

**V<sub>Z</sub> = 23.0 V (typ.)**  
**Automotive Alternator Diode**  
**SG-17VLEF Series**



**Data Sheet**

**Description**

The SG-17VLEF series are the rectification diodes designed for high efficiency alternator circuit of automotives, and have zener characteristics with high surge capability.

The package is a press-fit type, and 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.

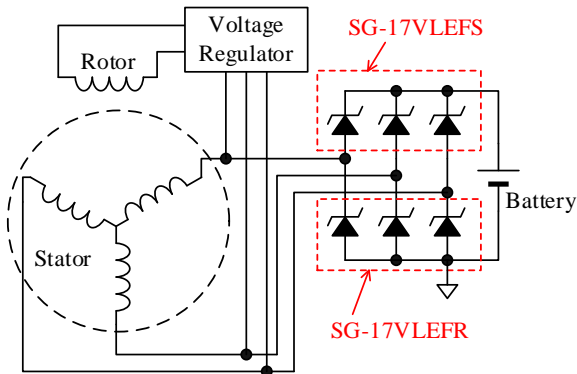
**Features**

- T<sub>J</sub> = 200 °C Capability Suitable for High Reliability and Automotive Requirement
- Thermal Fatigue Capability: 5,000 cyc.
- High Surge Capability
- RoHS Compliant

**Applications**

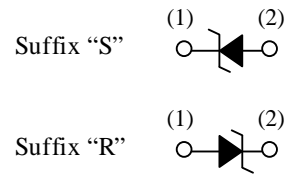
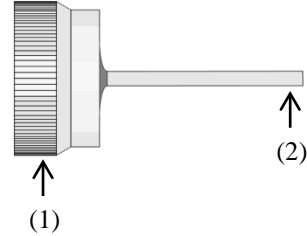
- Alternator Circuit for the 12 V Battery Automotive

**Typical Application**



**Package**

Press-fit



Not to scale

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

**Selection Guide**

Part Number	I <sub>F(AV)</sub>	T <sub>J</sub> (Max.)	V <sub>Z</sub>	
			Min.	Max.
SG-17VLEFS	50 A	200 °C	20 V	26 V
SG-17VLEFR				

## SG-17VLEF

### Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Peak Reverse Voltage	$V_{RM}$		17	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 3.	50	A
Surge Forward Current	$I_{FSM}$	Half cycle sine-wave, positive side, 10ms, one shot.	500	A
Surge Reverse Voltage	$V_{RSM}$	One shot, see Figure 2.	50	V
Junction Temperature	$T_J$		-40 to 200	$^\circ\text{C}$
Case Temperature	$T_C$		-40 to 185	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		-40 to 200	$^\circ\text{C}$

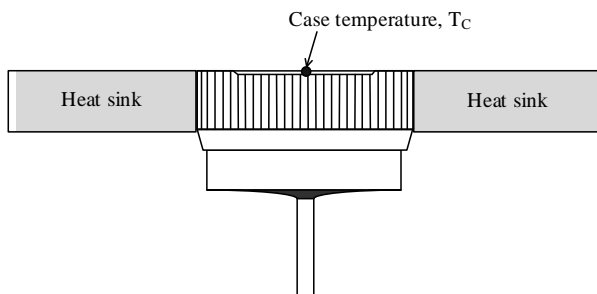


Figure 1. Case Temperature Measurement Conditions

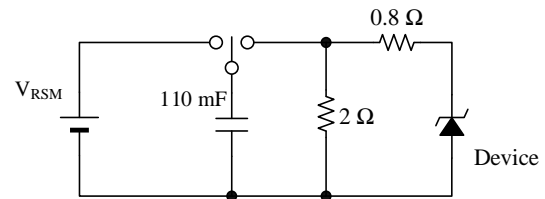


Figure 2. Surge Reverse Voltage Measurement Circuit (JASO A-1)

### Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	$V_F$	$I_F = 100\text{ A}$ , $t = 5\text{ ms}$	—	—	0.67	V
Reverse Leakage Current	$I_R$	$V_R = V_{RM}$	—	—	20	$\mu\text{A}$
Reverse Leakage Current Under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$ , $T_J = 200\text{ }^\circ\text{C}$	—	—	200	mA
Breakdown Voltage	$V_Z$	$I_Z = 10\text{ mA}$	20.0	23.0	26.0	V
Thermal Resistance	$R_{th(j-c)}$	<sup>(1)</sup>	—	—	0.5	$^\circ\text{C/W}$

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

Rating and Characteristic Curves

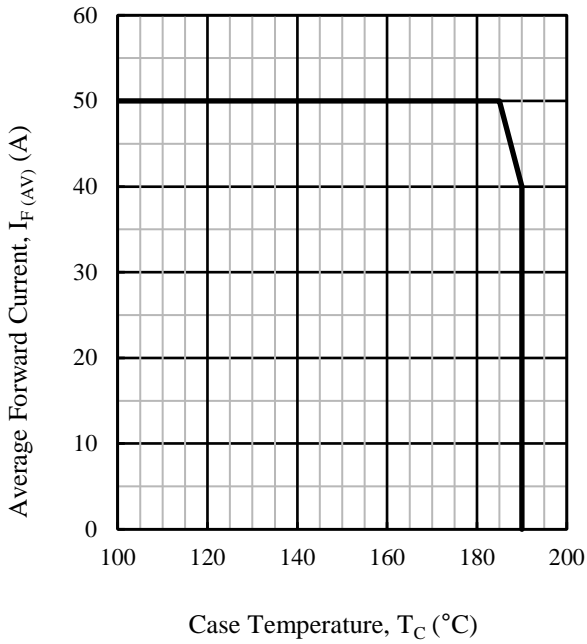


Figure 3. Power Dissipation Curves<sup>(2)</sup>

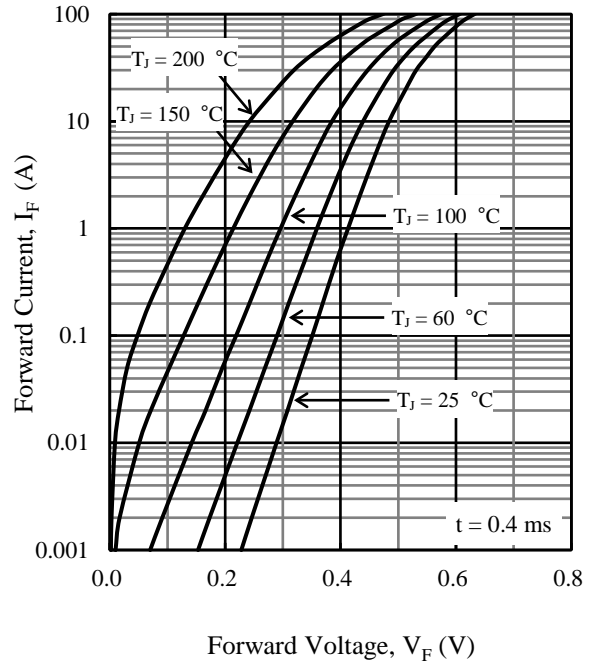


Figure 4.  $I_F$  vs.  $V_F$  Typical Characteristics

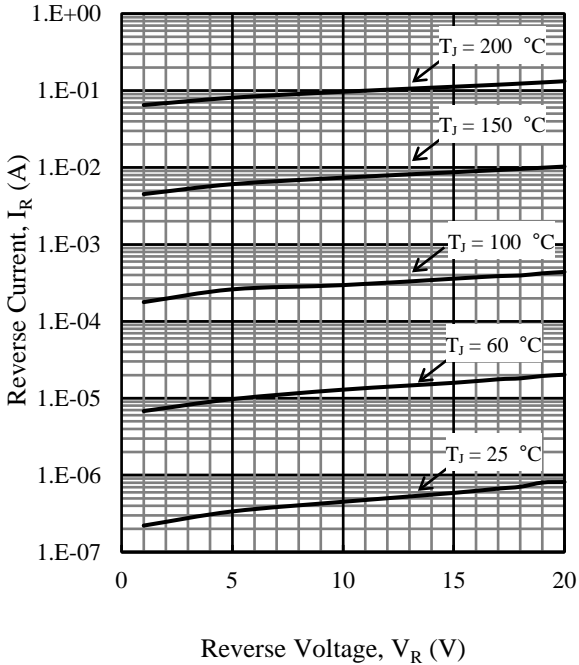


Figure 5.  $I_R$  vs.  $V_R$  Typical Characteristics

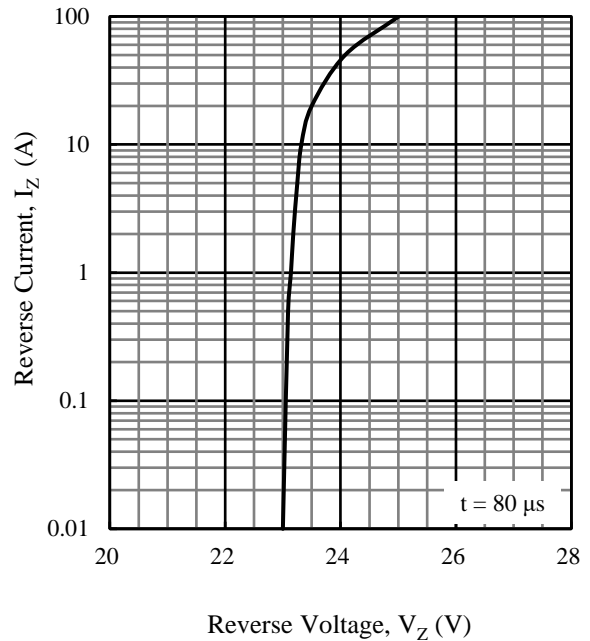


Figure 6.  $I_Z$  vs.  $V_Z$  Typical Characteristics

<sup>(2)</sup> See Figure 1 for the measurement conditions of case temperature.

