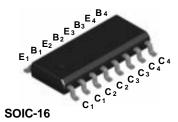


MMPQ6700



| | TRANSISTOR TYPE | | | | | | | | |
|---|-----------------|----------------|----------------|---|----------------|----------------|----------------|-----|--|
| | C ₁ | B ₁ | E, | & | C ₂ | B ₂ | E ₂ | NPN | |
| Γ | C ₃ | В | E ₃ | & | C ₄ | B ₄ | E ₄ | PNP | |

Quad NPN & PNP General Purpose Amplifier

These complimentary 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 & 66. See 2N3904 (NPN) & 2N3906 (PNP) for characteris-

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|-----------------------------------|--|-------------|-------|
| V_{CEO} | Collector-Emitter Voltage | 40 | V |
| V _{CBO} | Collector-Base Voltage | 40 | V |
| V _{EBO} | Emitter-Base Voltage | 5.0 | V |
| Ic | Collector Current - Continuous | 200 | mA |
| T _J , T _{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

^{*}These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

- These ratings are based on a maximum junction temperature of 150 degrees C.
 These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|-----------------|--|-------------|-------------|
| | | MMPQ6700 | |
| P_D | Total Device Dissipation Derate above 25°C | 1000 8.0 | mW mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient Effective 4 Die Each Die | 125 240 | °C/W |

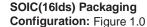
Quad NPN & PNP General Purpose Amplifier (continued)

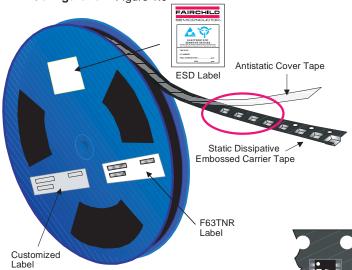
| Symbol | Parameter | Test Conditions | Min | Max | Units |
|---|--|--|----------------|--------------|-------|
| OFF CHA | RACTERISTICS | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage* | $I_C = 10 \text{ mA}, I_B = 0$ | 40 | | V |
| V _{(BR)CBO} | Collector-Base Breakdown Voltage | $I_C = 10 \mu A, I_E = 0$ | 40 | | V |
| V _{(BR)EBO} | Emitter-Base Breakdown Voltage | $I_E = 10 \mu A, I_C = 0$ | 5.0 | | V |
| I _{CBO} | Collector-Cutoff Current | $V_{CB} = 30 \text{ V}, I_{E} = 0$ | | 50 | nA |
| I _{EBO} | Emitter-Cutoff Current | V _{EB} = 4.0 V, I _C = 0 | | 50 | nA |
| ON CHAF | RACTERISTICS* | | | | |
| | RACTERISTICS* DC Current Gain | $V_{CE} = 1.0 \text{ V}, I_{C} = 0.1 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_{C} = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_{C} = 10 \text{ mA}$ | 30 50 70 | | |
| | | $V_{CE} = 1.0 \text{ V}, I_{C} = 1.0 \text{ mA}$ | 50 | 0.25 | V |
| h _{FE} | DC Current Gain | $V_{CE} = 1.0 \text{ V}, I_{C} = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_{C} = 10 \text{ mA}$ | 50 | 0.25 0.90 | V |
| VCE(sat) | DC Current Gain Collector-Emitter Saturation Voltage | $V_{CE} = 1.0 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 10 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ | 50 | | |
| V _{CE(sat)} V _{BE(sat)} | DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage | $V_{CE} = 1.0 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 10 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ | 50 | | |
| VCE(sat) | DC Current Gain Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage BIGNAL CHARACTERISTICS | $V_{CE} = 1.0 \text{ V}, I_{C} = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_{C} = 10 \text{ mA}$ $I_{C} = 10 \text{ mA}, I_{B} = 1.0 \text{ mA}$ $I_{C} = 10 \text{ mA}, I_{B} = 1.0 \text{ mA}$ | 50 | 0.90 | V |

^{*}Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 2.0%

SOIC-16 Tape and Reel Data and Package Dimensions





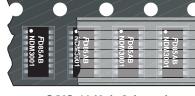


Packaging Description:

Packaging Description:

SOIC-16 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reled parts in standard option are shipped with 2,500 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). This and some other options are further described in the Packaging Information table.

These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.





