

Bipolar Transistor -160 V, -1 A, Low $V_{CE(sat)}$, PNP Single NSVT1418L

This device is bipolar junction transistor featuring high current, low saturation voltage, and high speed switching.

Suitable for automotive applications. AEC-Q101 qualified and PPAP capable.

Features

- Large Current Capacitance
- Low Collector to Emitter Saturation Voltage
- High Speed Switching
- High Allowable Power Dissipation
- AEC-Q101 Qualified and PPAP Capable
- Pb-Free, Halogen Free and RoHS Compliant
- Ultra Small Package Facilitates Miniaturization in End Products

Typical Applications

- High Side Switch
- Lighting, Infotainment

ABSOLUTE MAXIMUM RATINGS at $T_A = 25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Collector to Base Voltage	V_{CBO}	-180	V
Collector to Emitter Voltage	V_{CEO}	-160	V
Emitter to Base Voltage	V_{EBO}	-6	V
Collector Current	I_C	-1	A
Collector Current (Pulse)	I_{CP}	-2	A
Collector Dissipation (Note 1)	P_C	0.42	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

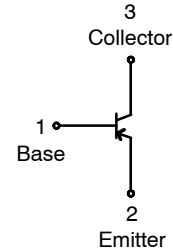
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface mounted on ceramic substrate. (250 mm² x 0.8 mm)

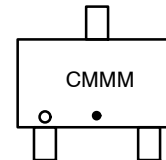


SOT-23
CASE 318-08

ELECTRICAL CONNECTION



MARKING DIAGRAM



CMM = Specific Device Code
M = Single Digit Date Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	$V_{CB} = -120\text{ V}, I_E = 0\text{ A}$			-0.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = -4\text{ V}, I_C = 0\text{ A}$			-0.1	μA
DC Current Gain	h_{FE1}	$V_{CE} = -5\text{ V}, I_C = -100\text{ mA}$	100		400	
	h_{FE2}	$V_{CE} = -5\text{ V}, I_C = -10\text{ mA}$	90			
Gain-Bandwidth Product	f_T	$V_{CE} = -10\text{ V}, I_C = -50\text{ mA}$		120		MHz
Output Capacitance	C_{ob}	$V_{CB} = -10\text{ V}, f = 1\text{ MHz}$		11		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C = -250\text{ mA}, I_B = -25\text{ mA}$		-0.1	-0.5	V
	$V_{CE(sat)2}$	$I_C = -250\text{ mA}, I_B = -50\text{ mA}$		-0.08	-0.13	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -250\text{ mA}, I_B = -25\text{ mA}$		-0.8	-1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\text{ }\mu\text{A}, I_E = 0\text{ A}$	-180			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{ mA}, R_{BE} = \infty$	-160			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -10\text{ }\mu\text{A}, I_C = 0\text{ A}$	-6			V
Turn-On Time	t_{on}	See Figure 1		90		ns
Storage Time	t_{stg}			1000		ns
Fall Time	t_f			70		ns

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.

