

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Parameter	Symbol	2N6306	2N6307	2N6308	Unit
Collector-base voltage	V_{CBO}	500	600	700	V
Collector-emitter voltage	V_{CEO}	250	300	350	V
Emitter-base voltage	V_{EBO}	8			V
Collector current – continuous	I_C	8			A
Collector current – peak	I_{CM}	16			A
Base current	I_B	4.0			A
Total power dissipation Derate above $T_C = 25^\circ\text{C}$	P_D	125 0.714			W W/°C
Junction and storage temperature range	T_J, T_{stg}	-65 to 200			°C
Thermal resistance, junction to case	$R_{\theta JC}$	1.4			°C/W

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

Parameter	Symbol	Conditions	2N6306		2N6307		2N6308		Unit
			Min	Max	Min	Max	Min	Max	
Collector-emitter sustaining voltage	$V_{CEO(sus)}$	$I_C = 100\text{mA}, I_B = 0$	250	-	300	-	350	-	V
Collector cutoff current	I_{CEO}	$V_{CE} = \text{Rated } V_{CEO}, I_B = 0$	-	0.5	-	0.5	-	0.5	mA
Collector cutoff current	I_{CEX}	$V_{CE} = 500\text{V}, V_{EB(off)} = 1.5\text{V}$	-	0.5	-	0.5	-	0.5	mA
		$V_{CE} = 600\text{V}, V_{EB(off)} = 1.5\text{V}$	-	-	-	-	-	-	
		$V_{CE} = 700\text{V}, V_{EB(off)} = 1.5\text{V}$	-	-	-	-	-	-	
		$V_{CE} = 450\text{V}, V_{EB(off)} = 1.5\text{V}, T_C = 150^\circ\text{C}$	-	2.5	-	2.5	-	2.5	
		$V_{CE} = 550\text{V}, V_{EB(off)} = 1.5\text{V}, T_C = 150^\circ\text{C}$	-	-	-	-	-	-	
		$V_{CE} = 650\text{V}, V_{EB(off)} = 1.5\text{V}, T_C = 150^\circ\text{C}$	-	-	-	-	-	-	
Emitter cutoff current	I_{EBO}	$V_{EB} = 8\text{V}, I_C = 0$	-	1.0	-	1.0	-	1.0	mA
DC current gain ⁽¹⁾	h_{FE}	$I_C = 3.0\text{A}, V_{CE} = 5\text{V}$	15	75	15	75	12	60	-
		$I_C = 8\text{A}, V_{CE} = 5\text{V}$	4.0	-	4.0	-	3.0	-	
Collector-emitter saturation voltage ⁽²⁾	$V_{CE(sat)}$	$I_C = 3.0\text{A}, I_B = 0.6\text{A}$	-	0.9	-	1.0	-	1.5	V
		$I_C = 8.0\text{A}, I_B = 2.0\text{A}$	-	5.0	-	5.0	-	-	
		$I_C = 8.0\text{A}, I_B = 2.67\text{A}$	-	-	-	-	-	5.0	
Base-emitter saturation voltage ⁽³⁾	$V_{BE(sat)}$	$I_C = 8.0\text{A}, I_B = 2.0\text{A}$	-	2.3	-	2.3	-	2.5	V
		$I_C = 8.0\text{A}, I_B = 2.67\text{A}$	-	-	-	-	-	-	
Base emitter on voltage ⁽⁴⁾	$V_{BE(on)}$	$I_C = 3.0\text{A}, V_{CE} = 5.0\text{A}$	-	1.3	-	1.3	-	1.5	V
Second breakdown energy	$E_{S/b}$	$I_{C(PK)} = 3.0\text{A}, L = 40\text{mH}, R_{BE} = 3\text{k}\Omega,$ $V_{BB2} = 1.5\text{V}$	-	180	-	180	-	180	μJ
Current gain – bandwidth product ⁽⁵⁾	f_T	$I_C = 0.3\text{A}, V_{CE} = 10\text{V}, f_{test} = 1.0\text{MHz}$	5.0	-	5.0	-	5.0	-	mA

2N6306-2N6308

SILICON NPN TRANSISTORS

Parameter	Symbol	Conditions	2N6306		2N6307		2N6308		Unit
			Min	Max	Min	Max	Min	Max	
Output capacitance	C_{ob}	$V_{CB} = 10V, I_B = 0, f = 0.1MHz$	250	-	300	-	350	-	V
Rise time	t_r	$V_{CC} = 125V, I_C = 3.0A, I_B = 0.5A$	-	0.6	-	0.6	-	0.6	μs
Storage time ⁽¹⁾	t_s	$V_{CC} = 125V, I_C = 3.0A, I_{B1} = 0.6A, I_{B2} = 1.5$ Pulse width = 25 μs Pulse width = 5.0 μs	-	1.6	-	1.6	-	1.6	μs
Fall time	t_f	$V_{CC} = 125V, I_C = 3.0A, I_{B1} = 0.6A, I_{B2} = 1.5$	-	0.4	-	0.4	-	0.4	μs

