

V_Z = 23.0 V (typ.)
Automotive Alternator Diode
SG-17NNJ23 Series

Description

The SG-17NNJ23 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, diodes with the suffix “S” and the suffix “R”, which have opposite polarities.

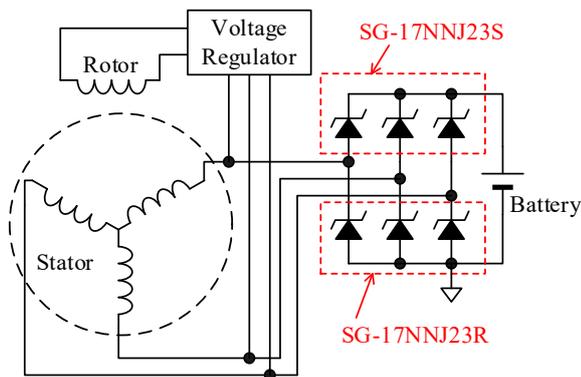
Features

- T_J = 210 °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

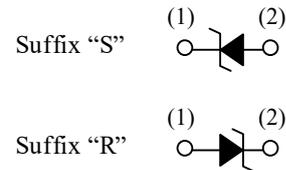
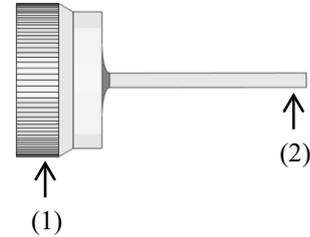
- Alternator Circuit for the 12 V Automotive Battery

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-17NNJ23S	45 A	210 °C	20 V	26 V
SG-17NNJ23R				

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	$I_{F(AV)}$		45	A
Surge Forward Current	I_{FSM}	Half cycle sine-wave, positive side, 10 ms, one shot.	450	A
Nonrepetitive Peak Reverse Voltage	V_{RSM}	One shot, see Figure 1.	50	V
Junction Temperature	T_J		-40 to 210	$^\circ\text{C}$
Case Temperature	T_C	See Figure 2.	-40 to 195	$^\circ\text{C}$
Storage Temperature	T_{STG}		-40 to 195	$^\circ\text{C}$

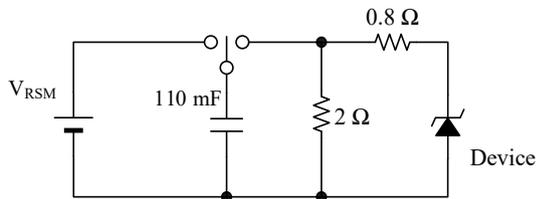


Figure 1. Nonrepetitive Peak Reverse Voltage Measurement Circuit (JASO A-1)

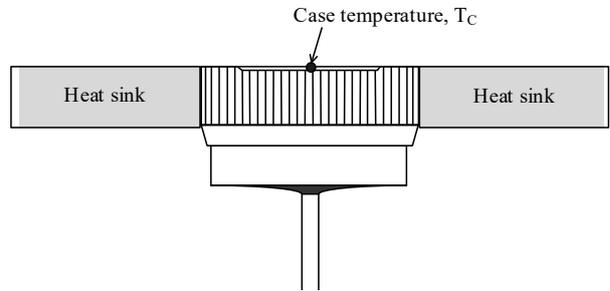


Figure 2. Case Temperature Measurement Conditions

Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	$I_F = 100\text{ A}$, $t = 5\text{ ms}$	—	—	0.92	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	1	μA
Reverse Leakage Current Under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 210\text{ }^\circ\text{C}$	—	—	10	mA
Breakdown Voltage	V_Z	$I_Z = 10\text{ mA}$	20.0	23.0	26.0	V
Breakdown Voltage Temperature Coefficient	r_Z	$I_Z = 10\text{ mA}$	—	—	25	$\text{mV}/^\circ\text{C}$
Thermal Resistance	$R_{th(J-C)}$	⁽¹⁾	—	—	0.5	$^\circ\text{C}/\text{W}$

