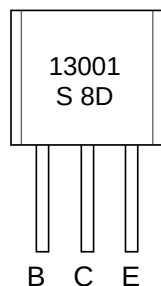


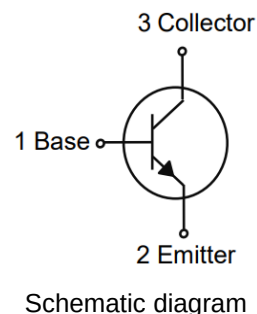
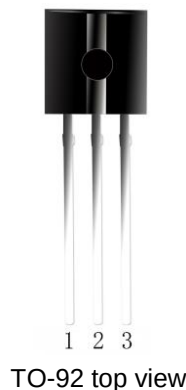
Features

- Power switching applications



13001 : Device code
S 8D : Code

Marking and pin assignment



Halogen-Free

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	600	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	8	V
I_C	Collector Current	250	mA
P_C	Collector Power Dissipation	625	mW
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-50~+150	°C

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)
13001	TO-92	13001	1,000	10,000	100,000

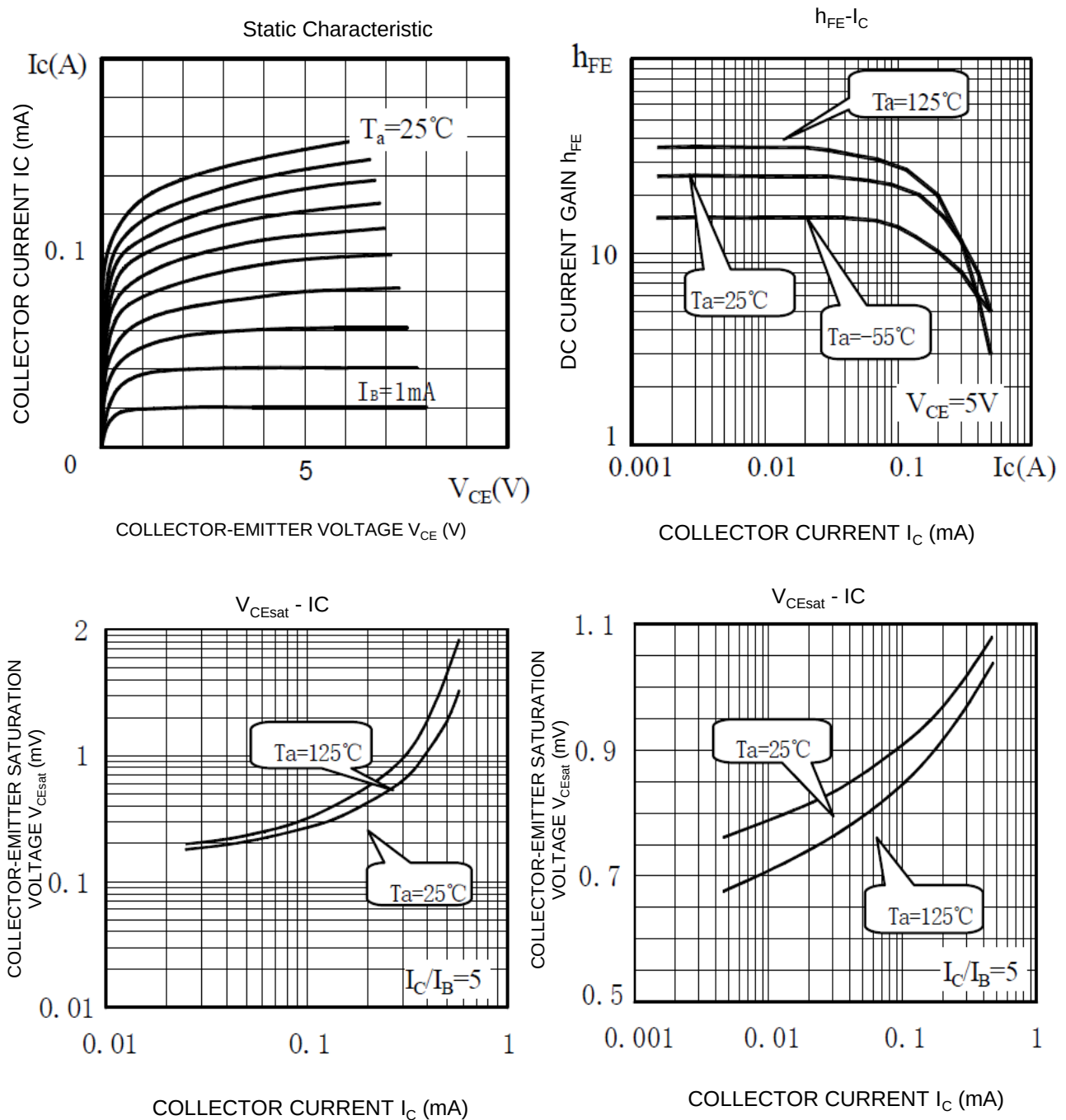
Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C=1mA, I_E=0$	600	--	--	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=1mA, I_B=0$	400	--	--	V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E=100\mu A, I_C=0$	8	--	--	V
I_{CBO}	Collector cut-off current	$V_{CB}=600V, I_E=0$	--	--	100	μA
I_{CEO}	Collector cut-off current	$V_{CE}=400V, I_B=0$	--	--	100	μA
I_{EBO}	Emitter cut-off current	$V_{EB}=5V, I_C=0$	--	--	100	μA
h_{FE}	DC current gain	$V_{CE}=20V, I_C=20mA$	15	--	30	
		$V_{CE}=10V, I_C=0.25mA$	5	--	--	
		$V_{CE}=5V, I_C=500mA$	1	--	--	
$V_{CE(sat)}$	Collector-emitter saturation voltage	$I_C=50mA, I_B=10mA$	--	--	0.4	V
$V_{BE(sat)}$	Base-emitter saturation voltage	$I_C=50mA, I_B=10mA$	--	--	1.1	V
f_T	Transition frequency	$V_{CE}=20V, I_C=20mA$ $f=30MHz$	8	--	--	MHz

