

1、Description & Applications

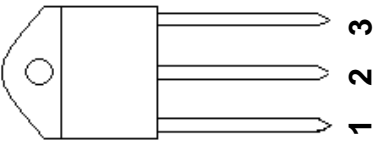
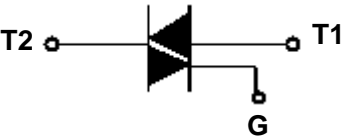
Suitable for general purpose AC power switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, water heaters, induction motor starting circuits...or for phase control operation in high power motor speed controllers, soft start circuits...

- Motor control
- Heating regulation
- water heaters

2、Features

- Blocking voltage to 800V
- On-state RMS current to 25A
- Ultra low gate trigger current
- TO-3P package.

3、Pinning information

PIN	Description	Simplified outline	Symbol
1	main terminal 1 (T1)	 TO-3P	
2	main terminal 2 (T2)		
3	gate (G)		
tab	main terminal		

4、Quick reference data

SYMBOL	PARAMETER	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current	25	A
I_{TSM}	Non-repetitive peak on-state current	220	A

5、Limiting value

Limiting values in accordance with the Maximum System(IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages		-	-	800	V
$I_{T(RMS)}$	RMS on-state current	Full Cycle Sine Wave 50 to 60 Hz (TC = +90 °C)	-	-	25	A
I_{TSM}	Peak Non-repetitive Surge Current	One Full Cycle Sine Wave, 60 Hz, t=16.7ms	-	-	220	A
I^2t	I^2t for fusing	tp = 10 ms	-	-	340	A ² s
di/dt	Critical rate of rise of on-state current	$I_G = 2 \times I_{GT}$, tr = 100 ns F = 120 Hz Tj = 125°C	-	-	50	A/μs
I_{GM}	Peak gate current	tp = 20μs, Tj = 125°C	-	-	2	A
V_{DSM} V_{RSM}	Non repetitive surge peak off-state voltage	tp = 10 ms Tj = 25°C	-	-	700	V
$P_{G(AV)}$	Average gate power	Tj = 125°C	-	-	0.5	W
Tstg	Storage temperature		-40	-	150	°C
Tj	Operating junction temperature		-40	-	125	°C

6、Characteristics

$T_J = 25^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT}	Gate trigger current	$V_D = 12\text{ V}; R_L = 33\Omega$				
		T2+ G+	-	-	50	mA
		T2+ G-	-	-	50	mA
		T2- G-	-	-	50	mA
		T2- G+	-	-	100	mA
V_{GT}	Gate Trigger Voltage (Continuous dc)	$V_D = 12\text{ V}; R_L = 33\Omega$				
		T2+ G+	-	0.9	2.0	V
		T2+ G-	-	0.9	2.0	V
		T2- G-	-	1.1	2.0	V
		T2- G+ "A" SUFFIX ONLY	-	-	2.0-	V
I_H	Holding current	$I_T = \pm 500\text{ mA}$		25	80	mA
I_L	Latching current	$I_G = 1.2 I_{GT}$ T2 G(++,-,-,++) T2 G(+/-)			60 100	mA
V_{TM}	On-state voltage	$I_{TM} = 35\text{ A } t_p = 380\text{ }\mu\text{s}$	-	1.3	2.0	V
V_{to}	Threshold voltage	$T_J = 125^\circ\text{C}$	-	-	0.85	V
R_d	Dynamic resistance	$T_J = 125^\circ\text{C}$	-	-	16	m Ω
V_{GD}	Gate Non-Trigger Voltage	$V_D = V_{DRM} R_L = 3.3\text{ k } T_J = 125^\circ\text{C}$	0.2	-	-	mA
Dynamic Characteristics						
dV/dt	Critical Rate of Rise of Voltage	$V_D = 67\% V_{DRM}$ gate open $T_J = 125^\circ\text{C}$	500	-	-	V/ μs
(dV/dt) _c	Critical Rate of Rise of Commutation Voltage	(dI/dt) _c = 13.3 A/ms $T_J = 125^\circ\text{C}$	10	-	-	V/ μs

7、Thermal characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
R_{JC}	Thermal resistance junction to case		-	-	1.1	C/W
R_{JA}	Thermal Resistance, Junction to Ambient		-	-	50	C/W

