

## SENSITIVE GATE SCR

<div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center; margin-bottom: 20px;"> <p><b>TO-92</b> (FS01xxxA)</p> </div> <div style="text-align: center; margin-bottom: 20px;"> <p><b>SOT-223</b> (FS01xxxN)</p> </div> <div style="text-align: center;"> <p><b>SOT23-3L</b> (FS01xxxL)</p> </div> </div> <div style="text-align: center; margin-top: 20px;"> </div>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"><b>On-State Current</b> 0.8 Amp</td> <td style="padding: 5px;"><b>Gate Trigger Current</b> &lt; 200 <math>\mu</math>A</td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 5px;"><b>Off-State Voltage</b> 400 V ÷ 600 V</td> </tr> </table> <p><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>Glass/passivated die junctions</li> <li>Low current SCR</li> <li>Low thermal resistance</li> <li>High surge current capability</li> <li>Low forward voltage drop</li> <li>Solder dip 260°C, 10s</li> <li>Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC</li> <li>Meets MSL level 3, per J-STD-020, LF maximum peak of 260°C</li> </ul> <p><b>MECHANICAL DATA</b></p> <ul style="list-style-type: none"> <li><b>Case:</b> (TO-92 / SOT-223 / SOT23-3L). Epoxy meets UL 94V-0 flammability rating.</li> <li><b>Polarity:</b> As marked on the body.</li> <li><b>Terminals:</b> 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.</li> </ul> <p><b>TYPICAL APPLICATIONS</b></p> <p>Thanks to highly sensitive triggering levels, the FS01xxxx SCR series is suitable for all applications where available gate current is limited, such as ground fault circuit interruptors, pilot circuits in solid state relays, stand-by mode power supplies, smoke and alarm detectors.</p>	<b>On-State Current</b> 0.8 Amp	<b>Gate Trigger Current</b> < 200 $\mu$ A	<b>Off-State Voltage</b> 400 V ÷ 600 V	
<b>On-State Current</b> 0.8 Amp	<b>Gate Trigger Current</b> < 200 $\mu$ A				
<b>Off-State Voltage</b> 400 V ÷ 600 V					



**RoHS**  
COMPLIANT

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

SYMBOL	PARAMETER	CONDITIONS	Value	Unit
$I_{T(RMS)}$	RMS On-state Current	180° Conduction Angle, $T_C = 115^\circ C$	0.8	A
$I_{T(AV)}$	Average On-state Current	180° Conduction Angle, $T_C = 115^\circ C$	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	$t_p = 10$ ms, Half Cycle	0.24	$A^2s$
$I_{GM}$	Peak Gate Current	20 $\mu$ s max. $T_j = 125^\circ C$	1	A
$P_{G(AV)}$	Average Gate Power Dissipation	$T_j = 125^\circ C$	0.1	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

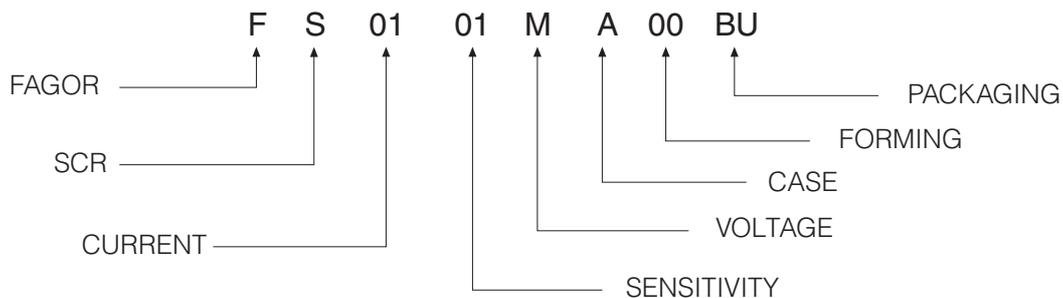
SYMBOL	PARAMETER	CONDITIONS	VOLTAGE		Unit
			D	M	
$V_{DRM}$ $V_{RRM}$	Repetitive Peak Off State Voltage	$R_{GK} = 1 k\Omega$	400	600	V

