

$V_R$	40	V
$I_o$	20	A
$I_{FSM}$	100	A

#### ● Features

- High reliability
- Power mold type
- Cathode common dual type
- Low  $V_F$

#### ● Application

- Switching power supply

#### ● Structure

- Silicon epitaxial planar

#### ● Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Limits	Unit
Repetitive peak reverse voltage	$V_{RM}$	Duty $\leq 0.5$	40	V
Reverse voltage	$V_R$	Reverse direct voltage	40	V
Average rectified forward current	$I_o$	60Hz half sin waveform, resistive load, $I_o/2$ per diode, $T_c=120^\circ\text{C Max.}$	20	A
Peak forward surge current	$I_{FSM}$	60Hz half sin waveform, non-repetitive, per diode, $T_a=25^\circ\text{C}$	100	A
Junction temperature <sup>(1)</sup>	$T_j$	-	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-	-55 ~ 150	$^\circ\text{C}$

Note(1) To avoid occurrence of thermal runaway, actual board is to be designed to fulfill  $dP_j/dT_j < 1/R_{\theta JA}$ .

#### Attention

Compared with PN junction diodes, Schottky Barrier Diode is generally high reverse current (IR). The reverse loss of the diode might increase as temperature increasing that causes heat-up and further IR. This phenomenon might end up the thermal destruction(thermal runaway). Therefore please give consideration to the reverse loss and the ambient temperature when using this product.

#### ● Outline



#### ● Inner Circuit



#### ● Packaging Specifications

Packing	Embossed Tape
Reel Size(mm)	330
Taping Width(mm)	24
Quantity(pcs)	1000
Taping Code	TL
Marking	BR20NS40A

● Electrical Characteristics (T<sub>j</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage <sup>(1)</sup>	V <sub>F</sub>	I <sub>F</sub> =10A	-	-	0.62	V
Reverse current <sup>(1)</sup>	I <sub>R</sub>	V <sub>R</sub> =40V	-	-	240	μA

Note (1) Value per diode

● Thermal Characteristics

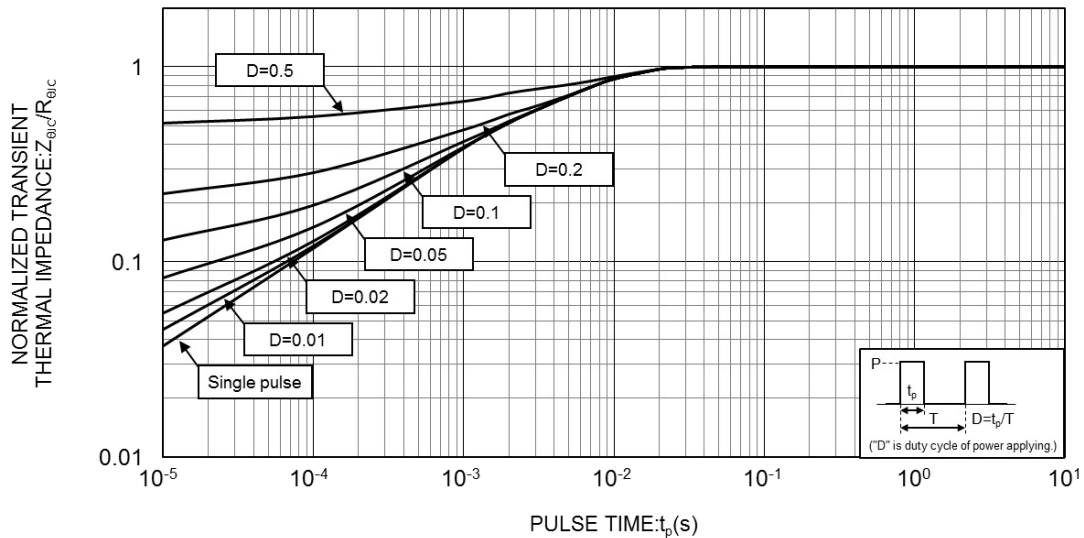
Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance (Junction to case) <sup>(1) (2)</sup>	Per diode	-	-	1.6	°C/W
	Per device	-	-	1.0	°C/W
Thermal Resistance (Junction to ambient) <sup>(1) (3)</sup>	R <sub>θJA</sub>	-	-	55	°C/W

Notes (1) Value is guaranteed by design.

