

# MUN2130, MMUN2130L, MUN5130, DTA113EE, DTA113EM3, NSBA113EF3



## Digital Transistors (BRT) $R1 = 1 \text{ k}\Omega$ , $R2 = 1 \text{ k}\Omega$

### PNP Transistors with Monolithic Bias Resistor Network

This series of digital transistors is designed to replace a single device and its external resistor bias network. The Bias Resistor Transistor (BRT) contains a single transistor with a monolithic bias network consisting of two resistors; a series base resistor and a base-emitter resistor. The BRT eliminates these individual components by integrating them into a single device. The use of a BRT can reduce both system cost and board space.

#### Features

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- S and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

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

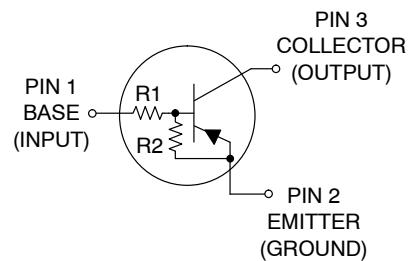
Rating	Symbol	Max	Unit
Collector-Base Voltage	$V_{CBO}$	50	Vdc
Collector-Emitter Voltage	$V_{CEO}$	50	Vdc
Collector Current – Continuous	$I_C$	100	mAdc
Input Forward Voltage	$V_{IN(fwd)}$	10	Vdc
Input Reverse Voltage	$V_{IN(rev)}$	10	Vdc

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.

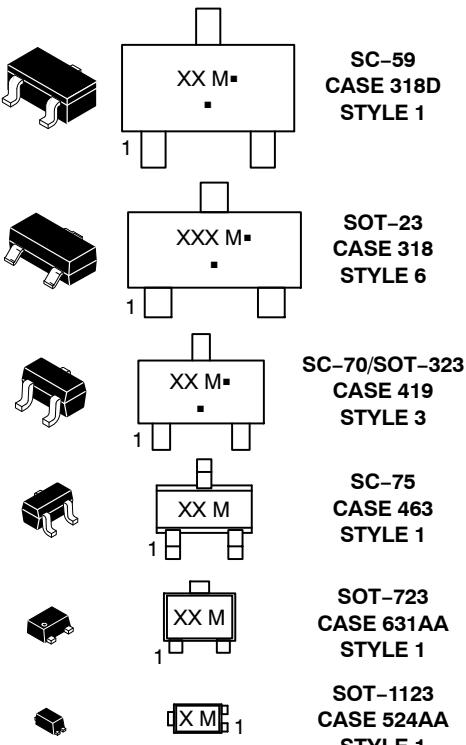
ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

#### PIN CONNECTIONS



#### MARKING DIAGRAMS



XXX = Specific Device Code

M = Date Code\*

▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation may vary depending upon manufacturing location.

#### ORDERING INFORMATION

See detailed ordering, marking, and shipping information on page 2 of this data sheet.

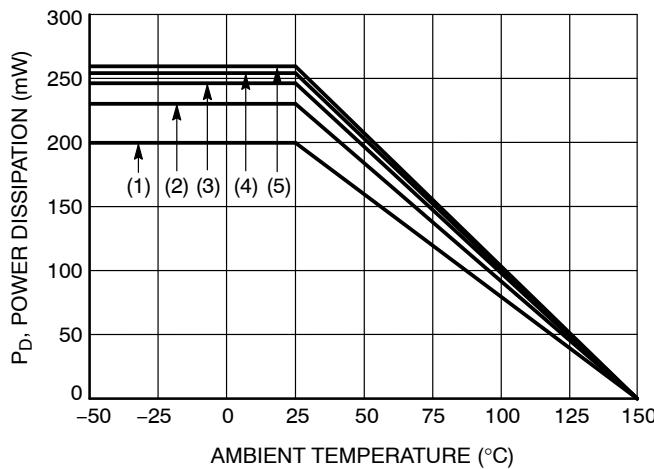
# MUN2130, MMUN2130L, MUN5130, DTA113EE, DTA113EM3, NSBA113EF3

