

## TRIAC series

### 1 Description

BT136E series triacs with low holding and latching current are especially recommended for use on middle and small resistance type power load.

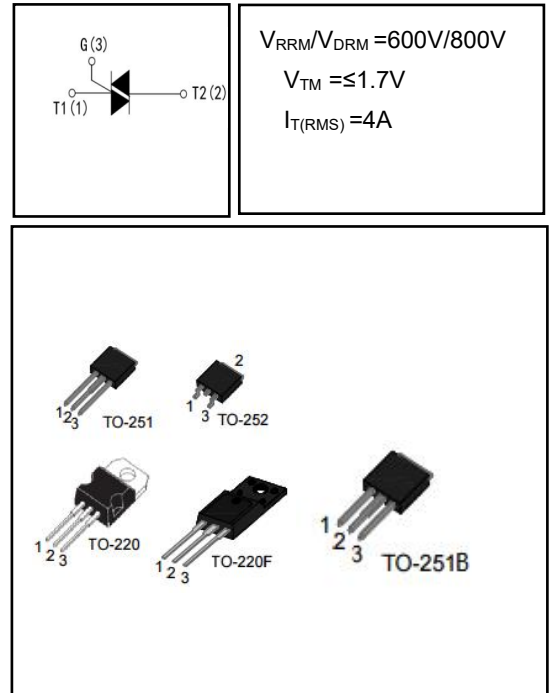
TO-220F provides insulation voltage rated at 2000V RMS from all three terminals to external heatsink. TO-220F series comply with UL standards (File ref: E252906).

### 2 Features

- High current output up to 4A
- Low Peak on-state voltage drop
- High voltage
- High reliability

### 3 Applications

- jet pumps of dishwashers
- fans of air-conditioner
- power charger
- AC Motor control



## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings (T<sub>c</sub>=25°C, unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Repetitive peak off-state voltage (T <sub>j</sub> =25°C)		V <sub>DRM</sub>	600/800	V
Repetitive peak reverse voltage (T <sub>j</sub> =25°C)		V <sub>RRM</sub>	600/800	V
Non repetitive surge peak Off-state voltage		V <sub>DSM</sub>	+ 100	V
Non repetitive peak reverse voltage		V <sub>RSM</sub>	+ 100	V
RMS on-state current	TO-251/252, T <sub>c</sub> =100°C	I <sub>T(RMS)</sub>	4	A
	TO-220F, T <sub>c</sub> =90°C			
	TO-220, T <sub>c</sub> =107°C			
Non repetitive surge peak on-state current	tp=8.3ms	I <sub>TSM</sub>	25	A
	tp=10ms		23	
I <sup>2</sup> t value for fusing (tp=10ms)		I <sup>2</sup> t	2.1	A
Repetitive rate of rise of on-state current IG=(2XIGT)	I - II - III	dI <sub>T</sub> /dt	50	A/us
	IV		10	
Peak gate current		I <sub>GM</sub>	1	A
Peak gate power		P <sub>GM</sub>	5	W
Average gate power dissipation		P <sub>G(AV)</sub>	0.5	W
Operating junction temperature range		T <sub>J</sub>	- 40 ~ 125	°C
Storage junction temperature range		T <sub>STG</sub>	- 40 ~ 150	°C

### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE			UNIT
		TO-220F	TO-220	TO-252/251	
Thermal Resistance, Junction to Case-sink	R <sub>thJC</sub>	3.3	3.0	4.0	°C/W

