



# TO-18 Plastic-Encapsulate Transistors

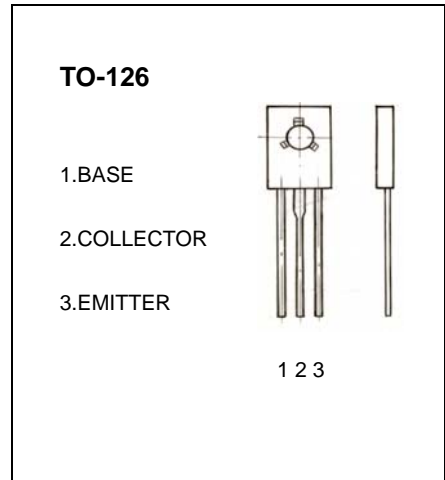
## 3DD13003 TRANSISTOR (NPN)

### FEATURES

- power switching applications

### MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CBO</sub>	Collector-Base Voltage	700	V
V <sub>CEO</sub>	Collector-Emitter Voltage	480	V
V <sub>EBO</sub>	Emitter-Base Voltage	9	V
I <sub>C</sub>	Collector Current -Continuous	1.5	A
P <sub>C</sub>	Collector Power Dissipation	1.5	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C



### ELECTRICAL CHARACTERISTICS (Tamb=25°C unless otherwise specified)

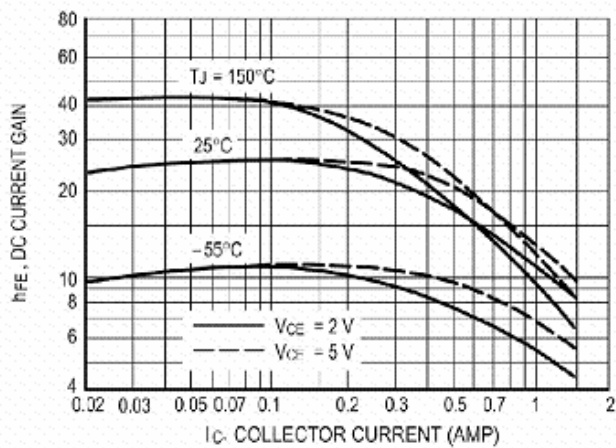
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =5mA, I <sub>E</sub> =0	700			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	480			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =2mA, I <sub>C</sub> =0	9			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =700V, I <sub>E</sub> =0			1	mA
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> =400V, I <sub>B</sub> =0			0.5	mA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =9V, I <sub>C</sub> =0			1	mA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> = 0.5 A	8		40	
	h <sub>FE2</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> = 1.5A	5			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =0.25A			0.8	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =0.25A			1.2	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =100mA, f =1MHz	5			MHz
Fall time	t <sub>f</sub>	I <sub>C</sub> =1A, I <sub>B1</sub> =-I <sub>B2</sub> =0.2A, V <sub>CC</sub> =100V			0.8	μs
Storage time	t <sub>s</sub>	I <sub>C</sub> =250mA	2		4	μs

### CLASSIFICATION OF h<sub>FE(1)</sub>

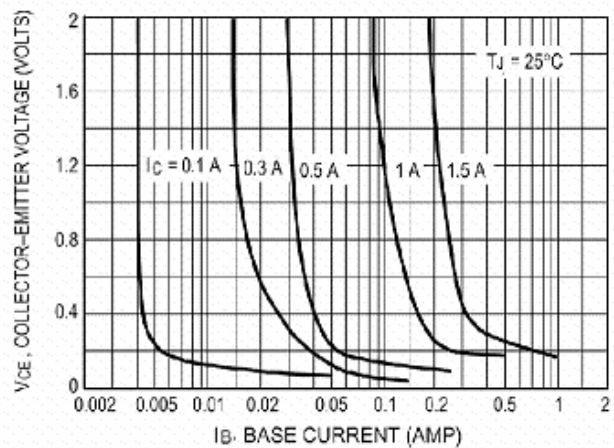
Range	10-15	15-20	20-25	25-30	30-35	35-40
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# Typical Characteristics

