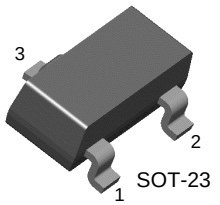
FAIRCHILD
SEMICONDUCTOR®

MMBT3646

Switching Transistor



SOT-23

1. Base 2. Emitter 3. Collector

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	15	V
V_{CES}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5	
I_C	Collector Current (DC) - Continuous	300	mA
P_D	Total Device Dissipation @ T_A=25°C - Derate above 25°C	625 5	mW mW/°C
T_J, T_{STG}	Operating and Storage Junction Temperature Range	150	°C

Electrical Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Units
Off Characteristics					
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage (I_C = 100μAdc, V_{BE} = 0)	40			V
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage (1) (I_C = 10mAdc, I_B = 0)	15			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_C = 100μAdc, I_E = 0)	40			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_E = 100μAdc, I_C = 0)	5			V
I_{CES}	Collector Cut-off Current (V_{CE} = 20Vdc, V_{BE} = 0) (V_{CE} = 20Vdc, V_{BE} = 0, T_A = 65°C)			0.5 3	μA
On Characteristics (1)					
h_{FE}	DC Current Gain (I_C = 30mAdc, V_{CE} = 0.4Vdc) (I_C = 100mAdc, V_{CE} = 0.5Vdc) (I_C = 300mAdc, V_{CE} = 1Vdc)	30 25 15		120	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (I_C = 30mAdc, I_B = 3mAdc) (I_C = 100mAdc, I_B = 10mAdc) (I_C = 300mAdc, I_B = 30mAdc) (I_C = 30mA, I_B = 3mA, T_A =65°C)			0.2 0.28 0.5 0.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage (I_C = 30mAdc, I_B = 3mAdc) (I_C = 100mAdc, I_B = 10mAdc) (I_C = 300mAdc, I_B = 30mAdc)	0.73		0.95 1.2 1.7	V

Electrical Characteristics T_C=25°C unless otherwise noted) (Continued)

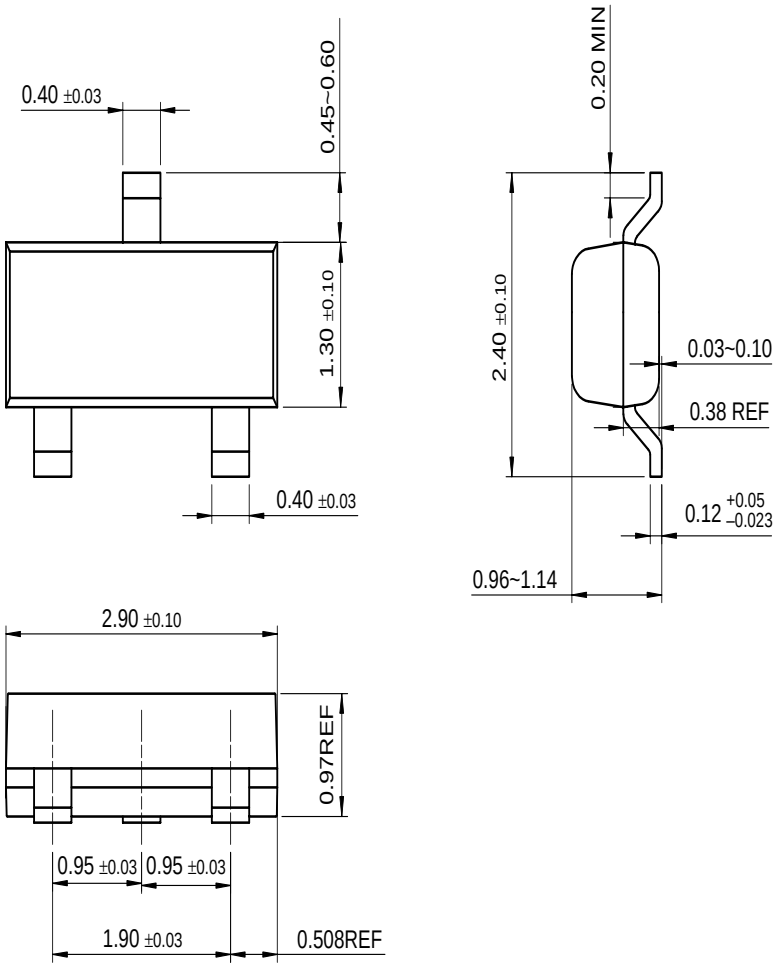
Symbol	Parameter		Min.	Typ.	Max.	Units
Small-Signal Characteristics						
C_{obo}	Output Capacitance (V_{CE} = 5Vdc, I_E = 0, f = 1MHz)				5	pF
C_{ibo}	Input Capacitance (V_{EB} = 0.5Vdc, I_C = 0, f = 1MHz)				8	pF
Switching Characteristics						
t_{on}	Turn-On Time	V_{CC} = 10Vdc, I_C = 300mAdc, I_{B1} = 30mAdc, $V_{CE(off)}$ = 3V			18	ns
t_d	Delay Time				10	ns
t_r	Rise Time				15	ns
t_{off}	Turn-Off Time	V_{CC} = 10Vdc, I_C = 300mAdc, I_{B1} = I_{B2} = 30mAdc			28	ns
t_f	Fall Time				15	ns
t_s	Storge Time				20	ns

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient			200	°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case			83.3	°C

Package Dimensions

SOT-23



Dimensions in Millimeters

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CROSSVOLT™	FRFET™	MicroPak™	QFET™	SuperSOT™-8
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