CR04AM-12A

600V - 0.4A - Thyristor
Low Power Use

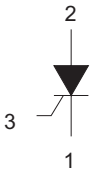
R07DS0636EJ0300
Rev.3.00
Aug 25, 2015

Features

- $I_{T\,(AV)}$: 0.4 A
- V_{DRM} : 600 V
- I_{GT} : 100 µA
- RoHS Compliant
- Non-Insulated Type
- Planar Passivation Type
- Halogen-free package (PRSS0003DJ-A)
- Completely Pb-free package (PRSS0003DJ-A)

Outline

RENESAS Package code: PRSS0003EA-A (Package name: TO-92*) PRSS0003DJ-A (Package name: TO-92)



1. Cathode
2. Anode
3. Gate

Applications

Solid state relay, igniter, strobe flasher, circuit breaker, and 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 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 kΩ

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, Ta=54°C
Surge on-state current	I_{TSM}	10	A	60Hz sine half wave, 1full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	0.4	A^2s	Value corresponding to 1cycle of half wave 60Hz, 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 forward current	I_{FGM}	0.3	A	
Junction temperature	Tj	– 40 to +125	°C	
Storage temperature	Tstg	– 40 to +125	°C	
Mass	—	0.23	g	Typical value

Electrical Characteristics

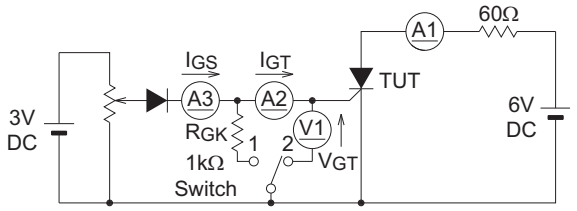
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	0.5	mA	Tj = 125°C, V_{RRM} applied
Repetitive peak off-state current	I_{DRM}	—	—	0.5	mA	Tj = 125°C, V_{DRM} applied R_{GK}=1 kΩ
On-state voltage	V_{TM}	—	—	1.2	V	Tj = 25°C, I_{TM} = 1.2 A instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	Tj = 25°C, V_D = 6 V, I_T = 0.1 A Note3
Gate non-trigger voltage	V_{GD}	0.2	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM} R_{GK}= 1 KΩ
Gate trigger current	I_{GT}	1 Note2	—	100 Note2	μA	Tj = 25°C, V_D = 6 V, I_T = 0.1 A Note3
Holding current	I_H	—	1.5	3	mA	Tj = 25°C, V_D = 12 V, R_{GK}= 1 kΩ
Thermal resistance	$R_{th(j-a)}$	—	—	150	°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	A	B	D	E
I_{GT} (μA)	1 to 30	20 to 50	1 to 50	20 to 100

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

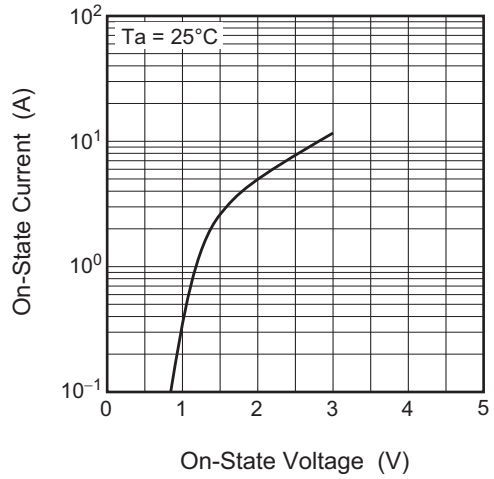
3. I_{GT}, V_{GT} measurement circuit.



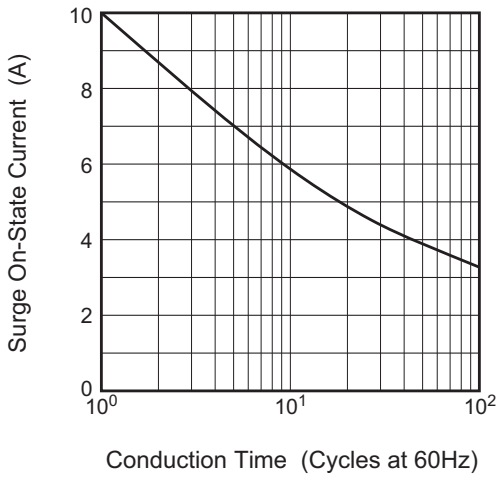
Switch 1 : I_{GT} measurement
Switch 2 : V_{GT} measurement
(Inner resistance of voltage meter is about 1kΩ)

