

Plastic-Encapsulate Transistors

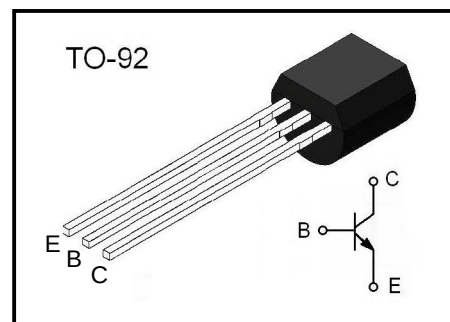
TRANSISTOR (NPN)

1W Output Amplifier of Potable Radios in Class B

Push-pull Operation

FEATURES

- ◆High total power dissipation. ($P_C = 625\text{mW}$)
- ◆High Collector Current. ($I_C = 500\text{mA}$)
- ◆Complementary to S9012



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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	BV_{CBO}	40	V
Collector-Emitter Voltage	BV_{CEO}	20	V
Emitter-Base Voltage	BV_{EBO}	5	V
Collector Current	I_C	500	mA
Collector Power Dissipation	P_C	625	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

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

Parameter	Conditions	Symbol	Value			Unit
			Min	Typ	Max	
Collector-base breakdown voltage	$I_C = 100\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	40			V
Collector-emitter breakdown voltage	$I_C = 1\text{mA}, I_B = 0$	$V_{(BR)CEO}$	20			V
Emitter-base breakdown voltage	$I_E = 100\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	5			V
Collector cut-off current	$V_{CB} = 25\text{V}, I_E = 0$	I_{CBO}			0.1	μA
Emitter cut-off current	$V_{EB} = 3\text{V}, I_C = 0$	I_{EBO}			0.1	μA
DC current gain	$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	$h_{FE(1)}$	120		400	
	$V_{CE} = 1\text{V}, I_C = 500\text{mA}$	$h_{FE(2)}$	40			
Collector-emitter saturation voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$	V_{CESAT}			0.6	V
base -emitter saturation voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$	V_{BESAT}			1.2	V
Transition frequency	$V_{CE} = 6\text{V}, I_B = 20\text{mA}$	f_T	100			MHz

CLASSIFICATION OF $h_{FE(1)}$

Classification	S9013-D	S9013-E	S9013-F	S9013-G	S9013-H	S9013-I	S9013-J
Range	64-91	78-112	96-135	102-166	144-202	200-350	300-400

Typical Characteristics

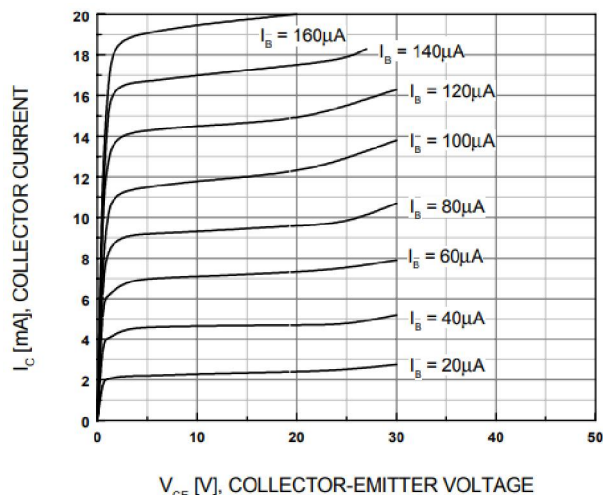


Figure 1. Static Characteristic

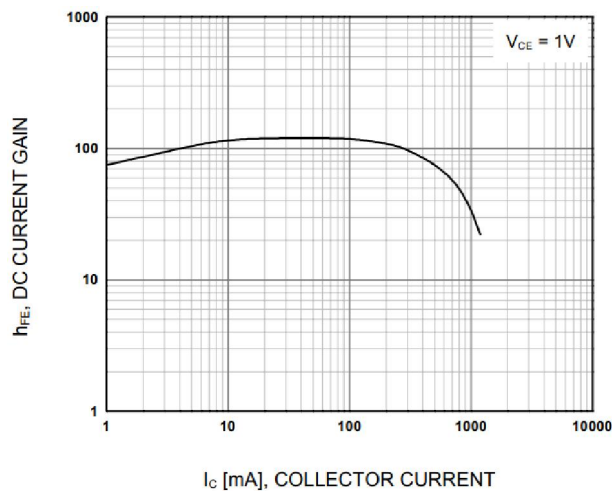
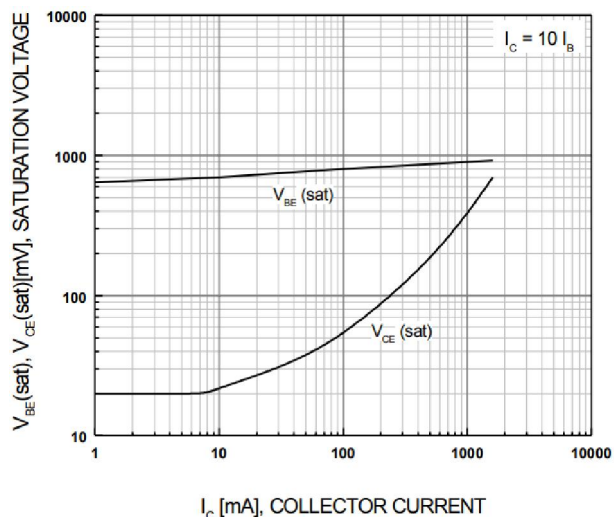


Figure 2. DC current Gain



**Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage**

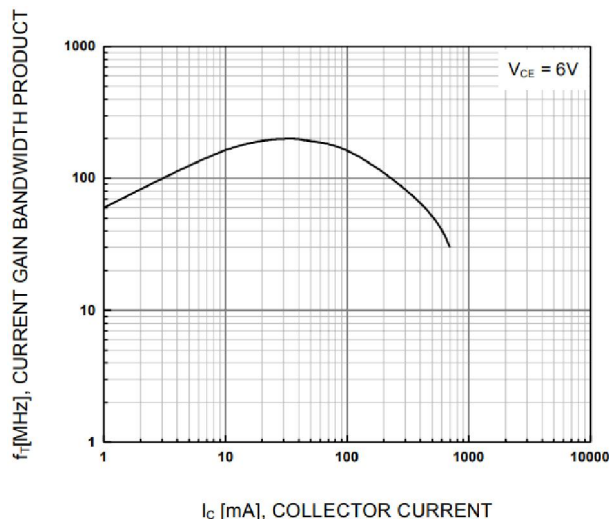


Figure 4. Current Gain Bandwidth Product

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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