

TRIACs, 16A

Snubberless, Logic Level and Standard

Features

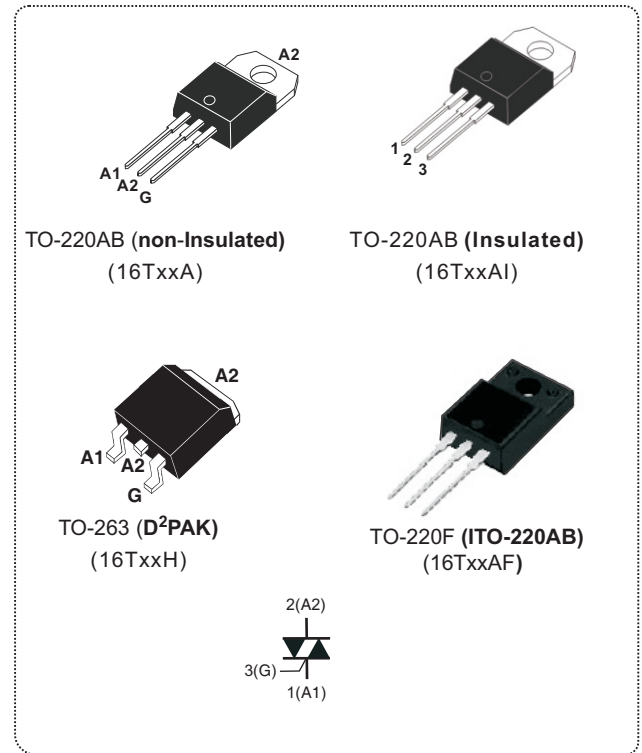
- Medium current Triac
- Low thermal resistance with clip bonding
- Low thermal resistance insulation ceramic for insulated 16T
- High commutation (4Q) or very high commutation (3Q) capability
- RoHS compliant, UL certified (File NO:E320098)
- Insulated tab (16TxxAI series, rated at 2500 V_{RMS})

Applications

- Snubberless versions (With Suffix W) especially recommended for use on inductive loads, because of their high commutation performances
- On/off or phase angle function in applications such as static relays, light dimmers and appliance motor speed controllers

Description

Available either in through-hole or surface-mount packages, the 16TxxA and 16TxxAI triacs series are suitable for general purpose mains power AC switching



SYMBOL	VALUE	UNIT
$I_{T(RMS)}$	16	A
V_{DRM}/V_{RRM}	600 to 1000	V
$I_{GT(Q1)}$	5 to 50	mA

Device summary			
SYMBOL	PARAMETER	16TxxAI ⁽¹⁾	16TxxA
$I_{T(RMS)}$	On-state RMS current	16	16
V_{DRM}/V_{RRM}	Repetitive peak off-state voltage	600/800/1000	600/800/1000
$I_{GT(Snubberless)}$	Triggering gate current	35/50	35/50
$I_{GT(Logic\ level)}$	Triggering gate current	10	10
$I_{GT(Standard)}$	Triggering gate current	25/50	25/50

Note 1: Insulated

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current (full sine wave)	$I_{T(RMS)}$	TO-220/TO-263	$T_c = 100^\circ\text{C}$	16	A
		TO-220insulate/TO-220F (ITO-220AB)	$T_c = 86^\circ\text{C}$		
Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	F = 50 Hz	t = 20 ms	160	A
		F = 60 Hz	t = 16.7 ms	168	
I^2t Value for fusing	I^2t	$t_p = 10$ ms		128	A^2s
Critical rate of rise of on-state current $I_G = 2xI_{GT}$, $t_r \leq 100\text{ns}$	di/dt	F = 100 Hz	$T_j = 125^\circ\text{C}$	50	$\text{A}/\mu\text{s}$
Peak gate current	I_{GM}	$T_p = 20$ μs	$T_j = 125^\circ\text{C}$	4	A
Average gate power dissipation	$P_{G(AV)}$	$T_j = 125^\circ\text{C}$		1	W
Storage temperature range	T_{stg}			- 40 to 150	$^\circ\text{C}$
Operating junction temperature range	T_j			- 40 to 125	

⊙ ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise specified)

