

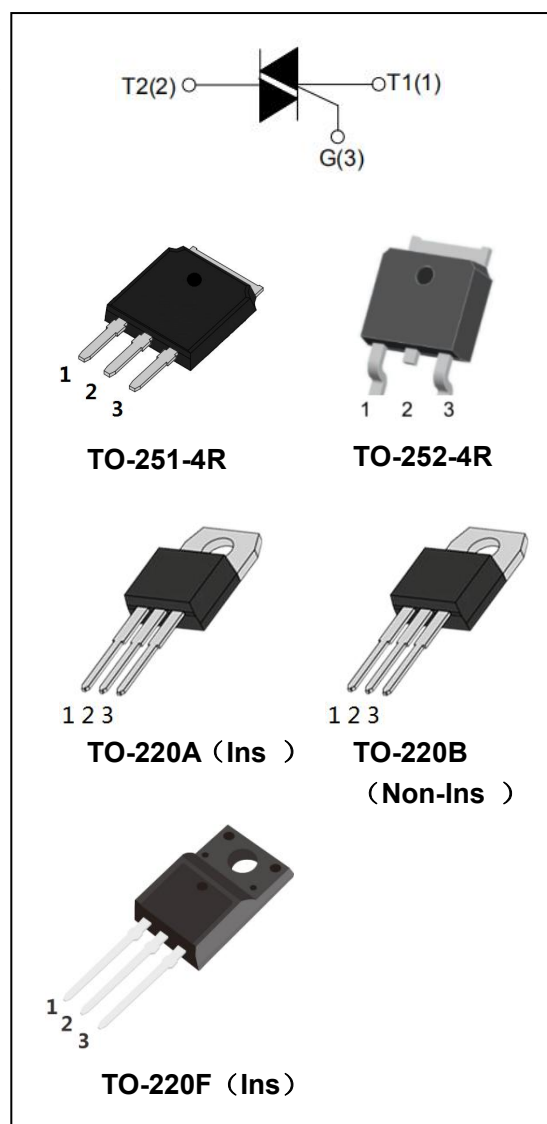


## Jiangsu Weida Semiconductor Co., Ltd.

### BTA04/BTB04 Series 4A Triacs

#### DESCRIPTION:

With high ability to withstand the shock loading of Large current, BTA04/BTB04 series triacs provide high dv/dt rate with strong resistance to electromagnetic interface. With high commutation performances, 3 quadrants products especially recommended for use on inductive load. From all three terminals to external heatsink, BTA04 provides a rated insulation voltage of 2500 V<sub>RMS</sub> complying with UL standards (File ref: E516503).



#### MAIN FEATURES:

symbol	value	unit
$I_{T(RMS)}$	4	A
$V_{DRM}/V_{RRM}$	600/800	V
$V_{TM}$	$\leq 1.5$	V

#### ABSOLUTE MAXIMUM RATINGS:

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{stg}$	-40~150	°C
Operating junction temperature range	$T_j$	-40~125	°C
Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )	$V_{DRM}$	600/800	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{RRM}$	600/800	V
RMS on-state current	$I_{T(RMS)}$	4	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)	$I_{TSM}$	40	A



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I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms)	I <sup>2</sup> t	8	A <sup>2</sup> s
Critical rate of rise of on-state current(I <sub>G</sub> =2×I <sub>GT</sub> )	di/dt	50	A/μs
Peak gate current	I <sub>GM</sub>	4	A
Average gate power dissipation	P <sub>G(AV)</sub>	1	W
Peak gate power	P <sub>GM</sub>	5	W

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub>=25°C unless otherwise specified)

#### 3 Quadrants:

Parameter	Test Condition	Quadrant		Value				Unit
				TW	SW	CW	BW	
I <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω	I - II -III	MAX	5	10	35	50	mA
V <sub>GT</sub>				1.5				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub>	I - II -III	MIN	0.2				V
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX	6	10	35	60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I -III	MAX	10	15	50	70	mA
		II		15	25	60	80	
dV/dt	V <sub>D</sub> =2/3V <sub>DRM</sub> T <sub>j</sub> =125°C Gate open		MIN	50	100	500	1000	V/μs

#### 4 Quadrants:

Parameter	Test Condition	Quadrant		Value		Unit
				C	B	
I <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω	I - II -III	MAX	25	50	mA
		IV		50	70	mA
V <sub>GT</sub>		ALL		1.5		V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub>	ALL	MIN	0.2		V
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX	40	60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I -III-IV	MAX	50	70	mA



