SamHop Microelectronics Corp.

SC8270S

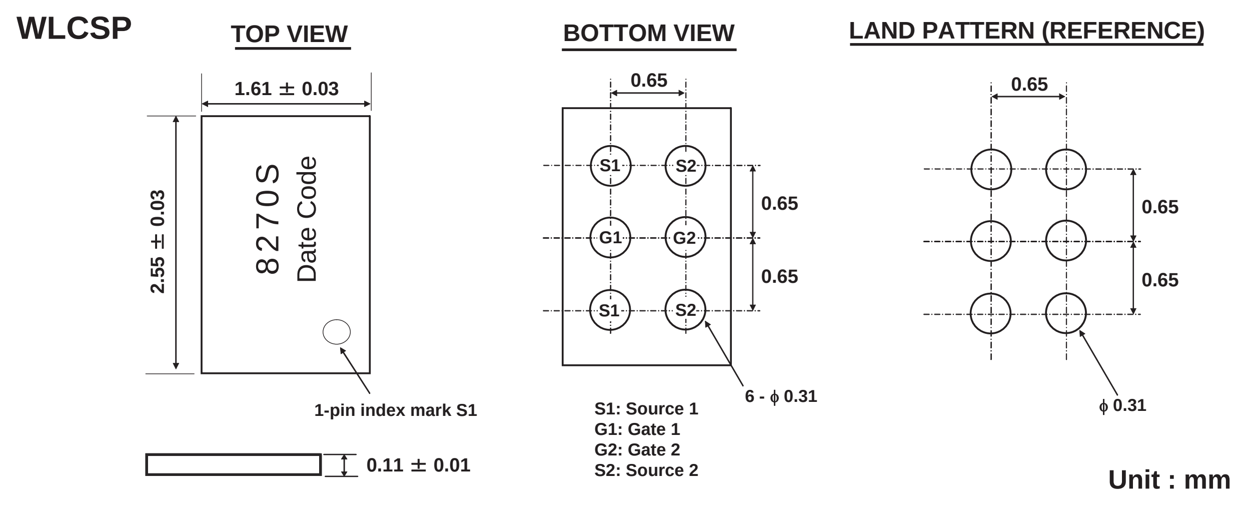
Preliminary

Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
VSSS	IS	RSS(ON) (mΩ) Max
24V	9A	10.2 @ VGS=4.5V
		10.5 @ VGS=4.0V
		11.5 @ VGS=3.8V
		12.0 @ VGS=3.1V
		14.0 @ VGS=2.5V

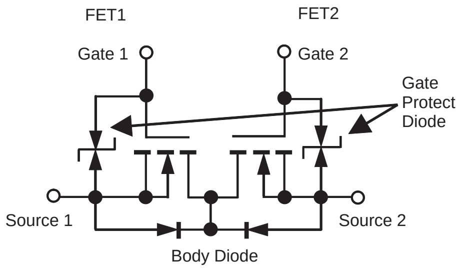
FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- Wafer level CSP.
- ESD Protected.



ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Symbol	Parameter	Limit	Units
V_{SSS}	Source-Source Voltage	24	V
V_{GSS}	Gate-Source Voltage	±12	V
I_S	Source Current-Continuous [a]	9	A
I_{SP}	-Pulsed [b]	90	A
P_T	Total Power Dissipation [a]	1.3	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{SSS}	Source-Source Breakdown Voltage	V_{GS}=0V , I_S=250uA	24			V
I_{SSS}	Zero Gate Voltage Source Current	V_{SS}=24V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±8V , V_{SS}=0V			±1	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{SS}=V_{GS} , I_S=1mA	0.5	0.8	1.5	V
$R_{SS(ON)}$	Source-Source On-State Resistance	V_{GS}=4.5V , I_S=2A	6.0	8.2	10.2	m ohm
		V_{GS}=4.0V , I_S=2A	6.2	8.5	10.5	m ohm
		V_{GS}=3.8V , I_S=2A	6.6	9.0	11.5	m ohm
		V_{GS}=3.1V , I_S=2A	7.0	9.5	12.0	m ohm
		V_{GS}=2.5V , I_S=2A	8.0	11.0	14.0	m ohm
g_{FS}	Forward Transconductance	V_{SS}=5V , I_S=2A		14		S
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=24V I_S=2A V_{GS}=4.0V R_{GEN}=6 ohm		430		ns
t_r	Rise Time			1700		ns
$t_{D(OFF)}$	Turn-Off Delay Time			5390		ns
t_f	Fall Time			3970		ns
Q_g	Total Gate Charge	V_{DD}=24V,I_S=4A, V_{G1S1}=4.0V		23		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{FSS}	Diode Forward Voltage	V_{GS}=0V,I_S=2A		0.77	1.2	V

