DT12T High Temperature TRIACs

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SILICON BIDIRECTIONAL THYRISTORS

General description

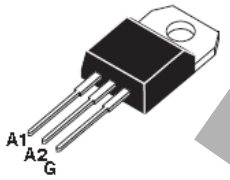
These products of 12A TRAIC are packages for third quadrant, DT12T TRIACs are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.

FEATURES

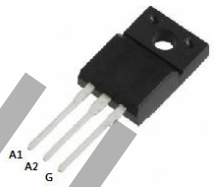
- Passivated die for reliability and uniformity
- Three-quadrant triggering.
- Over 800V V_{DRM}/V_{RRM}
- 150 Degree C operation temperature.
- Without snubber circuit.
- "Green" molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead free in RoHS II 2015/863/EU compliant
- Moisture sensitivity meets industry standard IPC/JEDEC J-STD-02

APPLICATIONS

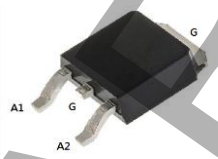
- General purpose AC switch control
- Control loads in Motor, Fan, and Pump.
- Solenoid drivers
- LED Dimming
- Inrush current limiting circuits



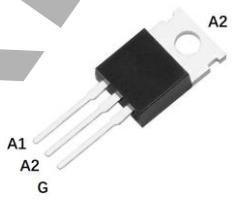
ITO-220



TO-220F



D2PAK



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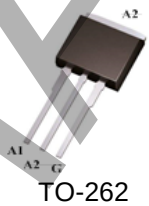
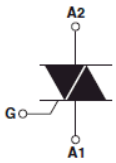


TO-262



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

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

Absolute Ratings

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

Thermal Characteristics

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

Note1: unidirectional, continuous & full cycle.

Static Characteristics

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT
Threshold Voltage (Tj = 150°C)		V_{to}	--	--	1	V
Dynamic resistors (Tj = 150°C)		R_d	--	--	35	mΩ
Peak repetitive forward or reverse blocking current (V_{AK} = rated V_{DRM} and V_{RRM}, gate open)	Tj = 25°C	I_{DRM} I_{RRM}	--	--	5	uA
	Tj = 125°C		--	--	700	uA
	Tj = 150°C				1.9	mA

ON Characteristics

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Peak forward on-state voltage (I_{TM} = 12 A @ Tj = 25°C)	V_{TM}	--	--	1.5	V
V_D= V_{DRM} , R_L=100Ω, Tj=150°C	V_{GD}	0.25	--	--	V
Gate trigger current (V_{AK} = 12V, R_L=100Ω)	I_{GT1} I_{GT2} I_{GT3}	--	--	35 35 35	mA
Gate trigger voltage (V_{AK} = 12V, R_L=100Ω)	V_{GT1} V_{GT2} V_{GT3}	--	--	1	V
Holding current (VAK = 12V, R_L=100Ω)	I_{H1} I_{H3}	--	--	50	mA
Latching current (V_{AK} = 12V, R_L=100Ω)	I_{L1} I_{L2} I_{L3}	--	--	50 80 50	mA
Critical rate of rise of on-state current, Tj = 150°C	dI/dt(s)	--	--	50	A/us
VD = 67% VDRM, gate open, Tj = 150°C	dV/dt	--	--	2000	V/us
Without snubber, Tj = 150°C	dI/dt(c)	--	--	6.5	A/ms
Tj=150°C, 10V/dt	dI/dt(c)	--	--	35	A/ms

