



# DT12T High Temperature TRIACs

## DT12T High Temperature TRIACs SILICON BIDIRECTIONAL THYRISTORS

### General description

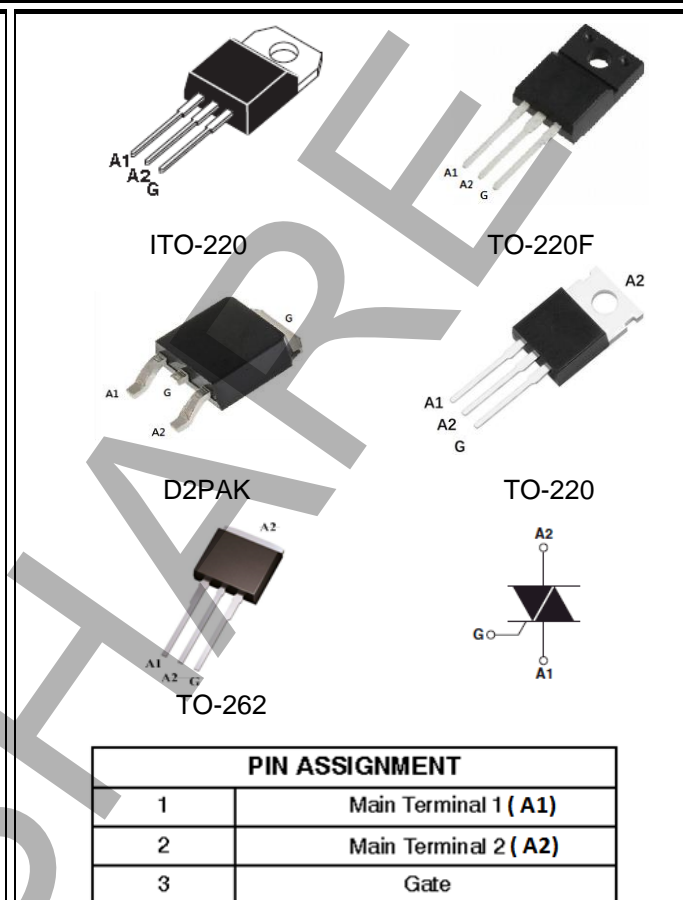
These products of 12A TRIAC are packages for third quadrant, DT12T TRIACs are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.

### FEATURES

- Passivated die for reliability and uniformity
- Three-quadrant triggering.
- Over 800V  $V_{DRM}/V_{RRM}$
- 150 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-02

### 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 High Temperature TRIACs

ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, unless otherwise specified.)

### Absolute Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Peak repetitive off-state voltage ( T <sub>j</sub> = -40 to 150°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 <sub>c</sub> = 100°C )	$I_{T(RMS)}$	12	A
Peak non-repetitive surge current ( one full cycle 60 Hz, T <sub>j</sub> = 25°C)	$I_{TSM}$	100	A
Circuit fusing consideration ( t = 8.3ms)	$I^2T$	41.5	A <sup>2</sup> S
Operating junction temperature range	T <sub>j</sub>	-40 to +150	°C
Storage temperature range	T <sub>STG</sub>	-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 04, Oct-2020

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CHARACTERISTIC & CURVES (T<sub>j</sub> = 25°C, unless otherwise specified.)



## Thermal Characteristics

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

Note1: unidirectional, continuous & full cycle.

