V_Z = 27 V (typ.)
Automotive Alternator Diode

SG-C17xxZ27 Series

Data Sheet

Description

The SG-C17xxZ27 series are the rectification diodes designed for alternator circuit of automotives, and have zener characteristics with high surge capability.

The package is the press-fit type that has high heat release capability and high reliability for high temperature and humidity environment. In addition, the bridge circuit can be configured easily in small area by using suffix "S" type and suffix "R" type of reverse polarity type.

Features

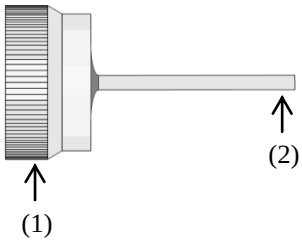
- T_J = 235 °C Capability Suitable for High Reliability and Automotive Requirement
- Thermal Fatigue Capability: 5,000 cyc.
- High Surge Capability
- RoHS Compliant

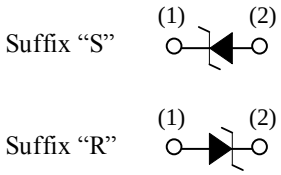
Applications

- Alternator Circuit for the 12 V Battery Automotive

Package

Pressfit

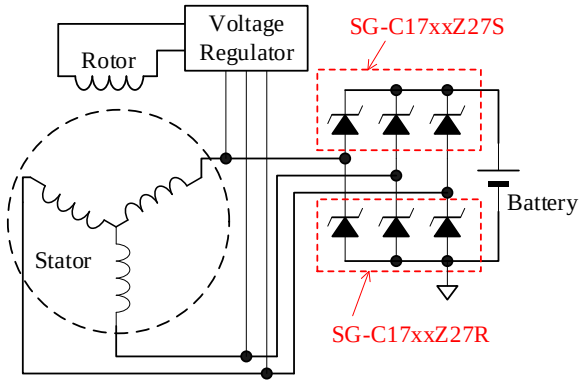




Not to scale

Pin No.	Suffix "S"	Suffix "R"
(1)	Cathode	Anode
(2)	Anode	Cathode

Typical Application



Selection Guide

Part Number	$I_{F(AV)}$	T_J (Max.)	V_Z	
			Min.	Max.
SG-C17LXZ27S	35 A	235 °C	24 V	30 V
SG-C17LXZ27R				
SG-C17VLZ27S	50 A			
SG-C17VLZ27R				
SG-C17VVZ27S	60 A			
SG-C17VVZ27R				
SG-C17WVZ27S	80 A			
SG-C17WVZ27R				

Contents

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Conditions	Rating	Unit	Remarks
Peak Reverse Voltage	V_{RM}		20	V	
Average Forward Current	$I_{F(AV)}$		35	A	SG-C17LXZ27S/R
			50		SG-C17VLZ27S/R
			60		SG-C17VVZ27S/R
			80		SG-C17WVZ27S/R
Surge Forward Current	I_{FSM}	Half cycle sine-wave, positive side, 10ms, one shot.	350	A	SG-C17LXZ27S/R
			500		SG-C17VLZ27S/R SG-C17VVZ27S/R
			600		SG-C17WVZ27S/R
Surge Reverse Voltage	V_{RSM}	One shot, See Figure 2.	50	V	SG-C17LXZ27S/R
			65		SG-C17VLZ27S/R
			75		SG-C17VVZ27S/R
			95		SG-C17WVZ27S/R
Junction Temperature	T_J		−40 to 235	°C	
Case Temperature	T_C	See Figure 1.	−40 to 215	°C	
Storage Temperature	T_{STG}		−40 to 215	°C	

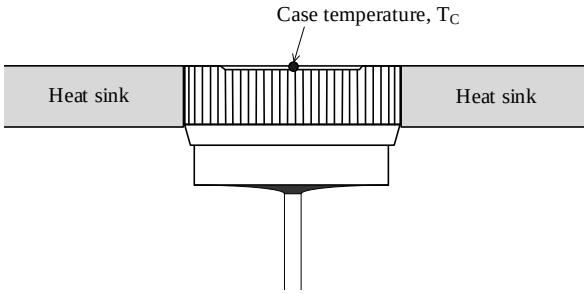


Figure 1. Lead Temperature Measurement Conditions

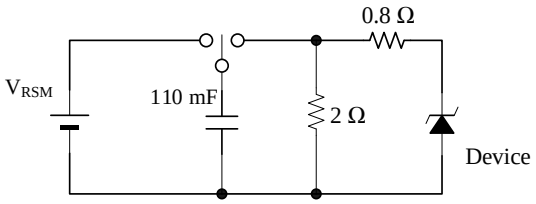


Figure 2. Surge Reverse Voltage Measurement Circuit (JASO A-1)

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	Remarks
Forward Voltage Drop	V_F	I_F = 100 A, t = 5 ms	—	—	1.25	V	SG-C17LXZ27S/R
			—	—	1.20		SG-C17VLZ27S/R
			—	—	1.15		SG-C17VVZ27S/R
			—	—	1.10		SG-C17WVZ27S/R
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	1	μA	
Breakdown Voltage	V_Z	I_Z = 10 mA	24	27	30	V	
Breakdown Voltage Temperature Coefficient	r_Z	I_Z = 10 mA	—	22	—	mV/°C	
Thermal Resistance	$R_{th(j-C)}$	(1)	—	—	0.6	°C/W	SG-C17LXZ27S/R
			—	—	0.5		SG-C17VLZ27S/R
			—	—	0.4		SG-C17VVZ27S/R SG-C17WVZ27S/R

(1) $R_{th(j-c)}$ is thermal resistance between junction and case. Case temperature is measured as shown in Figure 1.

