

Description

Complement to the 2N5003

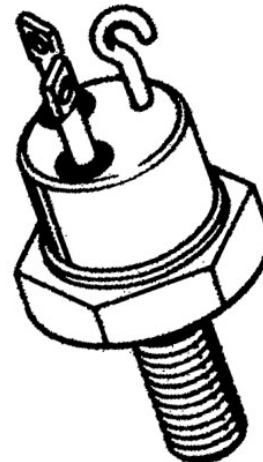
Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N5002J)
- JANTX level (2N5002JX)
- JANTXV level (2N5002JV)
- QCI to the applicable level
- 100% die visual inspection per MIL-STD-750 method 2072 for JANTXV
- Radiation testing (total dose) upon request

Please contact Semicoa for special configurations
www.SEMICOA.com or (714) 979-1900

Applications

- High-speed power-switching
- Power Transistor
- NPN silicon transistor



Features

- Hermetically sealed TO-59 metal can
- Also available in chip configuration
- Chip geometry 9202
- Reference document:
MIL-PRF-19500/534

Benefits

- Qualification Levels: JAN, JANTX, and JANTXV
- Radiation testing available

Absolute Maximum Ratings		$T_C = 25^\circ\text{C}$ unless otherwise specified	
Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	80	Volts
Collector-Base Voltage	V_{CBO}	100	Volts
Emitter-Base Voltage	V_{EBO}	5.5	Volts
Collector Current, Continuous	I_C	5	A
Power Dissipation, $T_A = 25^\circ\text{C}$ Derate linearly above 25°C	P_T	2 11.4	W mW/ $^\circ\text{C}$
Power Dissipation, $T_C = 25^\circ\text{C}$ Derate linearly above 25°C	P_T	58 331	W mW/ $^\circ\text{C}$
Thermal Resistance	$R_{\theta JA}$ $R_{\theta JC}$	88 3	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	T_J	-65 to +200	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 to +200	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

characteristics specified at $T_A = 25^\circ\text{C}$

Off Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\text{ mA}$	80			Volts
Collector-Emitter Cutoff Current	I_{CEO}	$V_{CE} = 40\text{ Volts}$			50	μA
Collector-Emitter Cutoff Current	I_{CEX}	$V_{CE} = 60\text{ Volts}$, $V_{EB} = 2\text{ Volts}$, $T_A = 150^\circ\text{C}$			500	μA
Collector-Emitter Cutoff Current	I_{CES1}	$V_{CE} = 60\text{ Volts}$			1	μA
	I_{CES2}	$V_{CE} = 100\text{ Volts}$			1	mA
Emitter-Base Cutoff Current	I_{EBO1}	$V_{EB} = 4\text{ Volts}$			1	mA
	I_{EBO2}	$V_{EB} = 5.5\text{ Volts}$			1	mA
Thermal Impedance	θ_{JC}				10	$^\circ\text{C/W}$

On Characteristics

Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
DC Current Gain	h_{FE1}	$I_C = 50\text{ mA}$, $V_{CE} = 5\text{ Volts}$	20			
	h_{FE2}	$I_C = 2.5\text{ A}$, $V_{CE} = 5\text{ Volts}$	30		90	
	h_{FE3}	$I_C = 5\text{ A}$, $V_{CE} = 5\text{ Volts}$	20			
	h_{FE4}	$I_C = 2.5\text{ A}$, $V_{CE} = 5\text{ Volts}$	15			
		$T_A = -55^\circ\text{C}$				
Base-Emitter Voltage	V_{BE}	$V_{CE} = 5\text{ Volts}$, $I_C = 2.5\text{ A}$			1.45	Volts
Base-Emitter Saturation Voltage	V_{BEsat1}	$I_C = 2.5\text{ A}$, $I_B = 250\text{ mA}$			1.45	Volts
	V_{BEsat2}	$I_C = 5\text{ A}$, $I_B = 500\text{ mA}$			2.20	Volts
Collector-Emitter Saturation Voltage	V_{CEsat1}	$I_C = 2.5\text{ A}$, $I_B = 250\text{ mA}$			0.75	Volts
	V_{CEsat2}	$I_C = 5\text{ A}$, $I_B = 500\text{ mA}$			1.50	Volts

Small Signal Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 5\text{ Volts}$, $I_C = 500\text{ mA}$, $f = 10\text{ MHz}$	6			
Small Signal Short Circuit Forward Current Transfer Ratio	h_{FE}	$V_{CE} = 5\text{ Volts}$, $I_C = 100\text{ mA}$, $f = 1\text{ kHz}$	20			
Open Circuit Output Capacitance	C_{OBO}	$V_{CB} = 10\text{ Volts}$, $I_E = 0\text{ mA}$, $100\text{ kHz} < f < 1\text{ MHz}$			250	pF

Switching Characteristics

Saturated Turn-On Time	t_{ON}	$I_C = 5\text{ A}$, $I_{B1} = I_{B2} = 500\text{ mA}$, $V_{BE} = 3.7\text{ Volts}$, $RL = 6\ \Omega$			0.5	μs
Rise Time	t_r				1.4	
Fall Time	t_f				0.5	
Saturated Turn-Off Time	t_{OFF}				1.5	