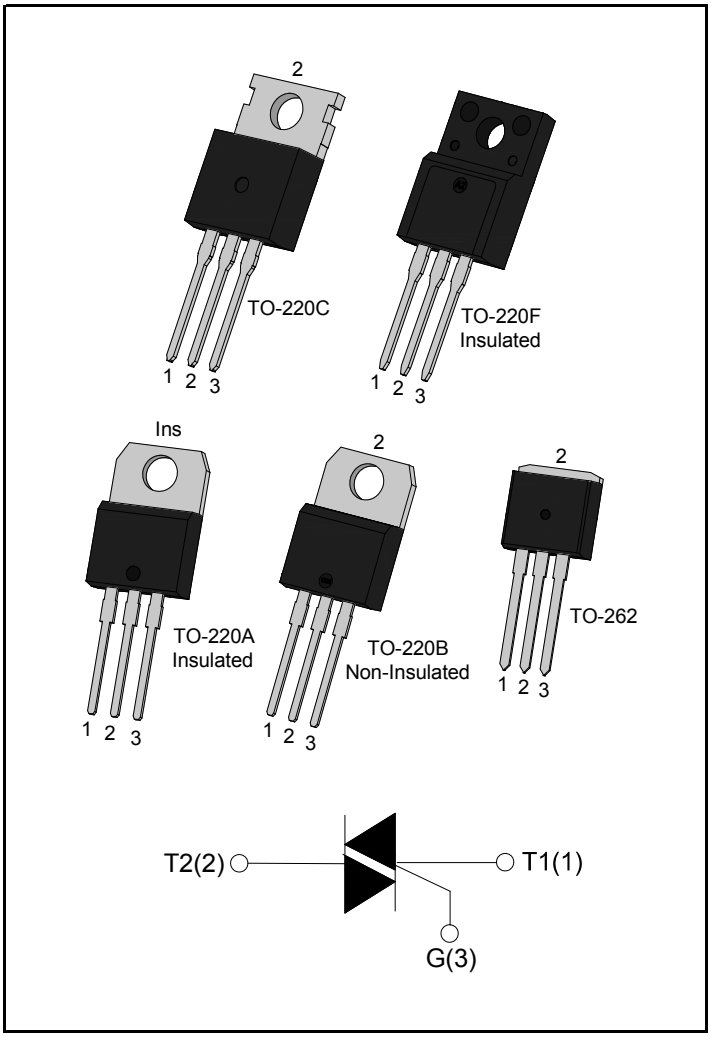
DESCRIPTION:

With high ability to withstand the shock loading of large current，BTA12 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, BTA12 provides a rated insulation voltage of 2500 VRMS, and BTF12 provides a rated insulation voltage of 2000 VRMS，complying with UL standards（File ref: E252906）. All the packages above are RoHS compliant.（2011/65/EU）



MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}/V_{RRM}	600/800/1200	V

H BT A 12 - 600 C

- H: HAOHAI ELECTRONICS CO.,LTD.
- BT: Bi-directional Triode 三端双向可控硅开关
- A: Insulated; B: Non Insulated; F: TO-220F; L: TO-262
- 12: 12A
- 600=600V; 800=800V; 1200=1200V
- C≤25mA（4-Q, I_{GT} Ⅰ-Ⅱ-Ⅲ）; B≤50mA（4-Q, I_{GT} Ⅰ-Ⅱ-Ⅲ）; TW≤5mA（3-Q, ALL）; SW≤10mA（3-Q, ALL）; CW≤35mA（3-Q, ALL）; BW≤50mA（3-Q, ALL）

