DT12T Standard Series TRIACs

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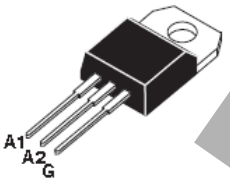
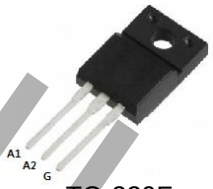
SILICON BIDIRECTIONAL THYRISTORS

General description

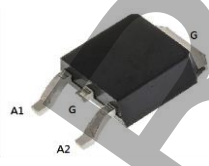
These products 12A TRAIC are packages for third quadrant, DT12T are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.



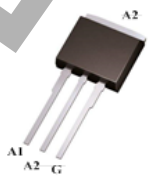
ITO-220



TO-220F



D2PAK



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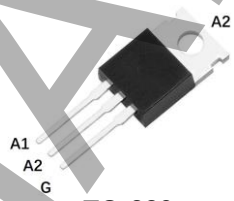

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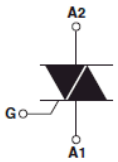

PIN ASSIGNMENT	
1	Main Terminal 1 (**A1**)
2	Main Terminal 2 (**A2**)
3	Gate

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

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DT12T Standard Series TRIACs

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

Absolute Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Peak repetitive off-state voltage (Tj = -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, 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 +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 04, MAY-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: without heatsink, unidirectional, continuous & full cycle.

Static Characteristics

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT
Threshold Voltage (Tj = 125°C)		V_{to}	--	--	0.95	V
Dynamic resistors (Tj = 125°C)		R_d	--	--	30	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		--	--	0.5	mA

ON Characteristics

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

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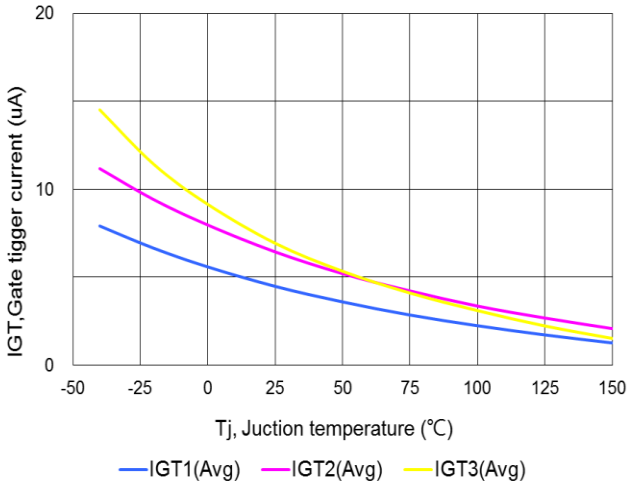
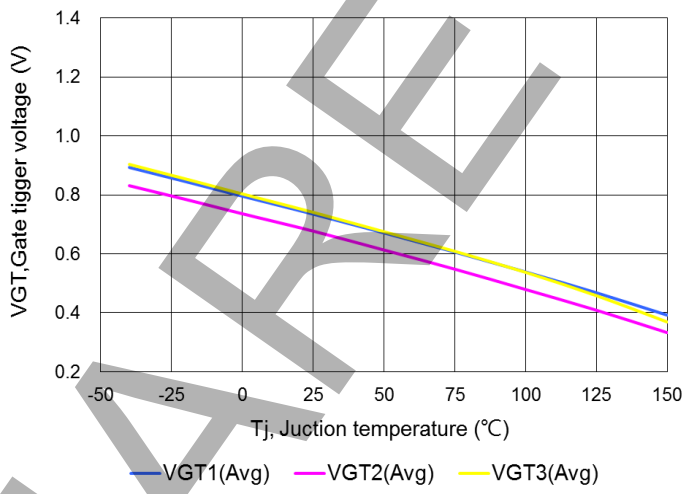
DT12T10 Characteristic

