SamHop Microelectronics Corp.

STM4639T

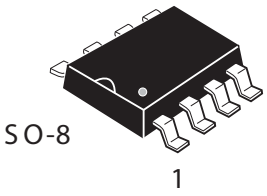
Ver 1.1

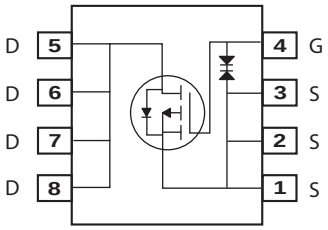
P-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-30V	-10A	12.5 @ VGS=-10V
		16.5 @ VGS=-4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface 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		±24	V
I_D	Drain Current-Continuous [a]	T_A=25°C	-10	A
		T_A=70°C	-8	A
I_{DM}	-Pulsed [b]		-56	A
E_{AS}	Single Pulse Avalanche Energy [d]		156	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=-10mA	-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}= ±24V , V_{DS}=0V			±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=-0.5mA	-1.0	-1.7	-3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V , I_D=-5A		10	12.5	m ohm
		V_{GS}=-4.5V , I_D=-5A		13	16.5	m ohm
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=-10V,V_{GS}=0V f=1.0MHz		3375		pF
C_{OSS}	Output Capacitance			768		pF
C_{RSS}	Reverse Transfer Capacitance			352		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=-15V I_D=-5A V_{GS}=-10V R_{GEN}= 4.7 ohm		46		ns
t_r	Rise Time			60		ns
$t_{D(OFF)}$	Turn-Off Delay Time			210		ns
t_f	Fall Time			57		ns
Q_g	Total Gate Charge	V_{DS}=-24V,I_D=-10A,V_{GS}=-10V		62		nC
Q_{gs}	Gate-Source Charge	V_{DS}=-24V,I_D=-10A, V_{GS}=-10V		7.6		nC
Q_{gd}	Gate-Drain Charge			16		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=-10A		-1.2	-1.8	V

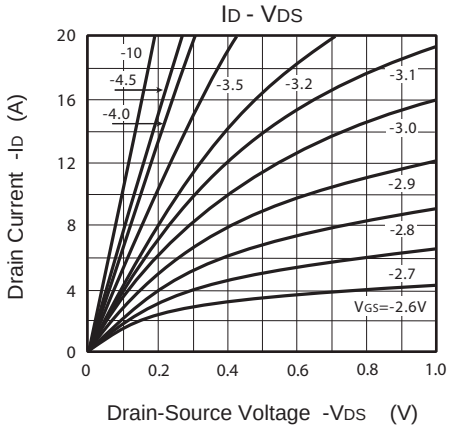
Notes

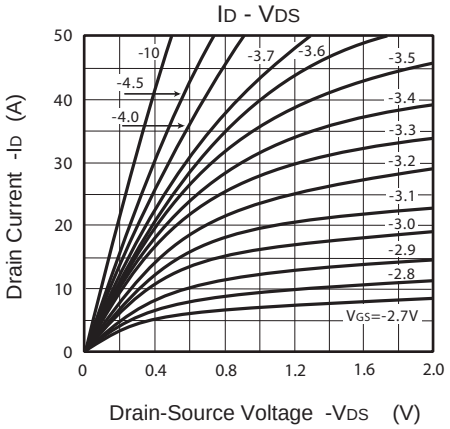
a.Surface Mounted on FR4 Board,t ≤ 10sec.

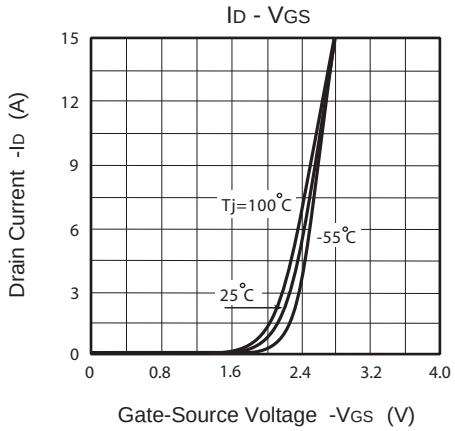
b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.

