

Product Summary

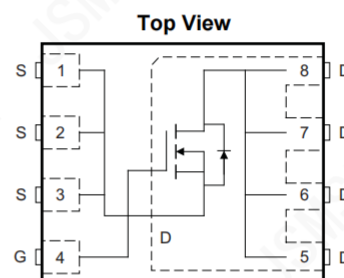
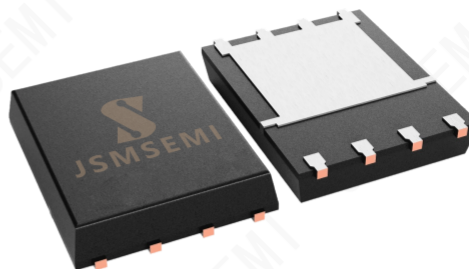
- V_{DS} 40V
- I_D 200A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<1.4m\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $<2.6m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor



■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	40	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^\circ\text{C}$	I_D	60	A
	$T_A=100^\circ\text{C}$		25	
	$T_C=25^\circ\text{C}$		200	
	$T_C=100^\circ\text{C}$		141	
Pulsed Drain Current ^A		I_{DM}	800	A
Avalanche energy ^B		EAS	450	mJ
Total Power Dissipation ^C	$T_A=25^\circ\text{C}$	P_D	2.2	W
	$T_A=100^\circ\text{C}$		0.9	
	$T_C=25^\circ\text{C}$		114	
Junction and Storage Temperature Range		T_J, T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	$R_{\theta JA}$	45	55	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.0	1.1	

■ Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	40	-	-	V
		V _{GS} = 0V, I _D =1mA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1	μA
		V _{DS} =40V, V _{GS} =0V, T _j =150°C	-	-	100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.3	1.7	2.3	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =50A	-	1.1	1.4	mΩ
		V _{GS} =4.5V, I _D =25A	-	1.7	2.6	
Diode Forward Voltage	V _{SD}	I _S =50A, V _{GS} =0V	-	-	1.2	V
Gate resistance	R _G	f=1MHz	-	3.5	-	Ω
Maximum Body-Diode Continuous Current	I _S		-	-	180	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1MHz	-	5500	-	pF
Output Capacitance	C _{oss}		-	1850	-	
Reverse Transfer Capacitance	C _{rss}		-	65	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =20V, I _D =50A	-	87	-	nC
Gate-Source Charge	Q _{gs}		-	18	-	
Gate-Drain Charge	Q _{gd}		-	15	-	
Reverse Recovery Charge	Q _{rr}	I _F =50A, di/dt=100A/us	-	53	-	nC
Reverse Recovery Time	t _{rr}		-	55	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =50A R _{GEN} =3Ω	-	14	-	ns
Turn-on Rise Time	t _r		-	15	-	
Turn-off Delay Time	t _{D(off)}		-	84	-	
Turn-off fall Time	t _f		-	44	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

