

**FH4812**
**N-Channel Double MOSFET**
**■ Description**

FH4812 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

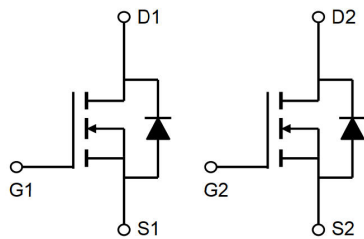
The SO-8 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for voltage conversion or switch applications.

**■ General Features**

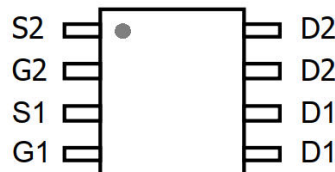
- $V_{DS} = 30V$  ,  $I_D = 10A$
- $R_{DS(ON)} < 11.5m\Omega(MAX)$  @  $V_{GS}=10V$
- $R_{DS(ON)} < 18 m\Omega(MAX)$  @  $V_{GS}=4.5V$

**■ Features**

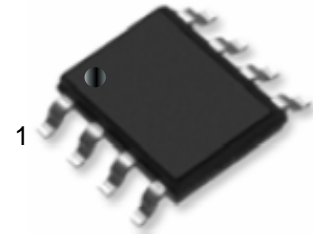
- Simple Drive Requirement
- High density cell design for ultra low Rdson
- Fast Switching Performance
- RoHS Compliant & Halogen-Free
- Fully characterized Avalanche voltage and current



Schematic diagram



Marking and pin assignment



SO-8 top view

**Absolute Maximum Ratings @ $T_j=25^\circ C$ (unless otherwise specified)**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A=25^\circ C$	Drain Current, $V_{GS} @ 10V^3$	10	A
$I_D @ T_A=70^\circ C$	Drain Current, $V_{GS} @ 10V^3$	8.7	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	40	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation	2	W
$E_{AS}$	Single Pulse Avalanche Energy <sup>4</sup>	7.2	mJ
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**Thermal Data**

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	62.5	$^\circ C/W$

Electrical Characteristics @ $T_j=25^{\circ}\text{C}$  (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=10A$	-	-	11.5	$m\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	-	18	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=1mA$	1	-	2	V
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=10A$	-	40	-	S
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge	$I_D=5A$	-	14	22.4	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=15V$	-	4.4	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	5.4	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V$	-	9	-	ns
$t_r$	Rise Time	$I_D=1A$	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	29	-	ns
$t_f$	Fall Time	$V_{GS}=10V$	-	9	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	790	1280	pF
$C_{oss}$	Output Capacitance	$V_{DS}=15V$	-	225	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0MHz$	-	160	-	pF
$R_g$	Gate Resistance	$f=1.0MHz$	-	2.5	5	$\Omega$

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{SD}$	Forward On Voltage <sup>2</sup>	$I_S=1.7A, V_{GS}=0V$	-	-	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_S=10A, V_{GS}=0V,$	-	11	-	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	4	-	nC

## Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board,  $t \leq 10\text{sec}$ ;  $135^{\circ}\text{C}/\text{W}$  when mounted on Min. copper pad.
4. Starting  $T_j=25^{\circ}\text{C}$ ,  $V_{DD}=30V$ ,  $L=0.1\text{mH}$ ,  $R_G=25\Omega$