8、Electrical Characteristics Curve

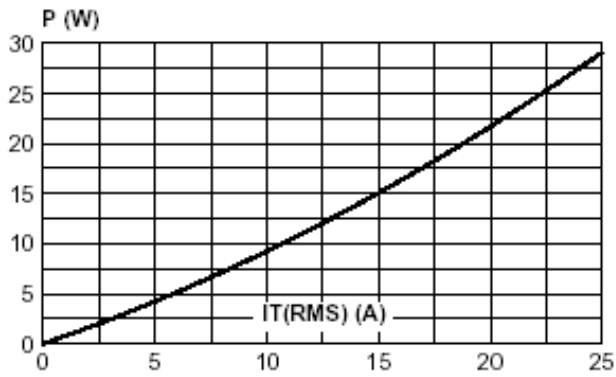
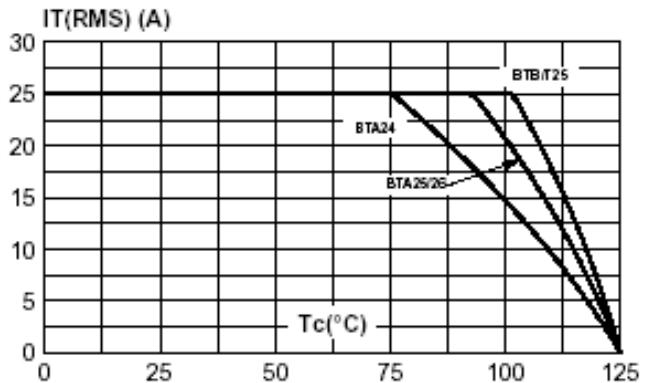
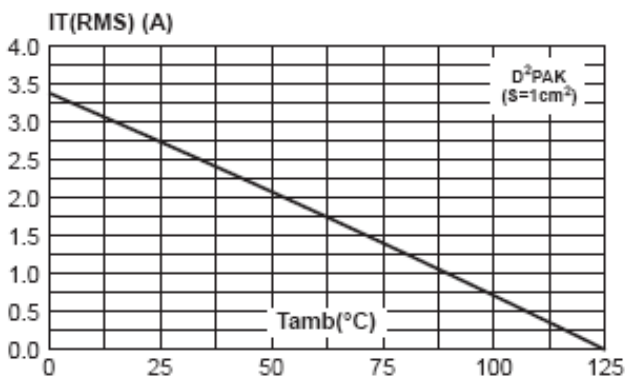
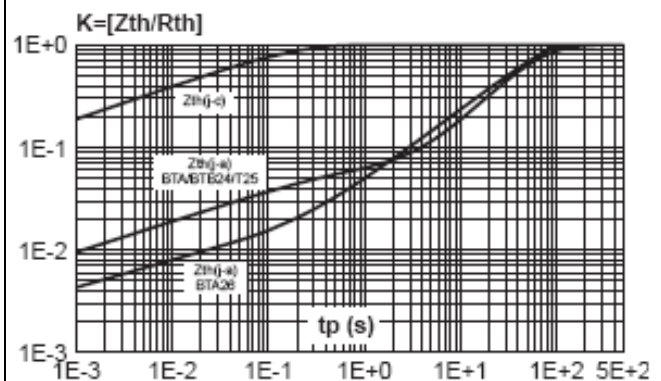
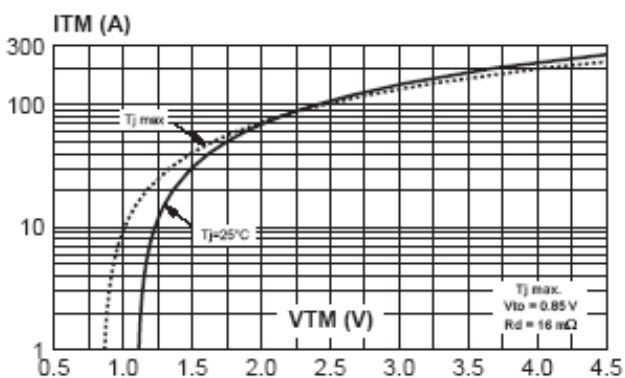
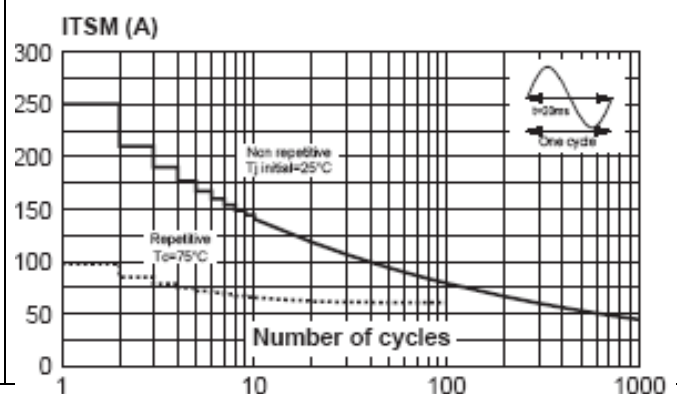
Fig. 1: Maximum power dissipation versus RMS on-state current (full cycle).**Fig. 2-1:** RMS on-state current versus case temperature (full cycle).**Fig. 2-2:** D²PAK RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 μ m), full cycle.**Fig. 3:** Relative variation of thermal impedance versus pulse duration.**Fig. 4:** On-state characteristics (maximum values).**Fig. 5:** Surge peak on-state current versus number of cycles.

Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t .

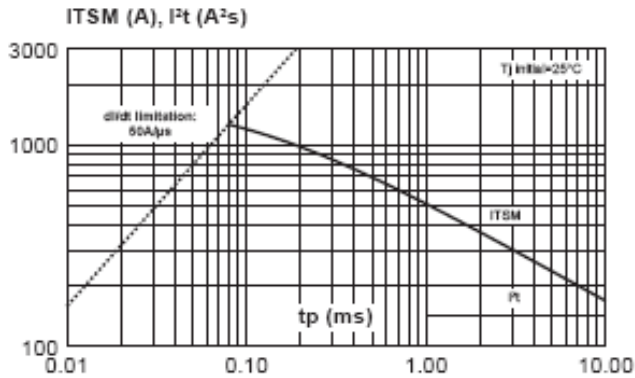


Fig. 8: Relative variation of critical rate of decrease of main current versus $(dV/dt)_c$ (typical values).

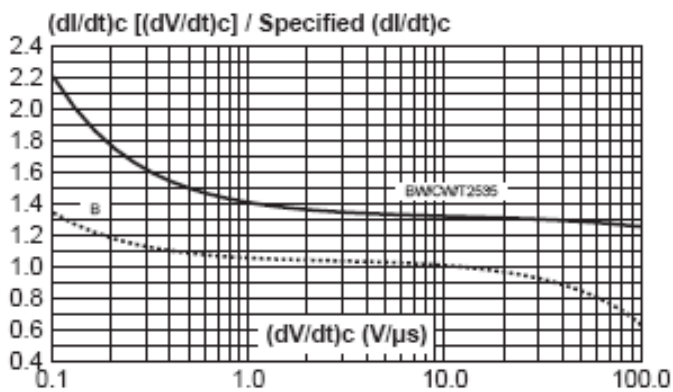


Fig. 10: D²PAK Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35μm).

