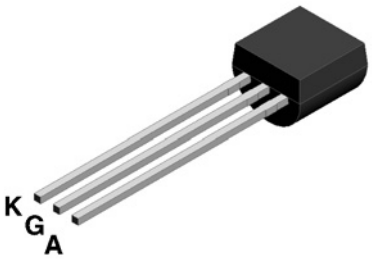
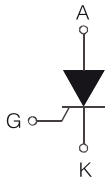
TO92





On-State Current	Gate Trigger Current
1.25 Amp	< 200 µA

Off-Satate Voltage

400 V ÷ 800 V

FEATURES

- Glass/passivated die junctions
- Low current SCR
- Low thermal resistance
- High surge current capability
- Low forward voltage drop
- Solder dip 260 ºC, 10s
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 ºC

Pb

e3

RoHS COMPLIANT

MECHANICAL DATA

- **Case:** TO92. Epoxy meets UL 94V-0 flammability rating.
- **Polarity:** As marked on the body.
- **Terminals:** Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test.

TYPICAL APPLICATIONS

Thanks to highly sensitive triggering levels, the FS02xxxA SCR series is suitable for all applications where available gate current is limited, such as ground fault circuit interruptors, pilot circuits in sold state relays, stand-by mode power supplies, smoke and alarm detectors.

Maximun Ratings and Electrical Characteristics at 25 °C

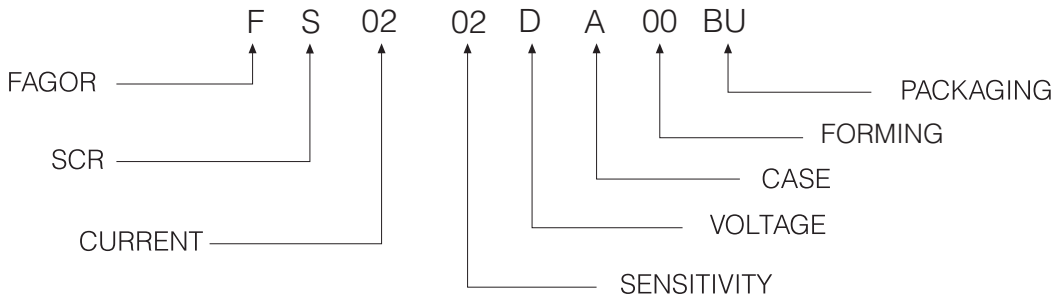
SYMBOL	PARAMETER	CONDITIONS	Value	Unit
$I_{T(RMS)}$	On-State Current	180 º Conduction Angel, T_c = 115 ºC	1.25	A
$I_{T(AV)}$	Average On-State Current	Half Cycle, θ = 180º, T_c = 115 ºC	0.8	A
I_{TSM}	Non-repetitive On-State Current	Half Cycle, 60 Hz	25	A
I_{TSM}	Non-repetitive On-State Current	Half Cycle, 50 Hz	22.5	A
I^2t	Fusing Current	tp = 10 ms, Half Cycle	2.5	A^2s
I_{GM}	Peak Gate Current	20 µs max.	1.2	A
P_{GM}	Peak Gate Dissipation	20 µs max.	3	W
$P_{G(AV)}$	Gate Dissipation	20 ms max.	0.2	W
T_j	Operating Temperature		(-40 to + 125)	ºC
T_{stg}	Storage Temperature		(-40 to + 150)	ºC
T_{sld}	Soldering Temperature	10s max.	260	ºC

SYMBOL	PARAMETER	CONDITIONS	Voltage			Unit
			D	M	N	
V_{DRM} V_{RRM}	Repetitive Peak Off State Voltage	R_{GK} = 1kΩ	400	600	800	V

Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS		SENSITIVITY				Unit
				01	02	03	04	
I_{GT}	Gate Trigger Current	V_D = 12 V_{DC}, R_L = 140Ω, Tj= 25 ºC	MIN	1		20	15	µA
			MAX	20	200	200	50	
V_{GT}	Gate Trigger Voltage	V_D = 12 V_{DC}, R_L = 140Ω, Tj= 25 ºC	MAX	0.8				V
V_{GD}	Gate Non Trigger Voltage	V_D = V_{DRM}, R_L = 3.3kΩ, R_{GK} = 220Ω, Tj= 125 ºC	MIN	0.1				V
$V_{R\,GM}$	Reverse Gate Voltage	$I_{R\,G}$ = 10µA	MIN	8				V
I_H	Holding Current	I_T = 50 mA, R_{GK} = 1kΩ, Tj= 25 ºC	MAX	5	5	7	5	mA
I_L	Latching Current	I_G = 1 mA, R_{GK} = 1kΩ	MAX	6	6	7	6	mA
dV / dt	Critical Rate of Voltage Rise	V_D = 0.67 x V_{DRM}, R_{GK} = 1kΩ, Tj= 125 ºC	MIN	15	10	30	30	V/µs
dI / dt	Critical Rate of Current Rise	I_G =2 x I_{GT}, tr ≤ 100ns, f = 60Hz, Tj= 125 ºC	MIN	50				A/µs
V_{TM}	On-State Voltage	at I_T = 2.5 Amp, tp = 380 µs, Tj= 25 ºc	MAX	1.45		2	1.45	V
V_{t0}	Threshold Voltage	Tj= 125 ºC	MAX	0.95				V
r_d	Dynamic resistance	Tj= 125 ºC	MAX	400				mΩ
I_{DRM} / I_{RRM}	Off-State Leakage Current	V_D = V_{DRM}, R_{GK} = 1kΩ, Tj = 125 ºC	MAX	500				µA
		V_R = V_{RRM}, Tj = 25 ºC	MAX	5				µA
$R_{th(j-c)}$	Thermal Resistance Junction-Case for DC	for AC 360º conduction angle		60				ºC/W ºC/W
$R_{th(j-a)}$	Thermal Resistance Junction-Amb for DC	S = 1 cm^2		150				ºC/W

Part Number Information

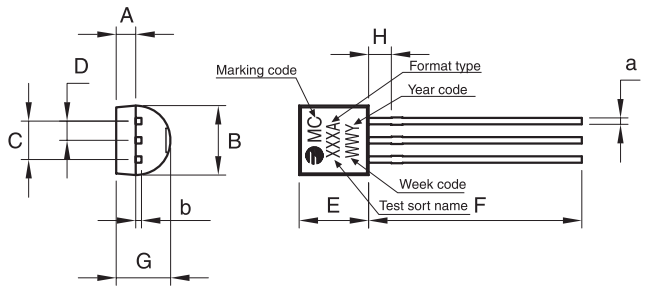


Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0202DA 00AM	AM	AMMO	2,000	0.2
FS0202DA 00BU	BU	BULK	10,000	0,2

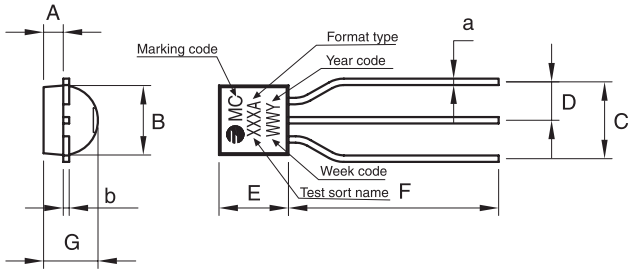
Package Outline Dimensions: (mm) TO92

TO-92 (BU)



REF.	DIMENSIONS Milimeters		
	Min.	Typ.	Max.
A	0.90	1.20	1.50
B	4.40	4.60	4.80
C	2.34	2.54	2.74
D	1.07	1.27	1.47
E	4.40	4.60	4.80
F	12.70	14.10	15.50
G	3.40	3.60	3.86
H	1.30	1.50	1.70
a	0.38	0.44	0.51
b	0.33	0.41	0.51

TO-92 (AMMO)



