

# CR12CM-12A

600V - 12A - Thyristor

Medium Power Use

R07DS1035EJ0500

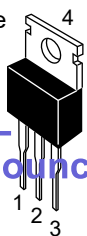
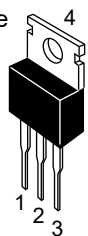
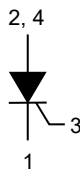
Rev.5.00

Jan. 15, 2019

## Features

- $I_T(AV)$  : 12 A
- $V_{DRM}$  : 600 V
- $I_{GT}$ : 30 mA
- Non-insulated Type
- Planar Passivation Type

## Outline

<p>RENESAS Package code: PRSS0004AG-A (Package name: TO-220AB)</p> <p>Ordering code #BB0</p>  <p><b>EOL announced</b></p>	<p>RENESAS Package code: PRSS0004AT-A (Package name: TO-220ABA)</p> <p>Ordering code #BH0</p> 	 <p>1. Cathode 2. Anode 3. Gate 4. Anode</p>
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## Application

Power supply, motor control, heater control and other general purpose applications.

## Maximum Ratings

Parameter	Symbol	Voltage class		Unit
		12		
Repetitive peak reverse voltage	$V_{RRM}$	600		V
Non-repetitive peak reverse voltage	$V_{RSM}$	720		V
DC reverse voltage	$V_R(DC)$	480		V
Repetitive peak off-state voltage	$V_{DRM}$	600		V
DC off-state voltage	$V_D(DC)$	480		V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_T(RMS)$	18.8	A	
Average on-state current	$I_T(AV)$	12	A	Commercial frequency, sine half wave 180°conduction, $T_c = 91^\circ C$ <sup>Note1</sup>
Surge on-state current	$I_{TSM}$	360	A	60 Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	544	A <sup>2</sup> s	Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	5	W	
Average gate power dissipation	$P_G(AV)$	0.5	W	
Peak gate forward voltage	$V_{FGM}$	6	V	
Peak gate reverse voltage	$V_{RGM}$	10	V	
Peak gate forward current	$I_{FGM}$	2	A	
Junction temperature	$T_j$	-40 to +125	°C	
Storage temperature	$T_{stg}$	-40 to +125	°C	

## Electrical Characteristics

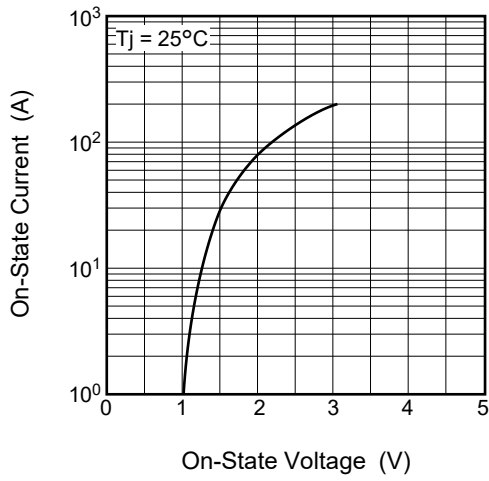
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	$I_{RRM}$	—	—	2.0	mA	$T_j = 125^\circ\text{C}$ , $V_{RRM}$ applied
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied
On-state voltage	$V_{TM}$	—	—	1.6	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 40\text{ A}$ , instantaneous value
Gate trigger voltage	$V_{GT}$	—	—	1.5	V	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$
Gate non-trigger voltage	$V_{GD}$	0.2	—	—	V	$T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$
Gate trigger current	$I_{GT}$	—	—	30	mA	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$
Holding current	$I_H$	—	30	—	mA	$T_j = 25^\circ\text{C}$ , $V_D = 12\text{ V}$
Thermal resistance	$R_{th(j-c)}$	—	—	1.2	$^\circ\text{C/W}$	Junction to case <sup>Note1 Note2</sup>

Notes: 1. Case temperature is measured at anode tab 1.5 mm away from the molded case.

