

# FH3117

## P-Channel Enhancement Mode MOSFET

### Description

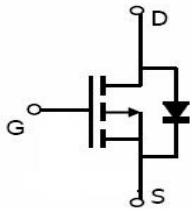
The FH3117 is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23-3L) using the Trench technology.

### Applications

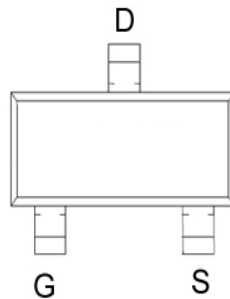
- ◆ High Speed Switch
- ◆ DC-DC Converters
- ◆ Lithium-Ion Battery

### Features

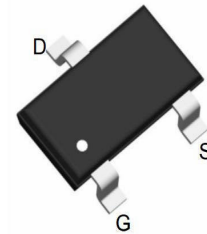
- ◆  $V_{DS} = -30V$  ;  $I_D = -6.2A$   
 $R_{DS(ON)}(Typ.) = 19 m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)}(Typ.) = 23 m\Omega$  @  $V_{GS} = -4.5V$
- ◆ LogicLevelCompatible
- ◆ SMDPackage(SOT-23-3L)
- ◆ TrenchTechnology
- ◆ FastSwitching



Schematic diagram



Marking and Pin Assignment



SOT-23-3L 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 (Note 3)	$I_{DM}$	-24.8	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<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	-34	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.1	-1.5	-1.9	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	-	19	22.5	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.0A	-	23	29	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5.0A	-	15		S
Diode Forward Voltage <b>(Note 2)</b>	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.0A	-	-	-1.2	V
Diode Forward Current <b>(Note 1)</b>	I <sub>S</sub>		-	-	-3.2	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	-	30	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	4	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	3	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz	-	1270	-	pF
Output Capacitance	C <sub>oss</sub>		-	190	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	134	-	
<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>		-	3.2	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	32	-	
Fall-Time	t <sub>f</sub>		-	11	-	

- Note:**
1. Mounted on FR4 board, t ≤ 5sec.
  2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
  3. Repetitive Rating: Pulse width limited by maximum junction temperature.

