

**$P_D = 1\text{ W}$**   
**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**

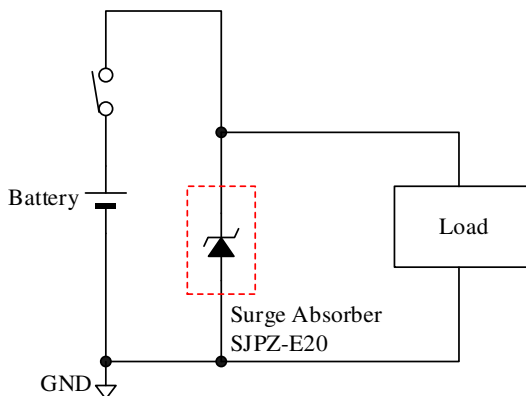
- $V_Z$  ----- 25 V to 31 V
- $P_{RSM}$  ----- 50 W (0.5 ms, single block pulse)
- $P_D$  ----- 1 W
- AEC-Q101 Qualified
- Meets the Surge Protection Requirements in ISO7637-2 Standard (Pulse 1 to 3)
- Suitable for High Reliability and Automotive Requirement
- High Surge Capability
- Flammability UL94V-0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

**Applications**

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

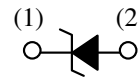
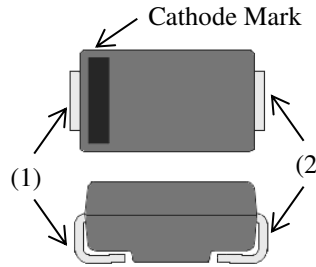
- Engine Control Units
- Electric Control Units
- Braking System
- Power Steering System
- Airbags
- Audio/Infotainment Equipment

**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 <sup>(1)</sup>	$P_D$	Lead temperature, $T_L$ <sup>(2)</sup>	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	$\mu\text{A}$
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	—	$\Omega$
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

