NST847BPDP6T5G

Dual Complementary General Purpose Transistor

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.

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

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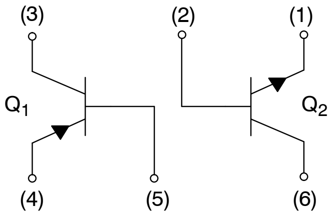
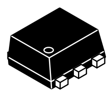


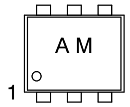
NST847BPDP6T5G*

*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 Specifications Brochure, BRD8011/D.

June, 2017 − Rev. 1

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

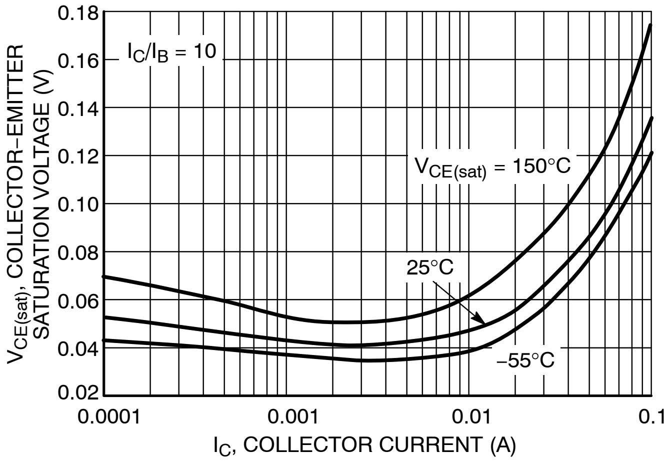


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

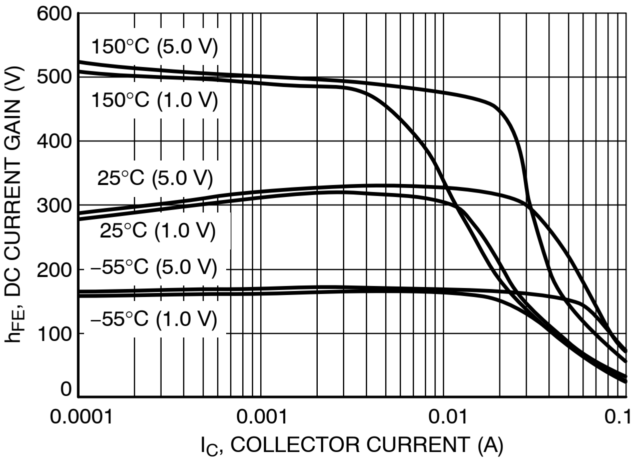


Figure 2. DC Current Gain vs. Collector Current

NPN TRANSISTOR

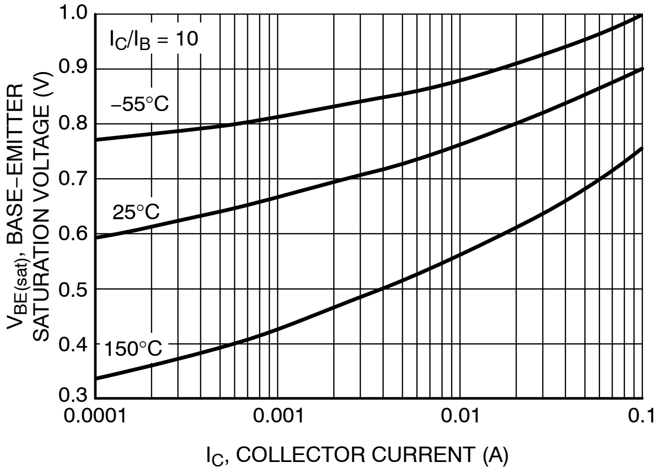