## Static Characteristics

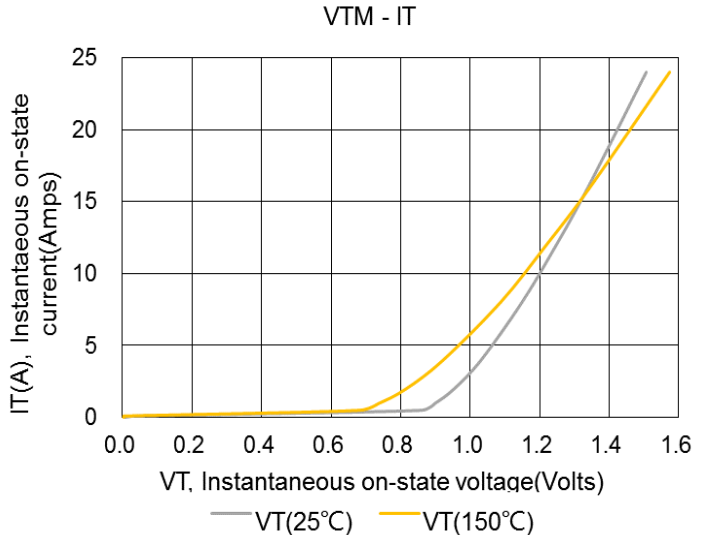
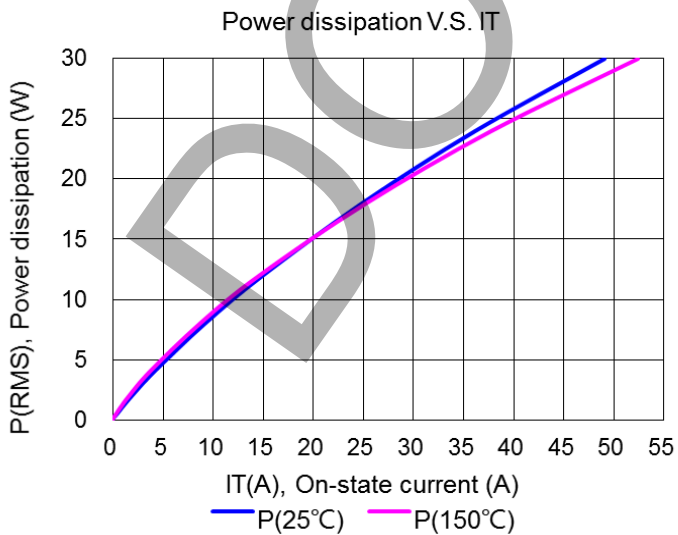
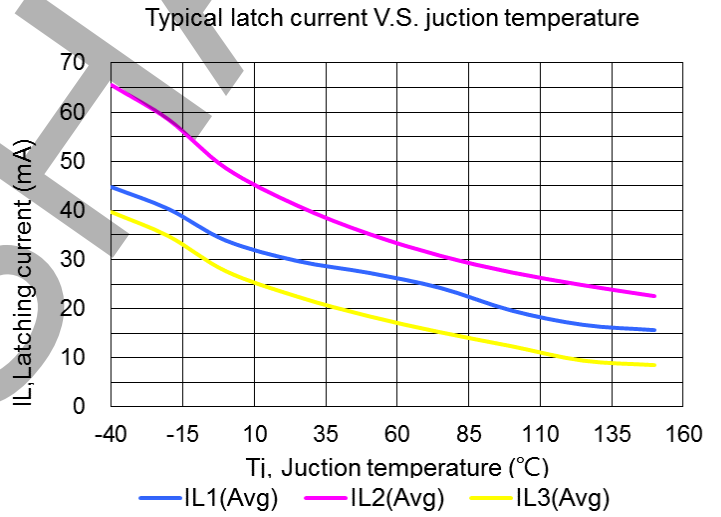
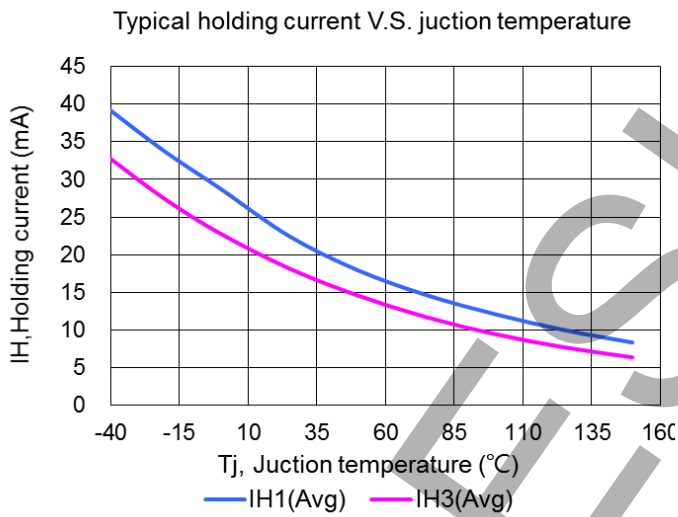
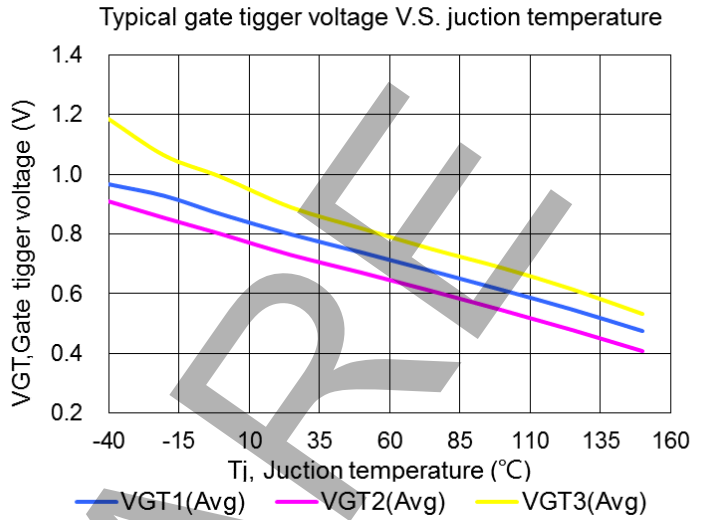
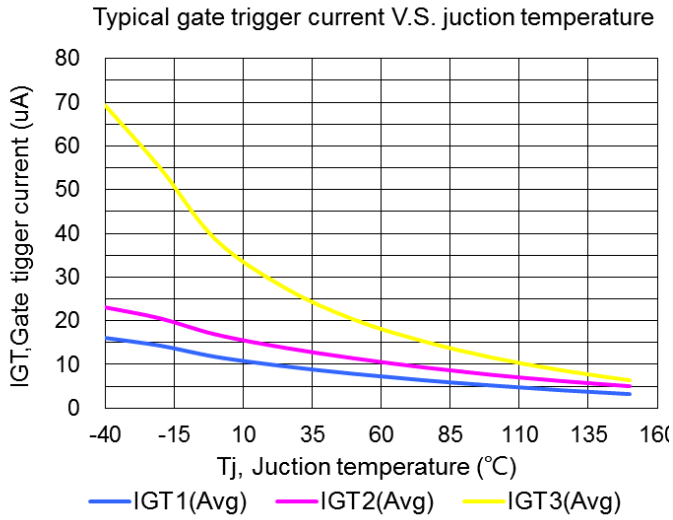
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Threshold Voltage (T <sub>j</sub> = 150°C)	V <sub>to</sub>	--	--	1	V
Dynamic resistors (T <sub>j</sub> = 150°C)	R <sub>d</sub>	--	--	35	mΩ
Peak repetitive forward or reverse blocking current (V <sub>AK</sub> = rated V <sub>DRM</sub> and V <sub>RRM</sub> , gate open)	T <sub>j</sub> = 25°C	--	--	5	uA
	T <sub>j</sub> = 125°C	--	--	700	uA
	T <sub>j</sub> = 150°C			1.9	mA

