

Complementary Power Transistors

DPAK For Surface Mount Applications

NJVMJD3xxT4G-VF01

Designed for general purpose amplifier and low speed switching applications.

Features

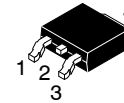
- Lead Formed for Surface Mount Applications in Plastic Sleeves
- Straight Lead Version in Plastic Sleeves ("1" Suffix)
- Lead Formed Version in 16 mm Tape and Reel ("T4" Suffix)
- Electrically Similar to Popular TIP31 and TIP32 Series
- Epoxy Meets UL 94, V-0 @ 0.125 in
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

MAXIMUM RATINGS

Symbol	Rating	Max	Unit
V_{CEO}	Collector-Emitter Voltage MJD31, MJD32 MJD31C, MJD32C	40 100	Vdc
V_{CB}	Collector-Base Voltage MJD31, MJD32 MJD31C, MJD32C	40 100	Vdc
V_{EB}	Emitter-Base Voltage	5.0	Vdc
I_C	Collector Current - Continuous	3.0	Adc
I_{CM}	Collector Current - Peak	5.0	Adc
I_B	Base Current	1.0	Adc
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	15 0.12	W W/ $^\circ\text{C}$
P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	1.56 0.012	W W/ $^\circ\text{C}$
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-65 to +150	$^\circ\text{C}$
HBM	ESD - Human Body Model	3B	V
MM	ESD - Machine Model	C	V

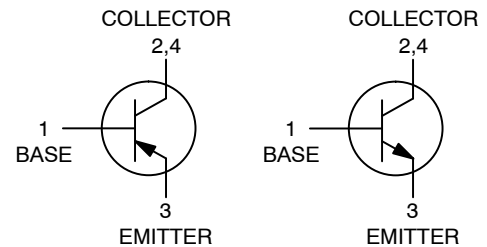
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

SILICON POWER TRANSISTORS 3 AMPERES 40 AND 100 VOLTS 15 WATTS

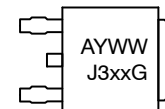


DPAK
CASE 369C
STYLE 1

COMPLEMENTARY



MARKING DIAGRAM



A = Site Code
Y = Year
WW = Work Week
xx = 1C or 2C
G = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

NJVMJD3xxT4G-VF01

THERMAL CHARACTERISTICS

Symbol	Characteristic	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	8.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient*	80	°C/W
T_L	Lead Temperature for Soldering Purposes	260	°C

* These ratings are applicable when surface mounted on the minimum pad sizes recommended.

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

Symbol	Characteristic	Min	Max	Unit
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OFF CHARACTERISTICS

$V_{CE(sus)}$	Collector-Emitter Sustaining Voltage (Note 1) ($I_C = 30\text{ mAdc}$, $I_B = 0$) MJD31, MJD32 MJD31C, MJD32C	40 100	– –	Vdc
I_{CEO}	Collector Cutoff Current ($V_{CE} = 40\text{ Vdc}$, $I_B = 0$) MJD31, MJD32 ($V_{CE} = 60\text{ Vdc}$, $I_B = 0$) MJD31C, MJD32C	– –	50 50	μAdc
I_{CES}	Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{EB} = 0$)	–	20	μAdc
I_{EBO}	Emitter Cutoff Current ($V_{BE} = 5\text{ Vdc}$, $I_C = 0$)	–	1	mAdc

ON CHARACTERISTICS (Note 1)

h_{FE}	DC Current Gain ($I_C = 1\text{ Adc}$, $V_{CE} = 4\text{ Vdc}$) ($I_C = 3\text{ Adc}$, $V_{CE} = 4\text{ Vdc}$)	25 10	– 50	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C = 3\text{ Adc}$, $I_B = 375\text{ mAdc}$)	–	1.2	Vdc
$V_{BE(on)}$	Base-Emitter On Voltage ($I_C = 3\text{ Adc}$, $V_{CE} = 4\text{ Vdc}$)	–	1.8	Vdc

DYNAMIC CHARACTERISTICS

f_T	Current Gain - Bandwidth Product (Note 2) ($I_C = 500\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f_{test} = 1\text{ MHz}$)	3	–	MHz
h_{fe}	Small-Signal Current Gain ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1\text{ kHz}$)	20	–	

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.

1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.

2. $f_T = |h_{fe}| \cdot f_{test}$.

