CR12CM-12B

Thyristor

Medium Power Use

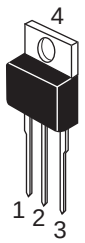
R07DS0232EJ0100
Rev.1.00
Dec 20, 2010

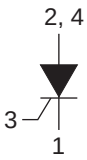
Features

- $I_{T\,(AV)}$: 12 A
- V_{DRM} : 600 V
- I_{GT} : 30 mA
- The product guaranteed maximum junction temperature of 150°C
- Non-Insulated Type
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0004AA-A
(Package name: TO-220)





1. Cathode
2. Anode
3. Gate
4. Anode

Applications

Switching mode power supply, regulator for autocycle, motor control, heater control, and other general purpose control 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, Tc = 116°C[Note2]
Surge on-state current	I_{TSM}	360	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	544	A^2s	Value corresponding to 1 cycle of half wave 60Hz, 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	Tj	– 40 to +150	°C	
Storage temperature	Tstg	– 40 to +150	°C	
Mass	—	2.0	g	Typical value

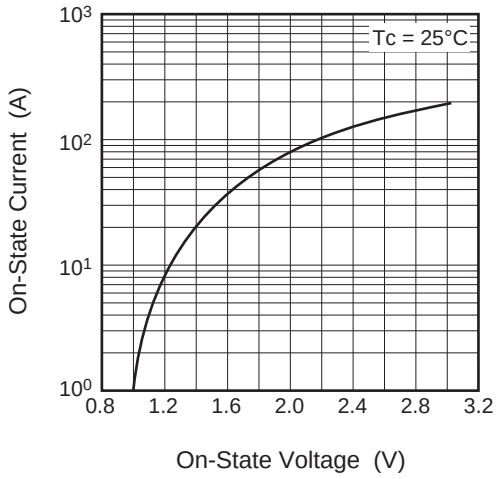
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	2.0/5.0	mA	Tj = 125°C/150°C, V_{RRM} applied
Repetitive peak off-state current	I_{DRM}	—	—	2.0/5.0	mA	Tj = 125°C/150°C, V_{DRM} applied
On-state voltage	V_{TM}	—	—	1.6	V	Tc = 25°C, I_{TM} = 40 A, instantaneous value
Gate trigger voltage	V_{GT}	—	—	1.5	V	Tj = 25°C, V_D = 6 V, I_T = 1 A
Gate non-trigger voltage	V_{GD}	0.2/0.1	—	—	V	Tj = 125°C/150°C, V_D = 1/2 V_{DRM}
Gate trigger current	I_{GT}	—	—	30	mA	Tj = 25°C, V_D = 6 V, I_T = 1 A
Holding current	I_H	—	15	—	mA	Tj = 25°C, V_D = 12 V
Thermal resistance	$R_{th\ (j-c)}$	—	—	1.2	°C/W	Junction to case[Note1 Note2]

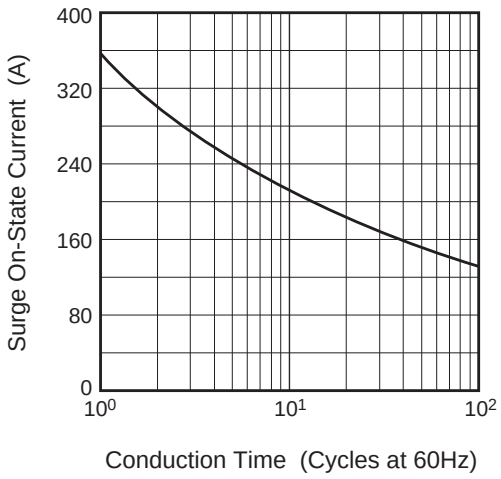
Notes: 1. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 1.0°C/W.
2. Case temperature is measured at anode tab 1.5 mm away from the molded case.

