SamHop Microelectronics Corp.

STM7096N

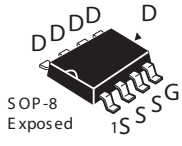
Aug 17,2005

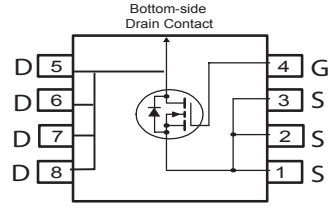
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
30V	13A	9 @ V_{GS} = 10V
		13 @ V_{GS} = 4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Surface Mount Package.
- Thermal Pad Exposed with Standard SOP-8 Outline





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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous[a] @ T_J=25°C	I_D	13	A
-Pulsed[b]	I_{DM}	40	A
Drain-Source Diode Forward Current[a]	I_S	1.7	A
Maximum Power Dissipation[a]	P_D	3.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient[a]	$R_{\theta JA}$	40	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.7	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A		9	12.5	m ohm
		V_{GS}=4.5V, I_D=10A		13	18	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=10V, V_{GS}=10V	10			A
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=10A		25		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V f=1.0MHz		2300		pF
Output Capacitance	C_{OSS}			300		pF
Reverse Transfer Capacitance	C_{RSS}			140		pF
Gate resistance	Rg	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		3		ohm
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=15V I_D=1 A V_{GS}=10V R_{GEN}=6 ohm		21		ns
Rise Time	t_r			20		ns
Turn-Off Delay Time	$t_{D(OFF)}$			75		ns
Fall Time	t_f			17		ns
Total Gate Charge	Q_g	V_{DS}=15V, I_D=12A, V_{GS}=10V		39.5		nC
		V_{DS}=15V, I_D=12A, V_{GS}=4.5V		17.5		nC
Gate-Source Charge	Q_{gs}	V_{DS}=15V, I_D=12A V_{GS}=10V		5		nC
Gate-Drain Charge	Q_{gd}			7		nC

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ELECTRICAL CHARACTERISTICS (T_C=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 = 1.7A		0.76	1.3	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.