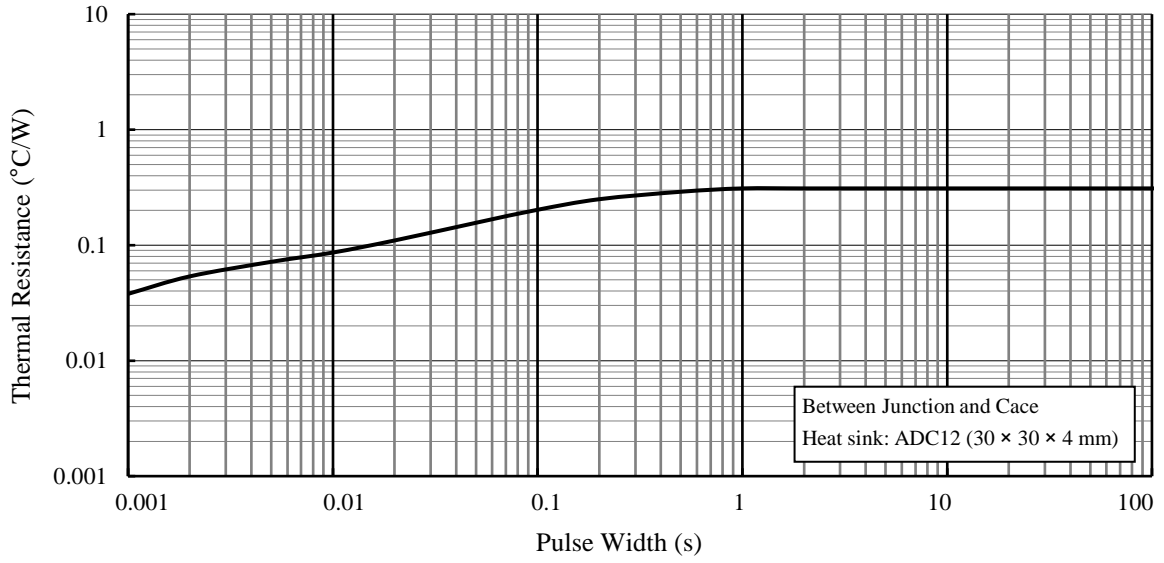


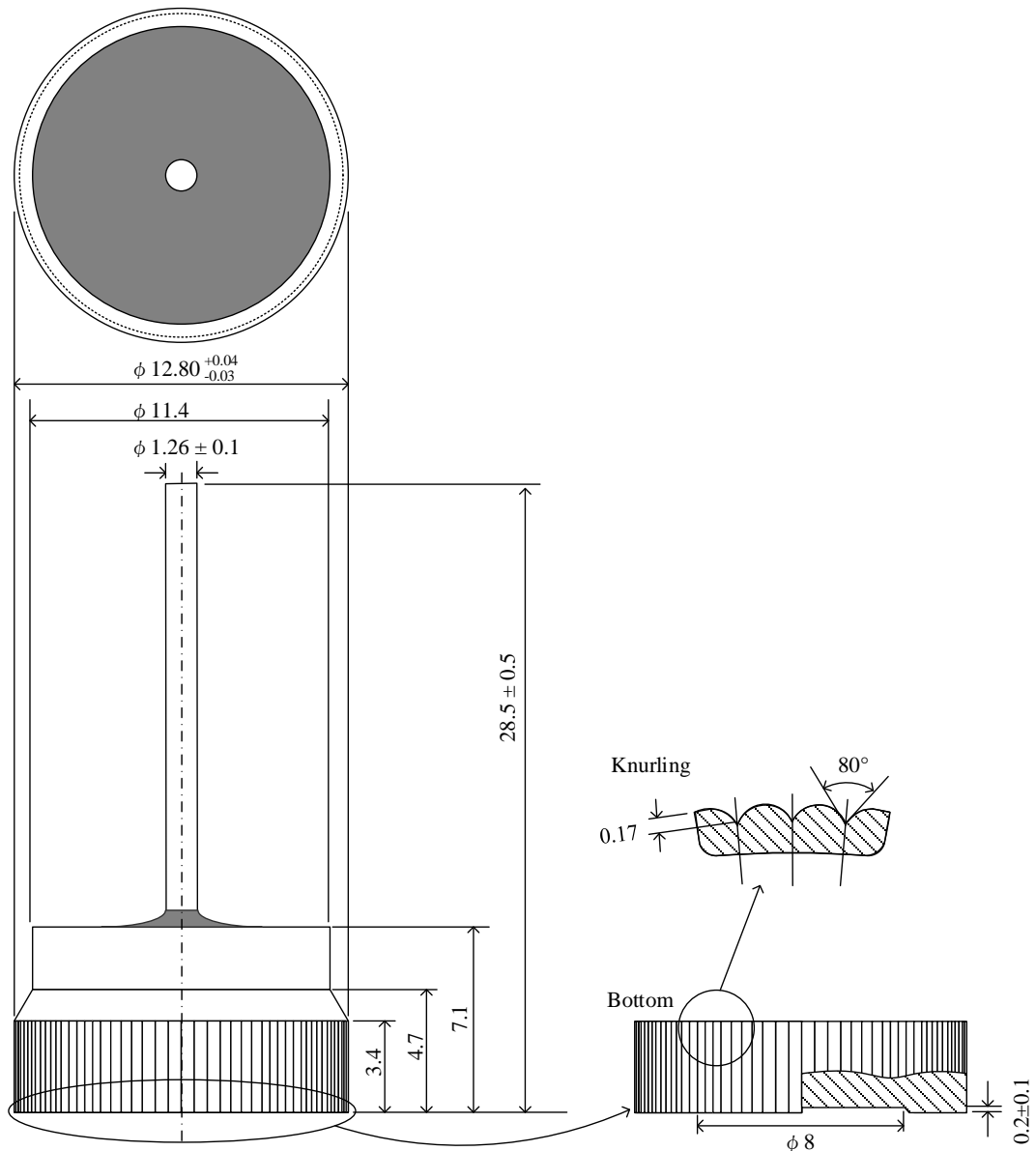
Figure 7. Typical Transient Thermal Resistance<sup>(3)</sup>

<sup>(3)</sup> See Figure 1 for measurement conditions of lead temperature.