(2) Transient dual interface measurement (TDIM) method.

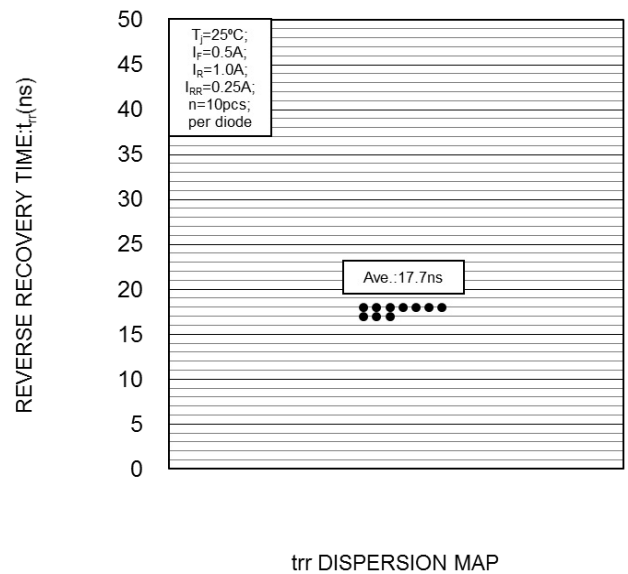
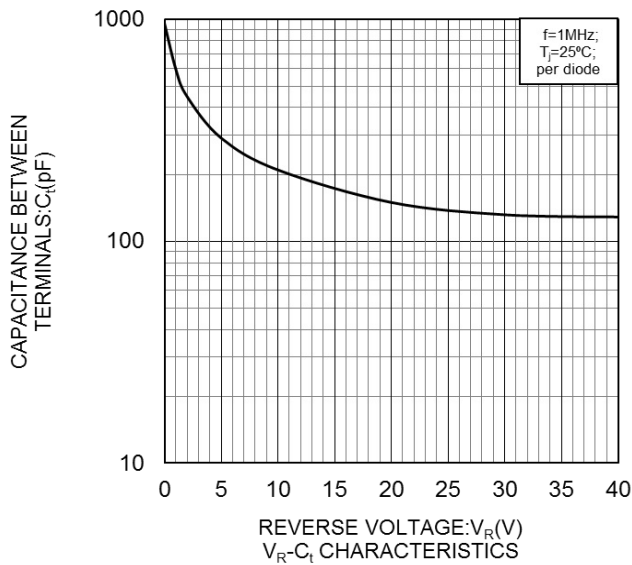
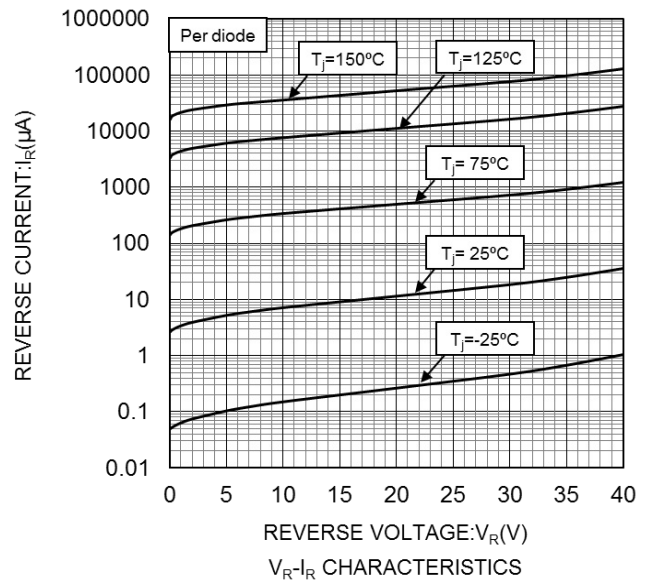
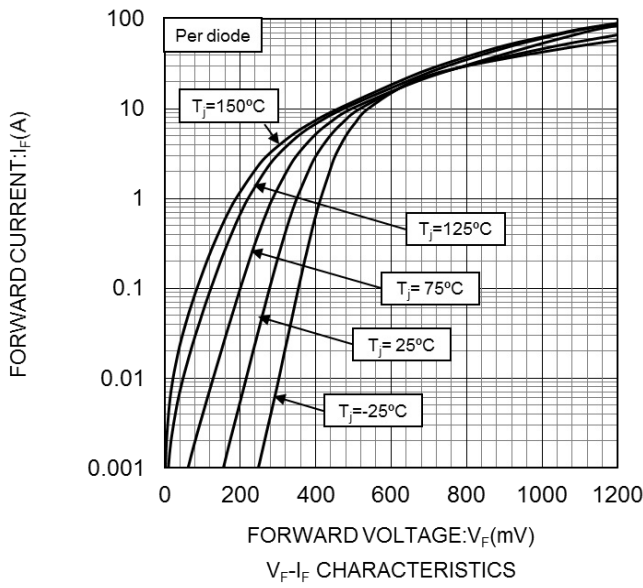
(3) Mounted on 50 x 50 x 1.6mm FR4 board, single-sided copper, 35μm thickness, reference footprint.

