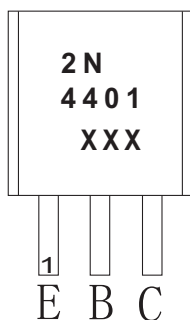


TRANSISTOR (NPN)

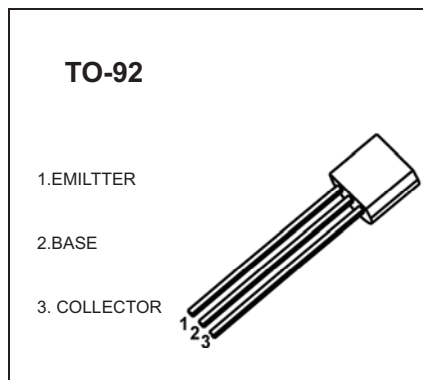
FEATURES

Power dissipation

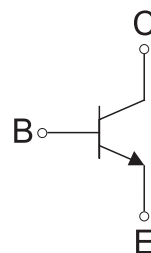
MARKING



2N4401=Device code
XXX=Code
GXX=Green molding compound device
CXX=Normal molding compound device



Equivalent Circuit



ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
2N4401	TO-92	Bulk	1000pcs/Bag
2N4401-TA	TO-92	Tape	2000pcs/Box