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

Mechanical Characteristics

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

Rating and Characteristic Curves

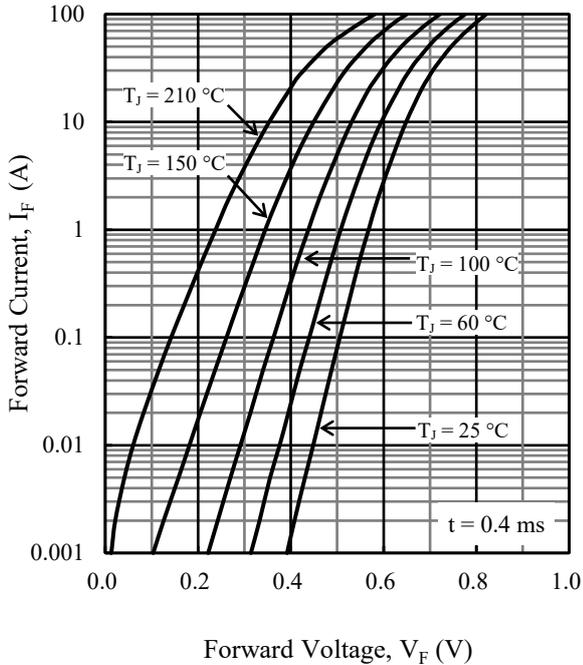


Figure 3. I_F vs. V_F Typical Characteristics

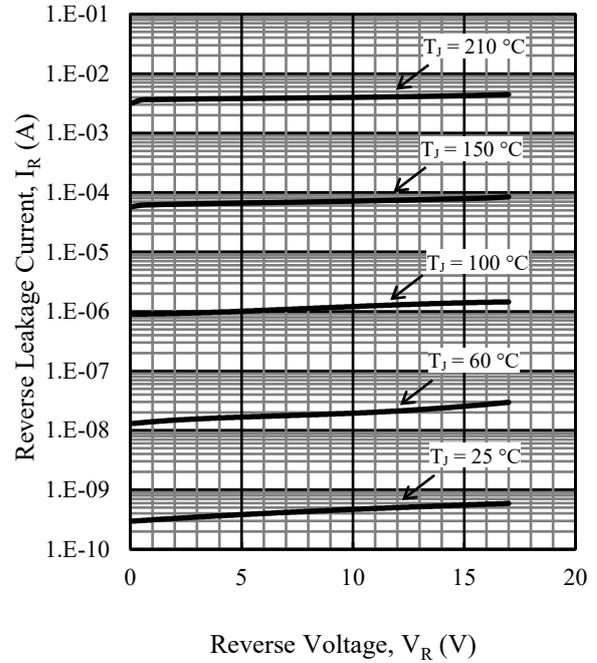