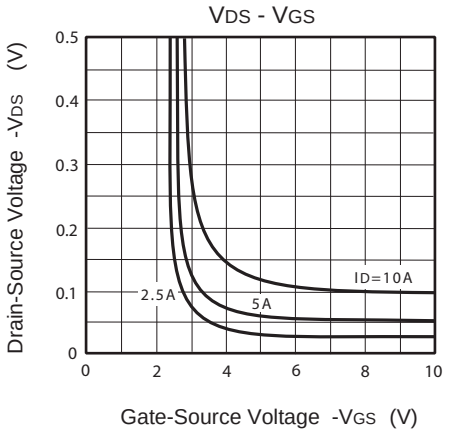
c.Guaranteed by design, not subject to production testing.

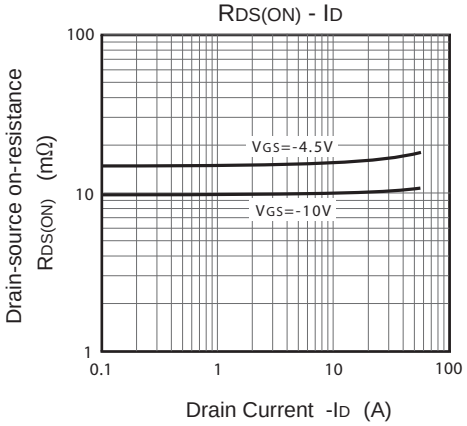
d.Starting T_J=25°C,L=0.5mH,V_{DD} = 20V.(See Figure13)

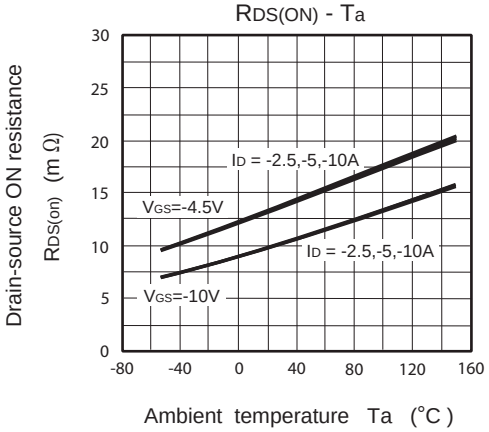

ID - VDS
Drain Current -ID (A)
Drain-Source Voltage -VDS (V)
-10
-4.5
-4.0
-3.5
-3.2
-3.1
-3.0
-2.9
-2.8
-2.7
VGS=-2.6V

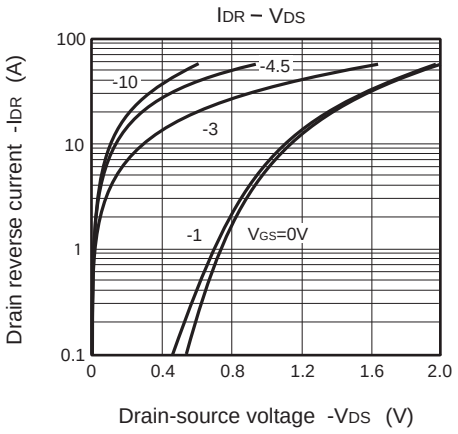

ID - VDS
Drain Current -ID (A)
Drain-Source Voltage -VDS (V)
-10
-4.5
-4.0
-3.7
-3.6
-3.5
-3.4
-3.3
-3.2
-3.1
-3.0
-2.9
-2.8
VGS=-2.7V

