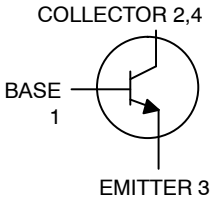
Bipolar Power Transistors

NPN Silicon

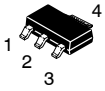
NJT4031N, NJV4031NT1G, NJV4031NT3G

NPN TRANSISTOR
3.0 AMPERES
40 VOLTS, 2.0 WATTS



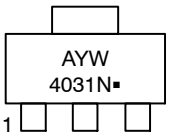
Features

- Epoxy Meets UL 94, V–0 @ 0.125 in
- NJV 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



SOT–223
CASE 318E
STYLE 1

MARKING DIAGRAM



A	= Assembly Location
Y	Year
W	= Work Week
4031N	= Specific Device Code
▪	= Pb–Free Package

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	40	Vdc
Collector–Base Voltage	V_{CB}	40	Vdc
Emitter–Base Voltage	V_{EB}	6.0	Vdc
Base Current – Continuous	I_B	1.0	Adc
Collector Current – Continuous	I_C	3.0	Adc
Collector Current – Peak	I_{CM}	5.0	Adc
ESD – Human Body Model	HBM	3B	V
ESD – Machine Model	MM	C	V

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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Power Dissipation Total P_D @ T_A = 25°C (Note 1) Total P_D @ T_A = 25°C (Note 2)	P_D	 2.0 0.80	W
Thermal Resistance, Junction–to–Case Junction–to–Ambient (Note 1) Junction–to–Ambient (Note 2)	 $R_{\theta JA}$ $R_{\theta JA}$	 64 155	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8” from case for 5 seconds	T_L	260	°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	°C

1. Mounted on 1” sq. (645 sq. mm) Collector pad on FR–4 bd material.
2. Mounted on 0.012” sq. (7.6 sq. mm) Collector pad on FR–4 bd material.

ORDERING INFORMATION

Device	Package	Shipping†
NJT4031NT1G	SOT–223 (Pb–Free)	1000 / Tape & Reel
NJV4031NT1G		
NJT4031NT3G	SOT–223 (Pb–Free)	4000 / Tape & Reel
NJV4031NT3G		

†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_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (I_C = 10 mAdc, I_B = 0 Adc)	$V_{CEO(sus)}$	40	–	–	Vdc
Emitter−Base Voltage (I_E = 50 μAdc, I_C = 0 Adc)	V_{EBO}	6.0	–	–	Vdc
Collector Cutoff Current (V_{CB} = 40 Vdc)	I_{CBO}	–	–	100	nAdc
Emitter Cutoff Current (V_{BE} = 6.0 Vdc)	I_{EBO}	–	–	100	nAdc
ON CHARACTERISTICS (Note 3)					
Collector−Emitter Saturation Voltage (I_C = 0.5 Adc, I_B = 5.0 mAdc) (I_C = 1.0 Adc, I_B = 10 mAdc) (I_C = 3.0 Adc, I_B = 0.3 Adc)	$V_{CE(sat)}$	 – – –	 – – –	 0.100 0.150 0.300	Vdc
Base−Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 0.1 Adc)	$V_{BE(sat)}$	–	–	1.0	Vdc
Base−Emitter On Voltage (I_C = 1.0 Adc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$	–	–	1.0	Vdc
DC Current Gain (I_C = 0.5 Adc, V_{CE} = 1.0 Vdc) (I_C = 1.0 Adc, V_{CE} = 1.0 Vdc) (I_C = 3.0 Adc, V_{CE} = 1.0 Vdc)	h_{FE}	 220 200 100	 – – –	 500 	
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 10 Vdc, f = 1.0 MHz)	C_{ob}	–	25	–	pF
Input Capacitance (V_{EB} = 5.0 Vdc, f = 1.0 MHz)	C_{ib}	–	170	–	pF
Current−Gain − Bandwidth Product (Note 4) (I_C = 500 mA, V_{CE} = 10 V, F_{test} = 1.0 MHz)	f_T	–	215	–	MHz

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.

