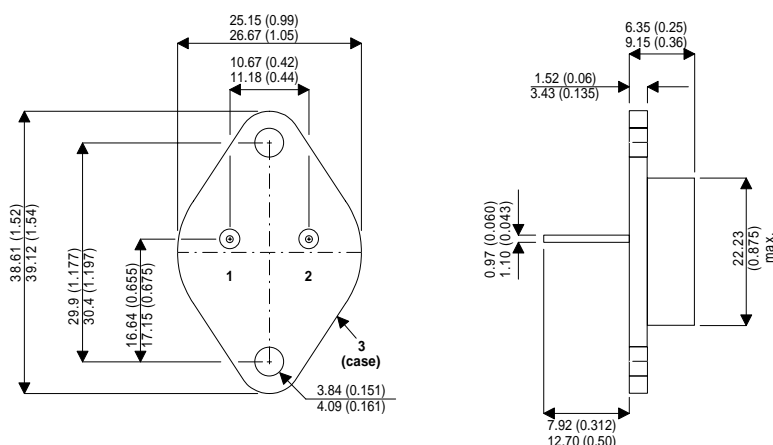


MECHANICAL DATA

Dimensions in mm (inches)


TO-204AA (TO-3)

PIN 1 — Base
PIN 2 — Emitter
Case is Collector.

HIGH CURRENT HIGH SPEED HIGH POWER SILICON NPN PLANAR TRANSISTOR

FEATURES

- Fast Turn-On Time - $1\mu\text{s}$ @ $I_C = 15\text{A}$
- High Current Capability

Applications

The BUX39 is an epitaxial silicon NPN planar transistor that has high current and high power handling capability and high switching speed.

This device is especially suitable for switching-control amplifiers, power gates, switching regulators, power-switching circuits converters, inverters and control circuits. Other recommended applications include DC-RF amplifiers and power oscillators.

*The BUX39 is in SEMELAB's maintenance series and is **NOT** recommended for new designs.*

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

V_{CBO}	Collector - Base Voltage		120V
V_{CEX}	Collector - Emitter Sustaining Voltage	@ $V_{\text{BE}} = -1.5\text{V}$	120V
V_{CER}	Collector - Emitter Voltage	@ $R_{\text{BE}} = 100\Omega$	110V
$V_{\text{CEO(sus)}}$	Collector - Emitter Sustaining Voltage		90V
V_{EBO}	Emitter - Base Voltage		7V
I_C	Collector Current		30A
I_{CM}	Peak Collector Current		40A
I_B	Base Current		6A
P_{tot}	Total Power Dissipation		120W
	Derate above 25°C		0.68 W / °C
T_{stg}, T_j	Maximum Junction and Storage Temperature Range		-65 to 100°C
T_L	Lead Temperature $\geq 1/32$ inch (0.8 mm) for 10 sec. max.		230°C

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{\text{CEO(sus)*}}$ Collector - Emitter Sustaining Voltage	$I_{\text{C}} = 0.2\text{A}$ $L = 25\text{mH}$ $I_{\text{B}} = 0$	90			V
$V_{\text{(BR)EBO}}$ Emitter - Base Breakdown Voltage	$I_{\text{C}} = 0$ $I_{\text{E}} = 50\text{mA}$	7			V
I_{CEO} Collector Cut-off Current	$V_{\text{CE}} = 70\text{V}$			1	mA
I_{CEX} Collector Cut-off Current	$V_{\text{CE}} = 120\text{V}$ $V_{\text{BE}} = -1.5\text{V}$			1	mA
	$V_{\text{CE}} = 120\text{V}$ $V_{\text{BE}} = -1.5\text{V}$ $T_{\text{C}} = 125^{\circ}\text{C}$			5	
I_{EBO} Emitter Cut-off Current	$I_{\text{C}} = 0$ $V_{\text{BE}} = -5\text{V}$			1	mA
$V_{\text{CE(sat)*}}$ Collector - Emitter Saturation Voltage	$I_{\text{C}} = 12\text{A}$ $I_{\text{B}} = 1.2\text{A}$		0.7	1.2	V
	$I_{\text{C}} = 20\text{A}$ $I_{\text{B}} = 2.5\text{A}$		1.25	1.6	
$V_{\text{BE(sat)*}}$ Base - Emitter Saturation Voltage	$I_{\text{C}} = 20\text{A}$ $I_{\text{B}} = 2.5\text{A}$		2.1	2.5	V
$h_{\text{FE}*}$ DC Current Gain	$I_{\text{C}} = 12\text{A}$ $V_{\text{CE}} = 4\text{V}$	15		45	—
	$I_{\text{C}} = 20\text{A}$ $V_{\text{CE}} = 4\text{V}$	8			
$I_{\text{S/b}}$ Second Breakdown Collector Current	$V_{\text{CE}} = 45\text{V}$ $t = 1\text{s}$	1			A
	$V_{\text{CE}} = 30\text{V}$ $t = 1\text{s}$	4			
f_{T} Transition Frequency	$I_{\text{C}} = 1\text{A}$ $V_{\text{CE}} = 15\text{V}$	8			MHz
t_{ON} Turn-On Time	$I_{\text{C}} = 20\text{A}$ $I_{\text{B}} = 2.5\text{A}$ $V_{\text{CC}} = 30\text{V}$		0.8	1.5	μs
t_{S} Storage Time	$I_{\text{C}} = 20\text{A}$ $V_{\text{CC}} = 30\text{V}$		0.55	1	
t_{f} Fall Time	$I_{\text{B1}} = -I_{\text{B2}} = 2.5\text{A}$		0.15	0.3	

THERMAL CHARACTERISTICS

$R_{\theta\text{JC}}$ Thermal Resistance Junction to Case			1.46	$^{\circ}\text{C/W}$
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