

## Sensitive gate SCRs, 4A

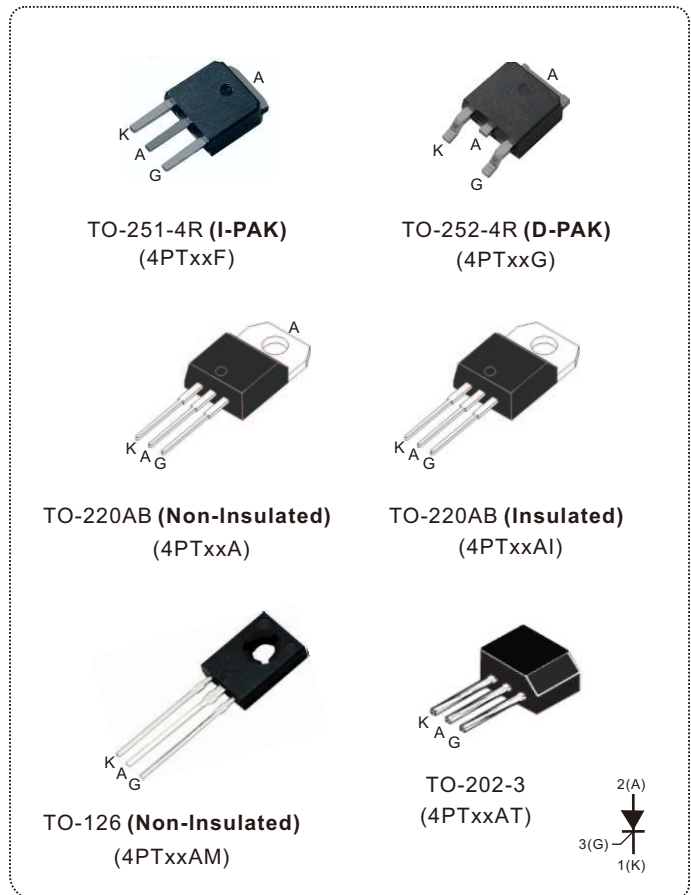
### Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	4	A
$V_{DRM}/V_{RRM}$	600 to 800	V
$I_{GT}$	10 to 200	$\mu A$

### DESCRIPTION

Thanks to highly sensitive triggering levels, the 4PT series is suitable for all applications where the available gate current is limited, such as motor control for hand tools, kitchen aids, capacitive discharge ignitions, overvoltage crowbar protection for low power supplies among others.

Available in through-hole or surface-mount packages, they provide an optimized performance in a limited space area.



### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current full sine wave (180° conduction angle)	$I_{T(RMS)}$	TO-251-4R/TO-252-4R/TO-220AB	$T_c=115^\circ C$	4	A
		TO-220AB insulated	$T_c=110^\circ C$		
		TO-126	$T_c=95^\circ C$		
		TO-202-3	$T_c=60^\circ C$		
Average on-state current (180° conduction angle)	$I_{T(AV)}$	TO-251-4R/TO-252-4R/TO-220AB	$T_c=115^\circ C$	2.5	A
		TO-220AB insulated	$T_c=110^\circ C$		
		TO-126	$T_c=95^\circ C$		
		TO-202-3	$T_c=60^\circ C$		
Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25°C)	$I_{TSM}$	F = 50 Hz	t = 20 ms	30	A
		F = 60 Hz	t = 16.7 ms	33	
$I^2t$ Value for fusing	$I^2t$	$t_p = 10$ ms		4.5	$A^2s$
Critical rate of rise of on-state current $I_G = 2xI_{GT}$ , $t_r \leq 100ns$	dI/dt	F = 60 Hz	$T_j = 125^\circ C$	50	A/ $\mu s$
Peak gate current	$I_{GM}$	$T_p = 20 \mu s$	$T_j = 125^\circ C$	1.2	A
Average gate power dissipation	$P_{G(AV)}$	$T_j = 125^\circ C$		0.2	W
Repetitive peak off-state voltage	$V_{DRM}$	$T_j = 125^\circ C$		600 and 800	V
Repetitive peak reverse voltage	$V_{RRM}$				
Storage temperature range	$T_{stg}$			- 40 to + 150	°C
Operating junction temperature range	$T_j$			- 40 to + 125	

