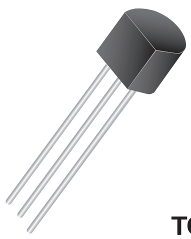
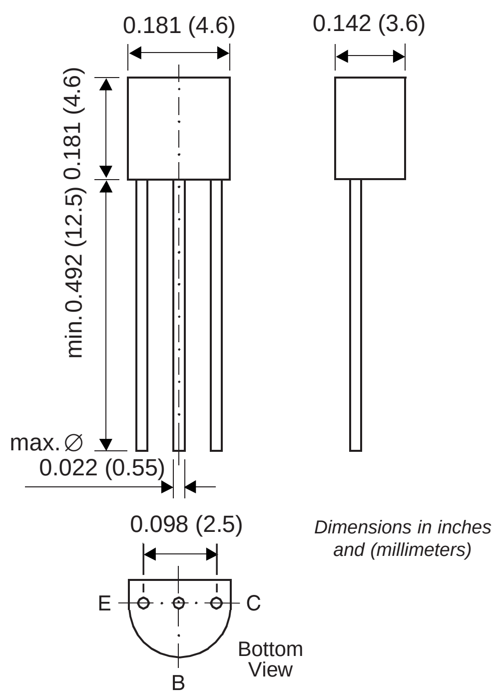
Small Signal Transistor (PNP)



TO-226AA (TO-92)



Features

- PNP Silicon Epitaxial Planar Transistor for switching and amplifier applications.
- On special request, this transistor is also manufactured in the pin configuration TO-18.
- This transistor is also available in the SOT-23 case with the type designation MMBT2907A.

Mechanical Data

Case: TO-92 Plastic Package

Weight: approx. 0.18g

Packaging Codes/Options:
E6/Bulk – 5K per container, 20K/box
E7/4K per Ammo mag., 20K/box

Maximum Ratings & Thermal Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Collector-Base Voltage		$-V_{CBO}$	60	V
Collector-Emitter Voltage		$-V_{CEO}$	60	V
Emitter-Base Voltage		$-V_{EBO}$	5.0	V
Collector Current		$-I_C$	600	mA
Power Dissipation	T_A = 25°C Derate above 25°C	P_{tot}	625 5.0	mW mW/°C
Power Dissipation	T_C = 25°C Derate above 25°C	P_{tot}	1.5 12	mW mW/°C
Thermal Resistance Junction to Ambient Air		$R_{\Theta JA}$	200[(1)]	°C/W
Thermal Resistance Junction to Case		$R_{\Theta JC}$	83.3	°C/W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_S	–55 to +150	°C

Note:
(1) Valid provided that leads are kept at ambient temperature.

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DC Current Gain	h_{FE}	$-V_{CE}$ = 10V, $-I_C$ = 0.1mA $-V_{CE}$ = 10V, $-I_C$ = 1mA $-V_{CE}$ = 10V, $-I_C$ = 10mA $-V_{CE}$ = 10V, $-I_C$ = 150mA(1) $-V_{CE}$ = 10V, $-I_C$ = 500mA(1)	75 100 100 100 50	— — — 300 —	— — — — —	— — — —
Collector-Base Breakdown Voltage	$-V_{(BR)CBO}$	$-I_C$ = 10µA, I_E = 0	60	—	—	V
Collector-Emitter Breakdown Voltage(1)	$-V_{(BR)CEO}$	$-I_C$ = 10mA, I_B = 0	60	—	—	V
Emitter-Base Breakdown Voltage	$-V_{(BR)EBO}$	$-I_E$ = 10µA, I_C = 0	5	—	—	V
Collector-Emitter Saturation Voltage(1)	$-V_{CEsat}$	$-I_C$ = 150mA, $-I_B$ = 15mA $-I_C$ = 500mA, $-I_B$ = 50mA	— —	— —	0.4 1.6	V
Base-Emitter Saturation Voltage(1)	$-V_{BEsat}$	$-I_C$ = 150mA, $-I_B$ = 15mA $-I_C$ = 500mA, $-I_B$ = 50mA	— —	— —	1.3 2.6	V
Collector Cut-off Current	$-I_{CEV}$	$-V_{EB}$ = 0.5V, $-V_{CE}$ = 30V	—	—	50	nA
Collector Cut-off Current	$-I_{CBO}$	$-V_{CB}$ = 50V, I_E = 0 $-V_{CB}$ = 50V, I_E = 0, T_A = 150°C	— —	— —	0.01 10	µA
Base Cut-off Current	$-I_{BL}$	$-V_{EB}$ = 0.5V, $-V_{CE}$ = 30V	—	—	50	nA
Current Gain-Bandwidth Product	f_T	$-V_{CE}$ = 20V, $-I_C$ = 50mA f = 100MHz	200	—	—	MHz
Output Capacitance	C_{obo}	$-V_{CB}$ = 10V, f = 1MHz, I_E = 0	—	—	8.0	pF
Emitter-Base Capacitance	C_{ibo}	$-V_{EB}$ = 2.0V, f = 1MHz, I_C = 0	—	—	30	pF

Notes:
(1) Pulse Test: Pulse width ≤ 300 µs, duty cycle ≤ 2.0%

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Turn-ON Time	t_{on}	$-I_{B1}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 30V	—	—	45	ns
Delay Time (see fig. 1)	t_d	$-I_{B1}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 30V	—	—	10	ns
Rise Time (see fig. 1)	t_r	$-I_{B1}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 30V	—	—	40	ns
Turn-OFF Time	t_{off}	$-I_{B1}$ = $-I_{B2}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 6V	—	—	100	ns
Storage Time (see fig. 2)	t_s	$-I_{B1}$ = $-I_{B2}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 6V	—	—	80	ns
Fall Time (see fig. 2)	t_f	$-I_{B1}$ = $-I_{B2}$ = 15mA, $-I_C$ = 150mA, $-V_{CC}$ = 6V	—	—	30	ns

Switching Time Equivalent Test Circuit

Figure 1: Delay and Rise Time test circuit

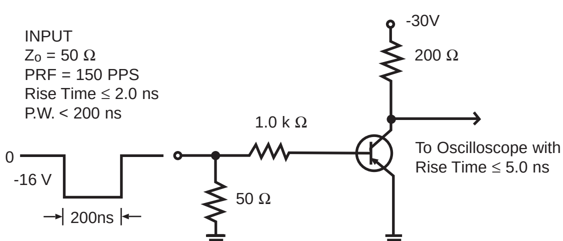
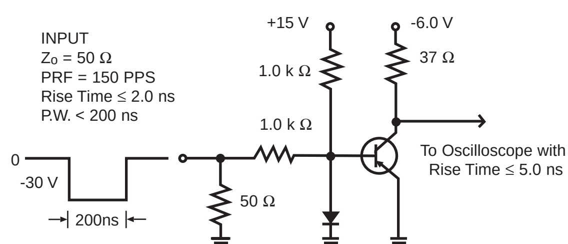


Figure 2: Storage and Fall Time test circuit



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