● Characteristic Curves

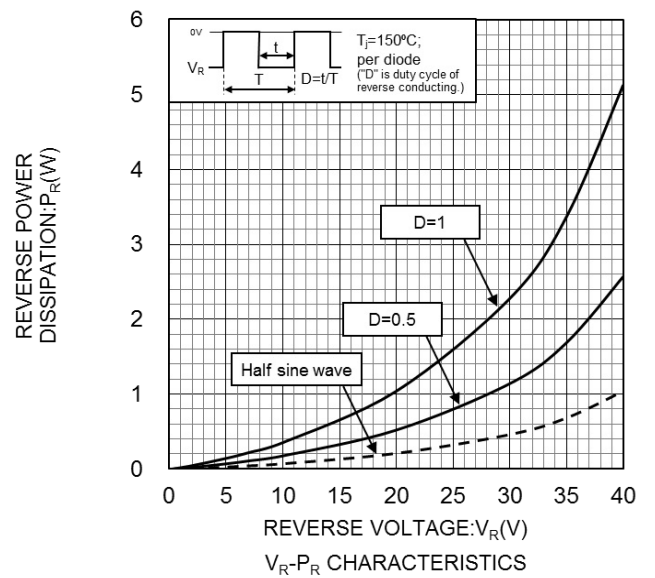
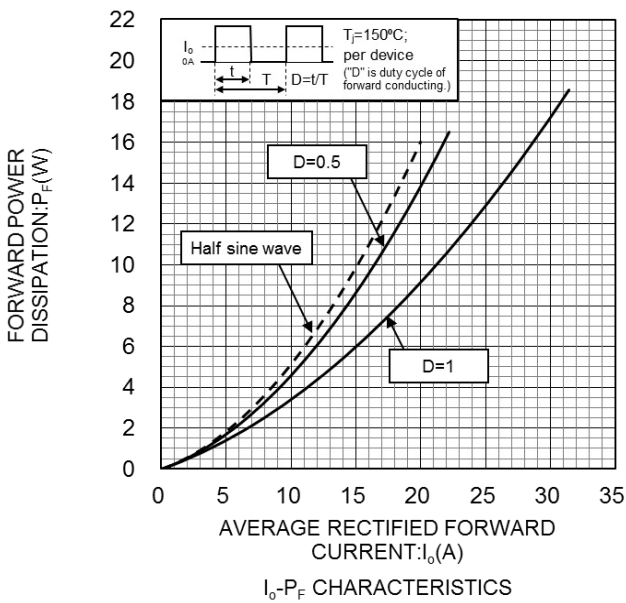
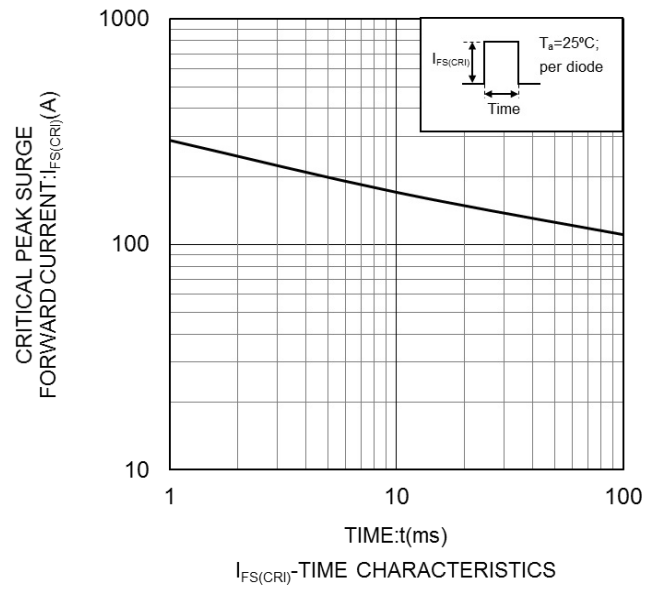
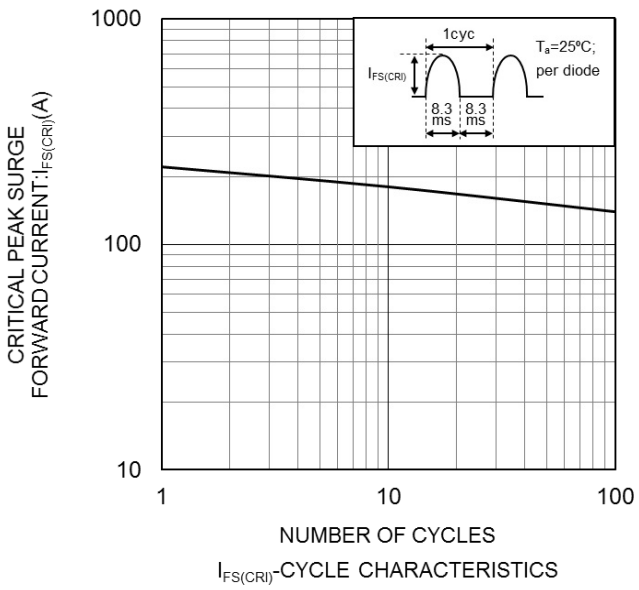


