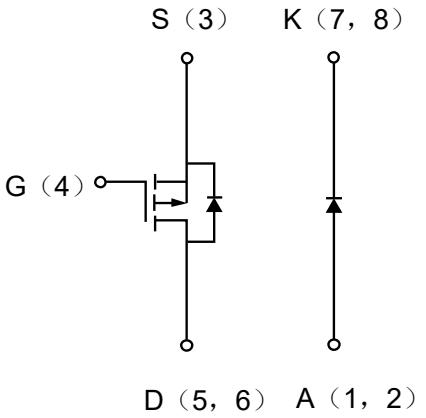
P-Channel 1.8-V (G-S) MOSFET with Schottky Diode

Description

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(Ω)	I_D(A)
-20	0.110 @ V_{GS}=-4.5V	-2.8
	0.160 @ V_{GS}=-2.5V	-2.0
	0.240 @ V_{GS}=-1.8V	-1.8

Schottky Product Summary		
V_{KA}(V)	V_F(V)	I_F(A)
20	0.48V @ 0.5A	1.0



Electrical characteristics per line@25℃(unless otherwise specified)

Parameter		Symbol	Value	Units
Drain-Source Voltage (MOSFET and Schottky)		V_{DS}	-20	V
Reverse Voltage (Schottky)		V_{KA}	20	
Gate-Source Voltage (MOSFET)		V_{GS}	± 10	
Continuous Drain Current (MOSFET)	T_J=25°C	I_D	-2.8	A
	T_J=85°C		-1.9	
Pulsed Drain Current (MOSFET)		I_{DM}	-10	
Continuous Source Current (MOSFET Diode Conduction)		I_S	-0.9	
Average Forward Current (Schottky)		I_F	1.0	
Pulsed Forward Current (Schottky)		I_{FM}	7	
Maximum Power Dissipation (MOSFET)	T_J=25°C	P_D	1.1	W
	T_J=85°C		0.6	
Maximum Power Dissipation (Schottky)	T_J=25°C		0.96	
	T_J=85°C		0.59	
Operating Junction and Storage Temperature Range		T_J,T_{stg}	-55 ~ 150	°C
Soldering Recommendation (Peak Temperature)		T_{PS}	260	°C

Absolute maximum ratings@25℃

Parameter		Condition	Symbol	Typical	Maximum	Unit
Thermal Resistance (Junction to Ambient)	MOSFET	t ≤ 5sec	R_{thJA}	50	60	°C/W
	Schottky			77	95	
	MOSFET	Steady State		90	110	
	Schottky			110	130	
Thermal Resistance (Junction to Pin)	MOSFET	Steady State	R_{thJP}	30	40	
	Schottky			33	40	

MOSFET Specifications (T_J=25℃ Unless Otherwise Noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.45			V
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
		V_{DS}=-16V, V_{GS}=0V, T_J=85°C			-5	
On-State Drain Current	I_D(on)	V_{DS}≤-5V, V_{GS}=-4.5V	-2			A
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-2.8A		0.095	0.110	Ω
		V_{GS}=-2.5V, I_D=-2.0A		0.140	0.160	
		V_{GS}=-1.8V, I_D=-1.8A		0.200	0.240	
Forward Tran Conductance	gfs	V_{DS}=-10V, I_D=-2.8A		7		S
Diode Forward Voltage	V_{SD}	I_S=-0.9A, V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-10V		4.2	6.0	nC
Gate-Source Charge	Q_{gs}	V_{GS}=-4.5V		1.3		
Gate-Drain Charge	Q_{gd}	I_D=-2.8A		0.60		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-10V, R_L=10Ω		15	23	ns
Rise Time	t_r	I_D=-1A		28	42	
Turn-Off Delay Time	$t_{d(off)}$	V_{GEN}=-4.5V, RG=6Ω		28	42	
Fall Time	t_f			25	38	
Source-Drain Reverse Recovery Time	t_{rr}	I_F=-0.9A, di/dt=100A/μs		20	40	

Schottky Specifications (T_J=25℃ Unless Otherwise Noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V_F	I_F=0.5A		0.43	0.48	V
		I_F=0.5A, T_J=125°C		0.33	0.4	
Maximum Reverse Leakage Current	I_{rm}	Vr=20V		0.002	0.100	mA
		Vr=20V, T_J=85°C		0.10	1	
		Vr=20V, T_J=125°C		1.5	10	
Junction Capacitance	C_T	Vr=10V		31		pF

