

# FH3415BG0

## P-Channel Enhancement Mode MOSFET

### Description

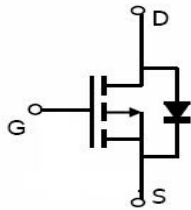
The FH3415BG0 is the P-Channel enhancement mode MOSFET in a plastic package using the Trench technology.

### Applications

- ◆ High Speed Switch
- ◆ DC-DC Converters
- ◆ Lithium-Ion Battery
- ◆ Lightning-cable

### Features

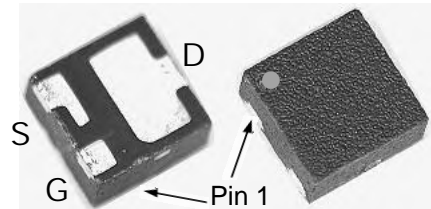
- ◆  $V_{DS} = -30V$  ;  $I_D = -6.2A$   
 $R_{DS(ON)} (Typ.) = 24 m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)} (Typ.) = 29 m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)} (Typ.) = 27 m\Omega$  @  $V_{GS} = -5.0V$
- ◆ LogicLevelCompatible
- ◆ SMD Package ( DFN1.5x1.5-3L )
- ◆ TrenchTechnology
- ◆ FastSwitching



Schematic diagram



Marking and Pin Assignment



DFN1.5x1.5-3L top view

### ■ Absolute Maximum Ratings ( $T_A = 25^\circ C$ , unless otherwise specified)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J = 150^\circ C$ )	$I_D$	-6.2	A
Pulsed Drain Current	$I_{DM}$	-24.8	A
Power Dissipation	$P_D$	2.0	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$
Thermal Resistance-Junction to Ambient (Note 1)	$R_{thJA}$	96	$^\circ C/W$

### ■ Electrical Characteristics (T<sub>A</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30	-35		V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.6	-2.0	V
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V			-1	μA
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.0A		24	29	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.0A		29	38	
		V <sub>GS</sub> = -5.0V, I <sub>D</sub> = -1.0A		27	37	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5.0A	8	13		S
Diode Forward Voltage (Note 2)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.0A			-1.0	V
Diode Forward Current (Note 1)	I <sub>S</sub>				-2.0	A
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A		24		nC
Gate-Source Charge	Q <sub>gs</sub>			3.2		
Gate-Drain Charge	Q <sub>gd</sub>			2.72		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		1072		pF
Output Capacitance	C <sub>oss</sub>			272		
Reverse Transfer Capacitance	C <sub>rss</sub>			124		
<b>Switching</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15V, R <sub>L</sub> = 15Ω, I <sub>D</sub> = -1A, V <sub>GS</sub> = -4.5V, R <sub>GEN</sub> = 10Ω		8		nS
Rise Time	t <sub>r</sub>			3		
Turn-Off Delay Time	t <sub>d(off)</sub>			32		
Fall-Time	t <sub>f</sub>			10		

