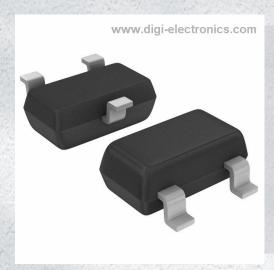


MUN2236T1G Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number MUN2236T1G-DG

Manufacturer onsemi

Manufacturer Product Number MUN2236T1G

Description TRANS PREBIAS NPN 50V 0.1A SC59

Detailed Description Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biase

d 50 V 100 mA 338 mW Surface Mount SC-59



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.



Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MUN2236T1G	onsemi
Series:	Product Status:
	Last Time Buy
Transistor Type:	Current - Collector (Ic) (Max):
NPN - Pre-Biased	100 mA
Voltage - Collector Emitter Breakdown (Max):	Resistor - Base (R1):
50 V	100 kOhms
Resistor - Emitter Base (R2):	DC Current Gain (hFE) (Min) @ lc, Vce:
100 kOhms	80 @ 5mA, 10V
Vce Saturation (Max) @ lb, lc:	Current - Collector Cutoff (Max):
250mV @ 300μA, 10mA	500nA
Power - Max:	Mounting Type:
338 mW	Surface Mount
Package / Case:	Supplier Device Package:
TO-236-3, SC-59, SOT-23-3	SC-59
Base Product Number:	
MUN2236	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	



Digital Transistors (BRT) R1 = 100 k Ω , R2 = 100 k Ω

NPN Transistors with Monolithic Bias Resistor Network

MUN2236, MMUN2236L, MUN5236, DTC115EE, DTC115EM3

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
- 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

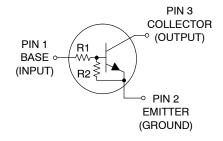
MAXIMUM RATINGS $(T_A = 25^{\circ}C)$

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)}	40	Vdc
Input Reverse Voltage	V _{IN(rev)}	10	Vdc

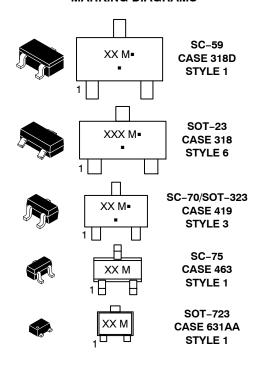
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1

PIN CONNECTIONS



MARKING DIAGRAMS



XXX = Specific Device Code

M = Date Code*

• Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering, marking, and shipping information in the package dimensions section on page 2 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 2.

^{*}Date Code orientation may vary depending upon manufacturing location.

Table 1. ORDERING INFORMATION

Device	Part Marking	Package	Shipping [†]
NSVMUN2236T1G*	8N	SC-59 (Pb-Free)	3000 / Tape & Reel
MMUN2236LT1G, NSVMMUN2236LT1G*	AA5	SOT-23 (Pb-Free)	3000 / Tape & Reel
MUN5236T1G, NSVMUN5236T1G*	8N	SC-70/SOT-323 (Pb-Free)	3000 / Tape & Reel
DTC115EET1G	8N	SC-75 (Pb-Free)	3000 / Tape & Reel
DTC115EM3T5G	8N	SOT-723 (Pb-Free)	8000 / Tape & Reel

DISCONTINUED (Note 1)

MUN2236T1G	8N	SC-59	3000 / Tape & Reel
		(Pb-Free)	

[†]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.

^{1.} DISCONTINUED: This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

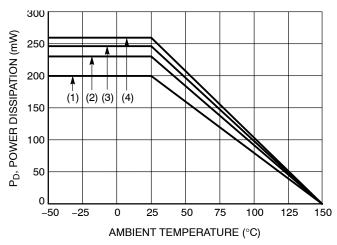


Figure 1. Derating Curve

- (1) SC-75 and SC-70/SOT323; Minimum Pad
- (2) SC-59; Minimum Pad
- (3) SOT-23; Minimum Pad
- (4) SOT-723; Minimum Pad