Performance Curves

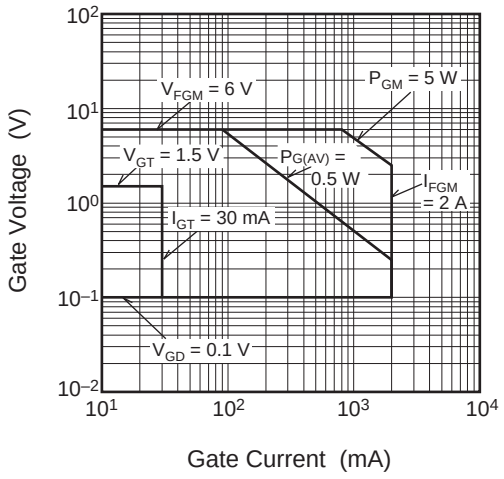
Maximum On-State Characteristics



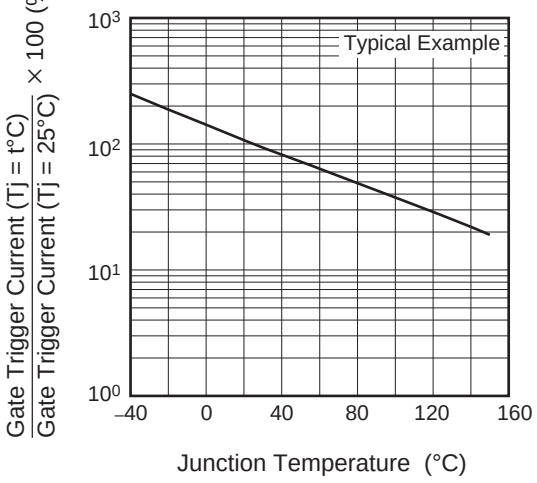
Rated Surge On-State Current



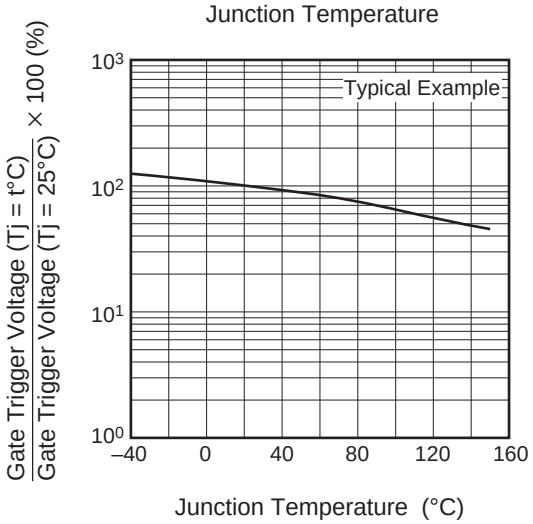
Gate Characteristics



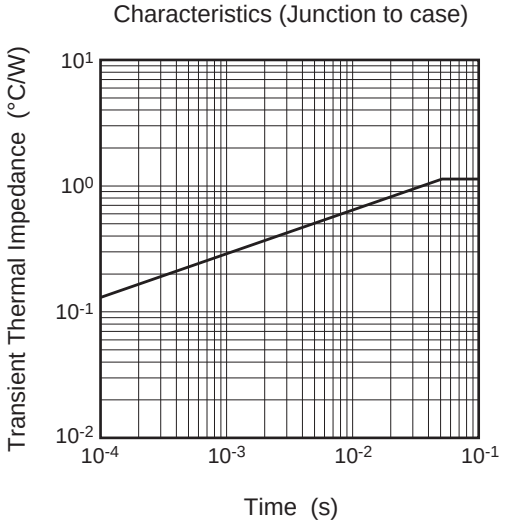
Gate Trigger Current vs. Junction Temperature



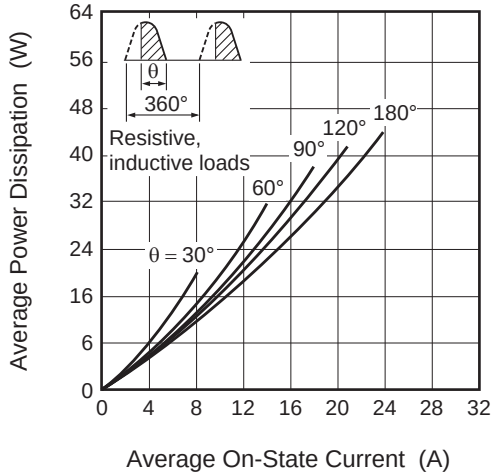
Gate Trigger Voltage vs. Junction Temperature



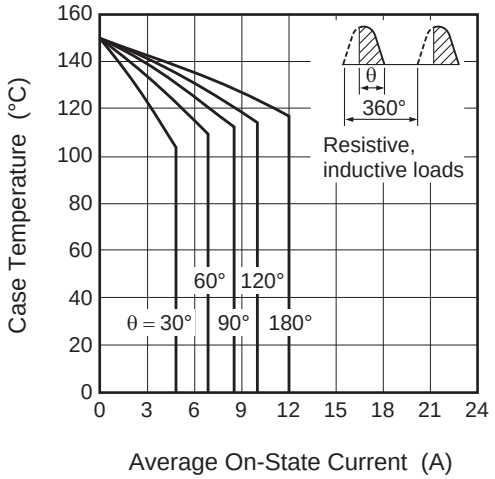
Maximum Transient Thermal Impedance Characteristics (Junction to case)



