

**$V_Z(\text{max.}) = 30 \text{ V} / 44 \text{ V}$**   
**Transient Voltage Suppressor**  
**SZ-10 Series**

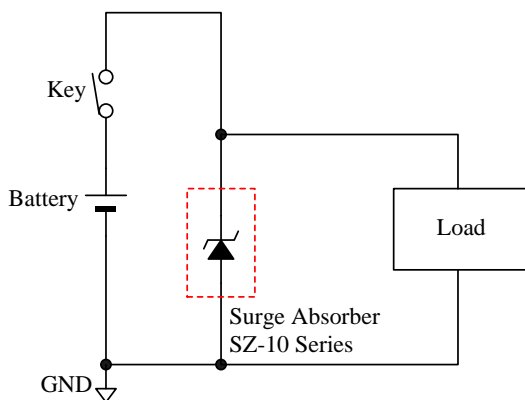
**Description**

Sanken SZ-10 series devices are power zener diodes designed for the protection of automotive electronic units from especially the surge generated during load dump conditions, voltage transients induced by inductive loads. The package of the IC has high dissipation and high surge capability.

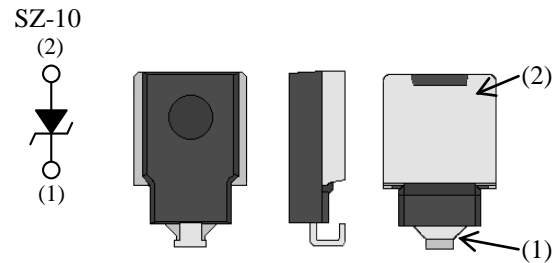
**Features**

- AEC-Q101 Qualified
- Meets ISO7637-2 Surge Protection Specification (Pulse 5a)
- $T_J = 175 \text{ }^\circ\text{C}$  Capability Suitable for High Reliability and Automotive Requirement
- High Surge Capability
- Flammability UL94V-0 (Equivalent)
- Compliant with RoHS Directive

**Typical Application**



**Package**



(1) Cathode  
 (2) Anode

Not to Scale

**SZ-10 Series**

Products	$V_Z$		$I_{RSM}$	$P_D$
	Min.	Max.		
SZ-10N27	24 V	30 V	70 A	5 W
SZ-10NN27			90 A	6 W
SZ-10N40	36 V	44 V	45 A	5 W
SZ-10NN40			70 A	6 W

**Application**

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

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# SZ-10 Series

## 1. Absolute Maximum Ratings

Unless specifically noted  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Rating	Unit	Note
Power Dissipation <sup>(1)</sup>	$P_D$	Lead temperature <sup>(2)</sup>	5	W	SZ-10N27 SZ-10N40
			6		SZ-10NN27 SZ-10NN40
DC Blocking Voltage	$V_{DC}$	-	22	V	SZ-10N27 SZ-10NN27
			32		SZ-10N40 SZ-10NN40
Peak Surge Reverse Current	$I_{RSM}$	<sup>(3)</sup>	45	A	SZ-10N40
			70		SZ-10N27 SZ-10NN40
			90		SZ-10NN27
Junction Temperature	$T_j$	-	- 55 to 175	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-	- 55 to 175	$^\circ\text{C}$	

<sup>(1)</sup> Refer to Figure 3-1 Power Dissipation Curves.