## ELECTRICAL SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

SYMBOL	TEST CONDITIONS		4PTxxxx	Unit	
$I_{GT}$	$V_D = 12\text{V}, R_L = 30\Omega$	Min.	10	$\mu\text{A}$	
		Max.	200		
$V_{GT}$		Max.	0.8	V	
$V_{GD}$	$V_D = V_{DRM}, R_L = 3.3\text{K}\Omega, R_{GK} = 220\Omega, T_J = 125^\circ\text{C}$	Min.	0.1	V	
$I_H$	$I_T = 50\text{mA}, R_{GK} = 1\text{K}\Omega$	Max.	5	mA	
$I_L$	$I_G = 1\text{mA}, R_{GK} = 1\text{K}\Omega$	Max.	6	mA	
dV/dt	$V_D = 67\% V_{DRM}, R_{GK} = 1\text{K}\Omega, T_J = 125^\circ\text{C}$	Min.	10	V/ $\mu\text{s}$	
$V_{TM}$	$I_T = 8\text{A}, t_p = 380\mu\text{s}$	$T_J = 25^\circ\text{C}$	Max.	1.6	V
$I_{DRM}$	$V_D = V_{DRM}, V_R = V_{RRM}$	$T_J = 25^\circ\text{C}$	Max.	5	$\mu\text{A}$
$I_{RRM}$	$R_{GK} = 1\text{K}$	$T_J = 125^\circ\text{C}$	Max.	1	mA

## THERMAL RESISTANCE

SYMBOL	Parameter	VALUE	UNIT
$R_{th(j-c)}$	Junction to case (DC)	IPAK/DPAK/TO-220AB/TO-126	2.8
$R_{th(j-a)}$	Junction to ambient	$S = 0.5\text{ cm}^2$ TO-252-4R(D-PAK)	70
		TO-220AB	60
		TO-251-4R(I-PAK)/TO-126	100
$R_{th(j-l)}$	Junction to lead (DC)	TO-202-3	15

## PRODUCT SELECTOR

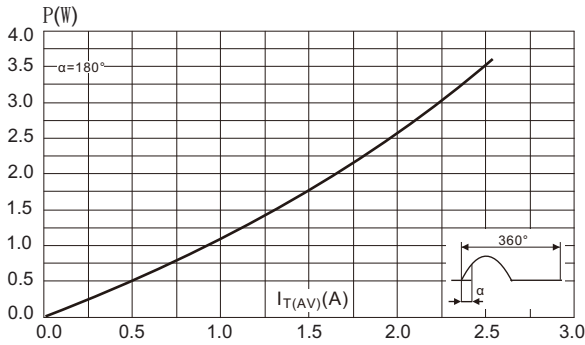
PART NUMBER	VOLTAGE (xx)		SENSITIVITY	PACKAGE
	600 V	800 V		
4PTxxA-S/4PTxxAI-S	V	V	70~200 $\mu\text{A}$	TO-220AB
4PTxxA-03/4PTxxAI-03	V	V	10~30 $\mu\text{A}$	TO-220AB
4PTxxA-05/4PTxxAI-05	V	V	20~50 $\mu\text{A}$	TO-220AB
4PTxxA-06/4PTxxAI-06	V	V	30~60 $\mu\text{A}$	TO-220AB
4PTxxA-08/4PTxxAI-08	V	V	50~80 $\mu\text{A}$	TO-220AB
4PTxxF-S	V	V	70~200 $\mu\text{A}$	I-PAK
4PTxxF-03	V	V	10~30 $\mu\text{A}$	I-PAK
4PTxxF-05	V	V	20~50 $\mu\text{A}$	I-PAK
4PTxxF-06	V	V	30~60 $\mu\text{A}$	I-PAK
4PTxxF-08	V	V	50~80 $\mu\text{A}$	I-PAK
4PTxxG-S	V	V	70~200 $\mu\text{A}$	D-PAK
4PTxxG-03	V	V	10~30 $\mu\text{A}$	D-PAK
4PTxxG-05	V	V	20~50 $\mu\text{A}$	D-PAK
4PTxxG-06	V	V	30~60 $\mu\text{A}$	D-PAK
4PTxxG-08	V	V	50~80 $\mu\text{A}$	D-PAK
4PTxxAM-S	V	V	70~200 $\mu\text{A}$	TO-126
4PTxxAM-03	V	V	10~30 $\mu\text{A}$	TO-126
4PTxxAM-05	V	V	20~50 $\mu\text{A}$	TO-126
4PTxxAM-06	V	V	30~60 $\mu\text{A}$	TO-126
4PTxxAM-08	V	V	50~80 $\mu\text{A}$	TO-126
4PTxxAT-03	V	V	10~30 $\mu\text{A}$	TO-202-3
4PTxxAT-06	V	V	30~60 $\mu\text{A}$	TO-202-3
4PTxxAT-08	V	V	50~80 $\mu\text{A}$	TO-202-3

