

## Description

Complement to the 2N5004

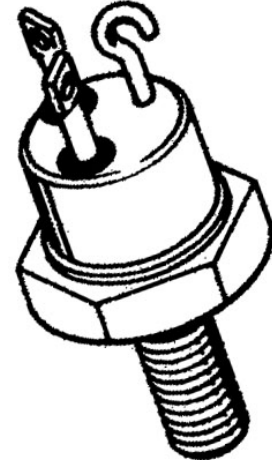
Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N5005J)
- JANTX level (2N5005JX)
- JANTXV level (2N5005JV)
- 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](http://www.SEMICOA.com) or (714) 979-1900

## Applications

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



## Features

- Hermetically sealed TO-59 metal can
- Also available in chip configuration
- Chip geometry 9702
- Reference document: MIL-PRF-19500/535

## 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 $25^\circ\text{C}$	$P_T$	2 11.4	W mW/ $^\circ\text{C}$
Power Dissipation, $T_C = 25^\circ\text{C}$ Derate linearly above $25^\circ\text{C}$	$P_T$	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	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CEX}$	$V_{CE} = 60\text{ Volts}$ , $V_{EB} = 2\text{ Volts}$ , $T_A = 150^\circ\text{C}$			500	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CES1}$	$V_{CE} = 60\text{ Volts}$			1	$\mu\text{A}$
	$I_{CES2}$	$V_{CE} = 100\text{ Volts}$			1	mA
Emitter-Base Cutoff Current	$I_{EBO1}$	$V_{EB} = 4\text{ Volts}$			1	$\mu\text{A}$
	$I_{EBO2}$	$V_{EB} = 5.5\text{ Volts}$			1	mA
Thermal Impedance	$\theta_{JC}$				3.1	$^\circ\text{C/W}$

On Characteristics			Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle $\leq 2.0\%$			
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
DC Current Gain	$h_{FE1}$	$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ Volts}$	50			
	$h_{FE2}$	$I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ Volts}$	70		200	
	$h_{FE3}$	$I_C = 5\text{ A}$ , $V_{CE} = 5\text{ Volts}$	40			
	$h_{FE4}$	$I_C = 2.5\text{ A}$ , $V_{CE} = 5\text{ Volts}$ $T_A = -55^\circ\text{C}$	25			
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	
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	

Dynamic Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 5\text{ Volts}$ , $I_C = 500\text{ mA}$ , $f = 10\text{ MHz}$	7			
Small Signal Short Circuit Forward Current Transfer Ratio	$h_{FE}$	$V_{CE} = 5\text{ Volts}$ , $I_C = 100\text{ mA}$ , $f = 1\text{ kHz}$	50			
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						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Turn-On Time	$t_{ON}$				0.5	
Rise Time	$t_r$	$I_C = 5\text{ A}$ , $I_{B1} = I_{B2} = 500\text{ mA}$ , $V_{BE} = 3.7\text{ Volts}$ , $R_L = 6\ \Omega$			1.4	$\mu\text{s}$
Fall Time	$t_f$				0.5	
Saturated Turn-Off Time	$t_{OFF}$				1.5	