V_Z = 23.0 V (typ.)
Automotive Alternator Diode

SG-K17VLEFG Series

Data Sheet

Description

The SG-K17VLEFG series are rectification diodes designed for automotive high-efficient alternator circuits. The products have Zener characteristics with high surge capability.

Supplied in a press-fit package with high heat dissipation, the products bring high reliability even under high temperature and humidity conditions. In addition, a bridge circuit can be configured easily in a small area by using two types in pairs, the suffix "S" and the suffix "R", which have opposite polarities.

Features

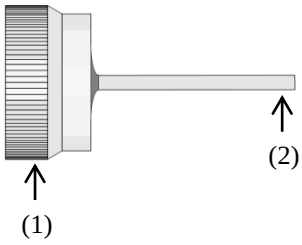
- T_J = 200 °C Capability Suitable for High Reliability and Automotive Requirements
- Thermal Fatigue Capability: 5,000 cyc.
- High Surge Capability (JASO A-1 Standard Compliant)
- RoHS Compliant

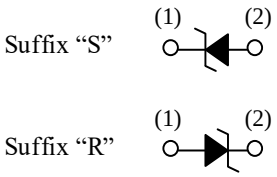
Applications

- Alternator Circuit for the 12 V Automotive Battery

Package

Press-fit

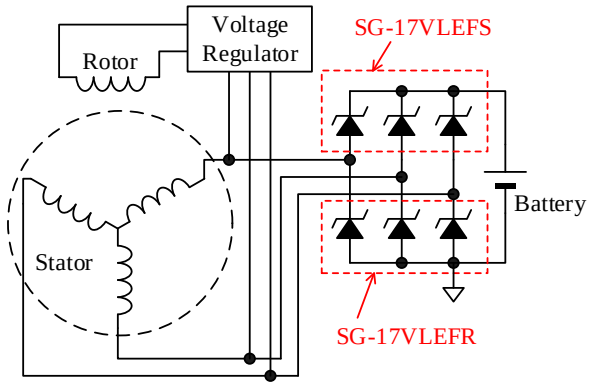




Not to scale

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-K17VLEFGS	50 A	200 °C	20 V	26 V
SG-K17VLEFGR				

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Conditions	Rating	Unit
Repetitive Peak Reverse Voltage	V_{RM}		17	V
Average Forward Current	$I_{F(AV)}$		50	A
Surge Forward Current	I_{FSM}	Half cycle sine-wave, positive side, 10ms, 1 shot.	500	A
Nonrepetitive Peak Reverse Voltage	V_{RSM}	1 shot, see Figure 1.	50	V
Junction Temperature	T_J		−40 to 200	°C
Case Temperature	T_C	See Figure 2.	−40 to 180	°C
Storage Temperature	T_{STG}		−40 to 200	°C

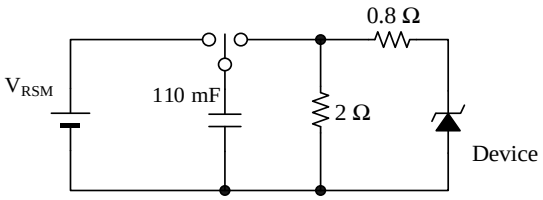


Figure 1. Nonrepetitive Peak Reverse Voltage Measurement Circuit (JASO A-1)

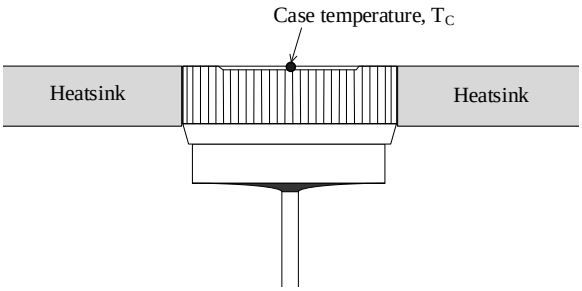


Figure 2. Case Temperature Measurement Conditions

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	I_F = 100 A, t = 5 ms	—	—	0.67	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	20	μA
Reverse Leakage Current Under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, T_J = 200 °C	—	—	200	mA
Breakdown Voltage	V_Z	I_Z = 10 mA	20.0	23.0	26.0	V
Breakdown Voltage Temperature Coefficient	r_Z	I_Z = 10 mA	—	—	25	mV/°C
Thermal Resistance	$R_{th(J-C)}$	(1)	—	—	0.5	°C/W

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Package Weight		—	6.7	—	g

(1) $R_{th(J-C)}$ is thermal resistance between junction and case. Case temperature is measured as shown in Figure 2.