**Table 1. ORDERING INFORMATION**

Device	Part Marking	Package	Shipping <sup>†</sup>
MUN2130T1G	6G	SC-59 (Pb-Free)	3000 / Tape & Reel
MMUN2130LT1G	A6G	SOT-23 (Pb-Free)	3000 / Tape & Reel
MUN5130T1G	6G	SC-70/SOT-323 (Pb-Free)	3000 / Tape & Reel
DTA113EET1G	6G	SC-75 (Pb-Free)	3000 / Tape & Reel
DTA113EM3T5G, NSVDTA113EM3T5G*	7E	SOT-723 (Pb-Free)	8000 / Tape & Reel
NSBA113EF3T5G	L (180°)**	SOT-1123 (Pb-Free)	8000 / Tape & Reel

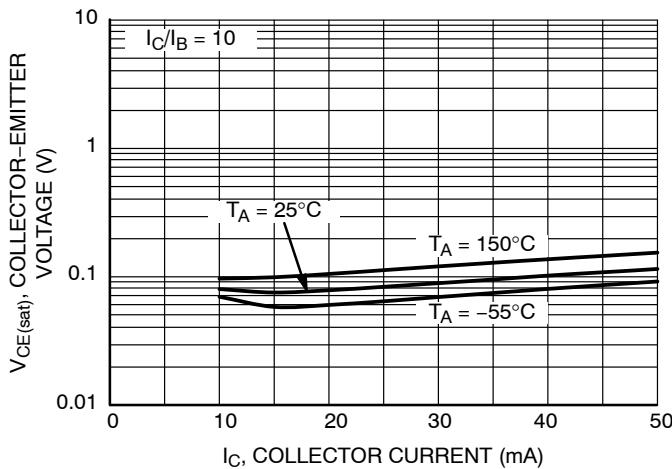
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*\* (xx°) = Degree rotation in the clockwise direction.

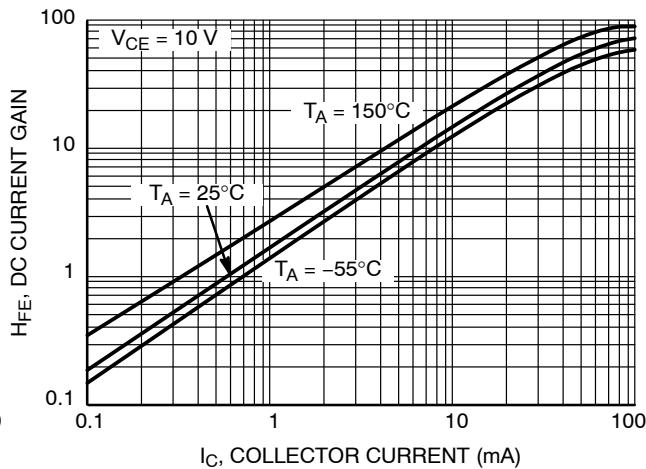


- (1) SC-75 and SC-70/SOT323; Minimum Pad
- (2) SC-59; Minimum Pad
- (3) SOT-23; Minimum Pad
- (4) SOT-1123; 100 mm<sup>2</sup>, 1 oz. copper trace
- (5) SOT-723; Minimum Pad