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

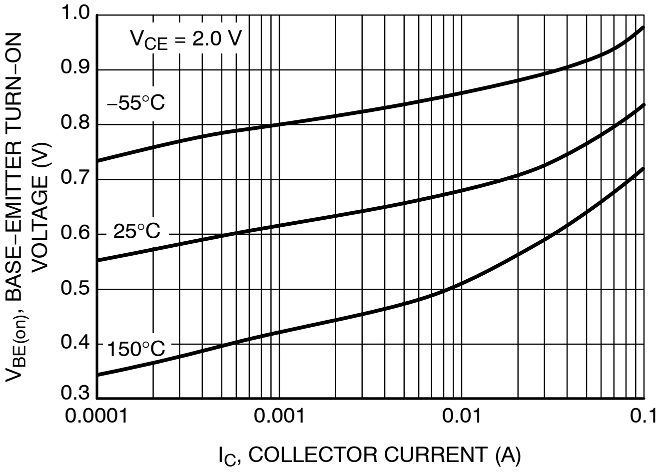


Figure 4. Base Emitter Turn−On Voltage vs. Collector Current

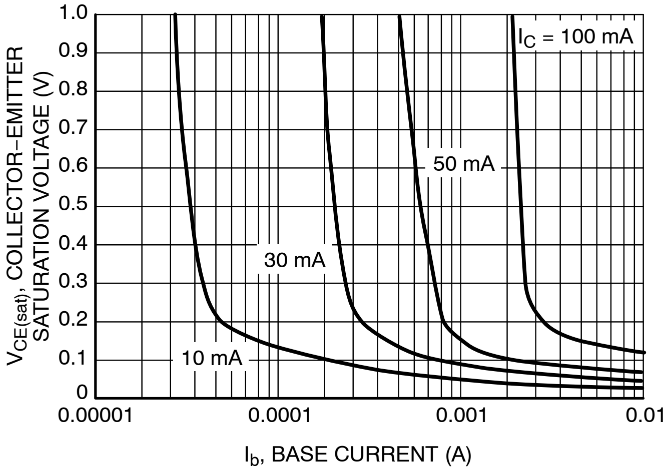


Figure 5. Saturation Region

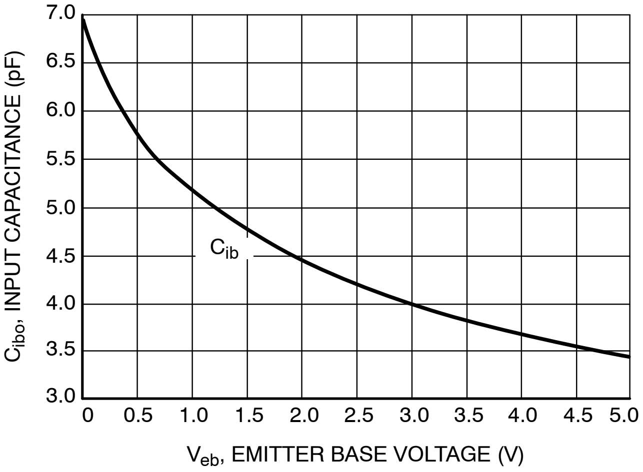


Figure 6. Input Capacitance

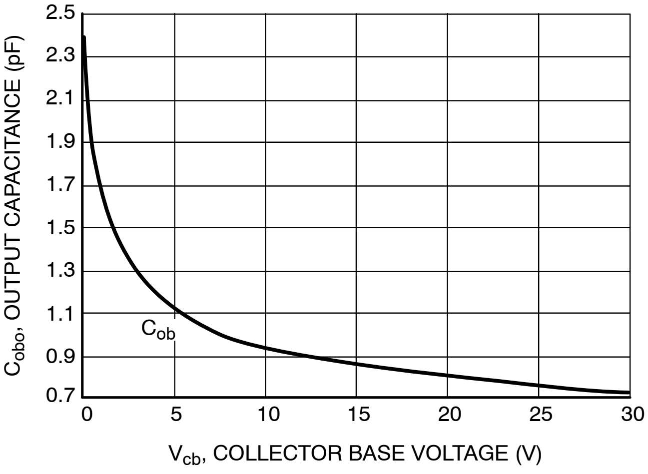


Figure 7. Output Capacitance

PNP TRANSISTOR

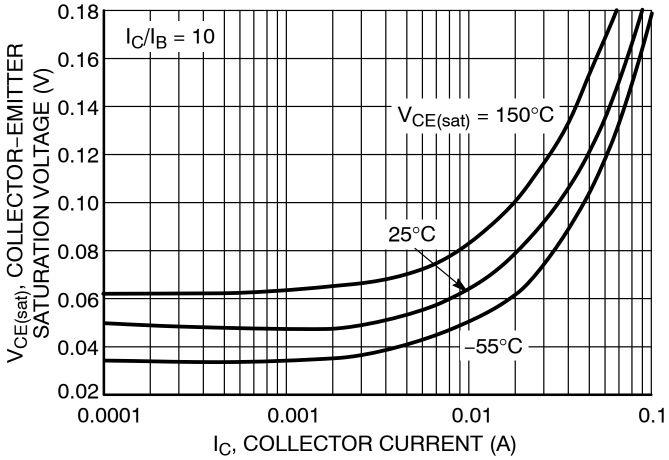


Figure 8. Collector Emitter Saturation Voltage vs. Collector Current

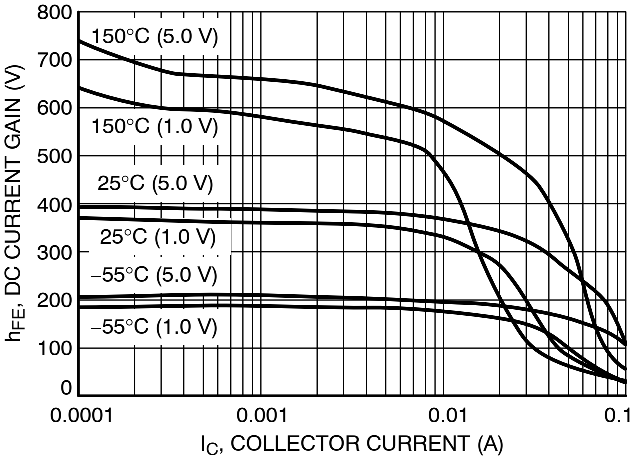


Figure 9. DC Current Gain vs. Collector Current

PNP TRANSISTOR

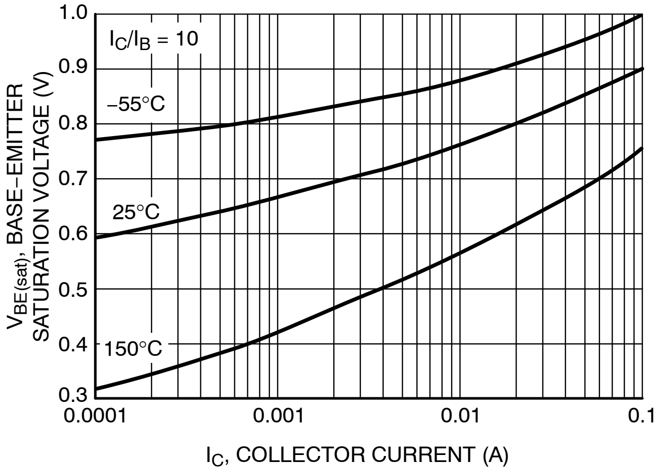


Figure 10. Base Emitter Saturation Voltage vs. Collector Current

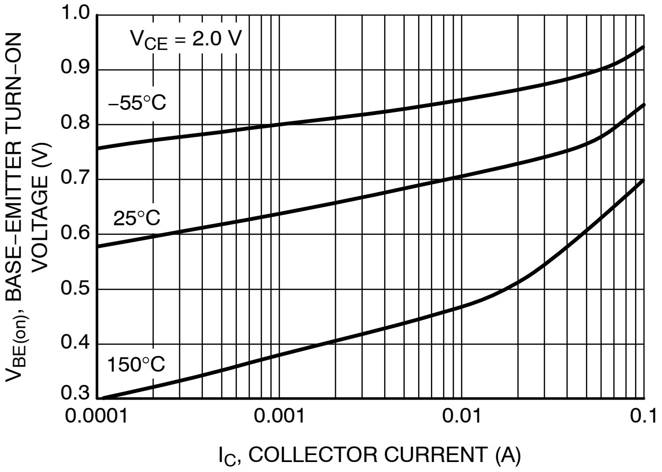


Figure 11. Base Emitter Turn−On Voltage vs. Collector Current