^{*}NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

Table 2. THERMAL CHARACTERISTICS

Characteristic		Symbol	Max	Unit
THERMAL CHARACTERISTICS (SC-59) (MUN2236)				
Total Device Dissipation $T_A = 25^{\circ}C$ Derate above 25°C	(Note 2) (Note 3) (Note 2) (Note 3)	P _D	230 338 1.8 2.7	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 2) (Note 3)	$R_{ hetaJA}$	540 370	°C/W
Thermal Resistance, Junction to Lead	(Note 2) (Note 3)	$R_{ hetaJL}$	264 287	°C/W
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C
THERMAL CHARACTERISTICS (SOT-23) (MMUN2236L)				
Total Device Dissipation $T_A = 25^{\circ}C$ Derate above 25°C	(Note 2) (Note 3) (Note 2) (Note 3)	P _D	246 400 2.0 3.2	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 1) (Note 3)	$R_{ heta JA}$	508 311	°C/W
Thermal Resistance, Junction to Lead	(Note 2) (Note 3)	$R_{ hetaJL}$	174 208	°C/W
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C
THERMAL CHARACTERISTICS (SC-70/SOT-323) (MUN5236)	•		•	
Total Device Dissipation $T_{A} = 25^{\circ}C$ Derate above 25°C	(Note 2) (Note 3) (Note 2) (Note 3)	P_{D}	202 310 1.6 2.5	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 2) (Note 3)	$R_{ hetaJA}$	618 403	°C/W
Thermal Resistance, Junction to Lead	(Note 2) (Note 3)	$R_{ heta JL}$	280 332	°C/W
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C
THERMAL CHARACTERISTICS (SC-75) (DTC115EE)				
Total Device Dissipation $T_A = 25^{\circ}C$ Derate above $25^{\circ}C$	(Note 2) (Note 3) (Note 2) (Note 3)	P _D	200 300 1.6 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 2) (Note 3)	$R_{ heta JA}$	600 400	°C/W
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C
THERMAL CHARACTERISTICS (SOT-723) (DTC115EM3)				
Total Device Dissipation $T_A = 25^{\circ}C$ Derate above 25°C	(Note 2) (Note 3) (Note 2) (Note 3)	P _D	260 600 2.0 4.8	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 2) (Note 3)	$R_{ heta JA}$	480 205	°C/W
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C

^{2.} FR-4 @ Minimum Pad.

^{3.} FR-4 @ 1.0 x 1.0 Inch Pad.

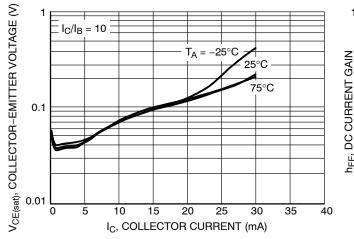
Table 3. ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS		•			
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 V, I _C = 0)	I _{EBO}	_	_	0.05	mAdc
Collector-Base Breakdown Voltage (I _C = 10 µA, I _E = 0)	V _(BR) CBO	50	_	-	Vdc
Collector–Emitter Breakdown Voltage (Note 4) (I _C = 2.0 mA, I _B = 0)	V _(BR) CEO	50	_	-	Vdc
ON CHARACTERISTICS		•			
DC Current Gain (Note 4) (I _C = 5.0 mA, V _{CE} = 10 V)	h _{FE}	80	150	-	
Collector–Emitter Saturation Voltage (Note 4) $(I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA})$	V _{CE(sat)}	_	_	0.25	Vdc
Input Voltage (off) $(V_{CE} = 5.0 \text{ V}, I_{C} = 100 \mu\text{A})$	V _{i(off)}	_	1.2	0.5	Vdc
Input Voltage (on) $(V_{CE} = 0.3 \text{ V, } I_{C} = 1.0 \text{ mA})$	V _{i(on)}	3.0	1.7	-	Vdc
Output Voltage (on) (V _{CC} = 5.0 V, V _B = 5.5 V, R _L = 1.0 k Ω)	V _{OL}	-	-	0.2	Vdc
Output Voltage (off) ($V_{CC} = 5.0 \text{ V}, V_B = 0.25 \text{ V}, R_L = 1.0 \text{ k}\Omega$)	V _{OH}	4.9	-	-	Vdc
Input Resistor	R1	70	100	130	kΩ
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.

4. Pulsed Condition: Pulse Width = 300 msec, Duty Cycle ≤ 2%.

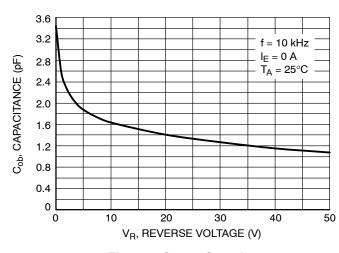
TYPICAL CHARACTERISTICS MUN2236, MMUN2236L, MUN5236, NSVMUN5236, DTC115EE, DTC115EM3