**4.3 Electrical Characteristics** (Tc=25°C, unless otherwise noted)

SYMBOL	PARAMETER	Test Conditions	Min	Typ	Max	Unit	
I <sub>GT</sub>	Triggering gate current	V <sub>D</sub> =12V R <sub>L</sub> =33Ω	I - II - III	-	-	10	mA
			IV	-	-	25	
			ALL	-	0.77	1.5	
V <sub>GT</sub>	Triggering gate voltage		-	0.77	1.5	V	
V <sub>GD</sub>	Non-triggering gate voltage	V <sub>D</sub> =V <sub>DRM</sub> T <sub>J</sub> =125°C R <sub>L</sub> =3.3KΩ	0.2	-	-	V	
I <sub>L</sub>	Latching Current	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III - II	-	-	30	mA
			IV	-	-	45	
I <sub>H</sub>	Holding Current	I <sub>T</sub> =100mA	-	-	25	mA	
dV/dt	Critical Rate of Rise of Off-state Voltage	V <sub>D</sub> =2/3V <sub>DRM</sub> Gate Open T <sub>J</sub> =125°C	50	-	-	V/us	
V <sub>TM</sub>	Peak Forward On-State Voltage	I <sub>TM</sub> =4A tp=380us	-	1.43	1.7	V	
I <sub>DRM</sub>	Maximum forward or reverse leakage current	V <sub>D</sub> =V <sub>DRM</sub> V <sub>R</sub> =V <sub>RRM</sub>	T <sub>J</sub> =25°C	-	-	10	uA
I <sub>RRM</sub>	Maximum reverse leakage current		T <sub>J</sub> =125°C	-	-	1	mA