## ON Characteristics

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Peak forward on-state voltage (I <sub>TM</sub> = 12 A @ T <sub>j</sub> = 25°C)	V <sub>TM</sub>	--	--	1.5	V
V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 100Ω, T <sub>j</sub> = 150°C	V <sub>GD</sub>	0.25	--	--	V
Gate trigger current (V <sub>AK</sub> = 12V, R <sub>L</sub> = 100Ω)	I <sub>GT1</sub>	--	--	35	mA
	I <sub>GT2</sub>	--	--	35	
	I <sub>GT3</sub>	--	--	35	
Gate trigger voltage (V <sub>AK</sub> = 12V, R <sub>L</sub> = 100Ω)	V <sub>GT1</sub>	--	--	1	V
	V <sub>GT2</sub>	--	--		
	V <sub>GT3</sub>	--	--		
Holding current (V <sub>AK</sub> = 12V, R <sub>L</sub> = 100Ω)	I <sub>H1</sub>	--	--	50	mA
	I <sub>H3</sub>	--	--		
Latching current (V <sub>AK</sub> = 12V, R <sub>L</sub> = 100Ω)	I <sub>L1</sub>	--	--	50	mA
	I <sub>L2</sub>	--	--	80	
	I <sub>L3</sub>	--	--	50	
Critical rate of rise of on-state current, T <sub>j</sub> = 150°C	dI/dt(s)	--	--	50	A/us
V <sub>D</sub> = 67% V <sub>DRM</sub> , gate open, T <sub>j</sub> = 150°C	dV/dt	--	--	2000	V/us
Without snubber, T <sub>j</sub> = 150°C	dI/dt(c)	--	--	6.5	A/ms
T <sub>j</sub> = 150°C, 10V/dt	dI/dt(c)	--	--	35	A/ms

