PNP General-Purpose Amplifier

NSVT5401MR6

Features

- This Device Has Matched Dies
- AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

ABSOLUTE MAXIMUM RATINGS (Notes 1, 2)

(T_A = 25°C, unless otherwise noted)

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	−150	V
Collector−Base Voltage	V_{CBO}	−160	V
Emitter−Base Voltage	V_{EBO}	−5.0	V
Collector Current − Continuous	I_C	−600	mA
Operating and Storage Junction 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. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady−state limits. **onsemi** should be consulted on applications involving pulsed or low−duty−cycle operations.

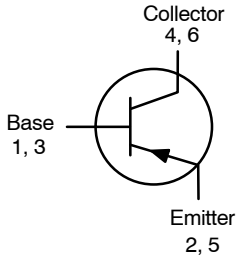
THERMAL CHARACTERISTICS (Note 3)

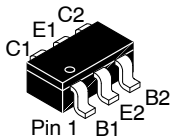
(T_A = 25°C, unless otherwise noted)

Characteristic	Symbol	Max	Unit
Total Device Dissipation	P_D	700	mW
Thermal Resistance, Junction−to−Ambient, Total	$R_{\theta JA}$	180	°C/W

3. Device mounted on a 1 in 2 pad of 2 oz copper.

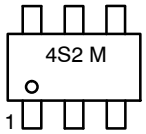
ELECTRICAL CONNECTION





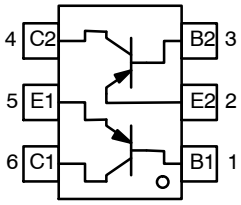
TSOT23 6−Lead
CASE 419BL

MARKING DIAGRAM



4S2 = Specific Device Code
M = Date Code

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping†
NSVT5401MR6T1G	TSOT23−6 (Pb−Free)	3000 / 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.

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

Parameter	Symbol	Test Condition	Min	Max	Unit
Collector−Emitter Breakdown Voltage (Note 4)	BV_{CEO}	I_C = −1.0 mA, I_B = 0	−150	–	V
Collector−Base Breakdown Voltage	BV_{CBO}	I_C = −100 μA, I_E = 0	−160	–	V
Emitter−Base Breakdown Voltage	BV_{EBO}	I_E = −10 μA, I_C = 0	−5.0	–	V
Collector Cut−Off Current	I_{CBO}	V_{CB} = −120 V, I_E = 0	–	−50	nA
		V_{CB} = −120 V, I_E = 0, T_A = 100°C	–	−50	μA
Emitter Cut−Off Current	I_{EBO}	V_{EB} = −3 V, I_C = 0	–	−50	nA
DC Current Gain (Note 4)	h_{FE1}	V_{CE} = −5 V, I_C = −1 mA	50	–	–
Variation Ratio of h_{FE1} Between Die 1 and Die 2	DIVID1	h_{FE1}(Die1) / h_{FE1}(Die2)	0.9	1.1	–
DC Current Gain (Note 4)	h_{FE2}	V_{CE} = −5 V, I_C = −10 mA	60	240	–
Variation Ratio of h_{FE2} Between Die 1 and Die 2	DIVID2	h_{FE2}(Die1) / h_{FE2}(Die2)	0.95	1.05	–
DC Current Gain (Note 4)	h_{FE3}	V_{CE} = −5 V, I_C = −50 mA	50	–	–
Variation Ratio of h_{FE3} Between Die 1 and Die 2	DIVID3	h_{FE3}(Die1) / h_{FE3}(Die2)	0.9	1.1	–
Collector−Emitter Saturation Voltage (Note 4)	V_{CE}(sat)	I_C = −10 mA, I_B = −1 mA	–	−0.2	V
		I_C = −50 mA, I_B = −5 mA	–	−0.5	
Base−Emitter Saturation Voltage (Note 4)	V_{BE}(sat)	I_C = −10 mA, I_B = −1 mA	–	−1	V
		I_C = −50 mA, I_B = −5 mA	–	−1	
Base−Emitter On Voltage (Note 4)	V_{BE}(on)	V_{CE} = −5 V, I_C = −10 mA	–	−1	V
Difference of V_{BE}(on) Between Die1 and Die 2	DEL	V_{BE}(on)(Die) − V_{BE}(on)(Die2)	−8	8	mV
Current Gain Bandwidth Product	f_T	V_{CE} = −10 V, I_C = −10 mA, f = 100 MHz	100	300	MHz
Output Capacitance	C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	–	6.0	pF
Noise Figure	NF	V_{CE} = −5.0 V, I_C = −250 μA, R_S = 1.0 kΩ f = 10 Hz to 15.7 kHz	–	8.0	dB

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. Pulse test: Pulse width ≤ 300 ms, duty cycle ≤ 2%

