

TO-220-3L Plastic-Encapsulate Transistor

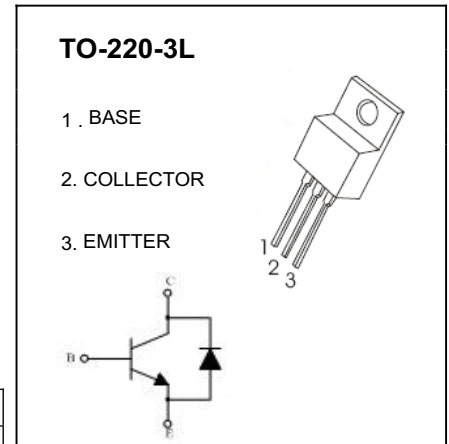
3DD13005ND66 TRANSISTOR (NPN)

FEATURES

- Power switching applications
- Good high temperature
- Low saturation voltage
- High speed switching

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage	700	V
V _{CEO}	Collector-Emitter Voltage	420	V
V _{EBO}	Emitter-Base Voltage	9	V
I _C	Collector Current -Continuous	4	A
P _C	Collector Power Dissipation	2	W
R _{θJA}	Thermal Resistance from Junction to Ambient	62.5	°C/ W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55-150	°C



ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 1mA, I _E =0	700			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 10mA, I _B =0	420			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = 1mA, I _C =0	9			V
Collector cut-off current	I _{CBO}	V _{CB} =700V, I _E =0			100	μA
Collector cut-off current	I _{CEO}	V _{CE} =400V, I _B =0			100	μA
Emitter cut-off current	I _{EBO}	V _{EB} =7V, I _C =0			100	μA
DC current gain	h _{FE(1)}	V _{CE} =5V, I _C =1A	10		40	
	h _{FE(2)}	V _{CE} =5V, I _C =200mA	10		60	
	h _{FE(3)}	V _{CE} =5V, I _C =10mA	5			
	h _{FE(4)}	V _{CE} =5V, I _C =4A	8		40	
Collector-emitter saturation voltage	V _{CE(sat)(1)}	I _C =1A, I _B =0.2A			0.3	V
	V _{CE(sat)(2)}	I _C =2A, I _B =0.4A	0.15		0.35	V
	V _{CE(sat)(3)}	I _C =4A, I _B =1A			0.8	V
Base-emitter saturation voltage	V _{BE(sat)}	I _C =2A, I _B =0.5A			1.6	V
Diode forward voltage	V _{FEC}	I _C =2A			2	V
Transition frequency	f _T	V _{CE} =10V, I _C =0.5A, f=1MHz	5			MHz
Rise time	t _r	I _C =250mA			0.5	μs
Storage time	t _s	I _C =250mA	2.0		4.0	
Fall time	t _f	I _C =250mA			0.5	

CLASSIFICATION of h_{FE(2)}

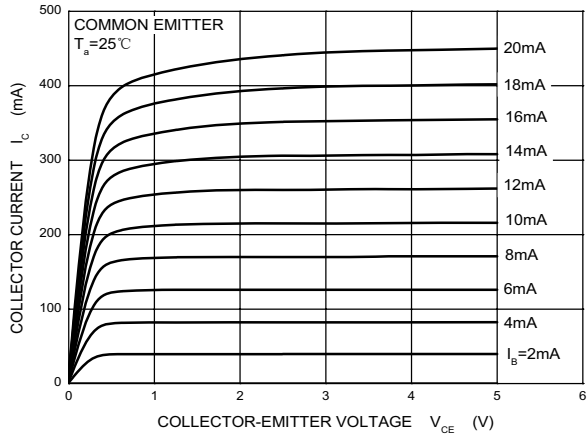
Range	20~30	30~40

CLASSIFICATION of t_s(μs)

