



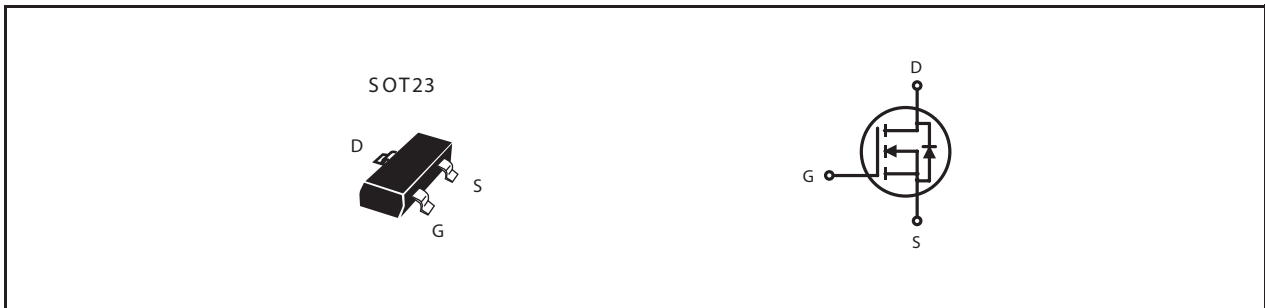
## N-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

VDSS	ID	RDS(ON) (mΩ) Max
60V	3A	83 @ VGS= 10V
		107 @ VGS= 4.5V

### FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- Surface Mount Package.



### ABSOLUTE MAXIMUM RATINGS (TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units	
V <sub>DS</sub>	Drain-Source Voltage	60	V	
V <sub>GS</sub>	Gate-Source Voltage	±20	V	
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>C</sub> =25°C	3	A
		T <sub>C</sub> =70°C	2.4	A
I <sub>DM</sub>	-Pulsed <sup>b</sup>	11.4	A	
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>d</sup>	23	mJ	
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	T <sub>C</sub> =25°C	1.25	W
		T <sub>C</sub> =70°C	0.8	W
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>	100	°C/W
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# STS6308

Ver 1.0

## 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> =250μA	60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =48V , V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.8	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =3A		66	83	m ohm
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =2.6A		79	107	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =3A		7.5		S
<b>DYNAMIC CHARACTERISTICS °</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1.0MHz		950		pF
C <sub>OSS</sub>	Output Capacitance			52		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			40		pF
<b>SWITCHING CHARACTERISTICS °</b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V I <sub>D</sub> =1A		15.7		ns
t <sub>r</sub>	Rise Time			12		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time	V <sub>GS</sub> =10V R <sub>GEN</sub> = 6 ohm		21		ns
t <sub>f</sub>	Fall Time			18.5		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =3A, V <sub>GS</sub> =10V		15		nC
		V <sub>DS</sub> =30V, I <sub>D</sub> =3A, V <sub>GS</sub> =4.5V		7		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =3A, V <sub>GS</sub> =10V		1.8		nC
Q <sub>gd</sub>	Gate-Drain Charge			3.5		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> = 1A		0.795	1.2	V

### Notes

- Surface Mounted on FR4 Board, t ≤ 10sec.
- Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Starting T<sub>J</sub>=25°C, L=0.5mH, V<sub>DD</sub> = 30V. (See Figure 13)

