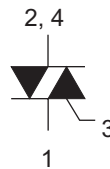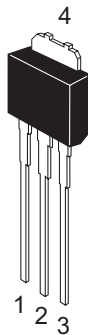# RENESAS

BCR5AS-12A

Triac

Medium Power Use

Features

- $I_{T\,(RMS)}$: 5 A
- V_{DRM} : 600 V
- I_{FGTI} , I_{RGTI}, $I_{RGT\,III}$: 30 mA

- Non-Insulated Type
- Planar Passivation Type
- Lead Mounted Type

Outline

RENESAS Package code: PRSS0004ZD-D
(Package name: DPAK(L)-3)

1. T_1 Terminal
2. T_2 Terminal
3. Gate Terminal
4. T_2 Terminal

Applications

Hybrid IC, solid state relay, switching mode power supply, light dimmer, electric fan, electric blanket, washing machine, and other general purpose control applications

Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak off-state voltage[Note1]	V_{DRM}	600	V
Non-repetitive peak off-state voltage[Note1]	V_{DSM}	720	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T (RMS)}$	5	A	Commercial frequency, sine full wave 360° conduction, Tc = 103°C[Note3]
Surge on-state current	I_{TSM}	50	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	10.4	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	3	W	
Average gate power dissipation	$P_{G (AV)}$	0.3	W	
Peak gate voltage	V_{GM}	10	V	
Peak gate current	I_{GM}	2	A	
Junction temperature	Tj	− 40 to +125	°C	
Storage temperature	Tstg	− 40 to +125	°C	
Mass	—	0.26	g	Typical value

Notes: 1. Gate open.

Electrical Characteristics

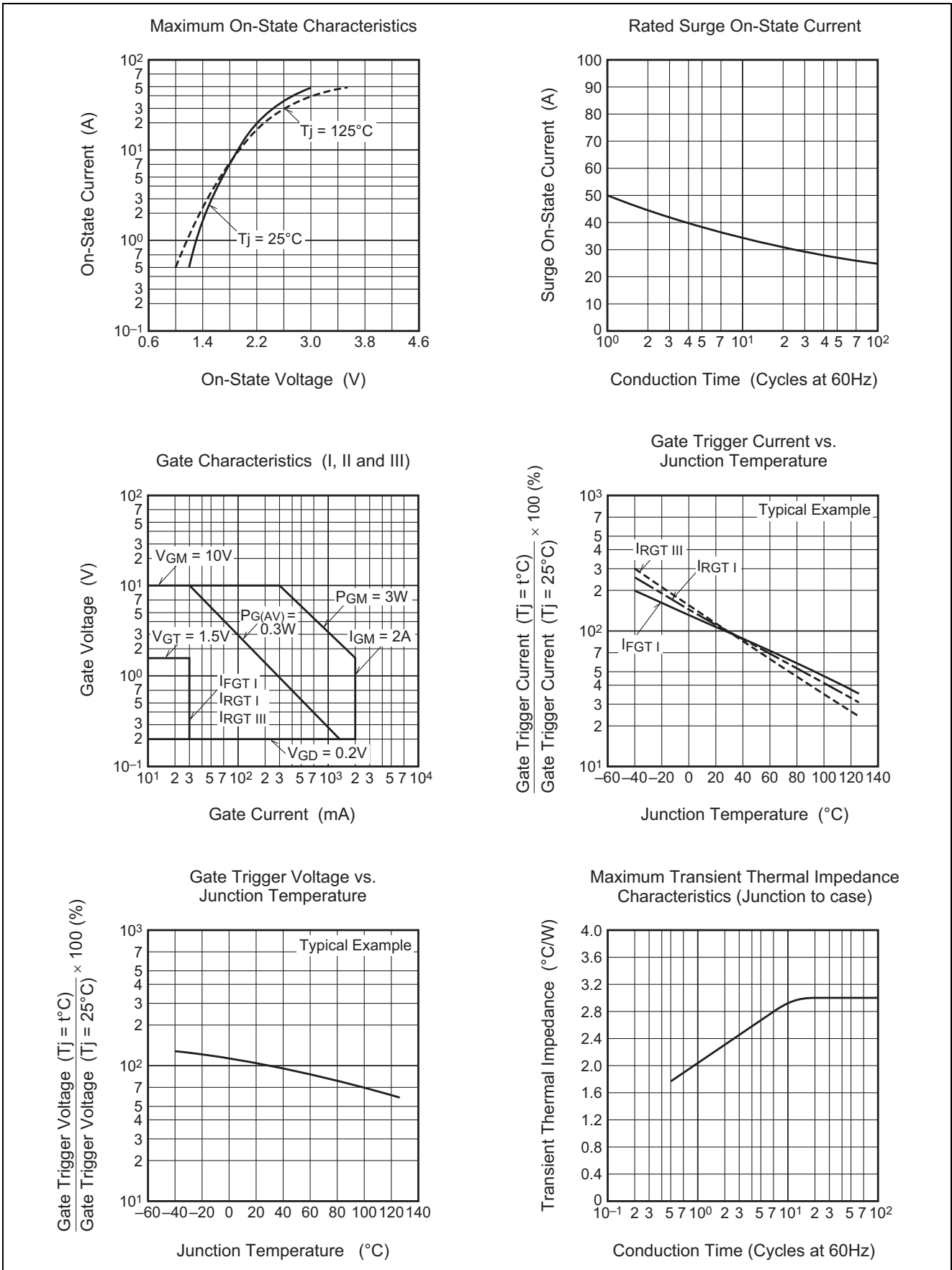| Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current		I_{DRM}	—	—	2.0	mA	Tj = 125°C, V_{DRM} applied
On-state voltage		V_{TM}	—	—	1.8	V	Tc = 25°C, I_{TM} = 7 A, Instantaneous measurement
Gate trigger voltage[Note2]	I	V_{FGTI}	—	—	1.5	V	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	V_{RGTI}	—	—	1.5	V	
	III	V_{RGTIII}	—	—	1.5	V	
Gate trigger current[Note2]	I	I_{FGTI}	—	—	30	mA	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	I_{RGTI}	—	—	30	mA	
	III	I_{RGTIII}	—	—	30	mA	
Gate non-trigger voltage		V_{GD}	0.2	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM}
Thermal resistance		$R_{th (j-c)}$	—	—	3.0	°C/W	Junction to case[Note3]
Critical-rate of rise of off-state commutating voltage[Note4]		(dv/dt)c	5	—	—	V/μs	Tj = 125°C

