UMW BT139D-800E

BT139 -800Bidirectional Thyristor

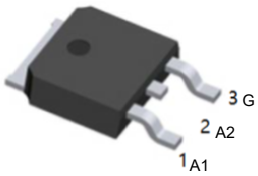
1.Description

NPNPN 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.

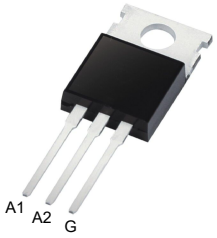
2.Features

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

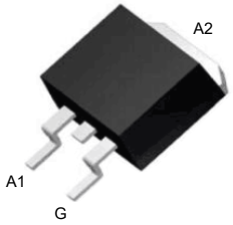
3.Pinning Information



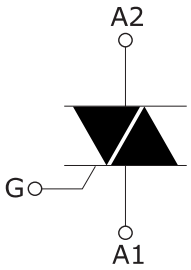
TO-252



TO-220/TO-220F



TO-263



4.Absolute maximum ratings (T_J=25°C unless otherwise stated)

Parameter			Symbol	Values	Units
RMSon-statecurrent(full sine wave)			$I_{T(RMS)}$	16	A
Non repetitive surge peakon-state current (full cycle,T_J initial=25°C)	F=50HZ, tp=20ms		I_{TSM}	155	A
I^2t value for fusing	tp=10ms		I^2t	120	A^2S
Critical rate of rise of on-state current I_G=2 x $I_{GT,}$ tr≤100ns	T_J=125°C		di/dt	50	A/us
Off state repetitive peak voltage Reverse repetitive peak voltage	T_J=25°C		V_{DRM}/V_{RRM}	800	V
Peak gate current	tp=20us	T_J=150°C	I_{GM}	2	A
Average gate power dissipation		T_J=150°C	$P_{G(AV)}$	0.5	W
Storage junction temperature range			T_{STG}	-40 to 150	°C
Operating junction temperature range			T_J	-40 to 125	°C

5.1 Electrical characteristics (3 quadrants)

Parameter	Quadrant	Range	Symbol	Values		Units
V_D=12V R_L=33Ω	Ⅰ	MAX	I_{GT}	≤30		mA
	Ⅱ	MAX	V_{GT}	1.5		V
V_D=V_{DRM}, R_L=3.3kΩ , T_J=125°C	Ⅲ	MIN	V_{GD}	0.2		V
I_T=100mA		MAX	I_H	60		mA
I_G=1.2 x I_{GT}		MAX	I_L	Ⅰ - Ⅲ	30	mA
		MAX		Ⅱ	40	mA
V_D = 67% V_{DRM}, gate open,mA, T_J=125°C		MIN	dv/dt	50		V/us
Critical rise rate of commutation voltage T_J=150°C		MIN	(dv/dt)c	10		V/us

5.2 Electrical characteristics (4 quadrants)

Parameter	Quadrant	Range	Symbol	value		Units
V_D=12V R_L=33Ω	Ⅰ	MAX	I_{GT}	Ⅰ Ⅱ Ⅲ	Ⅳ	mA
	Ⅱ	MAX		≤40	≤50	mA
	Ⅲ	MAX	V_{GT}	1.5		V
V_D=V_{DRM}, R_L=3.3kΩ , T_J=125°C	Ⅳ	MIN	V_{GD}	0.2		V
I_T=500mA		MAX	I_H	60		mA
I_G=1.2 x I_{GT}		MAX	I_L	40		mA
		MAX		50		mA
V_D = 67% V_{DRM}, gate open,mA, T_J=125°C		MIN	dv/dt	50		V/us
Critical rise rate of commutation voltage T_J=150°C		MIN	(dv/dt)c	10		V/us

6.Static Parameters

Parameter			Symbol	Values	Units
I_{TM}=16A	T_J=25°C	MAX	V_{TM}	1.5	V
threshold on-state voltage	T_J=150°C	MAX	V_{T0}	0.87	V
Dynamic resistance	T_J=150°C	MAX	Rd	14.6	mΩ
V_{DRM}=V_{RRM}	T_J=25°C	MAX	I_{DRM}, I_{RRM}	5	uA
	T_J=150°C	MAX		1	mA
Thermal resistance junction to ambient			$R_{th(j-a)}$	60	K/W
Thermal resistance junction to mounting base			$R_{th(j-b)}$	1.2	K/W

