



SamHop Microelectronics Corp.



STM4820

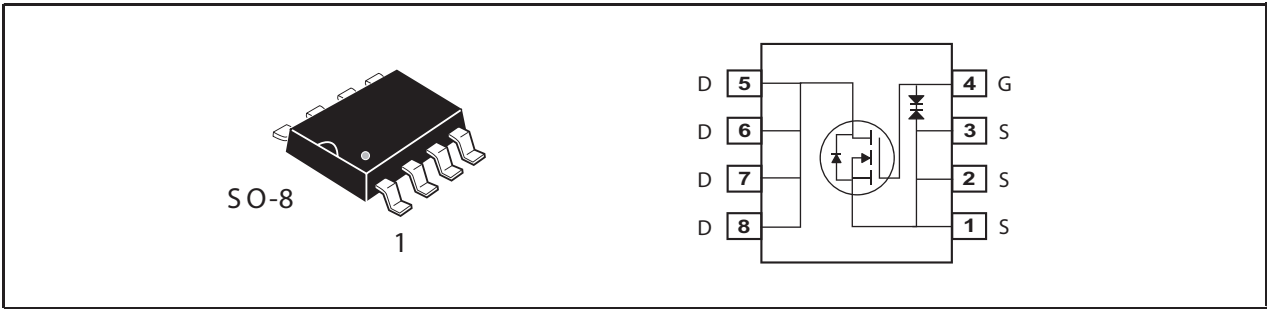
Ver 1.0

N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DS}	I _D	R _{DS(ON)} (mΩ) Max
30V	8.9A	21 @ V _{GS} =10V
		30 @ V _{GS} =4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.



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

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^a	T _A =25°C	8.9
		T _A =70°C	7.1
I _{DM}	-Pulsed ^b	45	A
E _{AS}	Single Pulse Avalanche Energy ^d	10	mJ
P _D	Maximum Power Dissipation ^a	T _A =25°C	2.5
		T _A =70°C	1.6
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	50	°C/W
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Details are subject to change without notice.

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V , V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V , V _{DS} =0V			±10	uA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	1.7	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =8.9A		17	21	m ohm
		V _{GS} =4.5V , I _D =7.5A		23	30	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =8.9A		14		S
DYNAMIC CHARACTERISTICS °						
C _{iss}	Input Capacitance	V _{DS} =15V,V _{GS} =0V f=1.0MHz		460		pF
C _{oss}	Output Capacitance			135		pF
C _{rss}	Reverse Transfer Capacitance			75		pF
SWITCHING CHARACTERISTICS °						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =15V I _D =1A V _{GS} =10V R _{GEN} =6 ohm		8		ns
t _r	Rise Time			12		ns
t _{D(OFF)}	Turn-Off Delay Time			19		ns
t _f	Fall Time			26		ns
Q _g	Total Gate Charge	V _{DS} =15V,I _D =8.9A,V _{GS} =10V		7.6		nC
		V _{DS} =15V,I _D =8.9A,V _{GS} =4.5V		3.8		nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V,I _D =8.9A,		1.2		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =10V		3.6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _s	Maximum Continuous Drain-Source Diode Forward Current				2.0	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _s =2.0A		0.78	1.3	V

Notes

- Surface Mounted on FR4 Board, t ≤ 10sec.
- Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Starting T_J=25°C, L=0.5mH, R_G=25Ω, V_{DD}=20V, V_{GS}=10V. (See Figure13)

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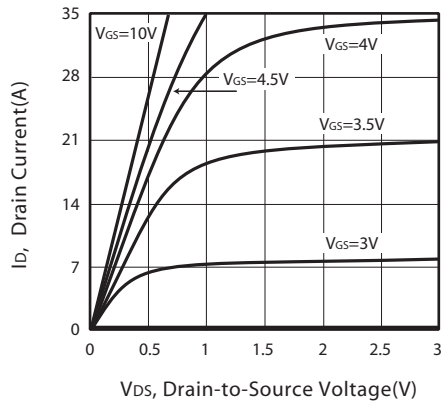