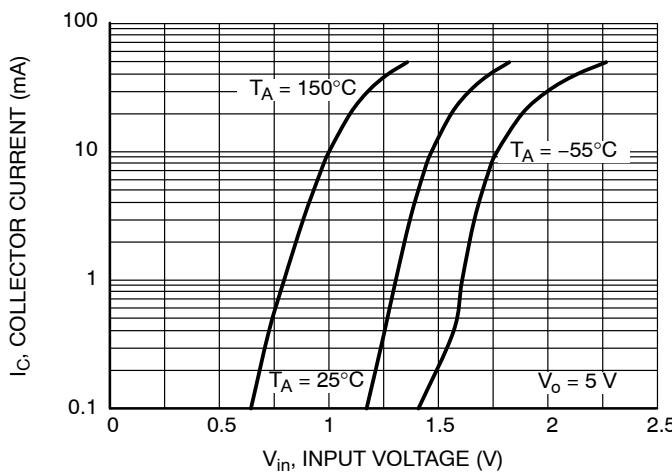
**Figure 1. Derating Curve**



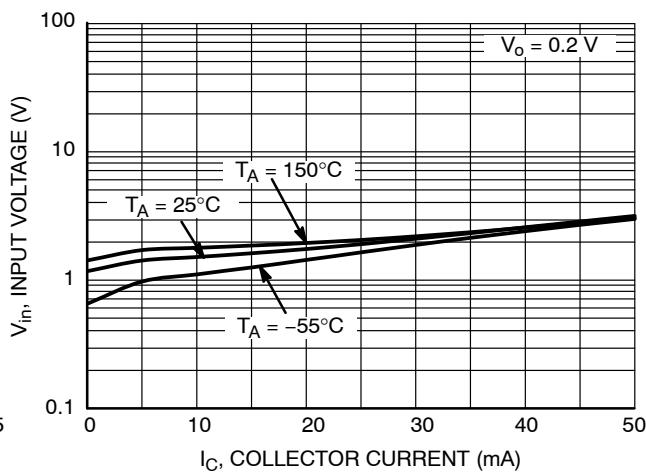
**Figure 2.  $V_{CE(sat)}$  vs.  $I_C$**



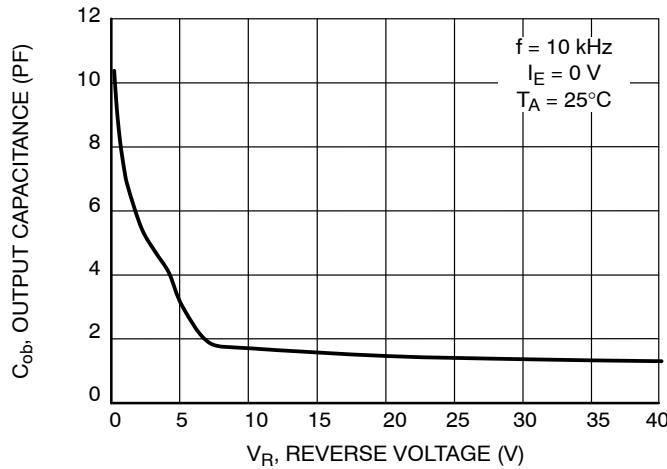
**Figure 3. DC Current Gain**



**Figure 4. Output Current vs. Input Voltage**



**Figure 5. Input Voltage vs. Output Current**



**Figure 6. Output Capacitance**

# MUN2130, MMUN2130L, MUN5130, DTA113EE, DTA113EM3, NSBA113EF3

**Table 2. THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
<b>THERMAL CHARACTERISTICS (SC-59) (MUN2130)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	230 338 1.8 2.7	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$		(Note 1) (Note 2)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	540 370	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	264 287	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$
<b>THERMAL CHARACTERISTICS (SOT-23) (MMUN2130L)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	246 400 2.0 3.2	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$		(Note 1) (Note 2)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	508 311	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	174 208	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$
<b>THERMAL CHARACTERISTICS (SC-70/SOT-323) (MUN5130)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	202 310 1.6 2.5	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$		(Note 1) (Note 2)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	618 403	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	280 332	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$
<b>THERMAL CHARACTERISTICS (SC-75) (DTA113EE)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	200 300 1.6 2.4	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$		(Note 1) (Note 2)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	600 400	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$
<b>THERMAL CHARACTERISTICS (SOT-723) (DTA113EM3)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	260 600 2.0 4.8	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$		(Note 1) (Note 2)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	480 205	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

1. FR-4 @ Minimum Pad.
2. FR-4 @ 1.0 x 1.0 Inch Pad.
3. FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper traces, still air.
4. FR-4 @ 500 mm<sup>2</sup>, 1 oz. copper traces, still air.

