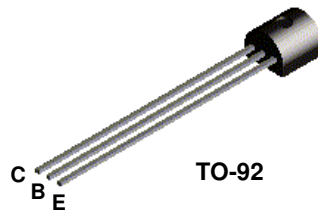
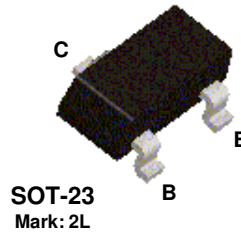


2N5401



MMBT5401



PNP General Purpose Amplifier

This device is designed as a general purpose amplifier and switch for applications requiring high voltages. Sourced from Process 74.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	150	V
V _{CBO}	Collector-Base Voltage	160	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	200	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		2N5401	*MMBT5401	
P _D	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	357	°C/W

* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

PNP General Purpose Amplifier

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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OFF CHARACTERISTICS

V _{(BR)CEO}	Collector-Emitter Breakdown Voltage*	I _C = 1.0 mA, I _B = 0	150		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 100 µA, I _E = 0	160		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 10 µA, I _C = 0	5.0		V
I _{CBO}	Collector Cutoff Current	V _{CB} = 120 V, I _E = 0 V _{CB} = 120 V, I _E = 0, T _A = 100°C		50 50	nA µA
I _{EBO}	Emitter Cutoff Current	V _{EB} = 3.0 V, I _C = 0		50	nA

ON CHARACTERISTICS*

h _{FE}	DC Current Gain	I _C = 1.0 mA, V _{CE} = 5.0 V I _C = 10 mA, V _{CE} = 5.0 V I _C = 50 mA, V _{CE} = 5.0 V	50 60 50	240	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 10 mA, I _B = 1.0 mA I _C = 50 mA, I _B = 5.0 mA		0.2 0.5	V V
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _C = 10 mA, I _B = 1.0 mA I _C = 50 mA, I _B = 5.0 mA		1.0 1.0	V V

SMALL SIGNAL CHARACTERISTICS

f _T	Current Gain - Bandwidth Product	I _C = 10 mA, V _{CE} = 10 V, f = 100 MHz	100	300	MHz
C _{obo}	Output Capacitance	V _{CB} = 10 V, I _E = 0, f = 1.0 MHz		6.0	pF
NF	Noise Figure	I _C = 250 µA, V _{CE} = 5.0 V, R _S = 1.0 kΩ, f = 10 Hz to 15.7 kHz		8.0	dB

*Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%

Spice Model

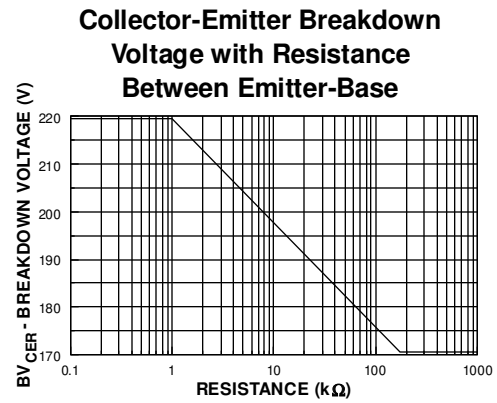
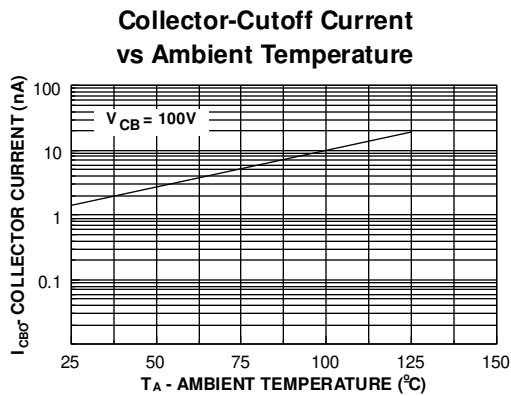
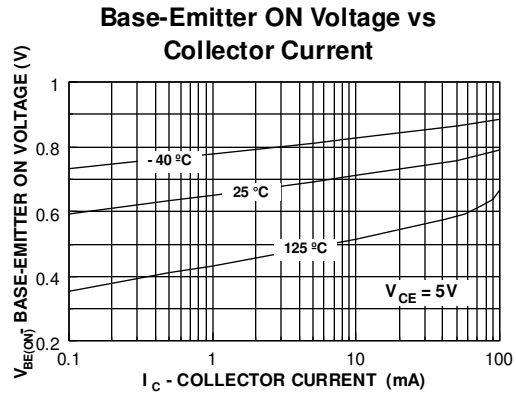
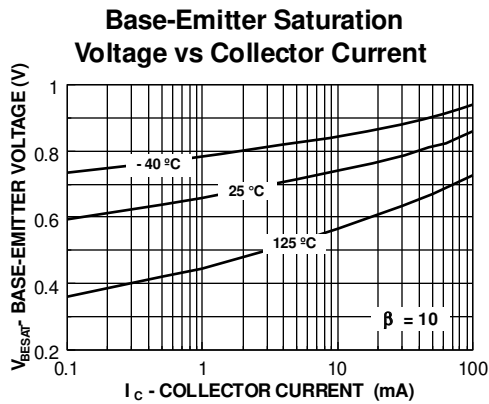
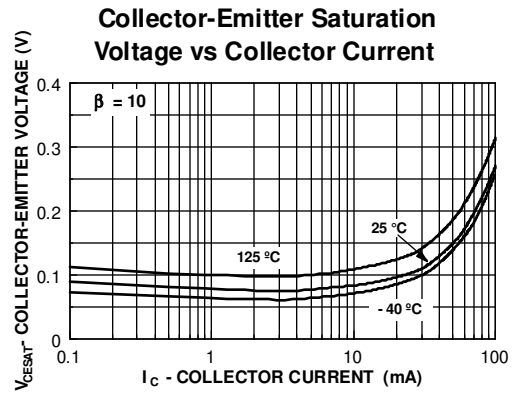
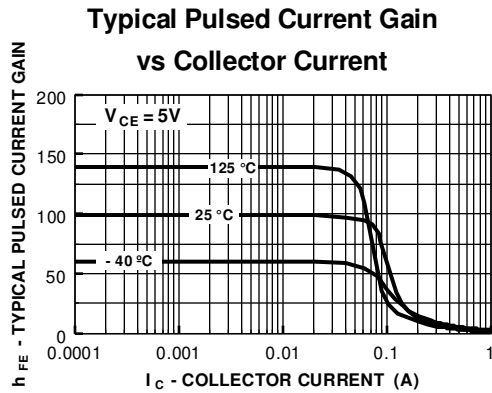
PNP (Is=21.48f Xti=3 Eg=1.11 Vaf=100 Bf=132.1 Ne=1.375 Ise=21.48f Ikf=.1848 Xtb=1.5 Br=3.661 Nc=2 Isc=0 Ikr=0 Rc=1.6 Cjc=17.63p Mjc=.5312 Vjc=.75 Fc=.5 Cje=73.39p Mje=.3777 Vje=.75 Tr=1.476n Tf=641.9p Itf=0 Vtf=0 Xtf=0 Rb=10)

PNP General Purpose Amplifier

(continued)

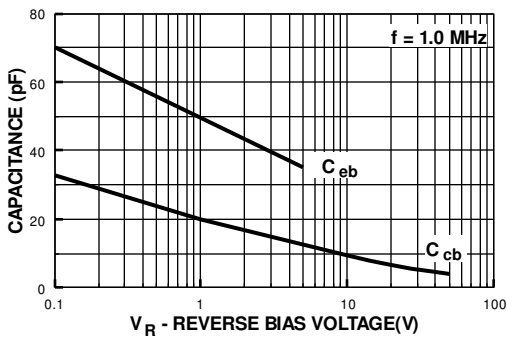
2N5401 / MMBT5401

Typical Characteristics



Typical Characteristics (continued)

Input and Output Capacitance
vs Reverse Voltage



Power Dissipation vs
Ambient Temperature