Performance Curves

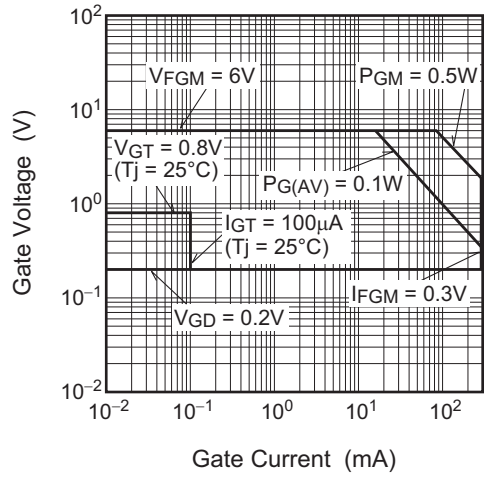
Maximum On-State Characteristics



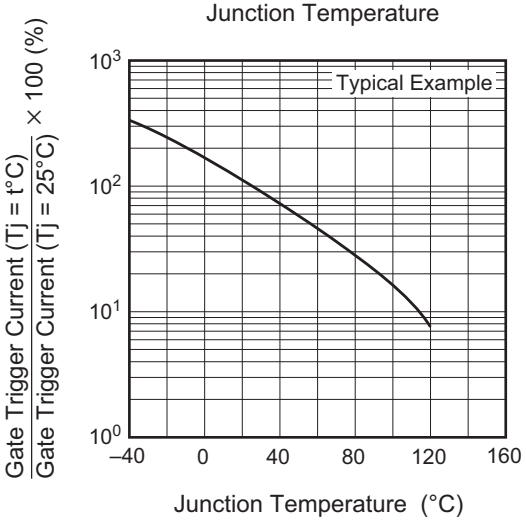
Rated Surge On-State Current



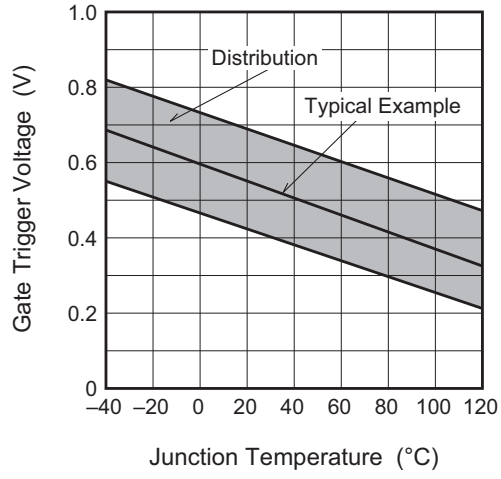
Gate Characteristics



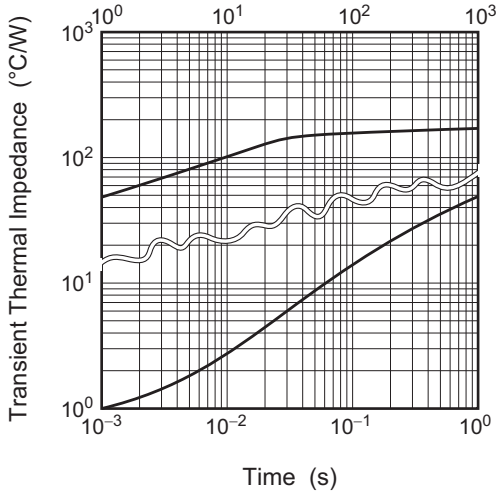
Gate Trigger Current vs. Junction Temperature



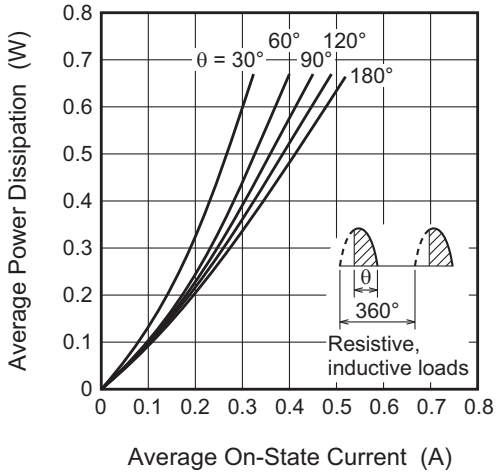
Gate Trigger Voltage vs. Junction Temperature



