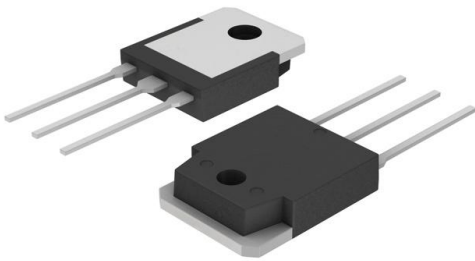


NJW3281G Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	NJW3281G-DG
Manufacturer	onsemi
Manufacturer Product Number	NJW3281G
Description	TRANS NPN 250V 15A TO3P-3L
Detailed Description	Bipolar (BJT) Transistor NPN 250 V 15 A 30MHz 200 W Through Hole TO-3P-3L



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

NJW3281G

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

250 V

Current - Collector Cutoff (Max):

50 μ A (ICBO)

Power - Max:

200 W

Operating Temperature:

-65°C ~ 150°C (TJ)

Package / Case:

TO-3P-3, SC-65-3

Base Product Number:

NJW3281

Manufacturer:

onsemi

Product Status:

Active

Current - Collector (Ic) (Max):

15 A

Vce Saturation (Max) @ Ib, Ic:

600mV @ 800mA, 8A

DC Current Gain (hFE) (Min) @ Ic, Vce:

75 @ 3A, 5V

Frequency - Transition:

30MHz

Mounting Type:

Through Hole

Supplier Device Package:

TO-3P-3L

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0075

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99

NJW3281G (NPN) NJW1302G (PNP)

Complementary NPN-PNP Silicon Power Bipolar Transistors

The NJW3281G and NJW1302G are power transistors for high power audio, disk head positioners and other linear applications.

Features

- Exceptional Safe Operating Area
- NPN/PNP Gain Matching within 10% from 50 mA to 5 A
- Excellent Gain Linearity
- High BVCEO
- High Frequency
- These Devices are Pb-Free and are RoHS Compliant

Benefits

- Reliable Performance at Higher Powers
- Symmetrical Characteristics in Complementary Configurations
- Accurate Reproduction of Input Signal
- Greater Dynamic Range
- High Amplifier Bandwidth

Applications

- High-End Consumer Audio Products
 - ◆ Home Amplifiers
 - ◆ Home Receivers
- Professional Audio Amplifiers
 - ◆ Theater and Stadium Sound Systems
 - ◆ Public Address Systems (PAs)

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

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	250	Vdc
Collector-Base Voltage	V _{CBO}	250	Vdc
Emitter-Base Voltage	V _{EBO}	5.0	Vdc
Collector-Emitter Voltage - 1.5 V	V _{CEX}	250	Vdc
Collector Current - Continuous	I _C	15	Adc
Collector Current - Peak (Note 1)	I _{CM}	30	Adc
Base Current - Continuous	I _B	1.6	Adc
Total Power Dissipation @ T _C = 25°C Derate Above 25°C	P _D	200 1.43	W W/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	0.625	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	40	°C/W

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

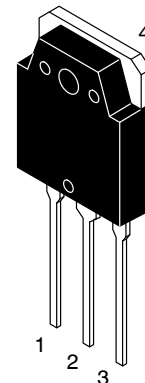
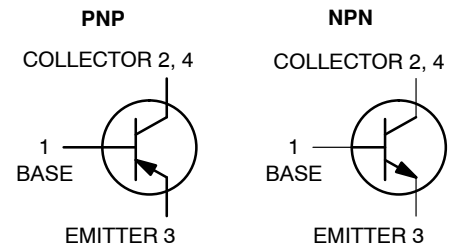
1. Pulse Test: Pulse Width = 5 ms, Duty Cycle < 10%.