**Note:** 1. Mounted on FR4 board, t ≤ 5sec.  
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

## ■ Typical Electrical and Thermal Characteristics

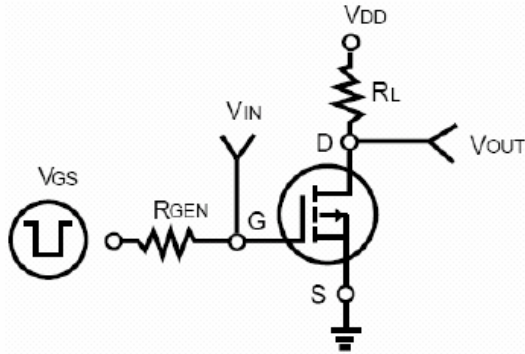


Figure 1: Switching Test Circuit

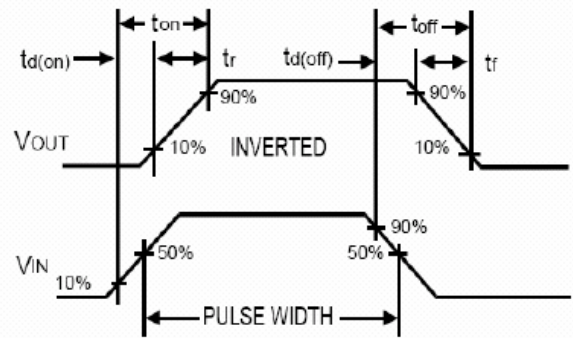


Figure 2: Switching Waveforms

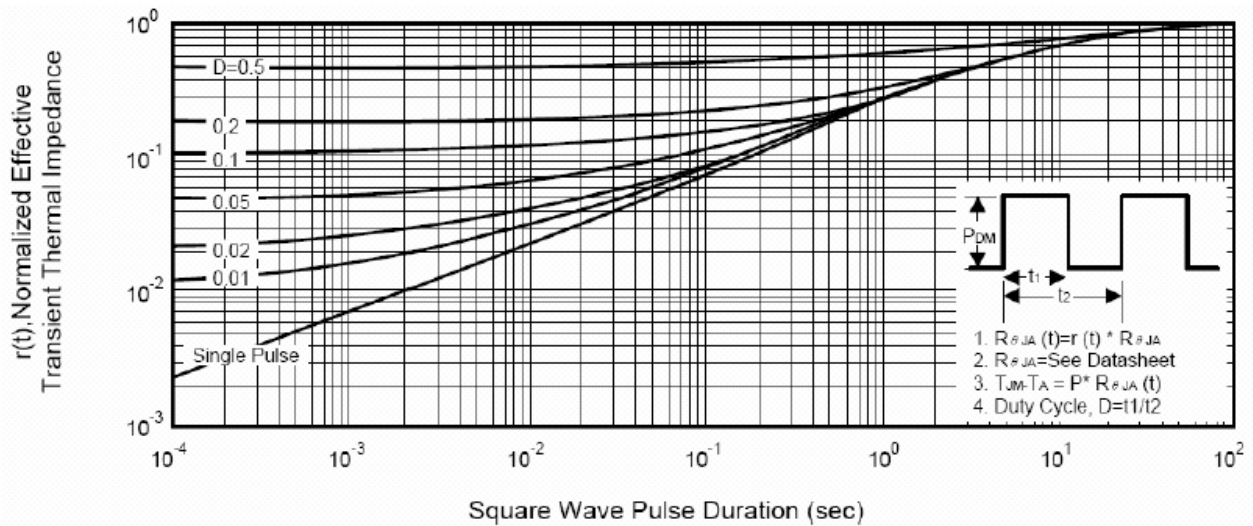
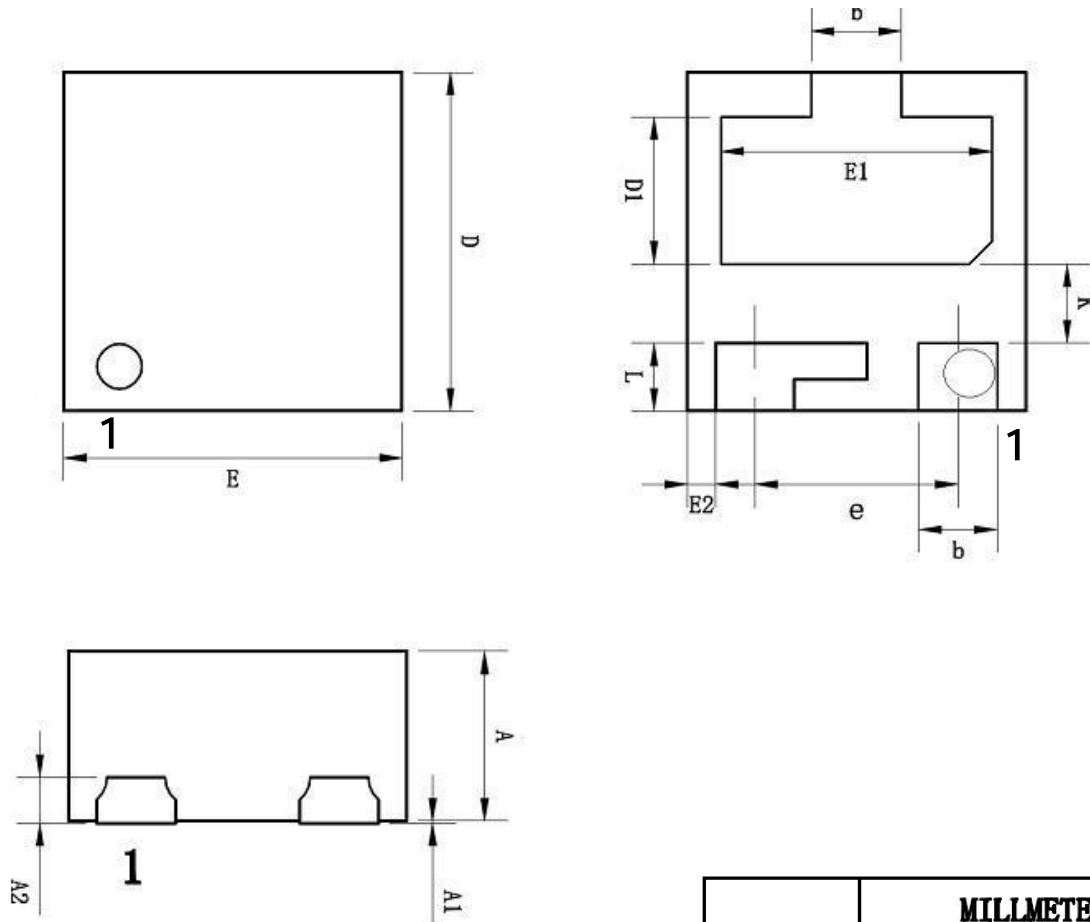


Figure 3: Normalized Maximum Transient Thermal Impedance

## Package Dimensions : DFN1.5x1.5-3L



SYMBOL	MILLMETER		
	MIN	NOM	MAX
A	—	—	0.80
A1	0.00	—	0.05
A2	0.203 TIY		
b	0.30	0.35	0.40
D	1.45	1.50	1.55
D1	0.60	0.65	0.70
E	1.45	1.50	1.55
E1	1.15	1.20	1.25
E2	0.125 TIY		
e	0.90 BSC		
K	0.35 BSC		
L	0.25	0.30	0.35