TYPICAL CHARACTERISTICS

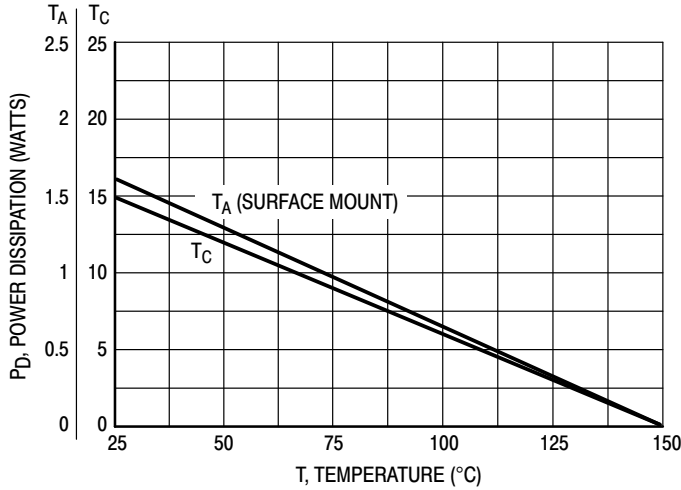
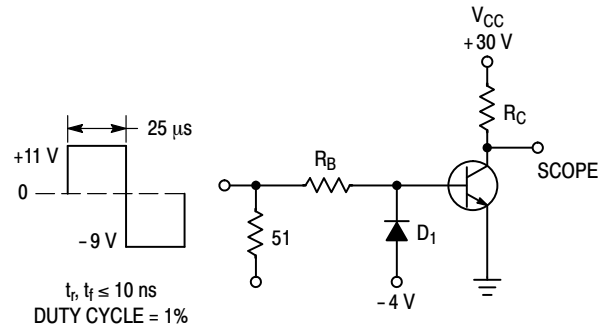


Figure 1. Power Derating



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS
 D_1 MUST BE FAST RECOVERY TYPE, e.g.:
 1N5825 USED ABOVE $I_B \approx 100\text{ mA}$
 MSD6100 USED BELOW $I_B \approx 100\text{ mA}$
 REVERSE ALL POLARITIES FOR PNP.

