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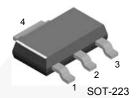


November 2014

NZT651 NPN Current Driver Transistor

Description

This device is designed for power amplifier, regulator and switching circuits where speed is important. Sourced from process 4P.



1. Base 2,4. Collector 3. Emitter

Ordering Information

Part Number	Marking	Package	Packing Method	
NZT651	651	SOT-223 4L	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 $T_A = 25^{\circ}\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage	60	V
V _{CBO}	Collector-Base Voltage	80	V
V_{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	4.0	Α
T _J , T _{STG}	Operating and Storage Junction 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 $T_A = 25^{\circ}C$ unless otherwise noted.

Symbol	Parameter	Max.	Unit
P _D	Total Power Dissipation	1.2	W
	Derate Above 25°C	9.7	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	103	°C/W

Note:

3. Device is mounted on FR-4 PCB 36 mm X 18 mm X 1.5 mm; mounting pad for the collector lead minimum 6 cm².

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	I _C = 10 mA, I _B = 0	60		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_C = 100 \mu A, I_E = 0$	80		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 100 μA, I _C = 0	5.0		V
I _{CBO}	Collector Cut-Off Current	$V_{CB} = 80 \text{ V}, I_{E} = 0$		100	nA
I _{EBO}	Emitter Cut-Off Current	$V_{EB} = 4.0 \text{ V}, I_{C} = 0$		0.1	μΑ
		$I_C = 50 \text{ mA}, V_{CE} = 2.0 \text{ V}$	75		
h _{FE}	DC Current Gain ⁽⁴⁾	$I_C = 500 \text{ mA}, V_{CE} = 2.0 \text{ V}$	75		
		$I_C = 1.0 \text{ A}, V_{CE} = 2.0 \text{ V}$	75		
		I _C = 2.0 A, V _{CE} = 2.0 V	40		
V _{CE} (sat)	Collector-Emitter Saturation	I _C = 1.0 A, I _B = 100 mA		0.3	V
	Voltage ⁽⁴⁾	I _C = 2.0 A, I _B = 200 mA		0.5	, v
V _{BE} (sat)	Base-Emitter Saturation Voltage ⁽⁴⁾	I _C = 1.0 A, I _B = 100 mA		1.2	V
V _{BE} (on)	Base-Emitter On Voltage ⁽⁴⁾	I _C = 1.0 A, V _{CE} = 2.0 V		1.0	V
f _T	Current Gain - Bandwidth Product	I _C = 50 mA, V _{CE} = 5.0 V, f = 100 MHz	75		MHz

Note:

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

Typical Performance Characteristics

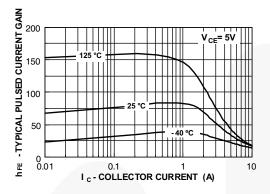


Figure 1. Typical Pulsed Current Gain vs. Collector Current

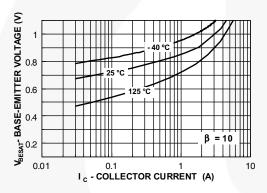


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

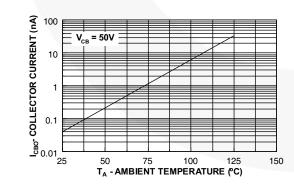


Figure 5. Collector Cut-Off Current vs.
Ambient Temperature

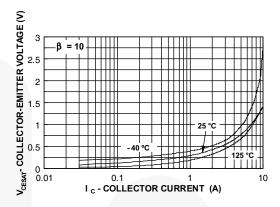


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

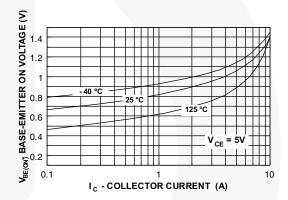


Figure 4. Base-Emitter On Voltage vs. Collector Current

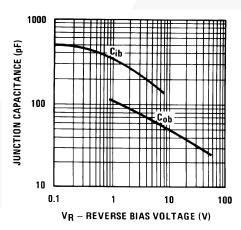


Figure 6. Junction Capacitance vs. Reverse Bias Voltage

Typical Performance Characteristics (Continued)

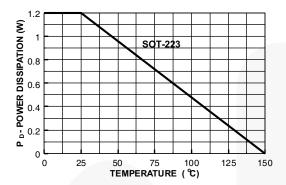
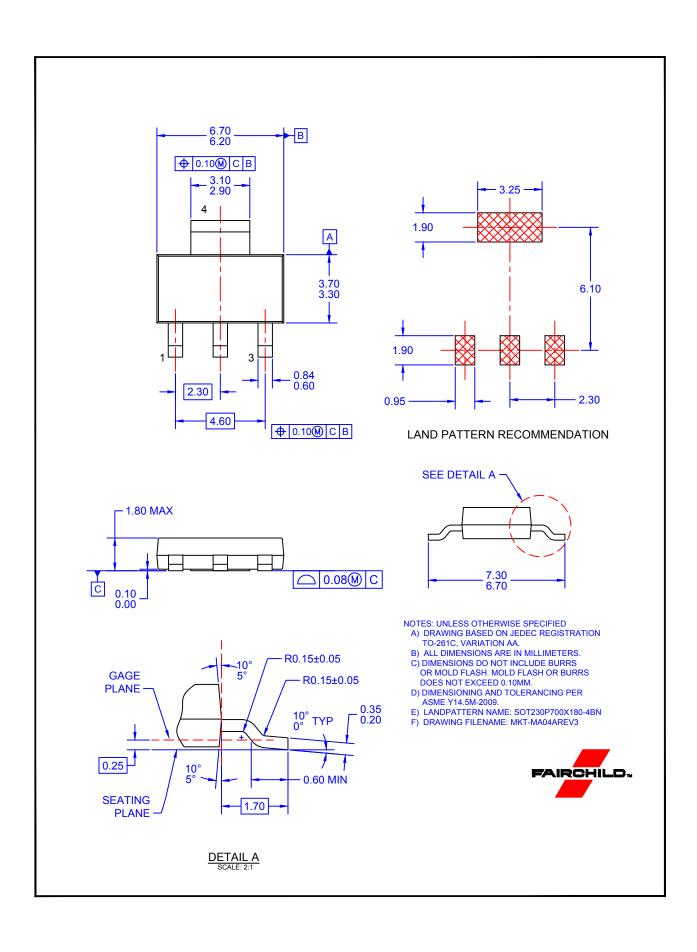


Figure 7. Power Dissipation vs. Ambient Temperature



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Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru 4 moschip.ru 9