SamHop Microelectronics Corp.

STM4639

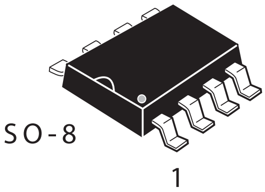
Ver 2.1

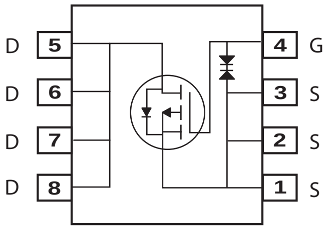
P-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-30V	-14A	8.5 @ V_{GS}=-10V
		13 @ V_{GS}=-4.5V

FEATURES

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





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	-14	A
		T_A=70°C	-11.2	A
I_{DM}	-Pulsed [b]		-79	A
E_{AS}	Single Pulse Avalanche Energy [d]		180	mJ
P_D	Maximum Power Dissipation [a]	T_A=25°C	2.5	W
		T_A=70°C	1.6	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [a]	50	°C/W

ELECTRICAL CHARACTERISTICS (T_A=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	-0.8	-1.7	-2.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V , I_D=-14A		7	8.5	m ohm
		V_{GS}=-4.5V , I_D=-11.3A		9.8	13	m ohm
g_{FS}	Forward Transconductance	V_{DS}=-10V , I_D=-14A		32		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V f=1.0MHz		4049		pF
C_{OSS}	Output Capacitance			641		pF
C_{RSS}	Reverse Transfer Capacitance			351		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=-15V I_D=-1A V_{GS}=-10V R_{GEN}=3 ohm		24		ns
t_r	Rise Time			68		ns
$t_{D(OFF)}$	Turn-Off Delay Time			484		ns
t_f	Fall Time			188		ns
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-14A,V_{GS}=-10V		95		nC
		V_{DS}=-15V,I_D=-14A,V_{GS}=-4.5V		40		nC
Q_{gs}	Gate-Source Charge	V_{DS}=-15V,I_D=-14A, V_{GS}=-10V		6		nC
Q_{gd}	Gate-Drain Charge			23		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 [b]	V_{GS}=0V,I_S=-2.0A		-0.7	-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.
d.Starting T_J=25°C,L=3.0mH,V_{DD} = 30V,V_{GS}=10V.(See Figure13)