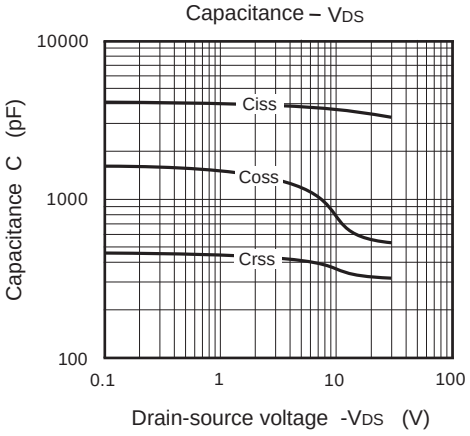

ID - VGS
Drain Current -ID (A)
Gate-Source Voltage -VGS (V)
Tj=100℃
-55℃
25℃

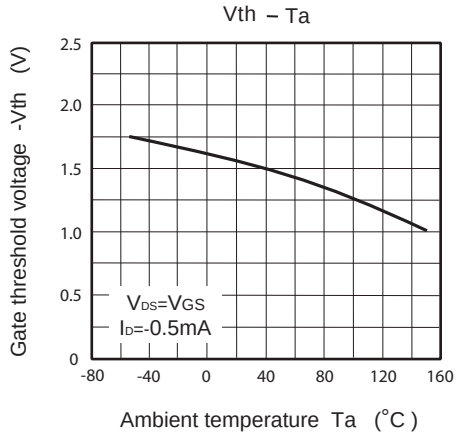

VDS - VGS
Drain-Source Voltage -VDS (V)
Gate-Source Voltage -VGS (V)
ID=10A
2.5A
5A

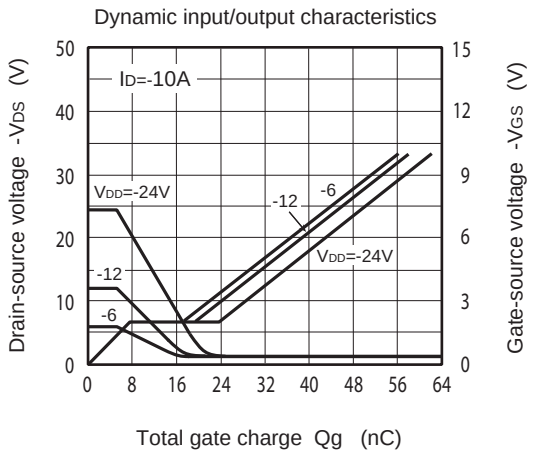

RDS(ON) - ID
Drain-source on-resistance RDS(ON) (mΩ)
Drain Current -ID (A)
VGS=-4.5V
VGS=-10V

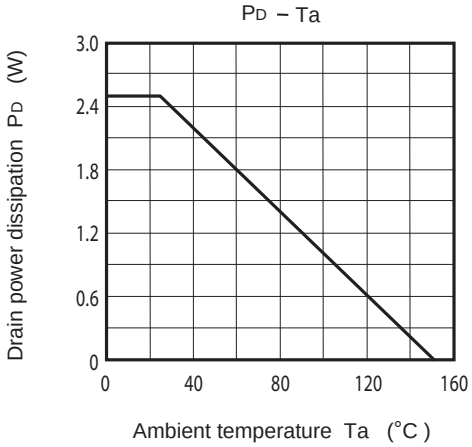

RDS(ON) - Ta
Drain-source ON resistance RDS(on) (m Ω)
Ambient temperature Ta (°C)
ID = -2.5,-5,-10A
VGS=-4.5V
ID = -2.5,-5,-10A
VGS=-10V


IDR – VDS
Drain reverse current -IDR (A)
100
10
1
0.1
-10
-4.5
-3
-1
VGS=0V
0
0.4
0.8
1.2
1.6
2.0
Drain-source voltage -VDS (V)

