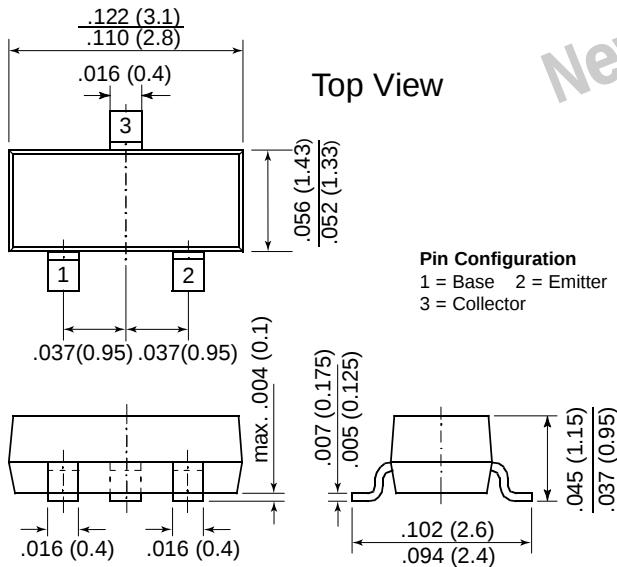


Small Signal Transistor (PNP)

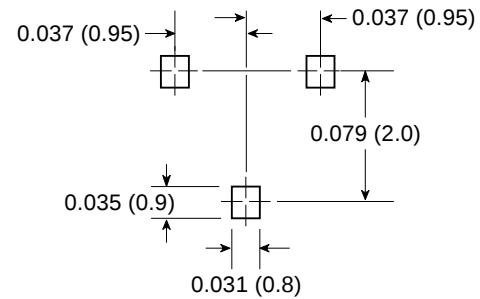


TO-236AB (SOT-23)



Dimensions in inches and (millimeters)

Mounting Pad Layout



Mechanical Data

Case: SOT-23 Plastic Package

Weight: approx. 0.008g

Marking Code: 2F

Packaging Codes/Options:

E8/10K per 13" reel (8mm tape)

E9/3K per 7" reel (8mm tape)

Features

- PNP Silicon Epitaxial Planar Transistor for switching and amplifier applications.
- This transistor is also available in the TO-92 case with the type designation MPS2907A.

Maximum Ratings & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameters	Symbols	Value	Units
Collector-Emitter Voltage	$-V_{CEO}$	60	V
Collector-Base Voltage	$-V_{CB0}$	60	V
Emitter-Base Voltage	$-V_{EB0}$	5.0	V
Collector Current	$-I_C$	600	mA
Power Dissipation ⁽¹⁾ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_{tot}	225 1.8	mW mW/°C
Power Dissipation ⁽²⁾ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_{tot}	300 2.4	mW mW/°C
Thermal Resistance Junction to Ambient Air FR-5 Board Alumina Substrate	$R_{\theta JA}$	556 417	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_S	- 55 to +150	°C

Notes:

(1) FR-5 Board = 1.0 x 0.75 x 0.062 in.

(2) Alumina Substrate = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

Small Signal Transistor (PNP)
Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DC Current Gain	h_{FE}	$-V_{CE} = 10\text{ V}, -I_C = 0.1\text{ mA}$	75	—	—	—
		$-V_{CE} = 10\text{ V}, -I_C = 1\text{ mA}$	100	—	—	
		$-V_{CE} = 10\text{ V}, -I_C = 10\text{ mA}$	100	—	—	
		$-V_{CE} = 10\text{ V}, -I_C = 150\text{ mA}^{(1)}$	100	—	300	
		$-V_{CE} = 10\text{ V}, -I_C = 500\text{ mA}^{(1)}$	50	—	—	
Collector Cutoff Current	$-I_{CEX}$	$-V_{EB} = 0.5\text{ V}, -V_{CE} = 30\text{ V}$	—	—	50	nA
Collector Cutoff Current	$-I_{CBO}$	$-V_{CB} = 50\text{ V}, I_E = 0$	—	—	0.01	μA
		$-V_{CB} = 50\text{ V}, I_E = 0, T_A = 125^\circ\text{C}$	—	—	10	
Emitter-Base Cutoff Current	$-I_{BL}$	$-V_{EB} = 0.5\text{ V}, -V_{CE} = 30\text{ V}$	—	—	50	nA
Collector-Emitter Saturation Voltage ⁽¹⁾	$-V_{CEsat}$	$-I_C = 150\text{ mA}, -I_B = 15\text{ mA}$	—	—	0.4	V
		$-I_C = 500\text{ mA}, -I_B = 50\text{ mA}$	—	—	1.6	
Base-Emitter Saturation Voltage ⁽¹⁾	$-V_{BEsat}$	$-I_C = 150\text{ mA}, -I_B = 15\text{ mA}$	—	—	1.3	V
		$-I_C = 500\text{ mA}, -I_B = 50\text{ mA}$	—	—	2.6	
Collector-Emitter Breakdown Voltage ⁽¹⁾	$-V_{(BR)CEO}$	$-I_C = 10\text{ mA}, I_B = 0$	60	—	—	V
Collector-Base Breakdown Voltage	$-V_{(BR)CBO}$	$-I_C = 10\text{ }\mu\text{A}, I_E = 0$	60	—	—	V
Emitter-Base Breakdown Voltage	$-V_{(BR)EBO}$	$-I_E = 10\text{ }\mu\text{A}, I_C = 0$	5.0	—	—	V
Current Gain-Bandwidth Product	f_T	$-V_{CE} = 20\text{ V}, -I_C = 50\text{ mA}$ $f = 100\text{ MHz}$	200	—	—	MHz
Output Capacitance	C_{obo}	$-V_{CB} = 10\text{ V}, f = 1.0\text{ MHz}$ $I_E = 0$	—	—	8	pF
Input Capacitance	C_{ibo}	$-V_{EB} = 2.0\text{ V}, f = 1.0\text{ MHz}$ $I_C = 0$	—	—	30	pF

Notes:

(1) Pulse test: Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2.0\%$

Small Signal Transistor (PNP)

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Turn-ON Time	t _{on}	-I _{B1} = 15 mA, -I _C = 150 mA -V _{CC} = 30 V	—	—	45	ns
Delay Time	t _d	-I _{B1} = 15 mA, -I _C = 150 mA -V _{CC} = 30 V	—	—	10	ns
Rise Time	t _r	-I _{B1} = 15 mA, -I _C = 150 mA, -V _{CC} = 30 V	—	—	40	ns
Turn-OFF Time	t _{off}	-I _{B1} = 15 mA, -I _C = 150 mA -V _{CC} = 6.0 V	—	—	100	ns
Storage Time	t _s	-I _{B1} = -I _{B2} = 15 mA, -I _C = 150 mA, -V _{CC} = 6.0 V	—	—	80	ns
Fall Time	t _f	-I _{B1} = -I _{B2} = 15 mA, -I _C = 150 mA, -V _{CC} = 6 V	—	—	30	ns

Switching Time Equivalent Test Circuit

Figure 1 - Delay and Rise Time Test Circuit

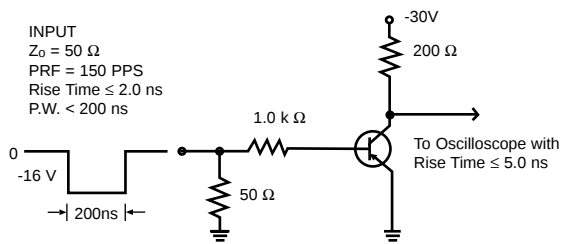


Figure 2 - Storage and Fall Time Test Circuit

