



300V/10A Silicon Carbide - Schottky Barrier Diode for Audio

■FEATURES

- Reverse voltage V_R : 300V
- Forward current I_F : 10A
- High-speed switching characteristics
15ns typ. ($V_R = 300V, T_a = 25^\circ C$)
- Low temperature dependence
- Low-loss assembly technology (Copper thick wire)
- Package Outline TO-247-3

■GENERAL DESCRIPTION

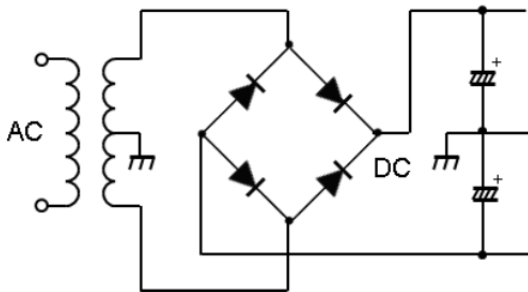
The MUSES7001 is a silicon carbide - schottky barrier diode (SiC-SBD) for audio.

The MUSES7001 improves the sound quality of audio equipment by high-speed switching characteristics and high-quality sound manufacturing technology.

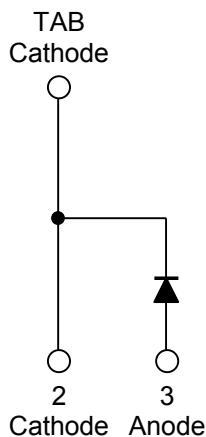
Combination with the MUSES series operational amplifiers and the MUSES7001 can offer an excellent quality sound, because the SiC-SBD will fully bring out the performance of the MUSES series operational amplifiers.

■APPLICATION

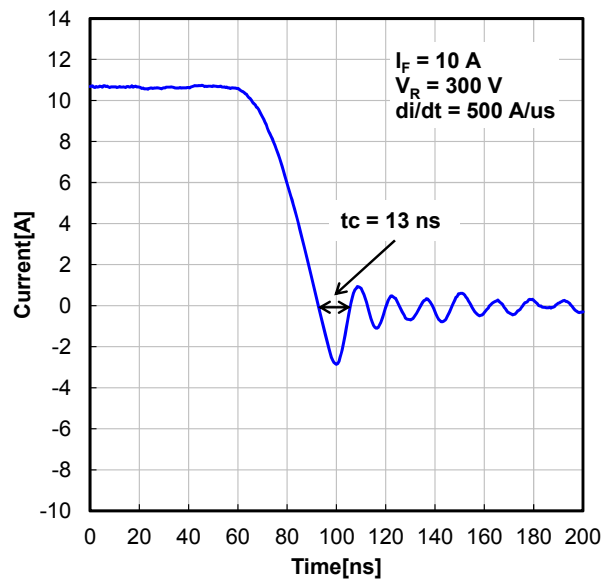
- Premium home audio
Bridge rectifier circuit for audio equipment



■EQUIVALENT CIRCUIT



■HIGH-SPEED SWITCHING CHARACTERISTICS



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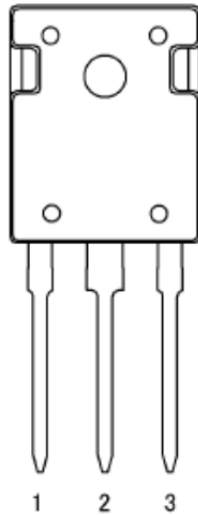
■ SiC-SBD LINEUP

PART NUMBER	NUMBER OF CIRCUITS	V_R	I_F	PACKAGE OUTLINE	NOTE
MUSES7003	2	300V	20A	TO-247-3	Common cathode
NJD7002	1	200V	0.5A	SSOP8-A3	

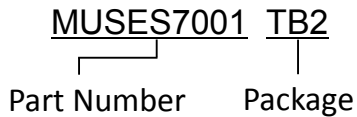
■ PIN CONFIGURATION

PIN NO.	SYMBOL
1	NC
2	Cathode
3	Anode
TAB	Cathode

(Top View)



■ MARK INFORMATION



■ ORDERING INFORMATION

PART NUMBER	PACKAGE OUTLINE	RoHS	HALOGEN-FREE	TERMINAL FINISH	MARKING	WEIGHT (g)	MOQ(pcs)
MUSES7001TB2	TO247-3	yes	yes	Sn-2Bi	MUSES7001	6.4	300