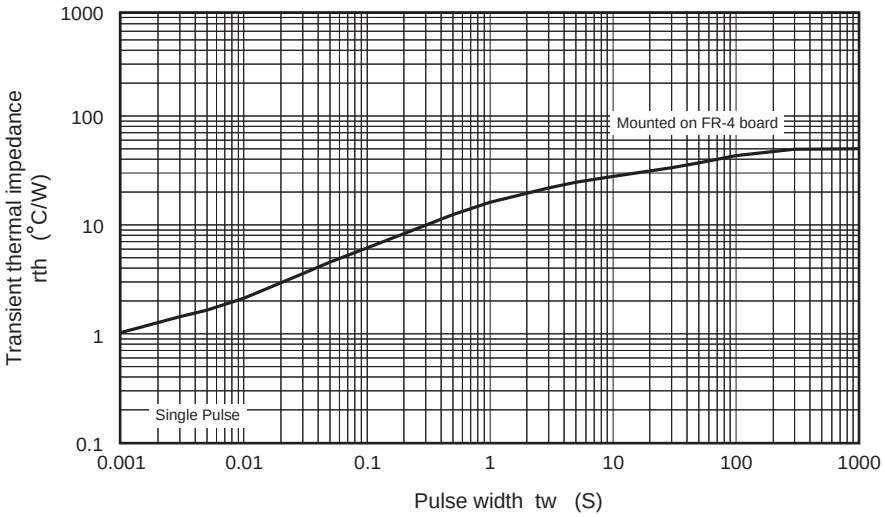

Capacitance – VDS
Capacitance C (pF)
10000
1000
100
Ciss
Coss
Crss
0.1
1
10
100
Drain-source voltage -VDS (V)


Vth – Ta
Gate threshold voltage -Vth (V)
2.5
2.0
1.5
1.0
0.5
0
VDS=VGS
ID=-0.5mA
-80
-40
0
40
80
120
160
Ambient temperature Ta (°C)

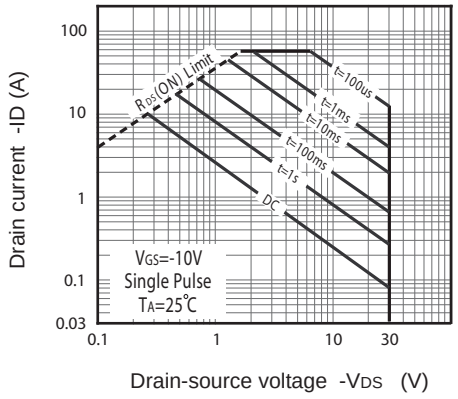

Dynamic input/output characteristics
Drain-source voltage -VDS (V)
Gate-source voltage -VGS (V)
ID=-10A
VDD=-24V
-12
-6
VDD=-24V
-12
-6
50
40
30
20
10
0
15
12
9
6
3
0
0
8
16
24
32
40
48
56
64
Total gate charge Qg (nC)


PD – Ta
Drain power dissipation PD (W)
3.0
2.4
1.8
1.2
0.6
0
0
40
80
120
160
Ambient temperature Ta (°C)

