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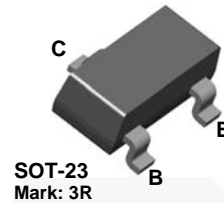


March 2014

# MMBT5771 PNP Switching Amplifier

## Description

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



## Ordering Information

Part Number	Marking	Package	Packing Method
MMBT5771	3R	SOT-23 3L	Tape and Reel

## Absolute Maximum Ratings<sup>(1),(2)</sup>

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  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	-15	V
$V_{CBO}$	Collector-Base Voltage	-15	V
$V_{EBO}$	Emitter-Base Voltage	-4.5	V
$I_C$	Collector Current - Continuous	-200	mA
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

### Notes:

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

## Thermal Characteristics<sup>(3)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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

### Note:

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

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage <sup>(4)</sup>	$I_C = -3.0\text{ mA}, I_B = 0$	-15		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = -100\ \mu\text{A}, V_{BE} = 0$	-15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -100\ \mu\text{A}, I_E = 0$	-15		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -100\ \mu\text{A}, I_C = 0$	-4.5		V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -8.0\text{ V}, I_E = 0$		-10	nA
$I_{CES}$	Collector Cut-Off Current	$V_{CE} = -8.0\text{ V}, V_{BE} = 0$		-10	nA
		$V_{CE} = -8.0\text{ V}, V_{BE} = 0,$ $T_A = 125^\circ\text{C}$		-5.0	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -4.5\text{ V}, I_C = 0$		-1.0	$\mu\text{A}$
$h_{FE}$	DC Current Gain <sup>(4)</sup>	$I_C = -1.0\text{ mA}, V_{CE} = -0.5\text{ V}$	35		V
		$I_C = -10\text{ mA}, V_{CE} = -0.3\text{ V}$	50	120	
		$I_C = -10\text{ mA}, V_{CE} = -0.3\text{ V},$ $T_A = -55^\circ\text{C}$	20		
		$I_C = -50\text{ mA}, V_{CE} = -1.0\text{ V}$	40		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(4)</sup>	$I_C = -1.0\text{ mA}, I_B = -0.1\text{ mA}$		-0.15	V
		$I_C = -10\text{ mA}, I_B = -1.0\text{ mA}$		-0.18	
		$I_C = -50\text{ mA}, I_B = -5.0\text{ mA}$		-0.60	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(4)</sup>	$I_C = -1.0\text{ mA}, I_B = -0.1\text{ mA}$		-0.80	V
		$I_C = -10\text{ mA}, I_B = -1.0\text{ mA}$	-0.75	-0.95	
		$I_C = -50\text{ mA}, I_B = -5.0\text{ mA}$		-1.50	
$C_{ob}$	Output Capacitance	$V_{CB} = -5.0\text{ V}, I_E = 0,$ $f = 140\text{ kHz}$		3.0	pF
$C_{ib}$	Input Capacitance	$V_{EB} = -0.5\text{ V}, I_C = 0,$ $f = 140\text{ kHz}$		3.5	pF
$h_{fe}$	Small-Signal Current Gain	$I_C = -10\text{ mA}, V_{CE} = -10\text{ V},$ $f = 100\text{ MHz}$	8.5		
$t_s$	Storage Time	$I_C = -10\text{ mA}, V_{CC} = -1.5\text{ V},$ $I_{B1} = I_{B2} = -1.0\text{ mA}$		20	ns
$t_{on}$	Turn-On Time	$I_C = -10\text{ mA}, V_{CC} = -1.5\text{ V},$ $I_B = -1.0\text{ mA}$		15	ns
$t_{off}$	Turn-Off Time	$I_C = -10\text{ mA}, V_{CC} = -1.5\text{ V},$ $I_{B1} = I_{B2} = -1.0\text{ mA}$		20	ns

### Note:

4. Pulse test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

Physical Dimensions

SOT-23

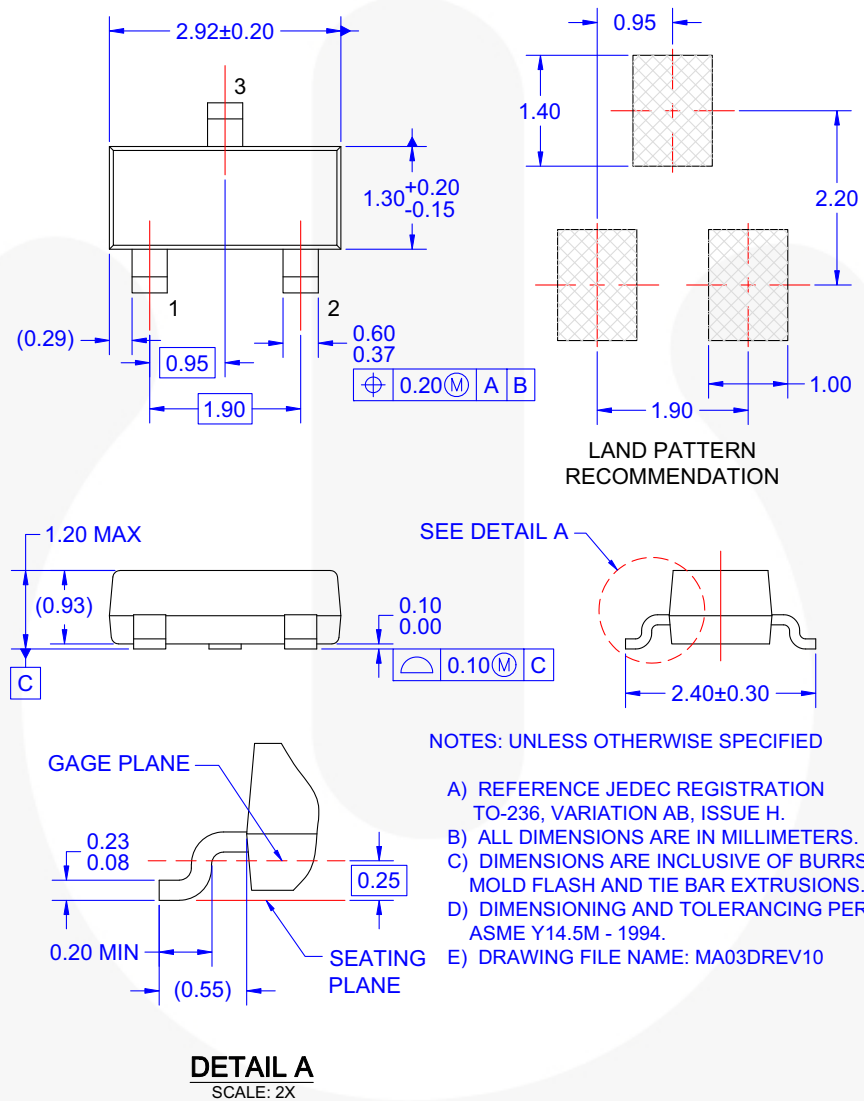


Figure 1. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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