MT8205A1

N-Channel Enhancement Mode Field Effect Transistor

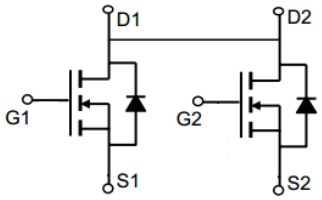
MT Semiconductor®

http://www.mtsemi.com

Product Summary

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
20V	6A	20 @ V_{GS}=4.5V
		24 @ V_{GS}=2.5V

Simplified Schematic

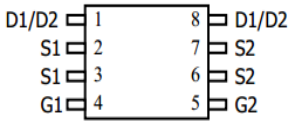


Features

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

MARKING DIAGRAM & PIN ASSIGNMENT

Top View



Applications

- Portable battery packs

Absolute Maximum Ratings (T_A = 25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous[a] @Tj=25℃	I_D	6	A
- Pulse d^{b}	I_{DM}	20	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	80	℃/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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±8V,V_{DS}=0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=V_{GS},I_D=250μA	0.5	0.7	1.1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=3A		20	21	mΩ
		V_{GS}=2.5V,I_D=0.8A		24	25	
Forward Transconductance	g_{FS}	V_{GS}=5V,I_D=1A		5		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=10V,V_{GS}=0V f=1.0MHz		608		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			86		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=10V I_D=6A, V_{GEN}=4.5V R_L=10ohm R_{GEN}=10ohm		10		ns
Rise Time	tr			14		ns
Turn-Off Delay Time	$t_{D(OFF)}$			39		ns
Fall Time	tf			26		ns
Total Gate Charge	Qg	V_{DS}=10V,I_D=1A V_{GS}=4.5V		9.2		nC
Gate-Source Charge	Qgs			1.6		nC
Gate-Drain Charge	Qgd			2.6		nC

ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

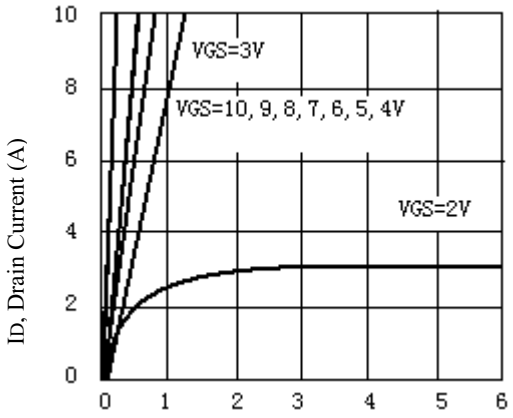
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1.0A		0.8		V

Notes

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

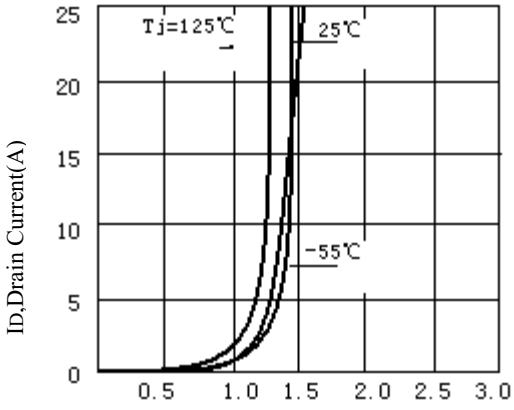
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

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



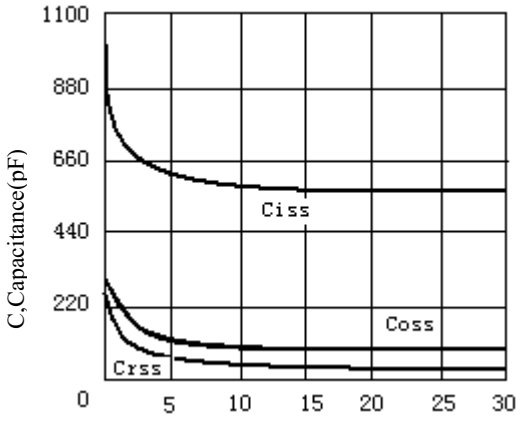
V_{DS}, Drain-to-Source Voltage (V)

