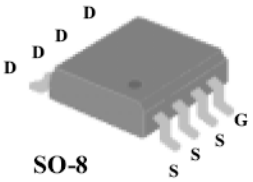
# P-Channel Enhancement Mode Field Effect Transistor

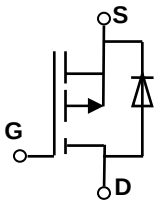
## FEATURES

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- SOP-8 package

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DSS}$ | $I_D$ | $R_{DS(ON)}$ (mΩ) Typ |
| -30V | -5.6A | 45@ $V_{GS}$=-10V |
| | | 75 @ $V_{GS}$=-4.5V |

NOTE:The MT9435A is available in a lead-free package




## ABSOLUTE MAXIMUM RATINGS（$T_A$=25℃ unless otherwise noted）

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous[a] @Tj=125℃ | $I_D$ | -5.6 | A |
| - Pulse [b] | $I_{DM}$ | -24 | A |
| Drain-source Diode Forward Current[a] | $I_S$ | -1.7 | A |
| Maximum Power Dissipation[a] | $P_D$ | 2.5 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 to 150 | ℃ |

## THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| Thermal Resistance, Junction-to Ambient[a] | Rth $J_A$ | 50 | ℃/W |

## ELECTRICAL CHARACTERISTICS ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V,$I_D$=-250μA | -30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-24V,$V_{GS}$=0V | | | -1 | μA |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$=±20V,$V_{DS}$=0V | | | ±100 | nA |
| ON CHARACTERITICS | | | | | | |
| Gate Threshold Voltage | $V_{GS}$(th) | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -1 | -1.5 | -2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=-10V,$I_D$=-5.6A | | 45 | 55 | mΩ |
| | | $V_{GS}$=-4.5V,$I_D$=-4.2A | | 75 | 85 | |
| Forward Transconductance | $g_{FS}$ | $V_{GS}$=-5V,$I_D$=-5.6A | | 5 | | S |
| DAYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-15V,$V_{GS}$=0V f=1.0MHz | | 582 | | pF |
| Output Capacitance | $C_{oss}$ | | | 125 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 86 | | pF |
| SWITCHING CHARACTERISISTICS | | | | | | |
| Turn-On Delay Time | $t_{D(ON)}$ | $V_{DD}$=-15V $I_D$=-5.6A, $V_{GEN}$=-4.5V $R_L$=10ohm $R_{GEN}$=10ohm | | 9 | | ns |
| Rise Time | tr | | | 10 | | ns |
| Turn-Off Delay Time | $t_{D(OFF)}$ | | | 38 | | ns |
| Fall Time | tf | | | 23 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=-15V,$I_D$=-1A $V_{GS}$=-10V | | 11.7 | | nC |
| Gate-Source Charge | Qgs | | | 2.1 | | nC |
| Gate-Drain Charge | Qgd | | | 2.9 | | nC |

## ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

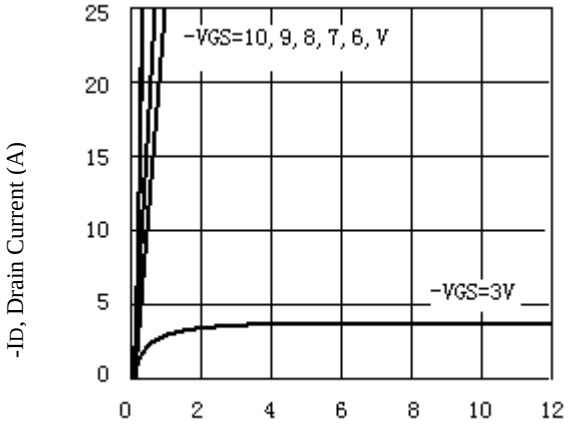
| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-1.7A | | -0.84 | -1.2 | V |

Notes

a. Surface Mounted on FR4 Board, t≦10sec

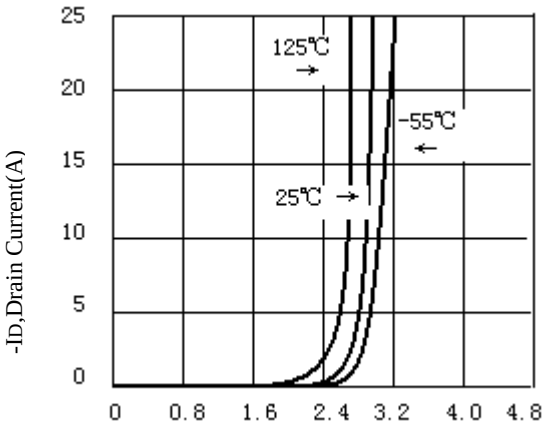
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

c. Guaranteed by design, not subject to production testing.