Rating and Characteristic Curves

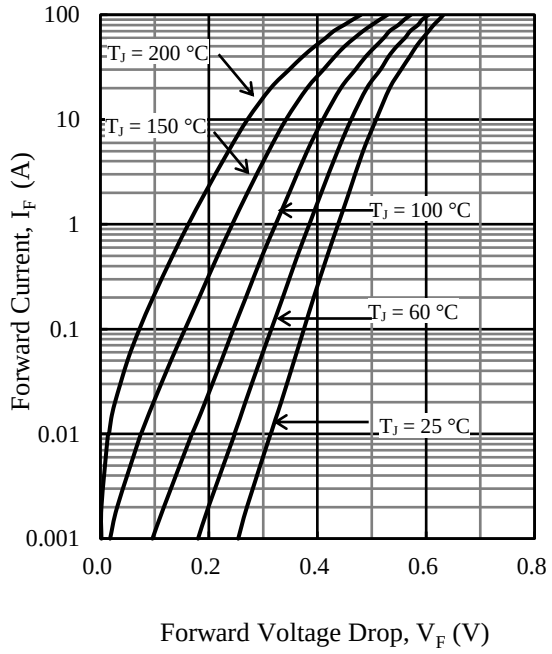


Figure 3. Typical Characteristics: I_F vs. V_F

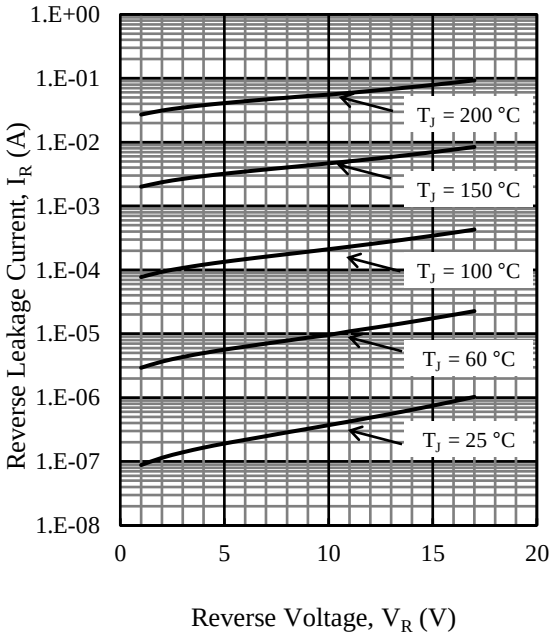


Figure 4. Typical Characteristics: I_R vs. V_R

