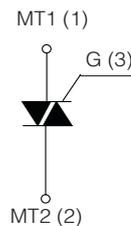
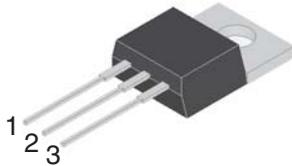


## INSULATED STANDARD SCR

### INSULATED TO-220AB


**On-State Current**

16 Amp

**Gate Trigger Current**

2 mA to 40 mA

**Off-State Voltage**

200 V ÷ 800 V

**FEATURES**

- Glass/passivated die junctions
- Provides voltage insulated tab (rated at 2500V RMS)
- High current SCR
- Low thermal resistance
- High surge current capability
- Low forward voltage drop
- Solder dip 260°C, 10s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Meets MSL level 3, per J-STD-020, LF maximum peak of 260° C


**RoHS**  
COMPLIANT

**MECHANICAL DATA**

- **Case:** INSULATED TO-220AB. 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 its triggering levels, the FS16xxxJ SCR series is suitable to fit all modes of control, found in applications such as overvoltage crowbar protection, motor control circuits in power tools and kitchen aids, inrush current limiting circuits, capacitive discharge ignition and voltage regulation circuits.

### Maximun Ratings and Electrical Characteristics at 25°C

SYMBOL	PARAMETER	CONDITIONS	Value	Unit
$I_{T(RMS)}$	On-state Current	180° Conduction Angle, $T_c = 110\text{ °C}$	16	A
$I_{T(AV)}$	Average On-state Current	Half Cycle, $\Theta = 180\text{ °}$ , $T_c = 110\text{ °C}$	10	A
$I_{TSM}$	Non-repetitive On-State Current	Half Cycle, 60 Hz	200	A
$I_{TSM}$	Non-repetitive On-State Current	Half Cycle, 50 Hz	190	A
$I^2t$	Fusing Current	$t_p = 10\text{ms}$ , Half Cycle	180	A <sup>2</sup> s
$I_{GM}$	Peak Gate Current	20 $\mu\text{s}$ max.	4	A
$P_{GM}$	Peak Gate Dissipation	20 $\mu\text{s}$ max.	10	W
$P_{G(AV)}$	Gate Dissipation	20ms max.	1	W
$T_j$	Operating Temperature		(-40 to +125)	°C
$T_{stg}$	Storage Temperature		(-40 to +150)	°C
$T_{sld}$	Soldering Temperature	10s max.	260	°C
$V_{RGM}$	Reverse Gate Voltage		5	V

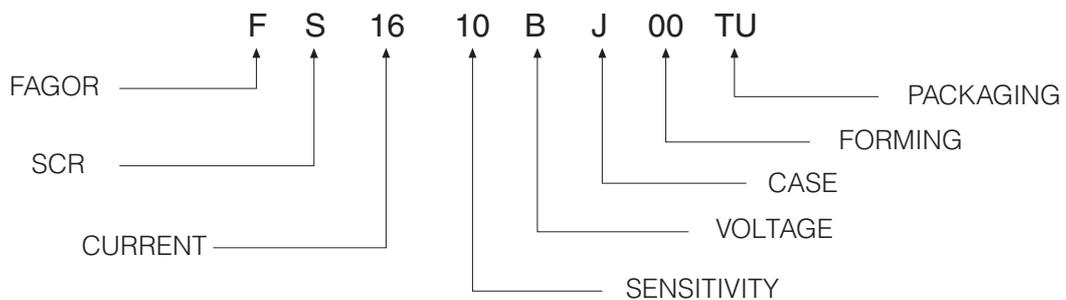
SYMBOL	PARAMETER	CONDITIONS	VOLTAGE					Unit
			B	D	M	S	N	
$V_{DRM}$ $V_{RRM}$	Repetitive Peak Off State Voltage	$R_{GK} = 1\text{ k}\Omega$	200	400	600	700	800	V

