

3 Quadrants Standard TRIAC

FEATURES

- ❑ Repetitive Peak Off-State Voltage : 600V/800V
- ❑ R.M.S On-State Current ($I_{T(RMS)} = 12A$)
- ❑ Gate Trigger Current : 50mA
- ❑ High commutation capability.

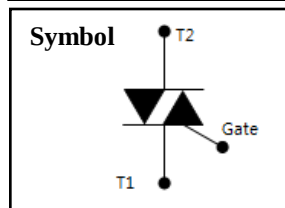
Applications

General purpose of AC switching, heating control, motor control, etc

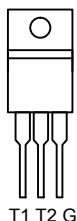
General Description

Din-Tek's standard TRIAC product is a glass passivated device, has a high commutative performance, stable gate triggering level to temperature and high off state voltage. It is generally suitable for power and phase control in ac application

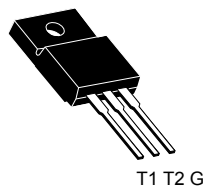
$$\begin{aligned} V_{DRM} &= 600V/800V \\ I_{T(RMS)} &= 12 A \\ I_{TSM} &= 126 A \\ I_{GT} &= 50mA \end{aligned}$$



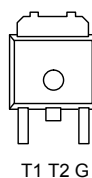
TO-220AB



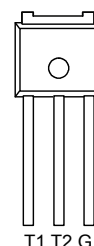
TO-220 FULLPAK



TO-252



TO-251



Absolute Maximum Ratings

($T_J = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Conditions	Ratings		Unit
			DTJ12A60	DTJ12A80	
V_{DRM}	Repetitive Peak Off-State Voltage	Sine wave, 50/60Hz, Gate open	600	800	V
V_{RRM}	Repetitive Peak Reverse Voltage		600	800	V
$I_{T(AV)}$	Average On-State Current	Full sine wave, $T_C = 97.6^\circ C$	10.8		A
$I_{T(RMS)}$	R.M.S. On-State Current		12		A
I_{TSM}	Surge On-State Current	½ cycle, 50Hz/60Hz, Sine wave, Non repetitive	120/126		A
I^2t	Fusing Current	$t = 10ms$	72		A ² S
P_{GM}	Forward Peak Gate Power Dissipation	$T_J = 125^\circ C$	5		W
$P_{G(AV)}$	Forward Average Gate Power Dissipation	$T_J = 125^\circ C$, over any 20ms	0.5		W
I_{FGM}	Forward Peak Gate Current	$T_J = 125^\circ C$, pulse width $\leq 20\mu s$	2		A
V_{RGM}	Reverse Peak Gate Voltage	$T_J = 125^\circ C$, pulse width $\leq 20\mu s$	5		V
T_J	Operating Junction Temperature		-40~+150		$^\circ C$
T_{STG}	Storage Temperature		-40~+150		$^\circ C$

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{DRM}	Repetitive Peak Off-State Current	$V_D = V_{\text{DRM}}$	$T_J=25^\circ\text{C}$	-	-	50 μA
			$T_J=125^\circ\text{C}$	-	-	5 mA
I_{RRM}	Repetitive Peak Reverse Current	$V_D = V_{\text{DRM}}$	$T_J=25^\circ\text{C}$	-	-	50 μA
			$T_J=125^\circ\text{C}$	-	-	5 mA
I_{GT}	Gate Trigger Current	$V_D = 12\text{V}$, $R_L=330\Omega$	1+, 1-, 3-	-	-	50 mA
V_{GT}	Gate Trigger Voltage	$V_D = 12\text{V}$, $R_L=330\Omega$	1+, 1-, 3-	-	-	2.0 V
V_{GD}	Non-Trigger Gate Voltage ¹	$V_D = 12\text{V}$, $R_L=330\Omega$, $T_J=125^\circ\text{C}$	0.2	-	-	V
V_{TM}	Peak On-State Voltage	$I_T = 17\text{A}$, $I_G = 20\text{mA}$	-	1.2	1.65	V
dv/dt	Critical Rate of Rise of Off-State Voltage	$V_D = 2/3 V_{\text{DRM}}$, $T_J=125^\circ\text{C}$	200	-	-	$\text{V}/\mu\text{s}$
I_H	Holding current	$I_T = 0.2\text{A}$	-	40	-	mA

Notes :

