



STC2200

SamHop Microelectronics Corp.

Mar 15 2005 ver1.2

N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
20V	2.3A	85 @ V _{GS} = 4.5V 110 @ V _{GS} = 2.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- SOT-323 package.



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}	±10	V
Drain Current-Continuous ^a @ T _c =25°C -Pulsed ^b	I _D	2.3	A
	I _{DM}	8	A
Drain-Source Diode Forward Current ^a	I _S	1	A
Maximum Power Dissipation ^a	P _D	1.0	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}	125	°C/W
--	-------------------	-----	------

STC2200

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	1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =2A		60	85	m-ohm
		V _{GS} = 2.5V, I _D = 1A		85	110	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 =2.3A		7		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C _{ISS}	V _{DS} =10V, V _{GS} = 0V f =1.0MHz		210		pF
Output Capacitance	C _{OSS}			75		pF
Reverse Transfer Capacitance	C _{RSS}			46		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		13.2		ns
Rise Time	t _r			9.1		ns
Turn-Off Delay Time	t _{D(OFF)}			27.3		ns
Fall Time	t _f			15.9		ns
Total Gate Charge	Q _g	V _{DS} =10V, I _D = 2A, V _{GS} =4.5V		4.2		nC
Gate-Source Charge	Q _{gs}			0.88		nC
Gate-Drain Charge	Q _{gd}			1.53		nC

STC2200

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 1A$		0.83	1.2	V

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

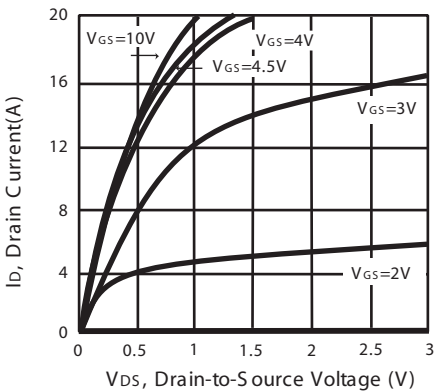


Figure 1. Output Characteristics

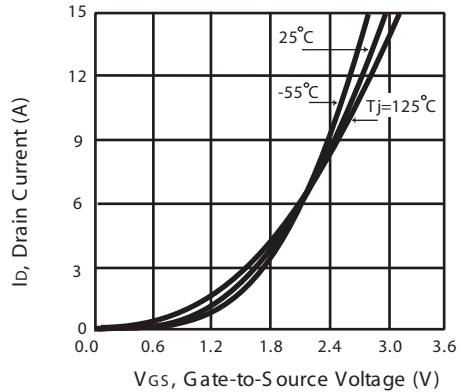


Figure 2. Transfer Characteristics

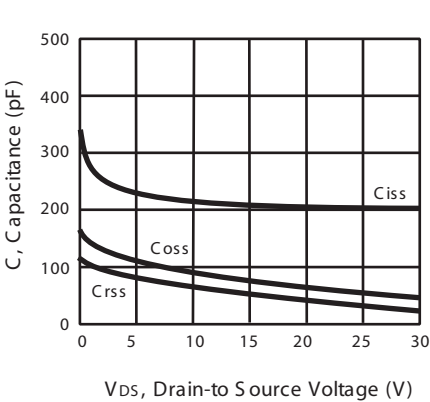


Figure 3. Capacitance

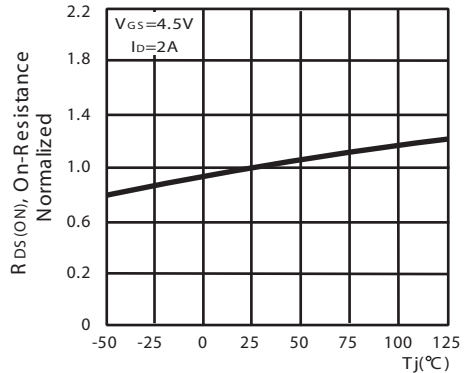
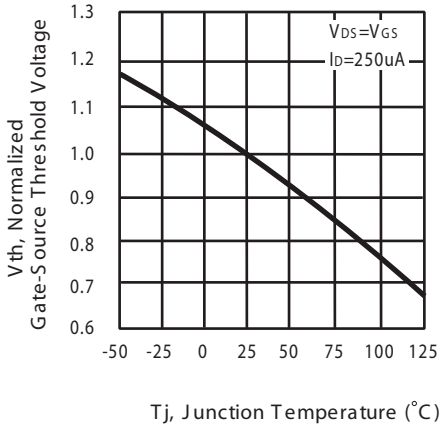


