

V_Z = 23.0 V (typ.)
Automotive Alternator Diode
SG-17VLEF Series

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.

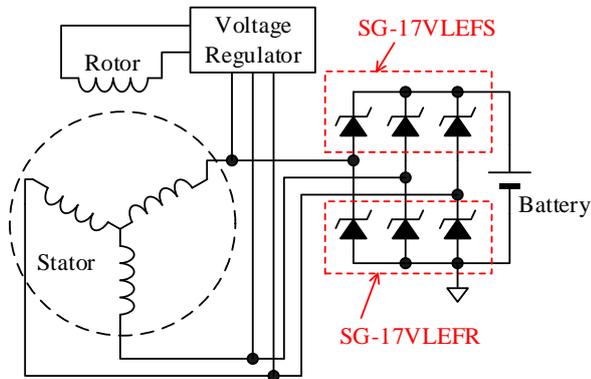
Features

- T_J = 200 °C Capability Suitable for High Reliability and Automotive Requirement
- Thermal Fatigue Capability: 5,000 cyc.
- High Surge Capability
- RoHS Compliant

Applications

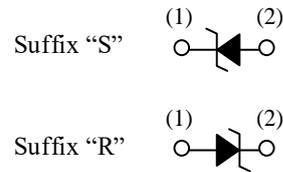
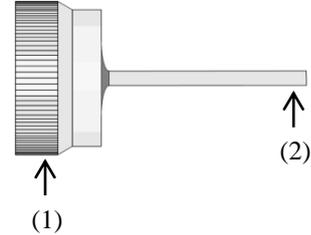
- Alternator Circuit for the 12 V Battery Automotive

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 _{F(AV)}	T _J (Max.)	V _Z	
			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
Repetitive 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, 1 shot.	500	A
Nonrepetitive Peak Reverse Voltage	V_{RSM}	1 shot, see Figure 2.	50	V
Junction Temperature	T_J		-40 to 200	$^\circ\text{C}$
Case Temperature	T_C		-40 to 180	$^\circ\text{C}$
Storage Temperature	T_{STG}		-40 to 200	$^\circ\text{C}$

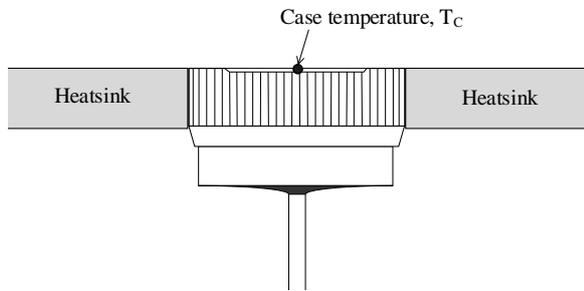


Figure 1. Case Temperature Measurement Conditions

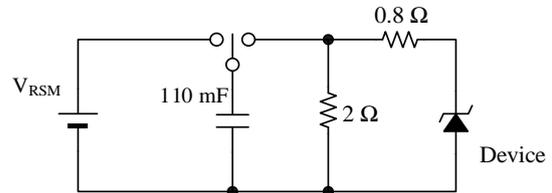


Figure 2. Nonrepetitive Peak Reverse Voltage Measurement Circuit (JASO A-1)

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	μA
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	$R_{th(J-C)}$	⁽¹⁾	—	—	0.5	$^\circ\text{C/W}$

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 1.