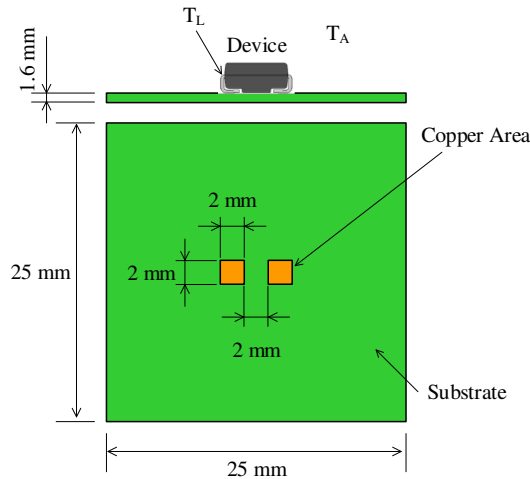


Figure 1. Lead Temperature Measurement Conditions

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

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

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

Derating Curves

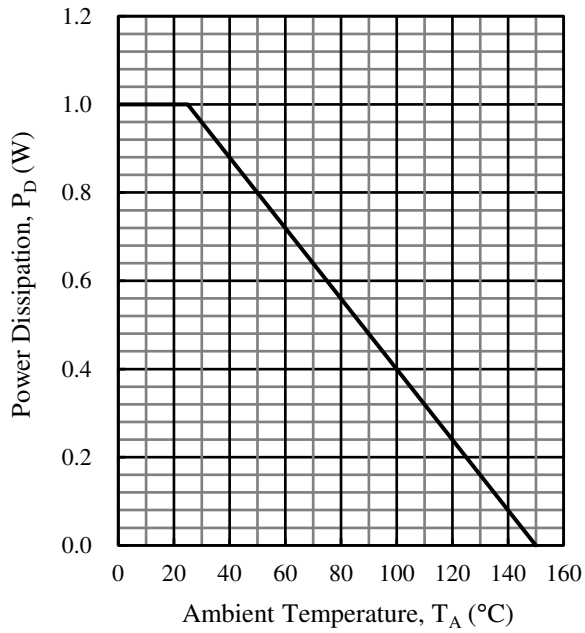


Figure 2. Power Dissipation Curve<sup>(4)</sup>

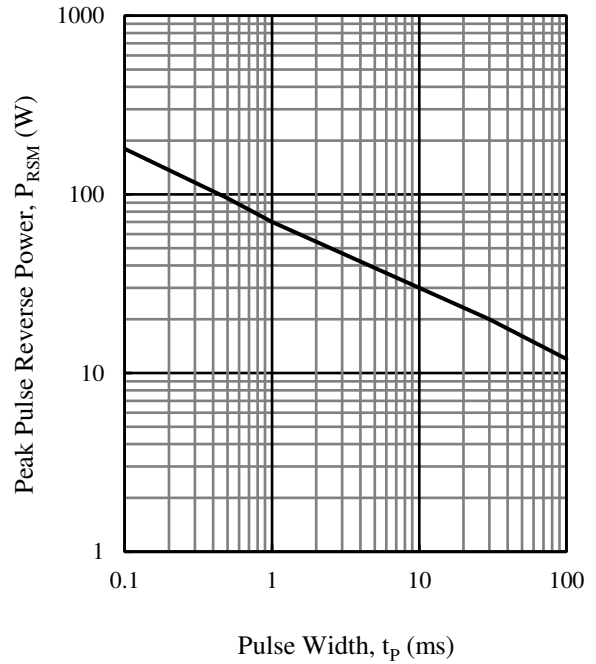


Figure 3. Peak Pulse Reverse Power<sup>(5)</sup>

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

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

