KERSMI ELECTRONIC CO.,LTD. **600V**

Description

This MOSFETS use advanced trench technology and design to provide excellent RDS(on) with low gate charge. It can be used in a wide variety of applications.

SYMBOL	PARAMETER	MAX	MAX	UNIT
	------	BTB04-600B	BTB04-600B	
V_{DRM}	Repetitive peak off-state	600	600	V
ID	RMS on-state current	4	4	A

Features

1) Low gate charge.
2) Green device available.
3) Advanced high cell denity trench technology for ultra RDS(ON)
4) Excellent package for good heat dissipation.

TO-220

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Thermal Resistance ,Junction to Case1	—	K/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient1	—	

Package Marking and Ordering Information

Part NO.	Marking	Package
BTB04-600B	BTB04-600B	TO-220

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board 2OZ copper.
2. The data tested by pulse width≤300us,duty cycle≤2%
3. The EAS data shows Max.rating.The test condition is V_{DD}=25v,V_{GS}=10V,L=0.1mH,i_{AS}=17.8A
4. The power dissipation is limited by 150℃ junction temperature.

Typical Characteristics T_J=25℃ unless otherwise noted

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (360° conduction angle)	BTA	Tc = 90°C	4	A
		BTB	Tc = 95°C		
I_{TSM}	Non repetitive surge peak on-state current (Tj initial = 25°C)		tp = 8.3ms	42	A
			tp = 10ms	40	
I^2t	I^2t value		tp = 10ms	8	A^2s
dI/dt	Critical rate of rise of on-state current Gate supply: I_G = 50mA dI_G/dt = 0.1A/μs		Repetitive F = 50Hz	10	A/μs
			Non repetitive	50	
Tstg Tj	Storage and operating junction temperature range			-40 to +150 -40 to +110	°C
Tl	Maximum lead soldering temperature during 10s at 4.5mm from case			260	°C

Symbol	Parameter	BTA / BTB04-			Unit
		400 T/D/S/A	600 T/D/S/A	700 T/D/S/A	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage Tj = 110°C	400	600	700	V

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-a)	Junction to ambient		60	°C/W
Rth (j-c) DC	Junction to case for DC	BTA	4.4	°C/W
		BTB	3.2	
Rth (j-c) AC	Junction to case for 360° conduction angle (F = 50Hz)	BTA	3.3	°C/W
		BTB	2.4	

ELECTRICAL CHARACTERISTICS

Symbol	Test conditions		Quadrant		BTA / BTB04				Unit
					T	D	S	A	
I_{GT}	V_D = 12V (DC) R_L = 33Ω	Tj = 25°C	I - II - III	MAX.	5	5	10	10	mA
			IV	MAX.	5	10	10	25	
V_{GT}	V_D = 12V (DC) R_L = 33Ω	Tj = 25°C	I - II - III - IV	MAX.	1.5				V
V_{GD}	V_D = V_{DRM} R_L = 3.3kΩ	Tj =110°C	I - II - III - IV	MIN.	0.2				V
tgt	V_D = V_{DRM} I_G = 40mA dI_G/dt = 0.5A/µs	Tj = 25°C	I - II - III - IV	TYP.	2				µs
I_L	I_G = 1.2I_{GT}	Tj = 25°C	I - III - IV	TYP.	10	10	20	20	mA
			II		20	20	40	40	
I_H*	I_T = 100mA Gate open	Tj = 25°C		MAX.	15	15	25	25	mA
V_{TM} *	I_{TM} = 5.5A tp = 380µs	Tj = 25°C		MAX.	1.65				V
I_{DRM} I_{RRM}	V_{DRM} rated V_{RRM} rated	Tj = 25°C		MAX.	0.01				mA
		Tj = 110°C		MAX.	0.75				
dV/dt *	Linear slope up to V_D = 67% V_{DRM} gate open	Tj = 110°C		TYP.	10	10	-	-	V/µs
				MIN.	-	-	10	10	
(dI/dt)c*	(dI/dt)c = 1.8A/ms	Tj = 110°C		TYP.	1	1	5	5	V/µs

* For either polarity of electrode A_2 voltage with reference to electrode A_1

Fig. 1: Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

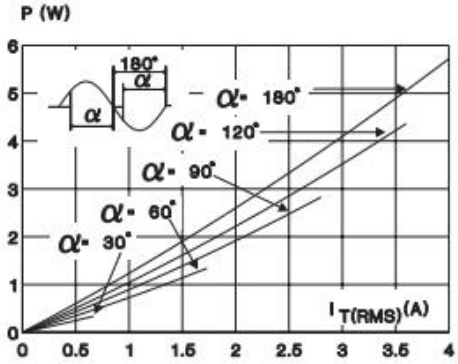

Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).

