



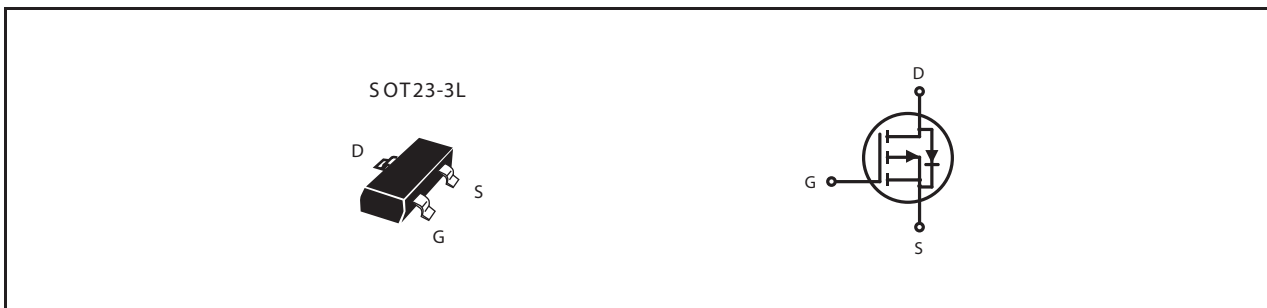
## P-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
-20V	-3.3A	70 @ V <sub>GS</sub> =-4.5V
		100 @ 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.



### ABSOLUTE MAXIMUM RATINGS (T<sub>C</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	±10	V	
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>C</sub> =25°C	-3.3	A
		T <sub>C</sub> =70°C	-2.6	A
I <sub>DM</sub>	-Pulsed <sup>b</sup>	-12.5	A	
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

Symbol	Parameter	Limit	Units
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient <sup>a</sup>	100	°C/W

# STS2305A

Ver 1.1

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=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> = ±10V, 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> =-250uA	-0.5	-0.8	-1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.3A		55	70	m ohm
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.8A		80	100	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-3.3A		11		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		380		pF
C <sub>OSS</sub>	Output Capacitance			196		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			175		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		28		ns
t <sub>r</sub>	Rise Time			98		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time	V <sub>GS</sub> =-4.5V R <sub>GEN</sub> = 6 ohm		157		ns
t <sub>f</sub>	Fall Time			132		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.3A, V <sub>GS</sub> =-4.5V		7		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.3A, V <sub>GS</sub> =-4.5V		0.6		nC
Q <sub>gd</sub>	Gate-Drain Charge			3.5		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				-1	A
V <sub>SD</sub>	Diode Forward Voltage <sup>b</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> = -1A		-0.8	-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.