SG-C17LXZ27S, SG-C17LXZ27R Rating and Characteristic Curves

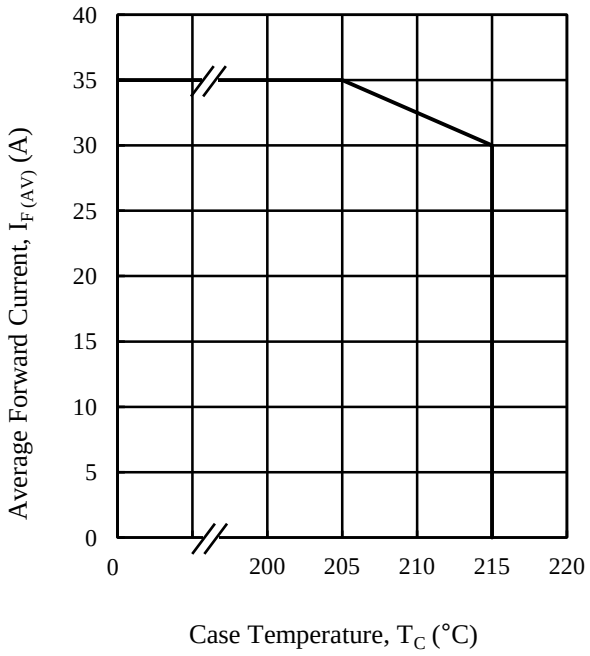


Figure 3. Power Dissipation Curves[2]

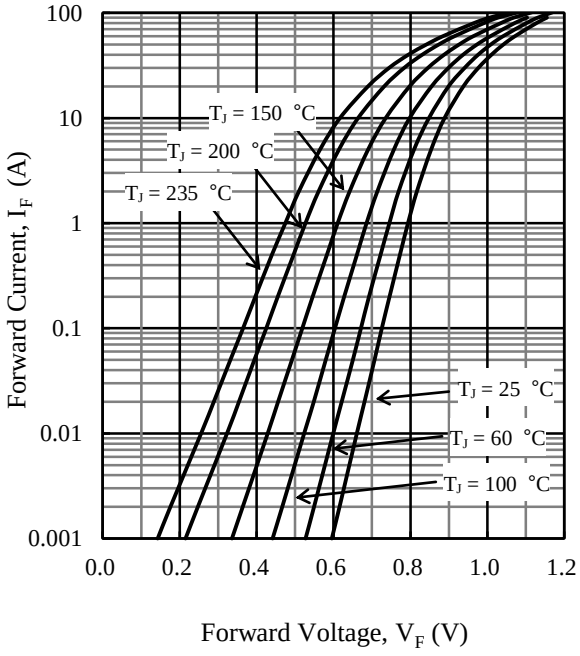


Figure 4. I_F vs. V_F Typical Characteristics

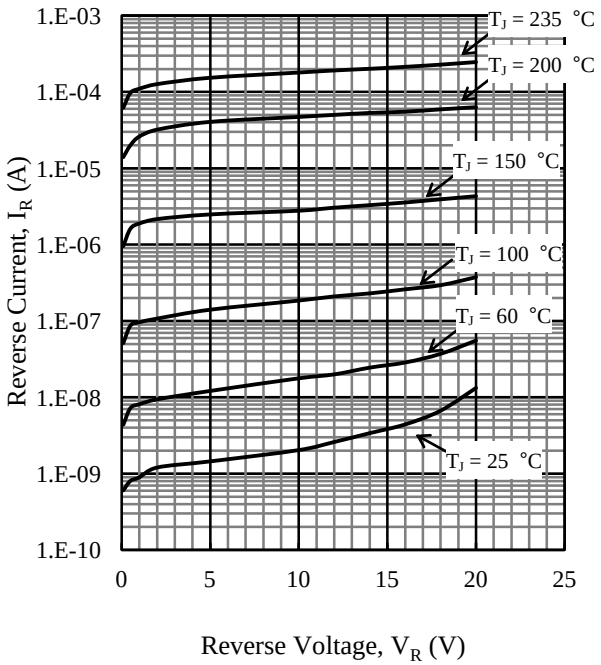


Figure 5. I_R vs. V_R Typical Characteristics

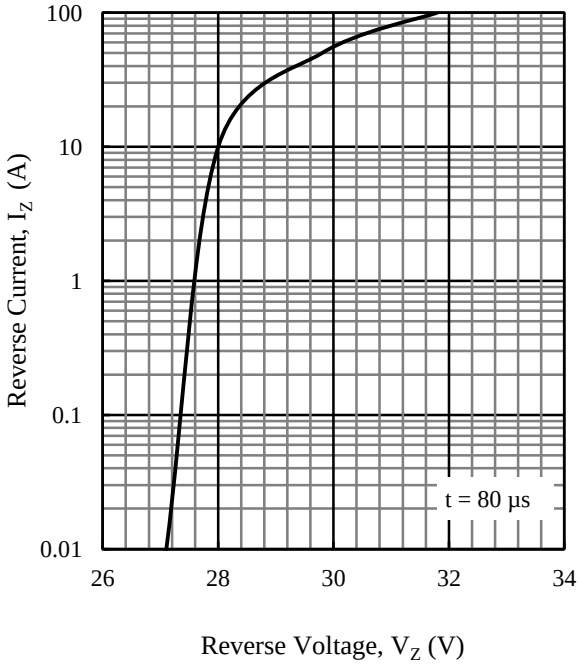


Figure 6. I_Z vs. V_Z Typical Characteristics

[2] See Figure 1 for the measurement conditions of lead temperature.