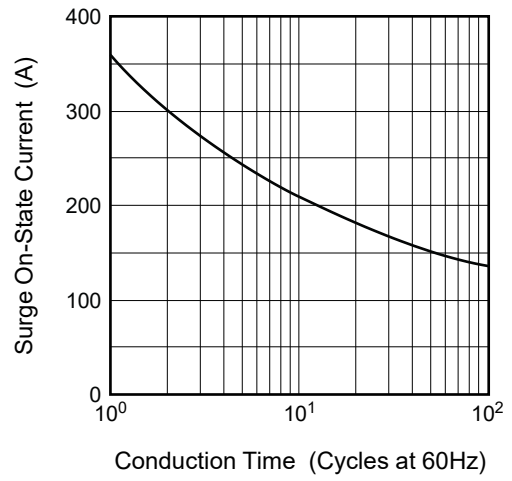
2. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $1.0^\circ\text{C/W}$ .

Performance Curves

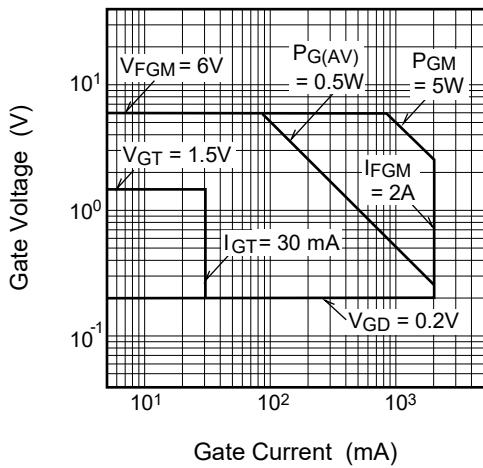
Maximum On-State Characteristics



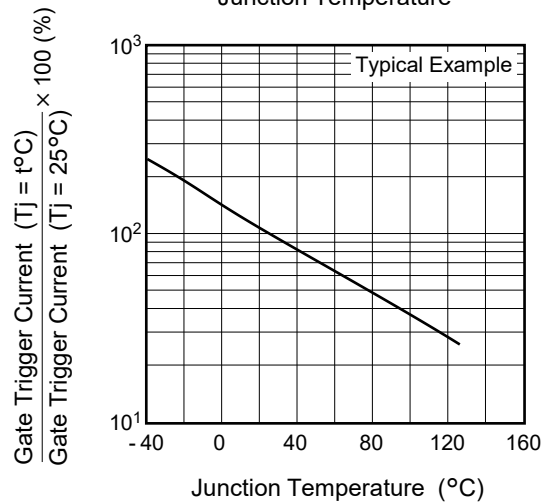
Rated Surge On-State Current



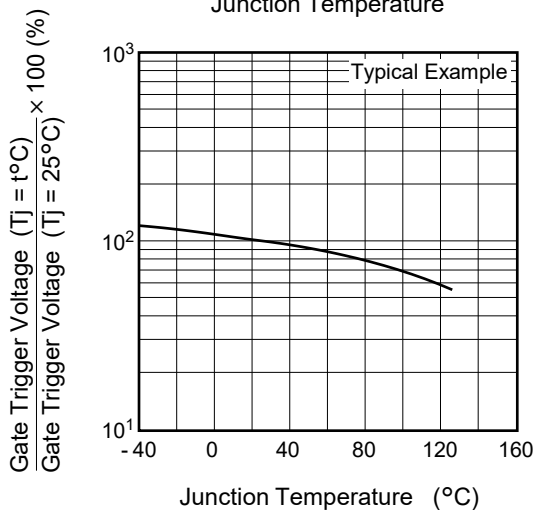
Gate Characteristics



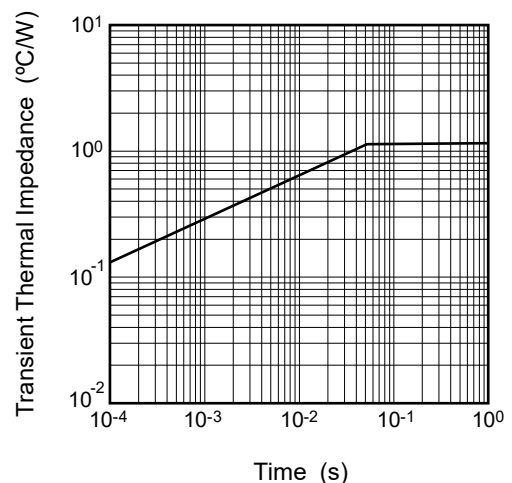
Gate Trigger Current vs. Junction Temperature



