

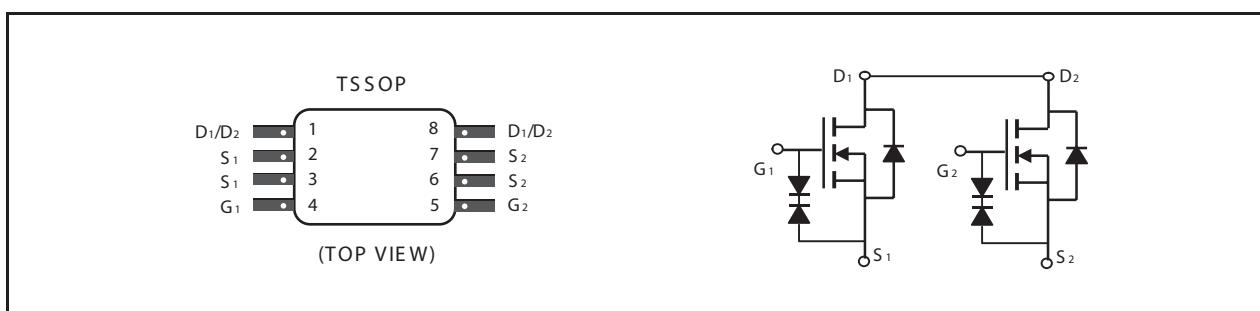


## Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V <sub>DS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
20V	7A	20 @ V <sub>GS</sub> =4.5V
		28 @ V <sub>GS</sub> =2.5V

## FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.

ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>A</sub> =25°C	7
		T <sub>A</sub> =70°C	5.6
I <sub>DM</sub>	-Pulsed <sup>b</sup>	28	A
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> =25°C	1.5
		T <sub>A</sub> =70°C	1
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150	°C

## THERMAL CHARACTERISTICS

R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient <sup>a</sup>	85	°C/W
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## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±12V, V <sub>DS</sub> =0V			±10	uA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5	0.85	1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =7A		16.5	20	m ohm
		V <sub>GS</sub> =4V, I <sub>D</sub> =6.8A		17	21	m ohm
		V <sub>GS</sub> =3V, I <sub>D</sub> =6.3A		20	25	m ohm
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =6A		23	28	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =7A		12		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V f=1.0MHz		815		pF
C <sub>OSS</sub>	Output Capacitance			215		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			180		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =10V I <sub>D</sub> =1A V <sub>GS</sub> =4.5V R <sub>GEN</sub> =10 ohm		28		ns
t <sub>r</sub>	Rise Time			83		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			63		ns
t <sub>f</sub>	Fall Time			41		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =7A, V <sub>GS</sub> =4.5V		11.5		nC
Q <sub>gs</sub>	Gate-Source Charge			2.4		nC
Q <sub>gd</sub>	Gate-Drain Charge			5		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				2.0	A
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =2.0A		0.79	1.2	V
<b>Notes</b> 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.						

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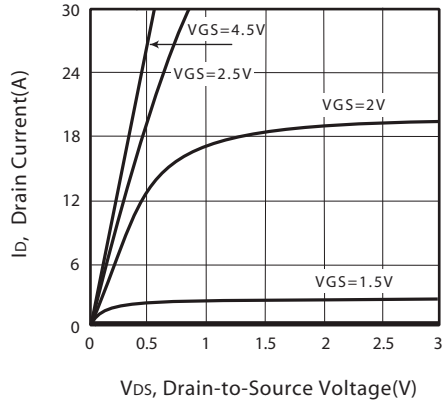