<sup>(2)</sup> Refer to Figure 1-1

<sup>(3)</sup> Refer to Figure 1-2

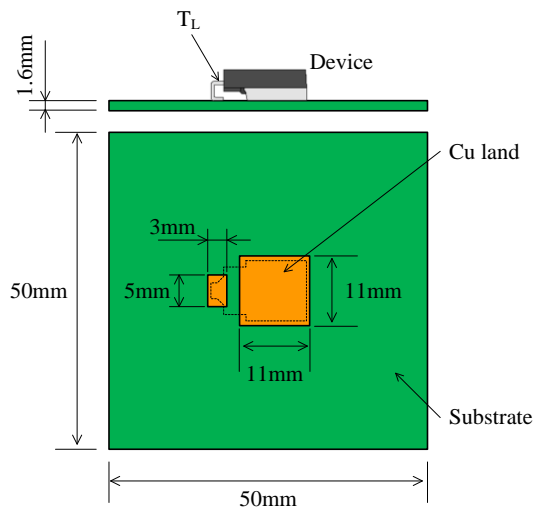


Figure 1-1 Lead temperature measurement condition

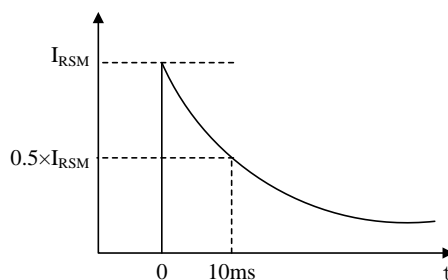


Figure 1-2 Definition of Peak Surge Reverse Current

## SZ-10 Series

### 2. Electrical Characteristics

Unless specifically noted,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Forward Voltage Drop	$V_F$	$I_F = 6\text{ A}$	–	–	1.03	V	SZ-10N40
			–	–	1.00		SZ-10N27
			–	–	0.98		SZ-10NN40
			–	–	0.95		SZ-10NN27
Reverse Leakage Current	$I_R$	$V_R = V_{DC}$	–	–	10	$\mu\text{A}$	
Breakdown Voltage	$V_Z$	$I_Z = 10\text{ mA}$	24	–	30	V	SZ-10N27 SZ-10NN27
			36	–	44		SZ-10N40 SZ-10NN40
Breakdown Voltage Temperature Coefficient	$r_Z$	$I_Z = 10\text{ mA}$	–	22	–	$\text{mV}/^\circ\text{C}$	SZ-10N27 SZ-10NN27
			–	36	–		SZ-10N40 SZ-10NN40
Breakdown Region Equivalent Resistance	$R_Z$	$I_Z = 1\text{ A to } 10\text{ A}$	–	0.08	–	$\Omega$	SZ-10N27 SZ-10NN27
			–	0.1	–		SZ-10N40 SZ-10NN40
Thermal Resistance	$R_{th(j-L)}$	<sup>(1)</sup>	–	2.0	–	$^\circ\text{C}/\text{W}$	