## SENSITIVE GATE SCR

### Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS	SENSITIVITY					Unit	
			01	02	03	04	18		
I <sub>GT</sub>	Gate Trigger Current	V <sub>D</sub> = 12 V <sub>DC</sub> , R <sub>L</sub> = 140Ω, T <sub>j</sub> = 25 °C	MIN	1		20	15	0.5	μA
			MAX	20	200	200	50	5	
V <sub>GT</sub>	Gate Trigger Voltage	V <sub>D</sub> = 12 V <sub>DC</sub> , R <sub>L</sub> = 140Ω, T <sub>j</sub> = 25 °C	MAX	0.8					V
V <sub>GD</sub>	Gate Non Trigger Voltage	V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3kΩ, R <sub>GK</sub> = 220Ω, T <sub>j</sub> = 125 °C	MIN	0.1					V
V <sub>RGM</sub>	Reverse Gate Voltage	I <sub>RG</sub> = 10μA,	MIN	8					V
I <sub>H</sub>	Holding Current	I <sub>T</sub> = 50 mA, R <sub>GK</sub> = 1kΩ, T <sub>j</sub> = 25 °C	MAX	5					mA
I <sub>L</sub>	Latching Current	I <sub>G</sub> = 1 mA, R <sub>GK</sub> = 1 kΩ	MAX	6					mA
dV / dt	Critical Rate of Voltage Rise	V <sub>D</sub> = 0.67 x V <sub>DRM</sub> , R <sub>GK</sub> = 1 kΩ, T <sub>j</sub> = 125 °C	MIN	80	75	80	80	80	V/μs
dI / dt	Critical Rate of Current Rise	I <sub>G</sub> = 2 x I <sub>GT</sub> , tr ≤ 100 ns, f = 60 Hz, T <sub>j</sub> = 125 °C	MIN	50					A/μs
V <sub>TM</sub>	On-state Voltage	at I <sub>T</sub> = 1.6 Amp, tp = 380 μs, T <sub>j</sub> = 25 °C	MAX	1.95					V
V <sub>T0</sub>	Threshold Voltage	T <sub>j</sub> = 125 °C	MAX	0.95					V
r <sub>d</sub>	Dynamic resistance	T <sub>j</sub> = 125 °C	MAX	600					mΩ
I <sub>DRM</sub> / I <sub>RRM</sub>	Off-State Leakage Current	V <sub>D</sub> = V <sub>DRM</sub> , R <sub>GK</sub> = 1kΩ, V <sub>R</sub> = V <sub>RRM</sub> , T <sub>j</sub> = 125 °C	MAX	100					μA
			MAX	1					μA
R <sub>th(j-c)</sub>	Thermal Resistance Junction-Case for DC	TO-92	80					°C/W	
		SOT-223	30					°C/W	
R <sub>th(j-a)</sub>	Thermal Resistance Junction-Amb for DC	Mounted on recommended Pad Layout	400					°C/W	
		TO-92	150					°C/W	
		S = 5 cm <sup>2</sup>	SOT-223	60					°C/W

### Part Number Information



# SENSITIVE GATE SCR

## Ordering information

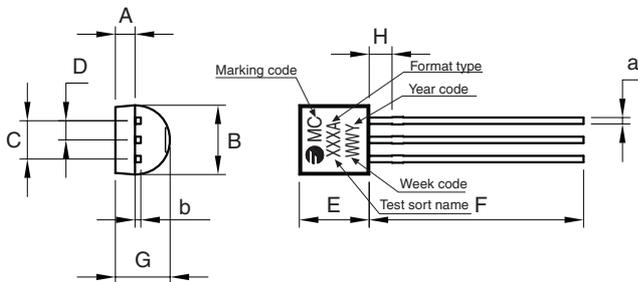
PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DA 00AM	AM	AMMO	2,000	0.2
FS0102DA 00BU	BU	BULK	10,000	0.2

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DN 00RS	RS	REEL	1,000	0.116
FS0102DN 00RB	RB	REEL	2,500	0.116

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FS0102DL 00RB	RB	REEL	3,000	0.01

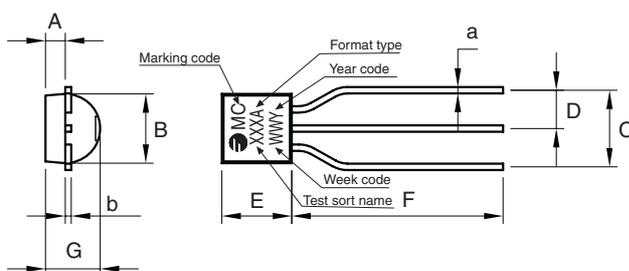
## Package Outline Dimensions: (mm) TO-92