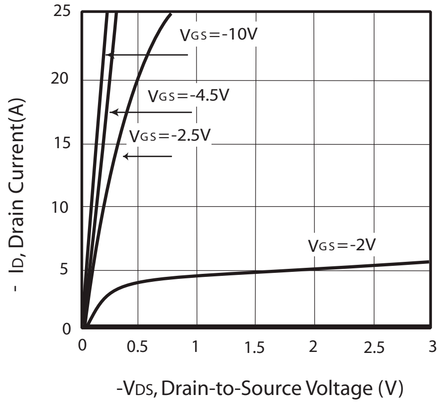


Figure 1. Output Characteristics

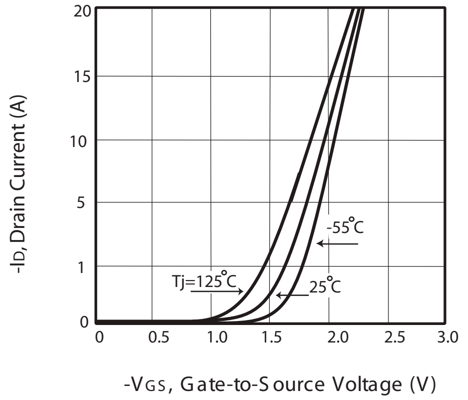


Figure 2. Transfer Characteristics

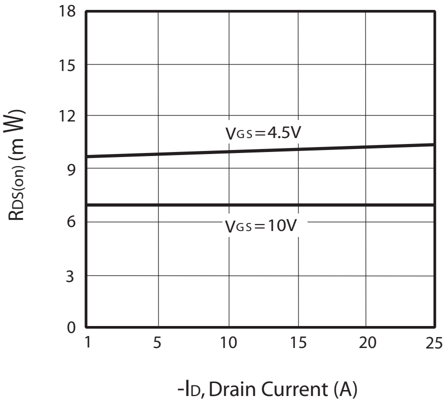


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

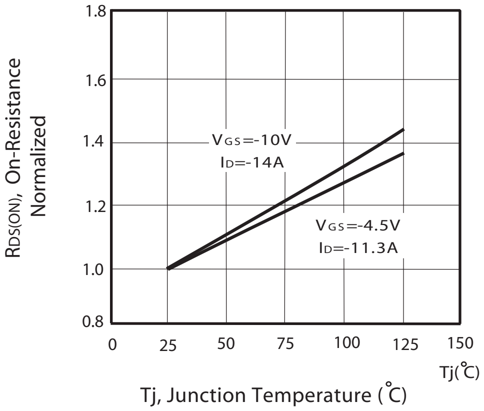


Figure 4. On-Resistance Variation with Drain Current and Temperature

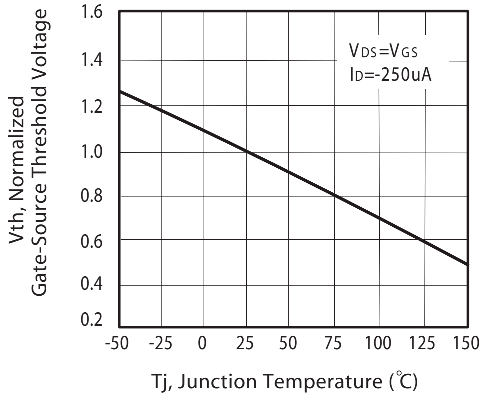


Figure 5. Gate Threshold Variation with Temperature

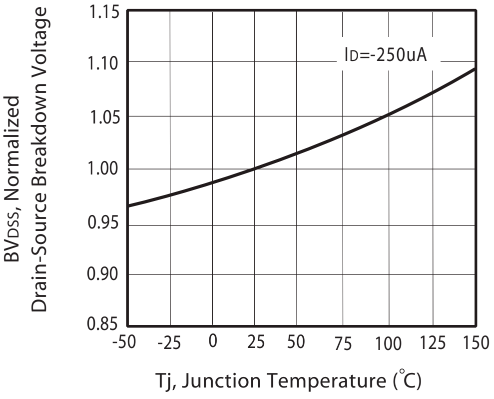


Figure 6. Breakdown Voltage Variation with Temperature

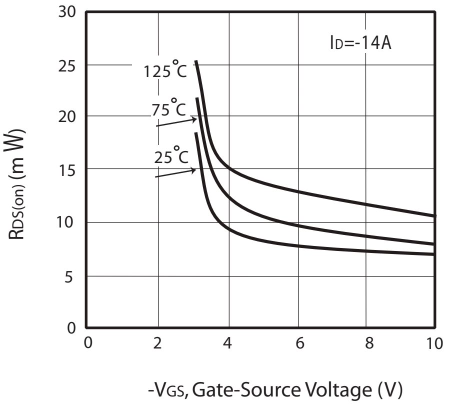