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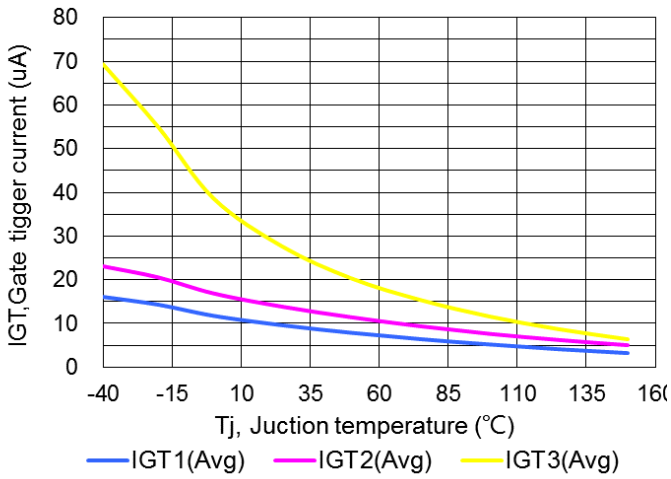
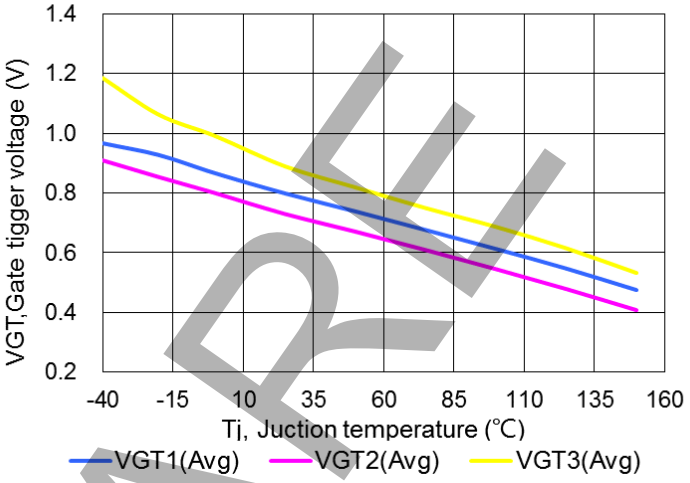
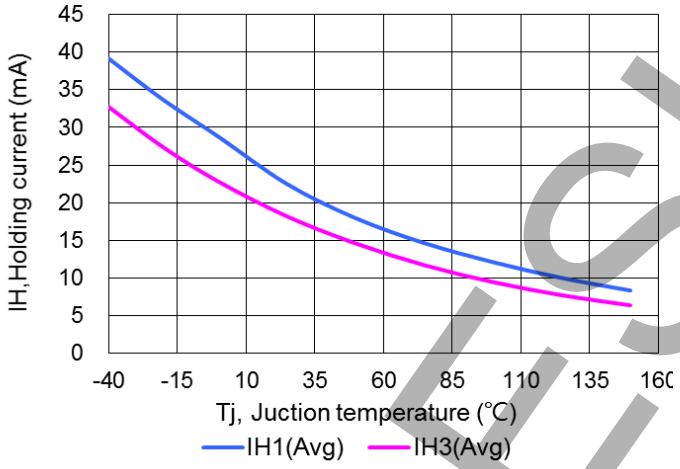
Typical gate trigger current V.S. juction temperature



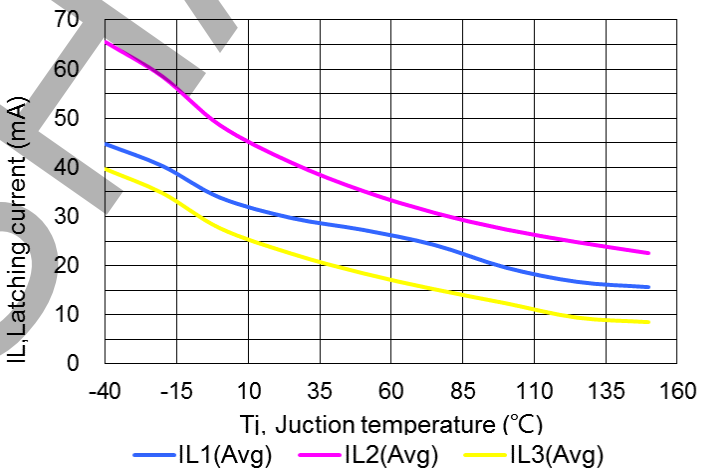
Typical gate tigger voltage V.S. juction temperature



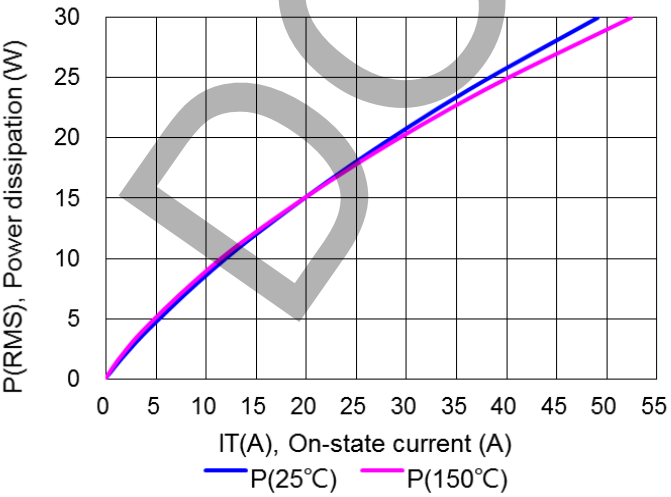
Typical holding current V.S. juction temperature