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.
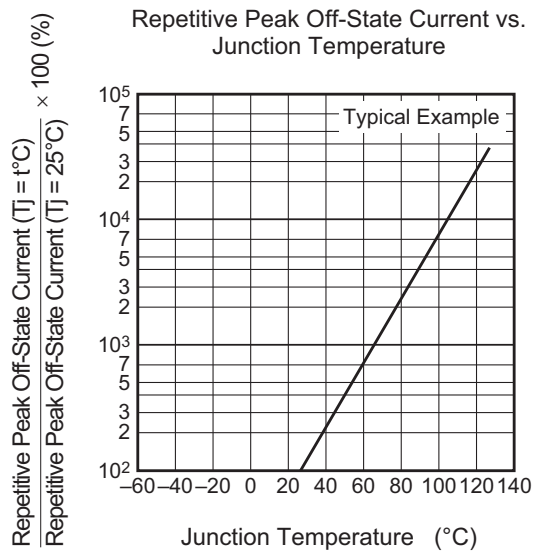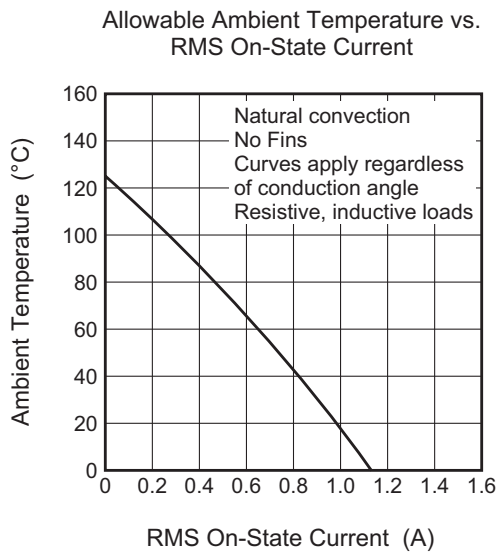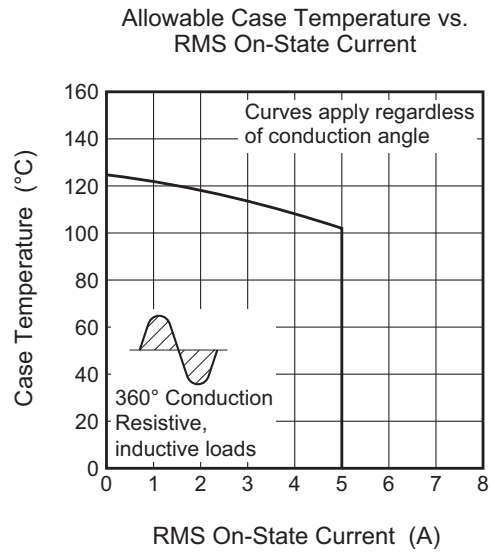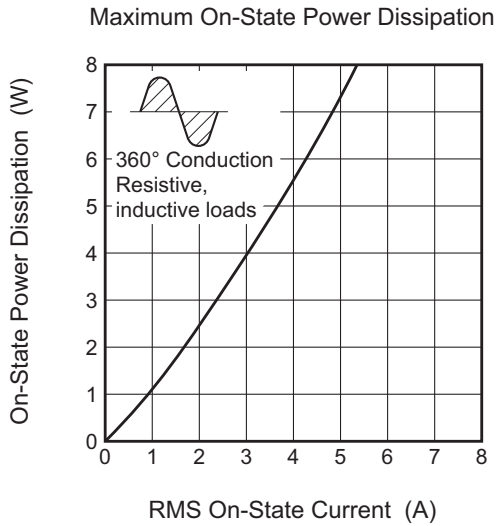   3. Case temperature is measured on the T_2 tab.
      4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.
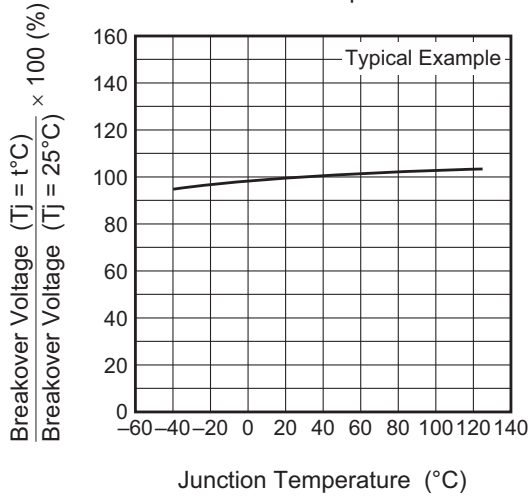
Test conditions	Commutating voltage and current waveforms (inductive load)

