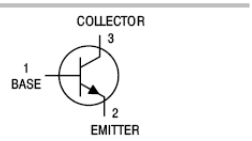
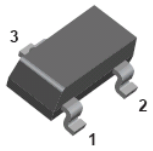
NPN General Purpose Amplifier MMBT4400

FEATURES

- This device is designed for use as general purpose amplifiers and switches requiring collector currents to 500 mA.

Lead-free





SOT-23

ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT4400	83	SOT-23

MAXIMUM RATING @ Ta=25℃ unless otherwise specified

Symbol	Parameter	Value	Units
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 Dissipation	350	mW
$R_{\theta JA}$	Thermal resistance,Junction to Ambient	357	℃/W
T_j,T_{stg}	Junction and Storage Temperature	-55 to +150	℃

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ELECTRICAL CHARACTERISTICS @ Ta=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	6.0		V
Collector cut-off current	I_{CEX}	V_{CE}=35V,V_{EB}=0.4V		0.1	μA
Emitter cut-off current	I_{BL}	V_{CE}=35V,V_{EB}=0.4V		0.1	μA
DC current gain	h_{FE}	V_{CE}=1V,I_C=1mA V_{CE}=1V,I_C=10mA V_{CE}=1V,I_C=150mA V_{CE}=2V,I_C=500mA	20 40 50 20	150	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=150mA, I_B=15mA I_C=500mA, I_B=50mA		0.40 0.75	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=150mA, I_B=15mA I_C=500mA, I_B=50mA	0.75	0.95 1.2	V
Output capacitance	C_{ob}	V_{CB}=5.0V,f=140kHZ		6.5	pF
Input capacitance	C_{ib}	V_{EB}=0.5V,f=140kHZ		30	pF
Small-Signal current gain	h_{fe}	I_C=20mA,V_{CE}=10V, f=100MHz	2.0		
Small-Signal current gain	h_{fe}	V_{CE}=10V, I_C=1.0mA f=1.0kHZ	20	250	
Input impedance	h_{ie}		0.5	7.5	kΩ
Voltage feedback ratio	h_{re}		0.1	8.0	$*10^{-4}$
Output admittance	h_{oe}		1.0	30	μA
Delay time	t_d	V_{CC}=30V,I_C=150mA, I_{B1}= 15mA,V_{EB}=2V		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

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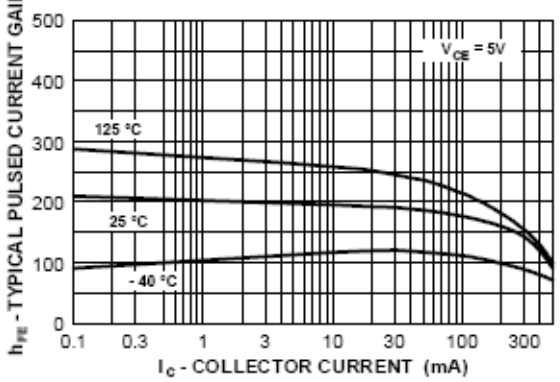
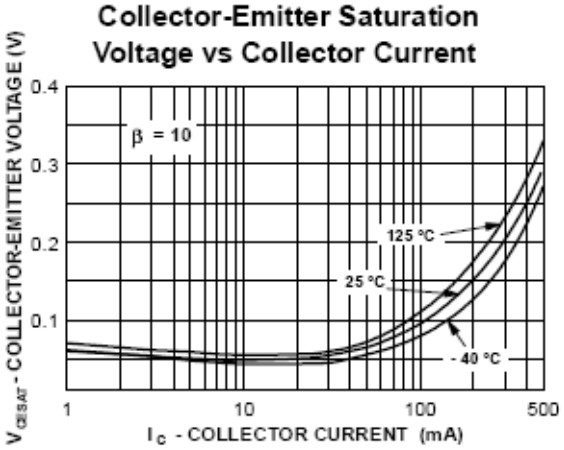
TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

