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October 2015

# MPSA29

## NPN Darlington Transistor

### Description

This device is designed for applications requiring extremely high current gain at collector currents to 500 mA. Sourced from process 03. See MPSA28 for characteristics.



### Ordering Information

Part Number	Top Mark	Package	Packing Method
MPSA29	MPSA29	TO-92 3L	Bulk
MPSA29_D26Z	MPSA29	TO-92 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	100	V
$V_{CBO}$	Collector-Base Voltage	100	V
$V_{EBO}$	Emitter-Base Voltage	12	V
$I_C$	Collector Current - Continuous	800	mA
$T_J, T_{STG}$	Operating and Storage Junction 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	625	mW
	Derate Above $25^\circ\text{C}$	5.0	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	$^\circ\text{C/W}$

**Note:**

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

**Electrical Characteristics<sup>(4)</sup>**

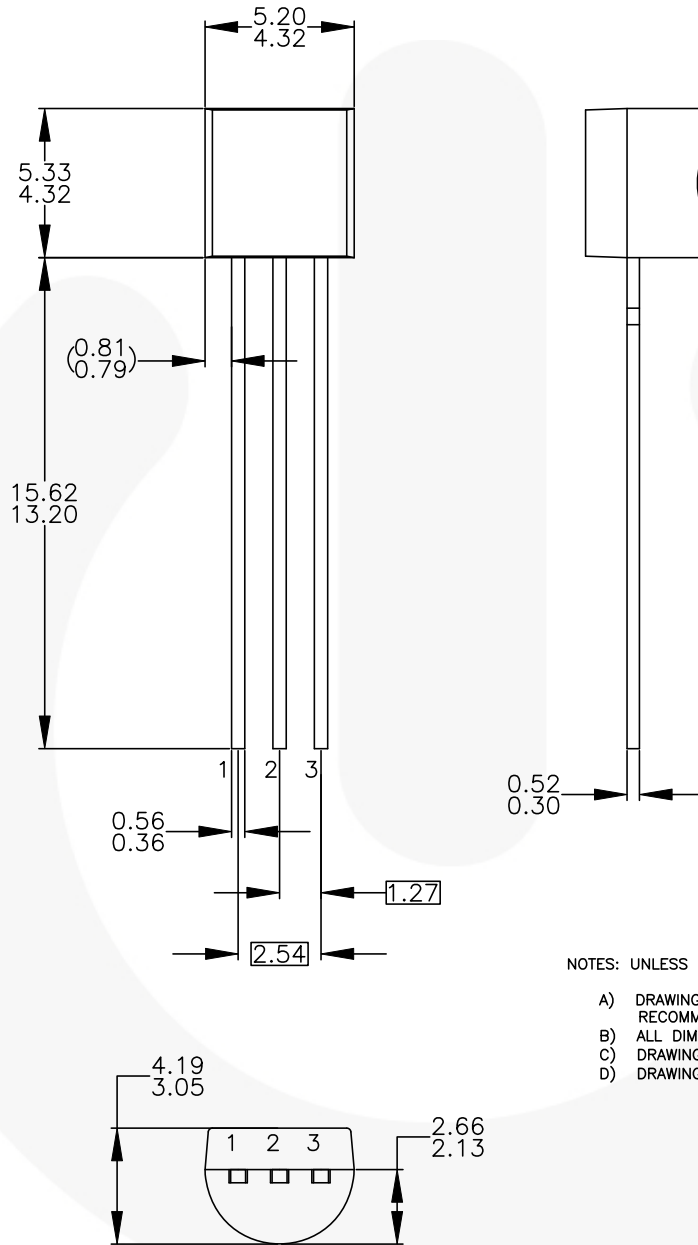
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 100\ \mu\text{A}$ , $I_B = 0$	100		V
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 100\ \mu\text{A}$ , $I_E = 0$	100		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\ \mu\text{A}$ , $I_C = 0$	12		V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 80\ \text{V}$ , $I_E = 0$		100	nA
$I_{CES}$	Collector Cut-Off Current	$V_{CE} = 80\ \text{V}$ , $I_E = 0$		500	nA
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 10\ \text{V}$ , $I_C = 0$		100	nA
$h_{FE}$	DC Current Gain	$V_{CE} = 5.0\ \text{V}$ , $I_C = 10\ \text{mA}$	10,000		
		$V_{CE} = 5.0\ \text{V}$ , $I_C = 100\ \text{mA}$	10,000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\ \text{mA}$ , $I_B = 0.01\ \text{mA}$		1.2	V
		$I_C = 100\ \text{mA}$ , $I_B = 0.1\ \text{mA}$		1.5	
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 100\ \text{mA}$ , $V_{CE} = 5.0\ \text{V}$		2.0	V
$f_T$	Current Gain - Bandwidth Product	$I_C = 10\ \text{mA}$ , $V_{CE} = 5.0\ \text{V}$ , $f = 100\ \text{MHz}$	125		MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10\ \text{V}$ , $I_E = 0$ , $f = 1.0\ \text{MHz}$		8.0	pF

