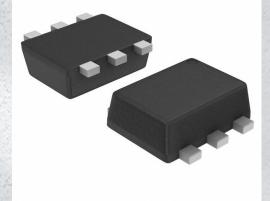


NSBC124XDXV6T1G Datasheet

www.digi-electronics.com



DiGi Electronics Part Number	NSBC124XDXV6T1G-DG
Manufacturer	onsemi
Manufacturer Product Number	NSBC124XDXV6T1G
Description	TRANS PREBIAS 2NPN 50V SOT563
Detailed Description	Pre-Biased Bipolar Transistor (BJT) 2 NPN - Pre-Bia sed (Dual) 50V 100mA 500mW Surface Mount SOT- 563

https://www.DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
NSBC124XDXV6T1G	onsemi
Series:	Product Status:
	Active
Transistor Type:	Current - Collector (Ic) (Max):
2 NPN - Pre-Biased (Dual)	100mA
Voltage - Collector Emitter Breakdown (Max):	Resistor - Base (R1):
50V	22kOhms
Resistor - Emitter Base (R2):	DC Current Gain (hFE) (Min) @ lc, Vce:
47kOhms	80 @ 5mA, 10V
Vce Saturation (Max) @ lb, lc:	Current - Collector Cutoff (Max):
250mV @ 1mA, 10mA	500nA
Frequency - Transition:	Power - Max:
	500mW
Mounting Type:	Package / Case:
Surface Mount	SOT-563, SOT-666
Supplier Device Package:	Base Product Number:
SOT-563	NSBC124

Environmental & Export classification

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

onsemi

Dual NPN Bias Resistor Transistors R1 = 22 k\Omega, R2 = 47 k Ω

NPN Transistors with Monolithic Bias Resistor Network

MUN5234DW1, NSBC124XDXV6

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°C, common for Q₁ and Q₂, unless otherwise noted)

Symbol	Rating	Max	Unit
V _{CBO}	Collector-Base Voltage	50	Vdc
V _{CEO}	Collector-Emitter Voltage	50	Vdc
Ι _C	Collector Current – Continuous	100	mAdc
V _{IN(fwd)}	Input Forward Voltage	40	Vdc
V _{IN(rev)}	Input Reverse Voltage	7	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.

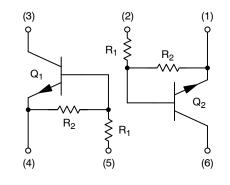


SOT-363 CASE 419B

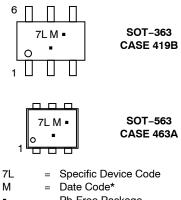


SOT-563 CASE 463A

PIN CONNECTIONS



MARKING DIAGRAMS



= Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping [†]
MUN5234DW1T1G	SOT-363	3,000 / Tape & Reel
NSBC124XDXV6T1G	SOT-563	4,000 / Tape & Reel
NSVBC124XDXV6T1G	SOT-563	4,000 / 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, <u>BRD8011/D</u>.