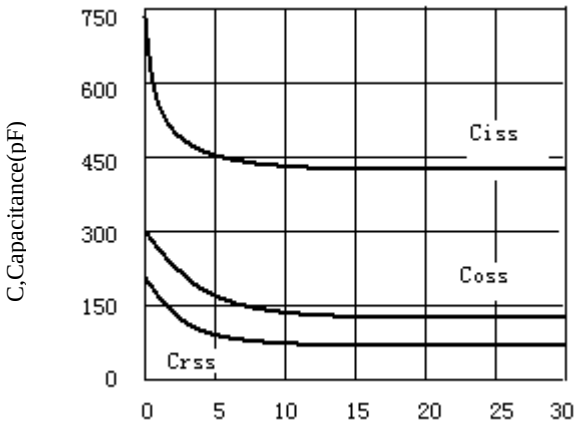

- $V_{DS}$, Drain-to-Source Voltage (V)

Figure 1. Output Characteristics




-$V_{GS}$, Gate-to-source Voltage (V)

Figure 2. Transfer Characteristics




- VGS, Drain-to Source Voltage

Figure3. Capacitance

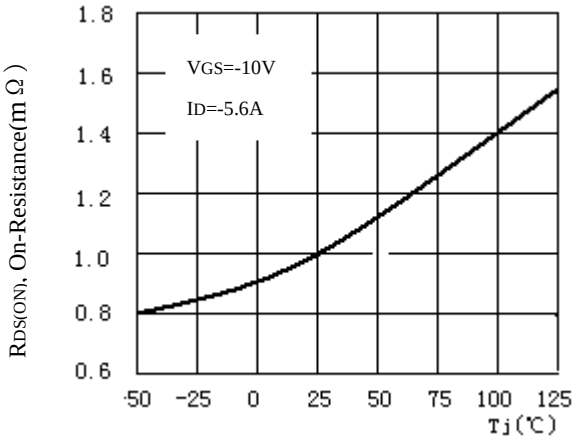



Figure4. On-Resistance Variation with Temperature

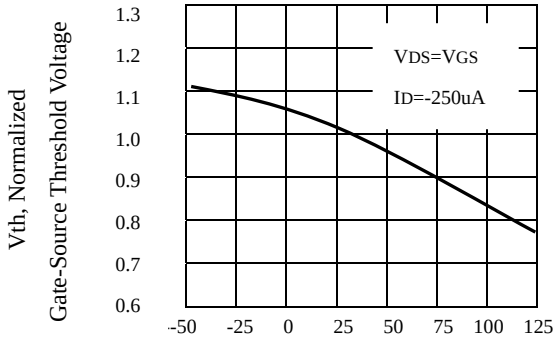



Figure5.Gate Threshold Variation With Temperature

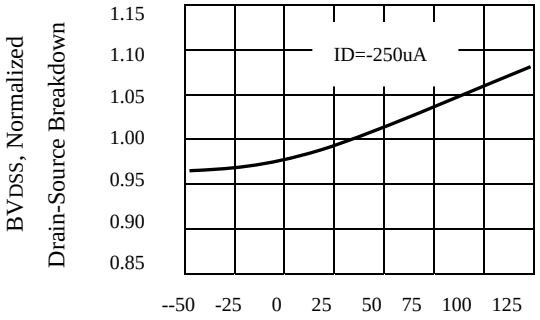



Figure6.Breakdown Voltage Variation With Temperature

