

# New Jersey Semi-Conductor Products, Inc.

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## 2N6413 NPN (SILICON)

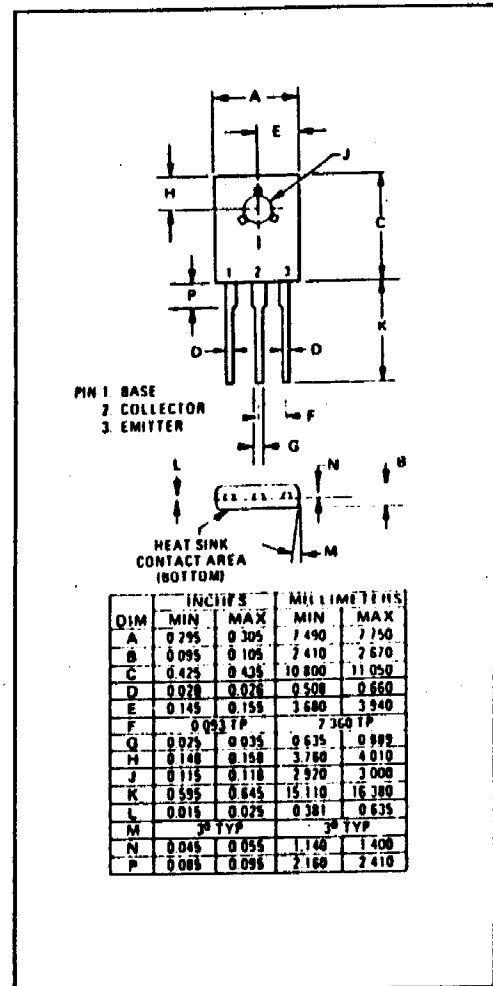
### \*MAXIMUM RATINGS

Rating	Symbol		Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	80	Vdc
Collector-Base Voltage	V <sub>CB0</sub>	80	Vdc
Emitter-Base Voltage	V <sub>EB0</sub>	6.0	Vdc
Collector Current - Continuous	I <sub>C</sub>	4.0	Adc
- Peak		8.0	Adc
Base Current	I <sub>B</sub>	1.0	Adc
Total Power Dissipation @ T <sub>C</sub> = 25°C	P <sub>D</sub>	15	Watts
Derate Above 25°C		0.12	W/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to +150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	8.34	°C/W

\*Indicates JEDEC Registered Data.



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**\* ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)**

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (1) (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>CE(sus)</sub>	60	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 30 V <sub>dc</sub> , I <sub>B</sub> = 0)	I <sub>CEO</sub>	—	100	μA <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 80 V <sub>dc</sub> , V <sub>BE(off)</sub> = 1.5 V <sub>dc</sub> )	I <sub>CEX</sub>	—	1.0	μA <sub>dc</sub>
(V <sub>CE</sub> = 40 V <sub>dc</sub> , V <sub>BE(off)</sub> = 1.5 V <sub>dc</sub> , T <sub>C</sub> = 125°C)		—	0.1	mA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 6.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	1.0	μA <sub>dc</sub>
<b>ON CHARACTERISTICS (1)</b>				
DC Current Gain (I <sub>C</sub> = 200 mA <sub>dc</sub> , V <sub>CE</sub> = 3.0 V <sub>dc</sub> ) (I <sub>C</sub> = 1.0 A <sub>dc</sub> , V <sub>CE</sub> = 3.0 V <sub>dc</sub> ) (I <sub>C</sub> = 2.0 A <sub>dc</sub> , V <sub>CE</sub> = 3.0 V <sub>dc</sub> ) (I <sub>C</sub> = 4.0 A <sub>dc</sub> , V <sub>CE</sub> = 3.0 V <sub>dc</sub> )	h <sub>FE</sub>	40 25 20 5.0	250 — — —	
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 500 mA <sub>dc</sub> , I <sub>B</sub> = 50 mA <sub>dc</sub> ) (I <sub>C</sub> = 1.0 A <sub>dc</sub> , I <sub>B</sub> = 100 mA <sub>dc</sub> ) (I <sub>C</sub> = 2.0 A <sub>dc</sub> , I <sub>B</sub> = 200 mA <sub>dc</sub> ) (I <sub>C</sub> = 4.0 A <sub>dc</sub> , I <sub>B</sub> = 800 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	— — — —	0.4 0.6 0.8 2.5	V <sub>dc</sub>
Base-Emitter Saturation Voltage (I <sub>C</sub> = 2.0 A <sub>dc</sub> , I <sub>B</sub> = 200 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	—	1.8	V <sub>dc</sub>
Base-Emitter on Voltage (I <sub>C</sub> = 2.0 A <sub>dc</sub> , V <sub>CE</sub> = 3.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	—	1.8	V <sub>dc</sub>
<b>DYNAMIC CHARACTERISTICS</b>				
Current-Gain – Bandwidth Product (I <sub>C</sub> = 100 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 10 MHz)	f <sub>T</sub>	50	—	MHz
Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>C</sub> = 0) f = 0.1 MHz)	C <sub>ob</sub>	—	50	pF
Small-Signal Current Gain (I <sub>C</sub> = 200 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 1.0 kHz)	h <sub>fe</sub>	10	—	—

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(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%