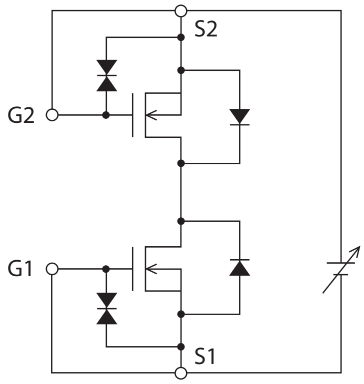
Note

a.Mounted on FR4 board of 25.4mm x 25.4mm x 1.6mm.

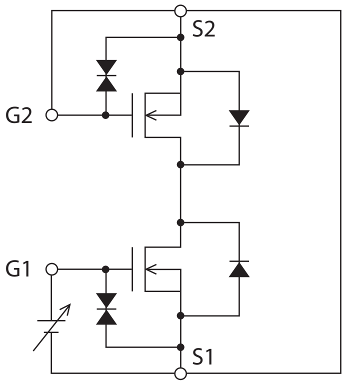
b.Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.

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

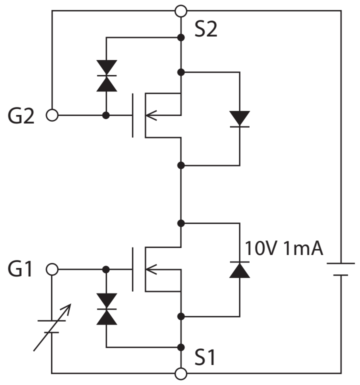
V_{SSS} / I_{SSS}



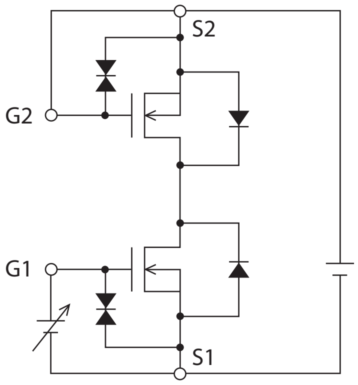
I_{GSS} (+) / (--)



V_{GS} (off)

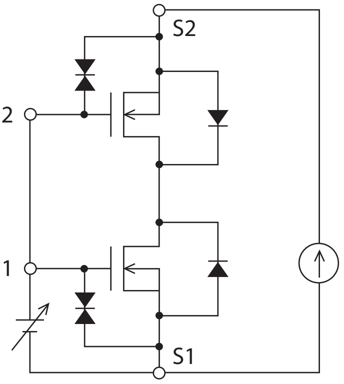


| yfs |

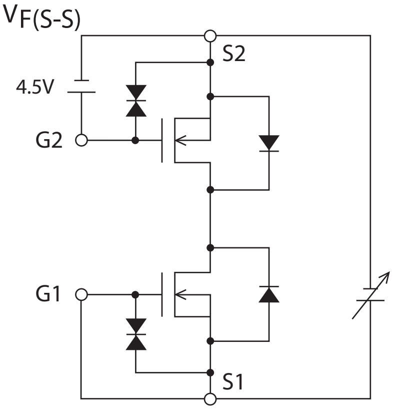


* Note: Connect the mesurement terminal reversely
if you want to measure the FET2 side.