7.Typical Characteristic

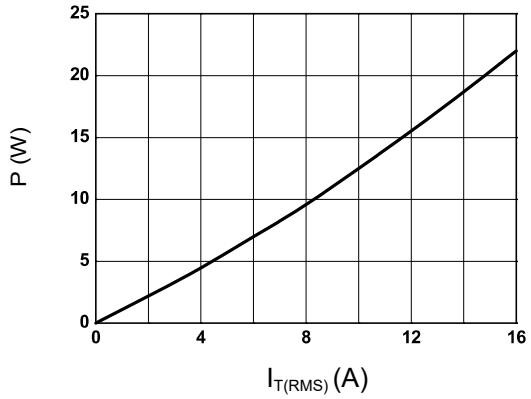


Figure 1: Maximum power dssipation versus RMS on-state current (full cycle)

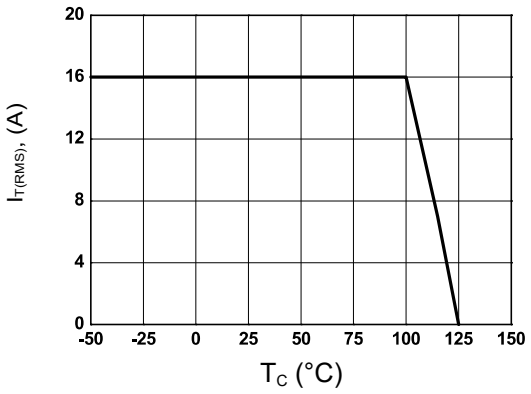


Figure 2: RMS on-slale curent versus case temperature (full cycle)

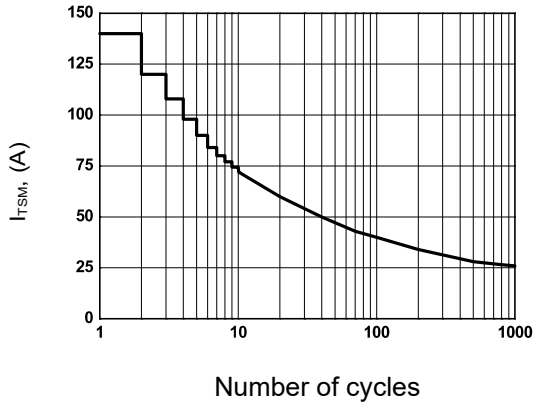


Figure 3: Surge peak on-stale current versus number of cycles

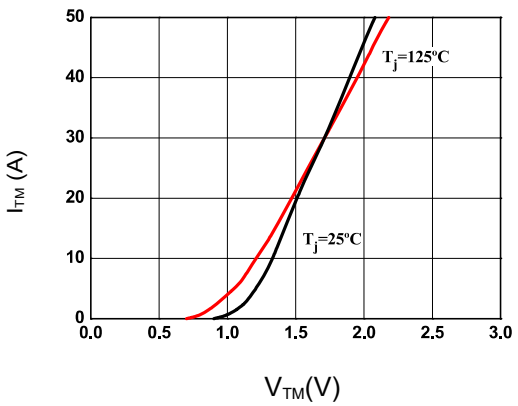


Figure 4: On-state characteristics (maximum values)

