

## 3 Quadrants Standard TRIAC

### FEATURES

- ❑ Repetitive Peak Off-State Voltage : 600V/800V
- ❑ R.M.S On-State Current ( $I_{T(RMS)} = 20A$ )
- ❑ Gate Trigger Current : 50mA
- ❑ High commutation capability.

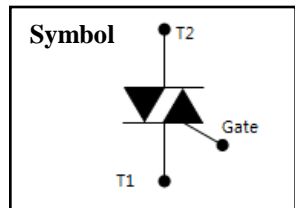
### Applications

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

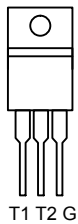
### General Description

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

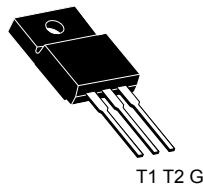
$V_{DRM} = 600V/800V$
$I_{T(RMS)} = 20 A$
$I_{TSM} = 258 A$
$I_{GT} = 50mA$



TO-220AB



TO-220 FULLPAK



TO-247AC



### Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ unless otherwise specified )

Symbol	Parameter	Conditions	Ratings		Unit
			DTJ20A60	DTJ20A80	
$V_{DRM}$	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, $T_C = 97.6^\circ\text{C}$	18.5		A
$I_{T(RMS)}$	R.M.S. On-State Current		20		A
$I_{TSM}$	Surge On-State Current	½ cycle, 50Hz/60Hz, Sine wave, Non repetitive	250/258		A
$I^2t$	Fusing Current	$t = 10\text{ms}$	152		A <sup>2</sup> S
$P_{GM}$	Forward Peak Gate Power Dissipation	$T_J = 125^\circ\text{C}$	5		W
$P_{G(AV)}$	Forward Average Gate Power Dissipation	$T_J = 125^\circ\text{C}$ , over any 20ms	1		W
$I_{FGM}$	Forward Peak Gate Current	$T_J = 125^\circ\text{C}$ , pulse width $\leq 20\mu\text{s}$	2		A
$V_{RGM}$	Reverse Peak Gate Voltage	$T_J = 125^\circ\text{C}$ , pulse width $\leq 20\mu\text{s}$	10		V
$T_J$	Operating Junction Temperature		-40~+150		$^\circ\text{C}$
$T_{STG}$	Storage Temperature		-40~+150		$^\circ\text{C}$

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

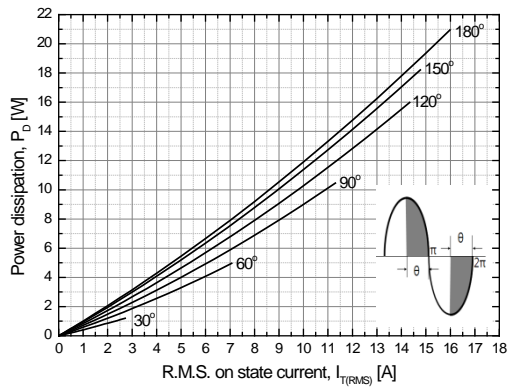
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$I_{DRM}$	Repetitive Peak Off-State Current	$V_D = V_{DRM}$	$T_J=25^\circ\text{C}$	-	-	50	$\mu\text{A}$
			$T_J=125^\circ\text{C}$	-	-	5	$\text{mA}$
$I_{RRM}$	Repetitive Peak Reverse Current	$V_D = V_{DRM}$	$T_J=25^\circ\text{C}$	-	-	50	$\mu\text{A}$
			$T_J=125^\circ\text{C}$	-	-	5	$\text{mA}$
$I_{GT}$	Gate Trigger Current	$V_D = 12\text{V}, R_L=330\Omega$	1+, 1-, 3-	-	-	50	$\text{mA}$
$V_{GT}$	Gate Trigger Voltage	$V_D = 12\text{V}, R_L=330\Omega$	1+, 1-, 3-	-	-	2.0	$\text{V}$
$V_{GD}$	Non-Trigger Gate Voltage <sup>1</sup>	$V_D = 12\text{V}, R_L=330\Omega, T_J=125^\circ\text{C}$		0.2	-	-	$\text{V}$
$V_{TM}$	Peak On-State Voltage	$I_T = 23\text{A}, I_G = 50\text{mA}$		-	1.2	1.6	$\text{V}$
dv/dt	Critical Rate of Rise of Off-State Voltage	$V_D = 2/3 V_{DRM}, T_J=125^\circ\text{C}$		200	-	-	$\text{V}/\mu\text{s}$
$I_H$	Holding current	$I_T = 0.2\text{A}$		-	50	-	$\text{mA}$