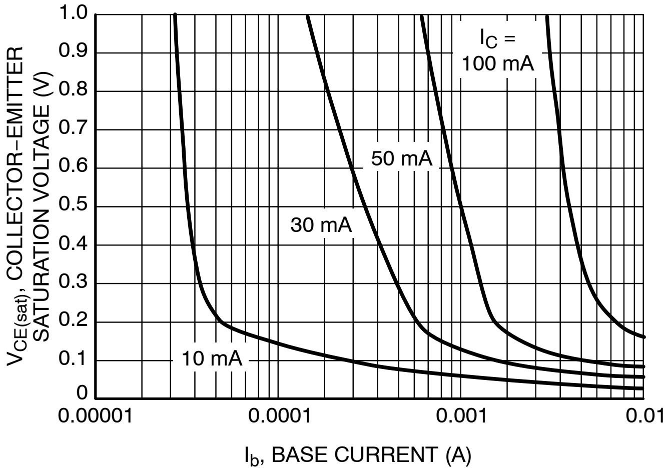


Figure 12. Saturation Region

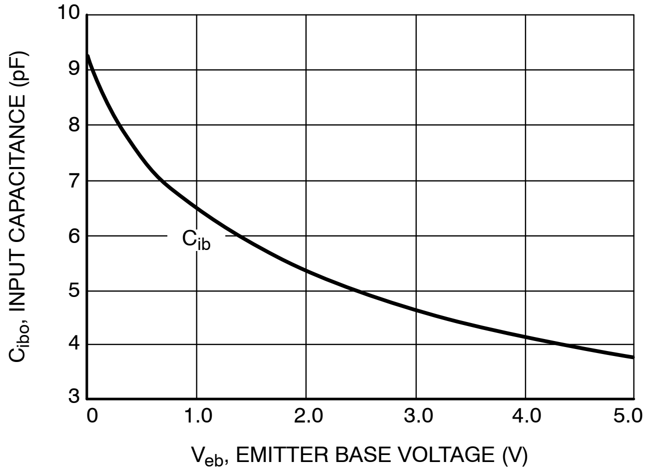


Figure 13. Input Capacitance

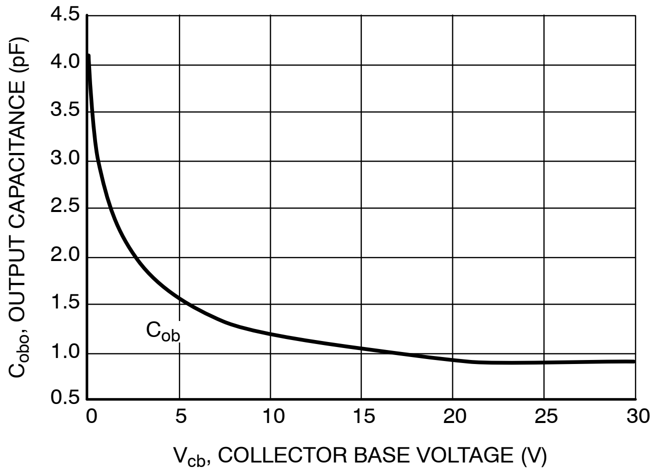


Figure 14. Output Capacitance

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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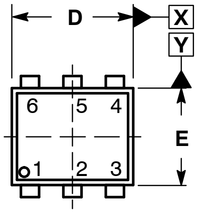
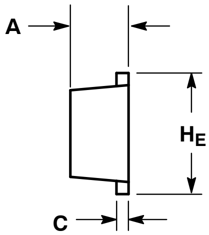
SCALE 4:1

SOT−963
CASE 527AD−01
ISSUE E

DATE 09 FEB 2010



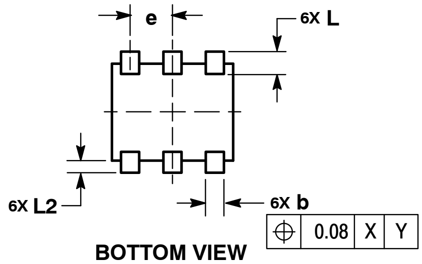
TOP VIEW



SIDE VIEW

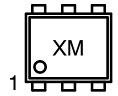
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS		
DIM	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_E	0.95	1.00	1.05
L	0.19 REF		
L2	0.05	0.10	0.15



BOTTOM VIEW

GENERIC MARKING DIAGRAM*



X = 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.

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

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

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

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

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

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

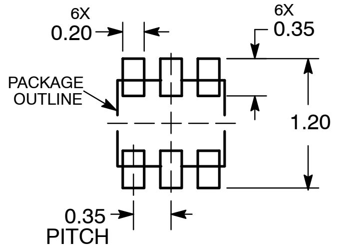
STYLE 8:
PIN 1. DRAIN
2. DRAIN
3. GATE
4. SOURCE
5. DRAIN
6. DRAIN

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

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

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

RECOMMENDED MOUNTING FOOTPRINT



DIMENSIONS: MILLIMETERS

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