



# MMBT4401

## Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Capable of 350mWatts of Power Dissipation and 600mA  $I_C$
- Operating and Storage Junction Temperatures:  $-55^{\circ}\text{C}$  to  $150^{\circ}\text{C}$
- Thermal Resistance Junction to Ambient:  $357^{\circ}\text{C/W}$
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: 2X/M4A

## Electrical Characteristics @ $25^{\circ}\text{C}$ Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
<b>OFF CHARACTERISTICS</b>				
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ( $I_C=1.0\text{mA}$ , $I_B=0$ )	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_C=10\text{mA}$ , $I_E=0$ )	60		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_E=0.1\text{mA}$ , $I_C=0$ )	6.0		Vdc
$I_{BL}$	Base Cutoff Current ( $V_{CE}=35\text{Vdc}$ , $V_{BE}=0.4\text{Vdc}$ )		0.1	$\mu\text{Adc}$
$I_{CEX}$	Collector Cutoff Current ( $V_{CE}=35\text{Vdc}$ , $V_{BE}=0.4\text{Vdc}$ )		0.1	$\mu\text{Adc}$

## ON CHARACTERISTICS

$h_{FE}$	DC Current Gain* ( $I_C=0.1\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ ) ( $I_C=1.0\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ ) ( $I_C=10\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ ) ( $I_C=150\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ ) ( $I_C=500\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ )	20 40 80 100 40	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )		0.4 0.75	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )	0.75	0.95 1.2	Vdc

## SMALL-SIGNAL CHARACTERISTICS

$f_T$	Current Gain-Bandwidth Product ( $I_C=20\text{mA}$ , $V_{CE}=10\text{Vdc}$ , $f=100\text{MHz}$ )	250		MHz
$C_{cb}$	Collector-Base Capacitance ( $V_{CB}=5.0\text{Vdc}$ , $I_E=0$ , $f=1.0\text{MHz}$ )		6.5	pF
$C_{eb}$	Emitter-Base Capacitance ( $V_{BE}=0.5\text{Vdc}$ , $I_C=0$ , $f=1.0\text{MHz}$ )		30.0	pF

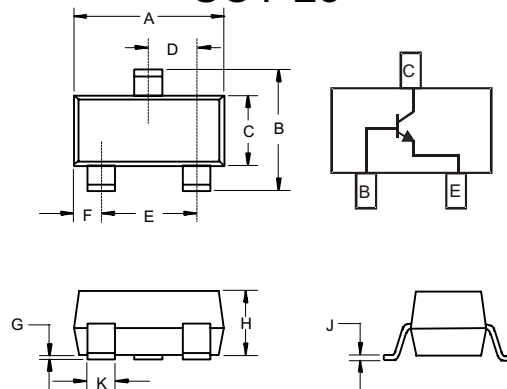
## SWITCHING CHARACTERISTICS

$t_d$	Delay Time	( $V_{CC}=30\text{Vdc}$ , $V_{BE}=0.2\text{Vdc}$ )	15	ns
$t_r$	Rise Time	( $I_C=150\text{mA}$ , $I_{B1}=15\text{mA}$ )	20	ns
$t_s$	Storage Time	( $V_{CC}=30\text{Vdc}$ , $I_C=150\text{mA}$ )	225	ns
$t_f$	Fall Time	( $I_{B1}=I_{B2}=15\text{mA}$ )	30	ns