Figure 1. Output Characteristics

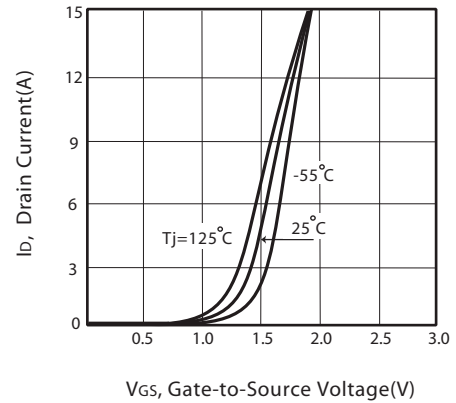


Figure 2. Transfer Characteristics

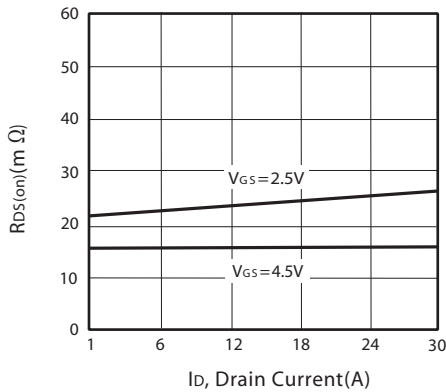


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

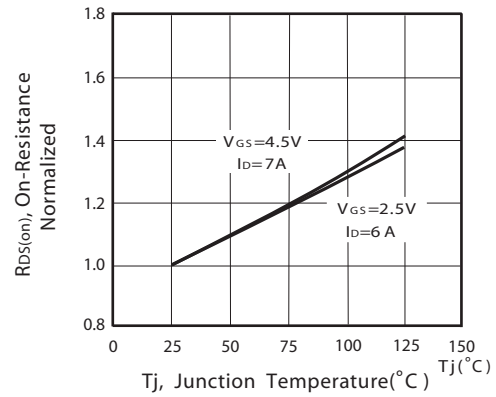


Figure 4. On-Resistance Variation with Drain Current and Temperature

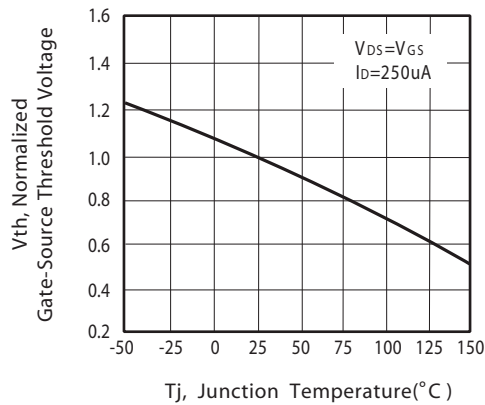


Figure 5. Gate Threshold Variation with Temperature

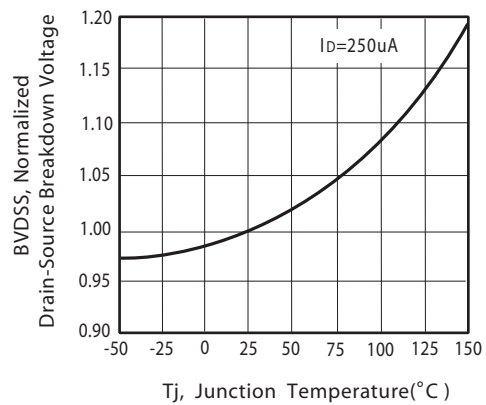


Figure 6. Breakdown Voltage Variation with Temperature

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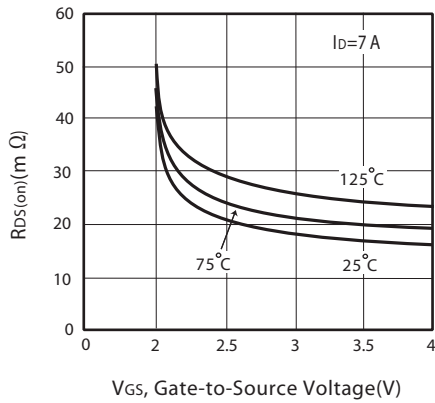