**INSULATED STANDARD SCR**

**Electrical Characteristics at Tamb = 25 °C**

SYMBOL	PARAMETER	CONDITIONS	SENSITIVITY		Unit	
			10	14		
$I_{GT}$	Gate Trigger Current	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$	MIN MAX	2 25	4 40	m A
$V_{GT}$	Gate Trigger Voltage	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$	MAX	1.3		V
$V_{GD}$	Gate Non Trigger Voltage	$V_D = V_{DRM}, R_L = 3.3k\Omega, R_{GK} = 220\Omega, T_j = 125^\circ C$	MIN	0.2		V
$I_H$	Holding Current	$I_T = 500 \text{ mA}$	MAX	40	50	mA
$I_L$	Latching Current	$I_G = 1.2 I_{GT}$	MAX	60	90	mA
$dV / dt$	Critical Rate of Voltage Rise	$V_D = 0.67 \times V_{DRM}, \text{ Gate open}, T_j = 125^\circ C$	MIN	500	1000	V/ $\mu$ s
$dI / dt$	Critical Rate of Current Rise	$I_G = 2 \times I_{GT}, Tr \leq 100 \text{ ns}, f = 60 \text{ Hz}, T_j = 125^\circ C$	MIN	50		A/ $\mu$ s
$V_{TM}$	On-state Voltage	at $I_T = 32 \text{ Amp}, tp = 380 \mu\text{s}, T_j = 25^\circ C$	MAX	1.6		V
$V_{t0}$	Threshold Voltage	$T_j = 125^\circ C$	MAX	0.77		V
$r_d$	Dynamic resistance	$T_j = 125^\circ C$	MAX	23		m $\Omega$
$I_{DRM} / I_{RRM}$		$V_D = V_{DRM}, R_{GK} = 1k\Omega, T_j = 125^\circ C$ $V_R = V_{RRM}, T_j = 25^\circ C$	MAX MAX	2 5		mA $\mu$ A
$R_{th(j-c)}$	Thermal Resistance Junction-Case for DC	for AC 360° conduction angle		1.1		°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Amb for DC			60		°C/W

**Part Number Information**



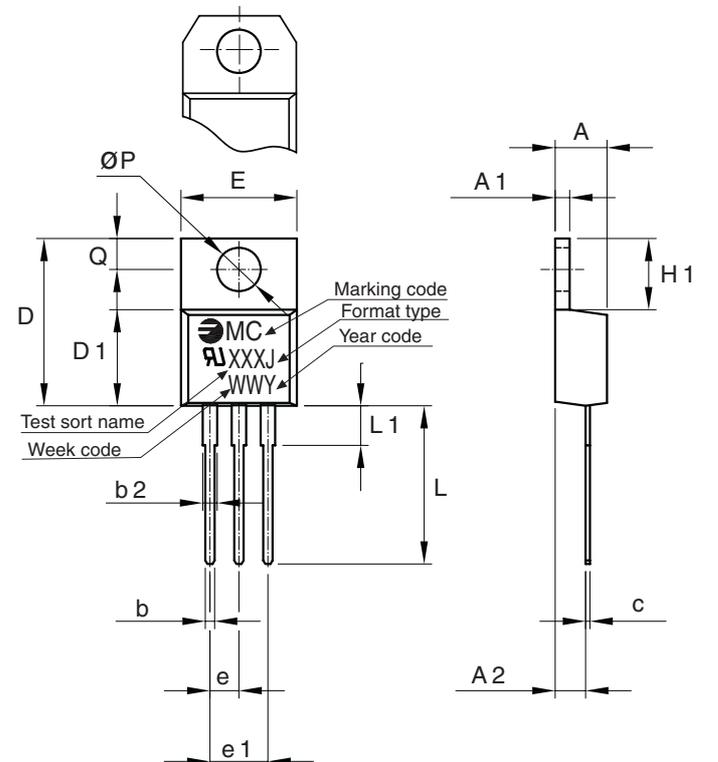
**INSULATED STANDARD SCR**

**Ordering information**

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS1614MJ 00TU	TU	TUBE	1000	2.30

**Package Outline Dimensions: (mm) INSULATED TO-220AB**

Optional with chamfer



The drawing shows a top view and a side view of the package. The top view includes dimensions:  $\varnothing P$ , E, Q, D, D1, b2, b, e, e1, L, and L1. The side view includes dimensions: A, A1, A2, H1, and c. Marking details include: MC, XXXJ, WWY, Test sort name, Week code, Marking code, Format type, and Year code.

REF.	DIMENSIONS	
	Millimeters	
	Min.	Max.
A	4.32	4.62
A1	1.21	1.29
A2	2.40	2.70
b	0.80	0.83
b2	1.40	--
c	0.42	0.48
D	15.5	15.68
D1	9.26	9.42
E	10.08	10.24
e	2.54	2.54
e1	5.08	5.08
H1	6.24	6.26
L	12.81	13.81
L1	3.28	4.17
P	3.70	3.80
Q	2.75	2.85

<b>Mounting Torque</b>	<b>0.5 N.m</b>
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**INSULATED STANDARD SCR**

**Ratings and Characteristics (Ta 25 °C unless otherwise noted)**

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

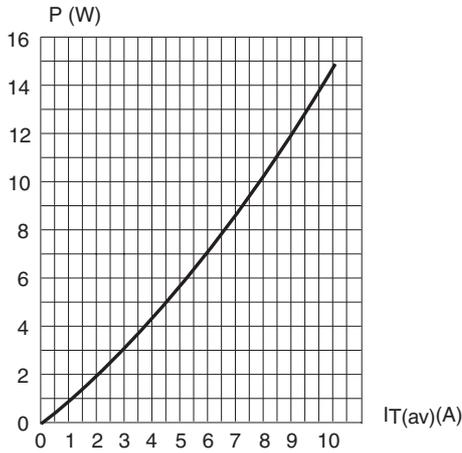


Fig. 2: Average and D.C. on-state current versus case temperature.