Figure 1. Output Characteristics

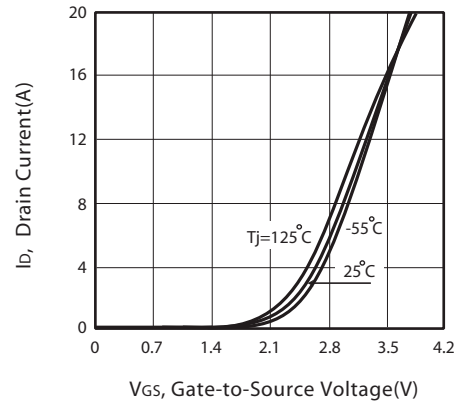


Figure 2. Transfer Characteristics

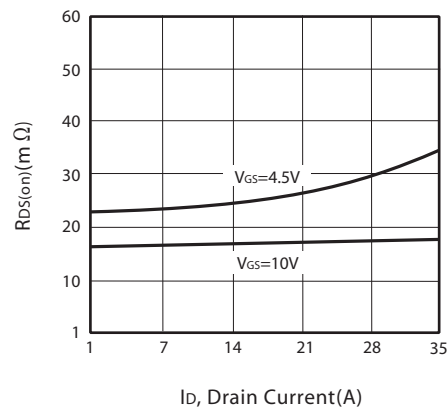


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

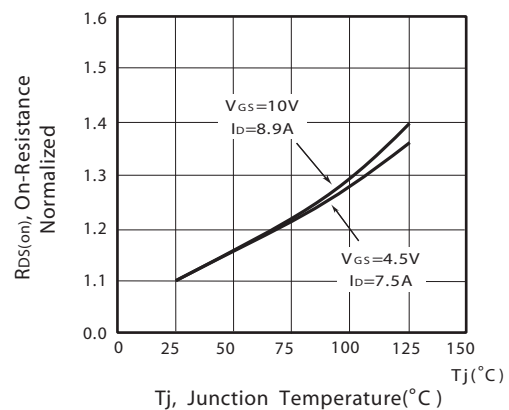


Figure 4. On-Resistance Variation with Drain Current and Temperature

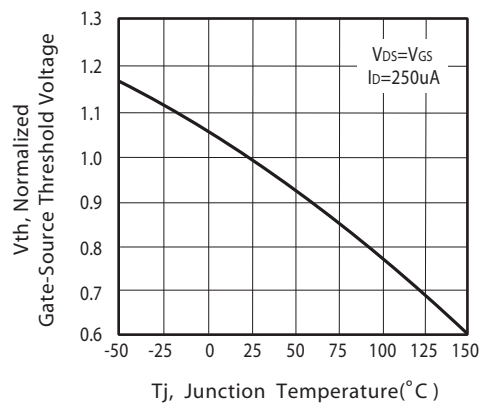


Figure 5. Gate Threshold Variation with Temperature

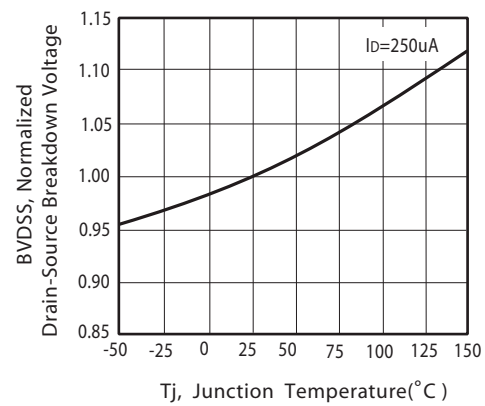


Figure 6. Breakdown Voltage Variation with Temperature

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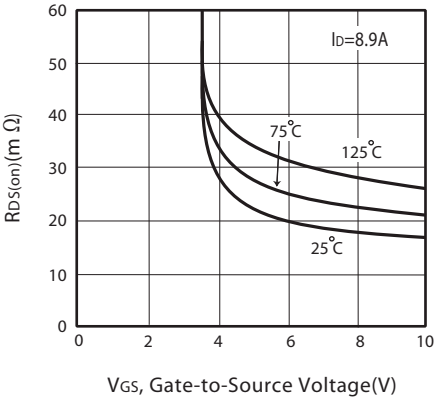