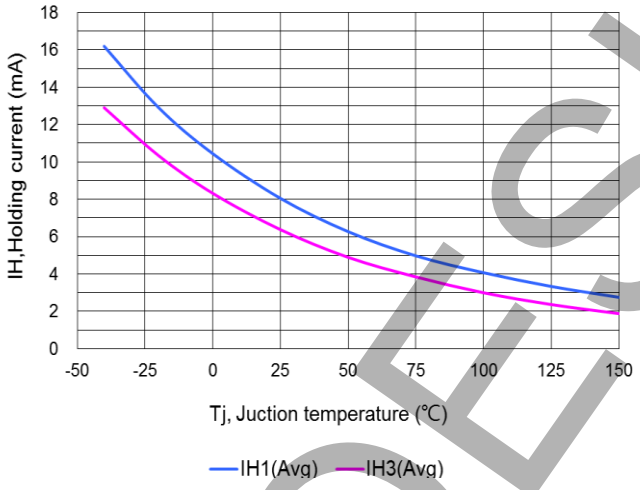
Typical gate trigger current V.S. juction temperature



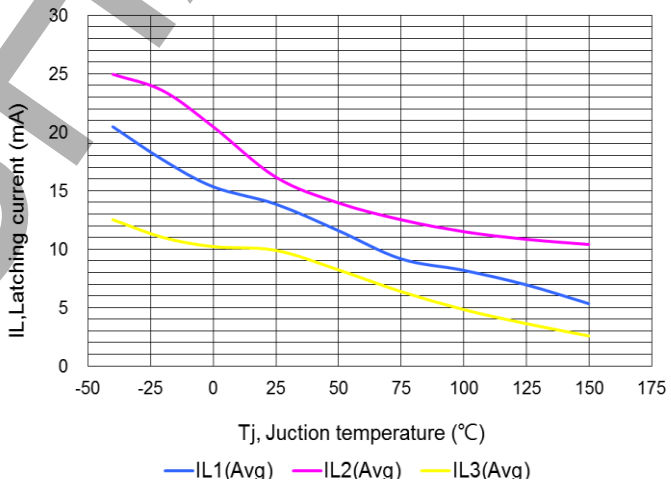
Typical gate tigger voltage V.S. juction temperature



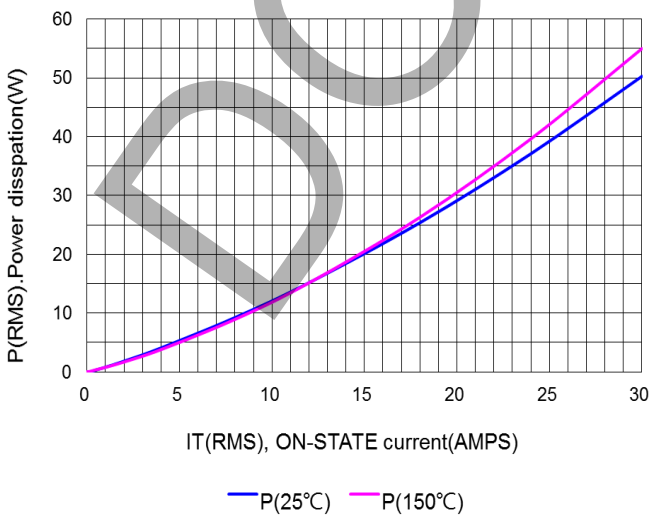
Typical holding current V.S. juction temperature



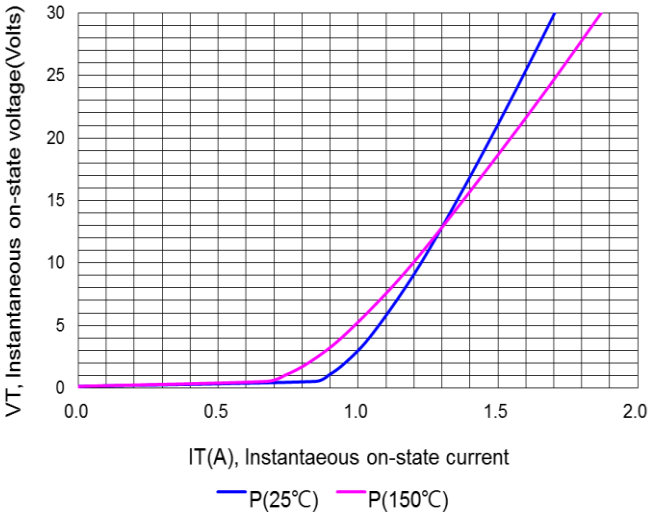
Typical latch current V.S. juction temperature