**5 Typical characteristics diagrams**

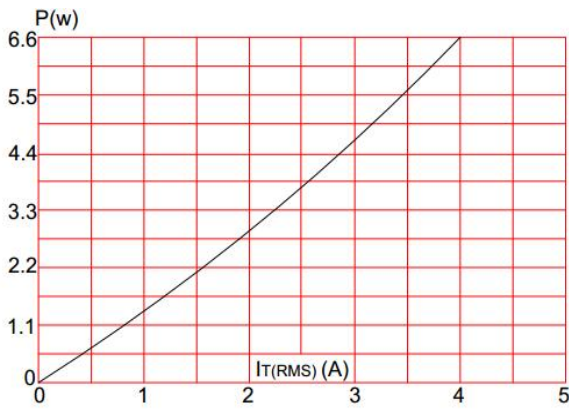


FIG.1: Maximum power dissipation versus RMS on-state current

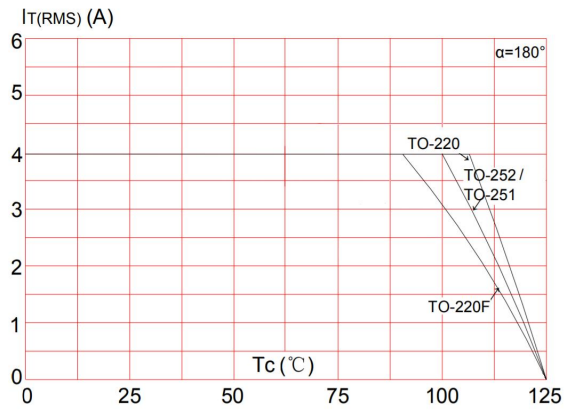


FIG.2: RMS on-state current versus case temperature

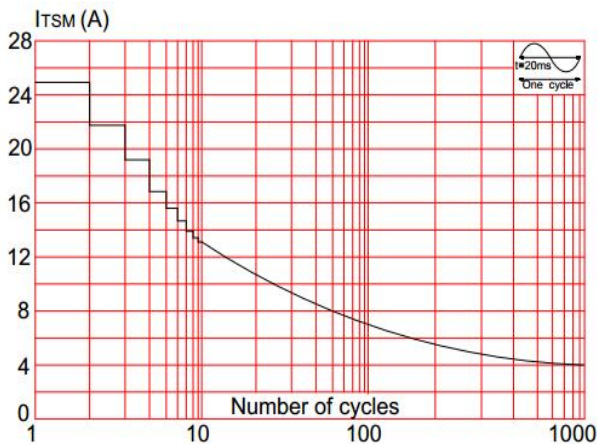


FIG.3: Surge peak on-state current versus number of cycles

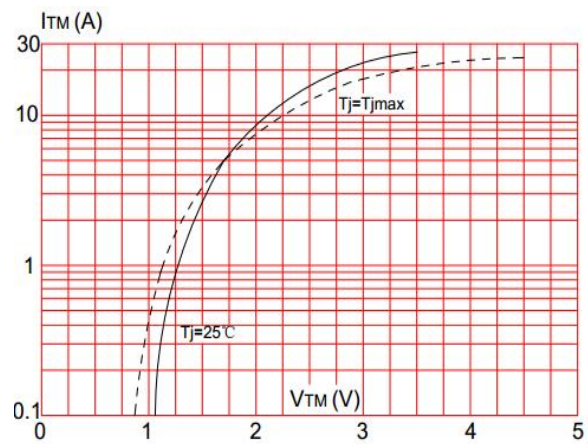


FIG.4: On-state characteristics (maximum values)

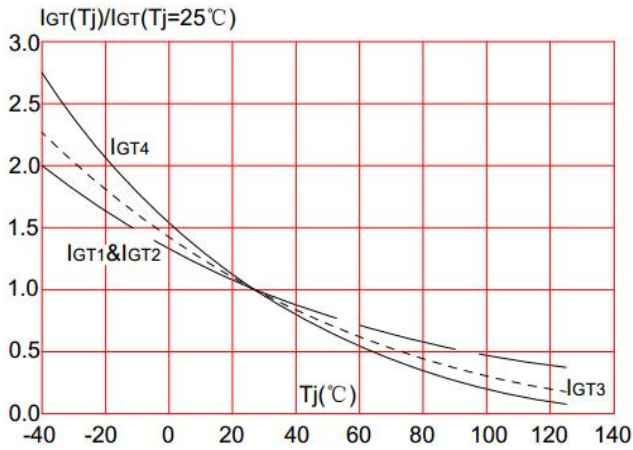
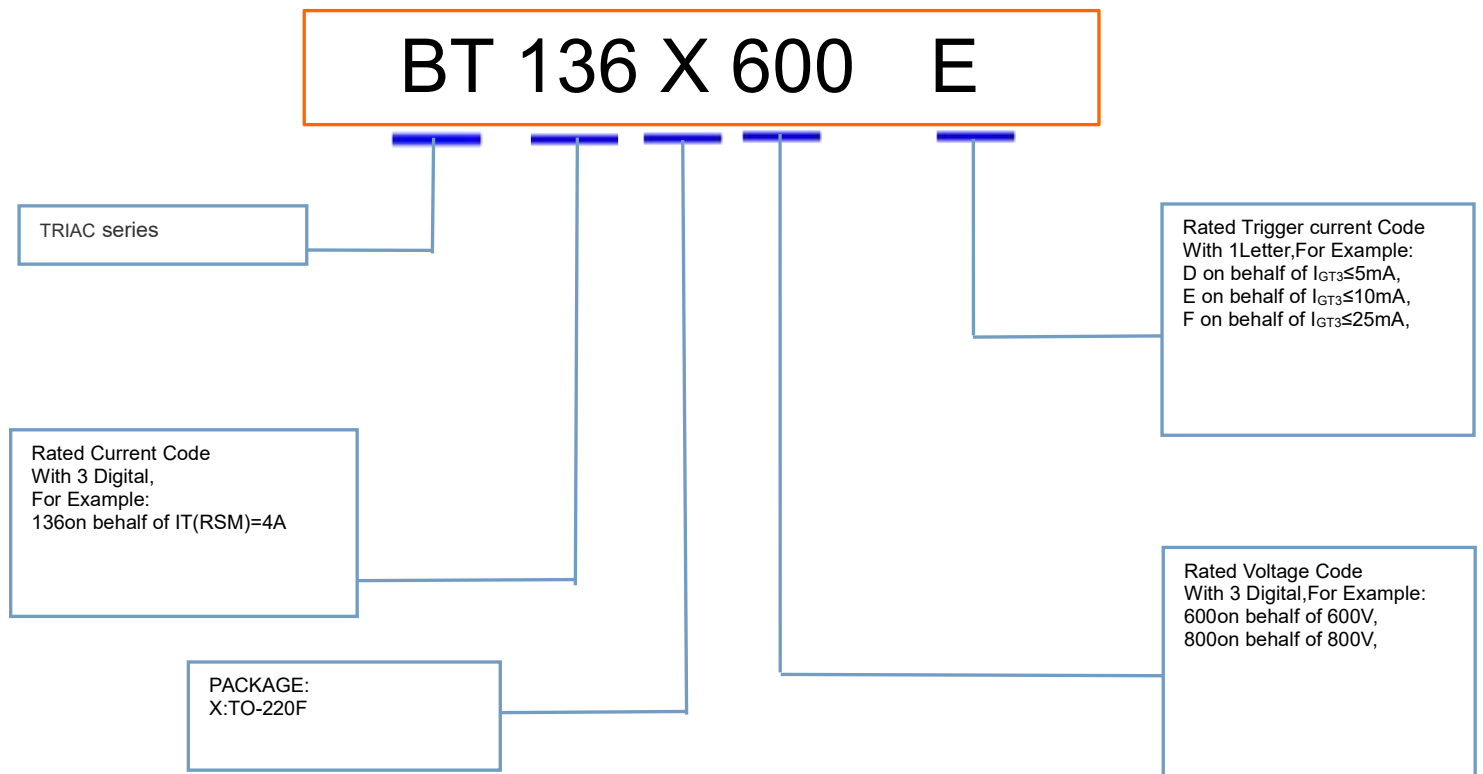


