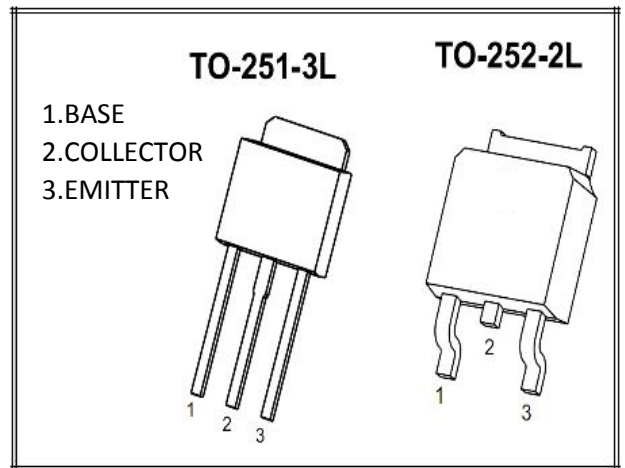
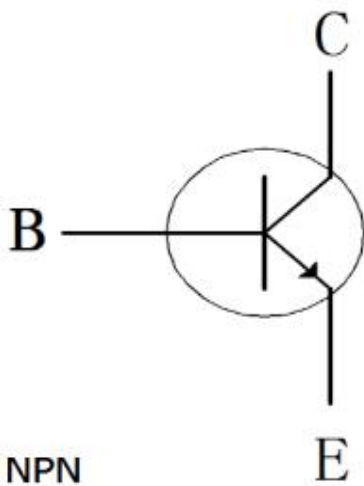


TRANSISTOR (NPN)

Equivalent Circuit:



FEATURES:

- power switching applications

MARKING:

TSD 13003 TSDD / U ****
TSD→logo (D→252) / (U→251)
****→Date

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	VCBO	700	V
Collector-Emitter Voltage	VCEO	450	V
Emitter-Base Voltage	VEBO	9	V
Collector Current -Continuous	IC	1.5	A
Collector Current -Pulsed	ICM	2	A
Collector Power Dissipation	PC	2	W
Thermal Resistance From Junction To Ambient	RθJA	125	°C/W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C



TSD13003

TO-252/TO-251 Plastic-Encapsulate Transistors

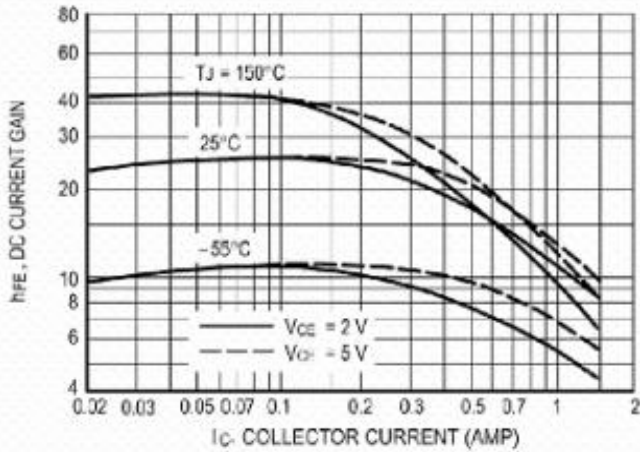
ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-base breakdown voltage	V(BR)CBO	IC= 5mA, IE=0	700			V
Collector-emitter breakdown voltage	V(BR)CEO	IC= 10mA, IB=0	450			V
Emitter-base breakdown voltage	V(BR)EBO	IE=2mA, IC=0	9			V
Collector cut-off current	ICBO	VCB= 600 V , IE=0			10	μA
Collector cut-off current	ICEO	VCB= 450V , IE=0			9	μA
Emitter cut-off current	IEBO	VEB= 9V , IC=0			10	μA
DC current gain	hFE	VCE= 5V, IC= 200mA	15		30	
	hFE	VCE= 5V, IC= 5mA	15			
Collector-emitter saturation voltage	VCE(sat)	IC= 500mA, IB= 100mA			0.8	V
Base-emitter saturation voltage	VBE(sat)	IC= 800mA, IB= 40mA			1	V
Transition frequency	fT	VCE= 5V, IC= 5mA f=1MHz	5			MHz
Fall time	tf	IC=1A, IB1=-IB2=0.2A VCC=100V			0.5	μs
Storage time	ts		1.5		4	μs