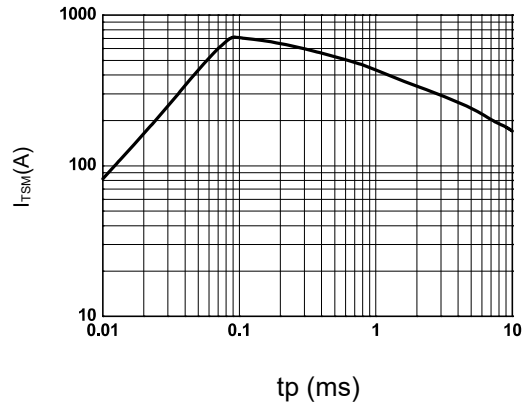


Figure 5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms

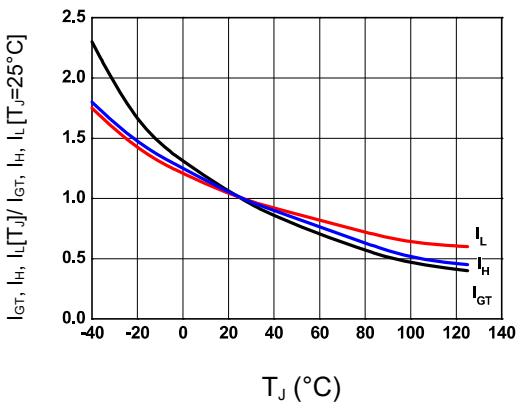
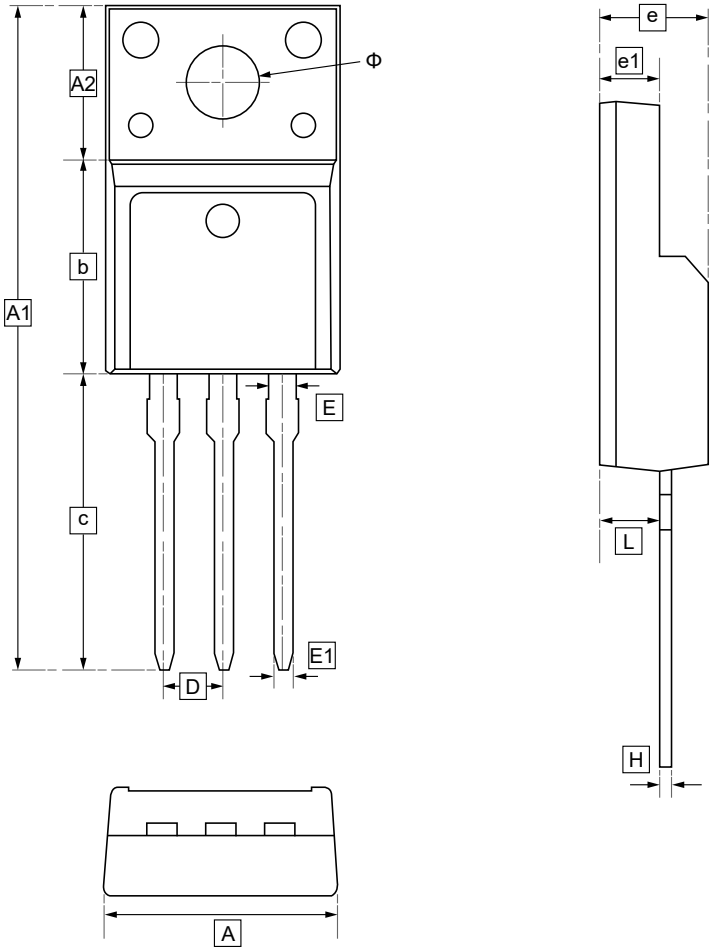


Figure 6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)

