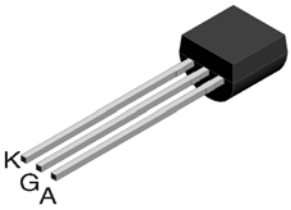
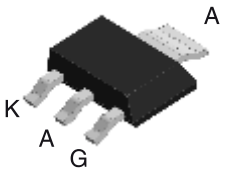
SENSITIVE GATE SCR

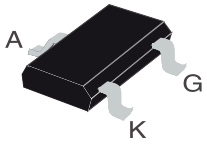
TO-92
(FS01xxxA)

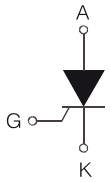


SOT-223
(FS01xxxN)



SOT23-3L
(FS01xxxL)





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

Off-Satate Voltage
400 V ÷ 600 V

FEATURES

- Glass/passivated die junctions
- Low current SCR
- Low thermal resistance
- High surge current capability
- Low forward voltaje 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/ sot-223/ sot23-3L. 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 FS011xxxx SCR 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

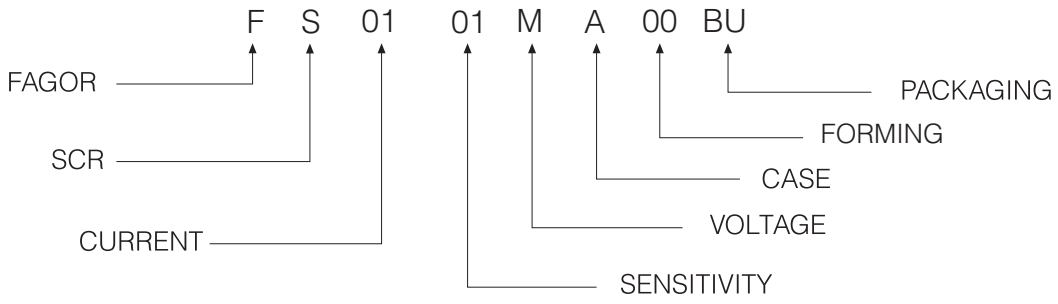
SYMBOL	PARAMETER	CONDITIONS	Value	Unit
$I_{T(RMS)}$	RMS On-State Current	180 º Conduction Angel, T_c = 115 ºC	0.8	A
$I_{T(AV)}$	Average On-State Current	180 º Conduction Angel, T_c = 115 ºC	0.5	A
I_{TSM}	Non-repetitive On-State Current	Half Cycle, 60 Hz	8	A
I_{TSM}	Non-repetitive On-State Current	Half Cycle, 50 Hz	7	A
I^2t	Fusing Current	tp = 10 ms, Half Cycle	0.24	A^2s
I_{GM}	Peak Gate Current	20 µs max. Tj = 125 ºC	1	A
$P_{G(AV)}$	Average Gate Power Dissipation	Tj = 125 ºC	0.1	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	
V_{DRM} V_{RRM}	Repetitive Peak Off State Voltage	R_{GK} = 1kΩ	400	600	V

Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS			SENSITIVITY					Unit
					01	02	03	04	18	
I_{GT}	Gate Trigger Current	V_D = 12 V_{DC}, R_L = 140Ω, Tj= 25 ºC		MIN	1		20	15	0.5	µA
				MAX	20	200	200	50	5	
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_{RGM}	Reverse Gate Voltage	I_{RG} = 10µA		MIN	8					V
I_H	Holding Current	I_T = 50 mA, R_{GK} = 1kΩ, Tj= 25 ºC		MAX	5					mA
I_L	Latching Current	I_G = 1 mA, R_{GK} = 1kΩ		MAX	6					mA
dV / dt	Critical Rate of Voltage Rise	V_D = 0.67 x V_{DRM}, R_{GK} = 1kΩ, Tj= 125 ºC		MIN	80	75	80	80	80	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 = 1.6 Amp, tp = 380 µs, Tj= 25 ºC		MAX	1.95					V
V_{t0}	Threshold Voltage	Tj= 125 ºC		MAX	0.95					V
r_d	Dynamic resistance	Tj= 125 ºC		MAX	600					mΩ
I_{DRM} / I_{RRM}	Off-State Leakage Current	V_D = V_{DRM}, R_{GK} = 1kΩ, Tj = 125 ºC V_R = V_{RRM}, Tj = 25 ºC		MIN	100 1					µA µA
$R_{th(j-c)}$	Thermal Resistance Junction-Case for DC		TO-92		80					ºC/W
			SOT-223		30					ºC/W
$R_{th(j-a)}$	Thermal Resistance Junction-Amb for DC	Mounted on recommed Pad Layout	SOT-23-3L		400					ºC/W
			TO-92		150					ºC/W
		S = 5 cm²	SOT-223		60					ºC/W