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		II		70	90	
dV/dt	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$ Gate open		MIN	200	500	V/ $\mu\text{s}$

### STATIC CHARACTERISTICS

Symbol	Test Condition			Value	Unit
$V_{TM}$	$I_{TM}=5.5\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^\circ\text{C}$	MAX	1.5	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}=V_{RRM}$	$T_j=25^\circ\text{C}$	MAX	5	$\mu\text{A}$
		$T_j=125^\circ\text{C}$		0.5	mA

### THERMAL RESISTANCES

Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-251-4R/ TO-252-4R	2.8	$^\circ\text{C/W}$
		TO-220A(Ins)	3.1	
		TO-220B(Non-Ins)	2.5	
		TO-220F(Ins)	3.4	

### ORDERING INFORMATION

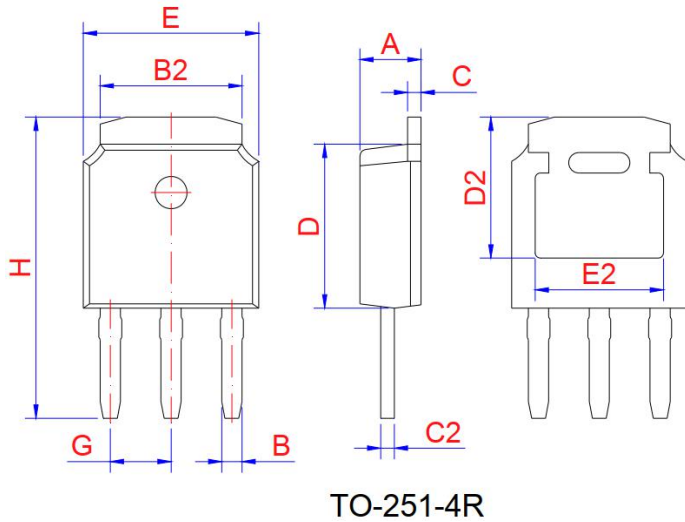
<p><b>B T</b></p> <p>Triacs</p> <hr/> <p>A: Insulated</p> <p>B: Non-Insulated</p>	<p><b>A</b></p> <hr/> <p><math>I_{T(RMS)}:4\text{A}</math></p>	<p><b>04 - 600</b></p> <hr/> <p><math>V_{DRM}, V_{RRM}</math>:</p> <p>600: 600V</p> <p>800: 800V</p>	<p><b>C W</b></p> <hr/> <p>B: <math>I_{GT1-3}\leq 50\text{mA}</math>, <math>I_{GT4}\leq 100\text{mA}</math></p> <p>C: <math>I_{GT1-3}\leq 25\text{mA}</math>, <math>I_{GT4}\leq 50\text{mA}</math></p> <p>TW: <math>I_{GT1-3}\leq 5\text{mA}</math></p> <p>SW: <math>I_{GT1-3}\leq 10\text{mA}</math></p> <p>CW: <math>I_{GT1-3}\leq 35\text{mA}</math></p> <p>BW: <math>I_{GT1-3}\leq 50\text{mA}</math></p>
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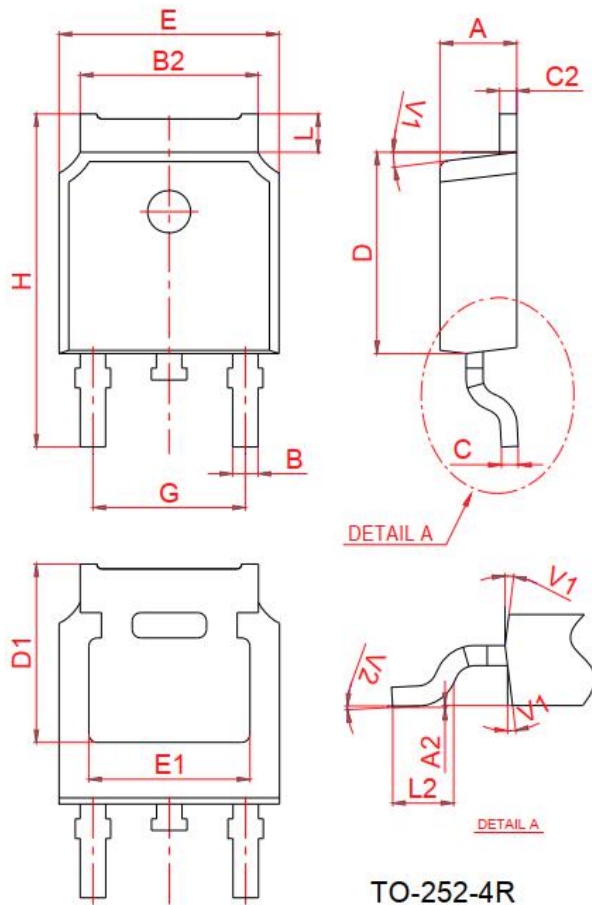
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## BTA04/BTB04 Series 4A Triacs