Jul, 15, 2010

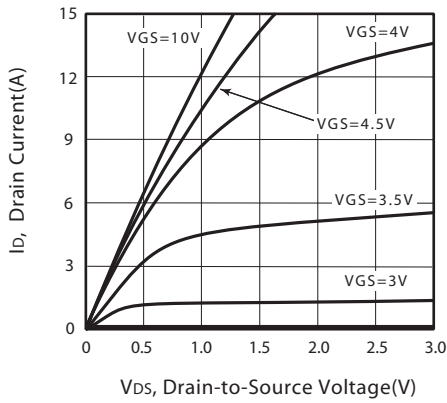


Figure 1. Output Characteristics

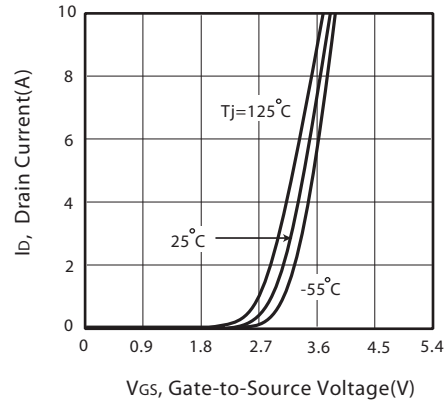


Figure 2. Transfer Characteristics

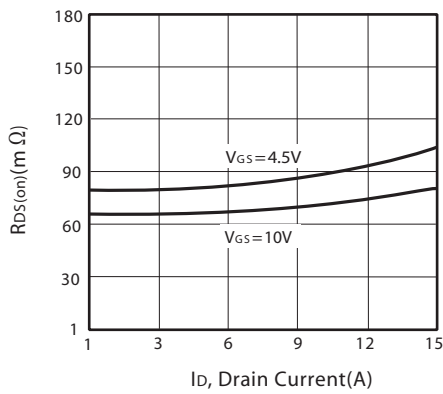


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

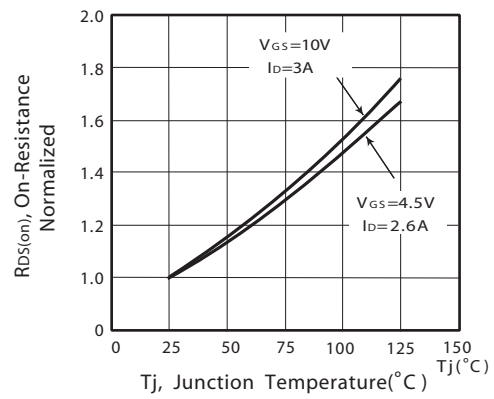


Figure 4. On-Resistance Variation with Drain Current and Temperature

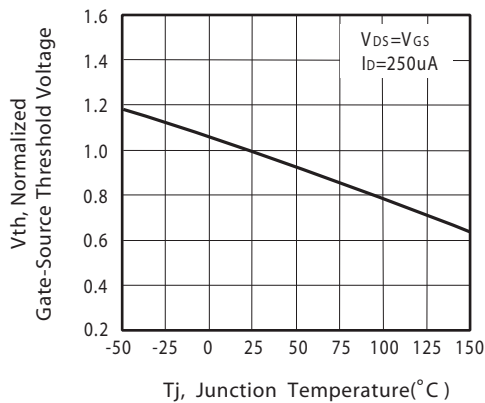


Figure 5. Gate Threshold Variation with Temperature

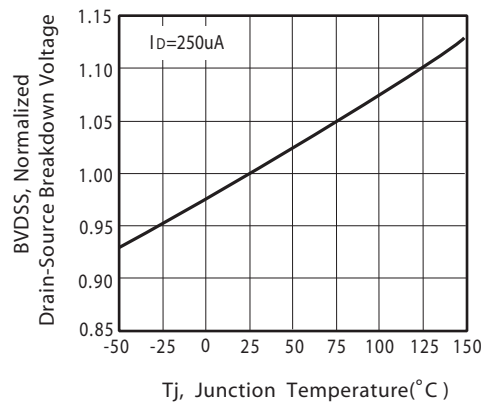


Figure 6. Breakdown Voltage Variation with Temperature

