FORSEMI FS4477B

P-Channel -20V (D-S) MOSFET

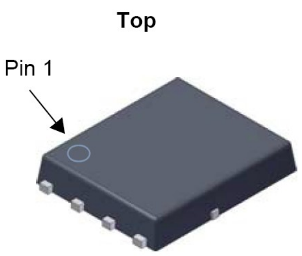
● FEATURES

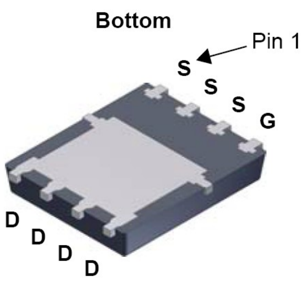
RDS(ON)≦9mΩ@VGS=-4.5V
RDS(ON)≦12mΩ@VGS=-2.5V
RDS(ON)≦18mΩ@VGS=-1.8V
high density cell design for extremely low RDS(ON)

● GENERAL DESCRIPTION

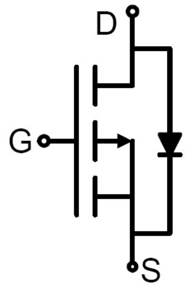
The FS4477B combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

● PIN CONFIGURATION





DFN3×3-8L



P-MOS

● Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Absolute Maximum Ratings TA=25°C unless otherwise noted				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		VDS	-20	V
Gate-Source Voltage		VGS	±8	V
Continuous Drain Current G	TC=25°C	ID	-40	A
	TC=100°C		-29	
Pulsed Drain Current C		IDM	-100	
Continuous Drain Current	TA=25°C	IDSM	-14.5	A
	TA=70°C		-11.5	
Avalanche Current C		IAS, IAR	-40	A
Avalanche energy L=0.1mH C		EAS, EAR	80	mJ
Power Dissipation B	TC=25°C	PD	29	W
	TC=100°C		12	
Power Dissipation A	TA=25°C	PDSM	3.1	W
	TA=70°C		2	
Junction and Storage Temperature Range		TJ, TSTG	-55 to 150	°C

* The device mounted on 1in2 FR4 board with 2 oz copper

Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250µA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V	-	-	1	µA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250µA	-0.3	-0.55	-0.9	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-14A V_{GS}=-2.5V, I_D=-13A V_{GS}=-1.8V, I_D=-11A	-	7.6 9.3 11.4	9 12 18	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-15A	-	20	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	3250	-	PF
Output Capacitance	C_{oss}		-	605	-	PF
Reverse Transfer Capacitance	C_{rss}		-	565	-	PF
Switching Characteristics(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V,I_D=-10A V_{GS}=-8V,R_{GEN}=6Ω	-	13	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	50	-	nS
Turn-Off Fall Time	t_f		-	14	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-10A, V_{GS}=-8V	-	84	-	nC
Gate-Source Charge	Q_{gs}		-	11.7	-	nC
Gate-Drain Charge	Q_{gd}		-	25	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V,I_S=-10A	-	-0.85	-1.2	V
Diode Forward Current(Note 2)	I_S		-	-	-50	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = -10A di/dt = 100A/µs(Note3)	-	-	45	nS
Reverse Recovery Charge	Q_{rr}		-	-	43	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

A. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R qJA t ≤ 10s value and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
B. The power dissipation PD is based on TJ(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
C. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial TJ=25°C.
D. The RqJA is the sum of the thermal impedance from junction to case RqJC and case to ambient.
E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.
F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of TJ(MAX)=150°C. The SOA curve provides a single pulse ratin g.
G. The maximum current rating is package limited.
H. These tests are performed with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in a still air environment with TA=25°C.