Power disspation VS ON-STATE current



IT-VTM



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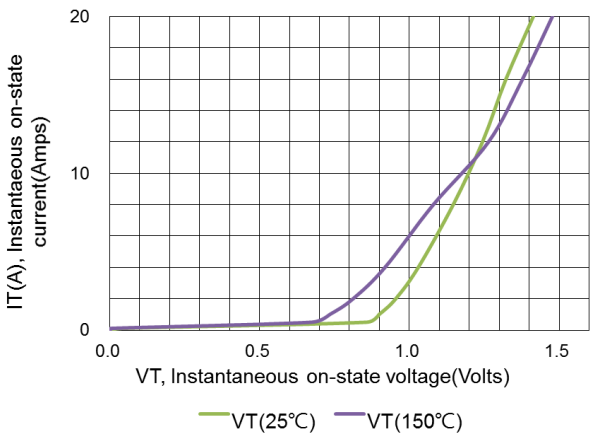
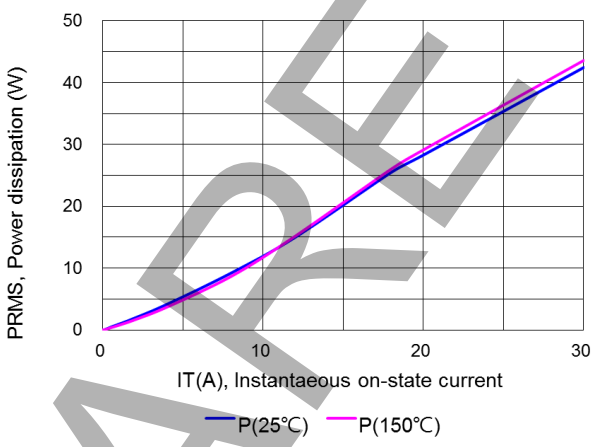
DT12T35 Characteristic

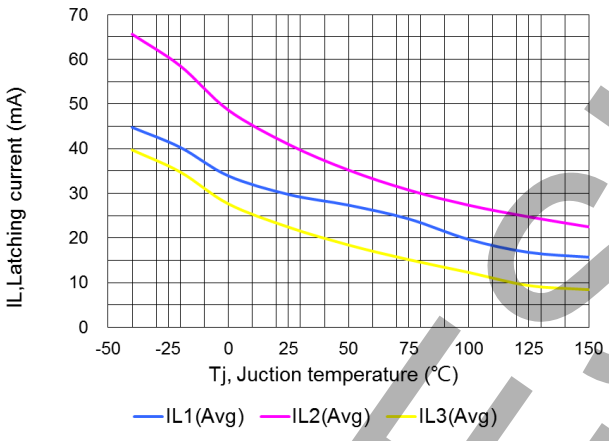
VTM - IT



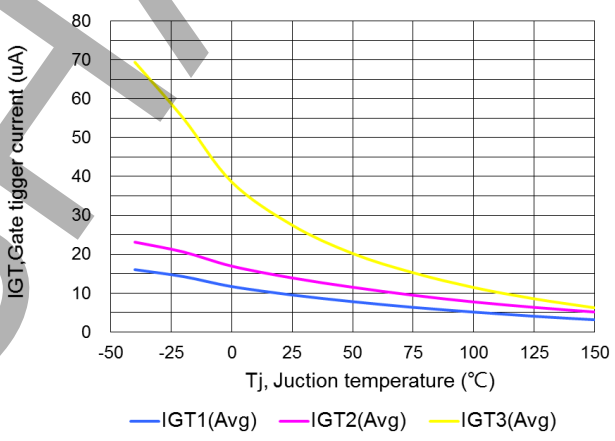
Power dissipation VS RMS on-state current



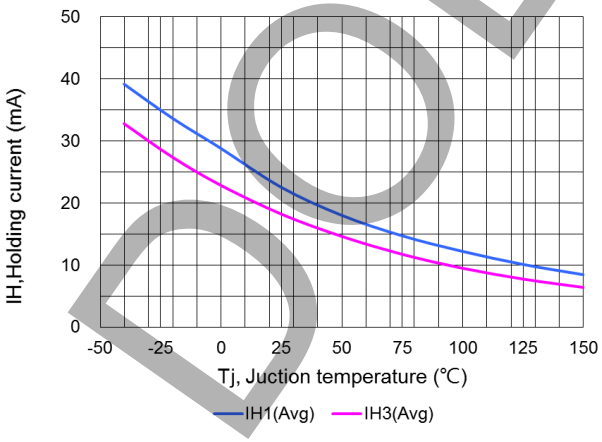
Typical latch current V.S. juction temperature