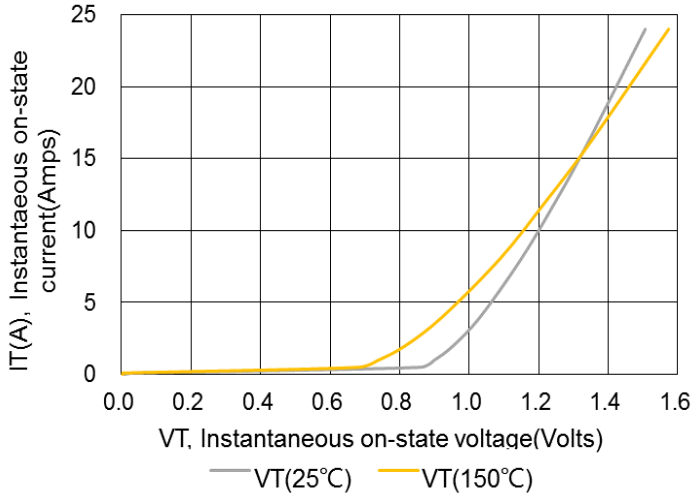
Typical latch current V.S. juction temperature



Power dissipation V.S. IT



VTM - IT



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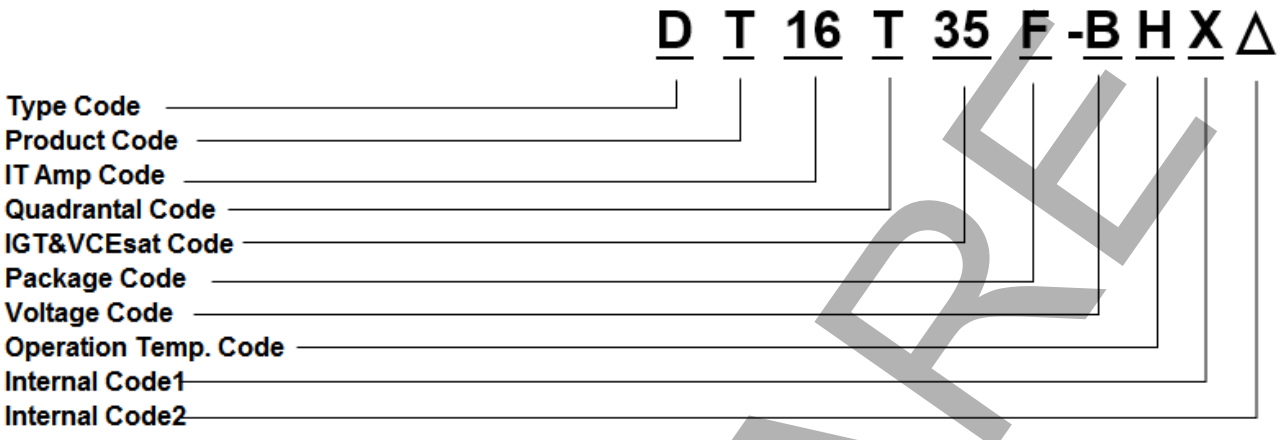
Ordering information scheme



