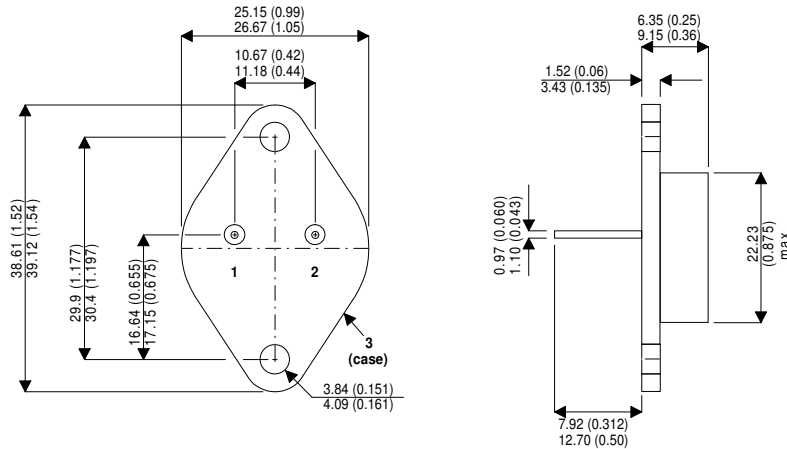


## MECHANICAL DATA

Dimensions in mm (inches)



**Bipolar NPN Device in a  
Hermetically Sealed TO3  
Metal Package**

## APPLICATIONS

**Intended for High Current  
Switching Applications.**

## TO3 (TO204AA)

Pin 1 = Base      Pin 2 = Emitter      Case = Collector

## ABSOLUTE MAXIMUM RATINGS

$T_{CASE} = 25^{\circ}C$  unless otherwise stated

$V_{CBO}$	Collector - Base Voltage	150V
$V_{CEX}$	Collector - Emitter Voltage ( $V_{BE} = -1.5V$ $R_{BE} = 100\Omega$ )	150V
$V_{CEO}$	Collector - Emitter Voltage	90V
$V_{EBO}$	Emitter - Base Voltage	7V
$I_C$	Continuous Collector Current	20A
$I_B$	Base Current	5A
$P_{tot}$	Total Power Dissipation at $T_{case} = 25^{\circ}C$ Derate above $25^{\circ}C$	140W 0.8W/ $^{\circ}C$
$T_{stg}$	Storage Temperature	-65 to $200^{\circ}C$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

## THERMAL CHARACTERISTICS

		Max.	Unit
$R_{th j-case}$	Thermal resistance to case	1.25	°C/W

## ELECTRICAL CHARACTERISTICS ( $T_{case}=25^{\circ}C$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$h_{FE}^*$	Forward-current transfer ratio $I_C = 2A$ $I_C = 12A$	$V_{CE} = 5.0V$	50	250	
			20	100	
$V_{CE(sat)}^*$	Collector to Emitter Saturation Voltage $I_C = 12A$ $I_C = 20A$	$I_B = 1.2A$ $I_B = 5A$		1.0	V
				2.5	
$V_{BE(sat)}^*$	Base to Emitter Saturated Voltage $I_C = 20A$	$I_B = 5A$		3.3	
$V_{(BR)CEO}^*$	Collector to Emitter Breakdown Voltage $I_C = 0.2A$		90		
$V_{(BR)CEX}^*$	Collector to Emitter Breakdown Voltage $I_C = 0.2A$ $V_{BE} = -1.5V$	$R_{BE} = 100\Omega$	150		
$I_{CEV}$	Collector Cut-Off Current $V_{CE} = 140V$ $V_{CE} = 100V$ $T_{Case} = 150^{\circ}C$	$V_{BE} = -1.5V$ $V_{BE} = -1.5V$		50	mA
				10	
$I_{CEO}$	Collector Cut-Off Current $V_{CE} = 70V$	$I_B = 0$		20	
$I_{EBO}$	Emitter Cut-Off Current $V_{EB} = 7V$ $V_{EB} = 5V$	$I_C = 0$		50	
				5	
$V_{BE}^*$	Base-Emitter Voltage $V_{CE} = 5.0V$	$I_C = 12A$		1.8	V

## DYNAMIC CHARACTERISTICS

$t_r$	Rise Time	$V_{CC} = 30V$ $I_C = 12A$ $I_{B1} = -I_{B2} = 1.2A$			0.5	$\mu s$
$t_s$	Storage Time				1.5	
$t_f$	Fall Time				0.5	
$C_{ob}$	Output Capacitance	$I_E = 0$ $f = 1.0MHz$	$V_{CB} = 10V$		500	pF
$ h_{fe} $	Small Signal Current Gain	$I_C = 2A$ $f = 5MHz$	$V_{CE} = 10V$	12		

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

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