Figure 2. Switching Time Test Circuit

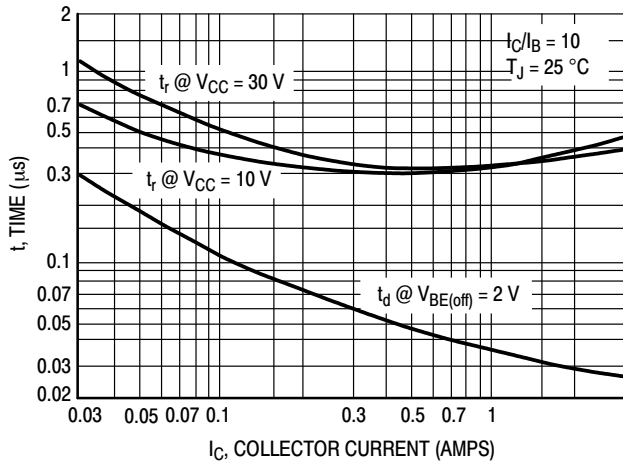


Figure 3. Turn-On Time

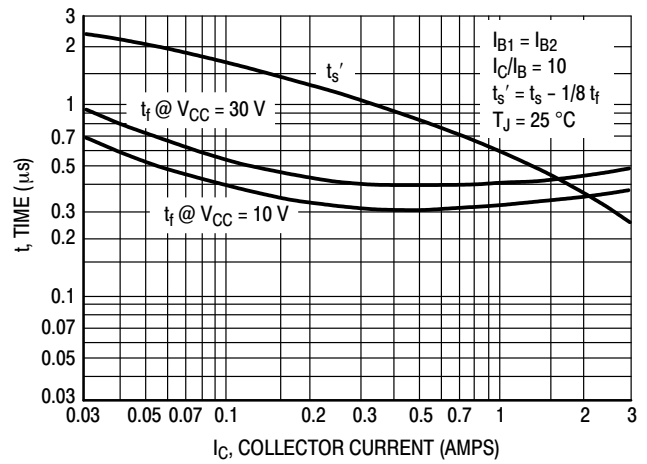


Figure 4. Turn-Off Time

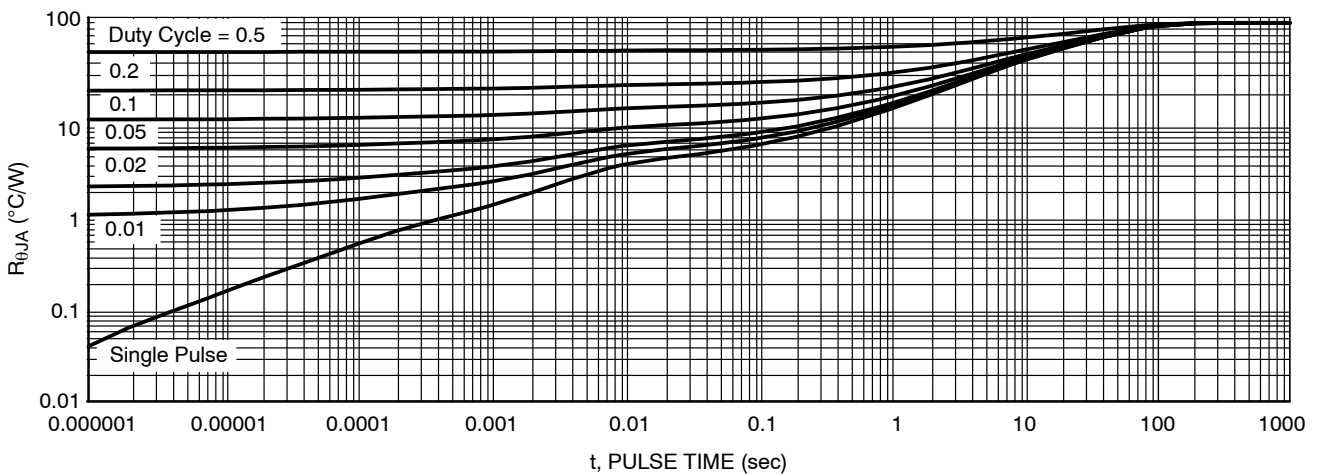


Figure 5. Thermal Response

TYPICAL CHARACTERISTICS – NJVMJD31CT4G–VF01 (NPN)