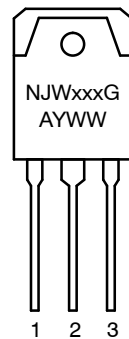
ON Semiconductor®

<http://onsemi.com>

15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 250 VOLTS 200 WATTS



MARKING DIAGRAM



**TO-3P
CASE 340AB
STYLES 1,2,3**

xxxx = 0281 or 0302
G = Pb-Free Package
A = Assembly Location
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
NJW3281G	TO-3P (Pb-Free)	30 Units/Rail
NJW1302G	TO-3P (Pb-Free)	30 Units/Rail

NJW3281G (NPN) NJW1302G (PNP)

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage ($I_C = 100\text{ mAdc}$, $I_B = 0$)	$V_{CE(sus)}$	250	–	–	Vdc
Collector Cutoff Current ($V_{CB} = 250\text{ Vdc}$, $I_E = 0$)	I_{CBO}	–	–	50	μAdc
Emitter Cutoff Current ($V_{EB} = 5\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	–	5	μAdc
SECOND BREAKDOWN					
Second Breakdown Collector with Base Forward Biased ($V_{CE} = 50\text{ Vdc}$, $t = 1\text{ s}$ (non-repetitive))	$I_{S/b}$	4	–	–	Adc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 100\text{ mAdc}$, $V_{CE} = 5\text{ Vdc}$) ($I_C = 1\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$) ($I_C = 3\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$) ($I_C = 5\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$) ($I_C = 8\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$)	h_{FE}	75 75 75 60 45	– – – – –	150 150 150 – –	–
Collector–Emitter Saturation Voltage ($I_C = 8\text{ Adc}$, $I_B = 0.8\text{ Adc}$)	$V_{CE(sat)}$	–	0.4	0.6	Vdc
Base–Emitter On Voltage ($I_C = 8\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$)	$V_{BE(on)}$	–	–	1.5	Vdc
DYNAMIC CHARACTERISTICS					
Current–Gain – Bandwidth Product ($I_C = 1\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$, $f_{test} = 1\text{ MHz}$)	f_T	–	30	–	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f_{test} = 1\text{ MHz}$)	C_{ob}	–	–	600	pF

NJW3281G (NPN) NJW1302G (PNP)

