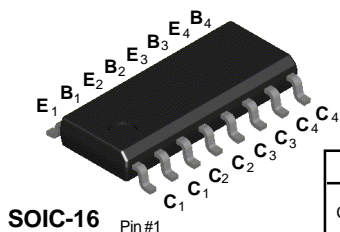


## MMPQ6502



TRANSISTOR TYPE		
C <sub>1</sub> B <sub>1</sub> E <sub>1</sub> & C <sub>2</sub> B <sub>2</sub> E <sub>2</sub>	NPN	
C <sub>3</sub> B <sub>3</sub> E <sub>3</sub> & C <sub>4</sub> B <sub>4</sub> E <sub>4</sub>	PNP	

### Quad NPN & PNP General Purpose Amplifier

These complimentary devices can be used in medium power amplifiers, drivers and switches with collector currents to 500 mA. These devices are best used when space is the primary consideration. Sourced from Process 19 & 63. See PN2222A (NPN) & PN2907A (PNP) for characteristics.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	30	V
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current - Continuous	1.0	A
T <sub>J</sub> , T <sub>stg</sub>	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.

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) 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
		MMPQ6502	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	1000	mW
		8.0	mW/°C
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient Effective 4 Die Each Die	125	°C/W
		240	°C/W

## Quad NPN & PNP General Purpose Amplifier

(continued)

MMMPQ6502

### Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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#### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	30		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ }\mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ }\mu\text{A}, I_C = 0$	5.0		V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 50 \text{ V}, I_E = 0$		30	nA
$I_{EBO}$	Emitter-Cutoff Current	$V_{EB} = 3.0 \text{ V}, I_C = 0$		30	nA

#### ON CHARACTERISTICS\*

$h_{FE}$	DC Current Gain	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 150 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 300 \text{ mA}$	50 75 100 30		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ $I_C = 300 \text{ mA}, I_B = 30 \text{ mA}$		0.4 1.4	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ $I_C = 300 \text{ mA}, I_B = 30 \text{ mA}$		1.3 2.0	V V

#### SMALL SIGNAL CHARACTERISTICS

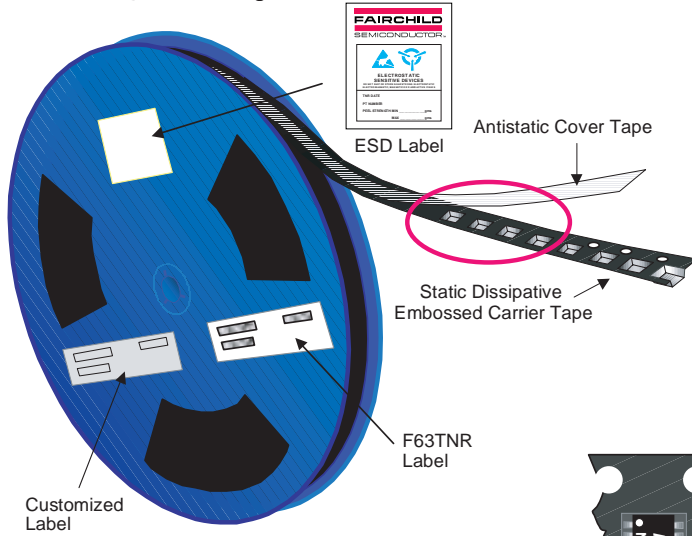
$C_{ob}$	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 1.0 \text{ MHz}$		8.0	pF
$C_{ib}$	Input Capacitance	$V_{BE} = 2.0 \text{ V}, f = 1.0 \text{ MHz}$		30	pF
$f_T$	Current-Gain Bandwidth Product	$I_C = 50 \text{ mA}, V_{CE} = 20 \text{ V},$ $f = 100 \text{ MHz}$	200		MHz

\*Pulse Test: Pulse Width  $\leq 300 \text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

# SOIC-16 Tape and Reel Data and Package Dimensions



## SOIC(16lds) Packaging Configuration: Figure 1.0

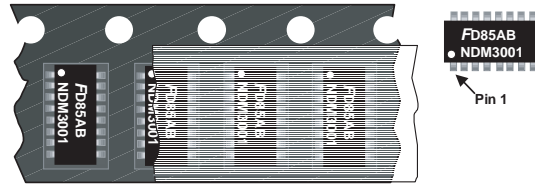


### Packaging Description:

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 reeled 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.