TYPICAL PERFORMANCE CHARACTERISTICS

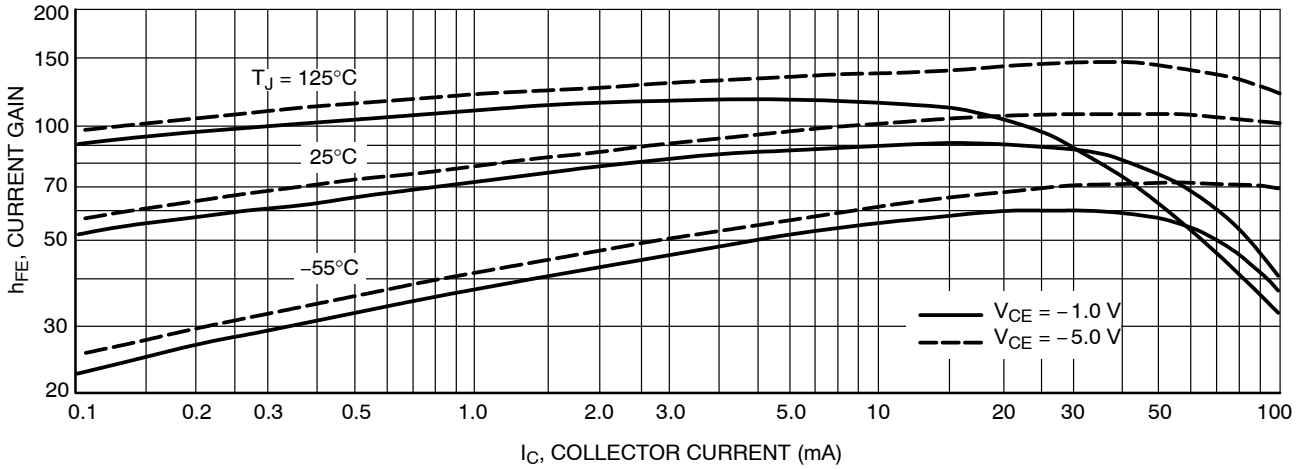


Figure 1. DC Current Gain

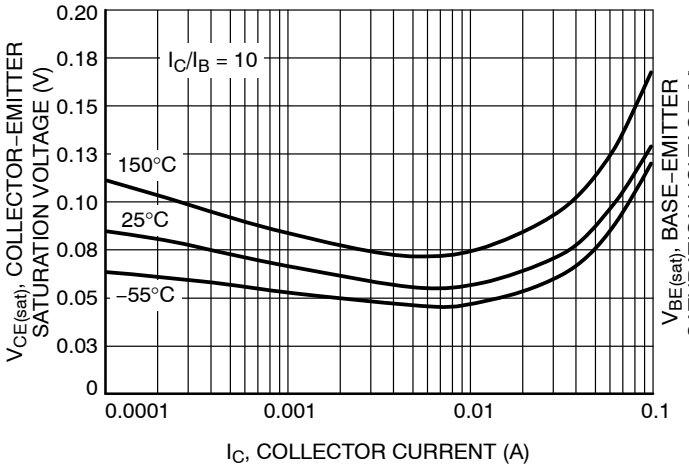


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

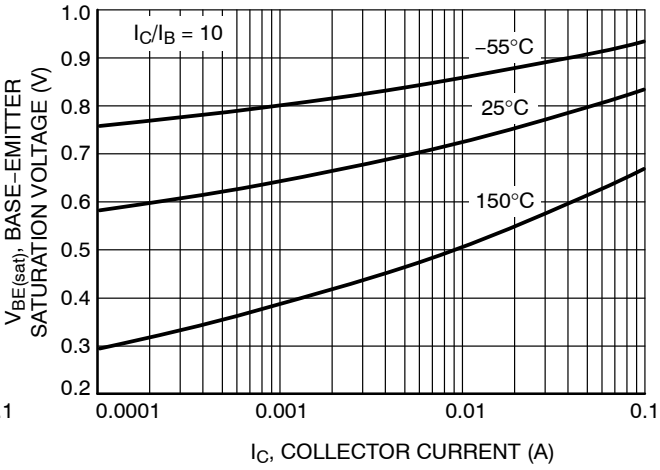


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

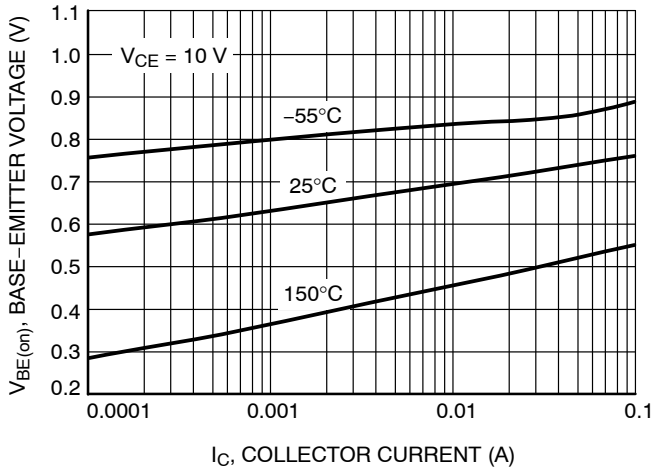


Figure 4. Base Emitter Voltage vs. Collector Current

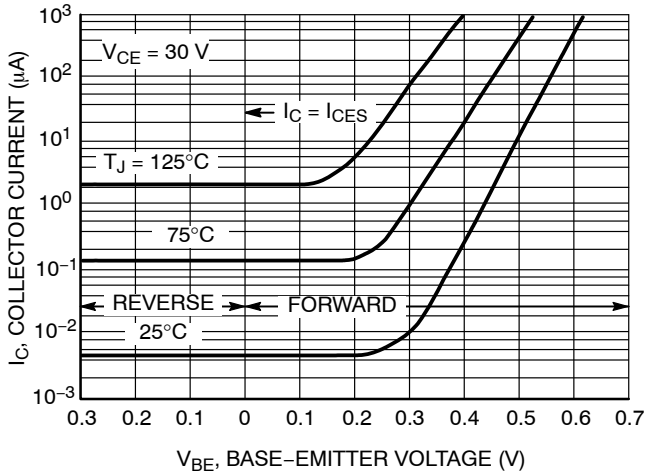


Figure 5. Collector Cut−Off Region

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

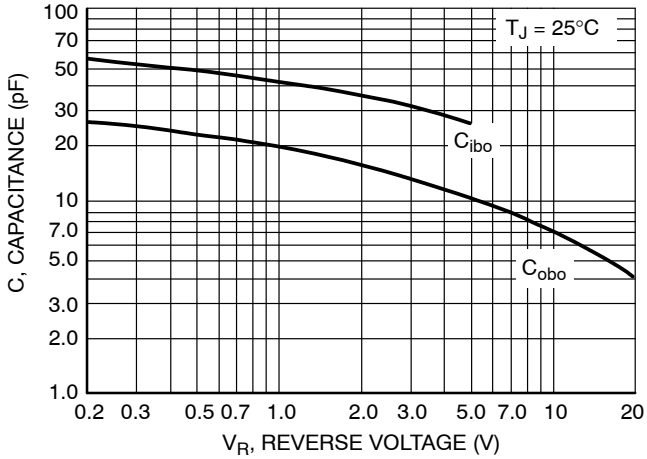
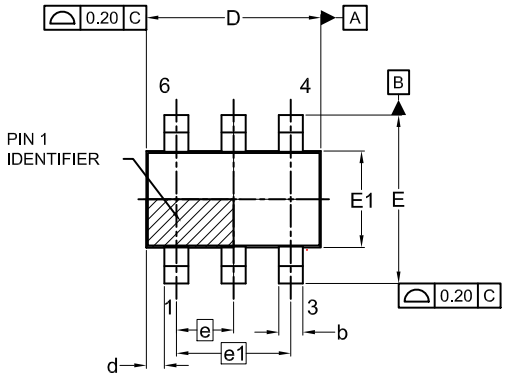


Figure 6. Capacitances

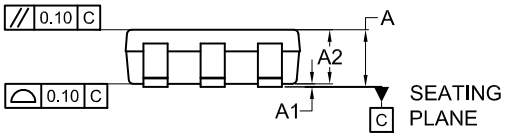
1
SCALE 2:1

TSOT23 6−Lead
CASE 419BL
ISSUE A

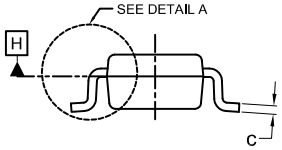
DATE 31 AUG 2020