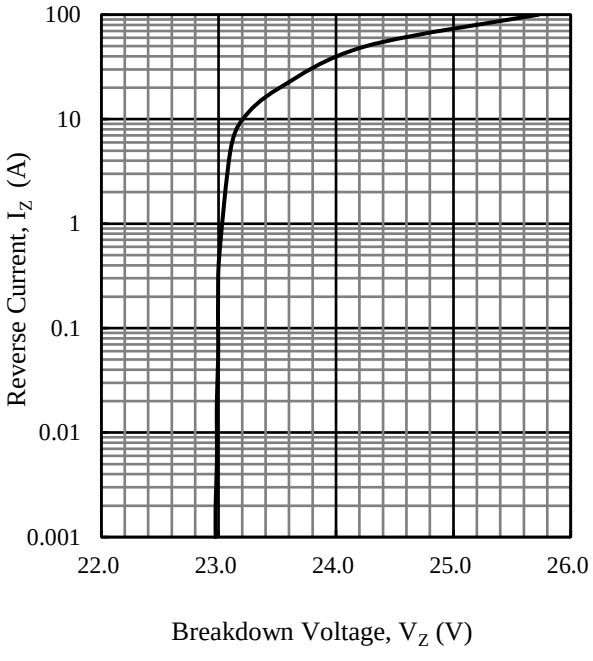


Figure 5. Typical Characteristics: I_Z vs. V_Z

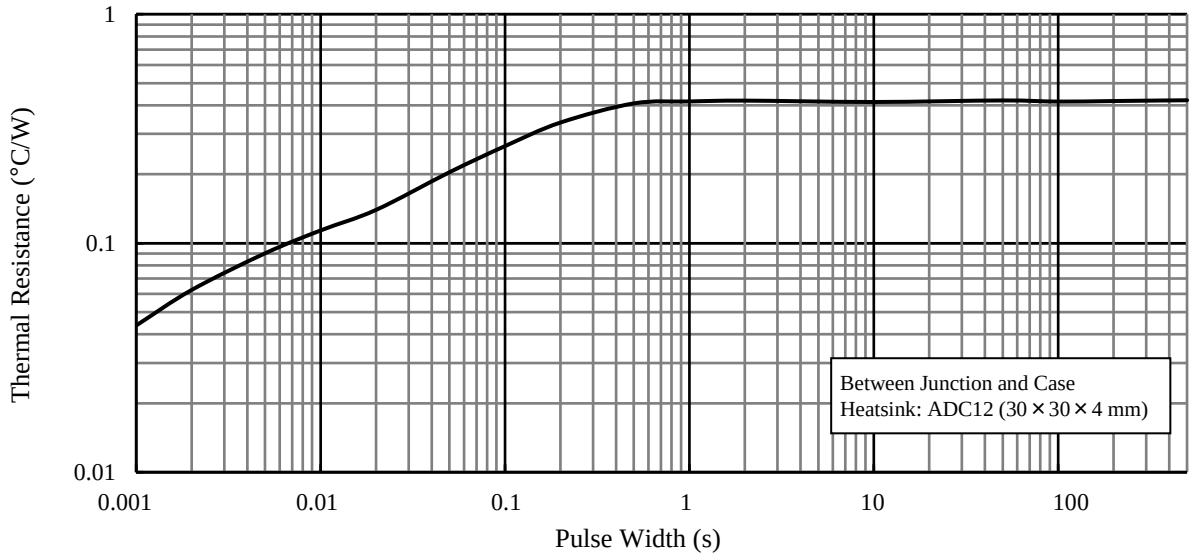
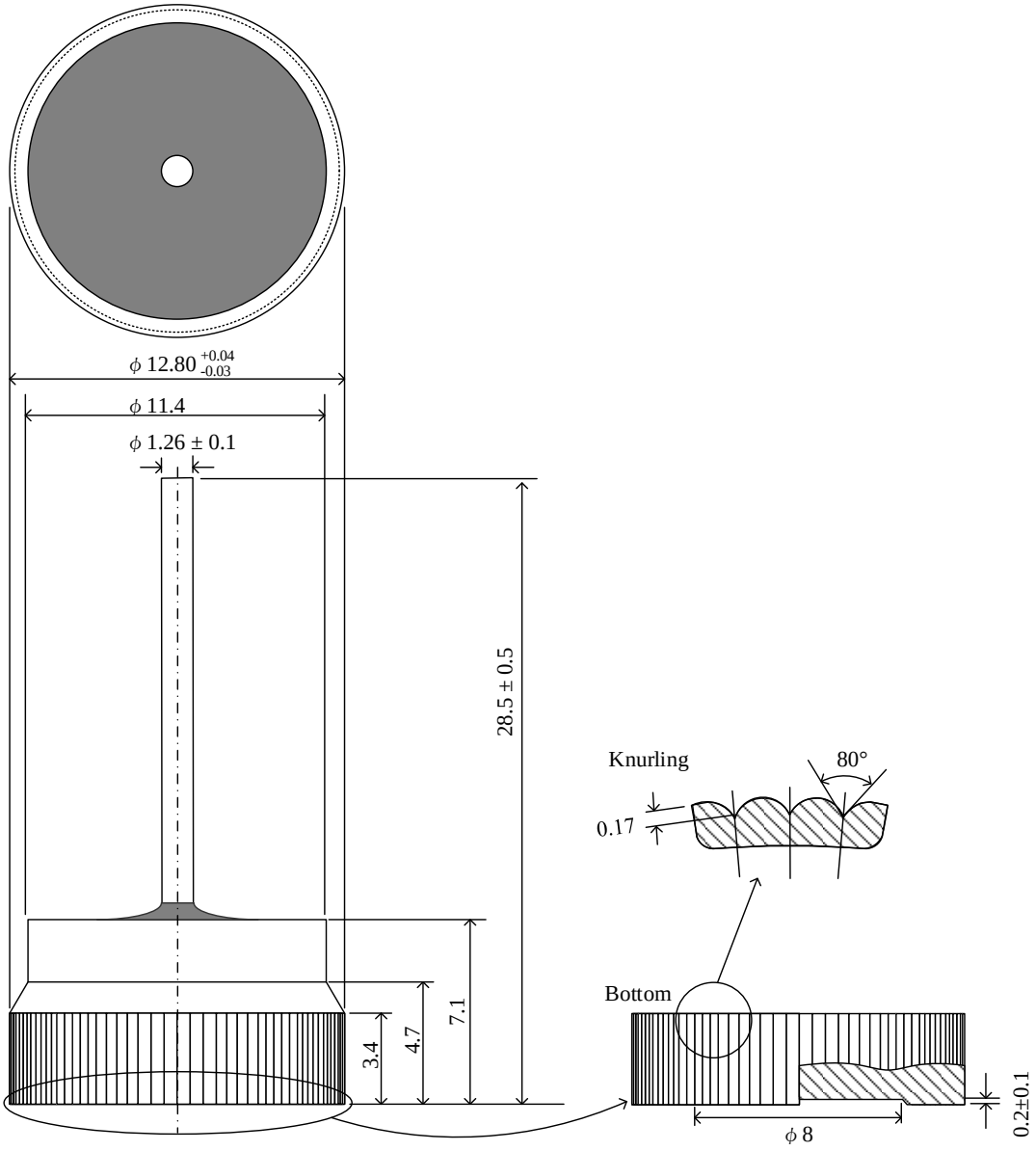