1000 V_{CE} = 10 V 75°C - 75°C

Figure 2. V_{CE(sat)} versus I_C

Figure 3. DC Current Gain



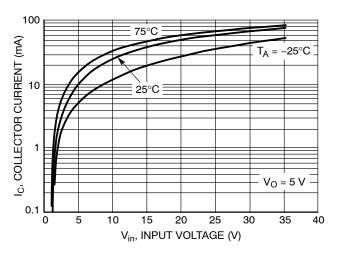


Figure 4. Output Capacitance

Figure 5. Output Current versus Input Voltage

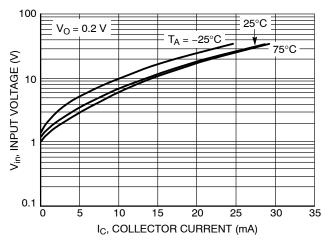


Figure 6. Input Voltage versus Output Current



MILLIMETERS

MIN

0.89

0.01

0.37

0.08

2.80

1.20

1.78

0.30

0.35

2.10

O°

NOM

1.00

0.06

0.44

0.14

2.90

1.30

1.90

0.43

0.54

2.40

PACKAGE DIMENSIONS



SOT-23 (TO-236) 2.90x1.30x1.00 1.90P **CASE 318 ISSUE AU**

DATE 14 AUG 2024

MAX

1.11

0.10

0.50

0.20

3.04

1.40

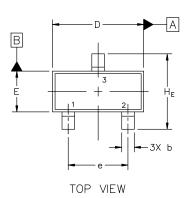
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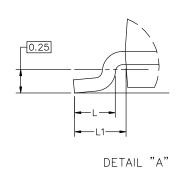
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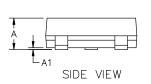
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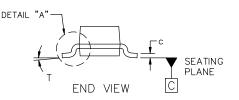
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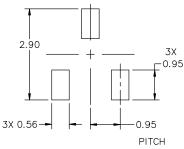
10°











Scale 3:1

NOTES:

DIM

Α

Α1

b

С

D

Ε

е L

L1

HE

Τ

- DIMENSIONING AND TOLERANCING 1.
- PER ASME Y14.5M, 2018. CONTROLLING DIMENSIONS: MILLIMETERS.
- MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE
- BASE MATERIAL.
 DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code

= Date Code

= Pb-Free Package



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

STYLES ON PAGE 2

DOCUMENT NUMBER:	98ASB42226B	Electronic versions are uncontrolled except when accessed directly from the Document Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.		
DESCRIPTION:	SOT-23 (TO-236) 2.90x1.30x1.00 1.90P		PAGE 1 OF 2	

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^{*}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.

SOT-23 (TO-236) 2.90x1.30x1.00 1.90P CASE 318 ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5: CANCELLED	STYLE 6: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 7: STYLE 8: PIN 1. EMITTER PIN 1. ANOD 2. BASE 2. NO CC 3. COLLECTOR 3. CATHO	ONNECTION	
STYLE 9: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 10: PIN 1. DRAIN 2. SOURCE 3. GATE	STYLE 11: STYLE 12: PIN 1. ANODE PIN 1. CATHO 2. CATHODE 2. CATHO 3. CATHODE-ANODE 3. ANODO	ODE 2. DRAIN 2. GATE	
STYLE 15: PIN 1. GATE 2. CATHODE 3. ANODE	STYLE 16: PIN 1. ANODE 2. CATHODE 3. CATHODE	STYLE 17: STYLE 18: PIN 1. NO CONNECTION PIN 1. NO CO 2. ANODE 2. CATHO 3. CATHODE 3. ANODO	ODE 2. ANODE 2. ANODE	
STYLE 21: PIN 1. GATE 2. SOURCE 3. DRAIN	STYLE 22: PIN 1. RETURN 2. OUTPUT 3. INPUT	STYLE 23: STYLE 24: PIN 1. ANODE PIN 1. GATE 2. ANODE 2. DRAIN 3. CATHODE 3. SOURCE		CTION
STYLE 27: PIN 1. CATHODE 2. CATHODE 3. CATHODE	STYLE 28: PIN 1. ANODE 2. ANODE 3. ANODE			

DOCUMENT NUMBER:	98ASB42226B	Electronic versions are uncontrolled except when accessed directly from the Document Rep Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.			
DESCRIPTION:	SOT-23 (TO-236) 2.90x1.30x1.00 1.90P		PAGE 2 OF 2		

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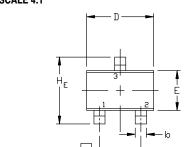


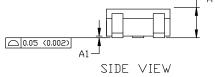
PACKAGE DIMENSIONS



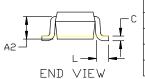
DATE 11 OCT 2022







TOP VIEW



NOTES:

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

	MILLIMETERS				INCHES		
DIM	MIN.	N□M.	MAX.	MIN.	N□M.	MAX.	
Α	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	
С	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	
е	1.20	1.30	1.40	0.047	0.051	0.055	
e1	0.65 BSC				0.026 BS	C	
L	0.20	0.38	0.56	0.008	0.015	0.022	
HE	2.00	2.10	2.40	0.079	0.083	0.095	



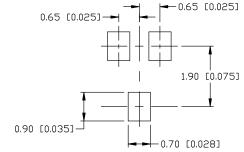


XX = Specific Device Code

М = 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.



