DT4T10T, DT4T10D, DT4T10F, DT4T10C

DT4T10X Series TRIAC
SILICON BIDIRECTIONAL THYRISTORS

General description

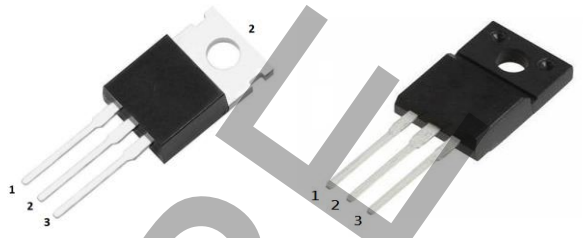
This products TRAIC are packages for third quadrant 4A by logic level triggered, DT4T10x are high commutation performance without snubber circuit. It can be controlled by phase angle trigger or on/off trigger.

FEATURES

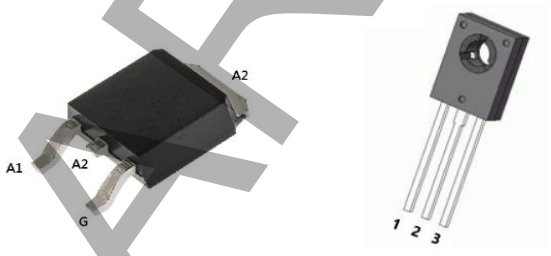
- Passivated die for reliability and uniformity
- Three-quadrant triggering, Over 1000V/ 800V V_{DRM}/V_{RRM}
- 150 Degree C operation temperature
- Without snubber circuit
- "Green" molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl)
- Lead free in RoHS II 2015/863/EU compliant
- Moisture sensitivity meets industry standard IPC/JEDEC J-STD-020

APPLICATIONS

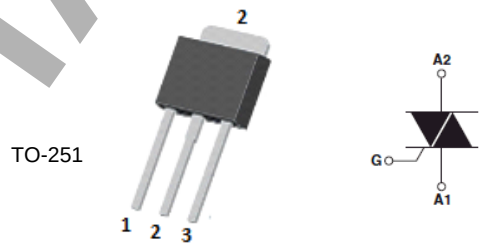
- General purpose AC switch control
- Control loads in Motor, Fan, and Pump.
- Solenoid drivers
- LED Dimming
- Heaters
- Inrush current limiting circuits



TO-220 TO-220F



DPAK TO-126



TO-251

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

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}	1000/ 800	V
On-stage RMS current (Full sine wave, T_C = 100°C)	$I_{T(RMS)}$	4	A
Peak non-repetitive surge current (one full cycle 60 Hz, Tj = 25°C)	I_{TSM}	25	A
Circuit fusing consideration (t = 8.3ms)	I^2T	5.18	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 08, Oct-2020

ON Characteristics

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Peak forward on-state voltage (I_{TM} = 4 A @ Tj = 25°C)	V_{TM}	--	--	1.7	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}	--	--	10 10 10	mA
Gate trigger voltage (V_{AK} = 12V, R_L=100Ω)	V_{GT1} V_{GT2} V_{GT3}	--	--	1.1	V
Holding current (VAK = 12V, R_L=100Ω)	I_{H1} I_{H3}	--	--	10	mA
Latching current (V_{AK} = 12V, R_L=100Ω)	I_{L1} I_{L2} I_{L3}	--	--	20 20 20	mA

Dynamic Characteristics

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Critical rate of rise of off-stage voltage (V_{AK} = 67% rated V_{DRM} , Tj = 150°C, gate open)	dv/dt	200	--	--	V/us
Critical rate of rise of on-state current, (VDRM=maximum VDRM ,Tj = 150°C)	di/dt(s)	50	--	--	A/us
Tj=150°C, gate open, Without Snubber	di/dt(c)	3	--	--	A/ms

