

DT12T Standard Series TRIACs

DT12T Standard Series TRIACs SILICON BIDIRECTIONAL THYRISTORS

General description

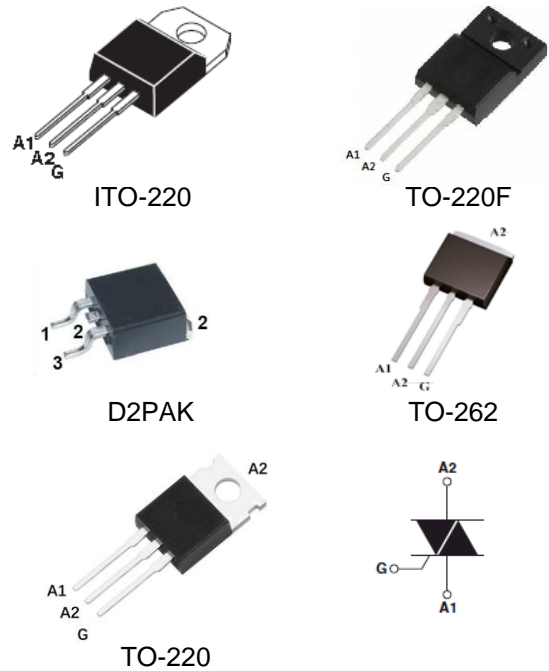
These products 12A TRIAC are packages for third quadrant, DT12T are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.

FEATURES

- Passivated die for reliability and uniformity
- Three-quadrant triggering.
- Over 800V V_{DRM}/V_{RRM}
- 125 Degree C operation temperature.
- Without snubber circuit.
- “Green” molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead free in RoHS II 2015/863/EU compliant
- Moisture sensitivity meets industry standard IPC/JEDEC J-STD-020'

APPLICATIONS

- General purpose AC switch control
- Control loads in Motor, Fan, and Pump.
- Solenoid drivers
- LED Dimming
- Inrush current limiting circuits



PIN ASSIGNMENT	
1	Main Terminal 1 (A1)
2	Main Terminal 2 (A2)
3	Gate

DT12T Standard Series TRIACs

ELECTRICAL CHARACTERISTICS (T_j = 25°C, unless otherwise specified.)

Absolute Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Peak repetitive off-state voltage (T _j = -40 to 125°C, Full sine wave, 50 to 60 Hz; Gate open) (Note 1)	V_{DRM} V_{RRM}	800	V
On-stage RMS current (Full sine wave, T _c = 100°C)	$I_{T(RMS)}$	12	A
Peak non-repetitive surge current (one full cycle 60 Hz, T _j = 25°C)	I_{TSM}	100	A
Circuit fusing consideration (t = 8.3ms)	I^2T	41.5	A ² S
Operating junction temperature range	T _j	-40 to +125	°C
Storage temperature range	T _{STG}	-40 to +150	°C

Note :

- (1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis.
Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Version 28, Jul-2021

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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)



Thermal Characteristics

PARAMETER	SYMBOL	VALUE		UNIT
Thermal resistance from junction to case, without heatsink, (1)	R _{th(j-c)}	Max	12	°C/W
Junction to ambient, without heatsink, (1)	R _{th(j-a)}	Typ	35	
Maximum lead temperature for soldering purposes (1/8" form case for 10 seconds)	T _L	Max	260	°C

Note1: without heatsink, unidirectional, continuous & full cycle.

Static Characteristics

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Threshold Voltage (T _j = 125°C)	V _{to}	--	--	0.95	V	
Dynamic resistors (T _j = 125°C)	R _d	--	--	30	mΩ	
Peak repetitive forward or reverse blocking current (V _{AK} = rated V _{DRM} and V _{RRM} , gate open)	T _j = 25°C	I _{DRM}	--	--	5	uA
	T _j = 125°C	I _{RRM}	--	--	0.5	mA

ON Characteristics

PARAMETER	SYMBOL	DT12T10	DT12T35		UNIT
Peak forward on-state voltage (I _{TM} = 12 A @ T _j = 25°C)	V _{TM}	1.5	1.5	Max	V
V _D = V _{DRM} , R _L = 100Ω, T _j = 125°C	V _{GD}	0.25	0.25	Min	V
Gate trigger current (V _{AK} = 12V, R _L = 100Ω)	I _{GT1}	10	35	Max	mA
	I _{GT2}	10	35		
	I _{GT3}	10	35		
Gate trigger voltage (V _{AK} = 12V, R _L = 100Ω)	V _{GT1}	1	1	Max	V
	V _{GT2}				
	V _{GT3}				
Holding current (V _{AK} = 12V, R _L = 100Ω)	I _{H1}	10	50	Max	mA
	I _{H3}				
Latching current (V _{AK} = 12V, R _L = 100Ω)	I _{L1}	20	50	Max	mA
	I _{L2}	30	80		
	I _{L3}	20	50		
Critical rate of rise of on-state current, T _j = 125°C	di/dt(s)	50	50	Max	A/us
V _D = 67% V _{DRM} , gate open, T _j = 125°C	dV/dt	500	3000	Max	V/us
Without snubber, T _j = 125°C	di/dt(c)	2	8	Max	A/ms
125°C, Gate open, 10V/dt	di/dt(c)	10	40	Max	A/ms

