UMW BT137S

BT137 bidirectional thyristor

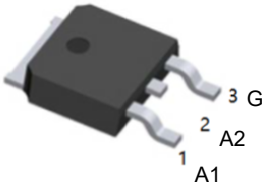
1.Description

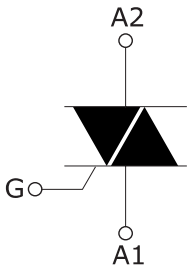
NPNPN five layer silicon bidirectional device; Single side trenching technology with independent intellectual property rights, table glass passivation process; Multilayer metallized electrode on the back; High blocking voltage and high temperature stability;

2.Features

Mainly used for: vacuum cleaners, power tools and other motor speed controller; solid state relays;heating controller (temperature control); other phase control circuit.

3.Pinning Information





TO-252

4.The limiting parameter

Parameter			Symbol	Values	Units
The through- state root - mean-square current			$I_{T(RMS)}$	8	A
On- state inrush current	F=50HZ	t=20ms	I_{TSM}	65	A
Limit value of I^2t	t_p=10ms		I^2t	21	A^2S
Critical rate of rise of on -state current		T_J=125°C	di/dt	50	A/us
Break- state repetition peak voltage inverse repetition peak voltage		T_J=25°C	V_{DRM}/V_{RRM}	600/800	V
peak gate current	t_p=20us	T_J=125°C	I_{GM}	2	A
The average power dissipated at the gate pole		T_J=125°C	$P_{G(AV)}$	0.5	W
storage temperature effective junction temperature			T_J, T_{STG}	-40 to 150	°C
				-40 to 125	°C

5.Electrical characteristics (three quadrants)

Parameter			Symbol	Values	Units
Trigger current V_D=12V, R_L=100Ω, Trigger voltage	Ⅰ	MAX	I_{GT}	≤50	mA
	Ⅱ	MAX	V_{GT}	1.5	V
Non triggering voltage T_J=125°C	Ⅲ	MIN	V_{GD}	0.2	V
Maintenance current, I_T=0.5A		MAX	I_H	60	mA
Dynaflex I_G=1.2I_{GT}		MAX	I_L	60	mA
				100	mA
Critical rate of rise of off- state voltage, V_D=2/3V_{DRM} T_J=125°C		MIN	dv/dt	500	V/us
Critical rate of rise of commutation voltage, T_J=125°C		MIN	(dv/dt)c	10	V/us

6.Electrical characteristics (four quadrants)

Parameter			Symbol	Values		Units
Trigger current V_D=12V, R_L=100Ω, Trigger voltage	Ⅰ	MAX	I_{GT}	Ⅰ Ⅱ Ⅲ	Ⅳ	mA
	Ⅱ	MAX		≤50	≤120	mA
	Ⅲ					
	Ⅳ	MAX	V_{GT}	1.5		V
Non triggering voltage T_J=125°C		MIN	V_{GD}	0.2		V
Maintenance current, I_T=0.5A		MAX	I_H	60		mA
Holding current, I_G=1.2I_{GT}		MAX	I_L	60		mA
				100		mA
Critical rate of rise of off- state voltage, V_D=2/3V_{DRM} T_J=125°C		MIN	dv/dt	500		V/us
Critical rate of rise of commutation voltage, T_J=125°C		MIN	(dv/dt)c	10		V/us

7.Static Parameters

Parameter			Symbol	Values	Units
On state peak voltage I_{TM}=8A	T_J=25°C	MAX	V_{TM}	1.5	V
threshold voltage	T_J=125°C	MAX	V_{T0}	0.86	V
slope resistance	T_J=125°C	MAX	Rd	36.6	mΩ
peak off - state current reverse peak current	T_J=25°C	MAX	I_{DRM}, I_{RRM}	5	uA
	T_J=125°C	MAX		1	mA
crust thermal resistance			$R_{th(j-c)}$	2.4	°C/W
			$R_{th(j-a)}$	75	°C/W

