

Silicon  
Transistors



absolute maximum ratings: (25°C) (unless otherwise specified)

Voltages			
Collector to Base	$V_{CBO}$	25	Volts
Collector to Emitter	$V_{CEO}$	25	Volts
Emitter to Base	$V_{EBV}$	12	Volts
Current			
Collector (Steady State)	$I_C$	300	mA
Collector (Pulsed)*	$I_C$	500	mA
Base (Steady State)	$I_B$	50	mA
Dissipation			
Total Power ( $T_A \leq 25^\circ C$ )†	$P_T$	400	mW
Total Power with Heatsink ( $T_A \leq 25^\circ C$ )††	$P_T$	600	mW
Total Power with Heatsink ( $T_C \leq 25^\circ C$ )†††	$P_T$	900	mW
Temperature			
Storage	$T_{STG}$	-65 to +150	°C
Operating	$T_J$	-65 to +125	°C
Lead, $1/16" \pm 1/32"$ from case for 10 sec. max.	$T_L$	+260	°C

\*Pulse conditions: 300  $\mu$ sec. pulse width, 2% duty cycle.

†Derate 4.0 mW/°C for increase in ambient temperature above 25°C.

††Derate 6.0 mW/°C for increase in ambient temperature above 25°C.

†††Derate 9.0 mW/°C for increase in case temperature above 25°C.

STATIC CHARACTERISTICS		Min.	Max.	
Collector to Base Breakdown Voltage ( $I_C = 0.1 \mu A, I_B = 0$ )	$V_{(BR)CBO}$	25		Volts
Collector to Emitter Breakdown Voltage ( $I_C = 10mA, I_B = 0$ )	$V_{(BR)CEO}$	25		Volts
Emitter to Base Breakdown Voltage ( $I_C = 0.1\mu A, I_B = 0$ )	$V_{(BR)EBV}$	12		Volts
Forward Current Transfer Ratio				
( $V_{CE} = 5V, I_C = 2mA$ )	2N5305	$h_{FE}$	2000	20000
( $V_{CE} = 5V, I_C = 100mA$ )	2N5305	$h_{FE}$	6000	
( $V_{CE} = 5V, I_C = 2mA$ )	2N5306, A	$h_{FE}$	7000	70000
( $V_{CE} = 5V, I_C = 100mA$ )	2N5306, A	$h_{FE}$	20000	
Collector Cutoff Current				
( $V_{CB} = 25V, I_B = 0$ )		$I_{CBO}$	100	nA
( $V_{CB} = 25V, I_B = 0, T_A = 100^\circ C$ )		$I_{CBO}$	20	$\mu A$
Emitter Cutoff Current ( $V_{EB} = 12V, I_C = 0$ )		$I_{EBO}$	100	nA
Collector Emitter Saturation Voltage				
( $I_C = 200mA, I_B = 0.2mA$ )		$V_{CE(SAT)}$	1.4	Volts
Base Emitter Saturation Voltage				
( $I_C = 200mA, I_B = 0.2mA$ )		$V_{BE(SAT)}$	1.6	Volts
Base Emitter Voltage ( $V_{CE} = 5V, I_C = 200mA$ )		$V_{BE}$	1.5	Volts
DYNAMIC CHARACTERISTICS		Min.	Typ.	Max.
Forward Current Transfer Ratio				
( $V_{CE} = 5V, I_C = 2mA, f = 1kHz$ )	2N5305	$h_{fe}$	2000	
( $V_{CE} = 5V, I_C = 2mA, f = 1kHz$ )	2N5306, A	$h_{fe}$	7000	
( $V_{CE} = 5V, I_C = 2mA, f = 10MHz$ )		$ h_{fe} $	15.6	dB
Gain-Bandwidth Product ( $V_{CE} = 5V, I_C = 2mA, f = 10MHz$ )		$f_T$	60	MHz
Input Impedance ( $V_{CE} = 5V, I_C = 2mA, f = 1kHz$ )		$h_{ie}$	650	kohms
Collector Base Capacitance ( $V_{CB} = 10V, f = 1MHz$ )		$C_{cb}$	7.8	pF
Emitter Capacitance ( $V_{EB} = 0.5V, f = 1MHz$ )		$C_{eb}$	10.5	pF