■ ABSOLUTE MAXIMUM RATINGs

SYMBOL	Parameter		Value	Unit
$I_{T(RMS)}$	RMS On-state Current	TO-220A（Ins）（T_C=85℃）	12	A
		TO-220B（Non-Ins）（T_C=100℃）		
		TO-220C（Non-Ins）（T_C=100℃）		
		TO-262（Non-Ins）（T_C=100℃）		
		TO-220F（Ins）（T_C=80℃）		
I_{TSM}	Non repetitive surge peak on-state current (full cycle, F=50Hz)		120	
I_{GM}	Peak gate current		4	
V_{DRM}	Repetitive peak off-state voltage（T_J=25℃）		600/800/1200	V
V_{RRM}	Repetitive peak reverse voltage（T_J=25℃）		600/800/1200	
V_{DSM}	Non repetitive surge peak Off-state voltage		V_{DRM} +100	
V_{RSM}	Non repetitive peak reverse voltage		V_{RRM} +100	
I^2t	I^2t value for fusing（tp=10ms）		78	A^2S
dI/dt	Critical rate of rise of on-state current（IG=2×I_{GT}）（Ⅰ-Ⅱ-Ⅲ）		50	A/μs
$P_{G(AV)}$	Average gate power dissipation		1	W
P_{GM}	Peak gate power		5	
T_{stg}	Storage junction temperature range		-40~+150	℃
T_J	Operating junction temperature range		-40~+125	

■ THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A（Ins）	2.3	℃/W
		TO-220B（Non-Ins）	1.4	
		TO-220C（Non-Ins）	1.4	
		TO-262（Non-Ins）	1.4	
		TO-220F（Ins）	2.5	

ELECTRICAL CHARACTERISTICS（T_J=25℃ unless otherwise specified）

■ 3-Quadrants

Symbol	Test Condition	Quadrant		Value				Unit
				BW	CW	SW	TW	
I_{GT}	V_D=12V，R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	35	10	5	mA
I_H	I_T=100mA		MAX	60	40	20	15	
I_L	I_G=1.2 I_{GT}	Ⅰ-Ⅲ	MAX	80	50	30	20	
		Ⅱ		90	60	40	30	
V_{GT}	V_D=12V，R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	MAX	1.3				V
V_{GD}	V_D=V_{DRM}，T_j=125℃，R_L=3.3KΩ	Ⅰ-Ⅱ-Ⅲ	MIN	0.2				
dV/dt	V_D=2/3V_{DRM} Gate Open，T_J=125℃		MIN	1000	500	200	100	V/μs
(dI/dt)c	Without snubber T_J=125℃		MIN	12	6.5	--	--	A/mS