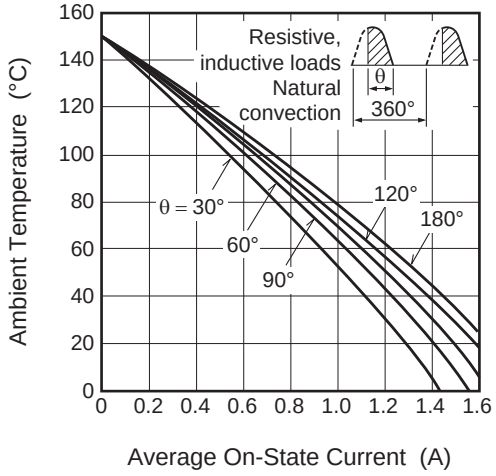
Maximum Average Power Dissipation
(Single-Phase Half Wave)



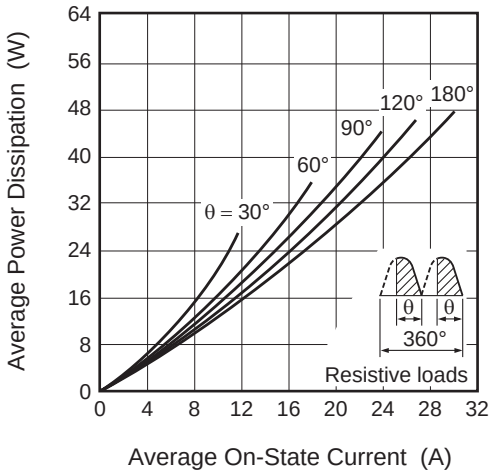
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



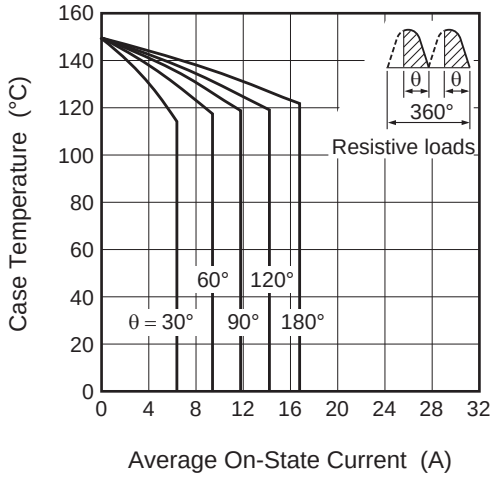
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



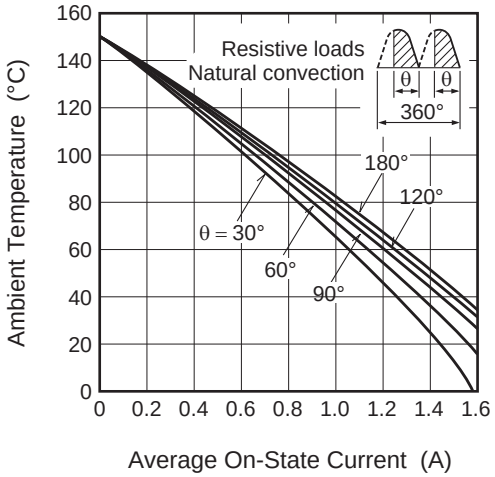
Maximum Average Power Dissipation
(Single-Phase Full Wave)



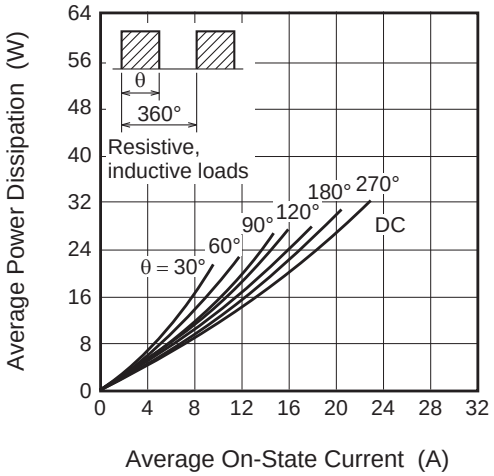
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