TYPICAL CHARACTERISTICS

PNP NJW1302G

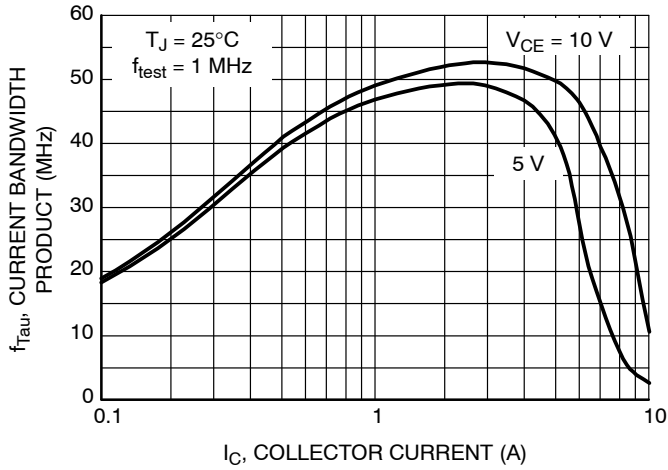


Figure 1. Typical Current Gain Bandwidth Product

NPN NJW3281G

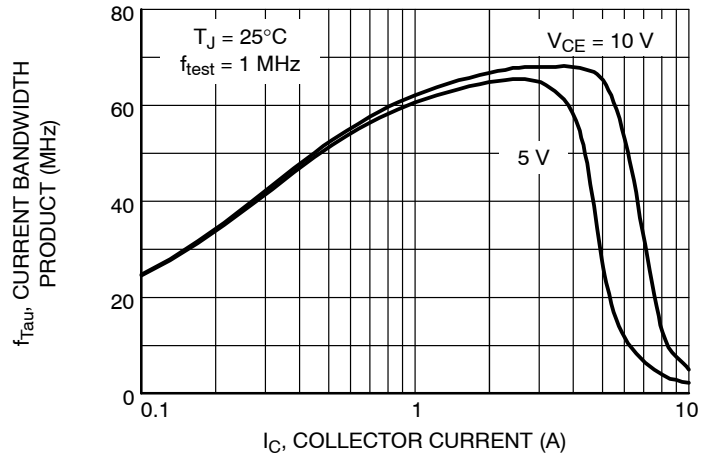


Figure 2. Typical Current Gain Bandwidth Product

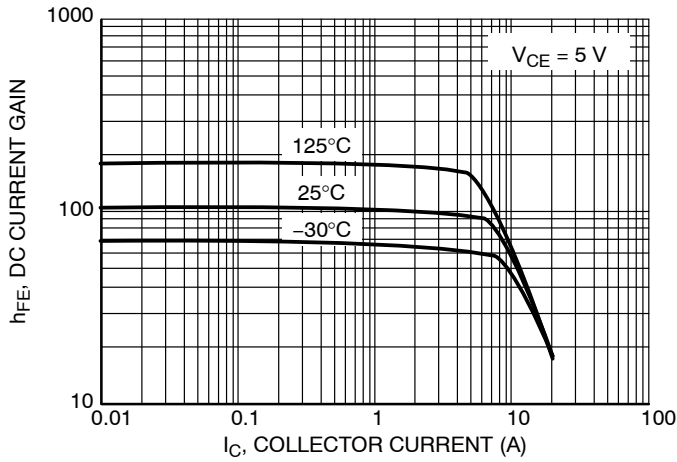


Figure 3. DC Current Gain

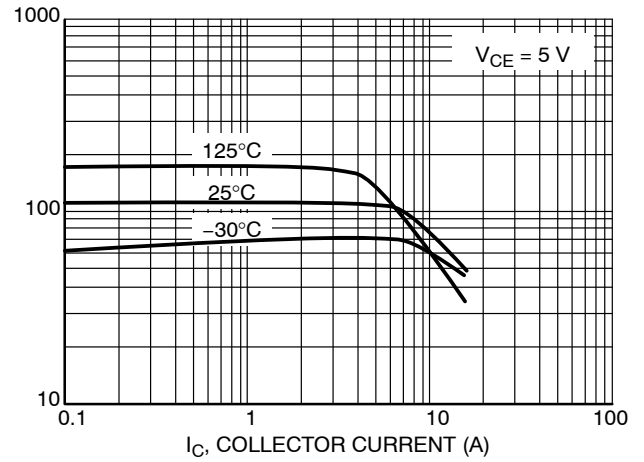


Figure 4. DC Current Gain

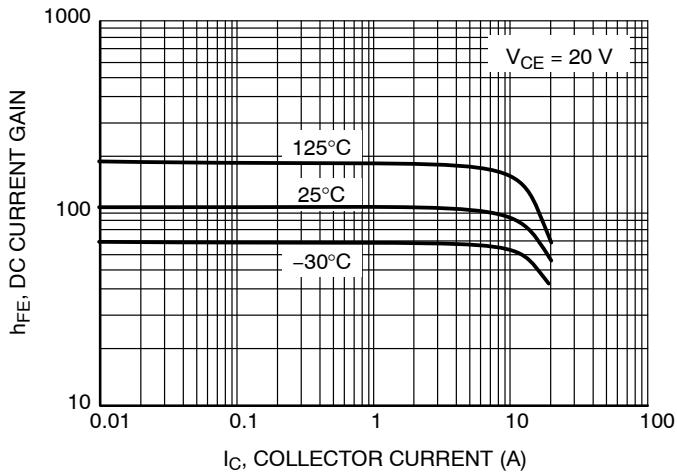


Figure 5. DC Current Gain

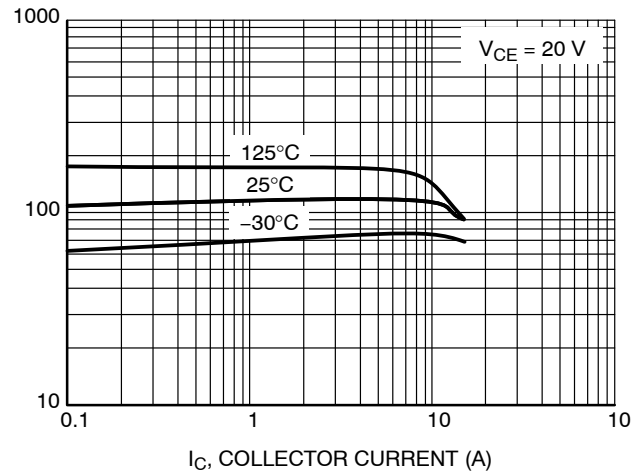


Figure 6. DC Current Gain

NJW3281G (NPN) NJW1302G (PNP)

