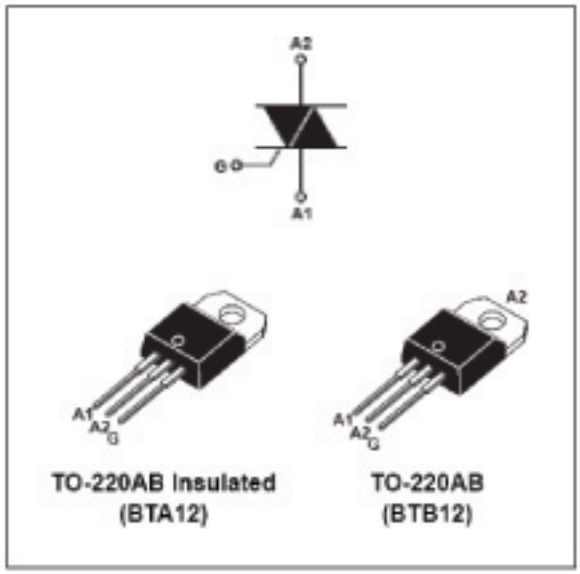
YIHUA
PART NAME: BTA/B12
ISSUE DATE:2010-03-13
Establishment: Carolyn

绍兴怡华电子科技有限公司

■ 主要特点：

符号	数值	单位
IT（RMS）	12	A
V_{DRM}/V_{RRM}	600&800	V
IGT（Q1）	5～50	mA

芯片尺寸：3.30mm*3.30mm



■ 用途：

BTB/BTA12 双向可控硅系列适用于一般交流开关电路,如:固态继电器,感应马达启动控制,调温控制,调光控制，调速控制…等.

■ 极限值：

符号	参数		数值	单位
$I_{T(RMS)}$	RMS 通态电流	T_C=90℃	12	A
I_{TSM}	通态峰值浪涌电流	F=50H_Z,t=20ms	120	A
I^2t	I^2t 耗散值	T_P=10ms	78	A^2s
di/dt	通态电流上升值	F=120H_Z,Tj=125℃	50	A/μs
I_{GM}	门极峰值电流	TP=20μs,Tj=125℃	4	A
$P_{G(AV)}$	平均门极耗散功率	Tj=125℃	1	W
Tstg	贮存结温范围		-40-+150	℃
Tj	工作结温范围		-40-+125	℃

■ 电特性

■ **SNUBBERLESS and Logic Level (3 quadrants)**

Symbol	Test Conditions	Quadrant		T12		BTA12 / BTB12				Unit
				T1205	T1235	TW	SW	CW	BW	
I_{GT} (1)	V_D = 12 V R_L = 30 Ω	I - II - III	MAX.	5	35	5	10	35	50	mA
V_{GT}		I - II - III	MAX.	1.3						V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ T_j = 125°C	I - II - III	MIN.	0.2						V
I_H (2)	I_T = 100 mA		MAX.	10	35	10	15	35	50	mA
I_L	I_G = 1.2 I_{GT}	I - III	MAX.	10	50	10	25	50	70	mA
		II		15	60	15	30	60	80	
dV/dt (2)	V_D = 67 %V_{DRM} gate open T_j = 125°C		MIN.	20	500	20	40	500	1000	V/µs
(dI/dt)c (2)	(dV/dt)c = 0.1 V/µs T_j = 125°C		MIN.	3.5		3.5	6.5			A/ms
	(dV/dt)c = 10 V/µs T_j = 125°C			1		1	2.9			
	Without snubber T_j = 125°C				6.5			6.5	12	

■ **Standard (4 quadrants)**

Symbol	Test Conditions	Quadrant		BTA12 / BTB12		Unit
				C	B	
I_{GT} (1)	V_D = 12 V R_L = 30 Ω	I - II - III	MAX.	25	50	mA
		IV		50	100	
V_{GT}		ALL	MAX.	1.3		V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ T_j = 125°C	ALL	MIN.	0.2		V
I_H (2)	I_T = 500 mA		MAX.	25	50	mA
I_L	I_G = 1.2 I_{GT}	I - III - IV	MAX.	40	50	mA
		II		80	100	
dV/dt (2)	V_D = 67 %V_{DRM} gate open T_j = 125°C		MIN.	200	400	V/µs
(dV/dt)c (2)	(dI/dt)c = 5.3 A/ms T_j = 125°C		MIN.	5	10	V/µs

