

# SILICON MULTI-EPITAXIAL NPN TRANSISTOR

## BUV20

- Hermetic TO3 (TO-204AE) Metal Package
- High Voltage, High Current, Fast Switching
- Suited For High Current Switching Industrial Applications
- High Reliability Screening Options Available



### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage		160V
$V_{CER}$	Collector – Emitter Voltage	$R_{BE} = 100\Omega$	150V
$V_{CEX}$	Collector – Emitter Voltage	$V_{BE} = -1.5V$	160V
$V_{CEO}$	Collector – Emitter Voltage		125V
$V_{EBO}$	Emitter – Base Voltage		7V
$I_C$	Collector Current – Continuous		50A
$I_{CM}$	Peak Collector Current	$t_p = 10\text{ms}$	60A
$I_B$	Base Current		10A
$P_D$	Total Power Dissipation at	$T_C = 25^\circ\text{C}$	250W
		Derate Above $25^\circ\text{C}$	1.43W/ $^\circ\text{C}$
$T_J$	Junction Temperature		+200 $^\circ\text{C}$
$T_{stg}$	Storage Temperature Range		-65 to +200 $^\circ\text{C}$

### THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction To Case	0.7	$^\circ\text{C}/\text{W}$

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

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = 20\text{mA}$ $I_B = 0$	125			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 1.0\text{mA}$ $I_C = 0$	7			
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = 100\text{V}$ $I_B = 0$			3	mA
$I_{CEX}$	Collector Cut-Off Current	$V_{CE} = 160\text{V}$ $V_{BE} = -1.5\text{V}$			3	
		$T_C = 125^\circ\text{C}$			12	
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 5\text{V}$ $I_C = 0$			1.0	
$h_{FE}^{(1)}$	Forward-current transfer ratio	$V_{CE} = 2\text{V}$ $I_C = 25\text{A}$	20		60	
		$V_{CE} = 4\text{V}$ $I_C = 50\text{A}$	10			
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = 25\text{A}$ $I_B = 2.5\text{A}$		0.3	0.6	V
		$I_C = 50\text{A}$ $I_B = 5\text{A}$		0.7	1.2	
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = 50\text{A}$ $I_B = 5\text{A}$		1.4	2	

## DYNAMIC CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$f_T$	Transition Frequency	$I_C = 2\text{A}$ $V_{CE} = 15\text{V}$ $f = 4\text{MHz}$	8			MHz
$t_{on}$	Turn-On Time	$I_C = 50\text{A}$ $V_{CC} = 30\text{V}$ $I_{B1} = 5\text{A}$			1.5	$\mu\text{s}$
$t_s$	Storage Time	$I_C = 50\text{A}$ $V_{CC} = 30\text{V}$			1.2	
$t_f$	Fall Time	$I_{B1} = -I_{B2} = 5\text{A}$			0.3	

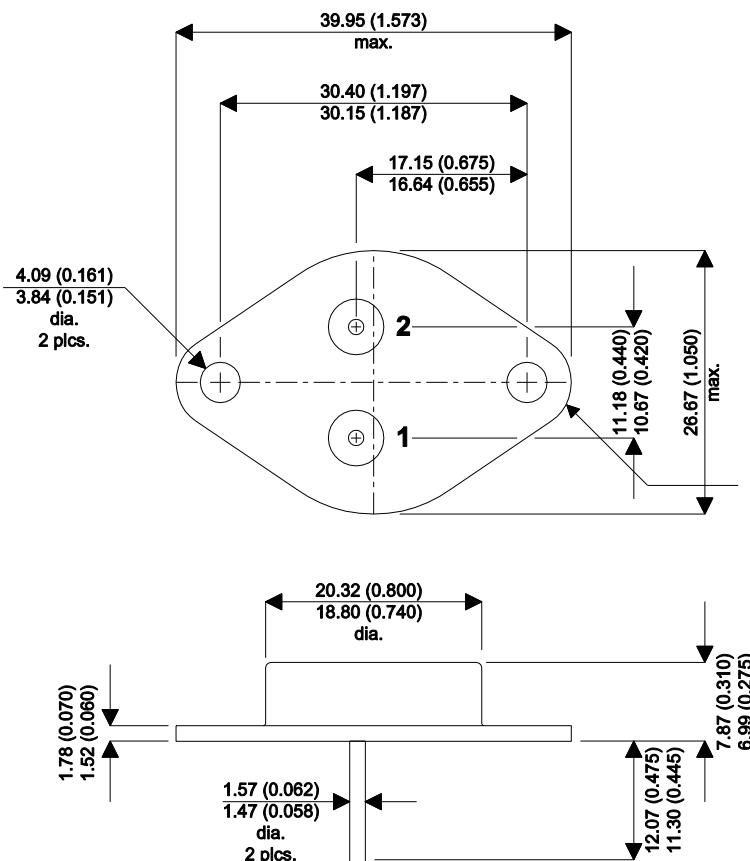
### Notes

(1) Pulse Width  $\leq 380\mu\text{s}$ ,  $\delta \leq 2\%$

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## MECHANICAL DATA

Dimensions in mm (inches)



**TO3 (TO-204AE) METAL PACKAGE**  
Underside View

Pin 1 - Base      Pin 2 - Emitter      Case - Collector

## PART NUMBER VARIANTS

Part Number Reference	Termination Finish
BUV20	Standard Finish – Pre-tinned 63% Tin, 37% Lead
BUV20.R	Lead Free Finish – Pre-tinned 96.5% Tin, 3% Silver, 0.5% Copper (SAC305)

### Notes:

- Specify lead finish option by part number at point of order
- All design variants contain Lead (Pb) within the construction of the device. The Lead content is fully RoHS compliant but using an exemption as currently understood from the EU directive 2011/65/EU (Annex III, exemption 7a).