Characteristic Curves

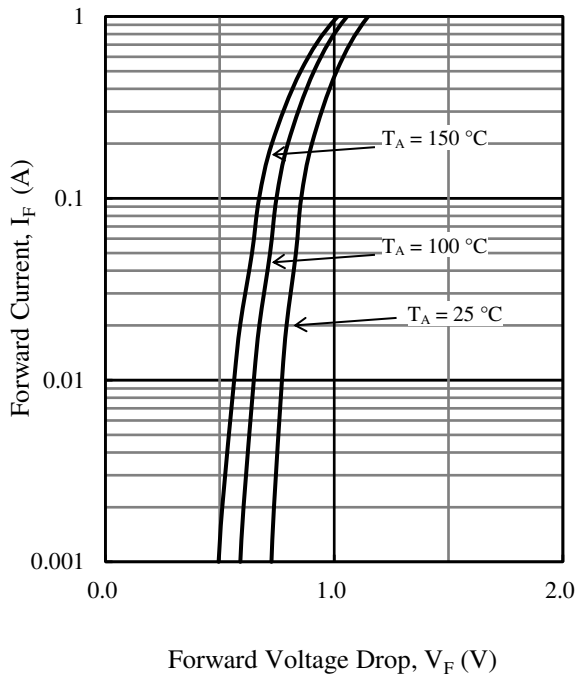


Figure 4. Typical Characteristics:  $I_F$  vs.  $V_F$

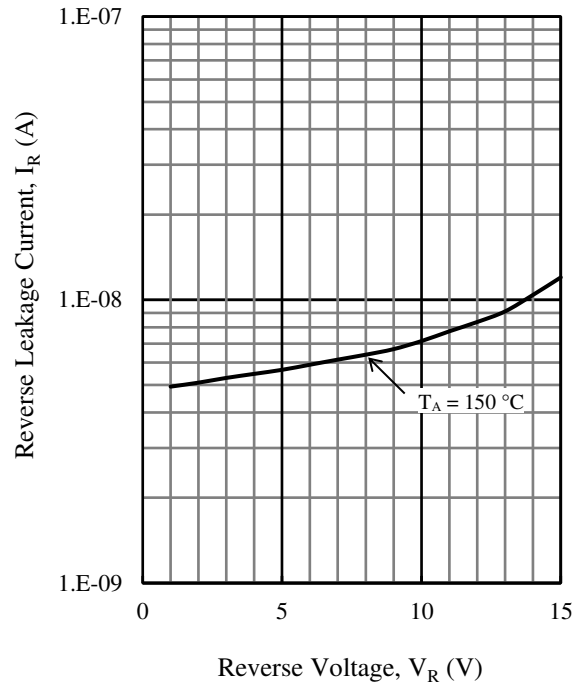


Figure 5. Typical Characteristics:  $I_R$  vs.  $V_R$  <sup>(6)</sup>

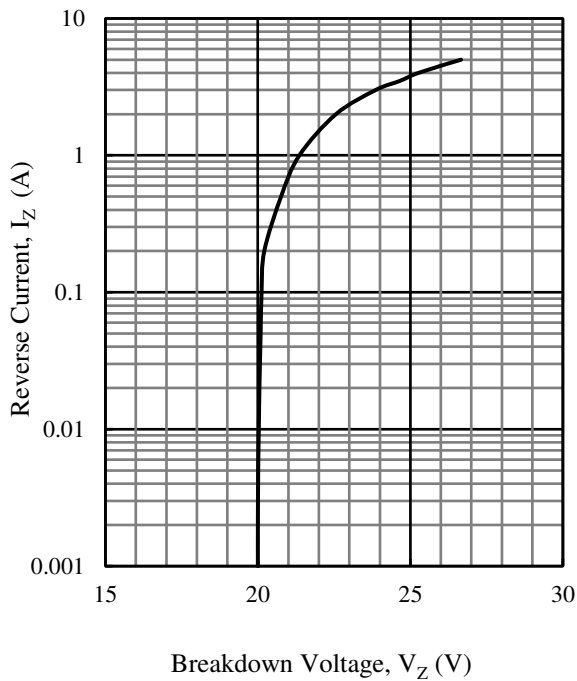


Figure 6. Typical Characteristics:  $I_Z$  vs.  $V_Z$   
( $T_J = 25\text{ °C}$ ,  $t = 0.4\text{ ms}$ )

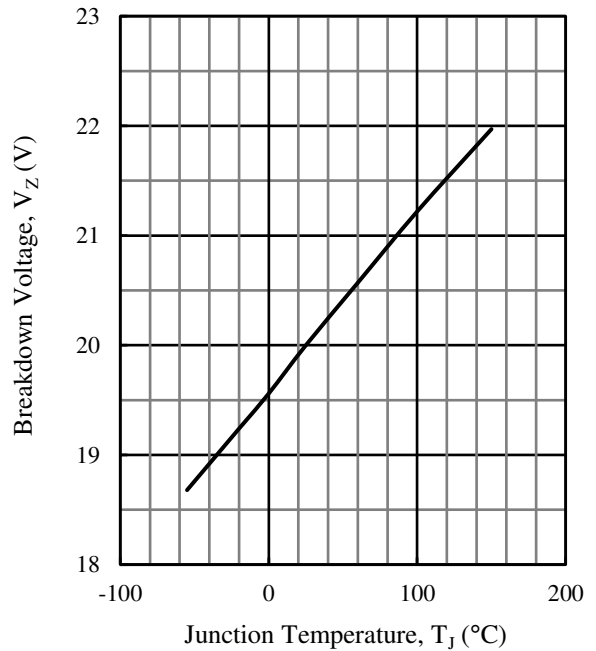


Figure 7. Typical Characteristics:  $V_Z$  vs.  $T_J$

<sup>(6)</sup>  $I_R$  is less than 10 nA at 100 °C or less.