Thermal Characteristics

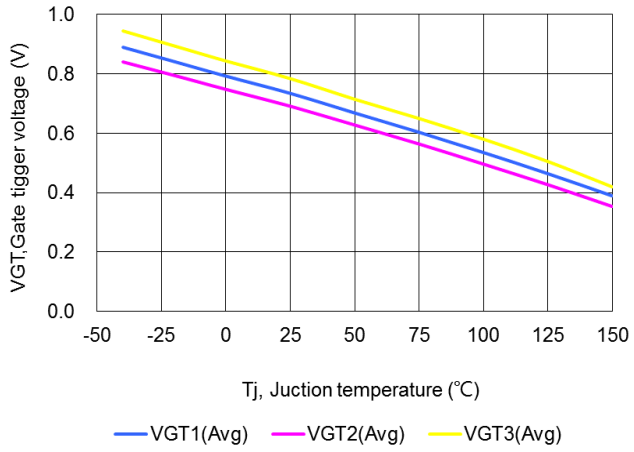
PARAMETER		SYMBOL	VALUE		UNIT
Thermal resistance from junction to lead (note 1)		Rth(j-L)	Typ	15	°C/W
Junction to case (DC) (note 1)	TO-220	Rth(j-c)	Typ	15	
	DPAK			26	
Maximum lead temperature for soldering purposes (1/8" form case for 10 seconds)		T_L	Max	260	°C

Note 1: without heatsink

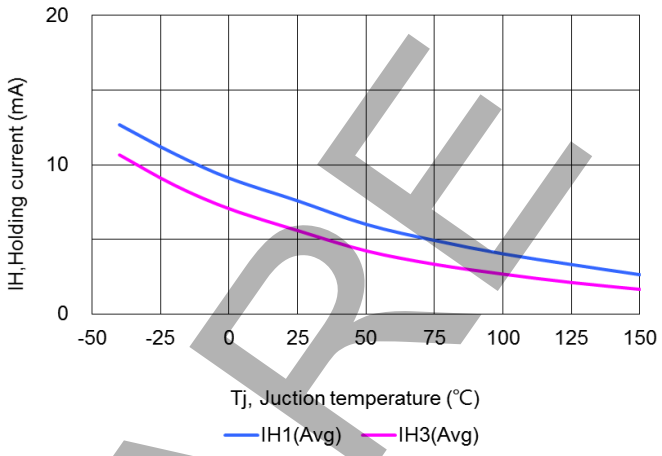
Static Characteristics

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT
Threshold Voltage (Tj = 150°C)		V_{to}	--	--	1	V
Dynamic resistors (Tj = 150°C)		R_d	--	--	200	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 = 150°C		--	--	2	mA

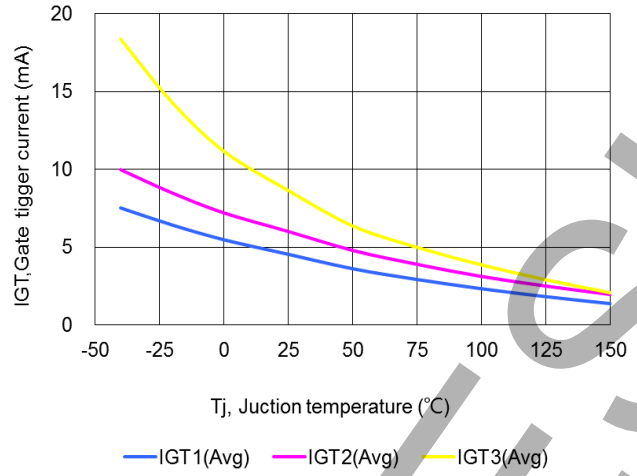
Typical gate tigger voltage V.S. juction temperature



