

2N5384, 2N5385

P-N-P EPITAXIAL PLANAR SILICON POWER TRANSISTORS

- 30 W at 100°C Case Temperature
- Typ t_{on} of 160 ns at 2 A I_c
- Max $V_{CE(sat)}$ of 0.6 V at 2 A I_c
- Min f_T of 30 MHz

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

Collector-Base Voltage	-100 V
Collector-Emitter Voltage (See Note 1)	-80 V
Emitter-Base Voltage	-6 V
Continuous Collector Current	-5 A
Peak Collector Current (See Note 2)	-12 A
Continuous Base Current	-1 A
Continuous Emitter Current	-6 A
Safe Operating Region at (or below) 100°C Case Temperature	See Figure 2
Continuous Device Dissipation at (or below) 100°C Case Temperature (See Note 3)	30 W
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 4)	2 W
Operating Collector Junction Temperature Range	-65°C to 200°C
Storage Temperature Range	-65°C to 200°C
Terminal Temperature $\frac{1}{8}$ Inch from Case for 10 Seconds	260°C

NOTES: 1. This value applies when the base-emitter diode is open-circuited.
2. This value applies for $t_p \leq 0.3$ ms, duty cycle $\leq 10\%$.

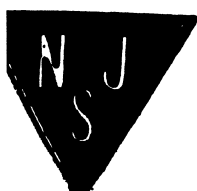
3. Derate linearly to 200°C case temperature at the rate of 0.3 W/deg.
4. Derate linearly to 200°C free-air temperature at the rate of 11.4 mW/deg.

*electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	MAX	UNIT
$V_{(BR)CEO}$ Collector-Emitter Breakdown Voltage	$I_c = -30$ mA, $I_b = 0$, See Note 5	-80		V
I_{C50} Collector Cutoff Current	$V_{CE} = -40$ V, $I_b = 0$		-50	μ A
I_{C55} Collector Cutoff Current	$V_{CE} = -90$ V, $V_{BE} = 0$ $V_{CE} = -50$ V, $V_{BE} = 0$, $T_c = 150^\circ\text{C}$		-10 -500	μ A
I_{E50} Emitter Cutoff Current	$V_{EB} = -4$ V, $I_c = 0$ $V_{EB} = -6$ V, $I_c = 0$		-1 -100	μ A
h_{FE} Static Forward Current Transfer Ratio	$V_{CE} = -4$ V, $I_c = -2$ A, See Notes 5 and 6 $V_{CE} = -4$ V, $I_c = -5$ A, See Notes 5 and 6	20	80	
V_{BE} Base-Emitter Voltage	$V_{CE} = -4$ V, $I_c = -5$ A, See Notes 5 and 6		-1.5	V
$V_{CE(sat)}$ Collector-Emitter Saturation Voltage	$I_b = -0.2$ A, $I_c = -2$ A, See Notes 5 and 6 $I_b = -1$ A, $I_c = -5$ A, See Notes 5 and 6		-0.6 -1.4	V
h_{fe} Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = -10$ V, $I_c = -1$ A, $f = 1$ kHz	20		
h_{fe} Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = -10$ V, $I_c = -1$ A, $f = 15$ MHz	2		

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300$ μ s, duty cycle $\leq 2\%$.

6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.



*thermal characteristics

PARAMETER		MAX	UNIT
$\theta_{J,C}$	Junction-to-Case Thermal Resistance	3.33	deg/W
$\theta_{J,A}$	Junction-to-Free-Air Thermal Resistance	87.5	

switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS†	TYP	UNIT
t_{on} Turn-On Time	$I_C = -2$ A, $I_{N1} = -150$ mA, $I_{N2} = 150$ mA,	160	ns
t_{off} Turn-Off Time	$V_{BE(off)} = 2.0$ V, $R_L = 15 \Omega$. See Figure 1	550	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

