



12A TRIACS

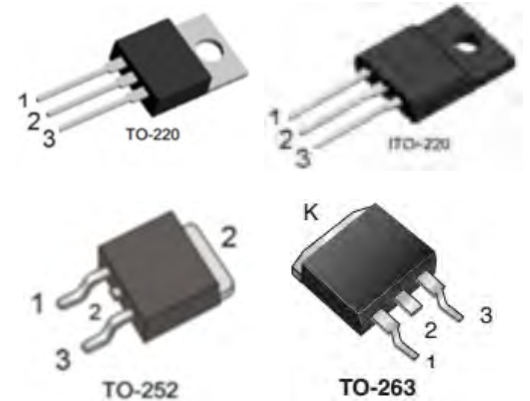
BTB12x Series

Description

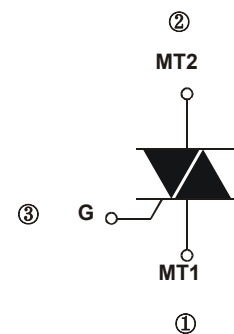
Available either in through-hole or surface-mount packages, the BTB12 triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers,...

Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}/V_{RRM}	600 and 800	V



Symbol



ORDERING INFORMATION

	BT	B	12	-	600	BW
Triac series						
Insulation B = non insulated						
Current 12 = 12A						
Voltage 600 = 600V 800 = 800V						
Sensitivity and type SW = $I_{GT1-3} < 10mA$ BW = $I_{GT1-3} < 50mA$ CW = $I_{GT1-3} < 35mA$ TW = $I_{GT1-3} < 5mA$ B = $I_{GT1-3} < 50mA, I_{GT} < 100mA$ C = $I_{GT1-3} < 25mA, I_{GT} < 50mA$ D = $I_{GT1-3} < 5mA, I_{GT} < 10mA$ E = $I_{GT1-3} < 10mA, I_{GT} < 25mA$						



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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_{DRM}	Repetitive peak off-state voltage	$T_j = 25^\circ\text{C}$	600/800	V
V_{RRM}	Repetitive peak reverse voltage			
$I_{T(RMS)}$	RMS on-state current (full sine wave)	$T_C = 105^\circ\text{C}$	12	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	$F = 50\text{ Hz}$ $t = 20\text{ ms}$	120	A
		$F = 60\text{ Hz}$ $t = 16.7\text{ ms}$	126	
I^2t	2t Value for fusing	$t_p = 10\text{ ms}$	78	A^2s
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$	$F = 120\text{ Hz}$ $T_j = 125^\circ\text{C}$	50	$\text{A}/\mu\text{s}$
I_{GM}	Peak gate current	$t_p = 20\text{ }\mu\text{s}$ $T_j = 125^\circ\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation	$T_j = 125^\circ\text{C}$	1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 125	$^\circ\text{C}$

Tables 4: Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

SNUBBERLESS and Logic Level (3 quadrants)

Symbol	Test Conditions	Quadrant		Value				Unit
				TW	SW	CW	BW	
$I_{GT}(1)$	$V_D = 12\text{ V}$ $R_L = 30\text{ }\Omega$	I - II - III	MAX.	5	10	35	50	mA
V_{GT}		I - II - III	MAX.	1.3				V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3\text{ k}\Omega$ $T_j = 125^\circ\text{C}$	I - II - III	MIN.	0.2				V
$I_H(2)$	$I_T = 100\text{ mA}$		MAX.	10	15	35	50	mA
I_L	$I_G = 1.2 I_{GT}$	I - III	MAX.	10	25	50	70	mA
		II		15	30	60	80	
$dV/dt(2)$	$V_D = 67\% V_{DRM}$ gate open $T_j = 125^\circ\text{C}$		MIN.	20	40	400	1000	$\text{V}/\mu\text{s}$

Standard (4 quadrants)

Symbol	Test Conditions	Quadrant		Value				Unit
				B	C	D	E	
$I_{GT}(1)$	$V_D = 12\text{ V}$ $R_L = 30\text{ }\Omega$	I - II - III IV	MAX.	50 100	25 50	5 10	10 25	mA
V_{GT}		ALL	MAX.	1.3				V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3\text{ k}\Omega$ $T_j = 125^\circ\text{C}$	ALL	MIN.	0.2				V
$I_H(2)$	$I_T = 500\text{ mA}$		MAX.	50	25	10	15	mA
I_L	$I_G = 1.2 I_{GT}$	I - III - IV	MAX.	50	40	10	25	mA
		II		100	80	15	30	
$dV/dt(2)$	$V_D = 67\% V_{DRM}$ gate open $T_j = 125^\circ\text{C}$		MIN.	400	200	10	20	$\text{V}/\mu\text{s}$