**Table 2. THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
<b>THERMAL CHARACTERISTICS (SOT-1123) (NSBA113EF3)</b>			
Total Device Dissipation $T_A = 25^\circ\text{C}$	$P_D$	254 297 2.0 2.4	mW $\text{mW}/^\circ\text{C}$
Derate above $25^\circ\text{C}$			
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	493 421	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	193	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

1. FR-4 @ Minimum Pad.
2. FR-4 @ 1.0 x 1.0 Inch Pad.
3. FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper traces, still air.
4. FR-4 @ 500 mm<sup>2</sup>, 1 oz. copper traces, still air.

**Table 3. ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Base Cutoff Current ( $V_{CB} = 50\text{ V}$ , $I_E = 0$ )	$I_{CBO}$	-	-	100	nAdc
Collector-Emitter Cutoff Current ( $V_{CE} = 50\text{ V}$ , $I_B = 0$ )	$I_{CEO}$	-	-	500	nAdc
Emitter-Base Cutoff Current ( $V_{EB} = 6.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$	-	-	4.3	mAdc
Collector-Base Breakdown Voltage ( $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	50	-	-	Vdc
Collector-Emitter Breakdown Voltage (Note 5) ( $I_C = 2.0\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	50	-	-	Vdc

**ON CHARACTERISTICS**

DC Current Gain (Note 5) ( $I_C = 5.0\text{ mA}$ , $V_{CE} = 10\text{ V}$ )	$h_{FE}$	3.0	5.0	-	
Collector-Emitter Saturation Voltage (Note 5) ( $I_C = 10\text{ mA}$ , $I_B = 5.0\text{ mA}$ )	$V_{CE(\text{sat})}$	-	-	0.25	Vdc
Input Voltage (off) ( $V_{CE} = 5.0\text{ V}$ , $I_C = 100\text{ }\mu\text{A}$ )	$V_{i(\text{off})}$	-	1.2	0.5	Vdc
Input Voltage (on) ( $V_{CE} = 0.3\text{ V}$ , $I_C = 20\text{ mA}$ )	$V_{i(\text{on})}$	2.0	1.6	-	Vdc
Output Voltage (on) ( $V_{CC} = 5.0\text{ V}$ , $V_B = 2.5\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ )	$V_{OL}$	-	-	0.2	Vdc
Output Voltage (off) ( $V_{CC} = 5.0\text{ V}$ , $V_B = 0.05\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ )	$V_{OH}$	4.9	-	-	Vdc
Input Resistor	$R_1$	0.7	1.0	1.3	$\text{k}\Omega$
Resistor Ratio	$R_1/R_2$	0.8	1.0	1.2	

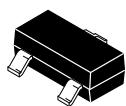
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

5. Pulsed Condition: Pulse Width = 300 msec, Duty Cycle  $\leq 2\%$ .

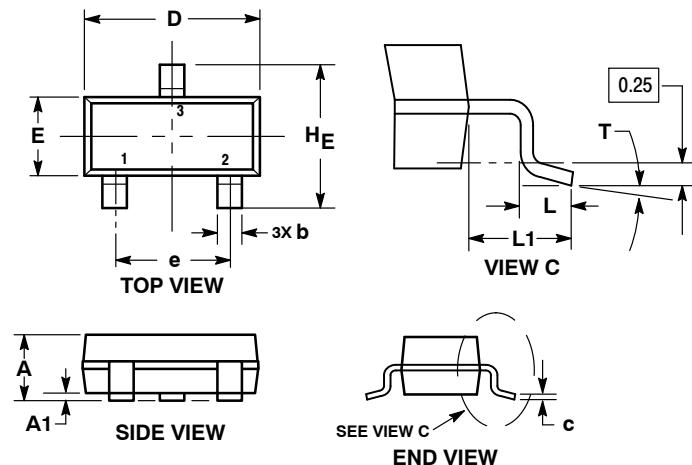
# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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SCALE 4:1