1. Pulse Width $\leq 1.0\text{ms}$, Duty Cycle $\leq 1\%$

Thermal Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{\theta\text{JC}}$	Thermal Resistance	Junction to Case			2.5	$^\circ\text{C}/\text{W}$
$R_{\theta\text{JA}}$	Thermal Resistance	Junction to Ambient			58	$^\circ\text{C}/\text{W}$

Typical Characteristics

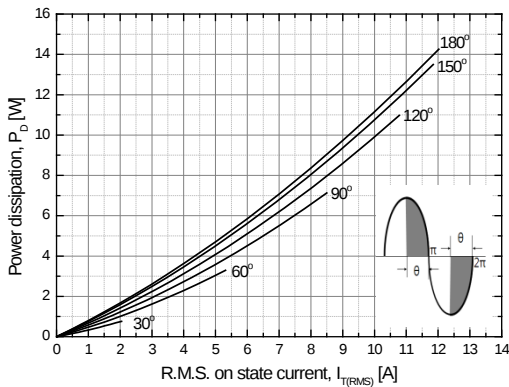


Fig 1. R.M.S. current vs. Power dissipation

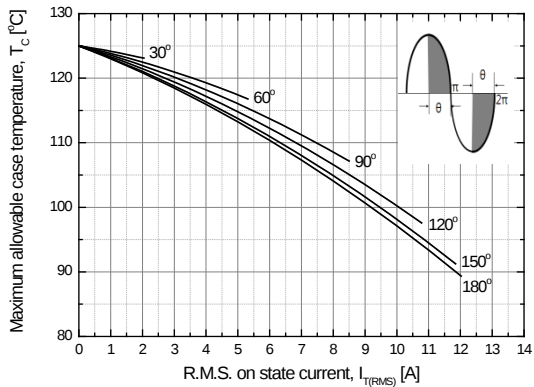


Fig 2. R.M.S. current vs. Case temperature

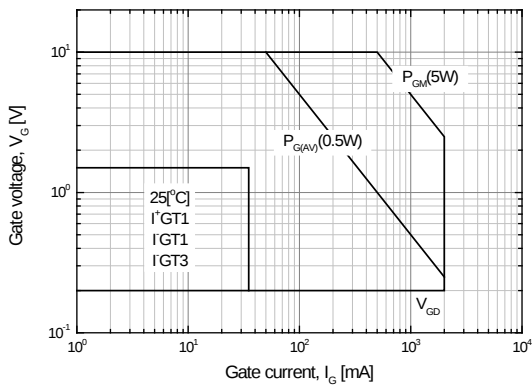
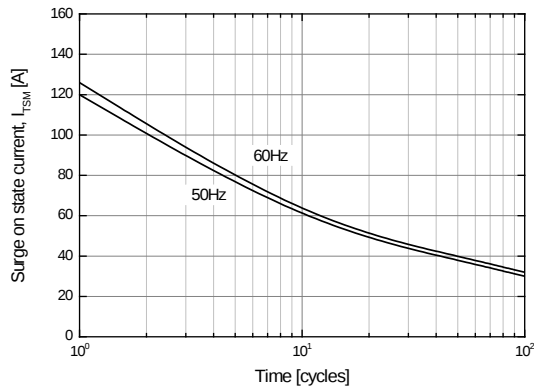
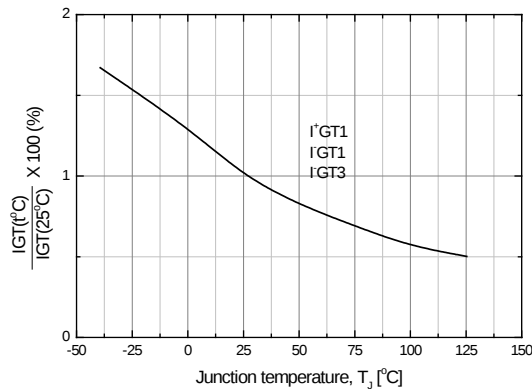