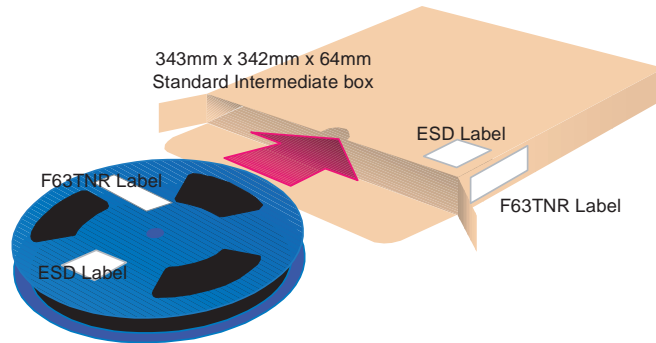
These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending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

SOIC (16lds) Packaging Information		
Packaging Option	Standard (no flow code)	L86Z
Packaging type	TNR	Rail/Tube
Qty per Reel/Tube/Bag	2,500	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		

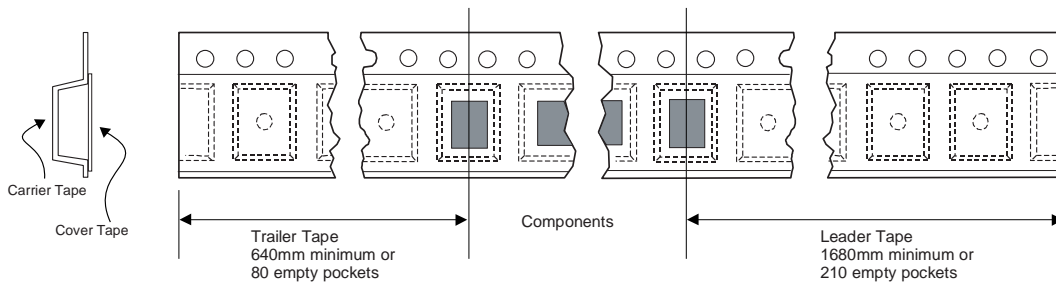


### SOIC-16 Unit Orientation

### F63TNR Label sample

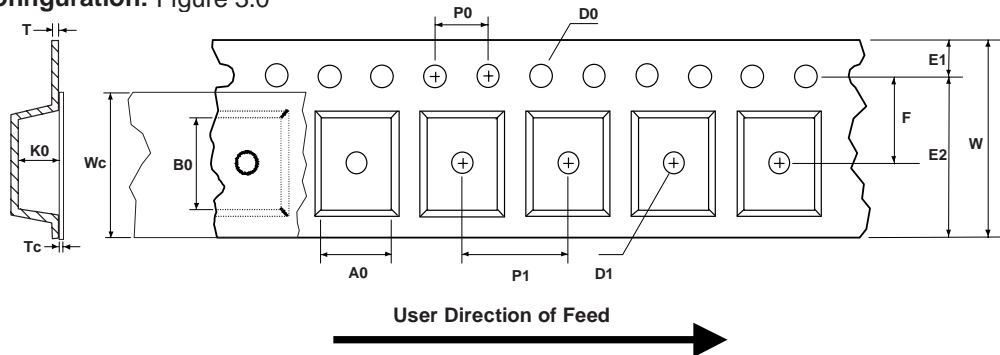


## SOIC(16lds) Tape Leader and Trailer Configuration: Figure 2.0



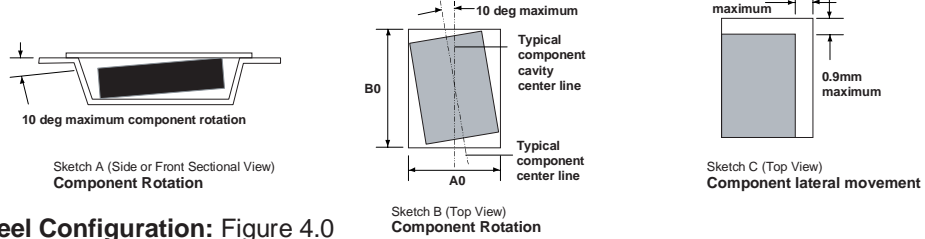
# SOIC-16 Tape and Reel Data and Package Dimensions, continued