**SOT-23 (TO-236)**  
CASE 318-08  
ISSUE AS

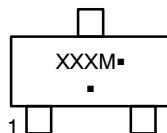
DATE 30 JAN 2018

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH.  
MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H <sub>E</sub>	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	---	10°	0°	---	10°

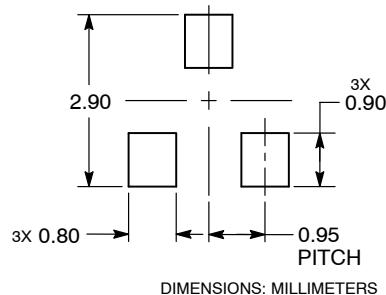
**GENERIC  
MARKING DIAGRAM\***



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

\*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**



STYLE 1 THRU 5:  
CANCELLED

STYLE 6:  
PIN 1. BASE  
2. Emitter  
3. Collector

STYLE 7:  
PIN 1. Emitter  
2. Base  
3. Collector

STYLE 8:  
PIN 1. ANODE  
2. NO CONNECTION  
3. CATHODE

STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 10:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE

STYLE 11:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE

STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 13:  
PIN 1. SOURCE  
2. DRAIN  
3. GATE

STYLE 14:  
PIN 1. CATHODE  
2. GATE  
3. ANODE

STYLE 15:  
PIN 1. GATE  
2. CATHODE  
3. ANODE

STYLE 16:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE

STYLE 17:  
PIN 1. NO CONNECTION  
2. ANODE  
3. CATHODE

STYLE 18:  
PIN 1. NO CONNECTION  
2. CATHODE  
3. ANODE

STYLE 19:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE-ANODE

STYLE 20:  
PIN 1. CATHODE  
2. ANODE  
3. GATE

STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

STYLE 22:  
PIN 1. RETURN  
2. OUTPUT  
3. INPUT

STYLE 23:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 24:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE

STYLE 25:  
PIN 1. ANODE  
2. CATHODE  
3. GATE

STYLE 26:  
PIN 1. CATHODE  
2. ANODE  
3. NO CONNECTION

STYLE 27:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE

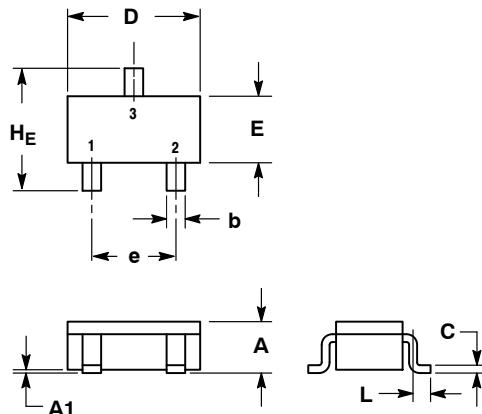
STYLE 28:  
PIN 1. ANODE  
2. ANODE  
3. ANODE

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DESCRIPTION:	SOT-23 (TO-236)	PAGE 1 OF 1