**Note:**

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

# Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-2009.
- D) DRAWING FILENAME: MKT-ZA03DREV4.



Figure 1. 3-Lead, TO-92, Molded, STD Straight Lead, Bulk Type

# Physical Dimensions (Continued)

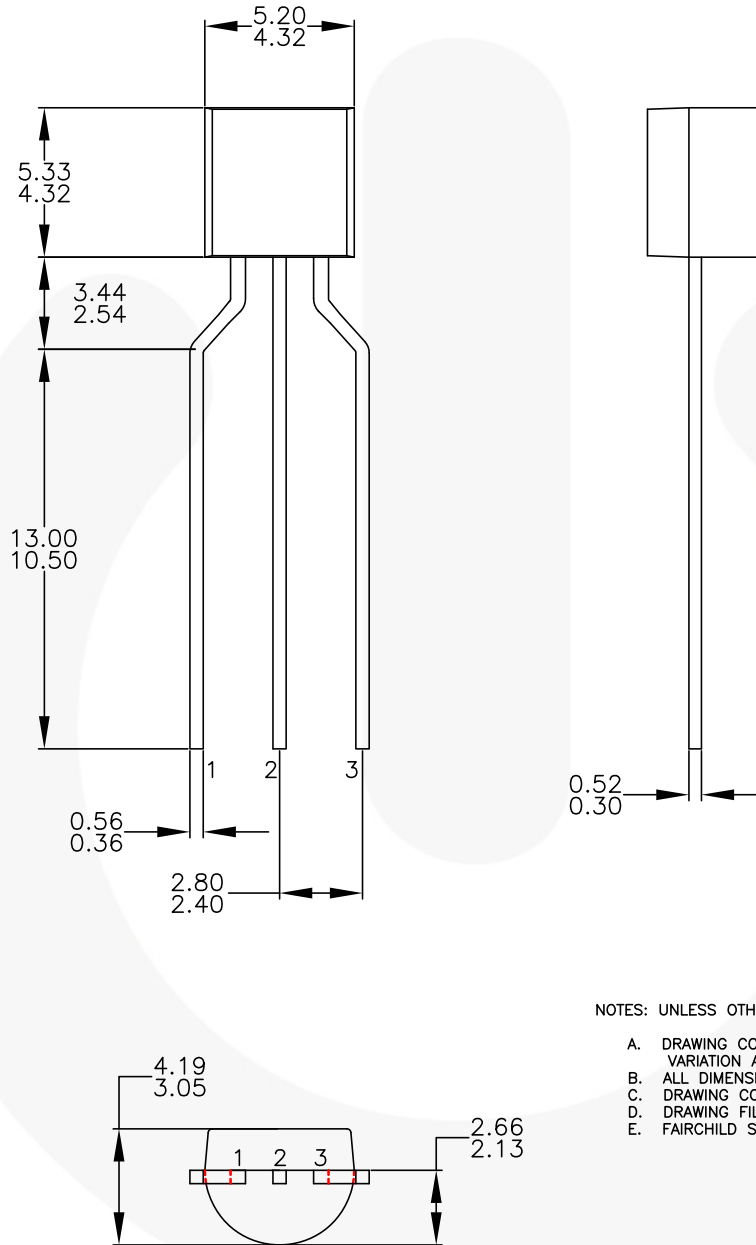


Figure 2. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo, Tape and Reel Type



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