REF.	DIMENSIONS Milimeters		
	Min.	Typ.	Max.
A	0.90	1.20	1.50
B	4.40	4.60	4.80
C	4.96	5.08	5.20
D	2.42	2.54	2.66
E	4.40	4.60	4.80
F	12.30	13.70	15.50
G	3.40	3.60	3.86
H	1.30	1.50	1.70
a	0.38	0.44	0.51
b	0.33	0.41	0.51

Rating and Characteristics (Ta 25 °C unless otherwise noted)

Fig. 1: Maximum average power dissipation versus average on-state current

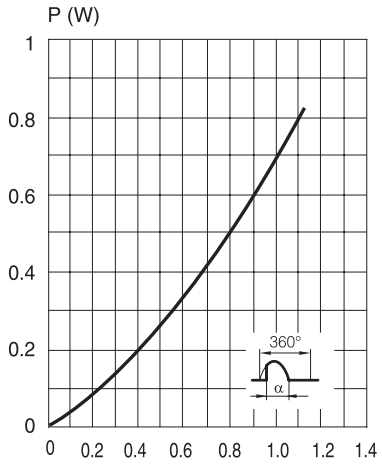


Fig. 2: Average and D.C. on-state current versus case temperature

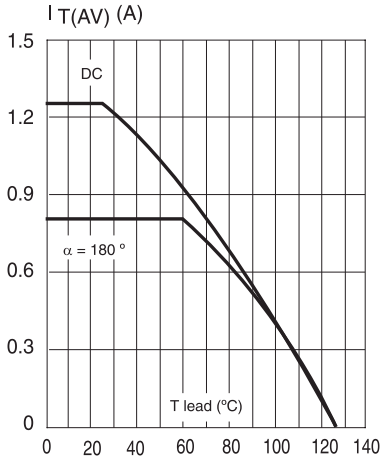


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration

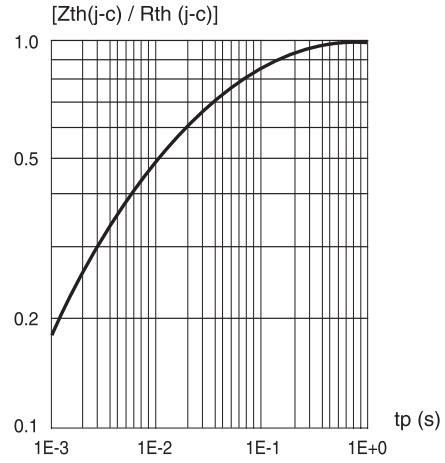


Fig. 4: Relative variation of gate trigger current, holding and latching current versus junction temperature

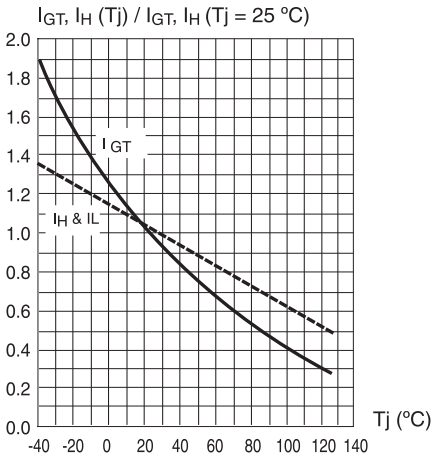


Fig. 5: Relative variation of holding current versus gate-cathode resistance (typical values).