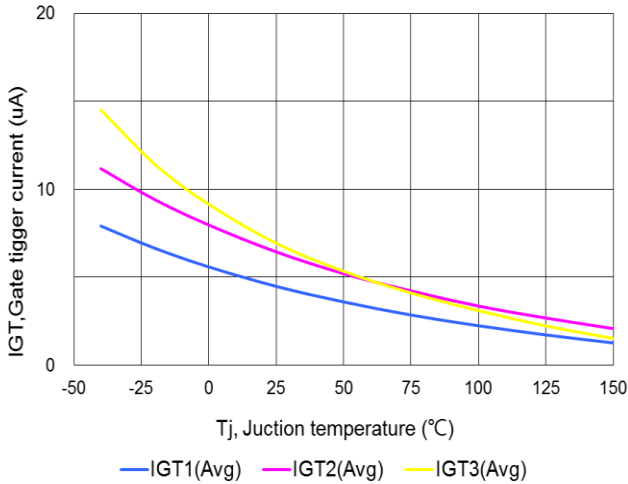
DT12T Standard Series TRIACs

CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)

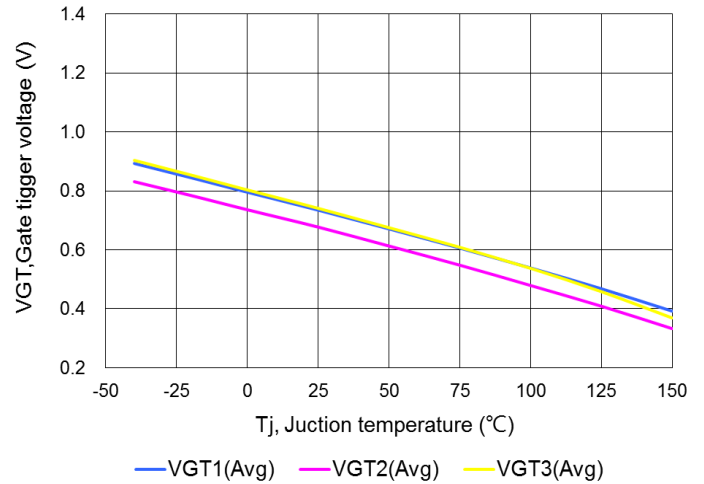


DT12T10 Characteristic

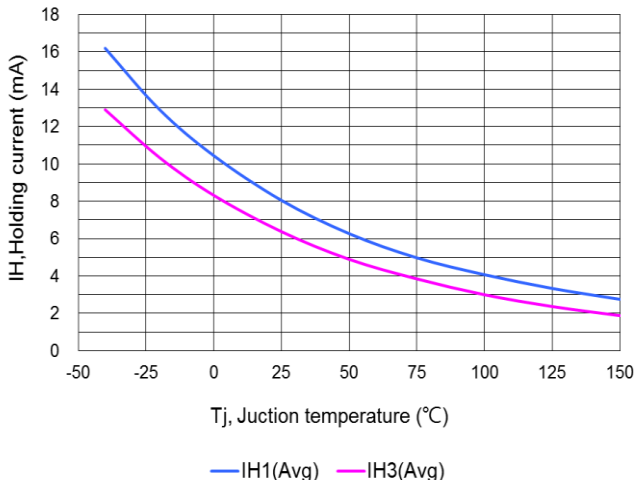
Typical gate trigger current V.S. junction temperature



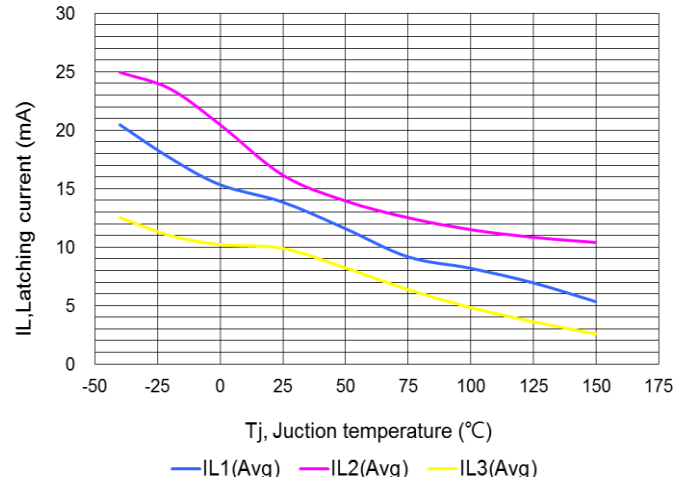
Typical gate trigger voltage V.S. junction temperature