FIG.5: Relative variations of gate trigger current, holding current and latching current versus junction temperature

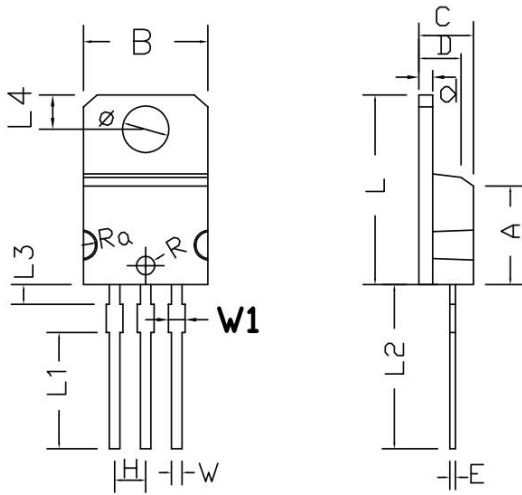
## 6 Product Names Rules



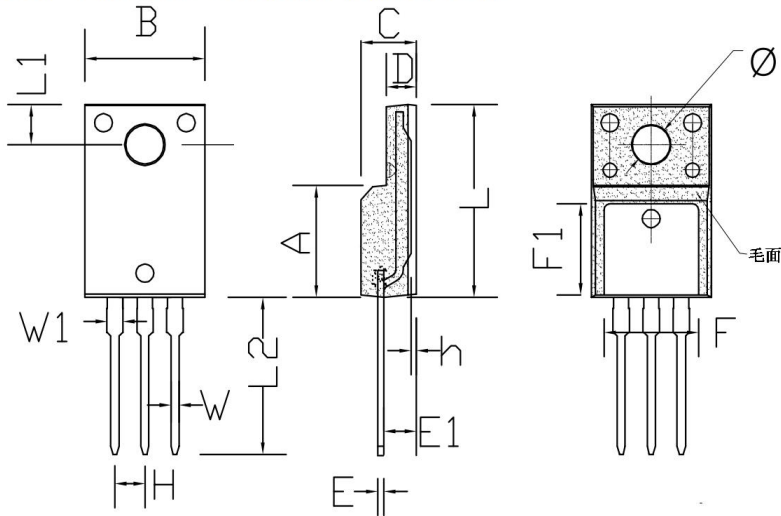
## 7 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
BT136X	TO-220F	BT136X	Pb-free	Tube	1000//box
BT136	TO-220	BT136	Pb-free	Tube	1000//box
BT136	TO-252/251	BT136	Pb-free	Braid	3000/disc

