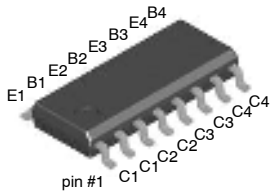
# Quad NPN and PNP General Purpose Amplifier

# MMPQ6700




**SOIC−16**
**CASE 751BG**

### Description

These complementary devices can be used in switches with collector currents of 10 μA to 100 mA. These devices are best used when space is the primary consideration. Sourced from process 23 and 66. See 2N3904 (NPN) and 2N3906 (PNP) for characteristics.

### ABSOLUTE MAXIMUM RATINGS

($T_A$ = 25°C unless otherwise noted.) (Notes 1, 2)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CEO}$ | Collector−Emitter Voltage | 40 | V |
| $V_{CBO}$ | Collector−Base Voltage | 40 | V |
| $V_{EBO}$ | Emitter−Base Voltage | 5.0 | V |
| $I_C$ | Collector Current − Continuous | 200 | mA |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | −55 to 150 | °C |

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 based on a maximum junction temperature of 150°C.
2. These are steady−state limits. **onsemi** should be consulted on applications involving pulsed or low−duty−cycle operations.

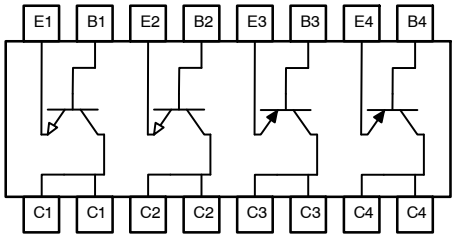
### THERMAL CHARACTERISTICS

($T_A$ = 25°C unless otherwise noted.) (Note 3)

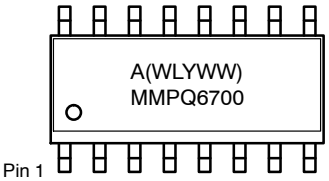
| Symbol | Parameter | | Max | Unit |
|---|---|---|---|---|
| $P_D$ | Total Device Dissipation | | 1000 | mW |
| | Derate Above 25°C | | 8.0 | mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction−to−Ambient | Effective 4 Dies | 125 | °C/W |
| | | Each Die | 240 | |

3. PCB size: FR−4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### INTERNAL CONNECTION




### MARKING DIAGRAM




A = Assembly Site
WL = Wafer Lot Number
Y = Year of Production (Last Number)
WW = Work Week
MMPQ6700 = Specific Device Code

### ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| MMPQ6700 | SOIC−16 (Pb−Free, Halide 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 Specification Brochure, BRD8011/D.

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**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted.)

| Symbol | Parameter | Test Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $BV_{CEO}$ | Collector−Emitter Breakdown Voltage (Note 4) | $I_C$ = 10 mA, $I_B$ = 0 | 40 | – | V |
| $BV_{CBO}$ | Collector−Base Breakdown Voltage | $I_C$ = 10 μA, $I_E$ = 0 | 40 | – | V |
| $BV_{EBO}$ | Emitter−Base Breakdown Voltage | $I_E$ = 10 μA, $I_C$ = 0 | 5.0 | – | V |
| $I_{CBO}$ | Collector Cut−Off Current | $V_{CB}$ = 30 V, $I_E$ = 0 | – | 50 | nA |
| $I_{EBO}$ | Emitter Cut−Off Current | $V_{EB}$ = 4.0 V, $I_C$ = 0 | – | 50 | nA |
| $h_{FE}$ | DC Current Gain (Note 4) | $V_{CE}$ = 1.0 V, $I_C$ = 0.1 mA | 30 | – | |
| | | $V_{CE}$ = 1.0 V, $I_C$ = 1.0 mA | 50 | – | |
| | | $V_{CE}$ = 1.0 V, $I_C$ = 10 mA | 70 | – | |
| $V_{CE(sat)}$ | Collector−Emitter Saturation Voltage (Note 4) | $I_C$ = 10 mA, $I_B$ = 1.0 mA | – | 0.25 | V |
| $V_{BE(sat)}$ | Base−Emitter Saturation Voltage (Note 4) | $I_C$ = 10 mA, $I_B$ = 1.0 mA | – | 0.9 | V |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 5.0 V, f = 100 kHz | – | 4.5 | pF |
| $C_{ib}$ | Input Capacitance | $V_{BE}$ = 0.5 V, f = 100 kHz<br>PNP<br>NPN | <br>–<br>– | <br>10<br>8.0 | pF |
| $f_T$ | Current Gain Bandwidth Product | $I_C$ = 10 mA, $V_{CE}$ = 20 V, f = 100 MHz | 200 | – | 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.