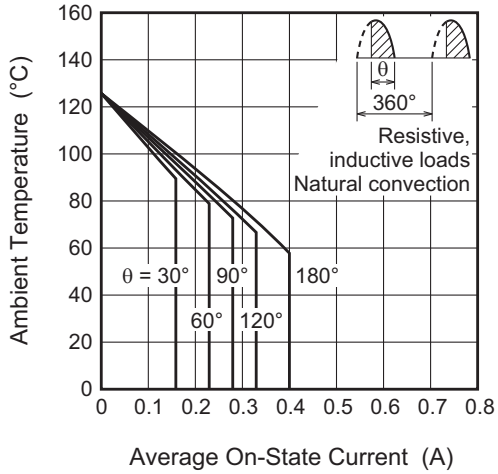
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



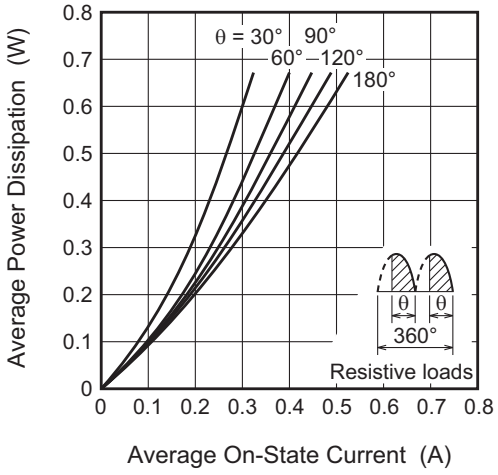
Maximum Average Power Dissipation
(Single-Phase Half Wave)



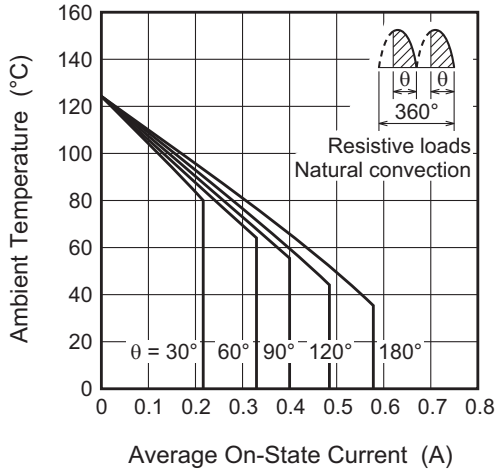
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



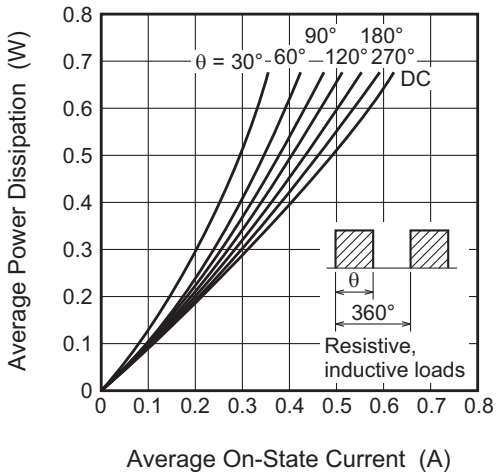
Maximum Average Power Dissipation
(Single-Phase Full Wave)



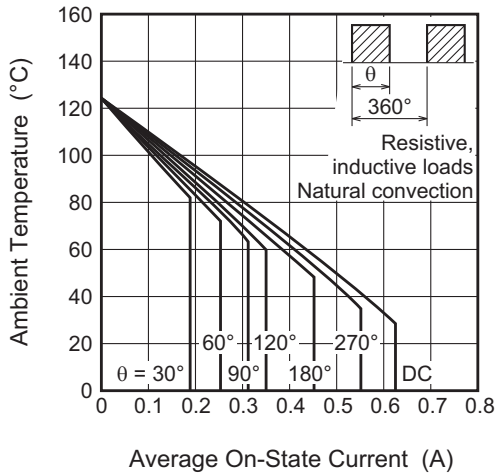
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