Figure 6. Typical Transient Thermal Resistance Characteristics [2]

[2] See Figure 2 for measurement conditions of case temperature.

Physical Dimensions

● **Press-fit**



NOTES:

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

- **Heatsink**
  - Recommended hole size and interference: See Figure 7
  - 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 Press-fit**
  The following are the key considerations and the guidelines for pressing a product into a heatsink:
  - Press pin contact area: See Figure 8 (The press pin must not be pressed to "No press area")
  - Recommended press pin form: See Figure 9
  - 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 10)

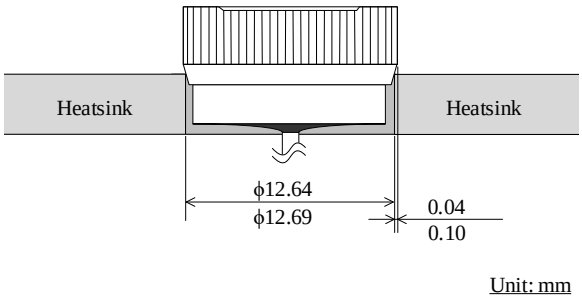


Figure 7 Recommended Hole Size and Interference

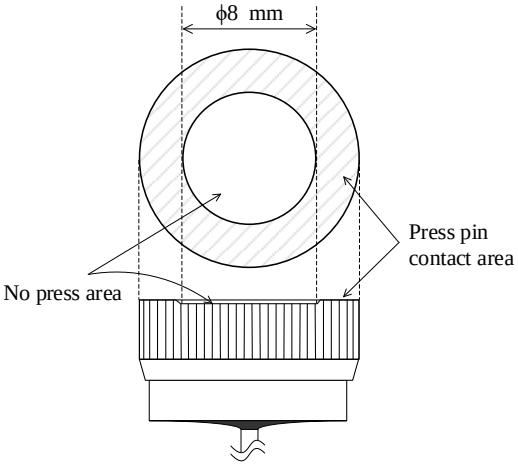


Figure 8 Press Pin Contact Area

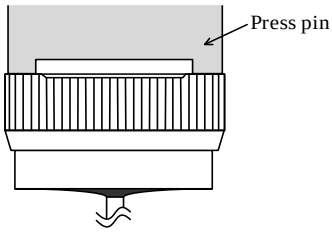


Figure 9 Recommended Press Pin Form

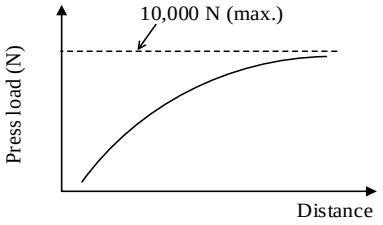
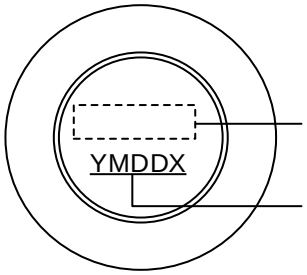


Figure 10 Maximum Press Load

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
BK23S	SG-K17VLEFGS
BK23R	SG-K17VLEFGR

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