SamHop Microelectronics Corp.

STS2300S

Sep. 8 2005

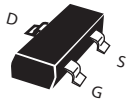
N-Channel Enhancement Mode Field Effect Transistor

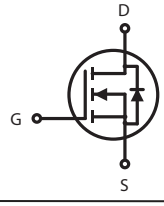
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
20V	6A	35 @ V_{GS} = 4.5V 45 @ V_{GS} = 2.5V

FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- SOT-23 package.

SOT-23





ABSOLUTE MAXIMUM RATING (T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous @ T_J=25℃	I_D	6	A
-Pulsed[b]	I_{DM}	20	A
Drain-Source Diode Forward Current	I_S	1.25	A
Maximum Power Dissipation[a]	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient[a]	R_{thJA}	100	°C/W

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[C]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=± 10V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.5	0.8	1.3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4A		30	35	m-ohm
		V_{GS}=2.5V, I_D=2A		38	45	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=4.5V	6			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=4A		18.1		S
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V f=1.0MHz		803		pF
Output Capacitance	C_{OSS}			120		pF
Reverse Transfer Capacitance	C_{RSS}			85		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_{GEN}=6 ohm		15		ns
Rise Time	t_r			18		ns
Turn-Off Delay Time	$t_{D(OFF)}$			78		ns
Fall Time	t_f			27		ns
Total Gate Charge	Q_g	V_{DS}=10V, I_D=4A, V_{GS}=4.5V		8.8		nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			3.9		nC

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is = 1.25A		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.

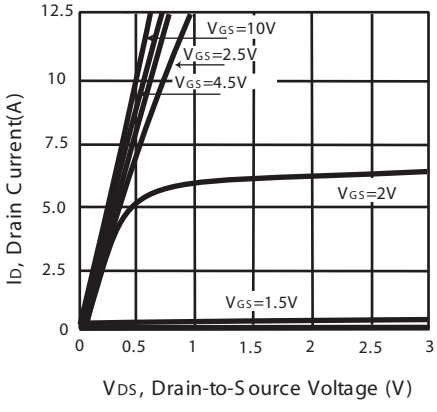


Figure 1. Output Characteristics

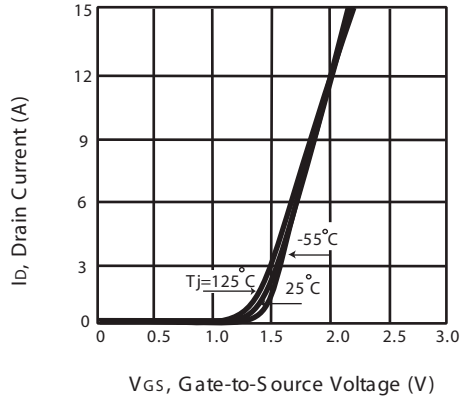


Figure 2. Transfer Characteristics

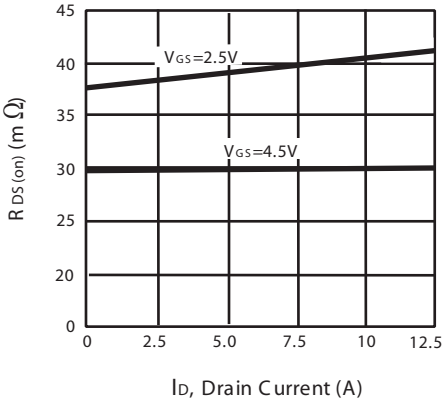


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

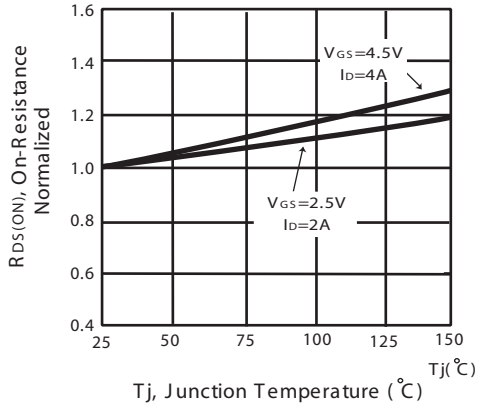


Figure 4. On-Resistance Variation with Drain Current and Temperature

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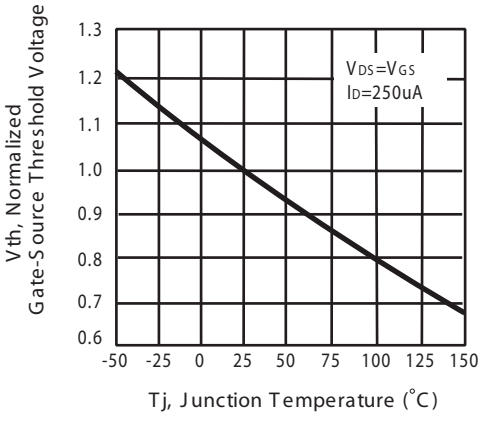