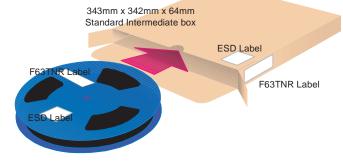
L86Z Packaging Option o flow code Packaging type Rail/Tube Qty per Reel/Tube/Bag 45 Reel Size 13" Dia Box Dimension (mm 343x64x343 530x130x83 Max qty per Box 5,000 13,500 Weight per unit (gm) 0.1437 0.1437 Weight per Reel (kg) 0.7735

Note/Comments

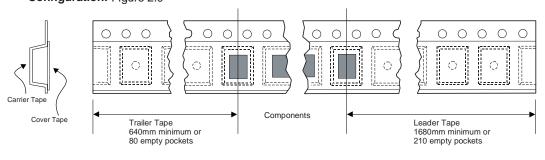
SOIC (16lds) Packaging Information

SOIC-16 Unit Orientation



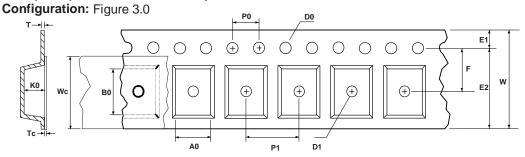


SOIC(16lds) Tape Leader and Trailer Configuration: Figure 2.0





SOIC(16lds) Embossed Carrier Tape



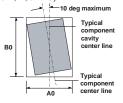
User Direction of Feed

| | Dimensions are in millimeter | | | | | | | | | | | | | |
|-----------------------|------------------------------|------------------|----------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|---------------|-----------------|-------------------|----------------|-----------------|
| Pkg type | Α0 | В0 | w | D0 | D1 | E1 | E2 | F | P1 | P0 | КО | Т | Wc | Тс |
| SOIC(16lds) (16mm) | 6.60 +/-0.30 | 10.35 +/-0.25 | 16.0 +/-0.3 | 1.55 +/-0.05 | 1.60 +/-0.10 | 1.75 +/-0.10 | 14.25 min | 7.50 +/-0.05 | 8.0 +/-0.1 | 4.0 +/-0.1 | 2.40 +/-0.40 | 0.450 +/-0.150 | 13.0 +/-0.3 | 0.06 +/-0.02 |

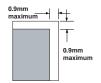
Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



Sketch A (Side or Front Sectional View)
Component Rotation



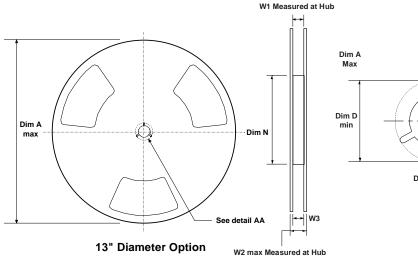
Sketch B (Top View)
Component Rotation

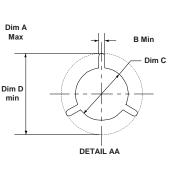


Sketch C (Top View)

Component lateral movement

SOIC(16Ids) Reel Configuration: Figure 4.0





| Dimensions are in inches and millimeters | | | | | | | | | |
|--|----------------|--------------|--------------|-----------------------------------|---------------|-------------|----------------------------------|---------------|------------------------------|
| Tape Size | Reel Option | Dim A | Dim B | Dim C | Dim D | Dim N | Dim W1 | Dim W2 | Dim W3 (LSL-USL) |
| 16mm | 13" Dia | 13.00 330 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 4.00 100 | 0.646 +0.078/-0.000 16.4 +2/0 | 0.882 22.4 | 0.626 - 0.764 15.9 - 19.4 |

SOIC-16 Tape and Reel Data and Package Dimensions, continued SOIC-16 (FS PKG Code S3) <u>1:1</u> Scale 1:1 on letter size paper Dimensions shown below are in: inches [millimeters] Part Weight per unit (gram): 0.1437 10.00 9.80 (0.25)8.89 5.75 -1.00 4 1.27 ⊕ 0.25@|C|B|A| 8.89 LAND PATTERN RECOMMENDATION SEE DETAIL A GAGE PLANE NOTES: UNLESS OTHERWISE SPECIFIED (R0.10) THIS PACKAGE CONFORMS TO JEDEC MS-012, VARIATION AC, ISSUE C, DATED MAY 1990. ALL DIMENSIONS ARE IN MILLIMETERS. STANDARD LEAD FINISH: 200 MICROINCHES / 5.08 MICRONS MIN. LEAD/TIN (SOLDER) ON COPPER. (R0.10) SEATING PLANE (1.04) DETAIL A

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