

MJD340 (NPN), MJD350 (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
- 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

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°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°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 MJD340 (NPN) MJD350 (PNP) | HBM | 3B 2 | V |
| ESD – Machine Model MJD340 (NPN) MJD350 (PNP) | MM | M4 M4 | 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.

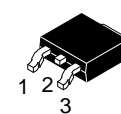
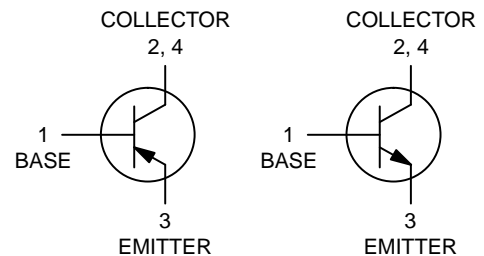
1. These ratings are applicable when surface mounted on the minimum pad sizes recommended.



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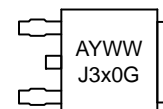
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SILICON POWER TRANSISTORS 0.5 AMPERE 300 VOLTS, 15 WATTS



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 (NPN), MJD350 (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) ($I_C = 1\text{ mA}$, $I_B = 0$) | $V_{CEO(sus)}$ | 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 ($I_C = 100\text{ mA}$, $I_B = 10\text{ mA}$) | $V_{CE(sat)}$ | – | 1 | V |
| Base-Emitter On Voltage ($I_C = 1\text{ A}$, $V_{CE} = 10\text{ V}$) | $V_{BE(on)}$ | – | 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 |
|---|-------|----|---|-----|

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 $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

MJD340 (NPN), MJD350 (PNP)