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

SOLDERING FOOTPRINT

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:	STYLE 7:	STYLE 8:	STYLE 9:	STYLE 10:	STYLE 11:
PIN 1. EMITTER	PIN 1. BASE	PIN 1. GATE	PIN 1. ANODE	PIN 1. CATHODE	PIN 1. CATHODE
2. BASE	2. EMITTER	2. SOURCE	2. CATHODE	2. ANODE	CATHODE
COLLECTOR	COLLECTOR	3. DRAIN	CATHODE-ANODE	3. ANODE-CATHODE	CATHODE

DOCUMENT NUMBER:	98ASB42819B	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-70 (SOT-323)		PAGE 1 OF 1

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PACKAGE DIMENSIONS

SC75-3 1.60x0.80x0.80, 1.00P

CASE 463 ISSUE H

DATE 01 FEB 2024

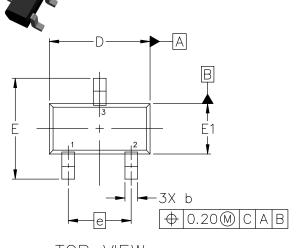
NOTES:

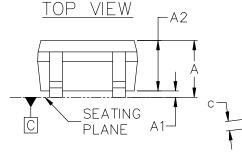
- DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
- ALL DIMENSION ARE IN MILLIMETERS.

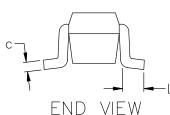
DIM	MILLIMETERS			
DIIVI	MIN.	NOM.	MAX.	
А	0.70	0.80	0.90	
A1	0.00	0.05	0.10	
A2	0.80 REF.			
Ь	0.15	0.20	0.30	
С	0.10	0.15	0.25	
D	1.55	1.60	1.65	
E	1.50	1.60	1.70	
E1	0.70	0.80	0.90	
е	1.00 BSC			
L	0.10	0.15	0.20	

-0.356

0.787







SIDE VIEW

GENERIC MARKING DIAGRAM*



XX = Specific Device Code

Μ = 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:	ST
PIN 1. BASE	F
EMITTER	

TYLE 2: PIN 1. ANODE 2. N/C 3. CATHODE 3. COLLECTOR

STYLE 3: 3 CATHODE

PIN 1. ANODE 2. ANODE

FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES

1.000

RECOMMENDED MOUNTING FOOTPRINT*

REFERENCE MANUAL, SOLDERRM/D.

1.803

0.508

STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE STYLE 5: PIN 1. GATE 2. SOURCE 3. DRAIN

DOCUMENT NUMBER:	98ASB15184C	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	SC75-3 1.60x0.80x0.80, 1.0	00P	PAGE 1 OF 1

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PACKAGE DIMENSIONS

MILLIMETERS

 $N\square M$.

0.50

0.21

0.31

0.12

1.20

0.80

0.40 BSC

1.20

0.29 REF



SOT-723 1.20x0.80x0.50, 0.40P CASE 631AA ISSUE E

DATE 24 JAN 2024

MAX.

0.55

0.27

0.37

0.17

1.25

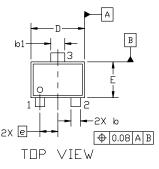
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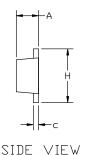
1.25

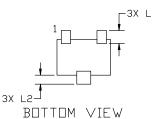
0.25

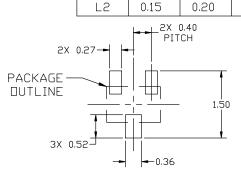
NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
- CONTROLLING DIMENSION: MILLIMETERS.
- MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH, MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.









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MIN.

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0.15

0.25

0.07

1.15

0.75

1.15

RECOMMENDED MOUNTING FOOTPRINT

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

GENERIC MARKING DIAGRAM*



XX = Specific Device Code = 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. Some products may not follow the Generic Marking.

STYLE 1:	STYLE 2:	STYLE 3:	STYLE 4:	STYLE 5:
PIN 1. BASE	PIN 1. ANODE	PIN 1. ANODE	PIN 1. CATHODE	PIN 1. GATE
2. EMITTER	2. N/C	2. ANODE	CATHODE	SOURCE
COLLECTOR	CATHODE	CATHODE	ANODE	DRAIN

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DESCRIPTION:	SOT-723 1.20x0.80x0.50, 0.40P		PAGE 1 OF 1

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