Jun,02,2010

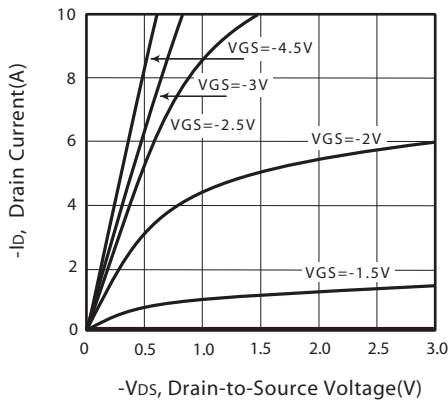


Figure 1. Output Characteristics

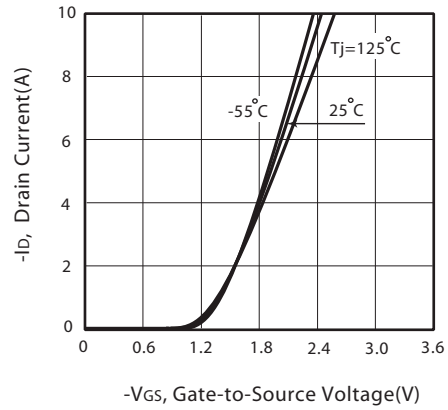


Figure 2. Transfer Characteristics

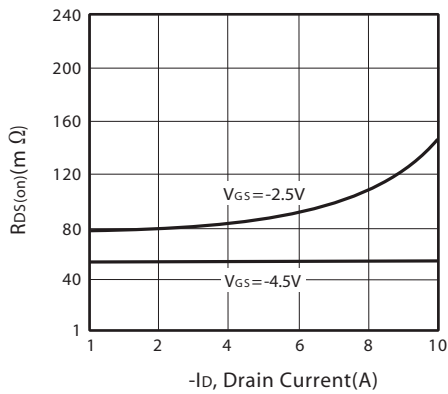


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

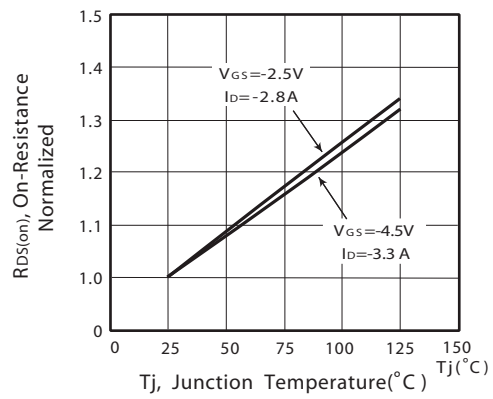


Figure 4. On-Resistance Variation with Drain Current and Temperature

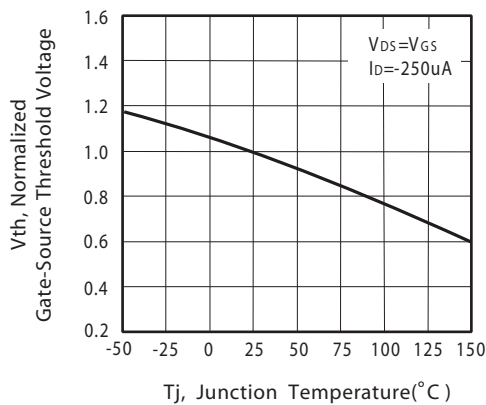


Figure 5. Gate Threshold Variation with Temperature

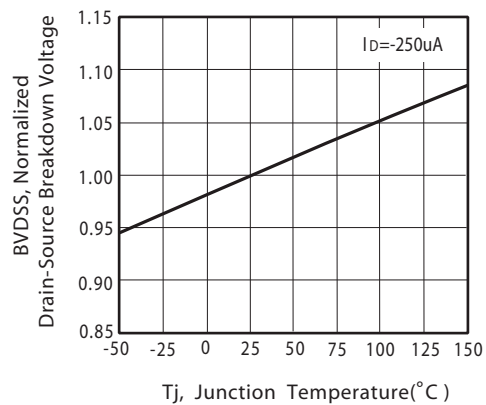


Figure 6. Breakdown Voltage Variation with Temperature

# STS2305A

Ver 1.1

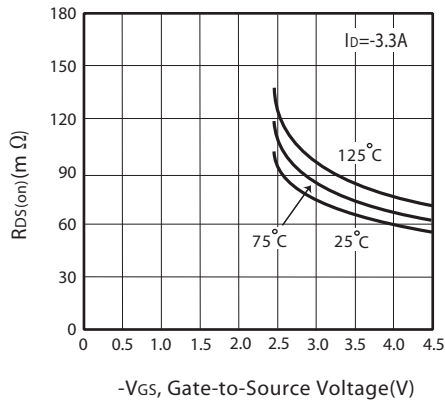