Figure 4. I_R vs. V_R Typical Characteristics

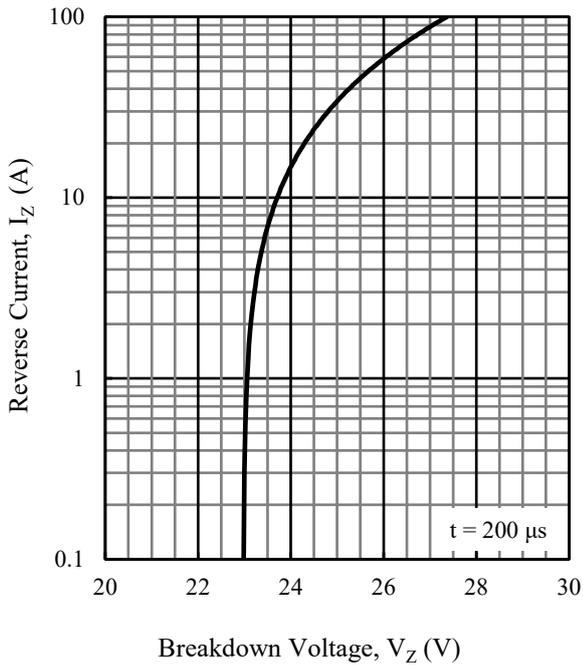


Figure 5. I_Z vs. V_Z Typical Characteristics

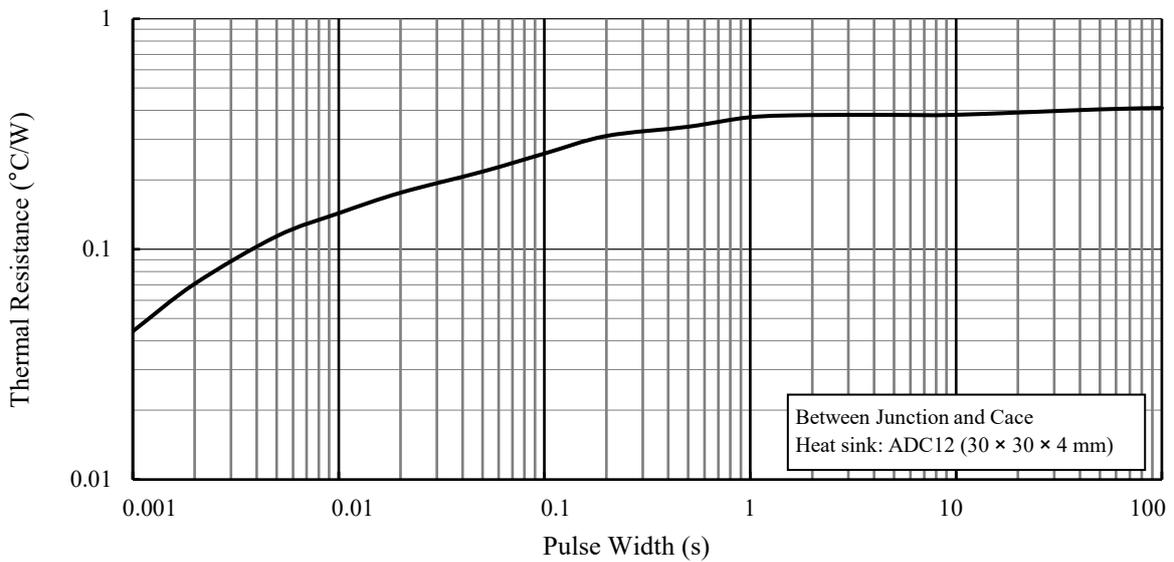


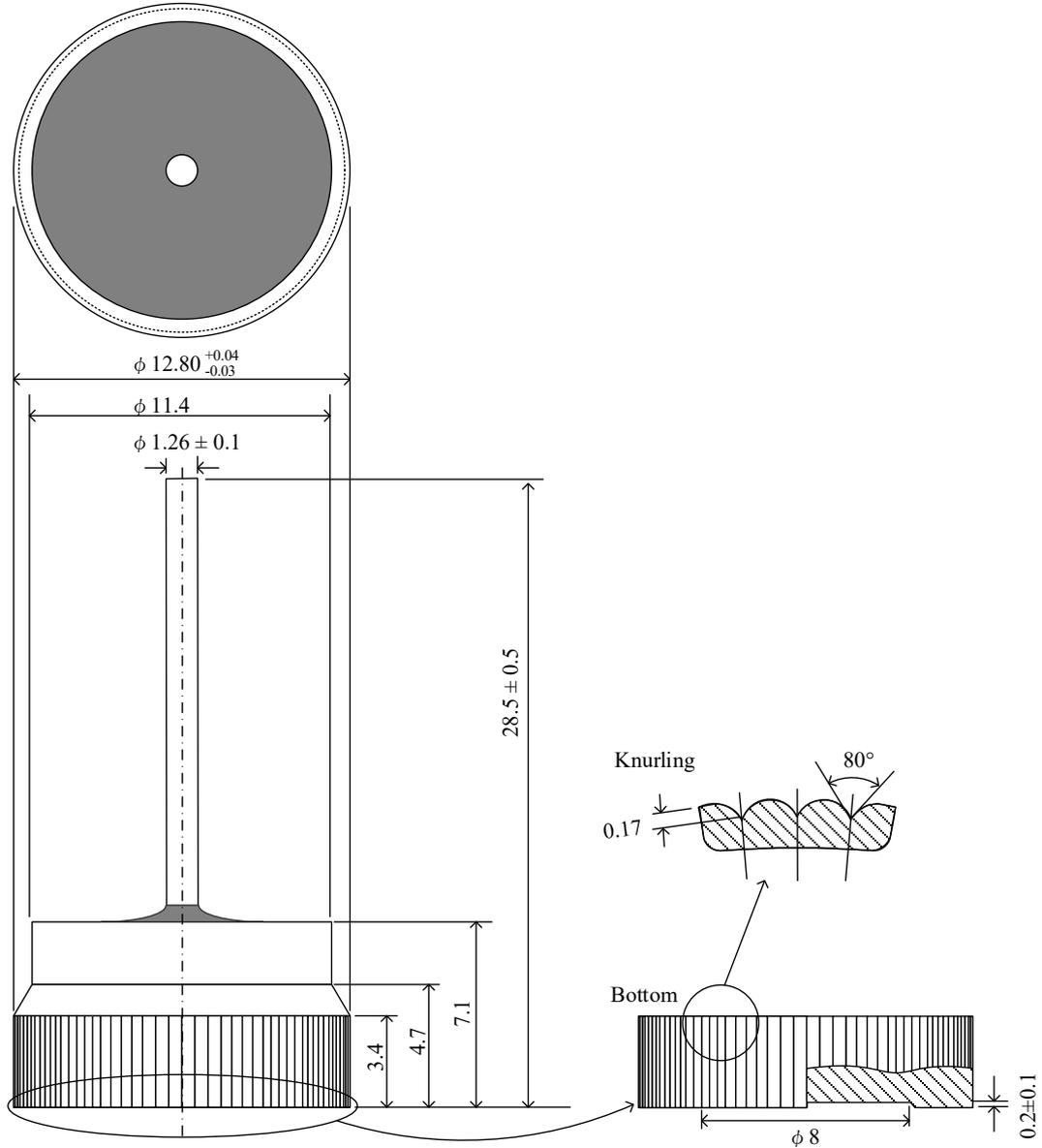
Figure 6. Typical Transient Thermal Resistance⁽²⁾