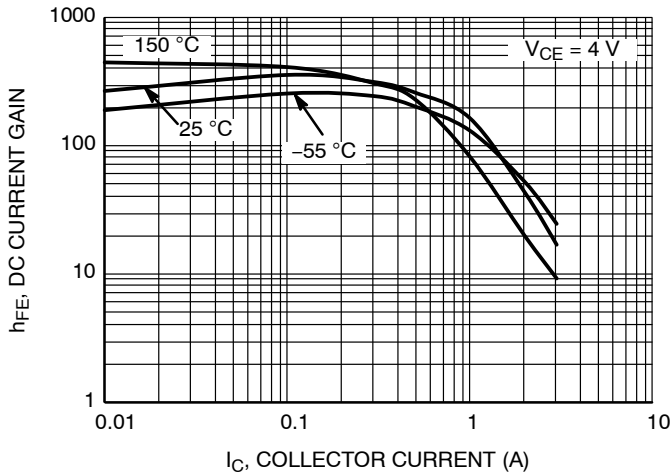


Figure 6. DC Current Gain at $V_{CE} = 4$ V

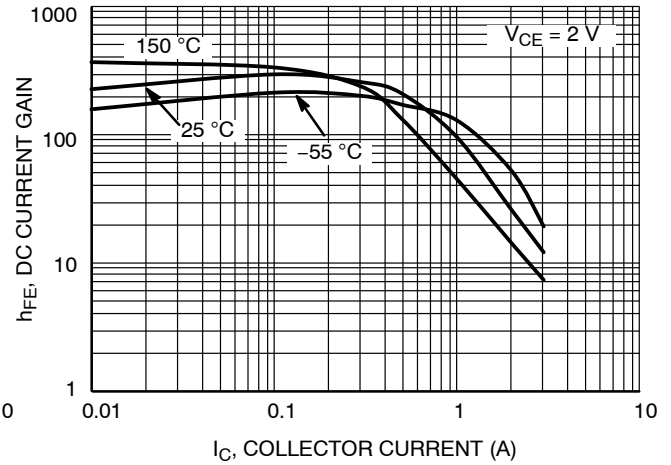


Figure 7. DC Current Gain at $V_{CE} = 2$ V

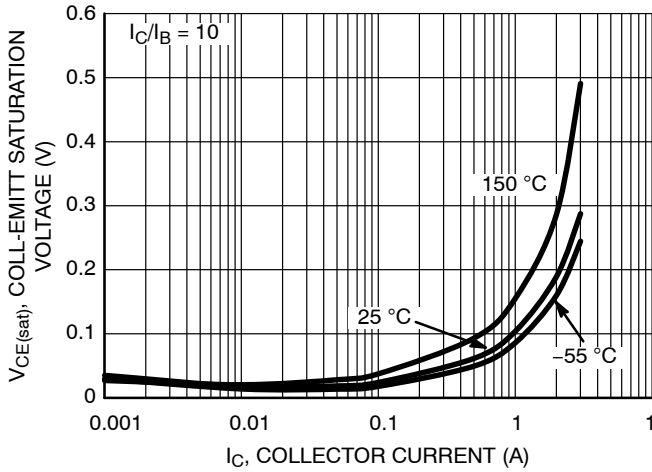


Figure 8. Collector-Emitter Saturation Voltage

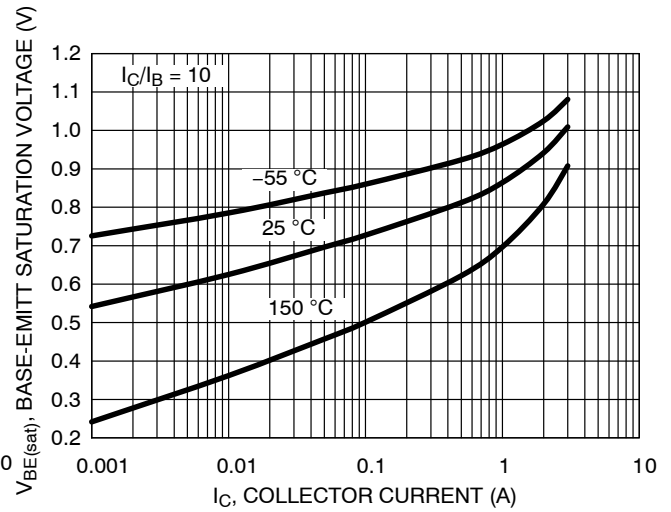


Figure 9. Base-Emitter Saturation Voltage

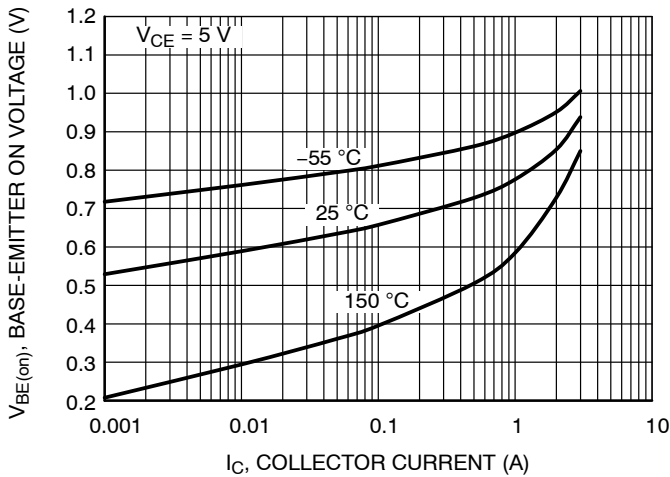


Figure 10. Base-Emitter "On" Voltage

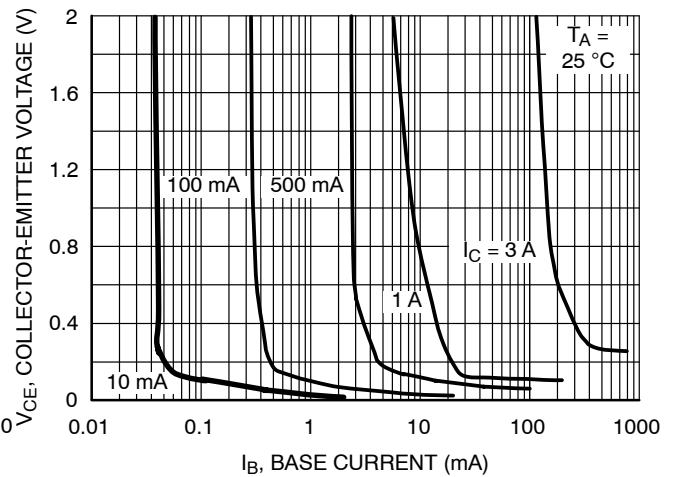


Figure 11. Collector Saturation Region

NJVMJD3xxT4G-VF01

TYPICAL CHARACTERISTICS – NJVMJD31CT4G–VF01 (NPN)