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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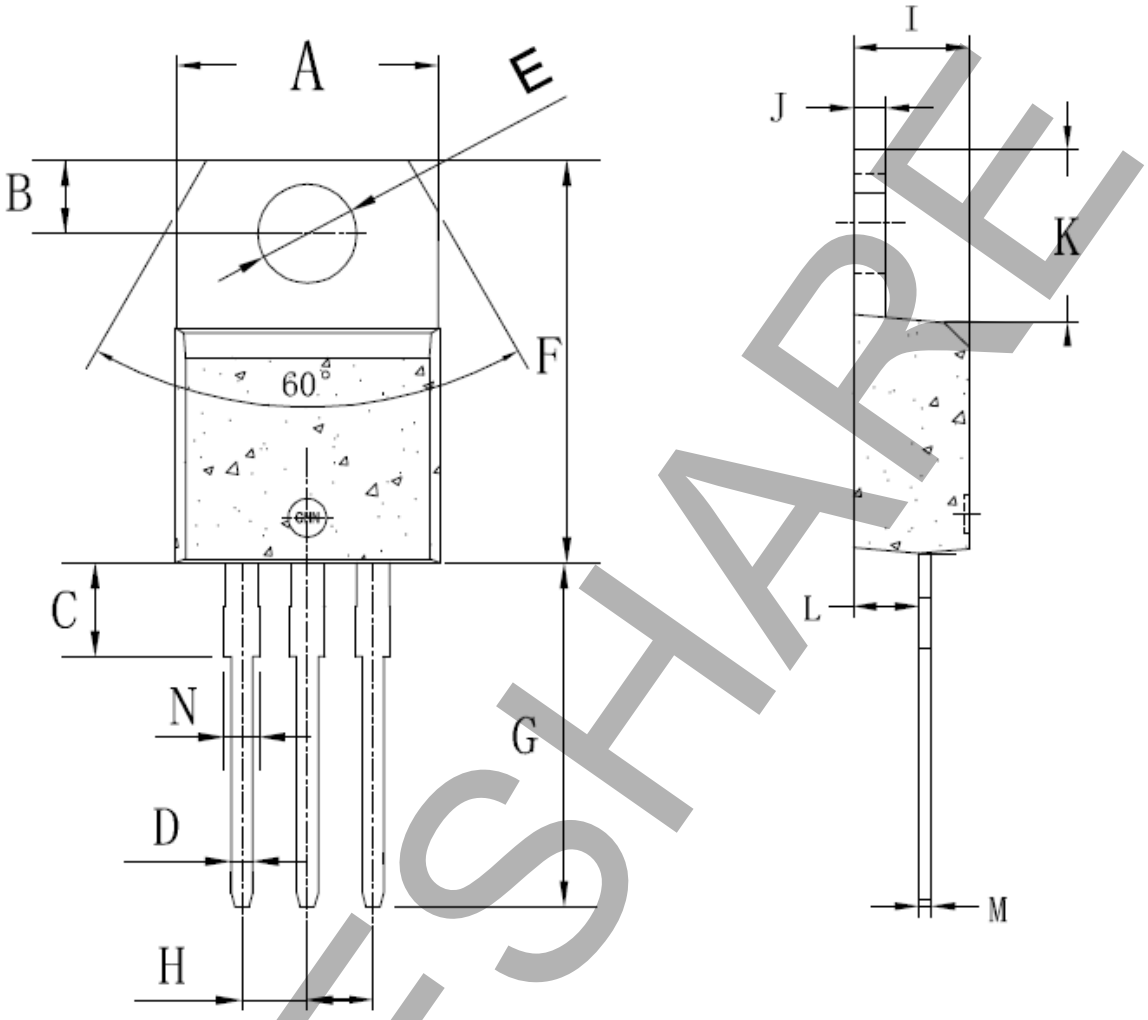
ITO-220 Plastic Package