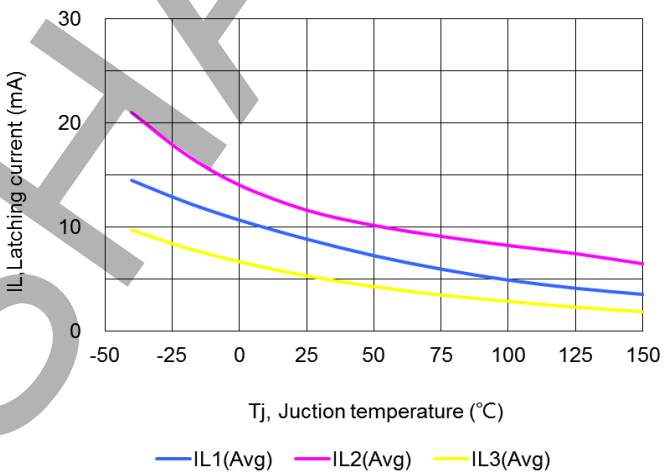
Typical holding current V.S. juction temperature



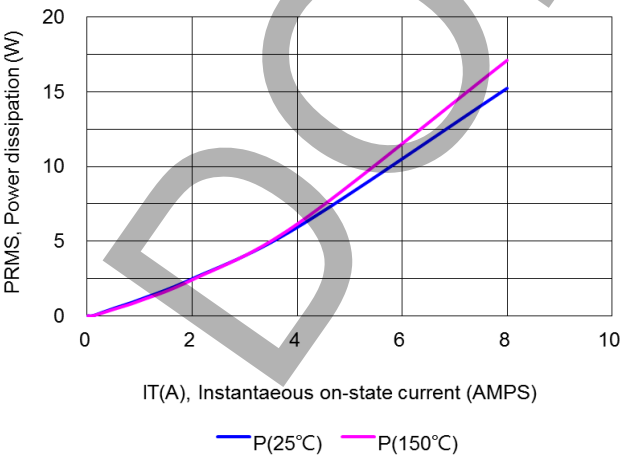
Typical gate trigger current V.S. juction temperature



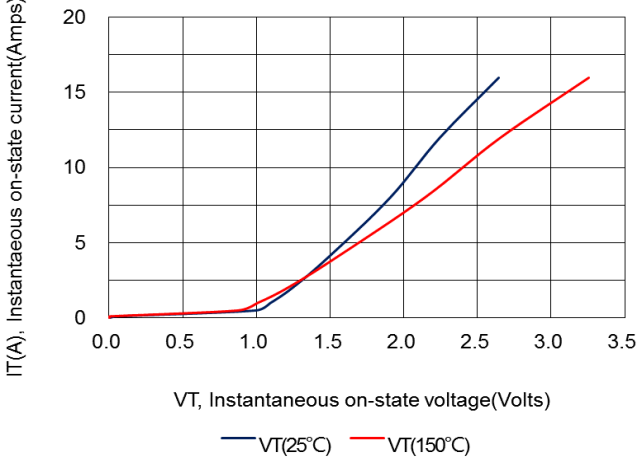
Typical latch current V.S. juction temperature



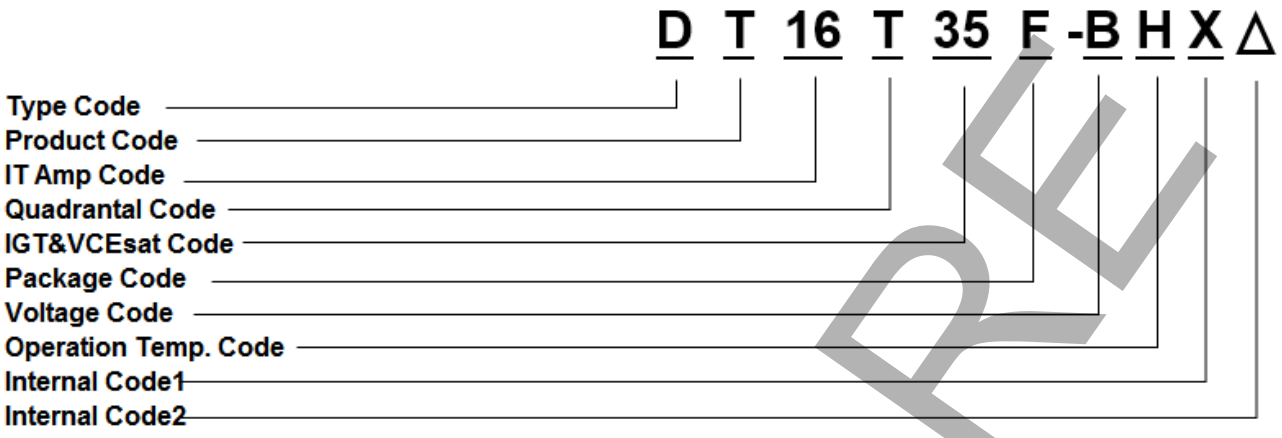
Power dissipation vs RMS on-state current