Part Number Information



Ordering information

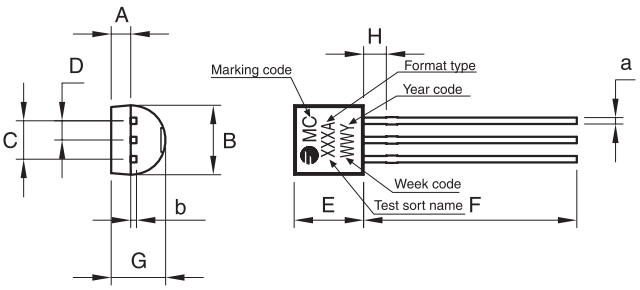
PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DA 00AM	AM	AMMO	2,000	0.2
FS0102DA 00BU	BU	BULK	10,000	0,2

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DN 00RB	RB	REEL	2,500	0.116

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DL 00RB	AM	AMMO	2,000	0.2

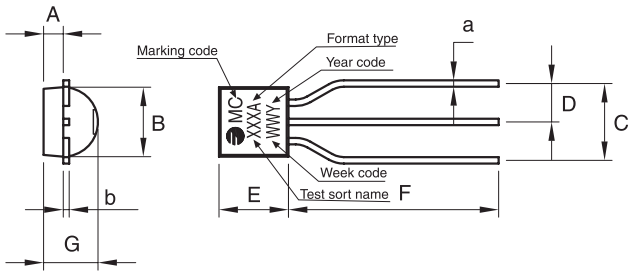
Package Outline Dimensions: (mm) TO92

TO-92 (BU)



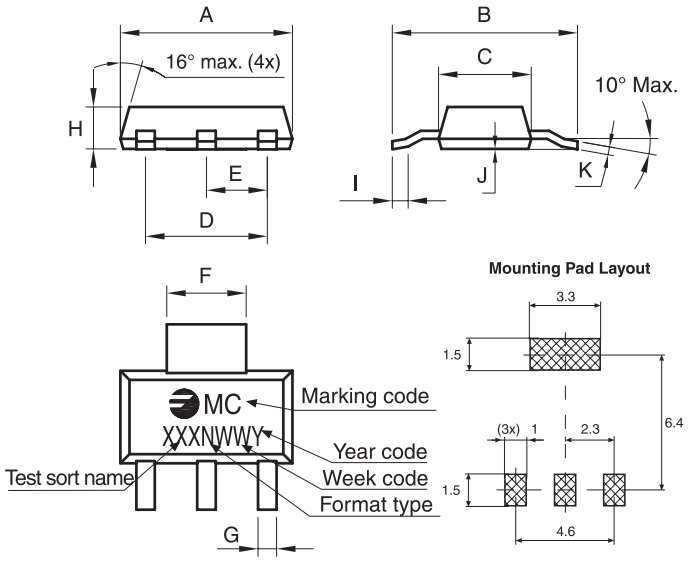
REF.	DIMENSIONS		
	Milimeters		
	Min.	Typ.	Max.
A	0.90	1.20	1.50
B	4.40	4.60	4.80
C	2.34	2.54	2.74
D	1.07	1.27	1.47
E	4.40	4.60	4.80
F	12.70	14.10	15.50
G	3.40	3.60	3.86
H	1.30	1.50	1.70
a	0.38	0.44	0.51
b	0.33	0.41	0.51