### 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

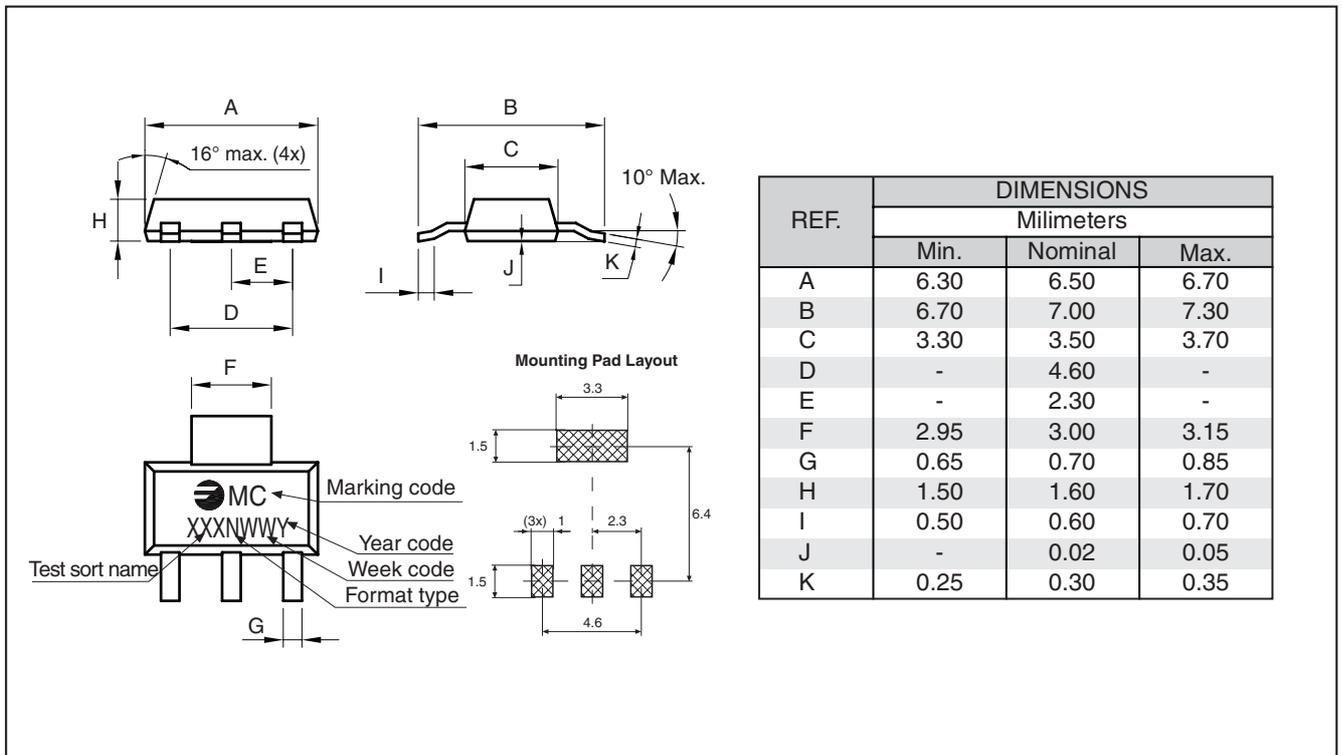
### TO-92 (AMMO)



