

New Jersey Semi-Conductor Products, Inc.

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2N5871, 2N5872, 2N6317, 2N6318 PNP (SILICON) 2N5873, 2N5874, 2N6315, 2N6316 NPN

COMPLEMENTARY SILICON MEDIUM-POWER TRANSISTORS

... designed for general-purpose power amplifier and switching applications.

- Low Collector-Emitter Saturation Voltage –
 $V_{CE(sat)} = 1.0 \text{ Vdc (Max) @ } I_C = 4.0 \text{ Adc}$
- Low Leakage Current – $I_{CEX} = 0.25 \text{ mAdc (Max)}$
- Excellent DC Current Gain – $h_{FE} = 20 \text{ (Min) @ } I_C = 2.5 \text{ Adc}$
- High Current Gain – Bandwidth Product –
 $f_T = 4.0 \text{ MHz @ } I_C = 0.25 \text{ Adc}$
- Choice of Packages – TO-3 – 2N5871/2N5874
TO-66 – 2N6315/2N6318

7.0 AMPERE COMPLEMENTARY SILICON POWER TRANSISTORS

60-80 VOLTS
115 WATTS – TO-3
90 WATTS – TO-66

*MAXIMUM RATINGS

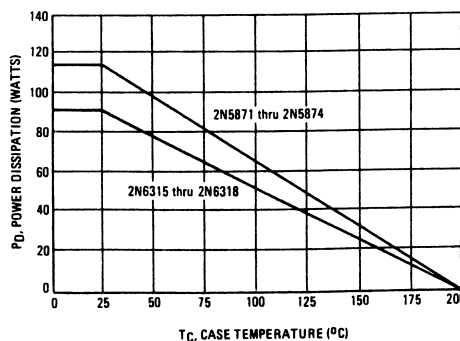
Rating	Symbol	2N5871 2N5873 2N6315 2N6317	2N5872 2N5874 2N6316 2N6318	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CB}	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current – Continuous	I_C	7.0	15	Adc
Peak		15	15	Adc
Base Current	I_B	2.0	2.0	Adc
		2N5871 Series	2N6315 Series	
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	P_D	115	90	Watts
Derate above 25°C		0.658	0.515	W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

THERMAL CHARACTERISTICS

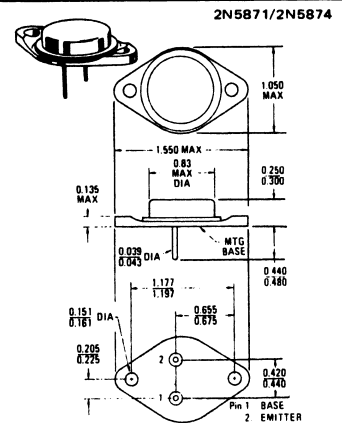
Characteristic	Symbol	2N5871 2N5872 2N5873 2N5874	2N6315 2N6316 2N6317 2N6318	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.52	1.94	$^\circ\text{C/W}$

*Indicates JEDEC registered data. Limits and conditions differ on some parameters and re-registration reflecting these changes has been requested. All above values meet or exceed present JEDEC registered data.

FIGURE 1 – POWER DERATING



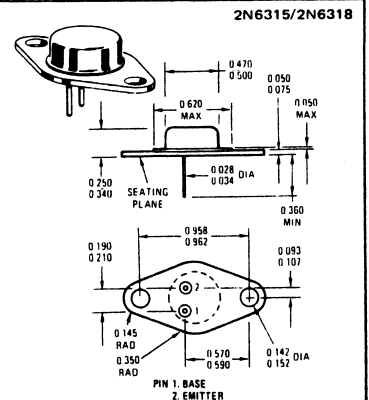
Safe Area Limits are indicated by Figures 5 and 6. Both limits are applicable and must be observed.



All JEDEC dimensions and notes apply

Collector connected to case

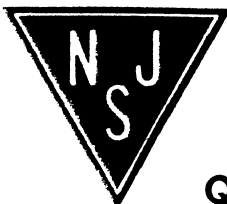
CASE 11
TO-3



All JEDEC dimensions and notes apply

Collector connected to case

CASE 80-02
TO-66



Quality Semi-Conductors

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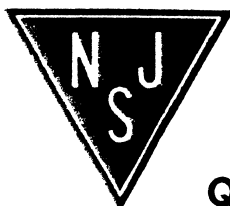
*ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) ($I_C = 100 \text{ mAdc}$, $I_B = 0$) 2N5871, 2N5873, 2N6315, 2N6317 2N6872, 2N5874, 2N6316, 2N6318	$V_{CE(sus)}$	60 80	— —	Vdc
Collector Cutoff Current ($V_{CE} = 30 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$) 2N5871, 2N5873, 2N6315, 2N6317 2N5872, 2N5874, 2N6316, 2N6318	I_{CEO}	— —	0.5 0.5	mAdc
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 80 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$) ($V_{CE} = 80 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$) 2N5871, 2N5873, 2N6315, 2N6317 2N5872, 2N5874, 2N6316, 2N6318	I_{CEX}	— — — —	0.25 0.25 2.0 2.0	mAdc
Collector Cutoff Current ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 80 \text{ Vdc}$, $I_E = 0$) 2N5871, 2N5873, 2N6315, 2N6317 2N5872, 2N5874, 2N6316, 2N6318	I_{CBO}	— —	0.25 0.25	mAdc
Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	1.0	mAdc
ON CHARACTERISTICS				
DC Current Gain (1) ($I_C = 0.5 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$) ($I_C = 2.5 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$) ($I_C = 7.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$)	h_{FE}	35 20 4.0	— 100 —	—
Collector-Emitter Saturation Voltage (1) ($I_C = 4.0 \text{ Adc}$, $I_B = 0.4 \text{ Adc}$) ($I_C = 7.0 \text{ Adc}$, $I_B = 1.75 \text{ Adc}$)	$V_{CE(sat)}$	— —	1.0 2.0	Vdc
Base-Emitter Saturation Voltage (1) ($I_C = 7.0 \text{ Adc}$, $I_B = 1.75 \text{ Adc}$)	$V_{BE(sat)}$	—	2.5	Vdc
Base-Emitter On Voltage (1) ($I_C = 2.5 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$)	$V_{BE(on)}$	—	1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain – Bandwidth Product (2) ($I_C = 0.25 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$, $f_{test} = 1.0 \text{ MHz}$)	f_T	4.0	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$) 2N5871, 2N5872, 2N6317, 2N6318 2N5873, 2N5874, 2N6315, 2N6316	C_{ob}	— —	300 200	pF
Small-Signal Current Gain ($I_C = 0.5 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	h_{fe}	20	—	—
SWITCHING CHARACTERISTICS				
Rise Time Storage Time Fall Time	($V_{CC} = 30 \text{ Vdc}$, $I_C = 2.5 \text{ Adc}$, $I_{B1} = I_{B2} = 0.25 \text{ Adc}$)	t_r t_s t_f	— — —	0.7 1.0 0.8 μs μs μs

*Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

(2) $f_T = |h_{fe}| \cdot f_{test}$



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