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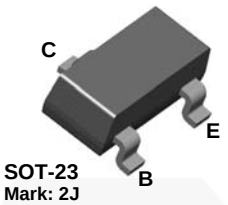
March 2014

MMBT3640
PNP Switching Amplifier

Description

This device is designed for very high-speed saturated switching at collector currents to 100 mA. Sourced from process 65.



SOT-23
Mark: 2J

Ordering Information

Part Number	Marking	Package	Packing Method
MMBT3640	2J	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings(1),(2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-12	V
V_{CBO}	Collector-Base Voltage	-12	V
V_{EBO}	Emitter-Base Voltage	-4	V
I_C	Collector Current - Continuous	-200	mA
T_J , T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Notes:

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics(3)

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation	225	mW
	Derate Above T_A = 25°C	1.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	556	°C/W

Note:

3. Device mounted on FR-4 PCB 1.6 inch X 1.6 inch X 0.06 inch.

Electrical Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage[4]	I_C = -10 mA, I_B = 0	-12		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	I_C = -100 µA, V_{BE} = 0	-12		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = -100 µA, I_E = 0	-12		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = -100 µA, I_C = 0	-4.0		V
I_{CES}	Collector Cut-Off Current	V_{CE} = -6.0 V, V_{BE} = 0		-0.01	µA
		V_{CE} = -6.0 V, V_{BE} = 0, T_A = 65°C		-1.00	
I_B	Base Current	V_{CE} = -6.0 V, V_{BE} = 0		-10	nA
h_{FE}	DC Current Gain[4]	I_C = -10 mA, V_{CE} = -0.3 V	30	120	
		I_C = -50 mA, V_{CE} = -1.0 V	20		
V_{CE}(sat)	Collector-Emitter Saturation Voltage[4]	I_C = -10 mA, I_B = -0.5 mA		-0.30	V
		I_C = -10 mA, I_B = -1.0 mA		-0.20	
		I_C = -50 mA, I_B = -5.0 mA		-0.60	
		I_C = -10 mA, I_B = -1.0 mA, T_A = 65°C		-0.25	
V_{BE}(sat)	Base-Emitter Saturation Voltage[4]	I_C = -10 mA, I_B = -0.5 mA	-0.75	-0.95	V
		I_C = -10 mA, I_B = -1.0 mA	-0.80	-1.00	
		I_C = -50 mA, I_B = -5.0 mA		-1.50	
f_T	Current Gain - Bandwidth Product	I_C = -10 mA, V_{CE} = -5.0 V, f = 100 MHz	500		MHz
C_{ob}	Output Capacitance	V_{CB} = -5.0 V, I_E = 0, f = 1.0 MHz		3.5	pF
C_{ib}	Input Capacitance	V_{EB} = -0.5 V, I_C = 0, f = 1.0 MHz		3.5	pF
t_d	Delay Time	V_{CC} = -6 V, $V_{BE(off)}$ = -1.9 V, I_C = -50 mA, I_{B1} = -5.0 mA		10	ns
t_r	Rise Time			30	ns
t_s	Storage Time	V_{CC} = -6 V, I_C = -50 mA, I_{B1} = I_{B2} = -5.0 mA		20	ns
t_f	Fall Time			12	ns
t_{on}	Turn-On Time	V_{CC} = -6 V, $V_{BE(off)}$ = -1.9 V, I_C = -50 mA, I_{B1} = -5.0 mA		25	ns
		V_{CC} = -1.5 V, I_C = -10 mA, I_{B1} = I_{B2} = -0.5 mA		60	
t_{off}	Turn-Off Time	V_{CC} = -6 V, $V_{BE(off)}$ = -1.9 V, I_C = -50 mA, I_{B1} = -5.0 mA		35	ns
		V_{CC} = -1.5 V, I_C = -10 mA, I_{B1} = I_{B2} = -0.5 mA		75	

Note:

4. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2.0%.

Physical Dimensions

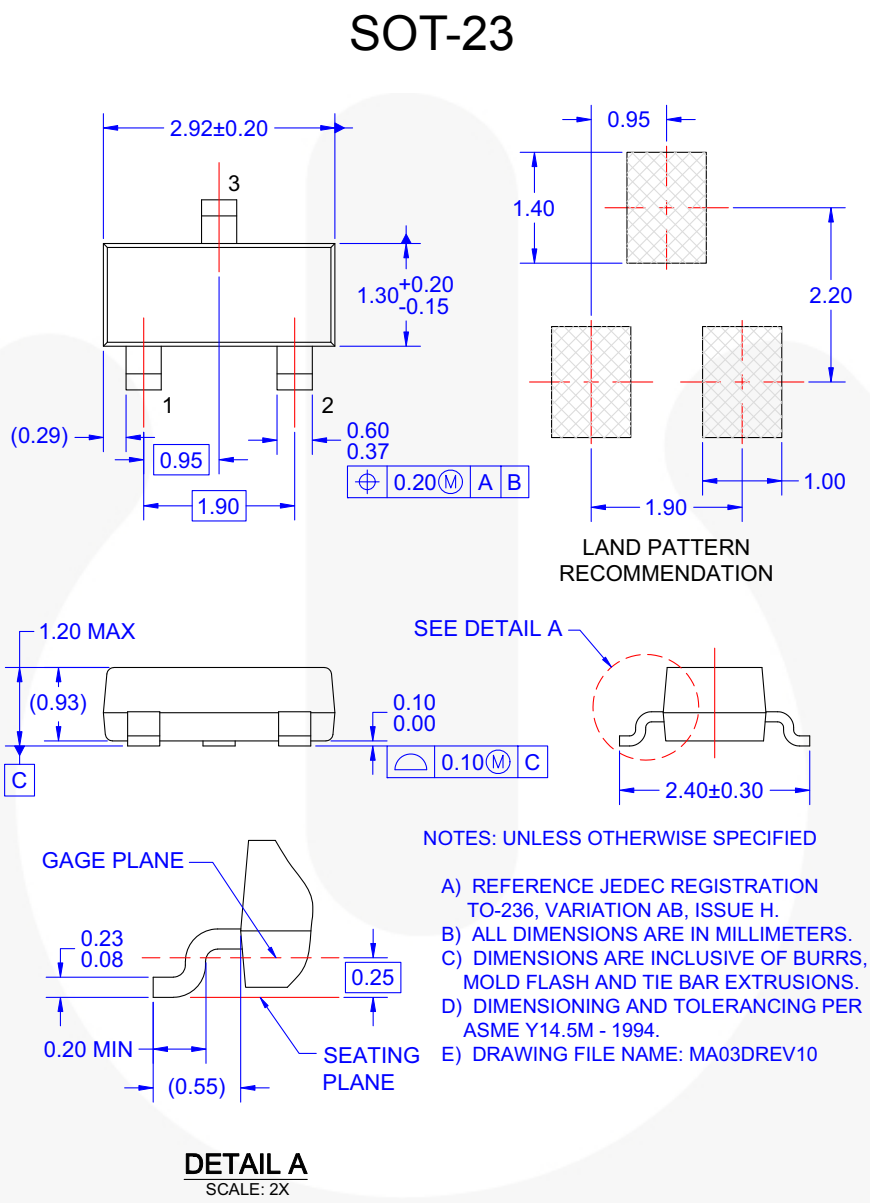


Figure1. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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