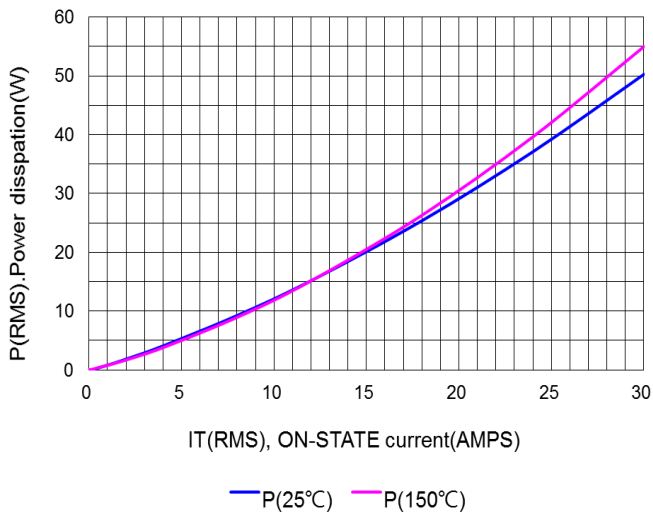
Typical holding current V.S. junction temperature



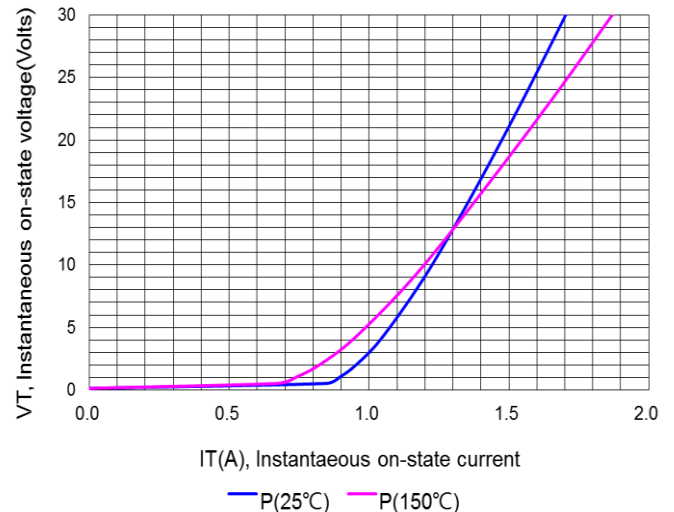
Typical latch current V.S. junction temperature



Power dissipation VS ON-STATE current



IT-VTM



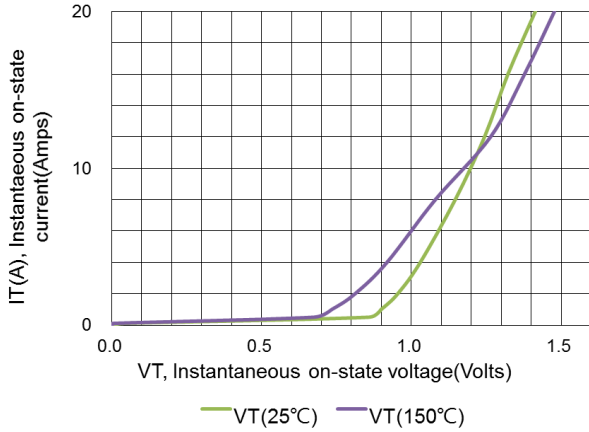
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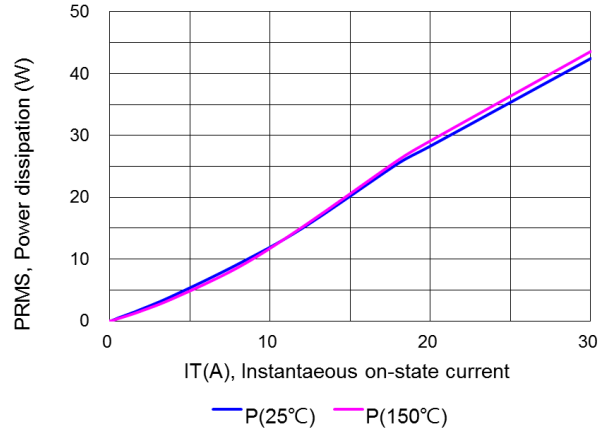