Figure 1. Output Characteristics



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

Figure 2. Transfer Characteristics



VGS, Drain-to Source Voltage

Figure3. Capacitance

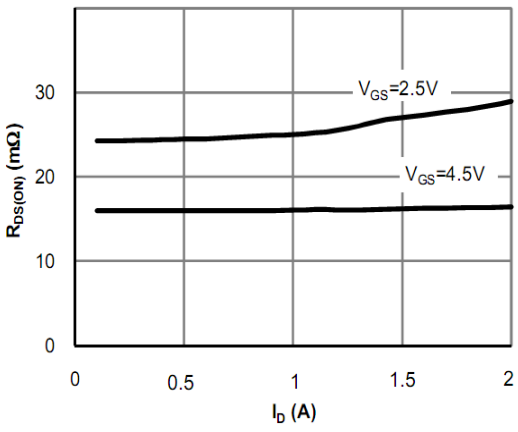


Figure4. On-Resistance Variation with Temperature

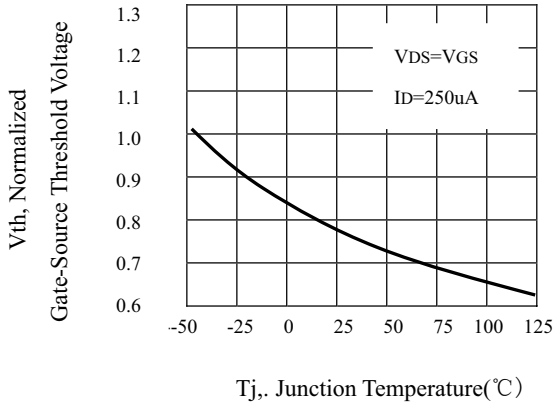


Figure5.Gate Threshold Variation With Temperature

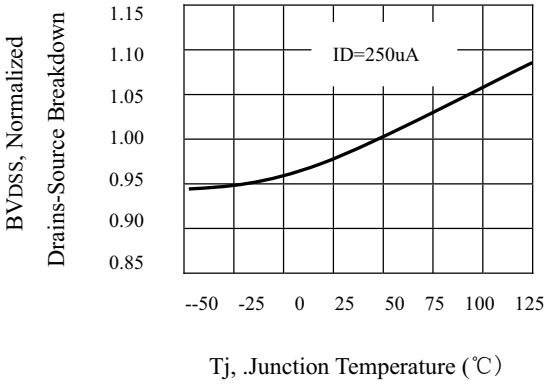


Figure6.Breakdown Voltage Variation With Temperature

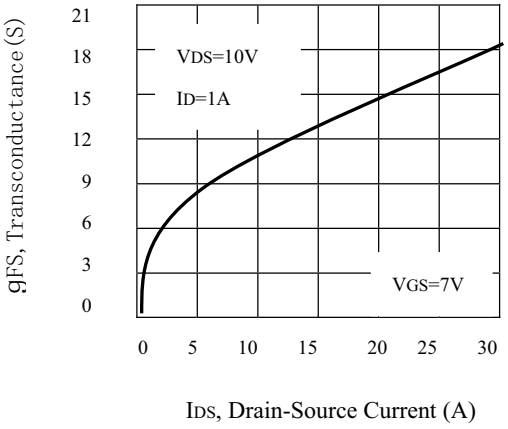


Figure7.Transconductance Variation With Drain Current

