

## **Rochester Electronics Manufactured Components**

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

## **Quality Overview**

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
  - Class Q Military
  - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
  - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

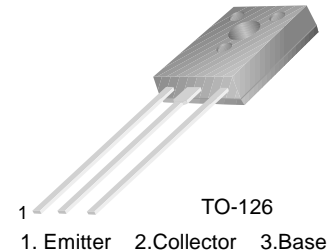
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The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

# BD136/138/140

## Medium Power Linear and Switching Applications

- Complement to BD135, BD137 and BD139 respectively



## PNP Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : BD136	- 45	V
	: BD138	- 60	V
	: BD140	- 80	V
$V_{CEO}$	Collector-Emitter Voltage : BD136	- 45	V
	: BD138	- 60	V
	: BD140	- 80	V
$V_{EBO}$	Emitter-Base Voltage	- 5	V
$I_C$	Collector Current (DC)	- 1.5	A
$I_{CP}$	Collector Current (Pulse)	- 3.0	A
$I_B$	Base Current	- 0.5	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	12.5	W
$P_C$	Collector Dissipation ( $T_a=25^\circ\text{C}$ )	1.25	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 55 ~ 150	$^\circ\text{C}$

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	* Collector-Emitter Sustaining Voltage : BD136	$I_C = - 30\text{mA}, I_B = 0$	- 45			V
	: BD138		- 60			V
	: BD140		- 80			V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = - 30\text{V}, I_E = 0$			- 0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = - 5\text{V}, I_C = 0$			- 10	$\mu\text{A}$
$h_{FE1}$	* DC Current Gain	$V_{CE} = - 2\text{V}, I_C = - 5\text{mA}$	25			
$h_{FE2}$		$V_{CE} = - 2\text{V}, I_C = - 0.5\text{A}$	25			
$h_{FE3}$		$V_{CE} = - 2\text{V}, I_C = - 150\text{mA}$	40		250	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = - 500\text{mA}, I_B = - 50\text{mA}$			- 0.5	V
$V_{BE(on)}$	* Base-Emitter ON Voltage	$V_{CE} = - 2\text{V}, I_C = - 0.5\text{A}$			- 1	V