DT12T35 Characteristic

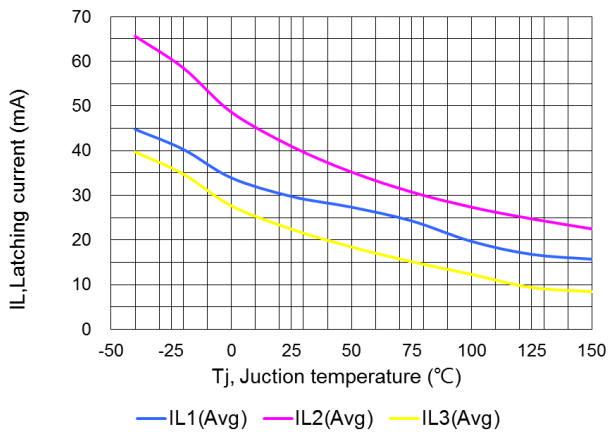
V_{TM} - I_T



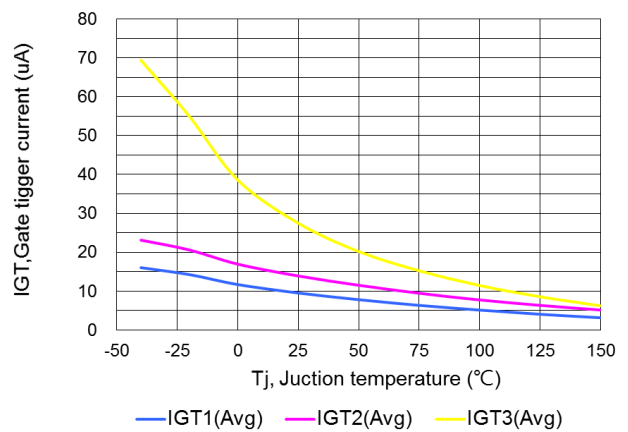
Power dissipation VS RMS on-state current



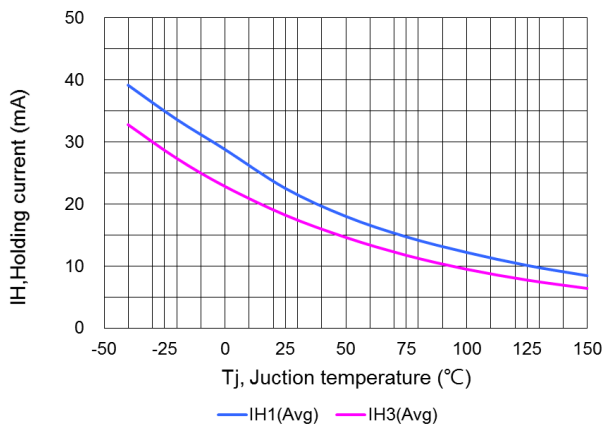
Typical latch current V.S. junction temperature



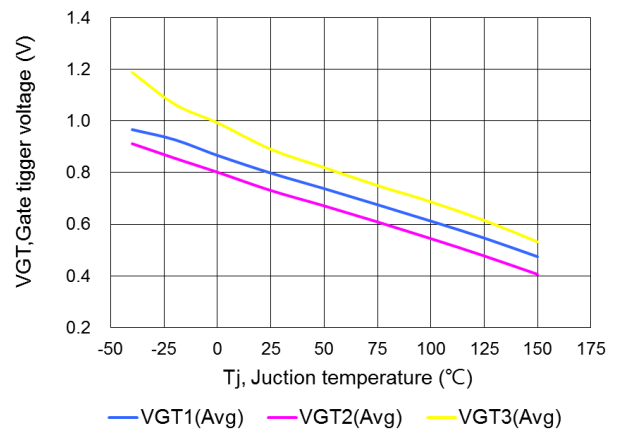
Typical gate trigger current V.S. junction temperature



Typical holding current V.S. junction temperature



Typical gate trigger voltage V.S. junction temperature

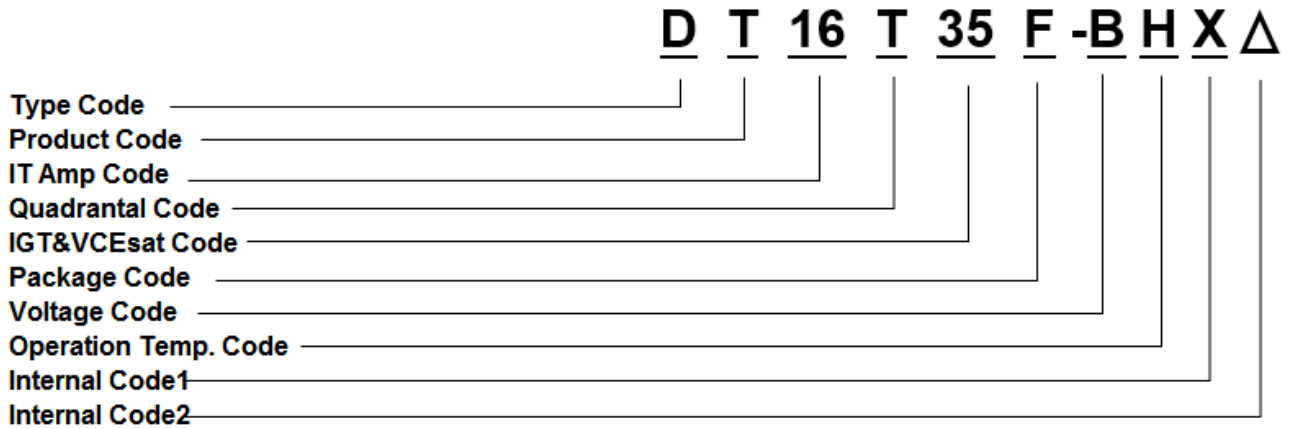


DT12T Standard Series TRIACs

CHARACTERISTIC & CURVES (Tj = 25°C, unless otherwise specified.)