TO-92 (AMMO)



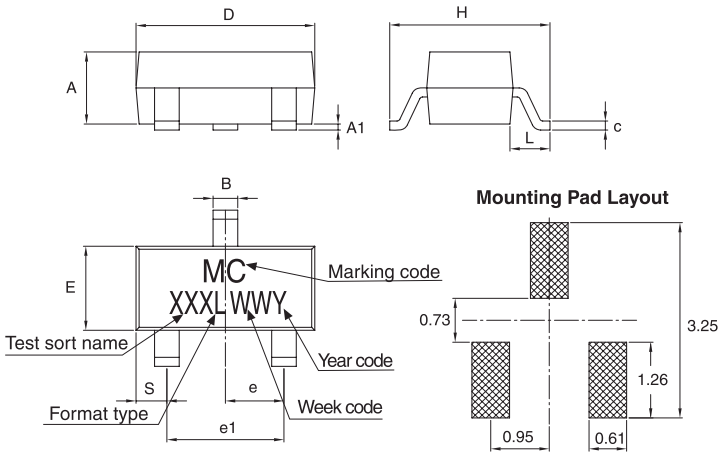
REF.	DIMENSIONS		
	Milimeters		
	Min.	Typ.	Max.
A	0.90	1.20	1.50
B	4.40	4.60	4.80
C	4.96	5.08	5.20
D	2.42	2.54	2.66
E	4.40	4.60	4.80
F	12.30	13.70	15.50
G	3.40	3.60	3.86
H	1.30	1.50	1.70
a	0.38	0.44	0.51
b	0.33	0.41	0.51

Package Outline Dimensions: (mm) TO-261AA (SOT-223)



REF.	DIMENSIONS Milimeters		
	Min.	Nominal	Max.
A	6.30	6.50	6.70
B	6.70	7.00	7.30
C	3.30	3.50	3.70
D	-	4.60	-
E	-	2.30	-
F	2.95	3.00	3.15
G	0.65	0.70	0.85
H	1.50	1.60	1.70
I	0.50	0.60	0.70
J	-	0.02	0.05
K	0.25	0.30	0.35

Package Outline Dimensions: (mm) SOT23-3L



REF.	DIMENSIONS Milimeters	
	Min.	Max.
A	0.89	1.4
A1	0.05	0.15
B	0.3	0.51
c	0.080	0.18
D	2.75	3.04
e	0.85	1.05
e1	1.7	2.1
E	1.2	1.6
H	2.1	2.75
L	0.40	0.70
S	0.45	0.65

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

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

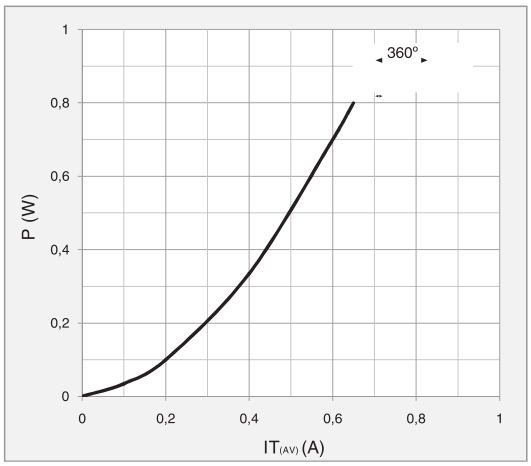


Fig. 2: Average and D.C. on-state current versus ambient temperature

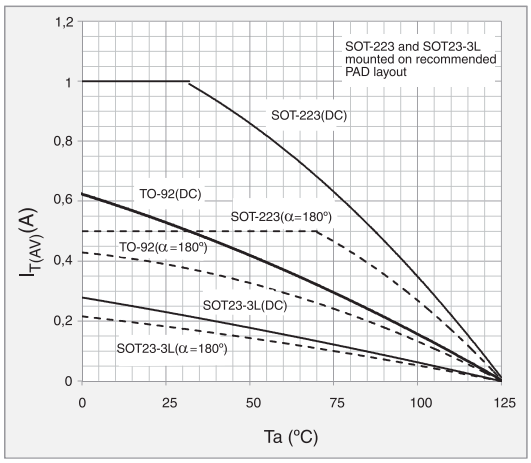


Fig. 3: Relative variation of thermal impedance junction to ambient verus pulse duration