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SCALE 2:1



**SC-59**  
CASE 318D-04  
ISSUE H

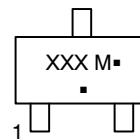
DATE 28 JUN 2012

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
<b>A</b>	1.00	1.15	1.30	0.039	0.045	0.051
<b>A1</b>	0.01	0.06	0.10	0.001	0.002	0.004
<b>b</b>	0.35	0.43	0.50	0.014	0.017	0.020
<b>c</b>	0.09	0.14	0.18	0.003	0.005	0.007
<b>D</b>	2.70	2.90	3.10	0.106	0.114	0.122
<b>E</b>	1.30	1.50	1.70	0.051	0.059	0.067
<b>e</b>	1.70	1.90	2.10	0.067	0.075	0.083
<b>L</b>	0.20	0.40	0.60	0.008	0.016	0.024
<b>H_E</b>	2.50	2.80	3.00	0.099	0.110	0.118

**GENERIC  
MARKING DIAGRAM**

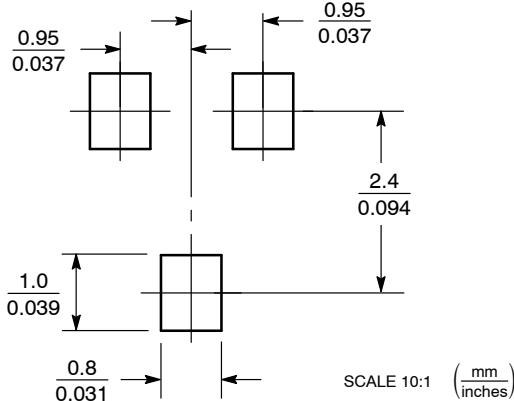


XXX = Specific Device Code  
M = Date Code  
■ = Pb-Free Package\*

(\*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.

**SOLDERING FOOTPRINT\***



SCALE 10:1 (mm/inches)

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

STYLE 1:  
PIN 1. BASE  
2. Emitter  
3. Collector

STYLE 2:  
PIN 1. ANODE  
2. N.C.  
3. CATHODE

STYLE 3:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 4:  
PIN 1. CATHODE  
2. N.C.  
3. ANODE

STYLE 5:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

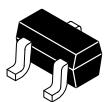
STYLE 6:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE/CATHODE

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DESCRIPTION:	SC-59	PAGE 1 OF 1

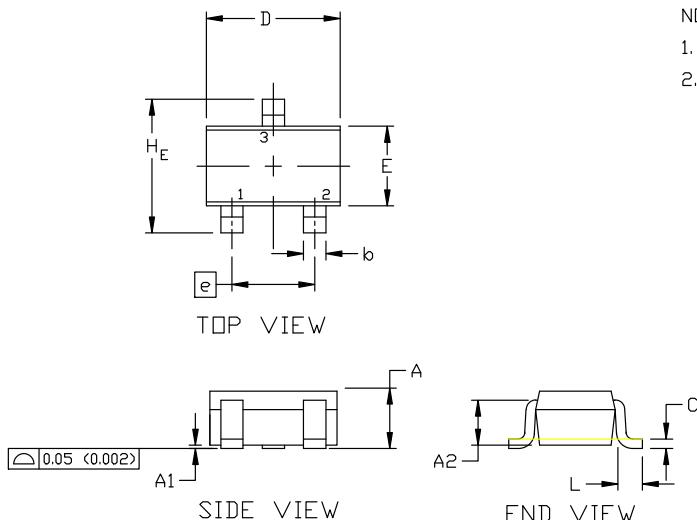
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**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**

**onsemi**<sup>TM</sup>



SCALE 4:1



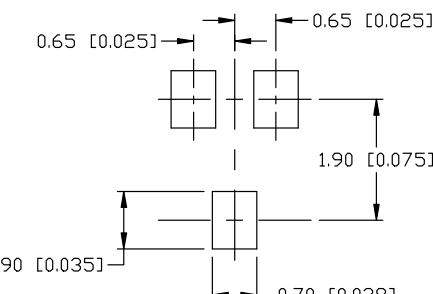
**SC-70 (SOT-323)**  
**CASE 419**  
**ISSUE R**

DATE 11 OCT 2022

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH

DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.00	2.20	0.071	0.080	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.20	0.38	0.56	0.008	0.015	0.022
H <sub>E</sub>	2.00	2.10	2.40	0.079	0.083	0.095

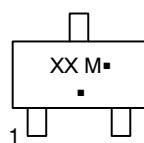


\* For additional information on our Pb-Free strategy and soldering details, please download the [ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D](#).

