



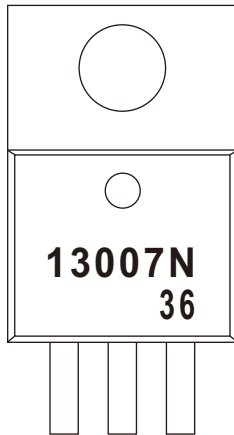
## TO-220-3L Plastic-Encapsulate Transistors

### 3DD13007N36 TRANSISTOR (NPN)

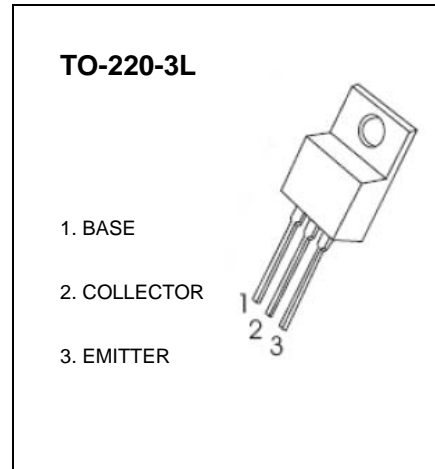
#### FEATURES

- Power switching applications

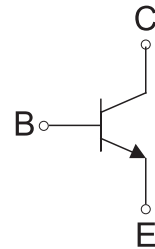
#### MARKING



13007N=Device code  
36=Code



#### Equivalent Circuit



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

Symbol	Parameter	Value	Unit
$V_{\text{CBO}}$	Collector-Base Voltage	700	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	400	V
$V_{\text{EBO}}$	Emitter-Base Voltage	9	V
$I_{\text{C}}$	Collector Current -Continuous	8	A
$P_{\text{C}}$	Collector Power Dissipation	2	W
$T_{\text{J}}, T_{\text{stg}}$	Operation Junction and Storage Temperature Range	-55~150	$^{\circ}\text{C}$

**ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Ma	
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =1mA, 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	400			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =1mA, 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			100	μ A
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> =400V, I <sub>B</sub> =0			100	μ A
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =9V, I <sub>C</sub> =0			100	μ A
DC current gain	h <sub>FE(1)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2A	10		40	
	h <sub>FE(2)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =8A	5			
Collector-emitter saturation voltage	V <sub>CE(sat)1</sub>	I <sub>C</sub> =2A, I <sub>B</sub> =0.4A			1	V
	V <sub>CE(sat)2</sub>	I <sub>C</sub> =5A, I <sub>B</sub> =1A			2	V
	V <sub>CE(sat)3</sub>	I <sub>C</sub> =8A, I <sub>B</sub> =2A			3	V
Base-emitter saturation voltage	V <sub>BE(sat)1</sub>	I <sub>C</sub> =2A, I <sub>B</sub> =0.4A			1.2	V
	V <sub>BE(sat)2</sub>	I <sub>C</sub> =5A, I <sub>B</sub> =1A			1.6	V
Storage time	t <sub>S</sub>	I <sub>C</sub> =500mA (UI9600)	3		6	μ s
Fall time	t <sub>f</sub>	I <sub>C</sub> =500mA (UI9600)			0.5	μ s
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.5A, f=1MHz	4			MHz