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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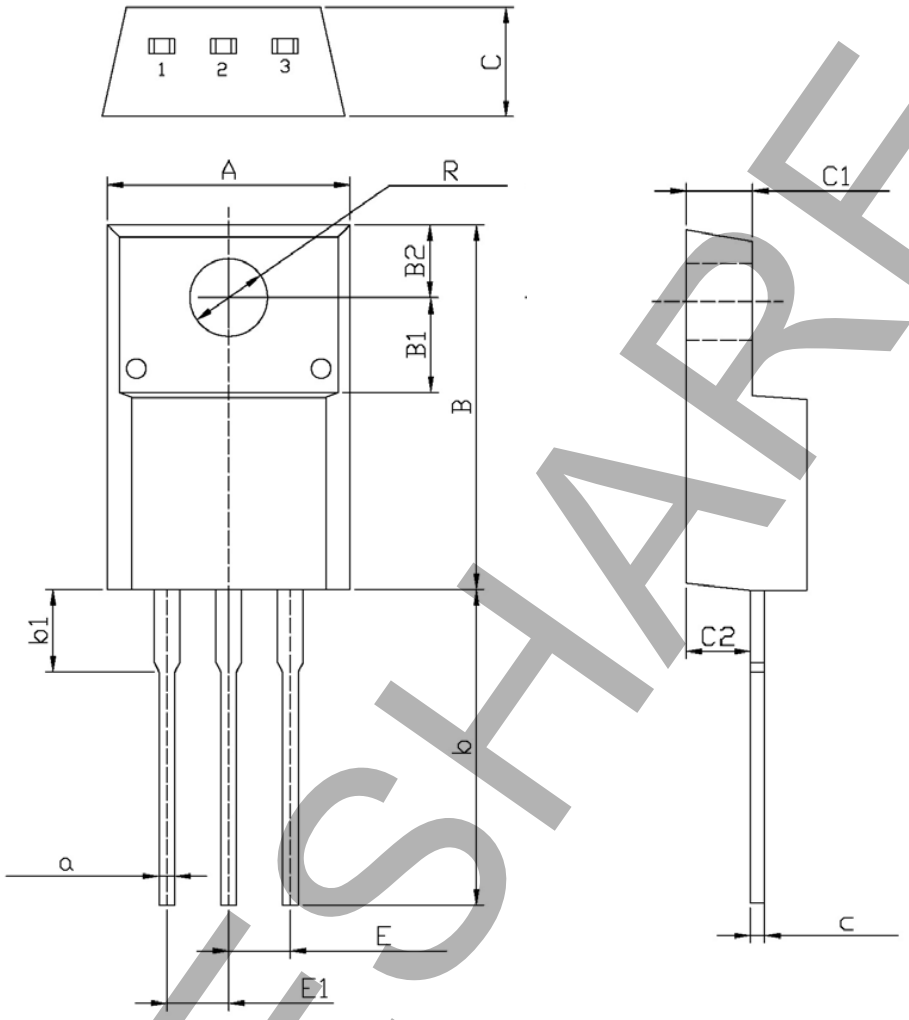
TO-220F Plastic Package



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			

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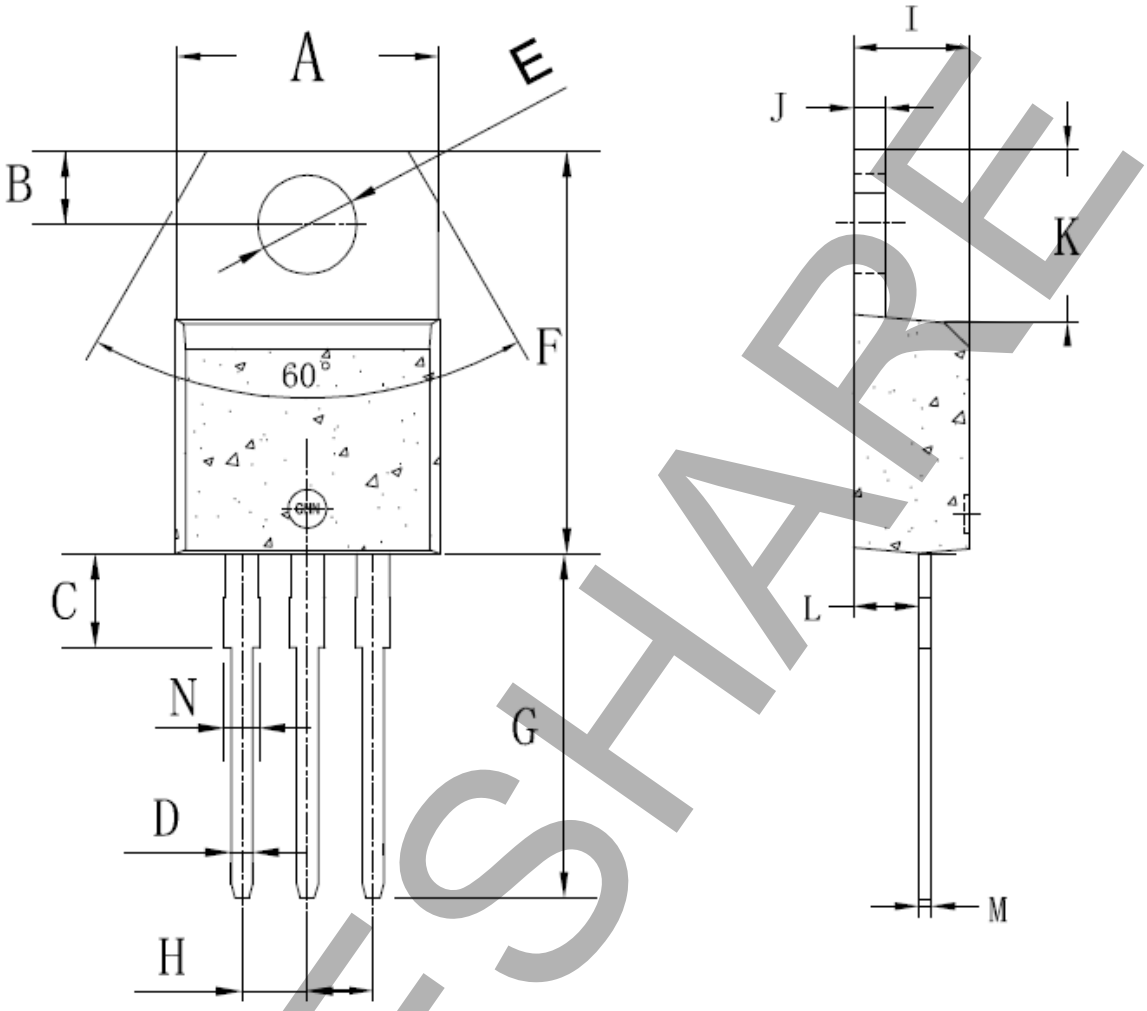
ITO-220 Plastic Package