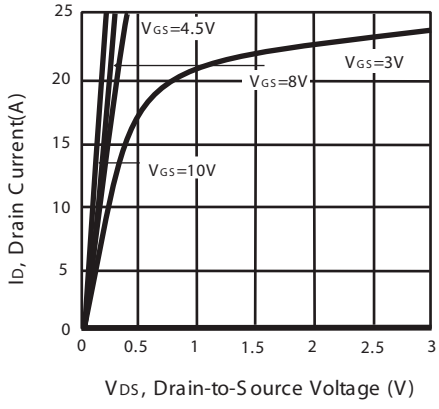

Figure 1. Output Characteristics

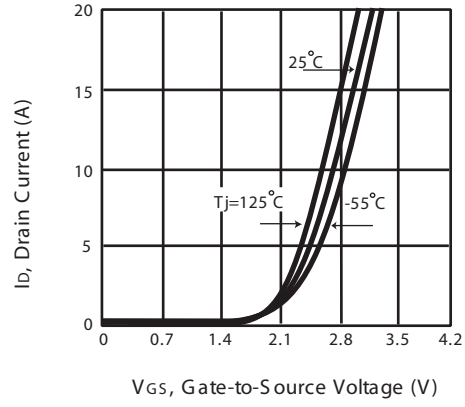

Figure 2. Transfer Characteristics

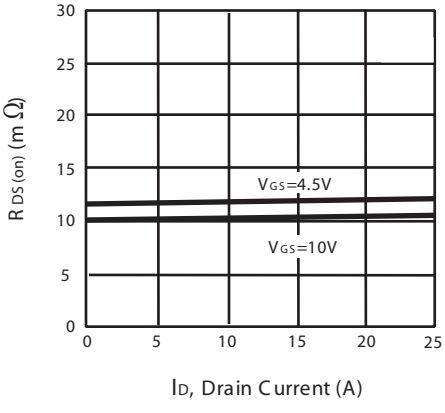

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

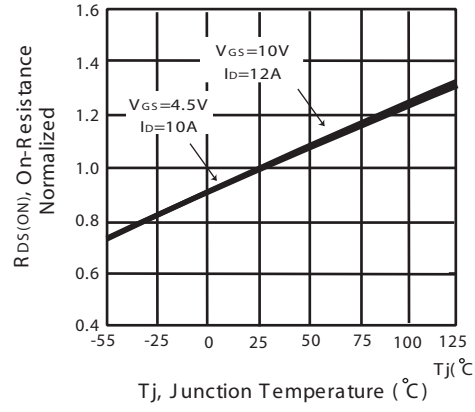

Figure 4. On-Resistance Variation with Drain Current and Temperature

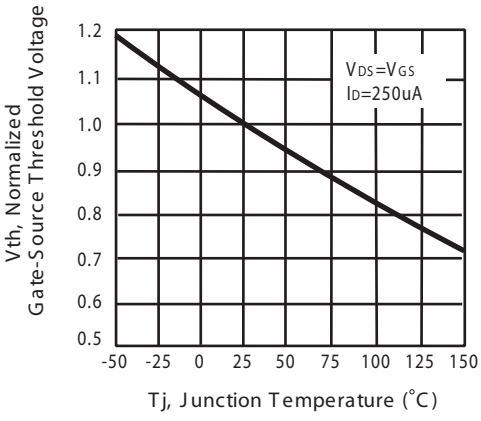

Figure 5. Gate Threshold Variation with Temperature

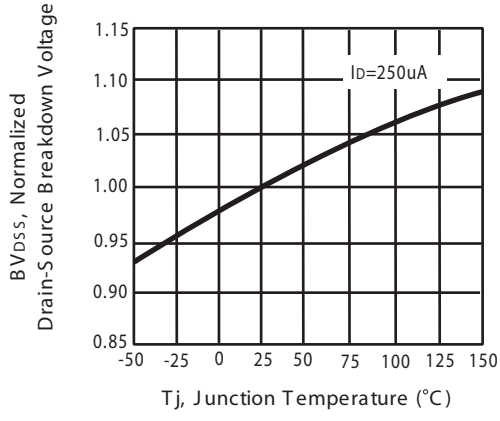

Figure 6. Breakdown Voltage Variation with Temperature

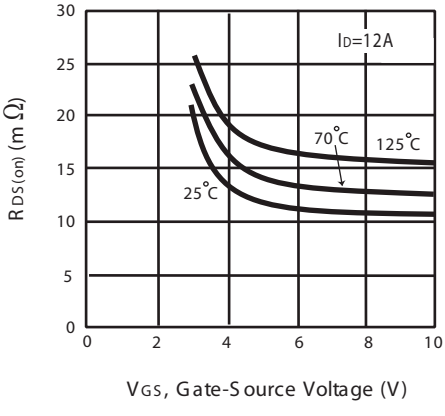

Figure 7. On-Resistance vs. Gate-Source Voltage

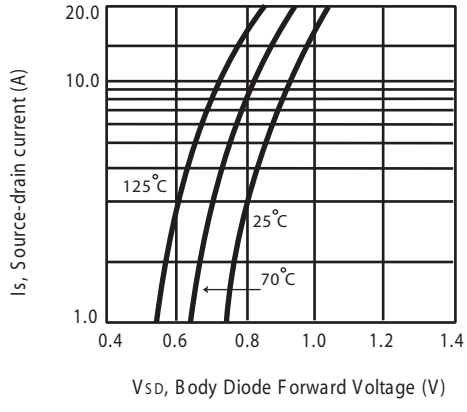

Figure 8. Body Diode Forward Voltage Variation with Source Current

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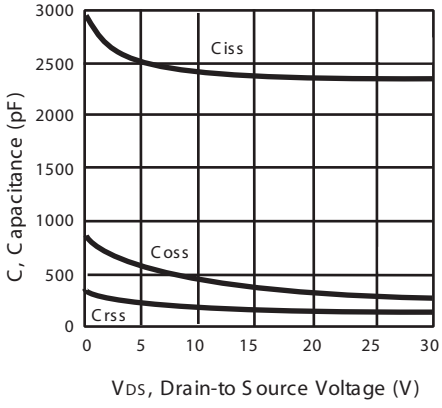