TYPICAL CHARACTERISTICS

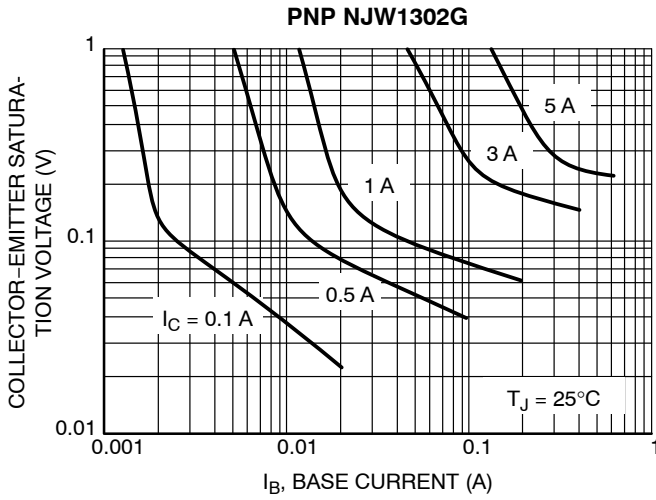


Figure 7. Saturation Region

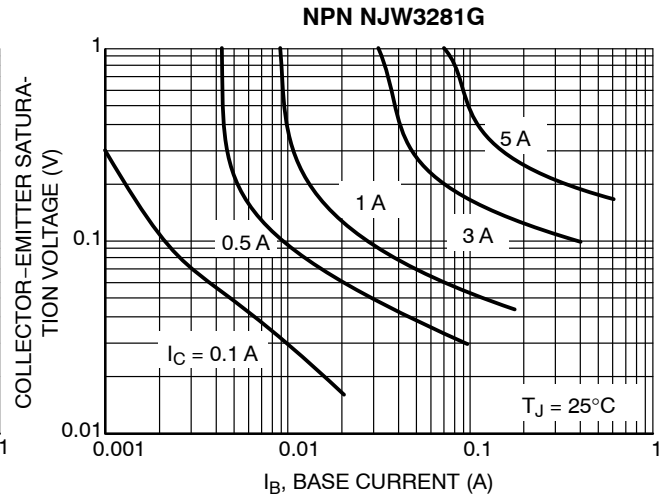


Figure 8. Saturation Region

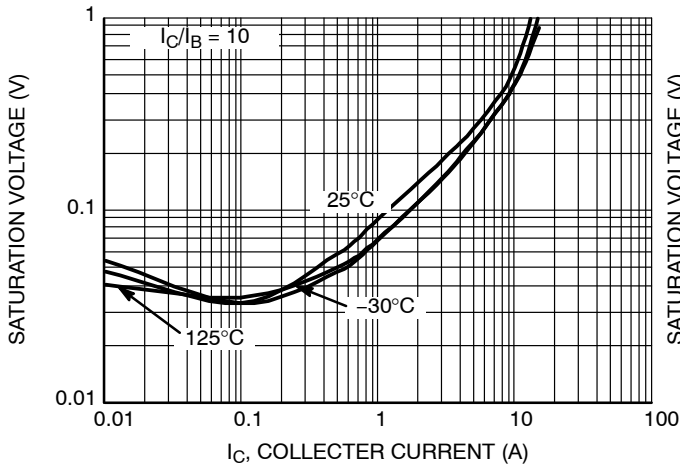


Figure 9. $V_{CE(sat)}$, Collector-Emitter Saturation Voltage