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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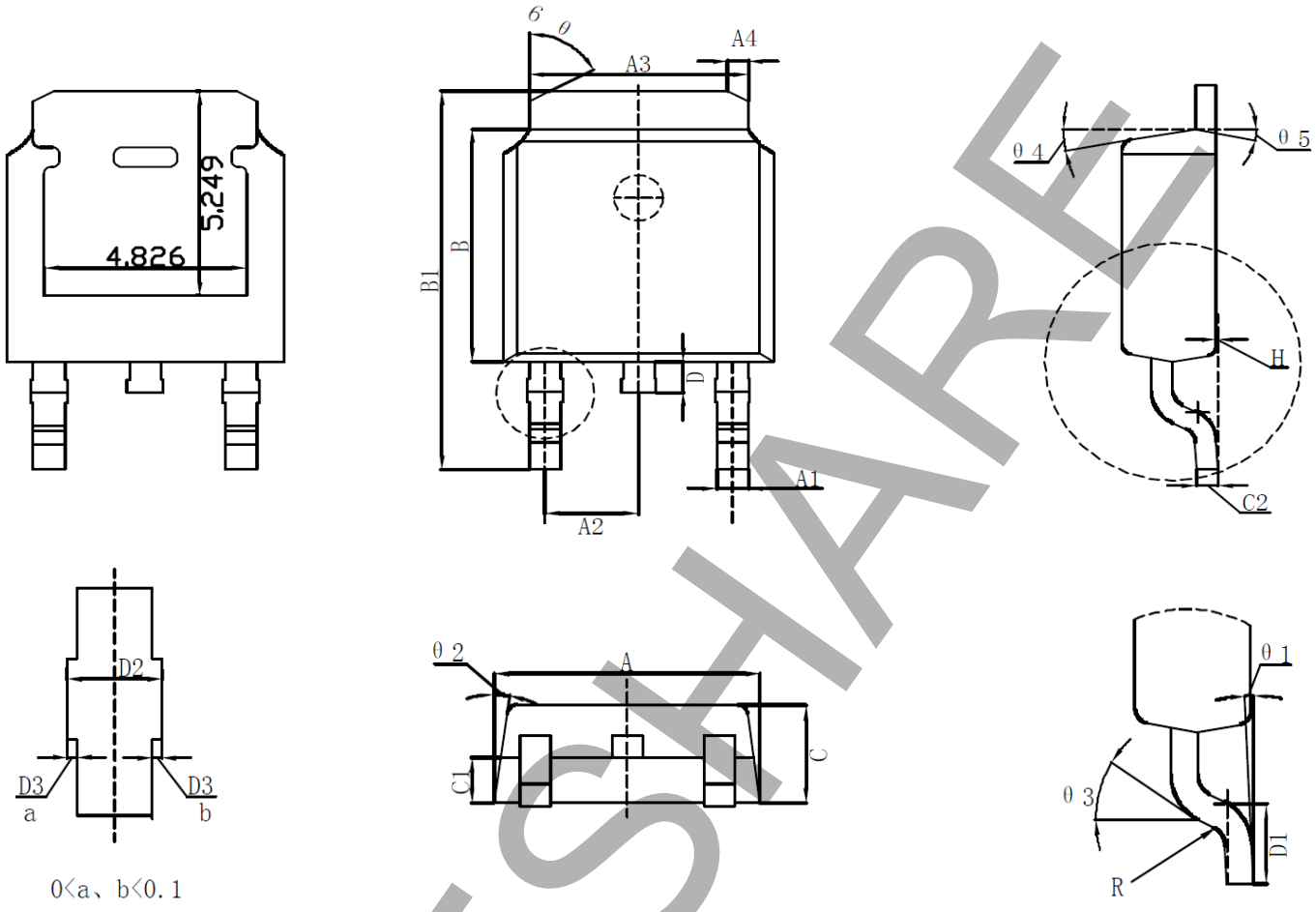
DPAK(TO-252) Plastic Package