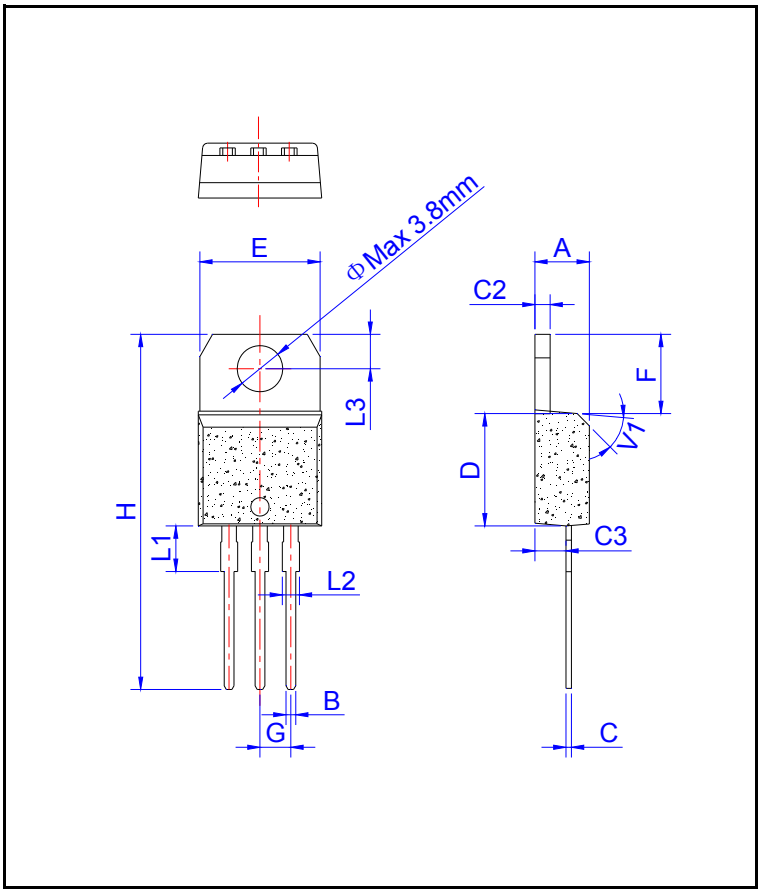
■ 4-Quadrants

Symbol	Test Condition	Quadrant		Value		Unit
				B	C	
I_{GT}	V_D=12V，R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	25	mA
		Ⅳ		70	50	
I_H	I_T=100mA		MAX	50	25	
I_L	I_G=1.2 I_{GT}	Ⅰ-Ⅲ-Ⅳ	MAX	50	40	
		Ⅱ		100	80	
V_{GT}	V_D=12V，R_L=33Ω	ALL	MAX	1.3		V
V_{GD}	V_D=V_{DRM}，T_j=125℃，R_L=3.3KΩ	ALL	MIN	0.2		
dV/dt	V_D=2/3V_{DRM} Gate Open，T_J=125℃		MIN	500	200	V/μs
(dI/dt)c	(dI/dt)c=5.3A/ms，T_J=125℃		MIN	10	5	A/mS

■ STATIC CHARACTERISTICS

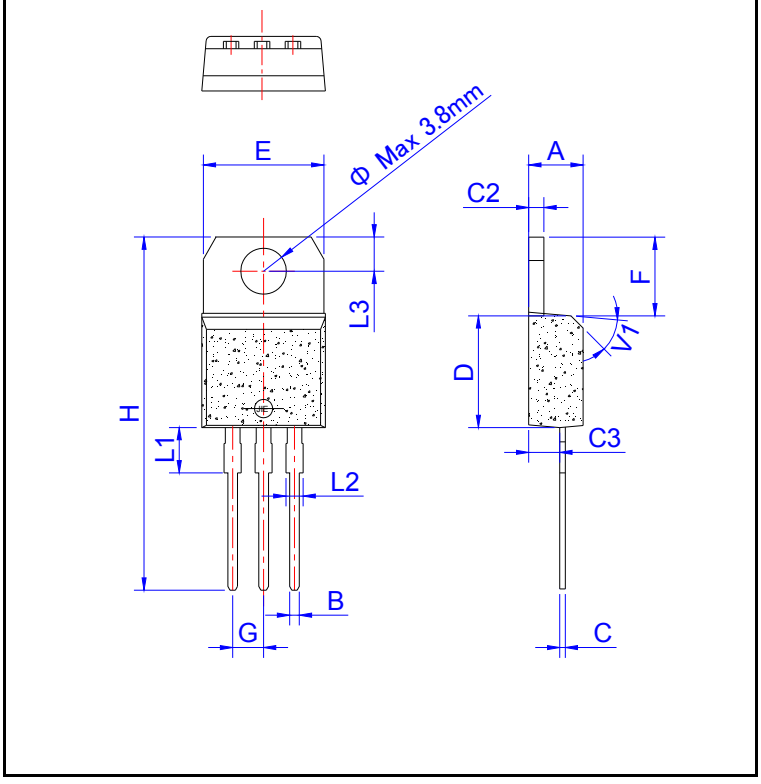
Symbol	Parameter		Value(MAX)	Unit
V_{TM}	T_M=17A，tp=380μs	T_J=25℃	1.5	V
I_{DRM}	V_D=V_{DRM}，V_R=V_{RRM}	T_J=25℃	5	μA
I_{RRM}		T_J=125℃	1	mA

