

CR05BM-12A

600V - 0.5A - Thyristor
Low Power Use

R07DS0992EJ0100
Rev.1.00
Dec 20, 2012

Features

- $I_{T(AV)}$: 0.5 A
- V_{DRM} : 600 V
- I_{GT} : 100 μ A
- Planar Type

Outline

RENESAS Package code: PRSS0003EA-A
(Package name: TO-92*)



1. Anode
2. Gate
3. Cathode

Applications

Igniter, solid state relay, strobe flasher, circuit breaker, and other general purpose control application

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 ^{Note1}	V_{DRM}	600	V
DC off-state voltage ^{Note1}	$V_{D(DC)}$	480	V

Notes: 1. With gate to cathode resistance $R_{GK} = 1 \text{ k}\Omega$.

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	0.63	A	
Average on-state current	$I_{T(AV)}$	0.4	A	Commercial frequency, sine half wave 180° conduction, $T_a = 54^\circ\text{C}$
		0.5	A	Commercial frequency, sine half wave 180° conduction, $T_a = 30^\circ\text{C}$
Surge on-state current	I_{TSM}	8	A	50 Hz sine half wave 1 full cycle, peak value, non-repetitive
I^2t for fusion	I^2t	0.32	A^2s	Value corresponding to 1 cycle of half wave 50 Hz, surge on-state current
Peak gate power dissipation	P_{GM}	0.5	W	
Average gate power dissipation	$P_{G(AV)}$	0.1	W	
Peak gate forward voltage	V_{FGM}	6	V	
Peak gate reverse voltage	V_{RGM}	6	V	
Peak gate current	I_{FGM}	0.3	A	
Junction Temperature	T_j	-40 to +125	$^\circ\text{C}$	
Storage temperature	T_{stg}	-40 to +125	$^\circ\text{C}$	
Mass	—	0.23	g	Typical value

Electrical Characteristics

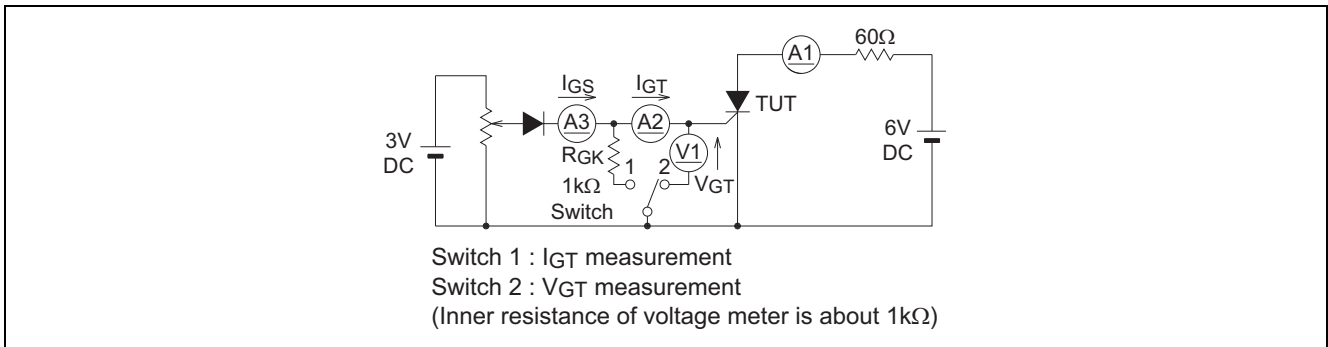
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	0.5	mA	$T_j = 125^\circ\text{C}$, V_{RRM} applied
Repetitive peak off-state current	I_{DRM}	—	—	0.5	mA	$T_j = 125^\circ\text{C}$, V_{DRM} applied, $R_{GK} = 1\text{ k}\Omega$
On-state voltage	V_{TM}	—	—	1.2	V	$T_c = 25^\circ\text{C}$, $I_{TM} = 1.2\text{ A}$, instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Gate non-trigger voltage	V_{GD}	0.2	—	—	V	$T_j = 125^\circ\text{C}$, $V_D = 1/2 V_{DRM}$, $R_{GK} = 1\text{ k}\Omega$
Gate trigger current	I_{GT}	1 ^{Note2}	—	100 ^{Note2}	μA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Holding current	I_H	—	—	5	mA	$T_j = 25^\circ\text{C}$, $V_D = 12\text{ V}$, $R_{GK} = 1\text{ k}\Omega$
Thermal resistance	$R_{th(j-a)}$	—	—	150	$^\circ\text{C/W}$	Junction to ambient

Notes: 2. If special values of I_{GT} are required, choose item D or E from those listed in the table below if possible.