Rating and Characteristic Curves

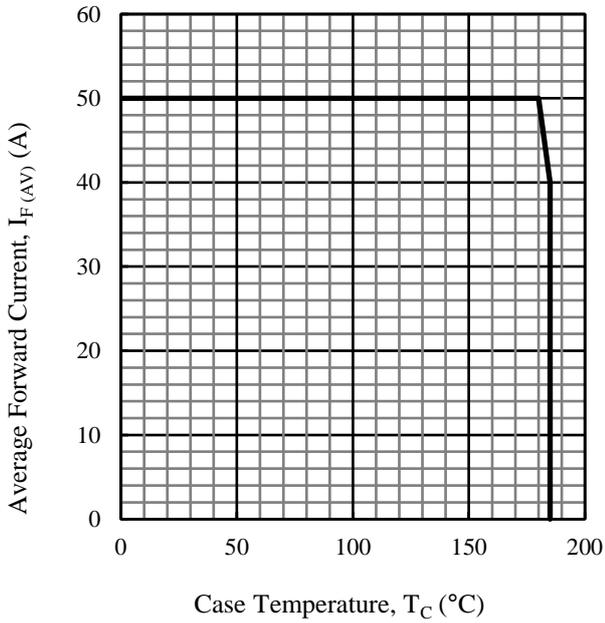


Figure 3. Power Dissipation Curves⁽²⁾

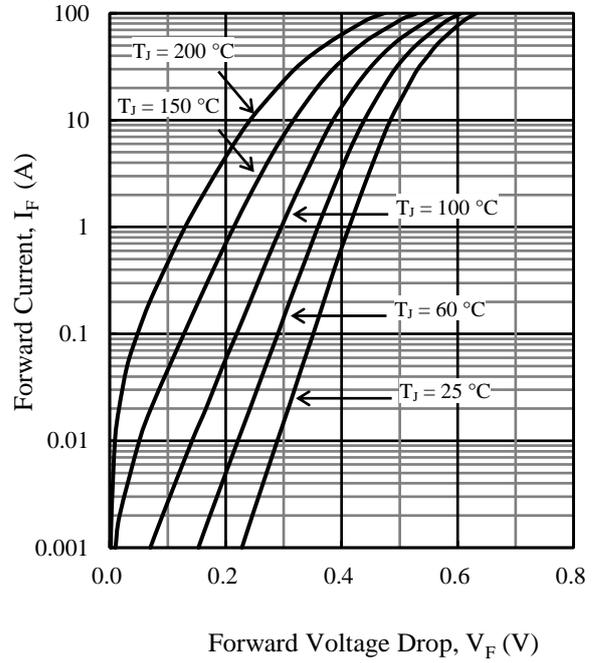


Figure 4. Typical Characteristics: I_F vs. V_F
($t = 0.4$ ms)

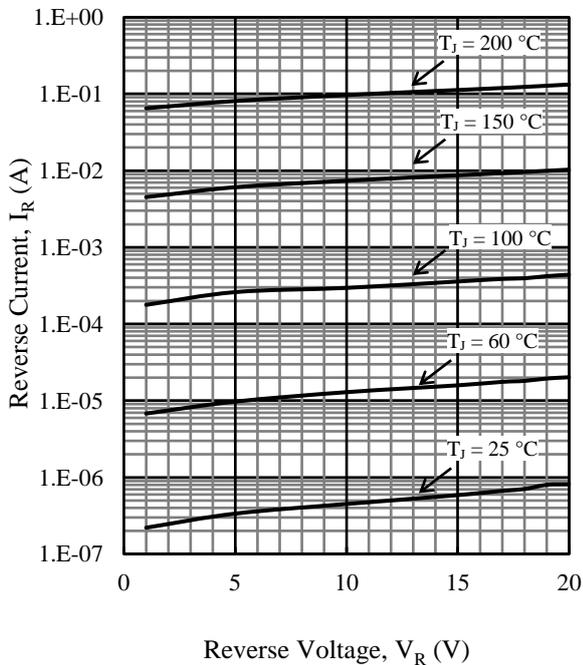


Figure 5. Typical Characteristics: I_R vs. V_R

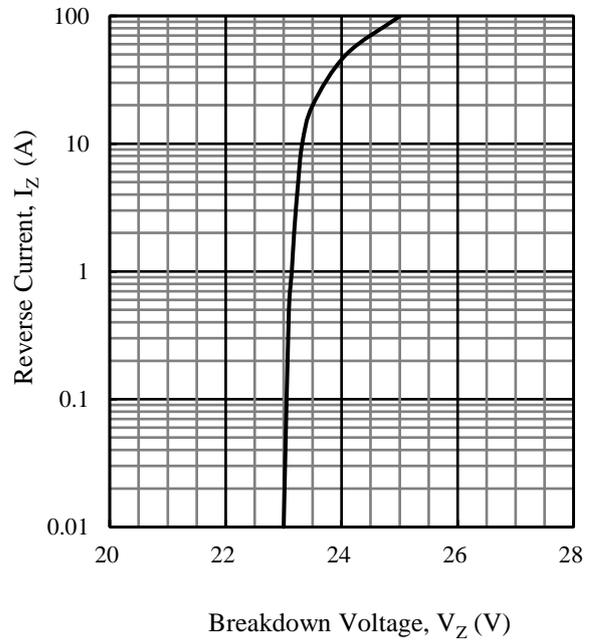


Figure 6. Typical Characteristics: I_Z vs. V_Z
($t = 80$ μ s)

⁽²⁾ See Figure 1 for the measurement conditions of case temperature.