Figure 7. On-Resistance vs. Gate-Source Voltage

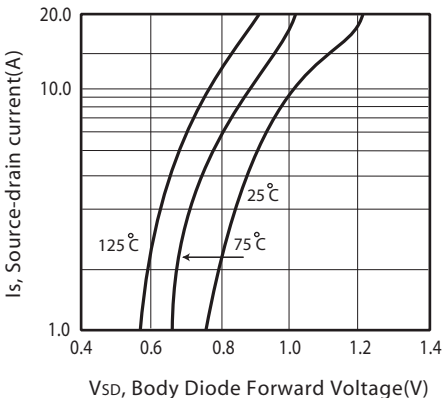


Figure 8. Body Diode Forward Voltage Variation with Source Current

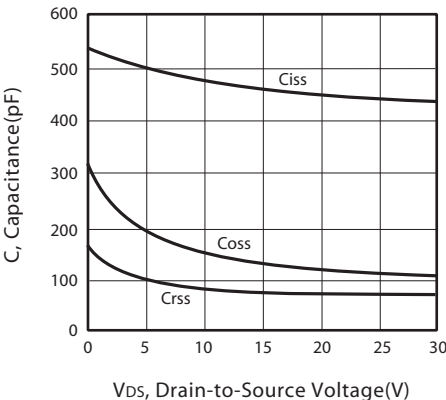


Figure 9. Capacitance

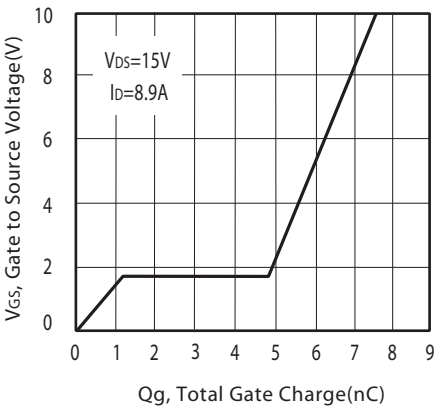


Figure 10. Gate Charge

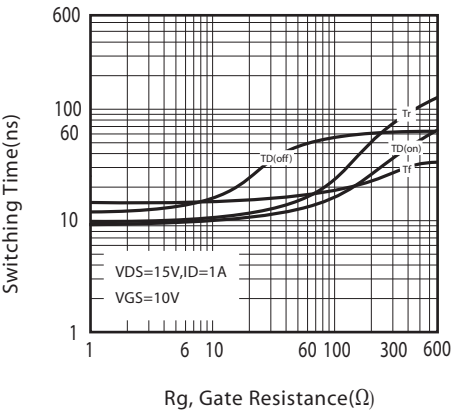


Figure 11. switching characteristics

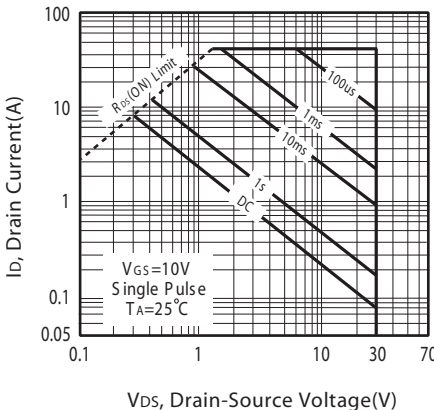
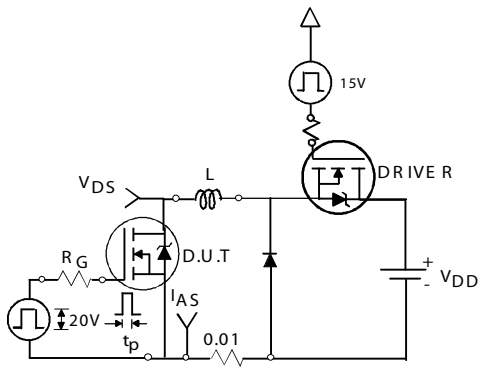