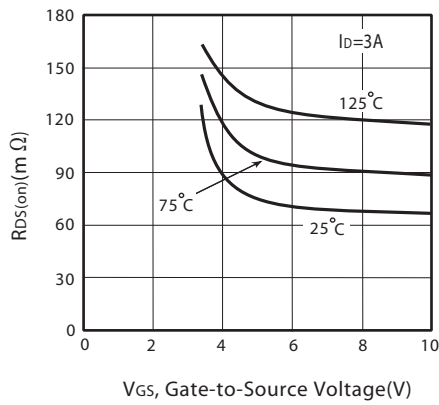


Figure 7. On-Resistance vs. Gate-Source Voltage

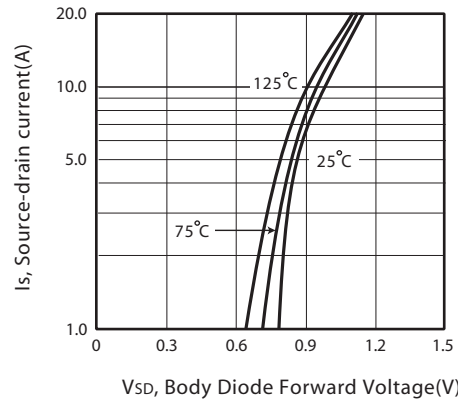


Figure 8. Body Diode Forward Voltage Variation with Source Current

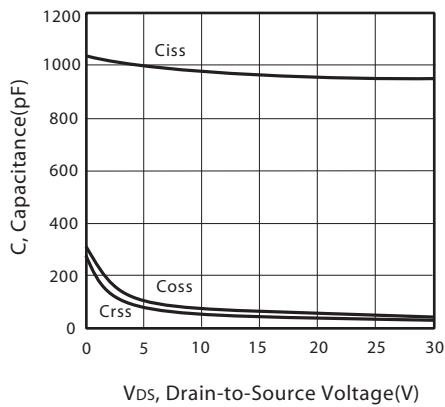


Figure 9. Capacitance

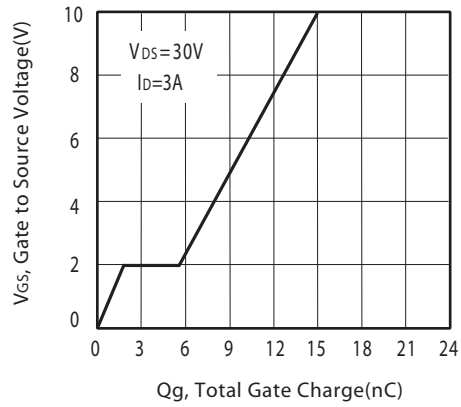


Figure 10. Gate Charge

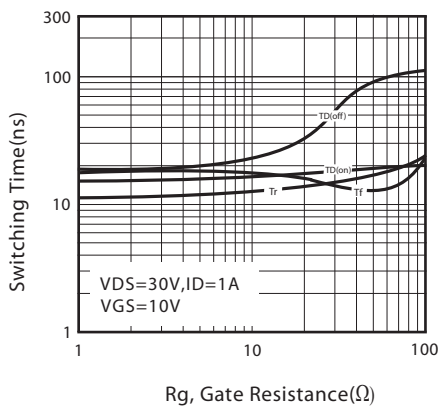


Figure 11. switching characteristics

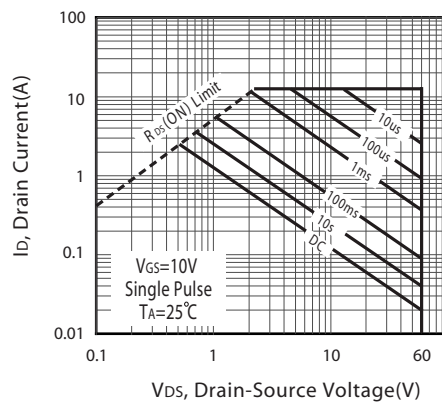
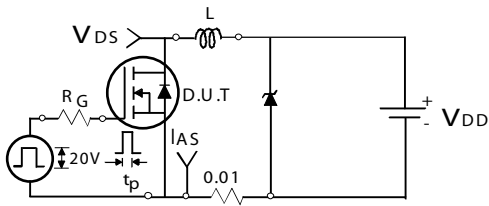
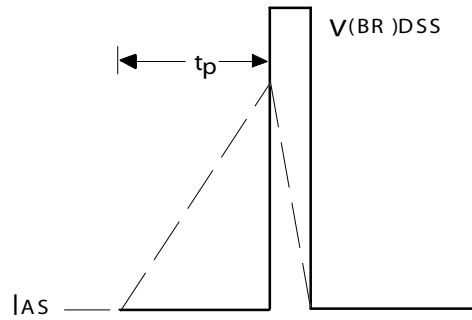