- **TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

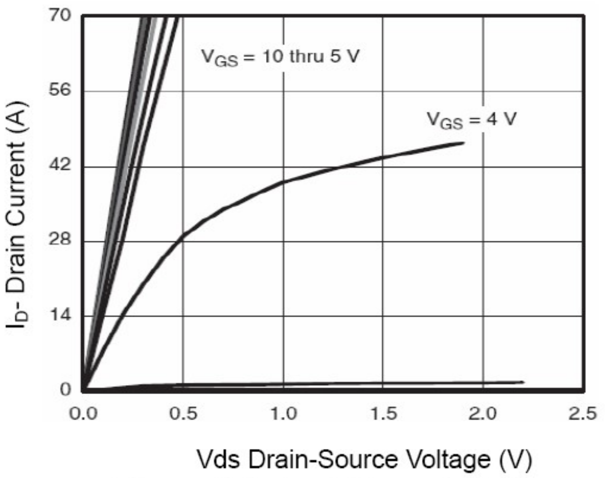


Figure 1 Output Characteristics

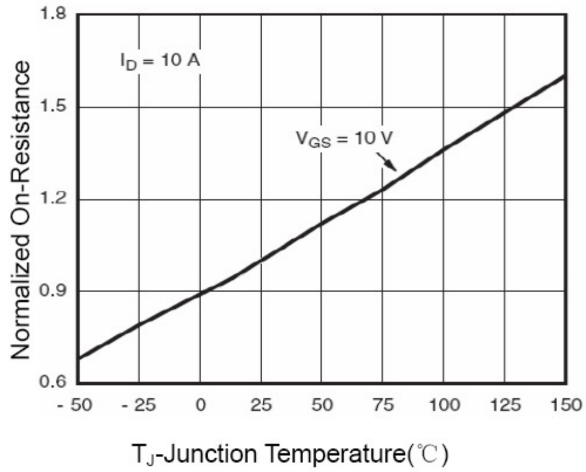


Figure 4 Rdson-Junction Temperature

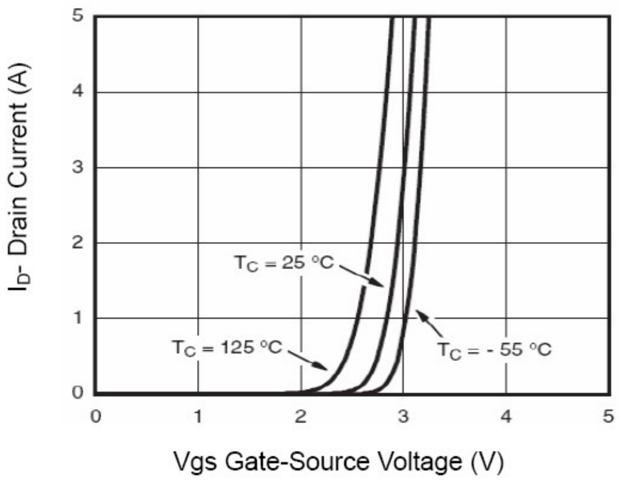


Figure 2 Transfer Characteristics

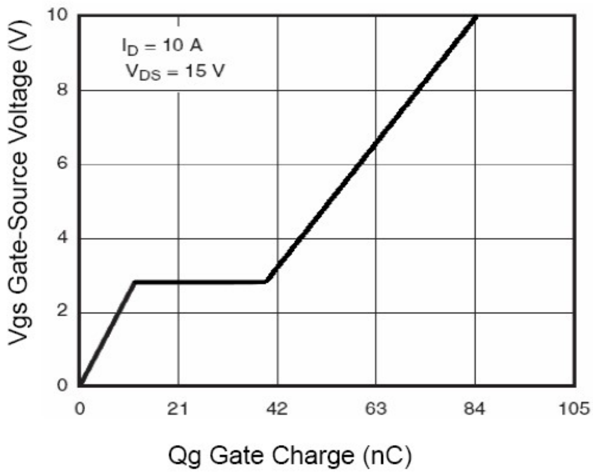


Figure 5 Gate Charge

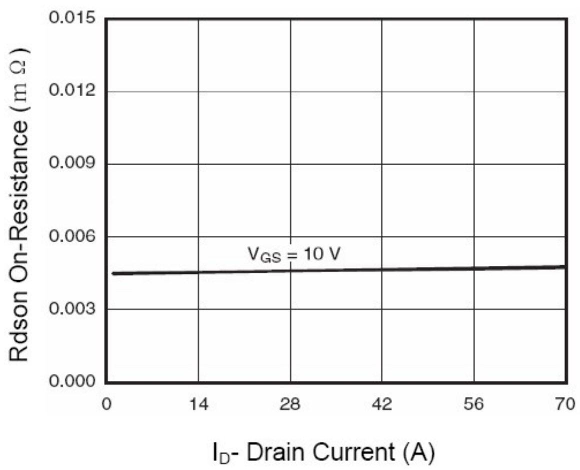


Figure 3 Rdson- Drain Current