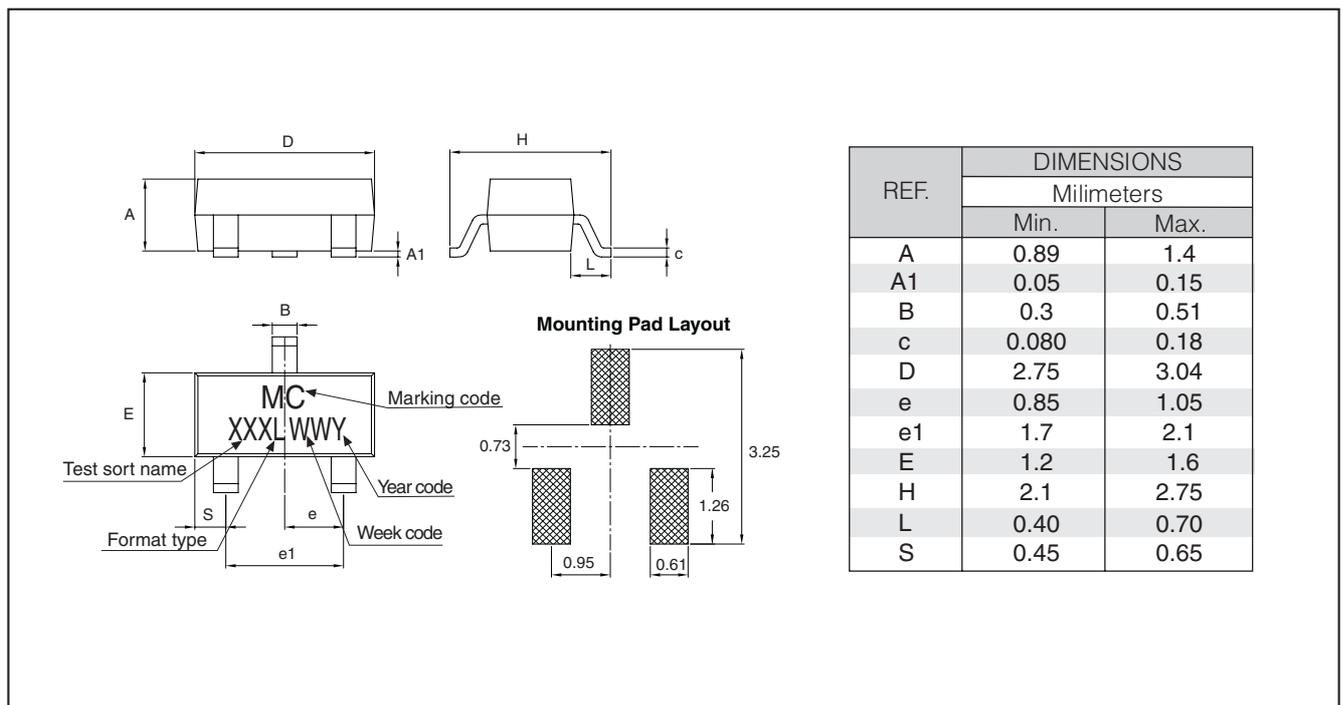
REF.	DIMENSIONS		
	Milimeters		
	Min.	Typ.	Max.
A	0.90	1.20	1.50
B	4.40	4.60	4.80
C	4.96	5.08	5.20
D	2.42	2.54	2.66
E	4.40	4.60	4.80
F	12.30	13.70	15.50
G	3.40	3.60	3.86
H	1.30	1.50	1.70
a	0.38	0.44	0.51
b	0.33	0.41	0.51

