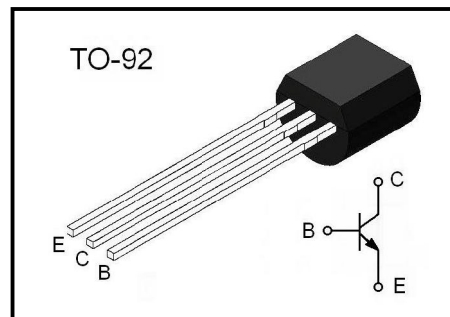


NPN Plastic-Encapsulate Transistors

Switching and Amplifier Applications



Absolute Maximum Rating (Ta=25°C)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	BV_{CBO}	30	V
Collector-Emitter Voltage	BV_{CEO}	25	V
Emitter-Base Voltage	BV_{EBO}	5	V
Collector Current	I_C	100	mA
Collector Power Dissipation	P_C	500	mW
Junction Temperature	T_j	150	°C
,Storage Temperature	T_{stg}	-55~+150	°C

Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	BV_{CBO}	$I_C = 100\mu A, I_E = 0$	30			V
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = 1mA, I_B = 0$	25			V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = 100\mu A, I_C = 0$	5			V
Collector cut-off current	I_{CBO}	$V_{CB} = 30V, I_E = 0$			15	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			15	nA
DC current gain	h_{FE}	$V_{CE} = 5V, I_C = 2mA$	120		800	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 0.5mA$			0.2	V
		$I_C = 100mA, I_B = 5mA$			0.6	
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10mA, I_B = 0.5mA$			0.83	V
		$I_C = 100mA, I_B = 5mA$			1.05	
Base -emitter saturation voltage	$V_{BE(on)}$	$V_{CE} = 5V, I_C = 2mA$			0.7	V
Transition frequency	f_T	$V_{CE} = 5V, I_C = 10mA$	150			MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0, f = 1MHz$		3.5		pF

h_{FE} Classification

Classification	BC238-A	BC238-B	BC238-C
Range	120~220	180~460	380~800

Typical Characteristics

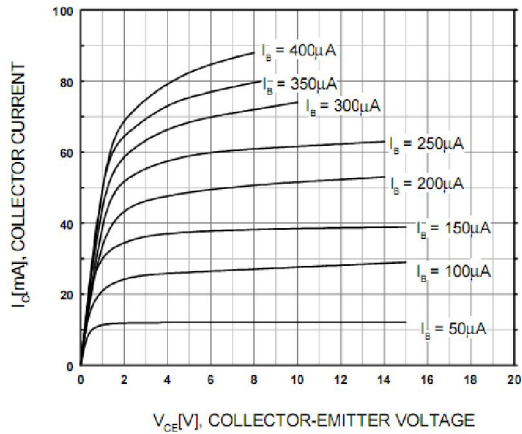


Figure 1. Static Characteristic

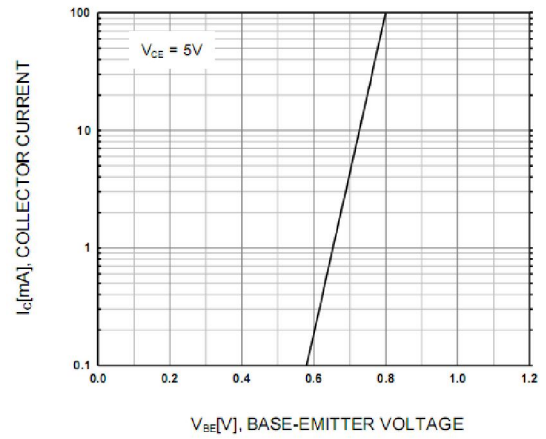


Figure 2. Transfer Characteristic

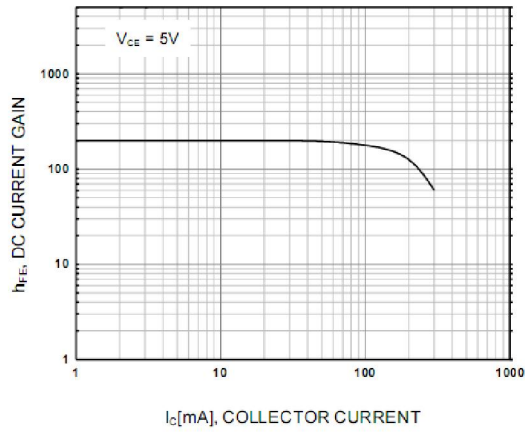


Figure 3. DC current Gain

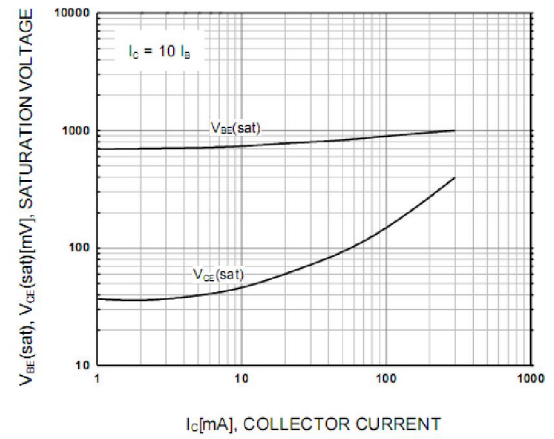


Figure 4. Saturation Voltage

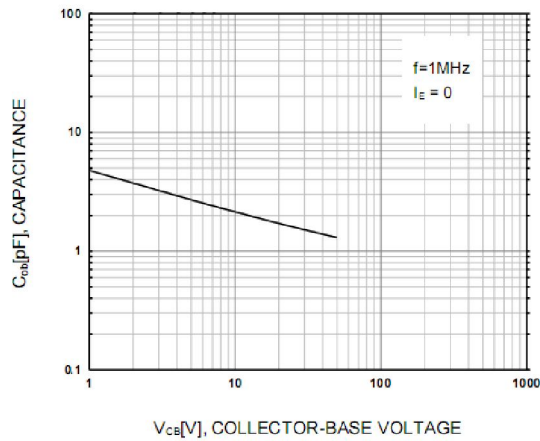


Figure 5. Output Capacitance

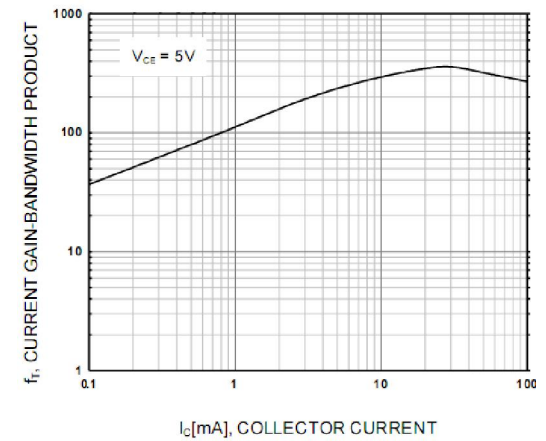


Figure 6. Current Gain Bandwidth Product

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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