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

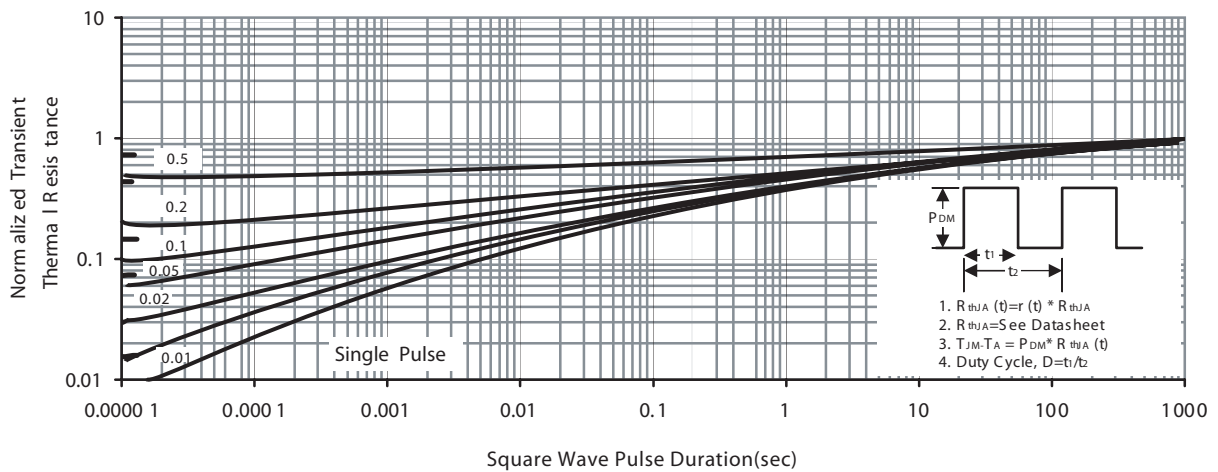
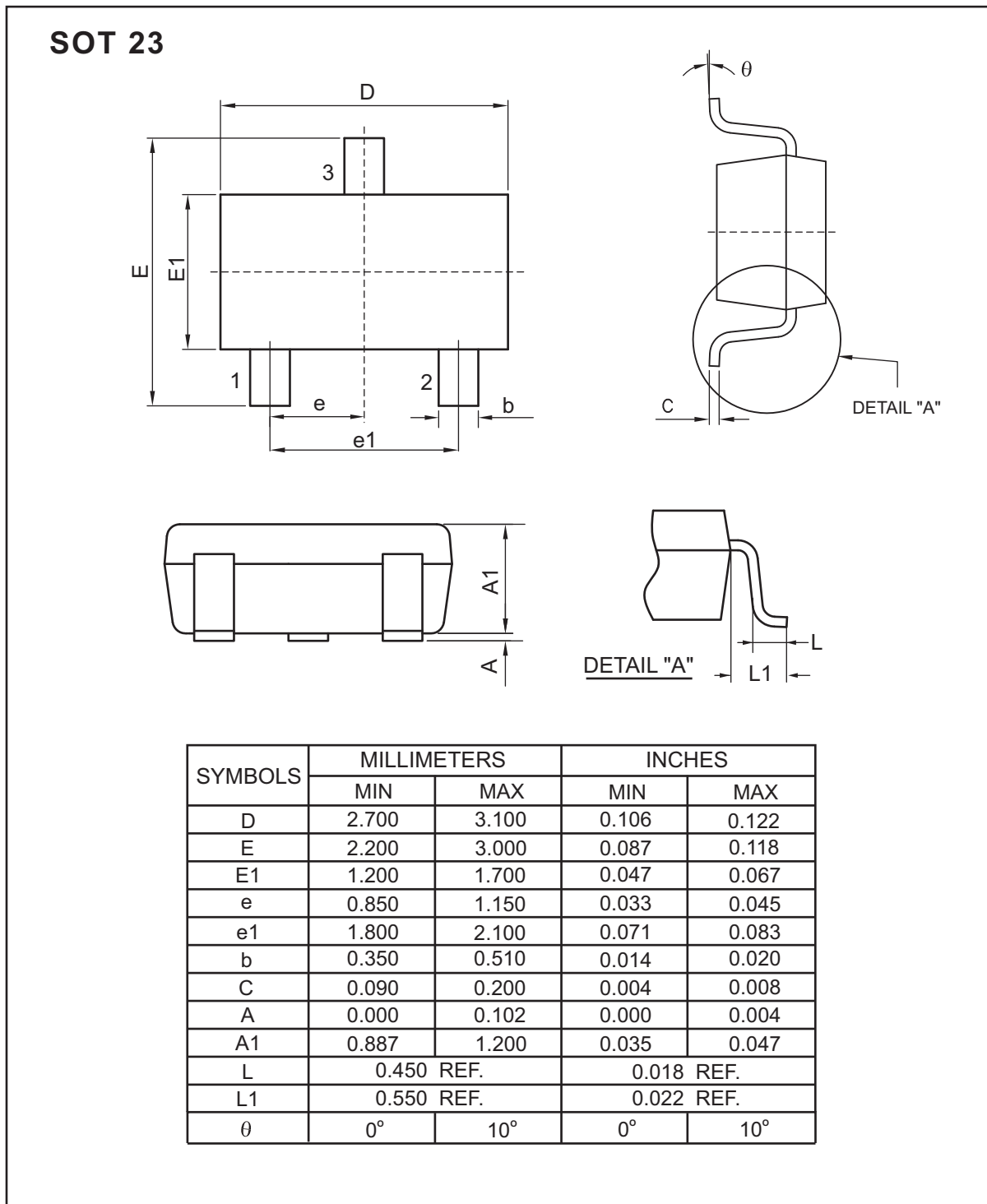


