

Dual -20V(D-S) P MOSFET

● FEATURES

For Single Dice

$R_{DS(ON)} \leq 11m\Omega @ V_{GS} = -4.5V$

$R_{DS(ON)} \leq 15m\Omega @ V_{GS} = -2.5V$

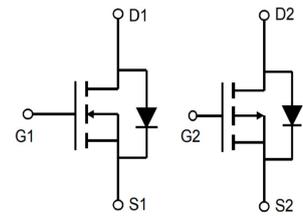
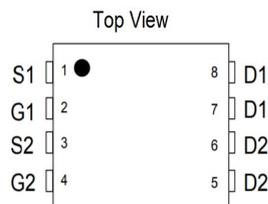
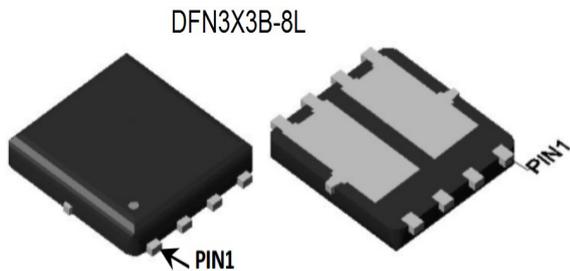
$R_{DS(ON)} \leq 20m\Omega @ V_{GS} = -1.8V$

high density cell design for extremely low $R_{DS(ON)}$

● GENERAL DESCRIPTION

The FS4479 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



● Absolute Maximum Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted for each single dice)

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

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

FS4479

● Electrical Characteristics (T_J=25°C unless otherwise noted for each single dice)

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 =-16A V _{GS} =-2.5V, I _D =-16A V _{GS} =-1.8V, I _D =-5A	-	9.5 13.4 17.5	11 15 20	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-15A	-	20	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	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}	T _J = 25°C, I _F = -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 R_{qJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =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 T_J(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 T_J(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
- D. The R_{qJA} is the sum of the thermal impedance from junction to case R_{qJC} 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 T_J(MAX)=150°C. The SOA curve provides a single pulse rating.
- 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 T_A=25°C.

