

# FH3415Y

## P-Channel Enhancement Mode MOSFET

### Description

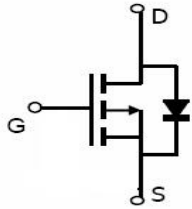
The FH3415Y is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23) using the Trench technology.

### Applications

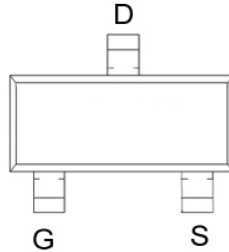
- ◆ High Speed Switch
- ◆ DC-DC Converters
- ◆ Lithium-Ion Battery

### Features

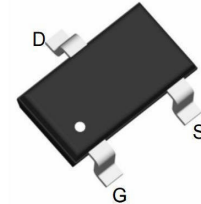
- ◆  $V_{DS} = -30V$  ;  $I_D = -4.7A$   
 $R_{DS(ON)}(Typ.) = 34m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)}(Typ.) = 39m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)}(Typ.) = 55m\Omega$  @  $V_{GS} = -2.5V$
- ◆ LogicLevelCompatible
- ◆ SMDPackage(SOT-23)
- ◆ TrenchTechnology
- ◆ FastSwitching



Schematic diagram



Marking and Pin Assignment



SOT-23 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	$V_{GS}$	$\pm 12$	V
Continuous Drain Current ( $T_J = 150^\circ C$ )	$I_D$	-4.7	A
Pulsed Drain Current	$I_{DM}$	-18	A
Power Dissipation	$P_D$	1.25	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$
Thermal Resistance-Junction to Ambient (Note 1)	$R_{thJA}$	100	$^\circ C/W$

### ■ Electrical Characteristics ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-33		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.50	-0.8	-1.10	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V$			-1	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -5.0V, I_D = -2.0A$		38	46	m $\Omega$
		$V_{GS} = -10V, I_D = -4.0A$		34	42	
		$V_{GS} = -4.5V, I_D = -4.0A$		39	48	
		$V_{GS} = -2.5V, I_D = -2.0A$		55	67	
Forward Transconductance	$g_{FS}$	$V_{DS} = -5V, I_D = -5.0A$	8	13		S
Diode Forward Voltage (Note 2)	$V_{SD}$	$V_{GS} = 0V, I_S = -1.0A$			-1.0	V
Diode Forward Current (Note 1)	$I_S$				-2.0	A
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -15V, V_{GS} = -10V, I_D = -1A$		21		nC
Gate-Source Charge	$Q_{gs}$			3.2		
Gate-Drain Charge	$Q_{gd}$			2.72		
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		1070		pF
Output Capacitance	$C_{oss}$			161		
Reverse Transfer Capacitance	$C_{rss}$			132		
<b>Switching</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15V, R_L = 15\Omega, I_D = -1A, V_{GS} = -4.5V, R_{GEN} = 10\Omega$		7		nS
Rise Time	$t_r$			3		
Turn-Off Delay Time	$t_{d(off)}$			31		
Fall-Time	$t_f$			10		

