



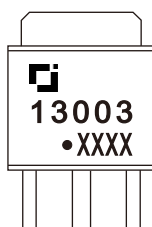
TO-251-3L Plastic-Encapsulate Transistors

3DD13003 TRANSISTOR (NPN)

FEATURES

- Power Switching Applications

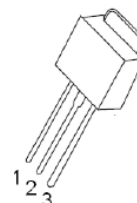
MARKING



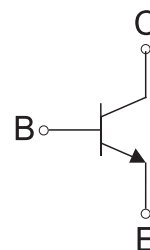
13003=Device code
Solid dot=Green moldinn compound device,
if none,the normal device
XXXX=Code

TO-251-3L

1. BASE
2. COLLECTOR
3. EMITTER



Equivalent Circuit



MAXIMUM RATINGS($T_A=25^\circ\text{C}$ 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}	Operation Junction and Storage Temperature Range	-55~+150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS (Ta=25°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	$h_{FE(1)}$	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$	20		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	μs
Storage time	t_s	$I_C = 250\text{mA}$	2		4	μs

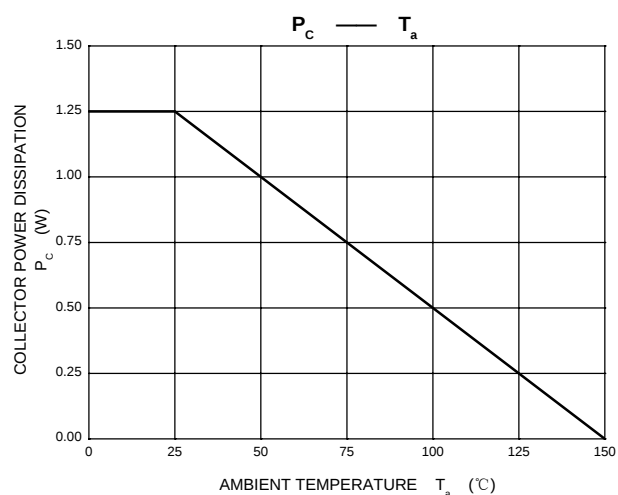
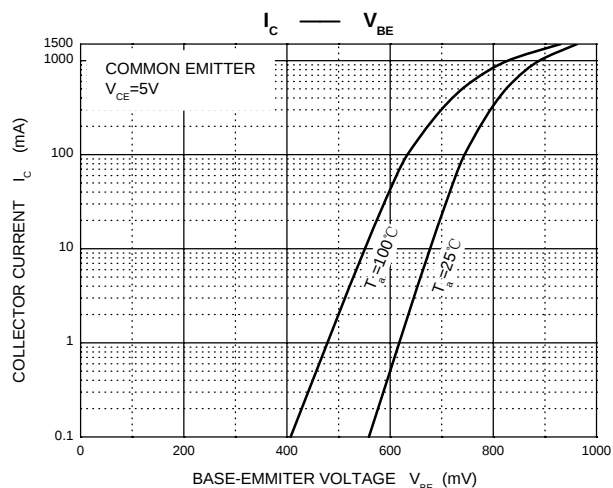
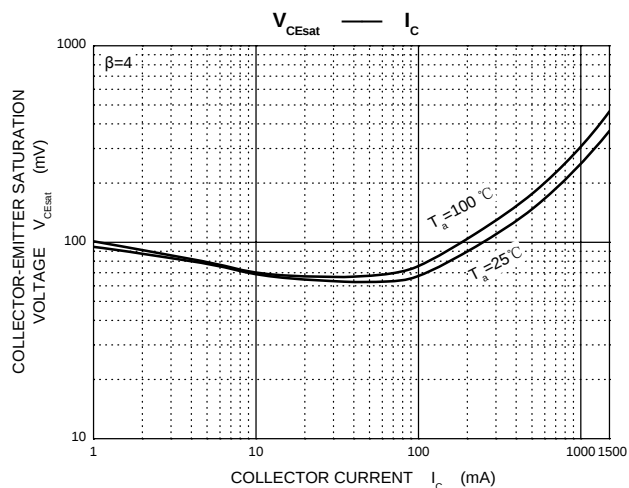
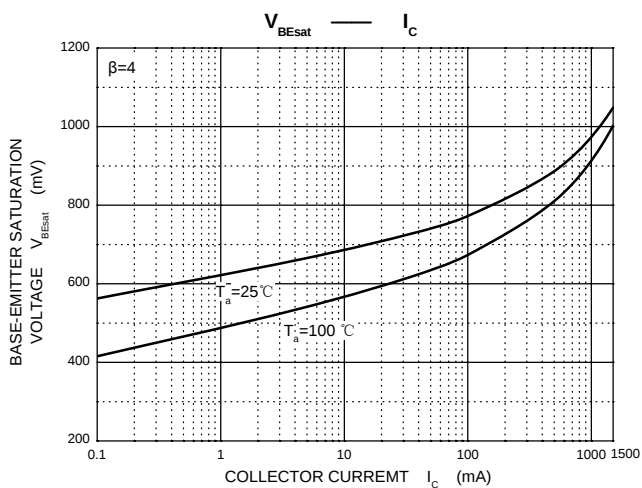
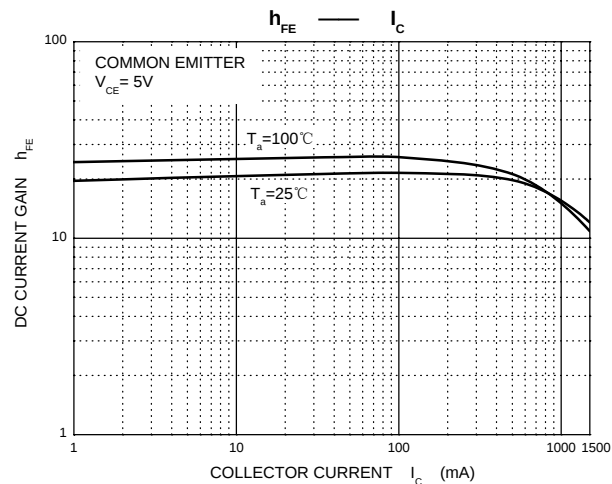
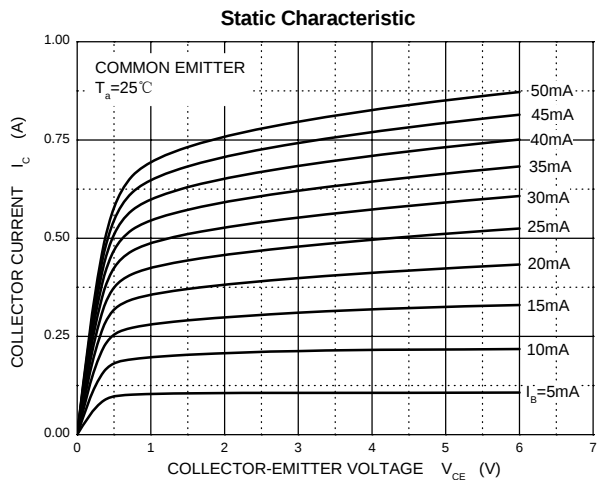
CLASSIFICATION OF $h_{FE(1)}$