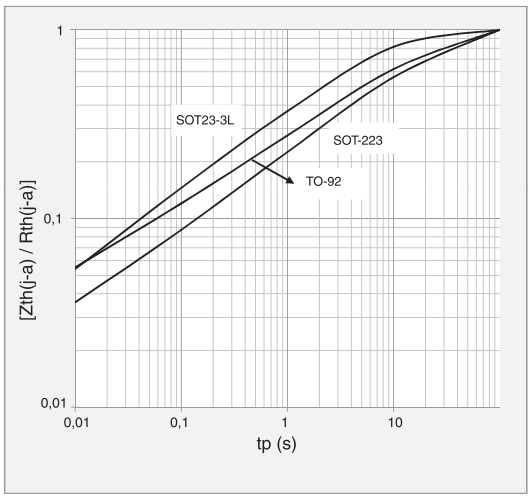


Fig. 4: Relative variation of gate trigger, holding and latching current versus junction temperature (Typical values)

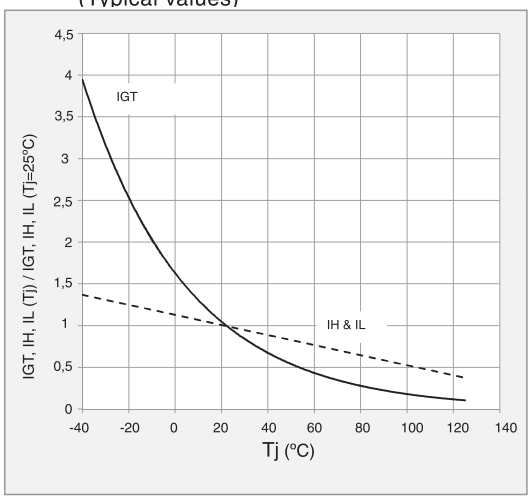


Fig. 5: Relative variation of holding current versus gate-cathode resistance (Typical values)

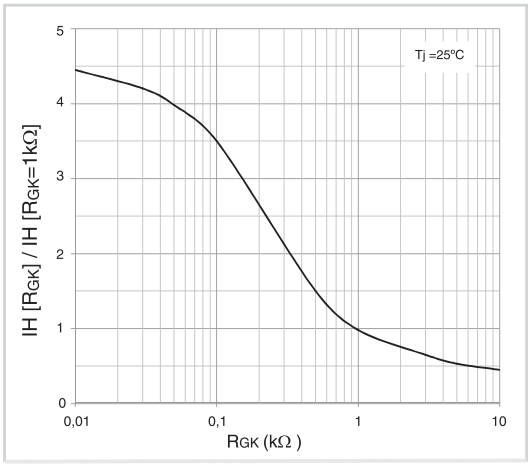


Fig. 6: Relative variation of dV/dt immunity versus gate-cathode resistance (Typical values)

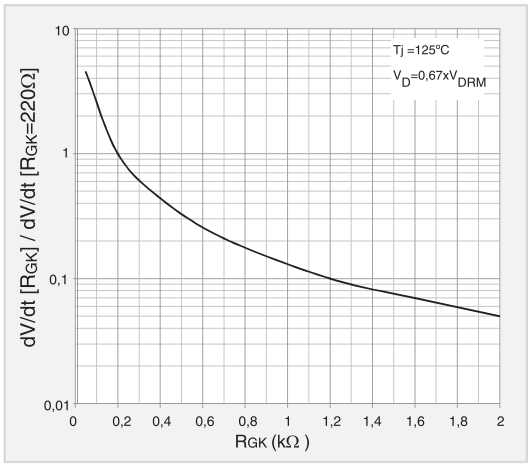


Fig. 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (Typical values)