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

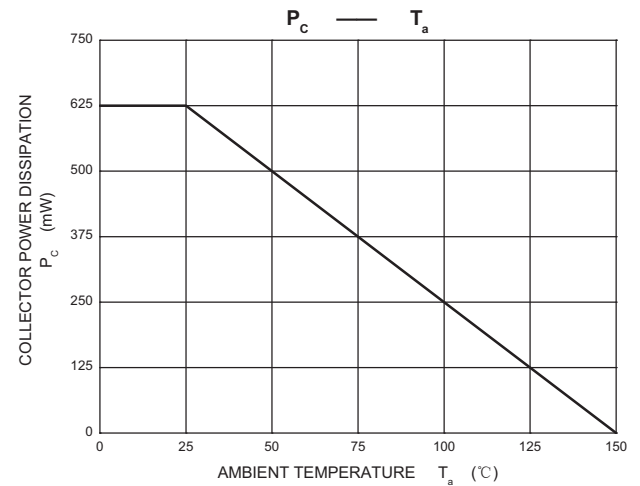
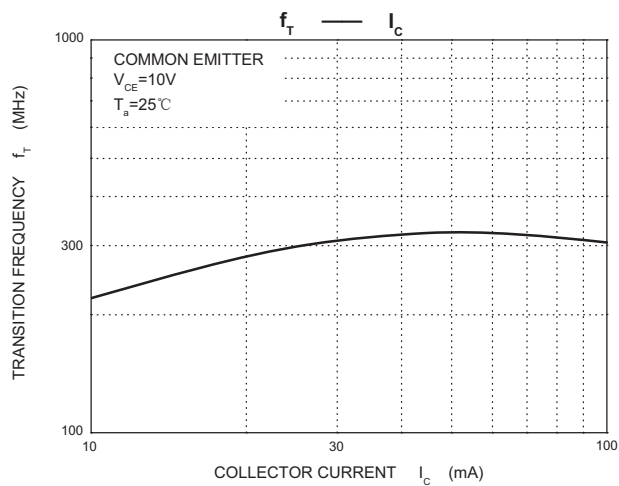
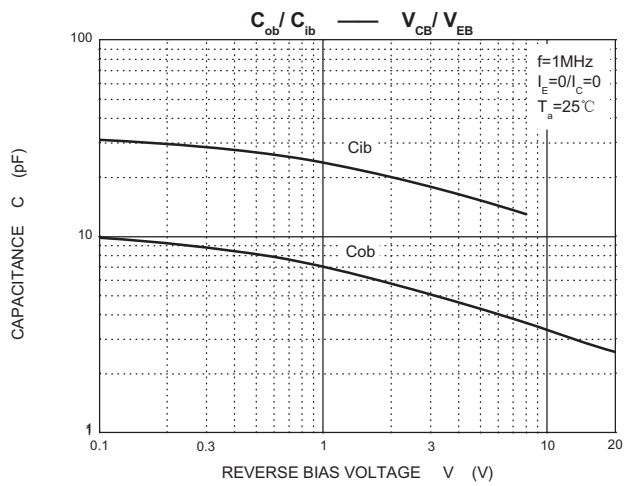
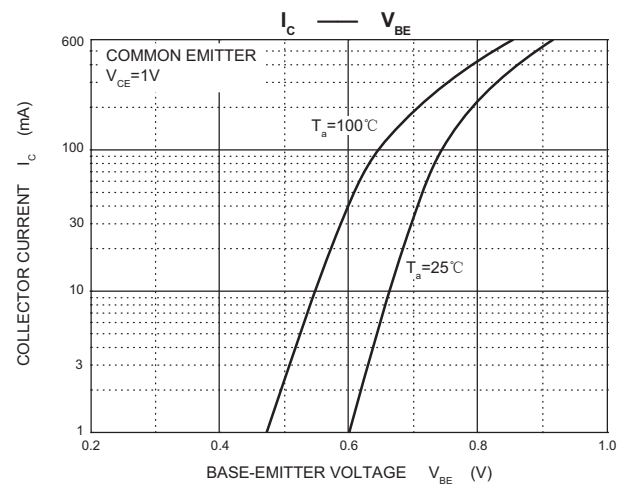
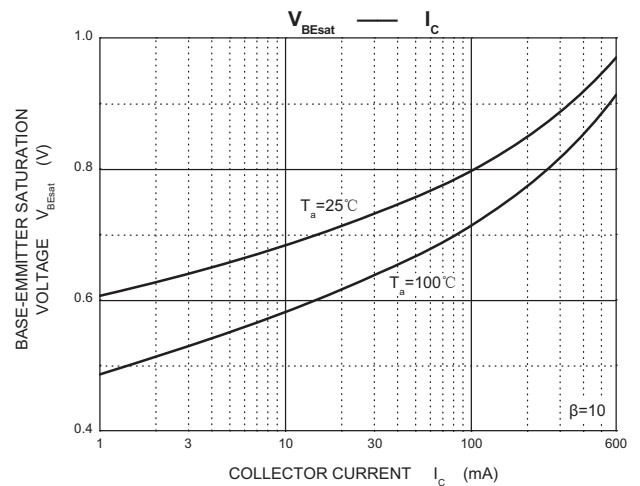
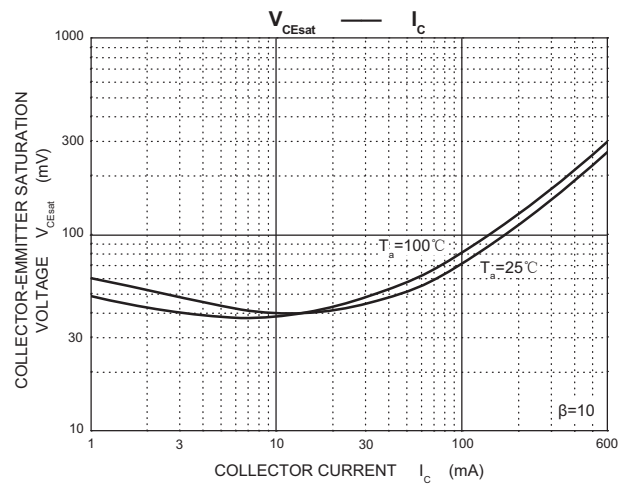
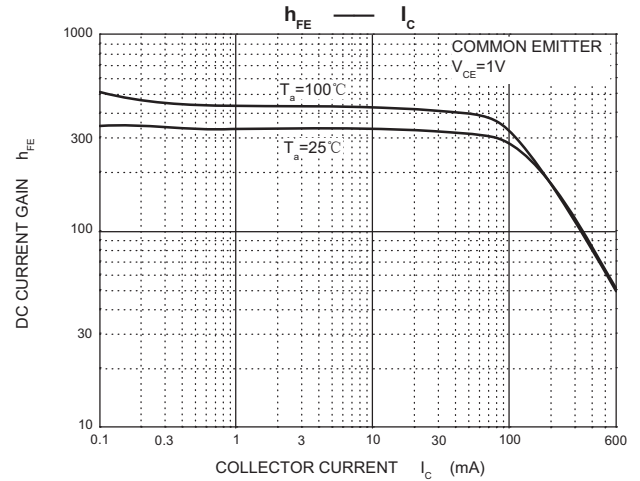
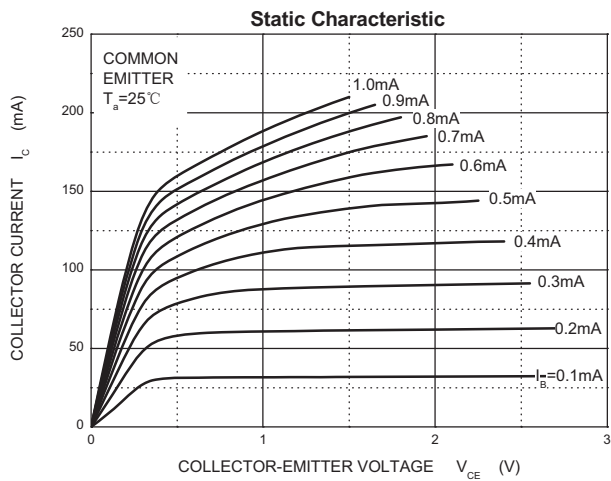
Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage	60	V
V _{CEO}	Collector-Emitter Voltage	40	V
V _{EBO}	Emitter-Base Voltage	6	V
I _C	Collector Current -Continuous	600	mA
P _C	Collector Power dissipation	0.625	W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55 ~ +150	°C
R _{θJA}	Thermal Resistance, junction to Ambient	357	°C/mW