■ 静态特性：

Symbol	Test Conditions			Value	Unit
V_T (2)	I_{TM} = 17 A t_p = 380 µs	T_j = 25°C	MAX.	1.55	V
V_{t0} (2)	Threshold voltage	T_j = 125°C	MAX.	0.85	V
R_d (2)	Dynamic resistance	T_j = 125°C	MAX.	35	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25°C	MAX.	5	µA
		T_j = 125°C		1	mA

Note 1: minimum I_{GT} is guaranted at 5% of I_{GT} max.

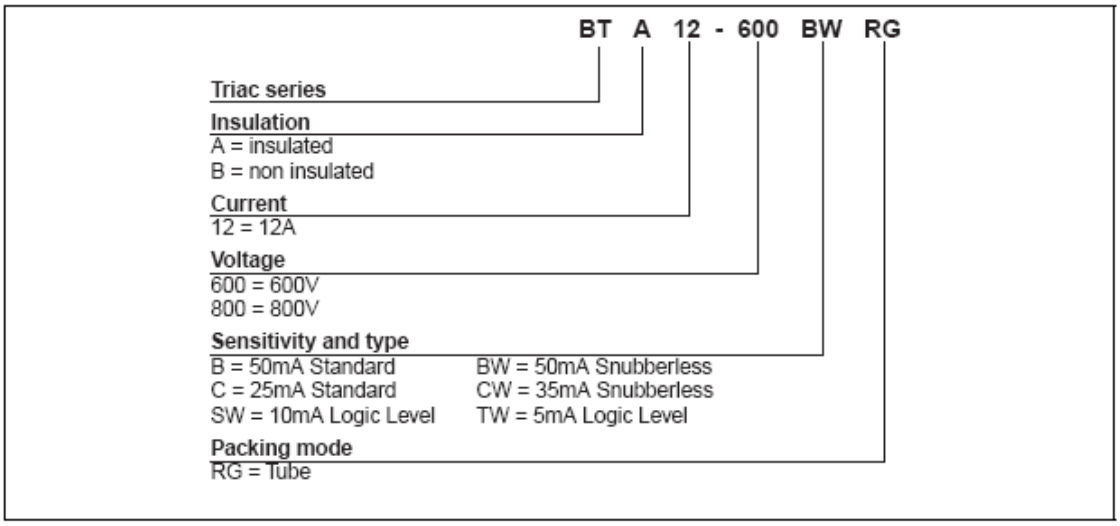
Note 2: for both polarities of A2 referenced to A1.

■ 热阻：

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case (AC)		I^2PAK / D^2PAK / TO-220AB	1.4	°C/W
			TO-220AB Insulated	2.3	
$R_{th(j-a)}$	Junction to ambient	S = 1 cm^2	D^2PAK	45	°C/W
			TO-220AB / I^2PAK TO-220AB Insulated	60	

S = Copper surface under tab.

■ 命名方式：



■ 特性曲线：

Figure 1: Maximum power dissipation versus RMS on-state current (full cycle)

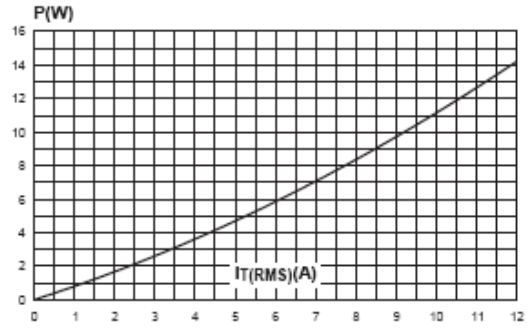


Figure 2: RMS on-state current versus case temperature (full cycle)

