



Data Sheet No. 2N5002

Type 2N5002
Geometry 9202
Polarity NPN
Qual Level: JAN - JANTXV

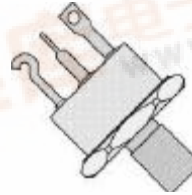
Generic Part Number:
2N5002

REF: MIL-PRF-19500/534

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 [9202](#) chip geometry.
- The Min and Max limits shown are per [MIL-PRF-19500/534](#) 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	5	A
Collector Current, Pulsed < 8.3 ms pulse-width, < 1% duty cycle	I_C	10	A
Power Disipation at 25°C ambient Derate above 25°C	P_T	2 11.4	Watt mW/°C
Reverse Pulse Energy		15	mJ
Operating Junction Temperature	T_J	-65 to +200	°C
Storage Temperature	T_{STG}	-65 to +200	°C



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

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage $I_C = 100\text{ mA}, I_B = 0, \text{pulsed}$	$V_{(BR)CBO}$	80	---	V
Emitter-Base Cutoff Current $V_{EB} = 4\text{ V}, I_C = 0$ $V_{EB} = 5.5\text{ V}, I_C = 0$	I_{EBO1} I_{EBO2}	---	1.0 1.0	μA mA
Collector-Emitter Cutoff Current $V_{CE} = 60\text{ V}, V_{BE} = 0$ $V_{CE} = 100\text{ V}, V_{BE} = 0$ $V_{CE} = 40\text{ V}, I_B = 0$ $V_{CE} = 60\text{ V}, V_{BE} = -2\text{ V}, T_C = 150^\circ\text{C}$	I_{CES1} I_{CES2} I_{CEO} I_{CEX}	---	1.0 1.0 50 500	μA mA μA μA

ON Characteristics	Symbol	Min	Max	Unit
Thermal Impedance			3.1	$^\circ\text{C/W}$
Forward Current Transfer Ratio $I_C = 50\text{ mA}, V_{CE} = 5\text{ V}$ $I_C = 2.5\text{ A}, V_{CE} = 5\text{ V}, \text{pulsed}$ $I_C = 5.0\text{ A}, V_{CE} = 5\text{ V}, \text{pulsed}$ $I_C = 2.55\text{ A}, V_{CE} = 5\text{ V pulsed}, T_C = -55^\circ\text{C}$	h_{FE1} h_{FE2} h_{FE3} h_{FE4}	20 30 20 15	--- 90 --- ---	--- --- --- ---
Base-Emitter Voltage, Nonsaturated $V_{CE} = 5\text{ V}, I_C = 2.5\text{ A}, \text{pulsed}$	V_{BE}	---	1.45	V dc
Base-Emitter Saturation Voltage $I_C = 2.5\text{ A}, I_B = 250\text{ mA}, \text{pulsed}$ $I_C = 5\text{ A}, I_B = 500\text{ mA}, \text{pulsed}$	$V_{BE(sat)1}$ $V_{BE(sat)2}$	---	1.45 2.2	V dc V dc
Collector-Emitter Saturation Voltage $I_C = 2.5\text{ A}, I_B = 250\text{ mA}, \text{pulsed}$ $I_C = 5\text{ A}, V_{CE} = 40\text{ V}, \text{pulsed}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	---	0.75 1.5	V dc V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Magnitude of Common Emitter Small Signal Short Circuit Forward Current Transfer Ratio $V_{CE} = 5\text{ V}, I_C = 500\text{ mA}, f = 10\text{ MHz}$	$ h_{fe} $	6	---	---
Common Emitter, Small Signal Short Circuit Forward Current Transfer Ratio $V_{CE} = 5\text{ V}, I_C = 100\text{ mA}, f = 1\text{ kHz}$	h_{fe}	20	---	---
Switching Time $I_C = 5\text{ A}, I_{B1} = 500\text{ mA}$ $I_{B2} = -500\text{ mA}$ $V_{BE(off)} = 3.7\text{ V}$ $R_L = 6\text{ ohms}$	t_{ON} t_s t_f t_{OFF}	---	0.5 1.4 0.5 1.5	μs μs μs μs
Open Circuit Output Capacitance $V_{CB} = 10\text{ V}$	C_{OBO}	---	250	pF