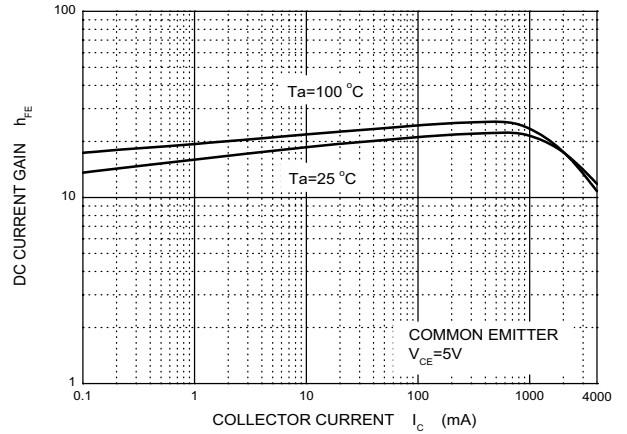
Rank	A	B
Range	2.0-3.0	3.0-4.0

Typical Characteristics

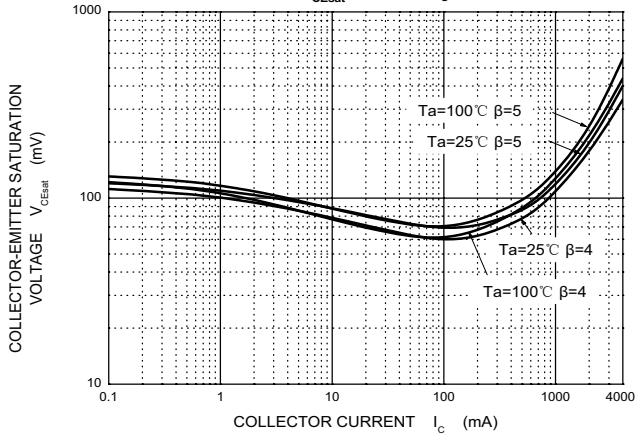
Static Characteristic



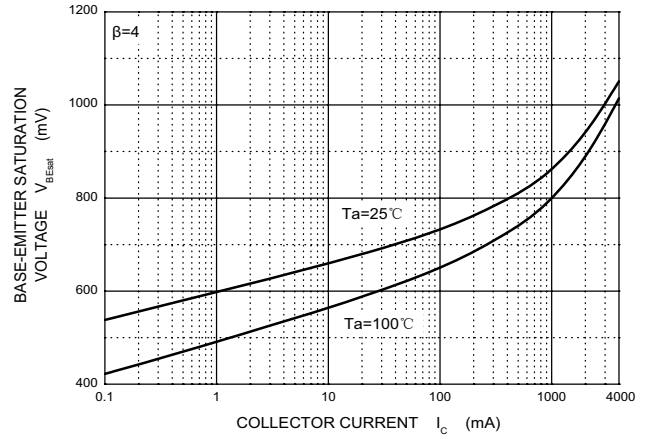
h_{FE} — I_C



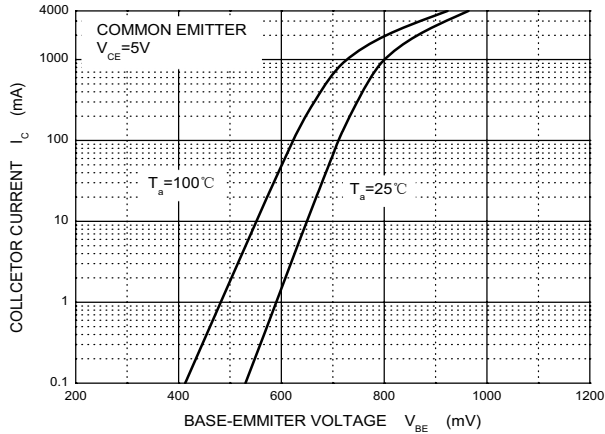
V_{CEsat} — I_C



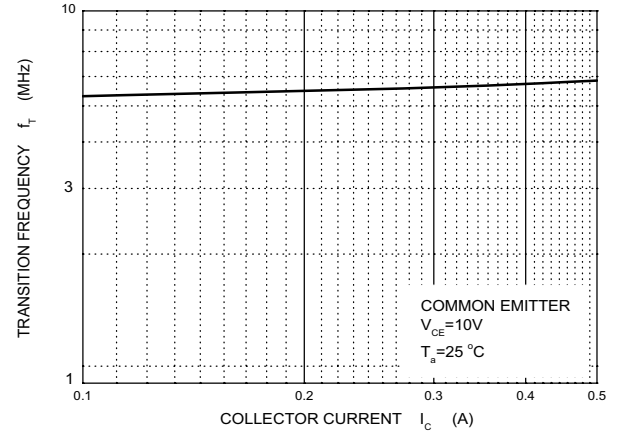
V_{BEsat} — I_C



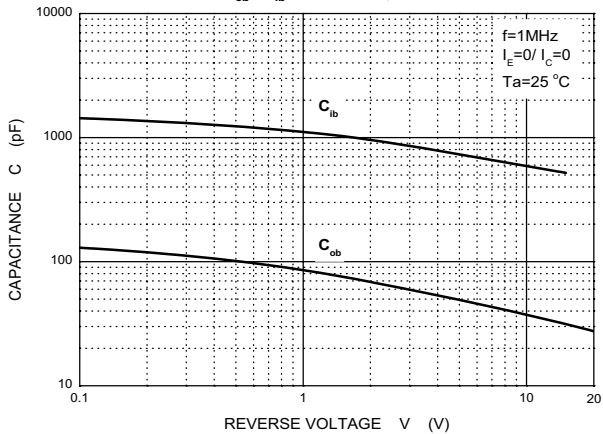
