

FH8204

N-Channel Enhancement Mode MOSFET

Description

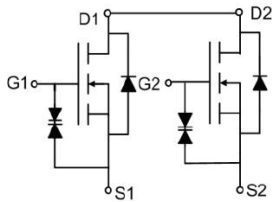
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Application

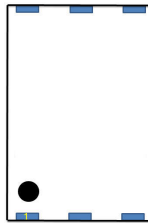
- ◆ MB/VGA/Vcore
- ◆ Portable Equipment
- ◆ Battery Powered System
- ◆ Load Switch
- ◆ LCD Display inverter

General Features

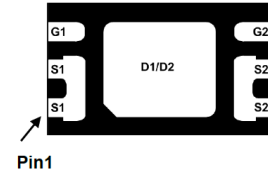
- ◆ 20V/9.5A,
 $R_{DS(ON)} < 9m\Omega @ V_{GS}=4.5V$
- ◆ Fast switching
- ◆ G-S ESD protection diode embedded
- ◆ Green Device Available
- ◆ DFN2x3 package design



Schematic diagram



Marking and Pin Assignment



DFN2x3-6L Pin assignment and Bottom View

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

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_A = 25^\circ C^1$	9.5
		$T_A = 70^\circ C^1$	7.6
Pulse Drain Current ²	I_{DM}	60	A
Maximum Power Dissipation ¹	P_D	$T_A = 25^\circ C$	1.56
		$T_A = 70^\circ C$	1
Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Unit
Junction-to-Ambient ¹	$R_{\theta JA}$	80	$^\circ C/W$

ELECTRICAL CHARACTERISTICS (T_j=25°C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250 μA	20			V
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 250 μA	0.45		1.5	V
Gate Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±12V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16V, V _{GS} = 0V, T _j = 25°C			1	μA
		V _{DS} = 16V, V _{GS} = 0V, T _j = 55°C			5	
Forward Trans conductance	g _{fs}	V _{DS} = 5V, I _D = 5.5A		38		S
Drain-Source On Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 5A			9	mΩ
		V _{GS} = 4.0V, I _D = 5A			9.5	
		V _{GS} = 3.7V, I _D = 5A			10	
		V _{GS} = 3.1V, I _D = 5A			11.2	
		V _{GS} = 2.5V, I _D = 5A			13.5	
Diode Forward Voltage ²	V _{SD}	I _S = 9.5A V _{GS} = 0V, T _j = 25°C			1.2	V
Maximum Body-Diode Continuous Current ¹					9.5	A
♦ Dynamic Parameters						
Input Cap.	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, F = 1MHz		1647		pF
Output Cap.	C _{oss}			170		
Reverse Transfer Cap.	C _{rss}			148		
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 5.5A		22		nC
Gate-Source Charge	Q _{gs}			3.1		
Gate-Drain Charge	Q _{gd}			8.2		
Turn-On DelayTime	T _{D(ON)}	V _{DS} = 15V, V _{GS} = 4.5V, R _G = 6Ω, I _D = 5.5A		10		nS
Turn-On Rise Time	t _r			39.5		
Turn-Off DelayTime	T _{D(OFF)}			65		
Turn-Off Fall Time	t _f			30		
Body Diode Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = 1A, di/dt = 100A/μs, T _j = 25°C				nS
Body Diode Reverse Recovery Charge	Q _{rr}					nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, t ≤ 10s.

