

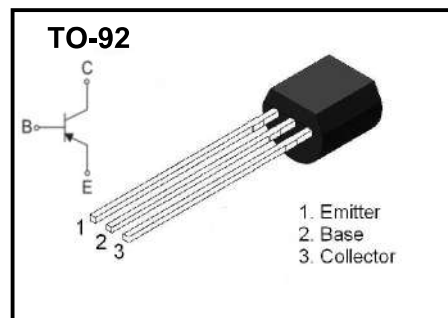
PNP Plastic-Encapsulate Transistors

Applications

◆ Low Noise Audio Amplifier

Features

- ◆ High DC current gain: $h_{FE} = 150 \sim 700$
- ◆ High breakdown voltage: $V_{CEO} = -120\text{ V}$
- ◆ Low pulse noise. Low $1/f$ noise



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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	BV_{CBO}	-120	V
Collector-Emitter Voltage	BV_{CEO}	-120	V
Emitter-Base Voltage	BV_{EBO}	-5	V
Collector Current	I_C	-100	mA
Collector Power Dissipation	P_C	300	mW
Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector-base breakdown voltage	BV_{CBO}	$I_C = -10\mu\text{A}$, $I_E = 0$	-120			V
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = -1\text{mA}$, $I_B = 0$	-120			V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = -10\mu\text{A}$, $I_C = 0$	-5			V
Collector cut-off current	I_{CBO}	$V_{CB} = -120\text{V}$, $I_E = 0$			-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -5\text{V}$, $I_C = 0$			-0.1	μA
DC current gain	h_{FE}	$V_{CE} = -6\text{V}$, $I_B = -2\text{mA}$	150		700	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10\text{mA}$, $I_B = -1\text{mA}$			-0.3	V
Base-emitter saturation voltage	$V_{BE(on)}$	$V_{CE} = -6\text{V}$, $I_B = -2\text{mA}$			-0.85	V
Transition frequency	f_T	$V_{CE} = -6\text{V}$, $I_C = -1\text{mA}$		100		MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$		4.0		pF

