

# MJD340, NJVMJD340T4G (NPN), MJD350, NJVMJD350T4G (PNP)

## High Voltage Power Transistors

### DPAK for Surface Mount Applications

Designed for line operated audio output amplifier, switchmode power supply drivers and other switching applications.

#### Features

- Lead Formed for Surface Mount Applications in Plastic Sleeves (No Suffix)
- Electrically Similar to Popular MJE340 and MJE350
- Epoxy Meets UL 94 V-0 @ 0.125 in
- NJW 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

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	$V_{CEO}$	300	Vdc
Collector-Base Voltage	$V_{CB}$	300	Vdc
Emitter-Base Voltage	$V_{EB}$	3	Vdc
Collector Current – Continuous	$I_C$	0.5	Adc
Collector Current – Peak	$I_{CM}$	0.75	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.12	W W/ $^\circ\text{C}$
Total Power Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.56 0.012	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$
ESD – Human Body Model	HBM	3B	V
ESD – Machine Model	MM	C	V

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.

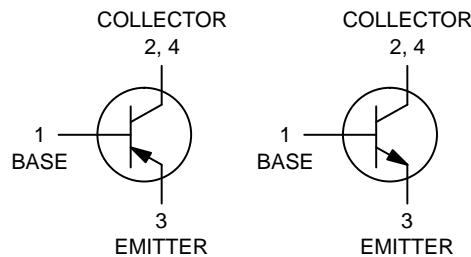
1. These ratings are applicable when surface mounted on the minimum pad sizes recommended.



ON Semiconductor®

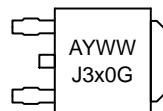
<http://onsemi.com>

SILICON  
POWER TRANSISTORS  
0.5 AMPERE  
300 VOLTS, 15 WATTS



DPAK  
CASE 369C  
STYLE 1

#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
J3x0 = Device Code  
x = 4 or 5  
G = Pb-Free Package

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

# MJD340, NJVMJD340T4G (NPN), MJD350, NJVMJD350T4G (PNP)

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	8.33	°C/W
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	80	°C/W
Leading Temperature for Soldering Purpose	$T_L$	260	°C

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

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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

### OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage (Note 3) ( $I_C = 1 \text{ mA}$ , $I_B = 0$ )	$V_{CEO(\text{sus})}$	300	–	V
Collector Cutoff Current ( $V_{CB} = 300 \text{ V}$ , $I_E = 0$ )	$I_{CEO}$	–	0.1	mA
Emitter Cutoff Current ( $V_{BE} = 3 \text{ V}$ , $I_C = 0$ )	$I_{EBO}$	–	0.1	mA

### ON CHARACTERISTICS (Note 3)

DC Current Gain ( $I_C = 50 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ )	$h_{FE}$	30	240	–
Collector-Emitter Saturation Voltage ( $I_C = 100 \text{ mA}$ , $I_B = 10 \text{ mA}$ )	$V_{CE(\text{sat})}$	–	1	V
Base-Emitter On Voltage ( $I_C = 1 \text{ A}$ , $V_{CE} = 10 \text{ V}$ )	$V_{BE(\text{on})}$	–	1.5	V