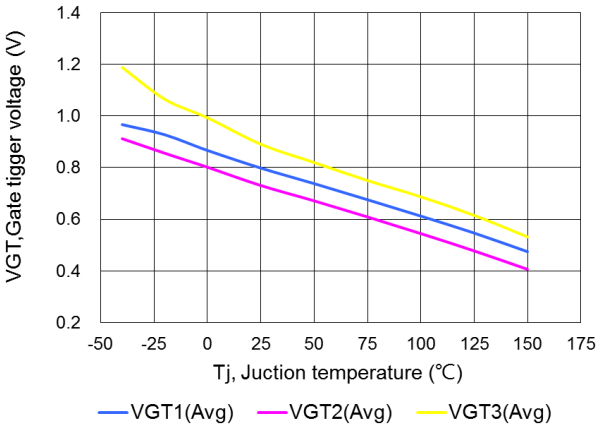
Typical gate trigger current V.S. juction temperature



Typical holding current V.S. juction temperature



Typical gate tigger voltage V.S. juction temperature



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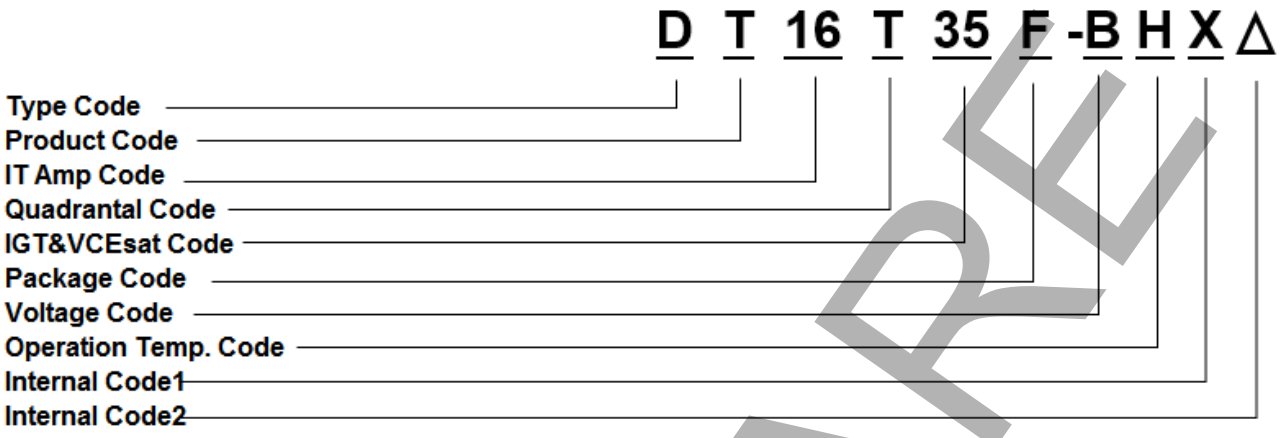
Ordering information scheme