Figure 7. On-Resistance vs. Gate-Source Voltage

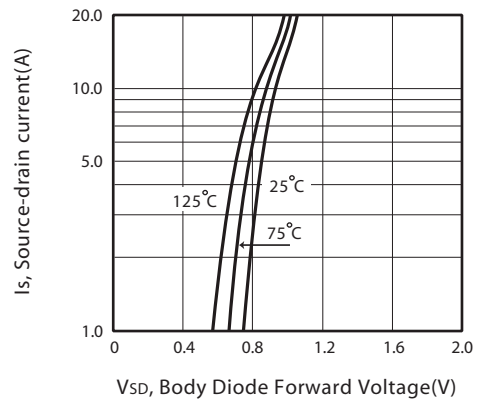


Figure 8. Body Diode Forward Voltage Variation with Source Current

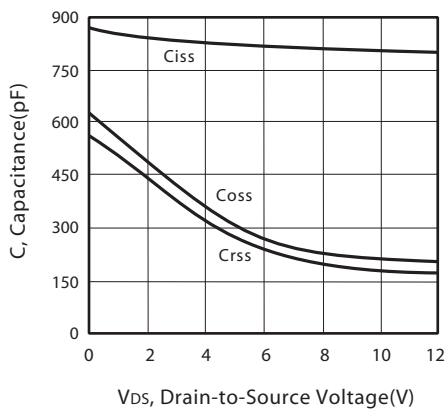


Figure 9. Capacitance

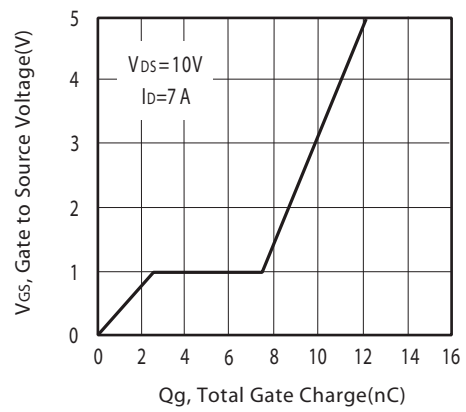


Figure 10. Gate Charge

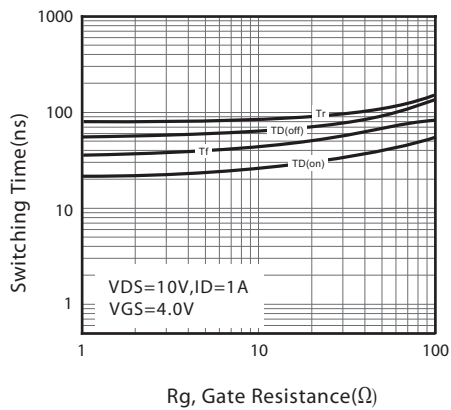


Figure 11. switching characteristics

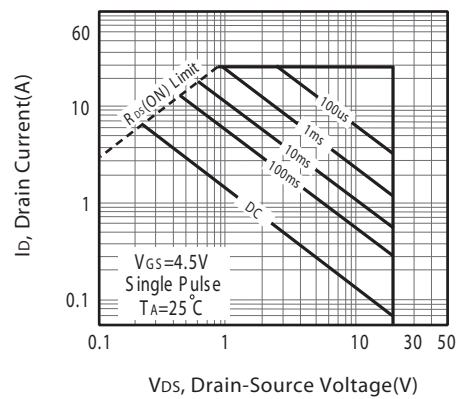


Figure 12. Maximum Safe Operating Area

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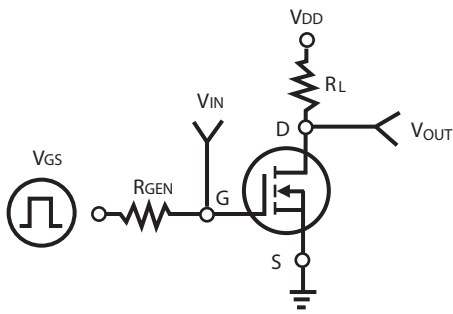