NORMALIZED TRANSIENT THERMAL IMPEDANCE FROM JUNCTION TO CASE (PER DEVICE)

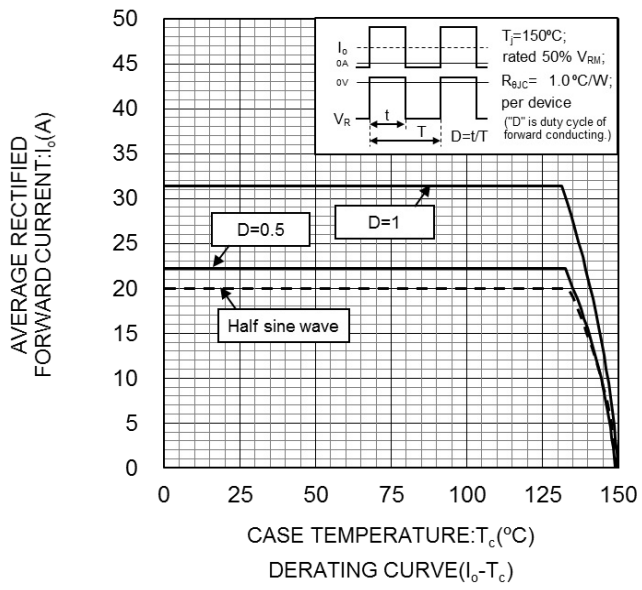
● Characteristic Curves



● Characteristic Curves



● Characteristic Curves



● Dimensions

TO-263S, [SC-83], (TO-263S)

