New Jersey Semi-Conductor Products, Inc.

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

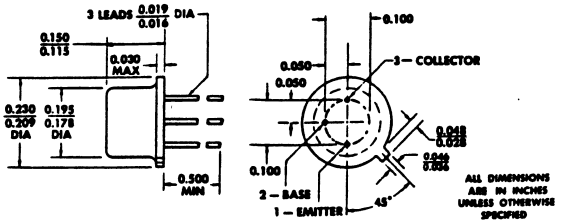
TELEPHONE: (201) 376-2922
(212) 227-6005
FAX: (201) 376-8960

TYPE 2N3013

N-P-N EPITAXIAL PLANAR SILICON TRANSISTOR

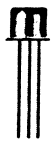
DESIGNED FOR VERY-HIGH-SPEED, HIGH-CURRENT SWITCHING APPLICATIONS

***mechanical data**



THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE.

ALL JEDEC TO-52 DIMENSIONS AND NOTES ARE APPLICABLE.



***absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)**

Collector-Base Voltage	40 v
Collector-Emitter Voltage (See Note 1)	40 v
Collector-Emitter Voltage (See Note 2)	15 v
Emitter-Base Voltage	5 v
Collector Current, Continuous	200 ma
Collector Current, Peak (See Note 3)	500 ma
Total Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 4)	0.36 w
Total Device Dissipation at (or below) 25°C Case Temperature (See Note 5)	1.2 w
Total Device Dissipation at 100°C Case Temperature	0.68 w
Operating Collector Junction Temperature	200°C
Storage Temperature Range	−65°C to +200°C

***electrical characteristics at 25°C free-air temperature (unless otherwise noted)**

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C = 100\ \mu a$, $I_E = 0$	40		v
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 10$ ma, $I_B = 0$, See Note 6	15		v
BV_{CES}	Collector-Emitter Breakdown Voltage	$I_C = 100\ \mu a$, $V_{BE} = 0$	40		v
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 100\ \mu a$, $I_C = 0$	5		v
I_{CES}	Collector Cutoff Current	$V_{CE} = 20$ v, $V_{BE} = 0$		0.3	μa
		$V_{CE} = 20$ v, $V_{BE} = 0$, $T_A = 125°C$		40	μa
I_B	Base Current	$V_{CE} = 20$ v, $V_{BE} = 0$		−0.3	μa
h_{FE}	Static Forward Current Transfer Ratio	$V_{CE} = 0.4$ v, $I_C = 30$ ma, See Note 6	30	120	
		$V_{CE} = 0.5$ v, $I_C = 100$ ma, See Note 6	25		
		$V_{CE} = 1$ v, $I_C = 300$ ma, See Note 6	15		
		$V_{CE} = 0.4$ v, $I_C = 30$ ma, $T_A = -55°C$, See Note 6	12		
V_{BE}	Base-Emitter Voltage	$I_B = 3$ ma, $I_C = 30$ ma, See Note 6	0.75	0.95	v
		$I_B = 10$ ma, $I_C = 100$ ma, See Note 6		1.20	v
		$I_B = 30$ ma, $I_C = 300$ ma, See Note 6		1.70	v
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_B = 3$ ma, $I_C = 30$ ma, See Note 6		0.18	v
		$I_B = 10$ ma, $I_C = 100$ ma, See Note 6		0.28	v
		$I_B = 30$ ma, $I_C = 300$ ma, See Note 6		0.50	v
		$I_B = 3$ ma, $I_C = 30$ ma, $T_A = 125°C$, See Note 6		0.25	v
$\lvert h_{fe} \rvert$	Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = 10$ v, $I_C = 30$ ma, $f = 100$ Mc	3.5		
C_{ob}	Common-Base Open-Circuit Output Capacitance	$V_{CB} = 5$ v, $I_E = 0$, $f = 140$ kc		5.0	pf
C_{ib}	Common-Base Open-Circuit Input Capacitance	$V_{EB} = 0.5$ v, $I_C = 0$, $f = 140$ kc		8.0	pf

NOTES:
1. This value applies when the base-emitter diode is short-circuited.
2. This value applies between 10 μa and 10 ma collector current when the base-emitter diode is open-circuited.
3. This value applies for PW < 10 μsec
4. Derate linearly to 200°C free-air temperature at the rate of 2.06 mw/C°.
5. Derate linearly to 200°C case temperature at the rate of 6.85 mw/C°.
6. These parameters must be measured using pulse techniques. PW = 300 μsec, Duty Cycle < 2%.