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
4. $f_T = |h_{FE}| \bullet f_{test}$

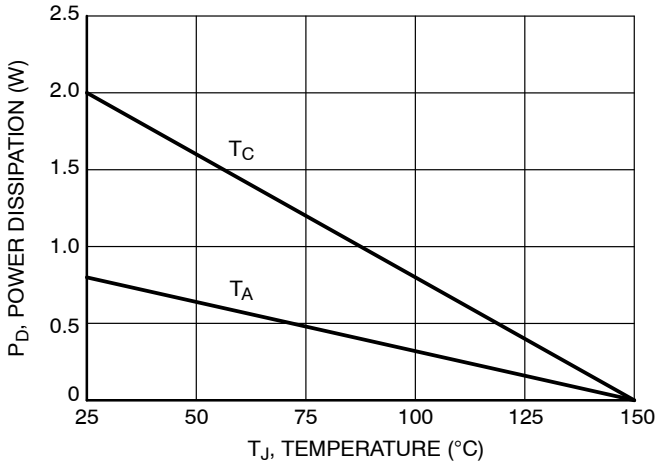


Figure 1. Power Derating

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TYPICAL CHARACTERISTICS

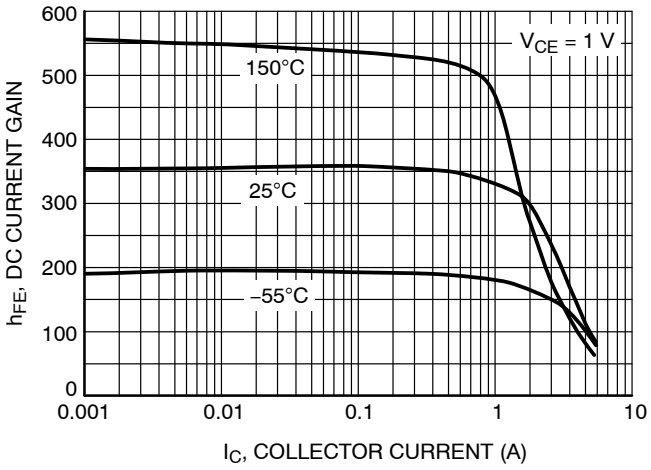


Figure 2. DC Current Gain

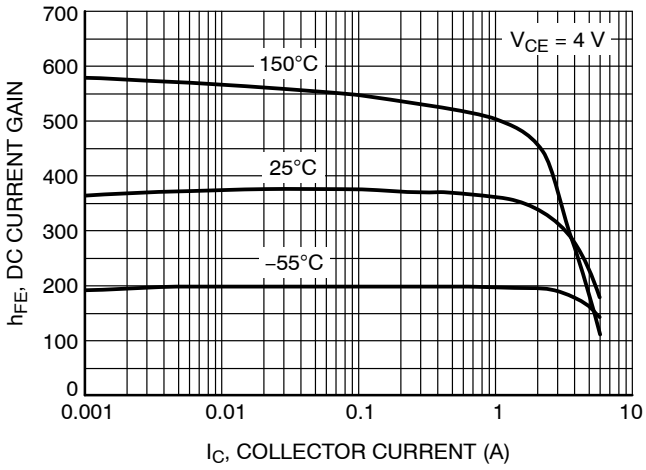


Figure 3. DC Current Gain

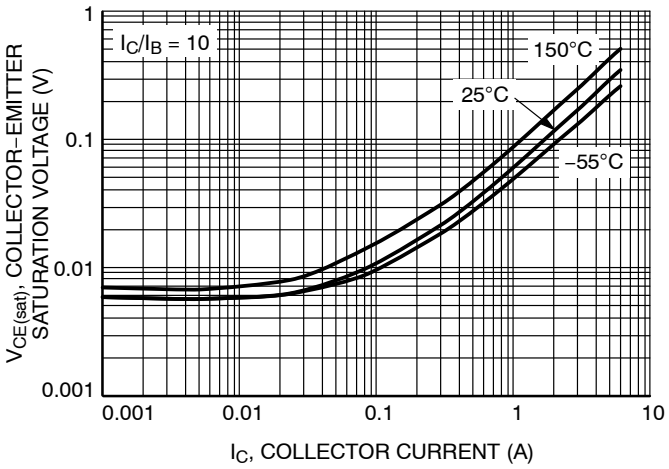