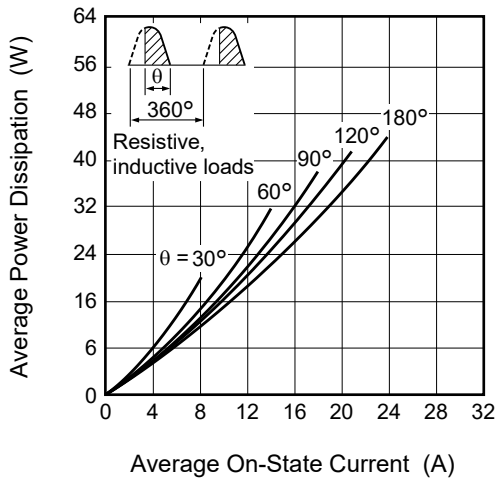
Gate Trigger Voltage vs. Junction Temperature



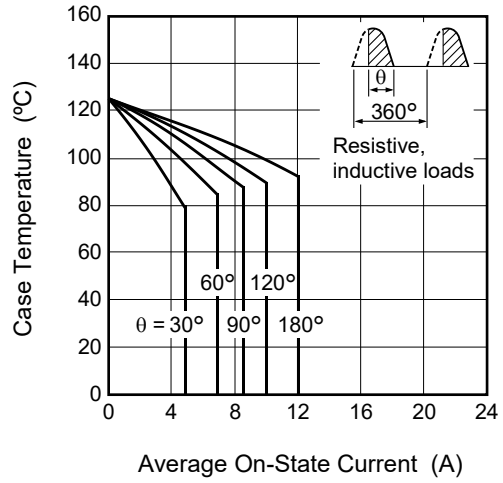
Maximum Transient Thermal Impedance Characteristics (Junction to case)



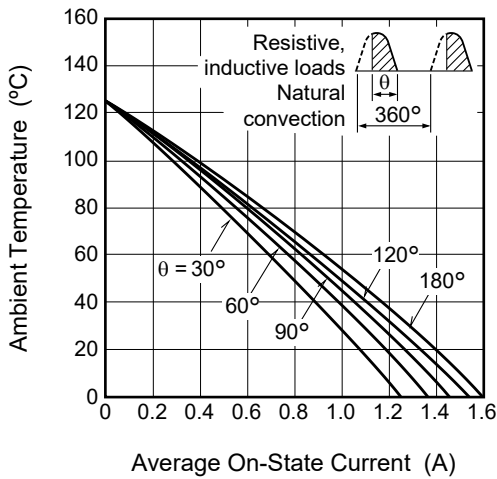
Maximum Average Power Dissipation (Single-Phase Half Wave)



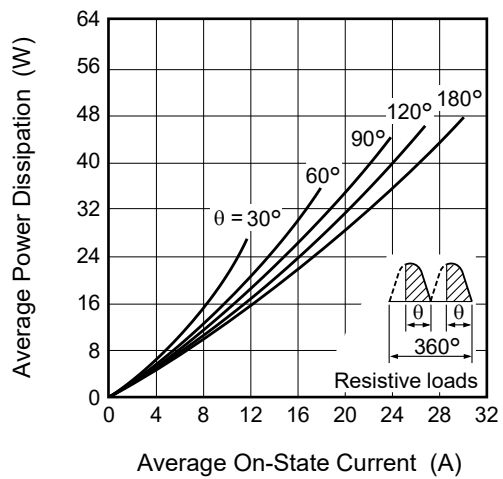
Allowable Case Temperature vs. Average On-State Current (Single-Phase Half Wave)



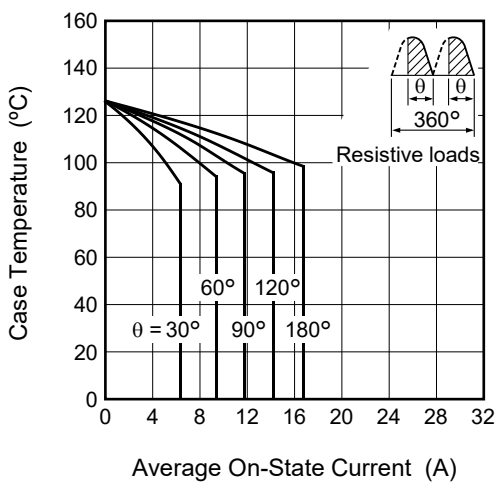
Allowable Ambient Temperature vs Average On-State Current (Single-Phase Half Wave)



