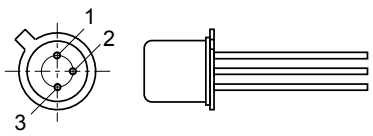
GOOD-ARK
SEMICONDUCTOR

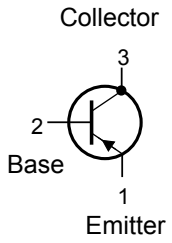
2N2907/2N2907A
PNP Switching Transistors

Features

- High current (max. 600 mA)
- Low voltage (max. 60 V)
- NPN complements: 2N2222 and 2N2222A



Package: TO-18



Schematic Diagram

Applications

- Switching and linear amplification

Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Max.	Unit
V_{CBO}	Collector-Base Voltage	Open Emitter	–	- 60	V
V_{CEO}	Collector-Emitter Voltage	Open Base, I_C < − 100 mA			
	2N2907		–	- 40	V
	2N2907A		–	- 60	V
V_{EBO}	Emitter-Base Voltage	Open Collector	–	- 5	V
I_C	Collector Current (DC)		–	- 600	mA
I_{CM}	Peak Collector Current		–	- 800	mA
I_{BM}	Peak Base Current		–	- 200	mA
P_{tot}	Total Power Dissipation	$T_A \leq 25$ °C	–	400	mW
		$T_C \leq 25$ °C	–	1.2	W
T_{STG}	Storage Temperature		- 65	+150	°C
T_J	Junction Temperature		–	+200	°C
T_A	Operating Ambient Temperature		- 65	+150	°C

Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
$R_{th\ j\text{-}a}$	Thermal Resistance - Junction to Ambient	in free air	438	K/W
$R_{th\ j\text{-}c}$	Thermal Resistance - Junction to Case		146	K/W

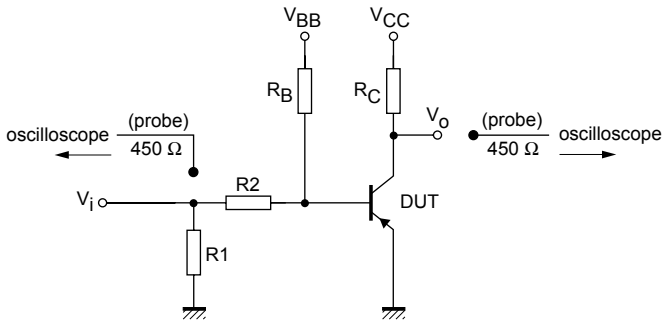
Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Max.	Unit
I_{CBO}	Collector Cut-off Current 2N2907	I_E = 0, V_{CB} = –50 V	–	–20	nA
		I_E = 0, V_{CB} = –50 V, T_{amb} = 150 °C	–	–20	µA
I_{CBO}	Collector Cut-off Current 2N2907A	I_E = 0, V_{CB} = –50 V	–	–10	nA
		I_E = 0, V_{CB} = –50 V, T_{amb} = 150 °C	–	–10	µA
I_{EBO}	Emitter Cut-off Current	I_C = 0, V_{EB} = –5 V	–	–50	nA
h_{FE}	DC Current Gain 2N2907	V_{CE} = –10 V			
		I_C = –0.1 mA	35	–	
		I_C = –1 mA	50	–	
		I_C = –10 mA	75	–	
		I_C = –150 mA; note 1	100	300	
		I_C = –500 mA; note 1	30		
h_{FE}	DC Current Gain 2N2907A	V_{CE} = –10 V			
		I_C = –0.1 mA	75	–	
		I_C = –1 mA	100	–	
		I_C = –10 mA	100	–	
		I_C = –150 mA; note 1	100	300	
		I_C = –500 mA; note 1	50	–	
V_{CEsat}	Collector-Emitter Saturation Voltage	I_C = –150 mA, I_B = –15 mA; note 1		–400	mV
		I_C = –500 mA, I_B = –50 mA; note 1		–1.6	V
V_{BEsat}	Base-Emitter Saturation Voltage	I_C = –150 mA, I_B = –15 mA; note 1		–1.3	V
		I_C = –500 mA, I_B = –50 mA; note 1		–2.6	V
C_c	Collector Capacitance	I_E = i_e =0, V_{CB} = –10 V, f = 1 MHz	–	8	pF
C_e	Emitter Capacitance	I_C = i_c =0, V_{EB} = –2 V, f = 1 MHz	–	30	pF
f_T	Transition Frequency	I_C = –50 mA, V_{CE} = –20 V, f = 100 MHz; note 1	200	–	MHz
Switching Times (between 10% and 90% levels)					
t_{on}	Turn-on Time	I_{Con} = –150 mA, I_{Bon} = –15 mA, I_{Boff} = 1 5 m A	–	45	ns
t_d	Delay Time		–	15	ns
t_r	Rise Time		–	35	ns
t_{off}	Turn-off Time		–	300	ns
t_s	Storage Time		–	250	ns
t_f	Fall Time		–	50	ns

