



STM4470

SamHop Microelectronics Corp.

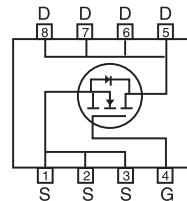
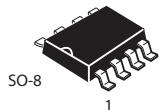
Oct. 16. 2006 Ver1.1

N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS} ^d	I _D	R _{DSON} (mΩ) Max
40V	10A	10 @ V _{GS} = 10V
		13 @ V _{GS} = 4.5V

FEATURES

- Super high dense cell design for low R_{DSON}.
- Rugged and reliable.
- Surface Mount Package.



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS} ^d	40	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous ^a @ T _J =25°C -Pulsed ^b	I _D	10	A
	I _{DM}	39	A
Drain-Source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	2.5	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θA}	50	°C/W
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ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage ^d	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$		1		μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$		± 100		nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.7	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$		8	10	m ohm
		$V_{GS}=4.5V, I_D=6A$		11	13	m ohm
On-State Drain Current	$I_{D(ON)}$	$V_{DS}=10V, V_{GS}=10V$	20			A
Forward Transconductance	g_F	$V_{DS}=10V, I_D=10A$		20		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V$ $f=1.0MHz$		1020		pF
Output Capacitance	C_{oss}			240		pF
Reverse Transfer Capacitance	C_{rss}			135		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=20V$ $I_D=1A$ $V_{GS}=10V$ $R_{GEN}=3.3 \text{ ohm}$		15		ns
Rise Time	t			22		ns
Turn-Off Delay Time	$t_{D(OFF)}$			48		ns
Fall Time	t			12		ns
Total Gate Charge	Q_g	$V_{DS}=20V, I_D=10A, V_{GS}=10V$		19.5		nC
		$V_{DS}=20V, I_D=10A, V_{GS}=4.5V$		9.8		nC
Gate-Source Charge	Q_{gs}	$V_{DS}=20V, I_D=10A$ $V_{GS}=10V$		2		nC
Gate-Drain Charge	Q_{gd}			5.5		nC

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1.7A$		0.73	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.
- d. Guaranteed when external $R_g = 3.3\text{ ohm}$ and $t_f < t_{f\max}$