**Notes :**

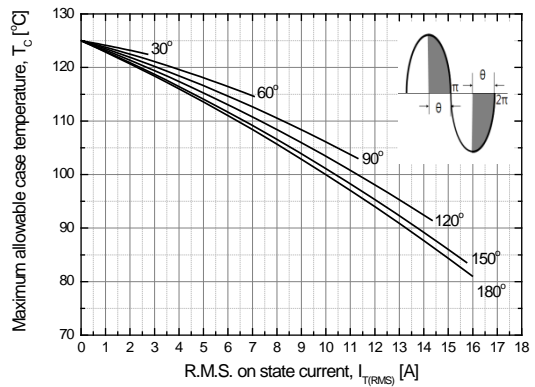
 1. Pulse Width  $\leq 1.0\text{ms}$ , Duty Cycle  $\leq 1\%$ 
**Thermal Characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	Junction to Case			2.1	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance	Junction to Ambient			58	$^\circ\text{C}/\text{W}$

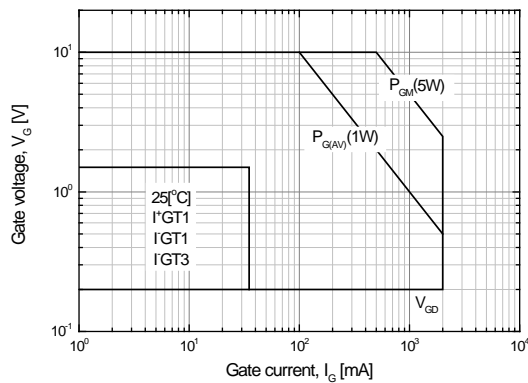
**Typical Characteristics**



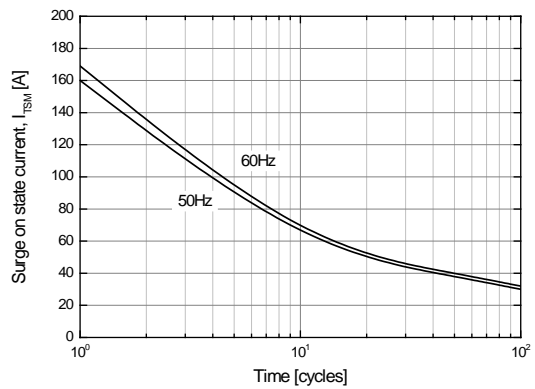
**Fig 1. R.M.S. current vs. Power dissipation**



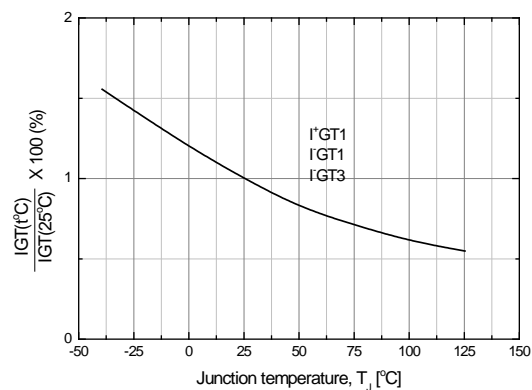
**Fig 2. R.M.S. current vs. Case temperature**



