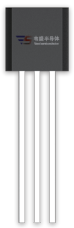
2N4401 TRANSISTOR (NPN)

FEATURES

Power dissipation



TO-92

1.EMITTER
2.COLLECTOR
3.BASE

ORDERING INFORMATION

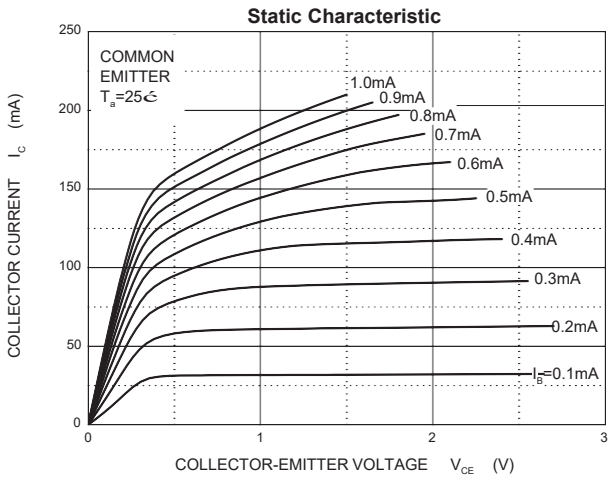
Part Number	Package	Packing Method	Pack Quantity
2N4401	TO-92	Bulk	1000pcs/Bag
2N4401-TA	TO-92	Tape	2000pcs/Box

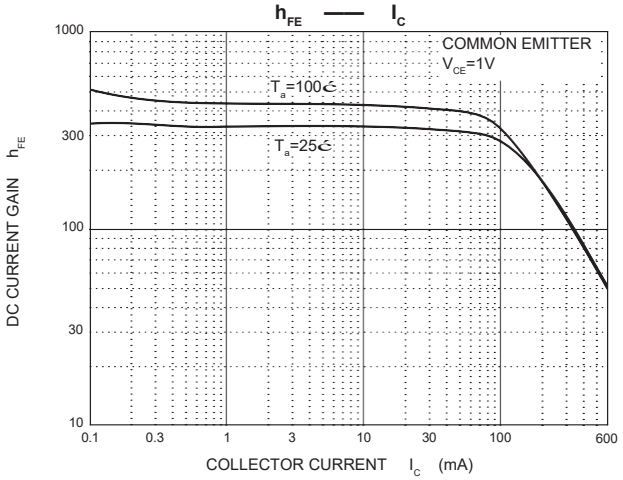
MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

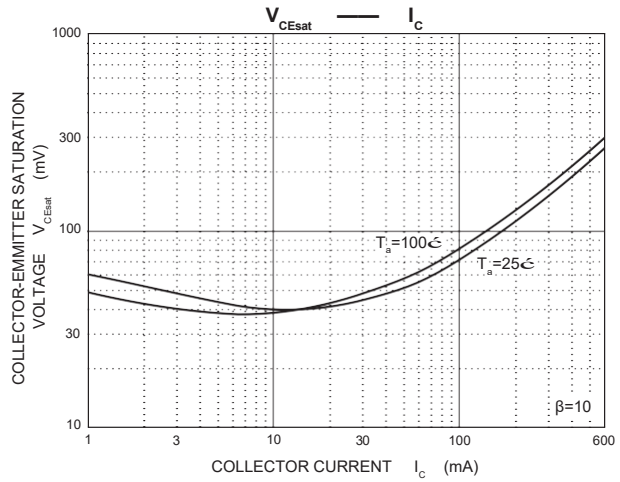
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	600	mA
P_C	Collector Power dissipation	0.625	W
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55 ~ +150	℃
$R_{\theta JA}$	Thermal Resistance, junction to Ambient	357	℃/mW

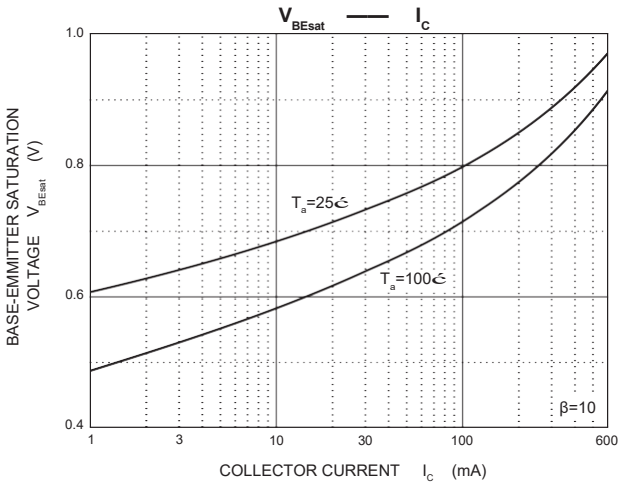
T_a=25℃ unless otherwise specified

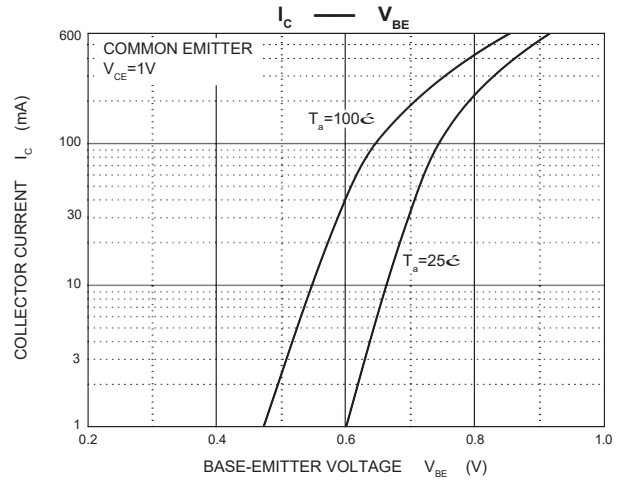
Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100μA , I_E=0	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C= 1mA , I_B=0	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=100μA, I_C=0	6		V
Collector cut-off current	I_{CBO}	V_{CB}=35V,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