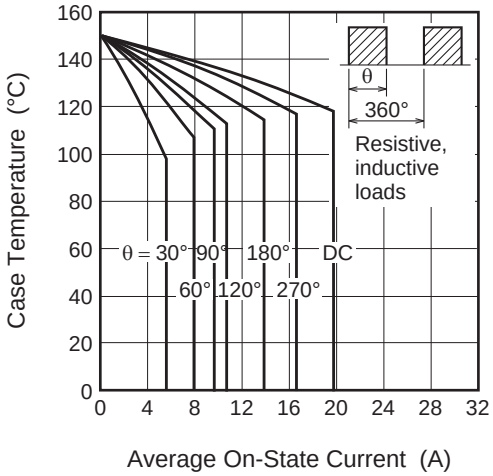
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



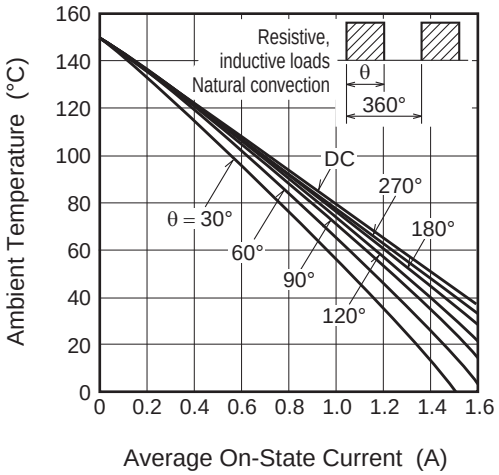
Maximum Average Power Dissipation
(Rectangular Wave)



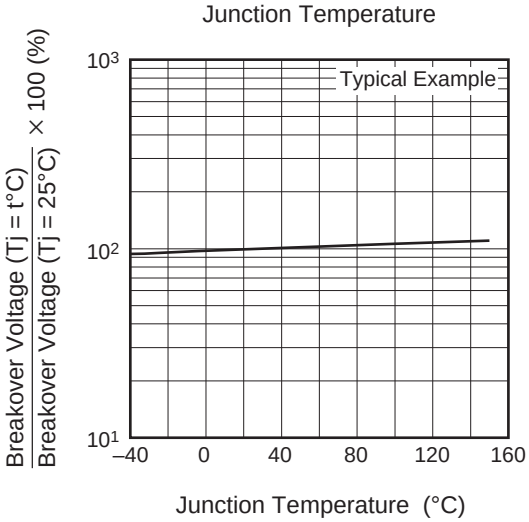
Allowable Case Temperature vs.
Average On-State Current
(Rectangular Wave)



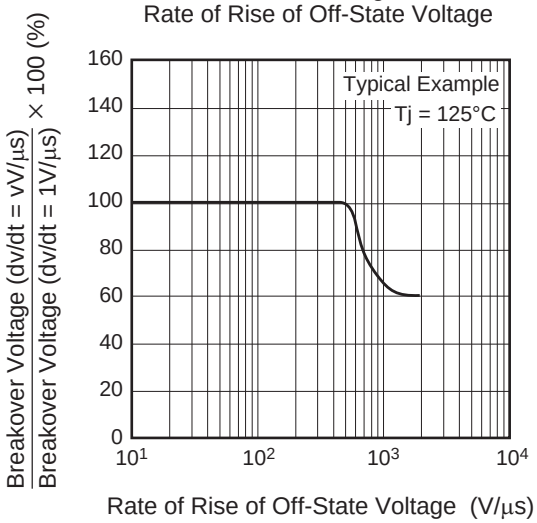
Allowable Ambient Temperature vs.
Average On-State Current
(Rectangular Wave)



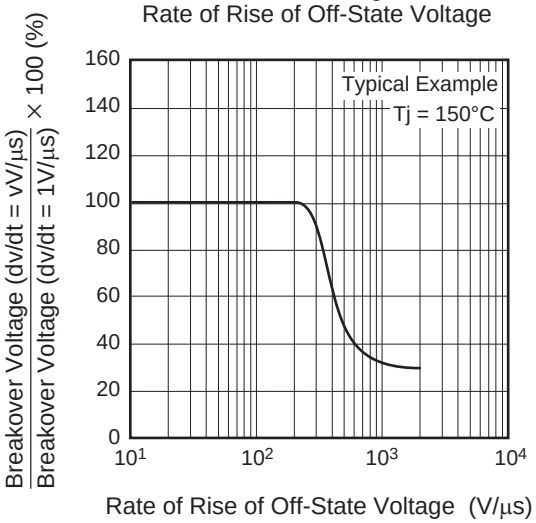
Breakover Voltage vs.
Junction Temperature