NSBC124XDXV6T1G onsemi TRANS PREBIAS 2NPN 50V SOT563

MUN5234DW1, NSBC124XDXV6

Symbol		Characteristic	Мах	Unit
IUN5234DW	1 (SOT-363) ONE JUNCTION H	EATED		
P _D	$\begin{array}{c} \mbox{Total Device Dissipation} \\ T_A = 25^\circ C \qquad (Note 1) \\ (Note 2) \\ \mbox{Derate above } 25^\circ C \\ (Note 2) \end{array}$	(Note 1)	187 256 1.5 2.0	mW mW/°C
R_{\thetaJA}	Thermal Resistance, Junction to Ambient	(Note 1) (Note 2)	670 490	°C/W
IUN5234DW	1 (SOT-363) BOTH JUNCTION	HEATED (Note 3)		
P _D	$\begin{array}{c} \mbox{Total Device Dissipation} \\ T_A = 25^\circ C \qquad (Note 1) \\ (Note 2) \\ \mbox{Derate above } 25^\circ C \\ (Note 2) \end{array}$	(Note 1)	250 385 2.0 3.0	m₩ mW/°C
R_{\thetaJA}	Thermal Resistance, Junction to Ambient (Note 2)	(Note 1)	493 325	°C/W
$R_{ extsf{ heta}JL}$	Thermal Resistance, Junction to Lead (Note 1) (Note 2)		188 208	°C/W
T _J , T _{stg}	Junction and Storage Temper	ature Range	–55 to +150	°C
NSBC124XDX	(V6 (SOT-563) ONE JUNCTION	HEATED		
P _D	Total Device Dissipation $T_A = 25^{\circ}C$ (Note 1) Derate above 25^{\circ}C	(Note 1)	357 2.9	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 1)	350	°C/W
NSBC124XDX	(V6 (SOT-563) BOTH JUNCTIO	N HEATED (Note 3)		
P _D	Total Device Dissipation $T_A = 25^{\circ}C$ (Note 1) Derate above 25^{\circ}C	(Note 1)	500 4.0	mW mW/°C
R_{\thetaJA}	Thermal Resistance, Junction to Ambient	(Note 1)	250	°C/W

°C

–55 to +150

Junction and Storage Temperature Range T_J, T_{stg}

FR-4 @ Minimum Pad.
 FR-4 @ 1.0 × 1.0 Inch Pad.
 Both junction heated values assume total power is sum of two equally powered channels.

MUN5234DW1, NSBC124XDXV6

Symbol	Characteristic	Min	Тур	Max	Unit
OFF CHAR	ACTERISTICS				
I _{CBO}	Collector-Base Cutoff Current $(V_{CB} = 50 \text{ V}, I_E = 0)$	_	-	100	nAdc
I _{CEO}	Collector-Emitter Cutoff Current ($V_{CE} = 50 \text{ V}, I_B = 0$)	-	-	500	nAdc
I _{EBO}	Emitter-Base Cutoff Current $(V_{EB} = 6.0 \text{ V}, I_C = 0)$	_	-	0.13	mAdc
V _{(BR)CBO}	Collector-Base Breakdown Voltage $(I_C = 10 \ \mu A, I_E = 0)$	50	-	_	Vdc
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage (Note 4) $(I_C = 2.0 \text{ mA}, I_B = 0)$	50	-	_	Vdc
ON CHARA	CTERISTICS				
h _{FE}	DC Current Gain (Note 4) (I _C = 5.0 mA, V _{CE} = 10 V)	80	150	-	
V _{CE(sat)}	Collector-Emitter Saturation Voltage (Note 4) $(I_{C} = 10 \text{ mA}, I_{B} = 1.0 \text{ mA})$	_	-	0.25	V
V _{i(off)}	Input Voltage (Off) (V _{CE} = 5.0 V, I _C = 100 μA)	-	0.8	-	Vdc
V _{i(on)}	Input Voltage (On) (V _{CE} = 0.2 V, I _C = 3.0 mA)	_	1.3	-	Vdc
V _{OL}	Output Voltage (On) $(V_{CC} = 5.0 \text{ V}, V_B = 2.5 \text{ V}, R_L = 1.0 \text{ k}\Omega)$	_	-	0.2	Vdc
V _{OH}	Output Voltage (Off) $(V_{CC} = 5.0 \text{ V}, \text{ V}_{B} = 0.5 \text{ V}, \text{ R}_{L} = 1.0 \text{ k}\Omega)$	4.9	-	_	Vdc
R1	Input Resistor	15.4	22	28.6	kΩ
R_1/R_2	Resistor Ratio	0.38	0.47	0.56	

ELECTRICAL CHARACTERISTICS (T_A = 25°C, common for Q₁ and Q₂, unless otherwise noted)