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

### 3. Performance Curves

#### 3.1 Power Dissipation

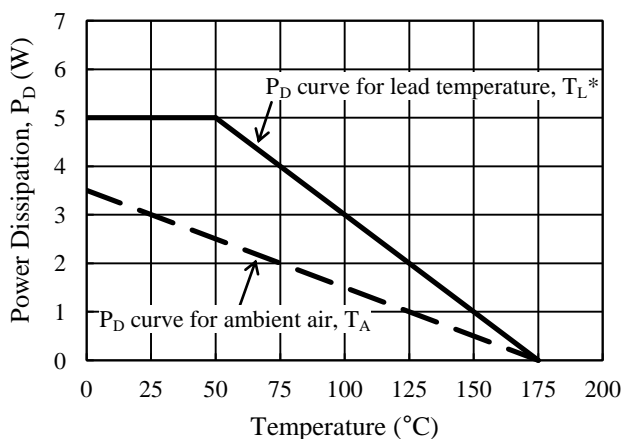


Figure 3-1 SZ10-N27 and SZ-10N40 Power Dissipation curves

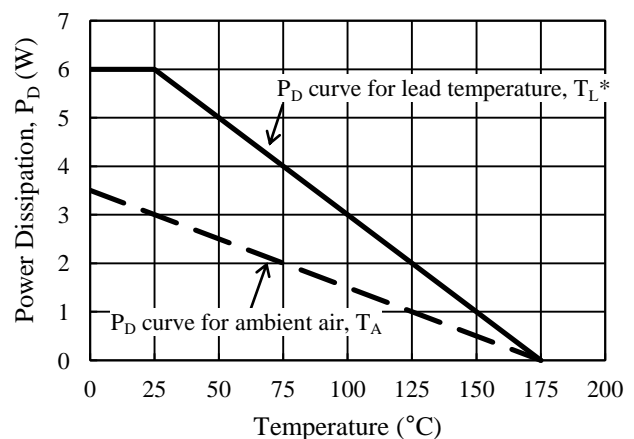


Figure 3-2 SZ10-NN27 and SZ-10NN40 Power Dissipation curves

\* Refer to Figure 1-1

3.2 Peak Surge Reverse Power Capability

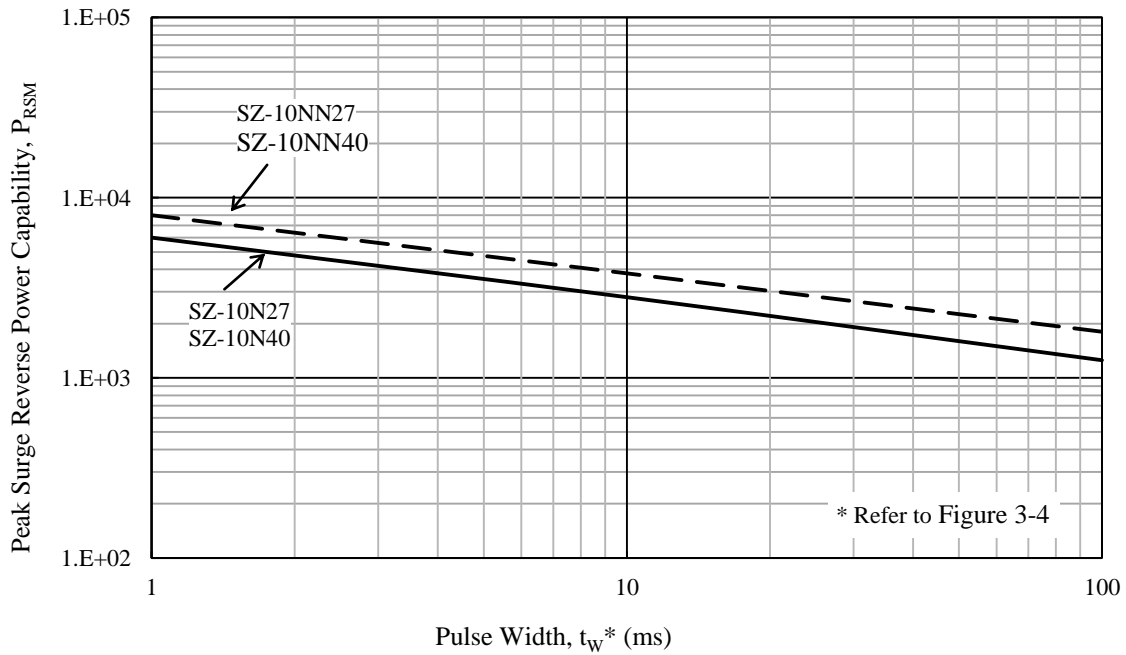


Figure 3-3 Peak surge reverse power capability