# DT12T High Temperature TRIACs

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

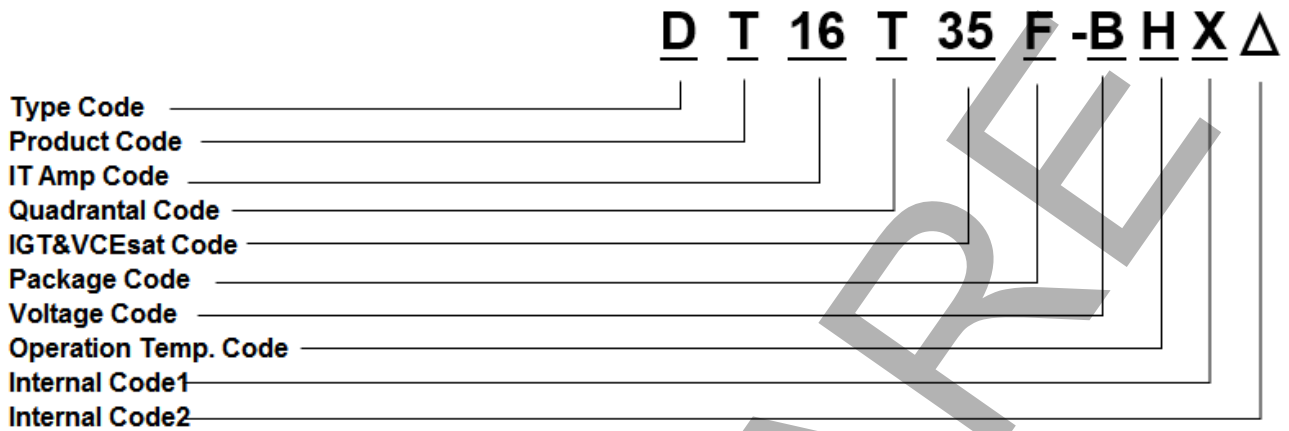


# DT12T High Temperature TRIACs

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



## Ordering information scheme



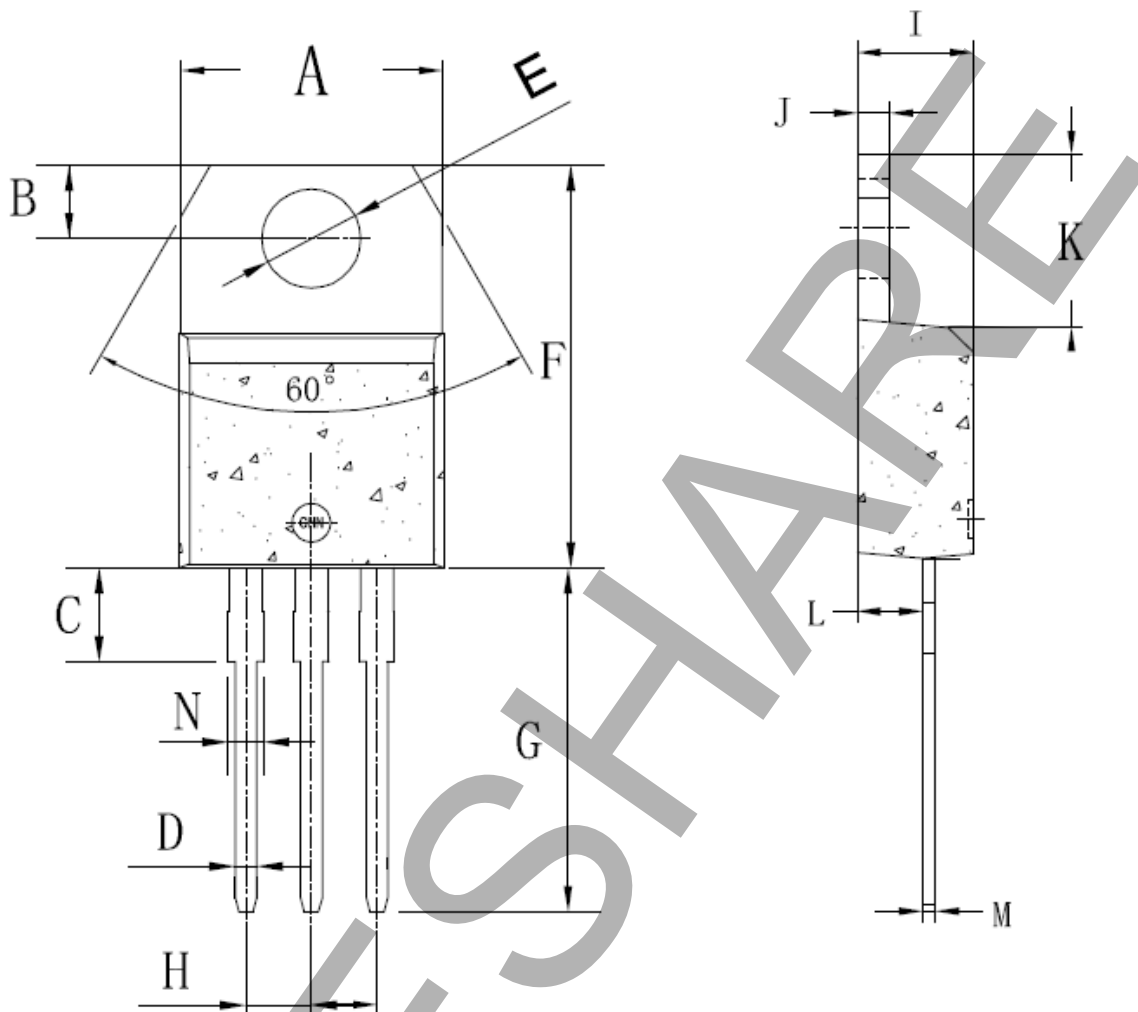
- Type Code: Doeshare Standar products
- Product Code: T for Triac series
- IT Amp Code: 16 for 16A, 1 for 1A
- Quadrantal Code: T for 3Q, F for 4Q
- IGT&VCEsat Code: 35 means Igt 35mA, 5 means Igt 5mA
- Package Code: A=>TO-92, C=>TO-126, D=> DPAK, E=>D2PAK, F=> TO-220F, G=>SOT-223  
M=>ITO-3P, P=>TO-3P,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

