



January 2015

# MMPQ6700

## Quad NPN and PNP General-Purpose Amplifier

### Description

These complementary devices can be used in switches with collector currents of 10  $\mu$ A 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.

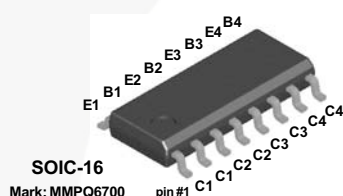


Figure 1. Device Package

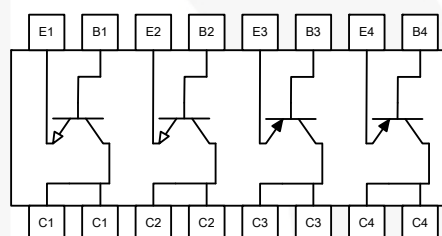


Figure 2. Internal Connection

### Ordering Information

Part Number	Top Mark	Package	Packing Method
MMPQ6700	MMPQ6700	SOIC 16L	Tape and Reel

### Absolute Maximum Ratings<sup>(1),(2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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	$^\circ\text{C}$

#### Notes:

- These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
- These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or

**Thermal Characteristics<sup>(3)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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

**Note:**

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.

**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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

**Note:**

4. Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

**Figure 3. 16-LEAD, SOIC, JEDEC MS-012, 0.150 inch, NARROW BODY**





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Rev. I73