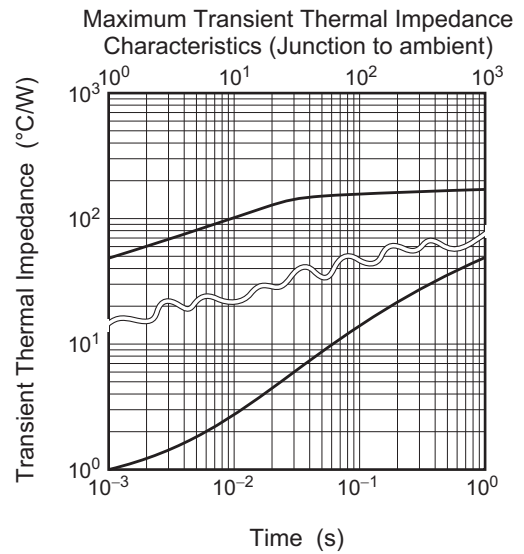
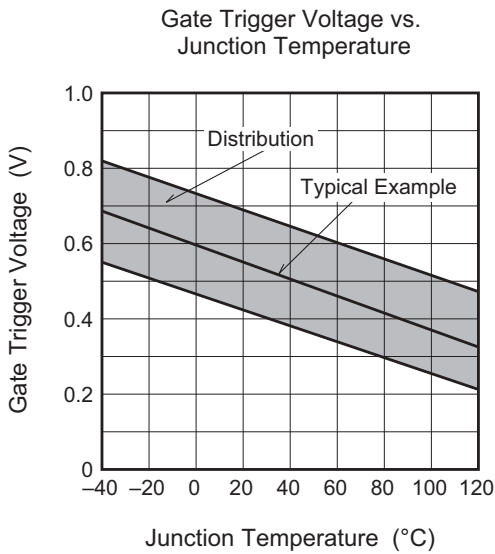
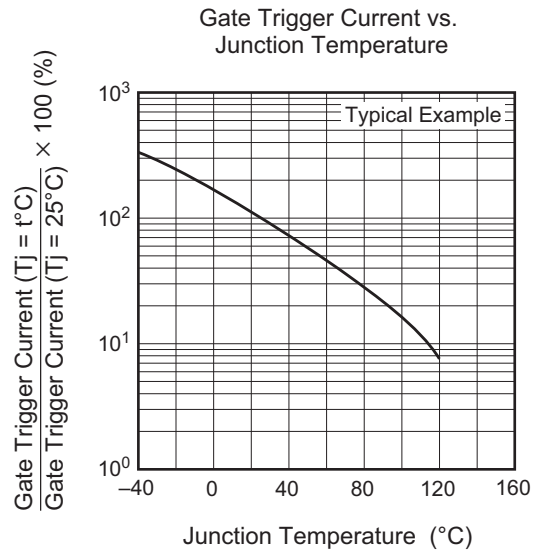
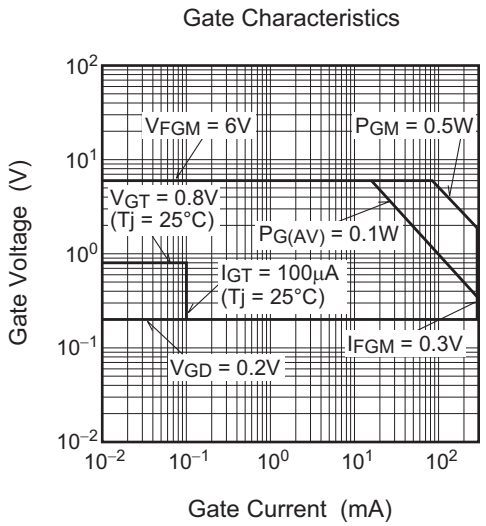
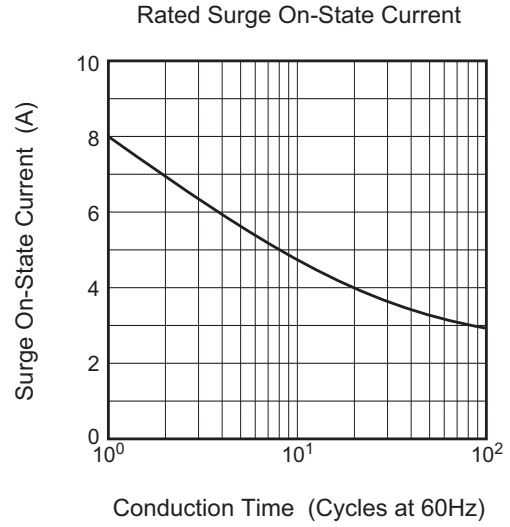
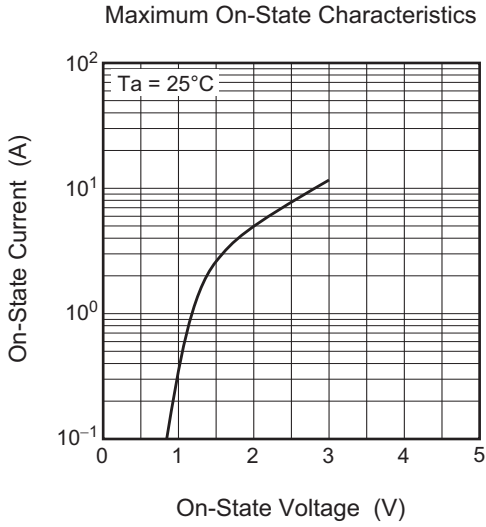
Item	D	E
$I_{GT} (\mu\text{A})$	1 to 50	20 to 100