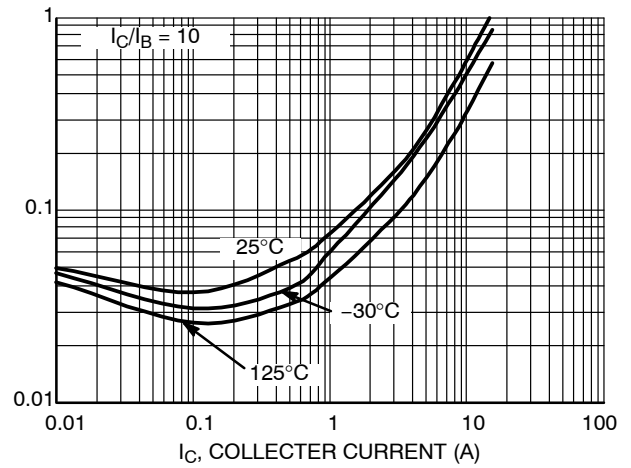


Figure 10. $V_{CE(sat)}$, Collector-Emitter Saturation Voltage

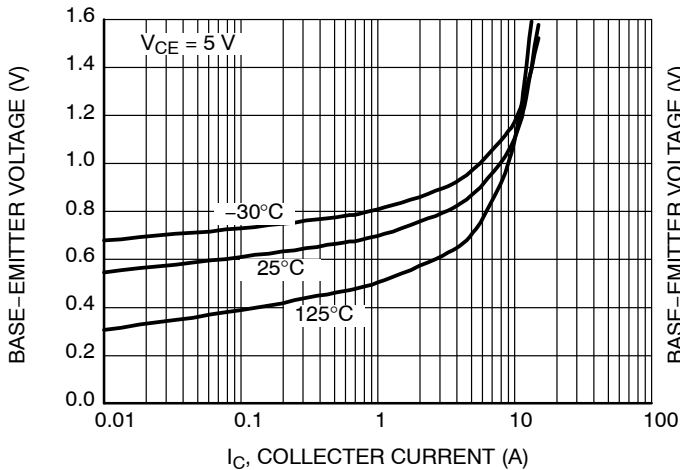


Figure 11. $V_{BE(on)}$, Base-Emitter Voltage

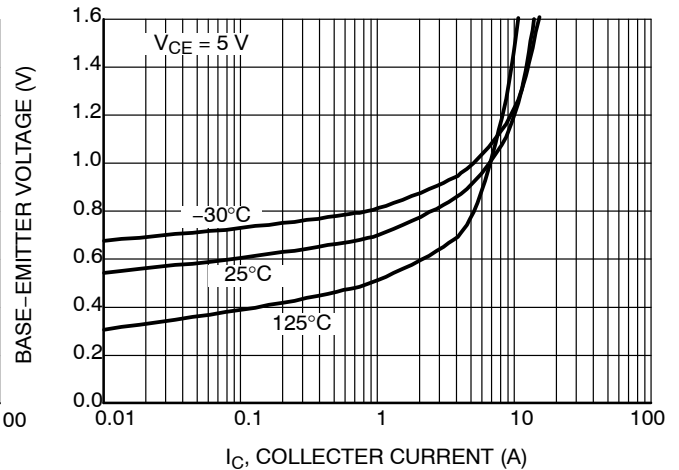


Figure 12. $V_{BE(on)}$, Base-Emitter Voltage

NJW3281G (NPN) NJW1302G (PNP)