**SENSITIVE GATE SCR**

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



**Package Outline Dimensions: (mm) SOT23-3L**



**SENSITIVE GATE SCR**

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

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

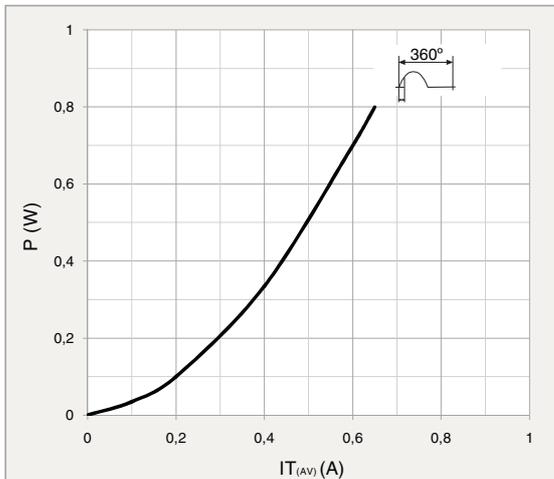


Fig. 2: Average and D.C. on-state current versus ambient temperature

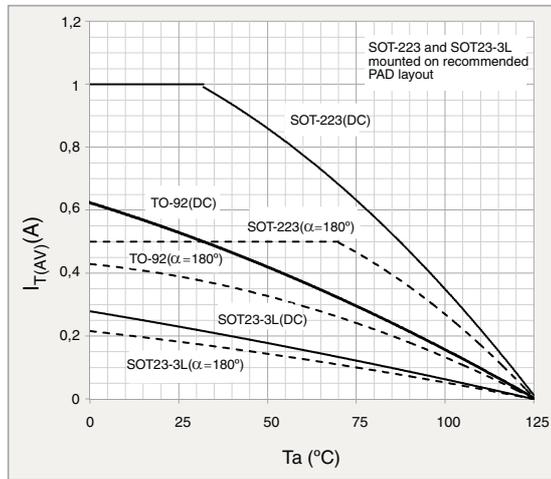


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration

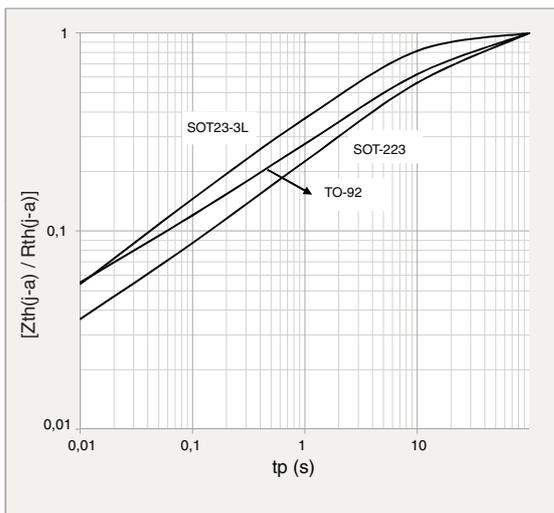


Fig. 4: Relative variation of gate trigger, holding and latching current versus junction temperature (Typical values)

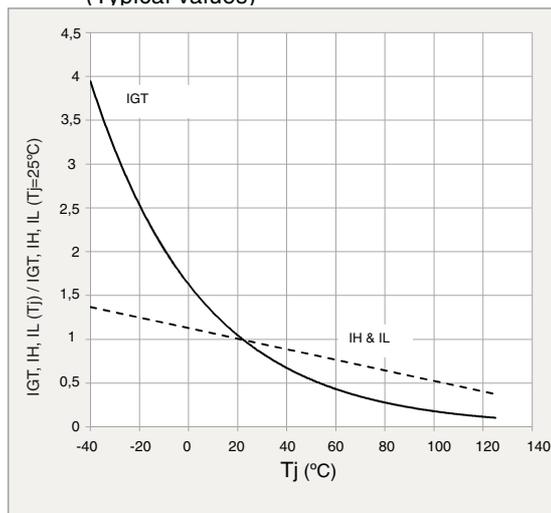


Fig. 5: Relative variation of holding current versus gate-cathode resistance (Typical values)

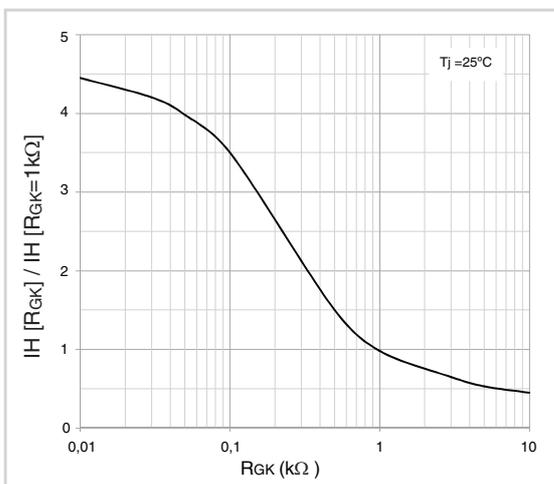
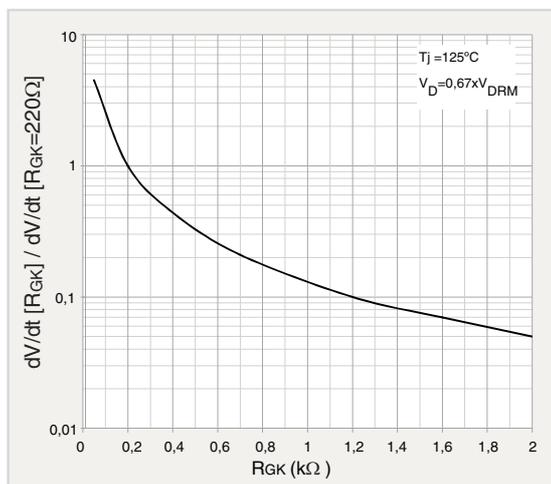


