

## Description

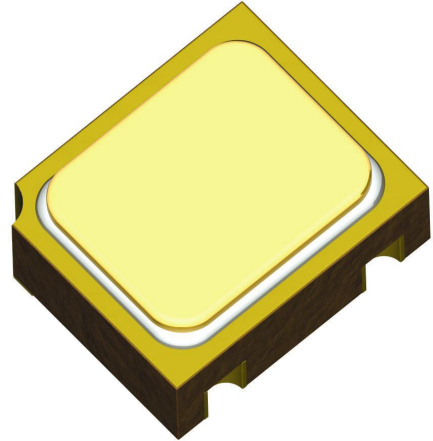
Semicoa Semiconductors offers:

- Screening and processing per MIL-PRF-19500 Appendix E
- JAN level (2N3960UBJ)
- JANTX level (2N3960UBJX)
- JANTXV level (2N3960UBJV)
- 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

- General purpose
- Low power switching transistor
- NPN silicon transistor



## Features

- Hermetically sealed Cersot ceramic
- Also available in chip configuration
- Chip geometry 0003
- Reference document: MIL-PRF-19500/399

## 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	$V_{CEO}$	12	Volts
Collector-Base Voltage	$V_{CBO}$	20	Volts
Emitter-Base Voltage	$V_{EBO}$	4.5	Volts
Power Dissipation, $T_A = 25^\circ\text{C}$ Derate linearly above $25^\circ\text{C}$	$P_T$	400 2.3	mW mW/ $^\circ\text{C}$
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	$V_{(BR)CEO}$	$I_C = 10 \mu\text{A}$	12			Volts
Collector-Base Cutoff Current	$I_{CBO}$	$V_{CB} = 20 \text{ Volts}$			10	$\mu\text{A}$
Collector-Emitter Cutoff Current	$I_{CEX1}$	$V_{CE} = 10\text{Volts}, V_{BE} = 0.4\text{Volts}$			1	$\mu\text{A}$
	$I_{CEX2}$	$V_{CE} = 10\text{Volts}, V_{BE} = 2 \text{ Volts}$			5	nA
	$I_{CEX3}$	$V_{CE} = 10\text{Volts}, V_{BE} = 2 \text{ Volts}, T_A = 150^\circ\text{C}$			5	$\mu\text{A}$
Emitter-Base Cutoff Current	$I_{EBO}$	$V_{EB} = 4.5 \text{ Volts}$			10	$\mu\text{A}$

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	$h_{FE1}$	$I_C = 1 \text{ mA}, V_{CE} = 1 \text{ Volts}$	40		300	
	$h_{FE2}$	$I_C = 10 \text{ mA}, V_{CE} = 1 \text{ Volts}$	60			
	$h_{FE3}$	$I_C = 30 \text{ mA}, V_{CE} = 1 \text{ Volts}$	30			
	$h_{FE4}$	$I_C = 10 \text{ mA}, V_{CE} = 1 \text{ Volts}, T_A = -55^\circ\text{C}$	30			
Base-Emitter Voltage	$V_{BE1}$	$V_{CE} = 1 \text{ Volts}, I_C = 1 \text{ mA}$			0.8	Volts
	$V_{BE2}$	$V_{CE} = 1 \text{ Volts}, I_C = 30 \text{ mA}$			1.0	
Collector-Emitter Saturation Voltage	$V_{CEsat1}$	$I_C = 1 \text{ mA}, I_B = 0.1 \text{ mA}$			0.2	Volts
	$V_{CEsat2}$	$I_C = 30 \text{ mA}, I_B = 3 \text{ mA}$			0.3	

Dynamic Characteristics						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Magnitude – Common Emitter, Short Circuit Forward Current Transfer Ratio	$ h_{FE} _1$ $ h_{FE} _2$ $ h_{FE} _3$	$f = 100 \text{ MHz}$				
		$V_{CE} = 4 \text{ Volts}, I_C = 5 \text{ mA},$	13			
		$V_{CE} = 4 \text{ Volts}, I_C = 10 \text{ mA},$	14			
Open Circuit Output Capacitance	$C_{OBO}$	$V_{CB} = 4 \text{ Volts}, I_E = 0 \text{ mA},$			2.5	pF
		$100 \text{ kHz} < f < 1 \text{ MHz}$				
Open Circuit Input Capacitance	$C_{IBO}$	$V_{EB} = 0.5 \text{ Volts}, I_C = 0 \text{ mA},$ $100 \text{ kHz} < f < 1 \text{ MHz}$			2.5	pF