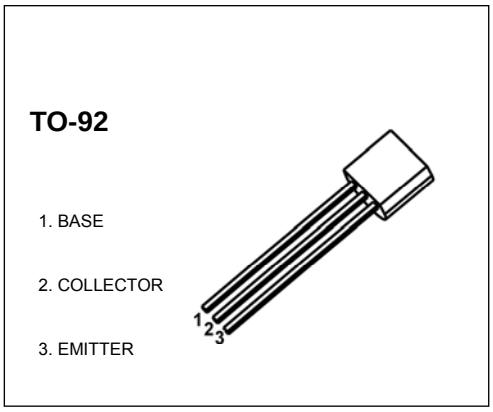
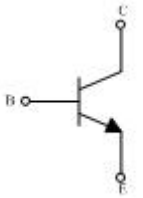
TO-92 Plastic-Encapsulate Transistors

3DD13001 TRANSISTOR (NPN)





FEATURES

- Power switching applications

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	8	V
I_C	Collector Current -Continuous	0.2	A
P_C	Collector Power Dissipation	0.625	W
T_j	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55~150	℃

ELECTRICAL CHARACTERISTICS (T_a=25℃ unless otherwise specified)

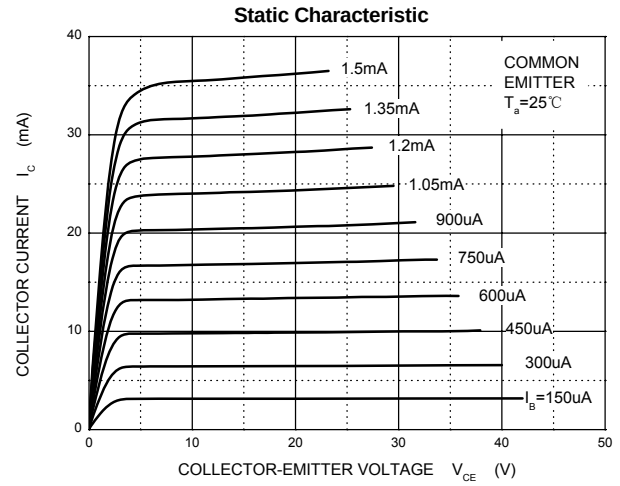
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C= 1mA,I_E=0	700			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=1mA,I_B=0	400		450	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=0.1mA,I_C=0	8			V
Collector cut-off current	I_{CBO}	V_{CB}=600V,I_E=0			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}=20V, I_C=20mA	14		29	
	$h_{FE(2)}$	V_{CE}=10V, I_C=0.25mA	5			
	$h_{FE(3)}$	V_{CE}=5V, I_C=0.5A	1			
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=50mA,I_B=10mA			0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=50mA,I_B=10mA			1.1	V
Transition frequency	f_T	V_{CE}=20V,I_C=20mA,f=1MHz	8			MHz
Rail time	t_r	I_C=0.1A			0.9	μs
Storage time	t_s		0.9		2.4	μs