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Static Characteristics

Symbol	Test Conditions			Value	Unit
V _{TM} (2)	I _{TM} = 17 A t _p = 380 μs	T _j = 25°C	MAX.	1.55	V
V _{t0} (2)	Threshold voltage	T _j = 125°C	MAX.	0.85	V
R _d (2)	Dynamic resistance	T _j = 125°C	MAX.	35	mΩ
I _{DRM}	V _{DRM} = V _{RRM}	T _j = 25°C	MAX.	5	υA
I _{RRM}		T _j = 125°C		1	mA

Note 1: minimum I_{GT} is guaranteed at 5% of I_{GT} max.

Note 2: for both polarities of MT2 referenced to MT1.

Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220(Non-Ins) TO263	1.6	$^\circ\text{C/W}$
		ITO-220(Ins)	4.6	
		TO-252	2.1	

CHARACTERISTICS

Fig. 1: Maximum power dissipation versus RMS on-state current (full cycle).

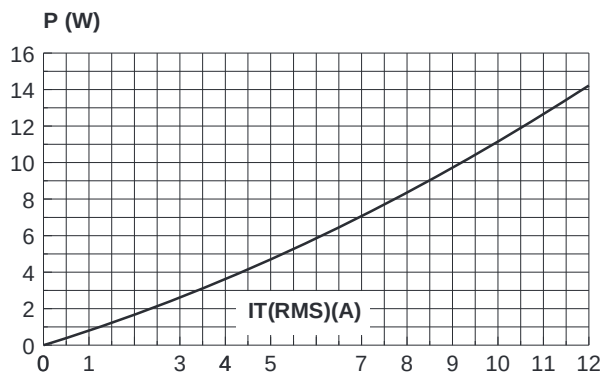


Fig. 2-1: RMS on-state current versus case temperature (full cycle).

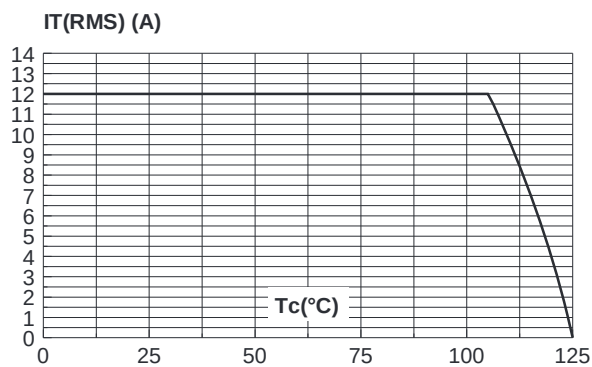




Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 μ m), full cycle.

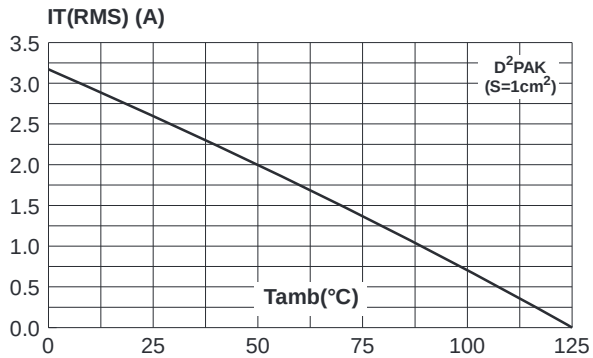


Fig. 3: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

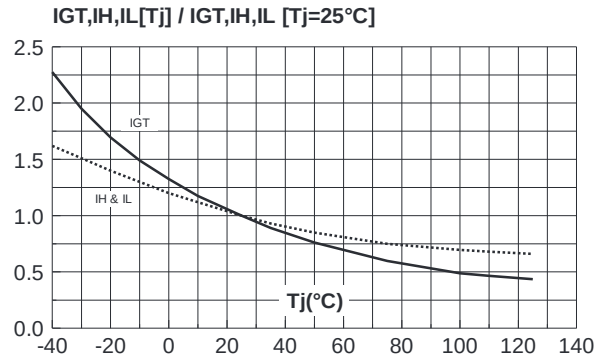


Fig. 4: On-state characteristics (maximum values).