# DT12T High Temperature TRIACs

CHARACTERISTIC & CURVES (T<sub>j</sub> = 25°C, unless otherwise specified.)



ITO-220 Plastic Package

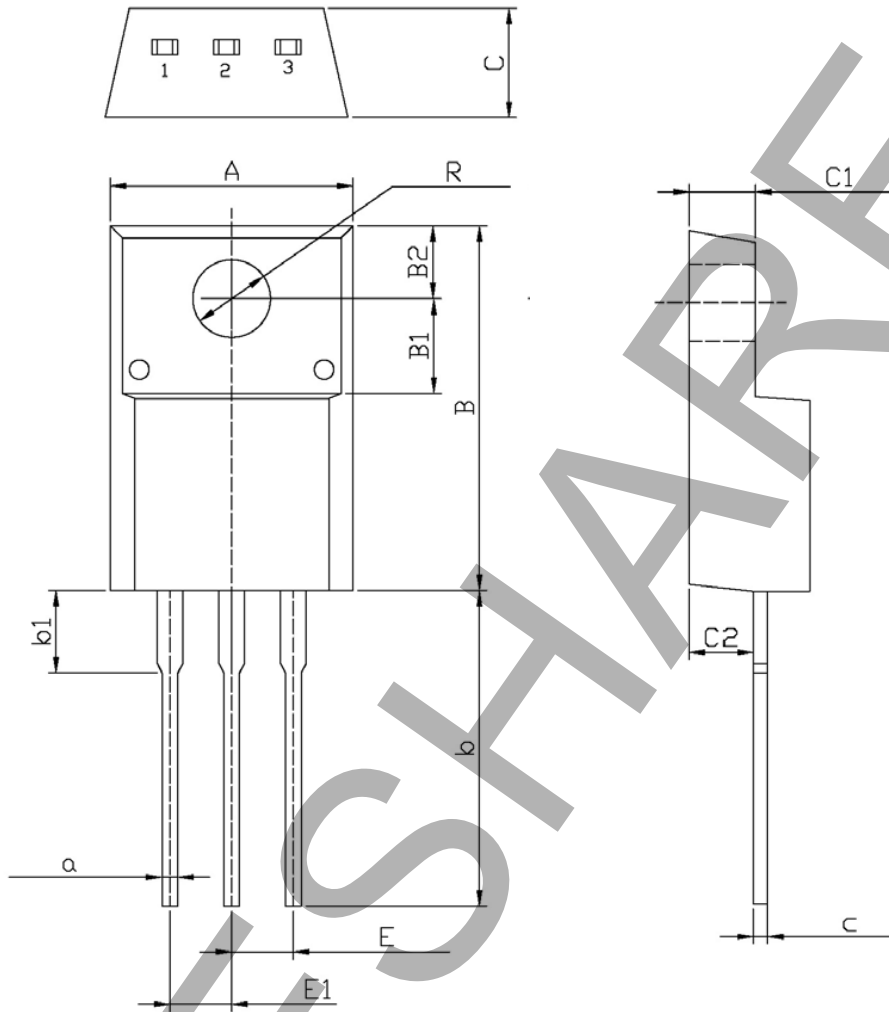


DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	9.8	10.4	E	3.75	3.95	I	4.38	4.61
B	2.65	3.1	F	14.8	16.1	J	1.15	1.36
C	2.8	4.2	G	13.05	13.6	K	5.85	6.82
D	0.7	0.92	H	2.4	2.7	L	2.35	2.75
M	0.35	0.65	N	1.18	1.42			

