January 2015

MMPQ6700
Quad NPN and PNP General-Purpose Amplifier

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.

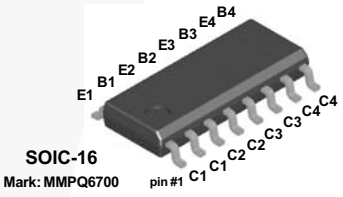

Figure 1. Device Package

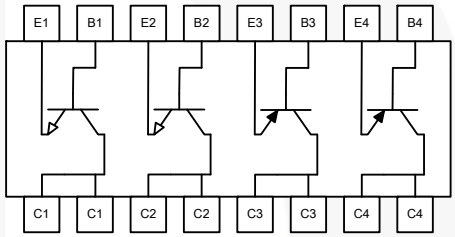

Figure 2. Internal Connection

Ordering Information

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

Absolute Maximum Ratings(1),(2)

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°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	°C

Notes:

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or

Thermal Characteristics[3]

Values are at T_A = 25°C unless otherwise noted.

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	°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°C unless otherwise noted.

Symbol	Parameter	Conditions		Min.	Max.	Unit
BV_{CEO}	Collector-Emitter Breakdown Voltage[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[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[4]	I_C = 10 mA, I_B = 1.0 mA			0.25	V
V_{BE}(sat)	Base-Emitter Saturation Voltage[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	**PNP**		10	pF
			NPN		8.0	
f_T	Current Gain Bandwidth Product	I_C = 10 mA, V_{CE} = 20 V, f = 100 MHz		200		MHz

Note:

4. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2.0%.

Physical Dimensions

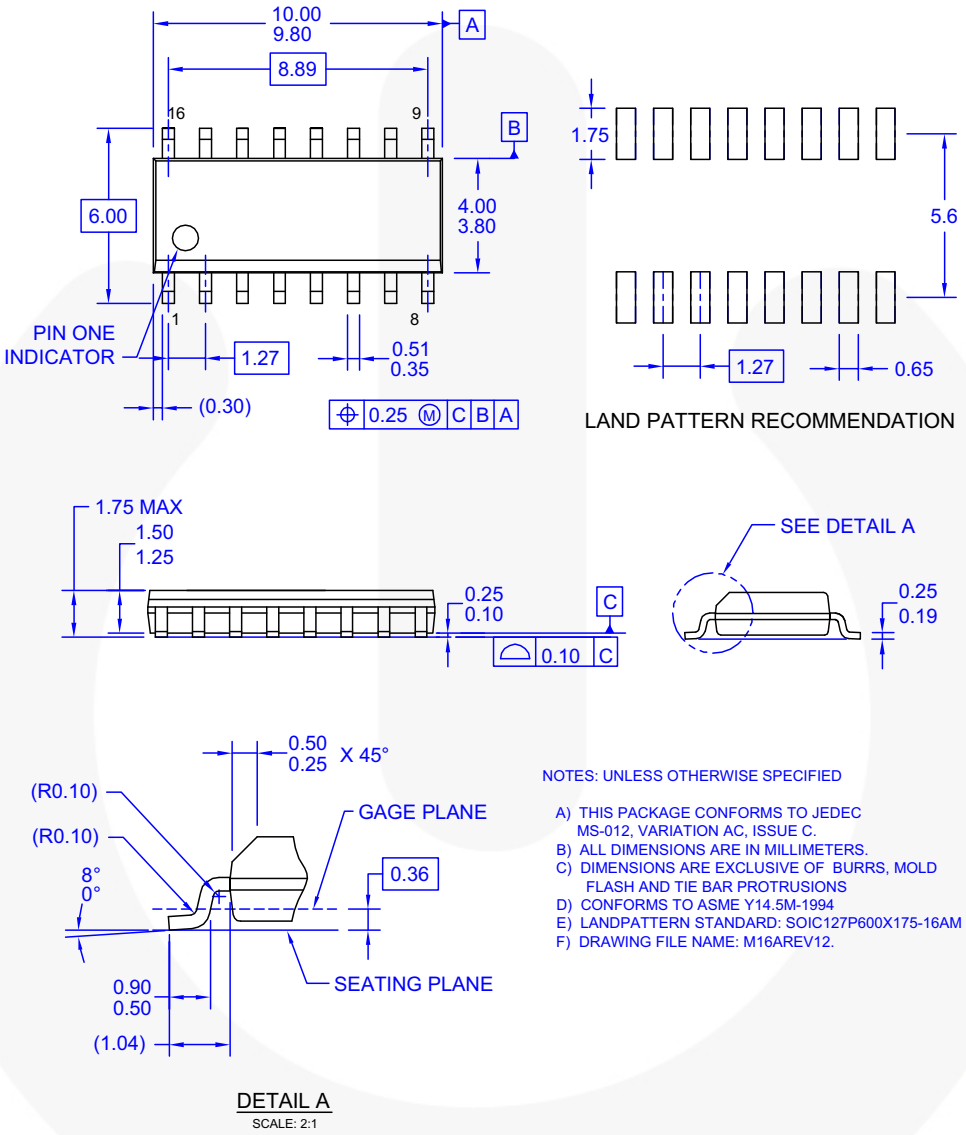

Figure 3. 16-LEAD, SOIC, JEDEC MS-012, 0.150 inch, NARROW BODY

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