2N2060

Silicon NPN Transistor

Data Sheet

Description

Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N2060J)
- JANTX level (2N2060JX)
- JANTXV level (2N2060JV)
- 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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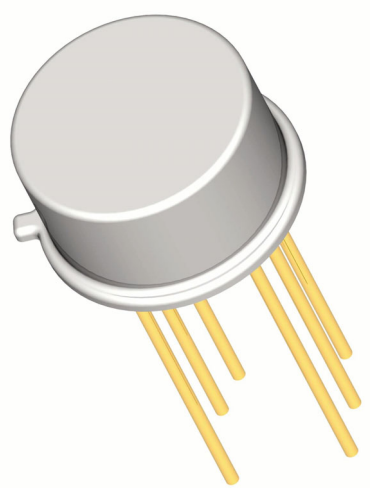
Applications

- Matched, Dual Transistors
- Low power
- NPN silicon transistor



Features

- Hermetically sealed TO-77 metal can
- Also available in chip configuration
- Chip geometry 0410
- Reference document: MIL-PRF-19500/270

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}	60	Volts
Collector-Base Voltage	V_{CBO}	100	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector Current, Continuous	I_C	500	mA
Power Dissipation, T_A = 25°C Derate linearly above 25°C	P_T	540 one section 600 both sections 3.08 one section 3.48 both sections	mW mW mW/°C mW/°C
Power Dissipation, T_C = 25°C Derate linearly above 25°C	P_T	1.5 one section 2.12 both sections 8.6 one section 12.1 both sections	W W mW/°C mW/°C
Operating Junction Temperature Storage Temperature	T_J 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 = 30 mA	60			Volts
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	I_C = 10 mA, R_{BE} = 10 Ω	80			Volts
Collector-Base Cutoff Current	I_{CBO1} I_{CBO2} I_{CBO3}	V_{CB} = 100 Volts V_{CB} = 80 Volts V_{CB} = 80 Volts, T_A = 150°C			10 2 10	µA nA µA
Collector-Emitter Cutoff Current	I_{CEO}	V_{CE} = xx Volts				µA
Collector-Emitter Cutoff Current	I_{CEX}	V_{CE} = xx Volts, V_{EB} = x Volts				µA
Collector-Emitter Cutoff Current	I_{CES}	V_{CE} = xx Volts				nA
Emitter-Base Cutoff Current	I_{EBO1} I_{EBO2}	V_{EB} = 7 Volts V_{EB} = 5 Volts			10 2	µA nA

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} h_{FE5}	I_C = 10 µA, V_{CE} = 5 Volts I_C = 100 µA, V_{CE} = 5 Volts I_C = 1 mA, V_{CE} = 5 Volts I_C = 10 mA, V_{CE} = 5 Volts I_C = 100 µA, V_{CE} = 5 Volts T_A = -55°C	25 30 40 50 10		75 90 120 150	
Base-Emitter Voltage Differential	$\lvert V_{BE1} - V_{BE2}\rvert_1$ $\lvert V_{BE1} - V_{BE2}\rvert_2$	V_{CE} = 5 Volts, I_C = 100 µA V_{CE} = 5 Volts, I_C = 1 mA			5	mVolts
Base-Emitter Voltage Differential change with temperature	$\lvert V_{BE1} - V_{BE2}\rvert_1$ $\lvert V_{BE1} - V_{BE2}\rvert_2$	V_{CE} = 5 Volts, I_C = 100 µA T_A = 25°C and -55°C V_{CE} = 5 Volts, I_C = 1 mA T_A = 25°C and +125°C			.8 1	mVolts

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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 = 50 mA, f = 20 MHz	3		25	
Small Signal Short Circuit Forward Current Transfer Ratio	h_{FE}	V_{CE} = 5 Volts, I_C = 1 mA, f = 1 kHz	50		150	
Open Circuit Output Capacitance	C_{OBO}	V_{CB} = 10 Volts, I_E = 0 mA, 100 kHZ < f < 1 MHz			15	pF
Open Circuit Input Capacitance	C_{IBO}	V_{EB} = 0.5 Volts, I_C = 0 mA, 100 kHZ < f < 1 MHz			85	pF
Noise Figure	NF_1 NF_2	V_{CE} = 10 Volts, I_C = 300 µA, f = 1 kHz, R_g = 510 Ω V_{CE} = 10 Volts, I_C = 300 µA, f = 10 kHz, R_g = 1 kΩ			8 8	dB
Short Circuit Input Impedance	h_{ib}	V_{CB} = 5V, I_C = 1mA, f = 1kHz	20		30	Ω
Short Circuit Input Impedance	h_{ie}	V_{CB} = 5V, I_C = 1mA, f = 1kHz	1		4	kΩ
Open Circuit Output Admittance	h_{oe}	V_{CB} = 5V, I_C = 1mA, f = 1kHz			16	µmhos

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