Figure 9. Capacitance

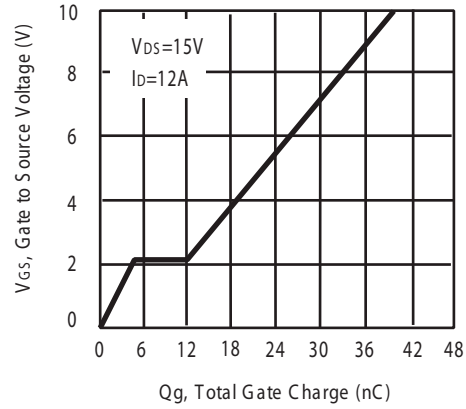

Figure 10. Gate Charge

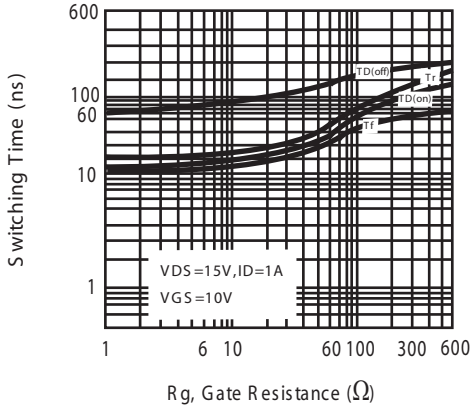

Figure 11.switching characteristics

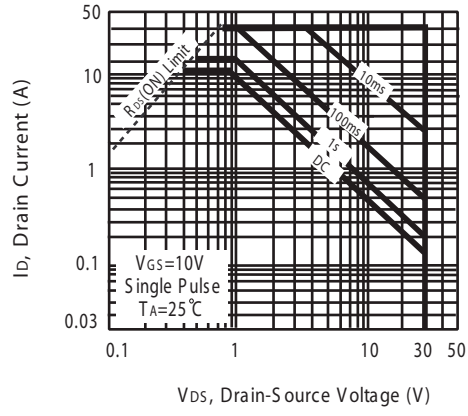

Figure 12. Maximum Safe Operating Area

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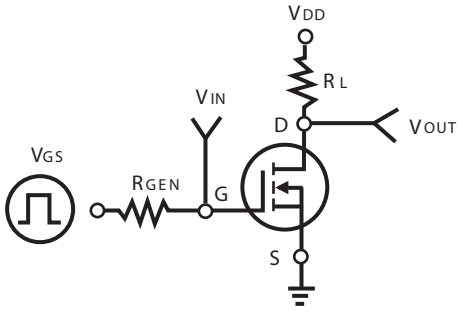