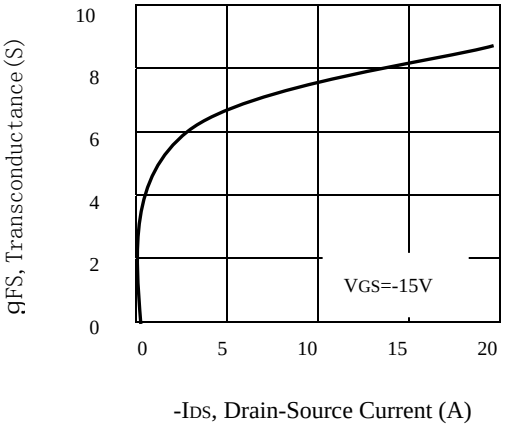



Figure7.Transconductance Variation With Drain Current

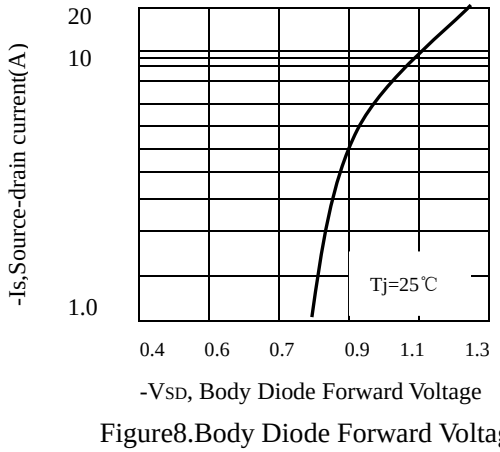



Figure8.Body Diode Forward Voltage Variation with Source Current

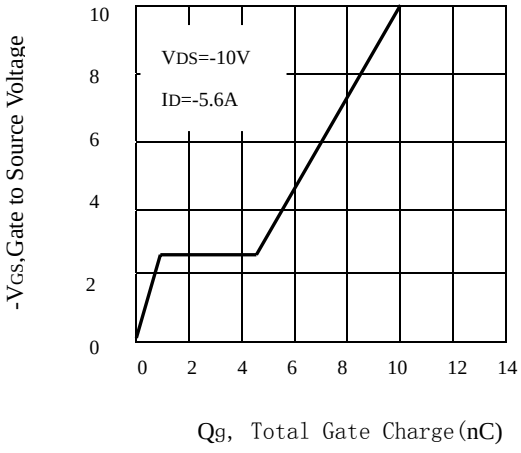



Figure9. Gate Charge

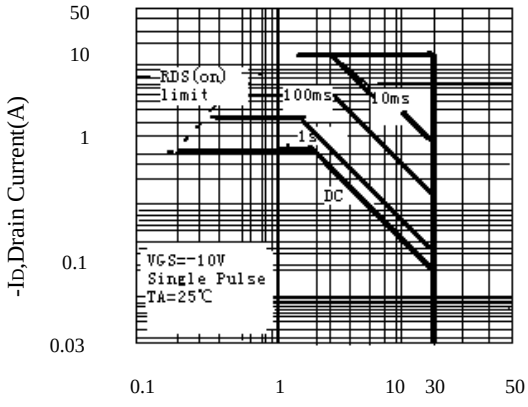



Figure10.Maximum Safe Operating Area

# SOIC-8 Tape and Reel Data

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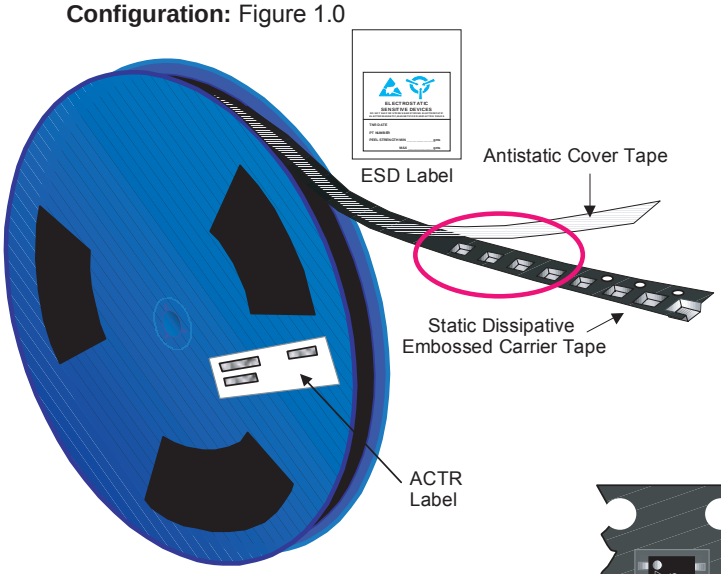
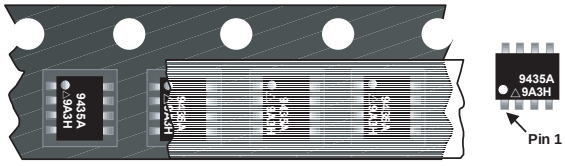
## SOIC(8lds) Packaging Configuration: Figure 1.0