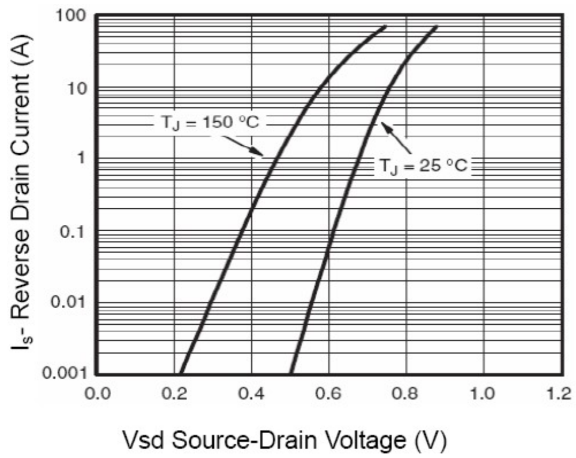
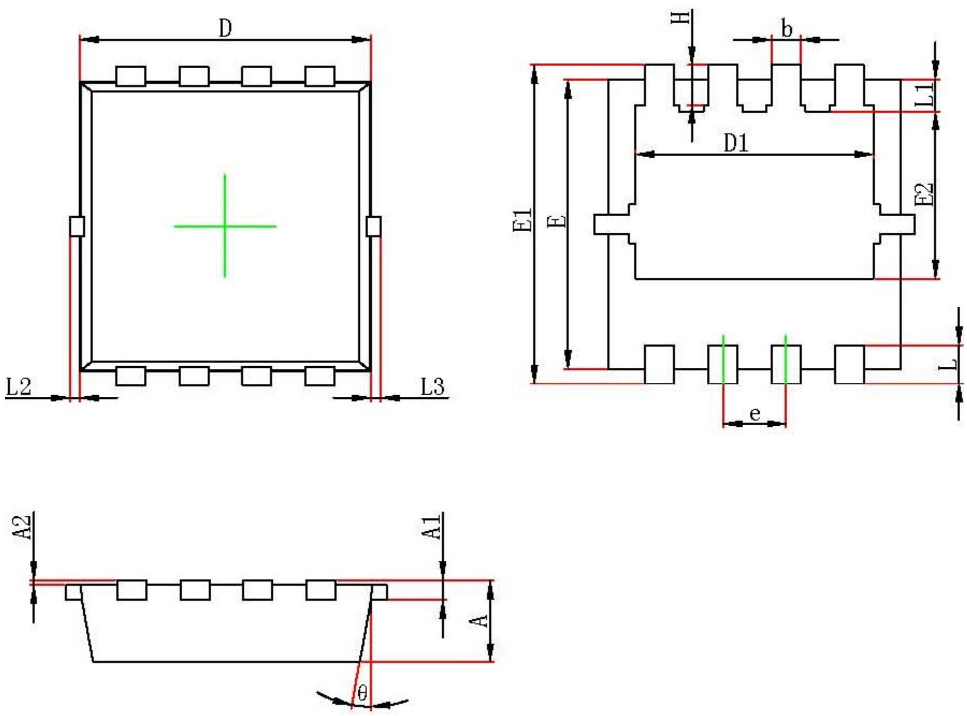


Figure 6 Source- Drain Diode Forward

- **PACKAGE DFN3×3-8L**



DFN3030-8L：mm			
Dim	**Min**	**Max**	**Typ**
A	0.65	0.85	0.75
A1	0.152Ref.		
A2	0	0.05	0.03
D	2.90	3.10	3.00
D1	2.24	2.54	2.39
E	2.90	3.10	3.00
E1	3.15	3.45	3.30
E2	1.23	1.64	1.43
e	0.55	0.75	0.65
b	0.20	0.40	0.30
L	0.30	0.50	0.40
L1	0.18	0.48	0.33
L2	0	0.10	0.05
L3	0	0.10	0.05
H	0.31	0.52	0.42
θ	9°	13°	11°