8.1 TO-220F Package Outline Dimensions

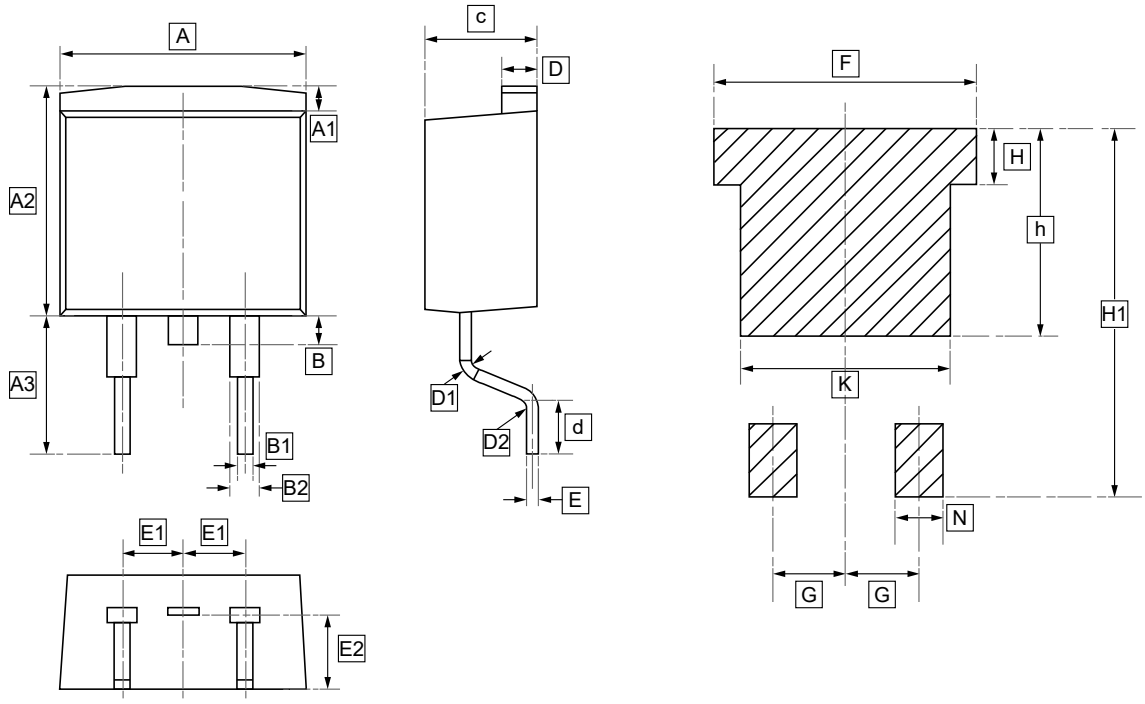


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	Φ	e	e1	L
Min	10.00	28.80	6.58	9.12	12.95	2.54	1.15	0.75	3.13	4.50	2.40	2.50
Max	10.20	29.20	6.78	9.32	13.25		1.25	0.85	3.23	4.70	2.60	2.70

Symbol	H
Min	0.45
Max	0.55

8.2 TO-263 Package Outline Dimensions

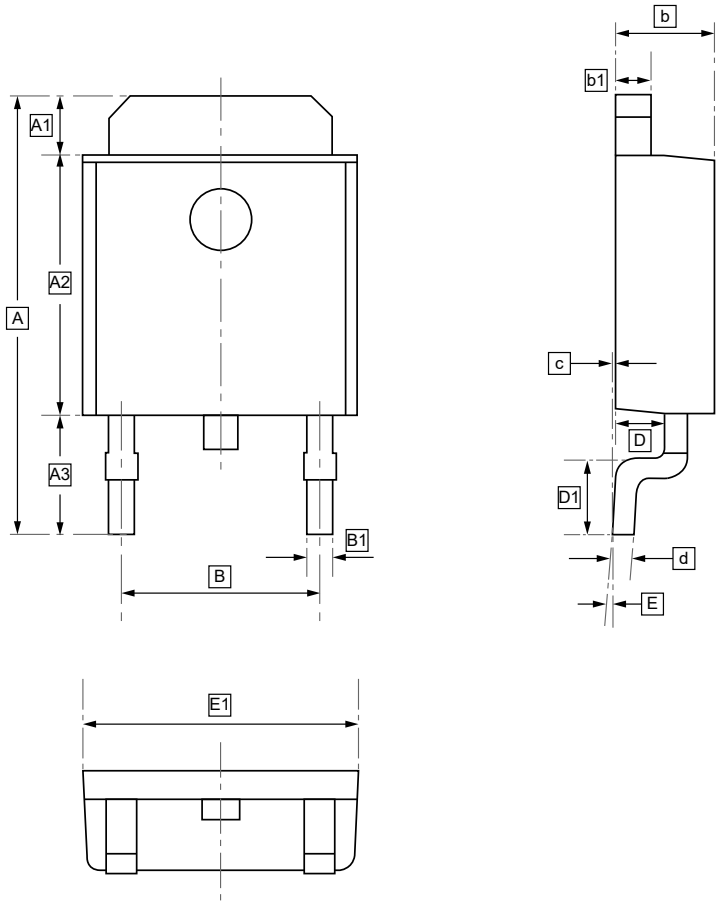


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	B2	c	D	D1	D2	d
Min	10.0	0.5	8.3	5.3	-	0.5	1.2	-	1.1	0.6R	0.8R	2.29
Max	TYP.	1.5	8.7	6.1	1.6	0.9	1.6	4.8	1.5	TYP.	TYP.	2.79

Symbol	E	E1	E2	F	H	h	H1	K	G	N
Min	0.3	2.54	2.6	10.4	2.3	8.5	16.0	8.8	2.54	2.08
Max	0.7	TYP.	3.0							

8.3 TO-252 Package Outline Dimensions

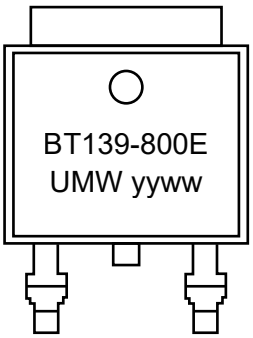


DIMENSIONS (mm are the original dimensions)

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

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW BT139D-800E	TO-252	2500	Tape and reel

10.Disclaimer

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