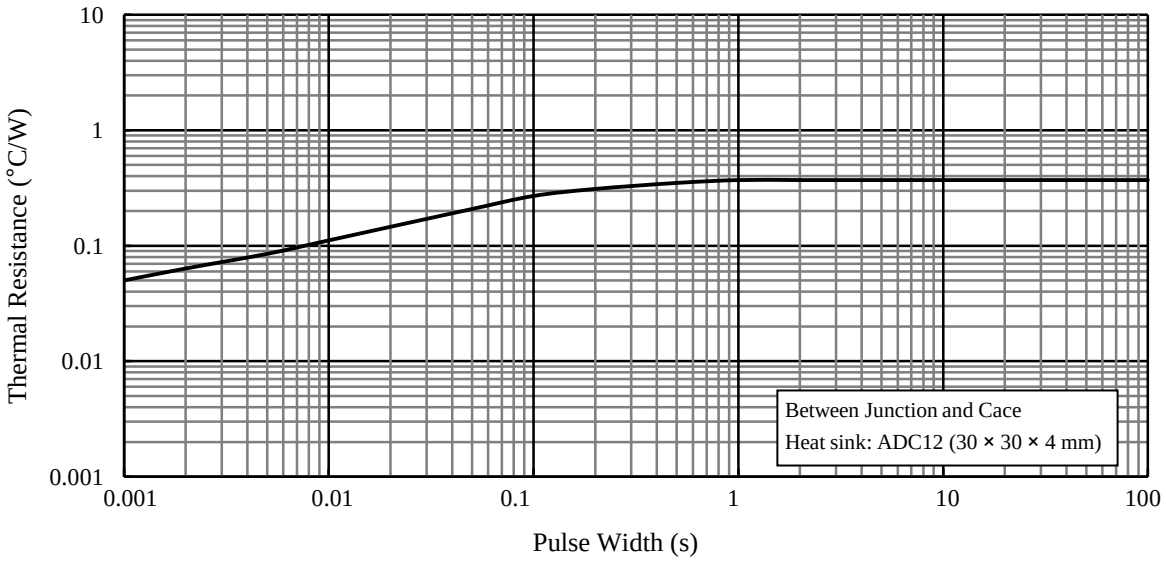


Figure 7. Typical Transient Thermal Resistance [3]

SG-C17VLZ27S, SG-C17VLZ27R Rating and Characteristic Curves

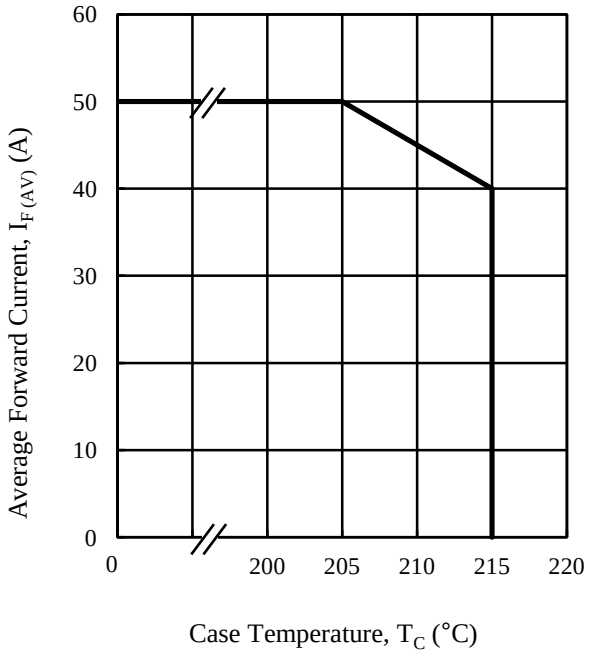


Figure 8. Power Dissipation Curves [4]

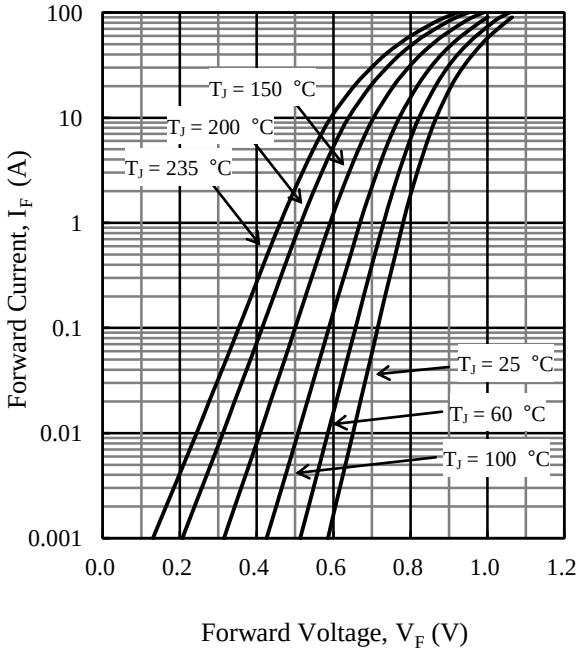


Figure 9. V_F vs. I_F Typical Characteristics

[3] See Figure 1 for measurement conditions of lead temperature.
[4] See Figure 1 for measurement conditions of lead temperature.