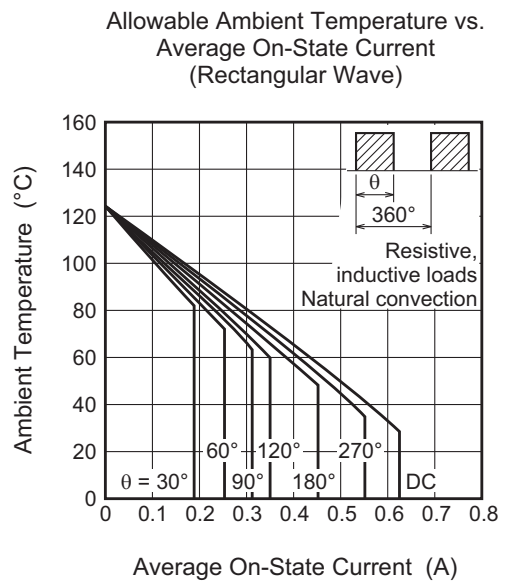
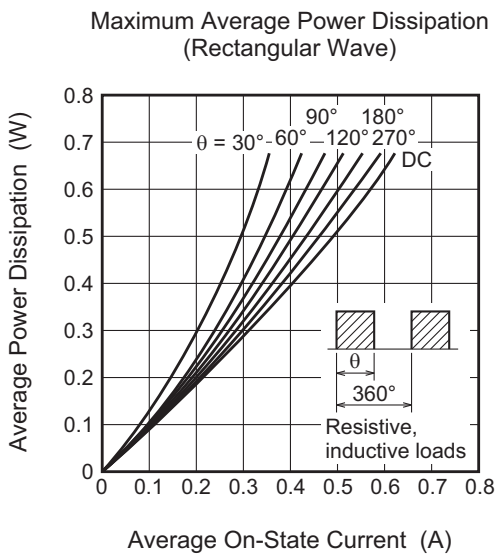
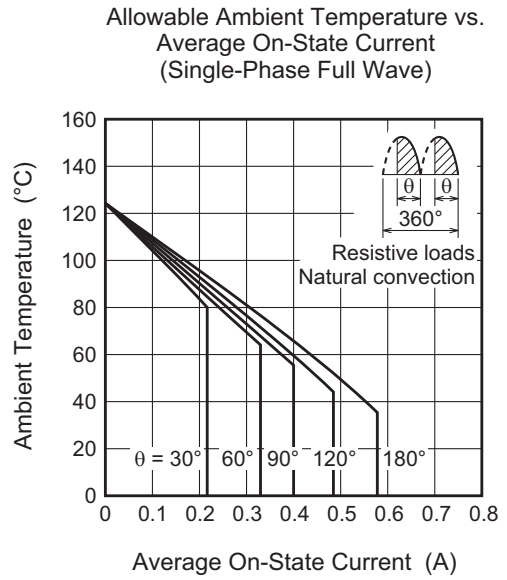
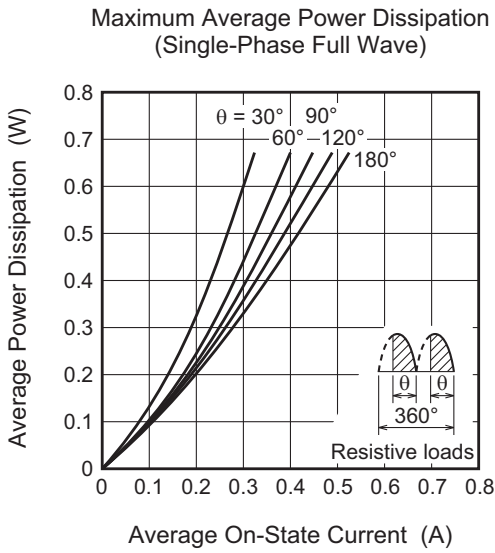
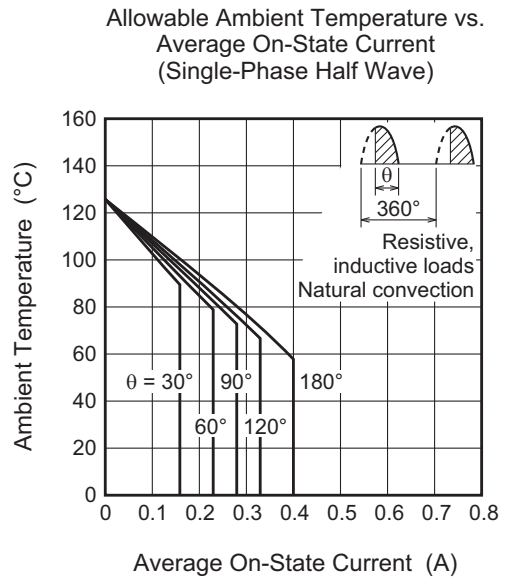
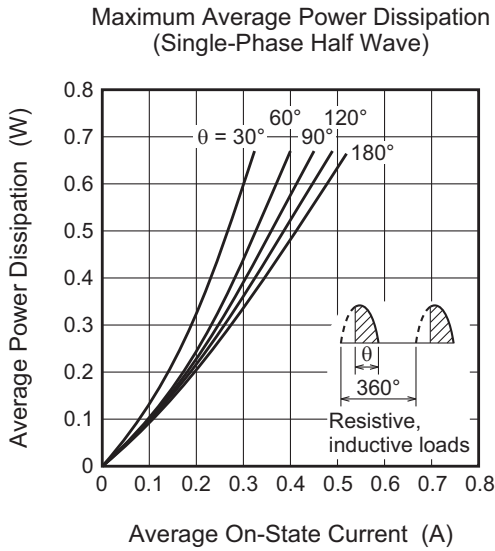
The above values do not include the current flowing through the 1 k Ω resistance between the gate and cathode.