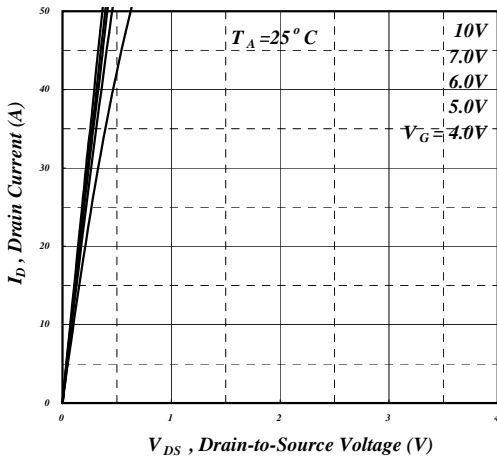


Fig 1. Typical Output Characteristics

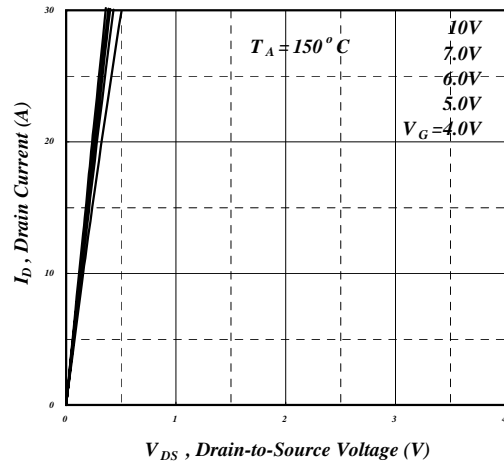


Fig 2. Typical Output Characteristics

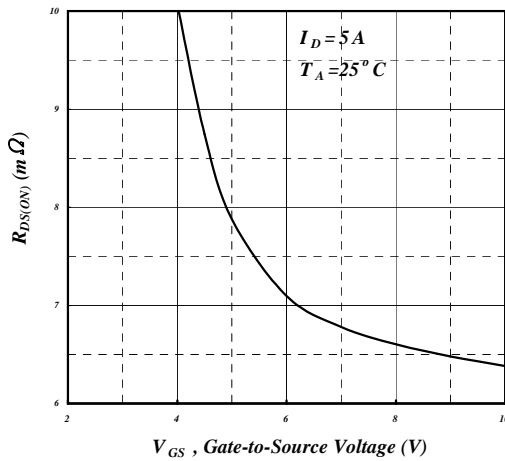


Fig 3. On-Resistance v.s. Gate Voltage

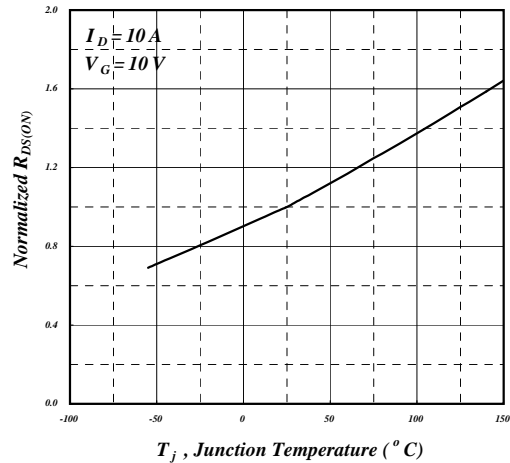


Fig 4. Normalized On-Resistance v.s. Junction Temperature

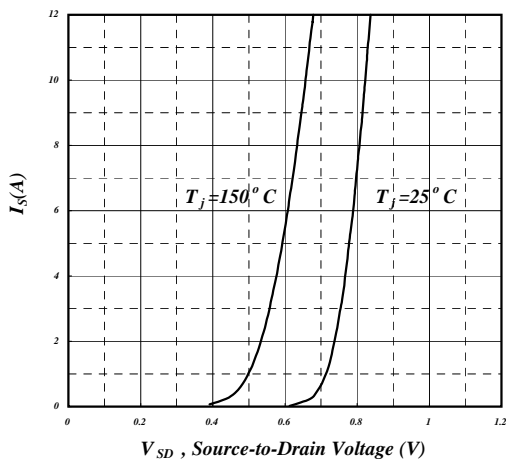


Fig 5. Forward Characteristic of Reverse Diode

