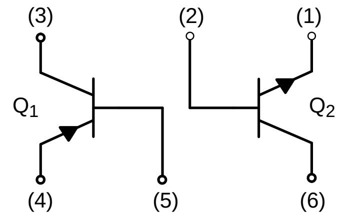
Dual Complementary General Purpose Transistor

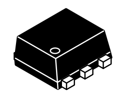
NST847BPDP6T5G

The NST847BPDP6T5G device is a spin-off of our popular SOT-23/SOT-323/SOT-563 three-leaded device. It is designed for general purpose amplifier applications and is housed in the SOT-963 six-leaded surface mount package. By putting two discrete devices in one package, this device is ideal for low-power surface mount applications where board space is at a premium.



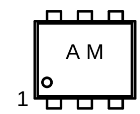
NST847BPDP6T5G*

* Q1 PNP
Q2 NPN



SOT-963
CASE 527AD

MARKING DIAGRAM



A = Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NST847BPDP6T5G	SOT-963 (Pb-Free)	8000/Tape & Reel

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

Features

- h_{FE}, 200−450
- Low $V_{CE(sat)}$, ≤ 0.3 V
- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- This is a Pb-Free Device

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector-Emitter Voltage		V_{CEO}	45	Vdc
Collector-Base Voltage		V_{CBO}	50	Vdc
Emitter-Base Voltage		V_{EBO}	6.0	Vdc
Collector Current − Continuous		I_C	100	mAdc
Electrostatic Discharge	HBM MM	ESD Class	2 B	

THERMAL CHARACTERISTICS

Characteristic (Single Heated)	Symbol	Max	Unit
Total Device Dissipation T_A = 25 °C Derate above 25 °C (Note 1)	P_D	240 1.9	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	520	°C/W
Total Device Dissipation T_A = 25 °C Derate above 25 °C (Note 2)	P_D	280 2.2	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	446	°C/W
Characteristic (Dual Heated) (Note 3)	**Symbol**	**Max**	**Unit**
Total Device Dissipation T_A = 25 °C Derate above 25 °C (Note 1)	P_D	350 2.8	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	357	°C/W
Total Device Dissipation T_A = 25 °C Derate above 25 °C (Note 2)	P_D	420 3.4	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	297	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°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.
1. FR-4 @ 100 mm^2, 1 oz. copper traces, still air.
2. FR-4 @ 500 mm^2, 1 oz. copper traces, still air.
3. Dual heated values assume total power is sum of two equally powered channels

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$				V
(I_C = 1.0 mA, I_B = 0)	(NPN)		45	–	–	
(I_C = −1.0 mA, I_B = 0)	(PNP)		−45	–	–	
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = 10 μA, I_E = 0)	(NPN)		50	–	–	
(I_C = −10 μA, I_E = 0)	(PNP)		−50	–	–	
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$				V
(I_C = 10 μA)	(NPN)		50	–	–	
(I_C = −10 μA)	(PNP)		−50	–	–	
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = 1.0 μA, I_C = 0)	(NPN)		6.0	–	–	
(I_E = −1.0 μA, I_C = 0)	(PNP)		−5.0	–	–	
Collector Cutoff Current		I_{CBO}				
(V_{CB} = 30 V)	(NPN)		–	–	15	nA
(V_{CB} = 30 V, T_A = 150 °C)	(NPN)		–	–	5.0	μA
(V_{CB} = −30 V)	(PNP)		–	–	−15	nA
(V_{CB} = −30 V, T_A = 150 °C)	(PNP)		–	–	−4.0	μA
ON CHARACTERISTICS (Note 4)						
DC Current Gain		h_{FE}				–
(I_C = 2.0 mA, V_{CE} = 5.0 V)	(NPN)		200	290	450	
(I_C = −2.0 mA, V_{CE} = −5.0 V)	(PNP)		220	290	475	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)	(NPN)		–	–	0.25	
(I_C = 100 mA, I_B = 5.0 mA)			–	–	0.60	
(I_C = −10 mA, I_B = −0.5 mA)	(PNP)		–	–	−0.30	
(I_C = −100 mA, I_B = −5.0 mA)			–	–	−0.70	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)	(NPN)		–	0.70	–	
(I_C = 100 mA, I_B = 5.0 mA)			–	0.90	–	
(I_C = −10 mA, I_B = −0.5 mA)	(PNP)		–	−0.70	–	
(I_C = −100 mA, I_B = −5.0 mA)			–	−0.90	–	
Base-Emitter On Voltage		$V_{BE(on)}$				V
(I_C = 2.0 mA, V_{CE} = 5.0 V)	(NPN)		0.58	0.66	0.70	
(I_C = 10 mA, V_{CE} = 5.0 V)			–	–	0.77	
(I_C = −2.0 mA, V_{CE} = −5.0 V)	(PNP)		−0.60	–	−0.75	
(I_C = −10 mA, V_{CE} = −5.0 V)			–	–	−0.82	
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain − Bandwidth Product		f_T				MHz
(I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz)	(NPN)		100	–	–	
(I_C = −10 mA, V_{CE} = −5.0 V, f = 100 MHz)	(PNP)		100	–	–	
Output Capacitance		C_{ob}				pF
(V_{CB} = 10 V, f = 1.0 MHz)	(NPN)		–	–	4.5	
(V_{CB} = −10 V, f = 1.0 MHz)	(PNP)		–	–	4.5	
Noise Figure		NF				dB
(I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 2 kΩ, f = 1 kHz, BW = 200 Hz)	(NPN)		–	–	10	
(I_C = −0.2 mA, V_{CE} = −5.0 V, R_S = 2 kΩ, f = 1 kHz, BW = 200 Hz)	(PNP)		–	–	10	

4. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

NPN TRANSISTOR

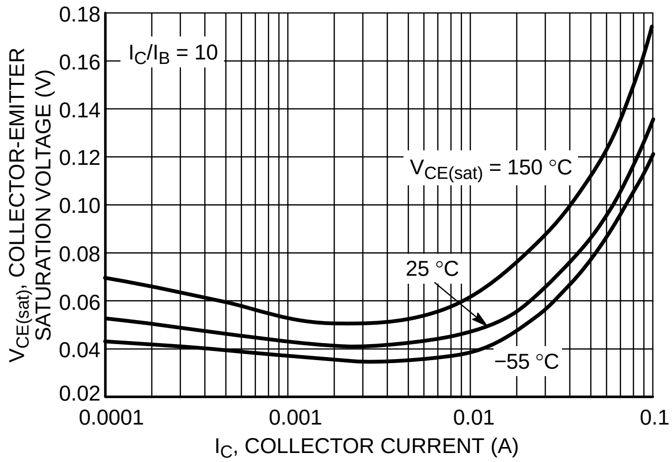


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

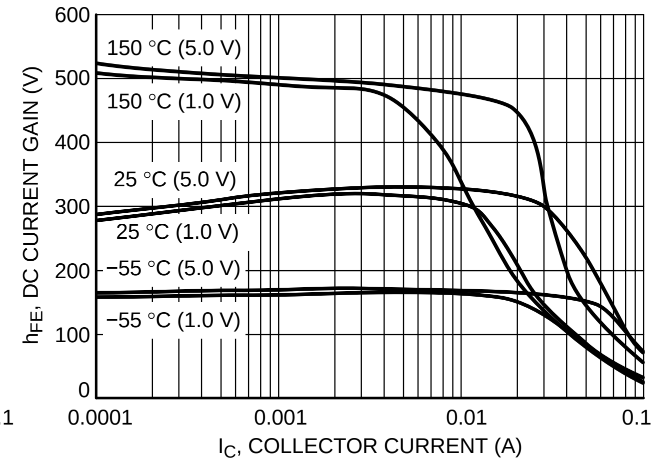


Figure 2. DC Current Gain vs. Collector Current

NPN TRANSISTOR

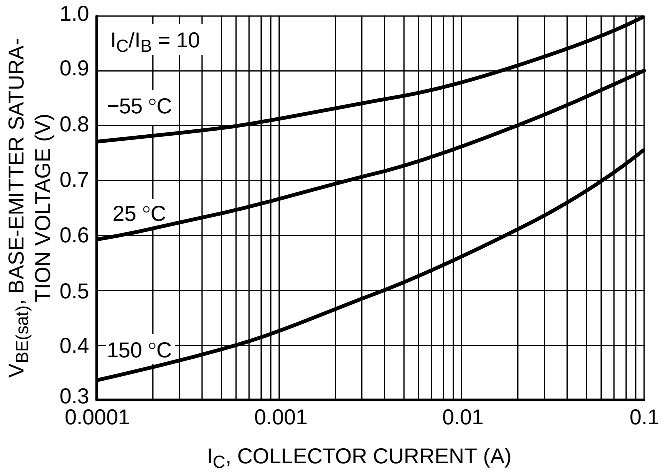