### PACKAGE MECHANICAL DATA



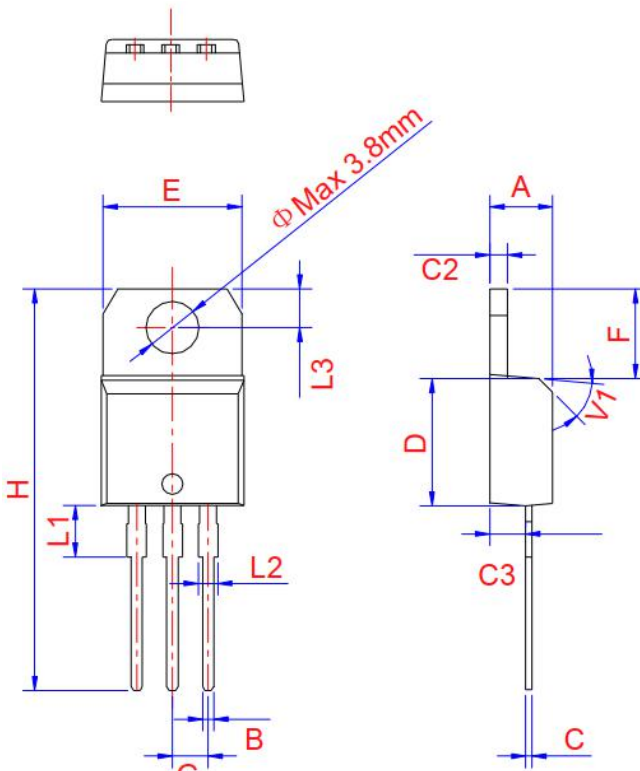
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10	2.30	2.50	0.083	0.091	0.098
B	0.66	0.76	0.86	0.026	0.030	0.034
B2	5.15	5.33	5.48	0.203	0.210	0.216
C	0.44	0.51	0.58	0.017	0.020	0.023
C2	0.44	0.51	0.58	0.017	0.020	0.023
D	5.90	6.10	6.30	0.232	0.240	0.248
D2	5.30REF			0.209REF		
E	6.40	6.60	6.80	0.252	0.260	0.268
E2	4.83REF			0.190REF		
G	2.19	2.29	2.39	0.086	0.090	0.094
H	10.60	11.20	11.80	0.417	0.441	0.465



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.2		2.4	0.087		0.094
A2	0		0.1	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.1		5.46	0.201		0.215
C	0.46		0.58	0.018		0.023
C2	0.44		0.58	0.017		0.023
D	5.9		6.3	0.232		0.248
D1	5.30REF			0.211REF		
E	6.4		6.8	0.252		0.268
E1	4.63			0.182		
G	4.372		4.772	0.172		0.188
H	9.8		10.4	0.386		0.409
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