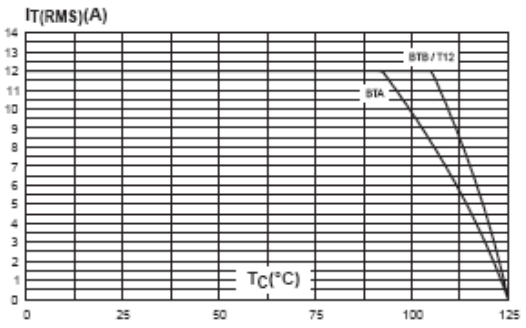


Figure 3: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm) (full cycle)

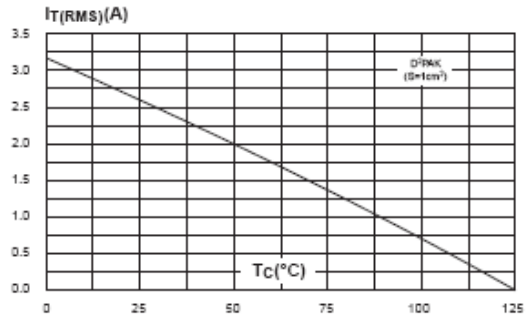


Figure 4: Relative variation of thermal impedance versus pulse duration

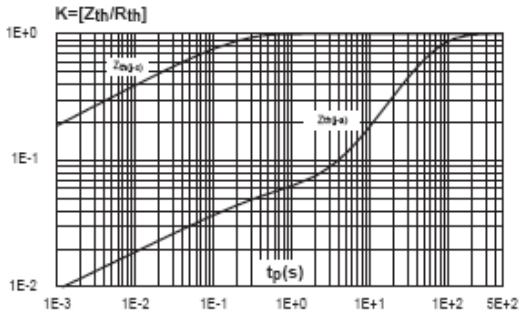


Figure 5: On-state characteristics (maximum values)

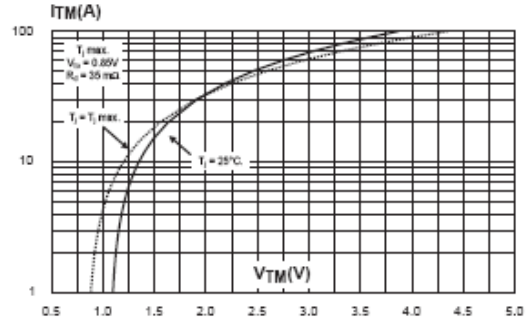
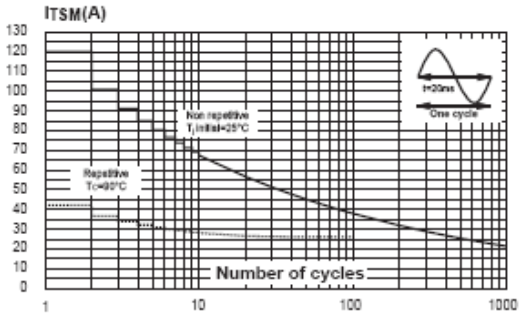


Figure 6: Surge peak on-state current versus number of cycles



■ 特性曲线：

Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms and corresponding value of I^2t

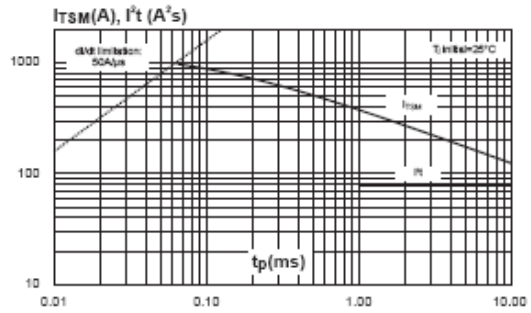


Figure 8: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

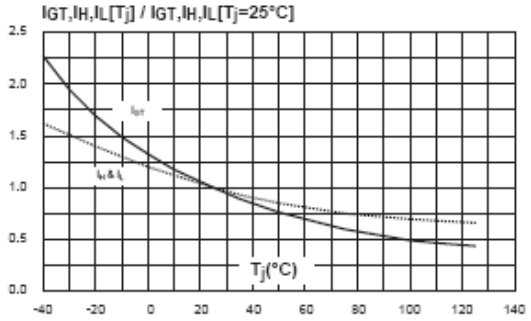


Figure 9: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (BW/CW/T1235)