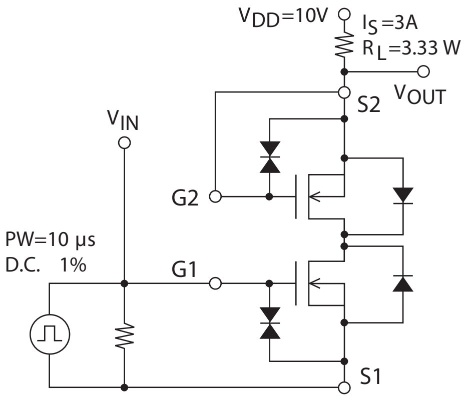
R_{SS} (on)



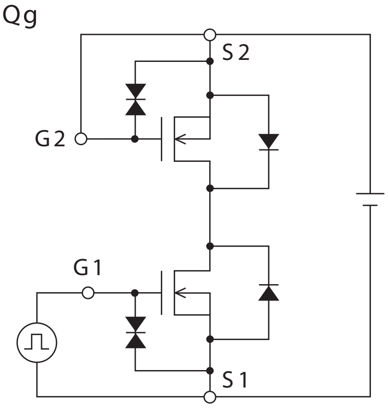
$V_{F(S-S)}$



t_d(on), t_r, t_d(off), t_f

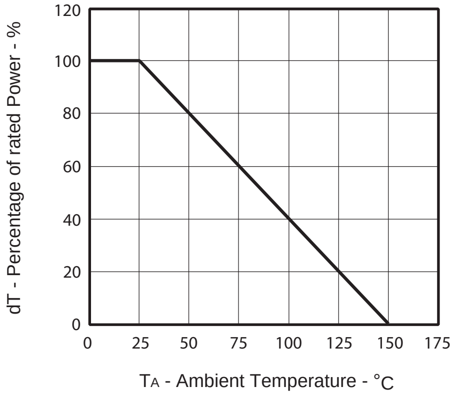


Qg

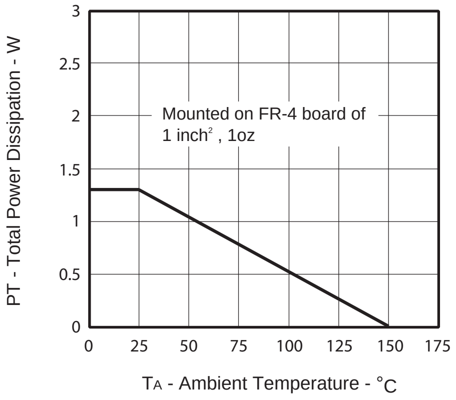


* Note: Connect the mesurement terminal reversely
if you want to measure the FET2 side.

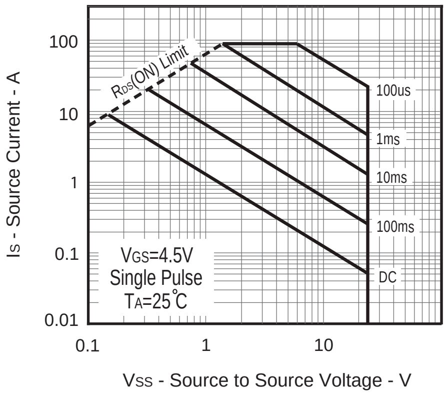
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



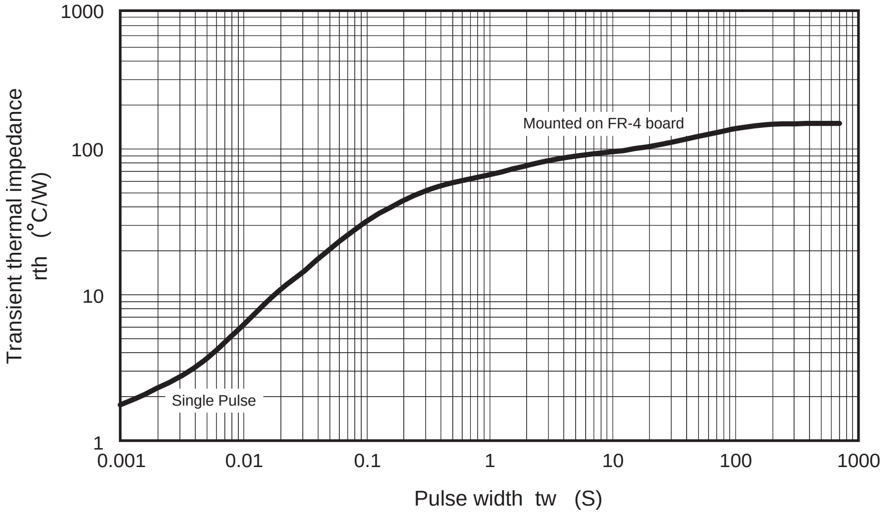
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