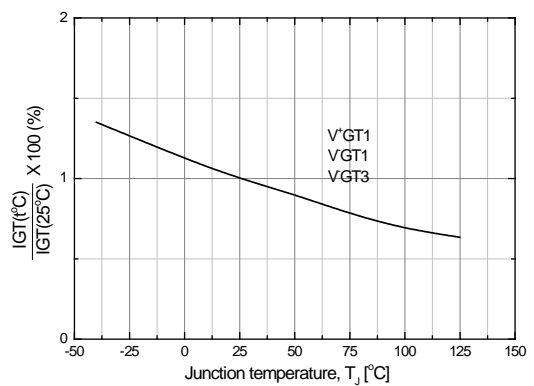
**Fig 3. Gate power characteristics**



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

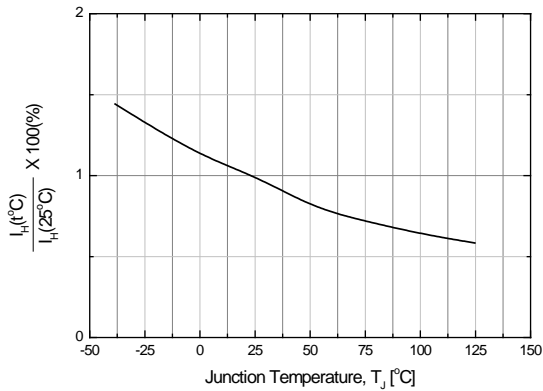


**Fig 5. Gate trigger current vs. junction temperature**

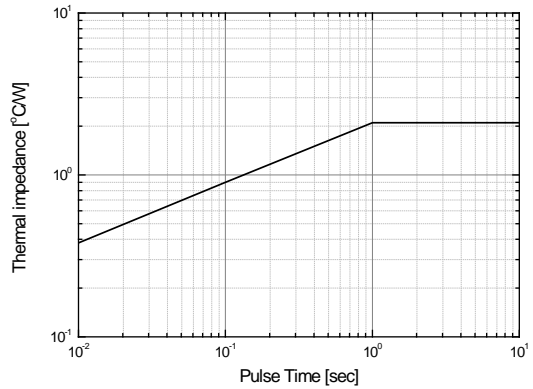


**Fig 6. Gate trigger voltage vs. junction temperature**

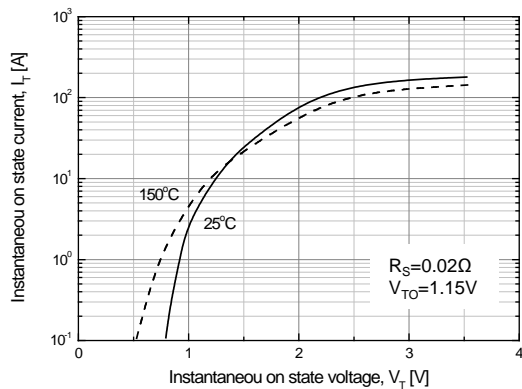
**Typical Characteristics**



**Fig 7. Holding current vs. Junction temperature**

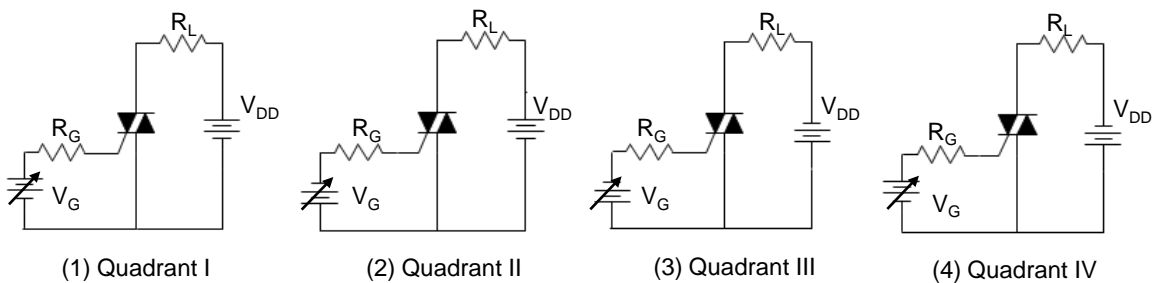