### 8 Dimensions

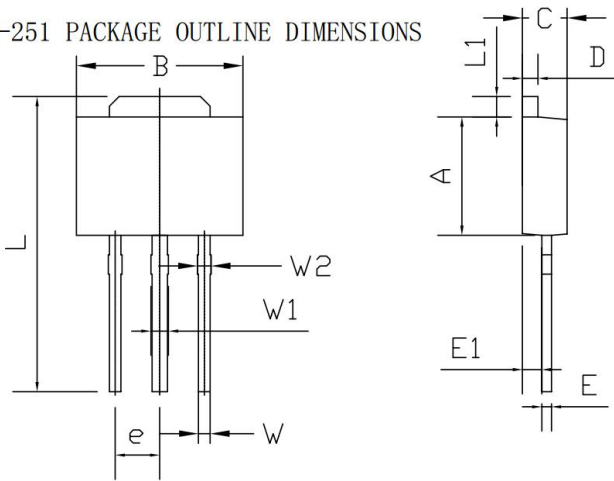
**TO-220M PACKAGE OUTLINE DIMENSIONS**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
	MIN	MAX	MIN	MAX
A	7.55	8.05	0.297	0.317
B	9.85	10.25	0.388	0.404
C	4.20	4.80	0.165	0.189
D	3.20	3.60	0.126	0.142
E	0.42	0.47	0.017	0.019
L	15.20	15.60	0.598	0.614
H	2.52	2.56	0.099	0.101
W	0.78	0.88	0.031	0.035
Φ	3.60	3.90	0.142	0.154
R	0.72	0.78	0.028	0.031
Ra	9.00	10.5	0.354	0.413
d	1.10	1.40	0.043	0.055
L1	9.3	9.7	0.366	0.382
L2	13.00	13.60	0.512	0.535
L3	1.20	1.70	0.047	0.067
L4	2.60	3.0	0.102	0.118
W1	1.10	1.50	0.043	0.059

**TO-220F PACKAGE OUTLINE DIMENSIONS**


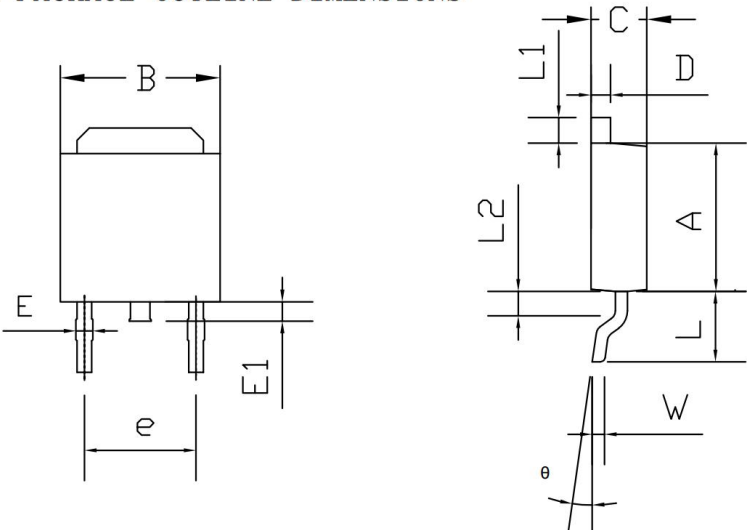
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	10.00	10.50	0.394	0.413
C	4.30	4.90	0.169	0.193
D	2.30	2.70	0.091	0.106
L	15.55	16.15	0.612	0.636
h	0.40	0.60	0.016	0.024
L1	3.15	3.55	0.124	0.140
L2	12.65	13.35	0.498	0.526
W	0.70	0.90	0.028	0.035
W1	1.15	1.55	0.045	0.061
H	2.54 TYP		0.100 TYP	
E	0.48	0.53	0.019	0.021
Φ	2.90	3.40	0.114	0.134
E1	2.40	2.90	0.094	0.114
F	7.75	8.25	0.305	0.325
F1	7.35	7.85	0.289	0.309