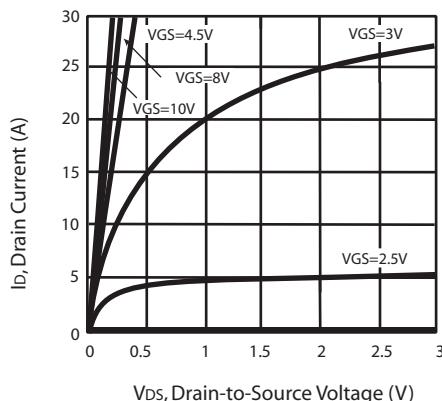


Figure 1. Output Characteristics

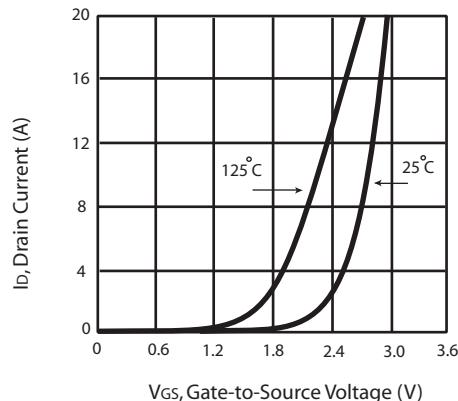


Figure 2. Transfer Characteristics

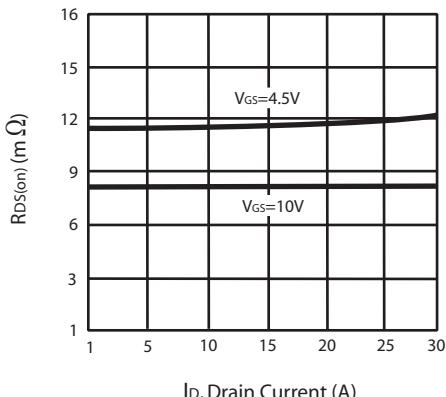


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

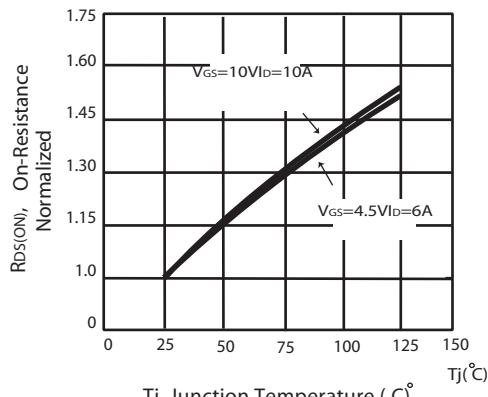


Figure 4. On-Resistance Variation with Drain Current and Temperature

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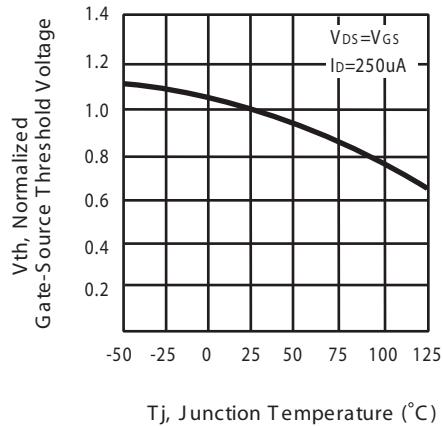


Figure 5. Gate Threshold Variation with Temperature

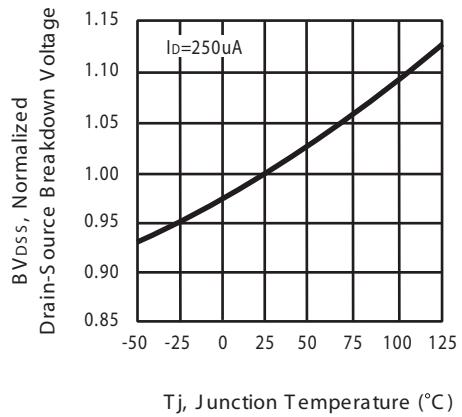


Figure 6. Breakdown Voltage Variation with Temperature

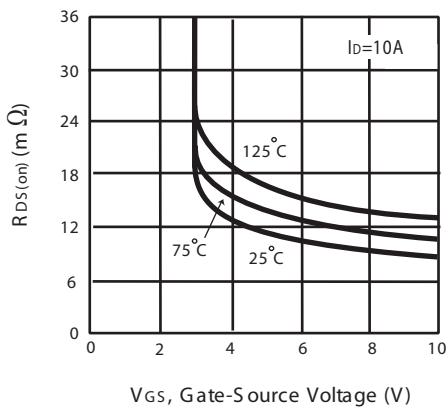


Figure 7. On-Resistance vs. Gate-Source Voltage

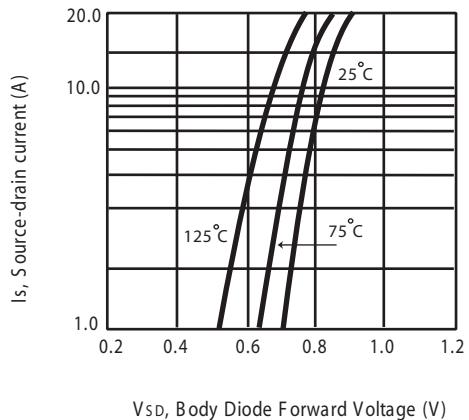


Figure 8. Body Diode Forward Voltage Variation with Source Current

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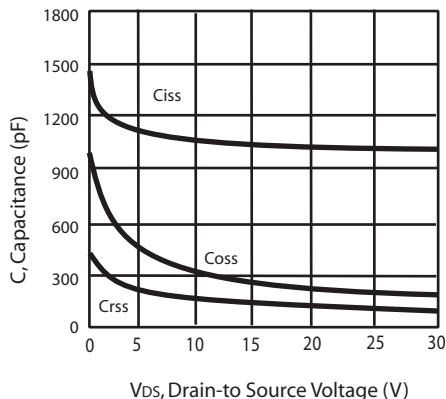