Figure 11. Switching Test Circuit

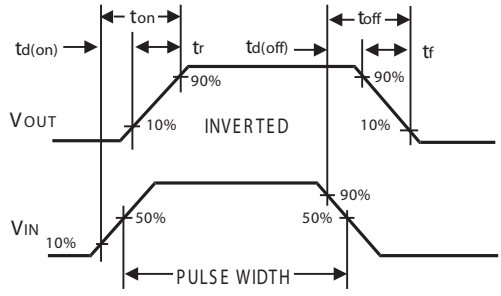
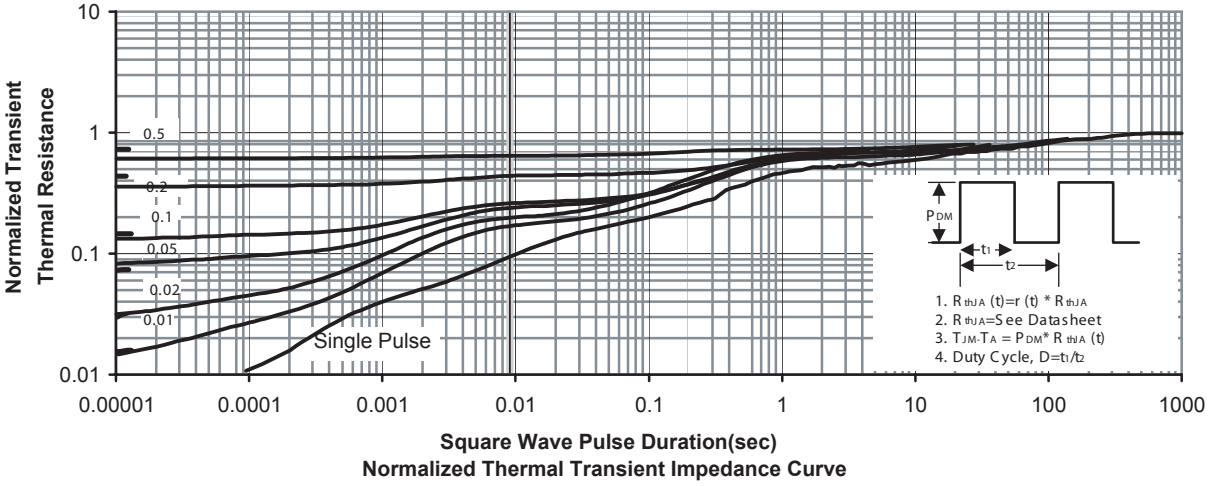


Figure 12. Switching Waveforms



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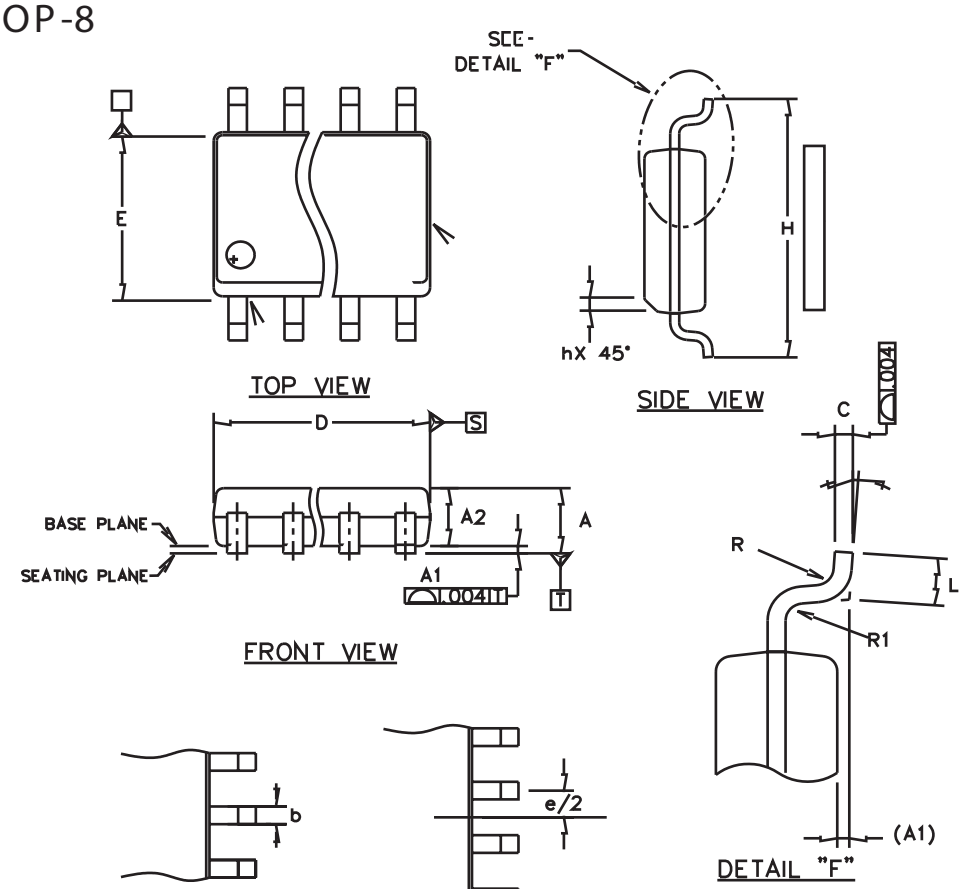
PACKAGE OUTLINE DIMENSIONS