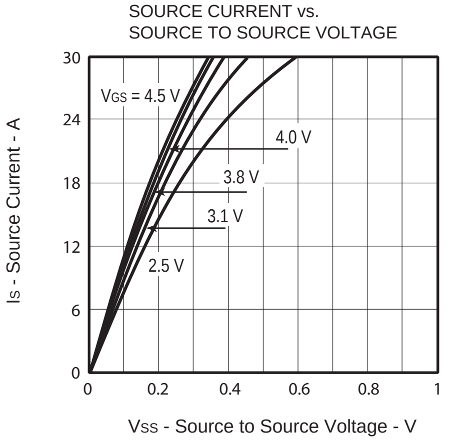


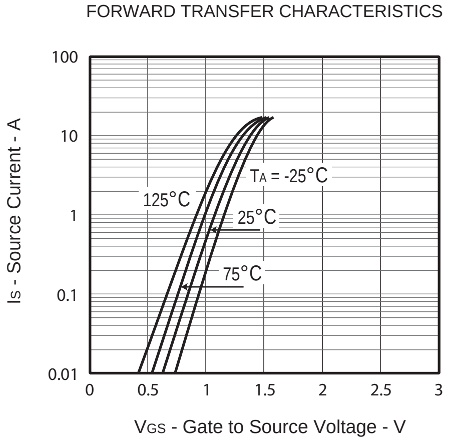
FORWARD BIAS SAFE OPERATING AREA

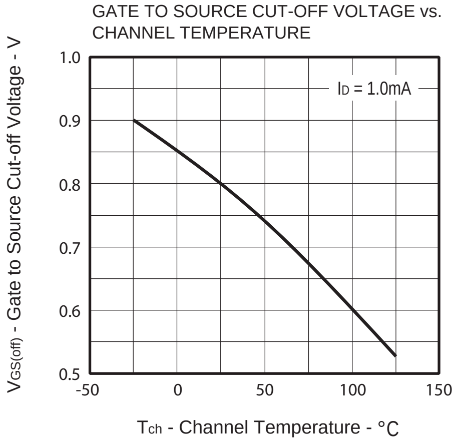


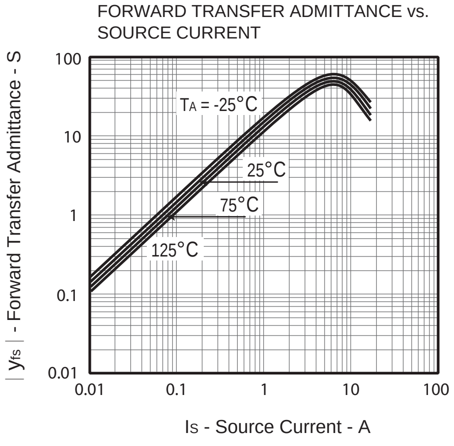
rth - tw

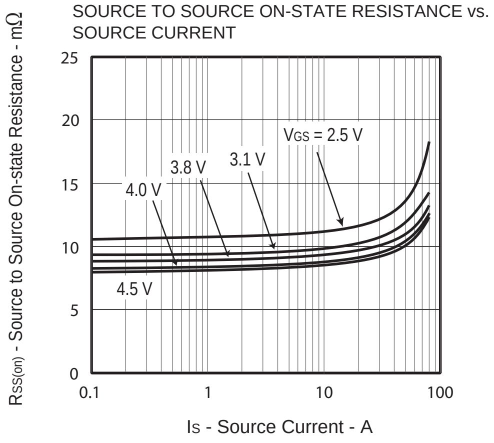


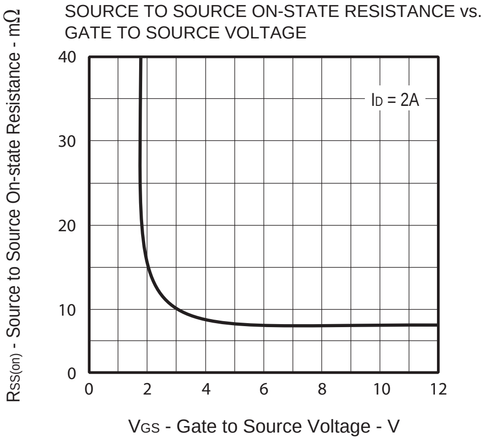

SOURCE CURRENT vs.
SOURCE TO SOURCE VOLTAGE
VGS = 4.5 V
4.0 V
3.8 V
3.1 V
2.5 V
30
24
18
12
6
0
0
0.2
0.4
0.6
0.8
1
Is - Source Current - A
VSS - Source to Source Voltage - V