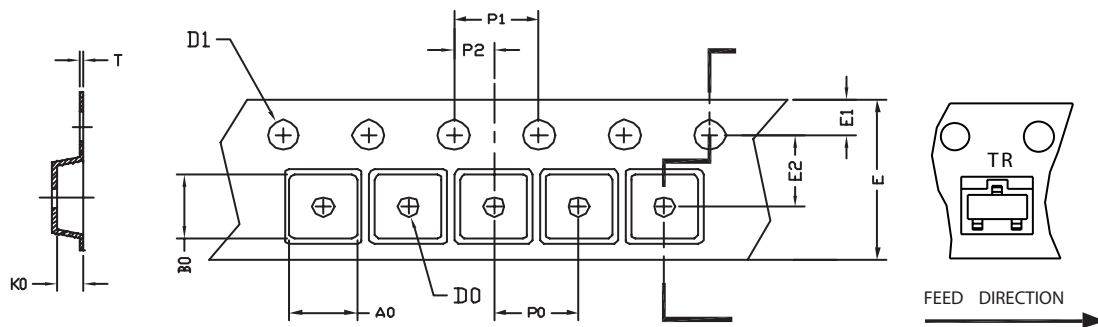
Figure 14. Normalized Thermal Transient Impedance Curve

## PACKAGE OUTLINE DIMENSIONS



## SOT-23 Tape and Reel Data

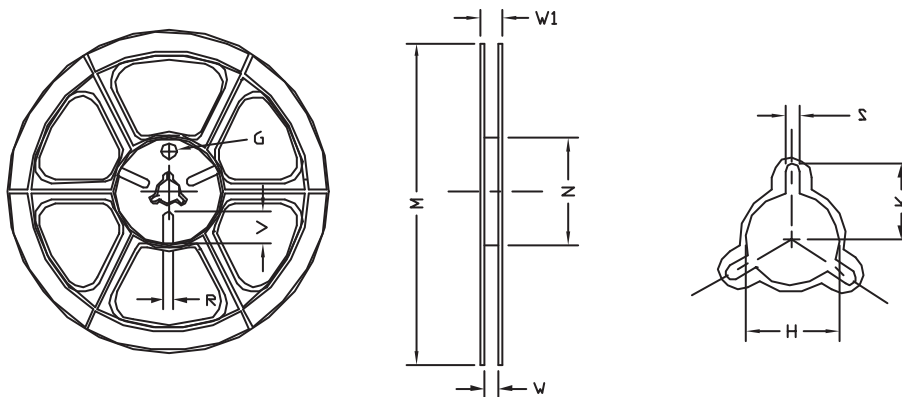
### SOT-23 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT-23	3.20 ±0.10	3.00 ±0.10	1.33 ±0.10	1.00 ±0.25	1.50 ±0.10	8.00 +0.30 -0.10	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.20 ±0.02

### SOT-23 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8mm	178	178 ±1	60 ±1	9.00 ±0.5	12.00 ±0.5	13.5 ±0.5	10.5	2.00 ±0.5	10.0	5.00	18.00