SOLID STATE INC.
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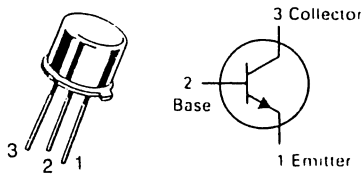
BLOOMFIELD, NEW JERSEY 07003 www.solidstateinc.com

2N3506
2N3507

TO-39 (TO-205AD)



SWITCHING TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	2N3506	2N3507	Unit
Collector-Emitter Voltage	V_{CEO}	40	50	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	3.0		Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.71		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 28.6		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.175	°C/mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	35	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

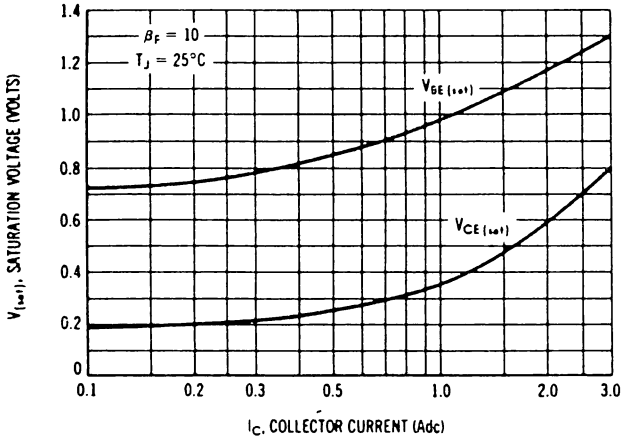
Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, pulsed, I_B = 0)	2N3506 2N3507	$V_{(BR)CEO}$	40 50	— —	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	2N3506 2N3507	$V_{(BR)CBO}$	60 80	— —	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 4.0 Vdc) (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 4.0 Vdc, T_A = 100°C) (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 4.0 Vdc) (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 4.0 Vdc, T_A = 100°C)	 2N3506 2N3507 	I_{CEX}	 — — — —	 1.0 150 1.0 150	μAdc
Base Cutoff Current (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 4.0 Vdc) (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 4.0 Vdc)	 2N3506 2N3507	I_{BL}	 — —	 1.0 1.0	μAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 500 mAdc, V_{CE} = 1.0 Vdc) (I_C = 1.5 Adc, V_{CE} = 2.0 Vdc) (I_C = 2.5 Adc, V_{CE} = 3.0 Vdc) (I_C = 3.0 Adc, V_{CE} = 5.0 Vdc)	 2N3506 2N3507 2N3506 2N3507 2N3506 2N3507 2N3506 2N3507	h_{FE}	 50 35 40 30 30 25 25 20	 — — 200 150 — — — —	—
Collector-Emitter Saturation Voltage(1)	(I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1.5 Adc, I_B = 150 mAdc) (I_C = 2.5 Adc, I_B = 250 mAdc)	$V_{CE(sat)}$	— — —	0.5 1.0 1.5	Vdc
Base-Emitter Saturation Voltage(1)	(I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1.5 Adc, I_B = 150 mAdc) (I_C = 2.5 Adc, I_B = 250 mAdc)	$V_{BE(sat)}$	— 0.9 —	1.0 1.4 2.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 100 mAdc, V_{CE} = 5 Vdc, f = 20 MHz)		f_T	60	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	40	pF
Input Capacitance (V_{BE} = 3 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	300	pF

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

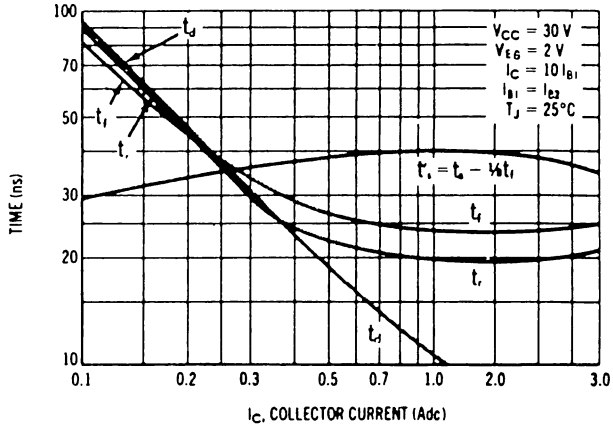
Characteristic		Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS					
Delay Time	I_C = 1.5 Adc, I_{B1} = 150 mAdc	t_d	—	15	ns
Rise Time	V_{CC} = 30 V, V_{EB} = 0 V	t_r	—	30	ns
Storage Time	I_C = 1.5 Adc, I_{B1} = I_{B2} = 150 mAdc	t_s	—	55	ns
Fall Time	V_{CC} = 30 V	t_f	—	35	ns

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2.0%.

