

**TO-251-3L Plastic-Encapsulate Transistors**

**3DD13003** TRANSISTOR ( NPN )

**FEATURES**

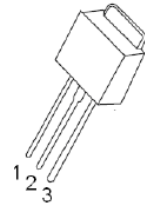
- Power Switching Applications

**MAXIMUM RATINGS**( $T_A=25\text{ }^\circ\text{C}$  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	9	V
$I_C$	Collector Current -Continuous	1.5	A
$P_c$	Collector Dissipation	1.25	W
$T_J, T_{stg}$	Junction and Storage Temperature	-55~+150	$^\circ\text{C}$

**TO-251-3L**

1. BASE
2. COLLECTOR
3. EMITTER



**ELECTRICAL CHARACTERISTICS** ( $T_a=25\text{ }^\circ\text{C}$  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	$V_{(BR)EBO}$	$I_E=1\text{ mA}, I_C=0$	9			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=700\text{ V}, I_E=0$			1	mA
Collector cut-off current	$I_{CEO}$	$V_{CE}=400\text{ V}, I_B=0$			0.5	mA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9\text{ V}, I_C=0$			1	mA
DC current gain	$h_{FE(1)}$	$V_{CE}=5\text{ V}, I_C=0.5\text{ A}$	8		40	
	$h_{FE(2)}$	$V_{CE}=5\text{ V}, I_C=1.5\text{ A}$	5			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=1\text{ A}, I_B=250\text{ mA}$			0.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=1\text{ A}, I_B=250\text{ mA}$			1.2	V
Base-emitter voltage	$V_{BE}$	$I_E=2\text{ A}$			3	V
Transition frequency	$f_T$	$V_{CE}=10\text{ V}, I_C=100\text{ mA}$ $f=1\text{ MHz}$	5			MHz
Fall time	$t_f$	$I_C=1\text{ A}, I_{B1}=-I_{B2}=0.2\text{ A}$ $V_{CC}=100\text{ V}$			0.5	$\mu\text{s}$
Storage time	$t_s$	$I_C=250\text{ mA}$	2		4	$\mu\text{s}$

**CLASSIFICATION OF  $h_{FE(1)}$**

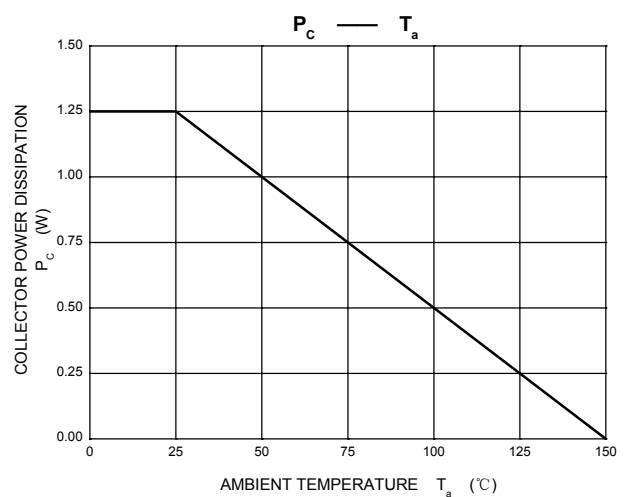
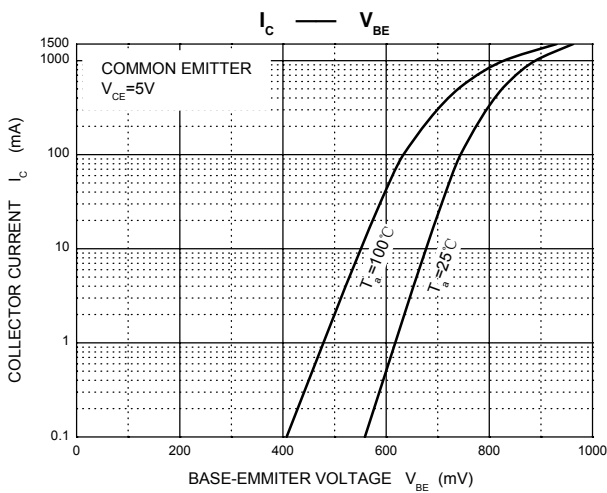
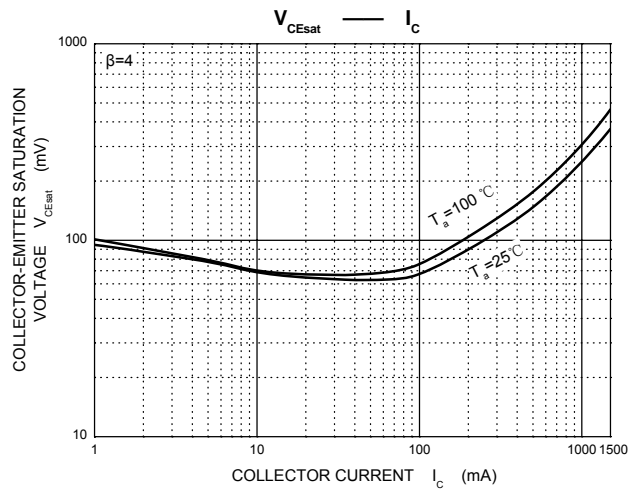
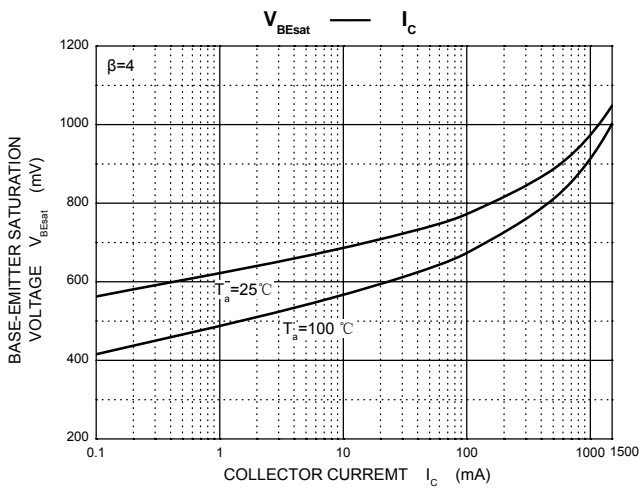
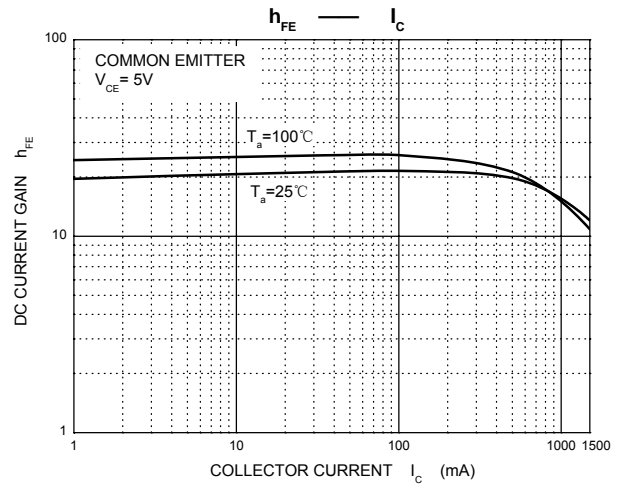
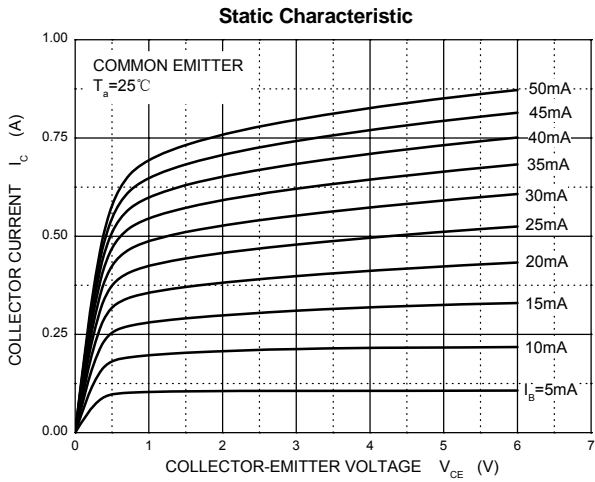
Rank							
Range	8-10	10-15	15-20	20-25	25-30	30-35	35-40