# DT12T High Temperature TRIACs

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

## TO-220F Plastic Package



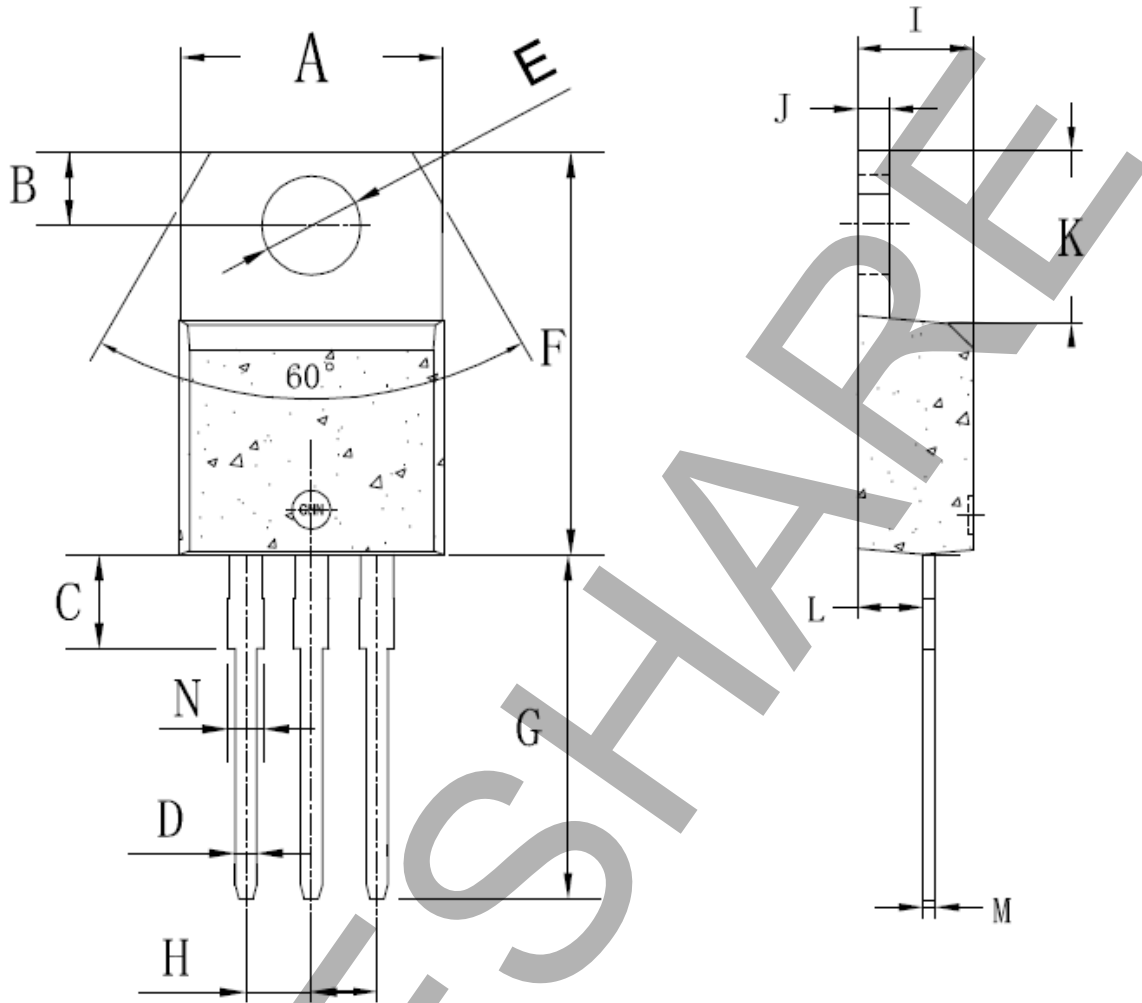
DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
C	4.3	4.7	R	3.0	3.4	E1	2.29	2.79
A	9.7	10.3	b	12.5	13.5	C1	2.5	2.9
B	14.7	15.3	b1	2.9	3.9	C2	2.5	2.7
B1	3.8	4.0	a	0.55	0.75	c	0.5	0.7
B2	2.9	3.1	E	2.29	2.79			

# DT12T High Temperature TRIACs

CHARACTERISTIC & CURVES (T<sub>j</sub> = 25°C, unless otherwise specified.)