SNUBBERLESS and Logic level (3 quadrants)							
SYMBOL	TEST CONDITIONS	QUADRANT		16Txxxx			Unit
				SW	CW	BW	
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$, $R_L = 33\Omega$	I - II - III	MAX.	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
$I_H^{(2)}$	$I_T = 500$ mA		MAX.	15	40	55	mA
I_L	$I_G = 1.2 I_{GT}$	I - III	MAX.	25	50	70	mA
		II		30	60	80	
$dV/dt^{(2)}$	$V_D = 67\% V_{DRM}$, gate open, $T_j = 125^\circ\text{C}$		MIN.	40	500	1000	$\text{V}/\mu\text{s}$
$(di/dt)^c^{(2)}$	$(dV/dt)_c = 0.1\text{ V}/\mu\text{s}$	$T_j = 125^\circ\text{C}$	MIN.	8.5	-	-	A/ms
	$(dV/dt)_c = 10\text{ V}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		3	-	-	
	Without snubber	$T_j = 125^\circ\text{C}$		-	8.5	14	

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

Note 2: For both polarities of A2 referenced to A1.

⊙ ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Standard (4 quadrants)							
SYMBOL	TEST CONDITIONS	QUADRANT		16Txxxx		UNIT	
				C	B		
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$, $R_L = 33\Omega$	I - II - III	MAX.	25	50	mA	
V_{GT}		IV		50	100		
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3\text{K}\Omega$, $T_j = 125^\circ\text{C}$	ALL		1.3		V	
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3\text{K}\Omega$, $T_j = 125^\circ\text{C}$	ALL		0.2		V	
$I_H^{(2)}$	$I_T = 500$ mA		MAX.	25	50	mA	
I_L	$I_G = 1.2 I_{GT}$	I - III - IV	MAX.	40	60	mA	
		II		80	120		
$dV/dt^{(2)}$	$V_D = 67\% V_{DRM}$, gate open, $T_j = 125^\circ\text{C}$		MIN.	200	400	$\text{V}/\mu\text{s}$	
$(dV/dt)^c^{(2)}$	$(di/dt)_c = 7\text{ A}/\text{ms}$, $T_j = 125^\circ\text{C}$		MIN.	5	10	$\text{V}/\mu\text{s}$	

STATIC CHARACTERISTICS					
SYMBOL	TEST CONDITIONS			VALUE	UNIT
$V_{TM}^{(2)}$	$I_{TM} = 22.5 \text{ A}$, $t_P = 380 \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.55	V
$V_{I0}^{(2)}$	Threshold voltage	$T_j = 125^\circ\text{C}$	MAX.	0.85	V
$R_d^{(2)}$	Dynamic resistance	$T_j = 125^\circ\text{C}$	MAX.	25	m Ω
I_{DRM} I_{RRM}	$V_D = V_{DRM}$ $V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	5	μA
		$T_j = 125^\circ\text{C}$		1	mA

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

Note 2: For both polarities of A2 referenced to A1.

THERMAL RESISTANCE					
SYMBOL				VALUE	UNIT
$R_{th(j-c)}$	Junction to case (AC)	TO-220AB, D ² PAK		1.2	$^\circ\text{C/W}$
		TO-220AB Insulated, TO-220F		2.1	
$R_{th(j-a)}$	Junction to ambient	$S^{(1)} = 1\text{cm}^2$	D ² PAK	45	$^\circ\text{C/W}$
			TO-220AB Insulated, TO-220AB, TO-220F	60	

Note 1: S=Copper surface under tab

PRODUCT SELECTOR						
PART NUMBER	VOLTAGE (xx)			SENSITIVITY	TYPE	PACKAGE
	600 V	800 V	1000 V			
16TxxA-B/16TxxAl-B	V	V	V	50 mA	Standard	TO-220AB
16TxxA-BW/16TxxAl-BW	V	V	V	50 mA	Snubberless	
16TxxA-C/16TxxAl-C	V	V	V	25 mA	Standard	
16TxxA-CW/16TxxAl-CW	V	V	V	35 mA	Snubberless	
16TxxA-SW/16TxxAl-SW	V	V	V	10 mA	Logic level	
16TxxH-B	V	V	V	50 mA	Standard	D ² PAK
16TxxH-C	V	V	V	25 mA	Standard	
16TxxH-SW	V	V	V	10 mA	Logic level	
16TxxH-CW	V	V	V	35 mA	Snubberless	
16TxxH-BW	V	V	V	50 mA	Snubberless	
16TxxAF-B	V	V	V	50 mA	Standard	TO-220F (ITO-220AB)
16TxxAF-C	V	V	V	25 mA	Standard	
16TxxAF-SW	V	V	V	10 mA	Logic level	
16TxxAF-CW	V	V	V	35 mA	Snubberless	
6TxxAF-BW	V	V	V	50 mA	Snubberless	