TYPICAL CHARACTERISTICS

MJD340

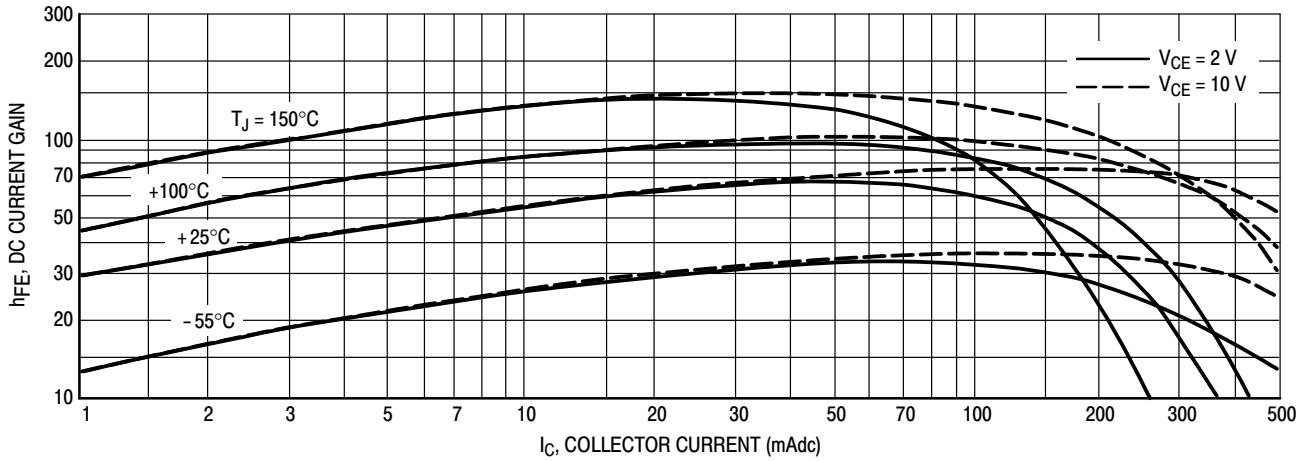


Figure 1. DC Current Gain

MJD340

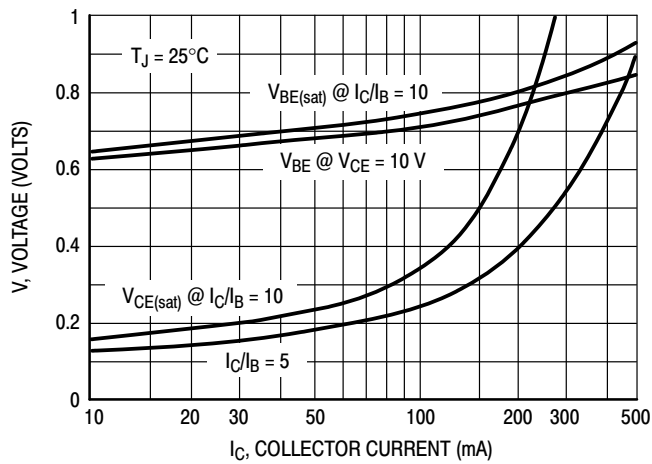


Figure 2. "On" Voltages

MJD350

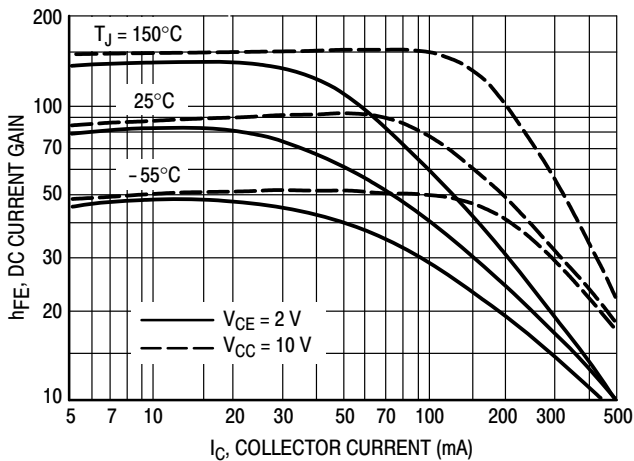


Figure 3. DC Current Gain

MJD350

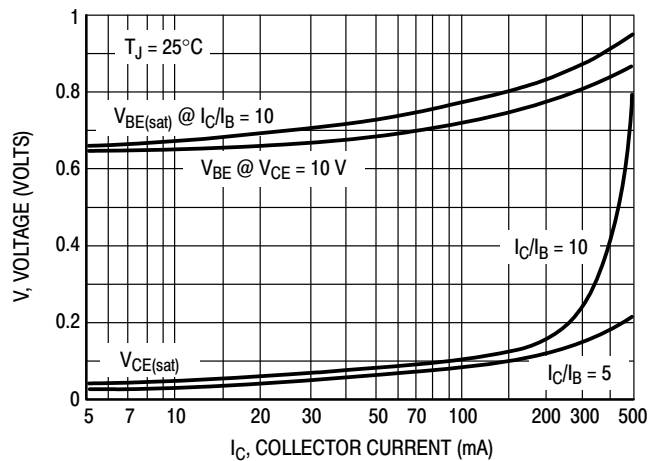


Figure 4. "On" Voltages

MJD340 (NPN), MJD350 (PNP)