**SOLDERING FOOTPRINT**

**GENERIC**

**MARKING DIAGRAM**



XX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*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. Some products may not follow the Generic Marking.

STYLE 1:  
CANCELLED

STYLE 2:  
PIN 1. ANODE  
2. N.C.  
3. CATHODE

STYLE 3:  
PIN 1. BASE  
2. Emitter  
3. Collector

STYLE 4:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 5:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 6:  
PIN 1. Emitter  
2. BASE  
3. COLLECTOR

STYLE 7:  
PIN 1. BASE  
2. Emitter  
3. Collector

STYLE 8:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

STYLE 9:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE

STYLE 10:  
PIN 1. CATHODE  
2. ANODE  
3. ANODE-CATHODE

STYLE 11:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE

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DESCRIPTION:	SC-70 (SOT-323)	PAGE 1 OF 1

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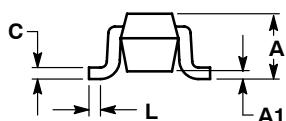
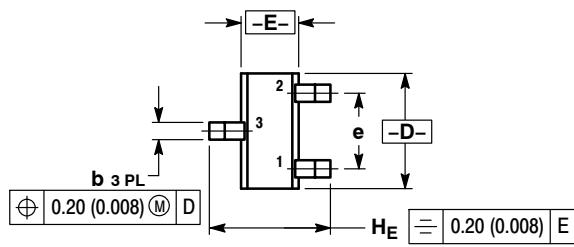
# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 4:1



STYLE 1:  
PIN 1. BASE  
2. Emitter  
3. Collector

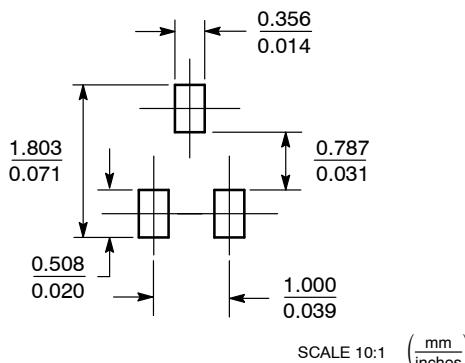
STYLE 2:  
PIN 1. ANODE  
2. N/C  
3. CATHODE

STYLE 3:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 4:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 5:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

### SOLDERING FOOTPRINT\*



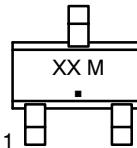
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.80	0.90	0.027	0.031	0.035
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.15	0.20	0.30	0.006	0.008	0.012
C	0.10	0.15	0.25	0.004	0.006	0.010
D	1.55	1.60	1.65	0.061	0.063	0.065
E	0.70	0.80	0.90	0.027	0.031	0.035
e	1.00	BSC		0.04	BSC	
L	0.10	0.15	0.20	0.004	0.006	0.008
H_E	1.50	1.60	1.70	0.060	0.063	0.067

### GENERIC MARKING DIAGRAM\*



XX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*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.

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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