Figure 4. On-Resistance Variation with Temperature

STC 2200



with Temperature

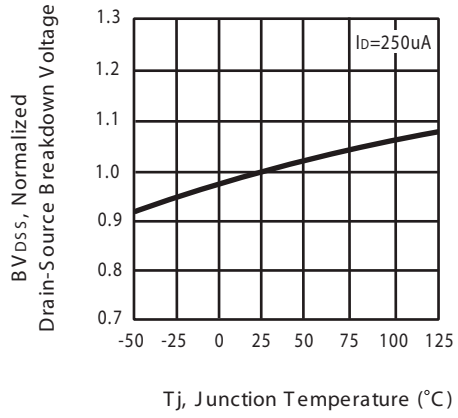


Figure 6. Breakdown Voltage Variation with Temperature

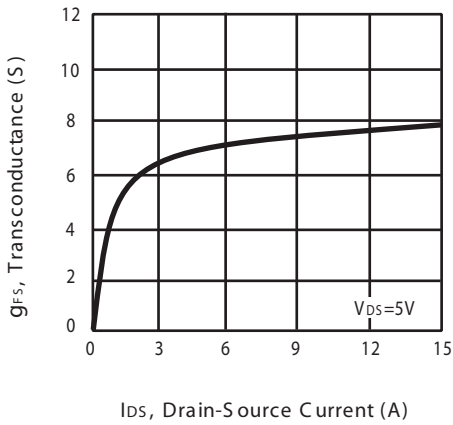


Figure 7. Transconductance Variation with Drain Current

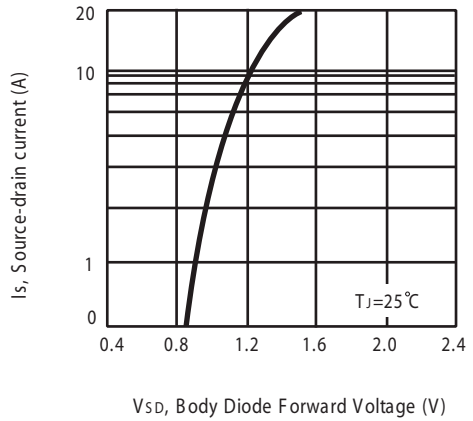