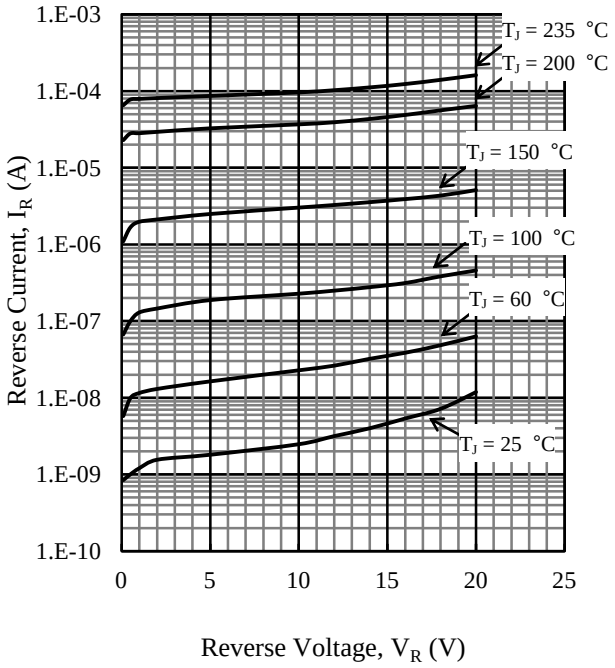


Figure 10. V_R vs. I_R Typical Characteristics

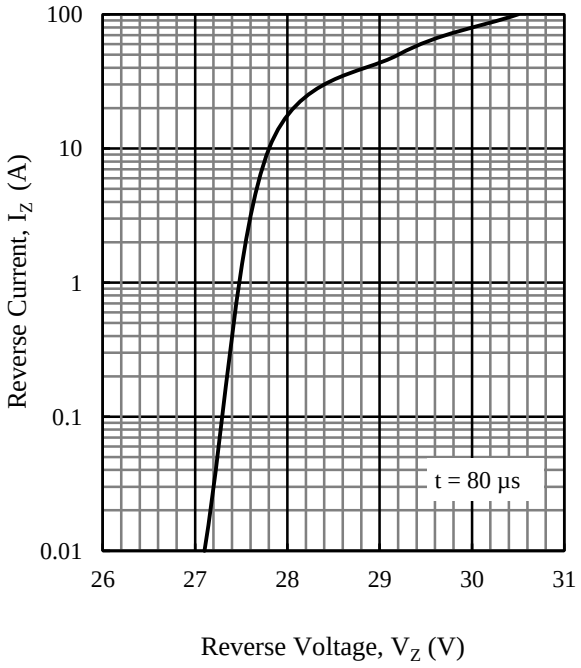


Figure 11. I_Z vs. V_Z Typical Characteristics

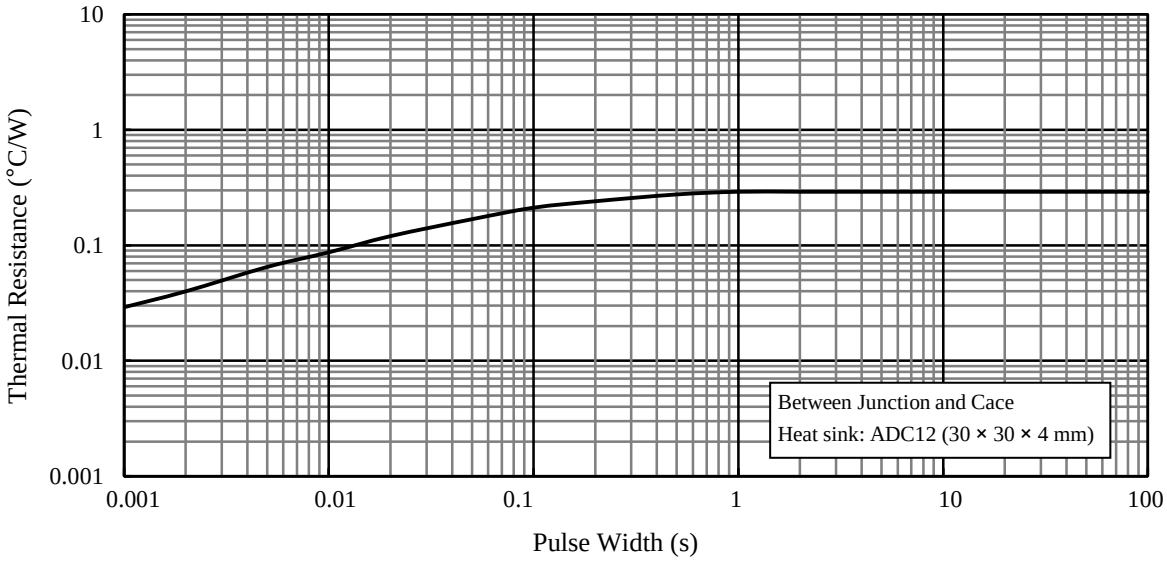


Figure 12. Typical Transient Thermal Resistance [5]

[5] See Figure 1 for the measurement conditions of lead temperature.

SG-C17VVZ27S, SG-C17VVZ27R Rating and Characteristic Curves

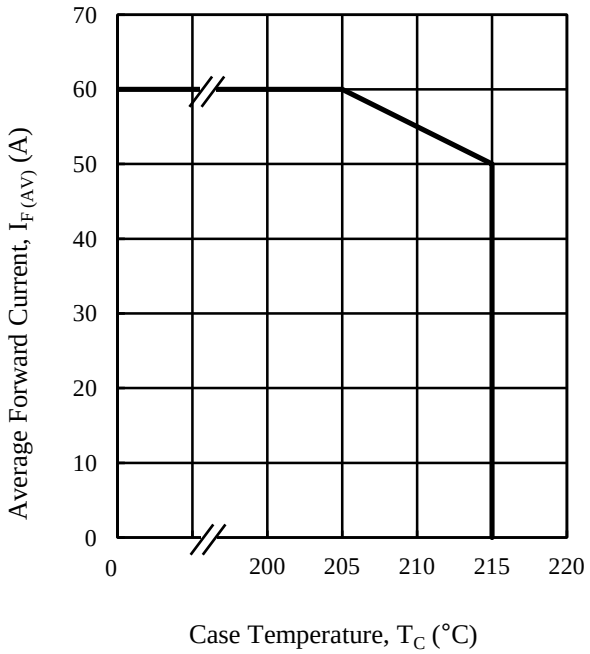


Figure 13. Power Dissipation Curves [6]