Figure 9. Capacitance

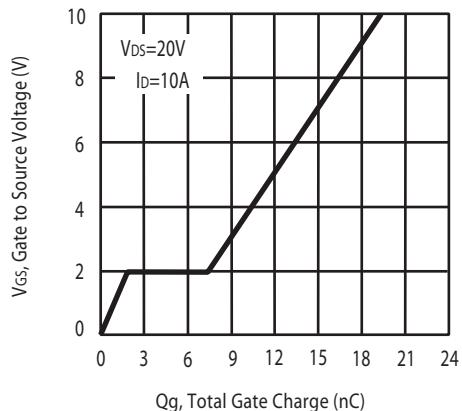


Figure 10. Gate Charge

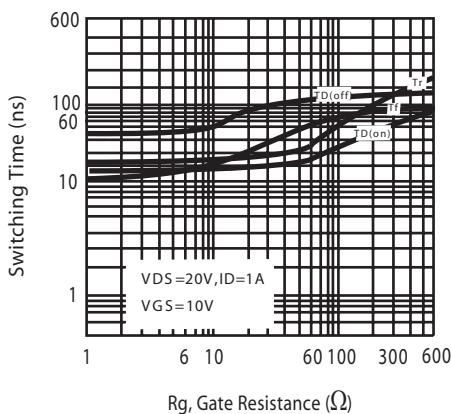


Figure 11. switching characteristics

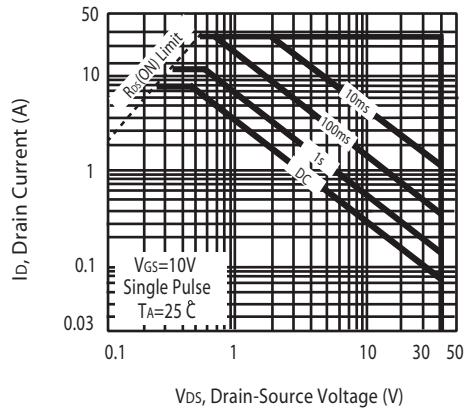
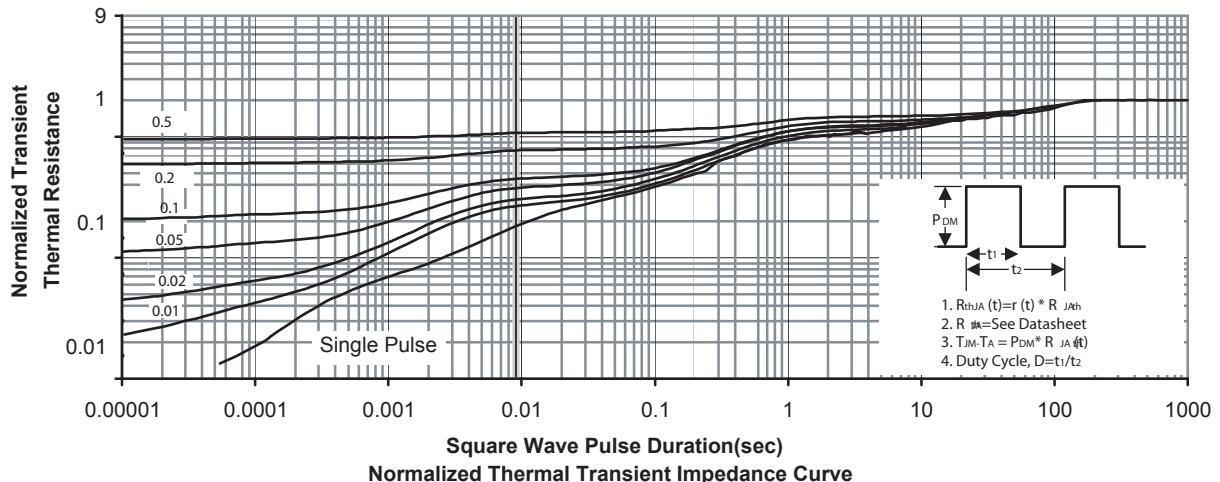


