

# TO-126 Plastic-Encapsulate Transistors

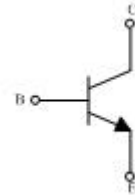
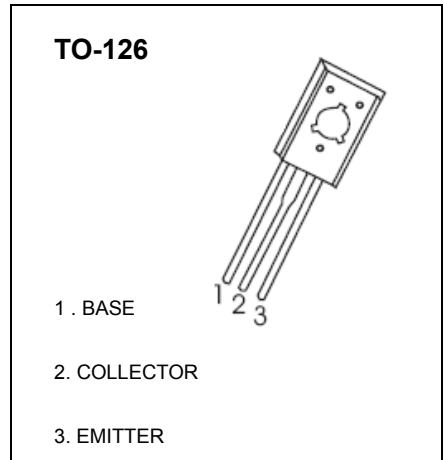
## 3DD13003N9 TRANSISTOR (NPN)

### FEATURES

Power switching applications

### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CB0}$	Collector-Base Voltage	700	V
$V_{CE0}$	Collector-Emitter Voltage	400	V
$V_{EB0}$	Emitter-Base Voltage	11	V
$I_C$	Collector Current -Continuous	1.5	A
$P_C$	Collector Power Dissipation	1.25	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	100	$^\circ\text{C}/\text{W}$
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^\circ\text{C}$



### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=1\text{mA}, I_E=0$	700			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10\text{mA}, I_B=0$	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=1\text{mA}, I_C=0$	11			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=600\text{V}, I_E=0$			100	$\mu\text{A}$
Collector cut-off current	$I_{CEO}$	$V_{CE}=400\text{V}, I_B=0$			500	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			100	$\mu\text{A}$
DC current gain	$h_{FE(1)}$	$V_{CE}=5\text{V}, I_C=0.5\text{A}$	10		40	
	$h_{FE(2)}$	$V_{CE}=5\text{V}, I_C=1\text{mA}$	10			
	$h_{FE(3)}$	$V_{CE}=5\text{V}, I_C=1\text{A}$	10			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			0.15	V
	$V_{CE(sat)2}$	$I_C=1\text{A}, I_B=0.2\text{A}$			0.25	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			1	V
	$V_{BE(sat)2}$	$I_C=1\text{A}, I_B=0.2\text{A}$			1	V
Storage time	$t_s$	$I_C=250\text{mA}$	2		4	$\mu\text{s}$