ORDERING INFORMATION					
ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
16TxxA-yy	16TxxA-yy	TO-220AB	2.0g	50	Tube
16TxxAl-yy	16TxxAl-yy	TO-220AB (insulated)	2.3g	50	Tube
16TxxAF-yy	16TxxAF-yy	TO-220F(ITO-220AB)	2.5g	50	Tube
16TxxH-yy	16TxxH-yy	TO-236(D ² PAK)	2.0g	50	Tube

Note: xx = voltage, yy = sensitivity

ORDERING INFORMATION SCHEME

	16 T 06 A - BW
Current	16 = 16A
Triac series	T
Voltage	06 = 600V 08 = 800V 10 = 1000V
Package type	A = TO-220AB (non-insulated) AI = TO-220AB (insulated) AF = TO-220F (ITO-220AB, insulated) H = TO-263 (D ² PAK)
IGT Sensitivity	B = 50mA Standard BW = 50mA Snubberless C = 25mA Standard CW = 35mA Snubberless SW = 10mA Logic Level

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

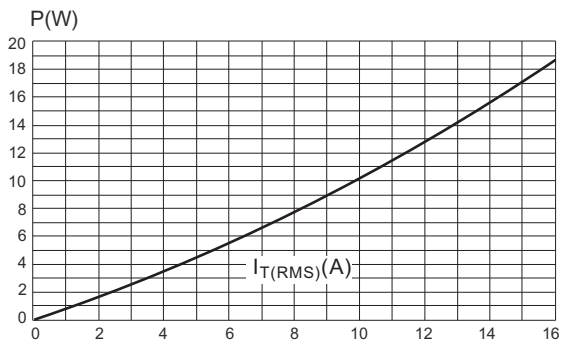


Fig.2 On-state rms current versus case temperature (full cycle)

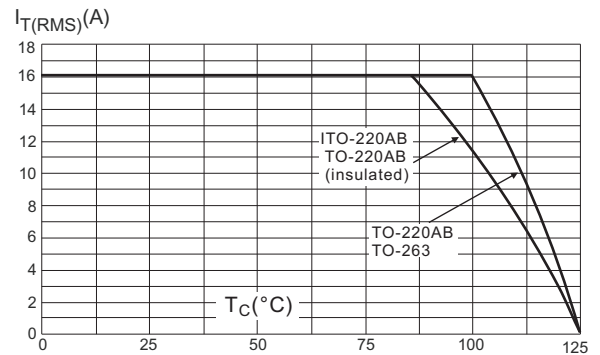


Fig.3 On-state current versus ambient temperature (full cycle)

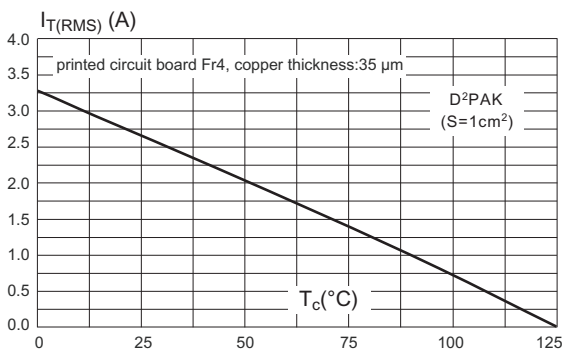


Fig.4 Relative variation of thermal impedance versus pulse duration

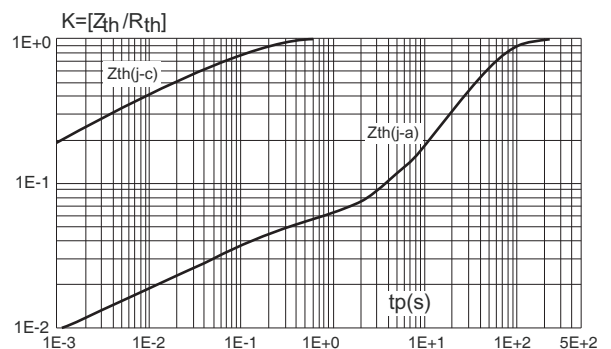


Fig.5 On-state characteristics (maximum values)