Typical Characteristics

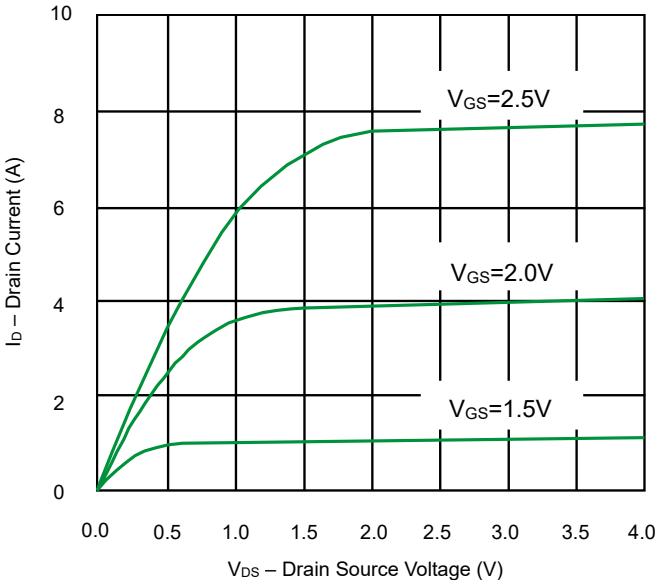


Fig 1. Output Characteristics

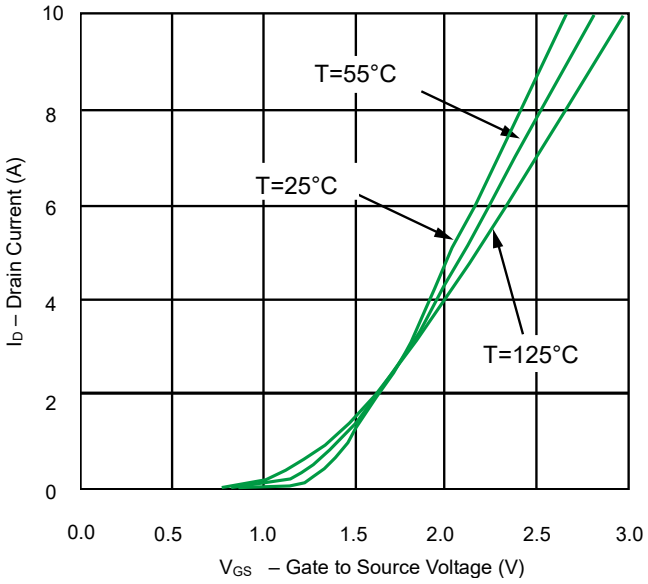


Fig 2. Transfer Characteristics

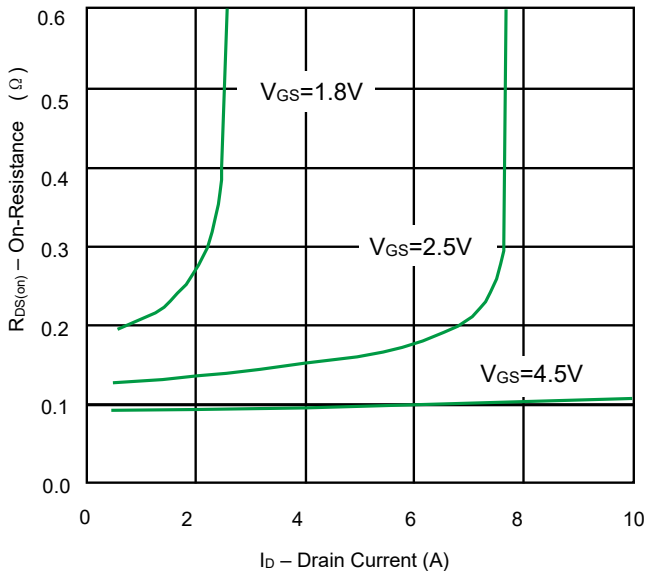


Fig 3. On-Resistance vs. Drain Current

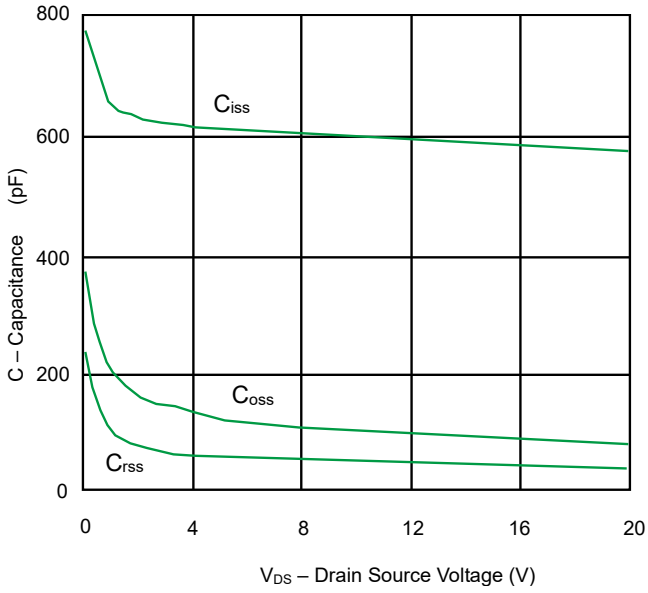
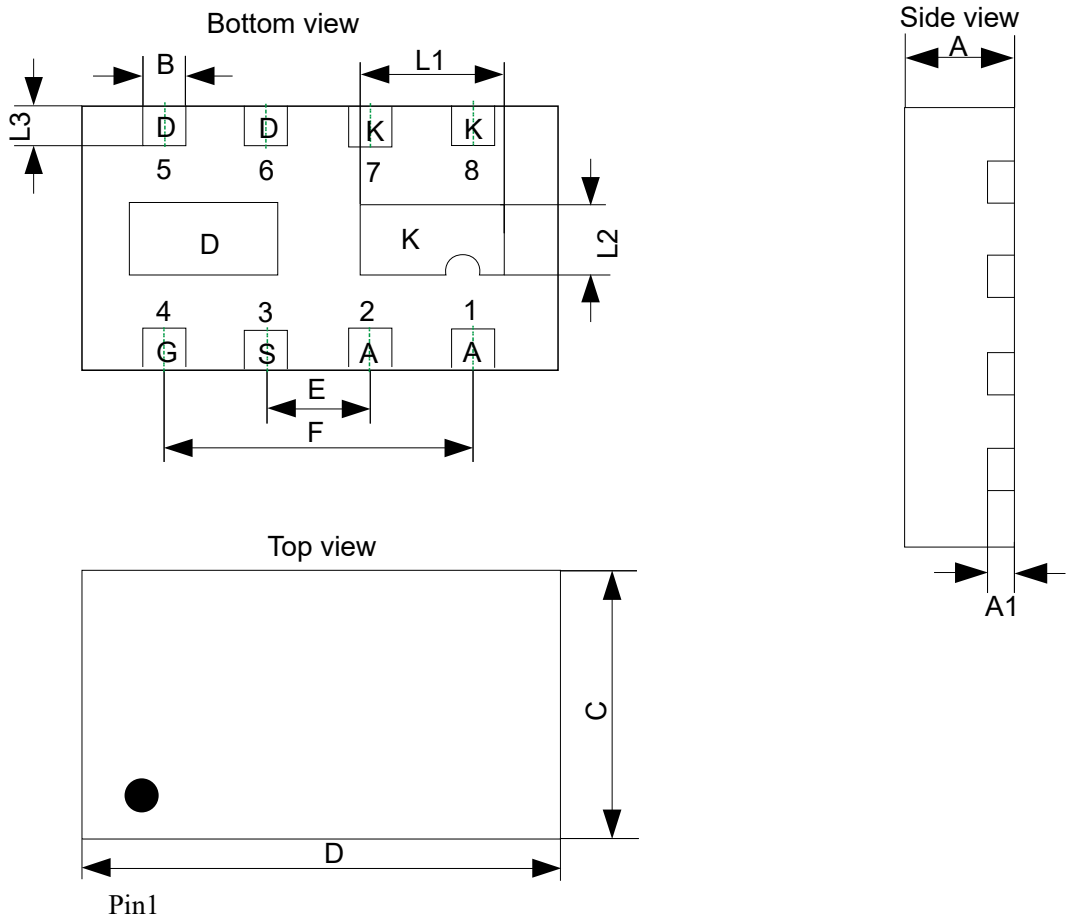


Fig 4. Capacitance

Product dimension (DFN3*2-8L)



Dim	Millimeters		
	MIN	Typ	MAX
A	0.550	0.600	0.650
A1	0.108	0.131	0.154
B	0.230	0.280	0.330
C	1.950	2.000	2.050
D	2.950	3.000	3.050
E	0.600	0.650	0.700
F	1.900	1.950	2.000
L1	0.820	0.920	1.020
L2	0.430	0.530	0.630
L3	0.250	0.300	0.350

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