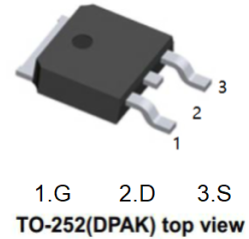


Product features and main applications:

NPNP five-layer structure of silicon bidirectional devices; with independent intellectual property rights of single-sided digging technology, table glass passivation process; multi-layer metallized electrodes on the back; with high blocking voltage and high temperature stability.

Mainly used in:

vacuum cleaners, power tools and other motor speed controllers; solid state relays; heating controllers (temperature regulation); other phase control circuits.



Characteristics

Absolute maximum ratings (Tj = 25 °C unless otherwise stated)

Symbol	Parameter name		value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	BTA BTB	Tc=80°C Tc=90°C	12 A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, Tj initial = 25°C)	F=50HZ tp=20ms	120	A
I^2t	I ² t value for fusing	tp=10ms	72	A ² S
di/dt	Critical rate of rise of on -state current IG = 2 x IGT, tr ≤ 100 ns	Tj=125°C	50	A/us

V_{DRM} / V_{RRM}	Off state repetitive peak voltage Reverse repetitive peak voltage	$T_j=25^{\circ}\text{C}$		600/800/1000	V
I_{GM}	Peak gate current	$t_p=20\mu\text{s}$	$T_j=150^{\circ}\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation		$T_j=150^{\circ}\text{C}$	1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			-40to+150 -40to+125	$^{\circ}\text{C}$

Electrical characteristics ($T_j = 25^{\circ}\text{C}$, unless otherwise specified) --3 quadrants

Symbol	Name and test conditions	Quadrant	Range	value	Unit
I_{GT}	$V_D=12\text{V}$ $R_L=100\Omega$	I II III	MAX	≤ 50	mA
V_{GT}			MAX	1.5	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3\text{ k}\Omega$, $T_j = 125^{\circ}\text{C}$		MIN	0.2	V
I_H	$I_T = 100\text{ mA}$		MAX	60	mA
I_L	$I_G = 1.2 \times I_{GT}$		MAX	60	mA
				100	
dv/dt	$V_D = 67\% V_{DRM}$, gate open, $T_j = 125^{\circ}\text{C}$		MIN	500	V/us
(dv/dt) _c	Critical rise rate of commutation voltage $T_j = 150^{\circ}\text{C}$		MIN	8	V/us

Electrical characteristics (T_j = 25 °C, unless otherwise specified)
-Standard Triac (4 quadrants)

Symbol	Name and test conditions	Quadrant	Range	value	Unit	
I _{GT}	V _D =12V R _L =100Ω	I II III IV	MAX	I II III	mA	
				IV		
V _{GT}	V _D = V _{DRM} , R _L = 3.3 kΩ , T _j = 125°C		MAX	1.5		V
				MIN	0.2	
I _H	I _T =500mA	MAX	60		mA	
I _L	I _G = 1.2 x I _{GT}	MAX	60		mA	
			100			
dv/dt	V _D = 67% V _{DRM} , gate open, T _j = 125°C	MIN	500		V/us	
(dv/dt) _c	Critical rise rate of commutation voltage T _J = 150°C	MIN	10		V/us	

Static parameters

Symbol	Parameter name			value	Unit
V_{TM}	$I_{TM} = 24A$	$T_j = 25^{\circ}C$	MAX	1.50	V
V_{TO}	threshold on-state voltage	$T_j = 150^{\circ}C$	MAX	0.86	V
Rd	Dynamic resistance	$T_j = 150^{\circ}C$	MAX	36.6	mΩ
I_{DRM} I_{RRM}	VDRM = VRRM	$T_j = 25^{\circ}C$ $T_j = 150^{\circ}C$	MAX	5	uA
				1	mA
$R_{th(j-c)}$	Junction to ambient	BTA		2.05	/W
		BTB		1.25	

BT138-800 characteristic curve

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

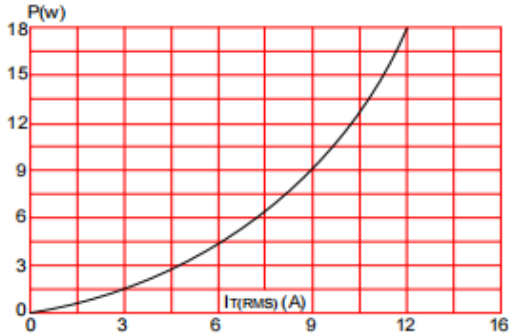


FIG.3: Surge peak on-state current versus number of cycles

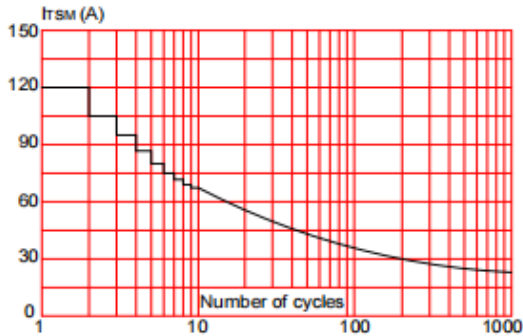


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t ($dI/dt < 50\text{A}/\mu\text{s}$)

