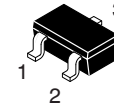


Bipolar Transistor

(-)15 V, (-)0.7 A, Low $V_{CE(sat)}$,
(PNP)NPN Single CP

2SB815, 2SD1048



1: Source
2: Drain
3: Gate

SC-59 / CP3
CASE 318BJ

Features

- Ultrasmall Package Allows Miniaturization in End Products
- Large Current Capacity ($I_C=0.7$ A) and Low-Saturation Voltage
- These are Pb-Free Devices

Specifications

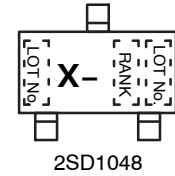
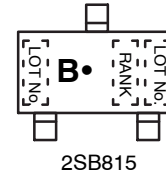
(): 2SB815

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

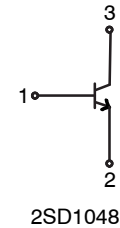
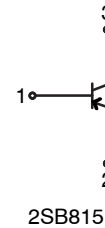
Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	V_{CBO}		(-)20	V
Collector to Emitter Voltage	V_{CEO}		(-)15	V
Emitter to Base Voltage	V_{EBO}		(-)5	V
Collector Current	I_C		(-)0.7	A
Collector Current (Pulse)	I_{CP}		(-)1.5	A
Collector Dissipation	P_C		200	mW
Junction Temperature	T_j		125	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +125	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MARKING DIAGRAMS



ELECTRICAL CONNECTION



ORDERING INFORMATION

Device	Package	Shipping [†]
2SB815-6-TB-E	SC-59 / CP3 (Pb-Free)	3000 / Tape & Reel
2SB815-7-TB-E	SC-59 / CP3 (Pb-Free)	3000 / Tape & Reel
2SD1048-6-TB-E	SC-59 / CP3 (Pb-Free)	3000 / Tape & Reel
2SD1048-7-TB-E	SC-59 / CP3 (Pb-Free)	3000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

2SB815, 2SD1048

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	I _{CBO}	V _{CB} = (-)15 V, I _E = 0 A	-	-	(-)0.1	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} = (-)4 V, I _C = 0 A	-	-	(-)0.1	μA
DC Current Gain	h _{FE1}	V _{CE} = (-)2 V, I _C = (-)50 mA	200*	-	600*	
	h _{FE2}	V _{CE} = (-)2 V, I _C = (-)500 mA	80	-	-	
Gain-Bandwidth Product	f _T	V _{CE} = (-)10 V, I _C = (-)50 mA	-	250	-	MHz
Output Capacitance	C _{ob}	V _{CB} = (-)10 V, f = 1 MHz	-	(13)8	-	pF
Collector to Emitter Saturation Voltage	V _{CE(sat)1}	I _C = (-)5 mA, I _B = (-)0.5 mA	-	(-15)10	(-35)25	mV
	V _{CE(sat)2}	I _C = (-)100 mA, I _B = (-)10 mA	-	(-60)30	(-120)80	mV

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

*The 2SB815/2SD1048 are classified by 50 mA h_{FE} as follows:

Rank	6	7
h _{FE}	200 to 400	300 to 600

2SB815, 2SD1048

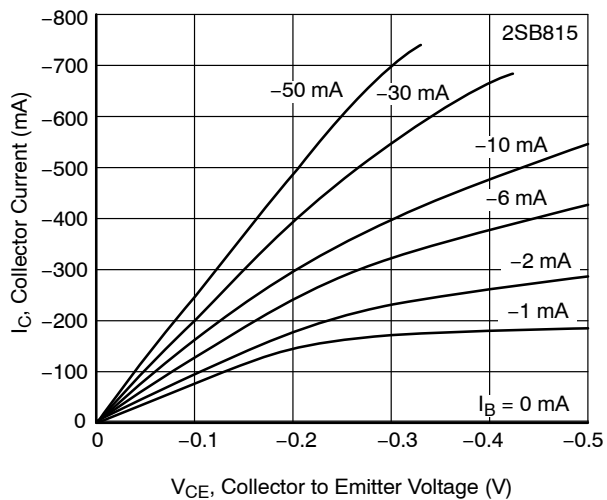


Figure 1. $I_C - V_{CE}$

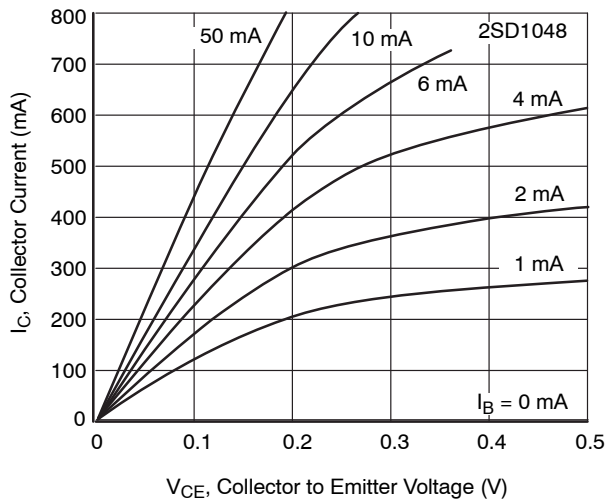


Figure 2. $I_C - V_{CE}$

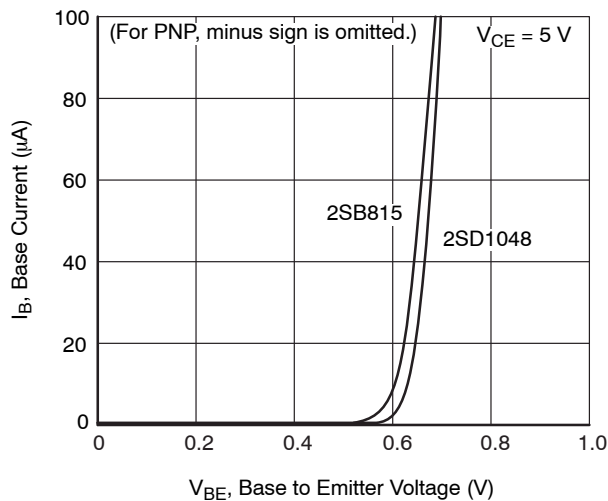


Figure 3. $I_B - V_{BE}$

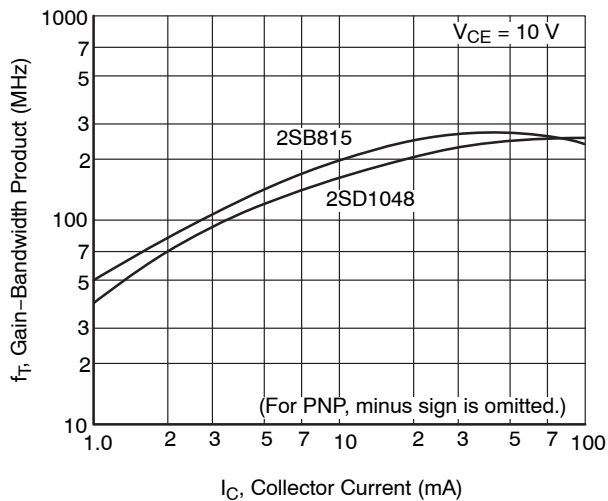


Figure 4. $f_T - I_C$

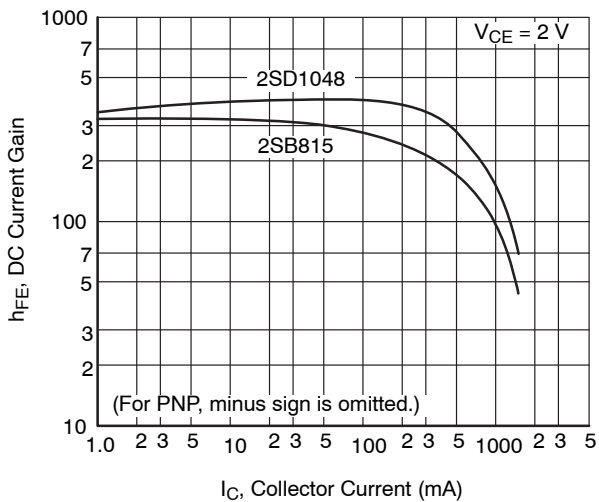


Figure 5. $h_{FE} - I_C$

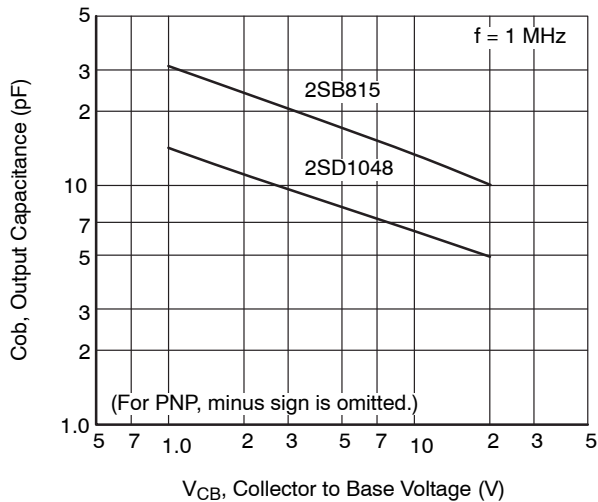


Figure 6. $C_{ob} - V_{CB}$

2SB815, 2SD1048

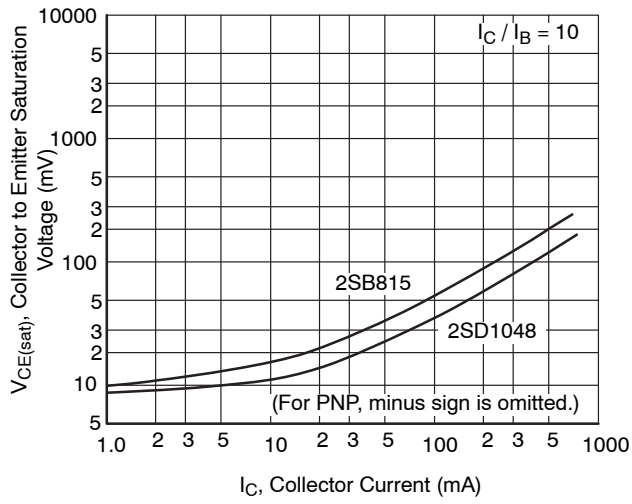


Figure 7. $V_{CE(sat)}$ - I_C

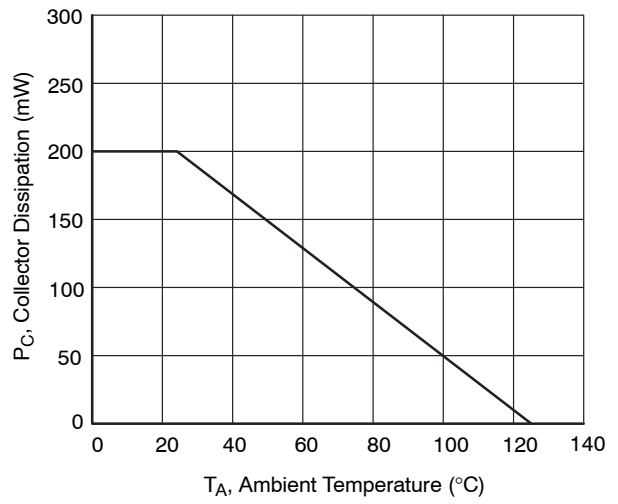


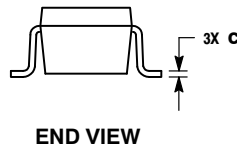
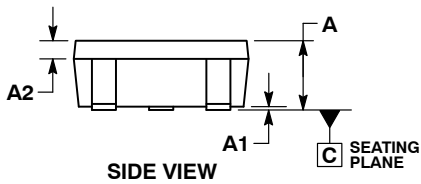
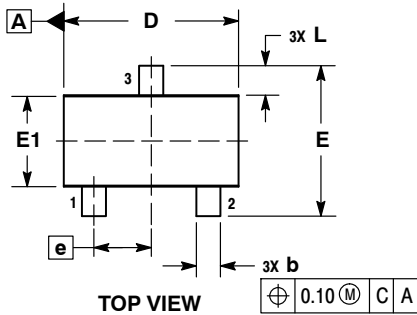
Figure 8. P_C - T_A



SCALE 2:1

SC-59 / CP3
CASE 318BJ
ISSUE 0

DATE 09 JAN 2015

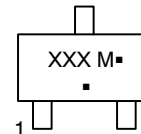


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER SIDE.
4. DIMENSIONS D AND E1 ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10 AND 0.20 FROM THE TIP.

DIM	MILLIMETERS	
	MIN	MAX
A	0.95	1.35
A1	0.00	0.10
A2	0.20	0.40
b	0.35	0.50
c	0.10	0.20
D	2.75	3.05
E	2.30	2.70
E1	1.35	1.65
e	0.95 BSC	
L	0.35	0.75

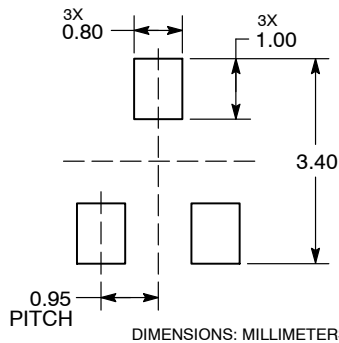
GENERIC MARKING DIAGRAM



- XXX = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)
*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, [SOLDERRM/D](#).

DOCUMENT NUMBER:	98AON94458F	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SC-59 / CP3	PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