**Packaging Description:**

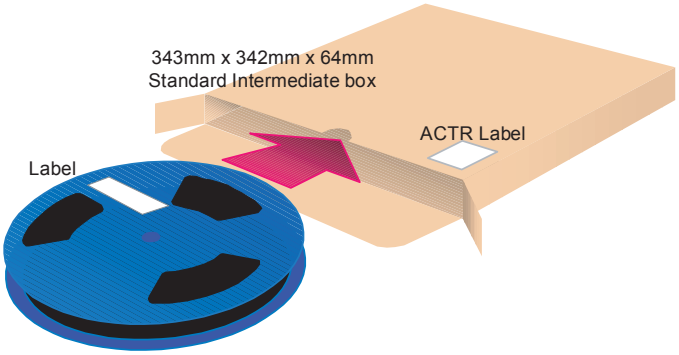
SOIC-8 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in 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). Other option comes in 500 units per 7" or 177cm diameter reel. 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.

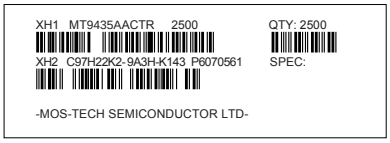



**SOIC-8 Unit Orientation**

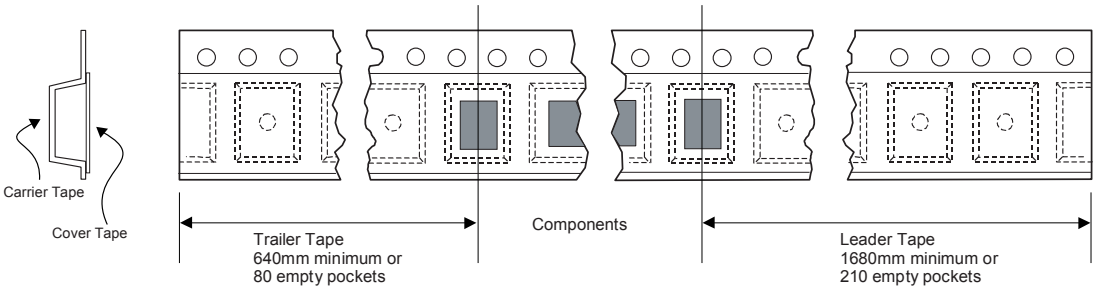
| SOIC (8lds) Packaging Information | | | | |
|---|---|---|---|---|
| **Packaging Option** | Standard (no flow code) | L86Z | F011 | D84Z |
| **Packaging type** | ACTR | Rail/Tube | TNR | TNR |
| **Qty per Reel/Tube/Bag** | 2,500 | 95 | 4,000 | 500 |
| **Reel Size** | 13" Dia | - | 13" Dia | 7" Dia |
| **Box Dimension (mm)** | 343x64x343 | 530x130x83 | 343x64x343 | 184x187x47 |
| **Max qty per Box** | 5,000 | 30,000 | 8,000 | 1,000 |
| **Weight per unit (gm)** | 0.0774 | 0.0774 | 0.0774 | 0.0774 |
| **Weight per Reel (kg)** | 0.6060 | - | 0.9696 | 0.1182 |
| **Note/Comments** | | | | |




MT9435AACTR Label sample




## SOIC(8lds) Tape Leader and Trailer Configuration: Figure 2.0



# Part Marking Information

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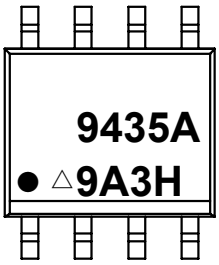
## SO-8 (PMG Code )

**SO-8 Devices**



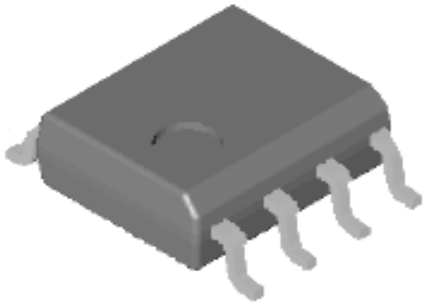

9435A = Example Base Part Number
● = Pin 1 Indicator
△ = ESD Symbol
9 = Year Code
A = Month Code
3 = Week Code
H = Assembly Factory Code