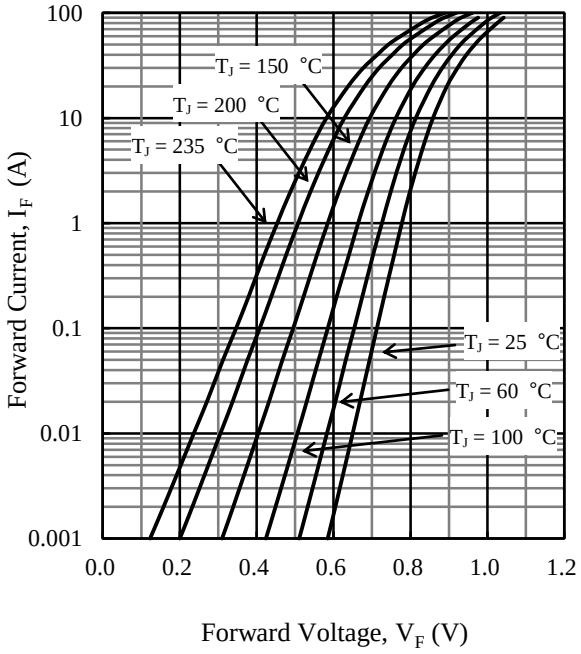


Figure 14. V_F vs. I_F Typical Characteristics

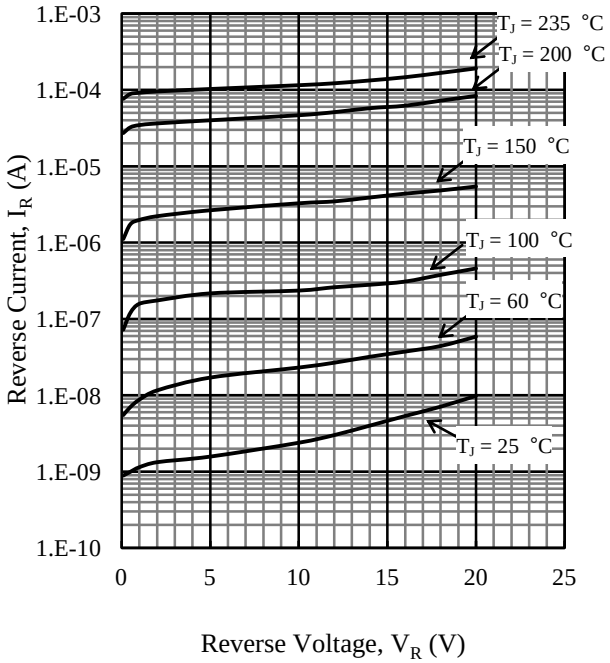


Figure 15. V_R vs. I_R Typical Characteristics

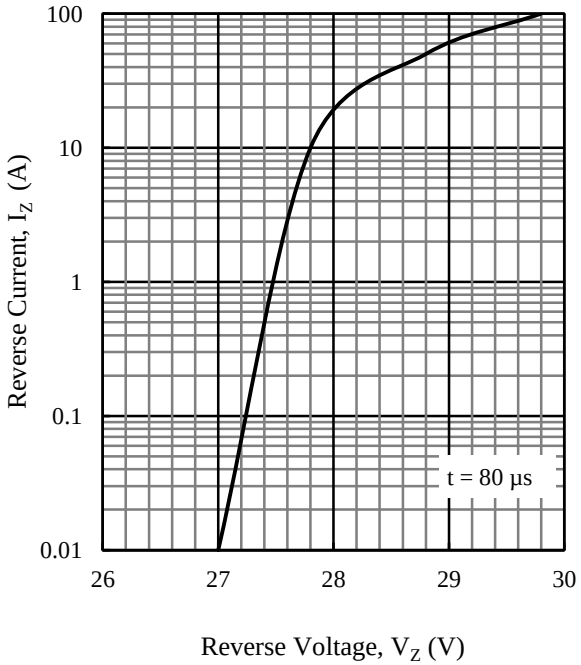


Figure 16. I_Z vs. V_Z Typical Characteristics

[6] See Figure 1 for the measurement conditions of lead temperature.