TO-220A（Ins）PACKAGE MECHANICAL DATA （mm & inch）



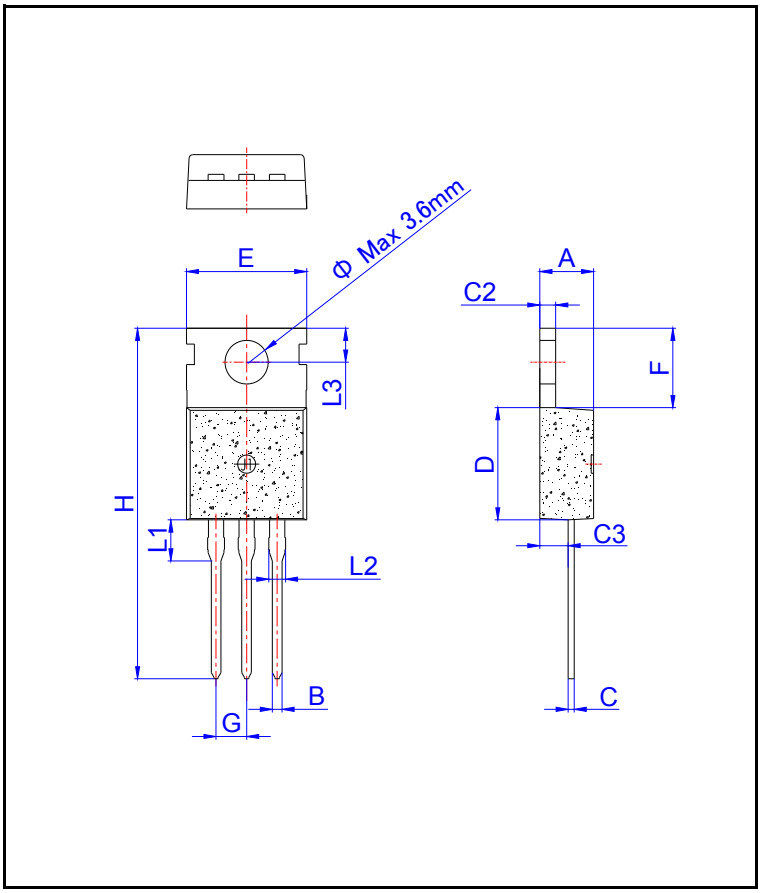
REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	0.61	0.88	0.024	0.035
C	0.46	0.70	0.018	0.028
C2	1.21	1.32	0.048	0.052
C3	2.40	2.72	0.094	0.107
D	8.60	9.70	0.339	0.382
E	9.80	10.4	0.386	0.409
F	6.55	6.95	0.258	0.274
G	2.54 TYP		0.1 TYP	
H	28.0	29.8	1.102	1.173
L1	3.75 TYP		0148 TYP	
L2	1.14	1.70	0.045	0.067
L3	2.65	2.95	0.104	0.116
V1	45° TYP		45° TYP	

TO-220B（Non-Ins） PACKAGE MECHANICAL DATA （mm & inch）



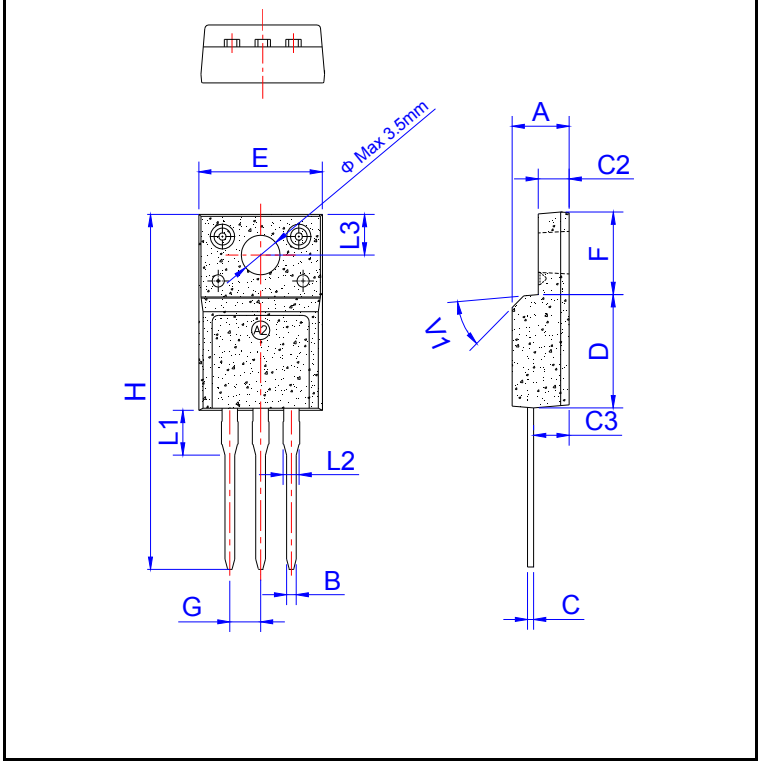
REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	0.61	0.88	0.024	0.035
C	0.46	0.70	0.018	0.028
C2	1.21	1.32	0.048	0.052
C3	2.40	2.72	0.094	0.107
D	8.60	9.70	0.339	0.382
E	9.60	10.4	0.378	0.409
F	6.20	6.60	0.244	0.260
G	2.54 TYP		0.1 TYP	
H	28.0	29.8	1.102	1.173
L1	3.75 TYP		0148 TYP	
L2	1.14	1.70	0.045	0.067
L3	2.65	2.95	0.104	0.116
V1	45° TYP		45° TYP	