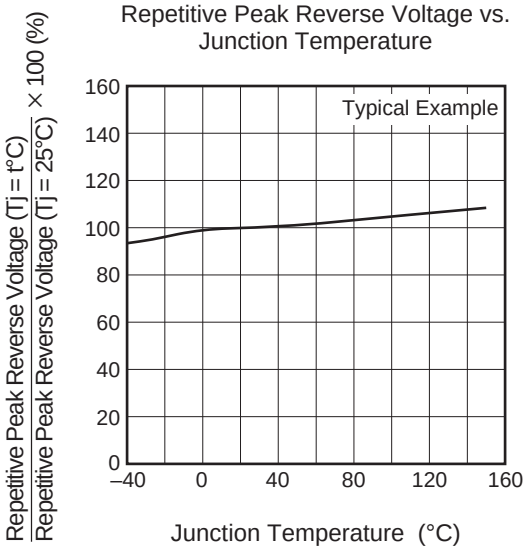
Breakover Voltage vs.
Rate of Rise of Off-State Voltage



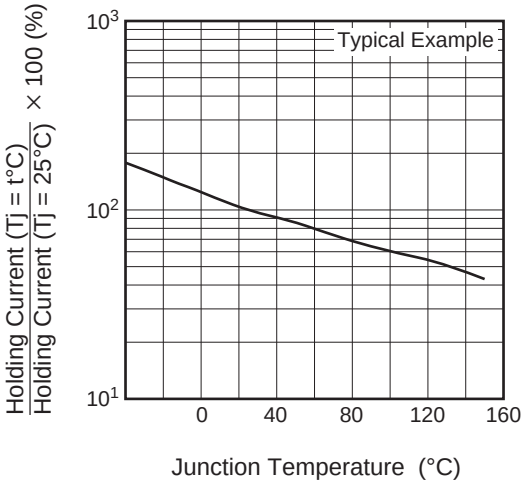
Breakover Voltage vs.
Rate of Rise of Off-State Voltage



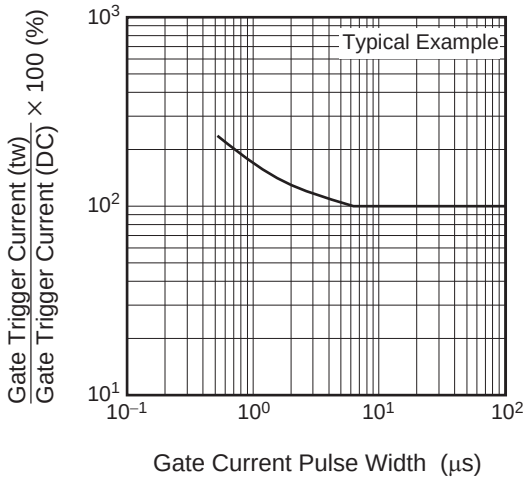
Repetitive Peak Reverse Voltage vs.
Junction Temperature



Holding Current vs.
Junction Temperature



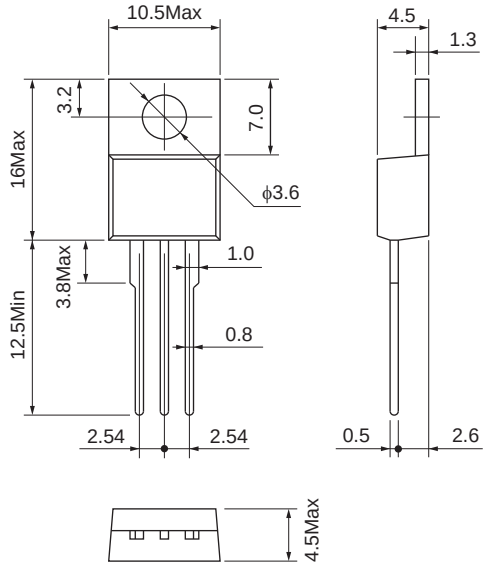
Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220	SC-46	PRSS0004AA-A	T220AB	2.0g

Unit: mm



Ordering Information

Orderable Part Number	Packing	Quantity	Remark
CR12CM-12B#B00	Bag	100 pcs.	Straight type
CR12CM-12B-A8#B00	Tube	50 pcs.	A8 Lead form

Note : Please confirm the specification about the shipping in detail.

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