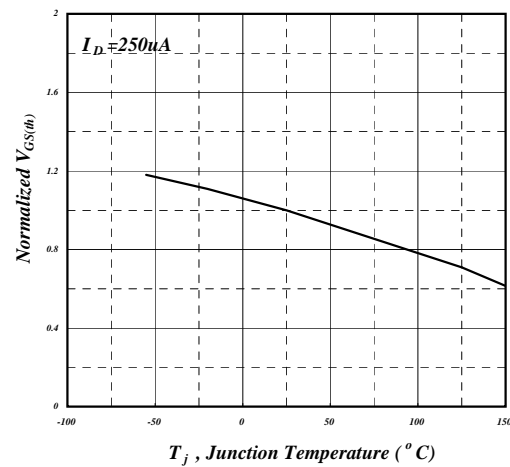


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

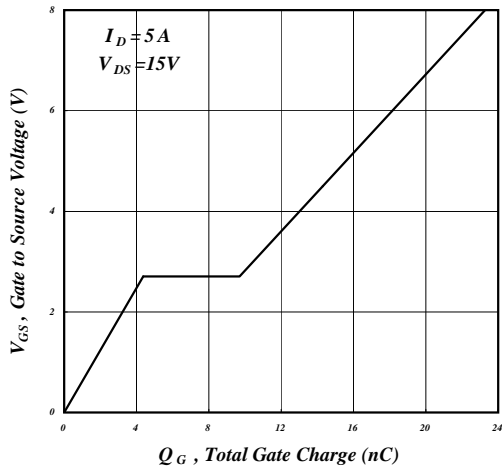


Fig 7. Gate Charge Characteristics

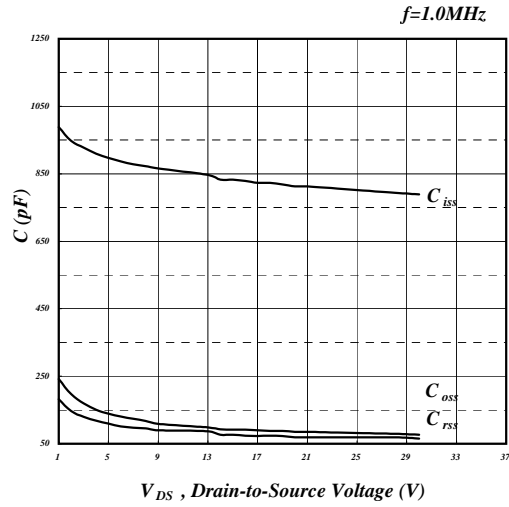


Fig 8. Typical Capacitance Characteristics

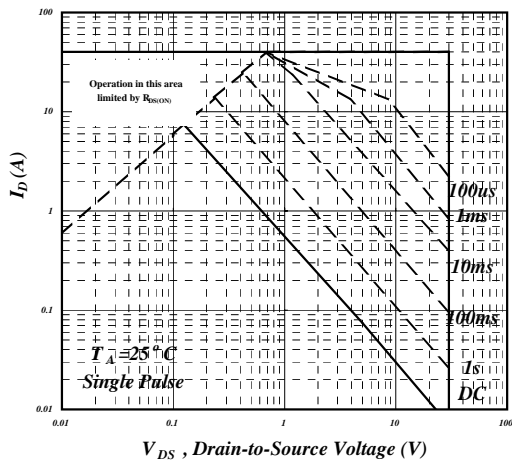


Fig 9. Maximum Safe Operating Area

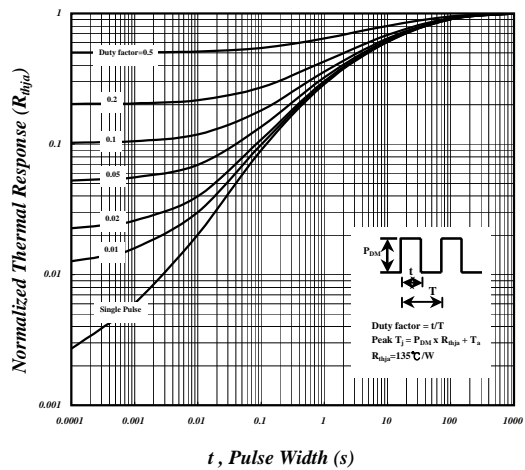