 B. $T_J=25^{\circ}\text{C}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$

 C. P_d is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

■ Typical Electrical and Thermal Characteristics Diagrams

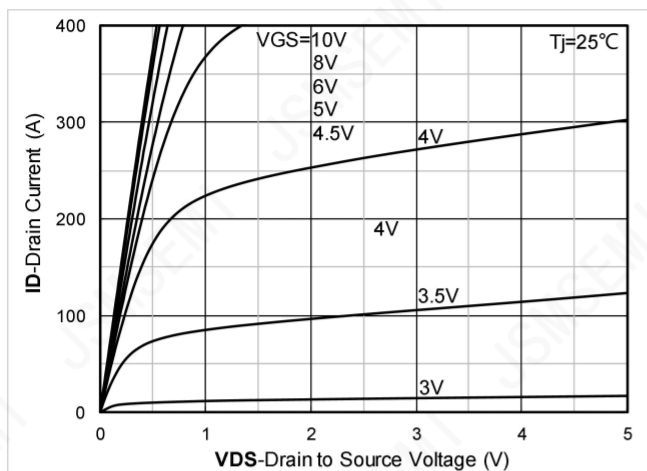


Figure 1. Output Characteristics

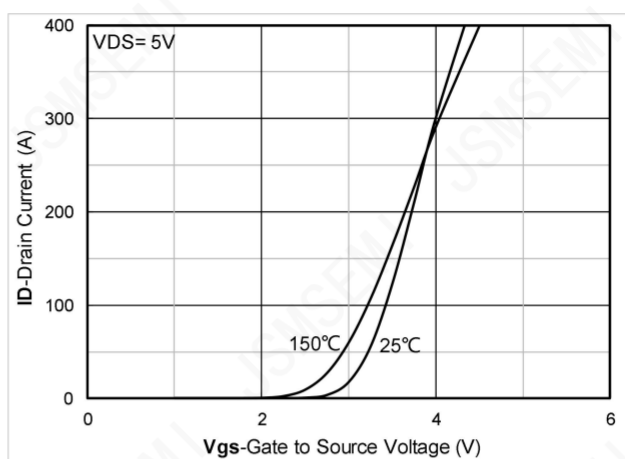


Figure 2. Transfer Characteristics

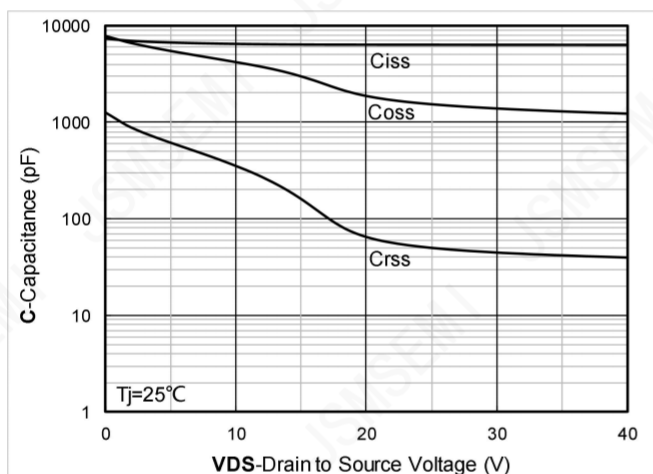


Figure 3. Capacitance Characteristics

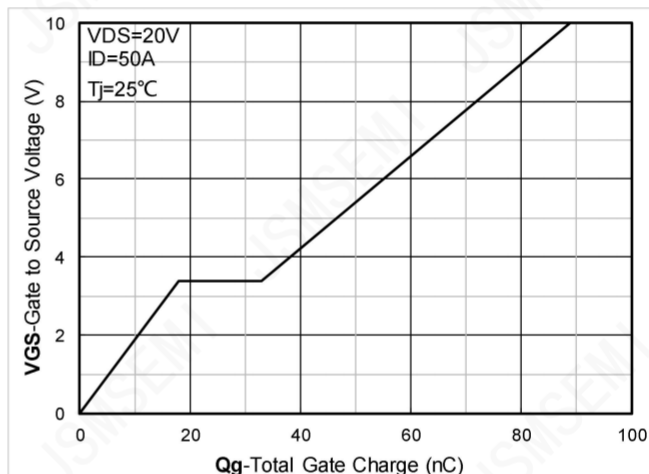