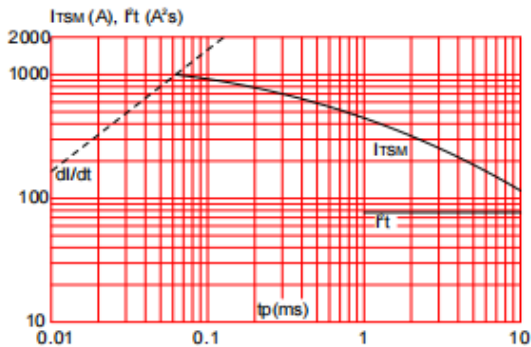


FIG.2: RMS on-state current versus case temperature

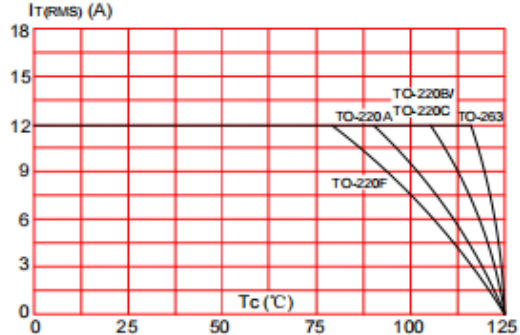


FIG.4: On-state characteristics (maximum values)

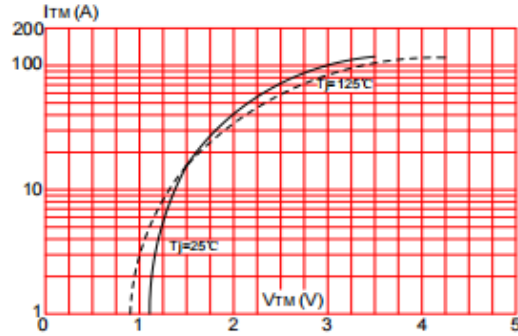
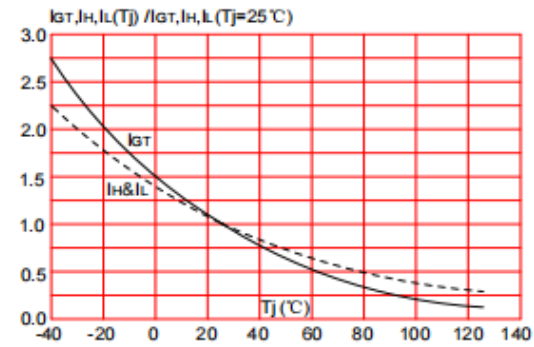
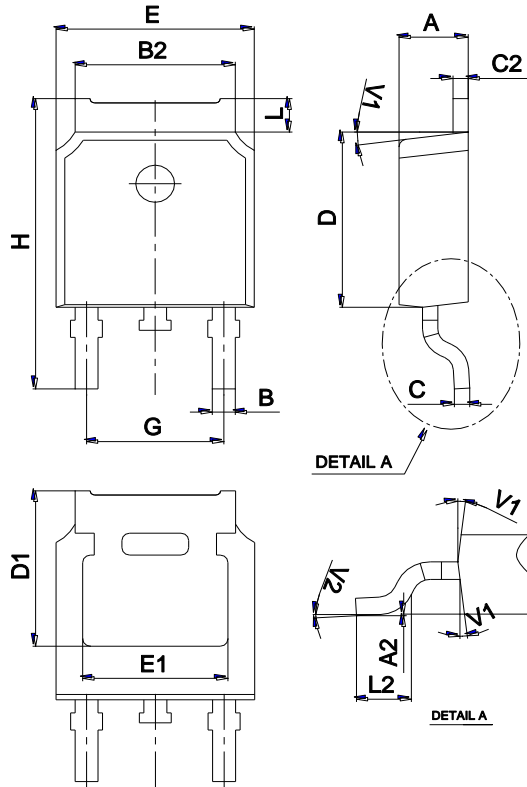


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

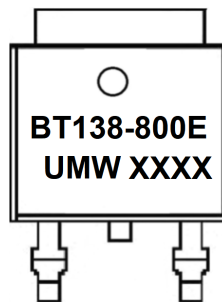


Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
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°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW BT138D-800E	TO-252	2500	Tape and reel