\* Pulse Test: PW=350 $\mu\text{s}$ , duty Cycle=2% Pulsed

## $h_{FE}$ Classification

Classification	6	10	16
$h_{FE3}$	40 ~ 100	63 ~ 160	100 ~ 250

## Typical Characteristics

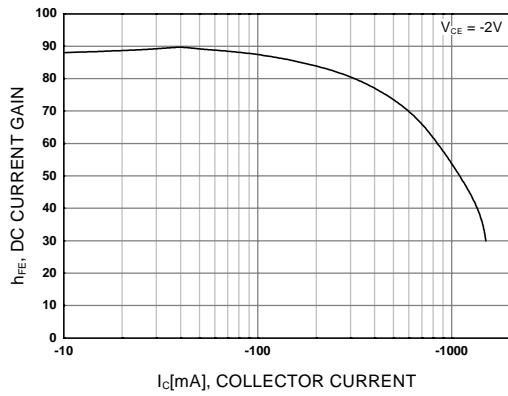


Figure 1. DC current Gain

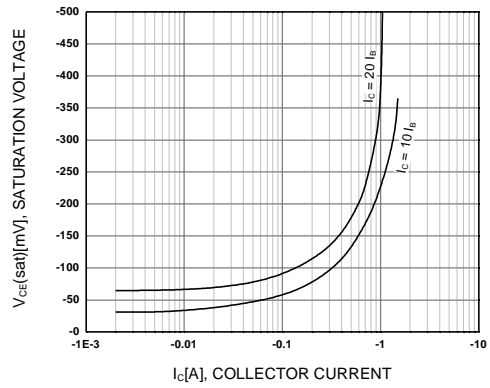


Figure 2. Collector-Emitter Saturation Voltage

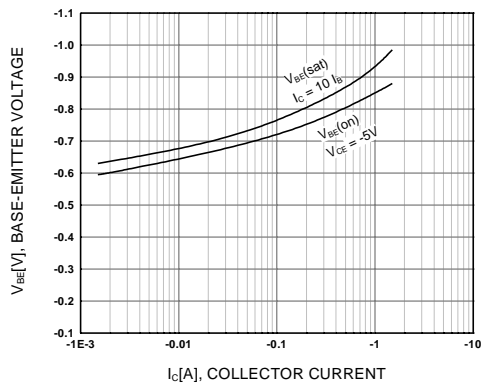


Figure 3. Base-Emitter Voltage

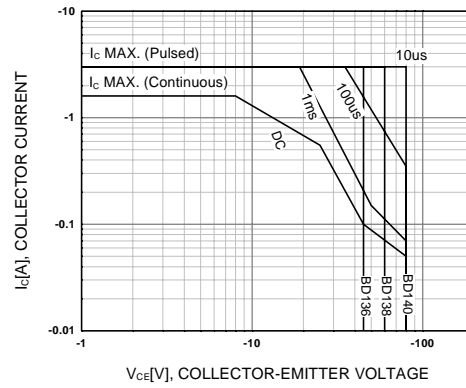


Figure 4. Safe Operating Area

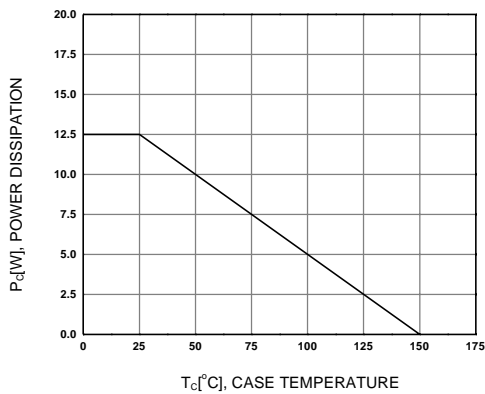
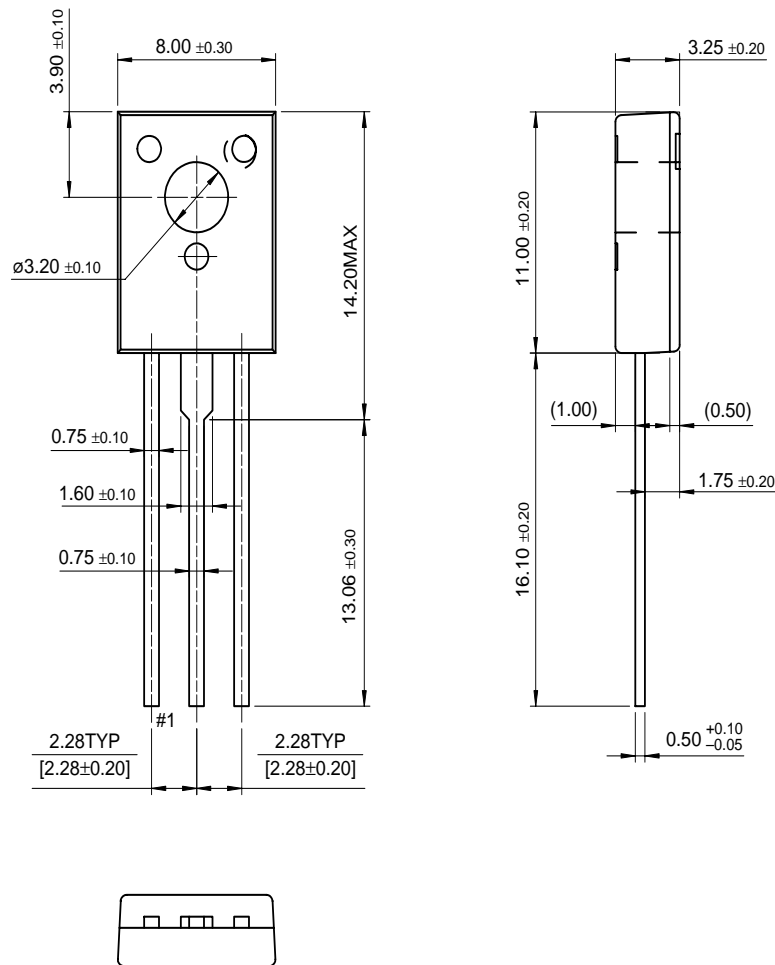


Figure 5. Power Derating

# Package Dimensions

## TO-126



Dimensions in Millimeters

BD136/138/140

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## PRODUCT STATUS DEFINITIONS

### Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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BD138  
PNP Epitaxial Silicon Transistor

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Product status/pricing/package

Product	Product status	Pricing*	Package type	Leads	Packing method
BD13810S	Full Production	\$0.163	<a href="#">TO-126</a>	3	BULK
BD1386S	Full Production	\$0.163	<a href="#">TO-126</a>	3	BULK
BD13816S	Full Production	\$0.163	<a href="#">TO-126</a>	3	BULK
BD13810STU	Full Production	\$0.163	<a href="#">TO-126</a>	3	RAIL
BD1386STU	Full Production	\$0.163	<a href="#">TO-126</a>	3	RAIL
BD13816STU	Full Production	\$0.163	<a href="#">TO-126</a>	3	RAIL

\* 1,000 piece Budgetary Pricing

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
BD14016S	Full Production	\$0.193	<a href="#">TO-126</a>	3	BULK
BD14010S	Full Production	\$0.193	<a href="#">TO-126</a>	3	BULK
BD14010STU	Full Production	\$0.193	<a href="#">TO-126</a>	3	RAIL
BD1406S	Full Production	\$0.193	<a href="#">TO-126</a>	3	BULK
BD14016STU	Full Production	\$0.193	<a href="#">TO-126</a>	3	RAIL
BD1406STU	Full Production	\$0.193	<a href="#">TO-126</a>	3	RAIL

\* 1,000 piece Budgetary Pricing

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BD13610STU	Full Production	\$0.19	<a href="#">TO-126</a>	3	RAIL
BD1366S	Full Production	\$0.19	<a href="#">TO-126</a>	3	BULK
BD13616S	Full Production	\$0.192	<a href="#">TO-126</a>	3	BULK
BD1366STU	Full Production	\$0.19	<a href="#">TO-126</a>	3	RAIL
BD13616STU	Full Production	\$0.192	<a href="#">TO-126</a>	3	RAIL

\* 1,000 piece Budgetary Pricing

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