ORDERING INFORMATION					
ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
4PTxxA-yy	4PTxxA-yy	TO-220AB	2.0g	50	Tube
4PTxxAI-yy	4PTxxAI-yy	TO-220AB (insulated)	2.3g	50	Tube
4PTxxF-yy	4PTxxF-yy	TO-251-4R(I-PAK)	0.40g	80	Tube
4PTxxG-yy	4PTxxG-yy	TO-252-4R(D-PAK)	0.38g	80	Tube
4PTxxAM-yy	4PTxxAM-yy	TO-126	0.75g	500	Bag
4PTxxAT-yy	4PTxxAT-yy	TO-202-3	g	500	Bag

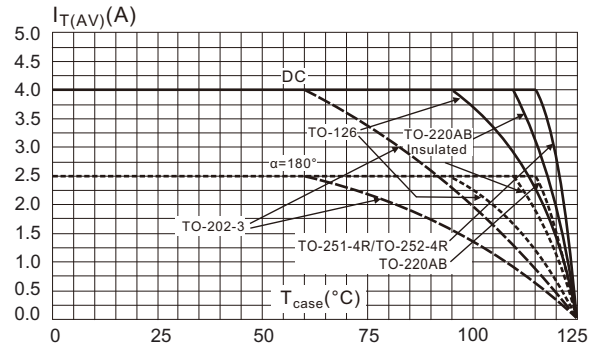
**Note:** xx = voltage, yy = sensitivity

ORDERING INFORMATION SCHEME	
<p><b>4 PT 06 AI - S</b></p>	<p><b>Current</b> 4 = 4A, <math>I_{T(RMS)}</math></p> <p><b>SCR series</b></p> <p><b>Voltage Code</b> 06 = 600V 08 = 800V</p> <p><b>Package type</b> A = TO-220AB (non-insulated) AI = TO-220AB (insulated) F = TO-251-4R (I-PAK) G = TO-252-4R (D-PAK) AM = TO-126 AT = TO-202-3</p> <p><b>IGT Sensitivity</b> 03 = 10~30 <math>\mu A</math> 05 = 20~50 <math>\mu A</math> 06 = 30~60 <math>\mu A</math> 08 = 50~80 <math>\mu A</math> S = 70~200 <math>\mu A</math></p>

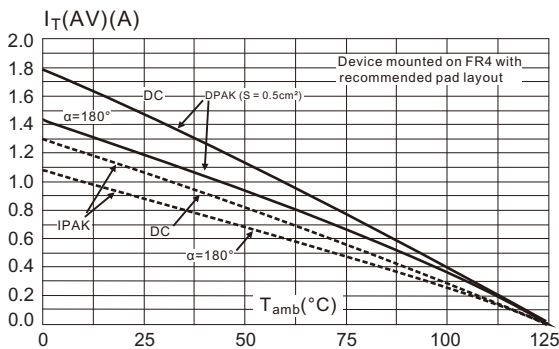
**Fig.1 Maximum average power dissipation versus on-state current**



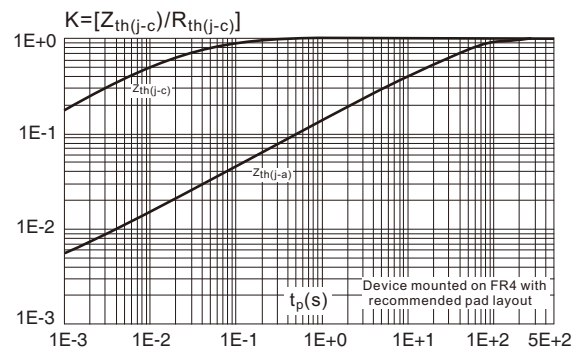
**Fig.2 Average and DC on-state current versus case temperature**