VTM - IT

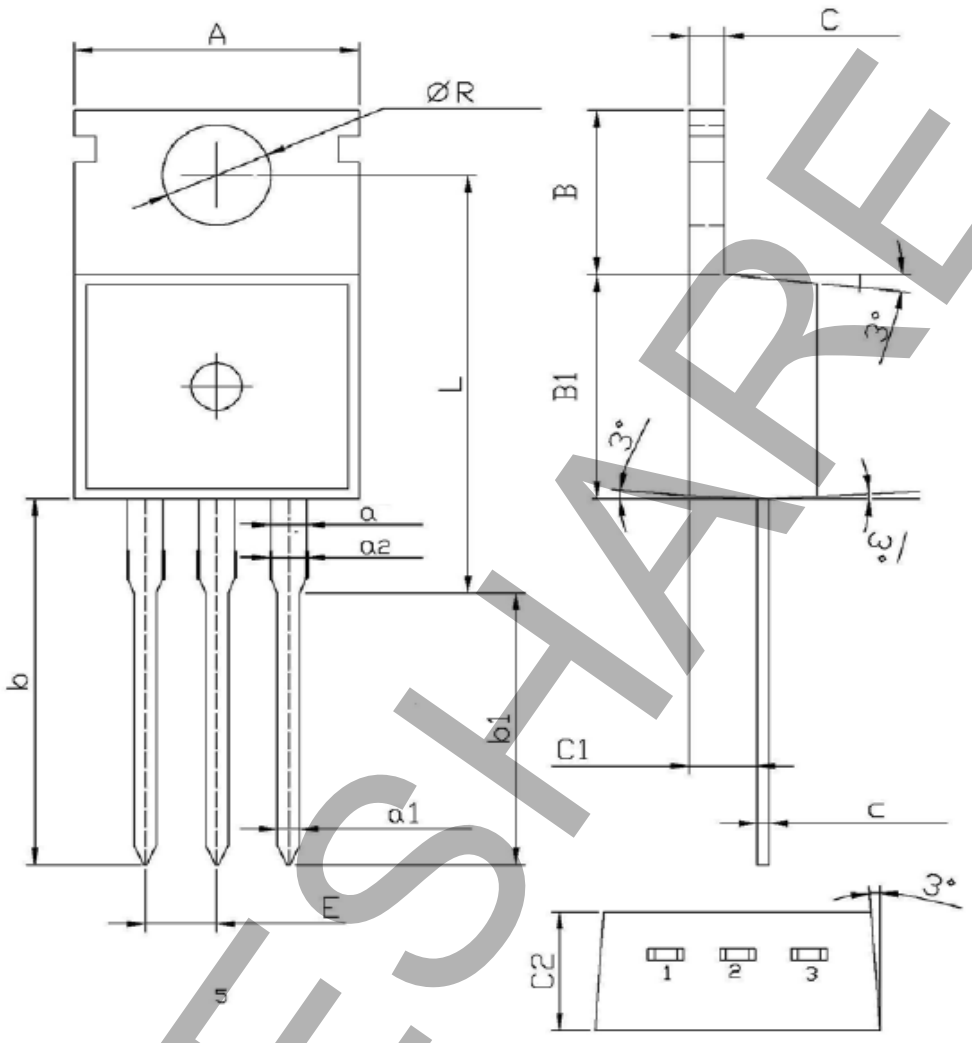


Ordering information scheme



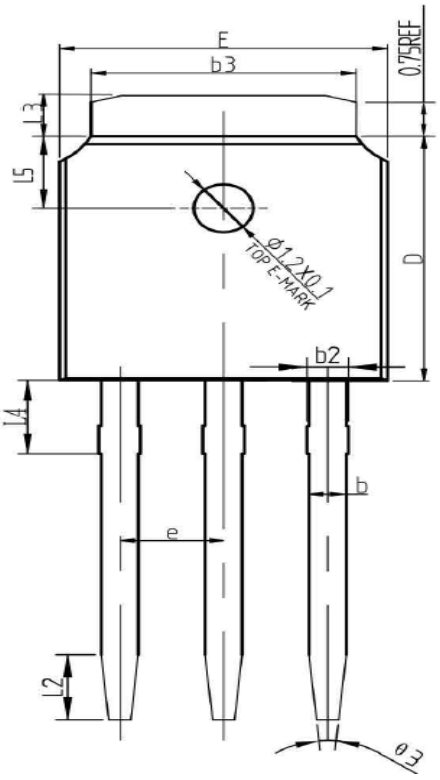
Type Code:	Doeshare Standar products
Product Code:	T for Triac series
IT Amp Code:	16 for 16A, 1 for 1A
Quadrantal Code:	T for 3Q, F for 4Q
IGT&VCEsat Code:	35 means Igt 35mA, 5 means Igt 5mA
Package Code:	A=>TO-92, C=>TO-126, D=> DPAK, E=>D2PAK, F=> TO-220F, G=>SOT-223 M=>ITO-3P, P=>TO-3P, T=> TO-220,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