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT	CONDITION
Peak Reverse voltage	V_{RM}	300	V	
Reverse voltage (DC)	V_R	300	V	
Forward current	I_F	10	A	$T_j \leq 150^\circ\text{C}$
Surge forward current	I_{FSM}	40 ^{*1}	A	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{STG}	-55 to 150	$^\circ\text{C}$	

*1: Non-repetitive maximum peak forward current in one cycle of 50Hz sin wave

■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward voltage	V_F	$I_F = 10\text{A}, T_j = 25^\circ\text{C}$	-	1.60	1.80	V
		$I_F = 10\text{A}, T_j = 150^\circ\text{C}$	-	1.85	2.15	
Reverse current	I_R	$V_R = 300\text{V}, T_j = 25^\circ\text{C}$	-	5	50	μA
		$V_R = 300\text{V}, T_j = 150^\circ\text{C}$	-	10	100	
Switching time	t_c	$V_R = 300\text{V}, di/dt=500\text{A}/\mu\text{s}$	-	15	20	ns
Total capacitance	C_t	$V_R = 1\text{V}, f = 1\text{MHz}$	-	370	430	pF
		$V_R = 300\text{V}, f = 1\text{MHz}$	-	45	-	

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE	UNIT
Junction-to-ambient thermal resistance	$Z_{th(j-a)}$	35	$^\circ\text{C}/\text{W}$
Junction-to-case thermal resistance	$Z_{th(j-c)}$	3.0	$^\circ\text{C}/\text{W}$

■ NOTE

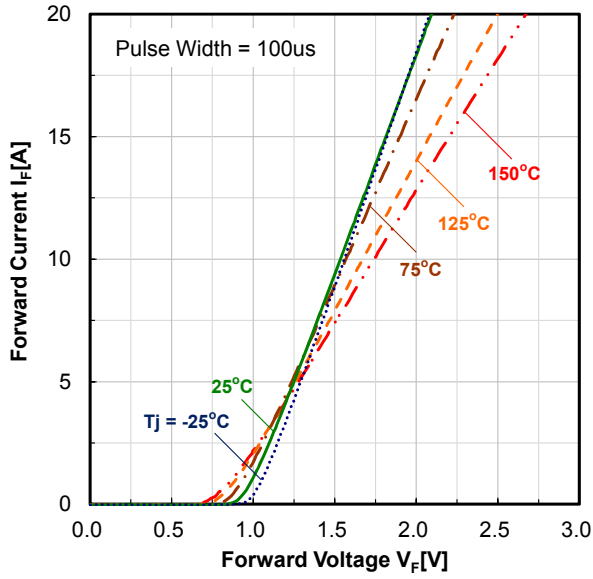
Junction temperature during operation should not exceed 150°C .

Be careful about thermal design. The temperature dependence of the forward characteristic depends on the operating current.

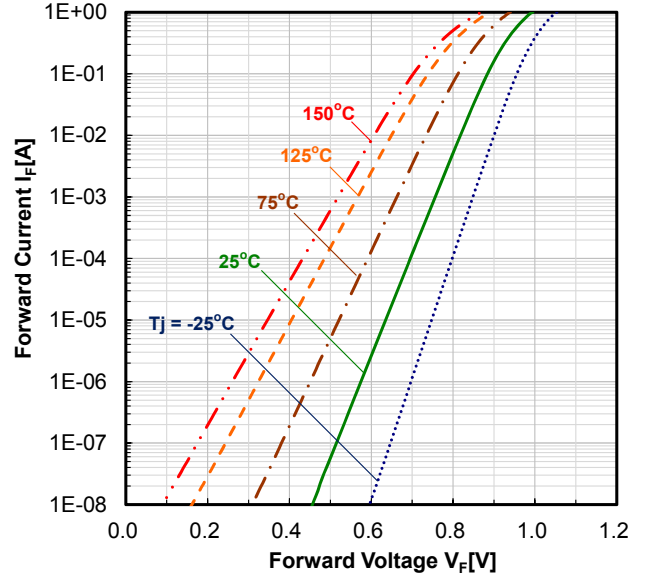
Be careful about inrush current at power-on. Inrush current shall not exceed the absolute maximum rating of surge forward current.