Figure 13. Switching Test Circuit

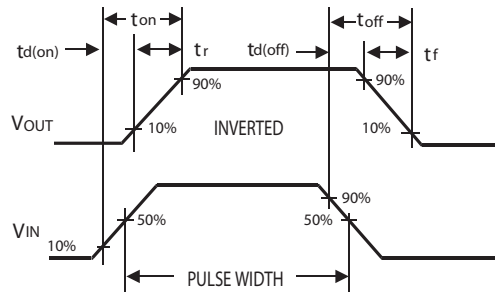
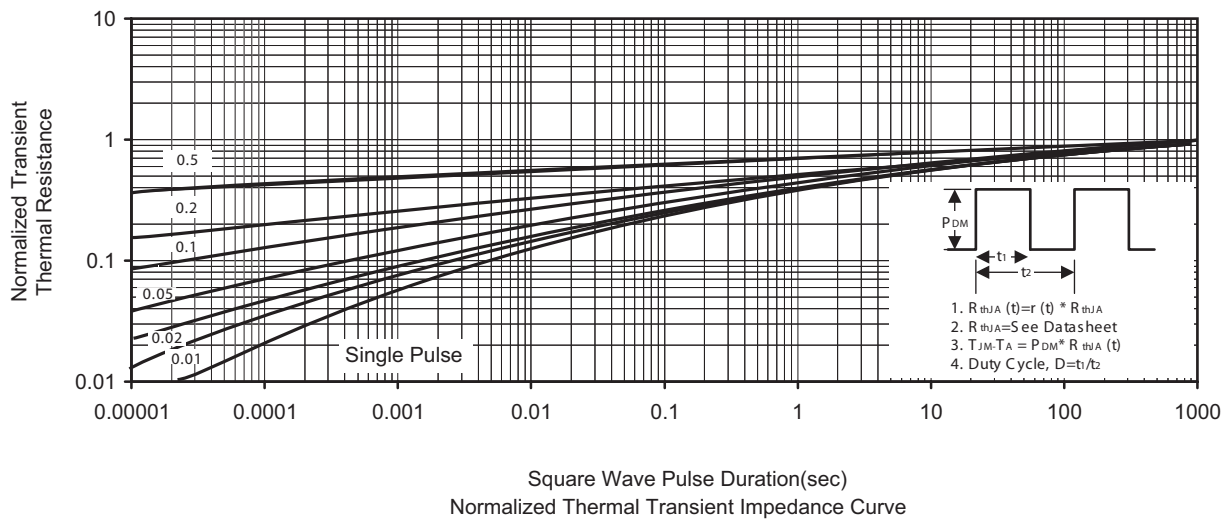