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

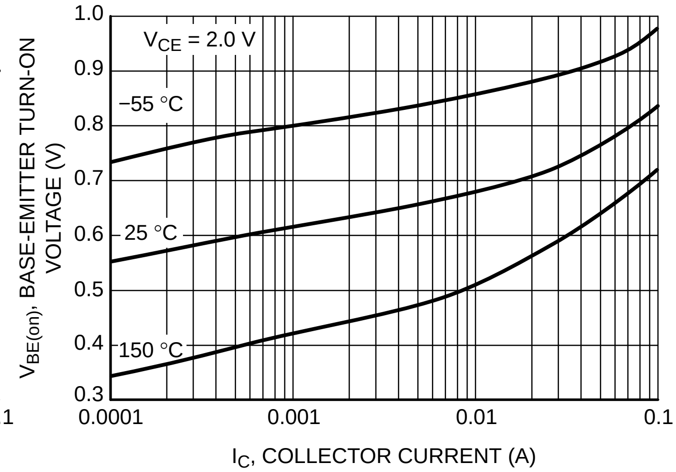


Figure 4. Base Emitter Turn-On Voltage vs. Collector Current

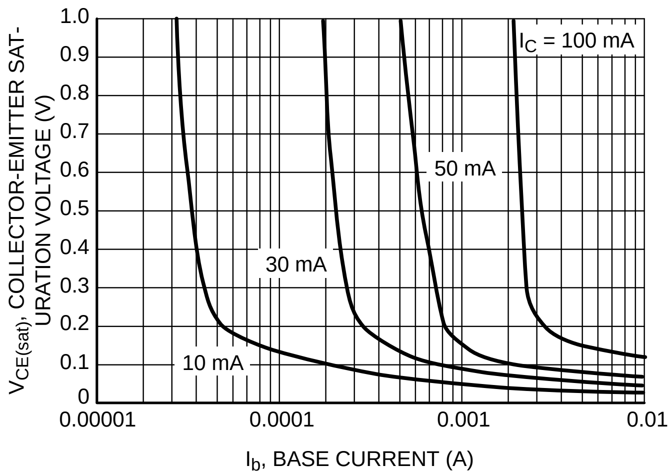


Figure 5. Saturation Region

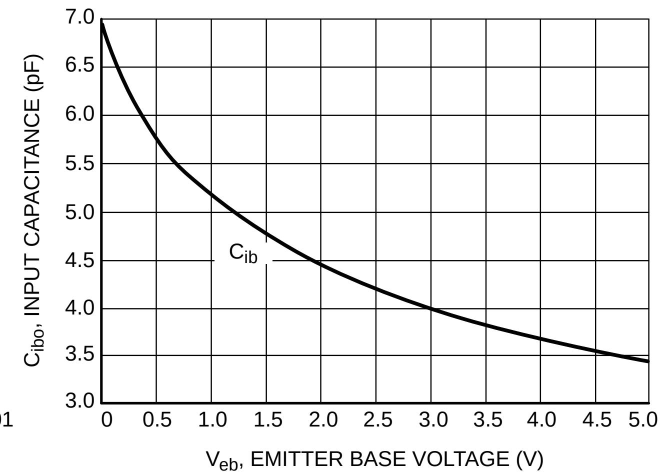


Figure 6. Input Capacitance

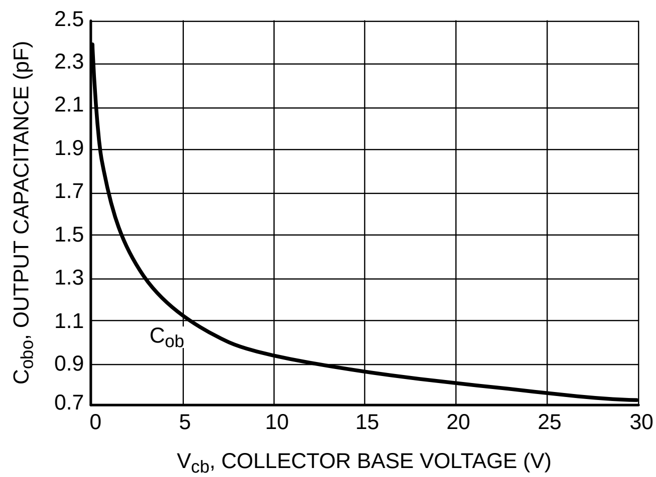


Figure 7. Output Capacitance