I_C — V_{BE}



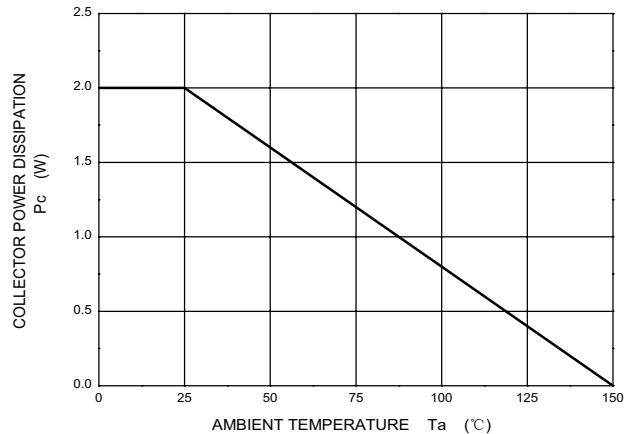
f_T — I_C



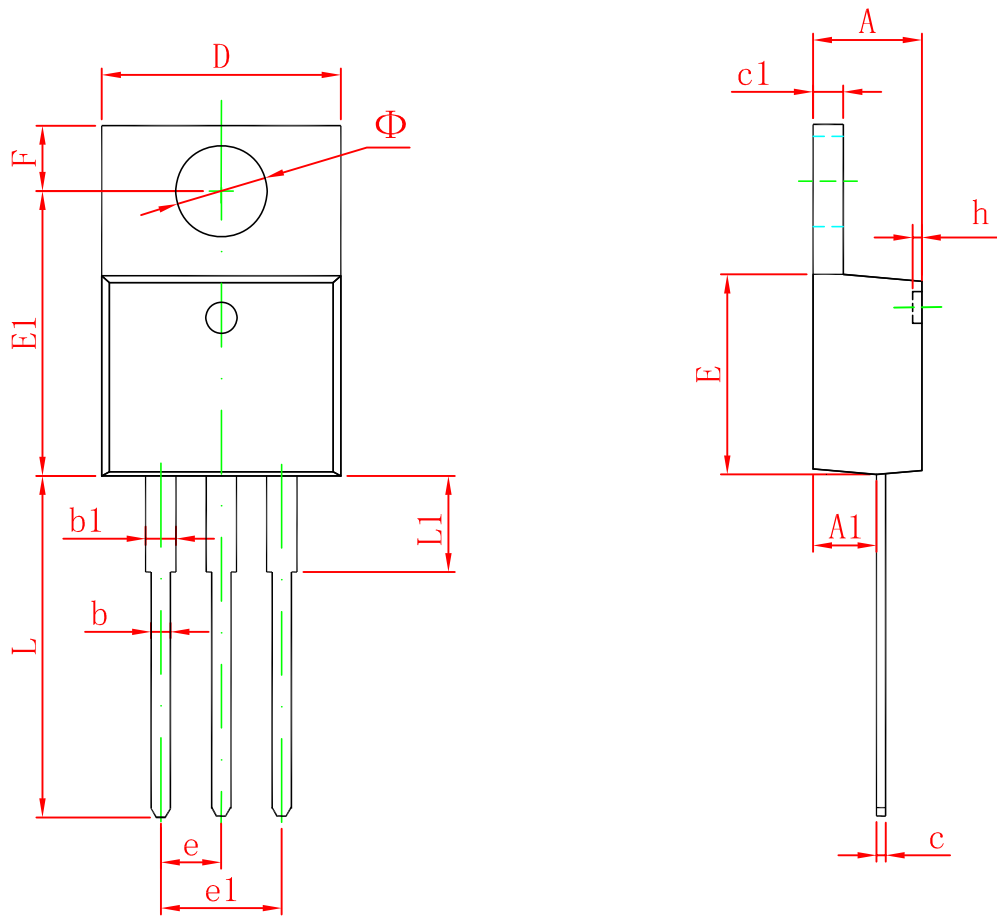
C_{ob}/C_{ib} — V_{CB}/V_{EB}



P_c — T_a



TO-220-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	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	1.170	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	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155