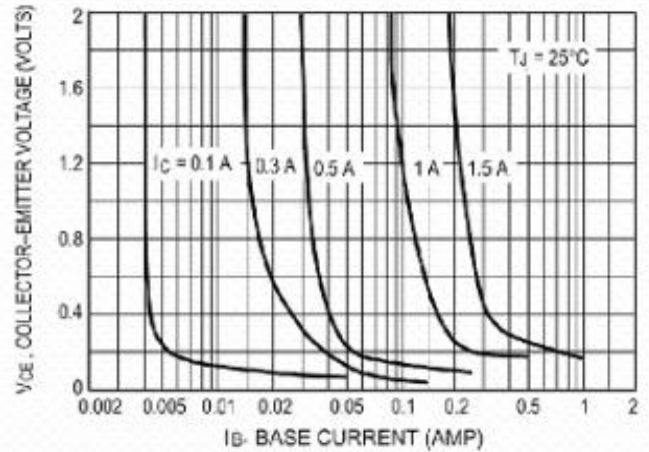
CLASSIFICATION OF hFE

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

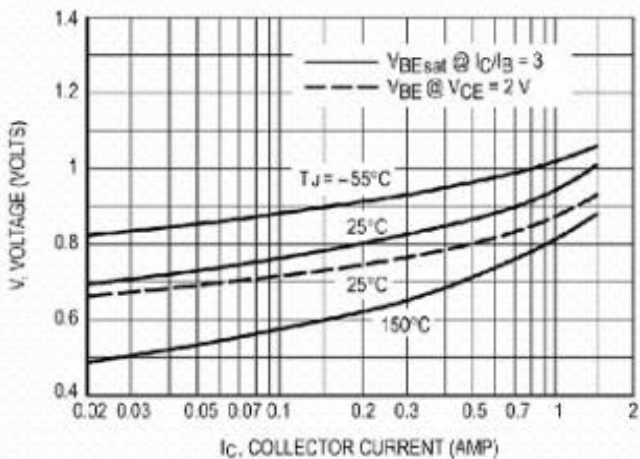
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