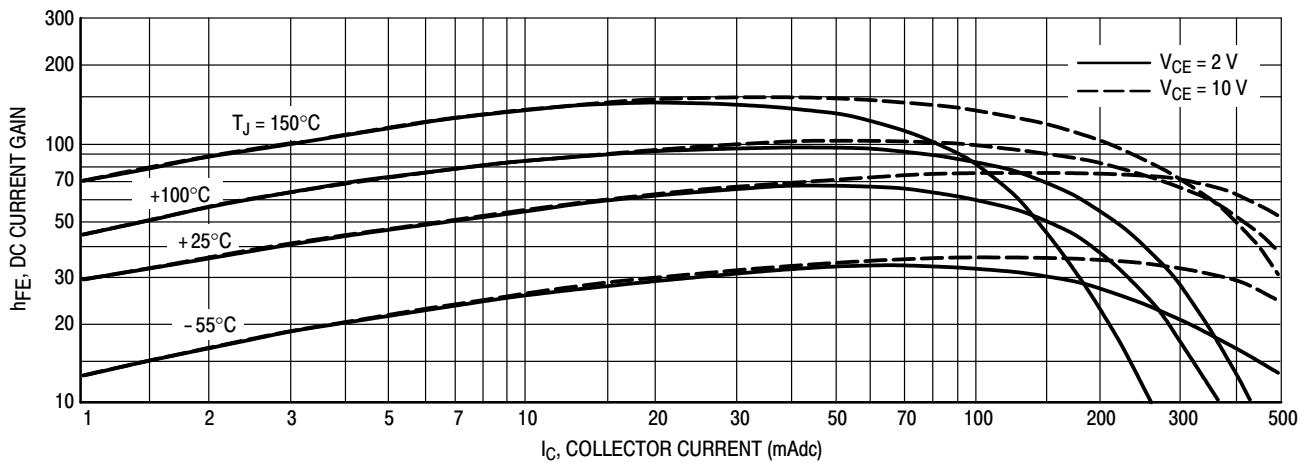
### DYNAMIC CHARACTERISTICS

Current Gain – Bandwidth Product ( $I_C = 50 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ , $f = 10 \text{ MHz}$ )	$f_T$	10	–	MHz
--	-------	----	---	-----