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

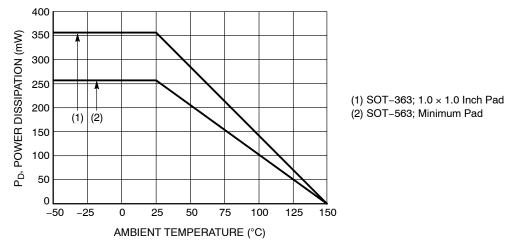
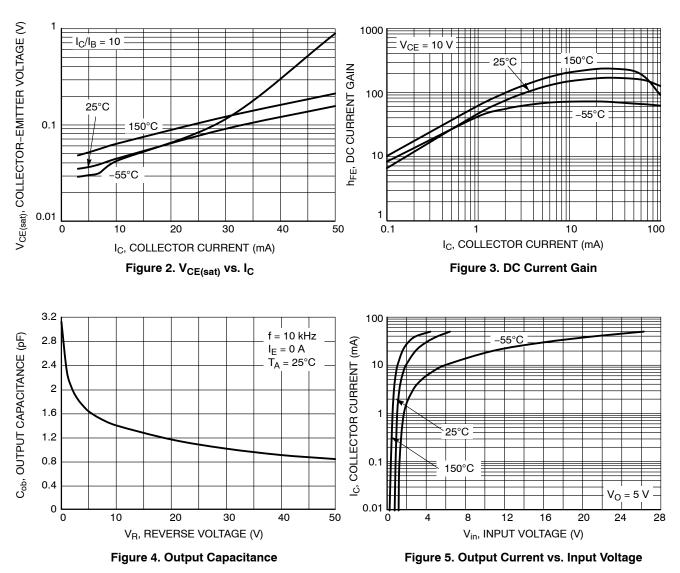


Figure 1. Derating Curve

MUN5234DW1, NSBC124XDXV6

TYPICAL CHARACTERISTICS MUN5234DW1, NSBC124XDXV6



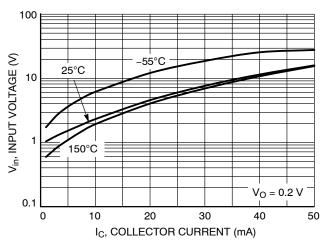


Figure 6. Input Voltage vs. Output Current

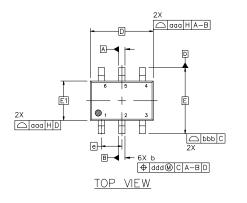
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PACKAGE DIMENSIONS

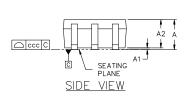
SC-88 2.00x1.25x0.90, 0.65P CASE 419B-02 **ISSUE Z**

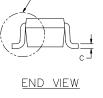
DATE 18 APR 2024



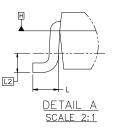


- DIMENSIONING AND TOLERANCING CONFORM TO ASME 1. Y14.5-2018.
- 2.
- ALL DIMENSION ARE IN MILLIMETERS. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 3. PER END.
- 4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF
- DATUMS A AND B ARE DETERMINED AT DATUM H. 5.
- DIMENSIONS & AND C APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP. 6.
- DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. 7 ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION & AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.





DETAIL A



	MILLIMETERS			
DIM	MIN.	NOM.	MAX.	
A			1.10	
A1	0.00		0.10	
A2	0.70	0.90	1.00	
b	0.15	0.20	0.25	
С	0.08	0.15	0.22	
D	2.00 BSC			
E	2.10 BSC			
E1	1.25 BSC			
е		0.65 BSC)	
L	0.26	0.36	0.46	
L2		0.15 BSC		
aaa	0.15			
bbb	0.30			
ссс	0.10			
ddd		0.10		

6X 0.66 6X 0.30-2.50 0.65 PITCH

RECOMMENDED MOUNTING FOOTPRINT*

FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

XXX = Specific Device Code = Date Code* Μ = Pb-Free Package

GENERIC **MARKING DIAGRAM***

XXXM.

