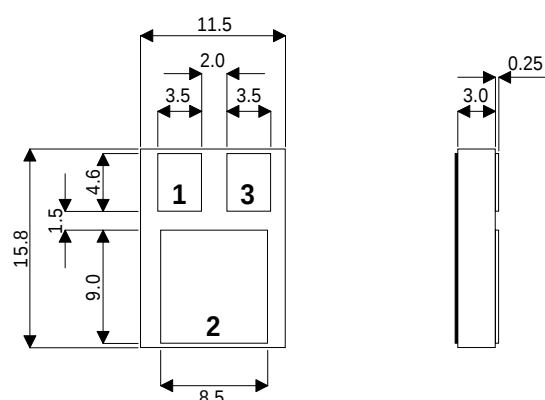


MECHANICAL DATA

Dimensions in mm



TO220 Ceramic Surface Mount Package

Pad 1 – Base Pad 2 – Collector Pad 3 – Emitter

ADVANCED DISTRIBUTED BASE DESIGN HIGH VOLTAGE HIGH SPEED NPN SILICON POWER TRANSISTOR

- SEMEFAB DESIGNED AND DIFFUSED DIE
- HIGH VOLTAGE
- FAST SWITCHING ($t_f = 40\text{ns}$)
- EXCEPTIONAL HIGH TEMPERATURE PERFORMANCE
- HIGH ENERGY RATING
- EFFICIENT POWER SWITCHING
- MILITARY AND HI-REL OPTIONS

FEATURES

- Multi-base design for efficient energy distribution across the chip resulting in significantly improved switching and energy ratings across full temperature range.
- Ion implant and high accuracy masking for tight control of characteristics from batch to batch.
- Triple Guard Rings for improved control of high voltages.

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

V_{CBO}	Collector – Base Voltage	1000V
V_{CEO}	Collector – Emitter Voltage ($I_B = 0$)	500V
V_{EBO}	Emitter – Base Voltage	10V
I_C	Collector Current	2A
$I_{\text{C(PK)}}$	Peak Collector Current	4A
I_B	Base Current	0.8A
P_{tot}	Total Dissipation at $T_{\text{case}} = 25^\circ\text{C}$	35W
	Derate above 25°C when used on efficient heatsink	0.2W/ $^\circ\text{C}$
T_{stg}	Operating and Storage Temperature Range	-65 to 200°C
R_{th}	Thermal Resistance Junction – Case	3.5 $^\circ\text{C/W}$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
ELECTRICAL CHARACTERISTICS					
$V_{\text{CEO(sus)}}^*$ Collector – Emitter Sustaining Voltage	$I_{\text{C}} = 100\text{mA}$	500			V
$V_{(\text{BR})\text{CBO}}^*$ Collector – Base Breakdown Voltage	$I_{\text{C}} = 1\text{mA}$	1000			
$V_{(\text{BR})\text{EBO}}^*$ Emitter – Base Breakdown Voltage	$I_{\text{E}} = 1\text{mA}$ $I_{\text{C}} = 0$	10			
I_{CEO}^* Collector – Emitter Cut-Off Current	$I_{\text{B}} = 0$ $V_{\text{CC}} = 500\text{V}$			100	μA
I_{CBO}^* Collector – Base Cut-Off Current	$I_{\text{E}} = 0$ $V_{\text{CB}} = 1000\text{V}$ $T_{\text{C}} = 125^{\circ}\text{C}$			10	μA
				100	
I_{EBO}^* Emitter Cut-Off Current	$I_{\text{C}} = 0$ $V_{\text{EB}} = 5\text{V}$ $T_{\text{C}} = 125^{\circ}\text{C}$			10	μA
				100	
h_{FE}^* DC Current Gain	$I_{\text{C}} = 100\text{mA}$ $V_{\text{CE}} = 4\text{V}$	20	40		—
	$I_{\text{C}} = 500\text{mA}$ $V_{\text{CE}} = 4\text{V}$	12	18		
	$I_{\text{C}} = 1\text{A}$ $V_{\text{CE}} = 4\text{V}$	5	8		
	$T_{\text{C}} = 125^{\circ}\text{C}$	4	7		
$V_{\text{CE(sat)}}^*$ Collector – Emitter Saturation Voltage	$I_{\text{C}} = 100\text{mA}$ $I_{\text{B}} = 20\text{mA}$		0.05	0.1	V
	$I_{\text{C}} = 500\text{mA}$ $I_{\text{B}} = 100\text{mA}$		0.15	0.2	
	$I_{\text{C}} = 1\text{A}$ $I_{\text{B}} = 200\text{mA}$		0.3	0.5	
$V_{\text{BE(sat)}}^*$ Base – Emitter Saturation Voltage	$I_{\text{C}} = 500\text{mA}$ $I_{\text{B}} = 100\text{mA}$		0.8	1.0	V
	$I_{\text{C}} = 1\text{A}$ $I_{\text{B}} = 200\text{mA}$		0.9	1.1	
$V_{\text{BE(on)}}^*$ Base – Emitter On Voltage	$I_{\text{C}} = 500\text{mA}$ $V_{\text{CE}} = 4\text{V}$		0.8	1.0	V
DYNAMIC CHARACTERISTICS					
f_{T} Transition Frequency	$I_{\text{C}} = 100\mu\text{A}$ $V_{\text{CE}} = 4\text{V}$ $f = 10\text{MHz}$		20		MHz
C_{ob} Output Capacitance	$V_{\text{CB}} = 20\text{V}$ $f = 1\text{MHz}$ $I_{\text{E}} = 0$		20	35	pF
SECOND BREAKDOWN					
$I_{\text{S/B}}$ Second Breakdown Collector Current	$V_{\text{CE}} = 50\text{V}$ $t = 1\text{s}$	0.8			A
SWITCHING CHARACTERISTICS (resistive load)					
t_{on} On Time	$V_{\text{CC}} = 150\text{V}$ $I_{\text{C}} = 1\text{A}$ $I_{\text{B1}} = 0.2\text{A}$ $I_{\text{B2}} = -0.4\text{A}$		0.08	0.2	μs
t_{s} Storage Time			2	4	
t_{f} Fall Time			0.04	0.1	

* Pulse test $t_{\text{p}} = 300\mu\text{s}$, $\delta \leq 2\%$