ITO-220 Plastic Package

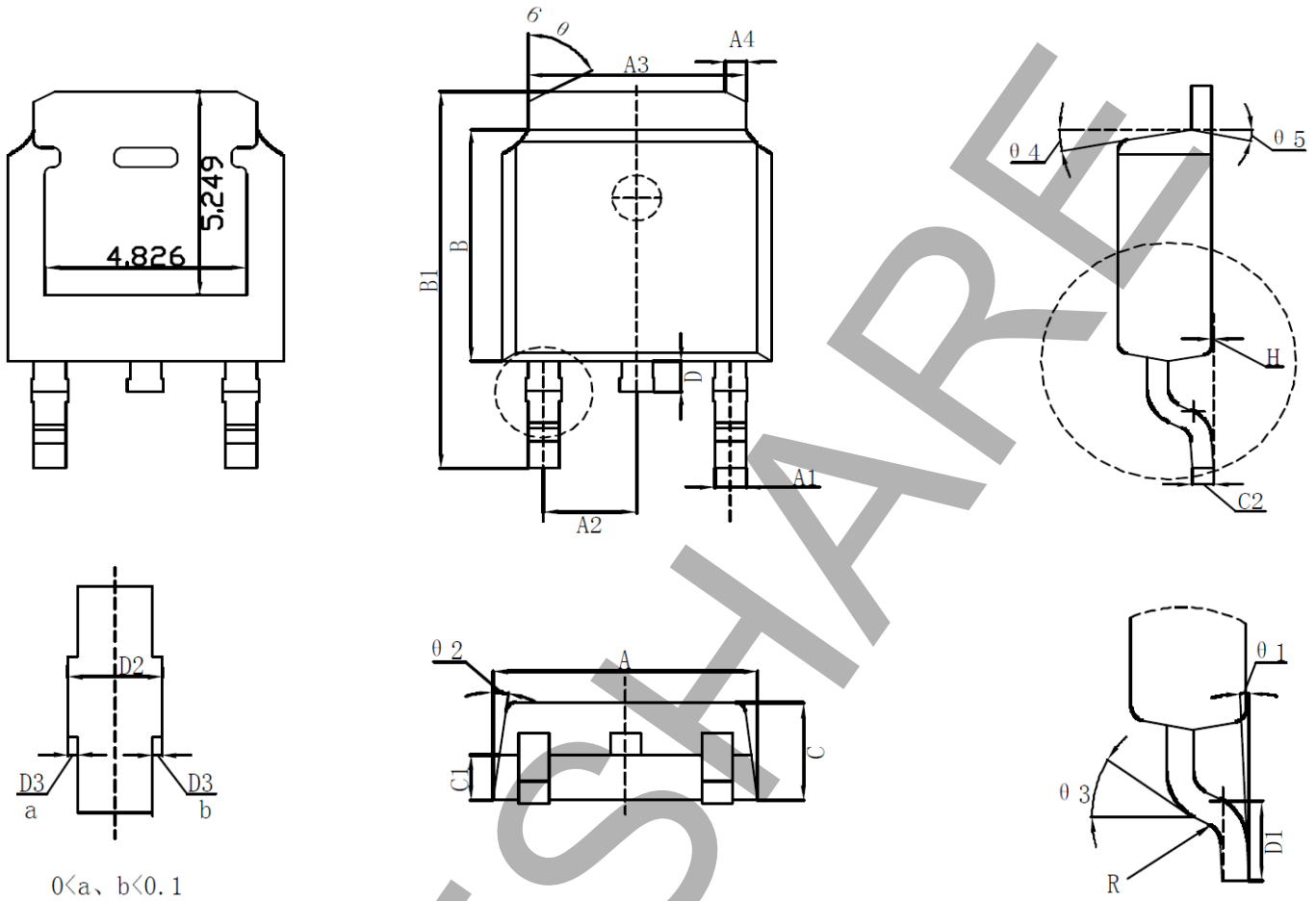


DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	9.8	10.4	E	3.75	3.95	I	4.38	4.61
B	2.65	3.1	F	14.8	16.1	J	1.15	1.36
C	2.8	4.2	G	13.05	13.6	K	5.85	6.82
D	0.7	0.92	H	2.4	2.7	L	2.35	2.75
M	0.35	0.65	N	1.18	1.42			