. 0

6

(Note: Microdot may be in either location)

*Date Code orientation and/or position may vary depending upon manufacturing 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. Some products may not follow the Generic Marking.

STYLES ON PAGE 2

DOCUMENT NUMBER:	98ASB42985B Electronic versions are uncontrolled except when accessed directly from the Document Repositor Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.			
DESCRIPTION:	SC-88 2.00x1.25x0.90, 0.65P		PAGE 1 OF 2	
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SC-88 2.00x1.25x0.90, 0.65P CASE 419B-02 ISSUE Z

DATE 18 APR 2024

STYLE 1: PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2	STYLE 2: CANCELLED	STYLE 3: CANCELLED	STYLE 4: PIN 1. CATHODE 2. CATHODE 3. COLLECTOR 4. EMITTER 5. BASE 6. ANODE	STYLE 5: PIN 1. ANODE 2. ANODE 3. COLLECTOR 4. EMITTER 5. BASE 6. CATHODE	STYLE 6: PIN 1. ANODE 2 2. N/C 3. CATHODE 1 4. ANODE 1 5. N/C 6. CATHODE 2
STYLE 7: PIN 1. SOURCE 2 2. DRAIN 2 3. GATE 1 4. SOURCE 1 5. DRAIN 1 6. GATE 2	STYLE 8: CANCELLED	STYLE 9: PIN 1. EMITTER 2 2. EMITTER 1 3. COLLECTOR 1 4. BASE 1 5. BASE 2 6. COLLECTOR 2	STYLE 10: PIN 1. SOURCE 2 2. SOURCE 1 3. GATE 1 4. DRAIN 1 5. DRAIN 2 6. GATE 2	STYLE 11: PIN 1. CATHODE 2 2. CATHODE 2 3. ANODE 1 4. CATHODE 1 5. CATHODE 1 6. ANODE 2	STYLE 12: PIN 1. ANODE 2 2. ANODE 2 3. CATHODE 1 4. ANODE 1 5. ANODE 1 6. CATHODE 2
STYLE 13:	STYLE 14:	STYLE 15:	STYLE 16:	STYLE 17:	STYLE 18:
PIN 1. ANODE	PIN 1. VREF	PIN 1. ANODE 1	PIN 1. BASE 1	PIN 1. BASE 1	PIN 1. VIN1
2. N/C	2. GND	2. ANODE 2	2. EMITTER 2	2. EMITTER 1	2. VCC
3. COLLECTOR	3. GND	3. ANODE 3	3. COLLECTOR 2	3. COLLECTOR 2	3. VOUT2
4. EMITTER	4. IOUT	4. CATHODE 3	4. BASE 2	4. BASE 2	4. VIN2
5. BASE	5. VEN	5. CATHODE 2	5. EMITTER 1	5. EMITTER 2	5. GND
6. CATHODE	6. VCC	6. CATHODE 1	6. COLLECTOR 1	6. COLLECTOR 1	6. VOUT1
STYLE 19:	STYLE 20:	STYLE 21:	STYLE 22:	STYLE 23:	STYLE 24:
PIN 1. I OUT	PIN 1. COLLECTOR	PIN 1. ANODE 1	PIN 1. D1 (i)	PIN 1. Vn	PIN 1. CATHODE
2. GND	2. COLLECTOR	2. N/C	2. GND	2. CH1	2. ANODE
3. GND	3. BASE	3. ANODE 2	3. D2 (i)	3. Vp	3. CATHODE
4. V CC	4. EMITTER	4. CATHODE 2	4. D2 (c)	4. N/C	4. CATHODE
5. V EN	5. COLLECTOR	5. N/C	5. VBUS	5. CH2	5. CATHODE
6. V REF	6. COLLECTOR	6. CATHODE 1	6. D1 (c)	6. N/C	6. CATHODE
STYLE 25:	STYLE 26:	STYLE 27:	STYLE 28:	STYLE 29:	STYLE 30:
PIN 1. BASE 1	PIN 1. SOURCE 1	PIN 1. BASE 2	PIN 1. DRAIN	PIN 1. ANODE	PIN 1. SOURCE 1
2. CATHODE	2. GATE 1	2. BASE 1	2. DRAIN	2. ANODE	2. DRAIN 2
3. COLLECTOR 2	3. DRAIN 2	3. COLLECTOR 1	3. GATE	3. COLLECTOR	3. DRAIN 2
4. BASE 2	4. SOURCE 2	4. EMITTER 1	4. SOURCE	4. EMITTER	4. SOURCE 2
5. EMITTER	5. GATE 2	5. EMITTER 2	5. DRAIN	5. BASE/ANODE	5. GATE 1
6. COLLECTOR 1	6. DRAIN 1	6. COLLECTOR 2	6. DRAIN	6. CATHODE	6. DRAIN 1