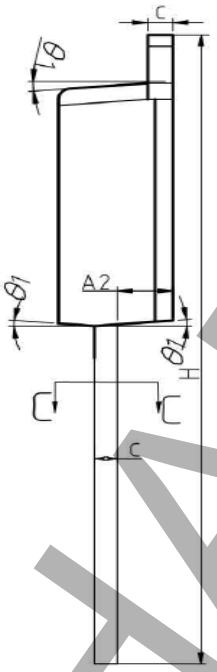
TO-220C Plastic Package

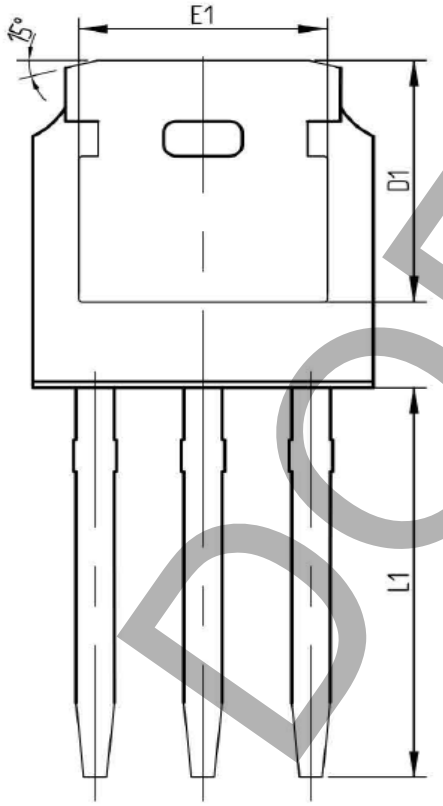


DIM	Millimeters		DIM	Millimeters		DIM	Millimeters	
	Min	Max		Min	Max		Min	Max
A	9.7	10.4	a	1.22	1.32	a2	1.18	1.45
B	6.13	6.82	a1	0.7	0.92	C2	4.3	4.71
C	1.2	1.42	b1	9.6	10.6	E	2.34	2.74
B1	9.0	9.4	c	0.38	0.65	R	3.55	3.78
b	12.6	13.6	C1	2.2	2.75	L	15.7	16.14