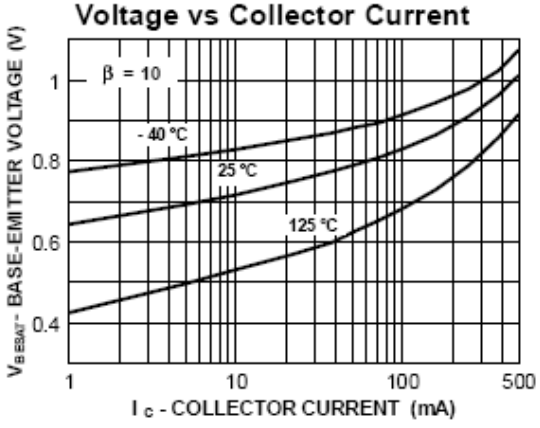
Typical Pulsed Current Gain vs Collector Current



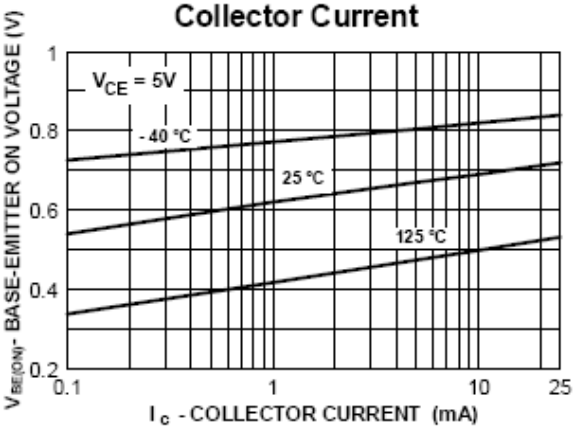
Collector-Emitter Saturation Voltage vs Collector Current



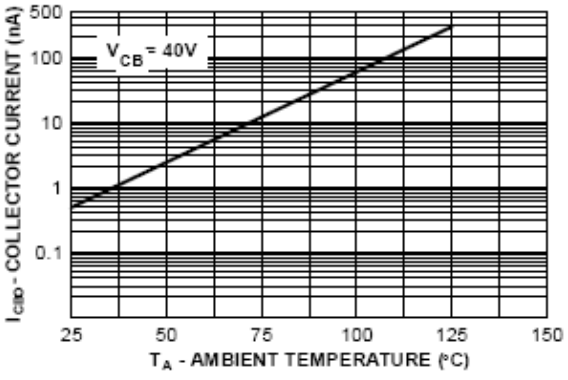
Base-Emitter Saturation Voltage vs Collector Current



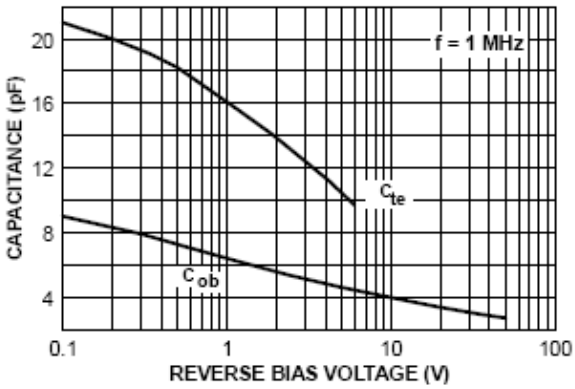
Base-Emitter ON Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature



Emitter Transition and Output Capacitance vs Reverse Bias Voltage



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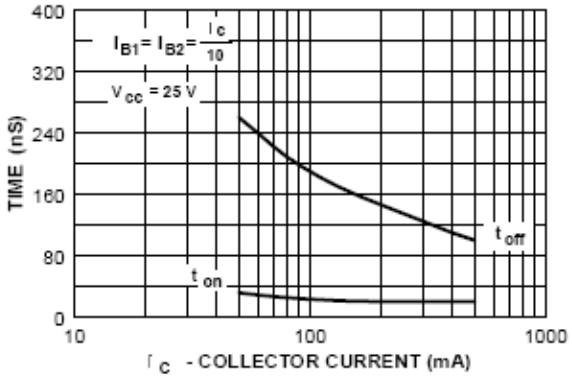
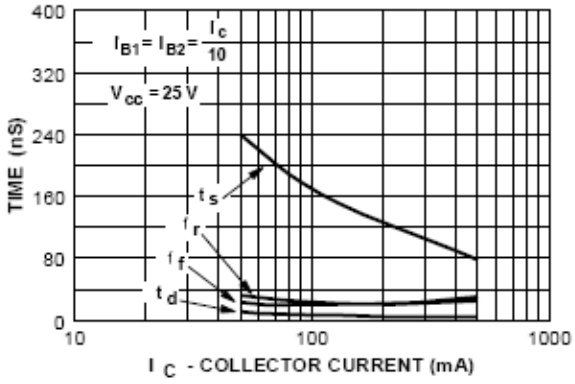
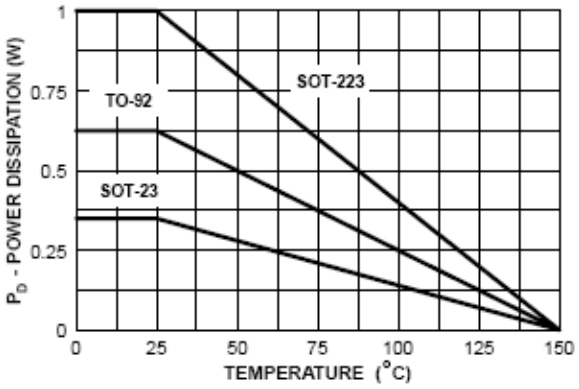
Turn On and Turn Off Times vs Collector Current



Switching Times vs Collector Current



Power Dissipation vs Ambient Temperature



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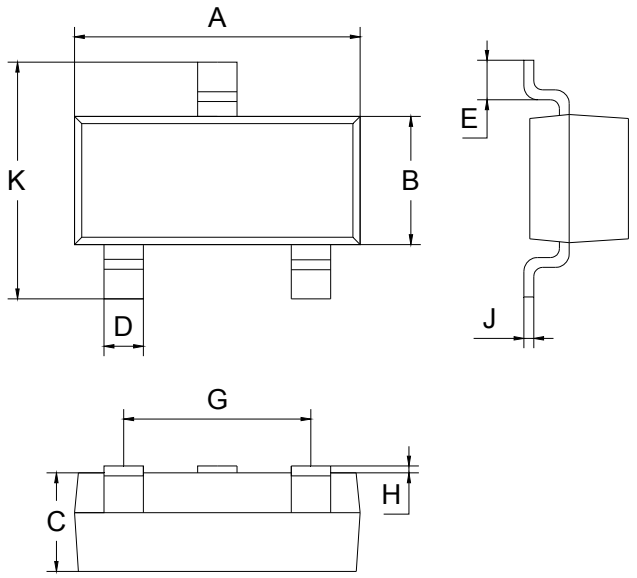
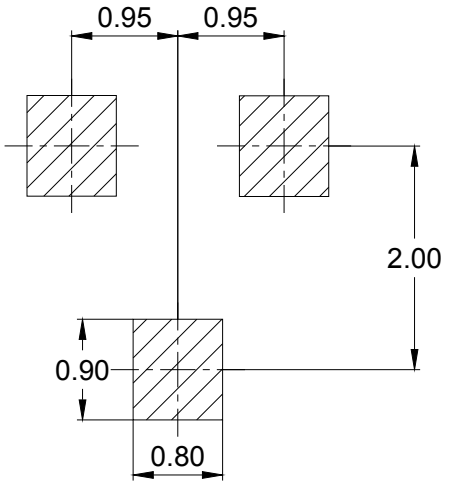
PACKAGE OUTLINE

Plastic surface mounted package SOT-23



SOT-23		
Dim	Min	Max
A	2.70	3.10
B	1.10	1.50
C	1.0 Typical	
D	0.4 Typical	
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.1 Typical	
K	2.20	2.60
All Dimensions in mm		

SOLDERING FOOTPRINT



Unit : mm

PACKAGE INFORMATION

Device	Package	Shipping
MMBT4400	SOT-23	3000/Tape&Reel