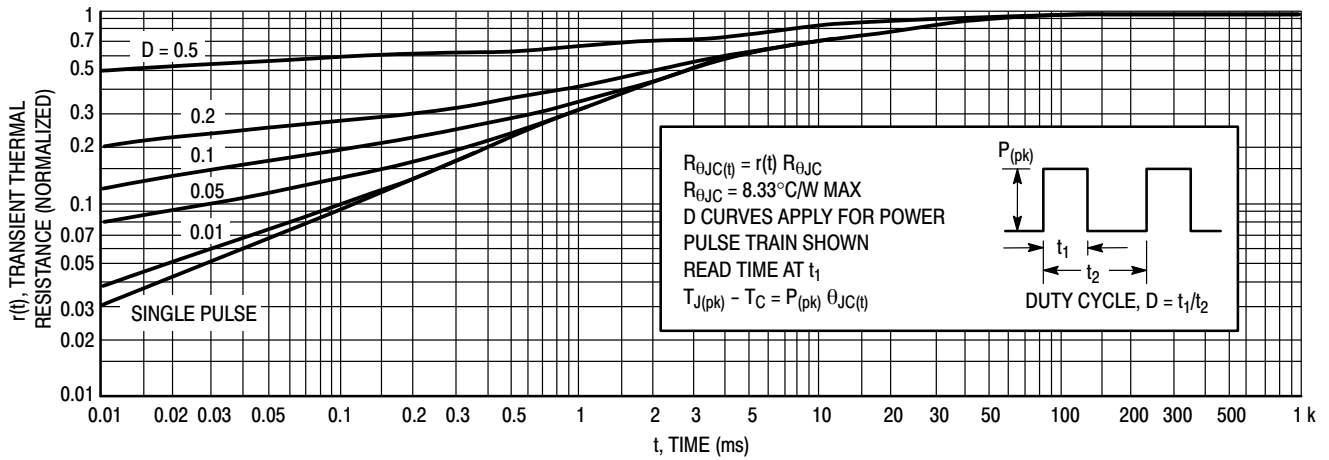


Figure 5. Thermal Response

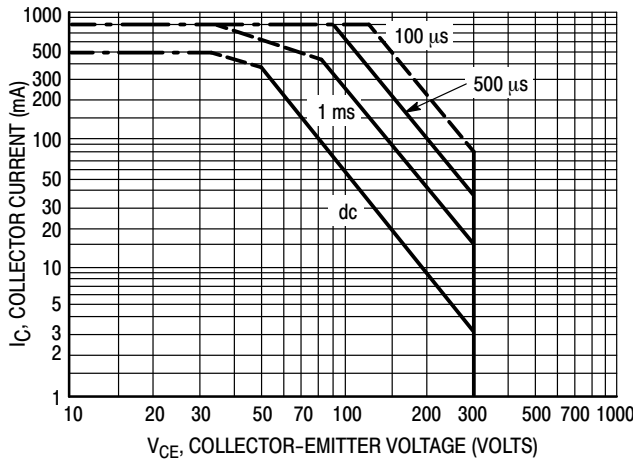


Figure 6. Active Region Safe Operating Area

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.

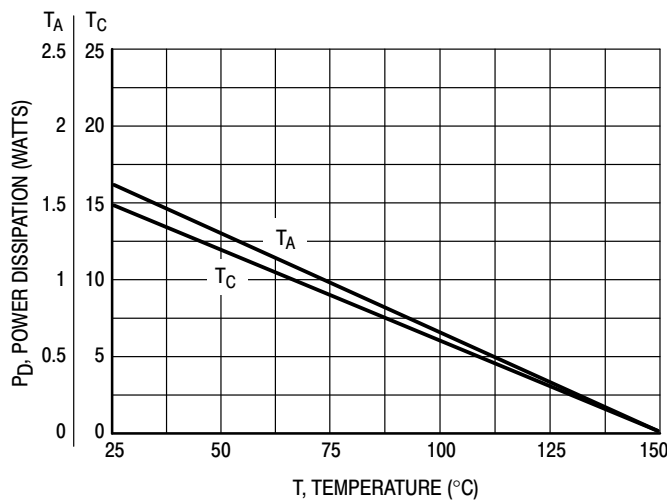


Figure 7. Power Derating

MJD340 (NPN), MJD350 (PNP)

ORDERING INFORMATION

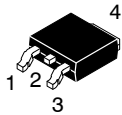
| Device | Package | Shipping† |
|--------------|-------------------|---------------------|
| MJD340G | DPAK (Pb-Free) | 75 Units / Rail |
| MJD340RLG | DPAK (Pb-Free) | 1,800 / Tape & Reel |
| MJD340T4G | DPAK (Pb-Free) | 2,500 / Tape & Reel |
| NJVMJD340T4G | DPAK (Pb-Free) | 2,500 / Tape & Reel |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

†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.

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

DPAK (SINGLE GAUGE) CASE 369C ISSUE F

DATE 21 JUL 2015



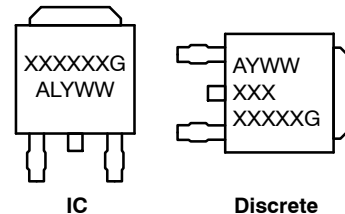
NOTES:

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.
7. OPTIONAL MOLD FEATURE.

| 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 | 0.028 | 0.045 | 0.72 | 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 | 0.114 REF | | 2.90 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 | --- |

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

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.

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.

| | | |
|------------------|---------------------|--|
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| DESCRIPTION: | DPAK (SINGLE GAUGE) | PAGE 1 OF 1 |

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