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

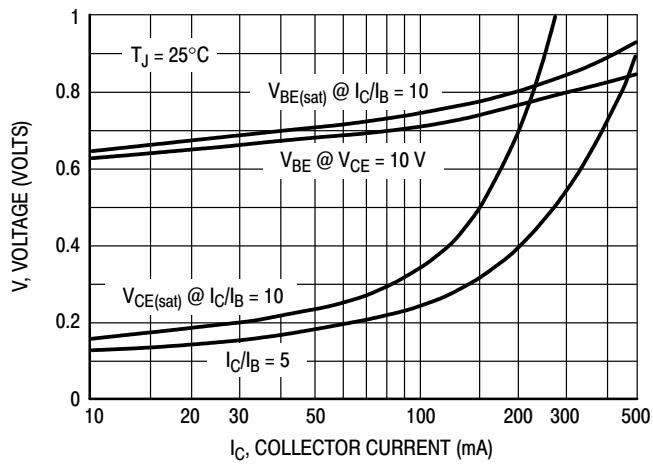
**TYPICAL CHARACTERISTICS**

**MJD340**



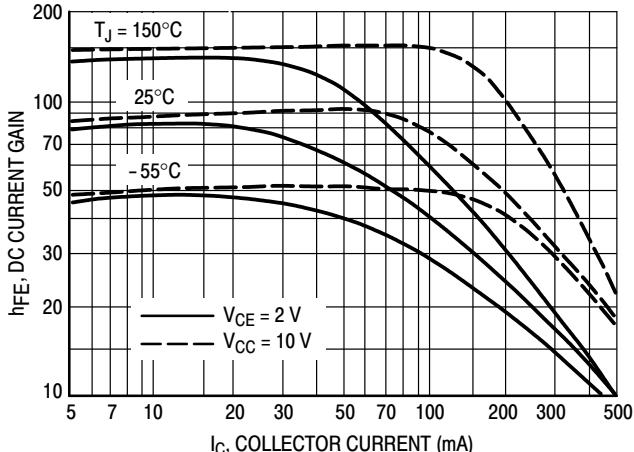
**Figure 1. DC Current Gain**

**MJD340**



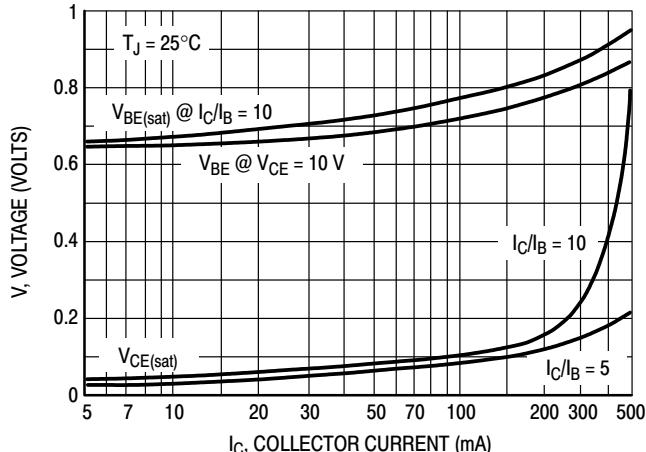
**Figure 2. "On" Voltages**

**MJD350**



**Figure 3. DC Current Gain**

**MJD350**



**Figure 4. "On" Voltages**

## MJD340, NJVMJD340T4G (NPN), MJD350, NJVMJD350T4G (PNP)

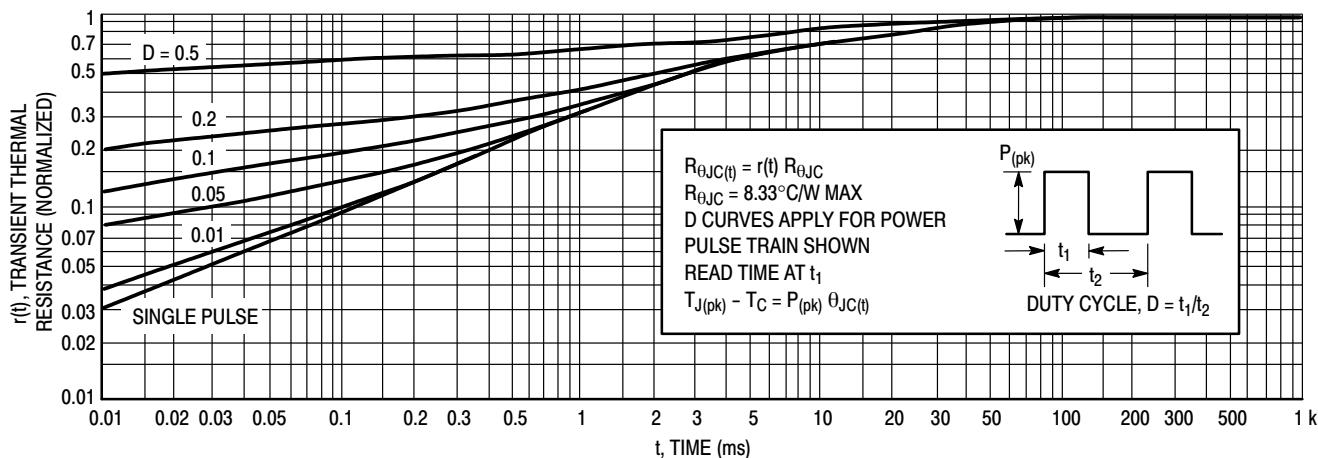


Figure 5. Thermal Response

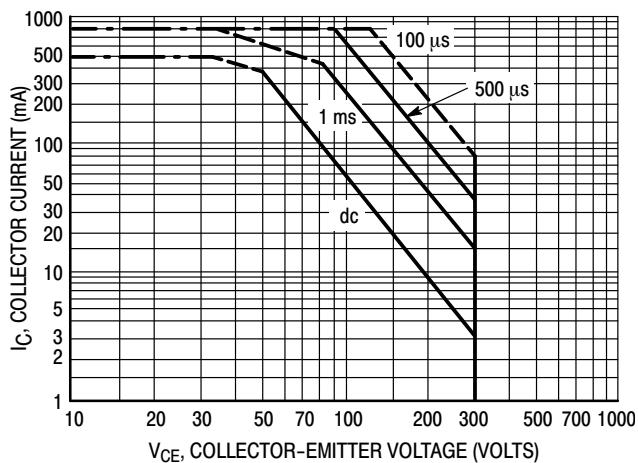


Figure 6. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second 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.

