

**Type 2N5003**  
**Geometry 9702**  
**Polarity PNP**  
**Qual Level: JAN - JANTXV**

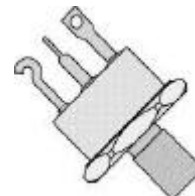
**Generic Part Number:**  
**2N5003**

**REF: MIL-PRF-19500/512**

**Features:**

[Request Quotation](#)

- Silicon power transistor for use in high speed power switching applications.
- Housed in a [TO-59](#) case.
- Also available in chip form using the [9702](#) chip geometry.
- The Min and Max limits shown are per [MIL-PRF-19500/512](#) which Semicoa meets in all cases.



[TO-59](#)

**Maximum Ratings**

$T_C = 25^{\circ}\text{C}$  unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	V
Collector-Base Voltage	$V_{CBO}$	100	V
Emitter-Base Voltage	$V_{EBO}$	5.5	V
Collector Current, Continuous	$I_C$	10	A
Collector Current, $P_W < 8.3$ ms, $< 1\%$ duty cycle	$I_C$	15	A
Power Disipation $T_A = 25^{\circ}\text{C}$ ambient Derate above $25^{\circ}\text{C}$	$P_T$	2 11.4	Watt $\text{mW}/^{\circ}\text{C}$
Power Disipation $T_C = 25^{\circ}\text{C}$ ambient Derate above $25^{\circ}\text{C}$	$P_T$	58 331	Watt $\text{mW}/^{\circ}\text{C}$
Operating Junction Temperature	$T_J$	-55 to +200	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to +200	$^{\circ}\text{C}$

### Electrical Characteristics

 $T_C = 25^\circ\text{C}$  unless otherwise specified

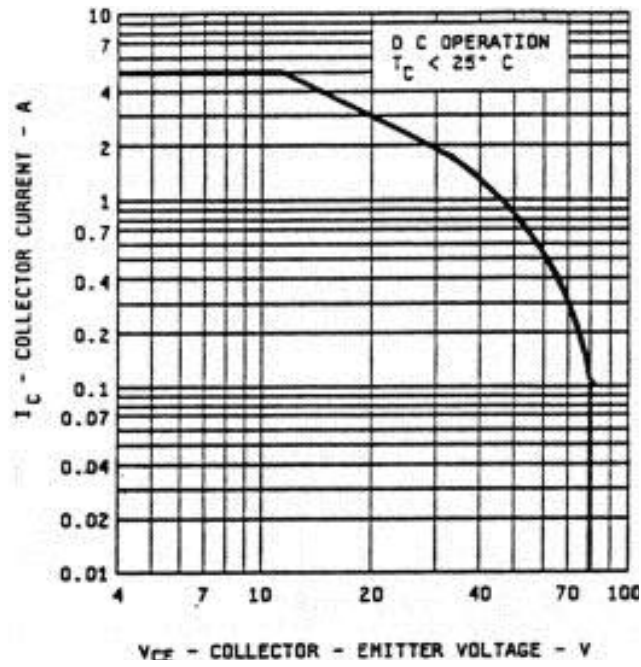
OFF Characteristics	Symbol	Min	Max	Unit
Thermal Impedance			3.1	$^\circ\text{C}/\text{W}$
Collector-Emitter Breakdown Voltage $I_C = 100\text{ mA}$ , $I_B = 0$ , pulsed	$V_{(BR)CEO}$	80	---	V
Collector-Emitter Cutoff Current $V_{CE} = 40\text{ V}$ , $V_{BE} = 0$ , Bias Condition D	$I_{CEO}$	---	50	$\mu\text{A}$
$V_{CE} = 60\text{ V}$ , $V_{BE} = 0$ , Bias Condition C	$I_{CES1}$	---	1.0	$\mu\text{A}$
$V_{CE} = 100\text{ V}$ , $V_{BE} = 0$ , Bias Condition C	$I_{CES2}$	---	1.0	mA
Collector-Emitter Cutoff Current $V_{CE} = 60\text{ V}$ , $V_{BE} = +2.0\text{ V}$ , $T_C = 150^\circ\text{C}$	$I_{CEX}$	---	500	$\mu\text{A}$
Base-Emitter Cutoff Current $V_{EB} = 4\text{ V}$ , $I_C = 0$ , Bias Condition D	$I_{EBO1}$	---	1.0	$\mu\text{A}$
$V_{EB} = 5.5\text{ V}$ , $I_C = 0$ , Bias Condition D	$I_{EBO2}$	---	1.0	mA

ON Characteristics	Symbol	Min	Max	Unit
<b>Forward Current Transfer Ratio</b> $I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$	$h_{FE1}$	20	---	---
$I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ V}$ , pulsed	$h_{FE2}$	30	90	---
$I_C = 5.0\text{ A}$ , $V_{CE} = 5\text{ V}$ , pulsed	$h_{FE3}$	20	---	---
$I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ V}$ pulsed, $T_A = -55^\circ\text{C}$	$h_{FE4}$	15	---	---
<b>Base-Emitter Voltage, Nonsaturated</b> $I_C = 2.5\text{ V}$ , $V_{CE} = 5\text{ V}$ pulsed	$V_{BE}$	---	1.45	V dc
<b>Base-Emitter Saturation Voltage</b> $I_C = 2.5\text{ A}$ , $I_B = 250\text{ mA}$ , pulsed	$V_{BE(sat)1}$	---	1.45	V dc
$I_C = 5\text{ A}$ , $I_B = 500\text{ mA}$ , pulsed	$V_{BE(sat)2}$	---	2.2	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
<i>Magnitude of Common Emitter Small Signal Short Circuit Forward Current Transfer Ratio</i> $V_{CE} = 5\text{ V}$ , $I_C = 500\text{ mA}$ , $f = 10\text{ MHz}$	$ h_{fe} $	6	---	---
<i>Common Emitter, Small Signal Short Circuit Forward Current Transfer Ratio</i> $V_{CE} = 5\text{ V}$ , $I_C = 100\text{ mA}$ , $f = 1\text{ kHz}$	$h_{fe}$	20	---	---
<i>Open Circuit Output Capacitance</i> $V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$	$C_{OBO}$	---	250	pF

Switching Time	Symbol	Min	Max	Unit
<i>Delay Time</i> $I_C = 5\text{ A}$ , $I_{B1} = 500\text{ mA}$	$t_{ON}$	---	0.5	$\mu\text{s}$
<i>Storage Time</i> $I_{B2} = -500\text{ mA}$	$t_s$	---	1.4	$\mu\text{s}$
<i>Fall Time</i> $V_{BE(off)} = 3.7\text{ V}$	$t_f$	---	0.5	$\mu\text{s}$
<i>Turn-Off Time</i> $R_L = 6\text{ ohms}$	$t_{OFF}$	---	1.5	$\mu\text{s}$

### Maximum Ratings



### Switching Time