PNP TRANSISTOR

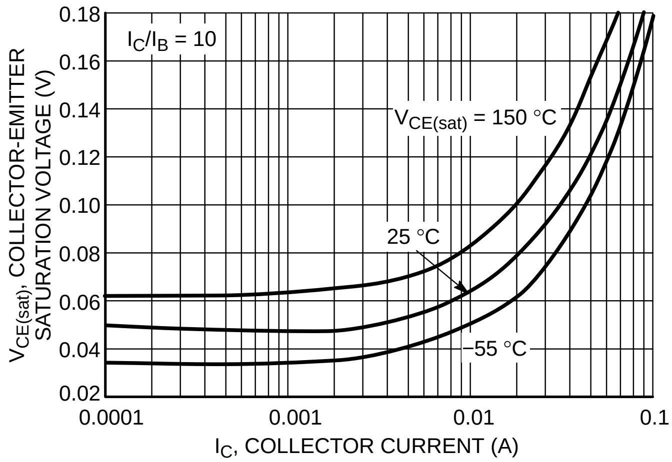


Figure 8. Collector Emitter Saturation Voltage vs. Collector Current

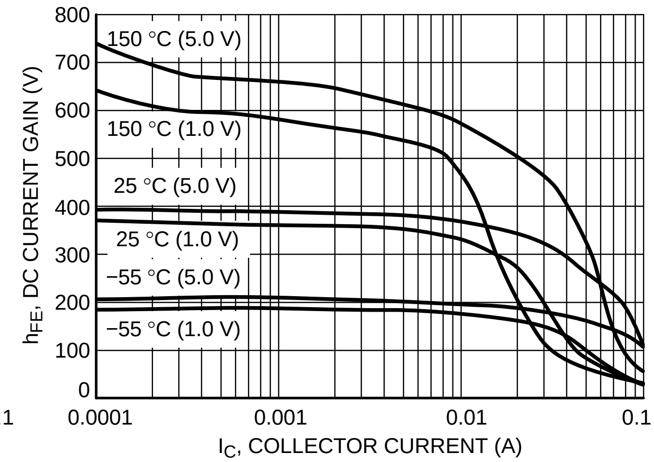


Figure 9. DC Current Gain vs. Collector Current

PNP TRANSISTOR

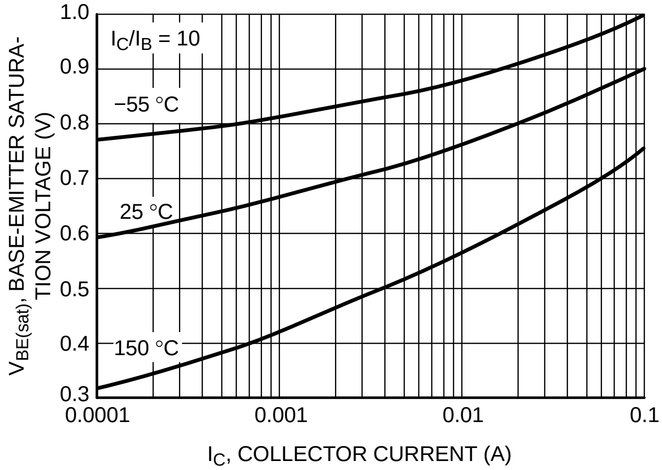


Figure 10. Base Emitter Saturation Voltage vs. Collector Current

