

PN2907 / MMBT2907

PNP General-Purpose Transistor

Description

This device is designed for use with general-purpose amplifiers and switches requiring collector currents to 500 mA. Sourced from process 63.



Ordering Information

Part Number	Top Mark	Package	Packing Method
PN2907BU	PN2907	TO-92 3L	Bulk
MMBT2907_D87Z	2B	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings^{(1),(2)}

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{CBO}	Collector-Base Voltage	-60	V
V_{EBO}	Emitter-Base Voltage	-5.0	V
I_C	Collector Current - Continuous	-800	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Notes:

- These ratings are based on a maximum junction temperature of 150°C .
- These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty cycle operations.

Thermal Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Max.		Unit
		PN2907 ⁽³⁾	MMBT2907 ⁽⁴⁾	
P_D	Total Device Dissipation	625	350	mW
	Derate Above 25°C	5.0	2.8	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3		$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	$^\circ\text{C}/\text{W}$

Notes:

- PCB size: FR-4 76 x 114 x 1.57 mm³ (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.
- Device mounted on FR-4 PCB 1.6 inch x 1.6 inch x 0.06 inch.

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

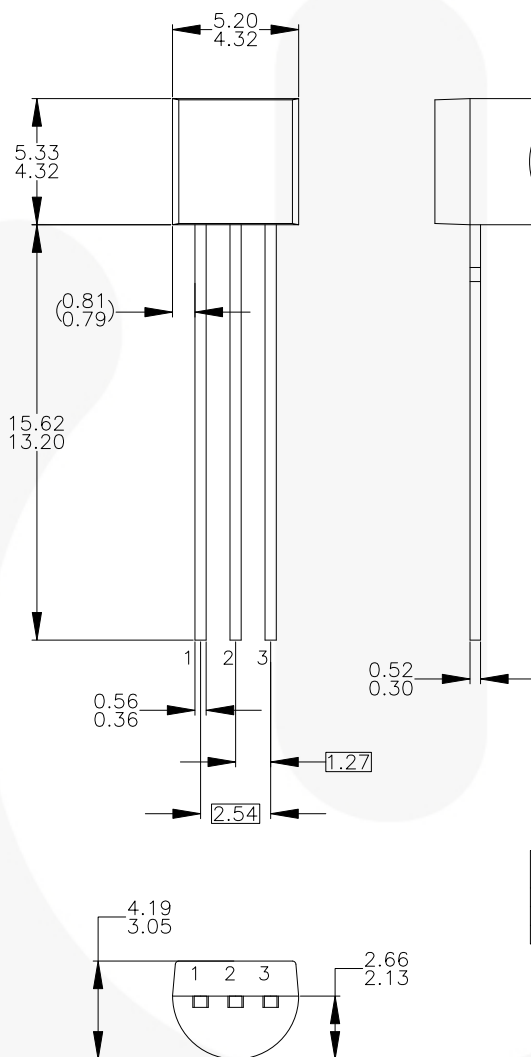
Symbol	Parameter	Conditions	Min.	Max.	Unit
Off Characteristics					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ⁽⁵⁾	$I_C = -10\text{ mA}, I_B = 0$	-40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	-60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\text{ }\mu\text{A}, I_C = 0$	-5.0		V
I_{CEX}	Collector Cut-Off Current	$V_{CE} = -30\text{ V}, V_{EB} = -0.5\text{ V}$		-50	nA
I_{BL}	Base Cut-Off Current	$V_{CE} = -30\text{ V}, V_{EB} = -0.5\text{ V}$		-50	nA
I_{CBO}	Collector Cut-Off Current	$V_{CB} = -50\text{ V}, I_E = 0$		-20	nA
		$V_{CB} = -50\text{ V}, I_E = 0, T_A = 150^\circ\text{C}$		-20	μA
On Characteristics ⁽⁵⁾					
h_{FE}	DC Current Gain	$V_{CE} = -10\text{ V}, I_C = -0.1\text{ mA}$	35		
		$V_{CE} = -10\text{ V}, I_C = -1.0\text{ mA}$	50		
		$V_{CE} = -10\text{ V}, I_C = -10\text{ mA}$	70		
		$V_{CE} = -10\text{ V}, I_C = -150\text{ mA}$	100	300	
		$V_{CE} = -10\text{ V}, I_C = -500\text{ mA}$	30		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -150\text{ mA}, I_B = -15\text{ mA}$		-0.4	V
		$I_C = -500\text{ mA}, I_B = -50\text{ mA}$		-1.6	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -150\text{ mA}, I_B = -15\text{ mA}$		-1.3	V
		$I_C = -500\text{ mA}, I_B = -50\text{ mA}$		-2.6	
Small Signal Characteristics					
C_{ob}	Output Capacitance	$V_{CB} = -10\text{ V}, f = 1.0\text{ MHz}$		8	pF
C_{ib}	Input Capacitance	$V_{EB} = -2.0\text{ V}, f = 1.0\text{ MHz}$		30	pF
h_{fe}	Small-Signal Current Gain	$I_C = -50\text{ mA}, V_{CE} = -20\text{ V}, f = 100\text{ MHz}$	2		
Switching Characteristics					
t_{on}	Turn-On Time	$V_{CC} = -30\text{ V}, I_C = -150\text{ mA}, I_{B1} = -15\text{ mA}$		45	ns
t_d	Delay Time			10	ns
t_r	Rise Time			40	ns
t_{off}	Turn-Off Time	$V_{CC} = -6.0\text{ V}, I_C = -150\text{ mA}, I_{B1} = I_{B2} = -15\text{mA}$		100	ns
t_s	Storage Time			80	ns
t_f	Fall Time			30	ns