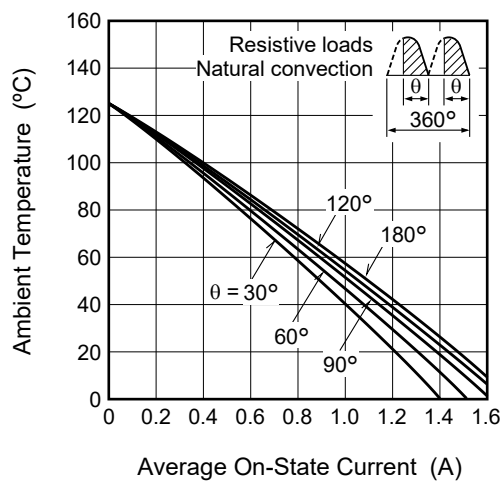
Maximum Average Power Dissipation (Single-Phase Full Wave)



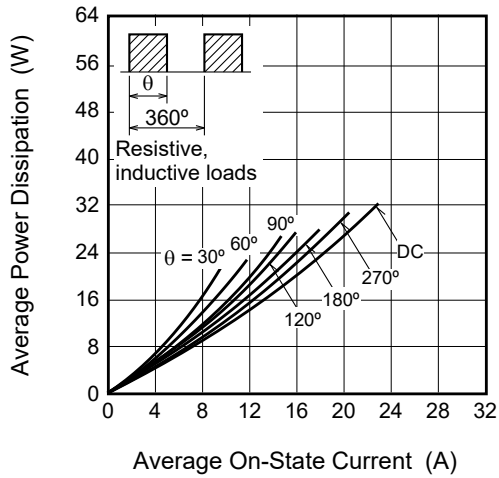
Allowable Case Temperature vs. Average On-State Current (Single-Phase Full Wave)



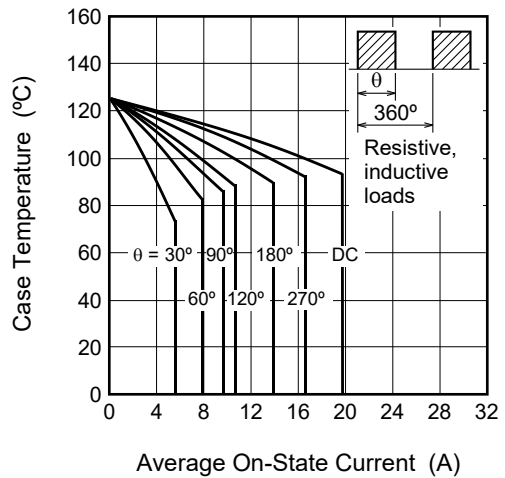
Allowable Ambient Temperature vs. Average On-State Current (Single-Phase Full Wave)



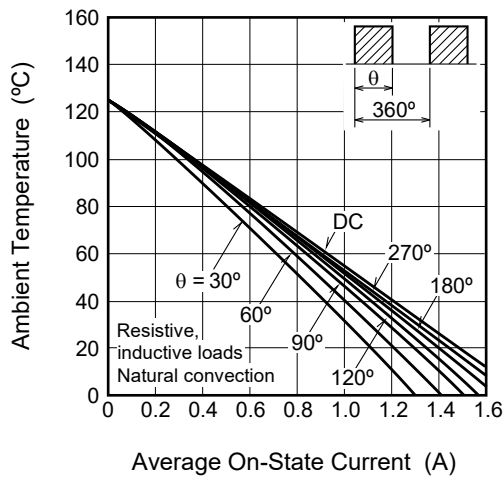
Maximum Average Power Dissipation (Rectangular Wave)