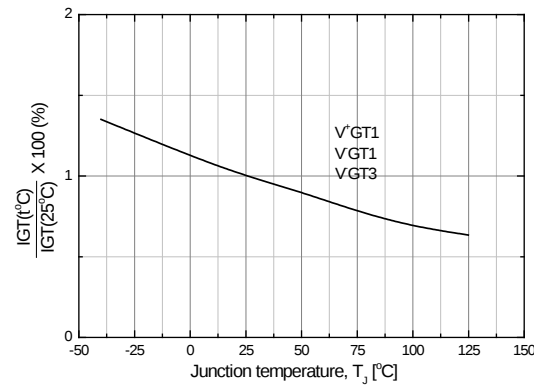
Fig 3. Gate power characteristics



**Fig 4. Surge on state current rating
(Non-repetitive)**



**Fig 5. Gate trigger current vs.
junction temperature**



**Fig 6. Gate trigger voltage vs.
junction temperature**

Typical Characteristics

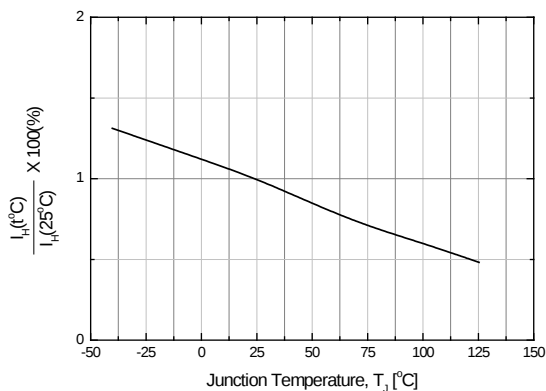


Fig 7. Holding current vs. Junction temperature

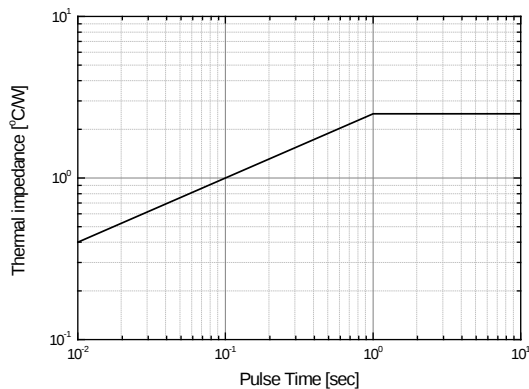


Fig 8. Thermal Impedance vs. pulse time

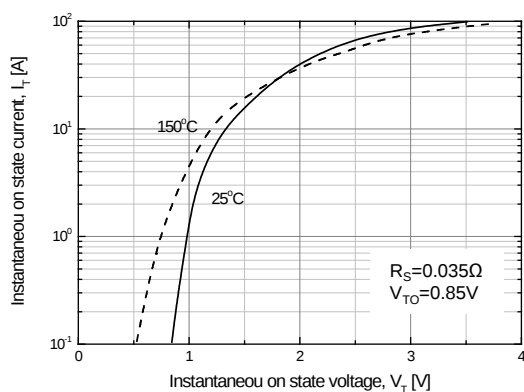
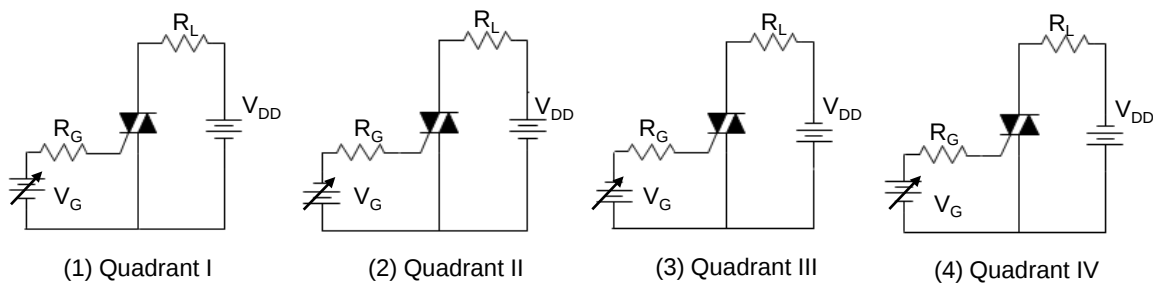