## SOIC(16lds) Embossed Carrier Tape Configuration: Figure 3.0

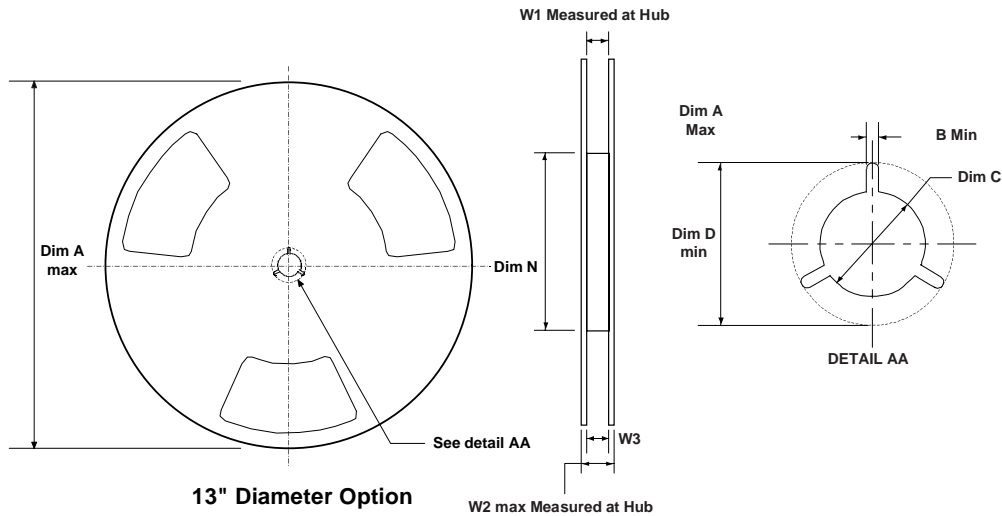


Dimensions are in millimeter														
Pkg type	A0	B0	W	D0	D1	E1	E2	F	P1	P0	K0	T	Wc	Tc
SOIC(16lds) (16mm)	6.60 +/-0.30	10.35 +/-0.25	16.0 +/-0.3	1.55 +/-0.05	1.60 +/-0.10	1.75 +/-0.10	14.25 min	7.50 +/-0.05	8.0 +/-0.1	4.0 +/-0.1	2.40 +/-0.40	0.450 +/-0.150	13.0 +/-0.3	0.06 +/-0.02

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).



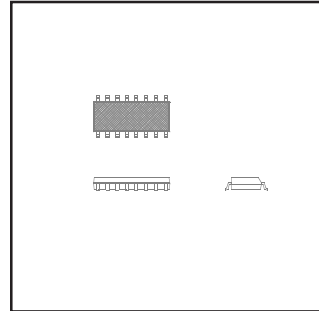
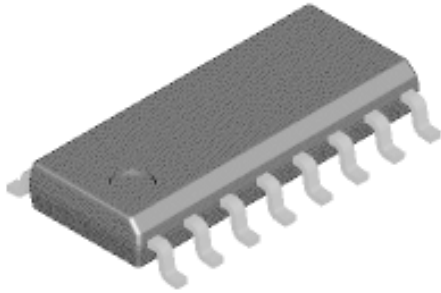
## SOIC(16lds) Reel Configuration: Figure 4.0



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)**

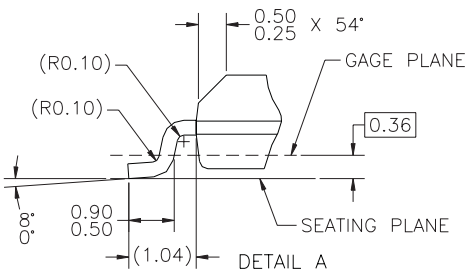
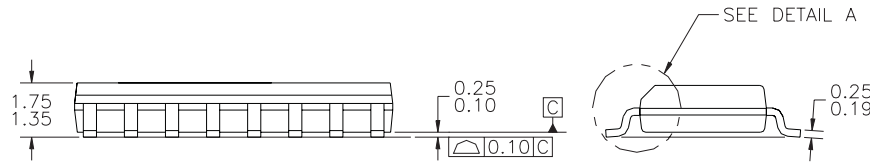
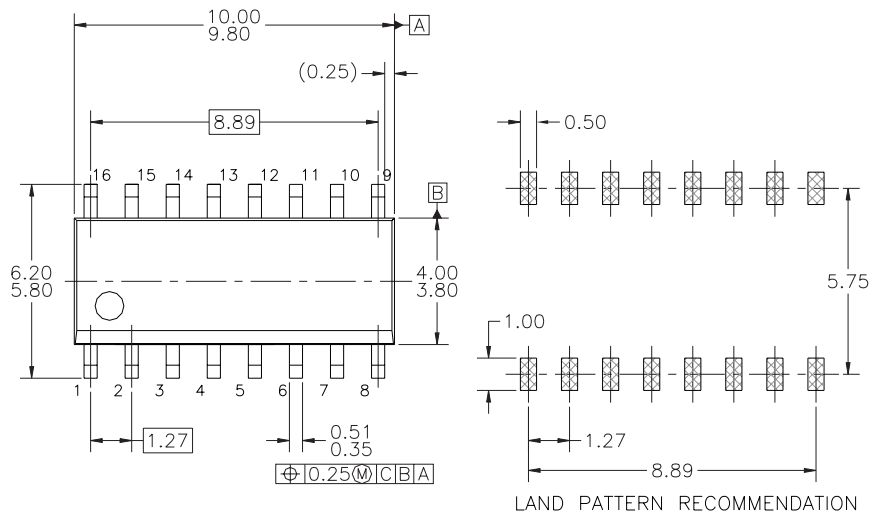


1:1

Scale 1:1 on letter size paper

Dimensions shown below are in:  
inches [millimeters]

Part Weight per unit (gram): 0.1437



NOTES: UNLESS OTHERWISE SPECIFIED

- A) THIS PACKAGE CONFORMS TO JEDEC MS-012, VARIATION AC, ISSUE C, DATED MAY 1990.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) STANDARD LEAD FINISH: 200 MICROINCHES / 5.08 MICRONS MIN. LEAD/TIN (SOLDER) ON COPPER.

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FACT™	QFET™	
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FASTr™	SuperSOT™-3	
GTO™	SuperSOT™-6	
HiSeC™	SuperSOT™-8	

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