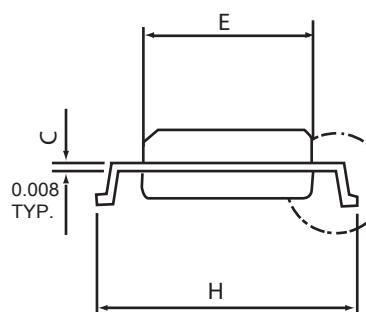
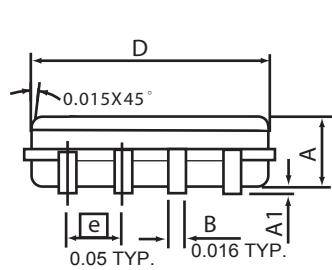
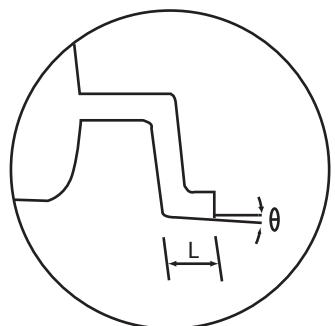
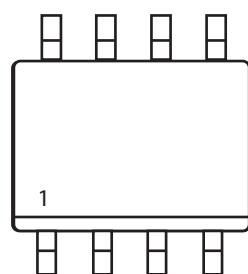
Figure 12. Maximum Safe Operating Area



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PACKAGE OUTLINE DIMENSIONS

SO-8

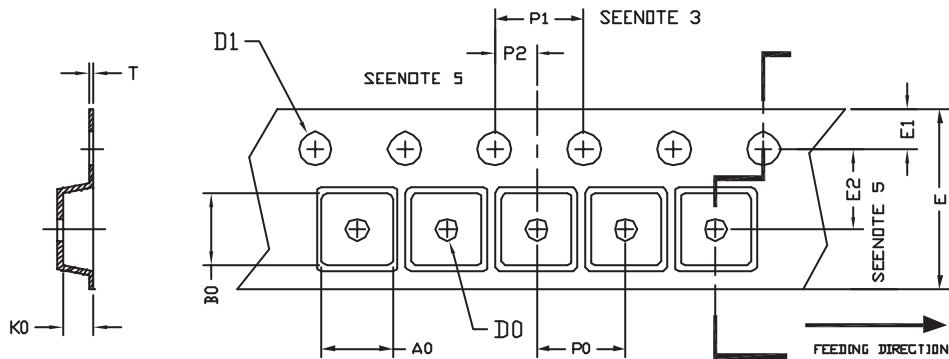


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

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SO-8 Tape and Reel Data

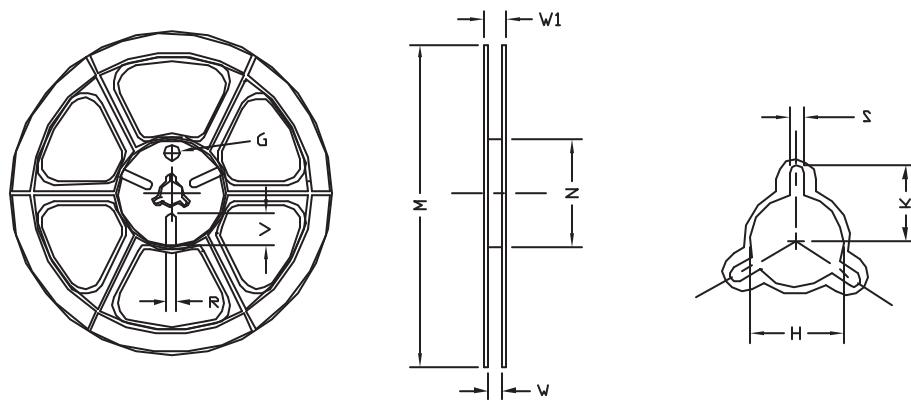
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	$\phi 1.5$ (MIN)	$\phi 1.5$ $+ 0.1$ $- 0.0$	12.0 ± 0.3	1.75	5.5 ± 0.05	8.0	4.0	2.0 ± 0.05	0.3 ± 0.05

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	$\phi 330$	330 ± 1	62 ± 1.5	12.4 $+ 0.2$	16.8 $- 0.4$	$\phi 12.75$ $+ 0.15$	---	2.0 ± 0.15	---	---	---