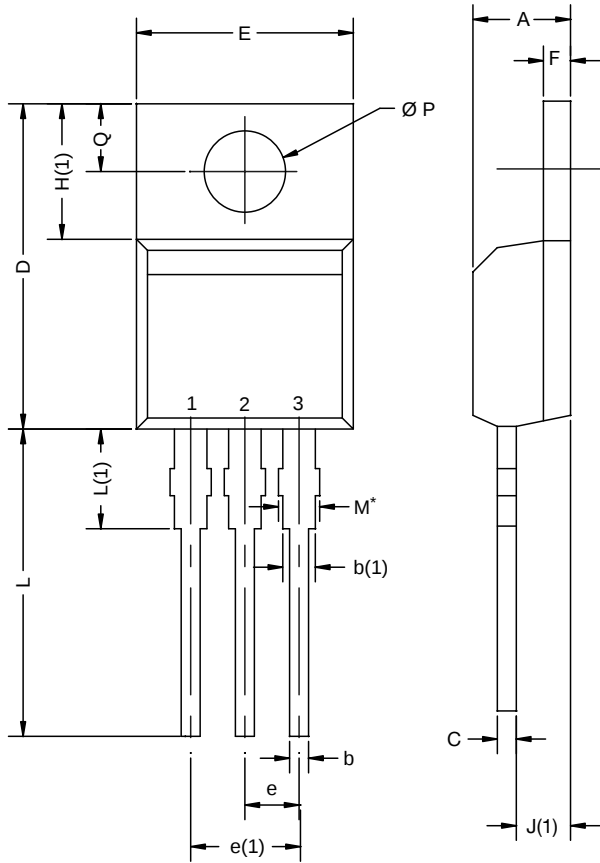
Fig 9. Instantaneous on state current vs. Instantaneous on state voltage

Measurement of gate trigger current



Note. Whole parameter and test condition can not be over absolute maximum ratings in this datasheet.

TO-220AB



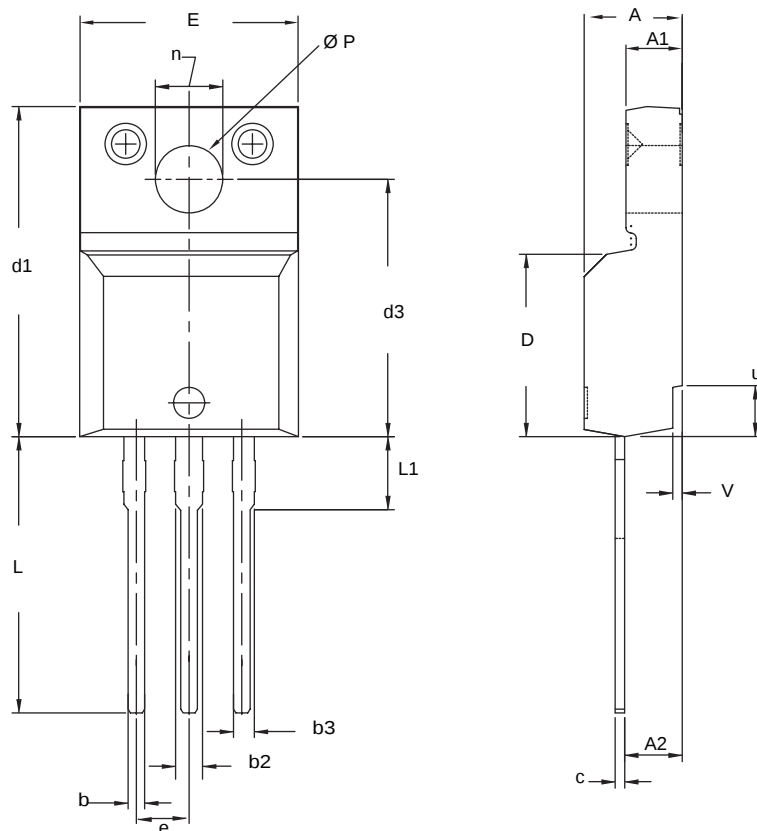
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
$\varnothing P$	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118

ECN: X12-0208-Rev. N, 08-Oct-12
DWG: 5471

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion)
Heatsink hole for HVM

TO-220 FULLPAK (HIGH VOLTAGE)