■ TYPICAL CHARACTERISTICS

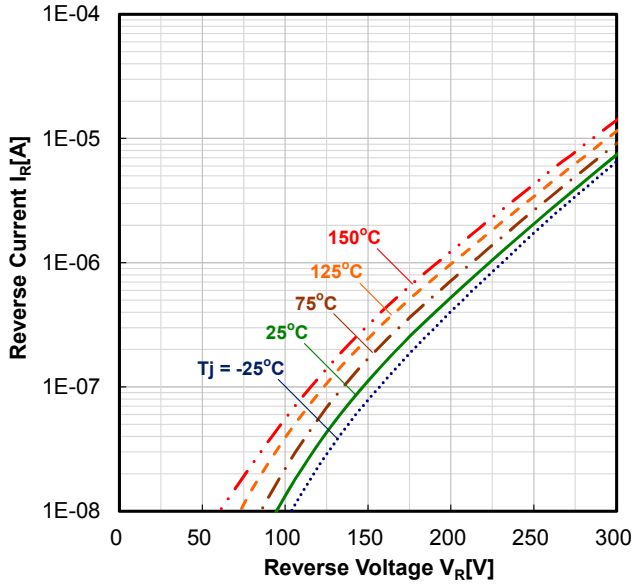
I_F - V_F Characteristics 1



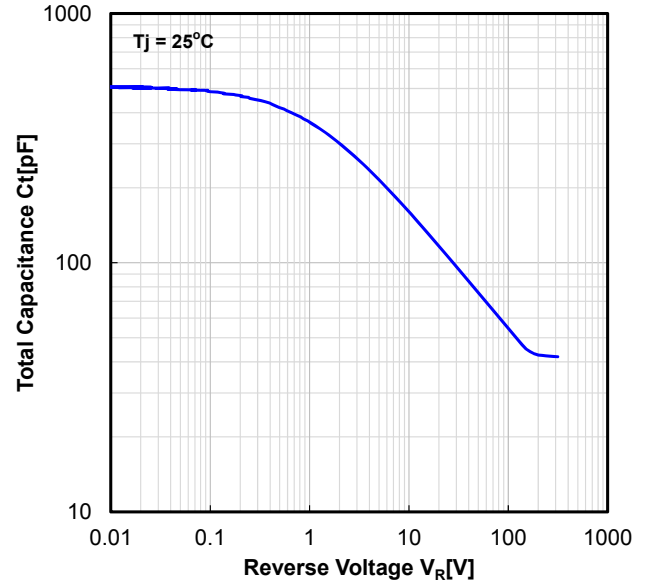
I_F - V_F Characteristics 2