Note:

5. Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2.0\%$.

Physical Dimensions

TO-92 (Bulk)



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
 B) ALL DIMENSIONS ARE IN MILLIMETERS.
 C) DRAWING CONFORMS TO ASME Y14.5M-1994.
 D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	P	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:

P — BIPOLAR E — EMITTER D — DRAIN
 F — JFET B — BASE S — SOURCE
 M — DMOS C — COLLECTOR G — GATE

- E) FOR PACKAGE 92, 94, 96, 97 AND 98:
 PIN CONFIGURATION DRAIN "D" AND SOURCE "S"
 ARE INTERCHANGEABLE AT JFET "F" OPTION.
 F) DRAWING FILENAME: MKT-ZA03DREV3.

Figure 1. 3-LEAD, TO92, JEDEC TO-92 COMPLIANT STRAIGHT LEAD CONFIGURATION (OLD TO92AM3)

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Physical Dimensions (Continued)

SOT-23

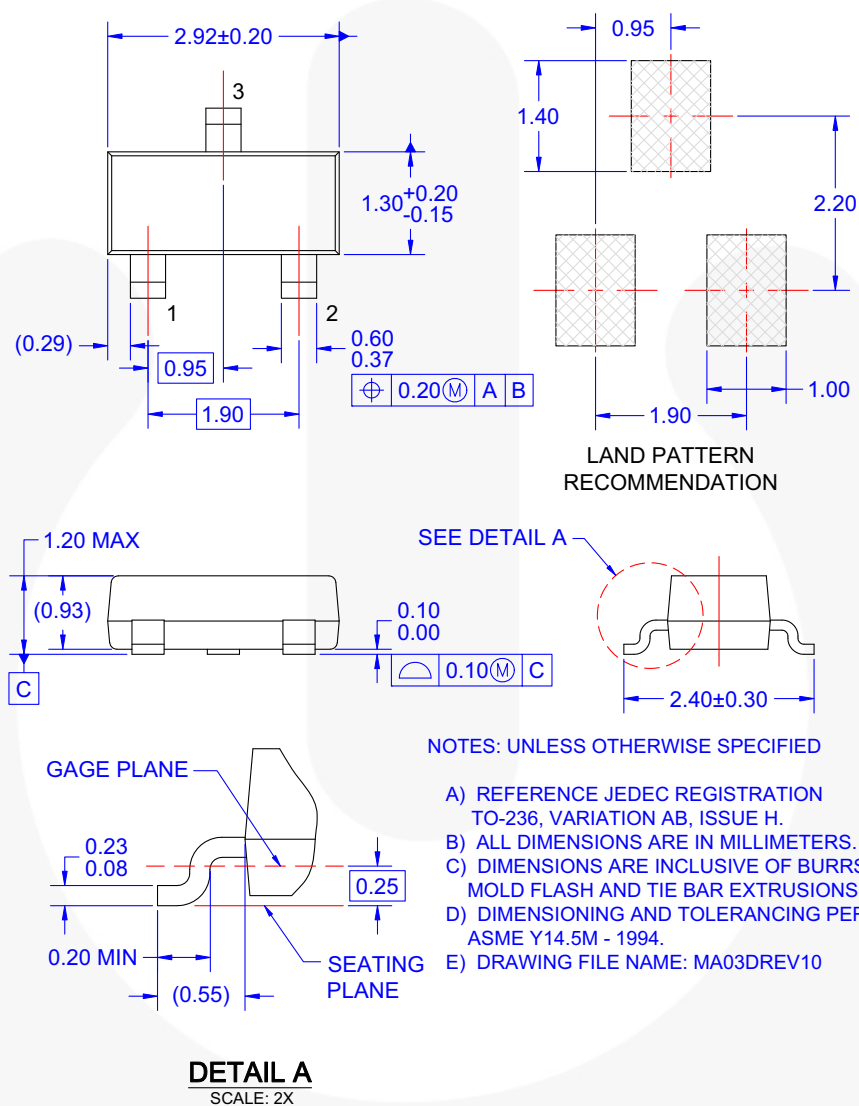


Figure 2. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

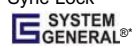
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