Fig 10. Effective Transient Thermal Impedance

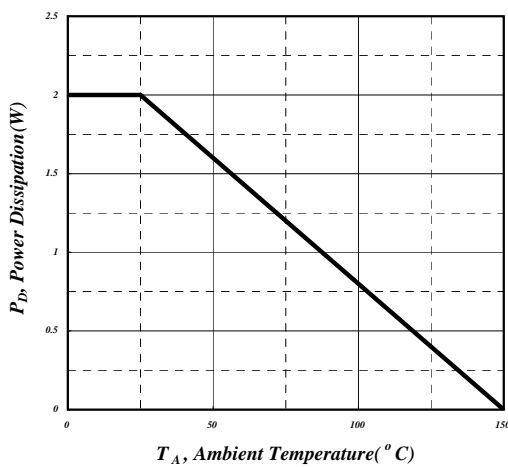


Fig 11. Total Power Dissipation

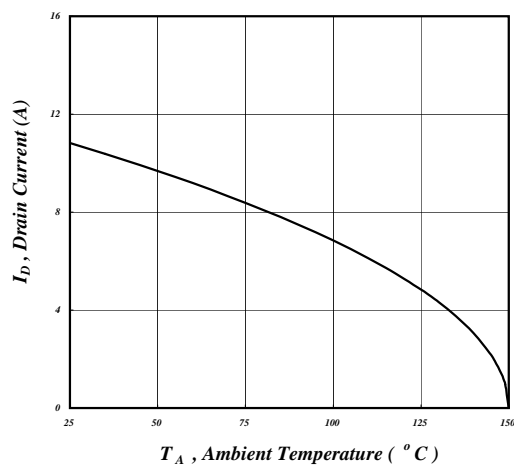
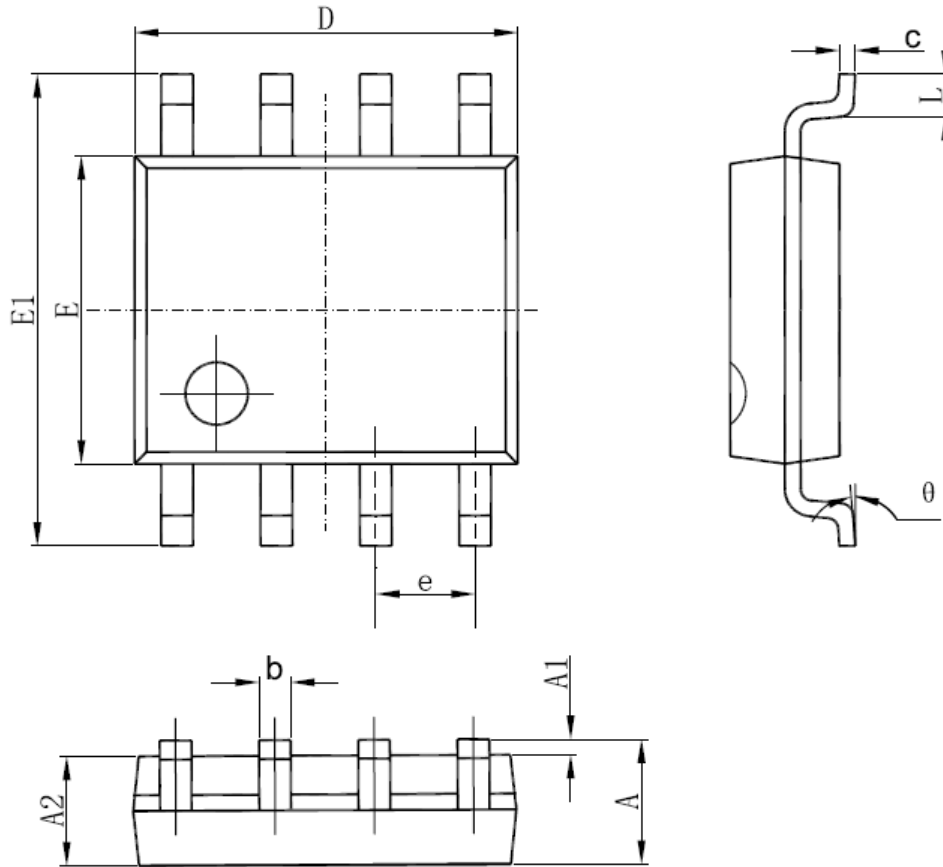


Fig 12. Drain Current v.s. Ambient Temperature

Package Information : SO-8



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	theta	0°	8°	0°	8°
D	4.700	5.100	0.185	0.200					

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