Figure 7. On-Resistance vs. Gate-Source Voltage

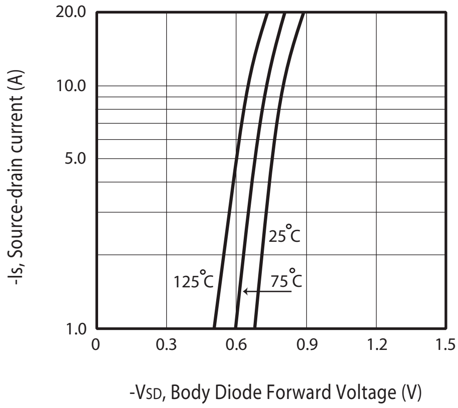


Figure 8. Body Diode Forward Voltage Variation with Source Current

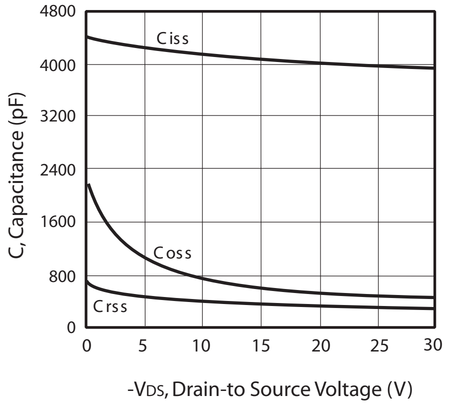


Figure 9. Capacitance

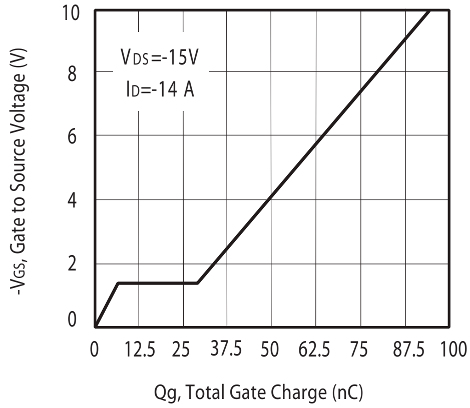


Figure 10. Gate Charge

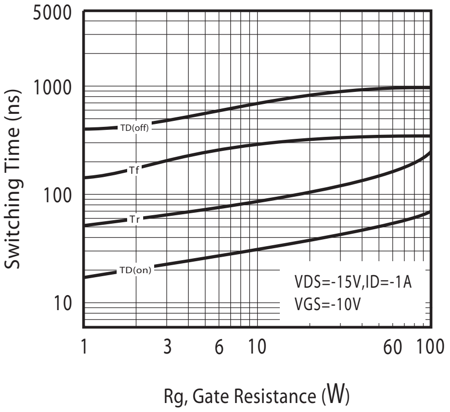


Figure 11.switching characteristics

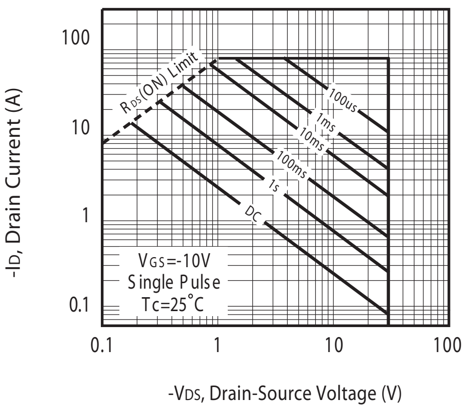
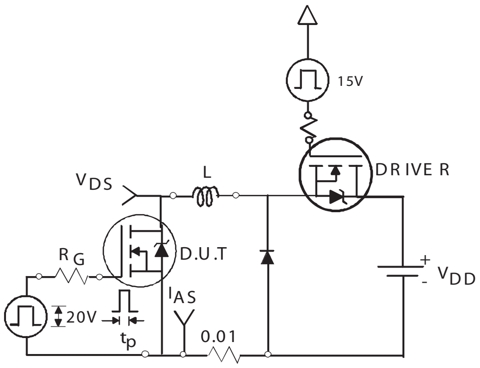
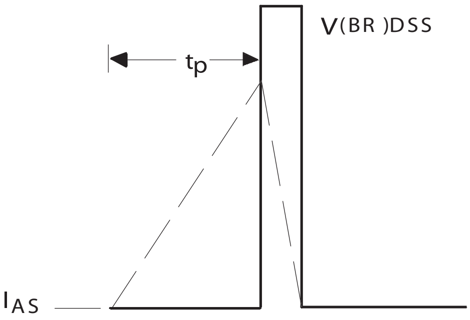


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

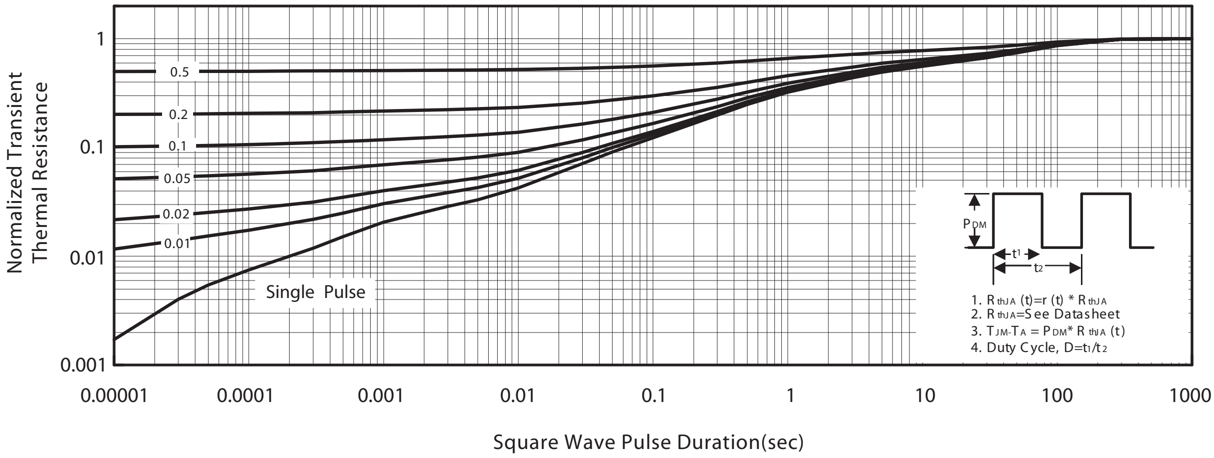
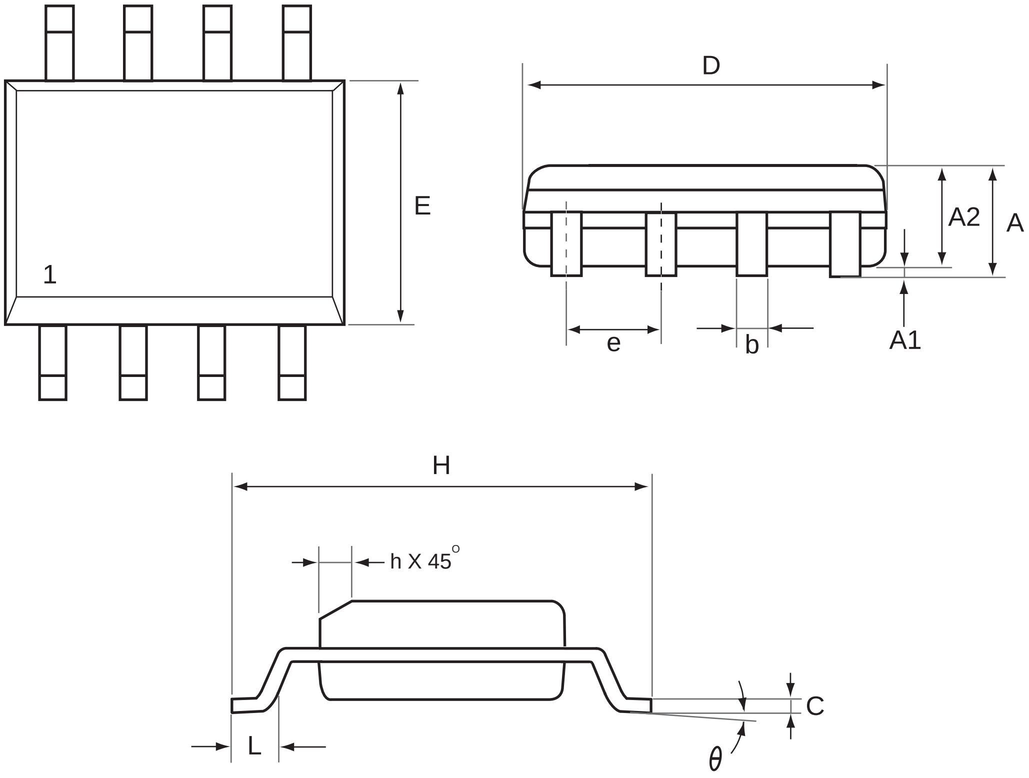