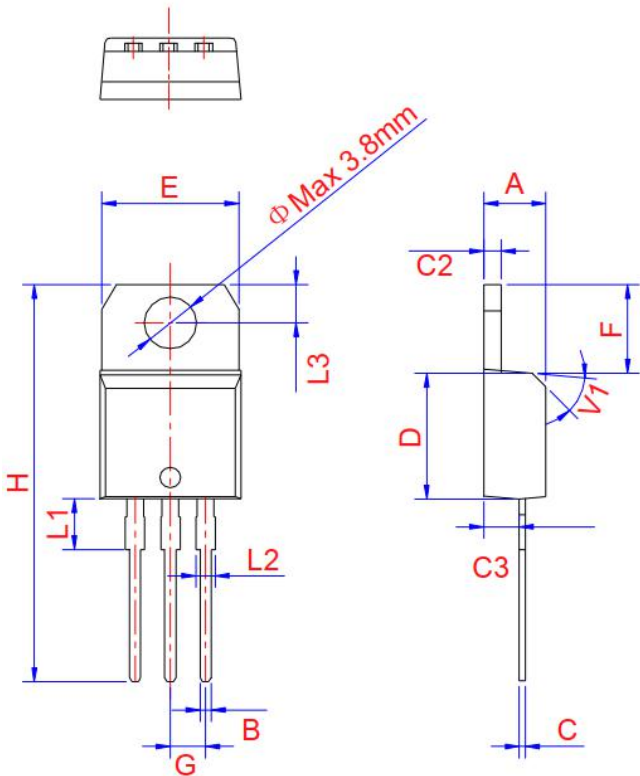


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**BTA04/BTB04 Series 4A Triacs**



TO-220A Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

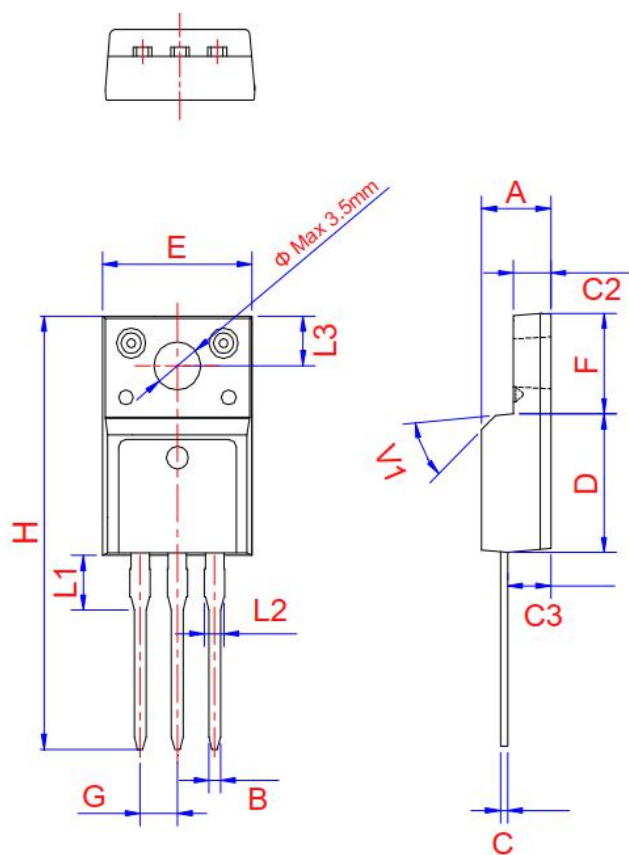


TO-220B Non-Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	



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TO-220F Ins

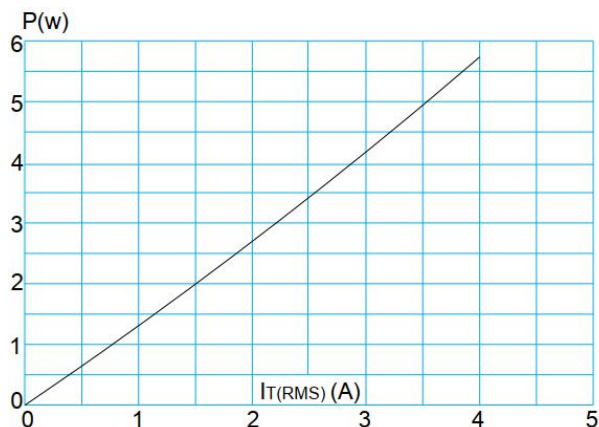
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.5		4.9	0.177		0.193
B	0.74	0.8	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.6		3	0.102		0.118
D	8.8		9.3	0.346		0.366
E	9.8		10.4	0.386		0.41
F	6.4		6.8	0.252		0.268
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.63			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65	3.3	0		0.13	0.116
V1		45°			45°	