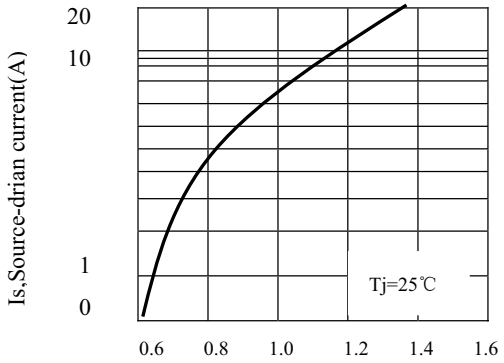


Figure8.Body Diode Forward Voltage Variation with Source Current

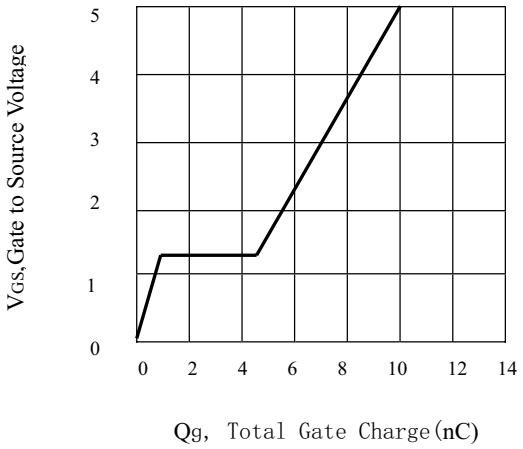


Figure9. Gate Charge

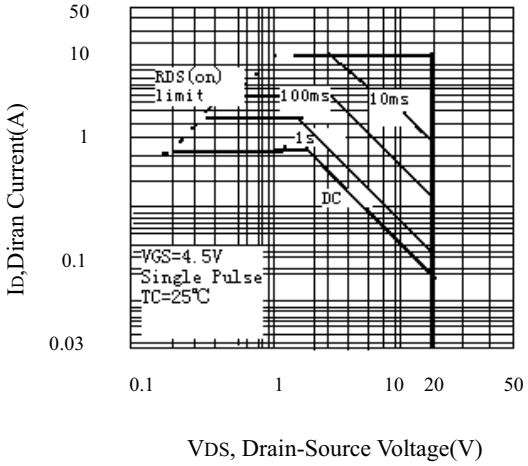
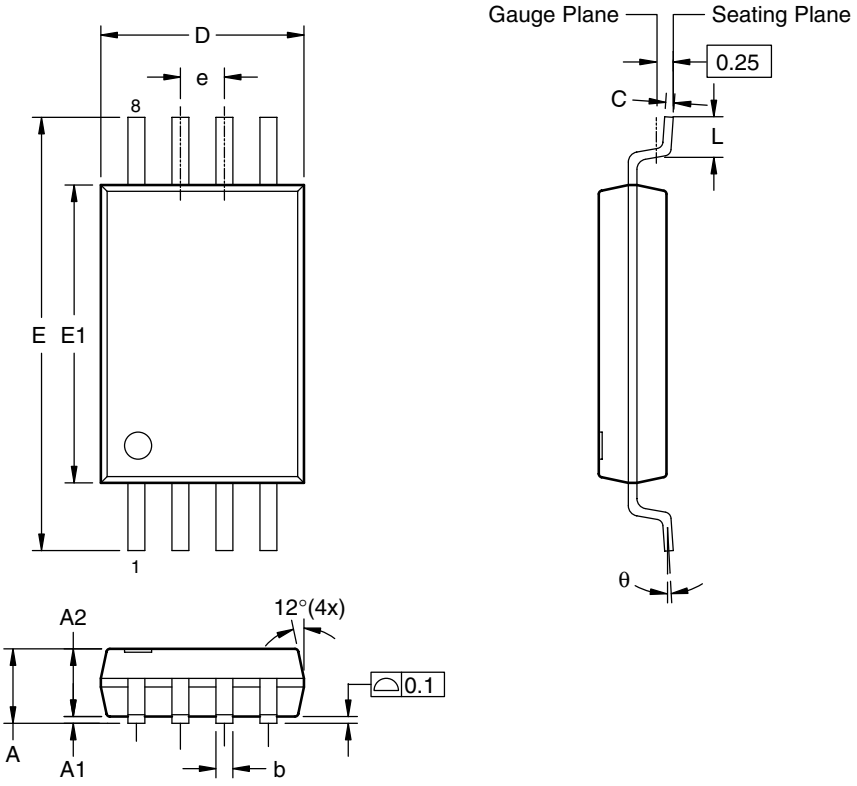
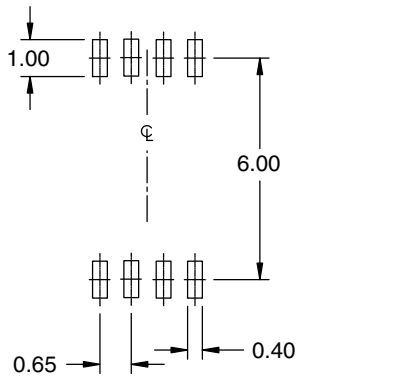


Figure10.Maximum Safe Operating Area

TSSOP-8 Package Dimensions



RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.20
A1	0.05	—	0.15
A2	0.80	1.00	1.05
b	0.19	—	0.30
C	0.09	—	0.20
D	2.90	3.00	3.10
E	6.40 BSC		
E1	4.30	4.40	4.50
e	0.65 BSC		
L	0.45	0.60	0.75
θ	0°	—	8°