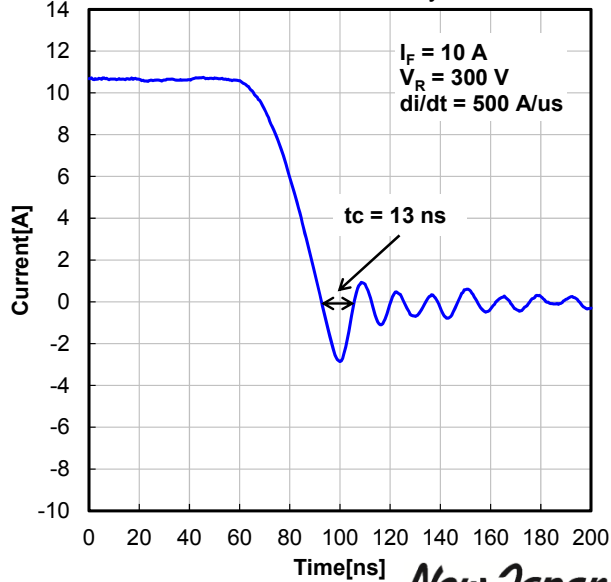
I_R - V_R Characteristics

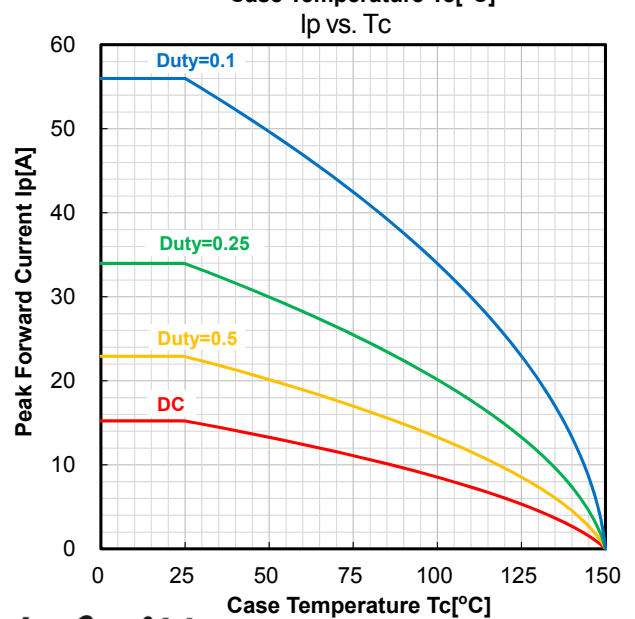
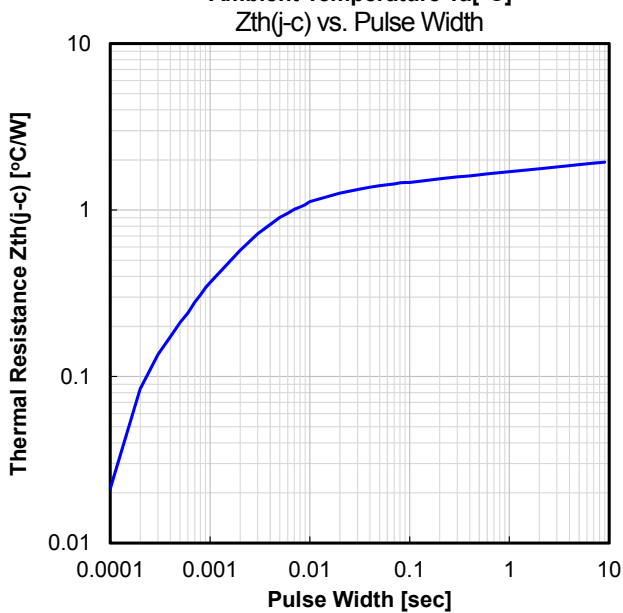