2.The data tested by pulsed , pulse width ≤ 10us , duty cycle ≤ 1%

TYPICAL CHARACTERISTICS

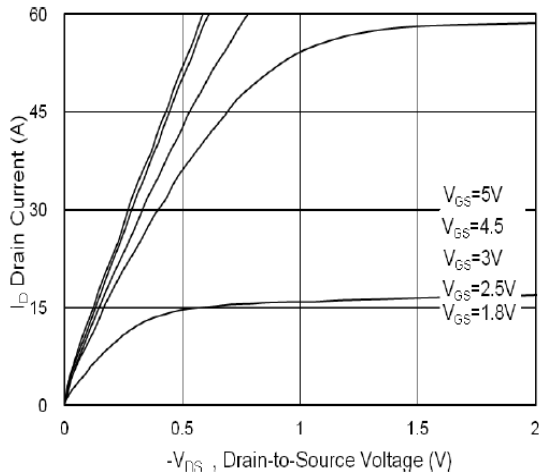


Fig.1 Typical Output Characteristics

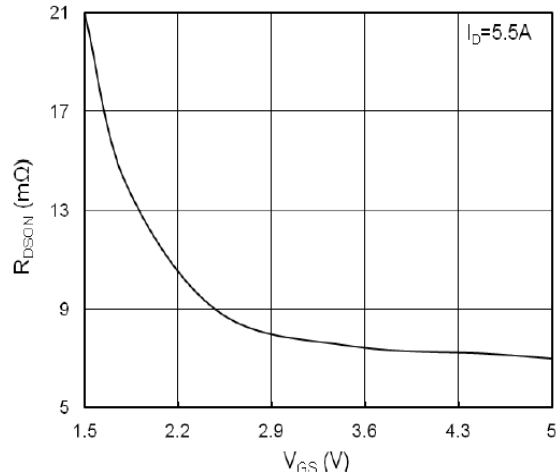


Fig.2 On-Resistance vs. Gate-Source

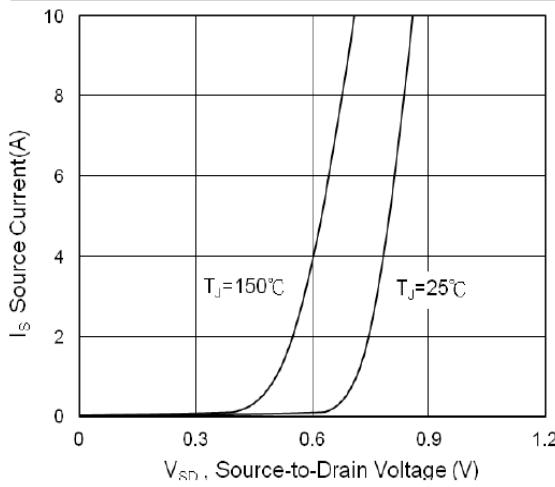


Fig.3 Forward Characteristics Of Reverse

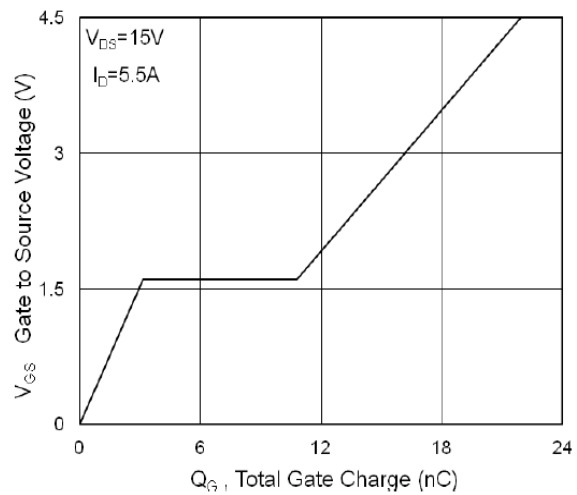


Fig.4 Gate-Charge Characteristics