## ■ Typical Electrical and Thermal Characteristics

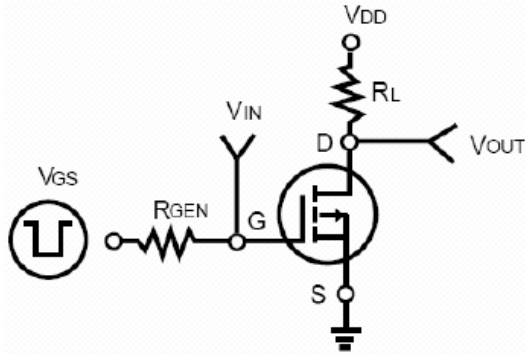


Figure 1: Switching Test Circuit

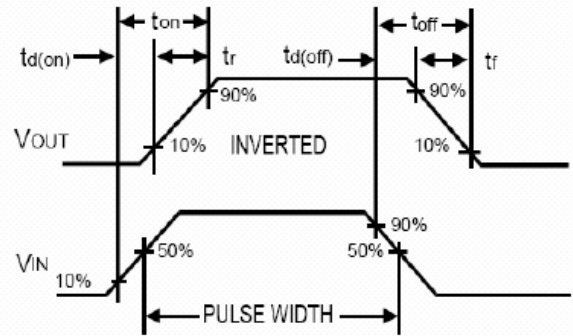


Figure 2: Switching Waveforms

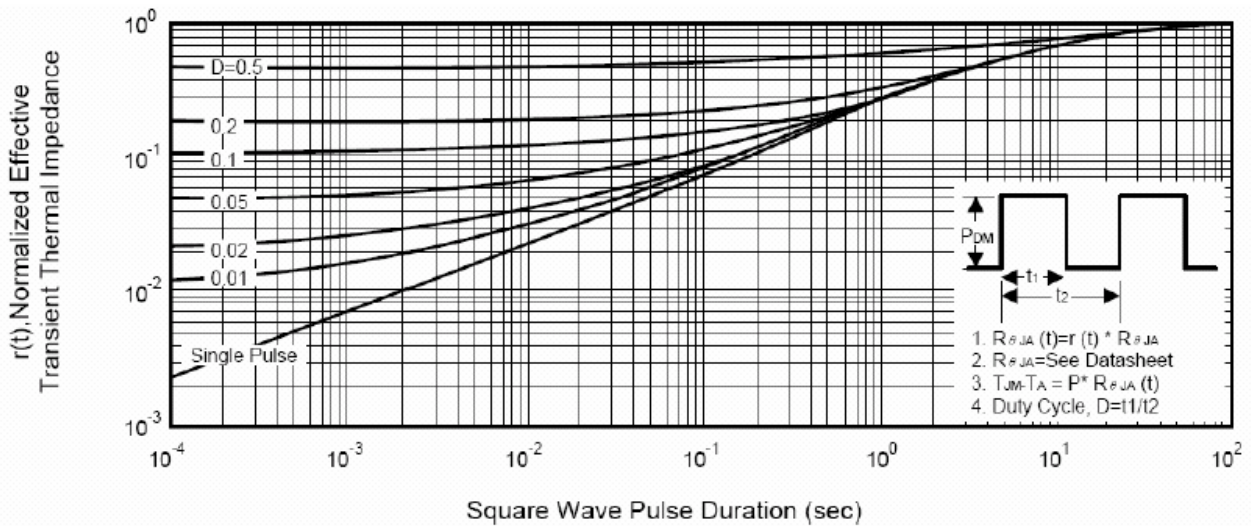
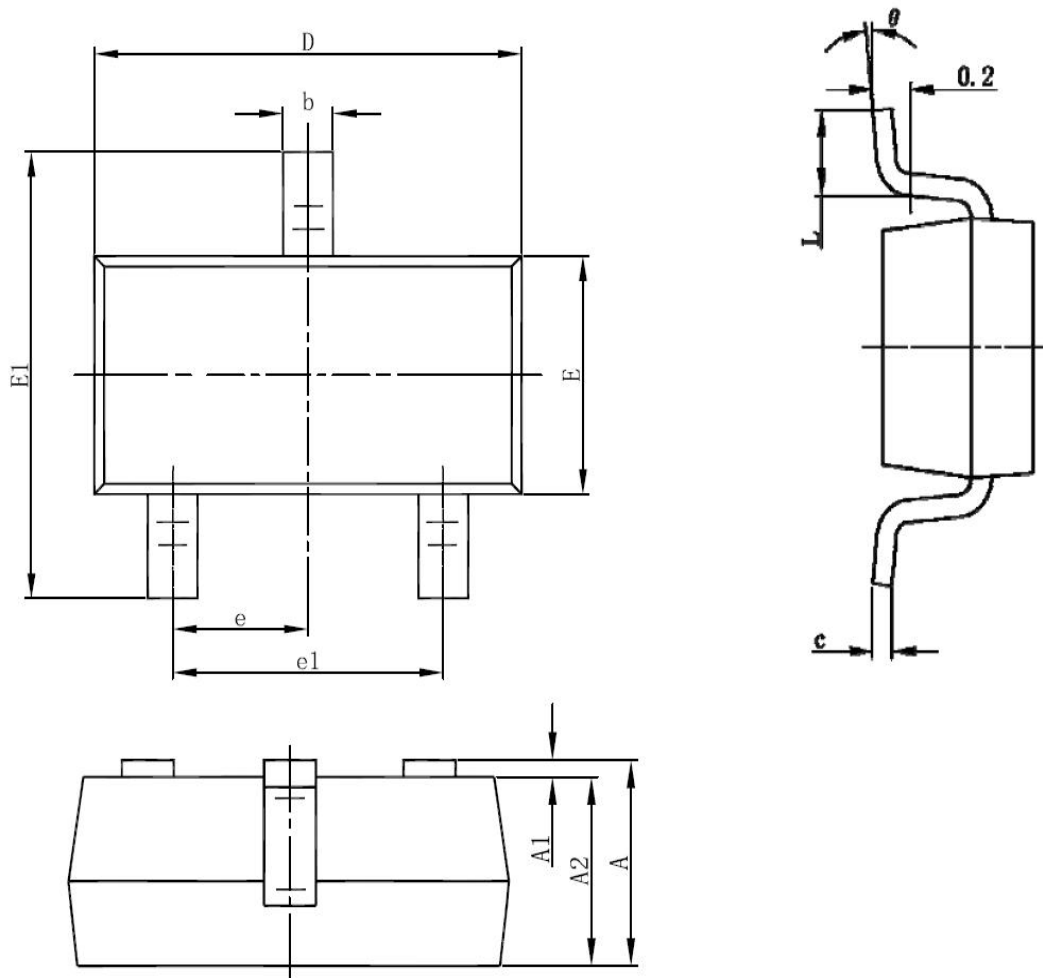


Figure 3: Normalized Maximum Transient Thermal Impedance

## ■ Package Dimensions : SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°