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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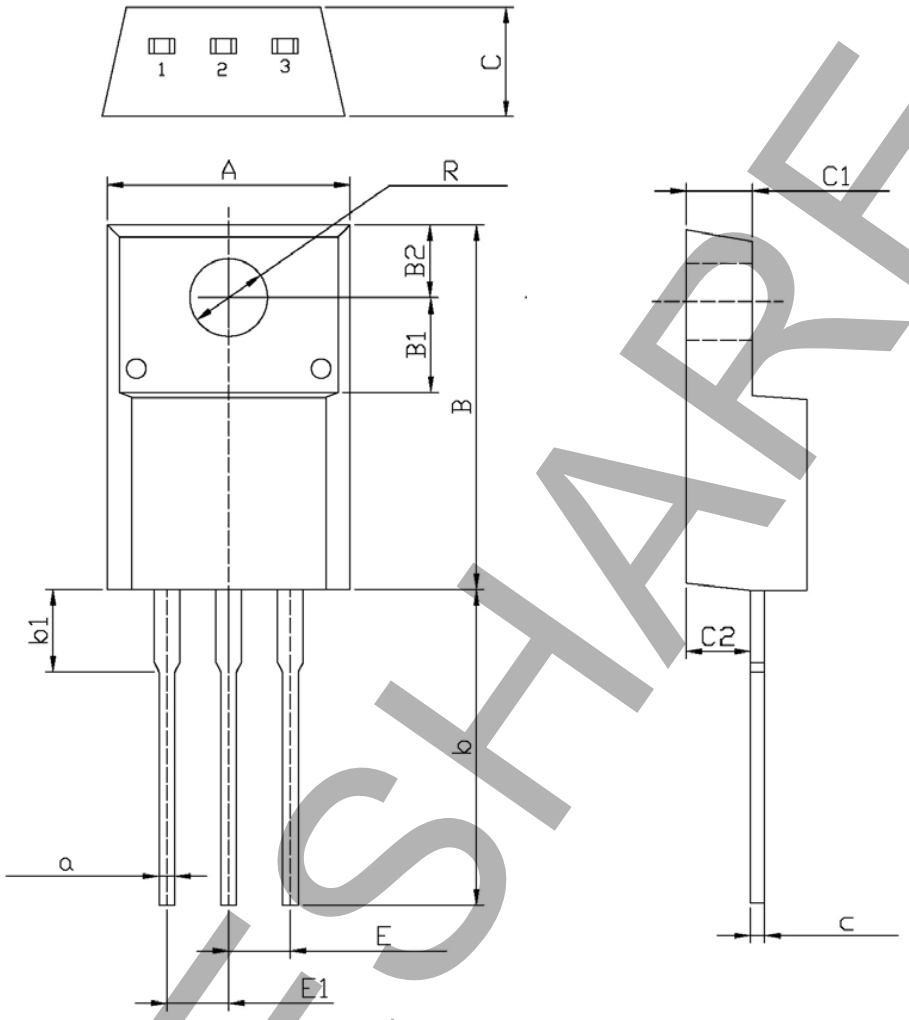
TO-220F Plastic Package



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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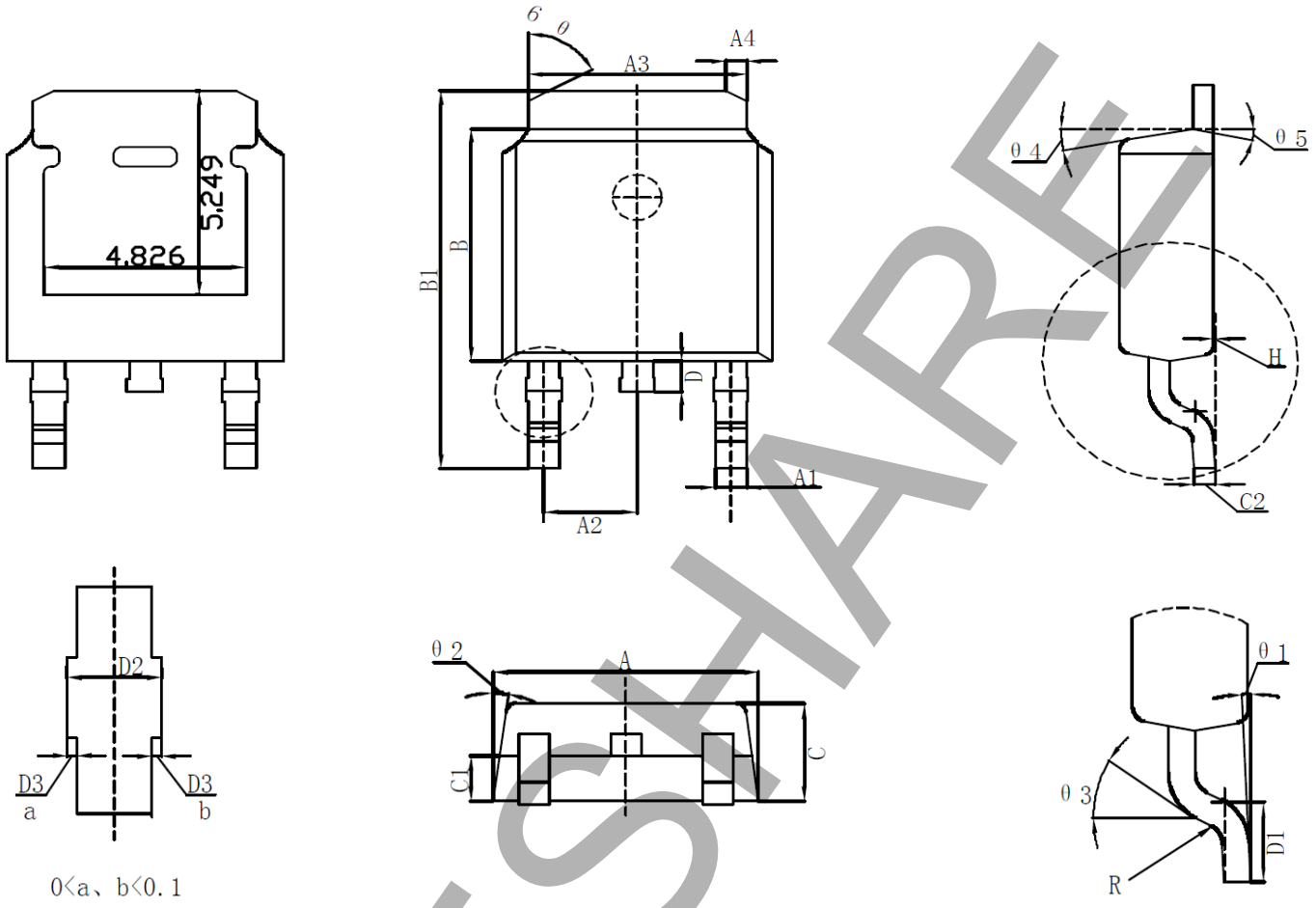
DPAK(TO-252) Plastic Package