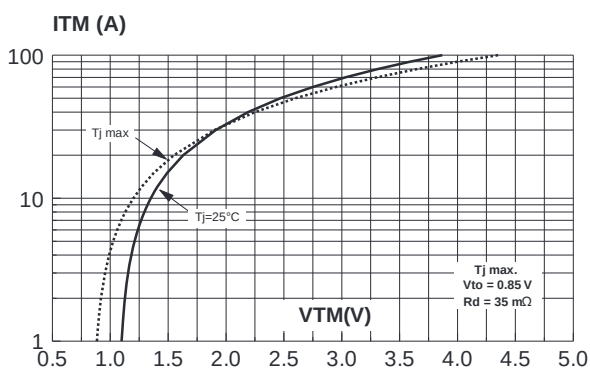
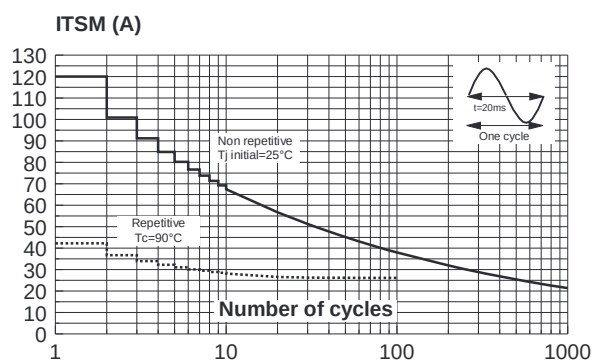


Fig. 5: Surge peak on-state current versus number of cycles.