8.1 Typical Characteristic

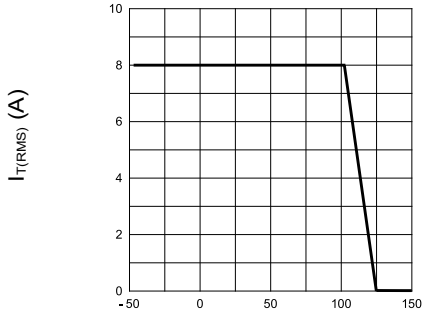


Figure 1: RMS on-state current as a function of mounting base temperature; maximum values

f=50Hz, T_{mb}≤102°C

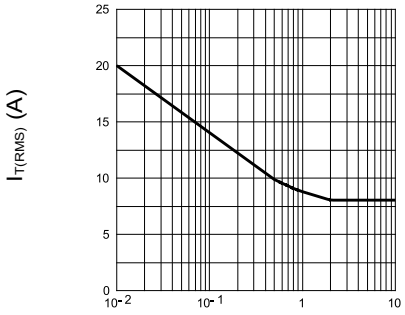


Figure 2: RMS on-state current as a function of surge duration; maximum values

(1) A2- G+, (2) A2- G-, (3) A2+ G-, (4) A2+ G+

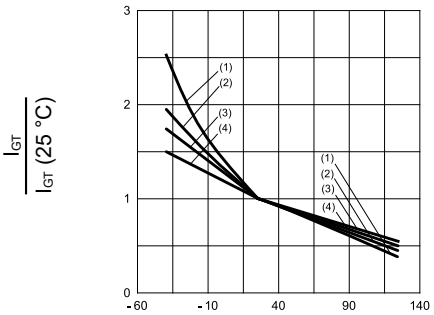


Figure 3: Normalized gate trigger current as a function of junction temperature

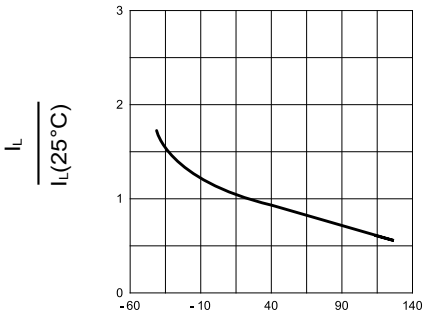


Figure 4: Normalized latching current as a function of junction temperature

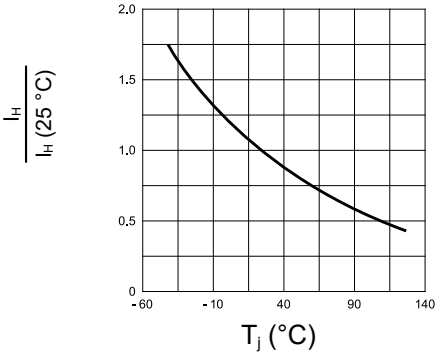


Figure 5: Normalized holding current as a function of junction temperature

Vo=1.264V, Rs=0.038Ω, (1) Tj=125°C; typical values
(2) Tj=125°C; maximum values, (3) Tj=25°C; maximum values

