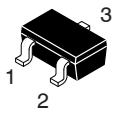
Bipolar Transistor

(–)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

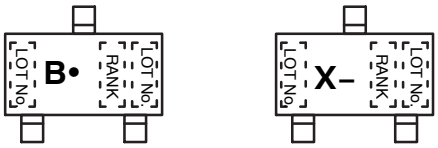
( ): 2SB815

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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	Tj		125	°C
Storage Temperature	Tstg		–55 to +125	°C

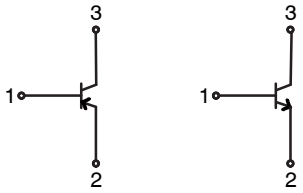
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MARKING DIAGRAMS



2SB815 2SD1048

ELECTRICAL CONNECTION



2SB815 2SD1048

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.

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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	$h_{FE}1$	V_{CE} = (−)2 V, I_C = (−)50 mA	200*	–	600*	
	$h_{FE}2$	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	Cob	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

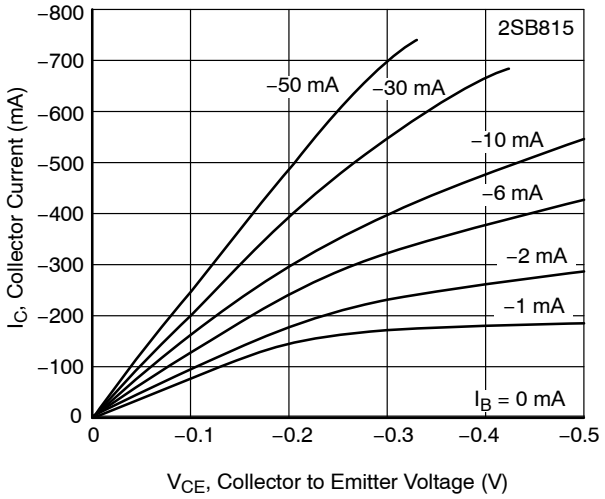

Figure 1. I_C – V_{CE}

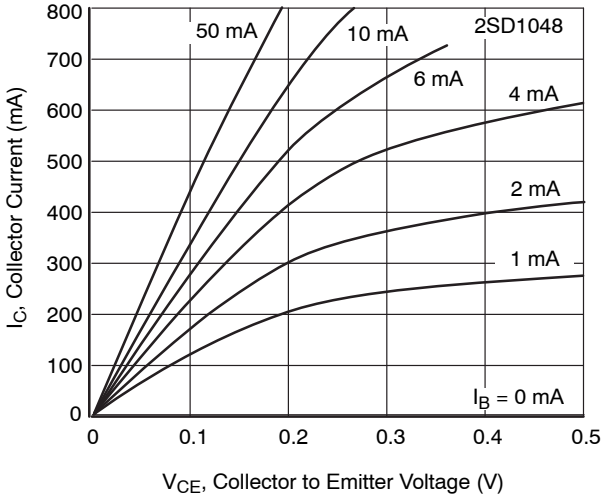

Figure 2. I_C – V_{CE}

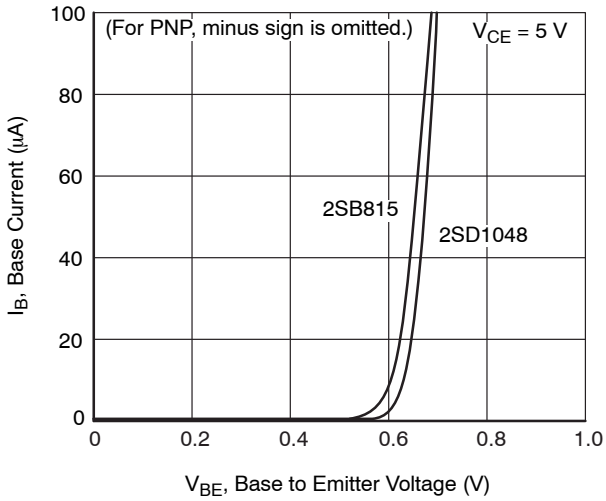