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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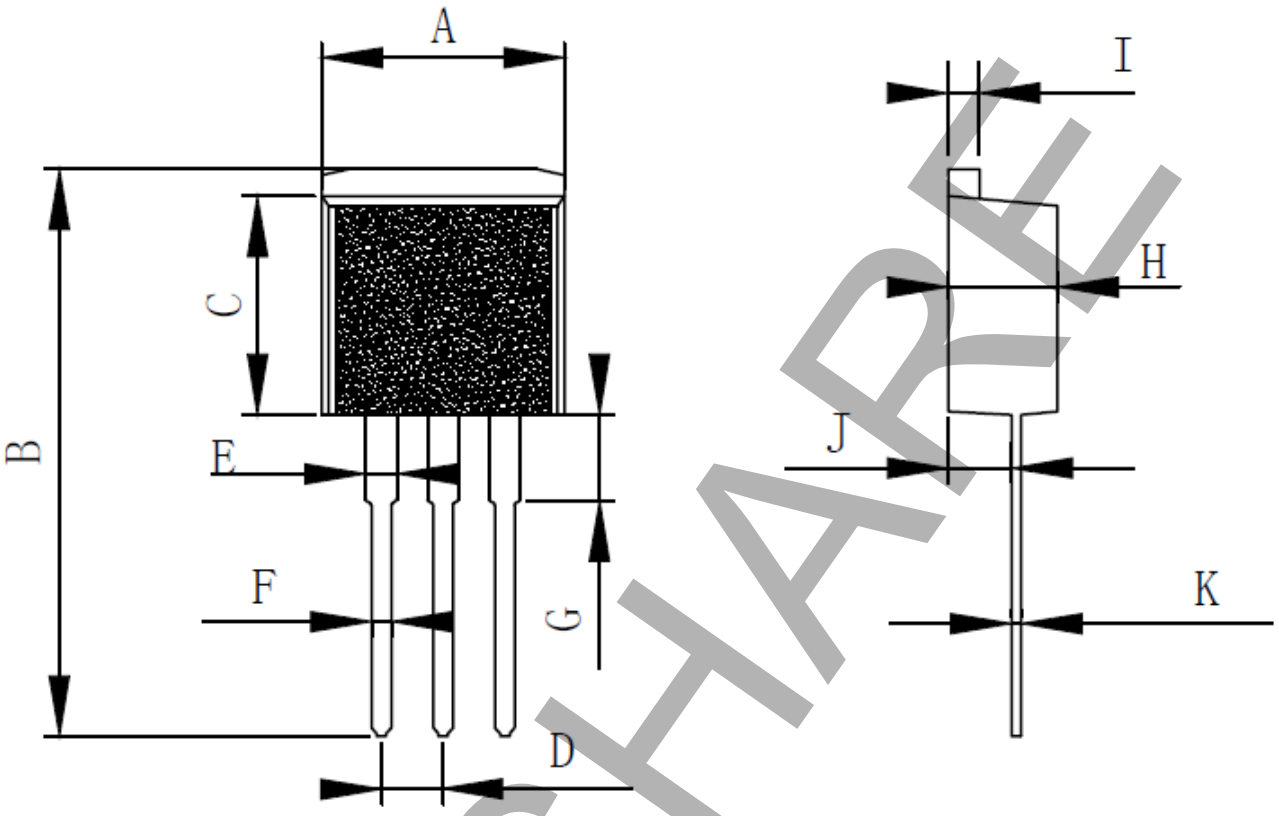
TO-262 Plastic Package