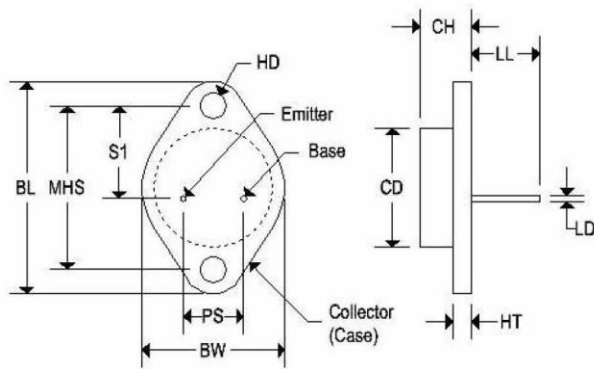
Note 1: Pulse test: pulse width $\leq 300\mu s$. Duty cycle = 2.0%

Note 2: $f_T = I_{hfe} * f_{test}$

Note 3: "On" time is 25°C. t_s decreases with shorter pulse width being approximately 50% of the values shown at a 5.0 μs pulse width.

MECHANICAL CHARACTERISTICS

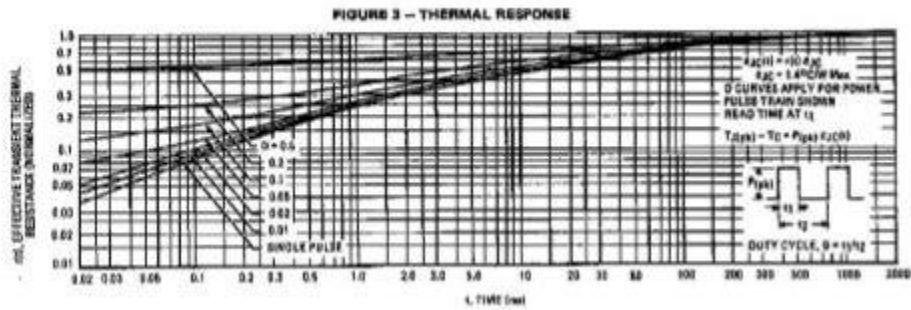
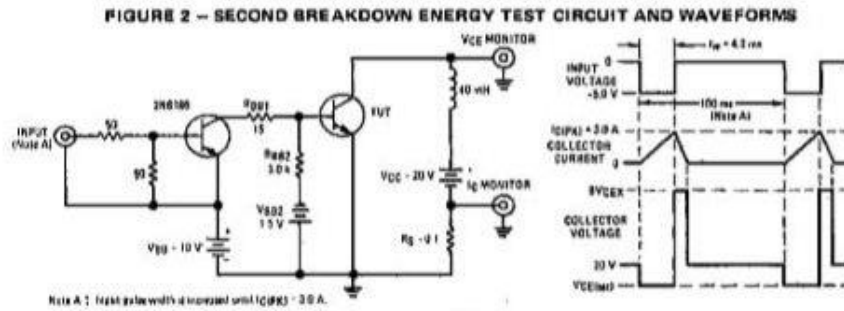
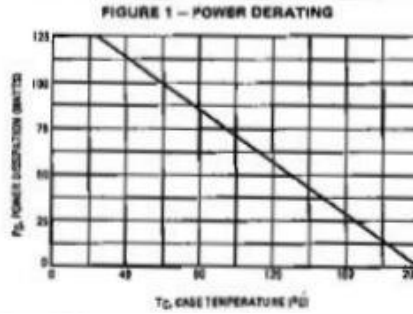
Case:	TO-3
Marking:	Alpha-Numeric
Polarity:	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

2N6306-2N6308

SILICON NPN TRANSISTORS



ACTIVE REGION SAFE OPERATING AREA

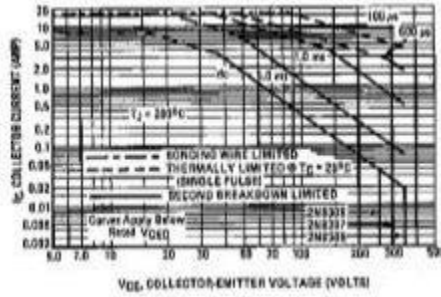


FIGURE 5 - SWITCHING TIMES TEST CIRCUIT

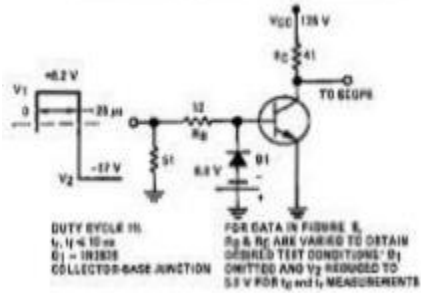


FIGURE 6 - TURN-ON AND TURN-OFF TIMES