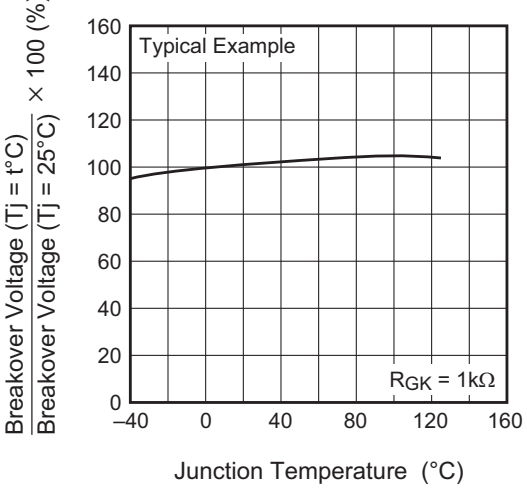
Maximum Average Power Dissipation
(Rectangular Wave)



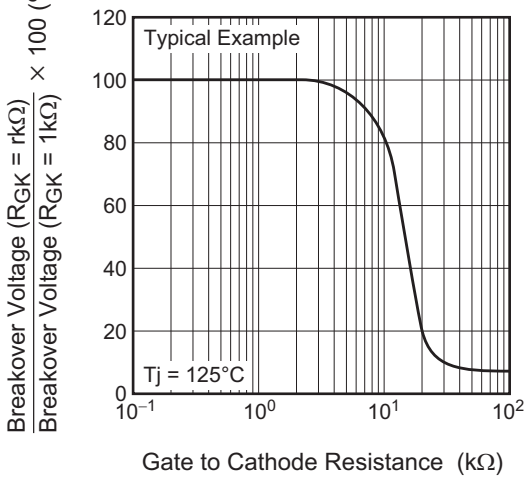
Allowable Ambient Temperature vs.
Average On-State Current
(Rectangular Wave)



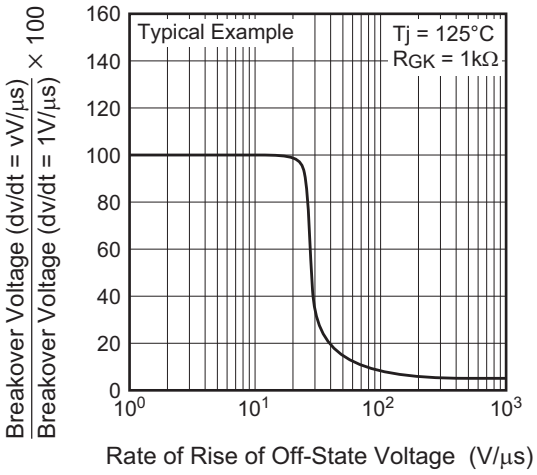
Breakover Voltage vs. Junction Temperature



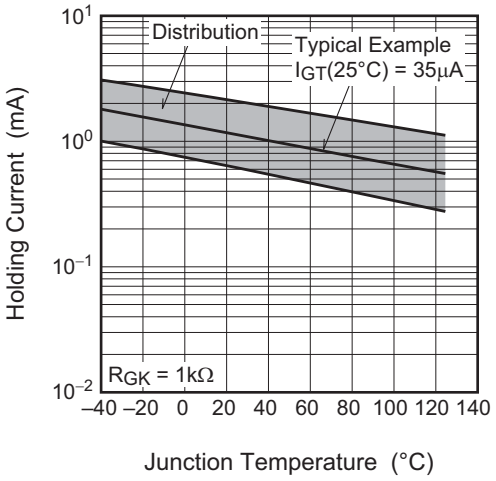
Breakover Voltage vs. Gate to Cathode Resistance



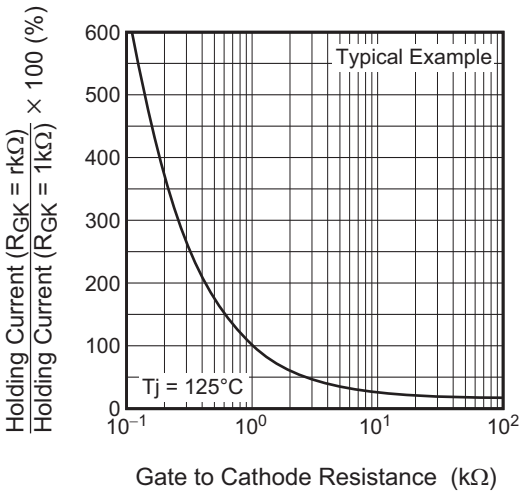
Breakover Voltage vs. Rate of Rise of Off-State Voltage