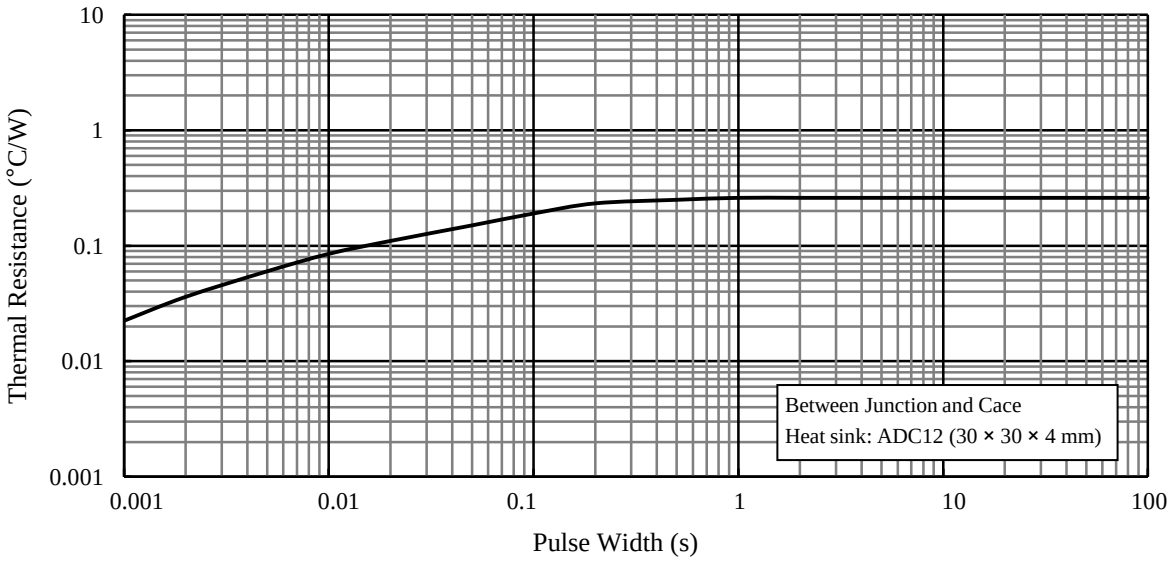


Figure 17. Typical Transient Thermal Resistance[7]

SG-C17VWZ27S, SG-C17VWZ27R Rating and Characteristic Curves

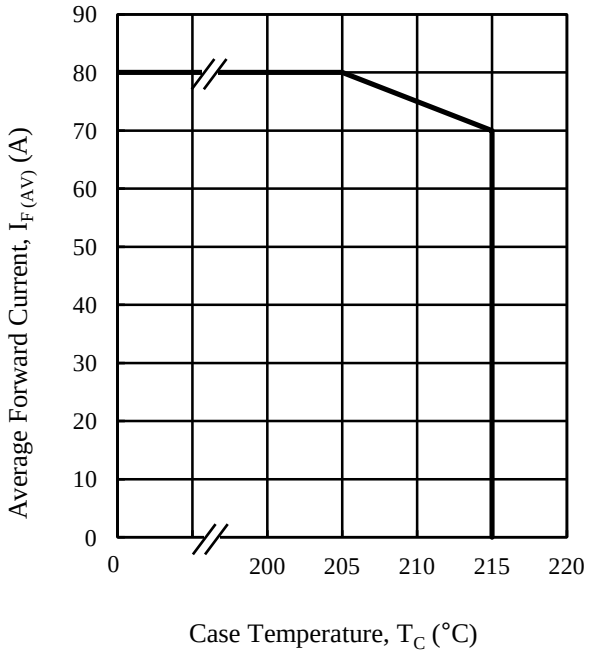


Figure 18. Power Dissipation Curves [8]

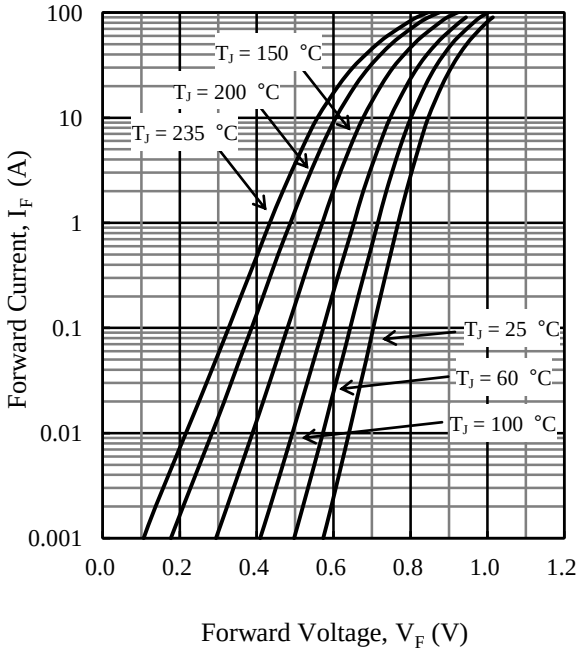


Figure 19. V_F vs. I_F Typical Characteristics

[7] See Figure 1 for the measurement conditions of lead temperature.
[8] See Figure 1 for the measurement conditions of lead temperature.