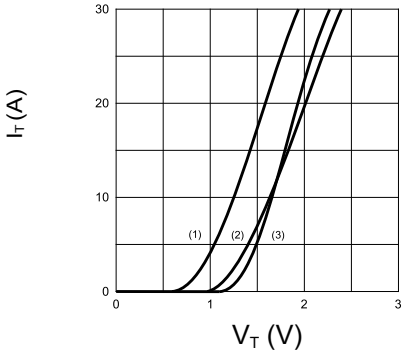


Figure 6: On-state current as a function of on-state voltage

8.2 Typical Characteristic

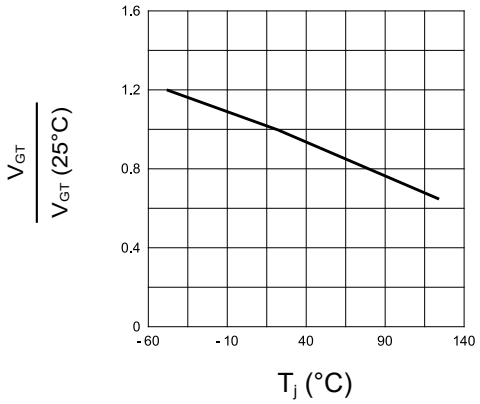


Figure 7: Normalized gate trigger voltage as a function of junction temperature

α = conduction angle, a = form factor = $I_{T(RMS)}/I_{T(AV)}$

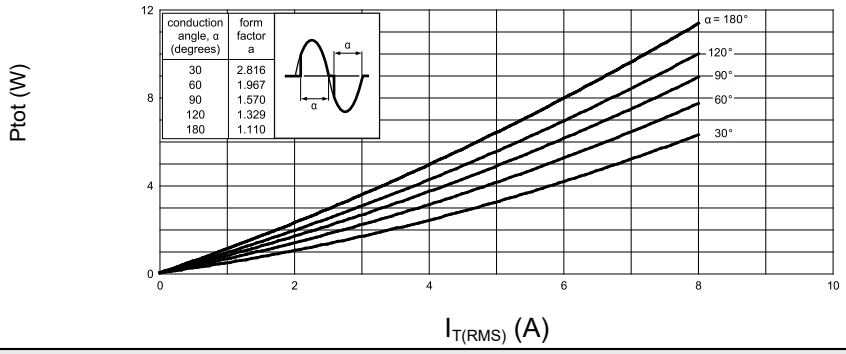


Figure 8: Total power dissipation as a function of RMS on-state current; maximum values

tp ≤ 20 ms, (1) dIT/dt limit, (2) T2- G+ quadrant limit

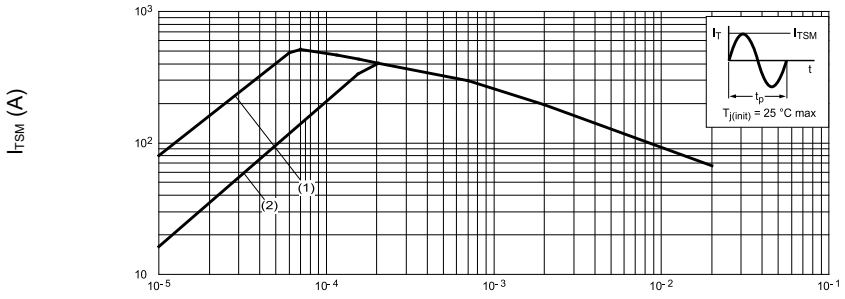
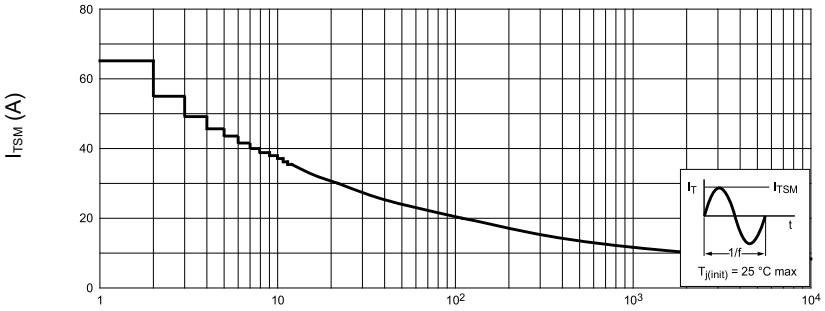


Figure 9: Non-repetitive peak on-state current as a function of pulse width; maximum values