Notes: 3. I_{GT} , V_{GT} measurement circuit.

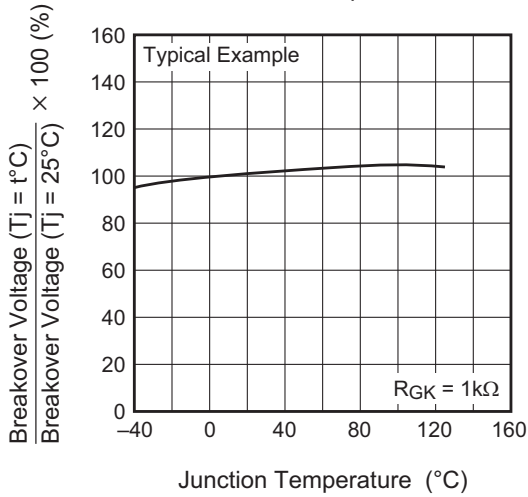


Performance Curves

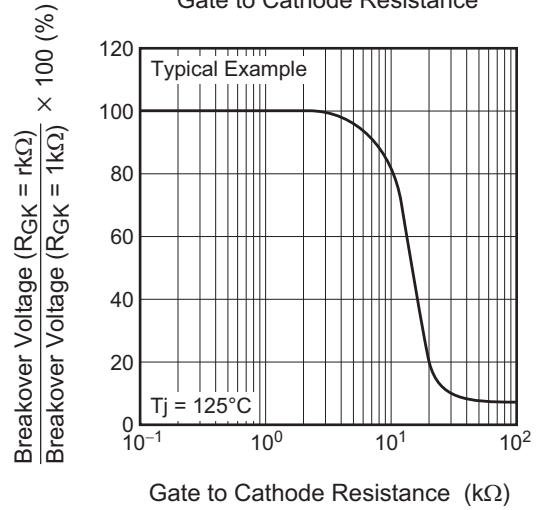




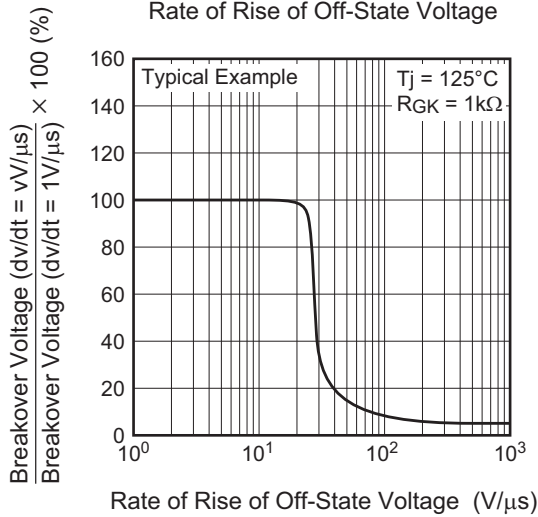
Breakover Voltage vs. Junction Temperature



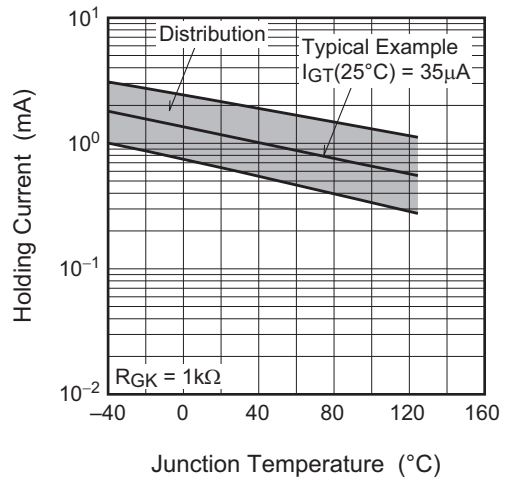
Breakover Voltage vs. Gate to Cathode Resistance



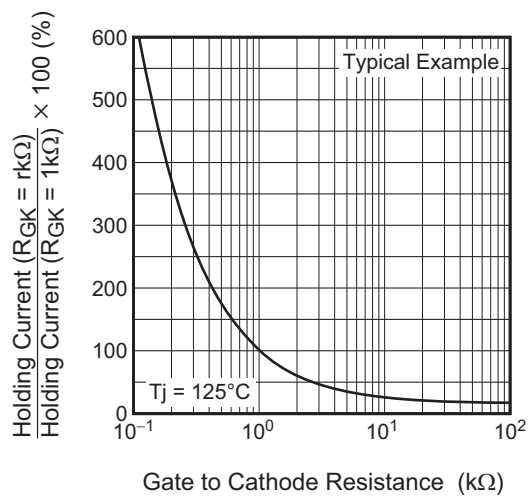
Breakover Voltage vs. Rate of Rise of Off-State Voltage