Ordering information scheme



- Type Code: Doeshare Standar products
- Product Code: T for Triac series
- IT Amp Code: 16 for 16A, 1 for 1A
- Quadrantal Code: T for 3Q, F for 4Q
- IGT&VCEsat Code: 35 means Igt 35mA, 5 means Igt 5mA
- Package Code: A=>TO-92, C=>TO-126, D=> DPAK, E=>D2PAK, F=> TO-220F, G=>SOT-223
M=>ITO-3P, P=>TO-3P, T=> TO-220, Y=>TO251
- Voltage Code: A=> 600V, B=> 800V, C=> 1000V
- Operation Temp Code: None=>125°C, H=>150°C

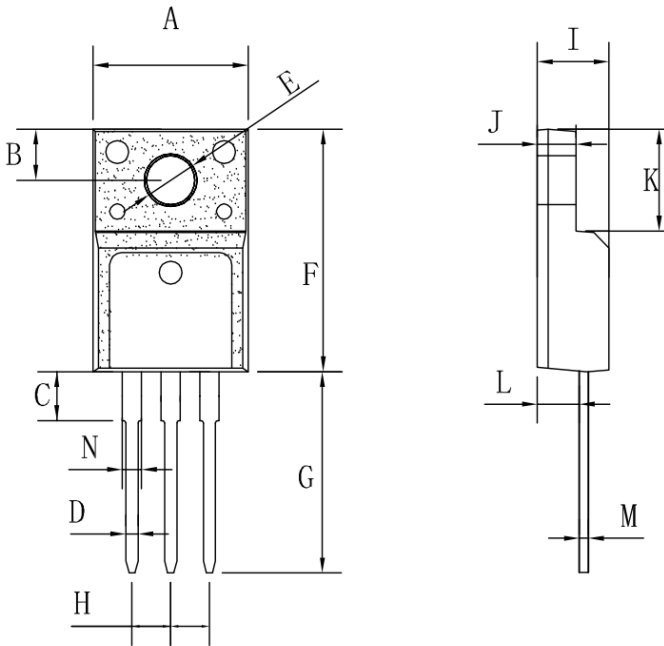
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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)

TO-220F Plastic Package

PACKAGE OUTLINE DIMENSIONS

TO-220F



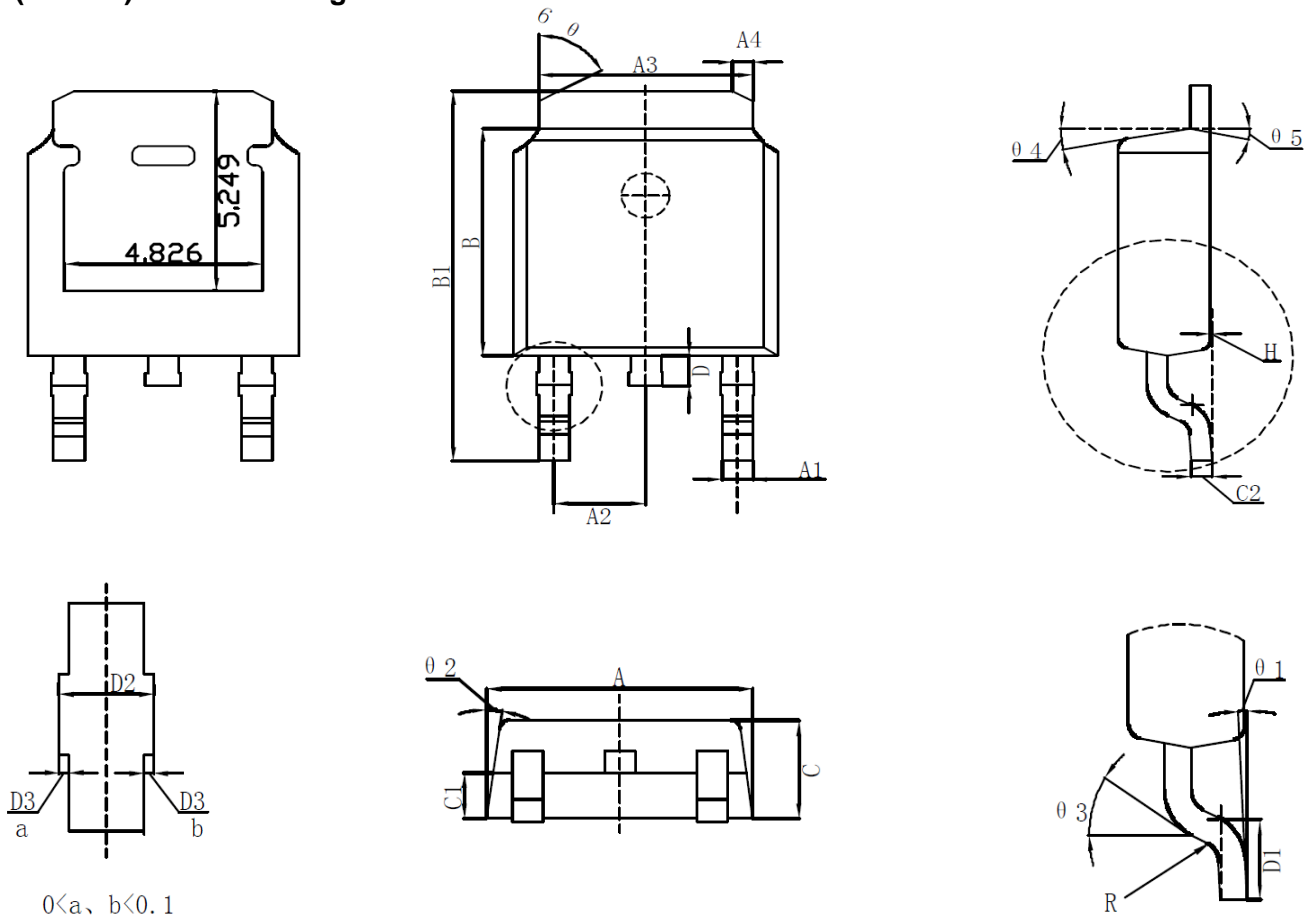
DIM.	Unit(mm)		Unit(inch)	
	Min	Max	Min	Max
A	9.6	10.5	0.377	0.413
B	3.15	3.65	0.124	0.143
C	2.95	3.5	0.116	0.137
D	0.7	0.92	0.027	0.036
E	3	3.4	0.118	0.133
F	15.3	16.5	0.602	0.649
G	12.85	13.45	0.505	0.529
H	2.4	2.7	0.094	0.106
I	4.15	5.12	0.163	0.201
J	2.28	2.65	0.089	0.104
K	6.12	6.95	0.240	0.273
L	2.45	2.9	0.096	0.114
M	0.5	0.6	0.019	0.023
N	1.18	1.42	0.046	0.055