Figure 7. On-Resistance vs. Gate-Source Voltage

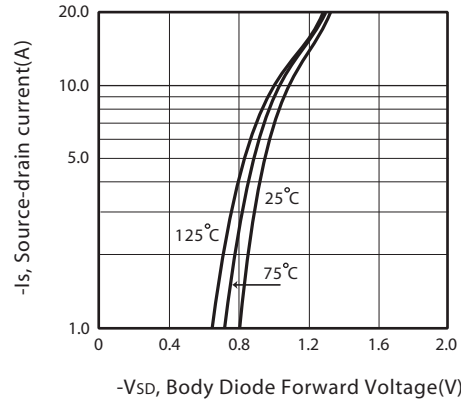


Figure 8. Body Diode Forward Voltage Variation with Source Current

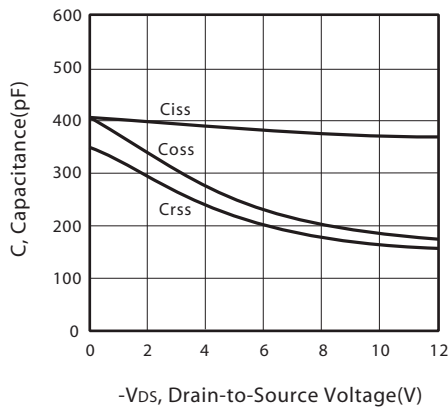


Figure 9. Capacitance

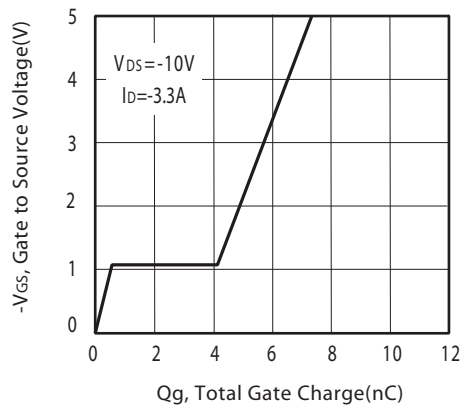


Figure 10. Gate Charge

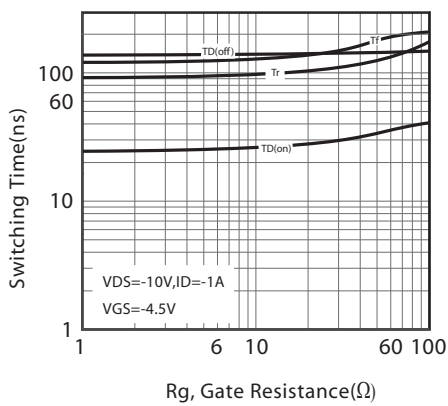


Figure 11. switching characteristics

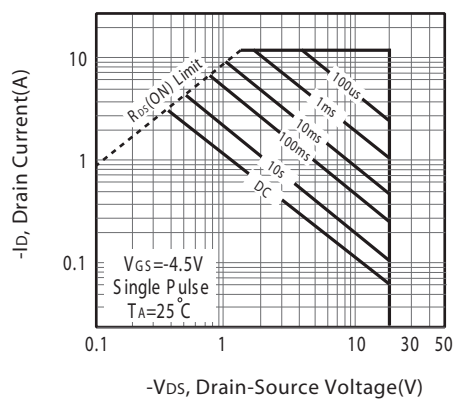


Figure 12. Maximum Safe Operating Area

Jun,02,2010

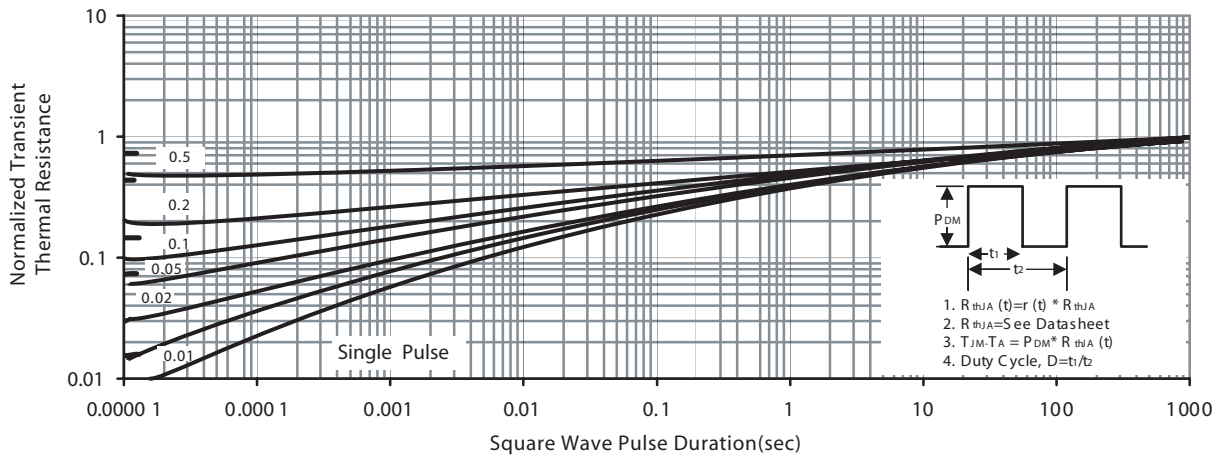


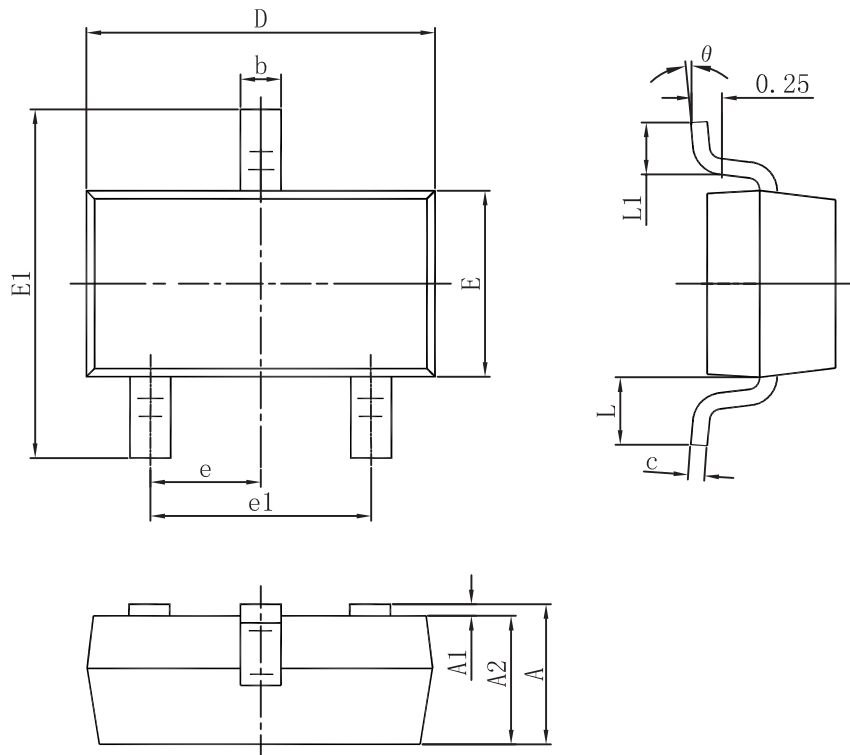
Figure 13. Normalized Thermal Transient Impedance Curve