Figure 4. Gate Charge

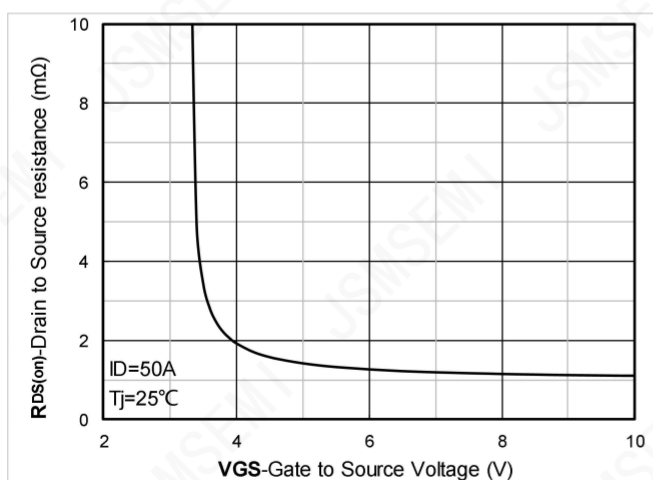


Figure 5. On-Resistance vs Gate to Source Voltage

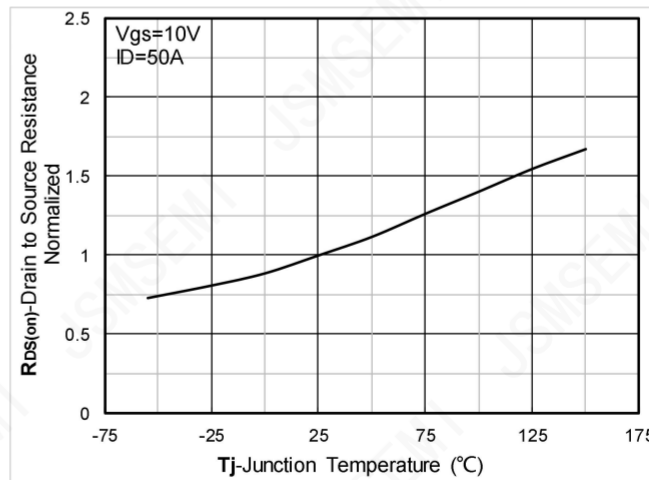


Figure 6. Normalized On-Resistance

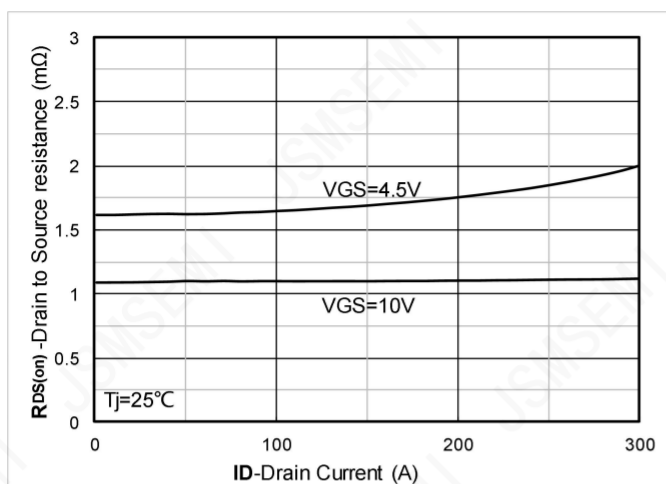


Figure 7. $R_{DS(on)}$ VS Drain Current

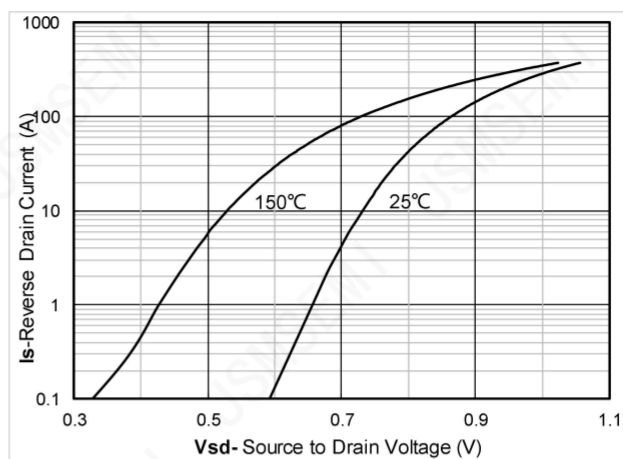


Figure 8. Forward characteristics of reverse diode

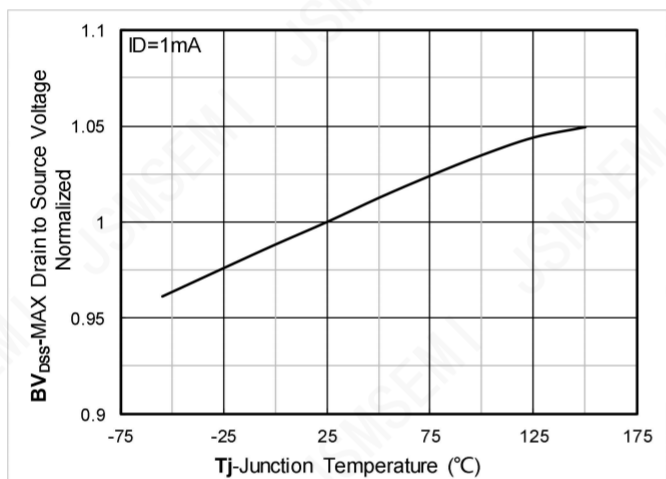


Figure 9. Normalized breakdown voltage

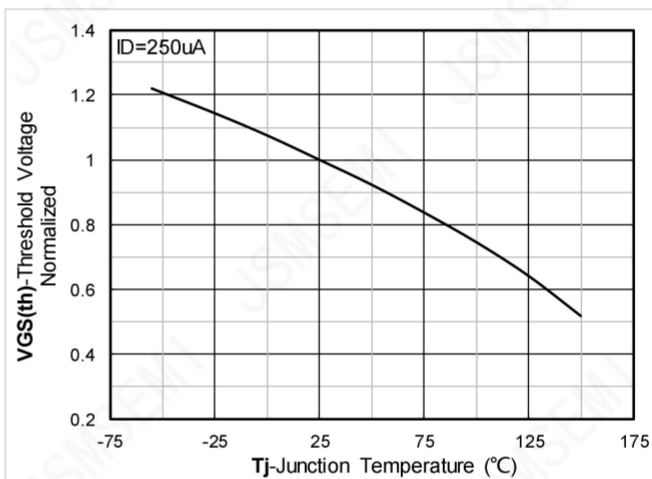


