

FH3415D

P-Channel Enhancement Mode MOSFET

Description

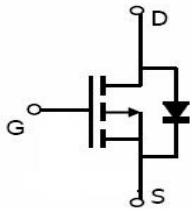
The FH3415D is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23-3L) using the Trench technology.

Applications

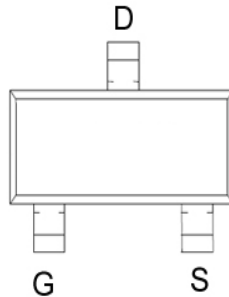
- ◆ High Speed Switch
- ◆ DC-DC Converters
- ◆ Lithium-Ion Battery

Features

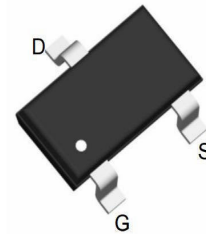
- ◆ $V_{DS} = -20V$; $I_D = -6.5A$
 $R_{DS(ON)}(Typ.) = 16m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)}(Typ.) = 19m\Omega$ @ $V_{GS} = -2.5V$
- ◆ LogicLevelCompatible
- ◆ SMDPackage(SOT-23-3L)
- ◆ TrenchTechnology
- ◆ FastSwitching



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}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_J = 150^\circ C$)	I_D	-6.5	A
Pulsed Drain Current (Note 3)	I_{DM}	-26	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°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.50	-0.62	-0.9	V
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±12V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -4.0A	-	16	19	mΩ
		V _{GS} = -2.5V, I _D = -2.0A	-	19	25	
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -5.0A	-	15		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		-	-	-2.2	A
Dynamic						
Total Gate Charge	Q _g	V _{DS} = -15V, V _{GS} = -10V, I _D = -1A	-	32	-	nC
Gate-Source Charge	Q _{gs}		-	4	-	
Gate-Drain Charge	Q _{gd}		-	3	-	
Input Capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz	-	1495	-	pF
Output Capacitance	C _{oss}		-	198	-	
Reverse Transfer Capacitance	C _{rss}		-	164	-	
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -15V, R _L = 15Ω, I _D = -1A, V _{GS} = -4.5V, R _{GEN} = 10Ω	-	9	-	nS
Rise Time	t _r		-	3.2	-	
Turn-Off Delay Time	t _{d(off)}		-	37	-	
Fall-Time	t _f		-	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