**Note:** 1. Mounted on FR4 board,  $t \leq 5\text{sec}$ .  
2. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

## ■ Typical Electrical and Thermal Characteristics

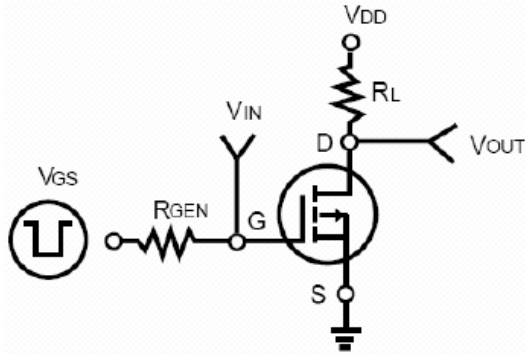


Figure 1: Switching Test Circuit

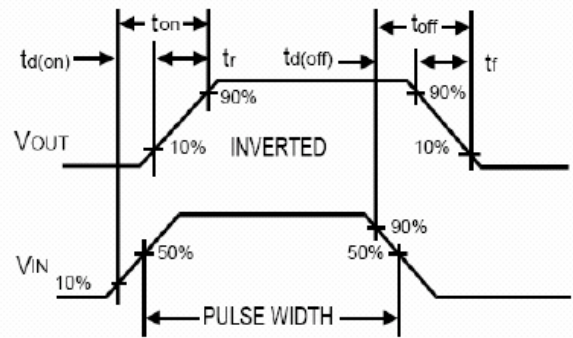


Figure 2: Switching Waveforms

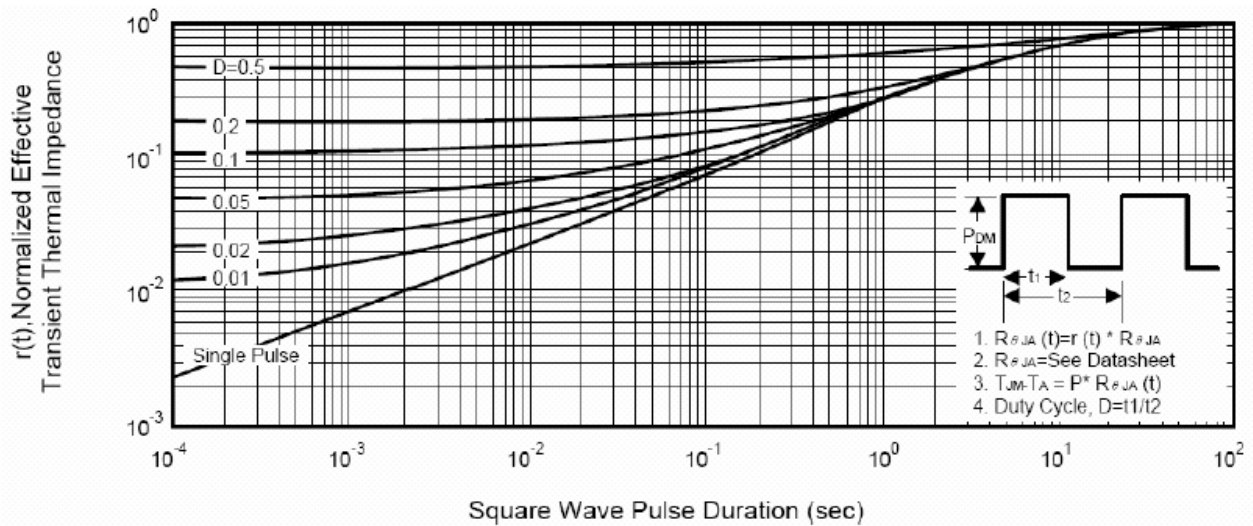
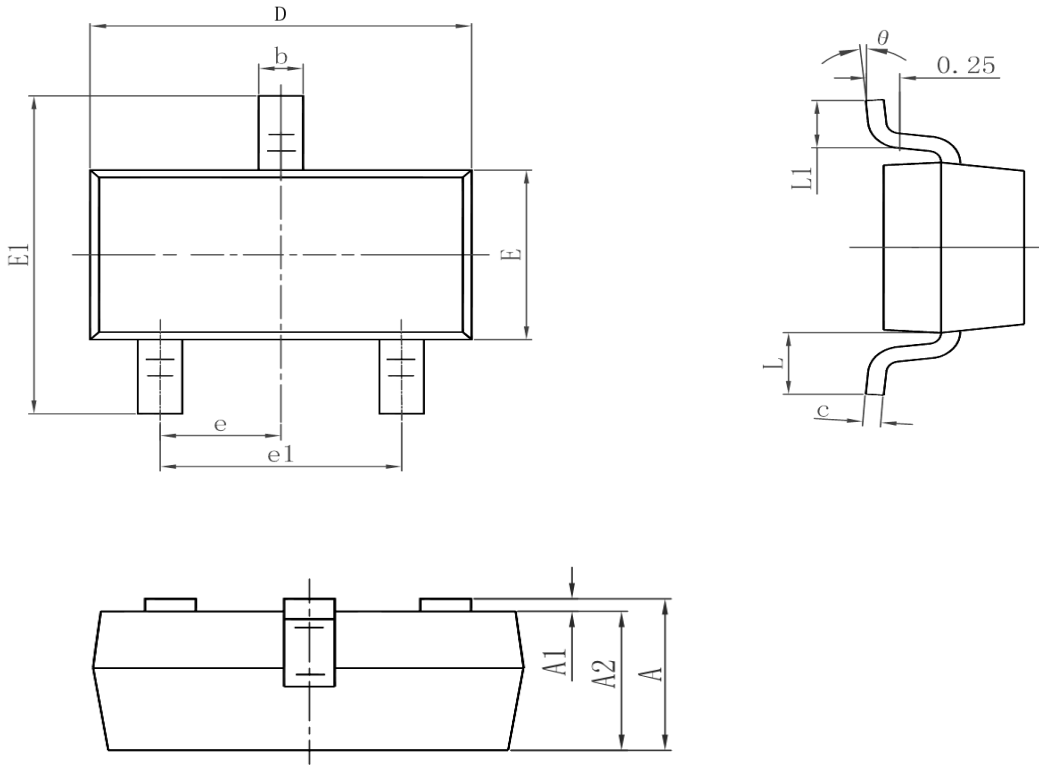


Figure 3: Normalized Maximum Transient Thermal Impedance

## ■ Package Dimensions : SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°