SOP-8

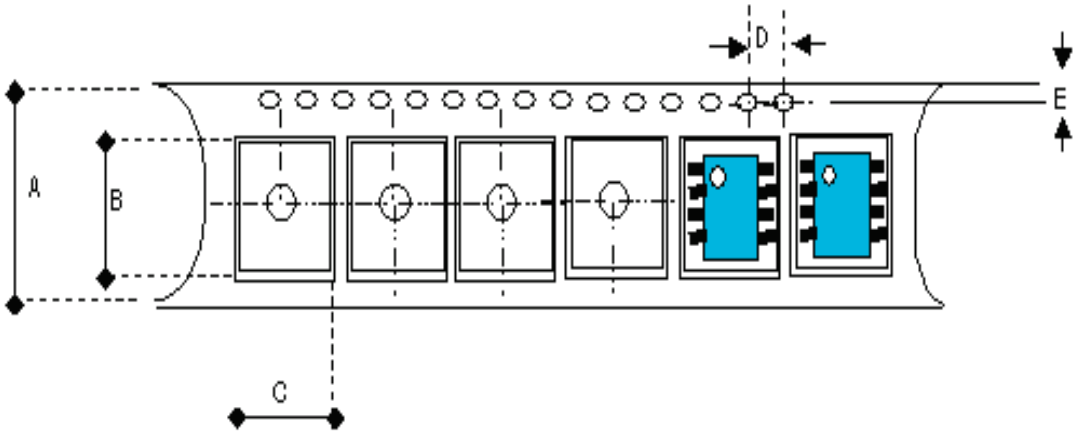


SYMBOL	MIN.	NOM.	MAX.	NOTE
A	.055	–	.069	1
A1	.0005	–	.004	1,5
A2	.050	–	.064	1
b	.013	–	.020	1
C	.008	–	.010	1,5
R	.003	–	–	1
R1	.003	–	–	1
e	.050 BSC.			1
E	.150	–	.157	1,4
h	.010	–	.019	1
H	.228	–	.244	1,5
L	.020	–	.028	1,6
Q1	0°	–	8°	1

	D			
VAR	MIN.	NOM.	MAX.	N
AA	0.189	–	–	8
AB	0.337	–	–	14
AC	0.386	–	–	16
NOTES	1,3	–	–	16

SO-8 Tape and Reel Data

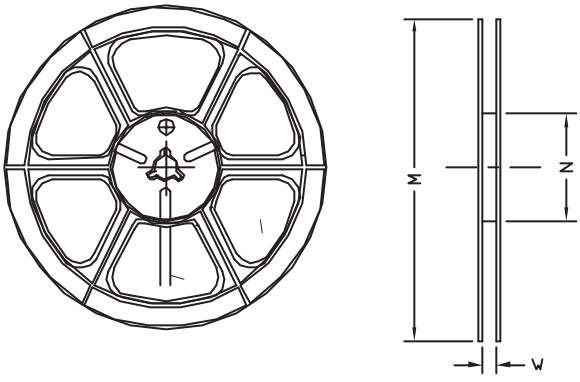
SO-8 Carrier Tape



unit:mm

PACKAGE	A	B	C	D	E
SOP 8N 150mil	12.0 ±0.3	5.0 ±0.1	4.0 ±0.1	6.5 ±0.1	1.5 ±0.1

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W
12 mm	ϕ 300	300	101	10 ± 0.2