

## Description

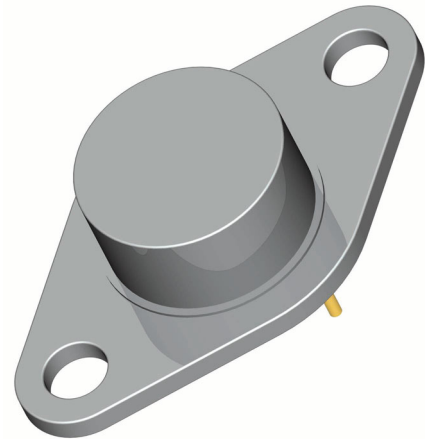
Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N5038J)
- JANTX level (2N5038JX)
- JANTXV level (2N5038JV)
- 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
- High power
- NPN silicon transistor



## Features

- Hermetically sealed TO-3 metal can
- Also available in chip configuration
- Chip geometry 9351
- Reference document: MIL-PRF-19500/439

## 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	$V_{CEO}$	90	Volts
Collector-Base Voltage	$V_{CBO}$	150	Volts
Emitter-Base Voltage	$V_{EBO}$	7	Volts
Collector Current, Continuous	$I_C$	20	A
Power Dissipation, $T_A = 25^\circ\text{C}$ Derate linearly above $25^\circ\text{C}$	$P_T$	140 800	W mW/°C
Thermal Resistance	$R_{\theta JA}$	1.25	°C/W
Operating Junction Temperature	$T_J$	-65 to +200	°C
Storage Temperature	$T_{STG}$	-65 to +200	°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	$V_{(BR)CEO}$	$I_C = 200 \text{ mA}$	90			Volts
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 25 \text{ mA}$	7			Volts
Collector-Base Cutoff Current	$I_{CBO1}$	$V_{CB} = 150 \text{ Volts}$			1	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CEO}$	$V_{CE} = 70 \text{ Volts}$			1	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CEX1}$ $I_{CEX2}$	$V_{CE} = 100 \text{ Volts}, V_{EB} = 1.5 \text{ Volts}$ $V_{CE} = 100 \text{ Volts}, V_{EB} = 1.5 \text{ Volts},$ $T_A = 150^\circ\text{C}$			5 100	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO}$	$V_{EB} = 5 \text{ Volts}$			1	$\mu\text{A}$

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	$h_{FE1}$	$I_C = 0.5 \text{ A}, V_{CE} = 5 \text{ Volts}$	50		200	
	$h_{FE2}$	$I_C = 2 \text{ A}, V_{CE} = 5 \text{ Volts}$	50			
	$h_{FE3}$	$I_C = 12 \text{ A}, V_{CE} = 5 \text{ Volts}$	15			
	$h_{FE4}$	$I_C = 12 \text{ A}, V_{CE} = 5 \text{ Volts}$ $T_A = -55^\circ\text{C}$	10			
Base-Emitter Voltage	$V_{BE}$	$V_{CE} = 5 \text{ Volts}, I_C = 12 \text{ A}$			1.8	Volts
Base-Emitter Saturation Voltage	$V_{BEsat}$	$I_C = 20 \text{ A}, I_B = 5 \text{ A}$			3.3	Volts
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 12 \text{ A}, I_B = 1.2 \text{ A}$			1.0	Volts
	$V_{CEsat2}$	$I_C = 20 \text{ A}, I_B = 5 \text{ A}$			2.5	

Dynamic Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} $	$V_{CE} = 10 \text{ Volts}, I_C = 2 \text{ A},$ $f = 5 \text{ MHz}$	12		48	
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 10 \text{ Volts}, I_E = 0 \text{ mA},$ $100 \text{ kHz} < f < 1 \text{ MHz}$			500	$\text{pF}$
Switching Characteristics						
Saturated Turn-On Time	$t_{ON}$	$I_C = 12 \text{ A}, I_{B1} = 1.2 \text{ A}$			0.5	$\mu\text{s}$
Saturated Turn-Off Time	$t_{OFF}$	$I_C = 12 \text{ A}, I_{B1} = -I_{B2} = 1.2 \text{ A}$			2.0	$\mu\text{s}$