8.3 Typical Characteristic

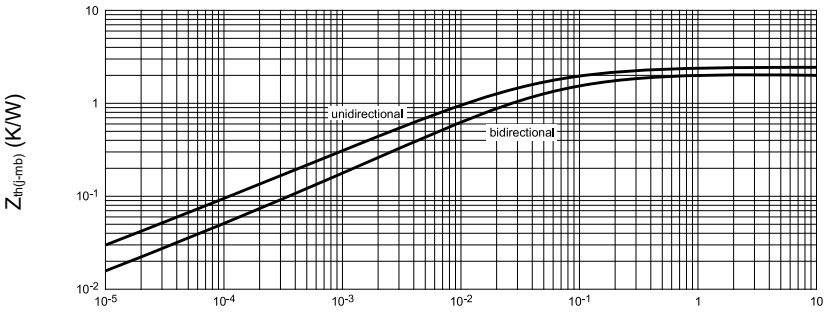
f = 50 Hz



number of cycles

Figure 10: Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

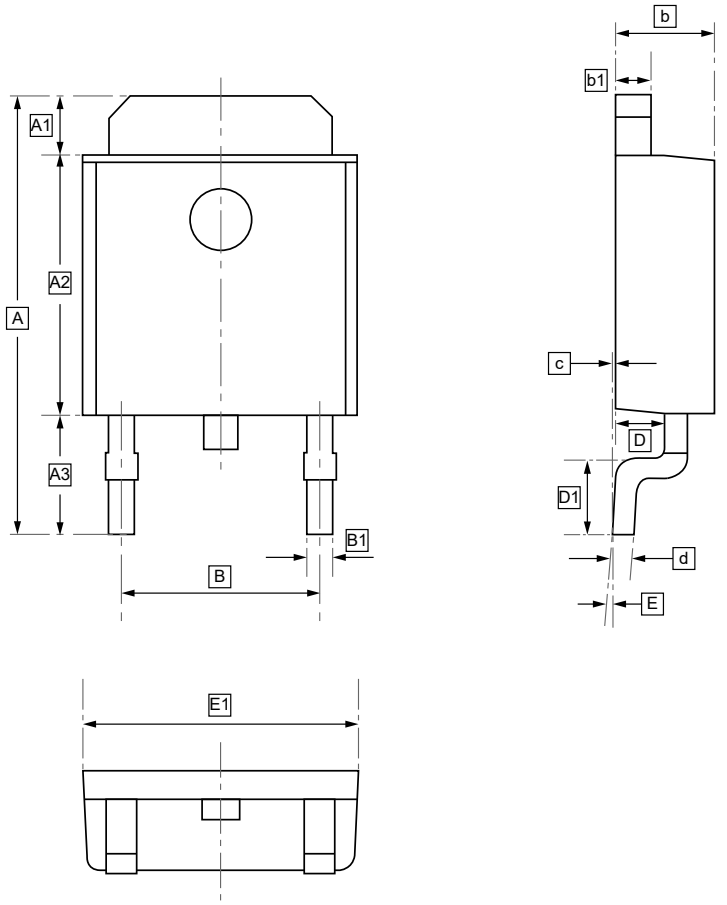
α = conduction angle, a = form factor = $I_{T(RMS)}/I_{T(AV)}$



t_p (s)

Figure 11: Transient thermal impedance from junction to mounting base as a function of pulse width

9.TO-252 Package Outline Dimensions

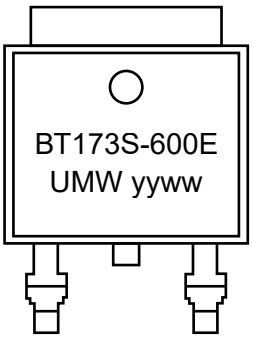


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	b	b1	c	D	D1	d
Min	10.04	1.35	5.94	2.65	4.60	0.55	2.20	0.75	0	1.05	1.73	0.45
Max	10.44	1.45	6.14	2.95		0.65	2.40	0.85	0.15	1.25		0.55

Symbol	E	E1
Min	0°	6.40
Max	8°	6.60

10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW BT137S-600E	BT137S-600E	TO-252	2500	Tape and reel
UMW BT137S-800E	BT137S-800E	TO-252	2500	Tape and reel

11.Disclaimer

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