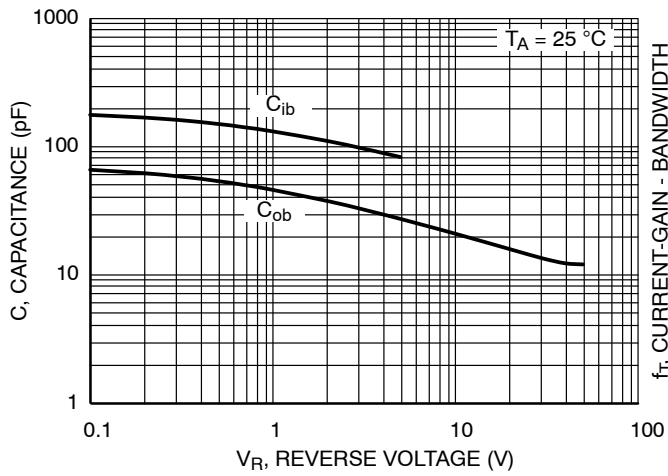


Figure 12. Capacitance

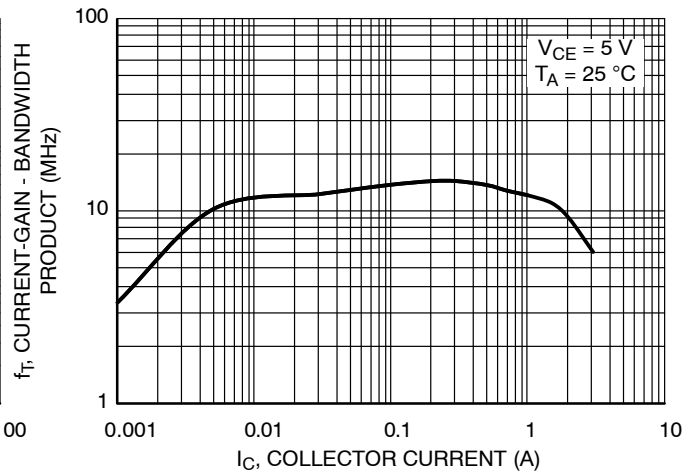


Figure 13. Current-Gain-Bandwidth Product

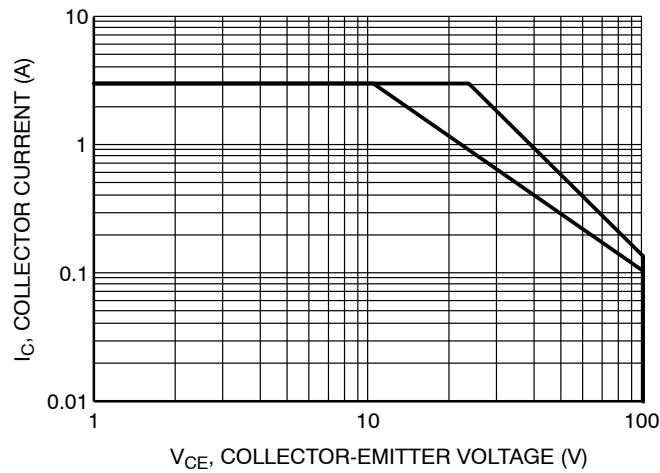


Figure 14. Safe Operating Area

TYPICAL CHARACTERISTICS – NJVMJD32CT4G–VF01 (PNP)