TYPICAL CHARACTERISTICS

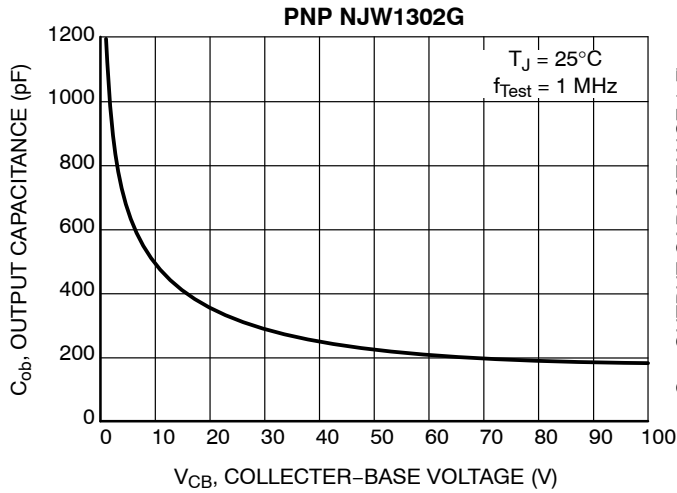


Figure 13. Output Capacitance

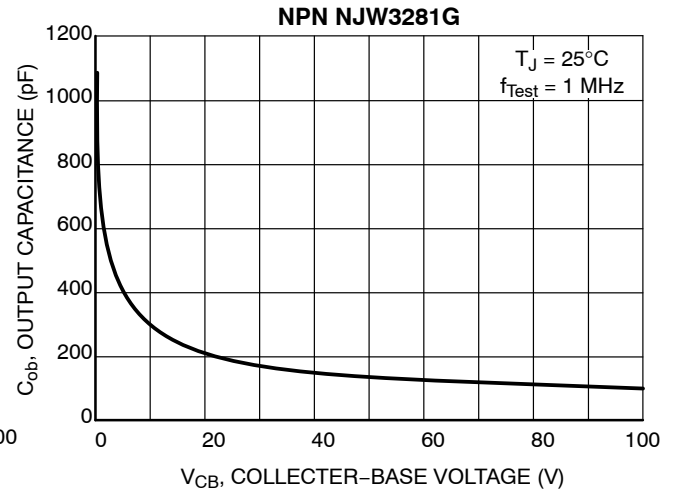


Figure 14. Output Capacitance

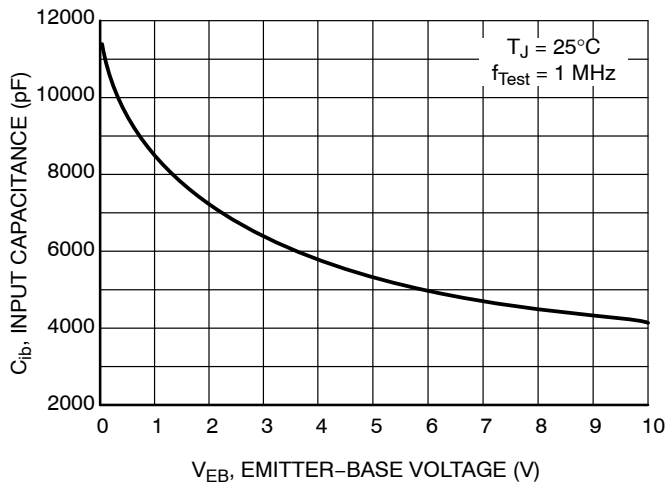


Figure 15. Input Capacitance

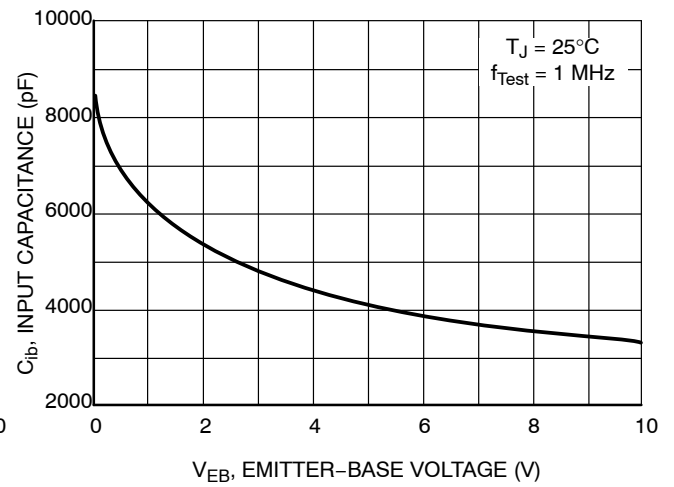


Figure 16. Input Capacitance

NJW3281G (NPN) NJW1302G (PNP)

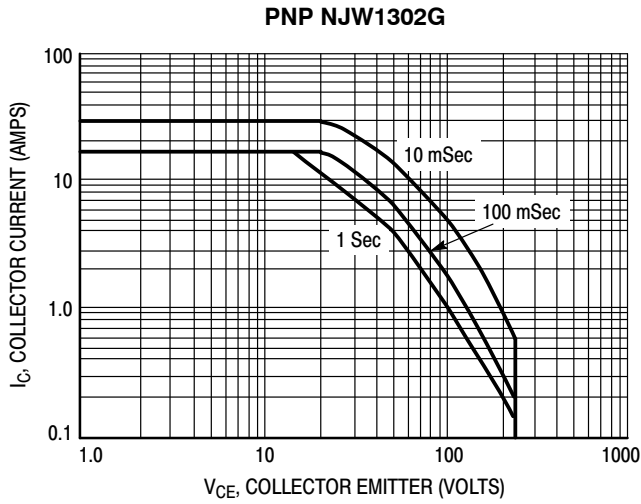


Figure 17. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor; average junction temperature and secondary breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