Figure 4. Collector−Emitter Saturation Voltage

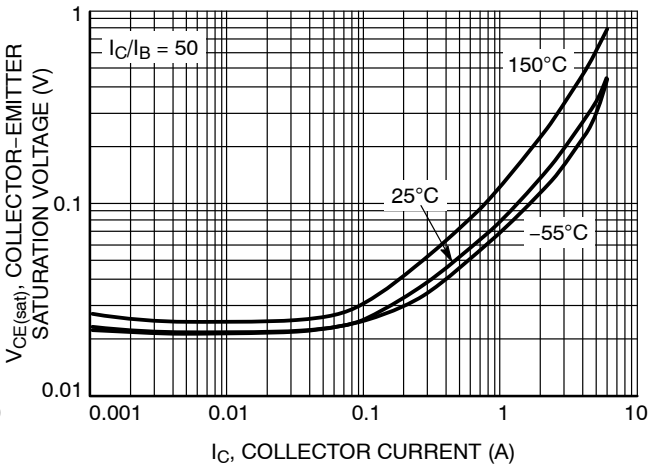


Figure 5. Collector−Emitter Saturation Voltage

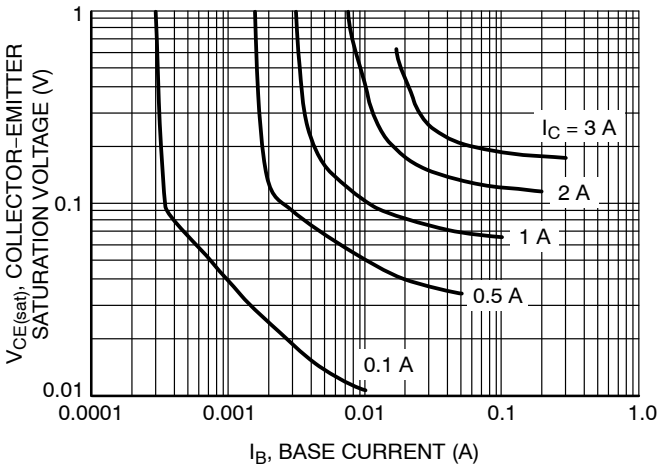


Figure 6. Collector Saturation Region

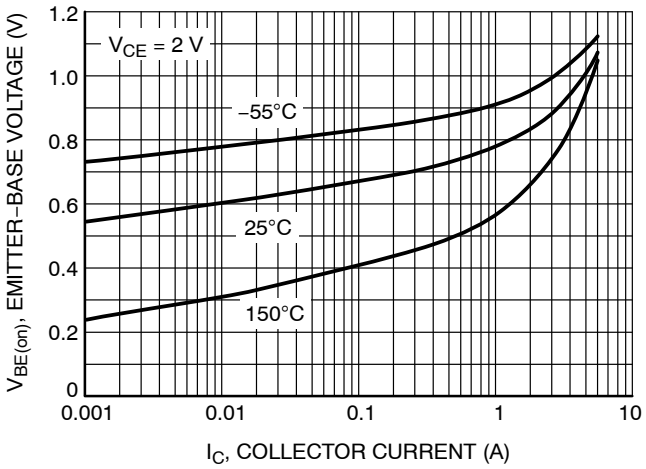


Figure 7. $V_{BE(on)}$ Voltage

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TYPICAL CHARACTERISTICS

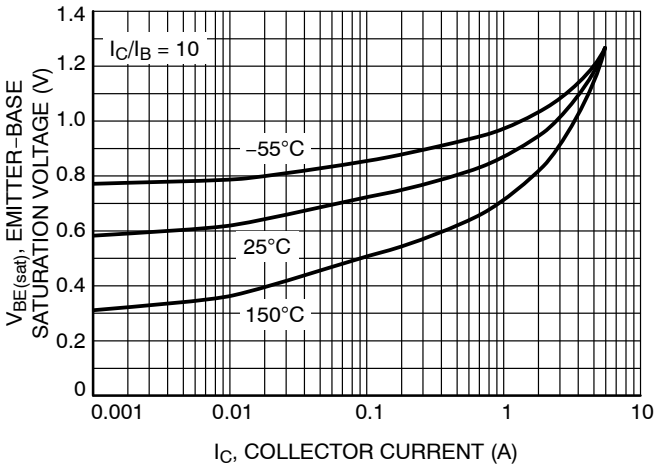


Figure 8. Base−Emitter Saturation Voltage

