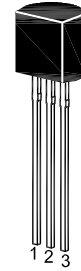


NPN Silicon Epitaxial Planar Transistor

for switching and amplifier applications.

As complementary types the PNP transistors 2N3905 and 2N3906 are recommended.

On special request, these transistors can be manufactured in different pin configurations.



1. Emitter 2. Base 3. Collector
TO-92 Plastic Package

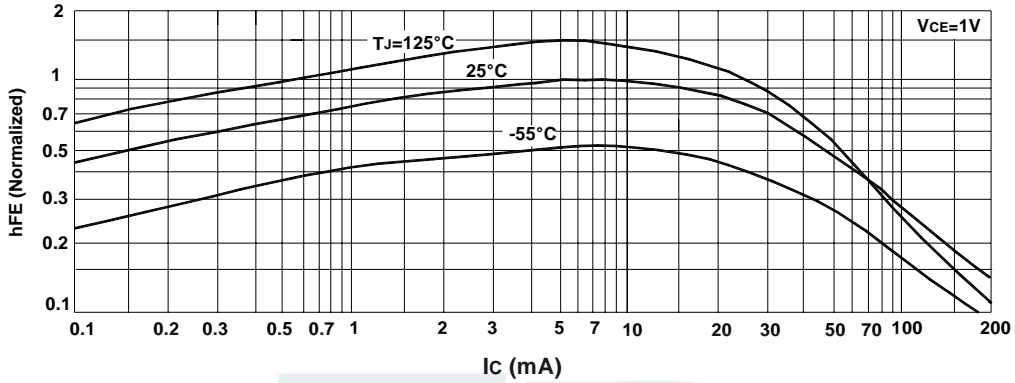
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Power Dissipation	P_{tot}	625	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

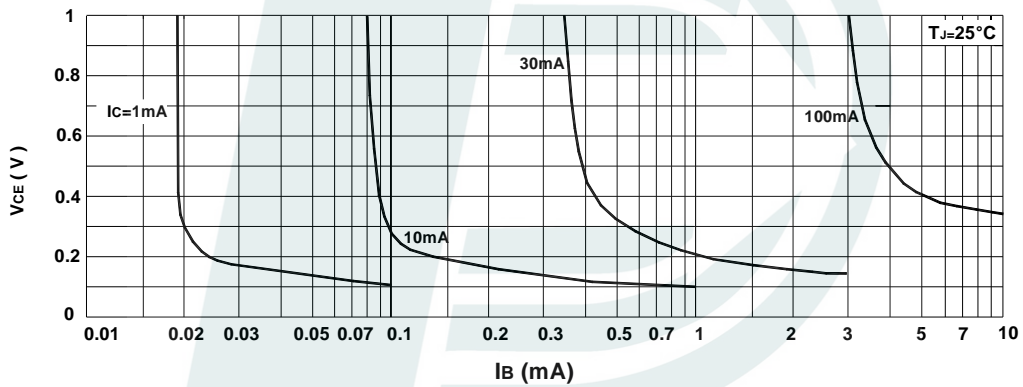
Characteristics at T_a = 25 °C

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at V _{CE} = 1 V, I _C = 0.1 mA at V _{CE} = 1 V, I _C = 1 mA at V _{CE} = 1 V, I _C = 10 mA at V _{CE} = 1 V, I _C = 50 mA at V _{CE} = 1 V, I _C = 100 mA	2N3903	h _{FE}	20	-
	2N3904	h _{FE}	40	-
	2N3903	h _{FE}	35	-
	2N3904	h _{FE}	70	-
	2N3903	h _{FE}	50	150
	2N3904	h _{FE}	100	300
Collector Base Cutoff Current at V _{CB} = 30 V	I _{CBO}	-	50	nA
Emitter Base Cutoff Current at V _{EB} = 6 V	I _{EBO}	-	50	nA
Collector Base Breakdown Voltage at I _C = 10 μA	V _{(BR)CBO}	60	-	V
Collector Emitter Breakdown Voltage at I _C = 1 mA	V _{(BR)CEO}	40	-	V
Emitter Base Breakdown Voltage at I _E = 10 μA	V _{(BR)EBO}	6	-	V
Collector Emitter Saturation Voltage at I _C = 10 mA, I _B = 1 mA at I _C = 50 mA, I _B = 5 mA	V _{CE(sat)}	-	0.2	V
	V _{CE(sat)}	-	0.3	V
Base Emitter Saturation Voltage at I _C = 10 mA, I _B = 1 mA at I _C = 50 mA, I _B = 5 mA	V _{BE(sat)}	-	0.85	V
	V _{BE(sat)}	-	0.95	V
Gain Bandwidth Product at V _{CE} = 20 V, I _C = 10 mA, f = 100 MHz	2N3903	f _T	250	-
	2N3904	f _T	300	-
Collector Base Capacitance at V _{CB} = 5 V, f = 100 KHz	C _{ob}	-	4	pF
Delay Time at V _{CC} = 3 V, V _{BE} = 0.5 V, I _C = 10 mA, I _{B1} = 1 mA	t _d	-	35	ns
Rise Time at V _{CC} = 3 V, V _{BE} = 0.5 V, I _C = 10 mA, I _{B1} = 1 mA	t _r	-	35	ns
Storage Time at V _{CC} = 3 V, I _C = 10 mA, I _{B1} = -I _{B2} = 1 mA	t _s	-	200	ns
Fall Time at V _{CC} = 3 V, I _C = 10 mA, I _{B1} = -I _{B2} = 1 mA	t _f	-	50	ns

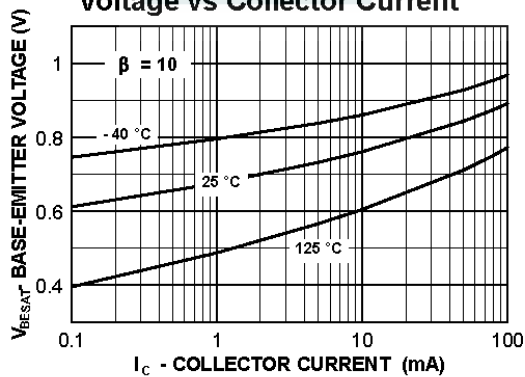
DC Current Gain



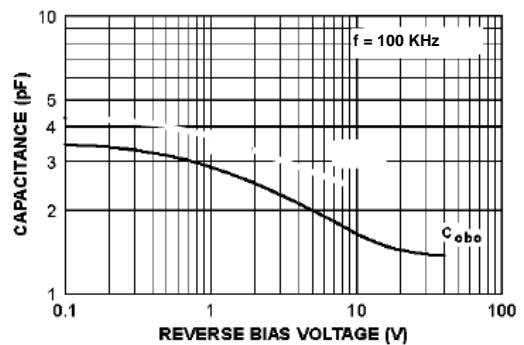
Collector Saturation Region



Base-Emitter Saturation Voltage vs Collector Current



Capacitance vs Reverse Bias Voltage



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