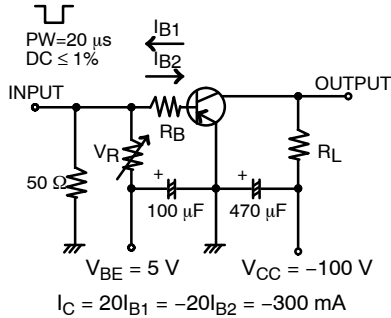


Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

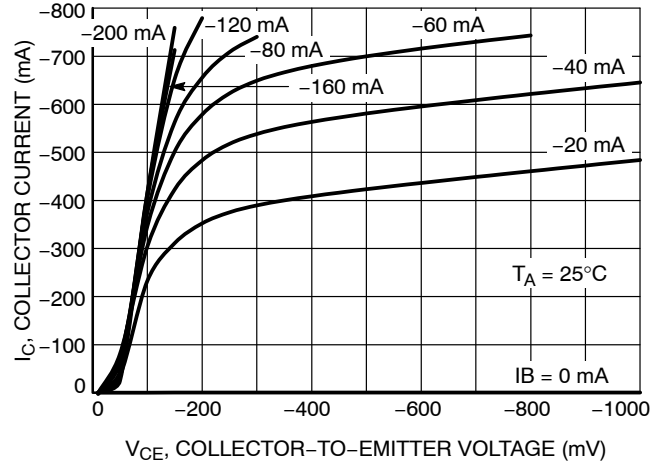


Figure 2. I_C vs. V_{CE}

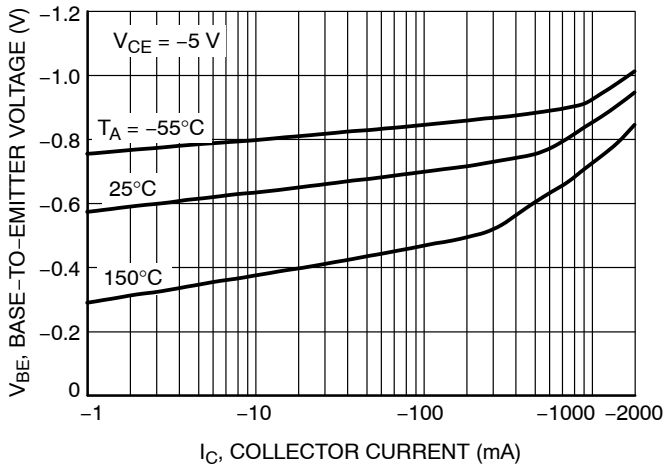


Figure 3. V_{BE} vs. I_C

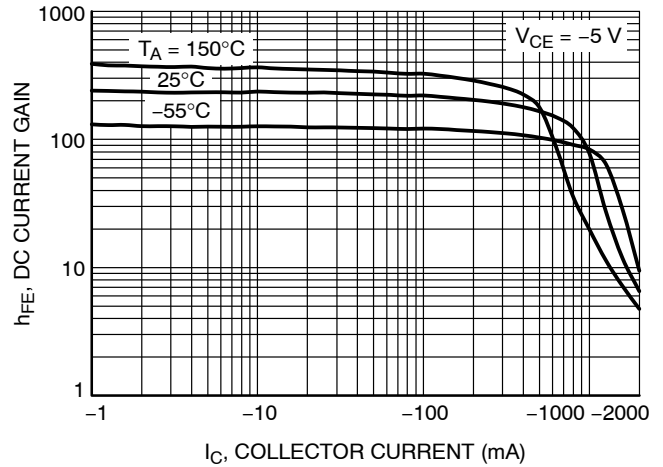


Figure 4. h_{FE} vs. I_C

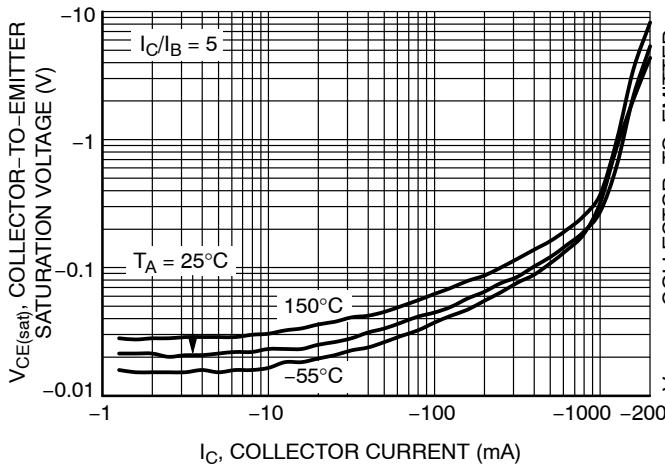


Figure 5. $V_{CE(sat)}$ vs. I_C

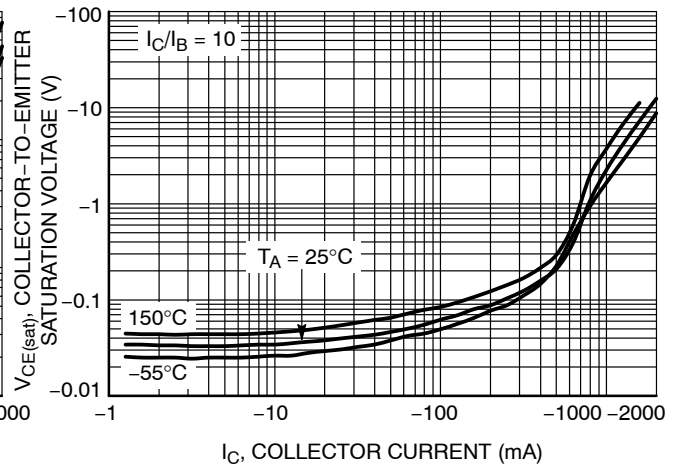


Figure 6. $V_{CE(sat)}$ vs. I_C

TYPICAL CHARACTERISTICS

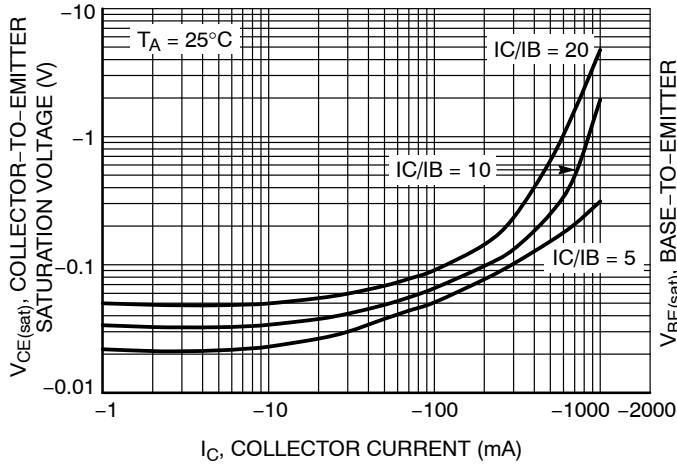


Figure 7. $V_{CE(sat)}$ vs. I_C

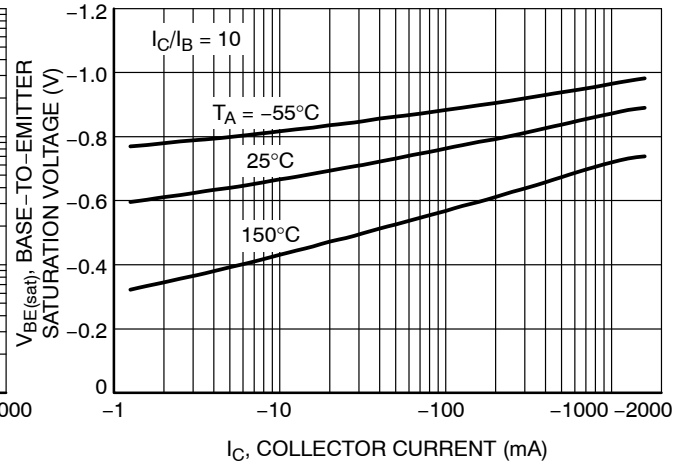


Figure 8. $V_{BE(sat)}$ vs. I_C

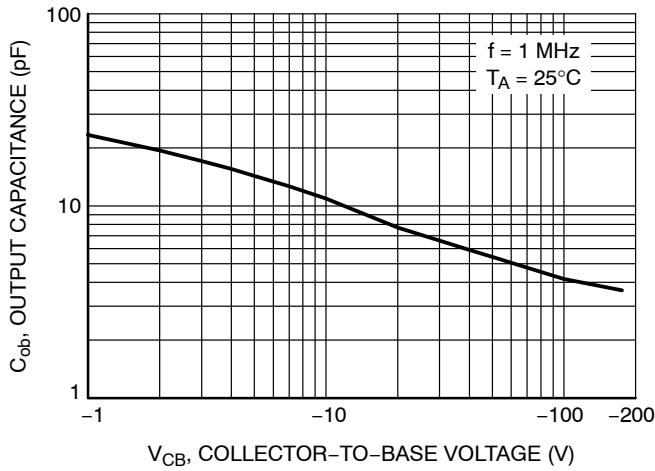


Figure 9. C_{ob} vs. V_{CB}

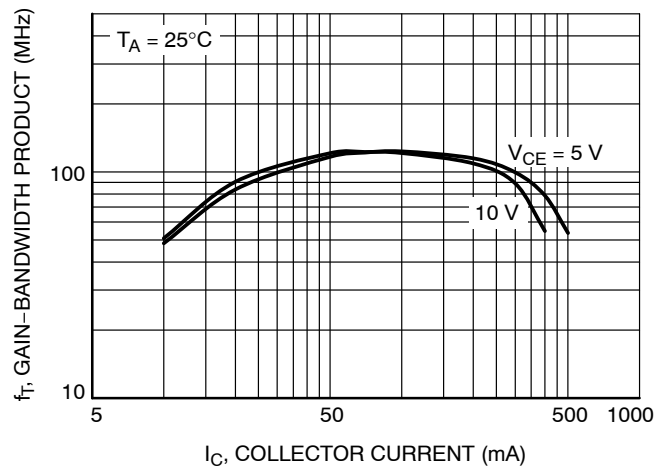


Figure 10. f_T vs. I_C

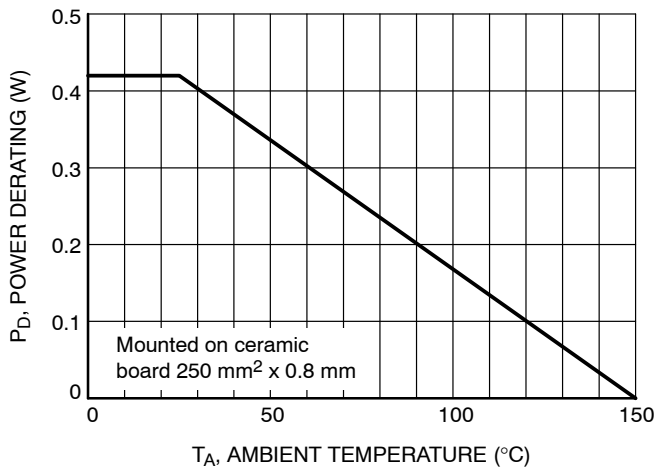


Figure 11. Power Derating

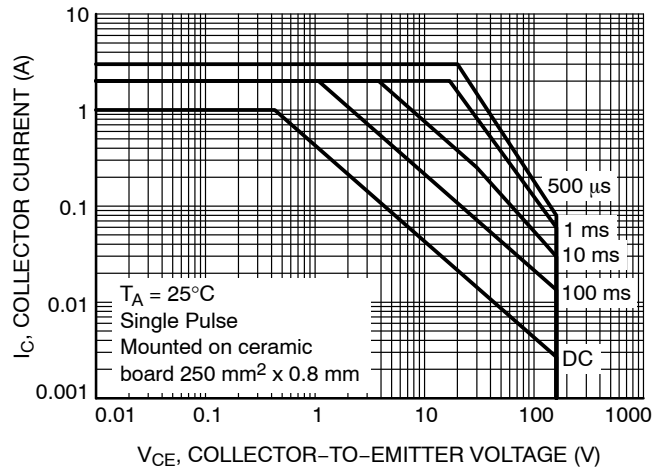


Figure 12. Safe Operating Area

NSVT1418L

ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing) †
NSVT1418LT1G	CMM	SOT-23 (Pb-Free / Halogen Free)	3,000 / 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.



SCALE 4:1

SOT-23 (TO-236) 2.90x1.30x1.00 1.90P
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DATE 14 AUG 2024



MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
HE	2.10	2.40	2.64
T	0°	---	10°

NOTES:

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

GENERIC MARKING DIAGRAM*


XXX = Specific Device Code
M = 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.


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.

STYLES ON PAGE 2

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STYLE 1 THRU 5: CANCELLED	STYLE 6: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 7: PIN 1. EMITTER 2. BASE 3. COLLECTOR	STYLE 8: PIN 1. ANODE 2. NO CONNECTION 3. CATHODE		
STYLE 9: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 10: PIN 1. DRAIN 2. SOURCE 3. GATE	STYLE 11: PIN 1. ANODE 2. CATHODE 3. CATHODE-ANODE	STYLE 12: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 13: PIN 1. SOURCE 2. DRAIN 3. GATE	STYLE 14: PIN 1. CATHODE 2. GATE 3. ANODE
STYLE 15: PIN 1. GATE 2. CATHODE 3. ANODE	STYLE 16: PIN 1. ANODE 2. CATHODE 3. CATHODE	STYLE 17: PIN 1. NO CONNECTION 2. ANODE 3. CATHODE	STYLE 18: PIN 1. NO CONNECTION 2. CATHODE 3. ANODE	STYLE 19: PIN 1. CATHODE 2. ANODE 3. CATHODE-ANODE	STYLE 20: PIN 1. CATHODE 2. ANODE 3. GATE
STYLE 21: PIN 1. GATE 2. SOURCE 3. DRAIN	STYLE 22: PIN 1. RETURN 2. OUTPUT 3. INPUT	STYLE 23: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 24: PIN 1. GATE 2. DRAIN 3. SOURCE	STYLE 25: PIN 1. ANODE 2. CATHODE 3. GATE	STYLE 26: PIN 1. CATHODE 2. ANODE 3. NO CONNECTION
STYLE 27: PIN 1. CATHODE 2. CATHODE 3. CATHODE	STYLE 28: PIN 1. ANODE 2. ANODE 3. ANODE				

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