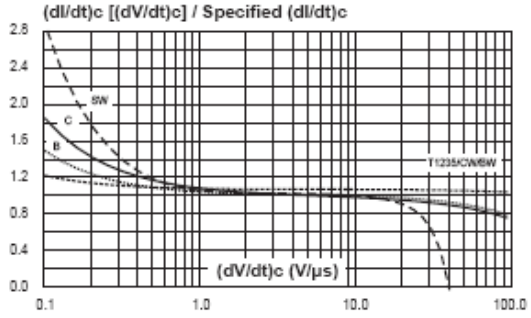


Figure 10: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (TW/T1205)

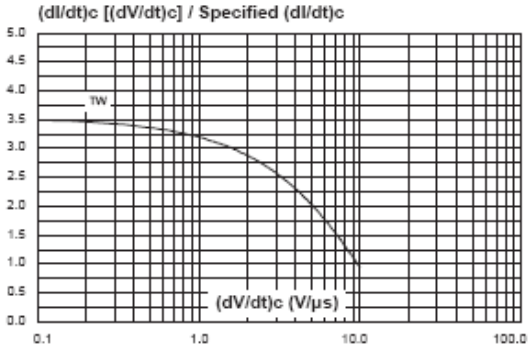


Figure 11: Relative variation of critical rate of decrease of main current versus junction temperature

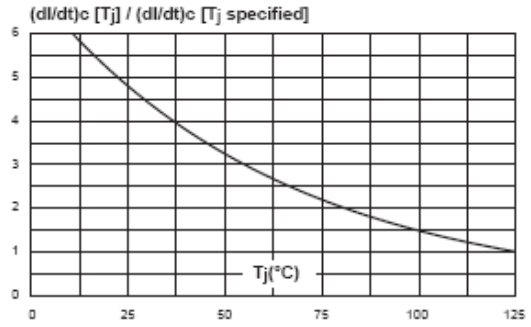
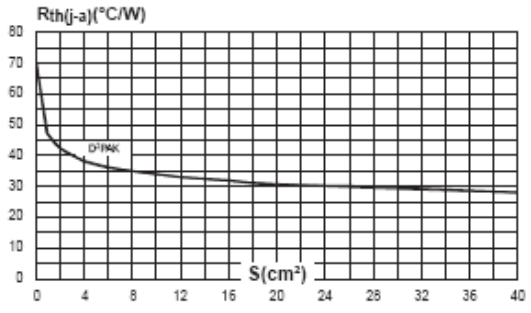
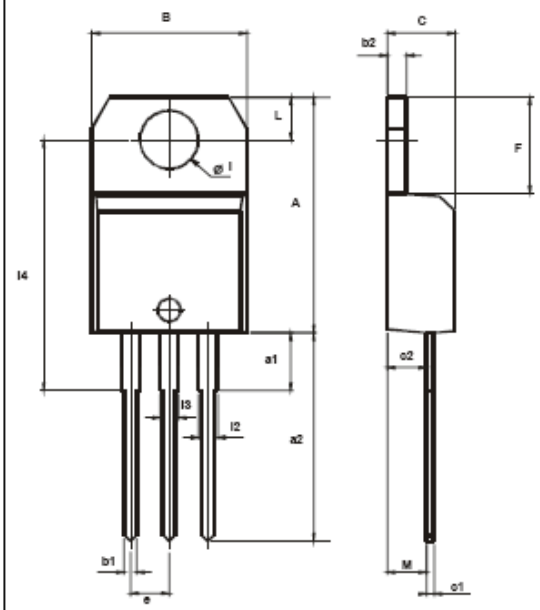


Figure 12: D²PAK Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35 µm)



■ TO-220AB/TO220ABInsulated 外形尺寸



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	