Figure 12. Maximum Safe Operating Area

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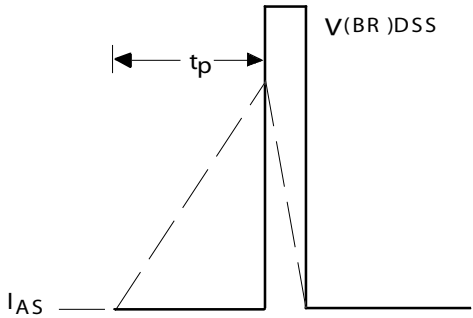
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Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

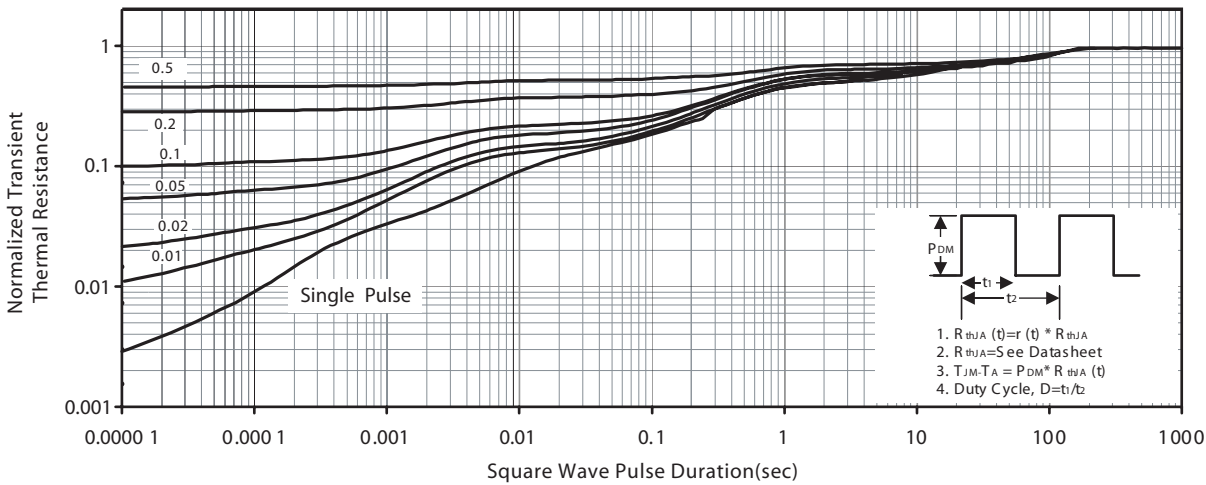


Figure 14. Normalized Thermal Transient Impedance Curve

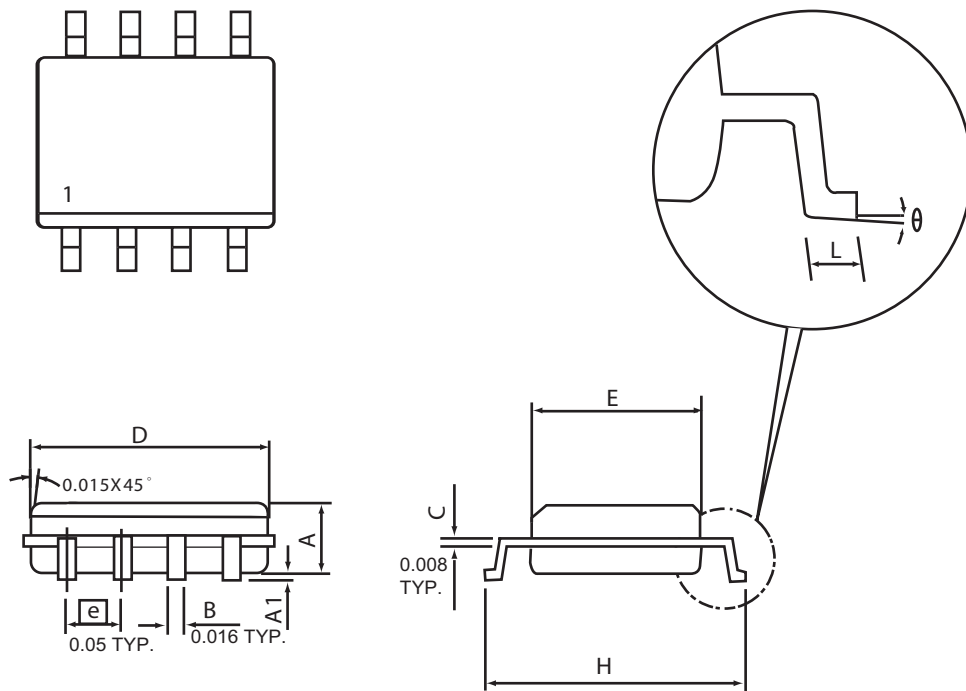
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PACKAGE OUTLINE DIMENSIONS