Figure 5. Gate Threshold Variation with Temperature

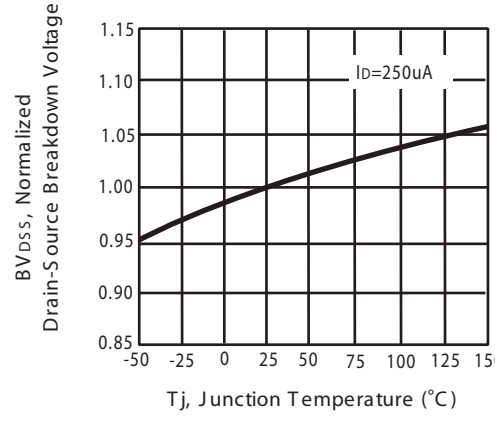


Figure 6. Breakdown Voltage Variation with Temperature

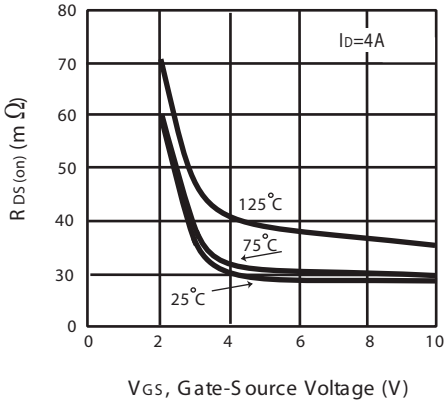


Figure 7. On-Resistance vs. Gate-Source Voltage

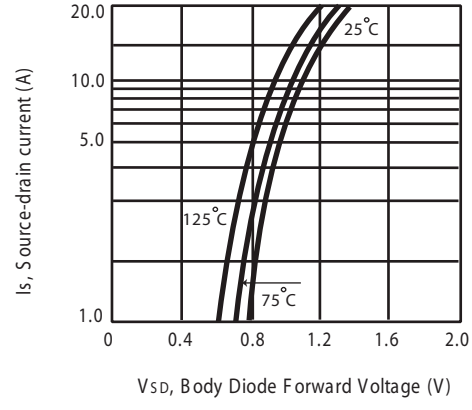


Figure 8. Body Diode Forward Voltage Variation with Source Current

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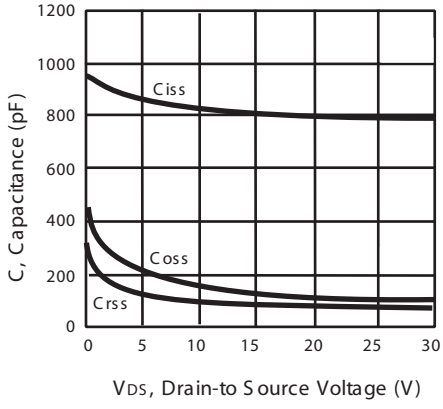