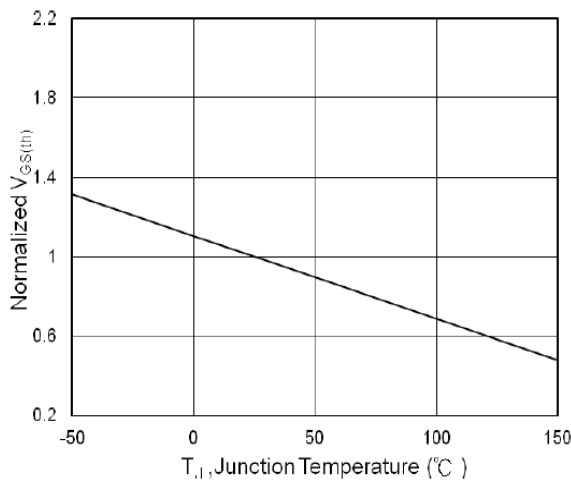


Fig.5 $V_{GS(th)}$ vs. T_J

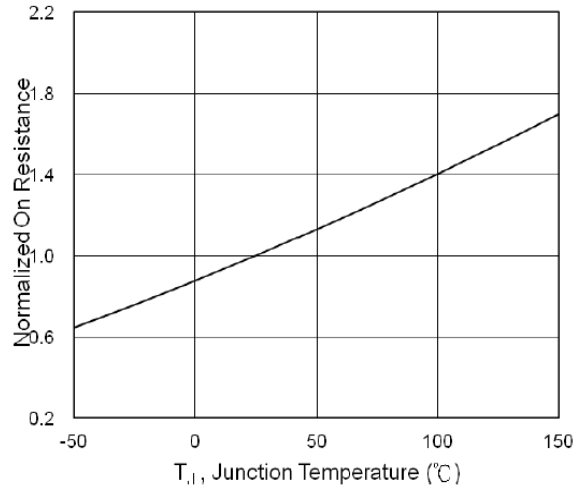


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

TYPICAL CHARACTERISTICS

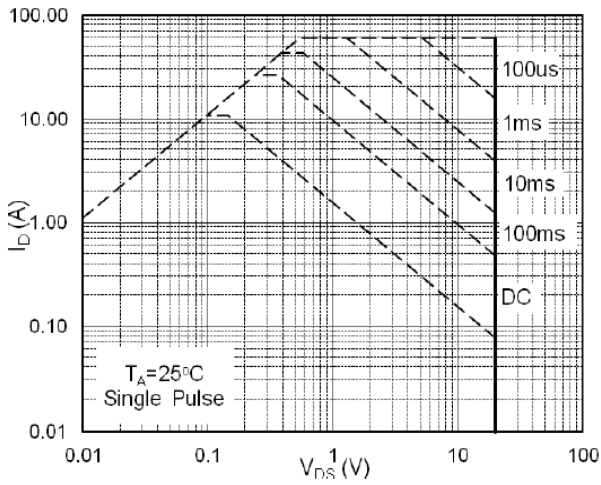


Fig.7 Capacitance

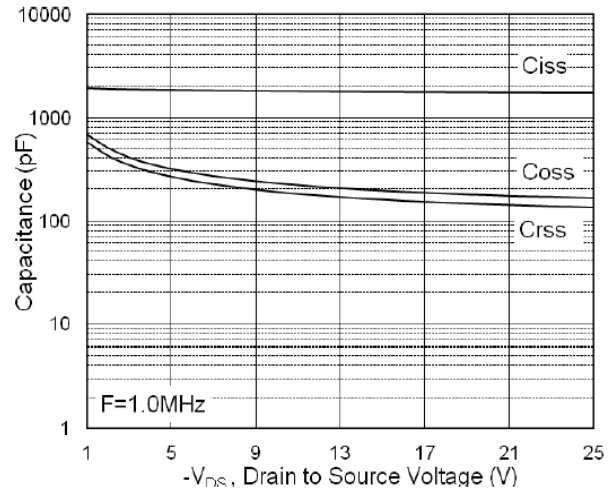


Fig.8 Safe Operating Area

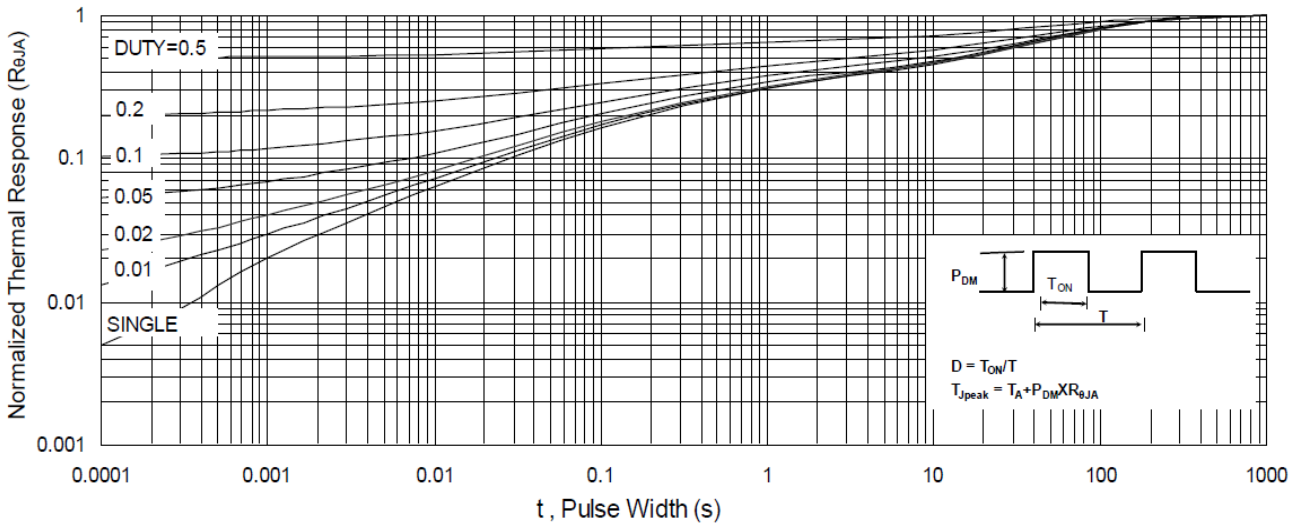


Fig.9 Normalized Maximum Transient Thermal Impedance

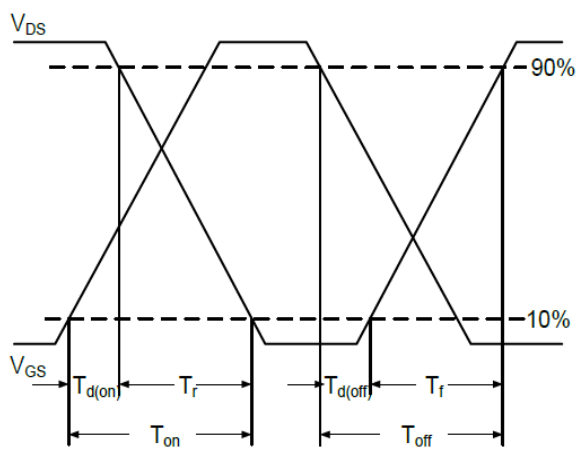