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°

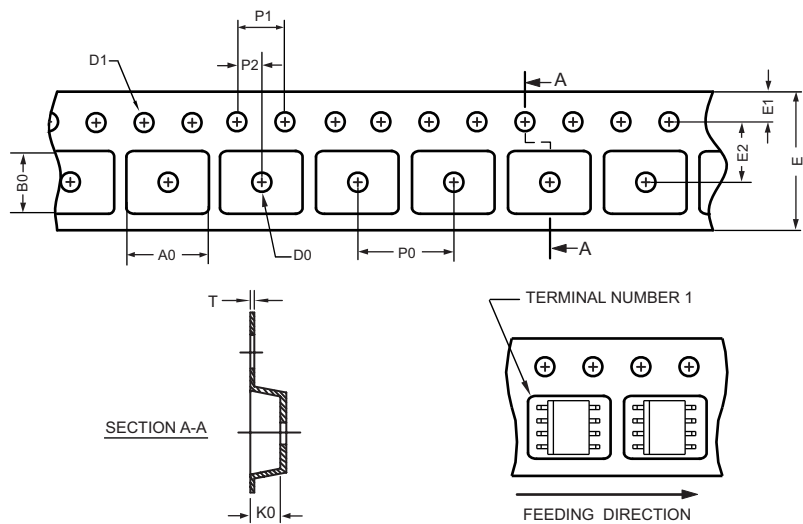
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SO-8 Tape and Reel Data

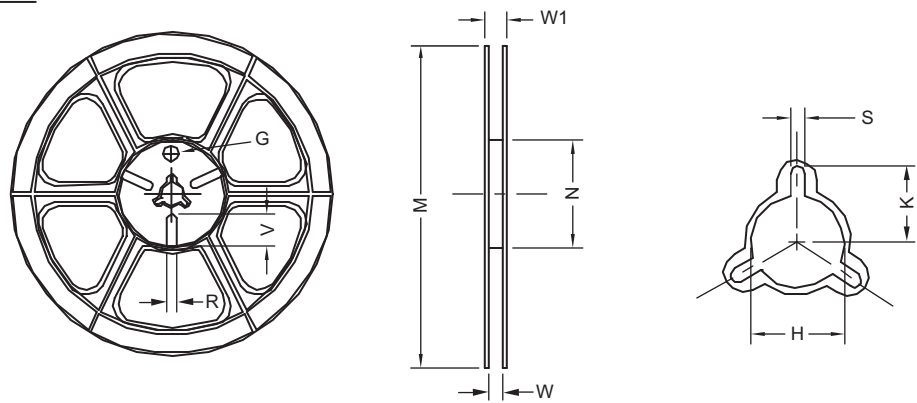
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.50 ±0.15	5.25 ±0.10	2.10 ±0.10	φ 1.5 (MIN)	φ 1.55 ±0.10	12.0 +0.3 - 0.1	1.75 ±0.10	5.5 ±0.10	8.0 ±0.10	4.0 ±0.10	2.0 ±0.10	0.30 ±0.013

SO-8 Reel



UNIT:mm

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

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