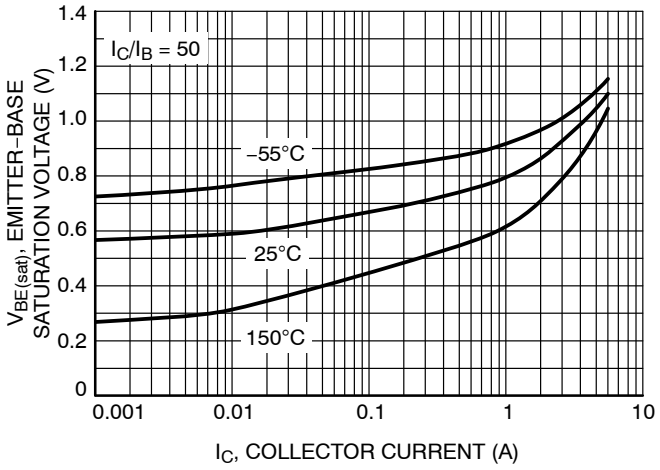


Figure 9. Base−Emitter Saturation Voltage

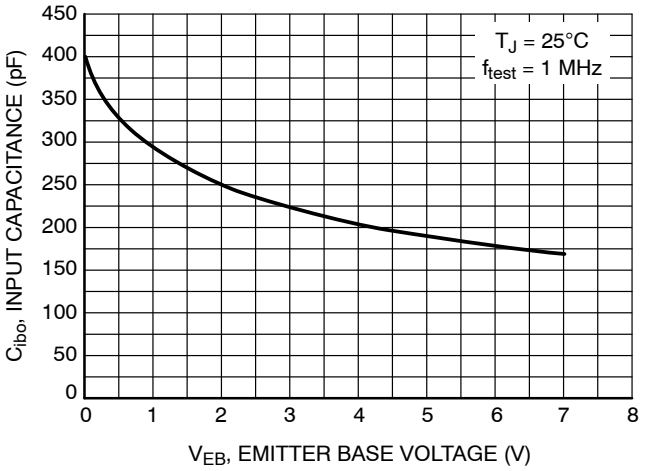


Figure 10. Input Capacitance

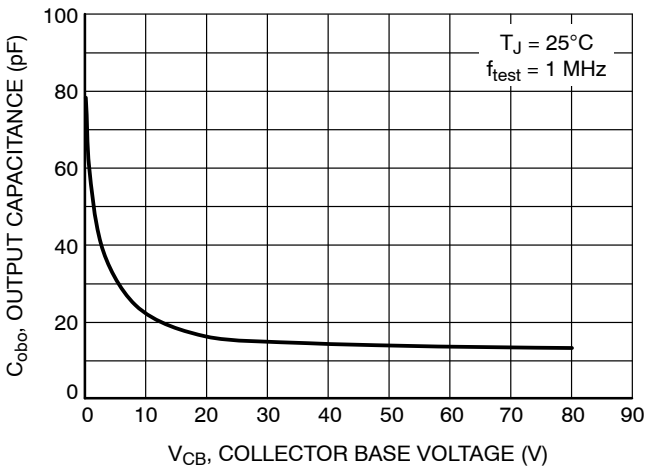


Figure 11. Output Capacitance

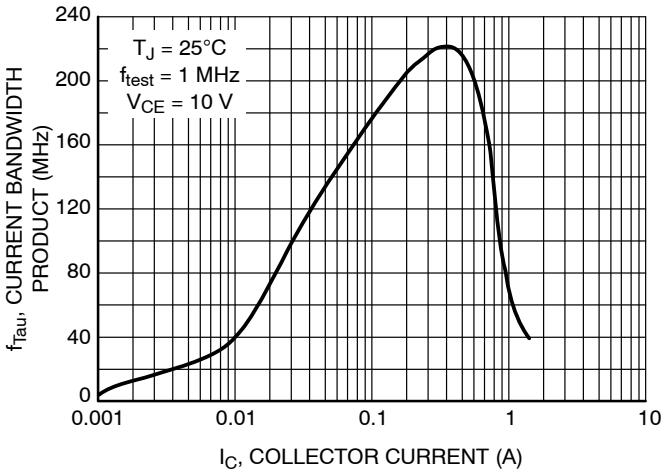


Figure 12. Current−Gain Bandwidth Product

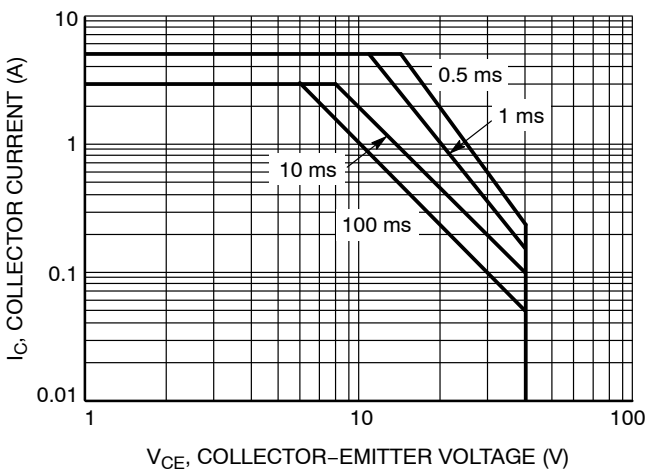


Figure 13. Safe Operating Area

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