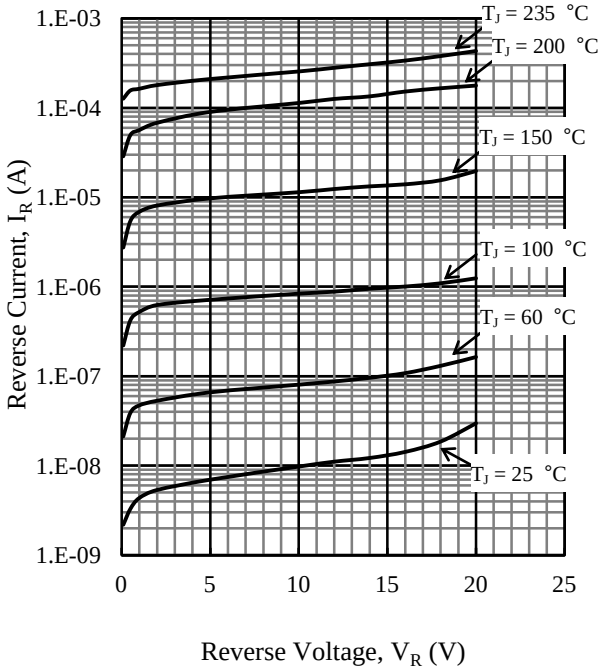


Figure 20. V_R vs. I_R Typical Characteristics

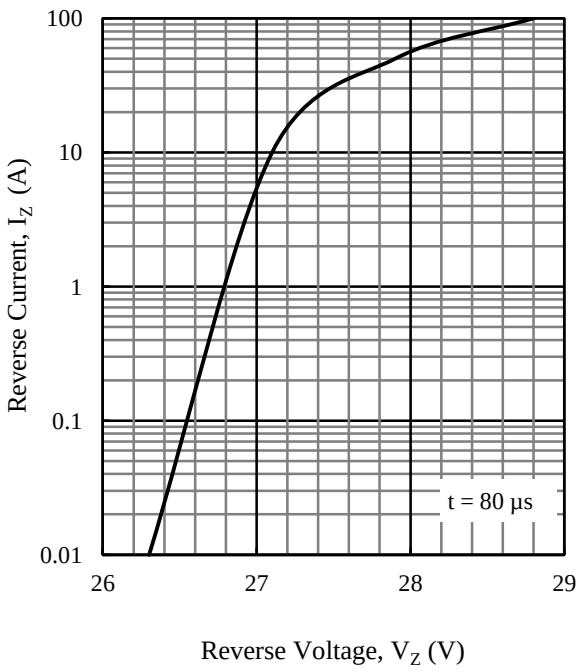


Figure 21. I_Z vs. V_Z Typical Characteristics

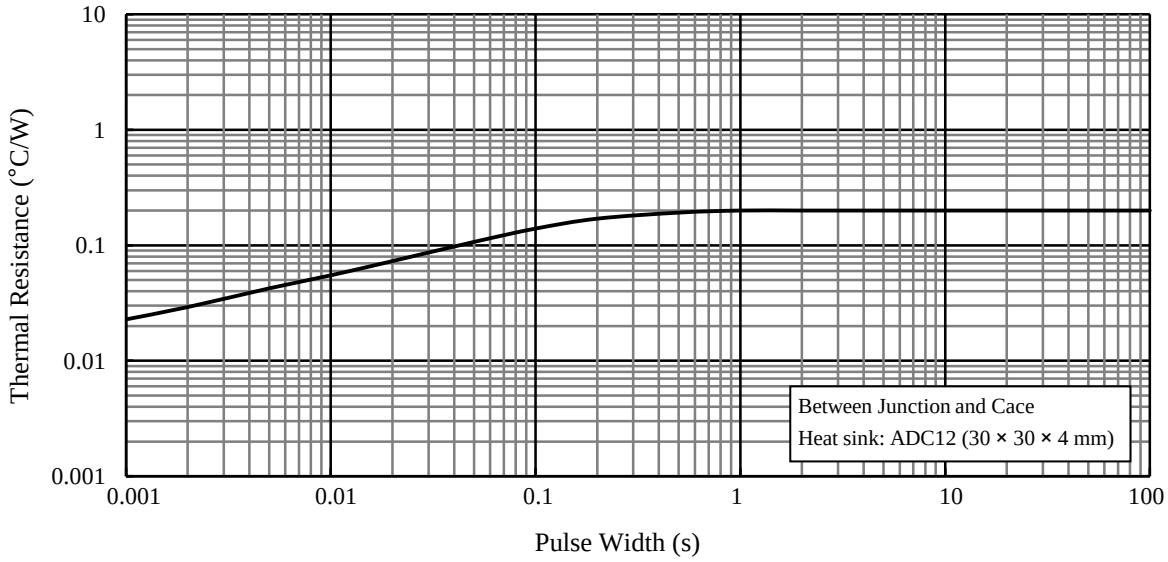
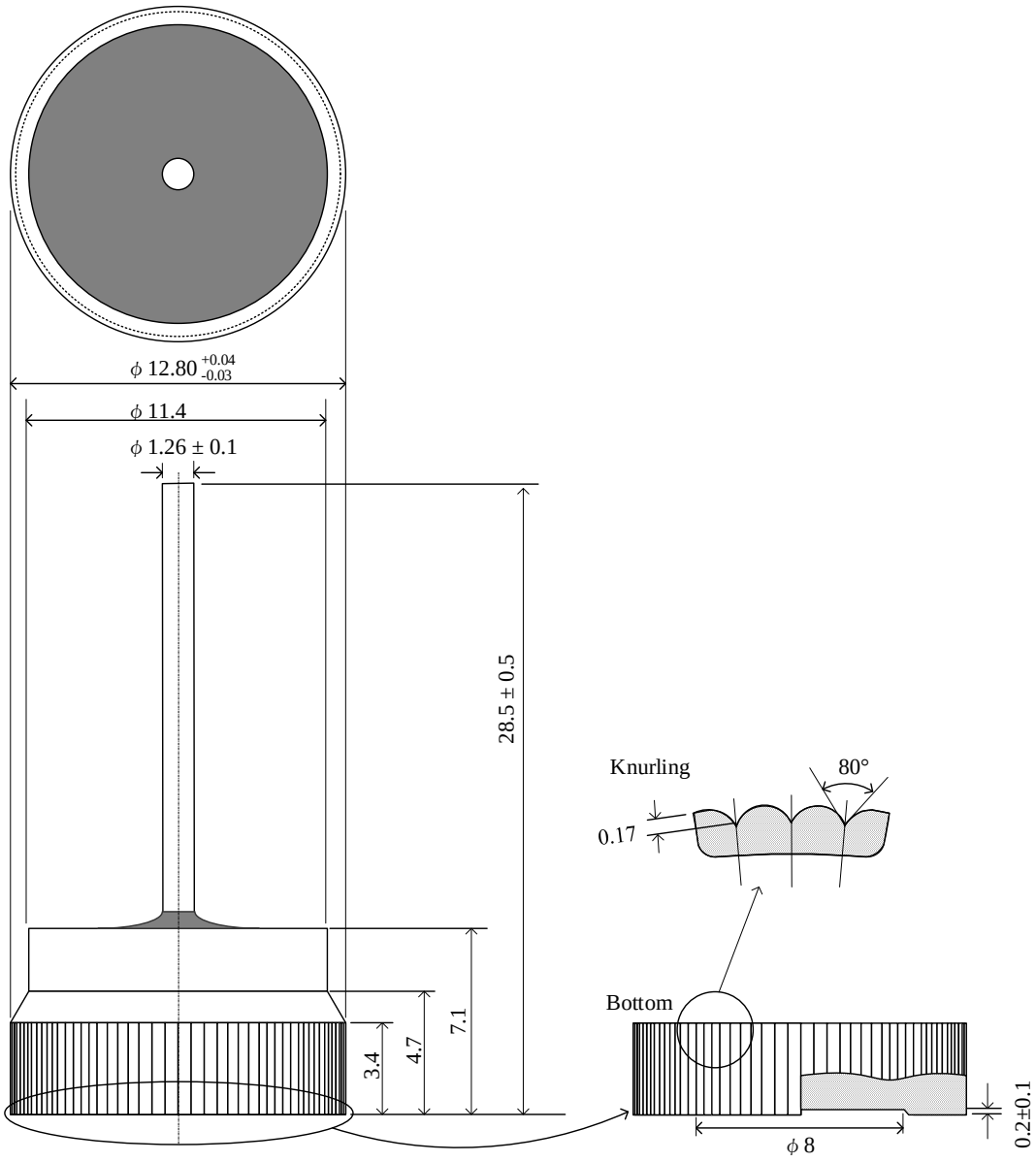