Figure 3. I_B – V_{BE}

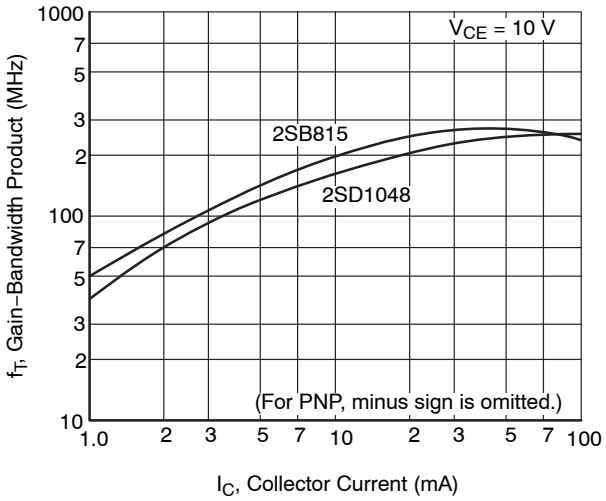

Figure 4. f_T – I_C

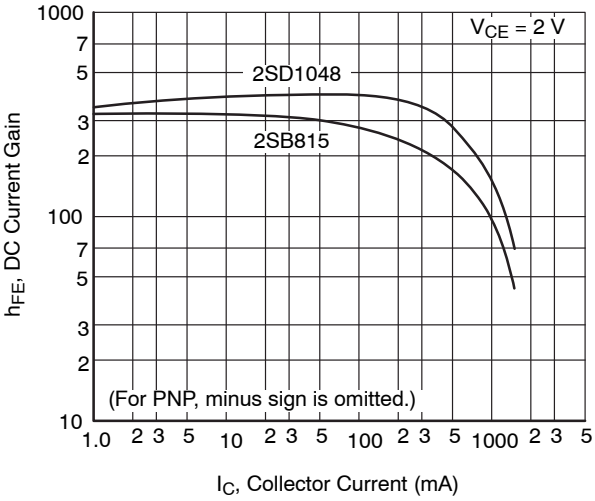

Figure 5. h_{FE} – I_C

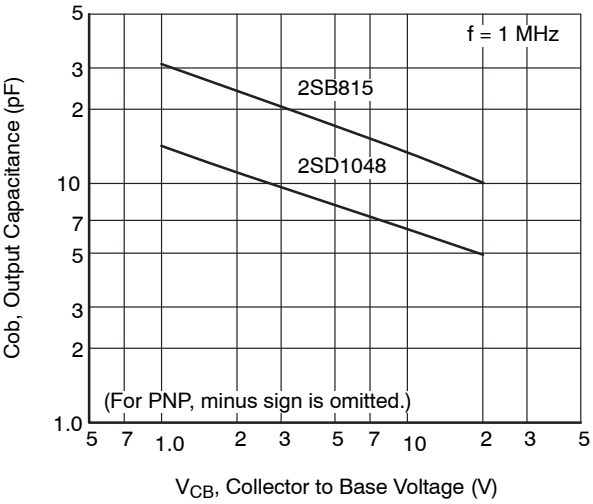

Figure 6. Cob – V_{CB}

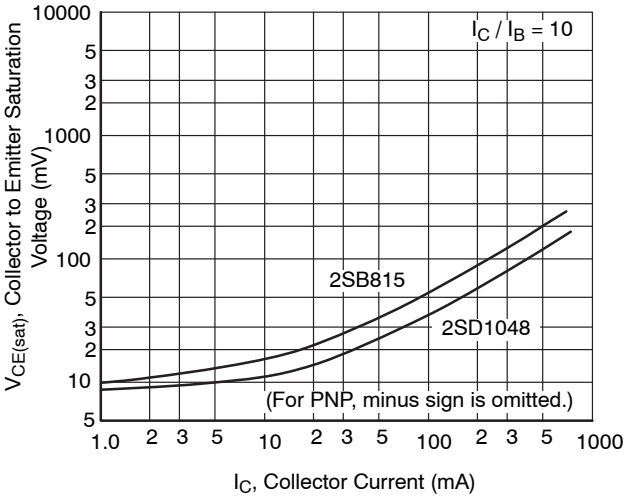

Figure 7. $V_{CE(sat)}$ – I_C

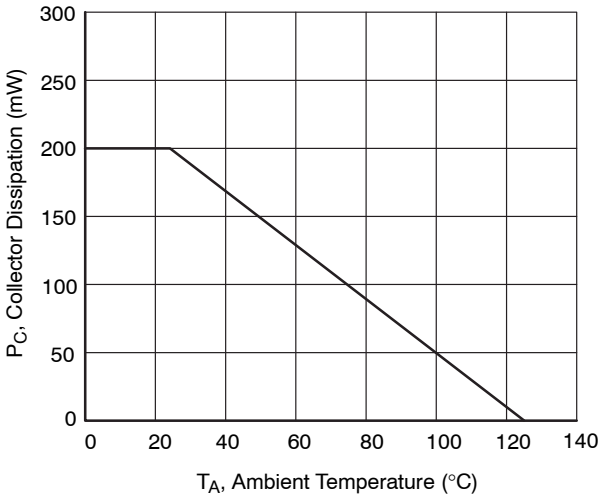

Figure 8. P_C – T_A

SCALE 2:1

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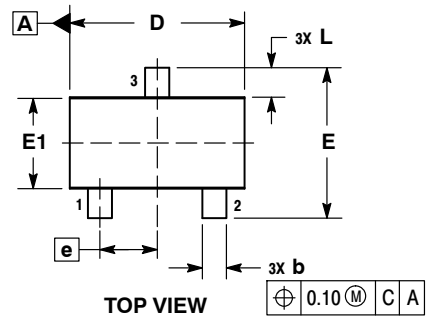
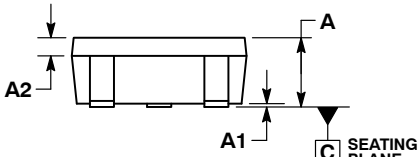
ISSUE O

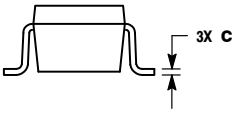
DATE 09 JAN 2015



TOP VIEW



SIDE VIEW

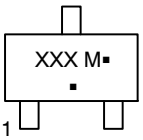


END VIEW

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.

	MILLIMETERS	
DIM	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

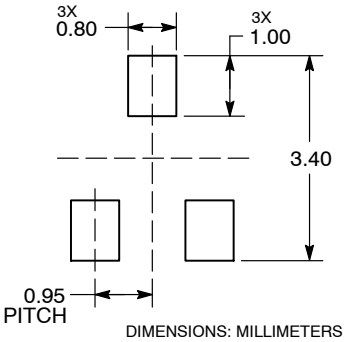
GENERIC MARKING DIAGRAM



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*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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