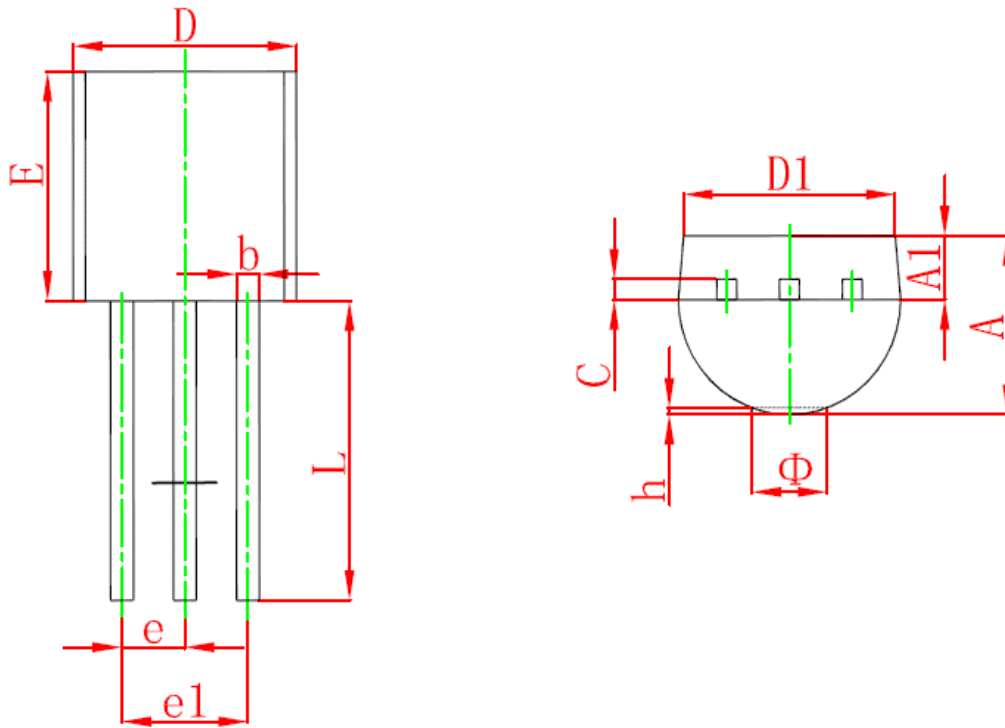
Classification of h_{FE}

Rank	L	H	J
Range	15-20	20-25	25-30

Typical Operating Characteristics



TO-92 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	3.480	3.560	0.137	0.140
A1	1.100	1.400	0.043	0.055
b	0.390	0.500	0.015	0.020
c	0.360	0.400	0.014	0.016
D	4.400	4.800	0.173	0.189
D1	3.430		0.135	
E	4.500	4.700	0.177	0.185
e	1.250TYP		0.049TYP	
e1	2.440	2.640	0.096	0.104
L	13.000	15.000	0.512	0.590
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015