**CLASSIFICATION OF  $t_s$**

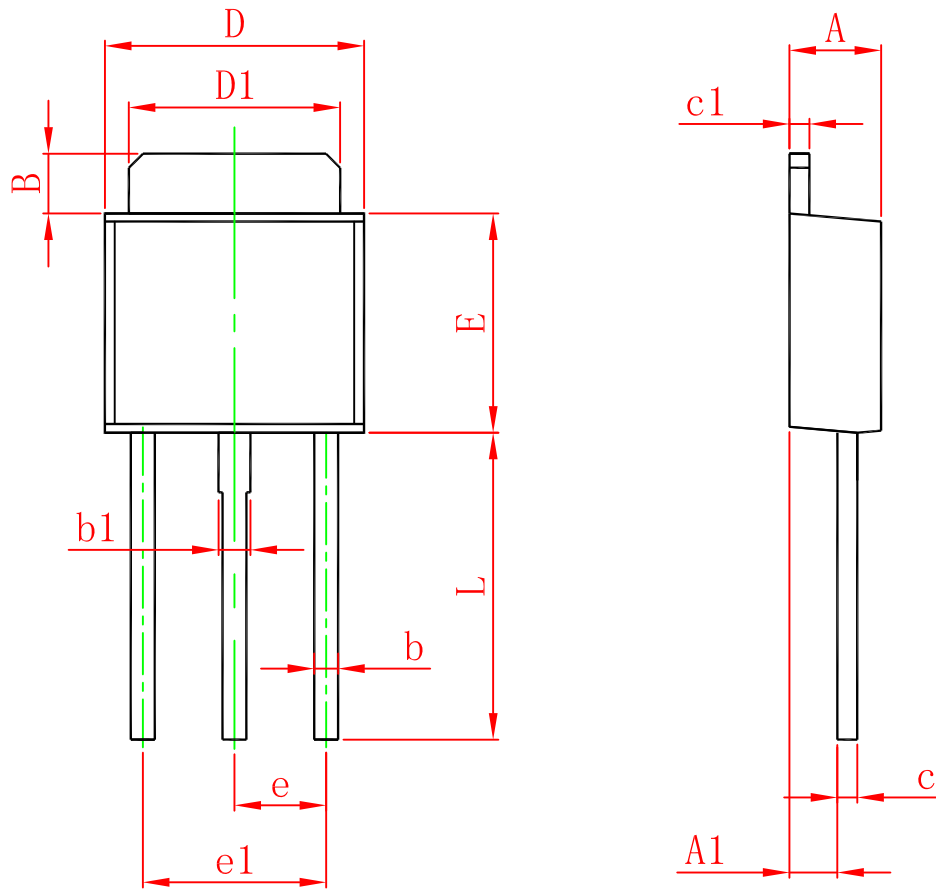
Rank	A1	A2	B1	B2
Range	2-2.5 ( $\mu\text{s}$ )	2.5-3 ( $\mu\text{s}$ )	3-3.5 ( $\mu\text{s}$ )	3.5-4 ( $\mu\text{s}$ )

# Typical Characteristics

# 3DD13003



# TO-251-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311