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

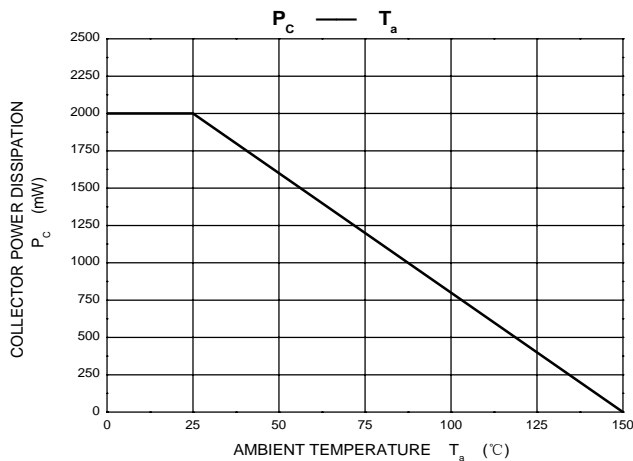
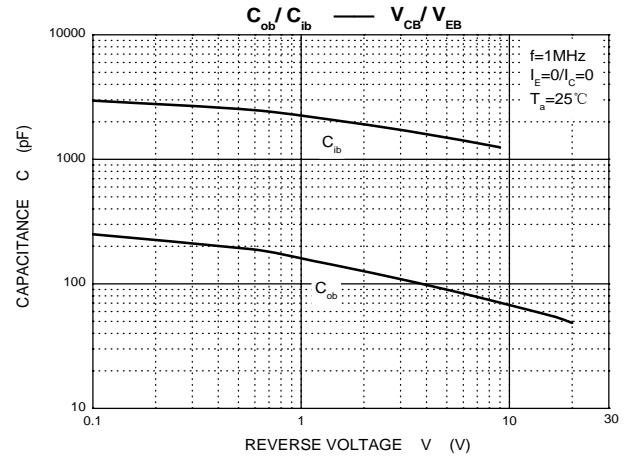
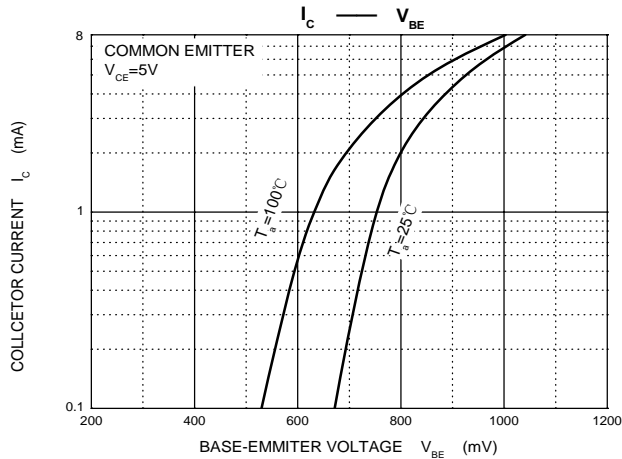
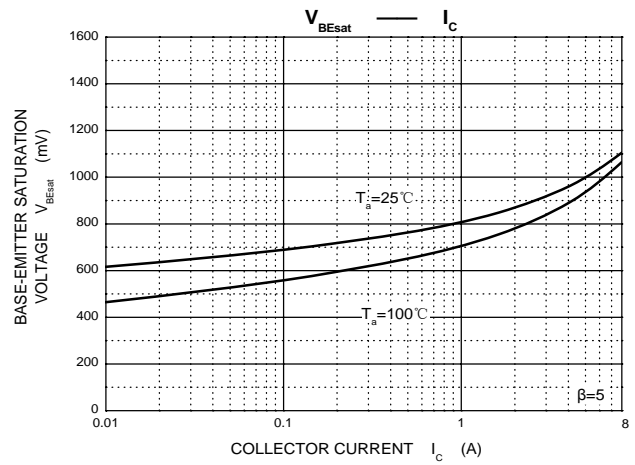
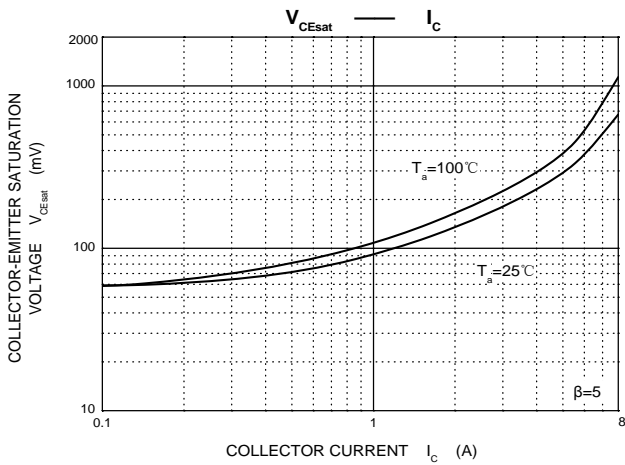
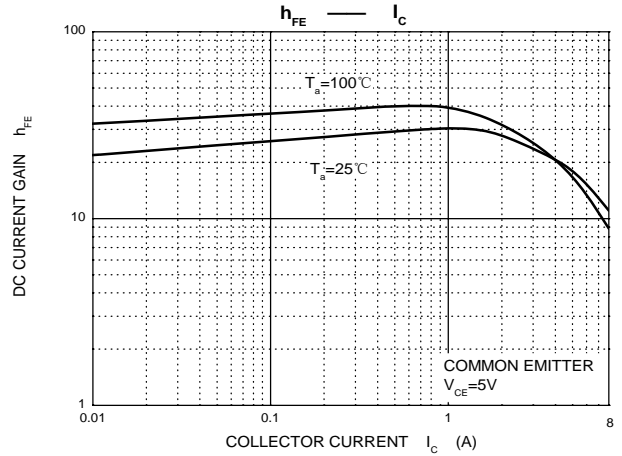
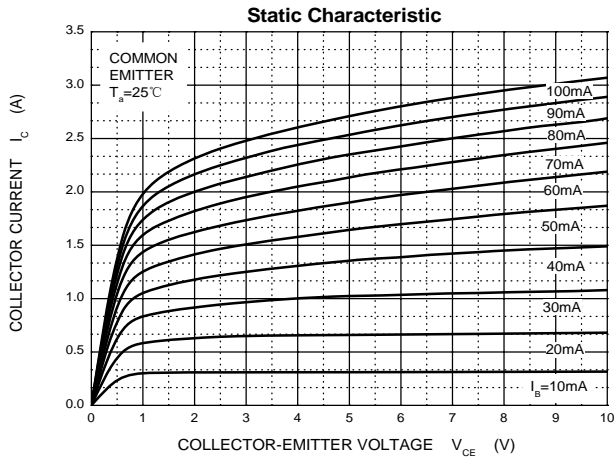
Range	10-15	15-20	20-25	25-30	30-35	35-40