Dimensions in inches

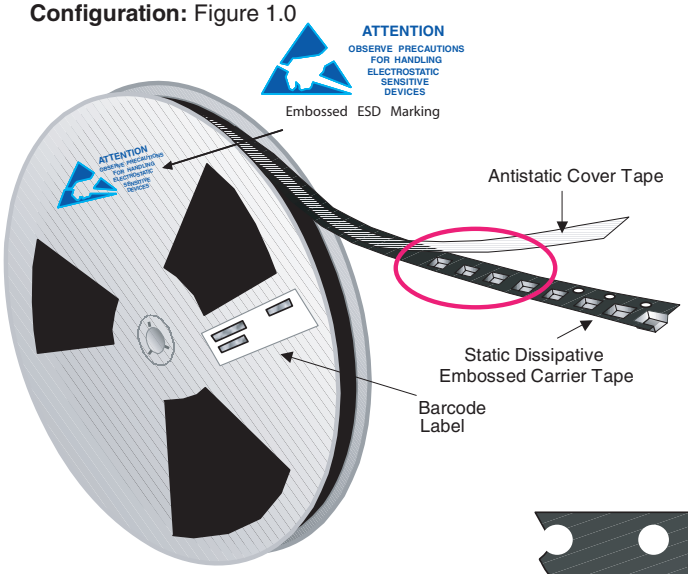
Symbols	Min.	Nom.	Max.
A	—	—	0.047
A1	0.002	—	0.006
A2	0.031	0.039	0.041
b	0.007	—	0.012
C	0.004	—	0.008
D	0.114	0.118	0.122
E	0.252 BSC		
E1	0.169	0.173	0.177
e	0.026 BSC		
L	0.018	0.024	0.030
θ	0°	—	8°

Notes:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.
6. Refer to JEDEC MO-153(AA).

TSSOP-(8 lds) Tape and Reel Data

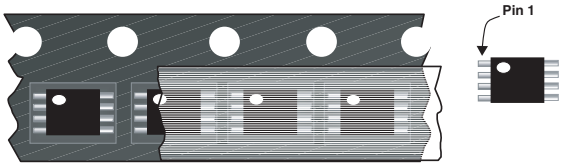
TSSOP-(8 lds) Packaging Configuration: Figure 1.0



Packaging Description:

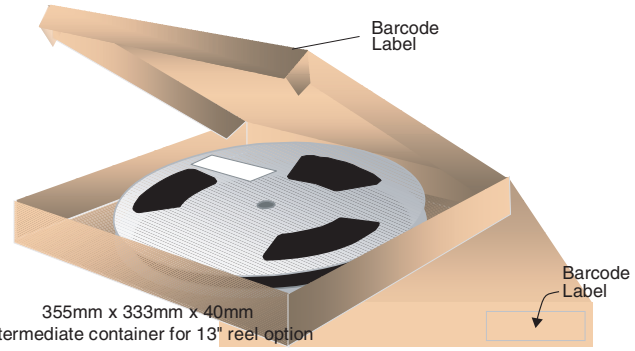
TSSOP-(8 lds) parts are shipped in normally tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 330mm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). This and the other packing option are 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. These boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.

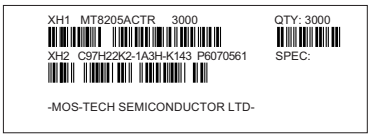


TSSOP-(8 lds) Unit Orientation

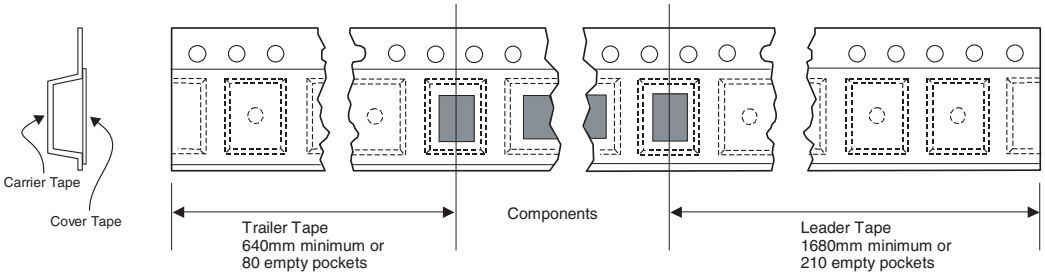
TSSOP-(8 lds) Packaging Information		
Packaging Option	Standard (no flow code)	F064
Packaging type	TNR	TNR
Qty per Reel/Tube/Bag	2,500	2,500
Reel Size	13" Dia	13" Dia
Box Dimensi on (mm)	355x333X40	355x333X40
Max qty per Box	5,000	5,000
Weight per unit (gm)	0.020	0.020
Weight per Reel (kg)	0.426	0.426
Carrier Tape Width	12mm	16mm
Note/Comments	-	-