The data of Figure 6 is based on  $T_{J(pk)} = 150^{\circ}\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^{\circ}\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in Figure 5. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

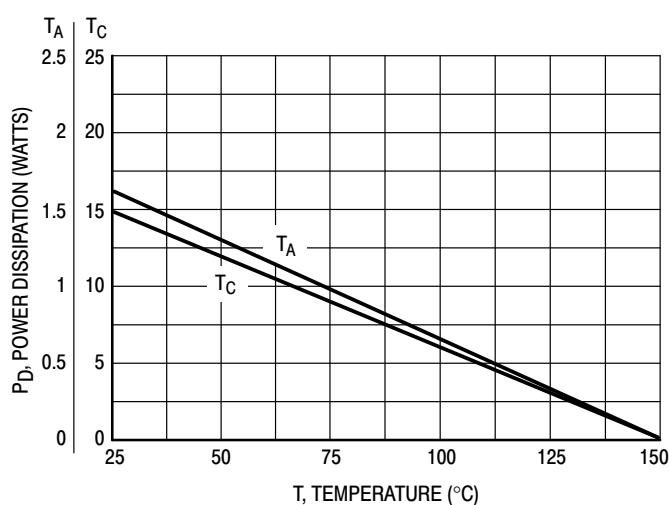


Figure 7. Power Derating

## **MJD340, NJVMJD340T4G (NPN), MJD350, NJVMJD350T4G (PNP)**

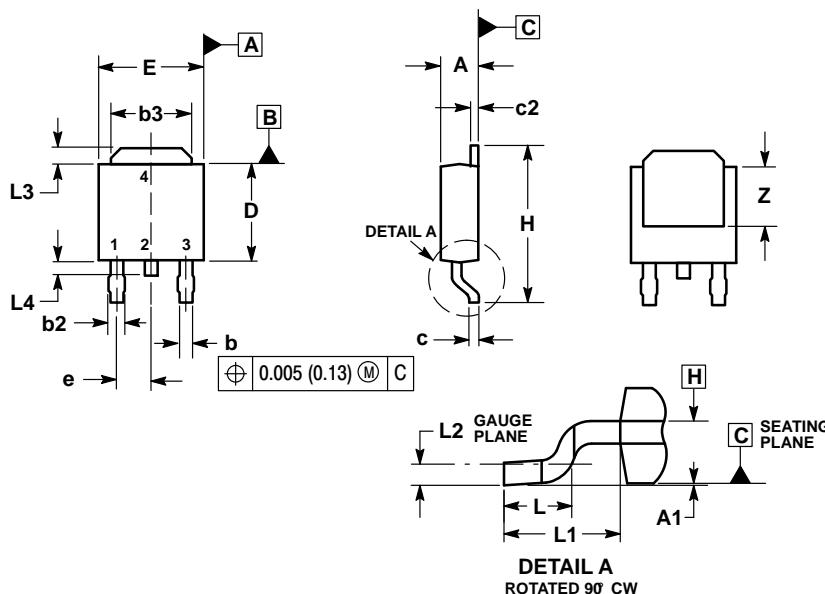
### **ORDERING INFORMATION**

<b>Device</b>	<b>Package</b>	<b>Shipping<sup>†</sup></b>
MJD340G	DPAK (Pb-Free)	75 Units / Rail
MJD340RLG	DPAK (Pb-Free)	1,800 / Tape & Reel
MJD340T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
NJVMJD340T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
MJD350G	DPAK (Pb-Free)	75 Units / Rail
MJD350T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
NJVMJD350T4G	DPAK (Pb-Free)	2,500 / Tape & Reel

<sup>†</sup>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.

PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE)  
CASE 369C  
ISSUE D



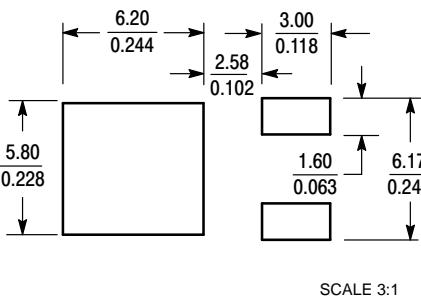
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
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 0.006 INCHES 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.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090	BSC	2.29	BSC
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108	REF	2.74	REF
L2	0.020	BSC	0.51	BSC
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---

STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. Emitter  
4. COLLECTOR

SOLDERING FOOTPRINT\*



SCALE 3:1 (mm  
inches)

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
Email: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

N. American Technical Support: 800-282-9855 Toll Free

USA/Canada

Europe, Middle East and Africa Technical Support:

Phone: 421 33 790 2910

Japan Customer Focus Center

Phone: 81-3-5817-1050

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative