



# MMBT4401

## NPN General Purpose Amplifier

### Features

- Halogen free available upon request by adding suffix "-HF"
- Surface Mount SOT-23 Package
- Capable of 350mWatts of Power Dissipation
- Operating and Storage Junction Temperatures: -55°C to 150°C
- I<sub>C</sub>=600mA
- Marking:2X/M4A
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
<b>OFF CHARACTERISTICS</b>				
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage* (I <sub>C</sub> =1.0mA, I <sub>B</sub> =0)	40		Vdc
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>C</sub> =10mA, I <sub>E</sub> =0)	60		Vdc
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>E</sub> =0.1mA, I <sub>C</sub> =0)	6.0		Vdc
I <sub>BL</sub>	Base Cutoff Current (V <sub>CE</sub> =35Vdc, V <sub>BE</sub> =0.4Vdc)		0.1	µAdc
I <sub>CEX</sub>	Collector Cutoff Current (V <sub>CE</sub> =35Vdc, V <sub>BE</sub> =0.4Vdc)		0.1	µAdc

### ON CHARACTERISTICS

h <sub>FE</sub>	DC Current Gain* (I <sub>C</sub> =0.1mA, V <sub>CE</sub> =1.0Vdc) (I <sub>C</sub> =1.0mA, V <sub>CE</sub> =1.0Vdc) (I <sub>C</sub> =10mA, V <sub>CE</sub> =1.0Vdc) (I <sub>C</sub> =150mA, V <sub>CE</sub> =1.0Vdc) (I <sub>C</sub> =500mA, V <sub>CE</sub> =1.0Vdc)	20		
		40		
		80	300	
		40		
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA) (I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)		0.4 0.75	Vdc
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA) (I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	0.75	0.95 1.2	Vdc

### SMALL-SIGNAL CHARACTERISTICS

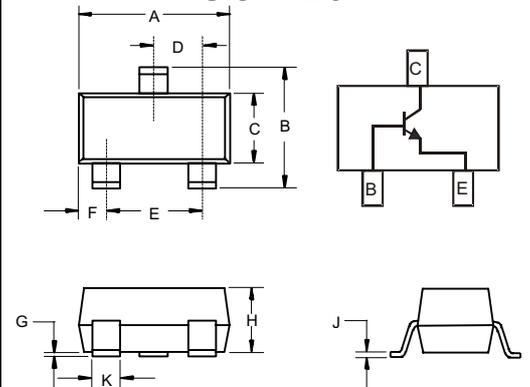
f <sub>T</sub>	Current Gain-Bandwidth Product (I <sub>C</sub> =20mA, V <sub>CE</sub> =10Vdc, f=100MHz)	250		MHz
C <sub>cb</sub>	Collector-Base Capacitance (V <sub>CB</sub> =5.0Vdc, I <sub>E</sub> =0, f=1.0MHz)		6.5	pF
C <sub>eb</sub>	Emitter-Base Capacitance (V <sub>BE</sub> =0.5Vdc, I <sub>C</sub> =0, f=1.0MHz)		30.0	pF

### SWITCHING CHARACTERISTICS

t <sub>d</sub>	Delay Time	(V <sub>CC</sub> =30Vdc, V <sub>BE</sub> =0.2Vdc)	15	ns
t <sub>r</sub>	Rise Time	I <sub>C</sub> =150mA, I <sub>B1</sub> =15mA	20	ns
t <sub>s</sub>	Storage Time	(V <sub>CC</sub> =30Vdc, I <sub>C</sub> =150mA)	225	ns
t <sub>f</sub>	Fall Time	I <sub>B1</sub> =I <sub>B2</sub> =15mA	30	ns

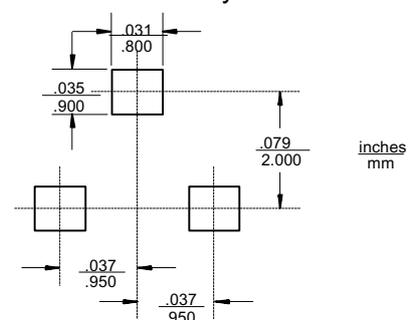
\*Pulse Width ≤ 300µs, Duty Cycle ≤ 2.0%