rth - tw

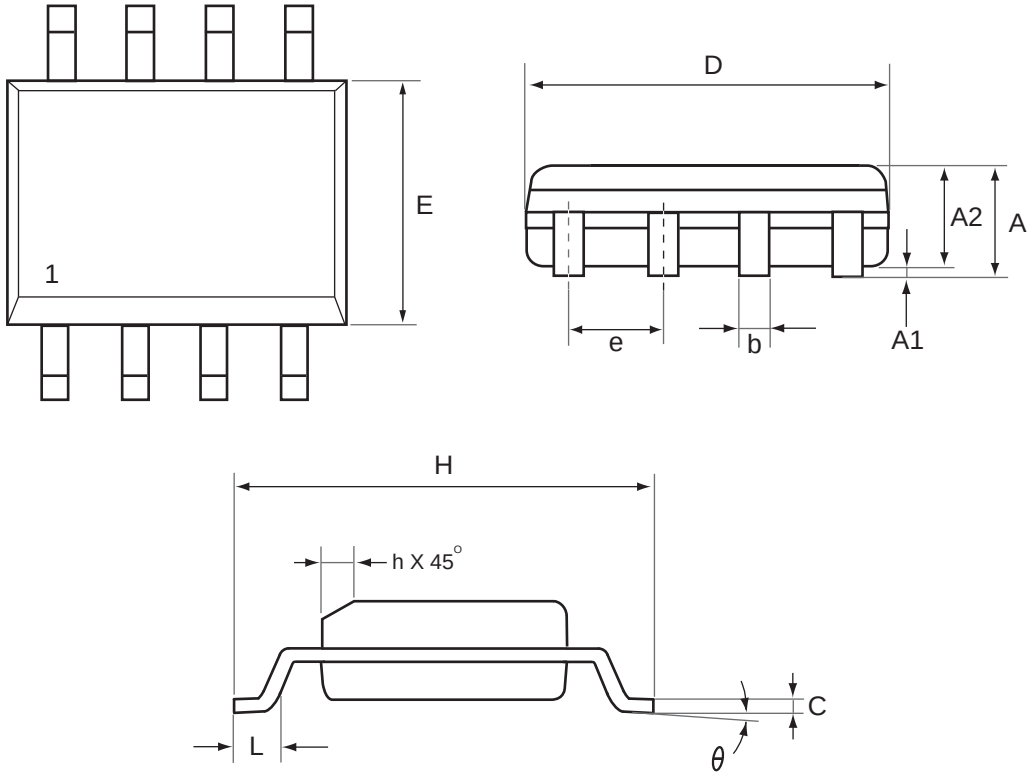


Safe operating area



PACKAGE OUTLINE DIMENSIONS

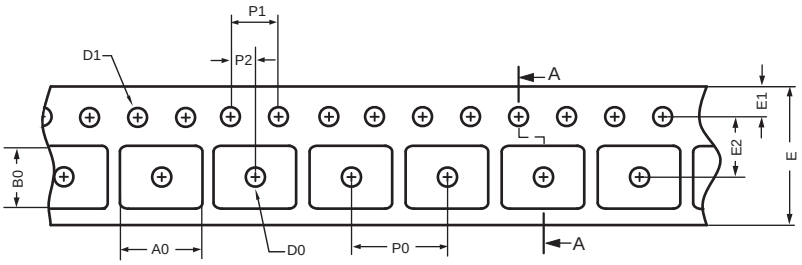
SO-8

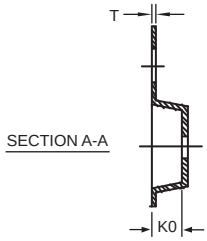


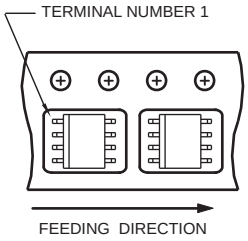
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.63	0.049	0.064
b	0.31	0.51	0.012	0.020
C	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	3.70	4.00	0.146	0.157
e	1.27 REF.		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°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

SO-8 Tape and Reel Data

SO-8 Carrier Tape



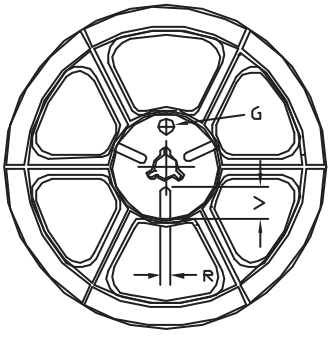


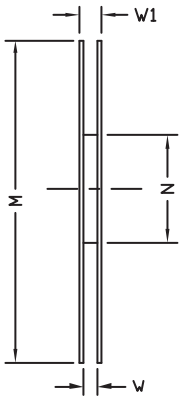


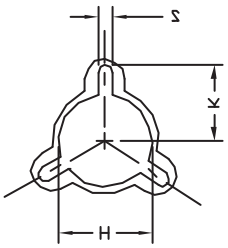
unit:㎜

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