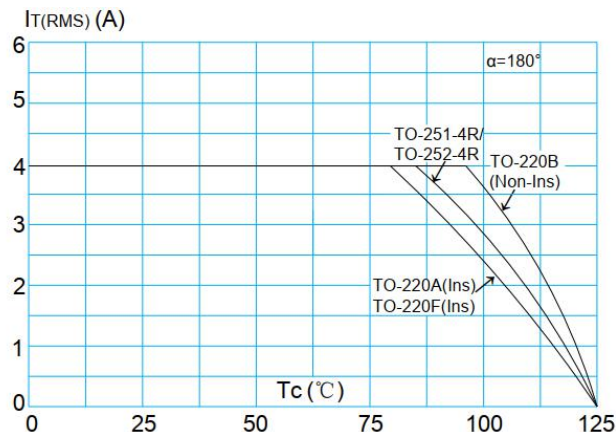
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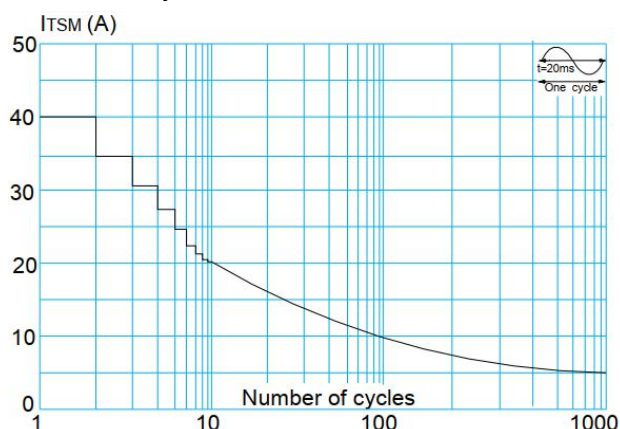
**FIG.1:** Maximum power dissipation versus RMS on-state current



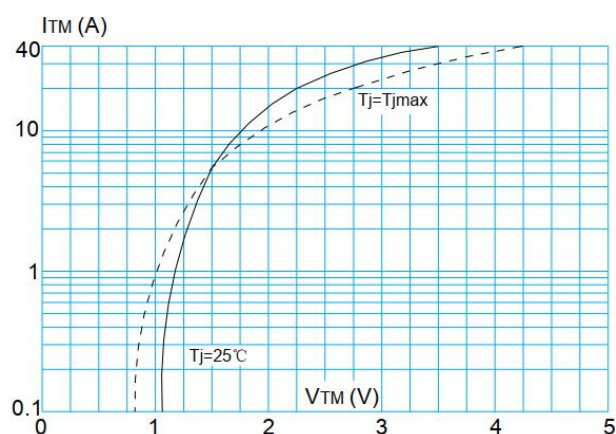
**FIG.2:** RMS on-state current versus case temperature



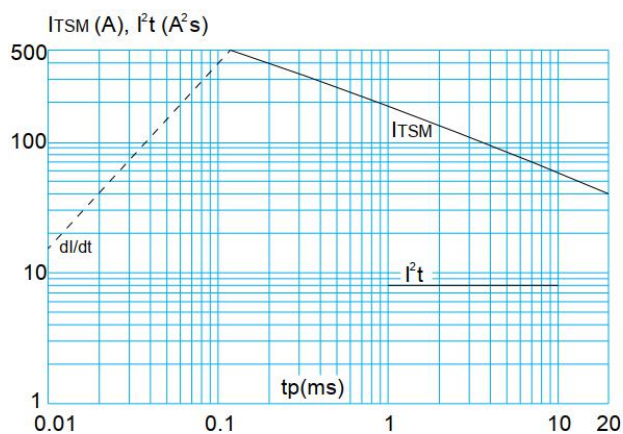
**FIG.3:** Surge peak on-state current versus number of cycles



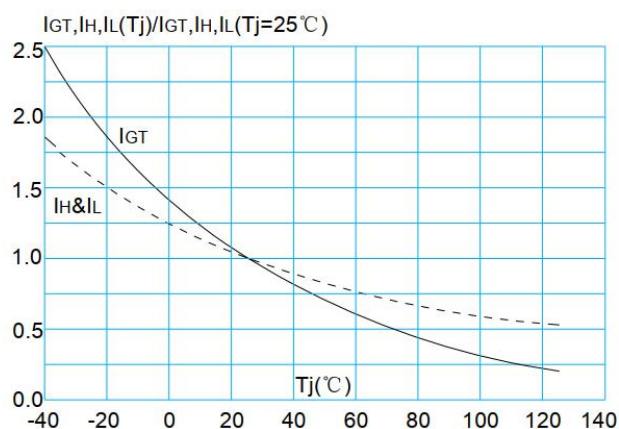
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( $I - II - III: di/dt < 50A/\mu s; IV: di/dt < 10A/\mu s$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature





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