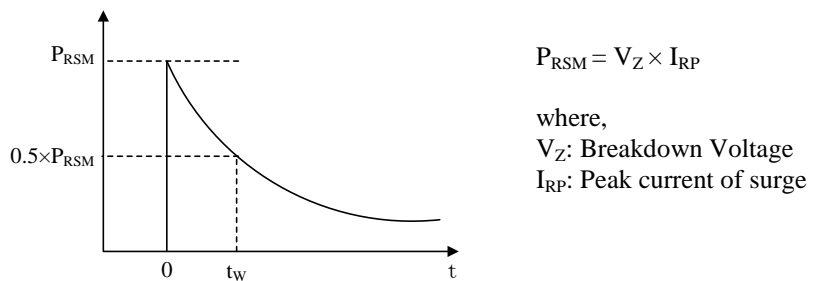


Figure 3-4 Definition of Peak Surge Reverse Power

3.3 SZ-10N27 Typical Characteristics

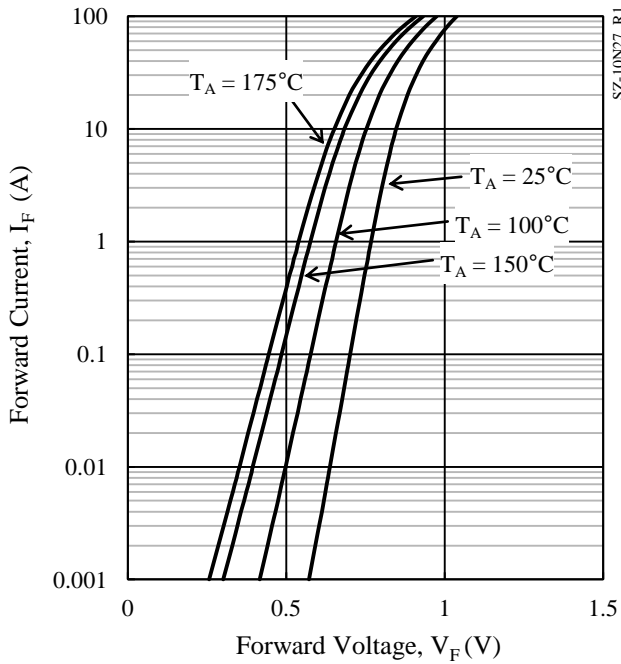


Figure 3-5  $I_F - V_F$  typical characteristics

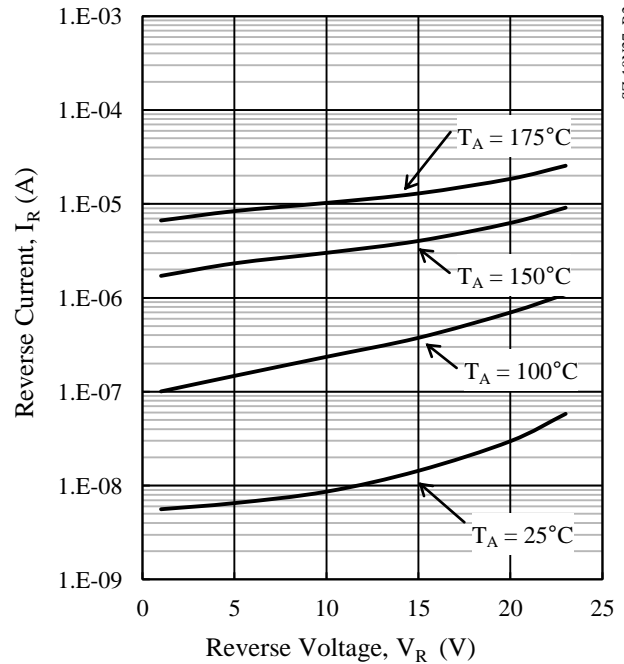


Figure 3-6  $I_R - V_R$  typical characteristics

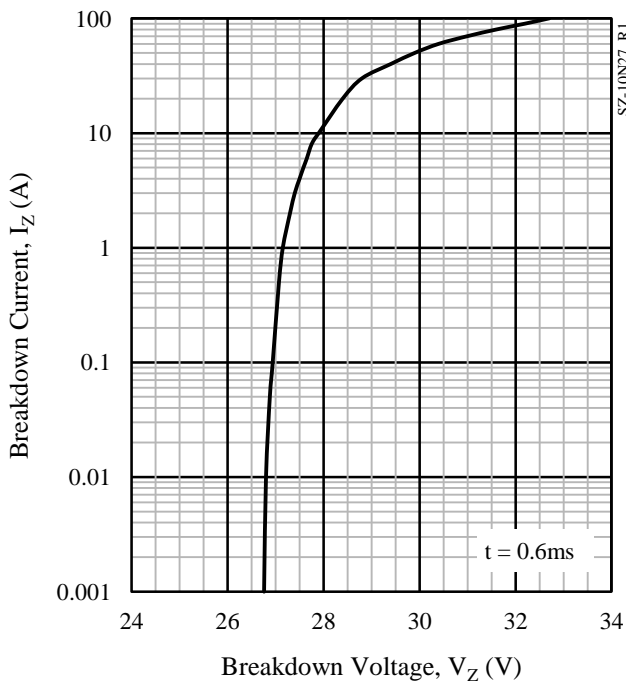


Figure 3-7  $I_Z - V_Z$  typical characteristics

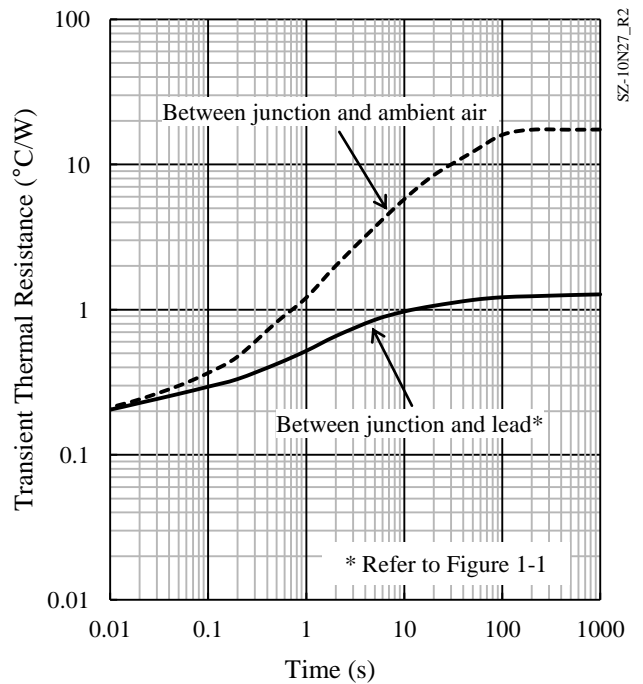


