



TO-220 Plastic-Encapsulate Transistors

3DD13005 TRANSISTOR (NPN)

FEATURES

Power dissipation

$$P_{CM} : 1.5 \text{ W (} T_{amb}=25 \text{)}$$

Collector current

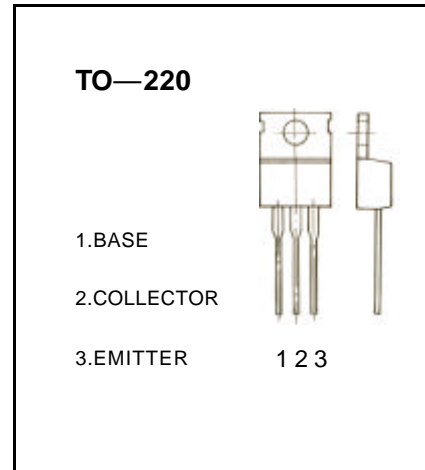
$$I_{CM} : 4 \text{ A}$$

Collector-base voltage

$$V_{(BR)CBO} : 700 \text{ V}$$

Operating and storage junction temperature range

$$T_J, T_{stg} : -55 \text{ to } +150$$



ELECTRICAL CHARACTERISTICS ($T_{amb}=25$ unless otherwise specified)

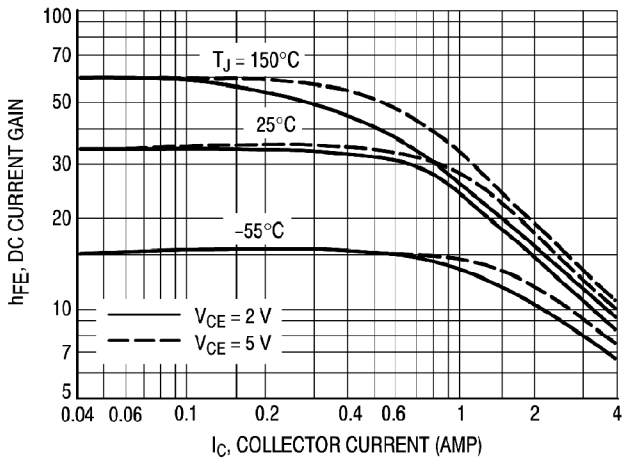
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 1000 \mu A, I_E = 0$	700			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10 \text{ mA}, I_B = 0$	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 1000 \mu A, I_C = 0$	9			V
Collector cut-off current	I_{CBO}	$V_{CB} = 700 \text{ V}, I_E = 0$			1000	μA
Collector cut-off current	I_{CEO}	$V_{CE} = 400 \text{ V}, I_B = 0$			100	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 9 \text{ V}, I_C = 0$			1000	μA
DC current gain	h_{FE}	$V_{CE} = 5 \text{ V}, I_C = 1000 \text{ mA}$	10		40	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2000 \text{ mA}, I_B = 500 \text{ mA}$			0.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 2000 \text{ mA}, I_B = 500 \text{ mA}$			1.6	V
Transition Frequency	f_T	$V_{CE} = 10 \text{ V}, I_C = 500 \text{ mA}$ $f = 1 \text{ MHz}$	5			MHz
Fall time	t_f	$I_{B1} = -I_{B2} = 0.4 \text{ A}, I_C = 2 \text{ A}$			0.9	μs
Storage time	t_s	$V_{CC} = 120 \text{ V}$			4	μs

CLASSIFICATION OF h_{FE}

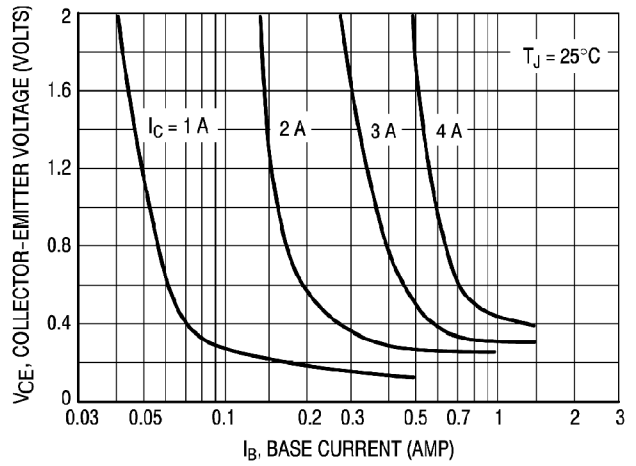
Rank						
Range	10-15	15-20	20-25	25-30	30-35	35-40