FORWARD TRANSFER CHARACTERISTICS
TA = -25°C
25°C
75°C
125°C
100
10
1
0.1
0.01
0
0.5
1
1.5
2
2.5
3
Is - Source Current - A
VGS - Gate to Source Voltage - V

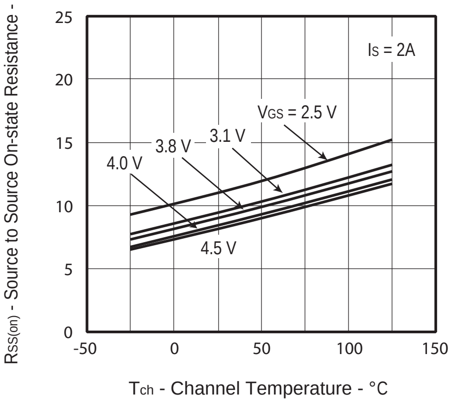

GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE
ID = 1.0mA
1.0
0.9
0.8
0.7
0.6
0.5
-50
0
50
100
150
VGS(off) - Gate to Source Cut-off Voltage - V
Tch - Channel Temperature - °C


FORWARD TRANSFER ADMITTANCE vs.
SOURCE CURRENT
TA = -25°C
25°C
75°C
125°C
100
10
1
0.1
0.01
0.01
0.1
1
10
100
| yfs | - Forward Transfer Admittance - S
Is - Source Current - A

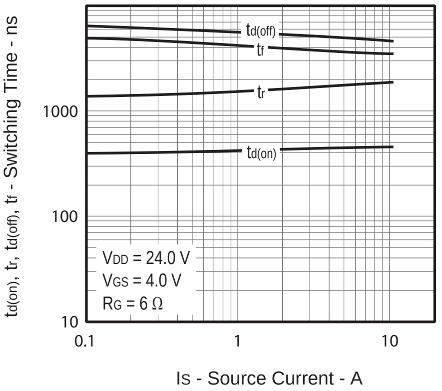

SOURCE TO SOURCE ON-STATE RESISTANCE vs.
SOURCE CURRENT
VGS = 2.5 V
3.1 V
3.8 V
4.0 V
4.5 V
25
20
15
10
5
0
0.1
1
10
100
RSS(on) - Source to Source On-state Resistance - mΩ
Is - Source Current - A


SOURCE TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE
ID = 2A
40
30
20
10
0
0
2
4
6
8
10
12
RSS(on) - Source to Source On-state Resistance - mΩ
VGS - Gate to Source Voltage - V

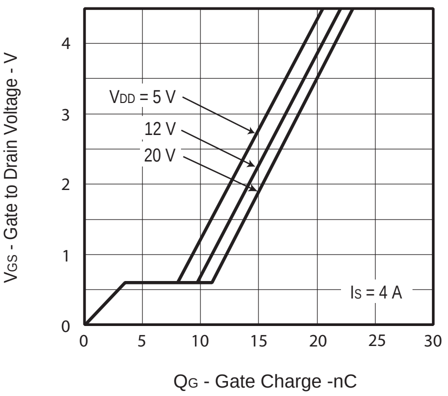
SOURCE TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



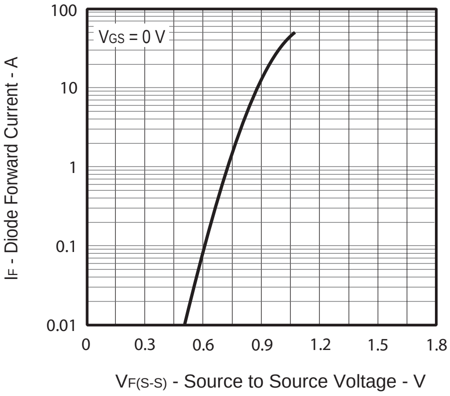
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



TOP MARKING DEFINITION

WLCSP