

2N4406 (SILICON)
2N4407



CASE 79
(TO-39)

PNP silicon annular transistors designed for general-purpose amplifier and switching applications.

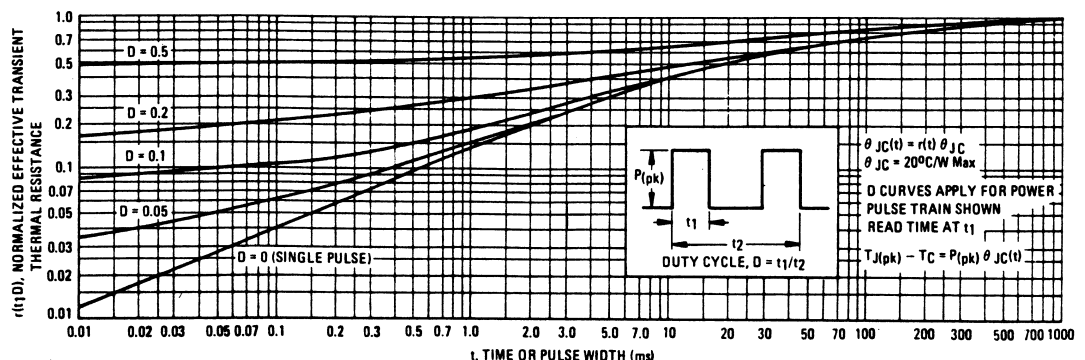
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CB}	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current	I_C	2.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$	P_D	1.25	Watts
Derate above 25°C		7.15	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	P_D	8.75	Watts
Derate above 25°C		50	mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	20	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	θ_{JA}	140	$^\circ\text{C/W}$

FIGURE 1 - THERMAL RESPONSE



2N4406, 2N4407 (continued)

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (1) ($I_C = 10\text{ mAdc}$, $I_B = 0$)	BV_{CEO}	80	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{Adc}$, $I_E = 0$)	BV_{CBO}	80	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}$, $I_C = 0$)	BV_{EBO}	5.0	-	Vdc
Collector Cutoff Current ($V_{CB} = 60\text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	25	nAdc
Emitter Cutoff Current ($V_{BE} = 3.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	-	25	nAdc

ON CHARACTERISTICS

DC Current Gain (1) ($I_C = 10\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	2N4406 2N4407	h_{FE}	30 80	-	-
($I_C = 150\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	2N4406 2N4407		25 75	100 225	
($I_C = 500\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	2N4406 2N4407		20 35	-	
($I_C = 1.0\text{ Adc}$, $V_{CE} = 1.0\text{ Vdc}$)	2N4406 2N4407		10 15	-	
($I_C = 1.5\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	2N4406, 2N4407		10	-	
Collector-Emitter Saturation Voltage (1) ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$)		$V_{CE(sat)}$	-	0.2	Vdc
($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)			-	0.4	
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			-	0.7	
($I_C = 1.5\text{ Adc}$, $I_B = 150\text{ mAdc}$)			-	1.5	
Base-Emitter Saturation Voltage (1) ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$)		$V_{BE(sat)}$	-	0.9	Vdc
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			0.9	1.3	
($I_C = 1.5\text{ Adc}$, $I_B = 150\text{ mAdc}$)			-	1.5	
Base-Emitter On Voltage (1) ($I_C = 500\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)		$V_{BE(on)}$	-	1.0	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	150	750	MHz
Collector-Base Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{cb}	-	15	pF
Collector-Emitter Capacitance ($V_{BE} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 1.0\text{ MHz}$)	C_{eb}	-	160	pF

SWITCHING CHARACTERISTICS

Delay Time ($V_{CC} = 30\text{ Vdc}$, $V_{BE(off)} = 2.0\text{ Vdc}$, $I_C = 1.0\text{ Adc}$, $I_{B1} = 100\text{ mAdc}$) (Figure 11)	t_d	-	15	ns
Rise Time	t_r	-	60	ns
Storage Time ($V_{CC} = 30\text{ Vdc}$, $I_C = 1.0\text{ Adc}$, $I_{B1} = I_{B2} = 100\text{ mAdc}$) (Figure 12)	t_s	-	175	ns
Fall Time	t_f	-	50	ns

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