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				

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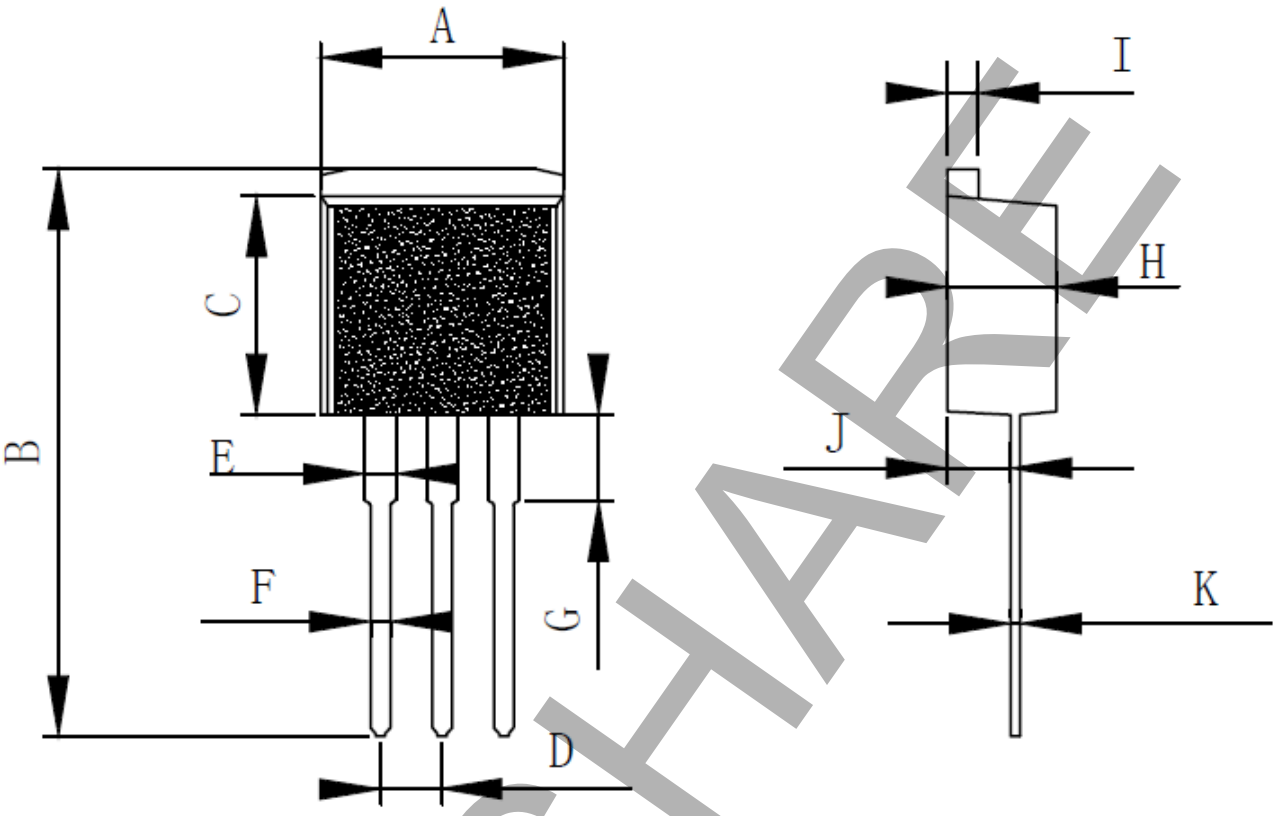
TO-262 Plastic Package



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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