Figure 14. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

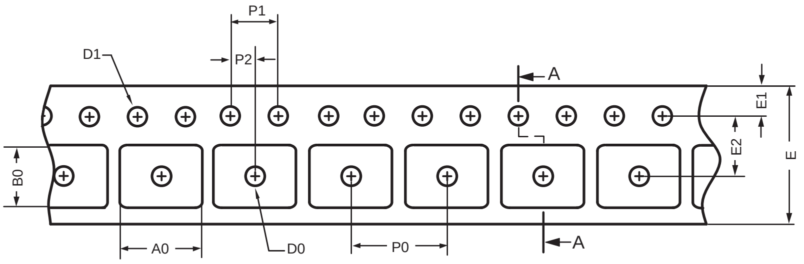
SO-8

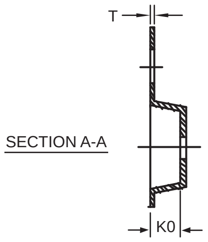


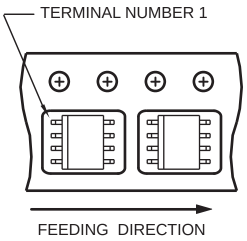
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.63	0.049	0.064
b	0.31	0.51	0.012	0.020
C	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	3.70	4.00	0.146	0.157
e	1.27 REF.		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°
h	0.25	0.50	0.010	0.020

SO-8 Tape and Reel Data

SO-8 Carrier Tape



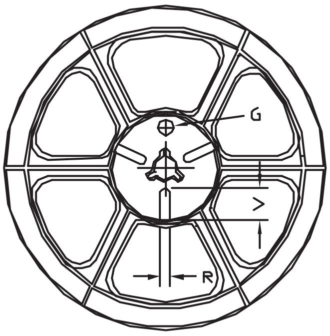


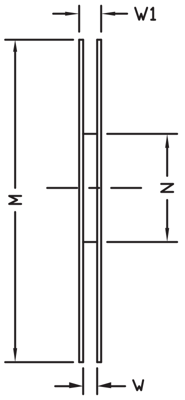


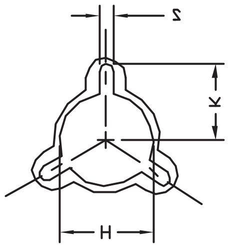
unit:㎜

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150㏕	6.50 ±0.15	5.25 ±0.10	2.10 ±0.10	ϕ1.5 (MIN)	ϕ1.55 ±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:㎜

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 ㎜	ϕ330	330 ± 1	62 ±1.5	12.4 + 0.2	16.8 - 0.4	ϕ12.75 + 0.15	–––	2.0 ±0.15	–––	–––	–––

TOP MARKING DEFINITION

SO-8