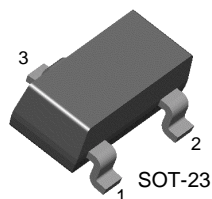


MMBT3904K

NPN Epitaxial Silicon Transistor

General Purpose Transistor



1. Base 2. Emitter 3. Collector

Marking



Absolute Maximum Ratings T_a = 25°C unless otherwise noted

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	200	mA
P _C	Collector Power Dissipation	350	mW
T _{STG}	Storage Temperature	150	°C

Electrical Characteristics T_a = 25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
BV _{CBO}	Collector-Base Breakdown Voltage	I _C = 10μA, I _E = 0	60		V
BV _{CEO}	Collector-Emitter Breakdown Voltage *	I _C = 1mA, I _B = 0	40		V
BV _{EBO}	Emitter-Base Breakdown Voltage	I _E = 10μA, I _C = 0	6		V
I _{CEX}	Collector Cut-off Current	V _{CE} = 30V, V _{EB} = 3V		50	nA
h _{FE}	DC Current Gain *	V _{CE} = 1V, I _C = 0.1mA V _{CE} = 1V, I _C = 1mA V _{CE} = 1V, I _C = 10mA V _{CE} = 1V, I _C = 50mA V _{CE} = 1V, I _C = 100mA	40 70 100 60 30	300	
V _{CE(sat)}	Collector-Emitter Saturation Voltage *	I _C = 10mA, I _B = 1mA I _C = 50mA, I _B = 5mA		0.2 0.3	V V
V _{BE(sat)}	Base-Emitter Saturation Voltage *	I _C = 10mA, I _B = 1mA I _C = 50mA, I _B = 5mA	0.65	0.85 0.95	V V
C _{ob}	Output Capacitance	V _{CB} = 5V, I _E = 0, f = 1MHz		4	pF
f _T	Current Gain-Bandwidth Product	V _{CE} = 20V, I _C = 10mA, f = 100MHz	300		MHz
NF	Noise Figure	I _C = 100μA, V _{CE} = 5V, R _S = 1KΩ f = 10Hz to 15.7KHz		5	dB
t _{ON}	Turn On Time	V _{CC} = 3V, V _{BE} = 0.5V I _C = 10mA, I _{B1} = 1mA		70	ns
t _{OFF}	Turn Off Time	V _{CC} = 3V, I _C = 10mA, I _{B1} = I _{B2} = 1mA		250	ns

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Typical Performance Characteristics