Figure 3-8 Typical transient thermal resistance

3.4 SZ-10NN27 Typical Characteristics

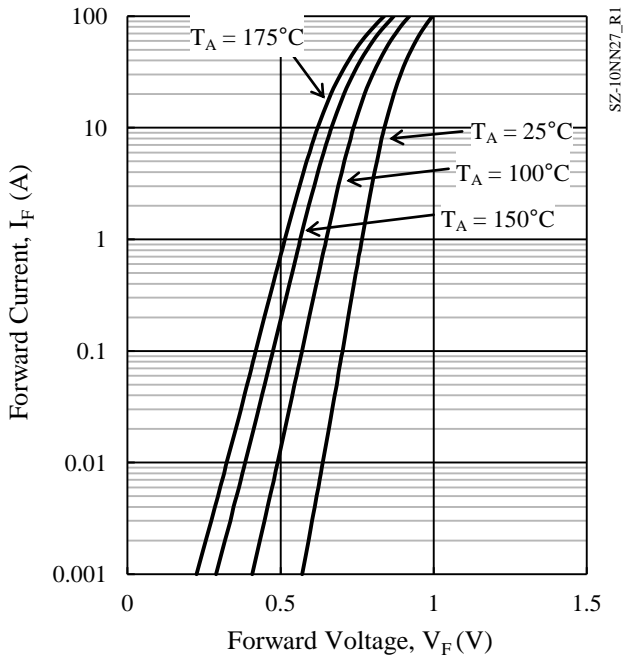


Figure 3-9  $V_F - I_F$  typical characteristics

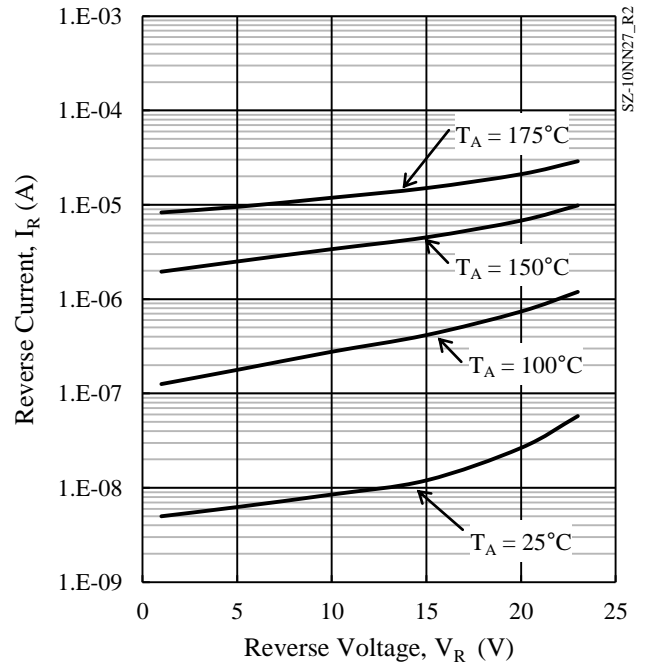


Figure 3-10  $V_R - I_R$  typical characteristics

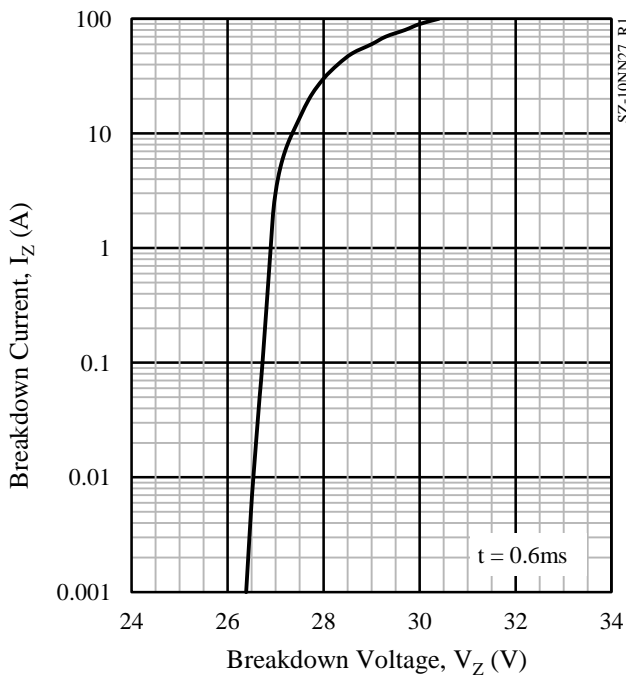


Figure 3-11  $I_Z - V_Z$  typical characteristics

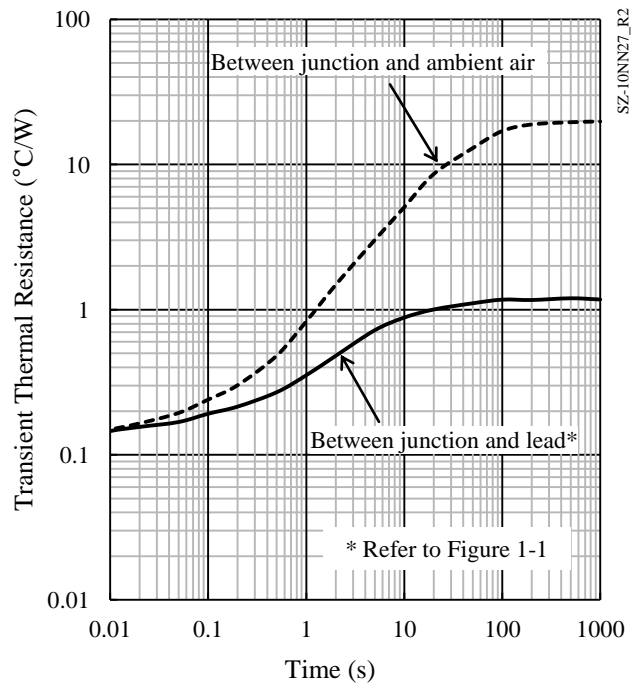


Figure 3-12 Typical transient thermal resistance

3.5 SZ-10N40 Typical Characteristics