FS4479

● TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

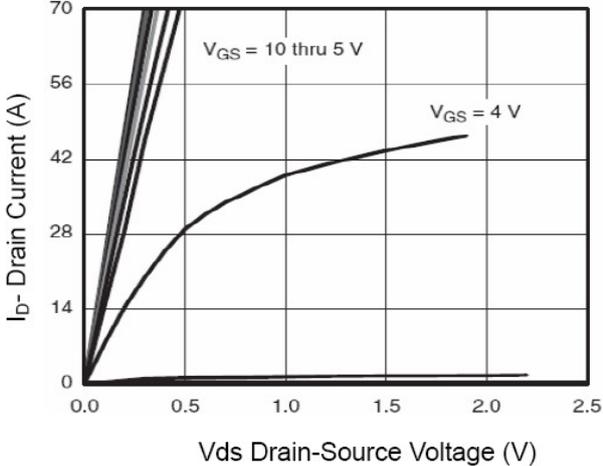


Figure 1 Output Characteristics

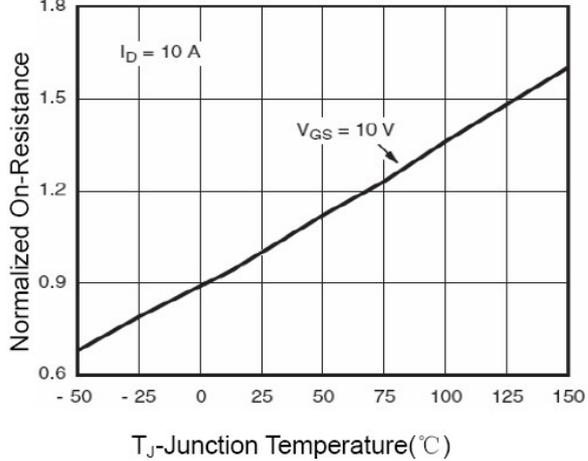


Figure 4 Rdson-Junction Temperature

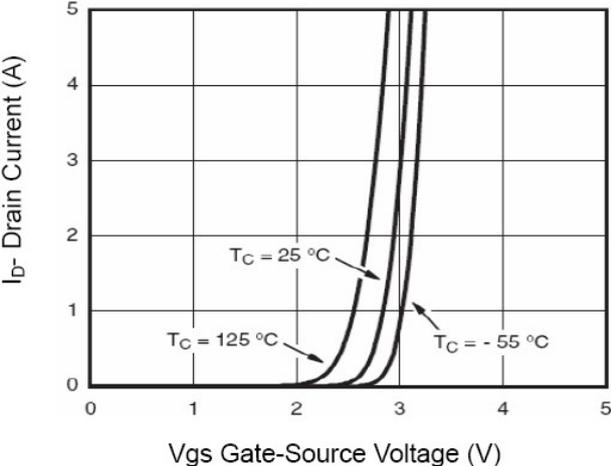


Figure 2 Transfer Characteristics

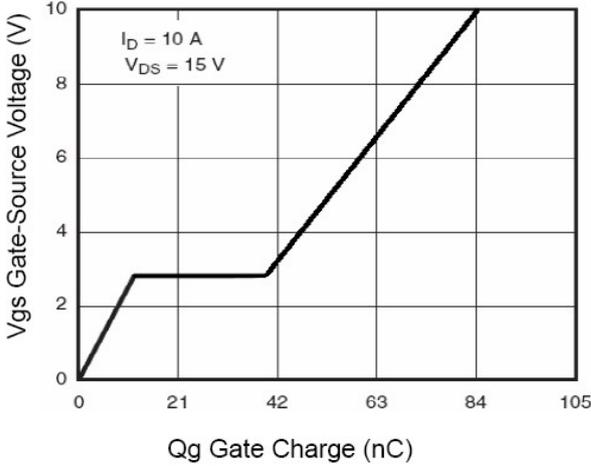


Figure 5 Gate Charge

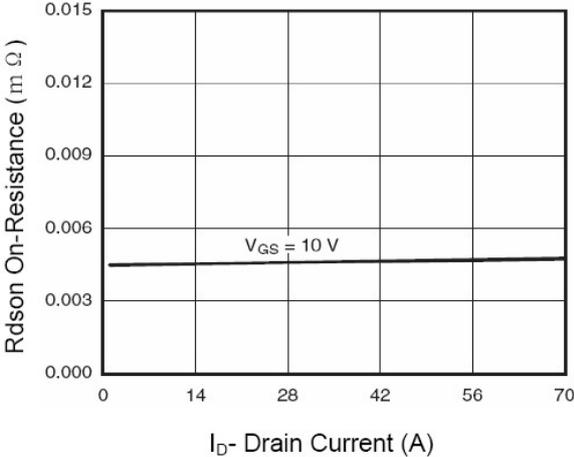


Figure 3 Rdson- Drain Current

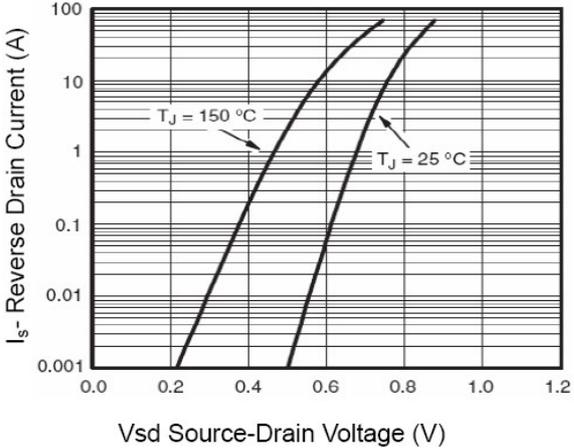
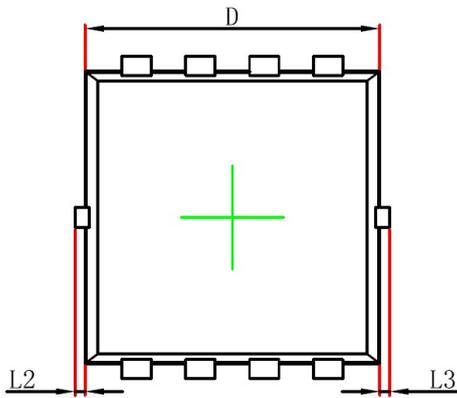


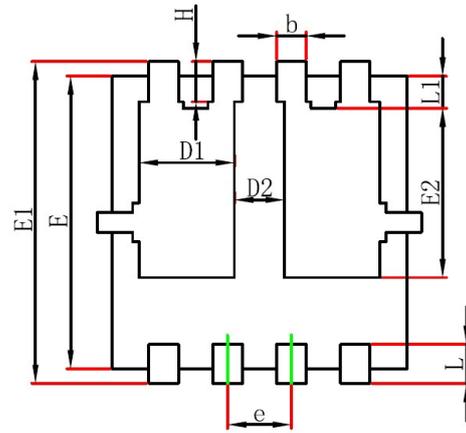
Figure 6 Source- Drain Diode Forward

FS4479

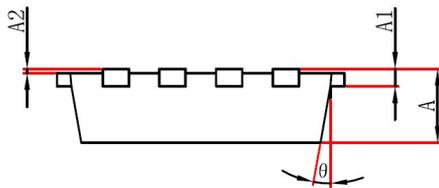
● PACKAGE DFN3×3B-8L



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°