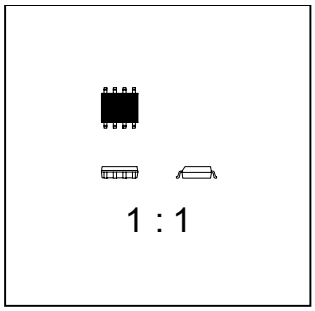
NOTE:

1. For analog switches base part includes DG prefix. Package suffix may or may not be present, depending on room available.

The current marking strategy is reflected. Contact your local sales representative for historical marking strategies for these packages.

# SOIC-8 (PKG Code S1)

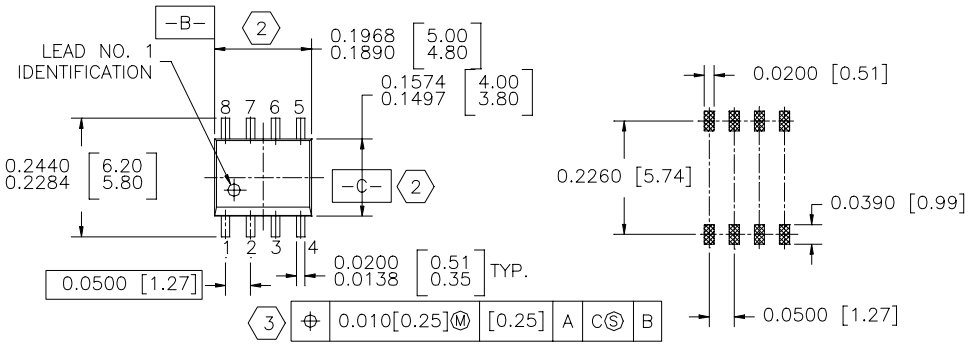


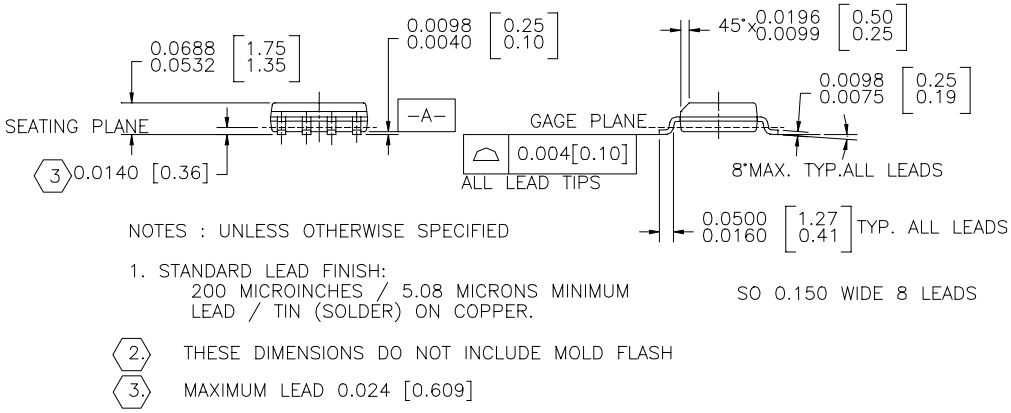



Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.0774




NOTES : UNLESS OTHERWISE SPECIFIED

1. STANDARD LEAD FINISH:
   200 MICROINCHES / 5.08 MICRONS MINIMUM
   LEAD / TIN (SOLDER) ON COPPER.

SO 0.150 WIDE 8 LEADS

2. THESE DIMENSIONS DO NOT INCLUDE MOLD FLASH

3. MAXIMUM LEAD 0.024 [0.609]

# SOIC-8 Tape and Reel Data, continued

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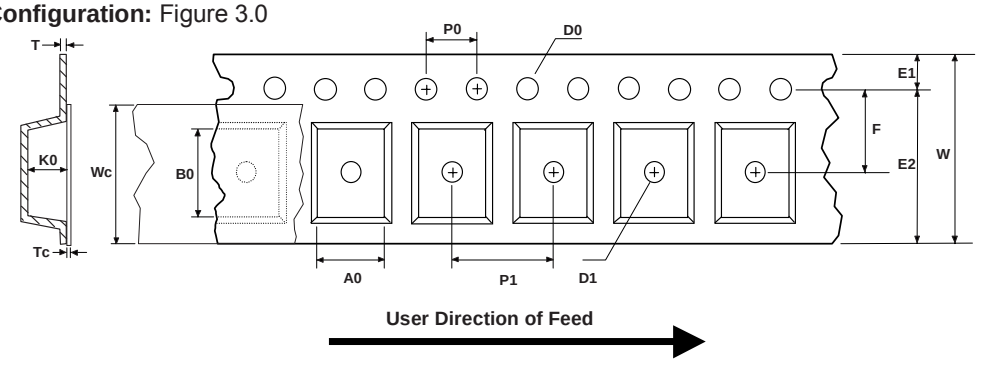
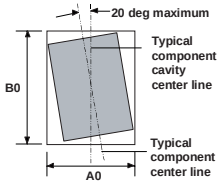
## SOIC(8lds) Embossed Carrier Tape
**Configuration:** Figure 3.0



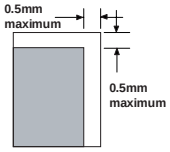

| Dimensions are in millimeter | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pkg type** | **A0** | **B0** | **W** | **D0** | **D1** | **E1** | **E2** | **F** | **P1** | **P0** | **K0** | **T** | **Wc** | **Tc** |