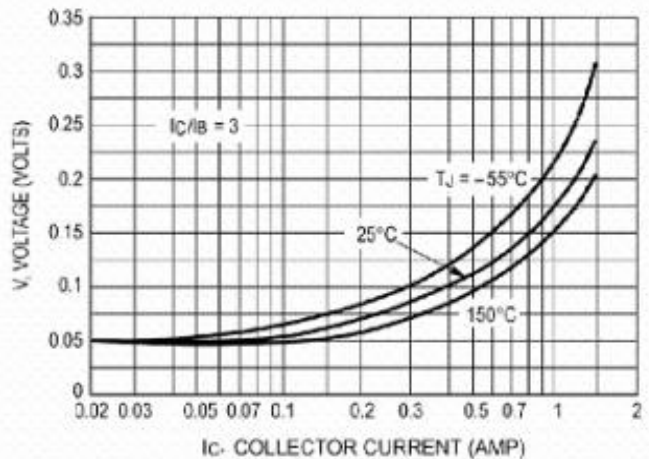
DC Current Gain



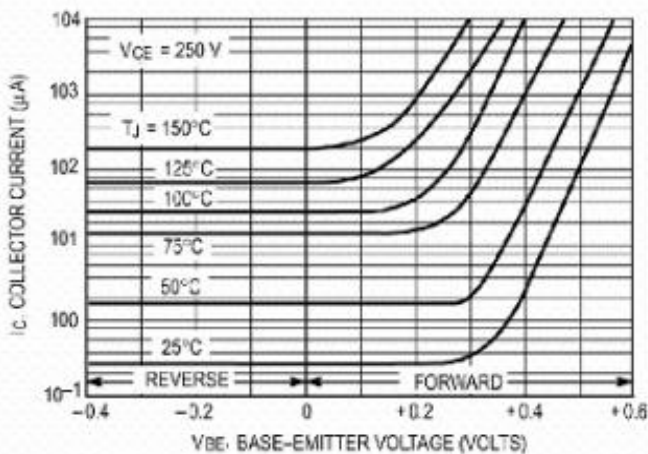
Collector Saturation Region



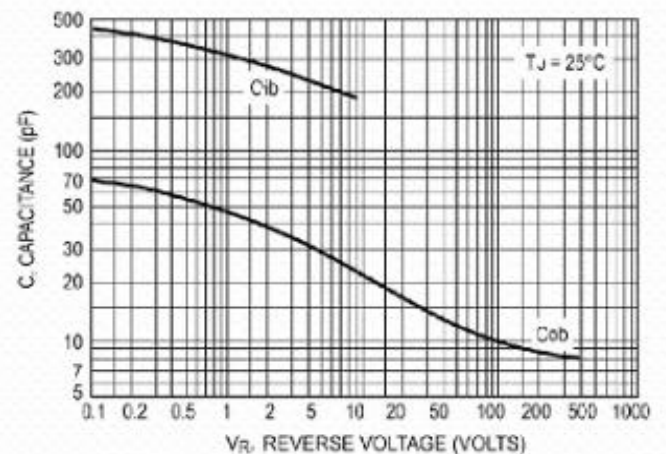
Base-Emitter Voltage



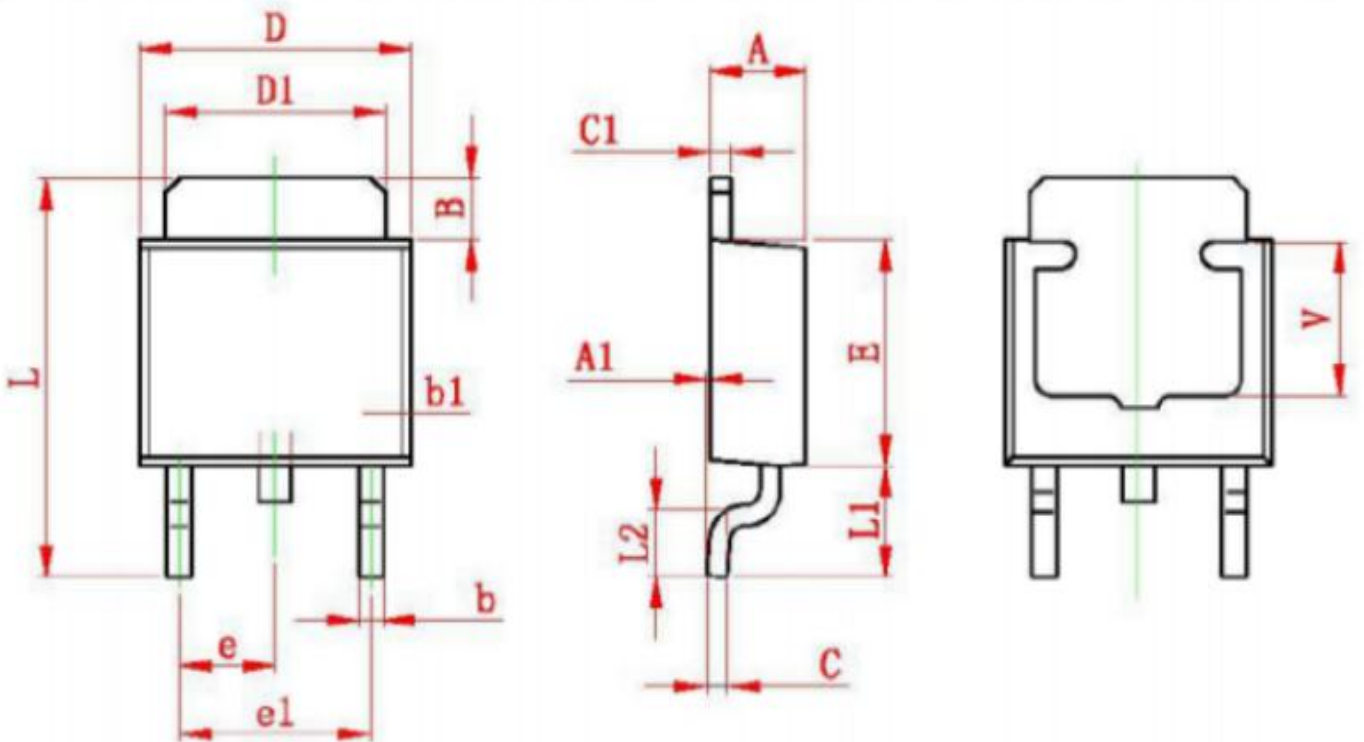
Collector-Emitter Saturation Region



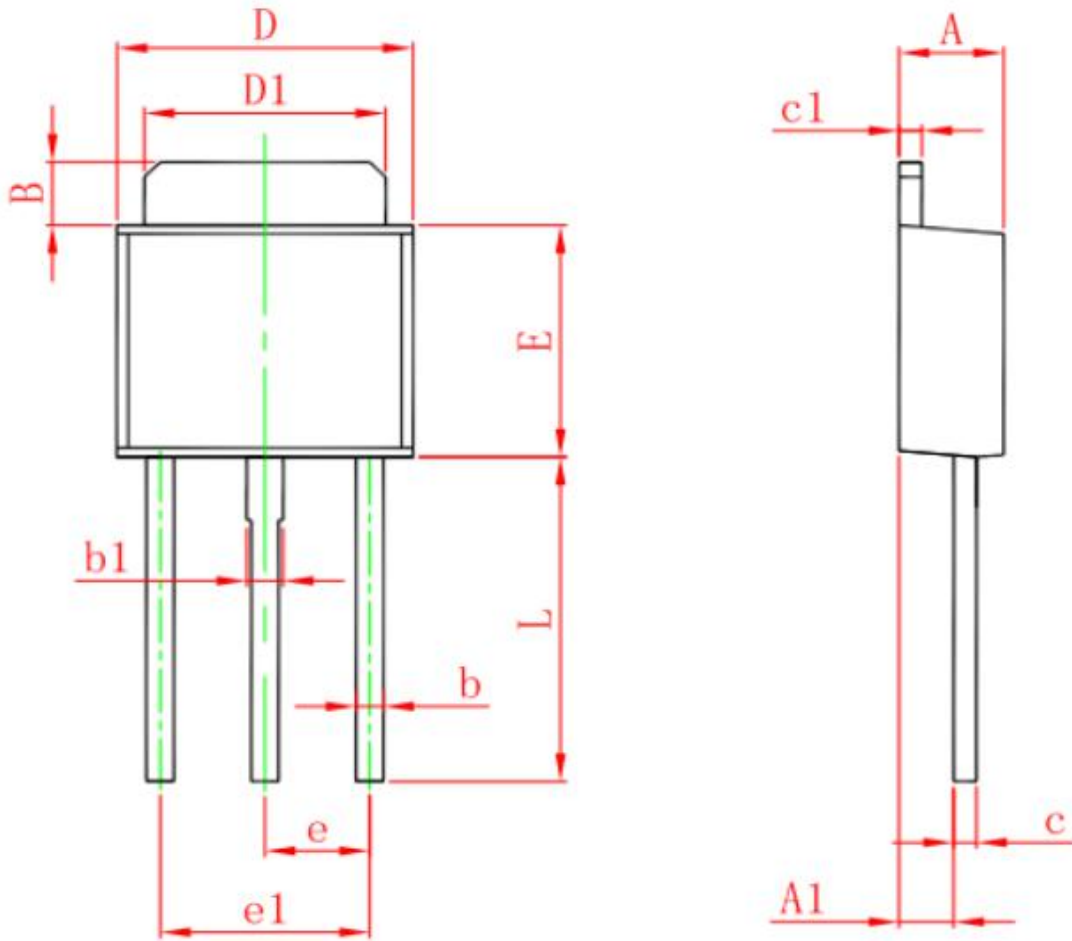
Collector Cutoff Region



Capacitance



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
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	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
V	3.80 REF		0.150 REF	



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