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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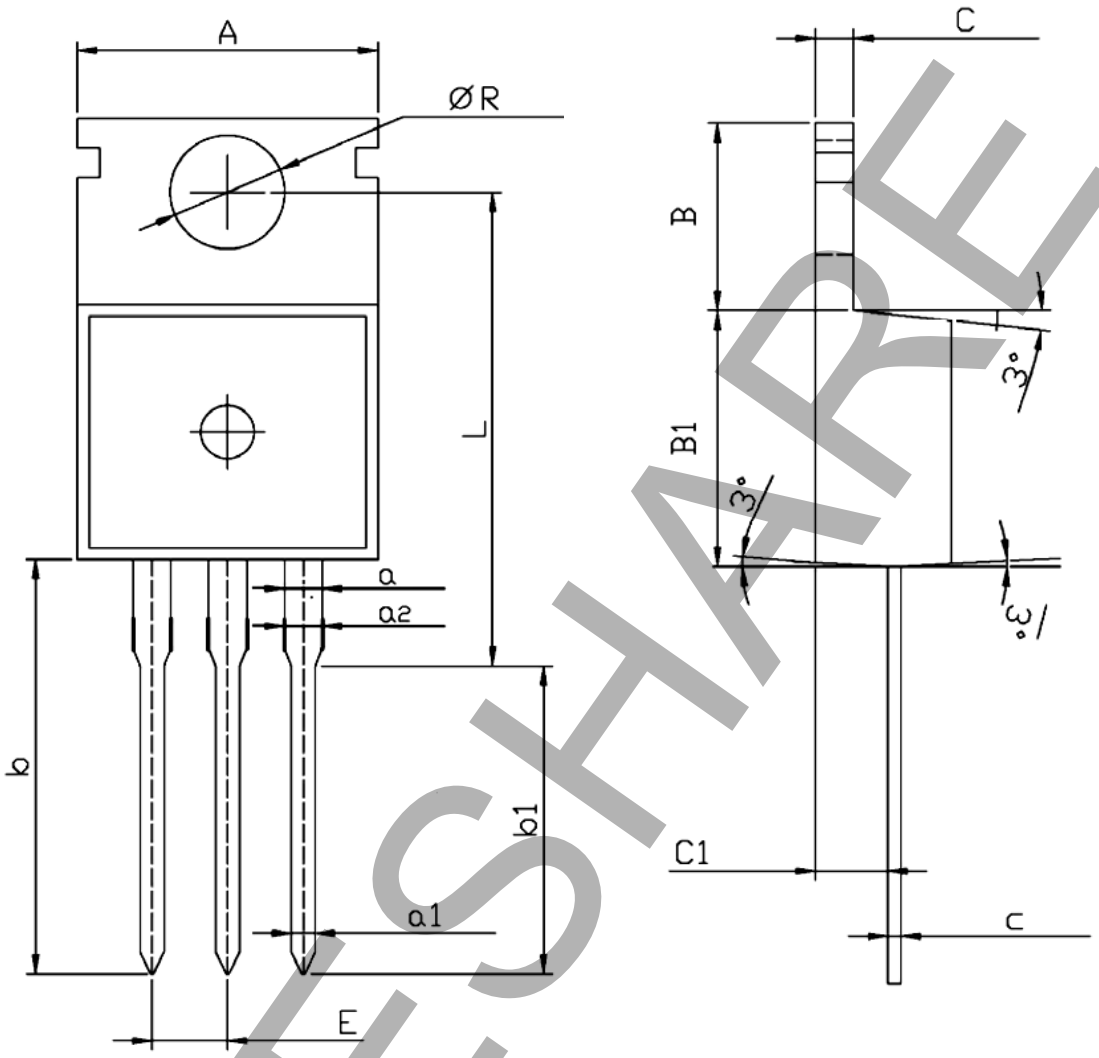
TO-220C Plastic Package