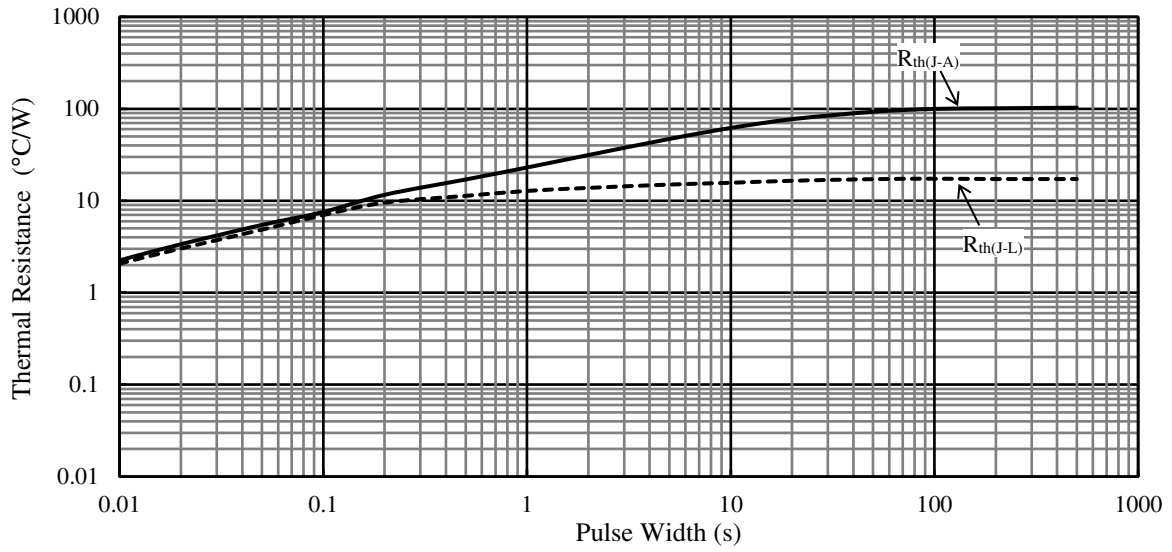


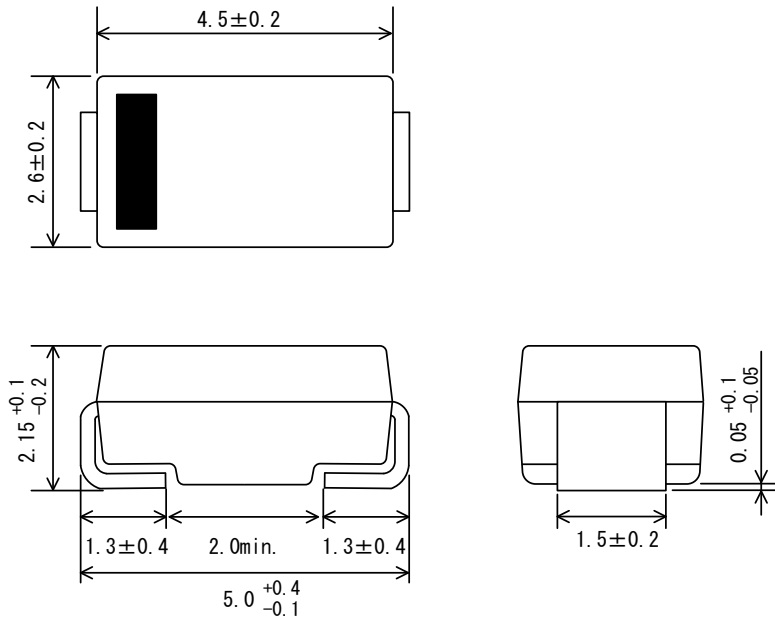
Figure 8. Typical Transient Thermal Resistance Characteristics <sup>(7)</sup>

<sup>(7)</sup> Lead temperature is measured as shown in Figure 1.

# SJPZ-E20

## Physical Dimensions

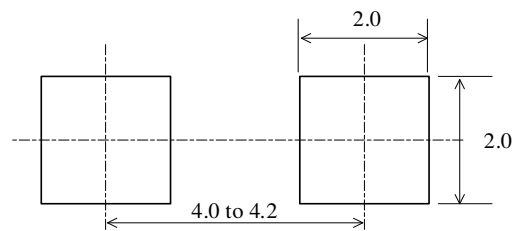
### • SJP Package



### 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

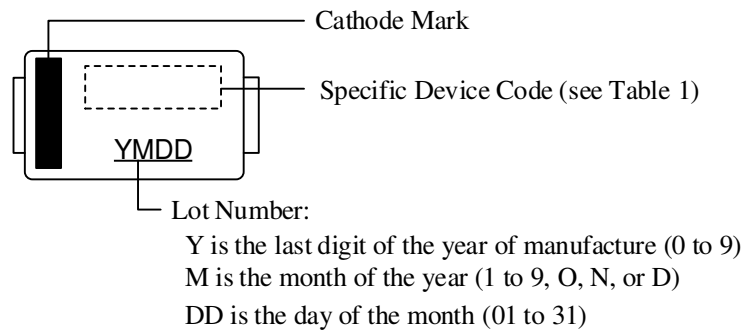


Table 1. Specific Device Code

Specific Device Code	Part Number
ZE20	SJPZ-E20

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