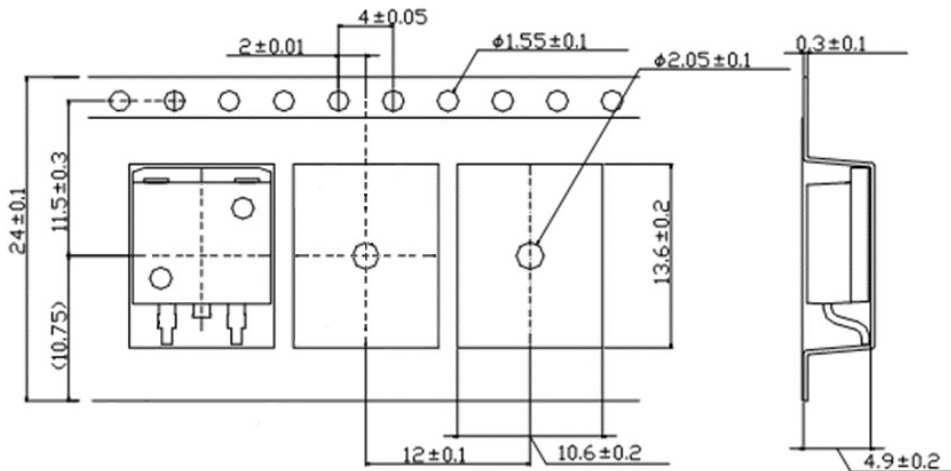


DIM	Millimeters			Inches		
	Min.	Average	Max.	Min.	Average	Max.
A	4.30	4.50	4.70	0.169	0.177	0.185
A1	0.00	-	0.30	0.000	-	0.012
A2	2.50	2.70	2.90	0.098	0.106	0.114
b	0.75	0.76	0.78	0.030	0.030	0.031
b2	1.21	1.22	1.24	0.048	0.048	0.049
b6	-	1.30	-	-	0.051	-
c	0.52	0.62	0.82	0.020	0.024	0.032
c2	1.10	1.30	1.50	0.043	0.051	0.059
D	8.80	9.00	9.20	0.346	0.354	0.362
D1	-	7.25	-	-	0.285	-
E	9.80	10.10	10.40	0.386	0.398	0.409
E1	-	8.90	-	-	0.350	-
e	-	2.54	-	-	0.100	-
H	12.80	13.10	13.40	0.504	0.516	0.528
L	-	1.20	-	-	0.047	-
L1	-	1.10	-	-	0.043	-
L2	0.70	1.00	1.30	0.028	0.039	0.051
L3	2.70	3.00	3.30	0.106	0.118	0.130

DIM	Millimeters			Inches		
	Min.	Average	Max.	Min.	Average	Max.
b3	-	2.50	-	-	0.098	-
b4	-	9.90	-	-	0.390	-
b5	-	11.00	-	-	0.433	-
I1	-	2.50	-	-	0.098	-
I2	-	8.50	-	-	0.335	-
I3	-	14.00	-	-	0.551	-
I4	-	2.50	-	-	0.098	-

● Taping (Unit:mm)



# Notice

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(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASS III	CLASS III	CLASS II b	CLASS III
CLASS IV		CLASS III	

2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
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3. Our Products are not designed under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc. prior to use, must be necessary:
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  - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
  - [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
  - [f] Sealing or coating our Products with resin or other coating materials
  - [g] Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
  - [h] Use of the Products in places subject to dew condensation
4. The Products are not subject to radiation-proof design.
5. Please verify and confirm characteristics of the final or mounted products in using the Products.
6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
8. Confirm that operation temperature is within the specified range described in the product specification.
9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

## Precaution for Mounting / Circuit board design

1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

**Precautions Regarding Application Examples and External Circuits**

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
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**Precaution for Electrostatic**

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

**Precaution for Storage / Transportation**

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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