| **SOIC**(8lds) (12mm) | 6.50 +/-0.10 | 5.30 +/-0.10 | 12.0 +/-0.3 | 1.55 +/-0.05 | 1.60 +/-0.10 | 1.75 +/-0.10 | 10.25 min | 5.50 +/-0.05 | 8.0 +/-0.1 | 4.0 +/-0.1 | 2.1 +/-0.10 | 0.450 +/- 0.150 | 9.2 +/-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**

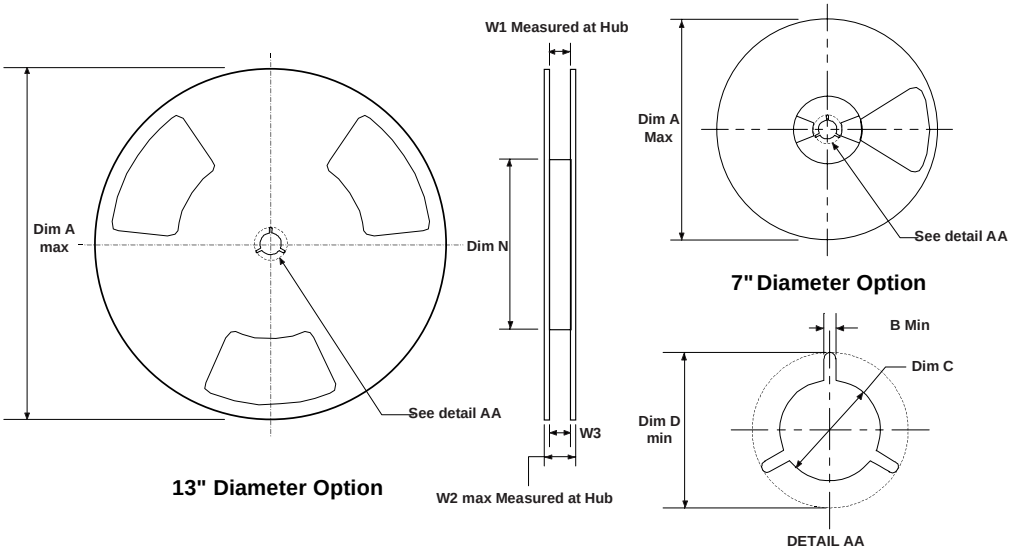



Sketch B (Top View)
**Component Rotation**




Sketch C (Top View)
**Component lateral movement**

## SOIC(8lds) 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)** |
| 12mm | 7" Dia | 7.00 177.8 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 2.165 55 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 – 0.606 11.9 – 15.4 |
| 12mm | 13" Dia | 13.00 330 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 7.00 178 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 – 0.606 11.9 – 15.4 |

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   2）植埋于人体使用的装置。
   3）用于治疗（切除患部、给药等）的装置。
   4）其他直接影响到人的生命的装置。
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## Keep safety first in your circuit designs!

1. MOS-TECH Semiconductor Corp. puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.
   Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.