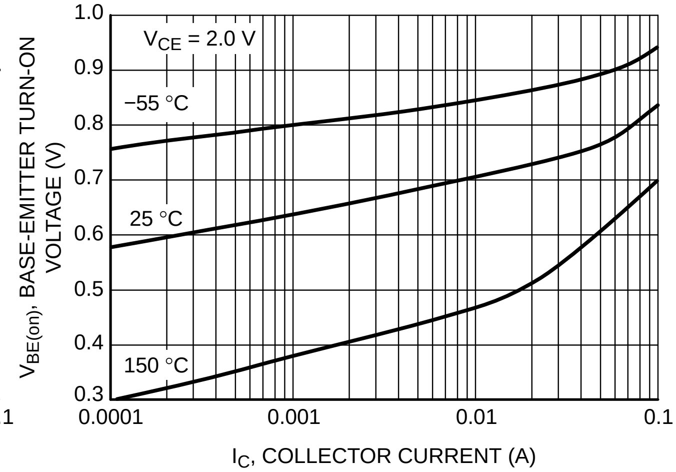


Figure 11. Base Emitter Turn-On Voltage vs. Collector Current

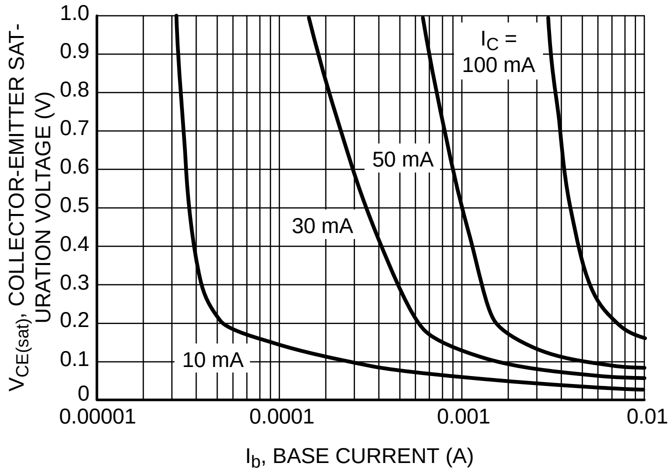


Figure 12. Saturation Region

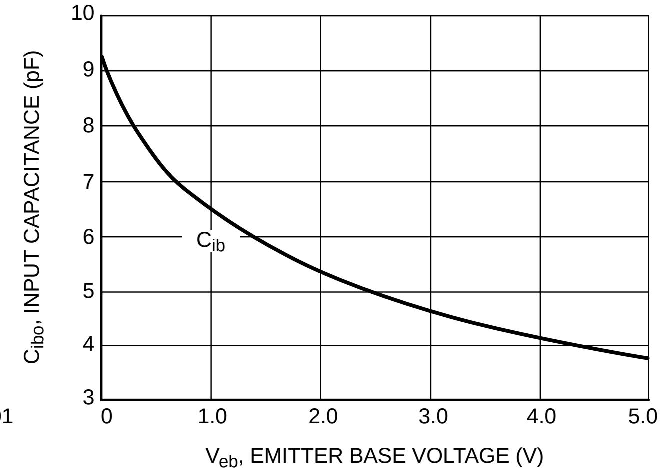


Figure 13. Input Capacitance

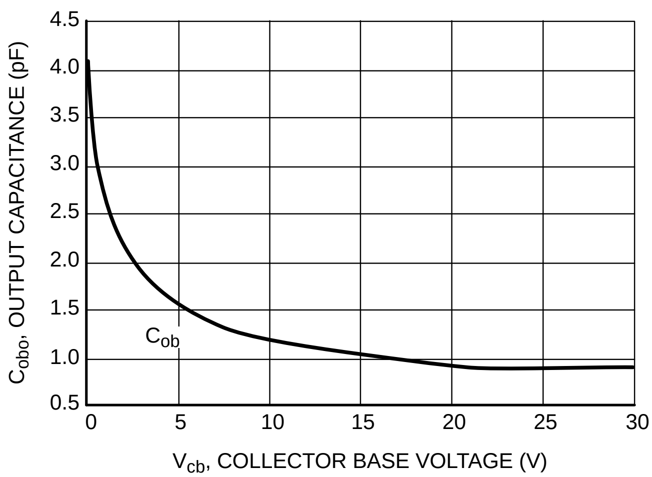
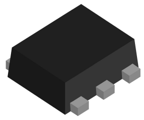


