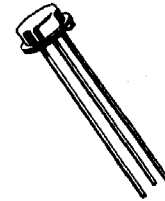


**2N5229 PNP SILICON
 2N5230 CHOPPER
 2N5231 TRANSISTORS**

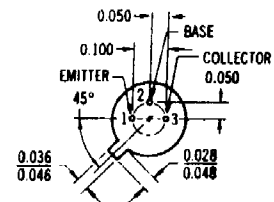
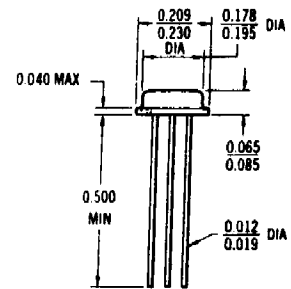


- Low Offset Voltage – $V_{EC(off)} = 0.5 \text{ mVdc (Max) @ } I_B = 100 \mu\text{Adc}$
- Low Dynamic "ON" Series Resistance –
 $r_{ec (ON)} = 6.0 \text{ Ohms (Max) @ } I_B = 1.0 \text{ mAdc}$
- Space Saving TO-46 Package

MAXIMUM RATINGS

Rating	Symbol	2N5229	2N5230	2N5231	Unit
*Collector-Emitter Voltage	V_{CEO}	10	20	30	Vdc
*Collector-Base Voltage	V_{CB}	15	30	50	Vdc
*Emitter-Base Voltage	V_{EB}	15	30	50	Vdc
*Collector Current	I_C	← 50 →			mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	← 0.5 → ← 2.86 →			Watt mW/ $^\circ\text{C}$
*Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	← 2.0 → ← 12 →			Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -65 to +200 →			$^\circ\text{C}$

*Indicates JEDEC Registered Data.



TO-46 PACKAGE



Quality Semi-Conductors

2N5229, 2N5230, 2N5231 (continued)

*ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Emitter-Collector Breakdown Voltage ($I_E = 10 \mu\text{A}$, $I_B = 0$)	2N5229 2N5230 2N5231	BV _{ECO}	10 20 30	— — —	V _{dc}
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{A}$, $I_E = 0$)	2N5229 2N5230 2N5231	BV _{CBO}	15 30 50	— — —	V _{dc}
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{A}$, $I_C = 0$)	2N5229 2N5230 2N5231	BV _{EBO}	15 30 50	— — —	V _{dc}
Collector Cutoff Current ($V_{CB} = 12 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 25 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$)	2N5229 2N5230 2N5231	I _{CBO}	— — —	1.0 1.0 1.0	nA _{dc}
Emitter Cutoff Current ($V_{EB} = 12 \text{ Vdc}$, $I_C = 0$) ($V_{EB} = 25 \text{ Vdc}$, $I_C = 0$) ($V_{EB} = 40 \text{ Vdc}$, $I_C = 0$)	2N5229 2N5230 2N5231	I _{EBO}	— — —	1.0 1.0 1.0	nA _{dc}
ON CHARACTERISTICS					
DC Current Gain ($I_C = 100 \mu\text{A}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 200 \mu\text{A}$, $V_{CE} = 0.5 \text{ Vdc}$) (Inverted Connection)		h _{FE}	50 15	— —	—
Offset Voltage ($I_B = 100 \mu\text{A}$, $I_E = 0$) ($I_B = 1.0 \text{ mA}$, $I_E = 0$)	2N5229, 2N5230 2N5231 2N5229 2N5230, 2N5231	V _{EC(off)}	— — — —	0.5 0.8 0.8 1.0	mV _{dc}
DYNAMIC CHARACTERISTICS					
Collector-Base Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 140 \text{ kHz}$)		C _{cb}	—	5.0	pF
Emitter-Base Capacitance ($V_{EB} = 10 \text{ Vdc}$, $I_C = 0$, $f = 140 \text{ kHz}$)		C _{eb}	—	4.0	pF
Small-Signal Current Gain ($I_C = 1.0 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 4.0 \text{ MHz}$)		h _{fe}	2.0	—	—
"ON" Series Resistance ($I_B = 1.0 \text{ mA}$, $I_E = 0$, $I_C = 100 \mu\text{A}$, $f = 1.0 \text{ kHz}$)	2N5229 2N5230 2N5231	r _{ec (ON)}	1.0 2.0 2.0	6.0 8.0 10	Ohms

*Indicates JEDEC Registered Data.