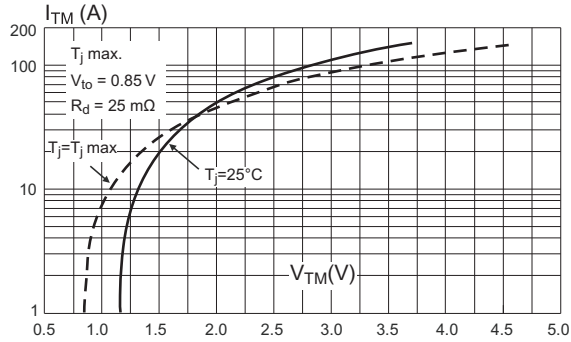


Fig.6 surge peak on-state current versus number of cycles

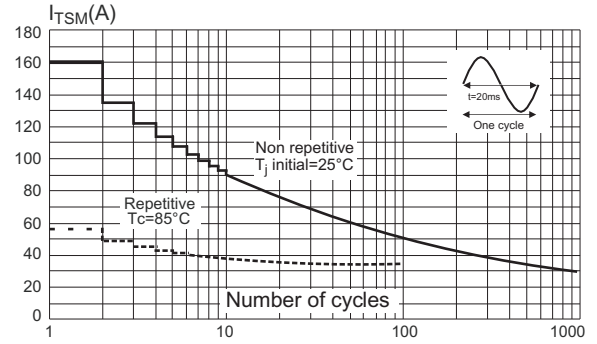


Fig.7. Non-repetitive surge peak on-state current for a sinusoidal

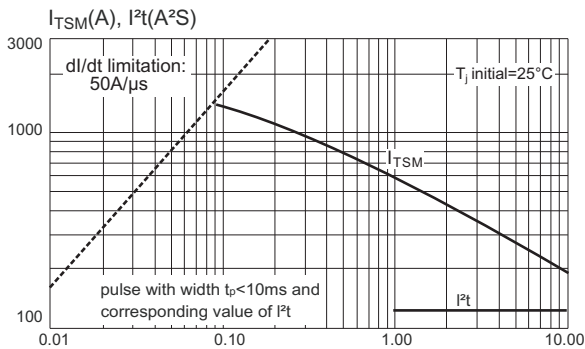


Fig.8 Relative variation of gate trigger current

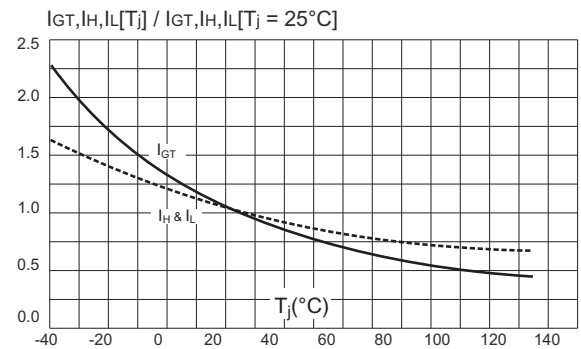


Fig.9 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)

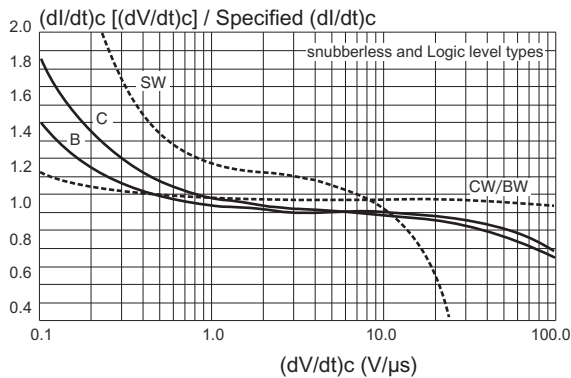


Fig.10 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)