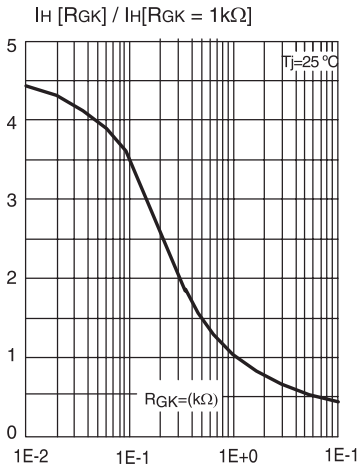
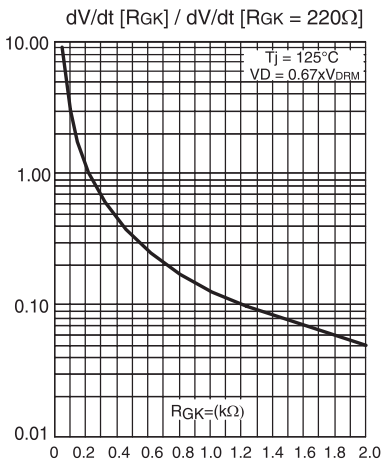


Fig. 6: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values).



Rating and Characteristics (Ta 25 °C unless otherwise noted)

Fig. 7: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values).

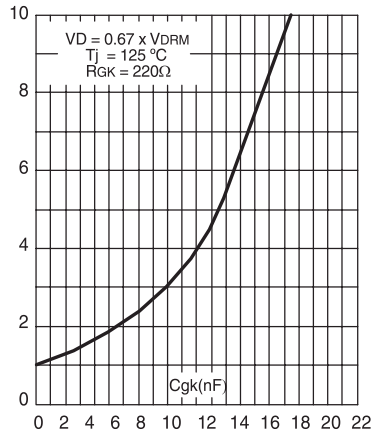


Fig. 8: Non repetitive surge peak on-state current versus number of cycles.

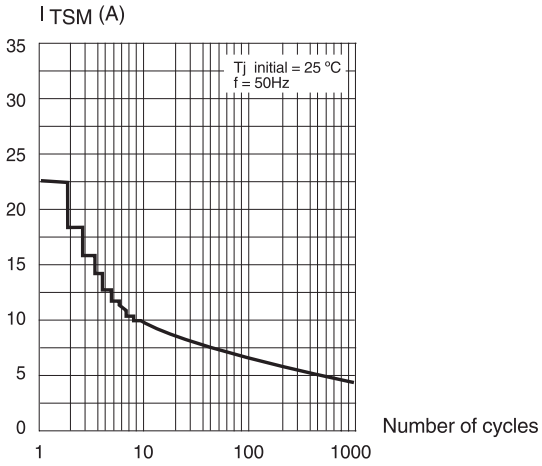


Fig. 9: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I^2t.

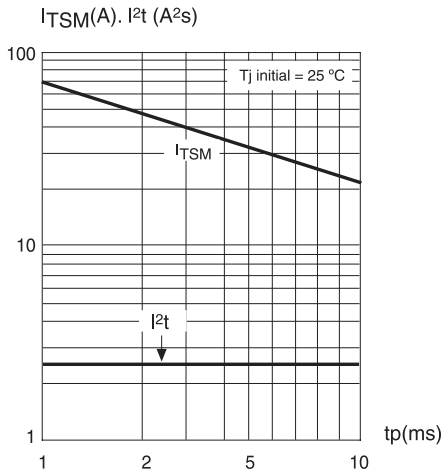
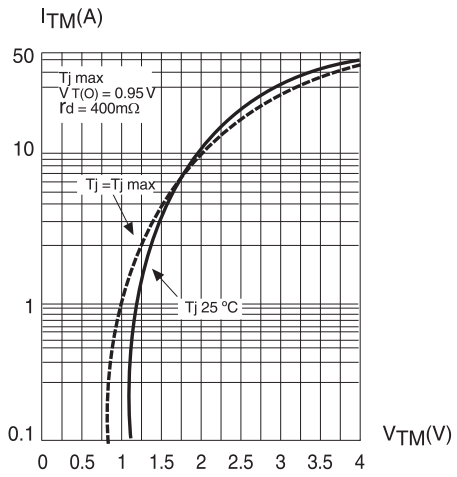


Fig. 10: On-state characteristics (maximum values)



Revision History

DATE	REVISION	DESCRIPTION OF CHANGES
16-Nov-2012	0	Original Data Sheet
20-Jan-2017	1	200V eliminated
20-Jan-2020	2	General review

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