SEMICOA

2N2060
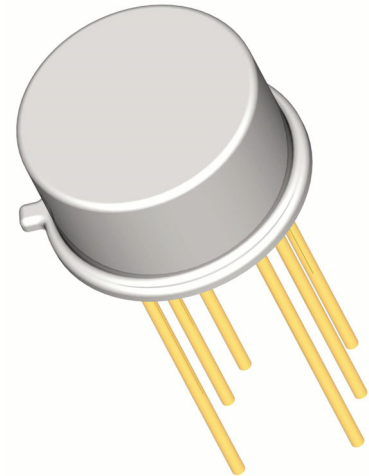Silicon NPN Transistor

Data Sheet

Description

Semicoa Corporation 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

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

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

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, $R_{BE} = 10\ \Omega$	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	$\|V_{BE1} - V_{BE2}\|_1$ $\|V_{BE1} - V_{BE2}\|_2$	$V_{CE} = 5$ Volts, $I_C = 100$ μA $V_{CE} = 5$ Volts, $I_C = 1$ mA			5	mVolts
Base-Emitter Voltage Differential change with temperature	$\|V_{BE1} - V_{BE2}\|_1$ $\|V_{BE1} - V_{BE2}\|_2$	$V_{CE} = 5$ 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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Data Sheet

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	V_{CE} = 10 Volts, I_C = 300 µA, f = 1 kHz, R_g = 510 Ω			8	dB
	NF_2	V_{CE} = 10 Volts, I_C = 300 µA, f = 10 kHz, R_g = 1 kΩ			8	
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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