Figure 14. Output Capacitance

REVISION HISTORY

Revision	Description of Changes	Date
2	Rebranded the Data Sheet to **onsemi** format.	6/25/2025

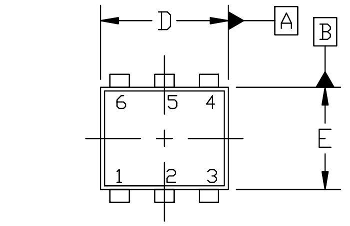


SOT−963 1.00x1.00x0.37, 0.35P
CASE 527AD
ISSUE F

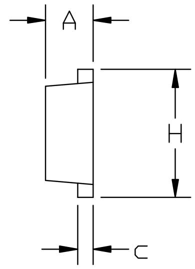
DATE 20 FEB 2024

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

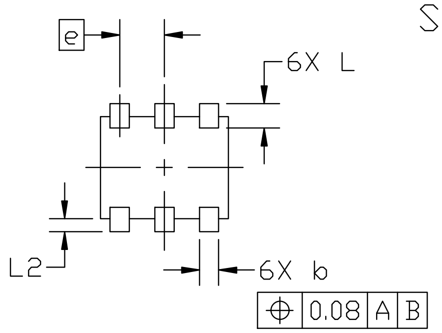
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.34	0.37	0.40
b	0.10	0.15	0.20
c	0.07	0.12	0.17
D	0.95	1.00	1.05
E	0.75	0.80	0.85
e	0.35 BSC		
H	0.95	1.00	1.05
L	0.19 REF		
L2	0.05	0.10	0.15



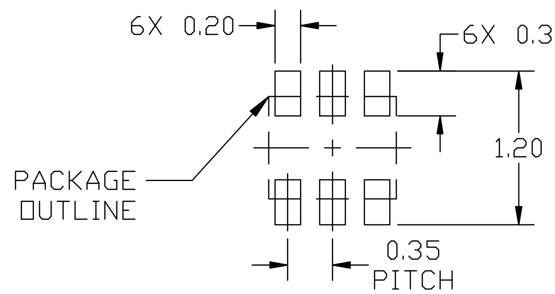
TOP VIEW



SIDE VIEW



BOTTOM VIEW



RECOMMENDED MOUNTING 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.

STYLE 1:
PIN 1. EMITTER 1
2. BASE 1
3. COLLECTOR 2
4. EMITTER 2
5. BASE 2
6. COLLECTOR 1

STYLE 2:
PIN 1. EMITTER 1
2. EMITTER2
3. BASE 2
4. COLLECTOR 2
5. BASE 1
6. COLLECTOR 1

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

STYLE 4:
PIN 1. COLLECTOR
2. COLLECTOR
3. BASE
4. EMITTER
5. COLLECTOR
6. COLLECTOR

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

STYLE 6:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. CATHODE
6. CATHODE

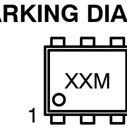
STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. CATHODE

STYLE 8:
PIN 1. DRAIN
2. DRAIN
3. GATE
4. SOURCE
5. DRAIN
6. DRAIN

STYLE 9:
PIN 1. SOURCE 1
2. GATE 1
3. DRAIN 2
4. SOURCE 2
5. GATE 2
6. DRAIN 1

STYLE 10:
PIN 1. CATHODE 1
2. N/C
3. CATHODE 2
4. ANODE 2
5. N/C
6. ANODE 1

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Month 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.

DOCUMENT NUMBER:	**98AON26456D**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**SOT−963 1.00x1.00x0.37, 0.35P**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

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