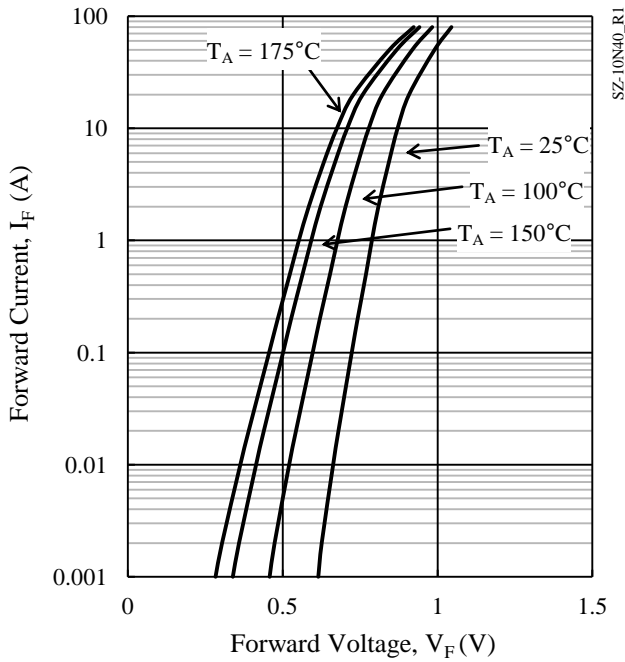


Figure 3-13  $V_F - I_F$  typical characteristics

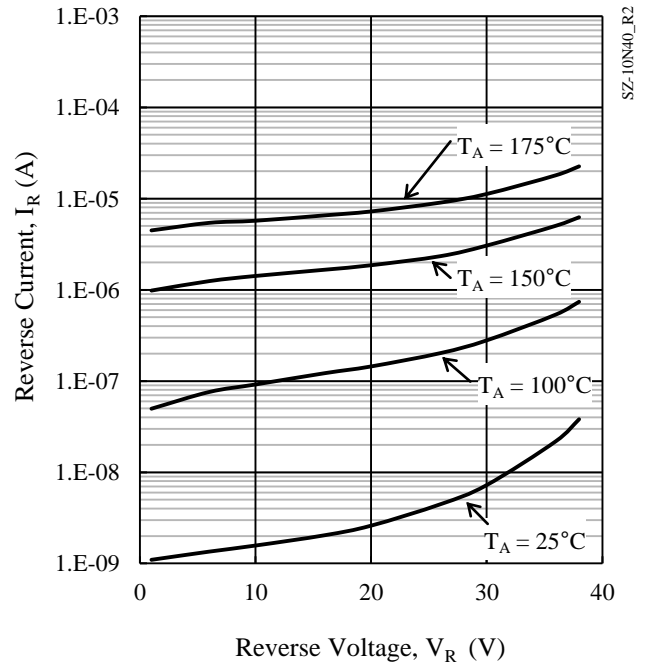


Figure 3-14  $V_R - I_R$  typical characteristics

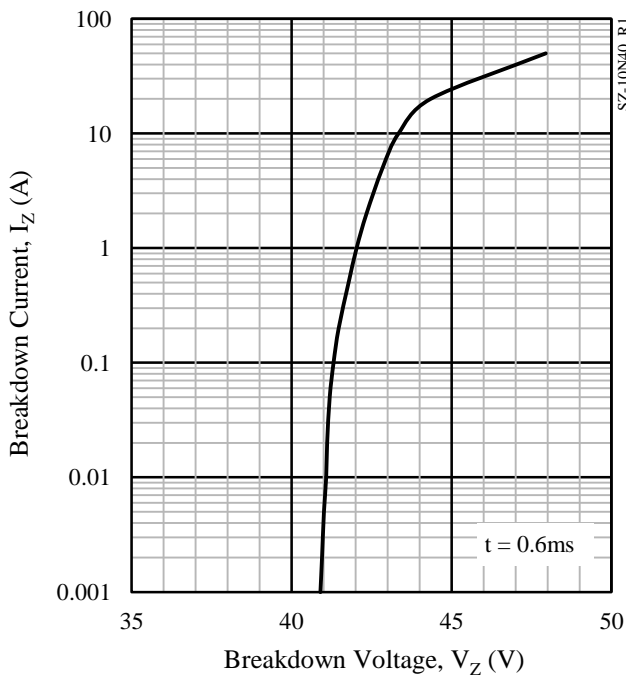


Figure 3-15  $I_Z - V_Z$  typical characteristics

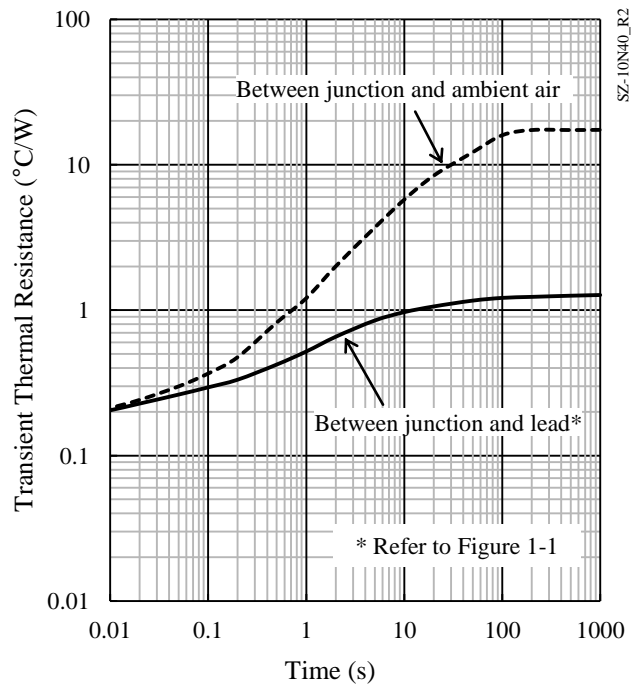


Figure 3-16 Typical transient thermal resistance



3.6 SZ-10NN40 Typical Characteristics

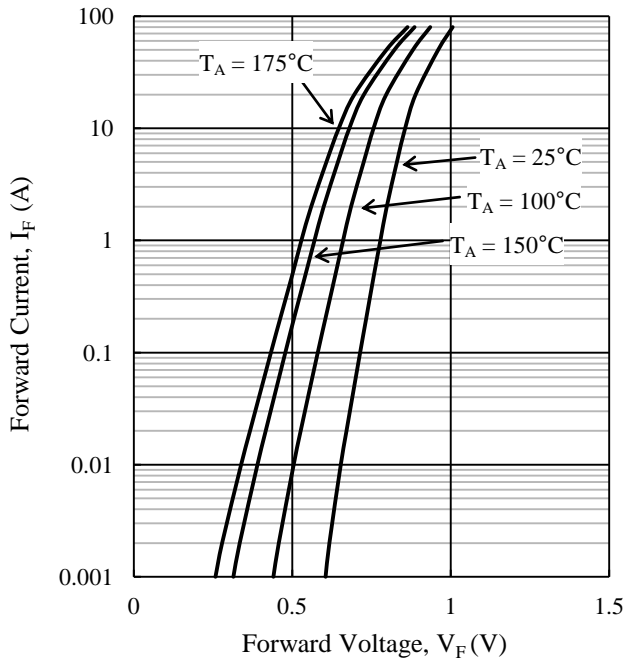