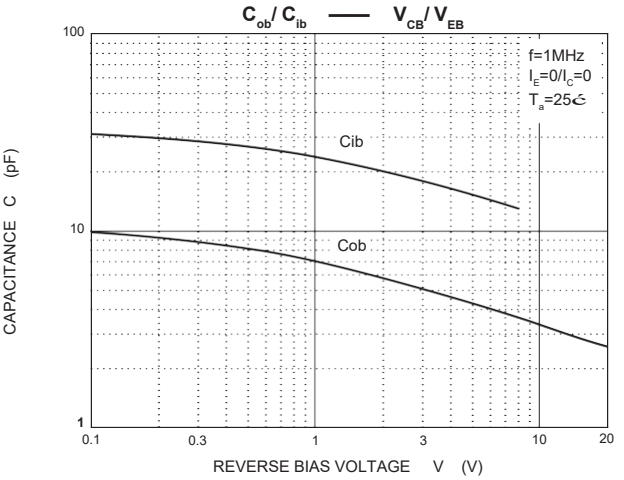

Static Characteristic
COMMON EMITTER
Ta=25℃
1.0mA
0.9mA
0.8mA
0.7mA
0.6mA
0.5mA
0.4mA
0.3mA
0.2mA
IB=0.1mA
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)

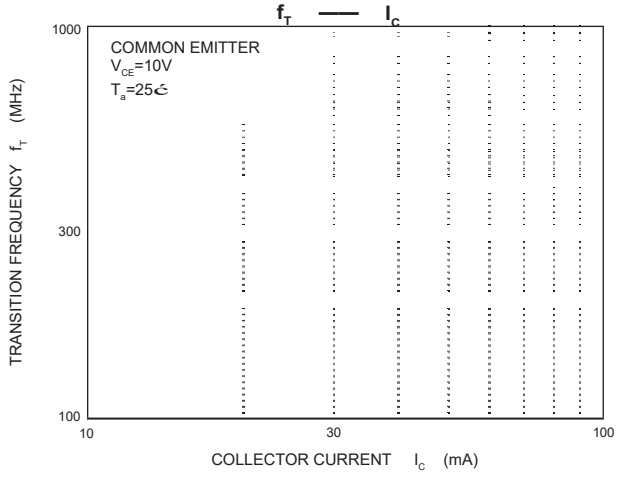

hFE — IC
COMMON EMITTER
VCE=1V
Ta=100℃
Ta=25℃
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (mA)

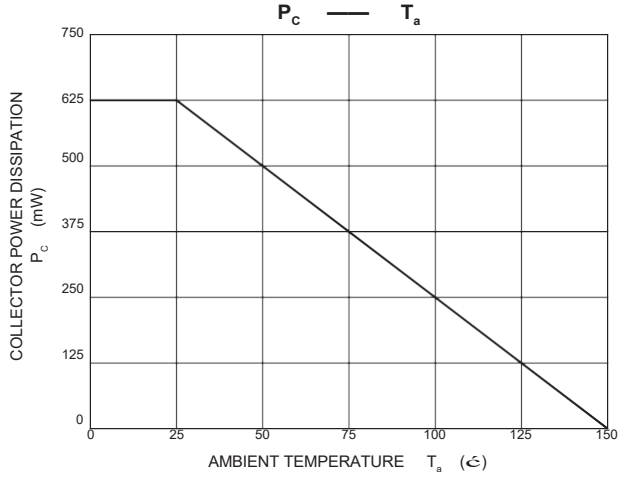

VCEsat — IC
COLLECTOR-EMMITTER SATURATION VOLTAGE VCEsat (mV)
Ta=100℃
Ta=25℃
β=10
COLLECTOR CURRENT IC (mA)


VBEsat — IC
BASE-EMMITTER SATURATION VOLTAGE VBEsat (V)
Ta=25℃
Ta=100℃
β=10
COLLECTOR CURRENT IC (mA)


IC — VBE
COMMON EMITTER
VCE=1V
Ta=100℃
Ta=25℃
COLLECTOR CURRENT IC (mA)
BASE-EMITTER VOLTAGE VBE (V)


Cob / Cib — VCB / VEB
f=1MHz
IE=0/IC=0
Ta=25℃
Cib
Cob
CAPACITANCE C (pF)
REVERSE BIAS VOLTAGE V (V)


fT — IC
COMMON EMITTER
VCE=10V
Ta=25℃
TRANSITION FREQUENCY fT (MHz)
COLLECTOR CURRENT IC (mA)


PC — Ta
COLLECTOR POWER DISSIPATION PC (mW)
AMBIENT TEMPERATURE Ta (℃)