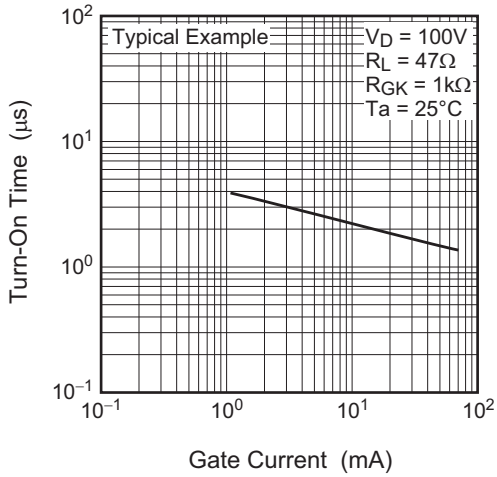
Holding Current vs. Junction Temperature



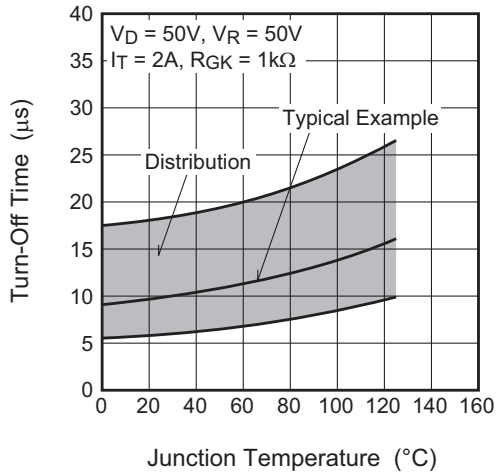
Holding Current vs. Gate to Cathode Resistance



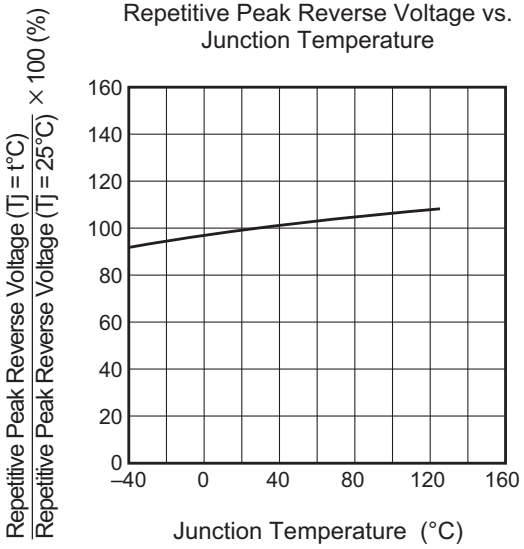
Turn-On Time vs. Gate Current



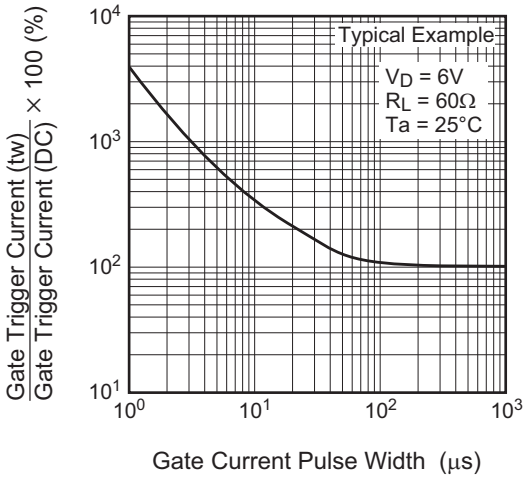
Turn-Off Time vs. Junction Temperature



Repetitive Peak Reverse Voltage vs. Junction Temperature



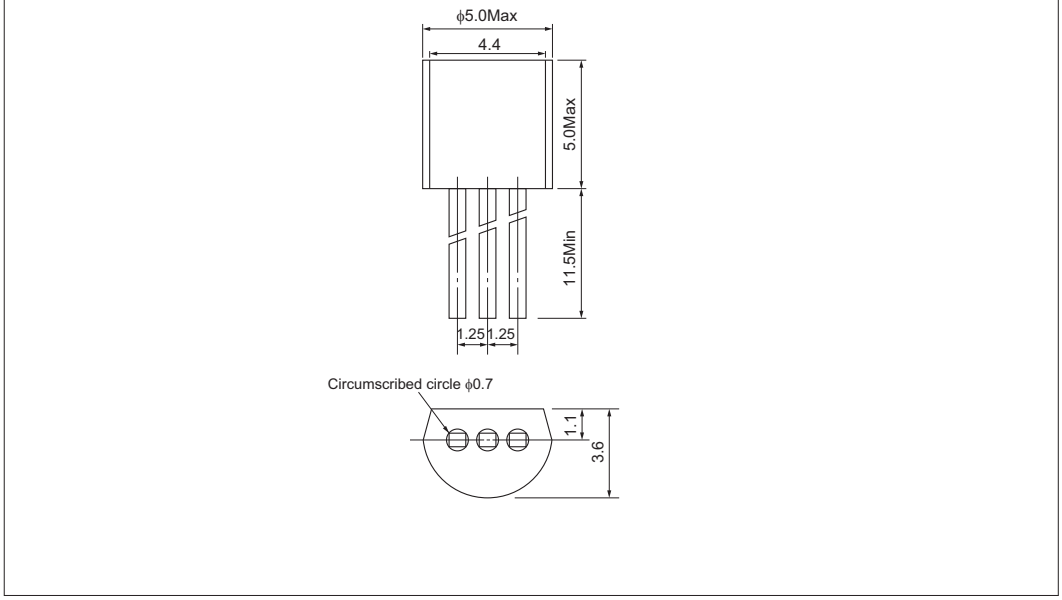
Gate Trigger Current vs. Gate Current Pulse Width