Figure 9. Capacitance

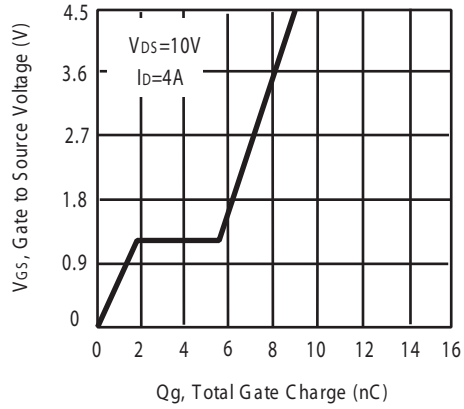


Figure 10. Gate Charge

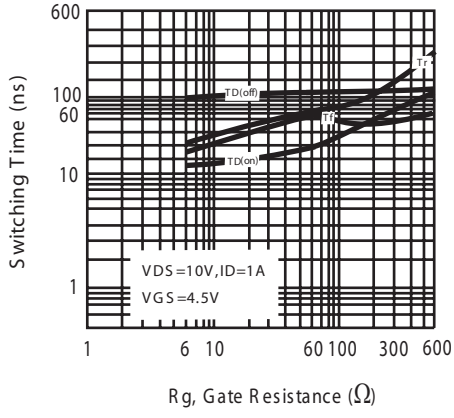
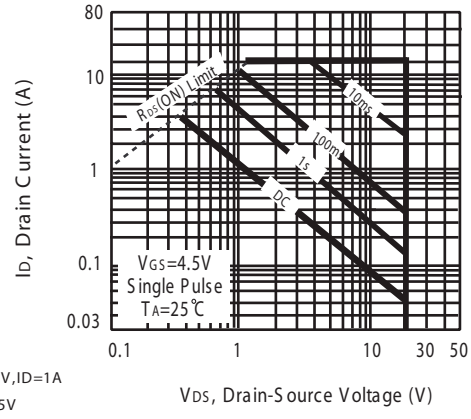


Figure 11.switching characteristics



VDS=10V,ID=1A
VGS=4.5V

Figure 12. Maximum Safe Operating Area

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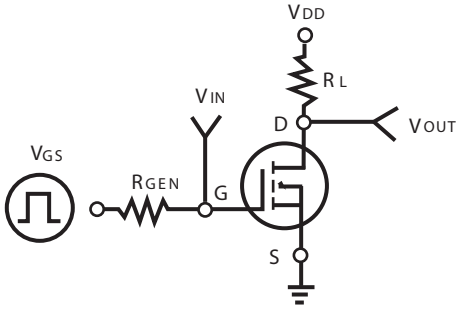


Figure 11. Switching Test Circuit

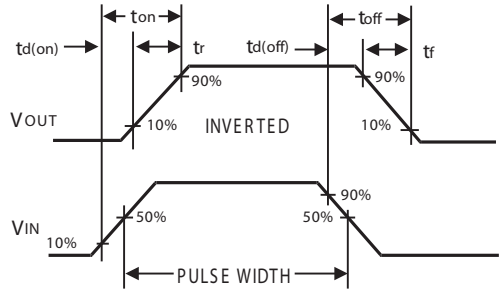
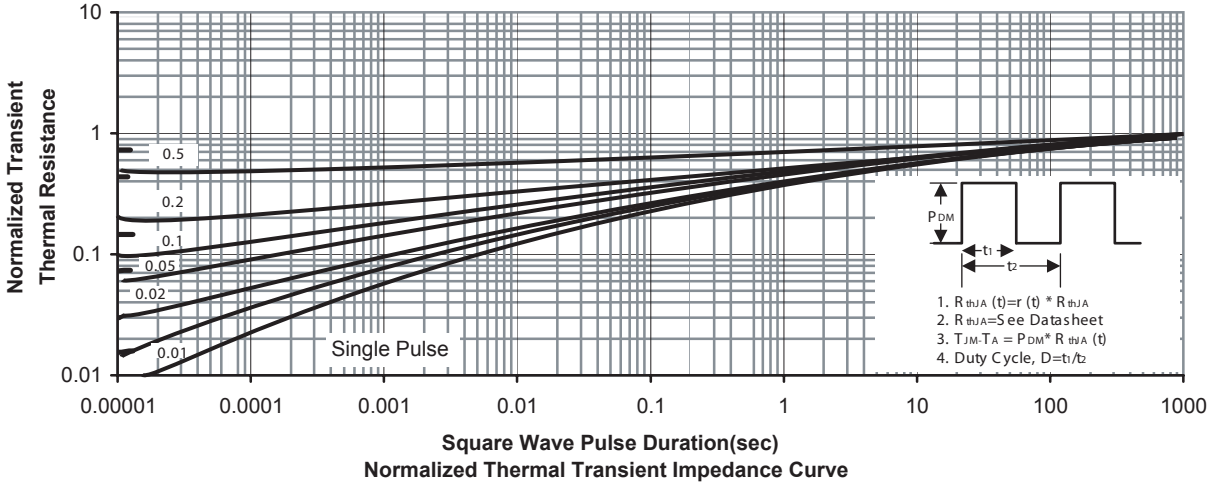