1. Junction temperature
   Tj = 125°C
2. Rate of decay of on-state commutating current
   (di/dt)c = −2.5 A/ms
3. Peak off-state voltage
   V_D = 400 V	

Performance Curves

Maximum On-State Characteristics

On-State Current (A) vs On-State Voltage (V)

Tj = 125°C
Tj = 25°C

Rated Surge On-State Current

Surge On-State Current (A) vs Conduction Time (Cycles at 60Hz)

Gate Characteristics (I, II and III)

Gate Voltage (V) vs Gate Current (mA)

$V_{GM} = 10V$
$P_{GM} = 3W$
$P_{G(AV)} = 0.3W$
$V_{GT} = 1.5V$
$I_{GM} = 2A$
I_{FGT} I
I_{RGT} I
I_{RGT} III
$V_{GD} = 0.2V$

Gate Trigger Current vs. Junction Temperature

$\dfrac{\text{Gate Trigger Current } (Tj = t°C)}{\text{Gate Trigger Current } (Tj = 25°C)} \times 100 \ (\%)$ vs Junction Temperature (°C)

Typical Example

I_{RGT} III
I_{RGT} I
I_{FGT} I

Gate Trigger Voltage vs. Junction Temperature

$\dfrac{\text{Gate Trigger Voltage } (Tj = t°C)}{\text{Gate Trigger Voltage } (Tj = 25°C)} \times 100 \ (\%)$ vs Junction Temperature (°C)

Typical Example

Maximum Transient Thermal Impedance Characteristics (Junction to case)

Transient Thermal Impedance (°C/W) vs Conduction Time (Cycles at 60Hz)