TO-220C（Non-Ins） PACKAGE MECHANICAL DATA （mm & inch）



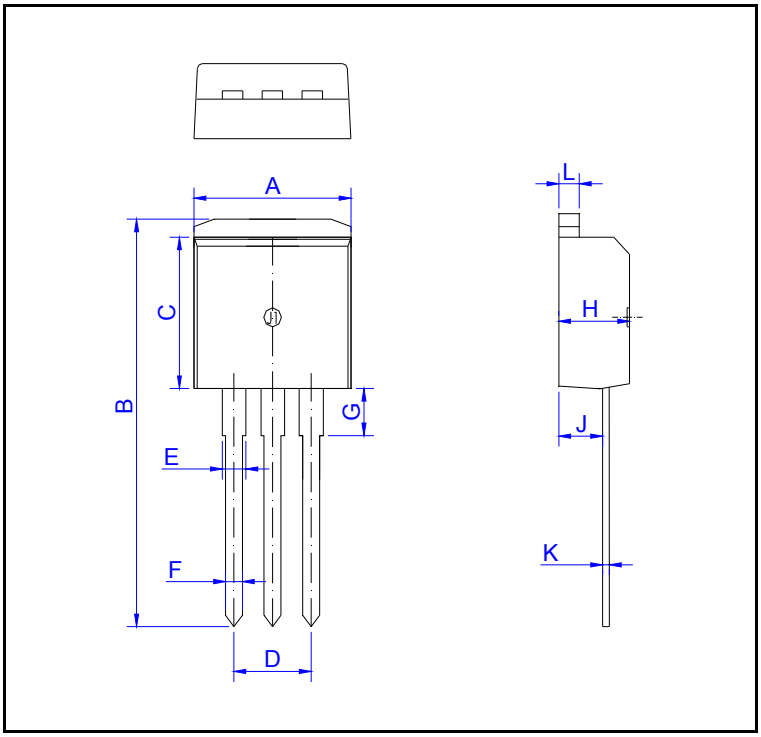
REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	0.70	0.90	0.028	0.035
C	0.45	0.60	0.018	0.024
C2	1.23	1.32	0.048	0.052
C3	2.20	2.60	0.087	0.102
D	8.90	9.90	0.350	0.390
E	9.90	10.3	0.390	0.406
F	6.30	6.90	0.248	0.272
G	2.54 TYP		0.1 TYP	
H	28.0	29.8	1.102	1.173
L1	3.39 TYP		0.133 TYP	
L2	1.14	1.70	0.045	0.067
L3	2.65	2.95	0.104	0.116
Φ	3.6 TYP		0.142 TYP	