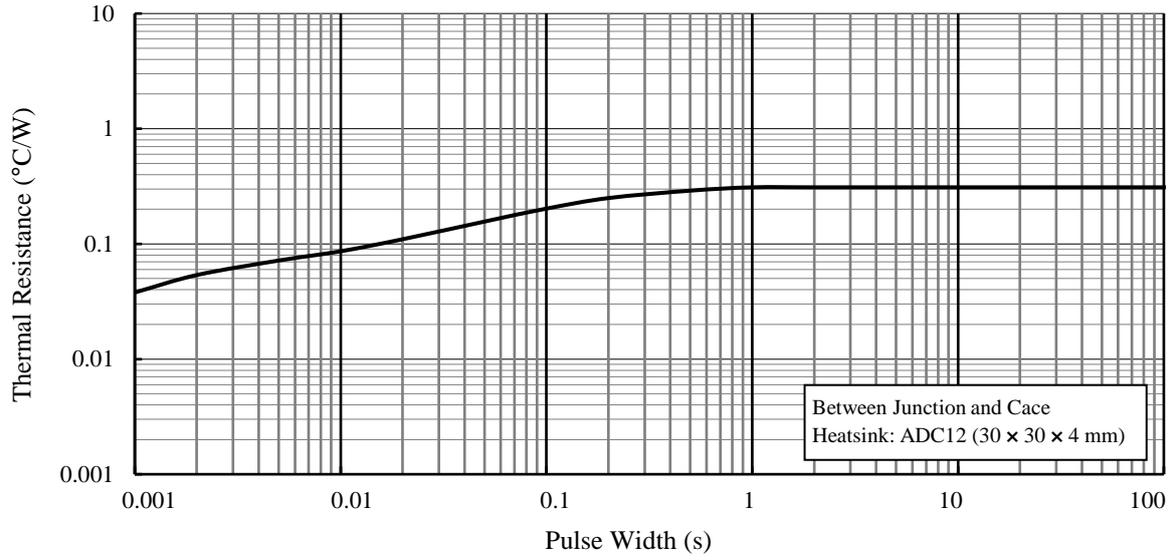


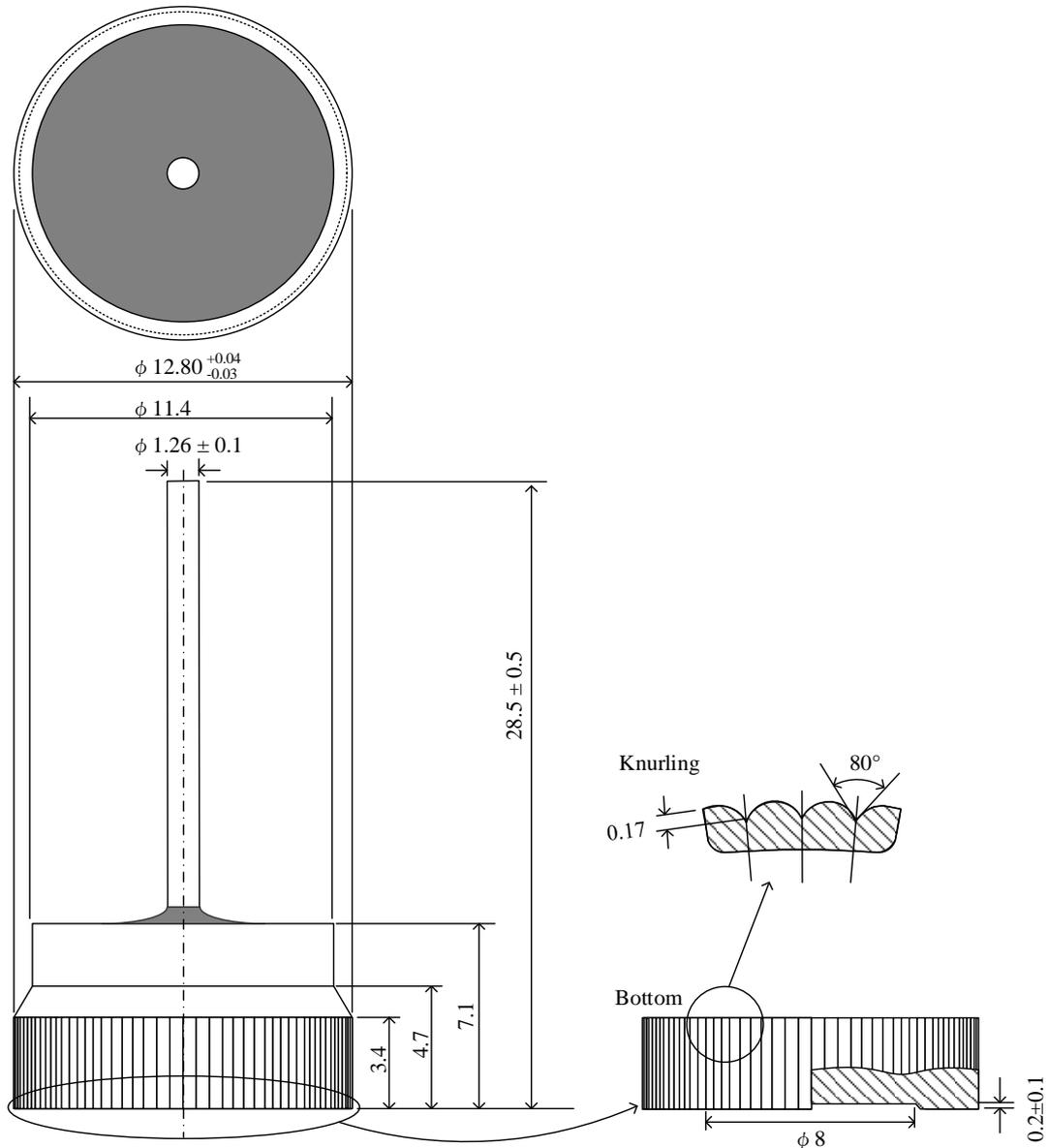
Figure 7. Typical Transient Thermal Resistance Characteristics ⁽³⁾