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

SG-17NNJ23

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

Note followings when the product is pressed into the 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: $\geq 30 \text{ mm}^2$ (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 10)

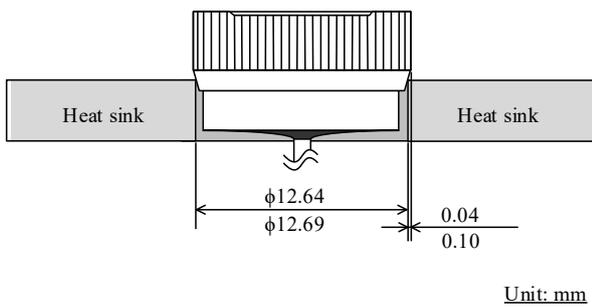


Figure 7 Recommended Hole Size and Interference

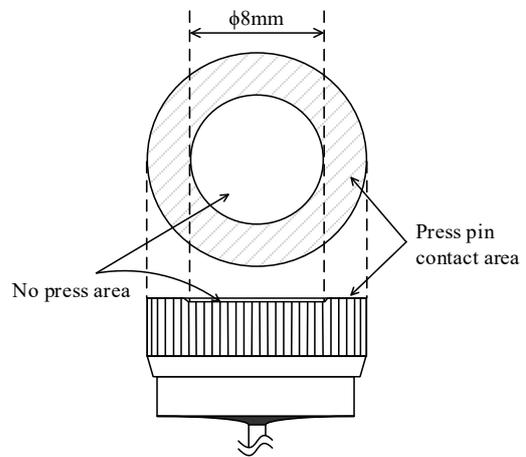


Figure 8 Press Pin Contact Area

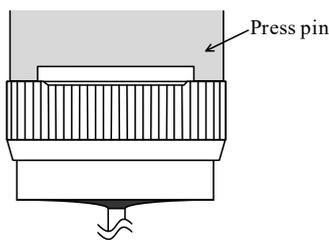


Figure 9 Recommended Press Pin Form

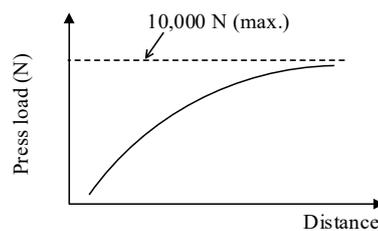


Figure 10 Maximum Press Load

Marking Diagram

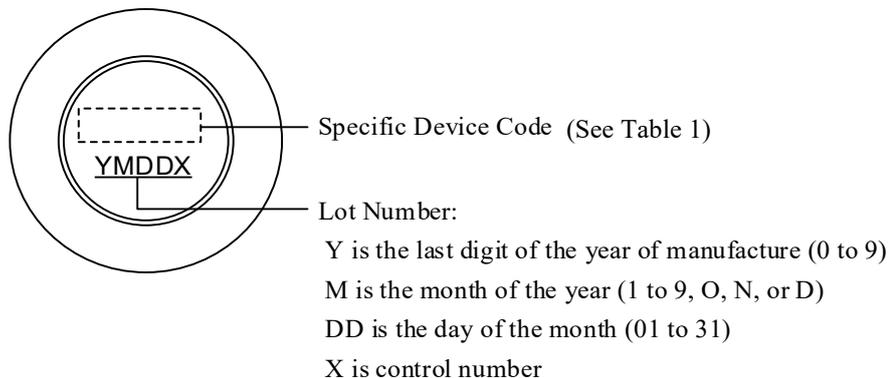


Table 1. Specific Device Code

Specific Device Code	Part Number
JM23S	SG-17NNJ23S
JM23R	SG-17NNJ23R

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