2N5038

Silicon NPN Transistor

Data Sheet

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
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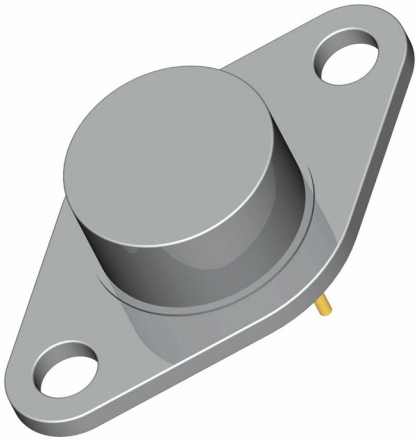
Applications

- 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°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°C Derate linearly above 25°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

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ELECTRICAL CHARACTERISTICS

characteristics specified at T_A = 25°C

Off Characteristics						
Parameter	**Symbol**	**Test Conditions**	**Min**	**Typ**	**Max**	**Units**
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 200 mA	90			Volts
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 25 mA	7			Volts
Collector-Base Cutoff Current	I_{CBO1}	V_{CB} = 150 Volts			1	µA
Collector-Emitter Cutoff Current	I_{CEO}	V_{CE} = 70 Volts			1	µA
Collector-Emitter Cutoff Current	I_{CEX1} I_{CEX2}	V_{CE} =100Volts, V_{EB} =1.5Volts V_{CE} =100Volts, V_{EB}=1.5Volts, T_A = 150°C			5 100	µA
Emitter-Base Cutoff Current	I_{EBO}	V_{EB} = 5 Volts			1	µA

On Characteristics						Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤ 2.0%
Parameter	**Symbol**	**Test Conditions**	**Min**	**Typ**	**Max**	**Units**
DC Current Gain	h_{FE1} h_{FE2} h_{FE3} h_{FE4}	I_C = 0.5 A, V_{CE} = 5 Volts I_C = 2 A, V_{CE} = 5 Volts I_C = 12 A, V_{CE} = 5 Volts I_C = 12 A, V_{CE} = 5 Volts T_A = -55°C	50 50 15 10		200	
Base-Emitter Voltage	V_{BE}	V_{CE} = 5 Volts, I_C = 12 A			1.8	Volts
Base-Emitter Saturation Voltage	V_{BEsat}	I_C = 20 A, I_B = 5 A			3.3	Volts
Collector-Emitter Saturation Voltage	V_{CEsat1} V_{CEsat2}	I_C = 12 A, I_B = 1.2 A I_C = 20 A, I_B = 5 A			1.0 2.5	Volts

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

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