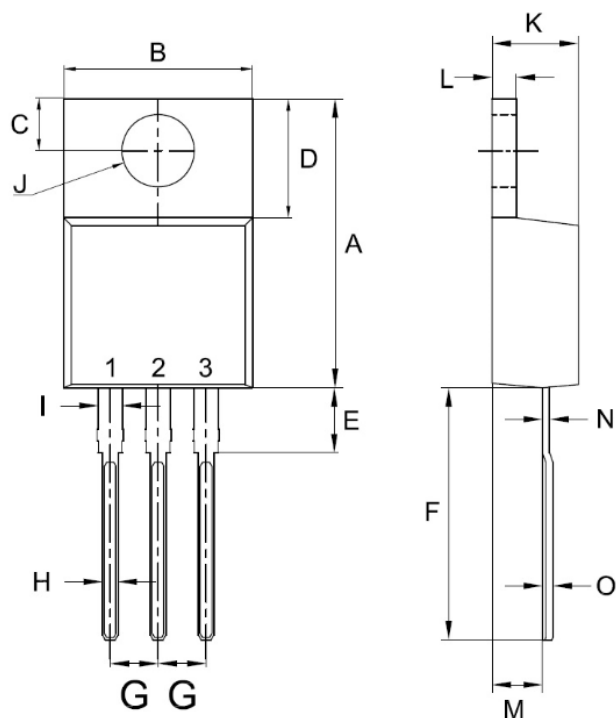




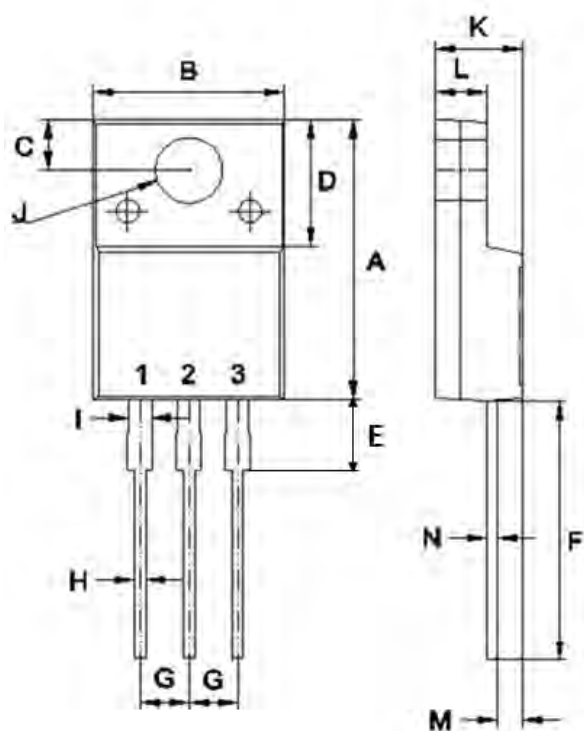
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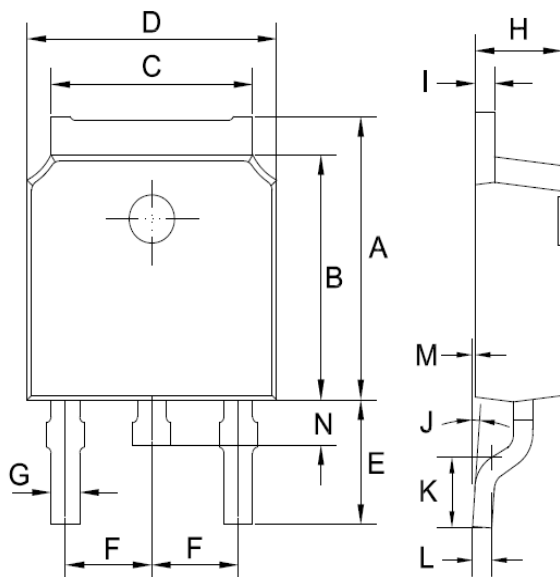
CHARACTERISTICS

**TO-220 Mechanical Drawing**

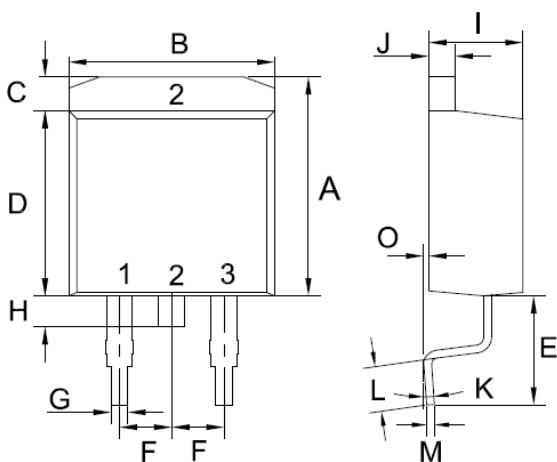
TO-220AB Unit:mm		
DIM	MIN	MAX
A	14.80	15.80
B	9.57	10.57
C	2.54	2.94
D	5.80	6.80
E	2.95	3.95
F	12.70	13.40
G	2.34	2.74
H	0.51	1.11
I	0.97	1.57
J	3.54 ϕ	4.14 ϕ
K	4.27	4.87
L	1.07	1.47
M	2.65	3.05
N	0.30	0.46
O	0.48	0.64

ITO-220AB Mechanical Drawing

ITO-220AB Unit:mm		
DIM	MIN	MAX
A	14.50	15.50
B	9.50	10.50
C	2.50	2.90
D	6.30	7.30
E	3.30	4.30
F	13.00	14.00
G	2.35	2.75
H	0.30	0.90
I	0.90	1.50
J	3.20	3.80
K	4.24	4.84
L	2.52	2.92
M	1.09	1.49
N	0.47	0.64

**TO-252 Mechanical Drawing**

TO-252 (DPAK)		
Unit:mm		
DIM	MIN	MAX
A	6.85	7.25
B	5.90	6.30
C	5.13	5.53
D	6.40	6.80
E	2.90	3.30
F	2.19	2.39
G	0.45	0.85
H	2.20	2.40
I	0.41	0.61
J	0°	8°
K	1.45	1.85
L	0.41	0.61
M	0.00	0.12
N	0.60	1.00

TO-263 Mechanical Drawing

TO-263 (D²PAK)		
Unit:mm		
DIM	MIN	MAX
A	10.44	10.84
B	9.81	10.21
C	1.44	1.84
D	8.80	9.20
E	4.46	4.66
F	2.44	2.64
G	0.61	1.01
H	0.70	1.30
I	4.27	4.87
J	1.07	1.47
K	0°	8°
L	2.10	2.50
M	0.30	0.46
O	0	0.25