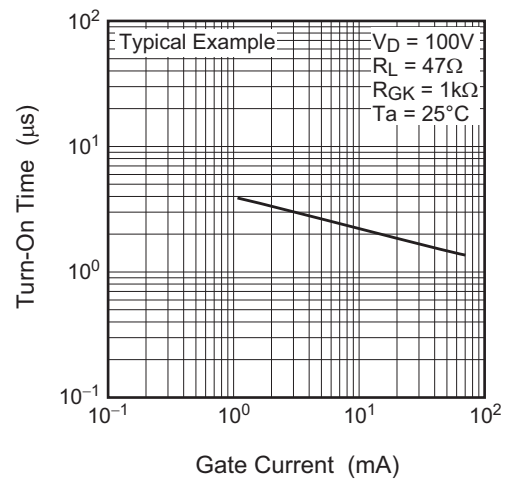
Holding Current vs. Junction Temperature



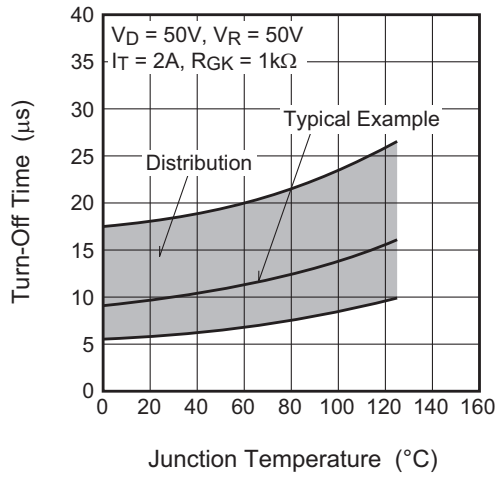
Holding Current vs. Gate to Cathode Resistance