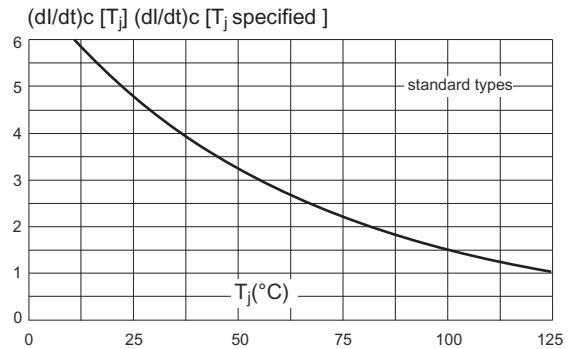
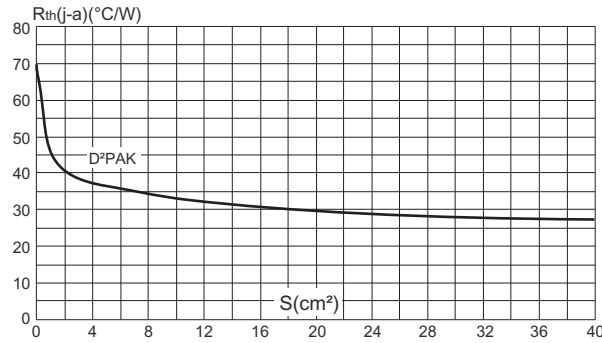
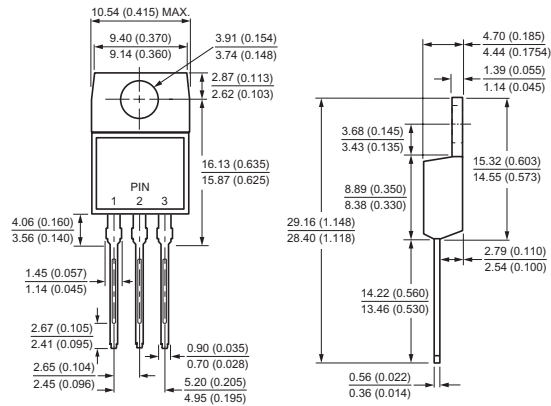


Fig.11 D²PAK thermal resistance junction to ambient versus copper surface under tab (printed circuit FR4, copper thickness: 35μm)

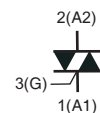
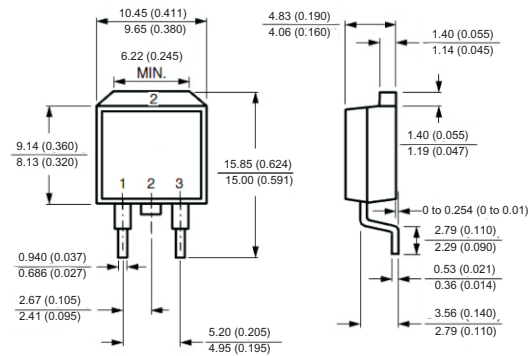


Case Style

TO-220AB



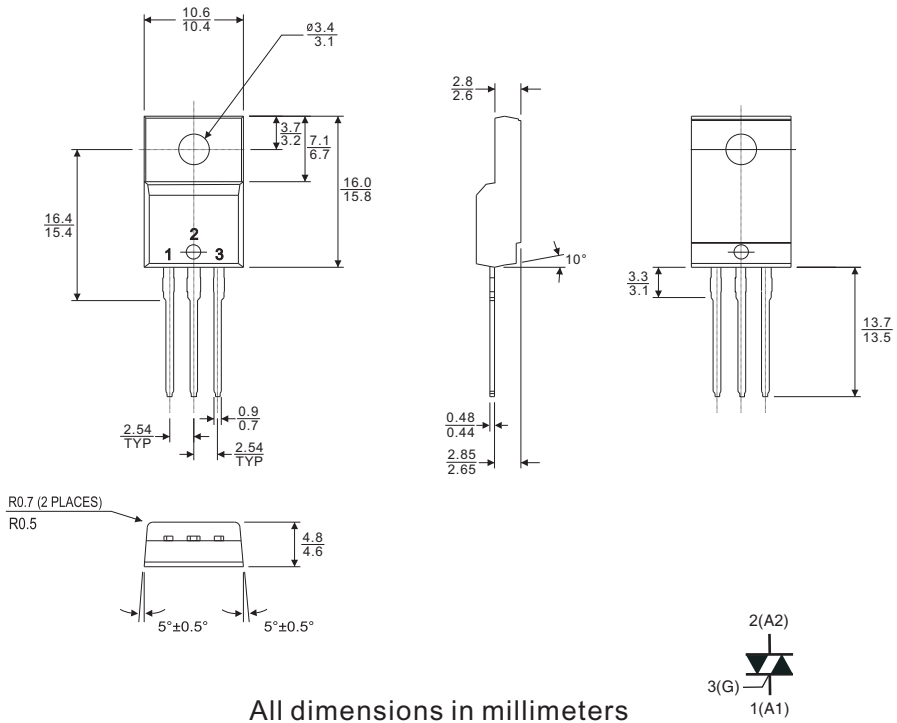
TO-263(D²PAK)



All dimensions in millimeters(inches)

Case Style

ITO-220AB



All dimensions in millimeters