Figure 1. DC current Gain

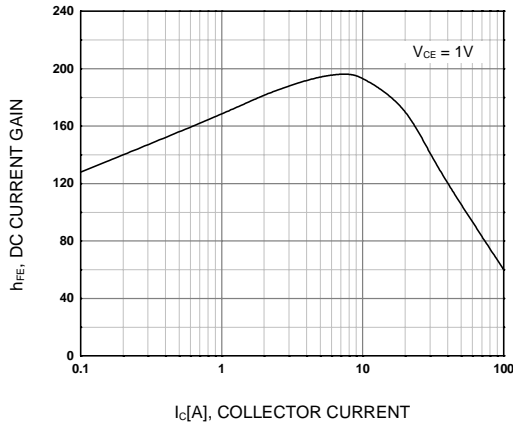


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

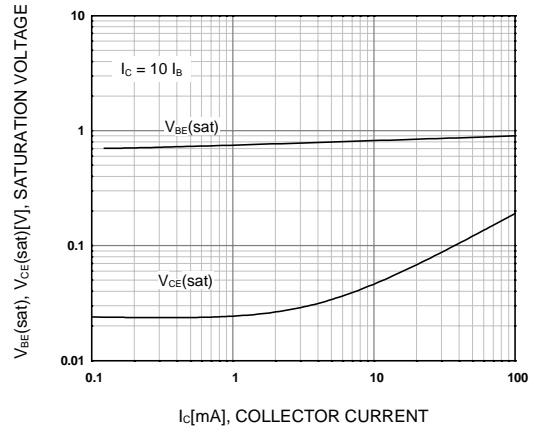


Figure 3. Output Capacitance

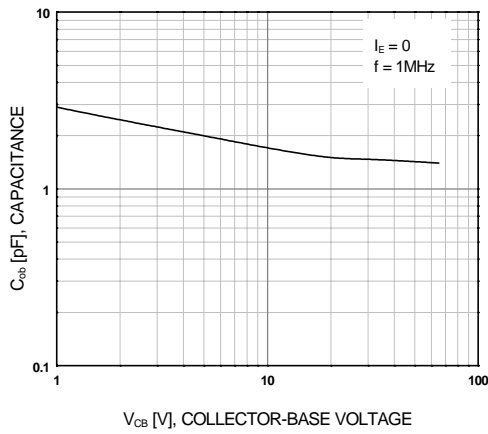
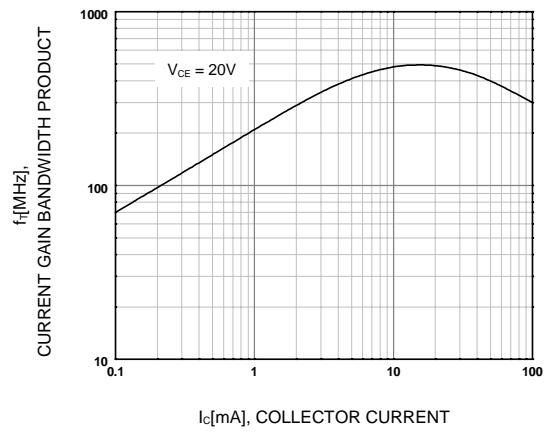
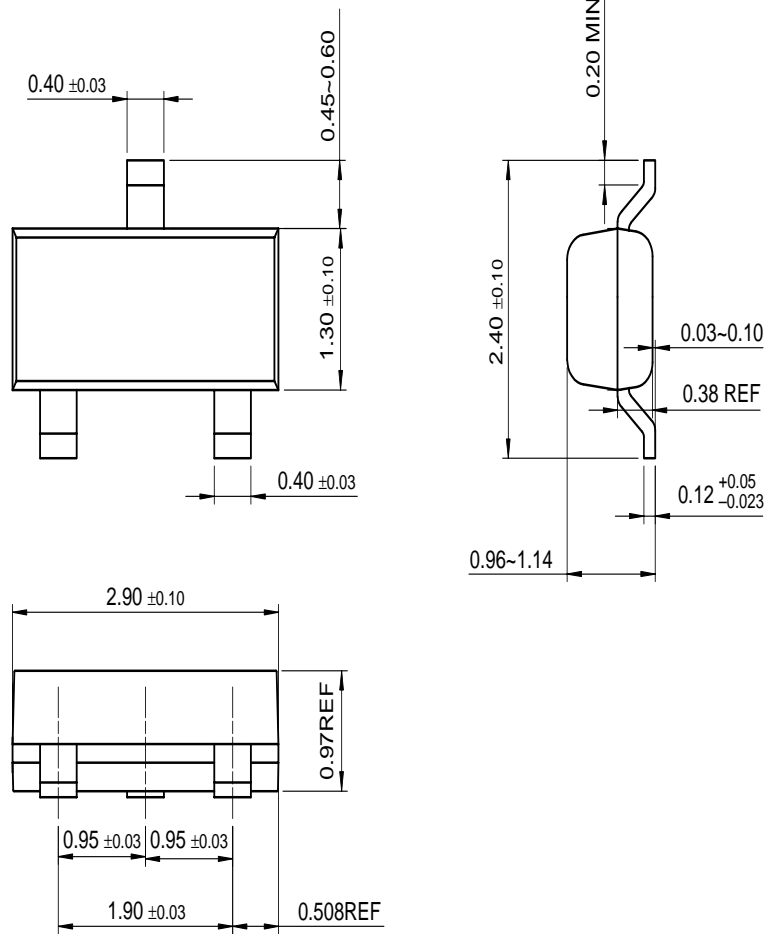


Figure 4. Current Gain Bandwidth Product



Mechanical Dimensions

SOT-23



Dimensions in Millimeters

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