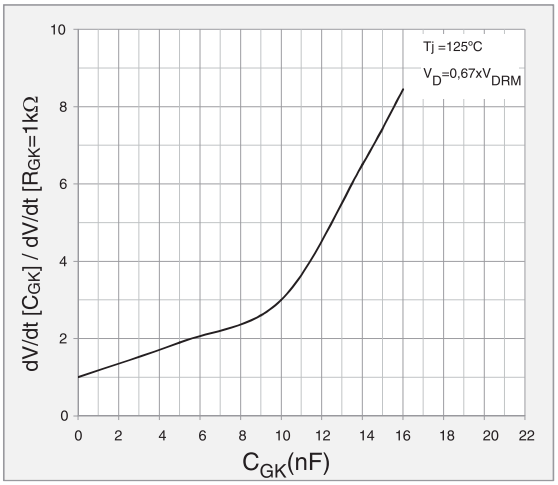


Fig. 8: Non repetitive surge peak on-state current versus number of cycles

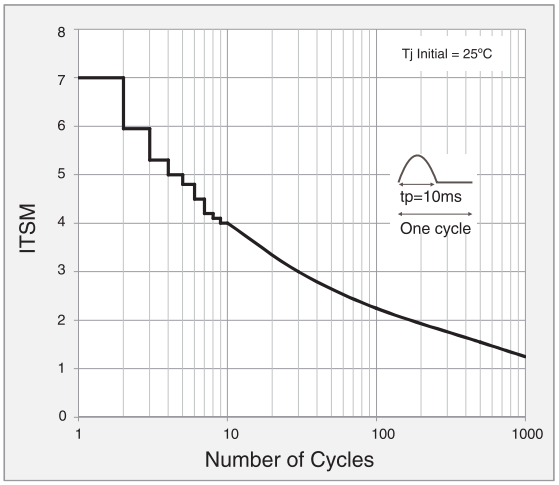


Fig. 9: Non repetitive surge peak on-state current and corresponding value of I^2t

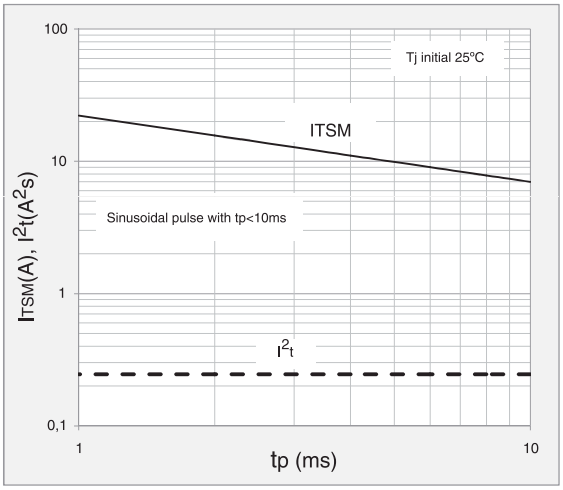
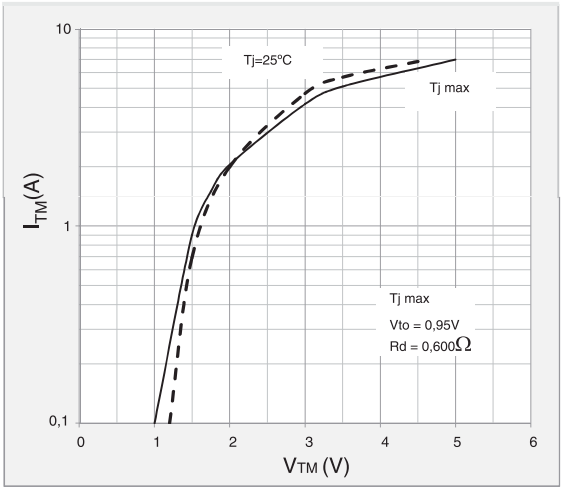


Fig.10 On-state characteristics (Maximum values)



Revision History

DATE	REVISION	DESCRIPTION OF CHANGES
18-Feb-2014	0	Original Data Sheet
10-Dec-2015	1	Updated Ordering Information

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