TO-220F（Ins） PACKAGE MECHANICAL DATA （mm & inch）



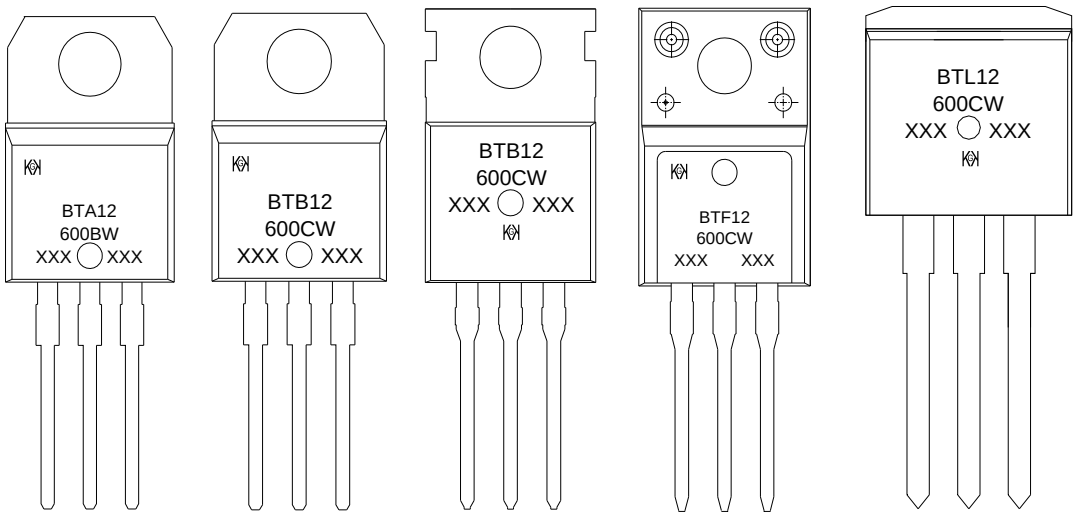
REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
B	0.74	0.83	0.029	0.033
C	0.47	0.65	0.019	0.026
C2	2.45	2.75	0.096	0.108
C3	2.60	3.00	0.102	0.118
D	8.80	9.30	0.346	0.366
E	9.80	10.4	0.386	0.410
F	6.40	6.80	0.252	0.268
G	2.54 TYP		0.1 TYP	
H	28.0	29.8	1.102	1.173
L1	3.63 TYP		0.143 TYP	
L2	1.14	1.70	0.045	0.067
L3	3.30 TYP		0.130 TYP	
V1	45° TYP		45° TYP	

TO-262（Non-Ins） PACKAGE MECHANICAL DATA （mm & inch）



REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	9.95	10.20	0.392	0.402
B	232.25	23.45	0.915	0.923
C	8.90	9.10	0.35	0.358
D	5.00	5.20	0.197	0.205
E	1.20	1.35	0.047	0.053
F	0.80	0.85	0.031	0.033
G	3.30	3.60	0.130	0.142
H	4.45	4.55	0.175	0.179
J	2.50	2.70	0.098	0.106
K	0.38	0.42	0.015	0.017
L	1.25	1.29	0.049	0.051