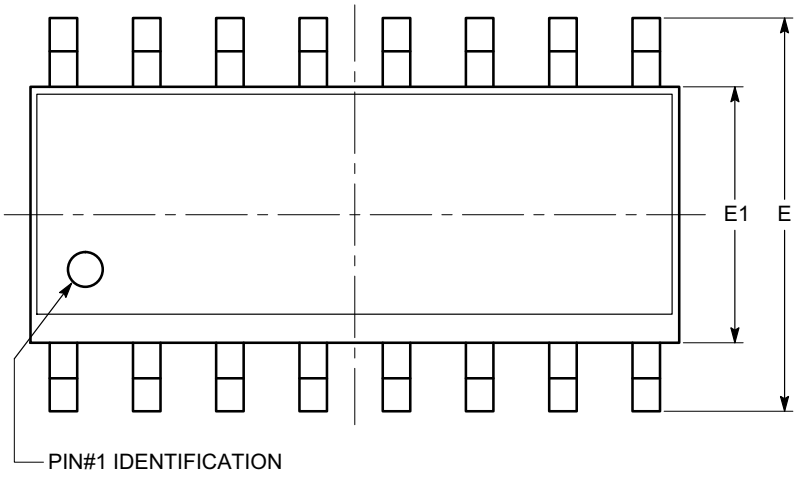
4. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.



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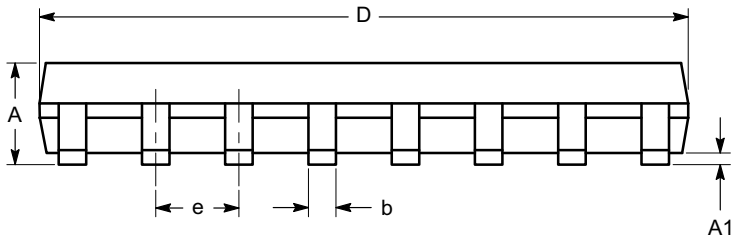
**SOIC−16, 150 mils**
CASE 751BG
ISSUE O

DATE 19 DEC 2008

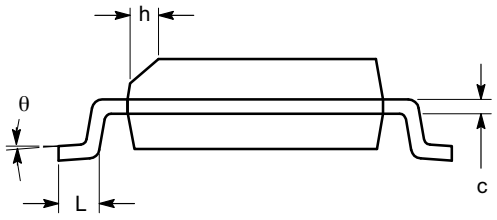



**TOP VIEW**

| SYMBOL | MIN | NOM | MAX |
|---|---|---|---|
| A | 1.35 | | 1.75 |
| A1 | 0.10 | | 0.25 |
| b | 0.33 | | 0.51 |
| c | 0.19 | | 0.25 |
| D | 9.80 | 9.90 | 10.00 |
| E | 5.80 | 6.00 | 6.20 |
| E1 | 3.80 | 3.90 | 4.00 |
| e | 1.27 BSC | | |
| h | 0.25 | | 0.50 |
| L | 0.40 | | 1.27 |
| θ | 0º | | 8º |




**SIDE VIEW**




**END VIEW**

**Notes:**
(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MS-012.

| | | | |
|---|---|---|---|
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| **DESCRIPTION:** | **SOIC−16, 150 mils** | | **PAGE 1 OF 1** |

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