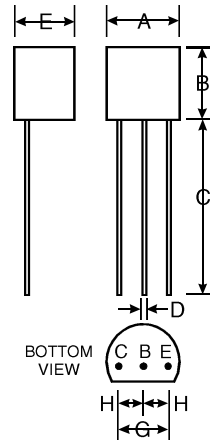


Features

Epitaxial Planar Die Construction
 Available in Both Through-Hole and Surface Mount Packages
 Suitable for Switching and Amplifier Applications
 Complementary NPN Types Available (2N3904)



TO-92		
Dim	Min	Max
A	4.32	4.83
B	4.32	4.78
C	12.50	15.62
D	0.36	0.56
E	3.15	3.94
G	2.29	2.79
H	1.14	1.40
All Dimensions in mm		

Mechanical Data

Case: TO-92, Molded Plastic
 Leads: Solderable per MIL-STD-202, Method 208
 Terminal Connections: See Diagram
 Marking: Type Number
 Weight: 0.18 grams (approx.)

Maximum Ratings @ $T_A = 25\text{ C}$ unless otherwise specified

Characteristic	Symbol	2N3906	Unit
Collector-Base Voltage	V_{CB0}	-40	V
Collector-Emitter Voltage	V_{CE0}	-40	V
Emitter-Base Voltage	V_{EB0}	-5.0	V
Collector Current - Continuous	I_C	-100	mA
Collector Current - Peak	I_{CM}	-200	mA
Power Dissipation (Note 1)	P_d	500	mW
Thermal Resistance, Junction to Ambient (Note 1)	R_{JA}	250	K/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	C

Notes: 1. Leads maintained at a distance of 2.0mm from body at specified ambient temperature.
 2. Pulse test: Pulse width 300 μ s, duty cycle 2%.

Electrical Characteristics

@ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
DC Current Gain	h_{FE}	50 70 100 60 30	300		-V _{CE} = 1.0V, -I _C = 0.1mA -V _{CE} = 1.0V, -I _C = 1.0mA -V _{CE} = 1.0V, -I _C = 10mA -V _{CE} = 1.0V, -I _C = 50mA -V _{CE} = 1.0V, -I _C = 100mA
Collector Saturation Voltage	V _{CE(SAT)}		0.25 0.40	V	(Note 2) -I _C = 10mA, -I _B = 1.0mA -I _C = 50mA, -I _B = 5.0mA
Base Saturation Voltage	V _{BE(SAT)}		0.85 0.95	V	(Note 2) -I _C = 10mA, -I _B = 1.0mA -I _C = 50mA, -I _B = 5.0mA
Collector Cutoff Current	I _{CEX}		50	nA	-V _{EB} = 3.0V, -V _{CE} = 30V
Emitter Cutoff Current	I _{BL}		50	nA	-V _{EB} = 3.0V, -V _{CE} = 30V
Collector-Base Breakdown Voltage	V _{(BR)CBO}	40		V	-I _C = 10 A, -I _E = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	40		V	-I _C = 1.0mA, -I _B = 0 (Note 2)
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5.0		V	-I _E = 10 A, -I _C = 0
Gain Bandwidth Product	f _T	250		MHz	-V _{CE} = 20V, -I _C = 10mA, f = 100MHz
Collector-Base Capacitance	C _{CBO}		4.5	pF	-V _{CB} = 5.0V, -I _E = 0, f = 100kHz
Emitter-Base Capacitance	C _{EBO}		10	pF	-V _{EB} = 0.5V, -I _C = 0, f = 100kHz
Noise Figure	NF		5.0	dB	-V _{CE} = 5.0V, -I _C = 100 A, R _G = 1.0k , f = 10 to 15000Hz
Delay Time	t _d		35	ns	-I _{B1} = 1.0mA, -I _C = 10mA, V _{CC} = 3.0V, V _{BE(off)} = 0.5V
Rise Time	t _r		35	ns	-I _{B1} = 1.0mA, -I _C = 10mA, -V _{CC} = 3.0V, -V _{BE(off)} = 0.5V
Storage Time	t _s		225	ns	-I _{B1} = -I _{B2} = 1.0mA, -I _C = 10mA, -V _{CC} = 3.0V
Fall Time	t _f		75	ns	-I _{B1} = -I _{B2} = 1.0mA, -I _C = 10mA, -V _{CC} = 3.0V

- Notes: 1. Leads maintained at a distance of 2.0mm from body at specified ambient temperature.
2. Pulse test: Pulse width 300 s, duty cycle 2%.