Fig.10 Switching Time Waveform

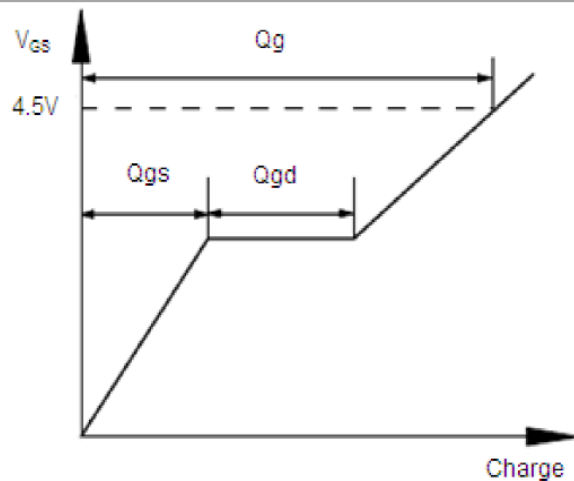
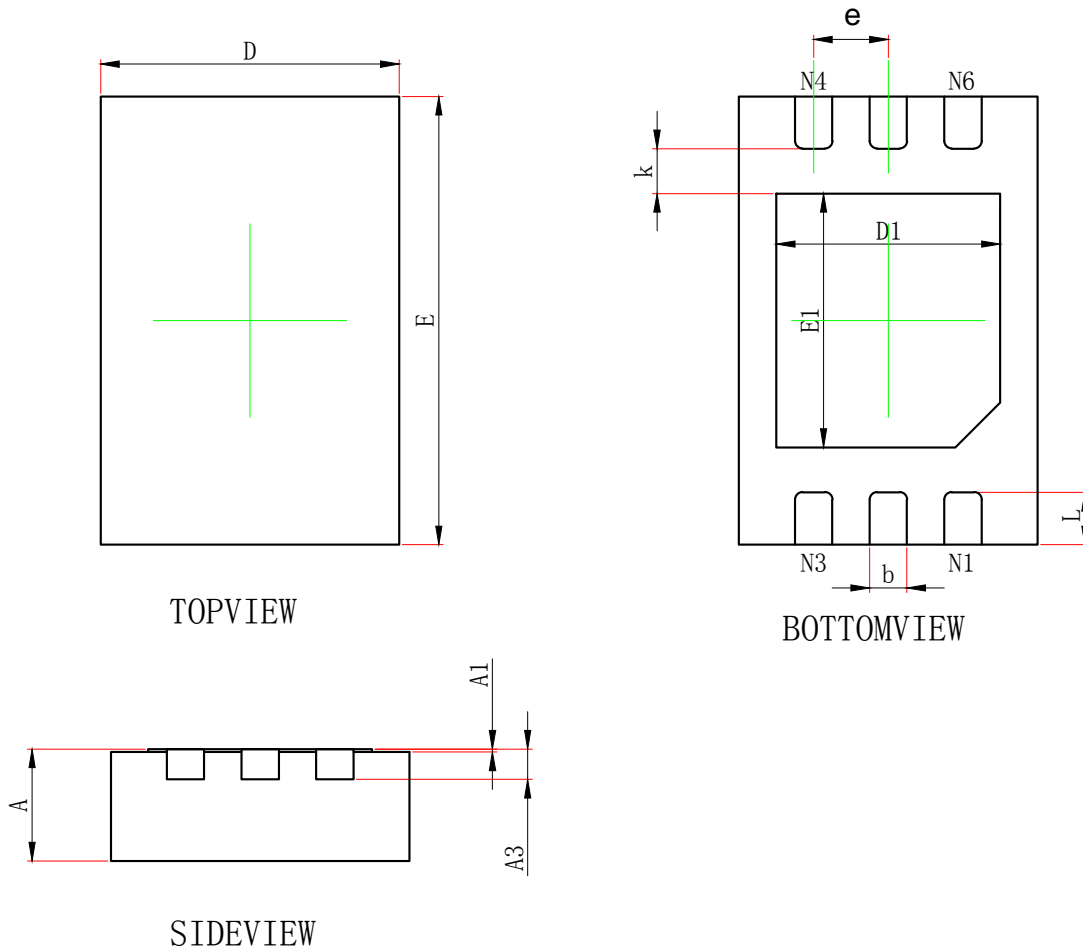


Fig.11 Gate Charge Waveform

Package Outline Dimensions : DFN2x3-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.950	2.050	0.077	0.081
E	2.950	3.050	0.116	0.120
D1	1.450	1.550	0.057	0.061
E1	1.650	1.750	0.065	0.069
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.300	0.400	0.012	0.016