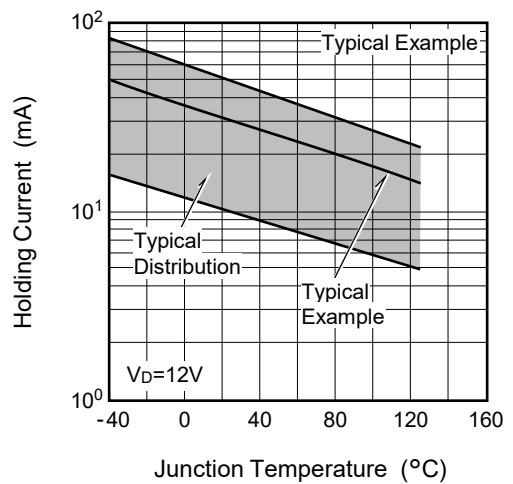
Allowable Case Temperature vs. Average On-State Current (Rectangular Wave)



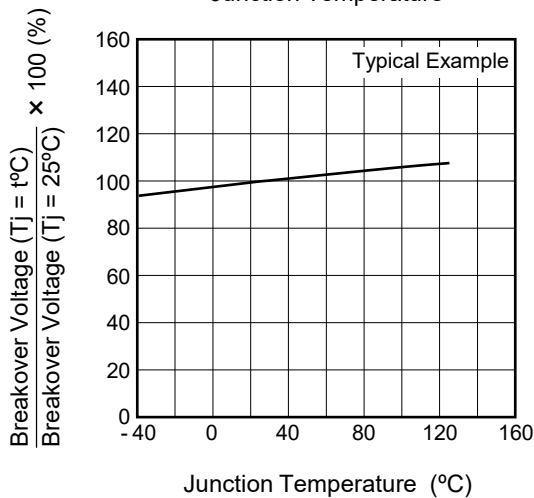
Allowable Ambient Temperature vs. Average On-State Current (Rectangular Wave)



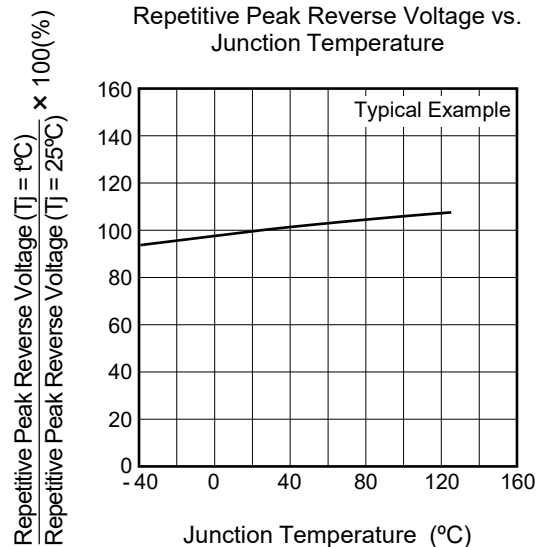
Holding Current vs. Junction Temperature