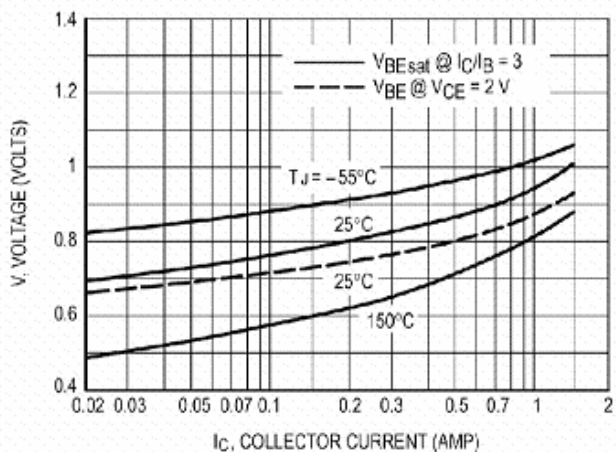
3DD13003



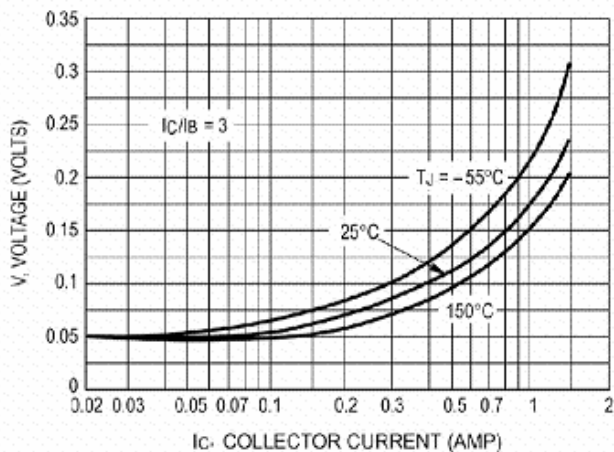
DC Current Gain



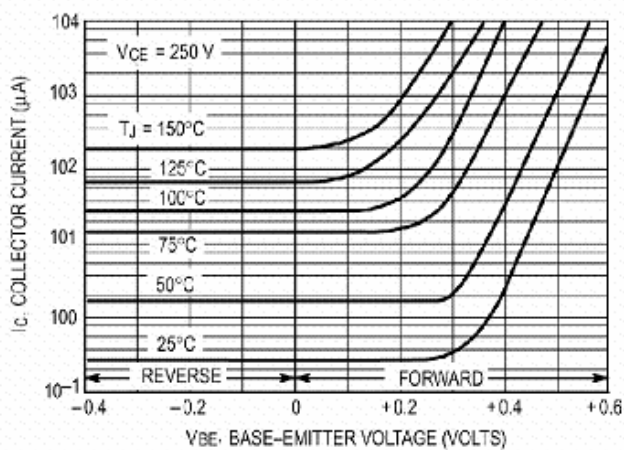
Collector Saturation Region



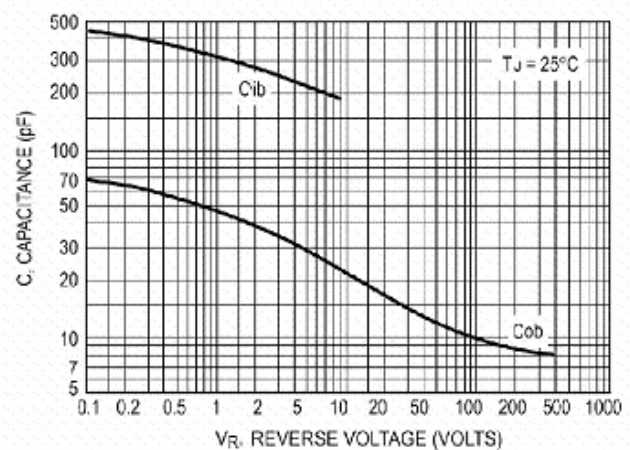
Base-Emitter Voltage



Collector-Emitter Saturation Region



Collector Cutoff Region



Capacitance