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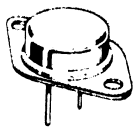
2N6306
2N6307, 2N6308

HIGH VOLTAGE NPN SILICON POWER TRANSISTORS

. . . designed for high voltage inverters, switching regulators and line-operated amplifier applications. Especially well suited for switching power supply applications in associated consumer products.

- High Collector-Base Voltage –
  V_{CB} = 500 Vdc – 2N6306
  = 600 Vdc – 2N6307
  = 700 Vdc – 2N6308
- Excellent DC Current Gain @ I_C = 3.0 Adc
  h_{FE} = 15 - 75 – 2N6306, 2N6307
  = 12 - 60 – 2N6308
- Low Collector-Emitter Saturation Voltage @ I_C = 3.0 Adc
  $V_{CE(sat)}$ = 0.8 Vdc (Max) – 2N6306
  = 1.0 Vdc (Max) – 2N6307
  = 1.5 Vdc (Max) – 2N6308
- Current Gain Bandwidth Product –
  f_T = 5.0 MHz (Min) @ I_C = 0.3 Adc

8 AMPERE
POWER TRANSISTORS
NPN SILICON
250-300-350 VOLTS
125 WATTS



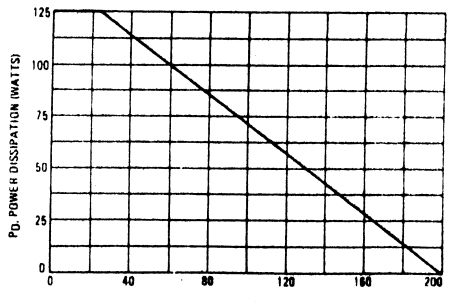
*MAXIMUM RATINGS

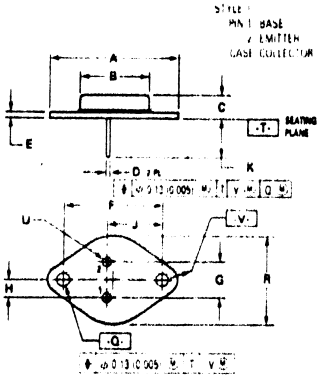
Rating	Symbol	2N6306	2N6307	2N6308	Unit
Collector-Base Voltage	V_{CB}	500	600	700	Vdc
Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
Emitter-Base Voltage	V_{EB}	← 8.0 →			Vdc
Collector Current – Continuous Peak	I_C	← 8.0 → 16			Adc
Base Current	I_B	← 4.0 →			Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 125 → 0.714			Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -65 to +200 →			°C

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.4	°C/W

*Indicates JEDEC Registered Data.

FIGURE 1 – POWER DERATING





NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO 204AA OUTLINE SHALL APPLY.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	–	39.37	–	1.550
B	–	21.08	–	0.830
C	8.26	8.76	0.250	0.325
D	0.97	1.09	0.038	0.043
E	1.40	1.77	0.055	0.070
F	10.79 BSC		0.87 BSC	
G	11.30 BSC		0.430 BSC	
J	5.46 BSC		0.215 BSC	
K	16.89 BSC		0.665 BSC	
Q	3.84	4.19	0.151	0.165
R	–	26.67	–	1.050
U	4.83	5.33	0.190	0.210
V	3.84	4.19	0.151	0.165

(TO-3)

***ELECTRICAL CHARACTERISTICS** (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (1)		$V_{CEO(sus)}$			Vdc
(I_C = 100 mAdc, I_B = 0)	2N6306		250	–	
	2N6307		300	–	
	2N6308		350	–	
Collector Cutoff Current		I_{CEO}			mAdc
(V_{CE} = Rated V_{CEO}, I_B = 0)				0.5	
Collector Cutoff Current		I_{CEX}			mAdc
(V_{CE} = 500 Vdc, $V_{EB(off)}$ = 1.5 Vdc)	2N6306			0.5	
(V_{CE} = 600 Vdc, $V_{EB(off)}$ = 1.5 Vdc)	2N6307			0.5	
(V_{CE} = 700 Vdc, $V_{EB(off)}$ = 1.5 Vdc)	2N6308			0.5	
(V_{CE} = 450 Vdc, $V_{EB(off)}$ = 1.5 Vdc, T_C = 150°C)	2N6306			2.5	
(V_{CE} = 550 Vdc, $V_{EB(off)}$ = 1.5 Vdc, T_C = 150°C)	2N6307			2.5	
(V_{CE} = 650 Vdc, $V_{EB(off)}$ = 1.5 Vdc T_C = 150°C)	2N6308			2.5	
Emitter Cutoff Current		I_{EBO}			mAdc
(V_{BE} = 8.0 Vdc, I_C = 0)				1.0	
ON CHARACTERISTICS					
DC Current Gain (1)		h_{FE}			–
(I_C = 3.0 Adc, V_{CE} = 5.0 Vdc)	2N6306, 2N6307		15	75	
	2N6308		12	60	
(I_C = 8.0 Adc, V_{CE} = 5.0 Vdc)	2N6306, 2N6307		4.0	–	
	2N6308		3.0	–	
Collector-Emitter Saturation Voltage (1)		$V_{CE(sat)}$			Vdc
(I_C = 3.0 Adc, I_B = 0.6 Adc)	2N6306			0.8	
	2N6307			1.0	
	2N6308			1.5	
(I_C = 8.0 Adc, I_B = 2.0 Adc)	2N6306, 2N6307			5.0	
(I_C = 8.0 Adc, I_B = 2.67 Adc)	2N6308			5.0	
Base-Emitter Saturation Voltage (1)		$V_{BE(sat)}$			Vdc
(I_C = 8.0 Adc, I_B = 2.0 Adc)	2N6306, 2N6307			2.3	
(I_C = 8.0 Adc, I_B = 2.67 Adc)	2N6308			2.5	
Base-Emitter On Voltage (1)		$V_{BE(on)}$			Vdc
(I_C = 3.0 Adc, V_{CE} = 5.0 Vdc)	2N6306, 2N6307			1.3	
	2N6308			1.5	
Second Breakdown Energy (Figure 2)		$E_{s/b}$			mJ
($I_{C(PK)}$ = 3.0 Adc, L = 40 mH, I_{BE} = 3.6 Ω, $V_{BE(off)}$ = 1.5 Vdc)				180	
DYNAMIC CHARACTERISTICS					
Current Gain – Bandwidth Product (2)		f_T			MHz
(I_C = 0.3 Adc, V_{CE} = 10 Vdc, f_{test} = 1.0 MHz)			5.0	–	
Output Capacitance		C_{ob}			pF
(V_{CB} = 10 Vdc, I_E = 0, f = 0.1 MHz)				250	
SWITCHING CHARACTERISTICS					
Rise Time		t_r			μs
(V_{CC} = 125 Vdc, I_C = 3.0 Adc, I_B = 0.6 Adc)				0.6	
Storage Time (3)		t_s			μs
(V_{CC} = 125 Vdc, I_C = 3.0 Adc, I_{B1} = 0.6 Adc, I_{B2} = 1.5 Adc)	Pulse Width = 25 μs			1.6	
	Pulse Width = 5.0 μs			0.8	
Fall Time		t_f			μs
(V_{CC} = 125 Vdc, I_C = 3.0 Adc, I_{B1} = 0.6 Adc, I_{B2} = 1.5 Adc)				0.4	