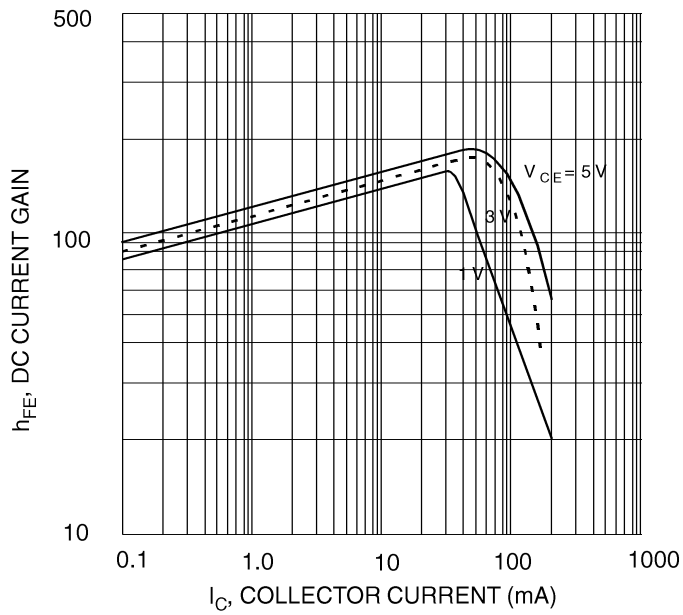


Fig. 1, DC Current Gain vs Collector Current

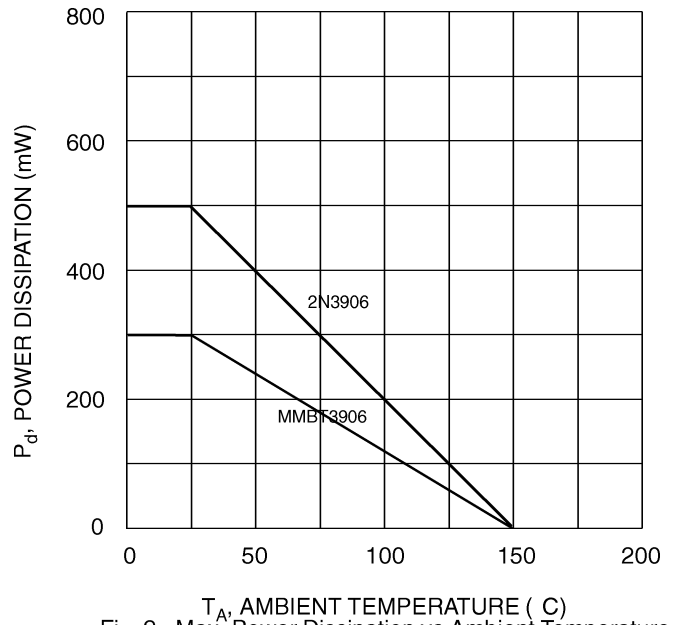


Fig. 2, Max Power Dissipation vs Ambient Temperature

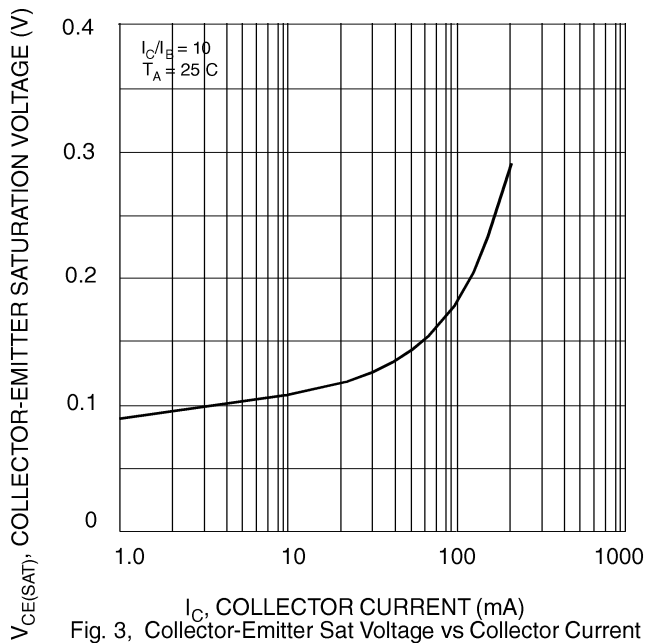


Fig. 3, Collector-Emitter Sat Voltage vs Collector Current

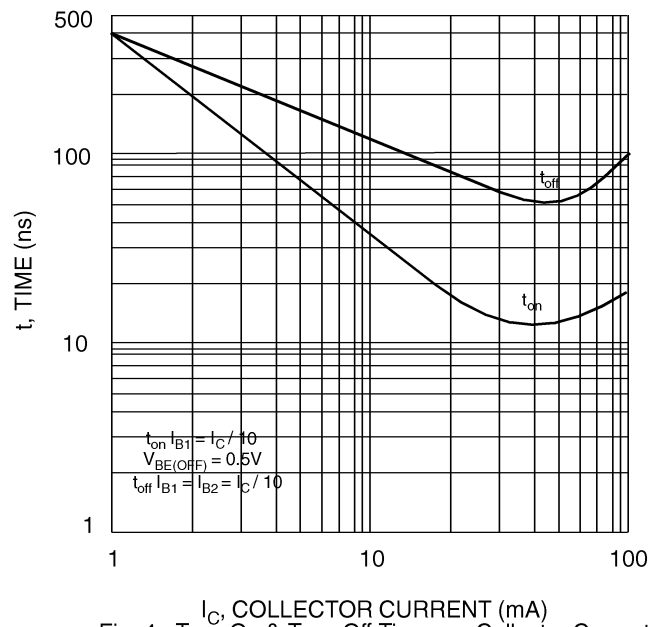


Fig. 4, Turn-On & Turn-Off Times vs Collector Current