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CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)



DPAK(TO-252) Plastic Package

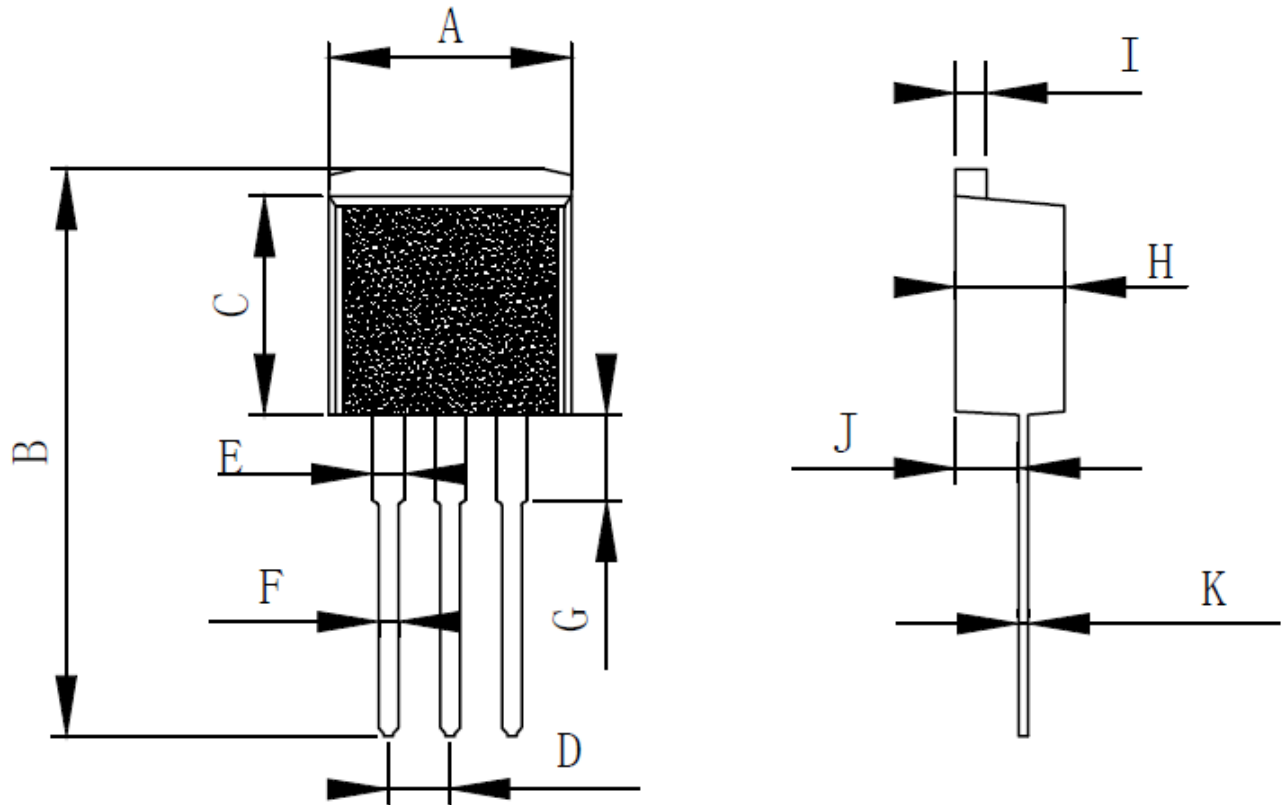


DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	6.50	6.70	C1	0.967	1.087	θ1	0° ~ 8°	
A1	0.71	0.81	C2	0.498	0.518	θ2	8.5° TYP4	
A2	2.236	2.336	D	0.70	0.90	θ3	25° TYP	
A3	5.284	5.384	D1	1.40	1.60	θ4	10° TYP	
A4	0.75	0.85	D2	0.81	0.91	θ5	10° TYP	
B	6.00	6.20	D3	0.05TYP		θ6	70° TYP	
B1	9.80	10.10	H	0.00	0.10			