Typical Characteristics

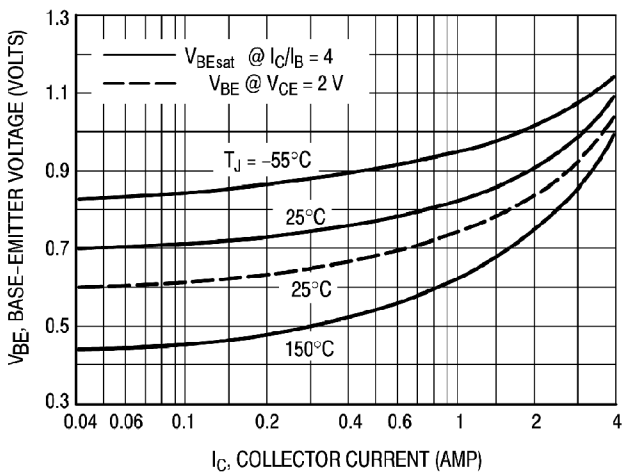
3DD13005



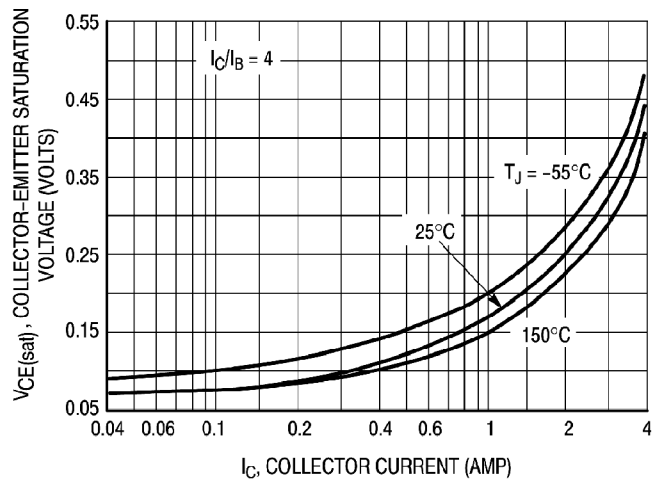
DC Current Gain



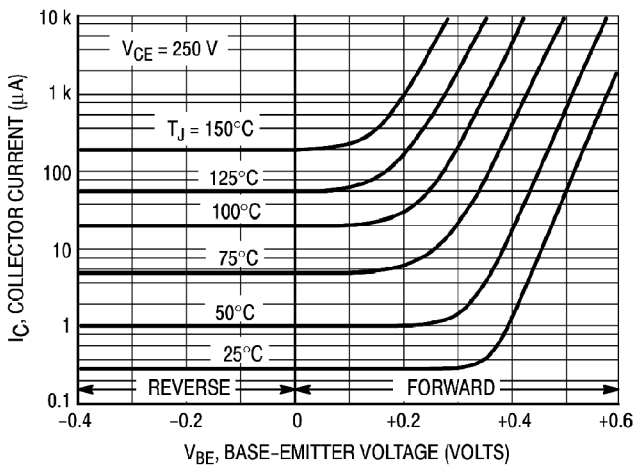
Collector Saturation Region



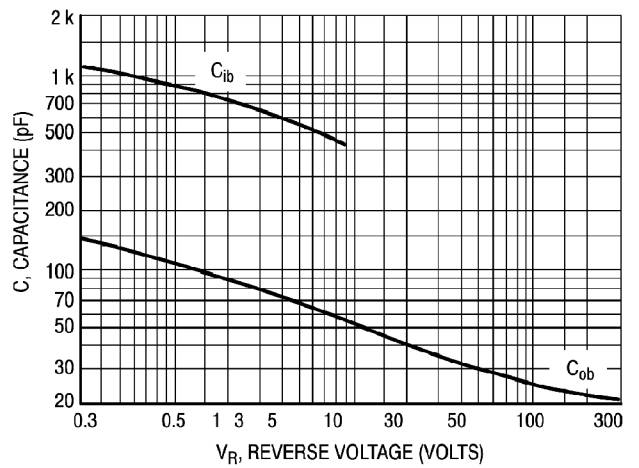
Base-Emitter Voltage



Collector-Emitter Saturation Voltage

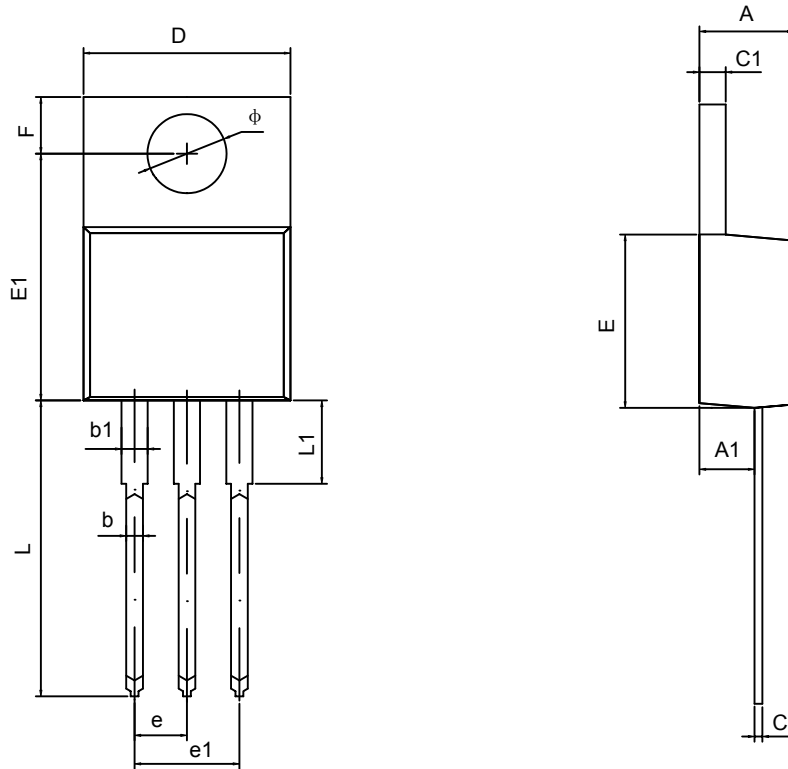


Collector Cutoff Region



Capacitance

TO-220-3L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	1.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.710	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540TYP		0.100TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
ϕ	3.790	3.890	0.149	0.153