TO-251 PACKAGE OUTLINE DIMENSIONS

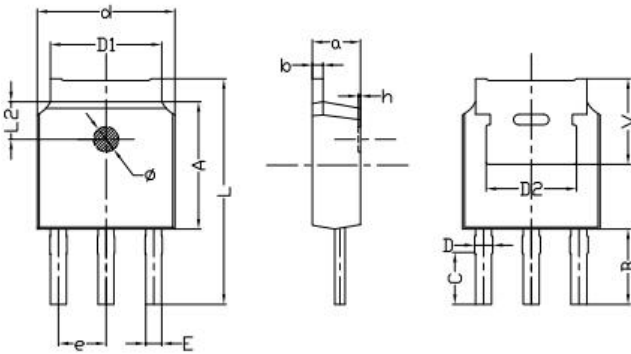


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	6.00	6.20	0.236	0.244
B	2.25	2.35	0.089	0.093
C	2.45	2.65	0.097	0.104
D	0.75	0.85	0.030	0.033
E	8.48	8.52	0.3341	0.3357
E1	5.10	5.46	0.201	0.215
e	2.29	2.31	0.0902	0.0910
L	15.00	15.40	0.5910	0.6068
L1	1.00	1.10	0.0394	0.0433
W	0.55	0.65	0.0217	0.0256
W1	0.85	0.95	0.0335	0.0374
W2	0.65	0.75	0.0256	0.0296

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	6.00	6.20	0.236	0.244
B	6.49	6.69	0.256	0.263
C	2.20	2.40	0.087	0.094
D	0.75	0.85	0.030	0.033
E	0.65	0.75	0.0256	0.0296
E1	0.70	0.90	0.028	0.035
e	4.58	4.62	0.1805	0.1820
L	2.85	2.95	0.112	0.116
L1	1.00	1.10	0.0394	0.0433
L2	0.70	0.90	0.0276	0.0355
W	0.48	0.52	0.019	0.020
ø	0	8	0	8

**TO-251B PACKAGE OUTLINE DIMENSIONS**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.0946
b	0.46	0.58	0.018	0.023
C	2.45	2.65	0.097	0.104
D	0.80	0.90	0.032	0.035
d	6.50	6.70	0.2561	0.2640
D1	5.10	5.46	0.201	0.215
D2	4.73	4.93	0.1864	0.1942
A	6.00	6.20	0.2364	0.2443
e	2.186	2.386	0.0861	0.0940
L	10.40	11.00	0.4098	0.4334
B	3.50	3.70	0.1379	0.1458
L2	1.50	1.70	0.0591	0.0670
Φ	1.10	1.30	0.0433	0.0512
h	0.00	0.30	0.0000	0.0118
V	5.25	5.45	0.2069	0.2147
E	0.60	0.80	0.0236	0.0315

### 9 Attentions

- Jiangsu Donghai Semiconductor Co.,Ltd. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
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- Product promotion is endless, our company will be dedicated to provide customers with better products.

### 10 Appendix

Revision history:

Date	REV.	Description	Page
2017.09.5	1.0	Original	
2022.1.20	1.1	Modify company name	ALL
2022.7.25	1.2	Add profile (251B)	1, 6 page