Figure 8. Body Diode Forward Voltage Variation with Source Current

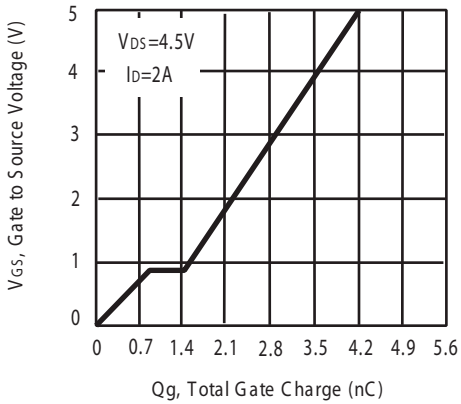


Figure 9. Gate Charge

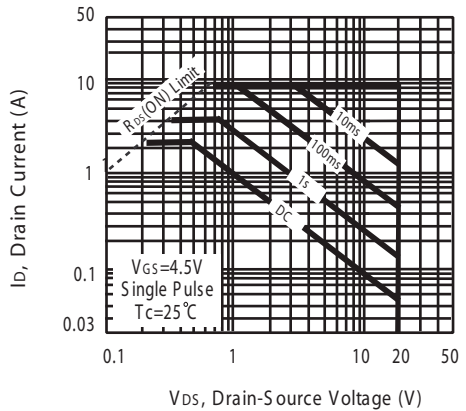


Figure 10. Maximum Safe Operating Area

STC2200

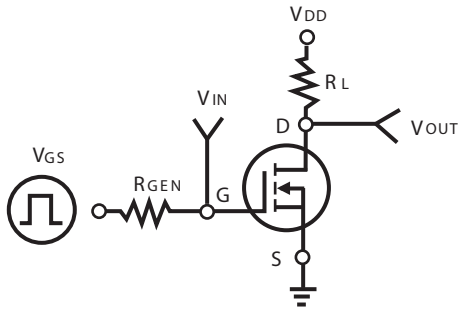


Figure 11. Switching Test Circuit

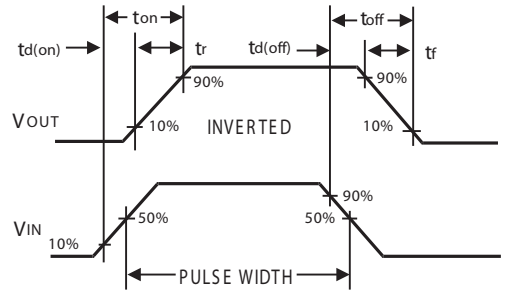
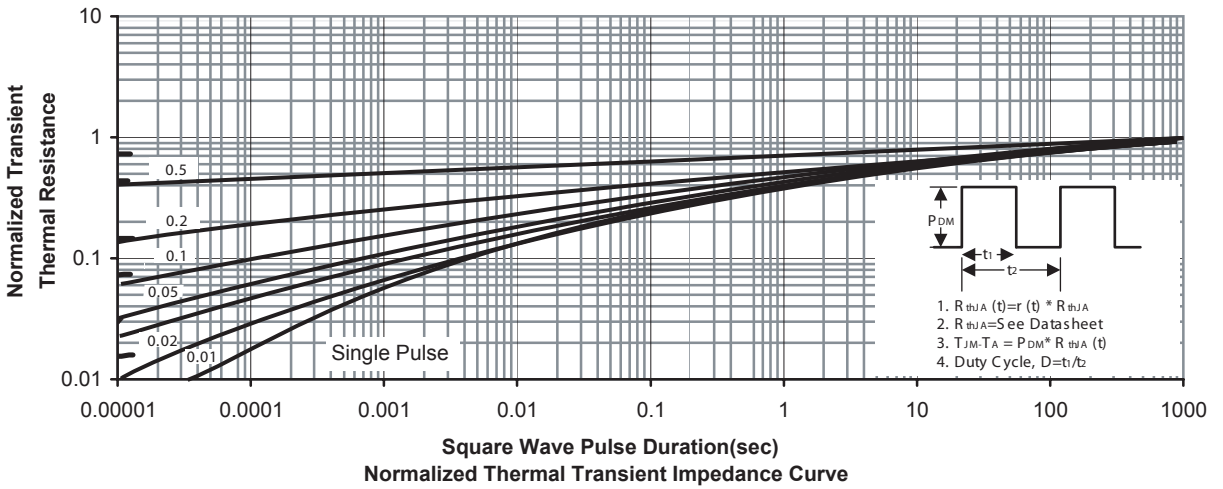