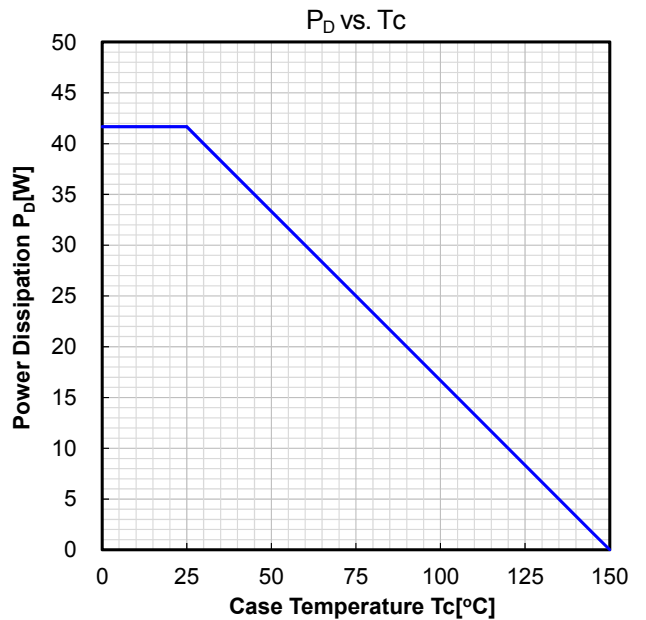
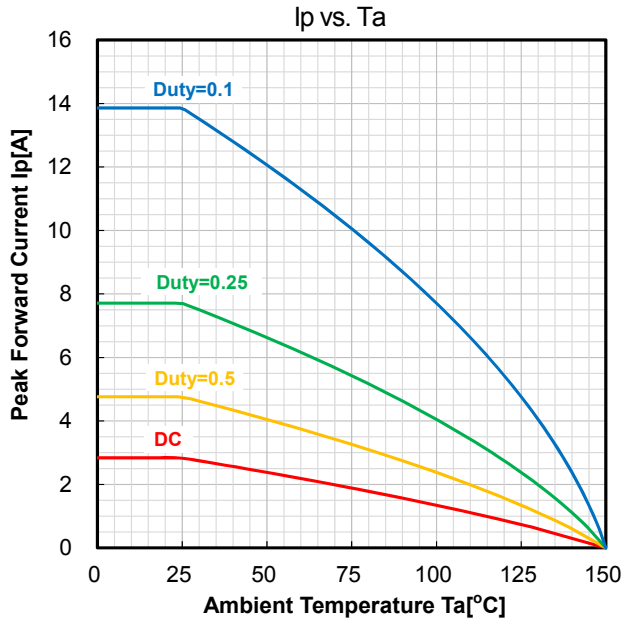
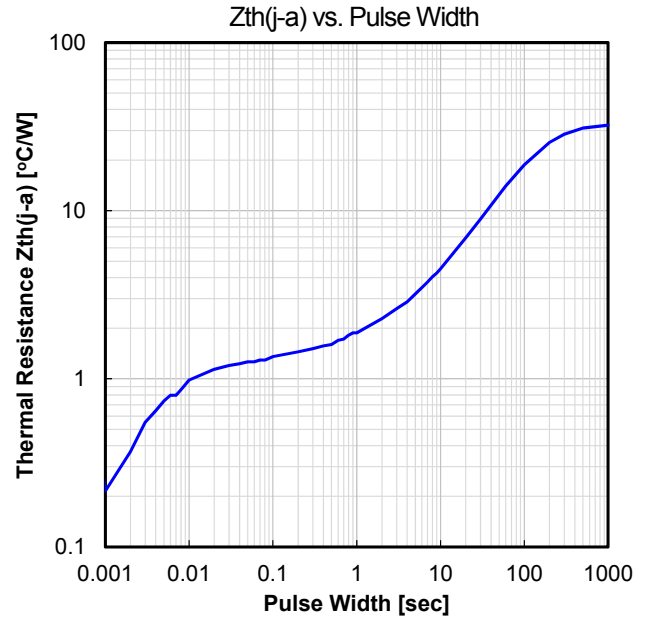
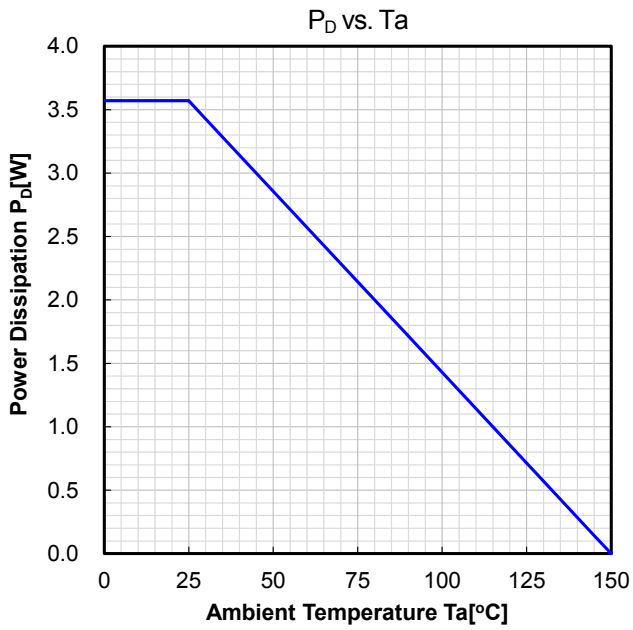