**CLASSIFICATION OF t<sub>S</sub>**

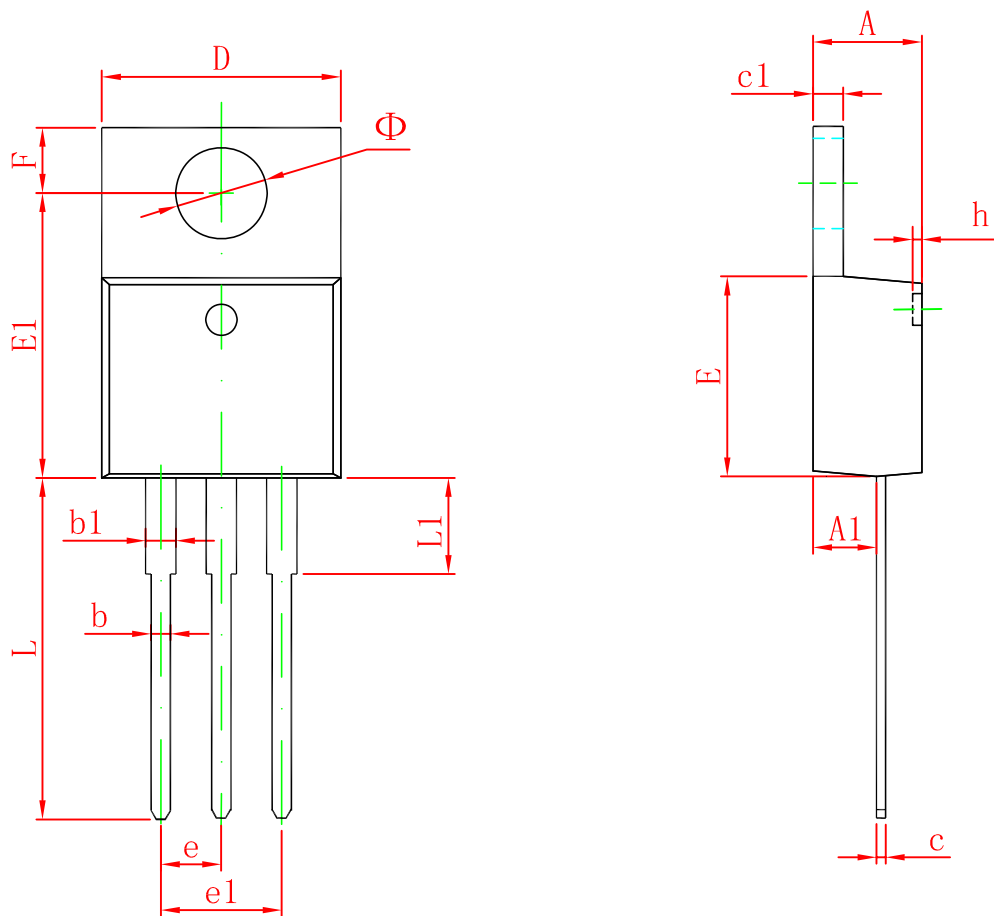
Rank	A	B	C
Range	3-4(μ s)	4-5(μ s)	5-6(μ s)

# Typical Characteristics

# 3DD13007N36



# TO-220-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
$\Phi$	3.735	3.935	0.147	0.155