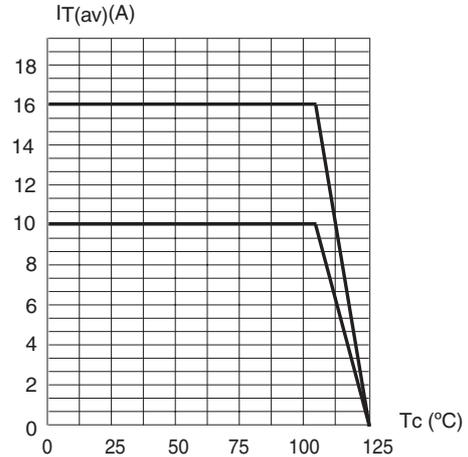


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

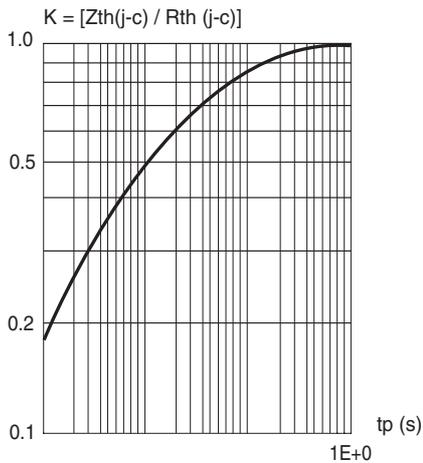


Fig. 4: Relative variation of gate trigger current, holding and latching current versus junction temperature.

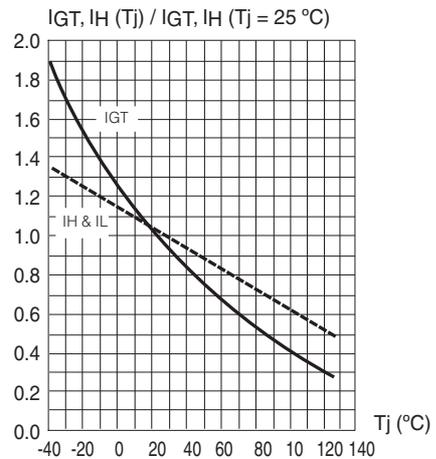


Fig. 5: Non repetitive surge peak on-state current versus number of cycles.

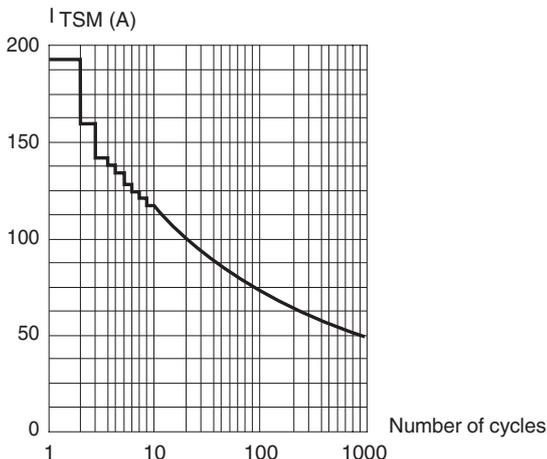
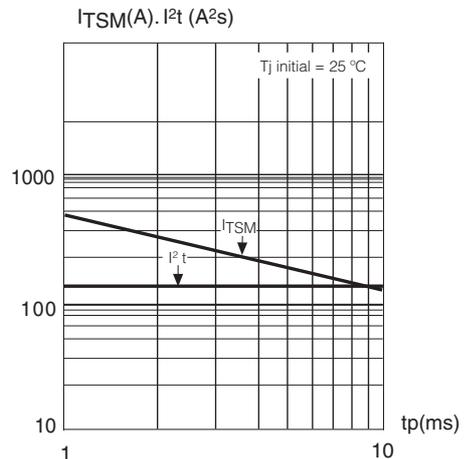


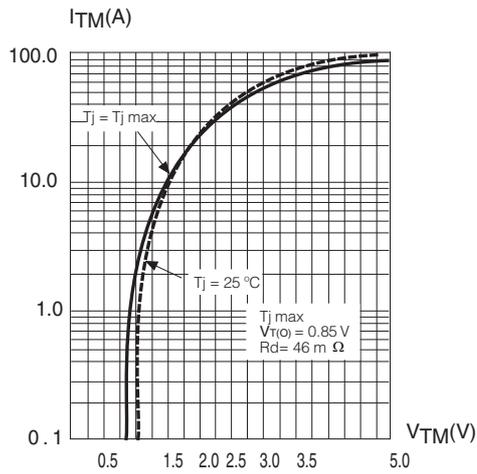
Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I²t.



**INSULATED STANDARD SCR**

**Ratings and Characteristics (Ta 25 °C unless otherwise noted)**

Fig. 7: On-state characteristics (maximum values).



**INSULATED STANDARD SCR**

## Disclaimer

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