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

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DESCRIPTION:	SC-88 2.00x1.25x0.90, 0.65P		PAGE 2 OF 2	

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MILLIMETERS

NDM.

0.55

0.22

0.13

1.60

SOT-563-6 1.60x1.20x0.55, 0.50P CASE 463A ISSUE J

DATE 15 FEB 2024

MAX.

0.60

0.27

0.18

1.70

- NOTES: 1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
- 2. ALL DIMENSION ARE IN MILLIMETERS.

DIM

А

b

С

D

 MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

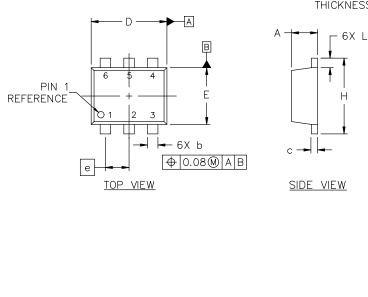
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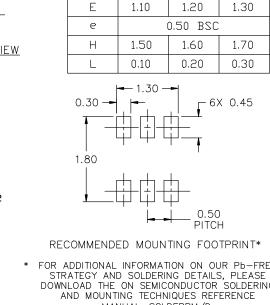
0.50

0.17

0.08

1.50





	TYLE 2: PIN 1. EMITTER 1 2. EMITTER 2 3. BASE 2 4. COLLECTOR 2 5. BASE 1 6. COLLECTOR 1	STYLE 3: PIN 1. CATHODE 2. CATHOD 3. ANDDE/ 4. CATHOD 5. CATHOD 6. ANDDE/	E 1 ANDDE 2 E 2 E 2 E 2		Н
	TYLE 5: VIN 1. CATHEDE 2. CATHEDE 3. ANEDE 4. ANEDE 5. CATHEDE 6. CATHEDE	STYLE 6: PIN 1. CATHODE 2. ANDDE 3. CATHOD 4. CATHOD 5. CATHOD 6. CATHOD	E E E	FOR ADDITIONAL INFORMATION ON OI STRATEGY AND SOLDERING DETAIL DOWNLOAD THE ON SEMICONDUCTOR AND MOUNTING TECHNIQUES REF MANUAL, SOLDERRM/D. GENERIC	JR Pb–FREE S, PLEASE SOLDERING
	TYLE 8: IN 1. DRAIN 2. DRAIN 3. GATE 4. SDURCE 5. DRAIN 6. DRAIN	STYLE 9: PIN 1. SDURCE 2. GATE 1 3. DRAIN 2 4. SDURCE 5. GATE 2 6. DRAIN 1	2	XX = Specific Device Code Month Code	
	TYLE 11: PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2			 = Pb–Free Package *This information is generic. Please r device data sheet for actual part m Pb–Free indicator, "G" or microdot " or may not be present. Some produc not follow the Generic Marking. 	arking. ", may ts may
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