Maximum On-State Power Dissipation

Allowable Case Temperature vs. RMS On-State Current

Allowable Ambient Temperature vs. RMS On-State Current

Repetitive Peak Off-State Current vs. Junction Temperature

Holding Current vs. Junction Temperature

Latching Current vs. Junction Temperature

Breakover Voltage vs. Junction Temperature

Breakover Voltage vs. Rate of Rise of Off-State Voltage
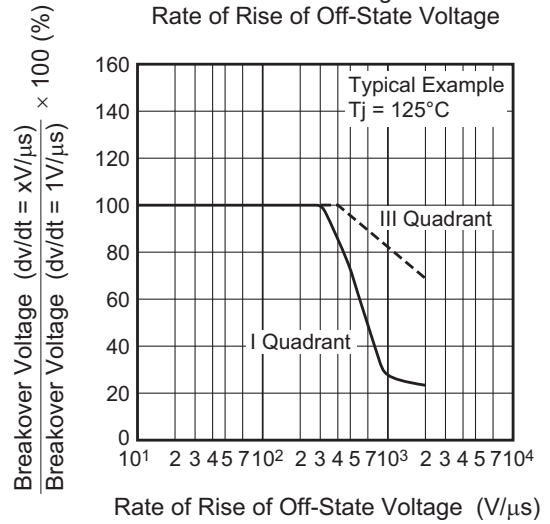
Commutation Characteristics
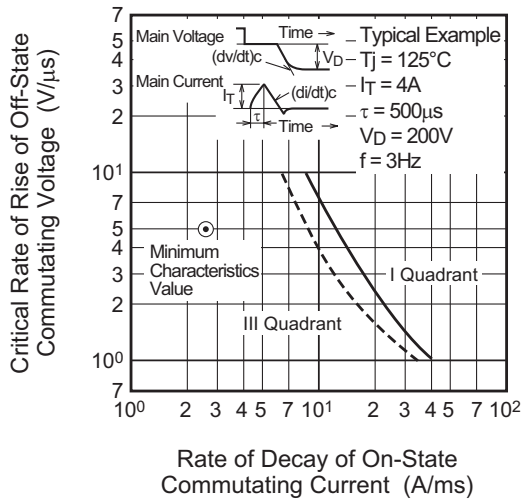
Gate Trigger Current vs. Gate Current Pulse Width
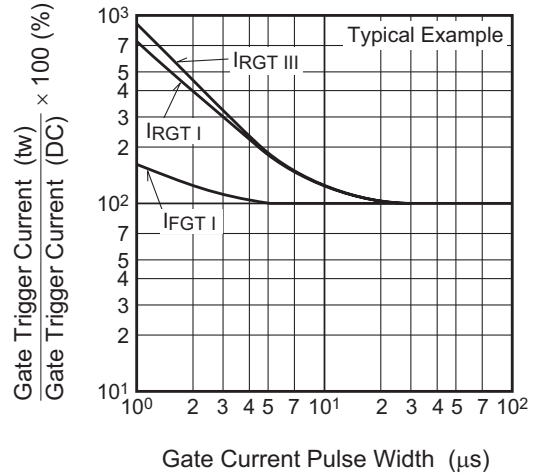
Gate Trigger Characteristics Test Circuits

Test Procedure I

Test Procedure II

Test Procedure III
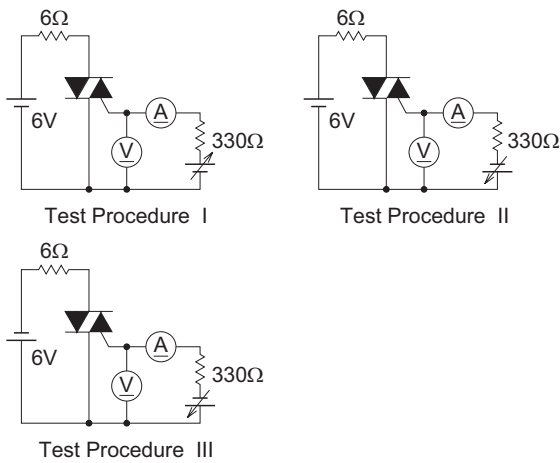
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Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
DPAK(L)-(3)	—	PRSS0004ZD-D	DPAK(L)-(3)/DPAK(L)-(3)V	0.36g	

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	100	Type name – A1	BCR5AS-12A-A1

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

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