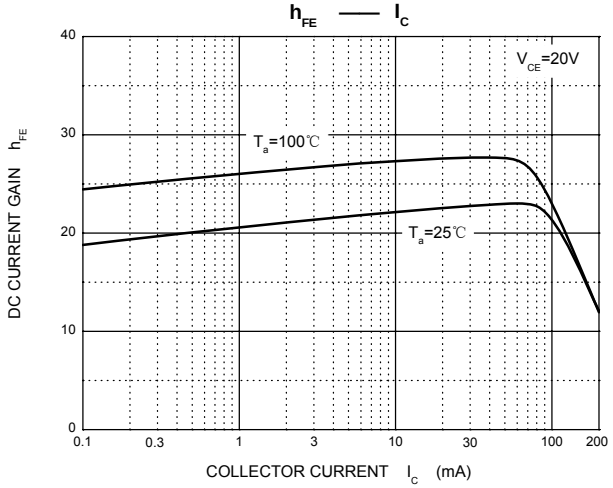
CLASSIFICATION OF $h_{FE(1)}$

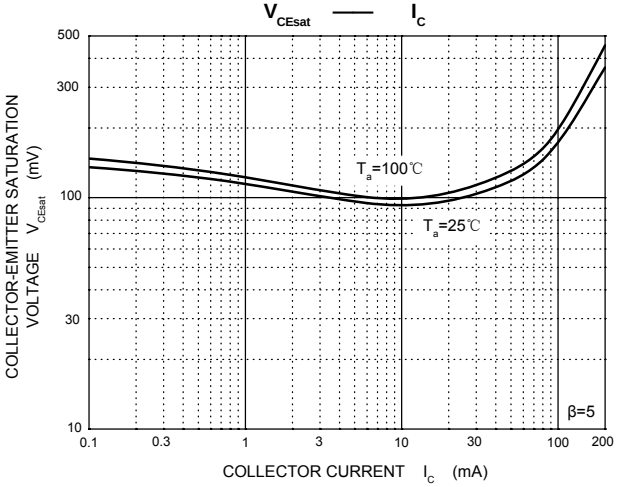
Range	14-17	17-20	20-23	23-26	26-29

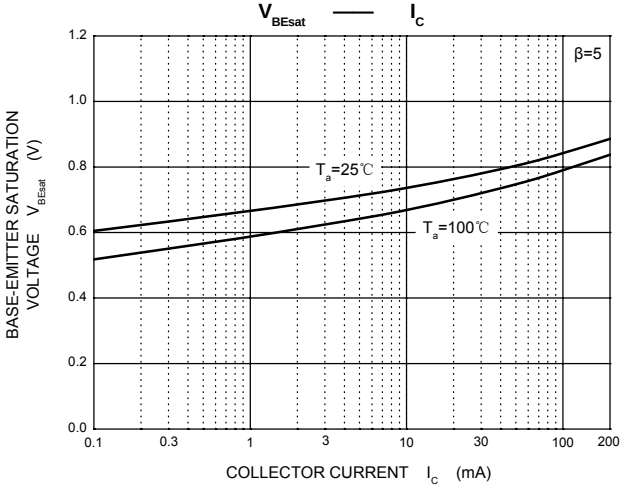
CLASSIFICATION OF t_S

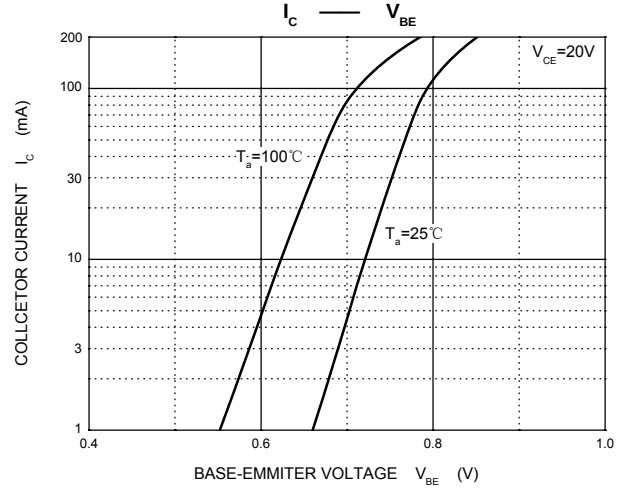
Range	0.9-2 (μ s)	1.4-2.4 (μ s)

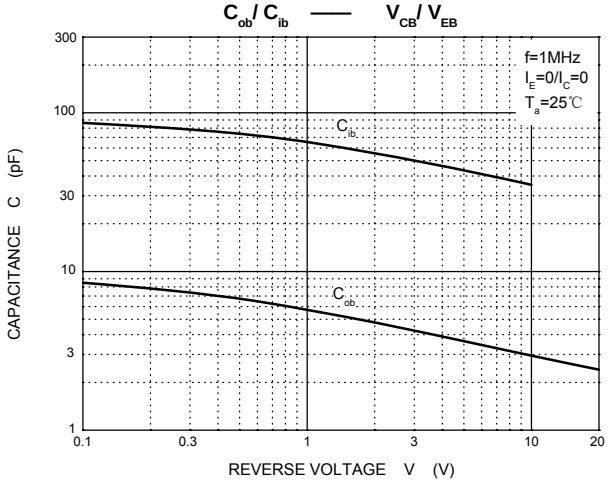

Static Characteristic
COMMON EMITTER
T_a=25℃
1.5mA
1.35mA
1.2mA
1.05mA
900uA
750uA
600uA
450uA
300uA
I_B=150uA
COLLECTOR CURRENT I_C (mA)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

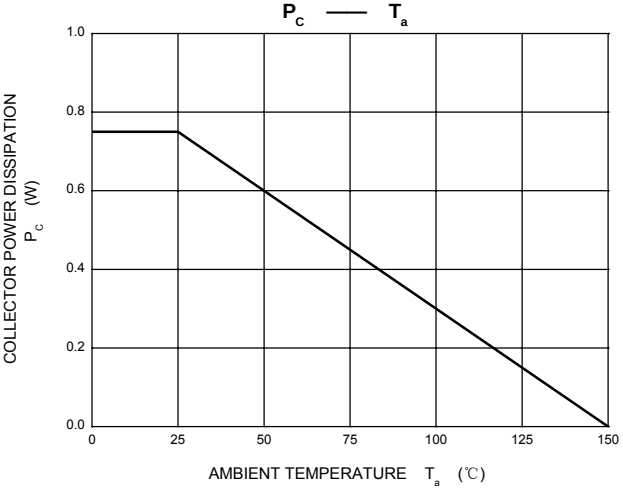

h_{FE} —— I_C
V_{CE}=20V
T_a=100℃
T_a=25℃
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)


V_{CEsat} —— I_C
T_a=100℃
T_a=25℃
β=5
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)
COLLECTOR CURRENT I_C (mA)


V_{BEsat} —— I_C
β=5
T_a=25℃
T_a=100℃
BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (V)
COLLECTOR CURRENT I_C (mA)


I_C —— V_{BE}
V_{CE}=20V
T_a=100℃
T_a=25℃
COLLCETOR CURRENT I_C (mA)
BASE-EMMITER VOLTAGE V_{BE} (V)


C_{ob}/ C_{ib} —— V_{CB}/ V_{EB}
f=1MHz
I_E=0/I_C=0
T_a=25℃
C_{ib}
C_{ob}
CAPACITANCE C (pF)
REVERSE VOLTAGE V (V)


P_C —— T_a
COLLECTOR POWER DISSIPATION P_C (W)
AMBIENT TEMPERATURE T_a (℃)