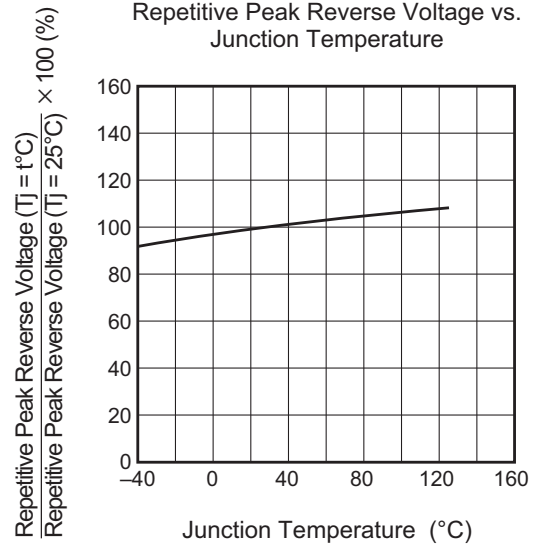
Turn-On Time vs. Gate Current



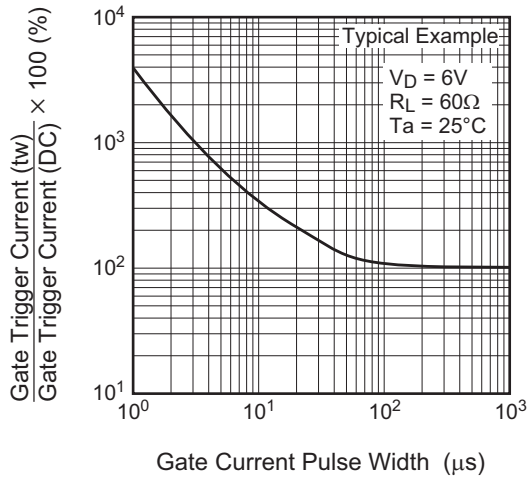
Turn-Off Time vs. Junction Temperature



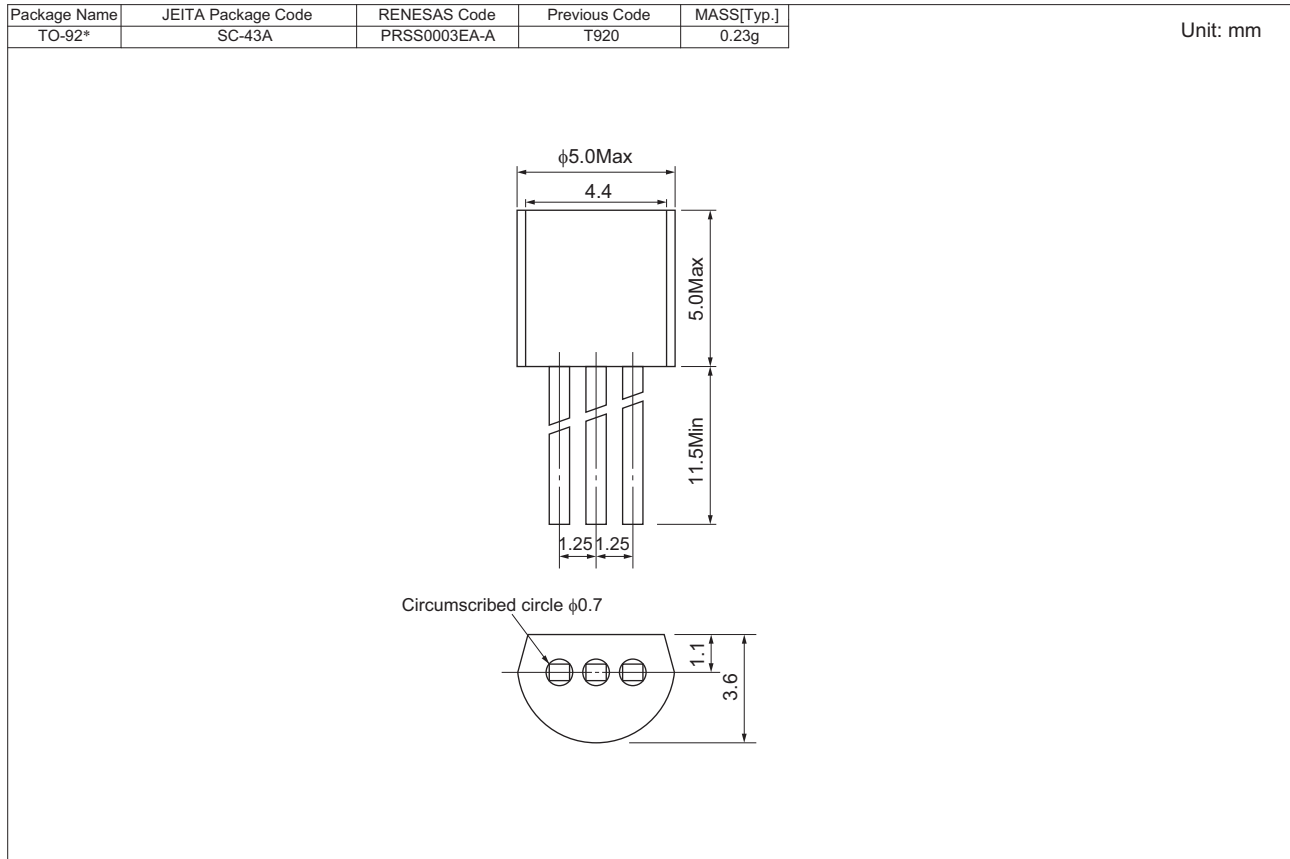
Repetitive Peak Reverse Voltage vs. Junction Temperature



Gate Trigger Current vs. Gate Current Pulse Width



Package Dimensions



Ordering Information

Orderable Part Number (example)	Packing	Quantity	Remark
CR05BM-12A#B00	Bag	500 pcs.	Straight type
CR05BM-12A-D#B00	Bag	500 pcs.	Straight type, IGT item: D
CR05BM-12A-A6#B00	Bag	500 pcs.	A6 Lead form
CR05BM-12A-DA6#B00	Bag	500 pcs.	A6 Lead form, IGT item: D
CR05BM-12A-TB#B00	Adhesive Tape	2000 pcs.	A8 Lead form
CR05BM-12A-DTB#B00	Adhesive Tape	2000 pcs.	A8 Lead form, IGT item: D

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

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