



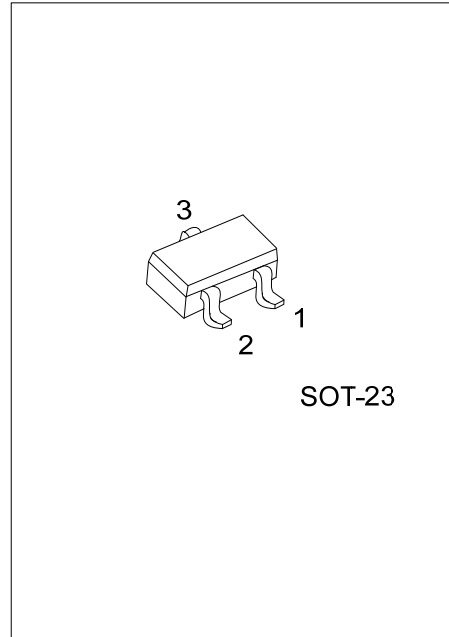
# MMBT5401

## PNP SILICON TRANSISTOR

### HIGH VOLTAGE SWITCHING TRANSISTOR

#### ■ FEATURES

- \*Collector-Emitter Voltage:  $V_{CE0}=-150V$
- \*High Current Gain



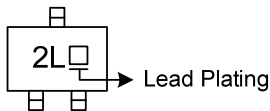
Lead-free: MMBT5401L  
 Halogen-free: MMBT5401G

#### ■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free Plating	Halogen-Free		1	2	3	
MMBT5401-x-AE3-R	MMBT5401L-x-AE3-R	MMBT5401G-x-AE3-R	SOT-23	E	B	C	Tape Reel

<p>MMBT5401L-x-AE3-R</p>	<p>(1) R: Tape Reel          (2) AE3: SOT-23          (3) x: refer to Classification of <math>h_{FE}</math>          (4) G: Halogen Free, L: Lead Free Plating, Blank: Pb/Sn</p>
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#### ■ MARKING



# MMBT5401

## PNP SILICON TRANSISTOR

### ■ ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector -Base Voltage	V <sub>CB0</sub>	-160	V
Collector -Emitter Voltage	V <sub>CEO</sub>	-150	V
Emitter -Base Voltage	V <sub>EBO</sub>	-5	V
DC Collector Current	I <sub>C</sub>	-600	mA
Power Dissipation	P <sub>D</sub>	350	mW
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	I <sub>C</sub> =-100μA, I <sub>E</sub> =0	-160			V
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> =-1mA, I <sub>B</sub> =0	-150			V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> =-10μA, I <sub>C</sub> =0	-6			V
Collector Cut-off Current	I <sub>CB0</sub>	V <sub>CB</sub> =-120V, I <sub>E</sub> =0			-50	nA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>BE</sub> =-3V, I <sub>C</sub> =0			-50	nA
DC Current Gain(Note)	h <sub>FE</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-1mA	80	160	400	
		V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA	80			
		V <sub>CE</sub> =-5V, I <sub>C</sub> =-50mA	80			
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA			-0.2 -0.5	V
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA			-1 -1	V
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =-10V, I <sub>C</sub> =-10mA, f=100MHz	100		300	MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHz			6.0	pF
Noise Figure	NF	I <sub>C</sub> =-0.25mA, V <sub>CE</sub> =-5V R <sub>S</sub> =1kΩ, f=10Hz ~ 15.7kHz			8	dB

Note: Pulse test: PW<300μs, Duty Cycle<2%

### ■ CLASSIFICATION OF h<sub>FE</sub>

RANK	A	B	C
RANGE	80-170	150-240	200-400



## ■ TYPICAL CHARACTERISTICS

Fig.1 Collector Output Capacitance

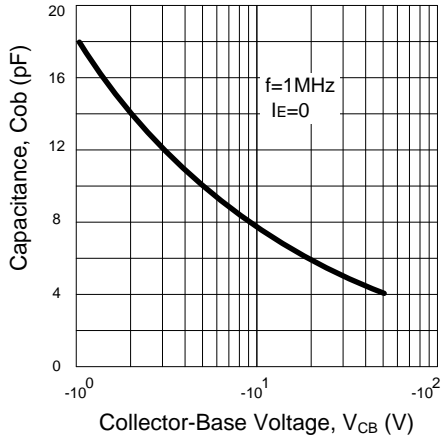


Fig.2 DC Current Gain

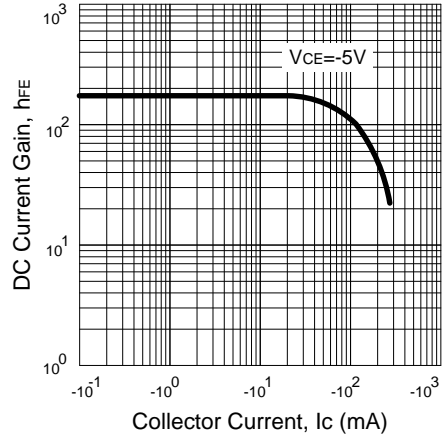


Fig.3 Base-Emitter on Voltage

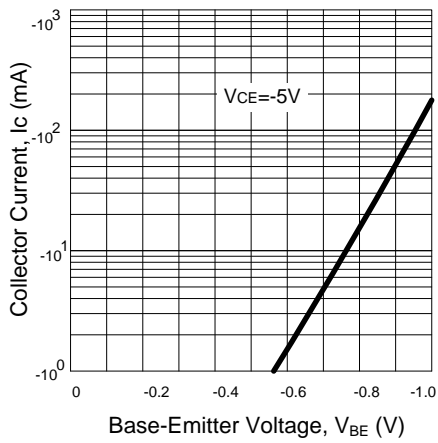


Fig.4 Saturation Voltage

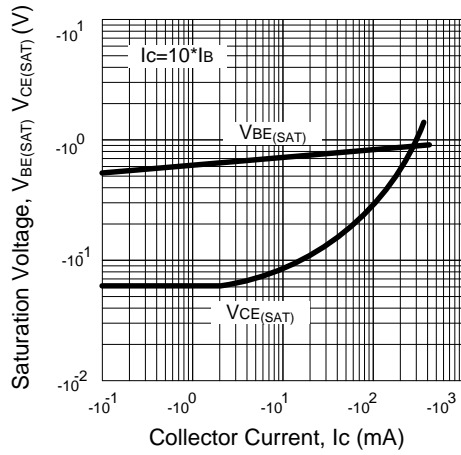
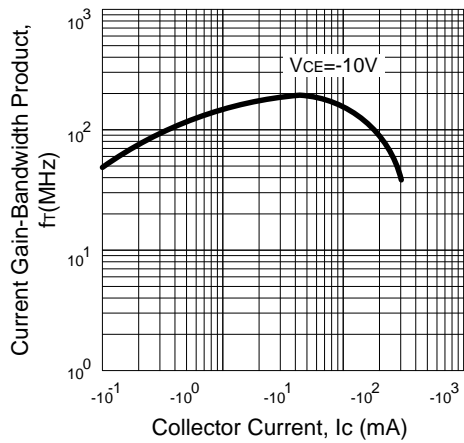


Fig.5 Current Gain-Bandwidth Product



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