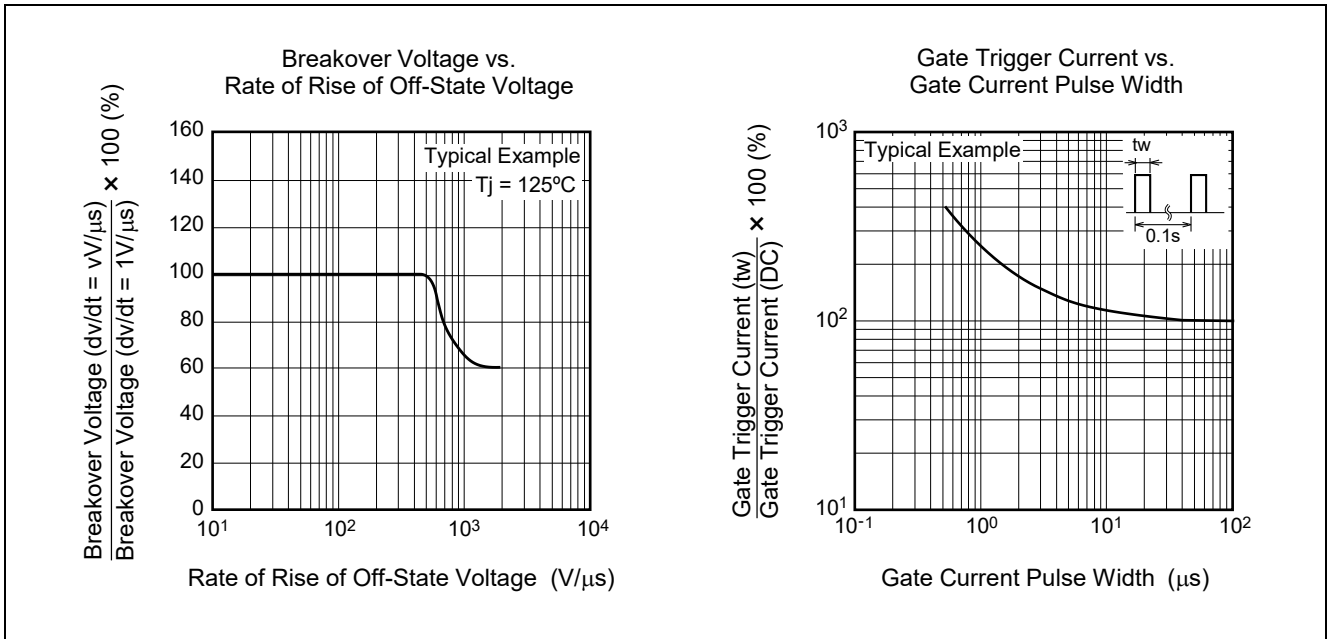


Breakover Voltage vs. Junction Temperature



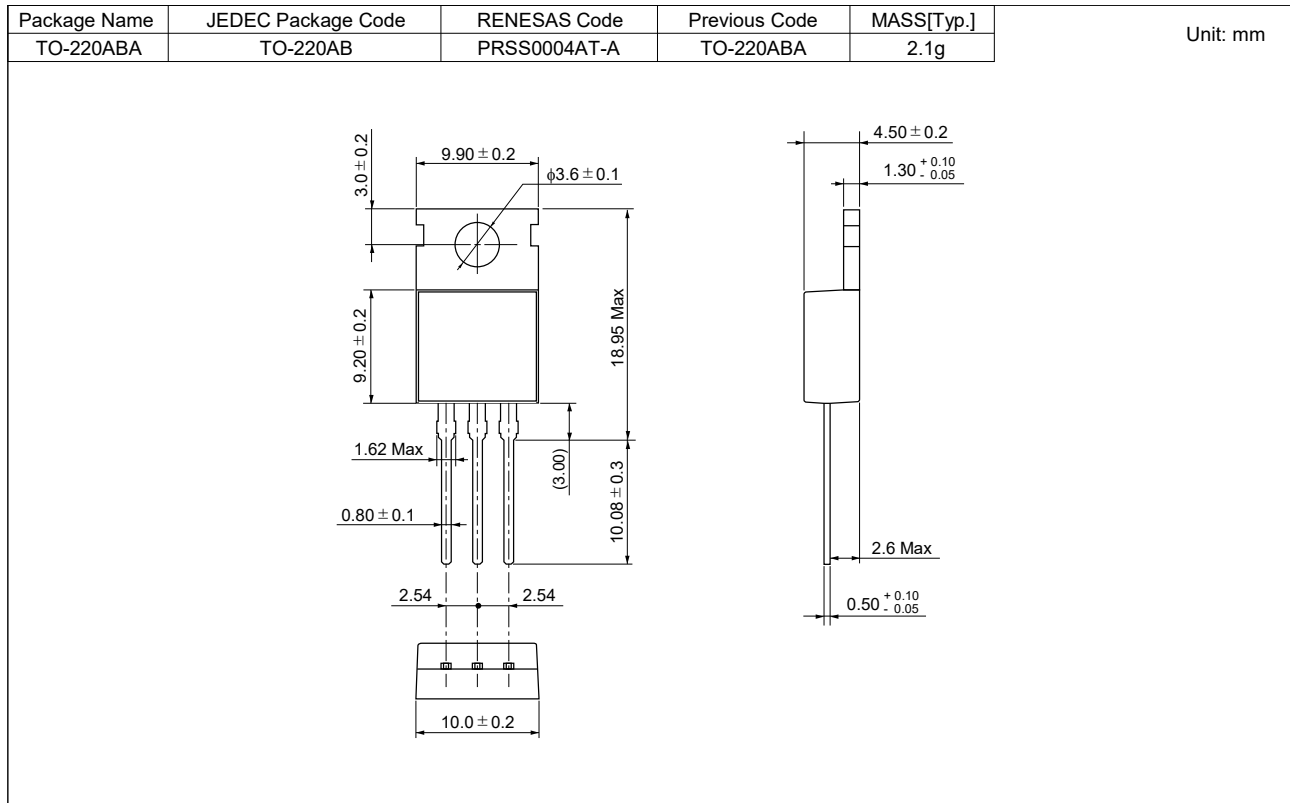
Repetitive Peak Reverse Voltage vs. Junction Temperature