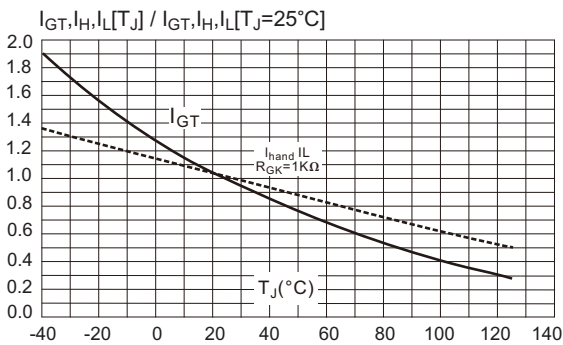
**Fig.3 Average and DC on-state current versus ambient temperature (DPAK)**



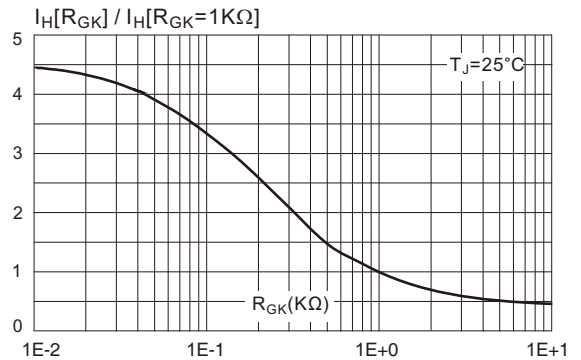
**Fig.4 Relative variation of thermal impedance junction to ambient versus pulse duration (DPAK)**



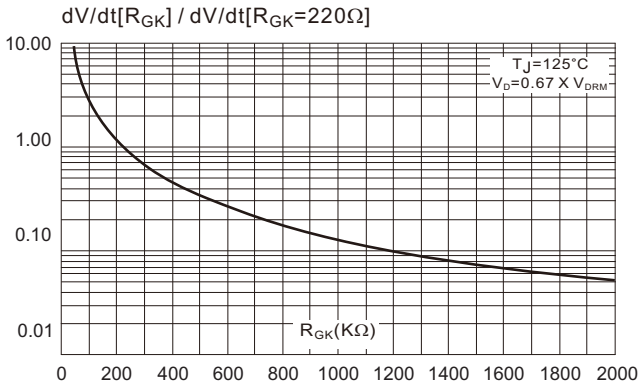
**Fig.5 Relative variation of gate trigger current and holding current versus junction temperature**



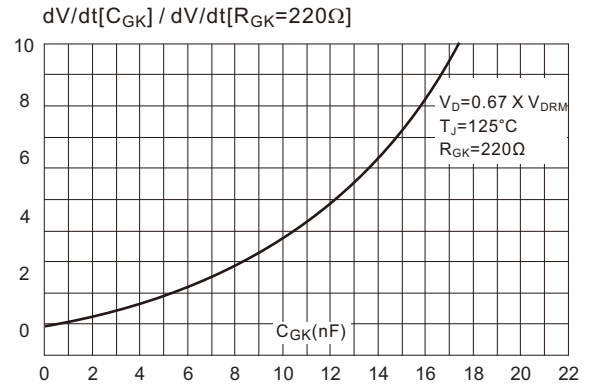
**Fig.6 Relative variation of holding current versus gate-cathode resistance (typical values)**



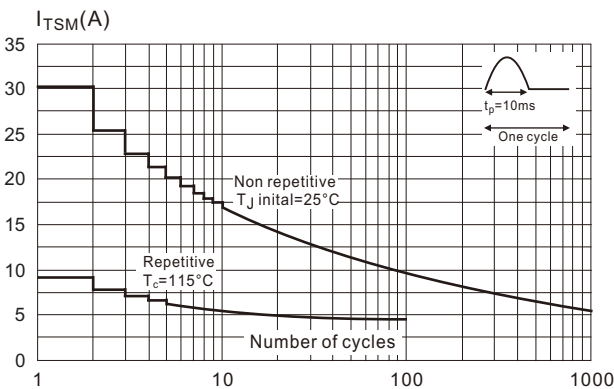
**Fig.7 Relative variation of dV/dt immunity versus gate-cathode resistance (typical values)**