Range	20-30	30-40
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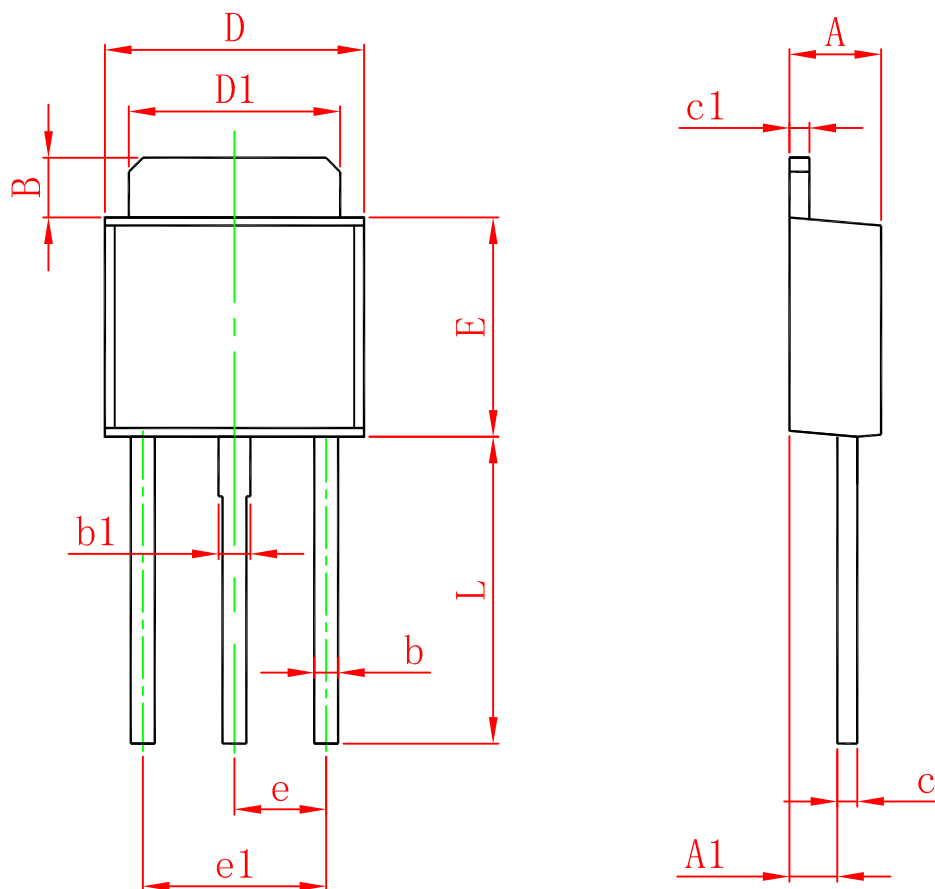
CLASSIFICATION OF t_s

Rank	A	B
Range	2.0-3.0 (μs)	3.0-4.0 (μs)

Typical Characteristics



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