# STS2305A

Ver 1.1

## PACKAGE OUTLINE DIMENSIONS

### SOT23-3L

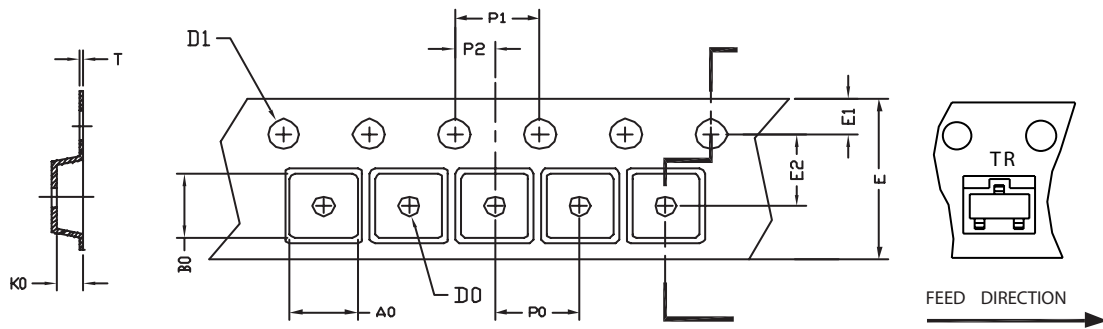


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
	0°	8°	0°	8°

Jun,02,2010

## SOT23-3L Tape and Reel Data

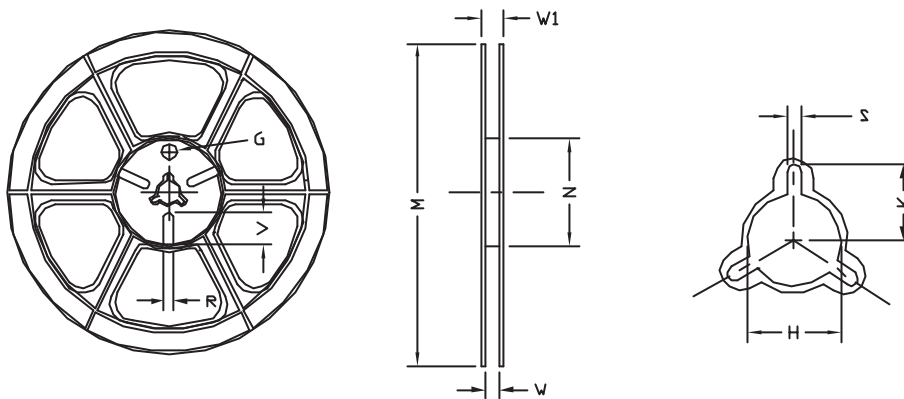
### SOT23-3L Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT23-3L	3.15 $\pm 0.10$	2.77 $\pm 0.10$	1.22 $\pm 0.10$	$\phi 1.00$ $+0.05$	$\phi 1.50$ $+0.10$	8.00 $+0.30$ $-0.10$	1.75 $\pm 0.10$	3.50 $\pm 0.05$	4.00 $\pm 0.10$	4.00 $\pm 0.10$	2.00 $\pm 0.05$	0.22 $\pm 0.04$

### SOT23-3L Reel



UNIT:mm

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