⁽³⁾ See Figure 1 for measurement conditions of case 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 ± 0.2 .

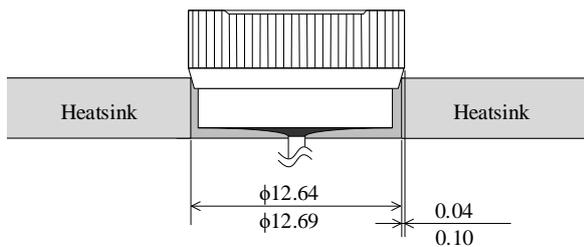
● Heatsink

- 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

The following are the key considerations and the guidelines for pressing a product into a 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)



Unit: mm

Figure 8 Recommended Hole Size and Interference

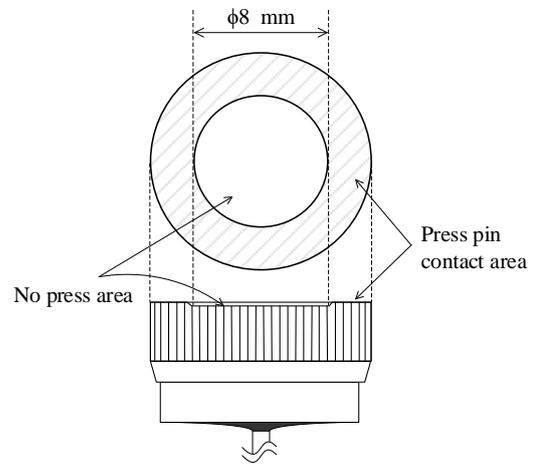


Figure 9 Press Pin Contact Area

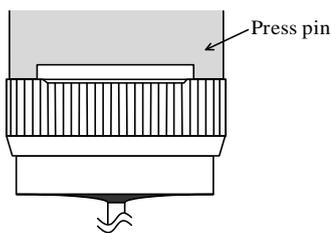


Figure 10 Recommended Press Pin Form

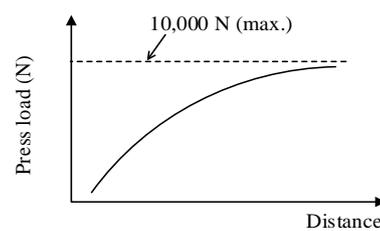


Figure 11 Maximum Press Load

Marking Diagram

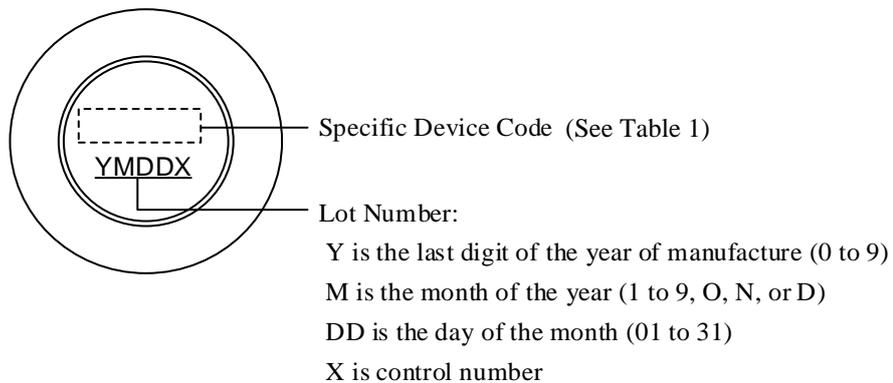


Table 1. Specific Device Code

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

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DSGN-AEZ-16003