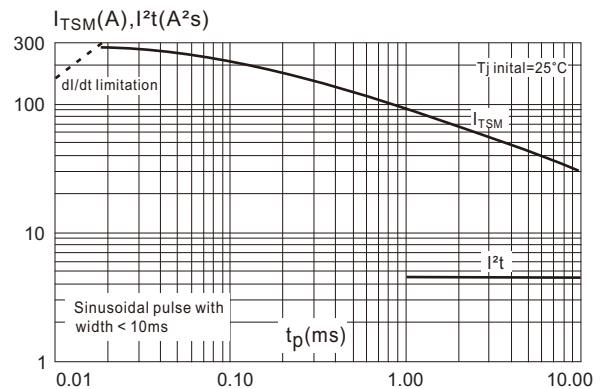
**Fig.8 Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values)**



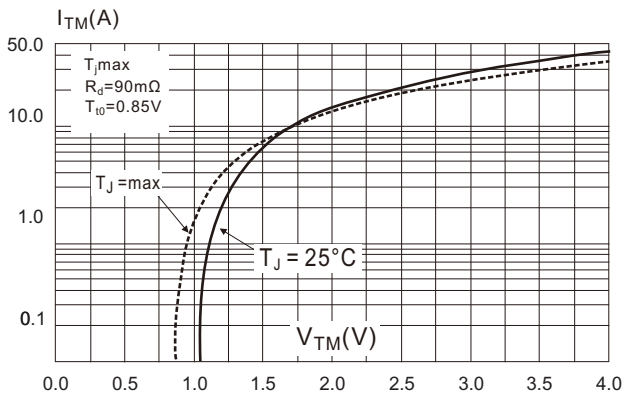
**Fig.9 Surge peak on-state current versus number of cycles**



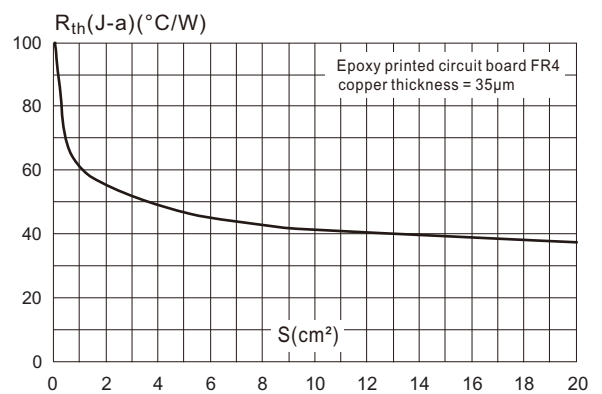
**Fig.10 Non-repetitive surge peak on-state current, and corresponding values of I²t**