h_{FE} Classification

Classification	2SA970-GR	2SA970-BL
Range	150~300	350~700

Typical Characteristics

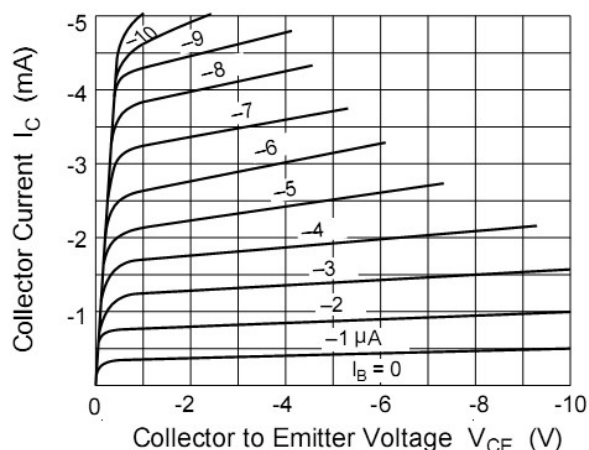


Fig.1 Static characteristics

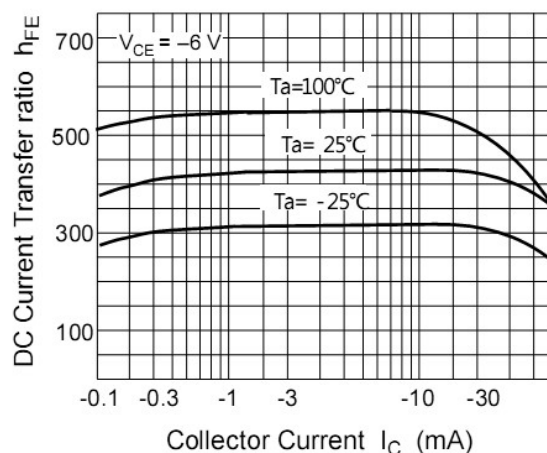


Fig.2 DC Current Gain

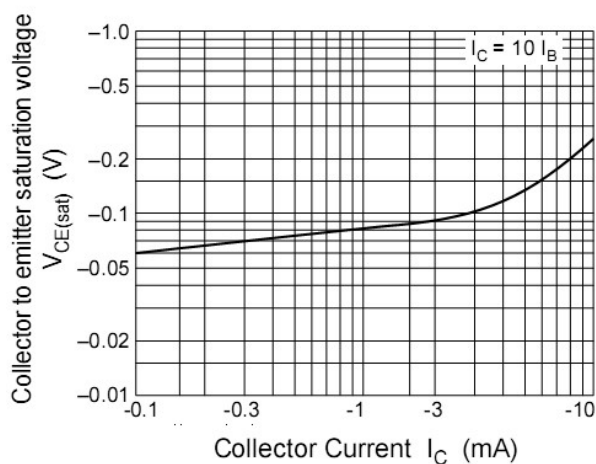


Fig.3 Collector-Emitter Saturation Voltage

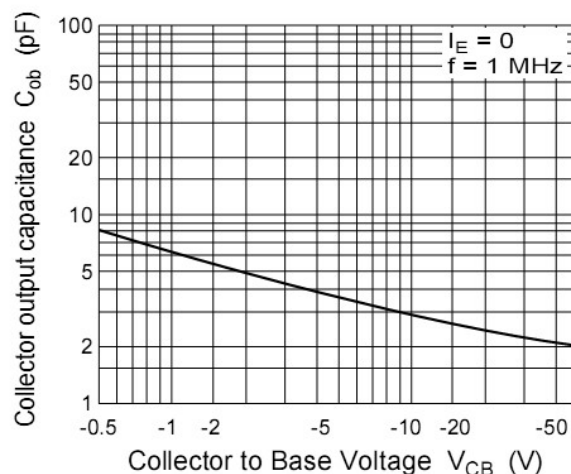


Fig.4 Collector Output Capacitance

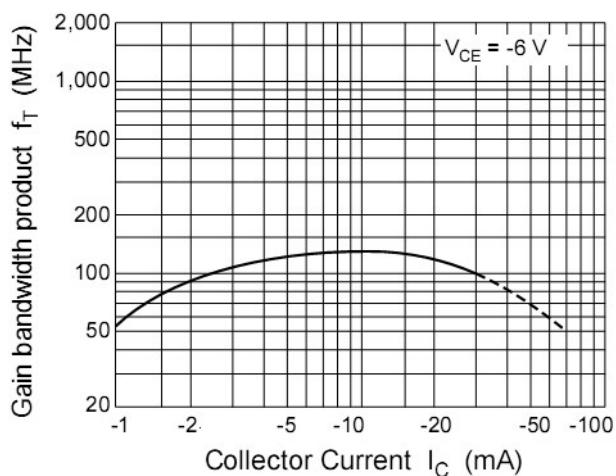


Fig.5 Current Gain Bandwidth Product

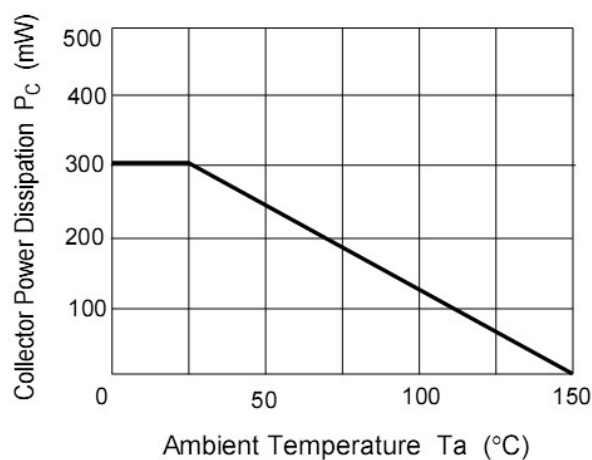


Fig.6 Maximum Collector Dissipation Curve

Ordering information

Package	Packing Description	Base Quantity
TO-92	Bulk	1000pcs/Bag
	Tape	2000pcs/Box

Package Dimensions

TO-92

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	3.30	3.70	0.130	0.146
A1	2.30	2.70	0.091	0.106
b	0.40	0.50	0.016	0.020
b1	0.50	0.70	0.020	0.028
c	0.35	0.45	0.014	0.018
D	4.45	4.70	0.175	0.185
E	4.40	4.65	0.173	0.183
e	1.17	1.37	0.046	0.054
e1	2.34	2.64	0.092	0.104
L	13.50	14.50	0.531	0.571
L1	1.80	2.20	0.071	0.087

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