SEMICOA SEMICONDUCTORS

Data Sheet No. 2N5002

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

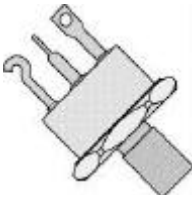
Generic Part Number: 2N5002

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°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°C unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage I_C = 100 mA, I_B = 0, pulsed	$V_{(BR)CBO}$	80	---	V
Emitter-Base Cutoff Current V_{EB} = 4 V, I_C = 0 V_{EB} = 5.5 V, I_C = 0	 I_{EBO1} I_{EBO2}	 --- ---	 1.0 1.0	 µA mA
Collector-Emitter Cutoff Current V_{CE} = 60 V, V_{BE} = 0 V_{CE} = 100 V, V_{BE} = 0 V_{CE} = 40 V, I_B = 0 V_{CE} = 60 V, V_{BE} = -2 V, T_C = 150°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	°C/W
Forward Current Transfer Ratio I_C = 50 mA, V_{CE} = 5 V I_C = 2.5 A, V_{CE} = 5 V, pulsed I_C = 5.0 A, V_{CE} = 5 V, pulsed I_C = 2.55 A, V_{CE} = 5 V pulsed, T_C = -55°C	 h_{FE1} h_{FE2} h_{FE3} h_{FE4}	 20 30 20 15	 --- 90 --- ---	 --- --- --- ---
Base-Emitter Voltage, Nonsaturted V_{CE} = 5 V, I_C = 2.5 A, pulsed	V_{BE}	---	1.45	V dc
Base-Emitter Saturation Voltage I_C = 2.5 A, I_B = 250 mA, pulsed I_C = 5 A, I_B = 500 mA, 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 A, I_B = 250 mA, pulsed I_C = 5 A, V_{CE} = 40 V, 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 V, I_C = 500 mA, f = 10 MHz	$\|h_{fe}\|$	6	---	---
Common Emitter, Small Signal Short Circuit Forward Current Transfer Ratio V_{CE} = 5 V, I_C = 100 mA, f = 1 kHz	h_{fe}	20	---	---
Switching Time I_C = 5 A, I_{B1} = 500 mA I_{B2} = -500 mA $V_{BE(off)}$ = 3.7 V R_L = 6 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 V	C_{OBO}	---	250	pF