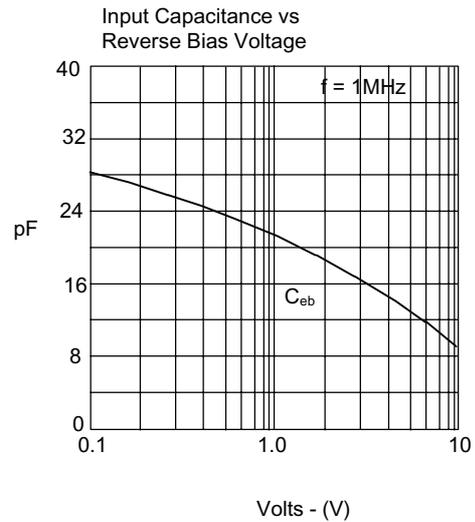
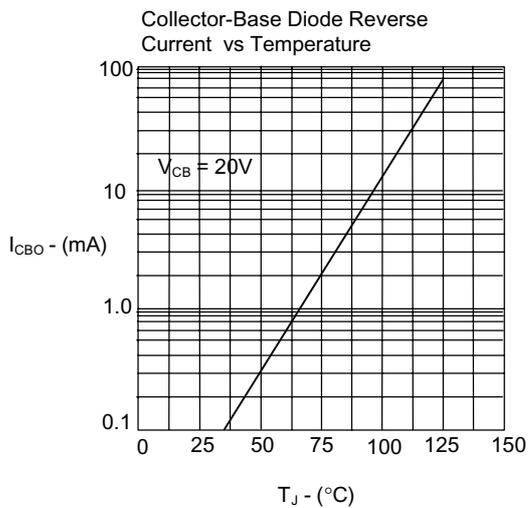
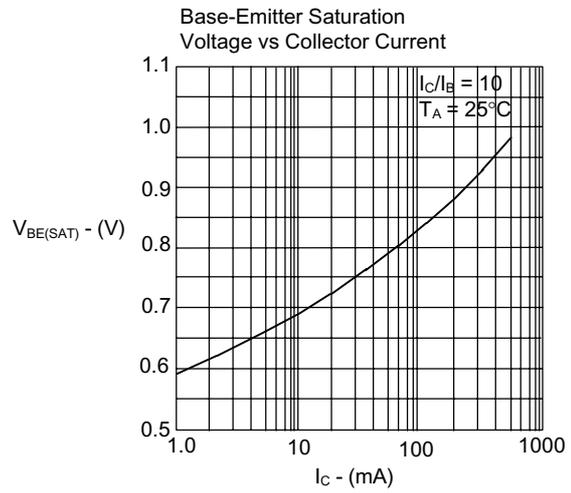
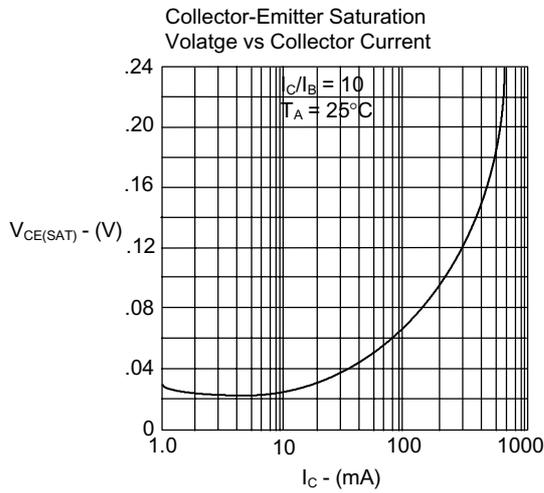
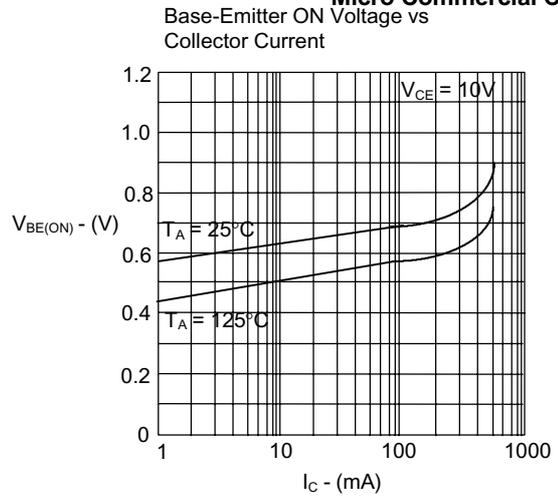
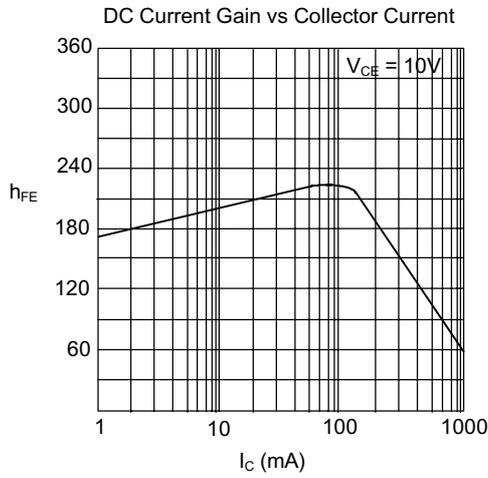
### SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout

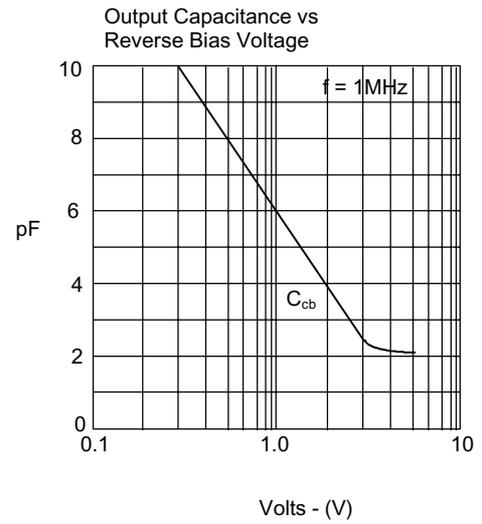
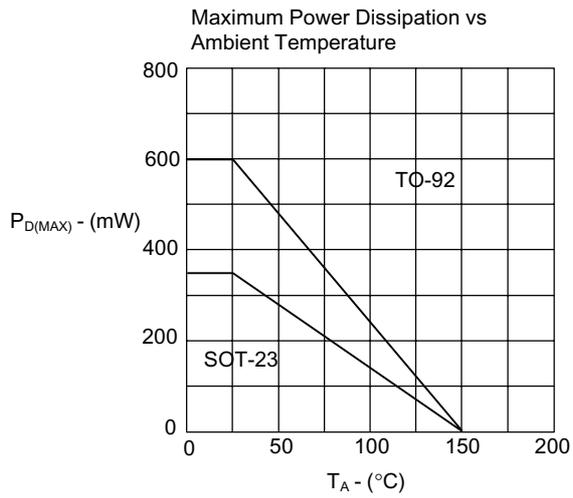




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### Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel; 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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