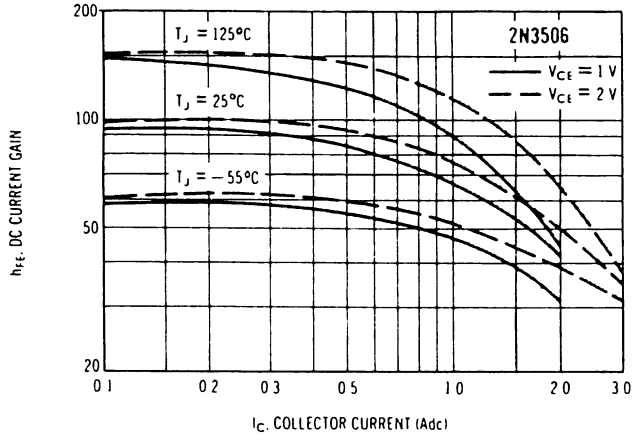
SATURATION VOLTAGES

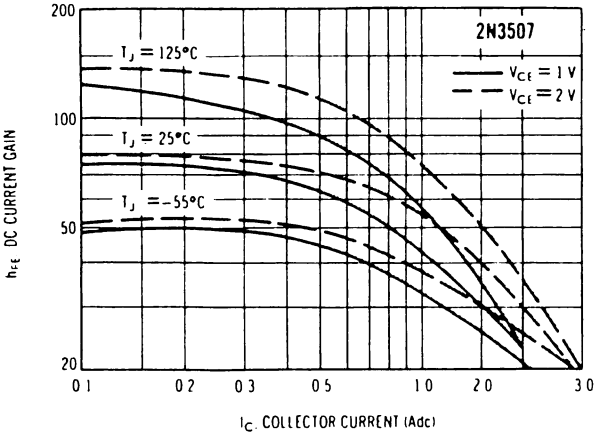


SWITCHING TIMES

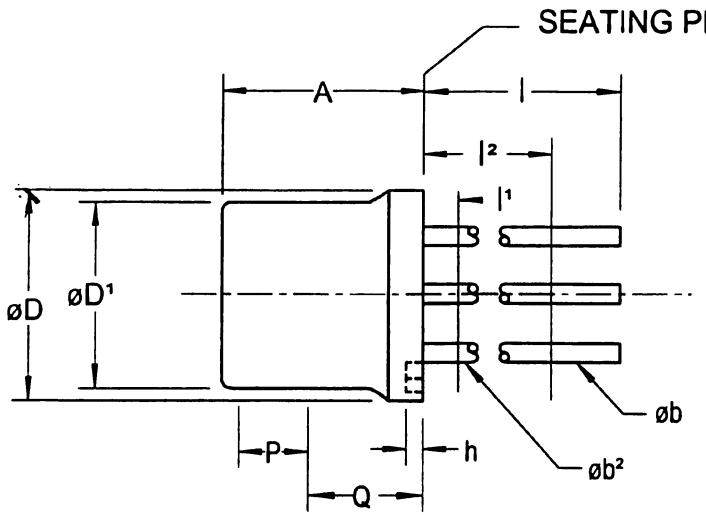


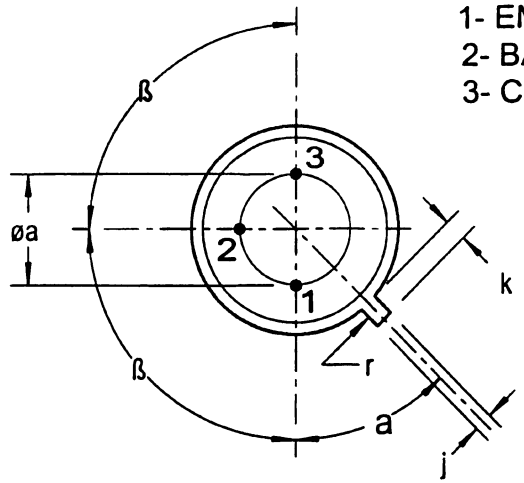
CURRENT GAIN CHARACTERISTICS



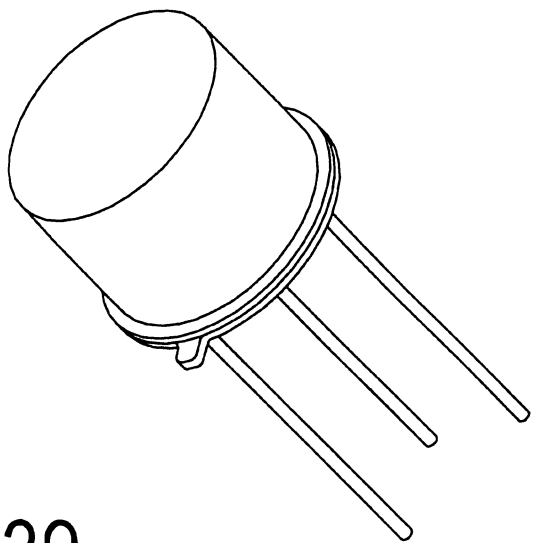


REV.	ECN#	DESCRIPTION	DATE	DRAWN BY





1- EMITTER
2- BASE
3- COLLECTOR



TO-39

SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
øa	.190	.210	4.83	5.33
A	.240	.260	6.10	6.60
øb	.016	.021	.406	.533
øb²	.016	.019	.406	.483
øD	.350	.370	8.89	9.40
øD¹	.315	.335	8.00	8.51
h	.009	.125	.229	3.18
j	.028	.034	.711	.864
k	.029	.045	.737	1.02
l	.500		12.70	
l¹		.050		1.27
l²	.250		6.35	
P	.100		2.54	
Q				
a	45° NOMINAL			
ß	90° NOMINAL			