IPAK(TO-251) Plastic Package

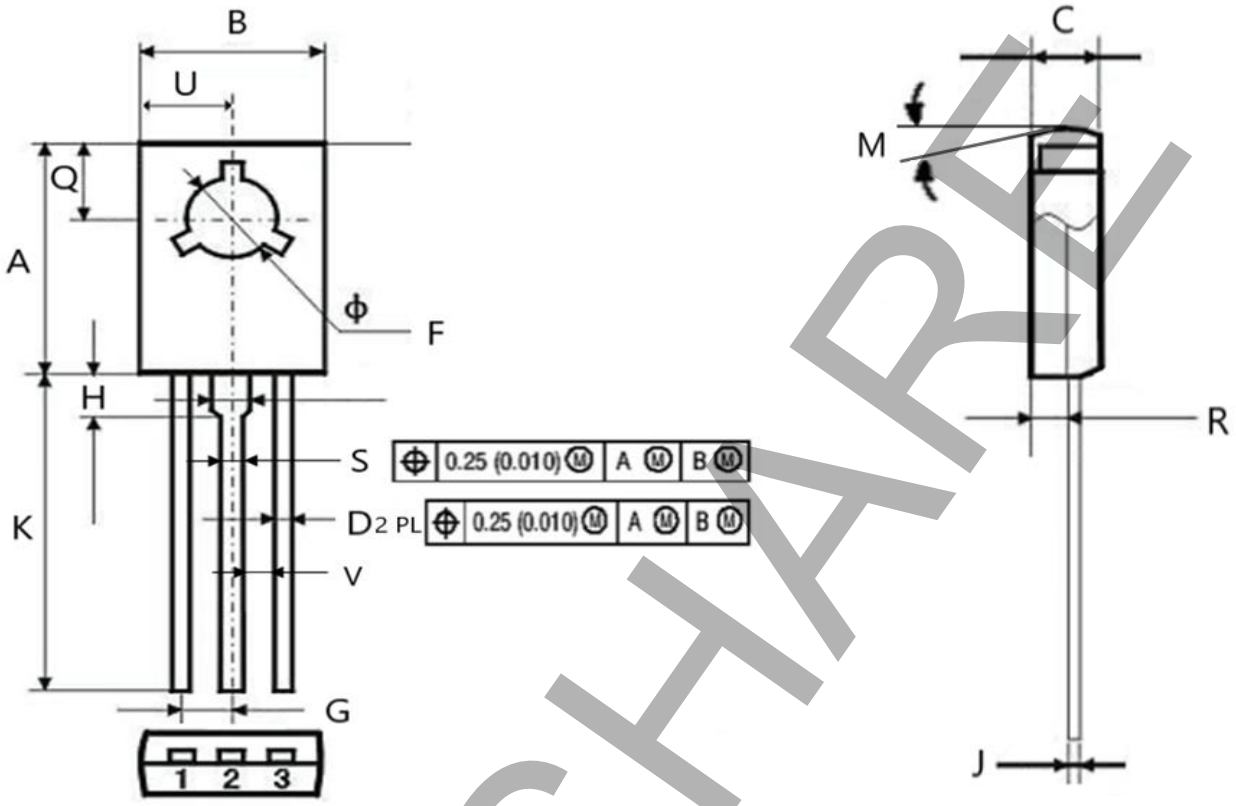






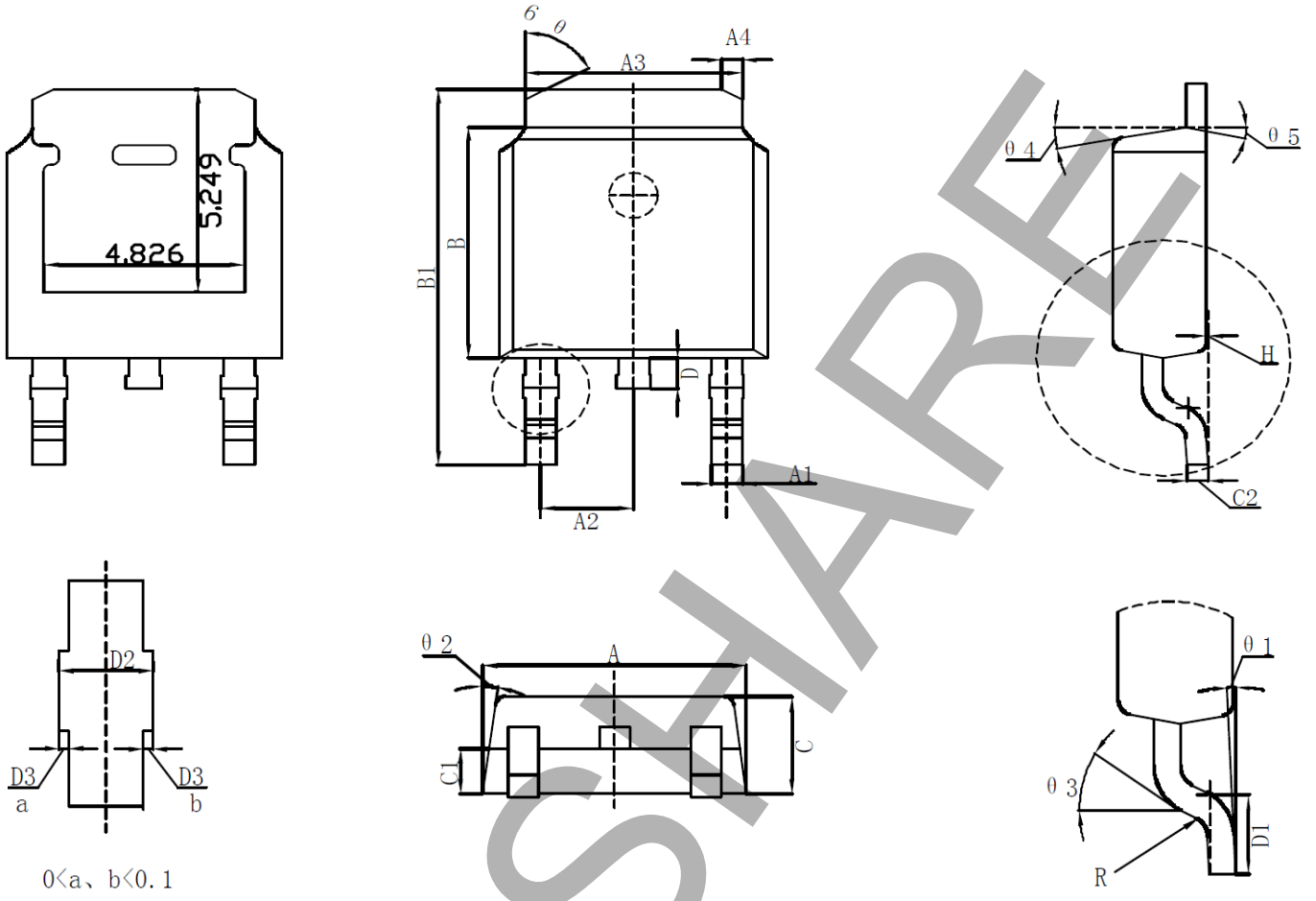
SYMBOL	mm		
	MIN	NOM	MAX
*A	2.20	2.30	2.38
*A2	0.97	1.07	1.17
*b	0.72	0.78	0.85
b1	0.71	0.76	0.81
*b2	0.72	0.88	0.95
*b3	5.23	5.33	5.46
*c	0.47	0.53	0.58
c1	0.46	0.51	0.56
*D	6.00	6.10	6.20
D1	5.30REF		
*E	6.50	6.60	6.70
E1	4.70	4.83	4.92
*e	2.286BSC		
*H	16.10	16.40	16.60
*L1	9.20	9.40	9.60
L2	1.25	1.35	1.45
*L3	0.90	1.02	1.22
L4	0.95	1.05	1.15
L5	1.70	1.80	1.90
θ1	5°	7°	9°
θ2	5°	7°	9°
θ3	11°	13°	15°