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

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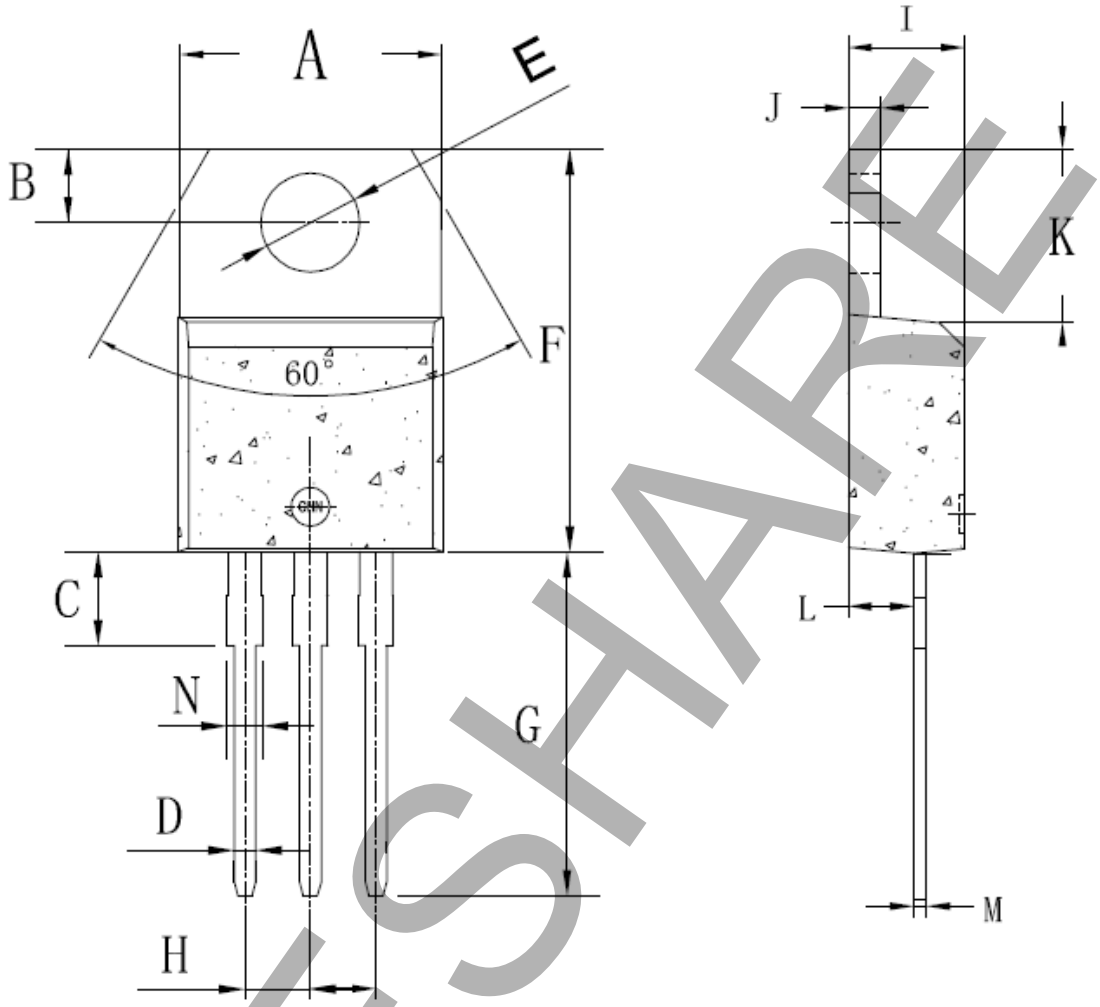
ITO-220 Plastic Package



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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