**Fig 8. Thermal Impedance vs. pulse time**



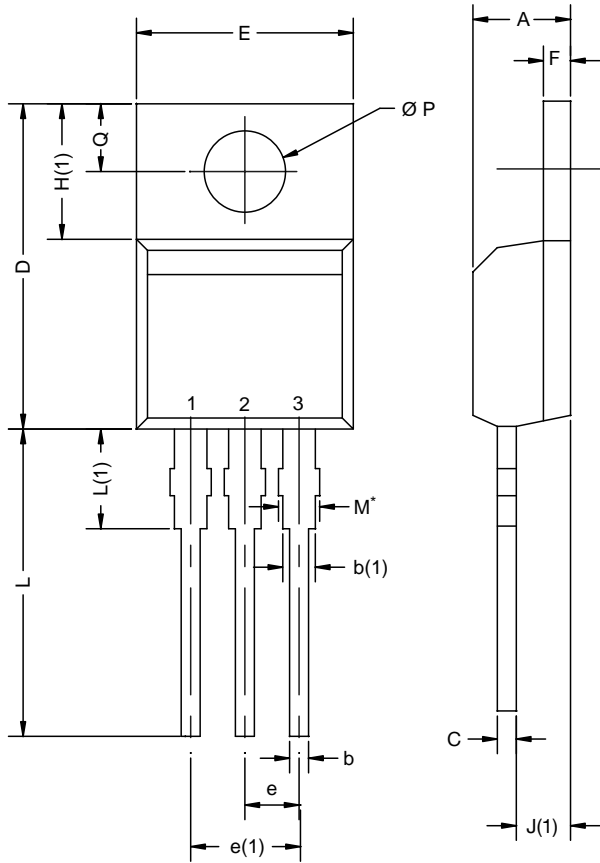
**Fig 9. Instantaneous on state current vs. Instantaneous on state voltage**

**Measurement of gate trigger current**



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

**TO-220AB**



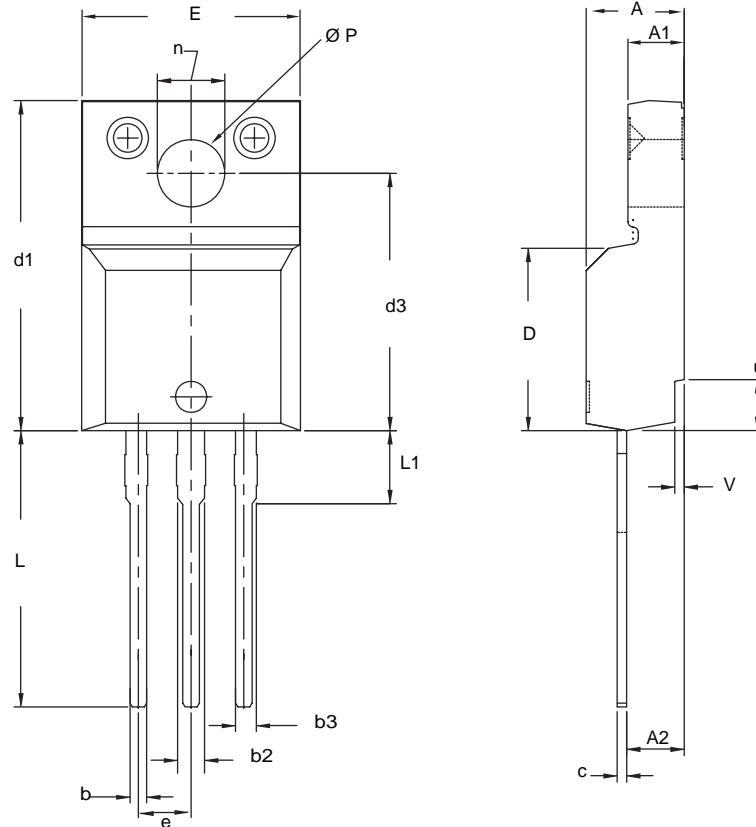
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	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
Ø 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)**