TO-126 Plastic Package



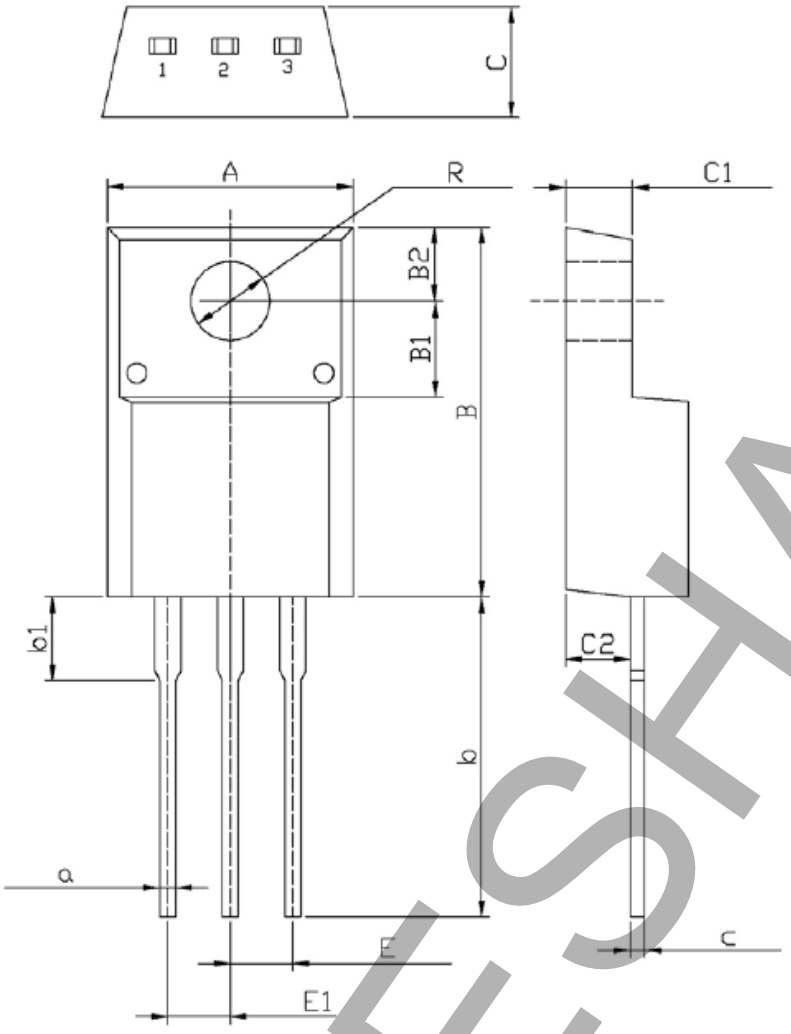
DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.425	0.433	10.80	11.04	K	0.575	0.655	14.61	16.63
B	0.295	0.323	7.50	8.20	M	5°TYP		5°TYP	
C	0.100	0.118	2.54	3.0	Q	0.148	0.158	3.76	4.01
D	0.020	0.026	0.51	0.66	R	0.045	0.065	1.15	1.65
F	0.115	0.130	2.93	3.30	S	0.025	0.035	0.64	0.88
G	0.094BSC		2.39BSC		U	0.145	0.161	3.69	4.10
H	0.050	0.095	1.27	2.41	V	0.040	-	1.02	-
J	0.015	0.025	0.39	0.63	-	-	-	-	-

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				

TO-220F Plastic Package



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

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