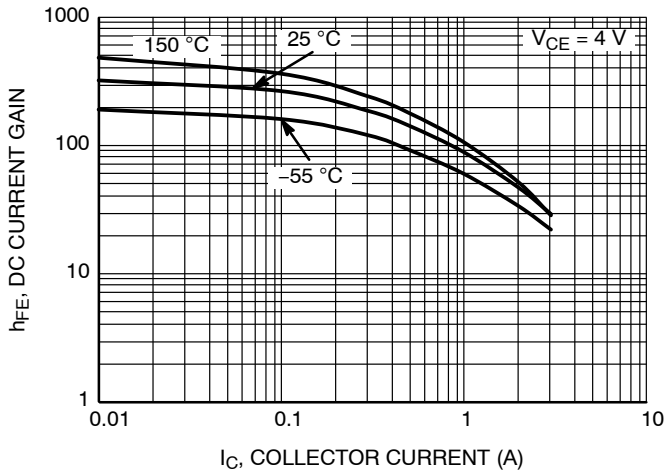


Figure 15. DC Current Gain at $V_{CE} = 4\text{ V}$

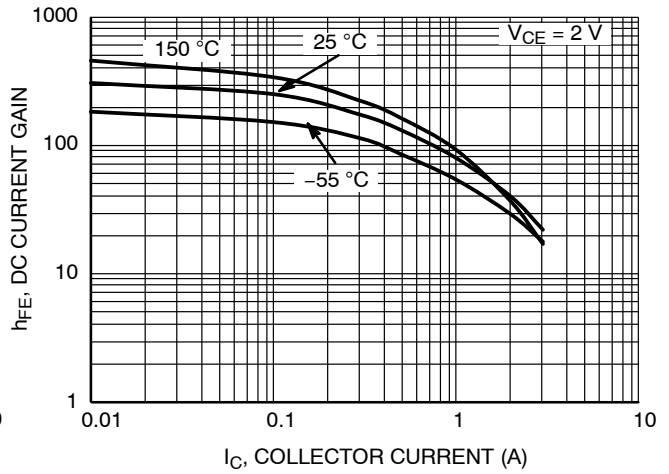


Figure 16. DC Current Gain at $V_{CE} = 2\text{ V}$

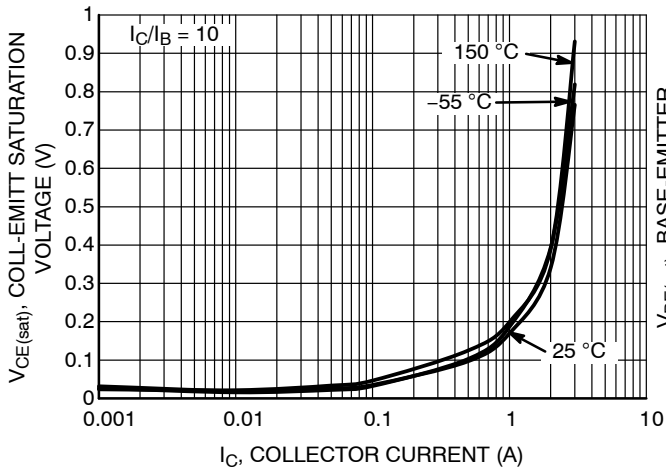


Figure 17. Collector-Emitter Saturation Voltage

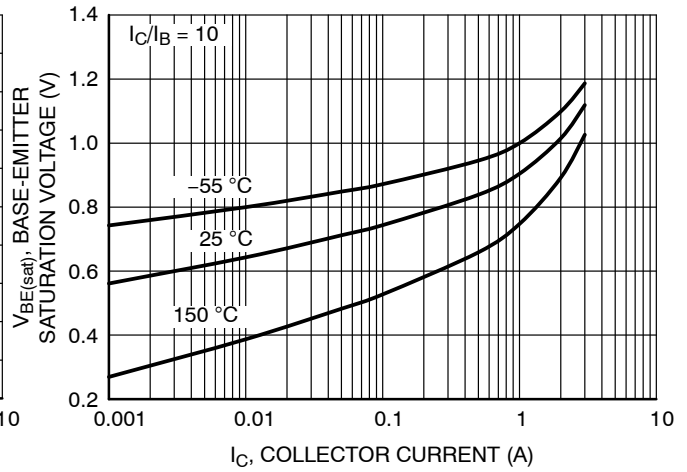


Figure 18. Base-Emitter Saturation Voltage

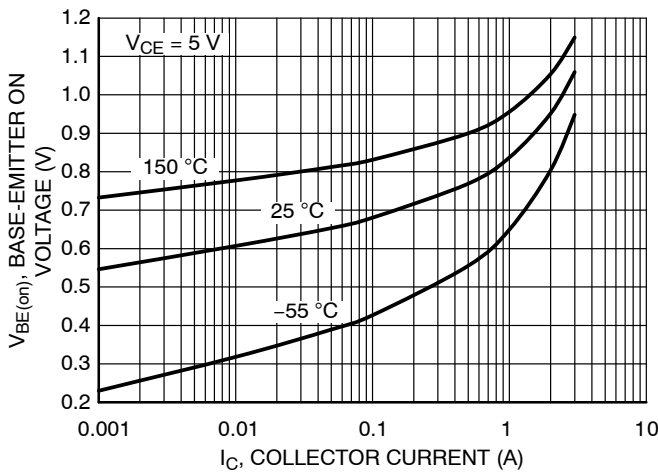


Figure 19. Base-Emitter "On" Voltage

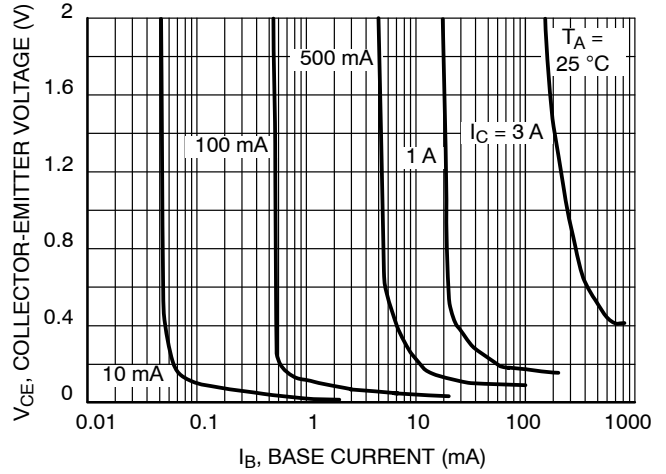


Figure 20. Collector Saturation Region

NJVMJD3xxT4G-VF01

TYPICAL CHARACTERISTICS – NJVMJD32CT4G–VF01 (PNP)