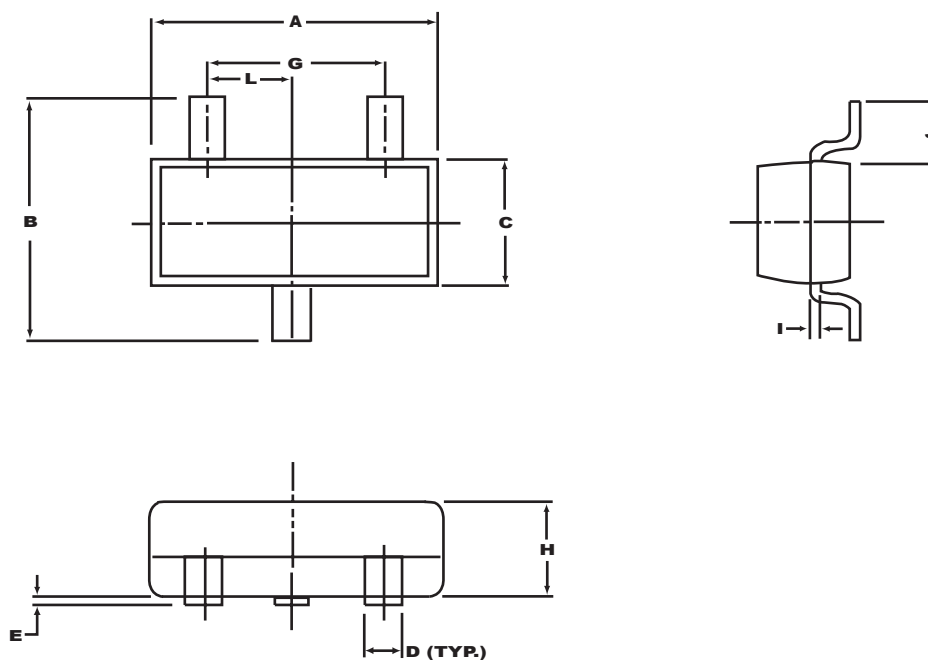
Figure 12. Switching Waveforms



STC2200

PACKAGE OUTLINE DIMENSIONS

SOT-323

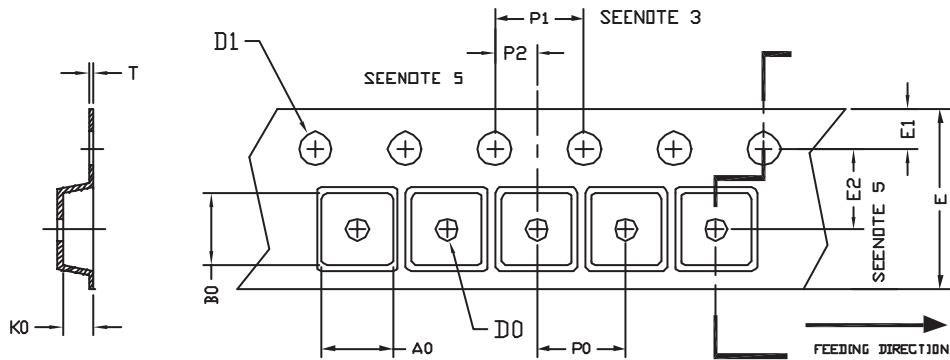


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.8	2.2	0.709	0.866
B	1.8	2.4	0.709	0.945
C	1.15	1.35	0.453	0.531
D	0.25	0.4	0.098	0.157
E	0	0.10	0	0.039
F	----	----	----	----
G	1.30 REF.		0.512 REF.	
H	0.80	1.00	0.315	0.394
I	0.10	0.25	0.039	0.098
J	----	---	----	----
L	0.65	----	0.256	----

STC2200

SOT-323 Tape and Reel Data

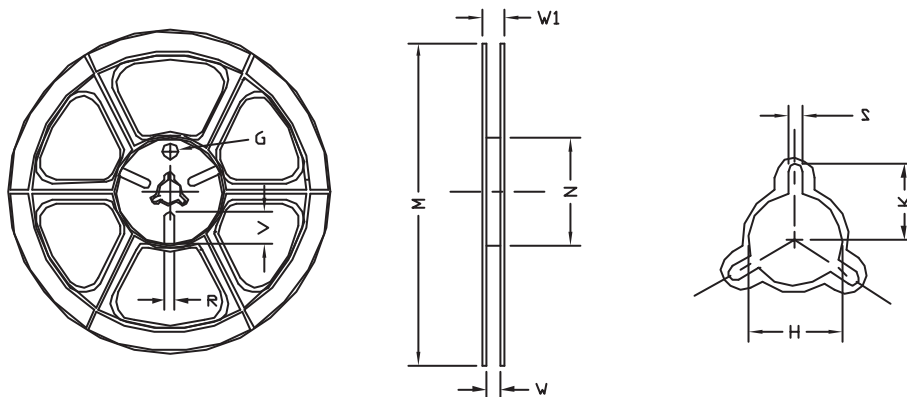
SOT-323 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT-323	2.40 ± 0.10	2.40 ± 0.10	1.19 ± 0.10	ϕ 1.00 $+0.25$	ϕ 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	0.254 ± 0.02

SOT-323 Reel



UNIT:mm

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