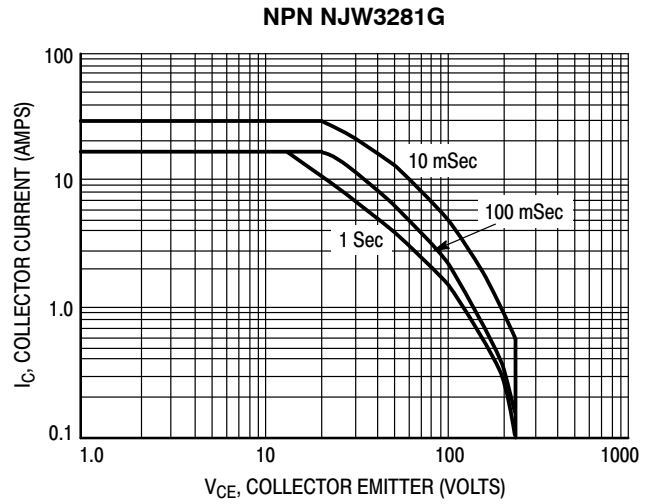


Figure 18. Active Region Safe Operating Area

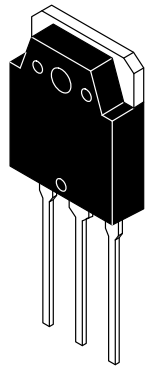
The data of Figures 17 and 18 is based on $T_{J(pk)} = 150^{\circ}C$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power than can be handled to values less than the limitations imposed by second breakdown.



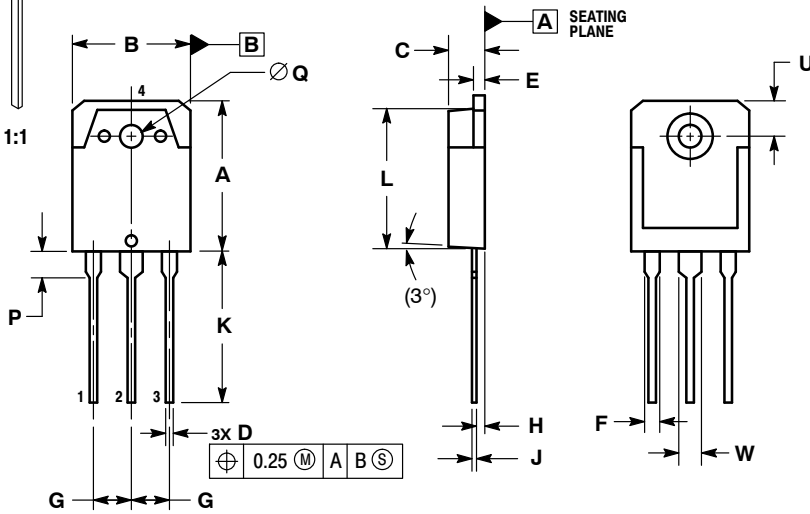
**MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS**

**TO-3P-3LD
CASE 340AB
ISSUE A**

DATE 30 OCT 2007



SCALE 1:1



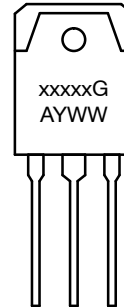
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.
4. DIMENSION A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	19.70	19.90	20.10
B	15.40	15.60	15.80
C	4.60	4.80	5.00
D	0.80	1.00	1.20
E	1.45	1.50	1.65
F	1.80	2.00	2.20
G	5.45 BSC		
H	1.20	1.40	1.60
J	0.55	0.60	0.75
K	19.80	20.00	20.20
L	18.50	18.70	18.90
P	3.30	3.50	3.70
Q	3.10	3.20	3.50
U	5.00 REF		
W	2.80	3.00	3.20

- | | | |
|--------------|--------------|-------------|
| STYLE 1: | STYLE 2: | STYLE 3: |
| PIN 1. BASE | PIN 1. ANODE | PIN 1. GATE |
| 2. COLLECTOR | 2. CATHODE | 2. DRAIN |
| 3. EMITTER | 3. ANODE | 3. SOURCE |
| 4. COLLECTOR | 4. CATHODE | 4. DRAIN |

**GENERIC MARKING
DIAGRAM***



- xxxxx = Specific Device Code
- G = Pb-Free Package
- A = Assembly Location
- Y = Year
- WW = Work Week

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.

DOCUMENT NUMBER:	98AON25095D	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	TO-3P-3LD	PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we stricly control the quality of products and services. Welcome your RFQ to

Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.