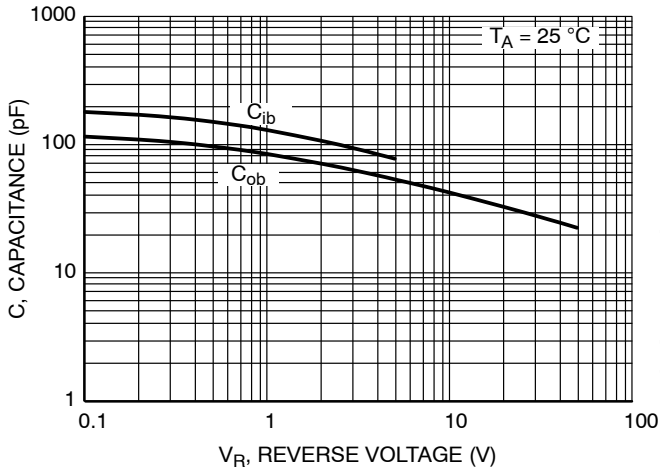


Figure 21. Capacitance

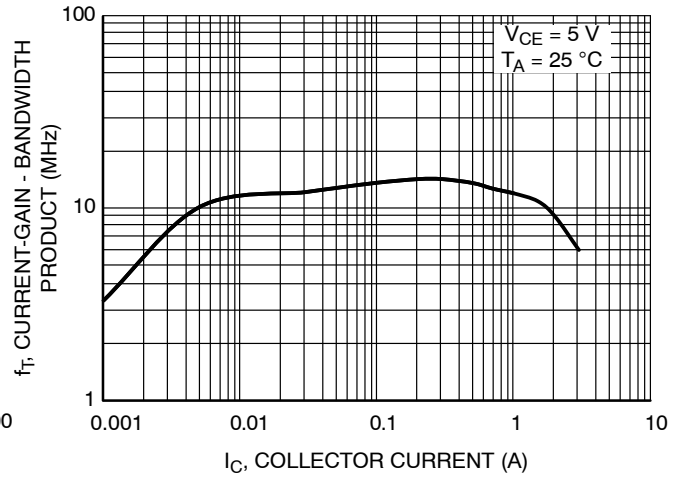


Figure 22. Current-Gain-Bandwidth Product

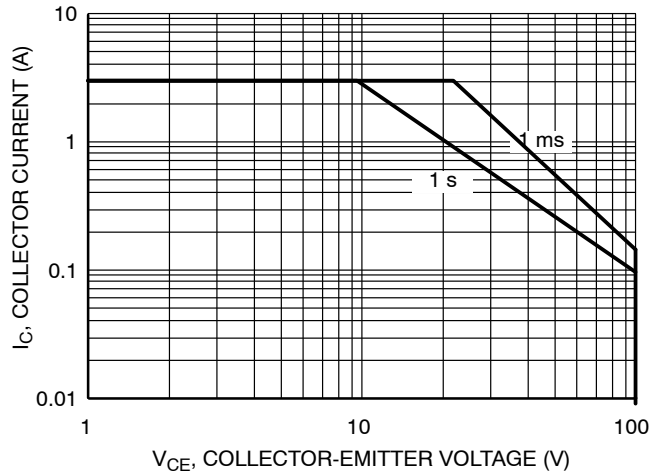


Figure 23. Safe Operating Area

ORDERING INFORMATION

Device	Package Type	Package	Shipping [†]
NJVMJD31CT4G–VF01*	DPAK (Pb-Free)	369C	2,500 / Tape & Reel
NJVMJD32CT4G–VF01*	DPAK (Pb-Free)	369C	2,500 / Tape & Reel

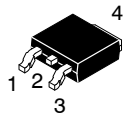
[†] For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

* NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

REVISION HISTORY

Revision	Description of Changes	Date
1	Rebranded the Data Sheet to onsemi format + Case Outline Update	8/20/2025

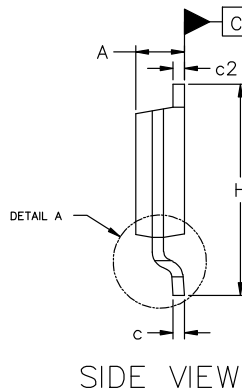
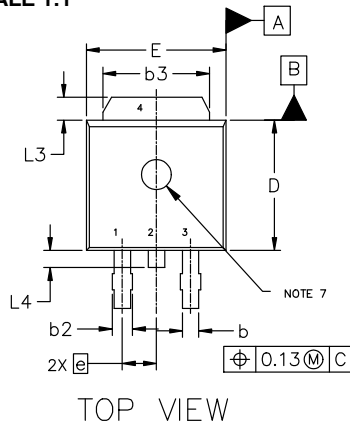
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