C_t - V_R Characteristics

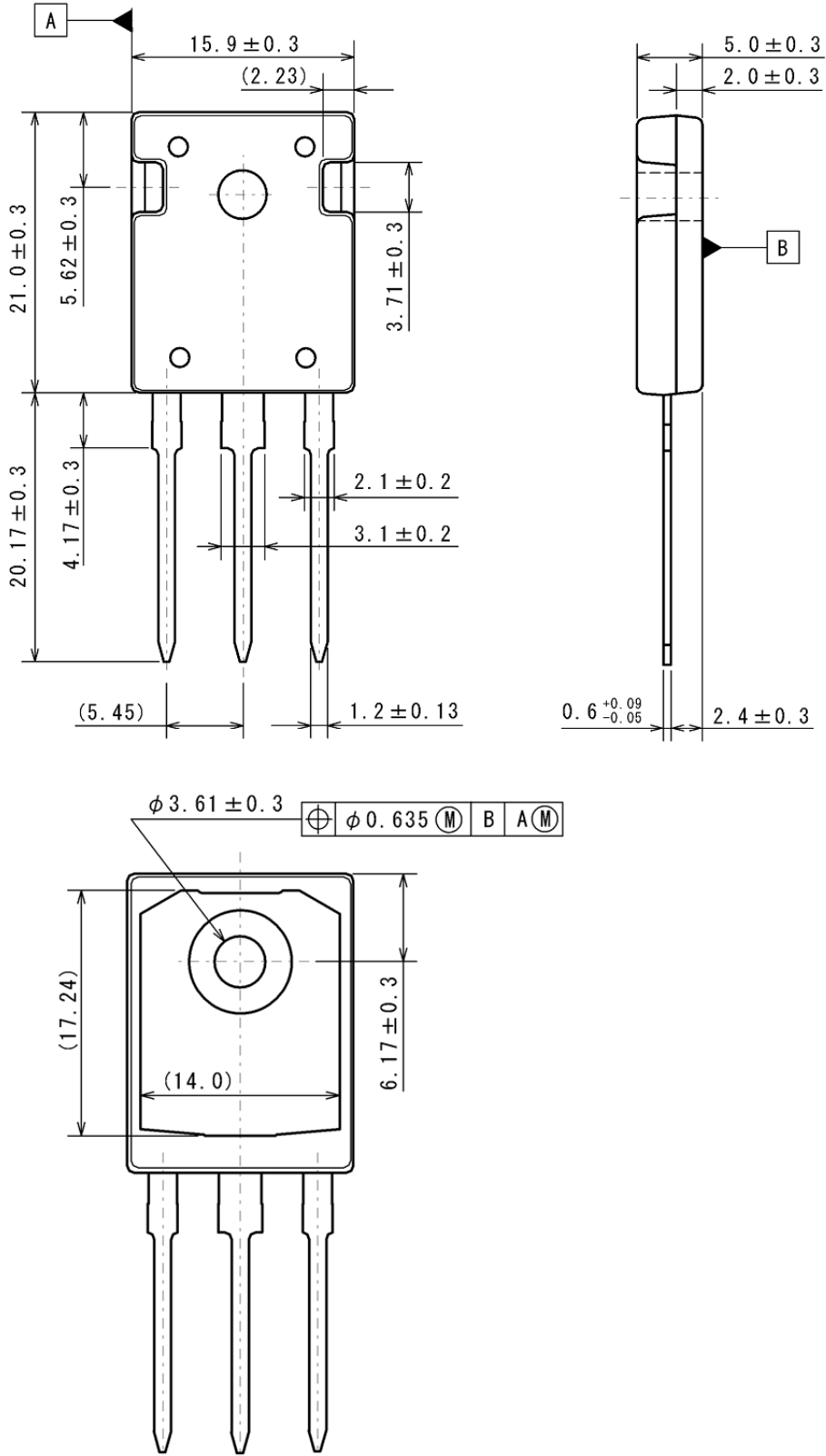


Reverse Recovery





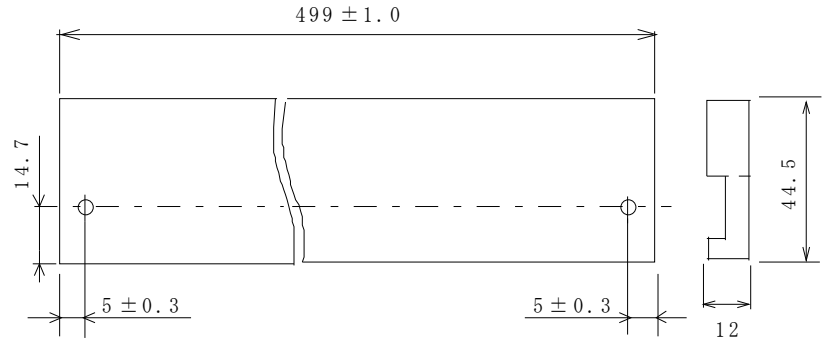
PACKAGE OUTLINE



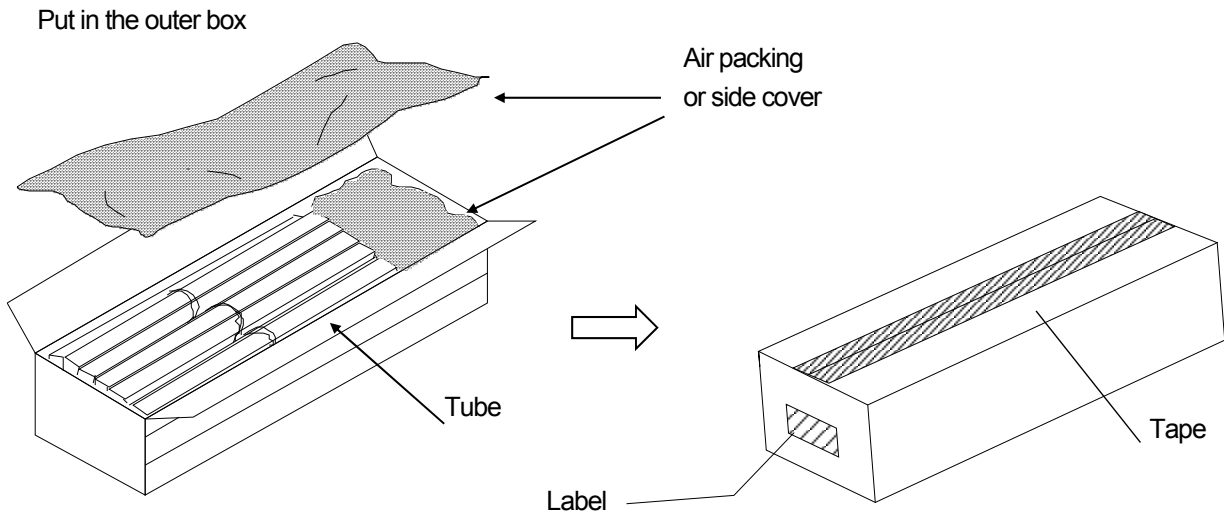
■PACKING SPECIFICATION

Plastic Tube Container dimensions for TO-247-3

- 1. Material PVC
- 2. Stopper Stick Pin
- 3. Contents 30pcs / Tube



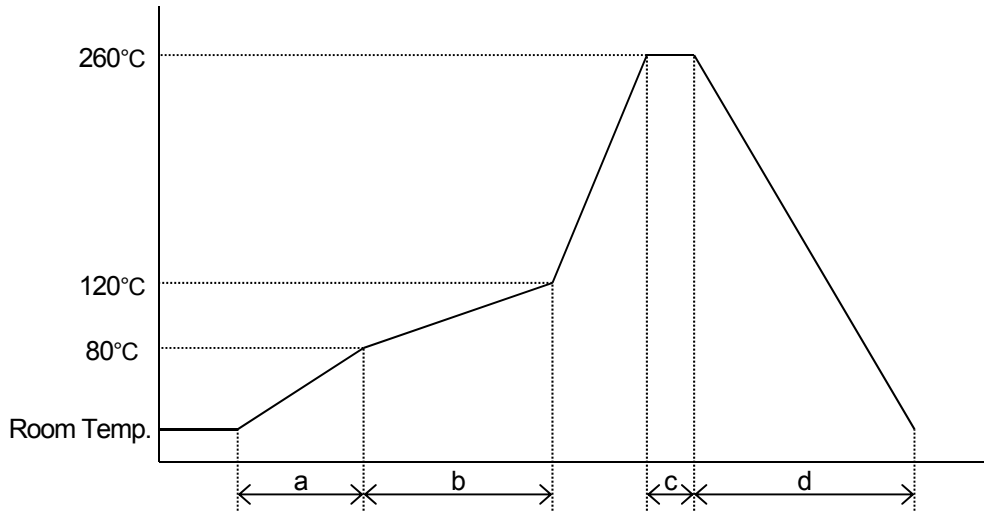
UNIT : mm



RECOMMENDED MOUNTING METHOD

FLOW SOLDERING METHOD

* flow soldering procedure



- a: Temperature ramping rate : 1 to 7°C /s
- b: Pre-heating temperature : 80 to 120°C
Pre-heating time : 60 to 120s
- c: Peak temperature : not exceeding 260°C
Peak time : within 10s
- d: Temperature ramping rate : 1 to 7°C /s

The temperature indicates at the lead.

IRON SOLDERING METHOD

* Iron Soldering conditions

Temperature of Iron: not exceeding 350°C

Soldering time: within 3s (At 1 lead)

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