# SG-17VLEF

## 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  $\pm 0.2$ .

● **Heatsink**

- Recommended hole size and interference: See Figure 8
- 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**

Note followings when the product is pressed into the heatsink.

- Press pin contact area: See Figure 9 (The press pin must not be pressed to “No press area”)
- Recommended press pin form: See Figure 10
- Contact area between the press pin and the product:  $\geq 30 \text{ mm}^2$  (If the contact area is too small, the product package is deformed and the product damage may be caused.)
- Maximum press load:  $\leq 10,000 \text{ N}$  (See Figure 11)

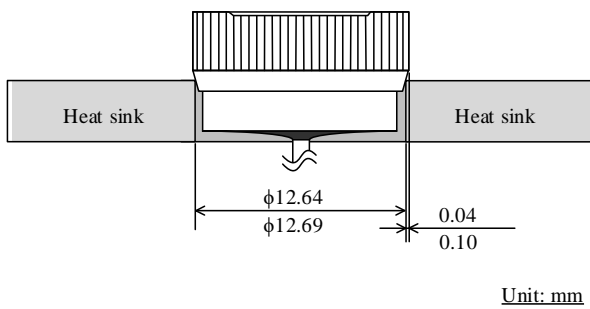


Figure 8 Recommended Hole Size and Interference

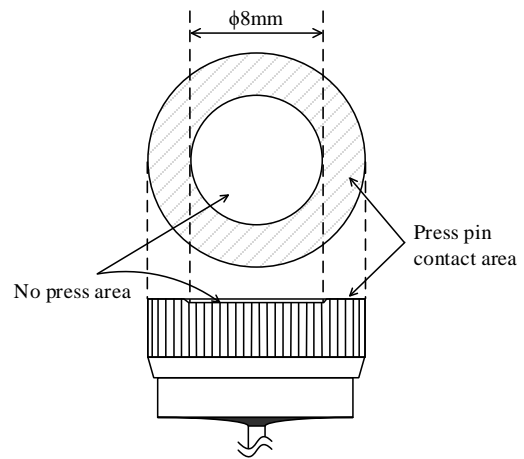


Figure 9 Press Pin Contact Area

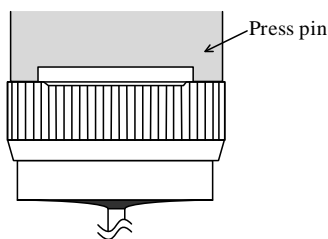


Figure 10 Recommended Press Pin Form

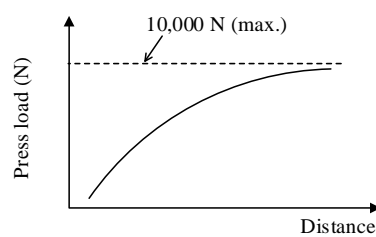


Figure 11 Maximum Press Load

## Marking Diagram

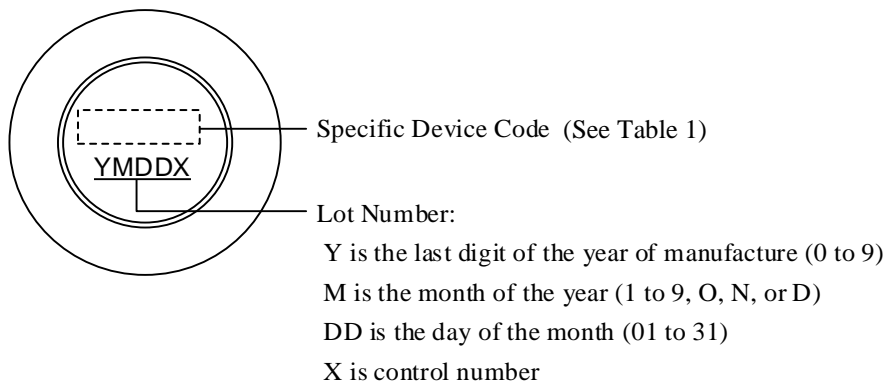


Table 1. Specific Device Code

Specific Device Code	Part Number
BF23S	SG-17VLEFS
BF23R	SG-17VLEFR

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