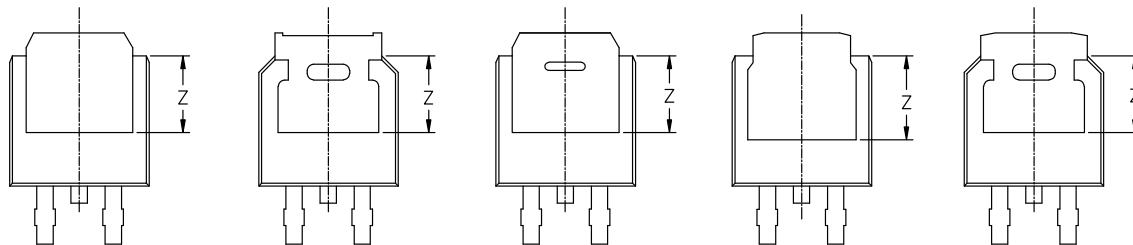
DPAK3 6.10x6.54x2.28, 2.29P
CASE 369C
ISSUE J

DATE 12 AUG 2025

SCALE 1:1

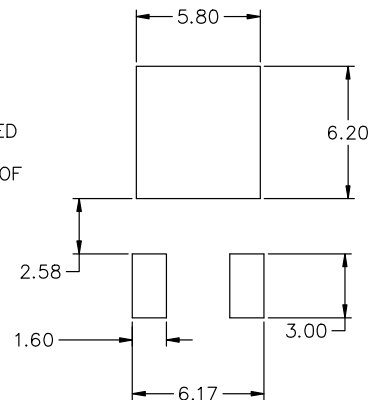
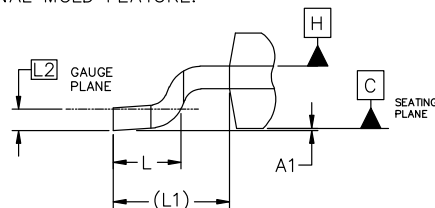


MILLIMETERS			
DIM	MIN	NOM	MAX
A	2.18	2.28	2.38
A1	0.00	---	0.13
b	0.63	0.76	0.89
b2	0.72	0.93	1.14
b3	4.57	5.02	5.46
c	0.46	0.54	0.61
c2	0.46	0.54	0.61
D	5.97	6.10	6.22
E	6.35	6.54	6.73
e	2.29 BSC		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L1	2.90 REF		
L2	0.51 BSC		
L3	0.89	---	1.27
L4	---	---	1.01
Z	3.93	---	---



NOTES:

1. DIMENSIONING AND TOLERANCING ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3, AND Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15mm PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
7. OPTIONAL MOLD FEATURE.



RECOMMENDED MOUNTING FOOTPRINT*

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

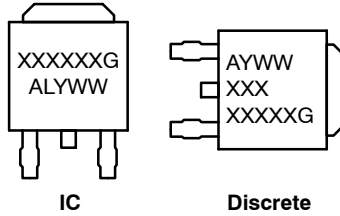
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DPAK3 6.10x6.54x2.28, 2.29P
CASE 369C
ISSUE J

DATE 12 AUG 2025

**GENERIC
MARKING DIAGRAM***



XXXXXX = Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
WW = Work Week
G = 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.

STYLE 1: PIN 1. BASE 2. COLLECTOR 3. EMITTER 4. COLLECTOR	STYLE 2: PIN 1. GATE 2. DRAIN 3. SOURCE 4. DRAIN	STYLE 3: PIN 1. ANODE 2. CATHODE 3. ANODE 4. CATHODE	STYLE 4: PIN 1. CATHODE 2. ANODE 3. GATE 4. ANODE	STYLE 5: PIN 1. GATE 2. ANODE 3. CATHODE 4. ANODE
STYLE 6: PIN 1. MT1 2. MT2 3. GATE 4. MT2	STYLE 7: PIN 1. GATE 2. COLLECTOR 3. EMITTER 4. COLLECTOR	STYLE 8: PIN 1. N/C 2. CATHODE 3. ANODE 4. CATHODE	STYLE 9: PIN 1. ANODE 2. CATHODE 3. RESISTOR ADJUST 4. CATHODE	STYLE 10: PIN 1. CATHODE 2. ANODE 3. CATHODE 4. ANODE

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