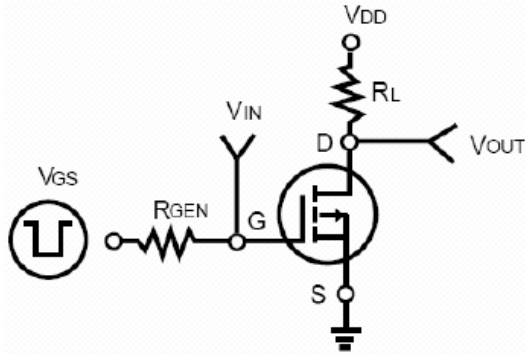


Figure 1: Switching Test Circuit

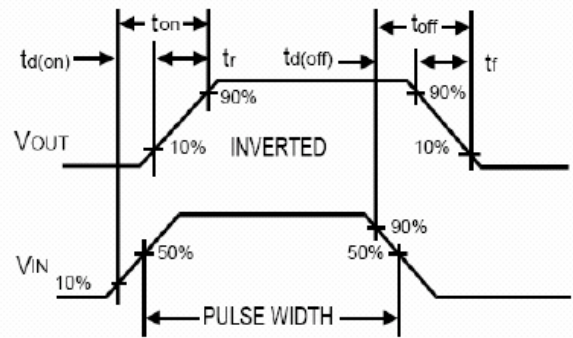


Figure 2: Switching Waveforms

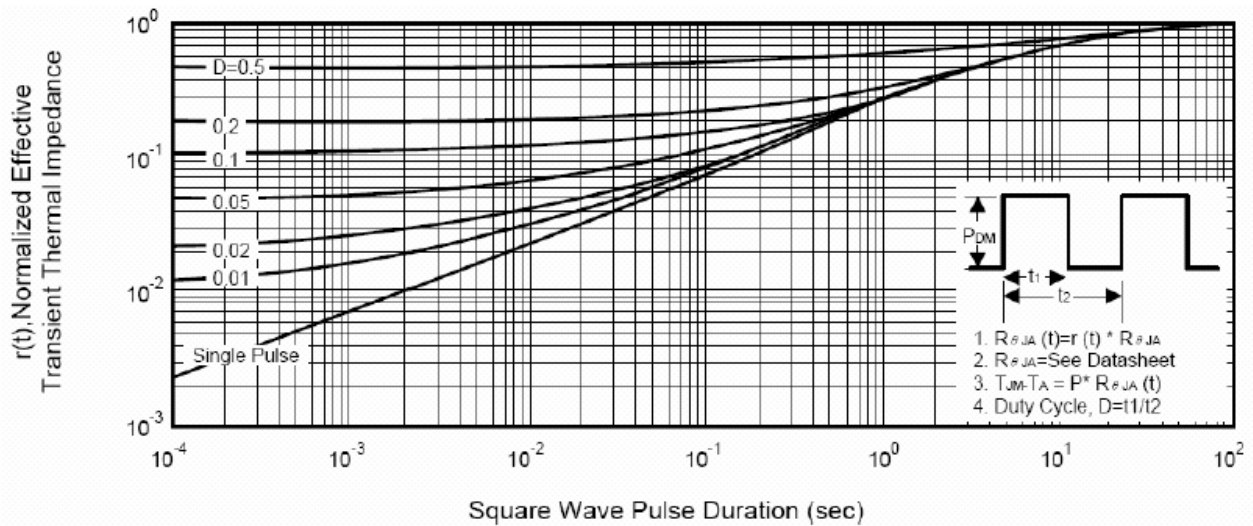
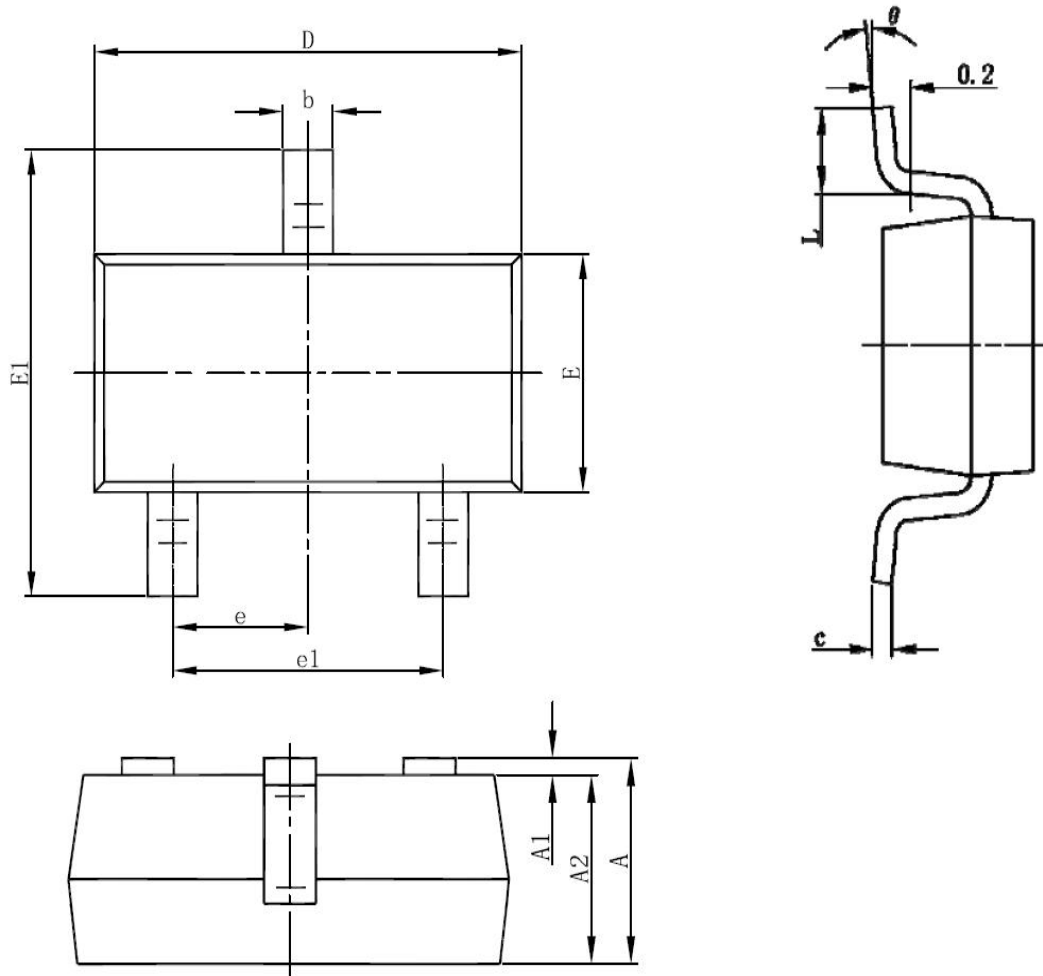


Figure 3: Normalized Maximum Transient Thermal Impedance

■ 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°

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