Package Dimensions

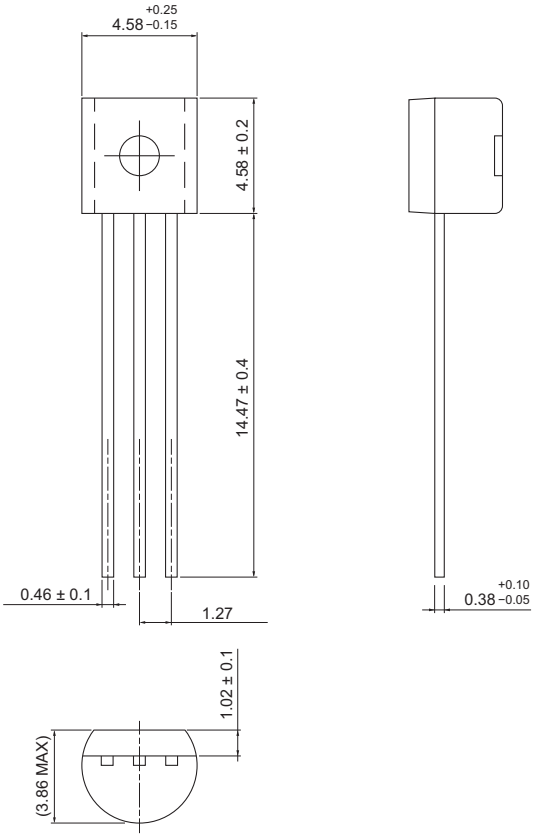
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-92*	SC-43A	PRSS0003EA-A	T920	0.23g

Unit: mm



JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
SC-43A	PRSS0003DJ-A	TO-92	0.23

Unit: mm



Ordering Information

Orderable Part Number	Package	Packing Note	Quantity	Remark
CR04AM-12A#B00	TO-92*	Plastic Bag	500 pcs.	Straight type
CR04AM-12A-☐#B00	TO-92*	Plastic Bag	500 pcs.	Straight type, ☐:I_{GT} item
CR04AM-12A-A6#B00	TO-92*	Plastic Bag	500 pcs.	A6 Lead form
CR04AM-12A-☐A6#B00	TO-92*	Plastic Bag	500 pcs.	A6 Lead form, ☐:I_{GT} item
CR04AM-12A-TB#B00	TO-92*	Adhesive Tape	2000 pcs.	A8 Lead form
CR04AM-12A-☐TB#B00	TO-92*	Adhesive Tape	2000 pcs.	A8 Lead form, ☐:I_{GT} item
CR04AM-12A #BD0	TO-92	Plastic Bag	1000 pcs.	Straight type, Halogen-free
CR04AM-12A-☐#BD0	TO-92	Plastic Bag	1000 pcs.	Straight type, Halogen-free, ☐:I_{GT} item
CR04AM-12A-A6#BD0	TO-92	Plastic Bag	1000 pcs.	A6 Lead form, Halogen-free
CR04AM-12A-☐A6#BD0	TO-92	Plastic Bag	1000 pcs.	A6 Lead form, Halogen-free, ☐:I_{GT} item
CR04AM-12A-TB#BD0	TO-92	Adhesive Tape	2000 pcs.	A8 Lead form, Halogen-free
CR04AM-12A-☐TB#BD0	TO-92	Adhesive Tape	2000 pcs.	A8 Lead form, Halogen-free, ☐:I_{GT} item

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

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