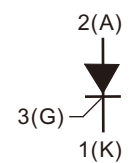
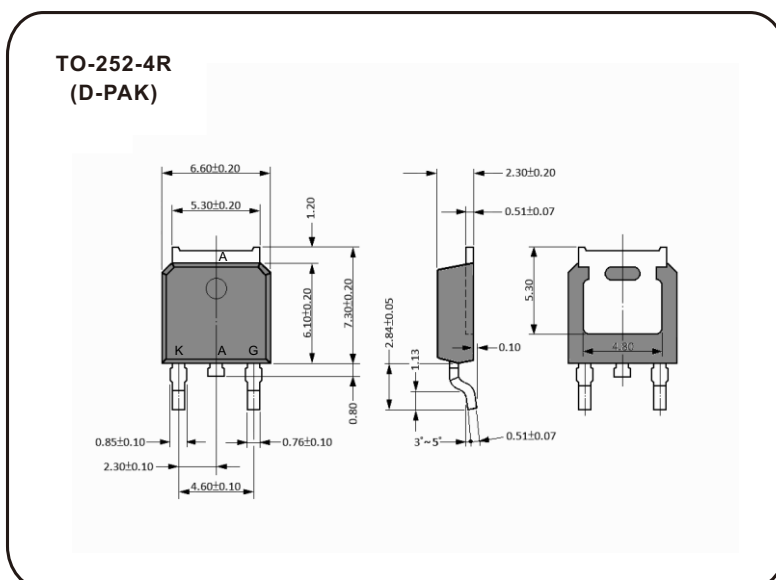
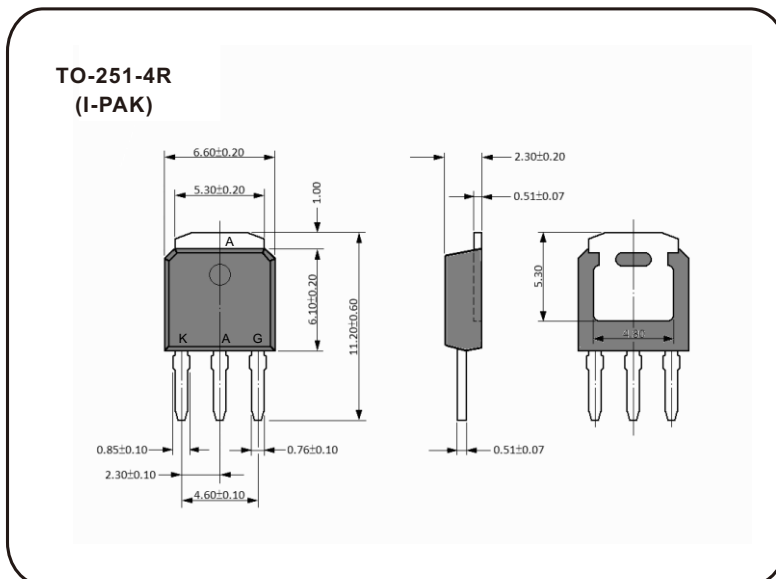
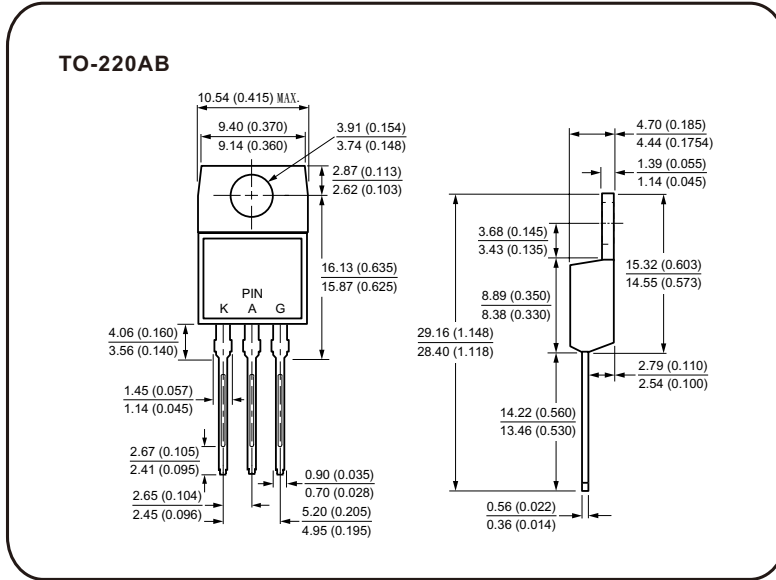
**Fig.11 On-state characteristics (maximum values)**



**Fig.12 Thermal resistance junction to ambient versus copper surface under tab (DPAK)**



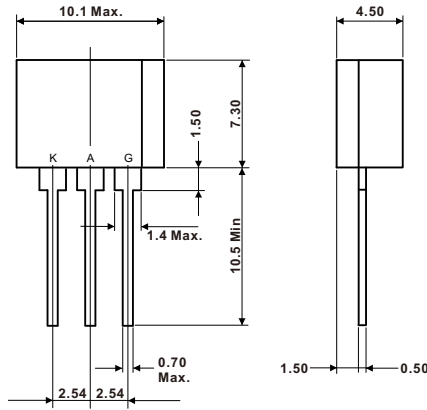
## Case Style



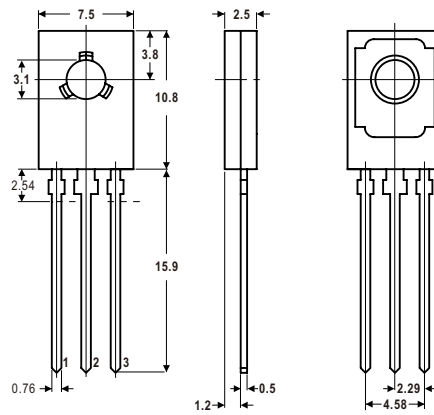
All dimensions in millimeters(inches)

**Case Style**

**TO-202-3**



**TO-126**



All dimensions in millimeters(inches)