Note

1. Pulse test: $t_p \leq 300$ µs, $\delta \leq 0.02$.

Test Circuits

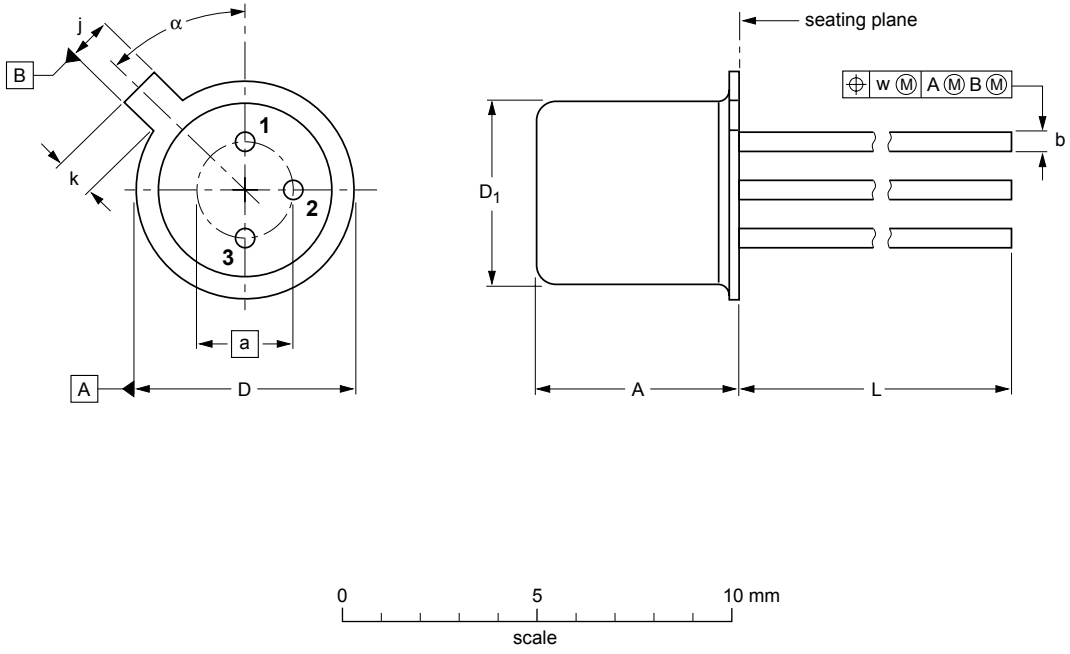


V_i = –9.5 V, T = 500 μs, t_p = 1 0 μ s, $t_r = t_f \leq 3$ ns.
R1 = 68 Ω, R2 = 325 Ω, R_B = 325 Ω, R_C = 160 Ω.
V_{BB} = 3.5 V, V_{CC} = –29.5 V.
Oscilloscope input impedance Z_i = 5 0Ω.

Test circuit for switching times.

Package Outline Dimensions TO-18

Metal-can cylindrical single-ended package, 3 leads



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	a	b	D	D_1	j	k	L	w	α
mm	5.31 4.74	2.54	0.47 0.41	5.45 5.30	4.70 4.55	1.03 0.94	1.1 0.9	15.0 12.7	0.40	45°

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	
	IEC	JEDEC	EIAJ			
SOT18/13	B11/C7 type 3	TO-18				