MARKING



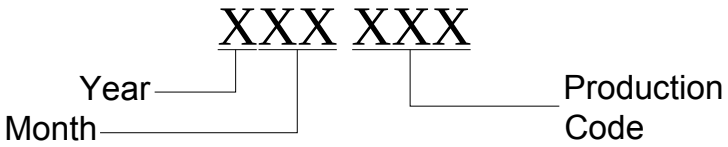


FIG-1: Maximum power dissipation versus RMS on-state current

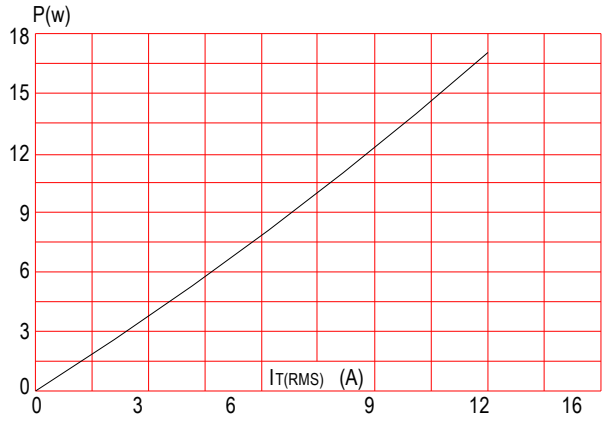


FIG-2: RMS on-state current versus case temperature

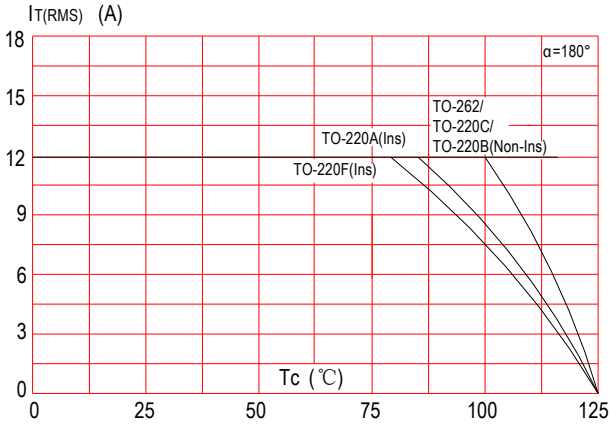


FIG-3: Surge peak on-state current versus number of cycles

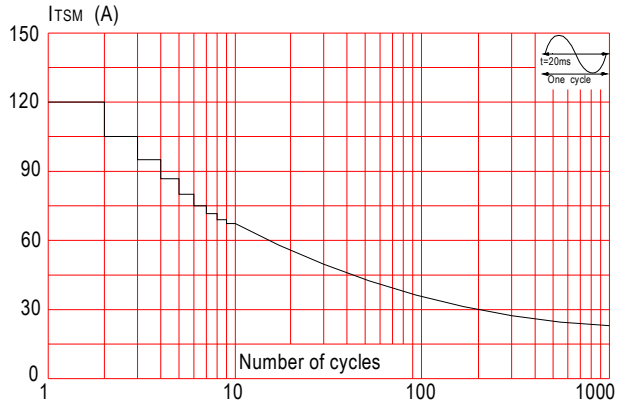


FIG-4: On-state characteristics（maximum values）

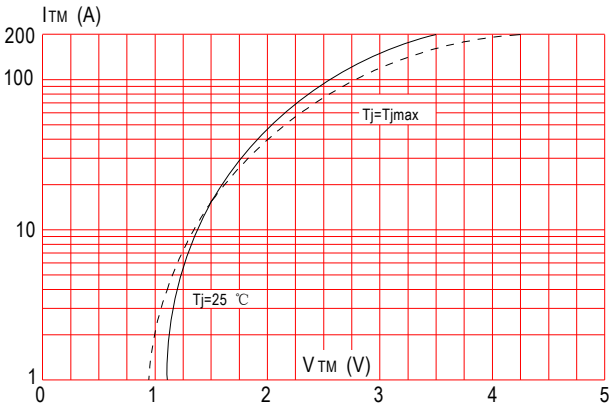


FIG-5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<20ms, and corresponging value of I^2t（dI/dt）（Ⅰ-Ⅱ-Ⅲ）≤50mA）

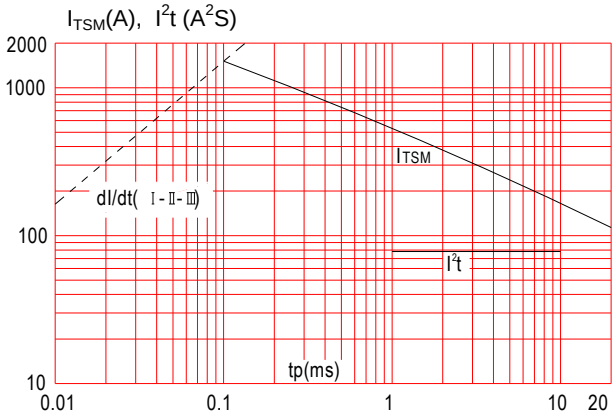
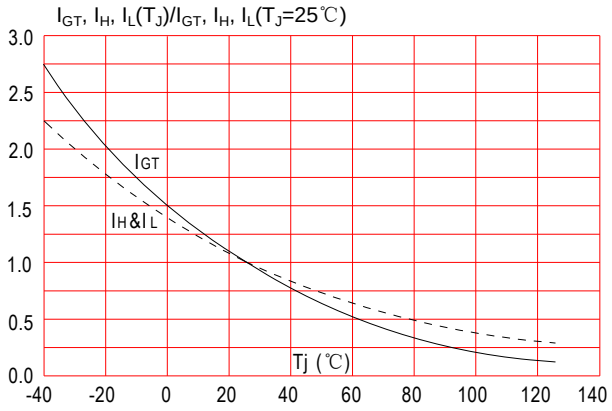


FIG-6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



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2014-06-10， KKG ™ Product Data-3.1
2020-08-15， KKG ™ Product Data-3.2

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