# DT12T High Temperature TRIACs

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

## DPAK(TO-252) Plastic Package



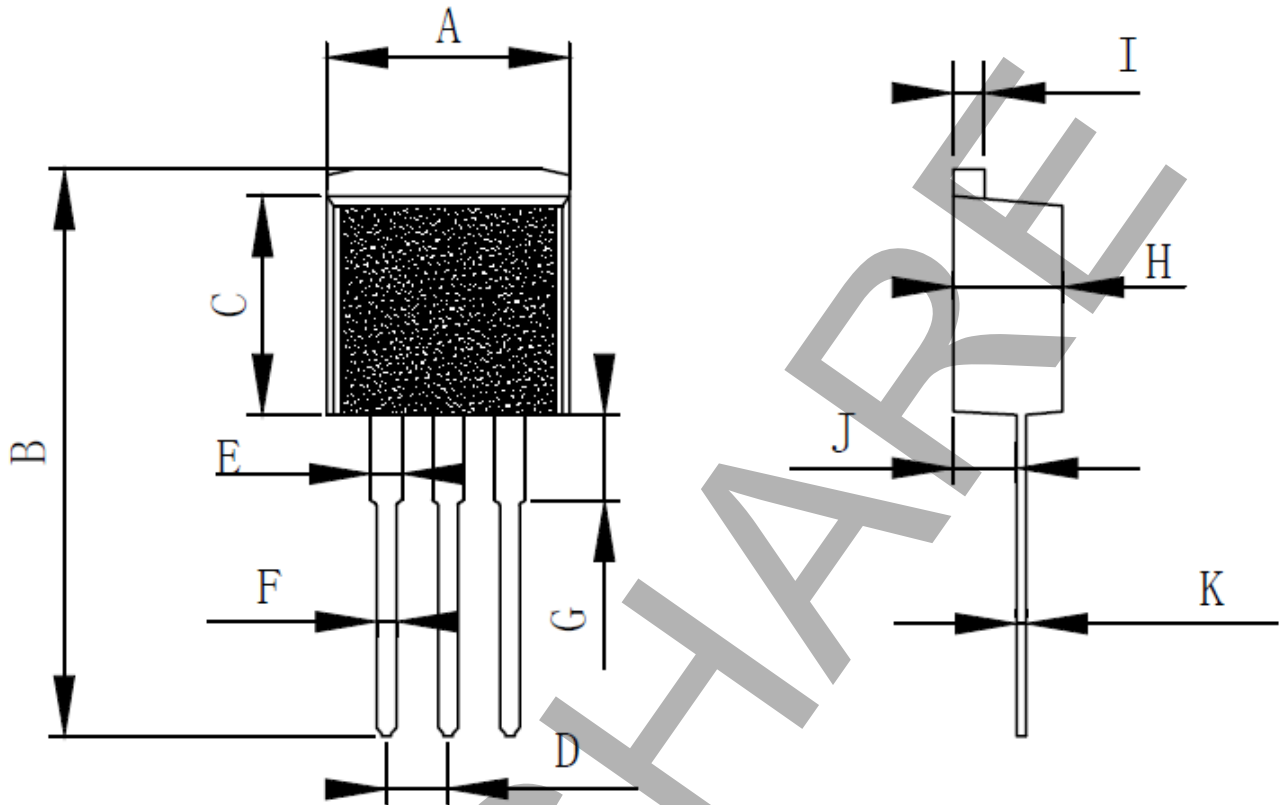
DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	6.50	6.70	C1	0.967	1.087	$\theta 1$	$0^\circ \sim 8^\circ$	
A1	0.71	0.81	C2	0.498	0.518	$\theta 2$	$8.5^\circ$ TYP4	
A2	2.236	2.336	D	0.70	0.90	$\theta 3$	$25^\circ$ TYP	
A3	5.284	5.384	D1	1.40	1.60	$\theta 4$	$10^\circ$ TYP	
A4	0.75	0.85	D2	0.81	0.91	$\theta 5$	$10^\circ$ TYP	
B	6.00	6.20	D3	0.05TYP		$\theta 6$	$70^\circ$ TYP	
B1	9.80	10.10	H	0.00	0.10			
C	2.20	2.40	R	0.40TYP				



# DT12T High Temperature TRIACs

CHARACTERISTIC & CURVES ( $T_j = 25^\circ\text{C}$ , 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

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