Figure 3-17  $V_F - I_F$  typical characteristics

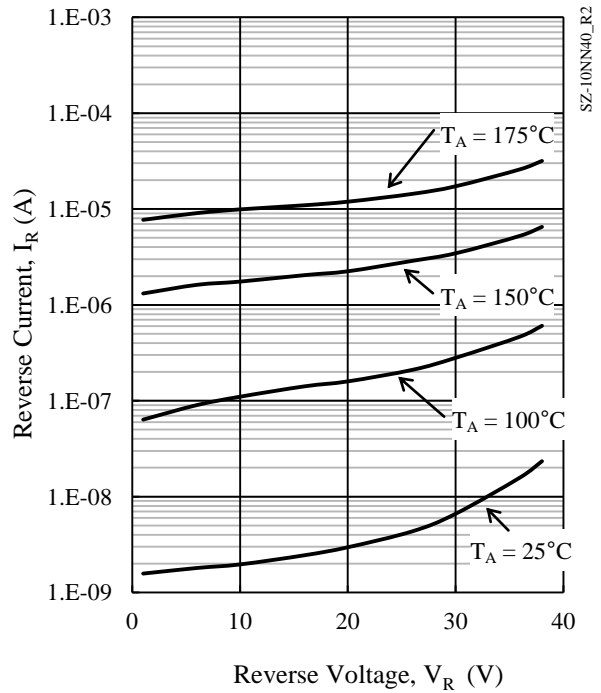


Figure 3-18  $V_R - I_R$  typical characteristics

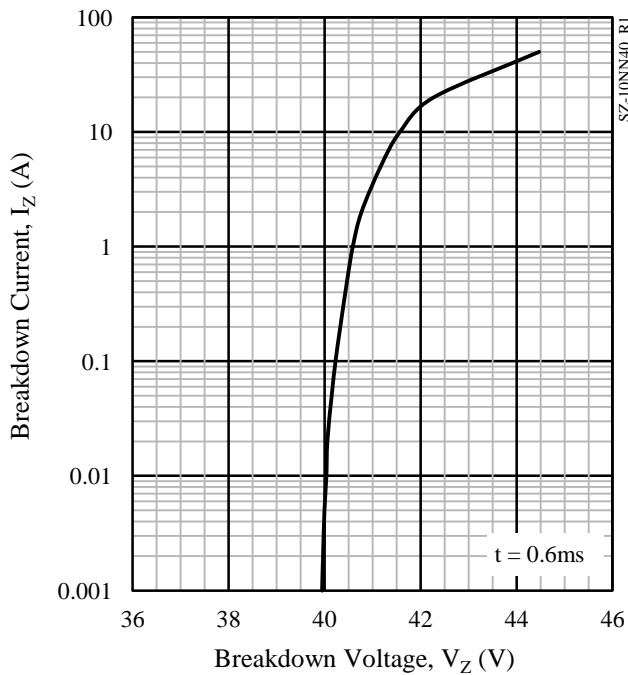


Figure 3-19  $I_Z - V_Z$  typical characteristics

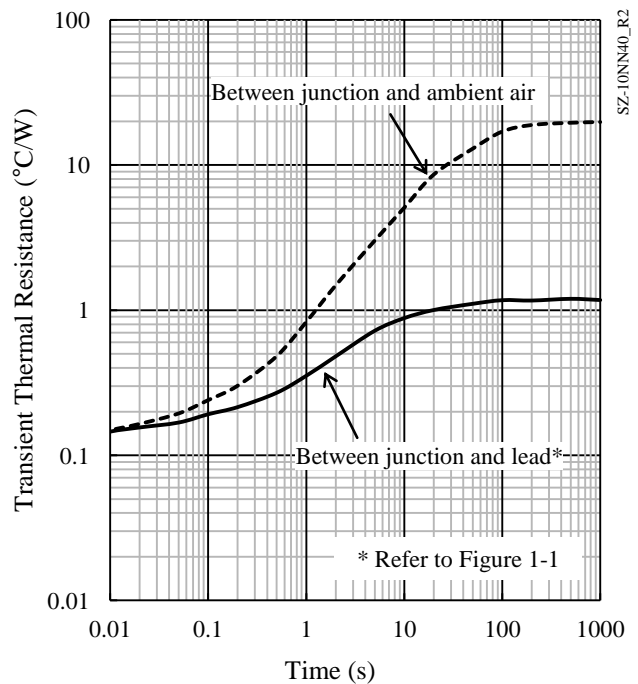
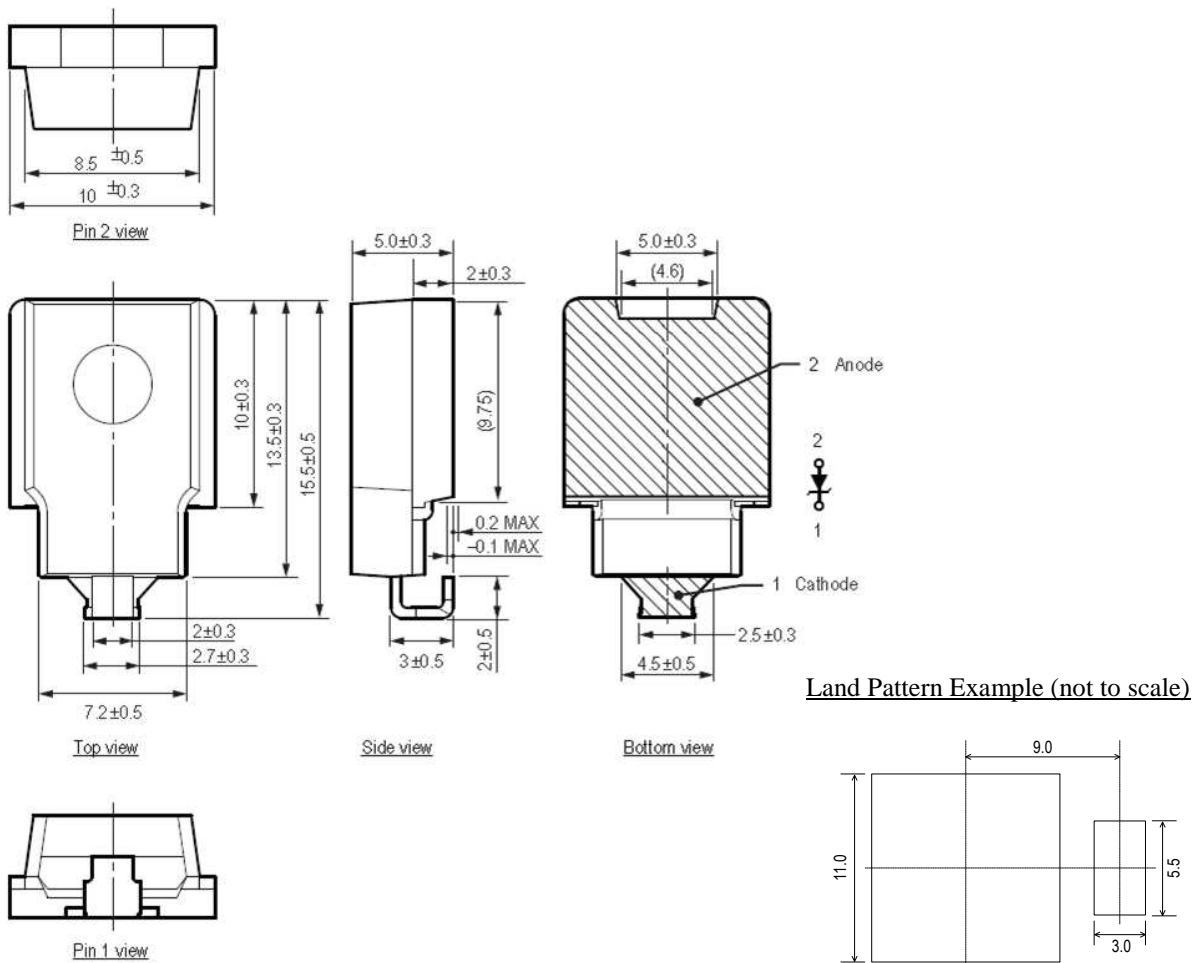


Figure 3-20 Typical transient thermal resistance

# SZ-10 Series

## 4. External Dimensions

- SZ-10



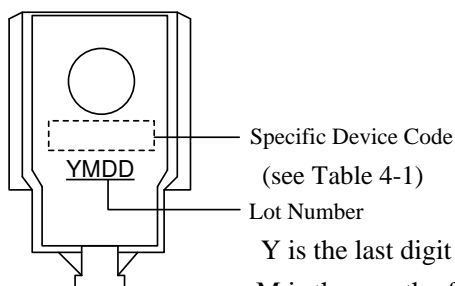
Land Pattern Example (not to scale)

Unit: mm

### NOTES:

- Dimension is in millimeters.
- Lead treatment Pb-free. Device composition compliant with the RoHS directive.
- MSL : JEDEC LEVEL3

## 5. Marking Diagram



Specific Device Code  
(see Table 4-1)

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 4-1 Specific Device Code

Specific Device Code	Products
BN27	SZ-10N27
BN40	SZ-10N40
DN27	SZ-10NN27
DN40	SZ-10NN40

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