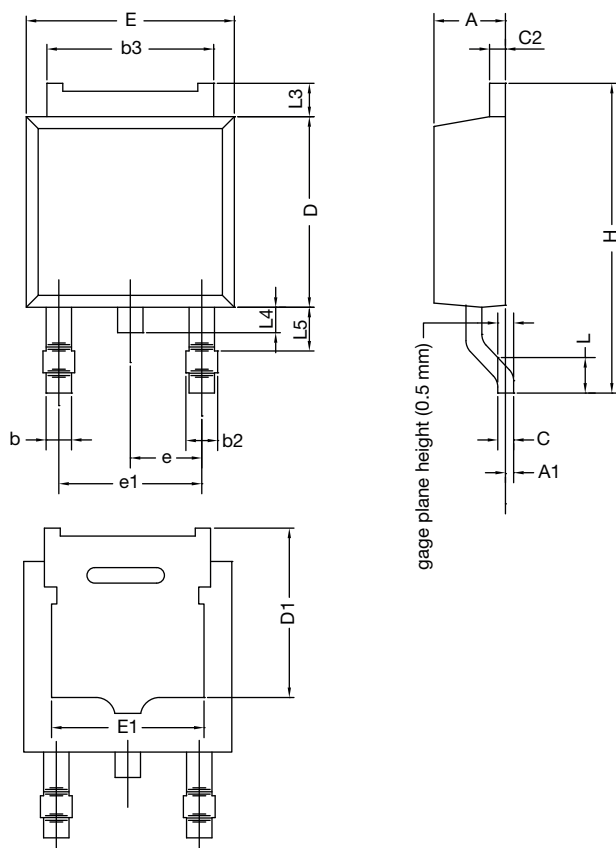
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.570	4.830	0.180	0.190
A1	2.570	2.830	0.101	0.111
A2	2.510	2.850	0.099	0.112
b	0.622	0.890	0.024	0.035
b2	1.229	1.400	0.048	0.055
b3	1.229	1.400	0.048	0.055
c	0.440	0.629	0.017	0.025
D	8.650	9.800	0.341	0.386
d1	15.88	16.120	0.622	0.635
d3	12.300	12.920	0.484	0.509
E	10.360	10.630	0.408	0.419
e	2.54 BSC		0.100 BSC	
L	13.200	13.730	0.520	0.541
L1	3.100	3.500	0.122	0.138
n	6.050	6.150	0.238	0.242
Ø P	3.050	3.450	0.120	0.136
u	2.400	2.500	0.094	0.098
v	0.400	0.500	0.016	0.020

ECN: X09-0126-Rev. B, 26-Oct-09
DWG: 5972

Notes

1. To be used only for process drawing.
2. These dimensions apply to all TO-220, FULLPAK leadframe versions 3 leads.
3. All critical dimensions should C meet $C_{pk} > 1.33$.
4. All dimensions include burrs and plating thickness.
5. No chipping or package damage.

TO-252AA CASE OUTLINE

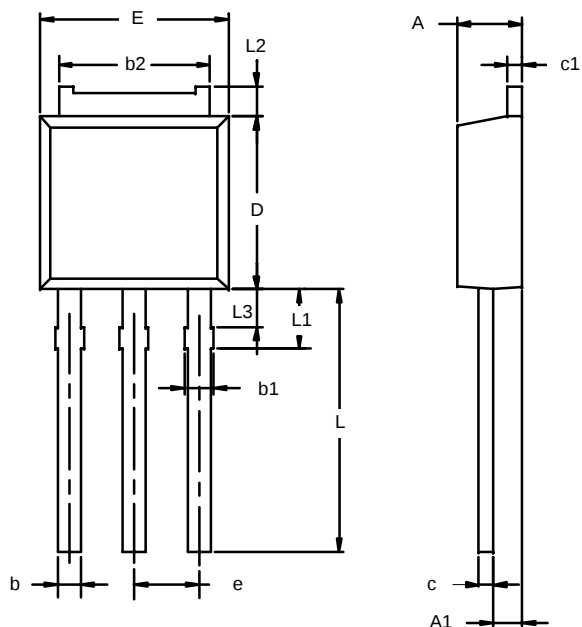


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060
ECN: X12-0247-Rev. M, 24-Dec-12				
DWG: 5347				

Note

- Dimension L3 is for reference only.

TO-251AA (DPAK)



Note: Dimension L3 is for reference only.

Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	2.21	2.38	0.087	0.094
A1	0.89	1.14	0.035	0.045
b	0.71	0.89	0.028	0.035
b1	0.76	1.14	0.030	0.045
b2	5.23	5.43	0.206	0.214
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.48	6.73	0.255	0.265
e	2.28 BSC		0.090 BSC	
L	8.89	9.53	0.350	0.375
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060
ECN: S-03946—Rev. E, 09-Jul-01 DWG: 5346				

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