ELECTRICAL CHARACTERISTICS

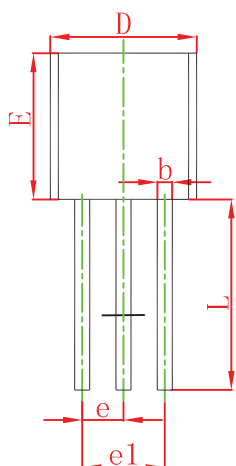
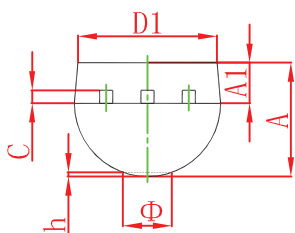
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}$, $I_C = 0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB} = 35\text{V}$, $I_E = 0$		0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$		0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1\text{V}$, $I_C = 0.1\text{mA}$	20		
	$h_{FE(2)}$	$V_{CE} = 1\text{V}$, $I_C = 1\text{mA}$	40		
	$h_{FE(3)}$	$V_{CE} = 1\text{V}$, $I_C = 10\text{mA}$	80		
	$h_{FE(4)}$	$V_{CE} = 1\text{V}$, $I_C = 150\text{mA}$	100	300	
	$h_{FE(5)}$	$V_{CE} = 2\text{V}$, $I_C = 500\text{mA}$	40		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$		0.4	V
	$V_{CE(sat)2}$	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$		0.75	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$		0.95	V
	$V_{BE(sat)2}$	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$		1.2	V
Transition frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 100\text{MHz}$	250		MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 100\text{KHz}$		6.5	pF
Delay time	t_d	$V_{CC} = 30\text{V}$, $V_{BE(OFF)} = 2\text{V}$ $I_C = 150\text{mA}$, $I_{B1} = 15\text{mA}$		15	ns
Rise time	t_r			20	ns
Storage time	t_s	$V_{CC} = 30\text{V}$, $I_C = 150\text{mA}$ $I_{B1} = -I_{B2} = 15\text{mA}$		225	ns
Fall time	t_f			30	ns

Typical Characteristics

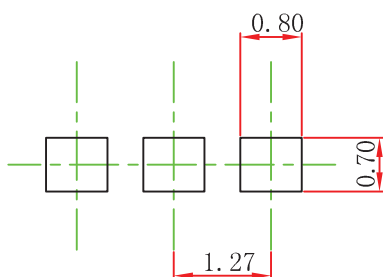


TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.