C	2.20	2.40	R	0.40TYP				

DT12T Standard Series TRIACs

CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)

TO-262 Plastic Package



Item	Unit: mm		
	Type	Min	Max
A	10	9.95	10.2
B	23.35	23.25	23.45
C	9	8.9	9.1
D	2.54	2.5	2.6
E	1.27	1.2	1.35
F	0.8	0.75	0.85
G	3.5	3.3	3.6
H	4.5	4.45	4.55
I	1.27	1.25	1.29
J	2.6	2.5	2.7
K	0.4	0.38	0.42

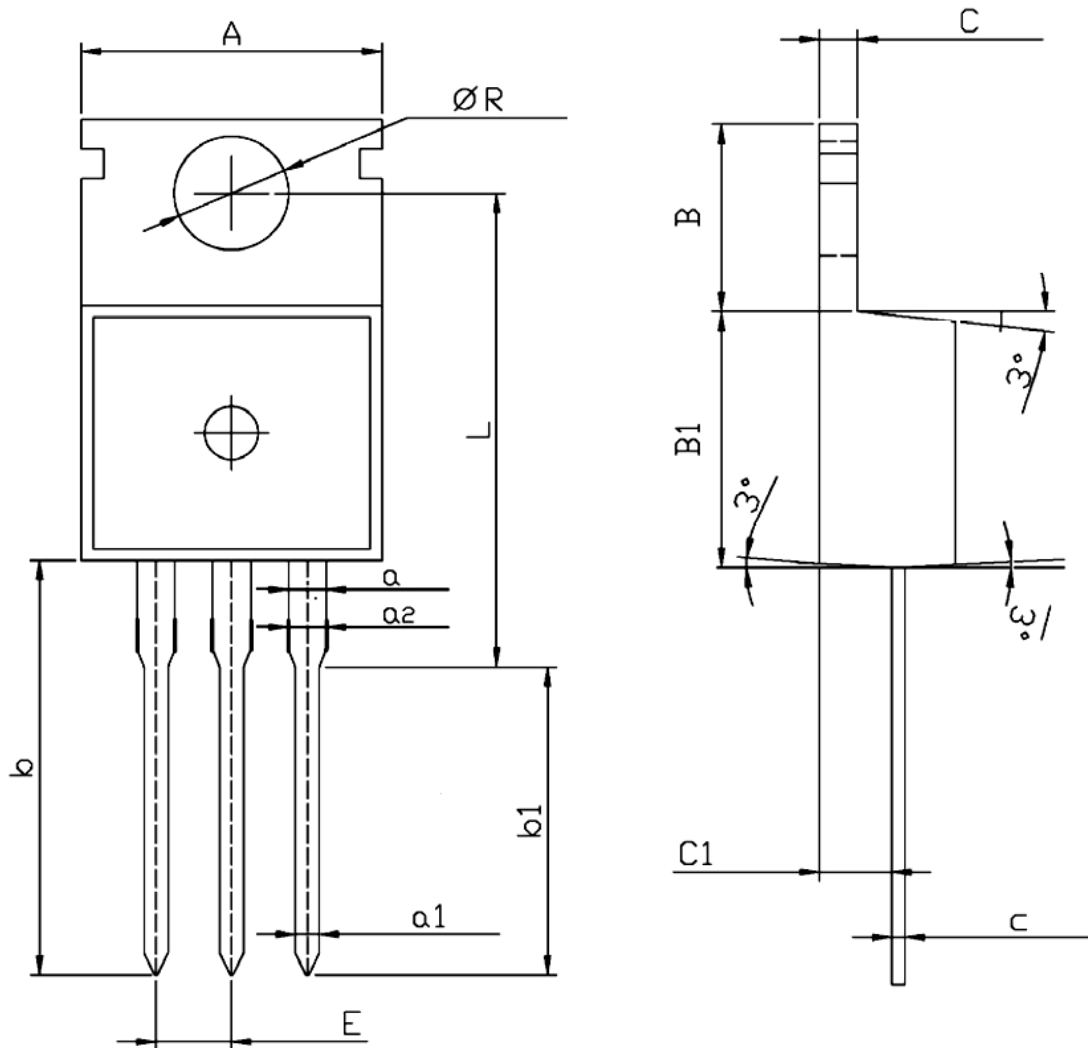
DT12T Standard Series TRIACs

CHARACTERISTIC & CURVES ($T_j = 25^\circ\text{C}$, unless otherwise specified.)