Figure 14. Switching Waveforms

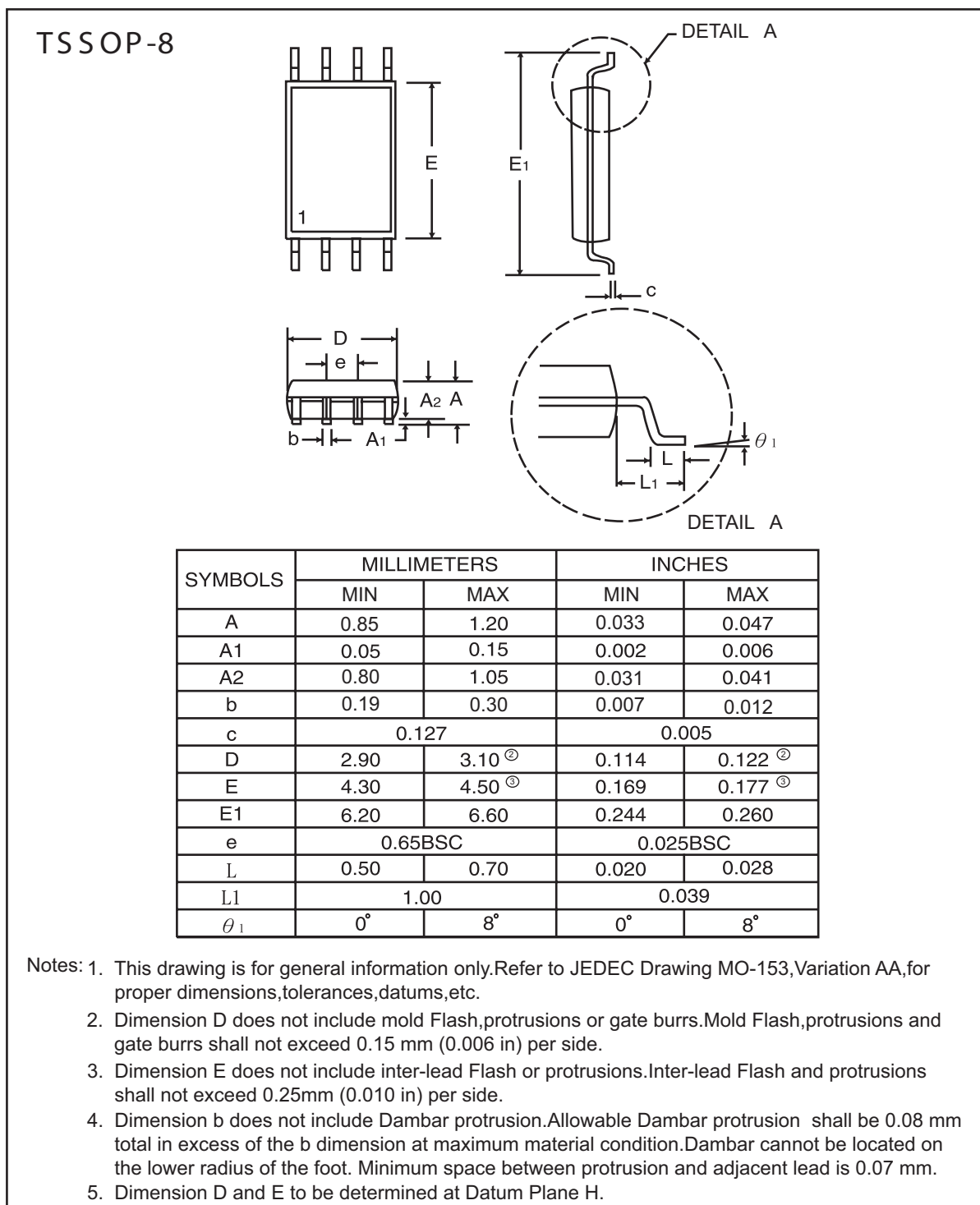


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## PACKAGE OUTLINE DIMENSIONS



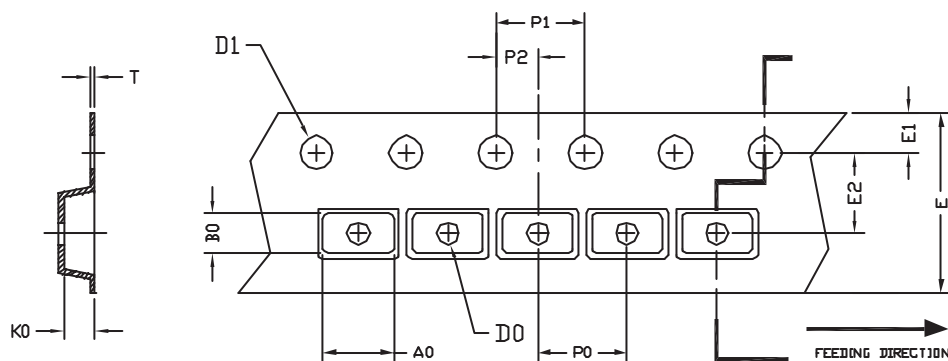
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## TSSOP-8 Tape and Reel Data

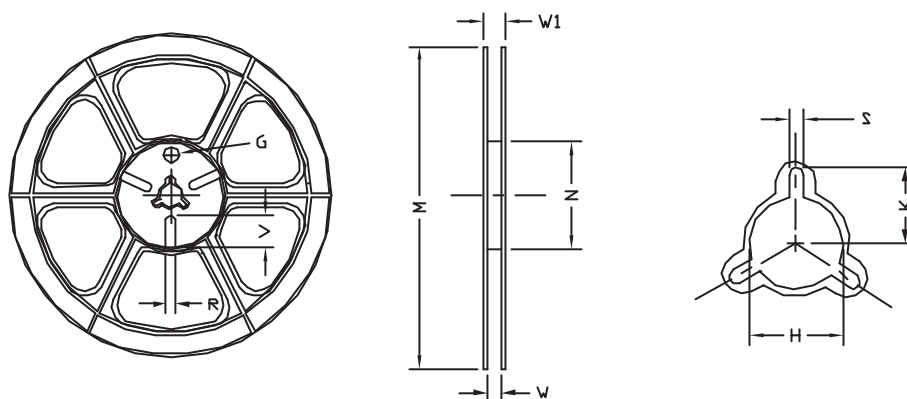
### TSSOP-8 Carrier Tape



UNIT : mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TSSOP 8	6.08	4.40	1.60	$\phi 1.50$ + 0.1 - 0.0	$\phi 1.50$ + 0.1 - 0.0	12.00 $\pm 0.3$	1.75	5.50 $\pm 0.05$	8.00	4.00	2.00 $\pm 0.05$	0.30 $\pm 0.05$

### TSSOP-8 Reel



UNIT : mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	$\phi 330$	330	100	12.5	16.0	$\phi 13.0$ + 0.5 - 0.2	10.6	2.0 $\pm 0.5$	---	---	---

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