### CLASSIFICATION of $h_{FE(1)}$

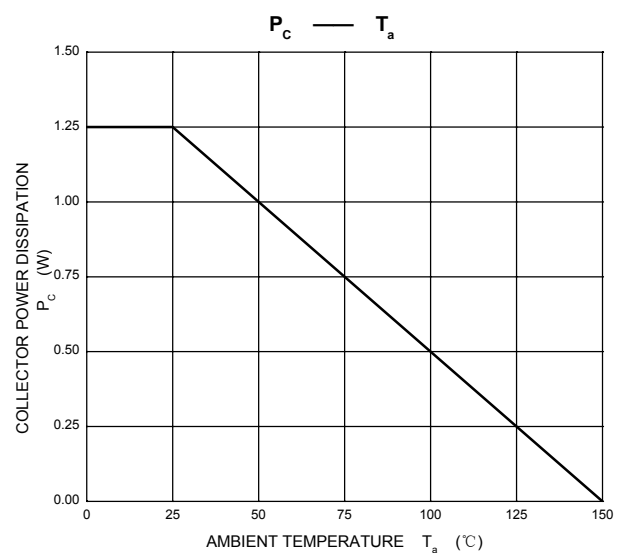
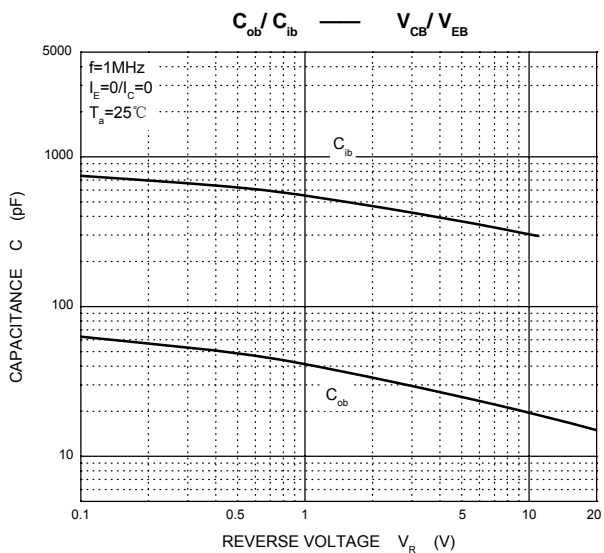
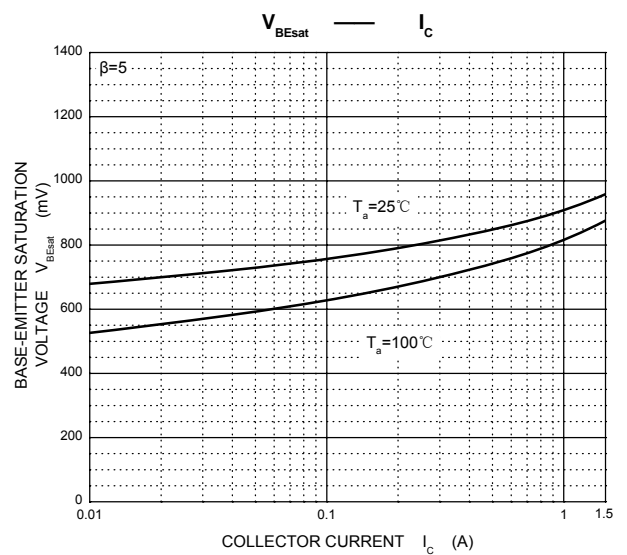
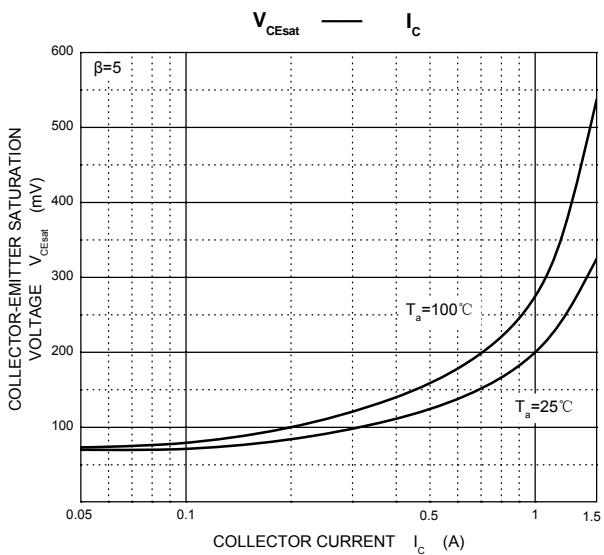
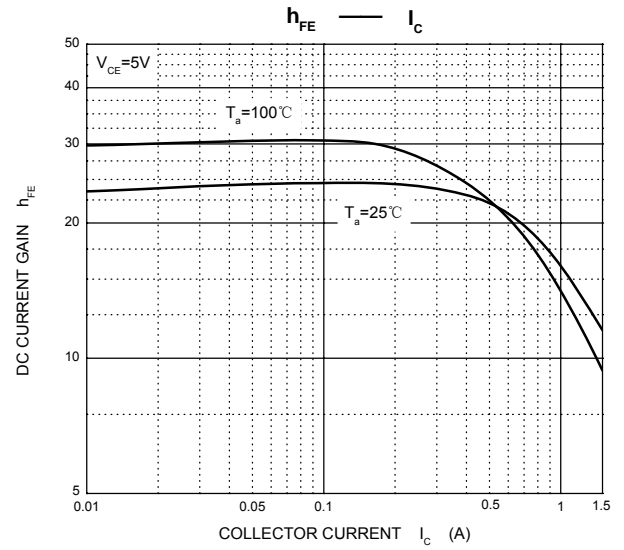
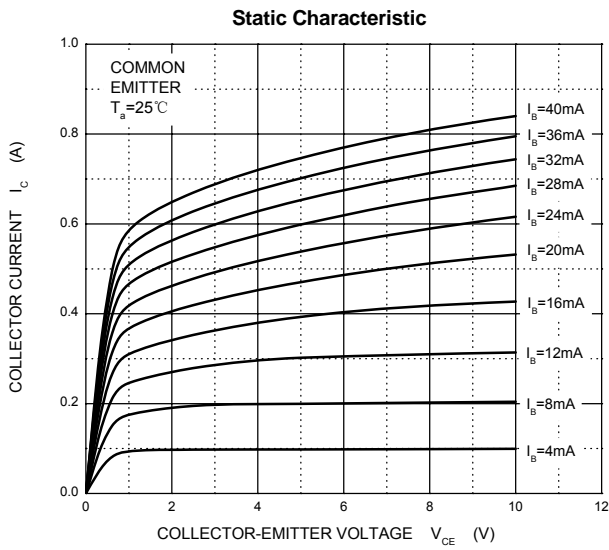
Range	10-15	15-20	20-25	25-30	30-35	35-40