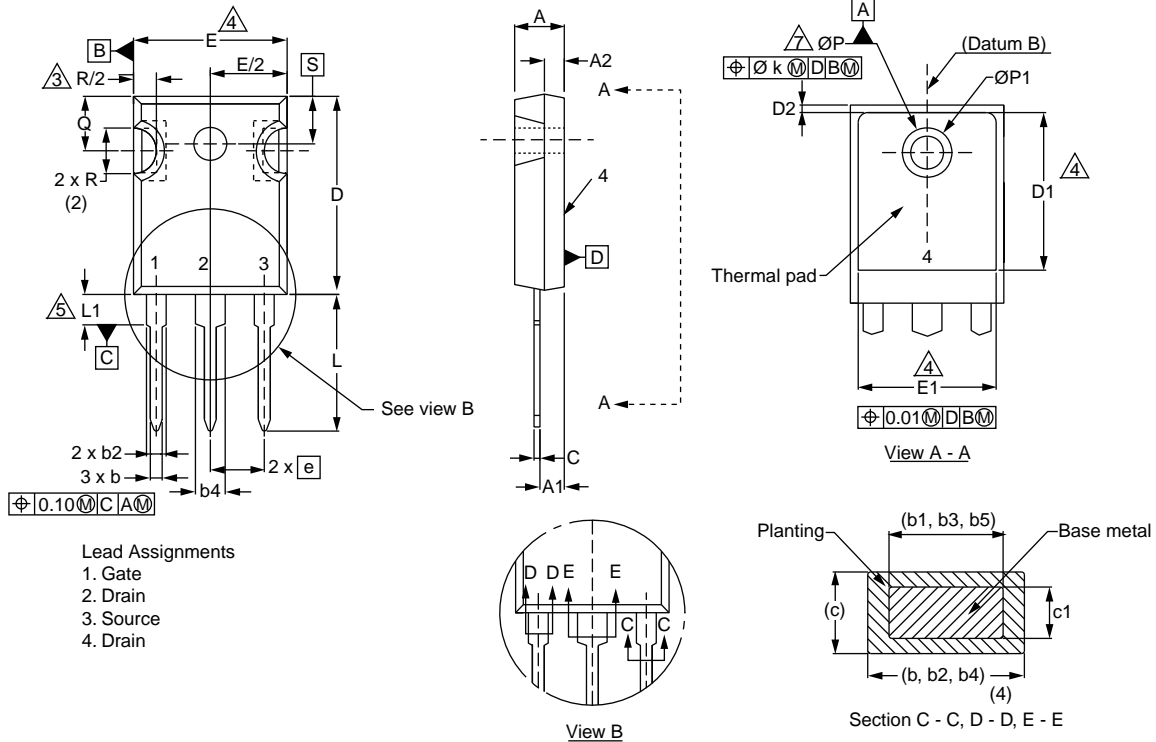
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.570	4.830	0.180	0.190
A1	2.570	2.830	0.101	0.111
A2	2.510	2.850	0.099	0.112
b	0.622	0.890	0.024	0.035
b2	1.229	1.400	0.048	0.055
b3	1.229	1.400	0.048	0.055
c	0.440	0.629	0.017	0.025
D	8.650	9.800	0.341	0.386
d1	15.88	16.120	0.622	0.635
d3	12.300	12.920	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
$\varnothing P$	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-247AC (High Voltage)**



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.58	5.31	0.180	0.209
A1	2.21	2.59	0.087	0.102
A2	1.17	2.49	0.046	0.098
b	0.99	1.40	0.039	0.055
b1	0.99	1.35	0.039	0.053
b2	1.53	2.39	0.060	0.094
b3	1.65	2.37	0.065	0.093
b4	2.42	3.43	0.095	0.135
b5	2.59	3.38	0.102	0.133
c	0.38	0.86	0.015	0.034
c1	0.38	0.76	0.015	0.030
D	19.71	20.82	0.776	0.820
D1	13.08	-	0.515	-

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D2	0.51	1.30	0.020	0.051
E	15.29	15.87	0.602	0.625
E1	13.72	-	0.540	-
e	5.46 BSC		0.215 BSC	
$\phi k$	0.254		0.010	
L	14.20	16.25	0.559	0.640
L1	3.71	4.29	0.146	0.169
N	7.62 BSC		0.300 BSC	
$\phi P$	3.51	3.66	0.138	0.144
$\phi P1$	-	7.39	-	0.291
Q	5.31	5.69	0.209	0.224
R	4.52	5.49	0.178	0.216
S	5.51 BSC		0.217 BSC	

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