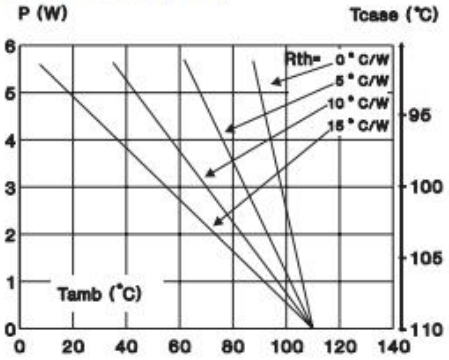

Fig. 3: Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).

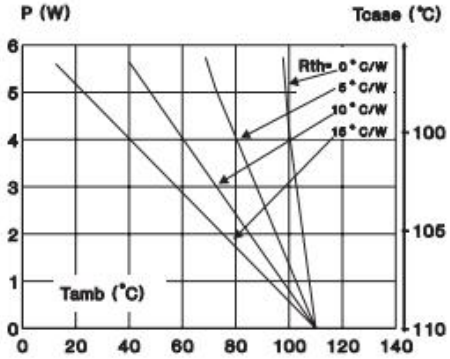

Fig. 4: RMS on-state current versus case temperature.

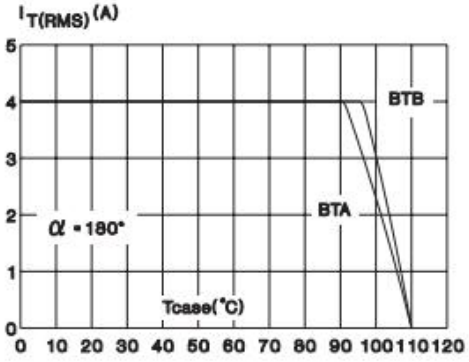

Fig. 5: Relative variation of thermal impedance versus pulse duration.

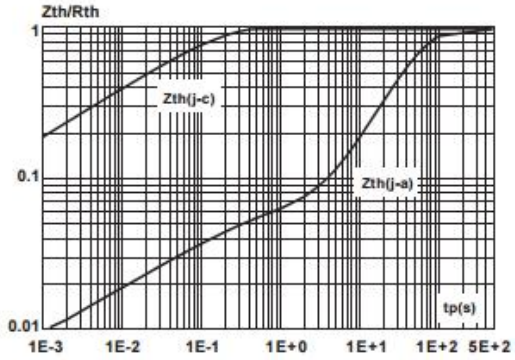

Fig. 6: Relative variation of gate trigger current and holding current versus junction temperature.

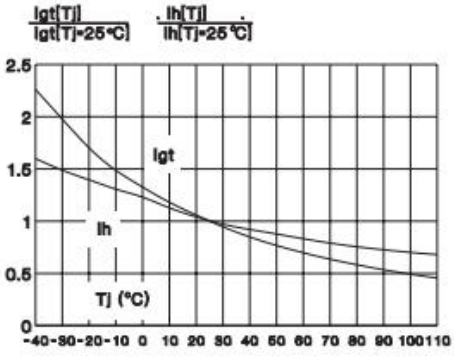

Fig. 7: Non repetitive surge peak on-state current versus number of cycles.

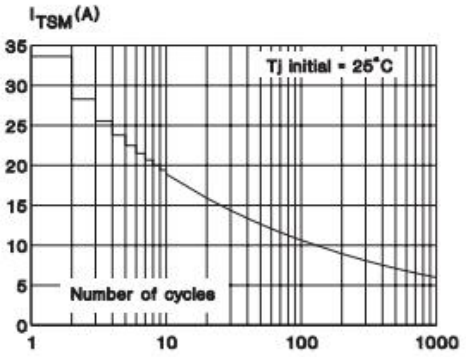

Fig. 8: Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of I^2t.

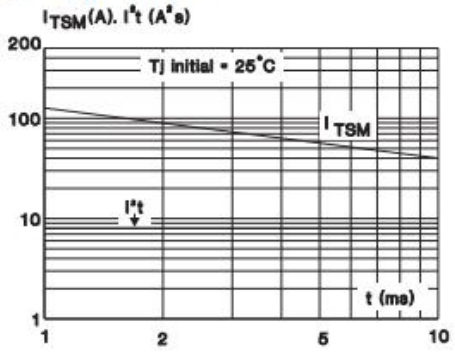

Fig. 9: On-state characteristics (maximum values).