Figure 10. Normalized Threshold voltage

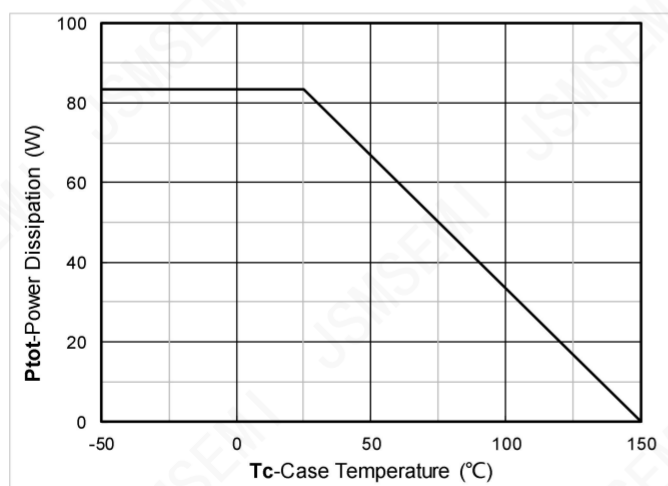


Figure 11. Power dissipation

40V N-Channel Enhancement Mode MOSFET

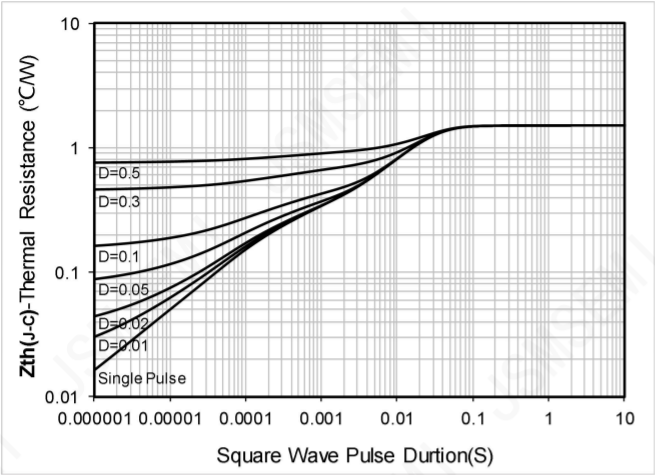


Figure 12. Maximum Transient Thermal Impedance

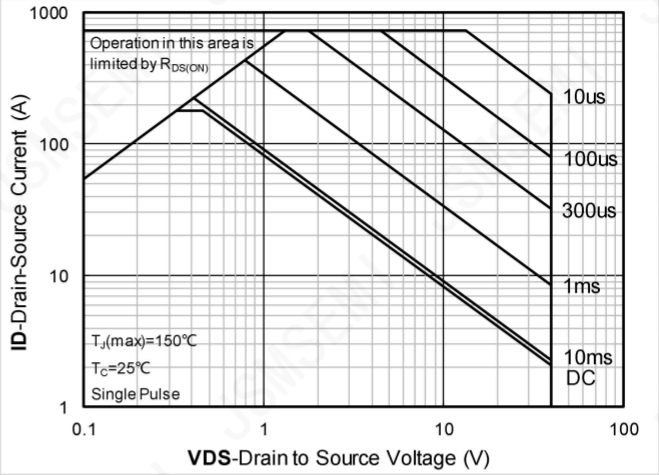


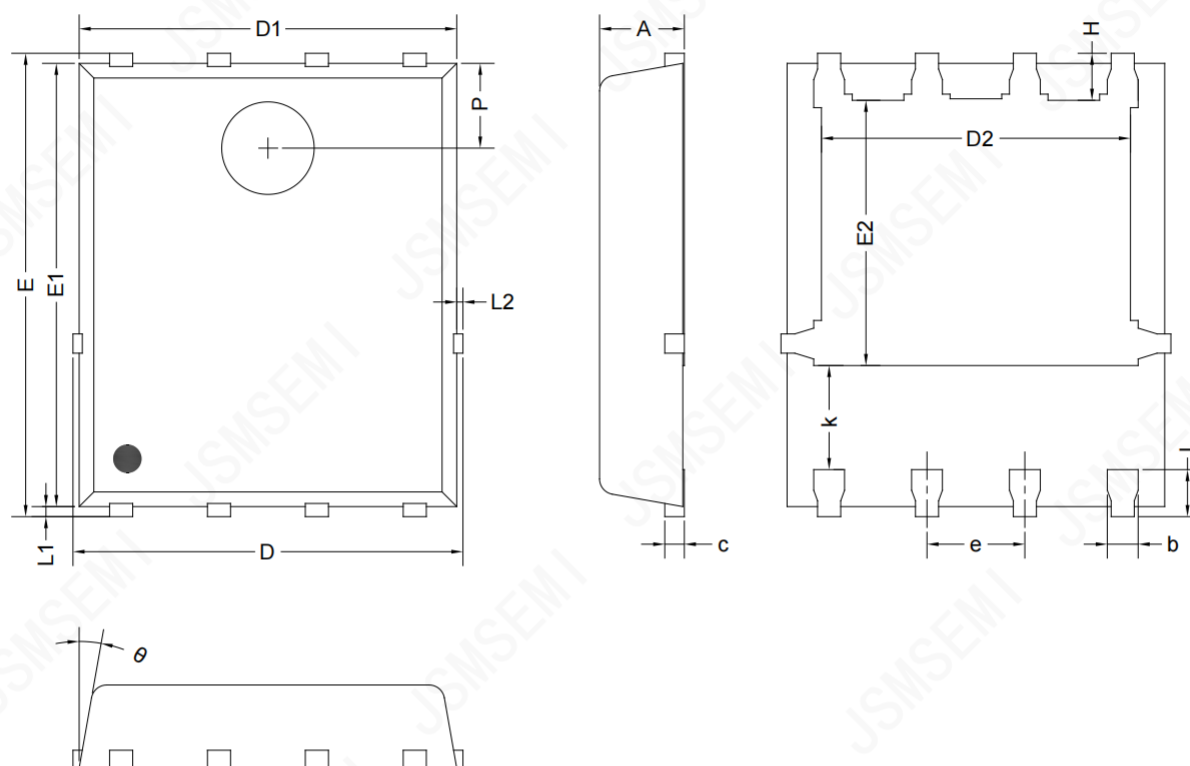
Figure 13. Safe Operation Area

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
SBSC019N04NSGATMA1	DFN5060-8L	014N04QG5	-55 to 150°C	1	T&R,5000	Rohs

Package Information

PDFN5060-8L



Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	1.000	1.100	1.200
b	0.350	0.400	0.450
c	0.210	0.250	0.340
D	4.800	-	5.100
D1	4.800	4.900	5.000
D2	3.910	4.010	4.110
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.340	3.440	3.540
e	1.270 BSC		
H	0.510	0.610	0.710
k	1.100	-	-
L	0.510	0.610	0.710
L1	0.060	0.130	0.200
L2	-	-	0.100
P	1.000	1.100	1.200
θ	8°	10°	12°

NOTE: This drawing is subject to change without notice.