### CLASSIFICATION of $t_s$

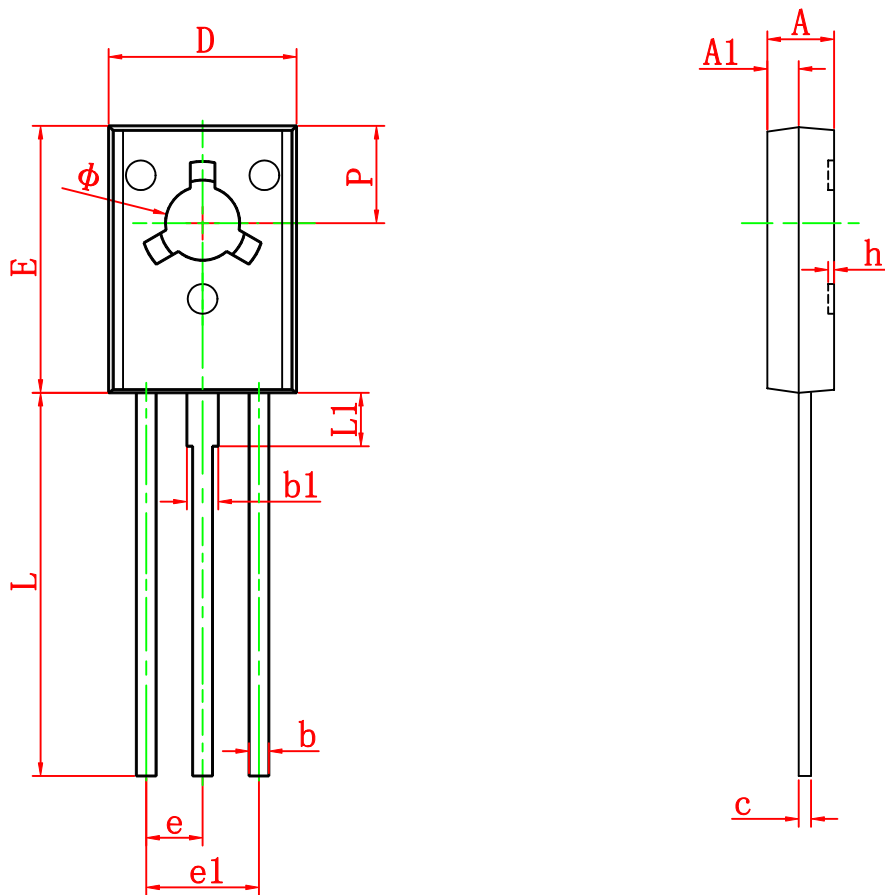
Rank	A1	A2	B1	B2
Range	2-2.5	2.5-3	3-3.5	3.5-4

# Typical Characteristics

# 3DD13003N9



# TO-126 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.500	2.900	0.098	0.114
A1	1.100	1.500	0.043	0.059
b	0.660	0.860	0.026	0.034
b1	1.170	1.370	0.046	0.054
c	0.450	0.600	0.018	0.024
D	7.400	7.800	0.291	0.307
E	10.600	11.000	0.417	0.433
e	2.290 TYP		0.090 TYP	
e1	4.480	4.680	0.176	0.184
h	0.000	0.300	0.000	0.012
L	15.300	15.700	0.602	0.618
L1	2.100	2.300	0.083	0.091
P	3.900	4.100	0.154	0.161
Φ	3.000	3.200	0.118	0.126