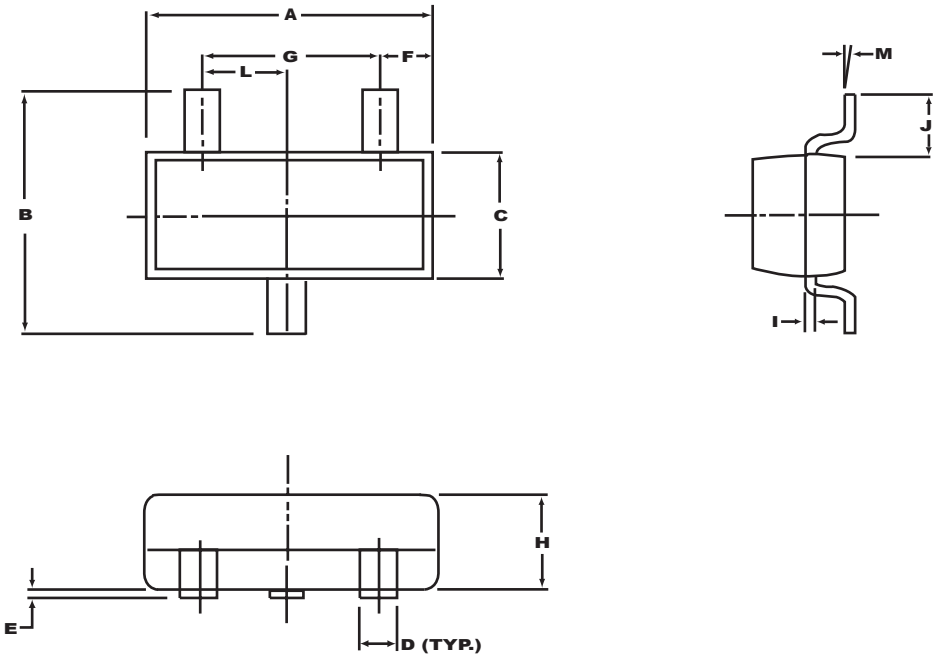
Figure 12. Switching Waveforms



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PACKAGE OUTLINE DIMENSIONS

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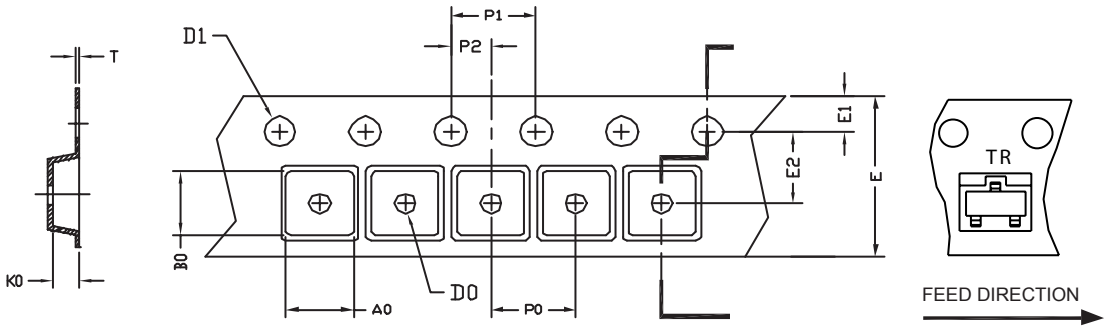


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.70	3.10	0.106	0.122
B	2.40	2.80	0.094	0.110
C	1.40	1.60	0.055	0.063
D	0.35	0.50	0.014	0.020
E	0	0.10	0	0.004
F	0.45	0.55	0.018	0.022
G	1.90 REF.		0.075 REF.	
H	1.00	1.30	0.039	0.051
I	0.10	0.20	0.004	0.008
J	0.40	-	0.016	-
L	0.45	1.15	0.033	0.045
M	0°	10°	0°	10°

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SOT-23 Tape and Reel Data

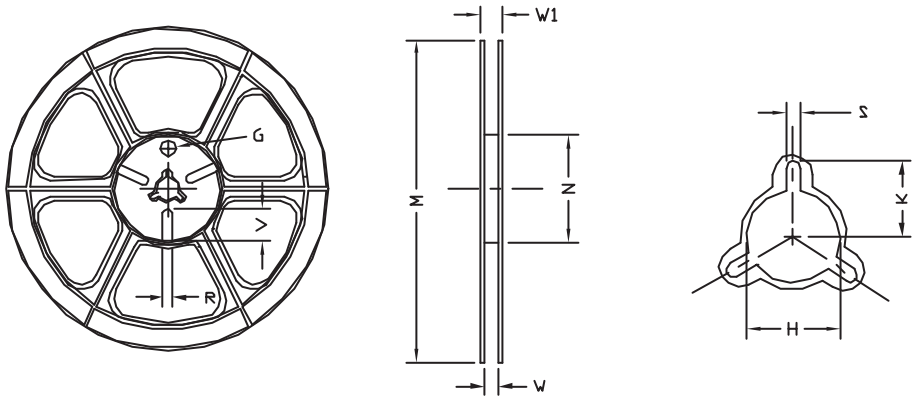
SOT-23 Carrier Tape



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