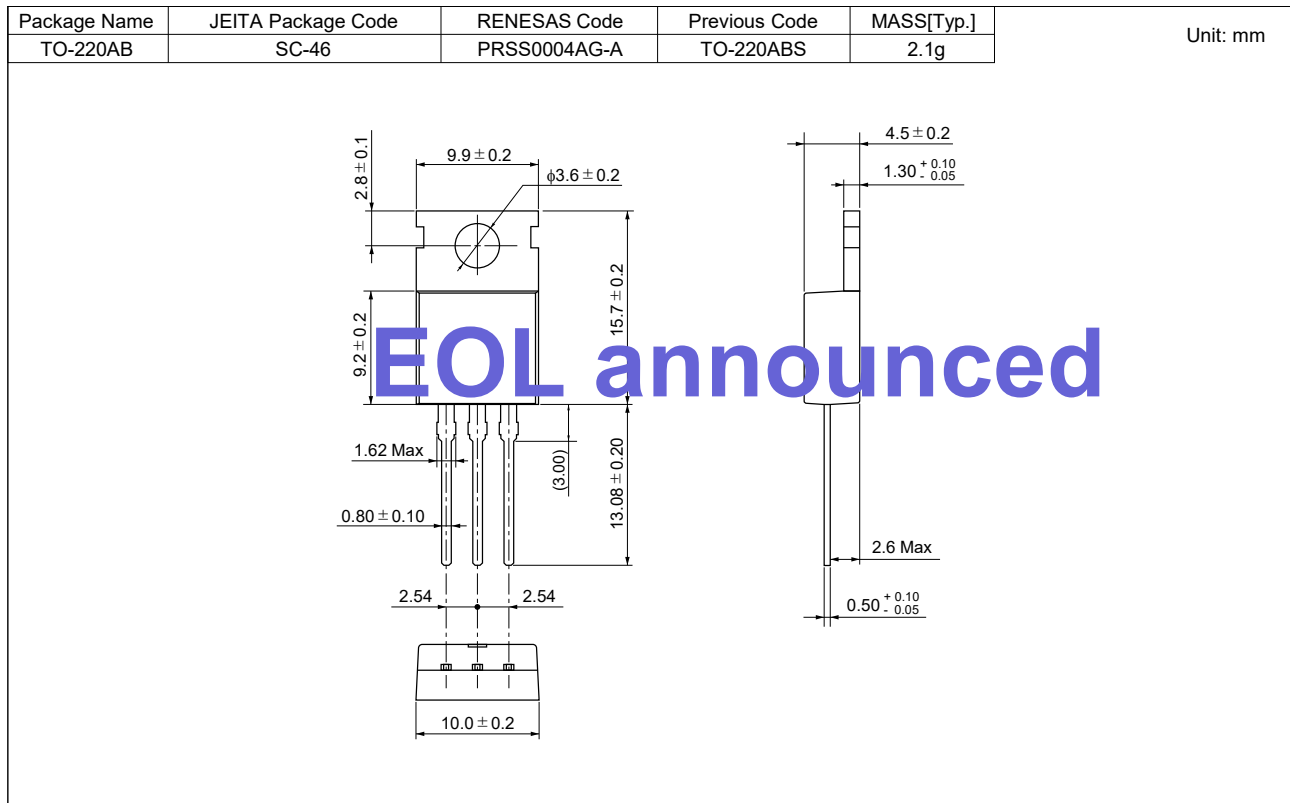


### Package Dimensions

Ordering code: #BH0



Ordering code: #BB0



**Ordering Information**

<b>Orderable Part Number</b>	<b>Package</b>	<b>Quantity</b> <sup>Note3</sup>	<b>Remark</b>	<b>Status</b>
CR12CM-12A#BH0	TO-220ABA	50 pcs./ tube	Straight type	Mass Production
CR12CM-12A#BB0	TO-220ABS	50 pcs./ tube	Straight type	EOL announced

Notes: 3. Please confirm the specification about the shipping in detail.



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