DOESHARE

TO-220C Plastic Package



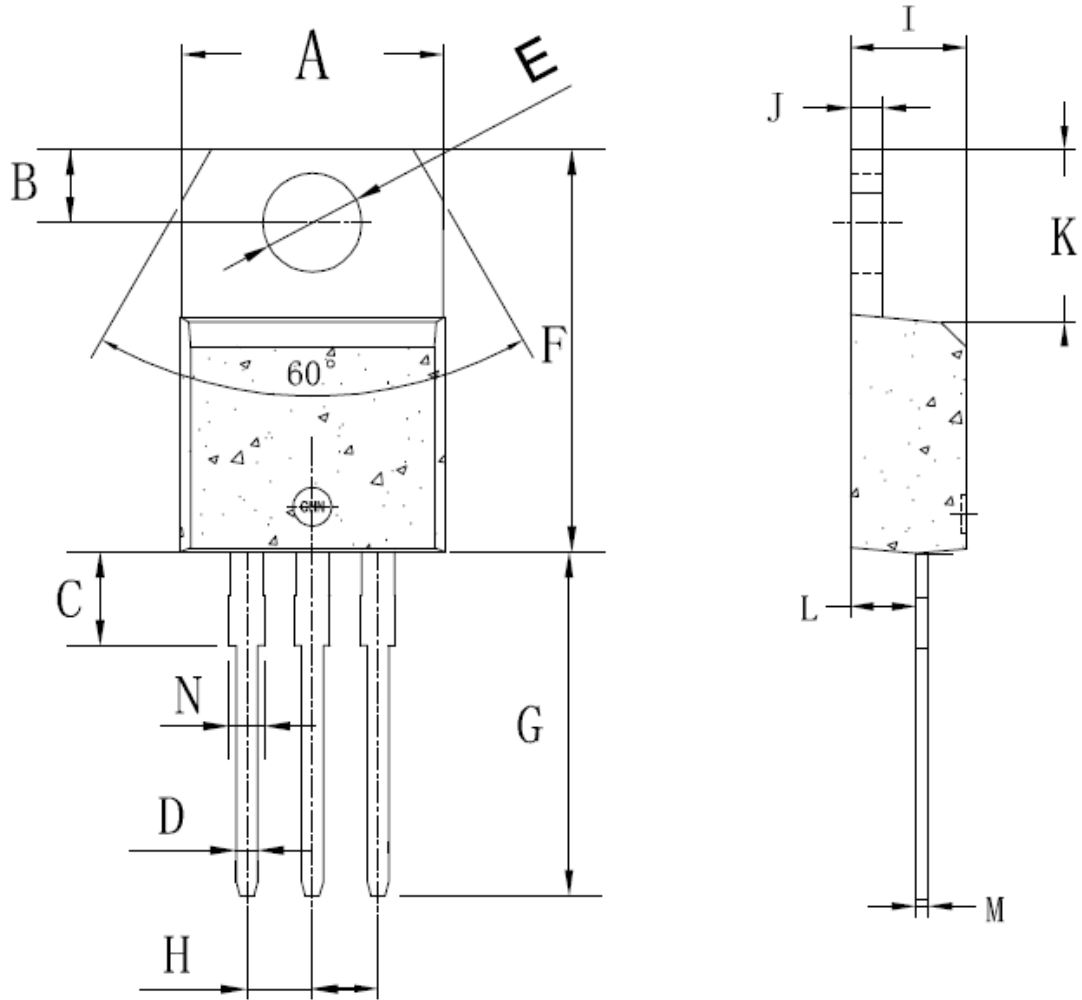
DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	9.7	10.4	a	1.22	1.32	a2	1.18	1.45
B	6.13	6.82	a1	0.7	0.92	C2	4.3	4.71
C	1.2	1.42	b1	9.6	10.6	E	2.34	2.74
B1	9.0	9.4	c	0.38	0.65	R	3.55	3.78
b	12.6	13.6	C1	2.2	2.75	L	15.7	16.14

DT12T Standard Series TRIACs

CHARACTERISTIC & CURVES (T_j = 25°C, unless otherwise specified.)



ITO-220 Plastic Package



DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	9.8	10.4	E	3.75	3.95	I	4.38	4.61
B	2.65	3.1	F	14.8	16.1	J	1.15	1.36
C	2.8	4.2	G	13.05	13.6	K	5.85	6.82
D	0.7	0.92	H	2.4	2.7	L	2.35	2.75
M	0.35	0.65	N	1.18	1.42			

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