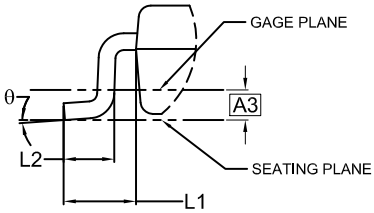
TOP VIEW



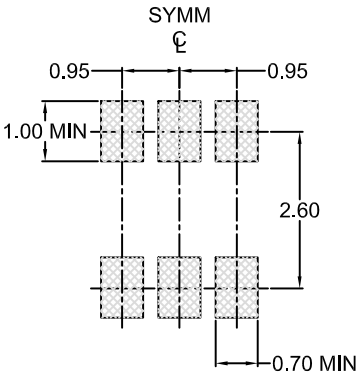
FRONT VIEW



SIDE VIEW



DETAIL A



LAND PATTERN
RECOMMENDATION

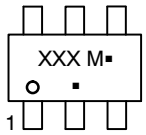
*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.25MM PER END. DIMENSIONS D AND E1 ARE DETERMINED AT DATUM H.
4. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.70	0.85	1.00
A3	0.25 BSC		
b	0.25	0.38	0.50
c	0.10	0.18	0.26
D	2.80	2.95	3.10
d	0.30 REF		
E	2.50	2.75	3.00
E1	1.30	1.50	1.70
e	0.95 BSC		
e1	1.90 BSC		
L1	0.60 REF		
L2	0.20	0.40	0.60
Θ	0°	-–	10°

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. Some products may not follow the Generic Marking.

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DESCRIPTION:	TSOT23 6−Lead		PAGE 1 OF 1

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