Figure 22. Typical Transient Thermal Resistance [9]

[9] See Figure 1 for the measurement conditions of lead temperature.

Physical Dimensions

● **Pressfit**



NOTES:

- Dimensions in millimeters
- Knurling number: 78
- Lead treatment: Pb-free (RoHS compliant)
- Must be pressfit into the heatsink when used.
- Dimensions without tolerances have a tolerance of ±0.2.

- **Heatsink**
  - Recommended hole size and interference: See Figure 23
  - Recommended heatsink material: ADC12 or the aluminum die-casting that has same characteristics as ADC12
  - Recommended heatsink material strength: 140 to 160 Hv

- **How to Pressfit**
  Note followings when the product is pressed into the heatsink.
  - Press pin contact area: See Figure 24 (The press pin must not be pressed to "No press area")
  - Recommended press pin form: See Figure 25
  - Contact area between the press pin and the product: ≥30 mm^2 (If the contact area is too small, the product package is deformed and the product damage may be caused.)
  - Maximum press load: ≤10,000 N (See Figure 26)

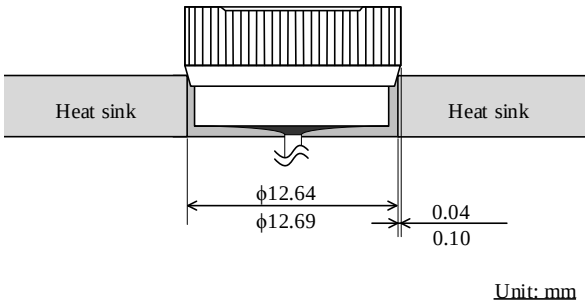


Figure 23 Recommended Hole Size and Interference

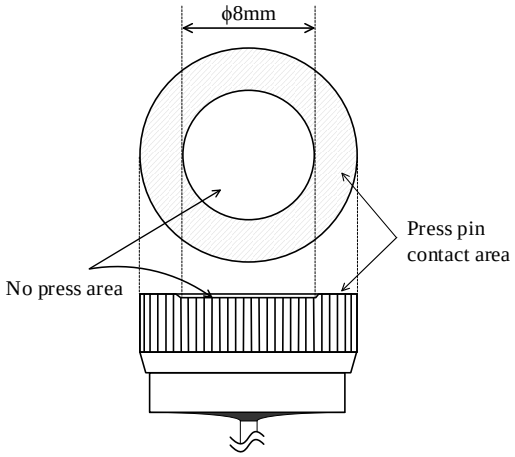


Figure 24 Press Pin Contact Area

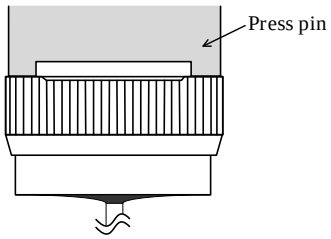


Figure 25 Recommended Press Pin Form

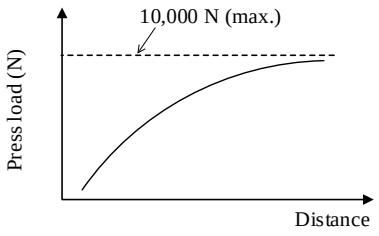
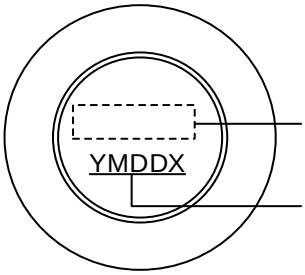


Figure 26 Maximum Press Load

Marking Diagram



Specific Device Code (See Table 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)
X is control number

Table 1. Specific Device Code

Specific Device Code	Part Number
AC27S	SG-C17LXZ27S
AC27R	SG-C17LXZ27R
BC27S	SG-C17VLZ27S
BC27R	SG-C17VLZ27R
DC27S	SG-C17VVZ27S
DC27R	SG-C17VVZ27R
HC27S	SG-C17WVZ27S
HC27R	SG-C17WVZ27R

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- No anti-radioactive ray design has been adopted for the Sanken Products.
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