Fig. 6: Relative variation of dV/dt immunity versus gate-cathode resistance (Typical values)



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

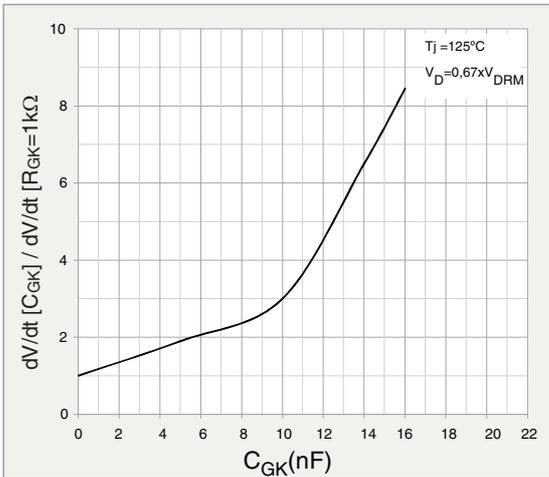


Fig. 8: Non repetitive surge peak on-state current versus number of cycles

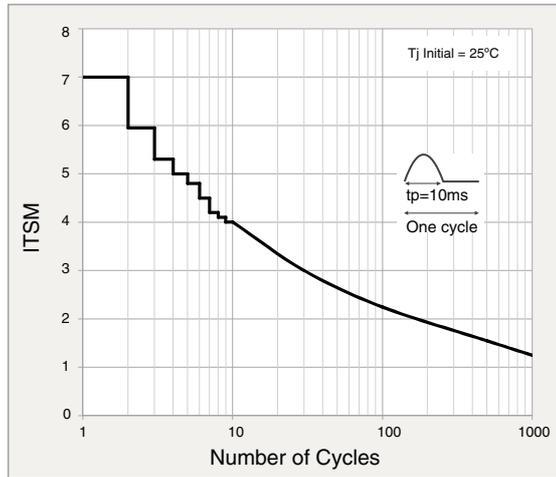


Fig. 9: Non repetitive surge peak on-state current and corresponding value of  $I^2 t$

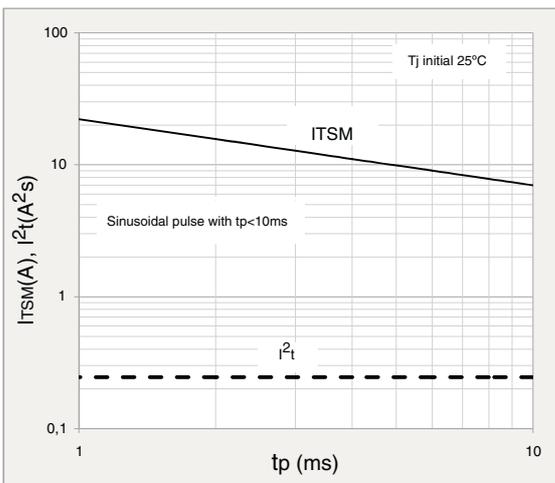
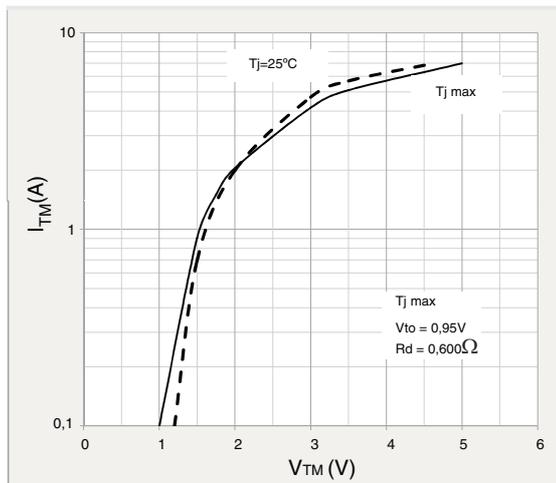


Fig.10 On-state characteristics (Maximum values)



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