Barcode Label sample



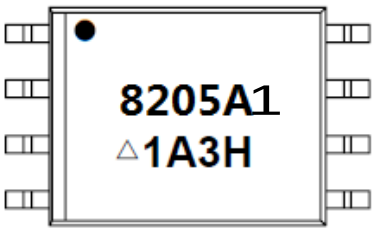
TSSOP-(8 lds) Tape Leader and Trailer Configuration: Figure 2.0



Part Marking Information

TSSOP-8 (PMG Code)

TSSOP-8 Devices



8205A1= Example Base Part Number
- ● = Pin 1 Indicator
- △ = ESD Symbol
- 1 = Year Code
- A = Month Code
- 3 = Week Code
- H = Assembly Factory Code

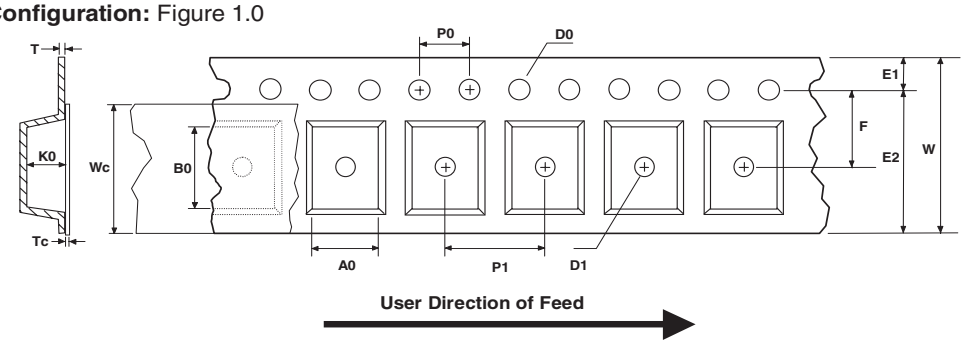
NOTE:

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.

TSSOP-(8 lds) Tape and Reel Data, continued

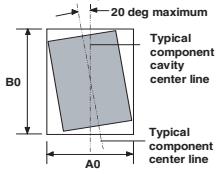
TSSOP-(8 lds) Embossed Carrier Tape
Configuration: Figure 1.0



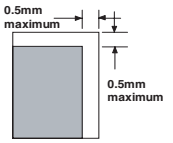
Dimensions are in millimeter														
Pkg type	**A0**	**B0**	**W**	**D0**	**D1**	**E1**	**E2**	**F**	**P1**	**P0**	**K0**	**T**	**Wc**	**Tc**
TSSOP-(8 lds) (12mm)	6.80 +/-0.10	3.40 +/-0.10	12.0 +/-0.3	1.55 +/-0.05	1.50 min	1.75 +/-0.10	10.25 min	5.50 +/-0.05	8.0 +/-0.1	4.0 +/-0.1	1.60 +/-0.10	0.30 +/-0.05	9.2 +/-0.3	0.06 +/-0.02
TSSOP-(8 lds) (16mm)	6.80 +/-0.10	3.40 +/-0.10	16 0 +/-0.3	1.55 +/-0.05	1.50 min	1.75 +/-0.10	14.25 min	7.50 +/-0.05	8.0 +/-0.1	4.0 +/-0.1	1.60 +/-0.10	0.30 +/-0.05	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

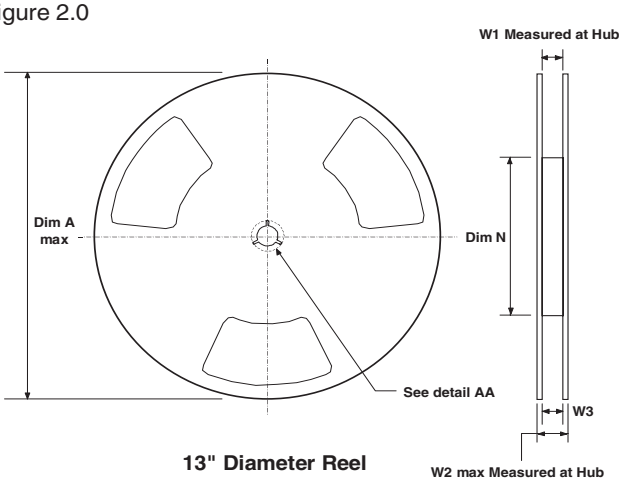


Sketch B (Top View)
Component Rotation



Sketch C (Top View)
Component lateral movement

TSSOP-(8 lds) Reel Configuration:
Figure 2.0



13" Diameter Reel

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	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
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

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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.