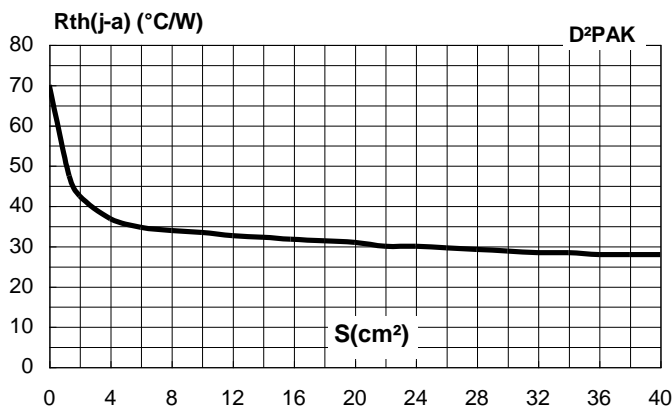


Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

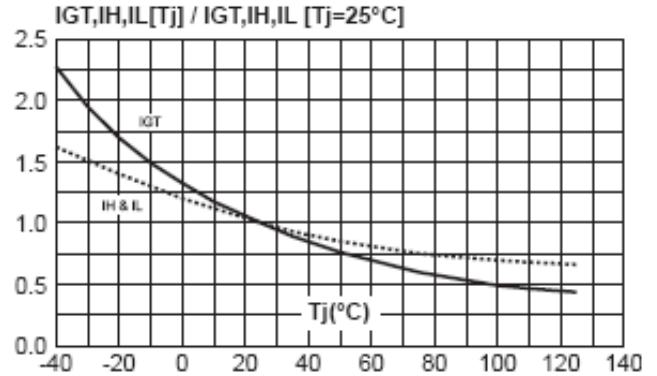
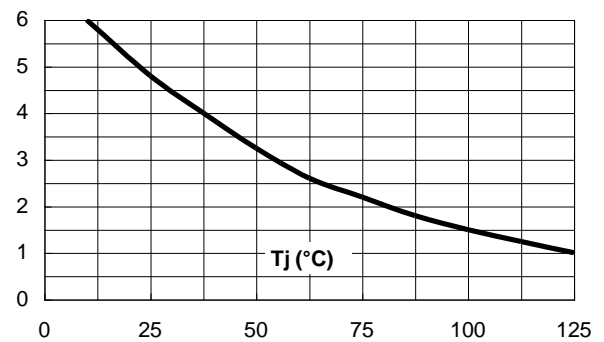
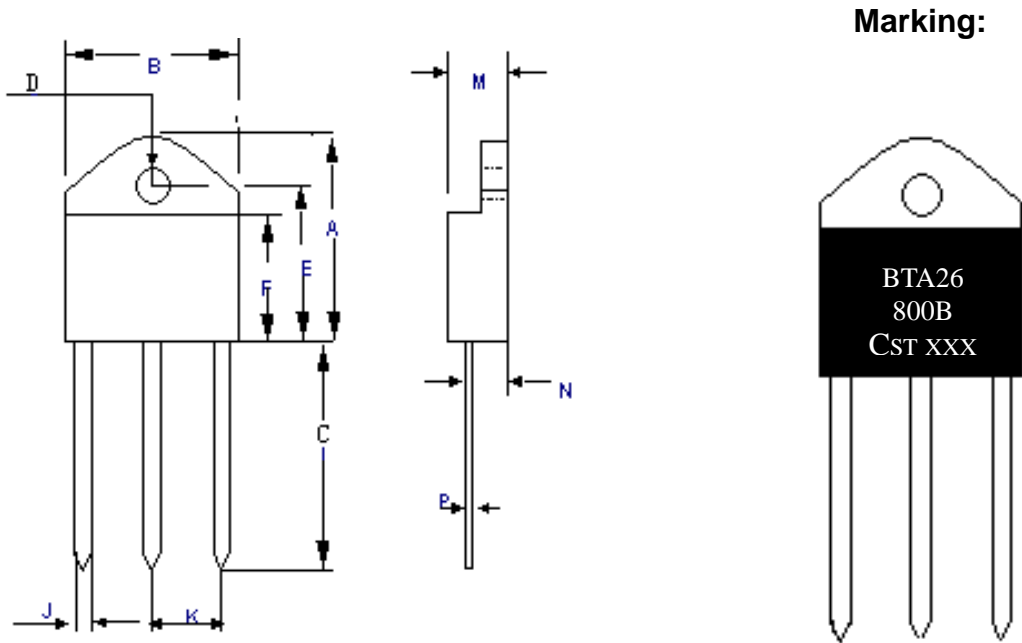


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.



9、 Package outline



DIM	Inches		Milimeters		DIM	Inches		Milimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.768	0.831	19.5	21.1	J	0.040	0.056	1.01	1.41
B	0.58	0.611	14.73	15.53	K	0.189	0.244	4.8	6.2
C	0.583	0.614	14.8	15.6	M	0.165	0.189	4.2	4.8
D	0.151	0.182	3.84	4.63	N	0.121	0.144	3.07	3.67
E	0.602	0.649	15.3	16.5	P	0.016	0.024	0.41	0.61
F	0.469	0.501	11.9	12.72					