New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

2N5384, 2N5385

P-N-P EPITAXIAL PLANAR SILICON POWER TRANSISTORS

- 30 W at 100°C Case Temperature
- Max $V_{CE(sat)}$ of 0.6 V at 2 A I_C
- Typ t_{on} of 160 ns 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 ⅛ 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_{CEO}	Collector Cutoff Current	V_{CE} = −40 V, I_B = 0			−50	μA
I_{CES}	Collector Cutoff Current	V_{CE} = −90 V, V_{BE} = 0			−10	μA
		V_{CE} = −50 V, V_{BE} = 0,	T_C = 150°C		−500	
I_{EBO}	Emitter Cutoff Current	V_{EB} = −4 V, I_C = 0			−1	μA
		V_{EB} = −6 V, I_C = 0			−100	
h_{FE}	Static Forward Current Transfer Ratio	V_{CE} = −4 V, I_C = −2 A,	See Notes 5 and 6	20	80	
		V_{CE} = −4 V, I_C = −5 A,	See Notes 5 and 6	10		
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		−0.6	V
		I_B = −1 A, I_C = −5 A,	See Notes 5 and 6		−1.4	
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 μs, duty cycle $\leq 2\%$.
6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.

*thermal characteristics

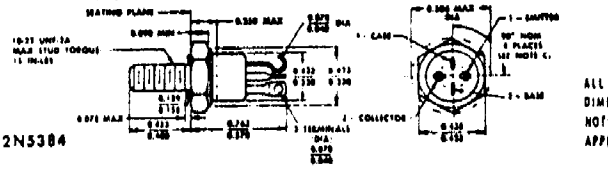
PARAMETER		MAX	UNIT
$\theta_{J\text{-}C}$	Junction-to-Case Thermal Resistance	3.33	deg/W
$\theta_{J\text{-}A}$	Junction-to-Free-Air Thermal Resistance	87.5	

switching characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS†	TYP	UNIT
t_{on}	Turn-On Time	I_C = −2 A, $I_{B(1)}$ = −150 mA, $I_{B(2)}$ = 150 mA,	160	ns
t_{off}	Turn-Off Time	$V_{BE(off)}$ = 2.8 V, R_L = 15 Ω. See Figure 1	550	

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

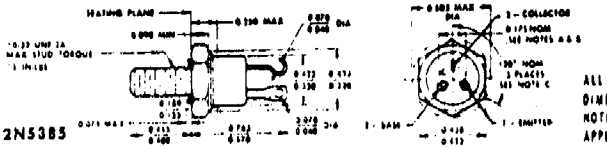
THE ACTIVE ELEMENTS ARE ELECTRICALLY INSULATED FROM THE CASE



2N5384

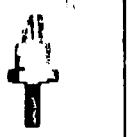
ALL JEDEC TO-111 DIMENSIONS AND NOTES ARE APPLICABLE

THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE



2N5385

ALL JEDEC TO-111 DIMENSIONS AND NOTES ARE APPLICABLE



NOTES: A. Position of terminals with respect to hexagon is not controlled.

B. Terminals located on true position within 0.030 inch relative to diameter of can.

C. This dimension applies to the location of the center line of the terminals.

D. The case temperature may be measured anywhere on the seating plane within 0.125 inch of the stud.

E. All dimensions are in inches unless otherwise specified.