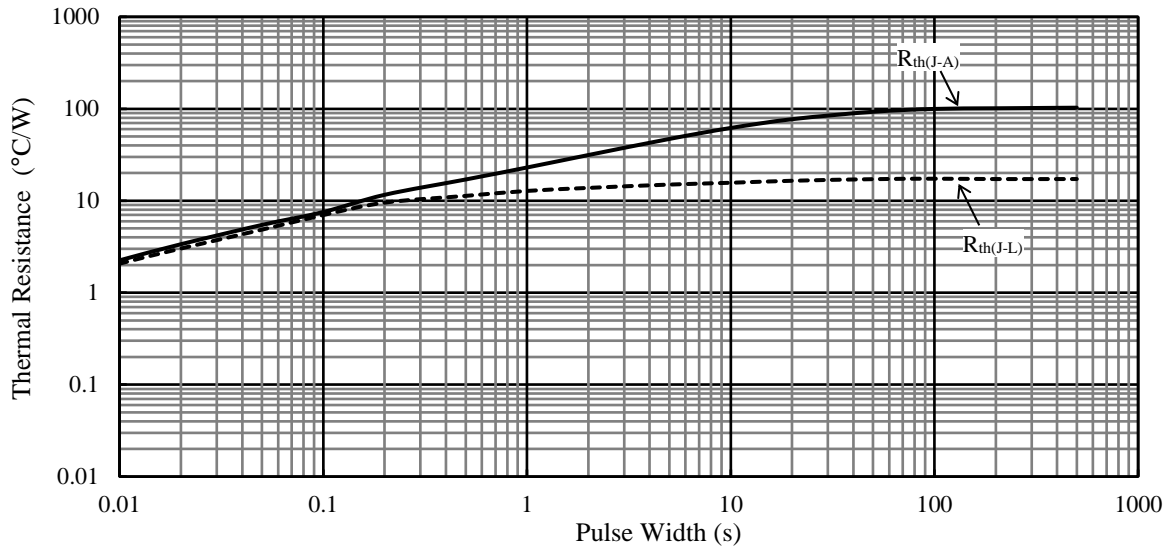


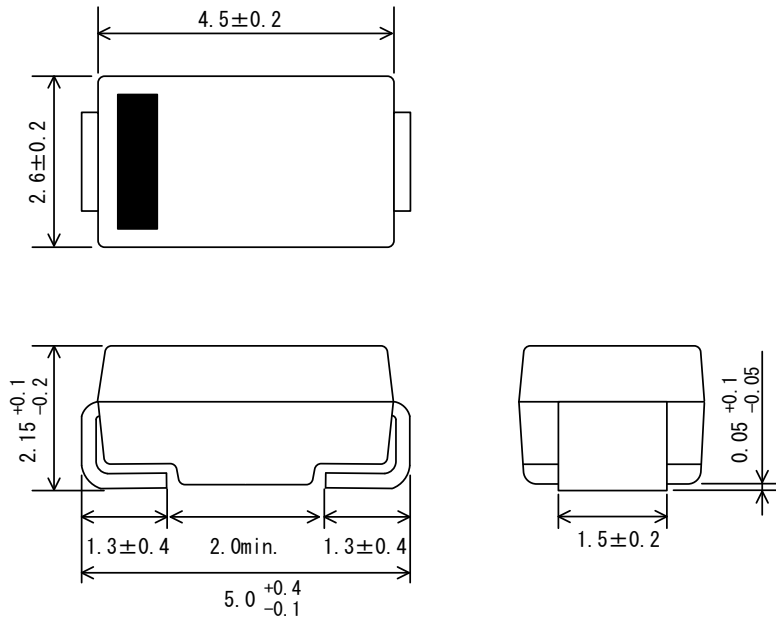
Figure 8. Typical Transient Thermal Resistance Characteristics ⁽⁷⁾

⁽⁷⁾ Lead temperature is measured as shown in Figure 1.

SJPZ-E20

Physical Dimensions

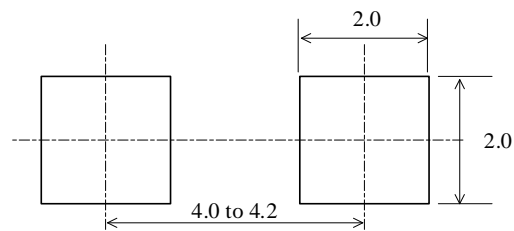
• SJP Package



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 s, 1 time
Reflow:
 Preheat: $150\text{ }^{\circ}\text{C}$ to $200\text{ }^{\circ}\text{C}$ / 60 s to 120 s
 Solder heating: $255\text{ }^{\circ}\text{C}$ / 30s, 3 times ($260\text{ }^{\circ}\text{C}$ peak)
 Soldering Iron: $350\text{ }^{\circ}\text{C}$ / 3.5 s, 1 time

• SJP Land Pattern Example



NOTE:

- Dimensions in millimeters

Marking Diagram

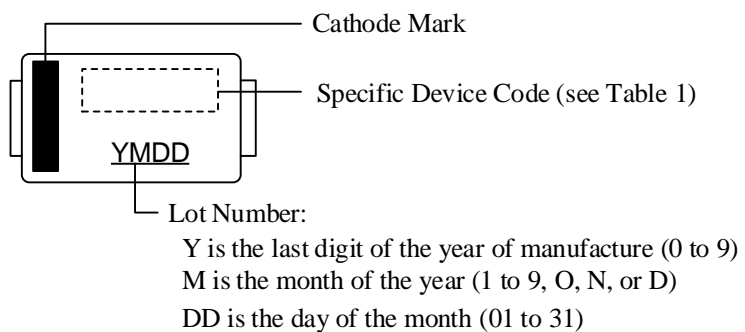


Table 1. Specific Device Code

Specific Device Code	Part Number
ZE20	SJPZ-E20

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