\*Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

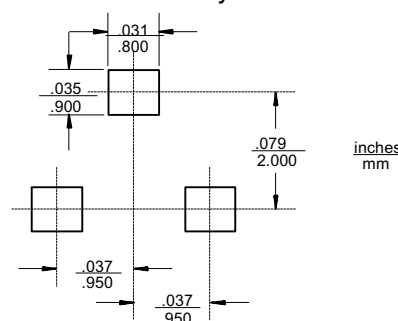
## NPN General Purpose Amplifier

### SOT-23

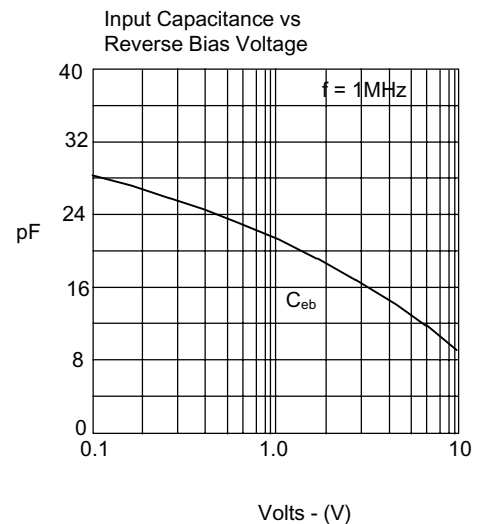
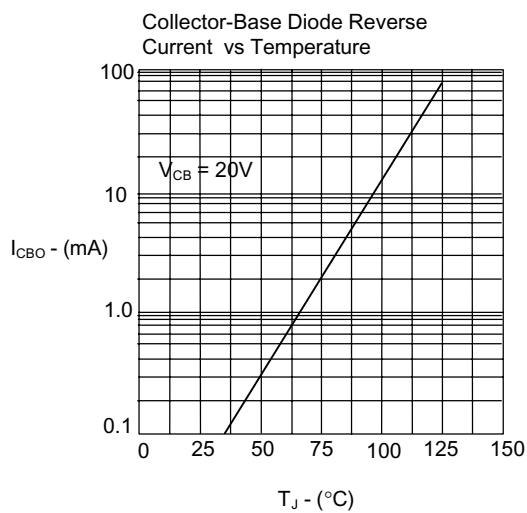
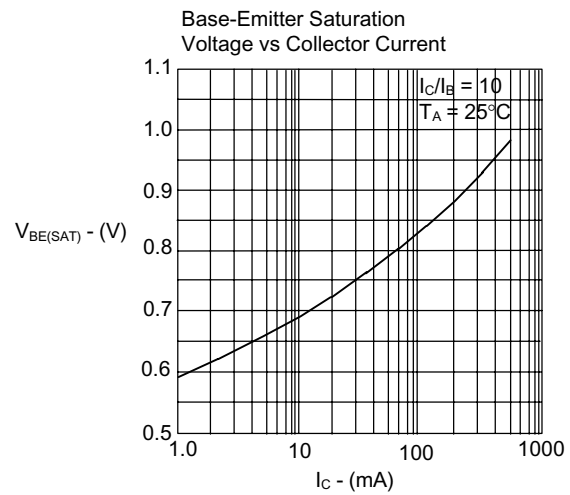
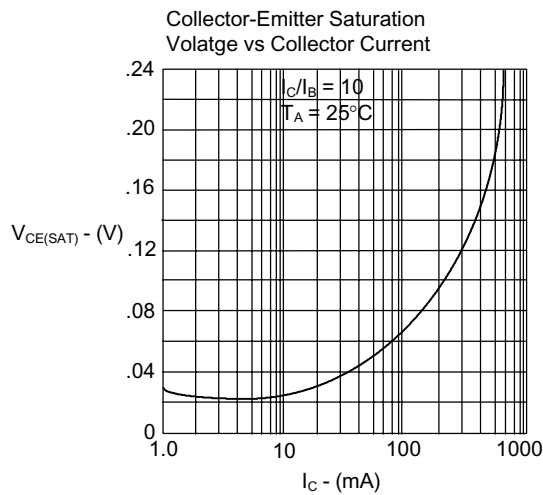
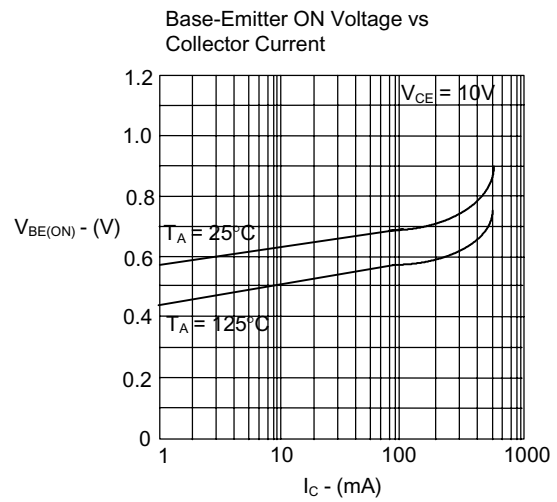
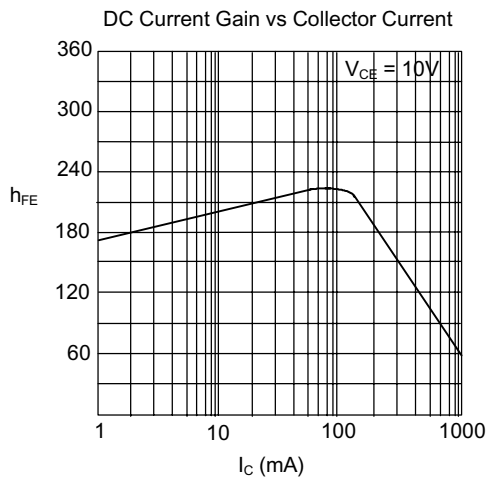


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

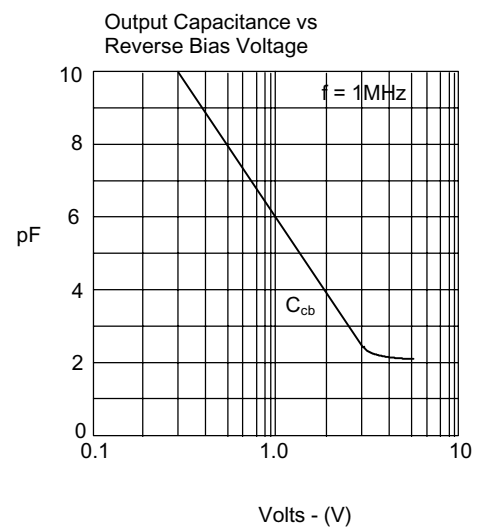
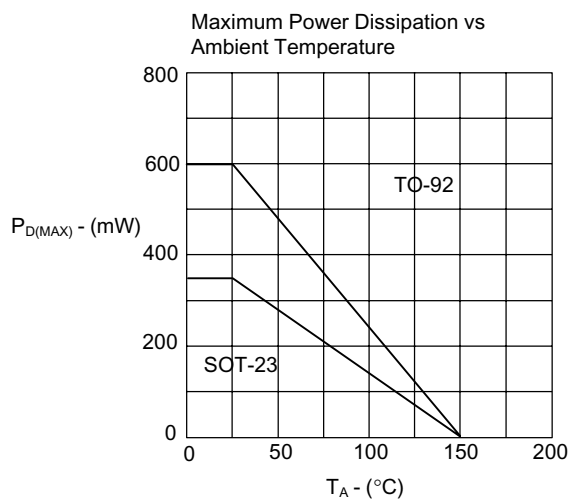
### Suggested Solder Pad Layout



# MMBT4401



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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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