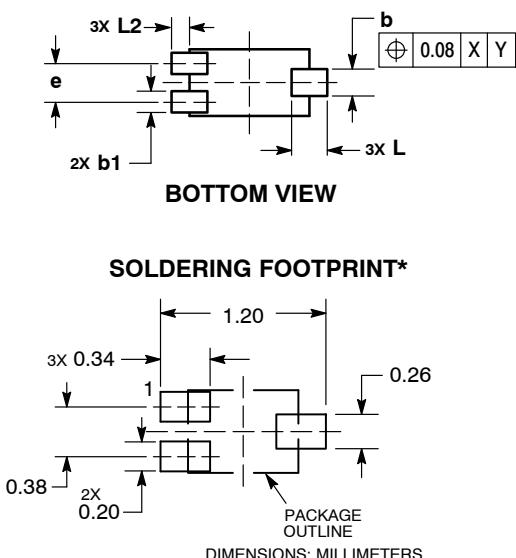
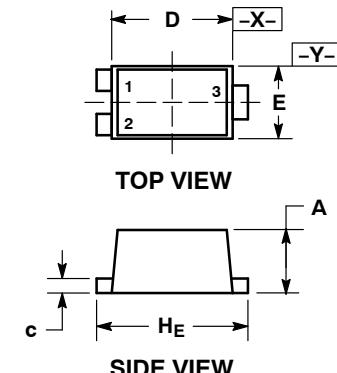
ON Semiconductor®



**SOT-1123**  
CASE 524AA  
ISSUE C

DATE 29 NOV 2011

SCALE 8:1



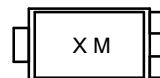
### SOLDERING FOOTPRINT\*

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

MILLIMETERS		
DIM	MIN	MAX
A	0.34	0.40
b	0.15	0.28
b1	0.10	0.20
c	0.07	0.17
D	0.75	0.85
E	0.55	0.65
e	0.35	0.40
H <sub>E</sub>	0.95	1.05
L	0.185	REF
L2	0.05	0.15

### GENERIC MARKING DIAGRAM\*



X = Specific Device Code  
M = Date Code

\*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.

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

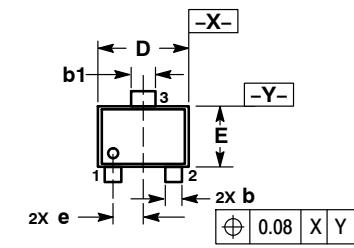
STYLE 1: PIN 1. BASE 2. Emitter 3. Collector	STYLE 2: PIN 1. ANODE 2. N/C 3. CATHODE	STYLE 3: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 5: PIN 1. GATE 2. SOURCE 3. DRAIN
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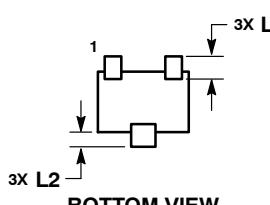
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SCALE 4:1



TOP VIEW



BOTTOM VIEW

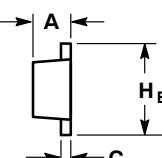
STYLE 1:  
PIN 1. BASE  
2. Emitter  
3. Collector

STYLE 2:  
PIN 1. ANODE  
2. NC  
3. CATHODE

STYLE 3:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 4:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 5:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN



SIDE VIEW

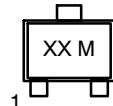
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
b	0.15	0.21	0.27
b1	0.25	0.31	0.37
C	0.07	0.12	0.17
D	1.15	1.20	1.25
E	0.75	0.80	0.85
e	0.40 BSC		
H <sub>E</sub>	1.15	1.20	1.25
L	0.29 REF		
L <sub>2</sub>	0.15	0.20	0.25

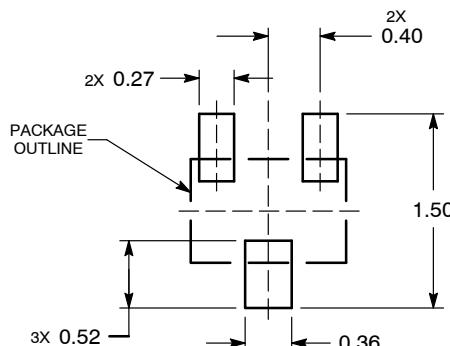
DATE 10 AUG 2009

**GENERIC  
MARKING DIAGRAM\***



XX = Specific Device Code  
M = Date Code

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.



DIMENSIONS: MILLIMETERS

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

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