FH3415D

P-Channel Enhancement Mode MOSFET

Description

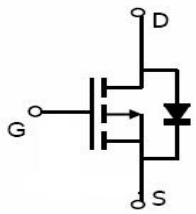
The FH3415D is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23-3L) using the Trench technology.

Applications

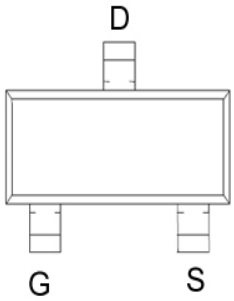
- High Speed Switch
- DC-DC Converters
- Lithium-Ion Battery

Features

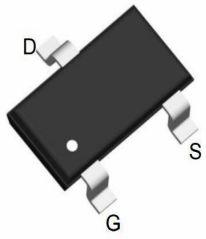
- V_{DS} = -20V ; I_D = -6.5A
  $R_{DS(ON)}$(Typ.)= 16mΩ @V_{GS} = -4.5V
  $R_{DS(ON)}$(Typ.)= 19mΩ @V_{GS} = -2.5V
- Logic Level Compatible
- SMD Package (SOT-23-3L)
- Trench Technology
- Fast Switching



Schematic diagram



Marking and Pin Assignment



SOT-23-3L top view

■ Absolute Maximum Ratings (T_A = 25°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°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	°C
Thermal Resistance-Junction to Ambient **(Note 1)**	R_{thJA}	100	°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

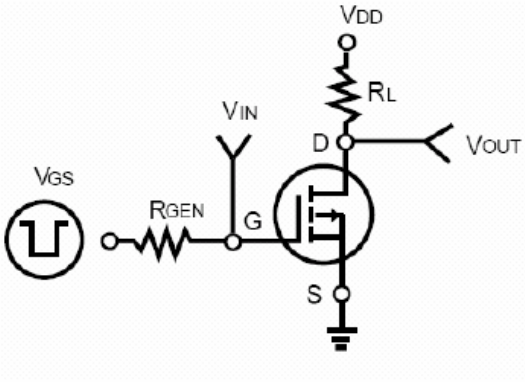


Figure 1: Switching Test Circuit

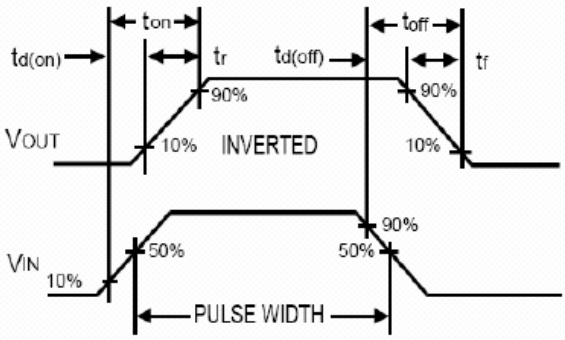


Figure 2: Switching Waveforms

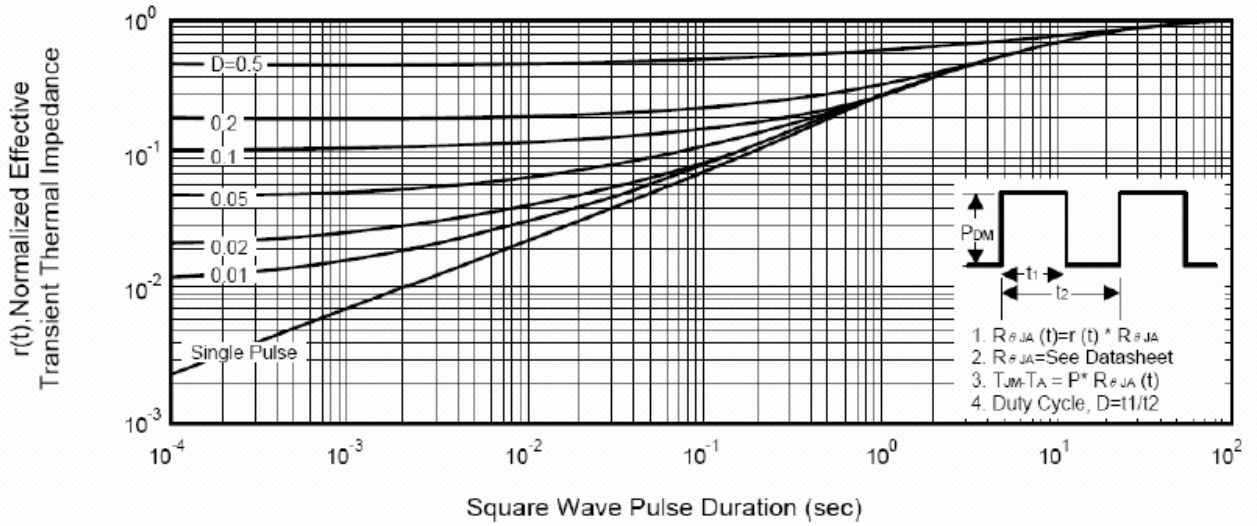
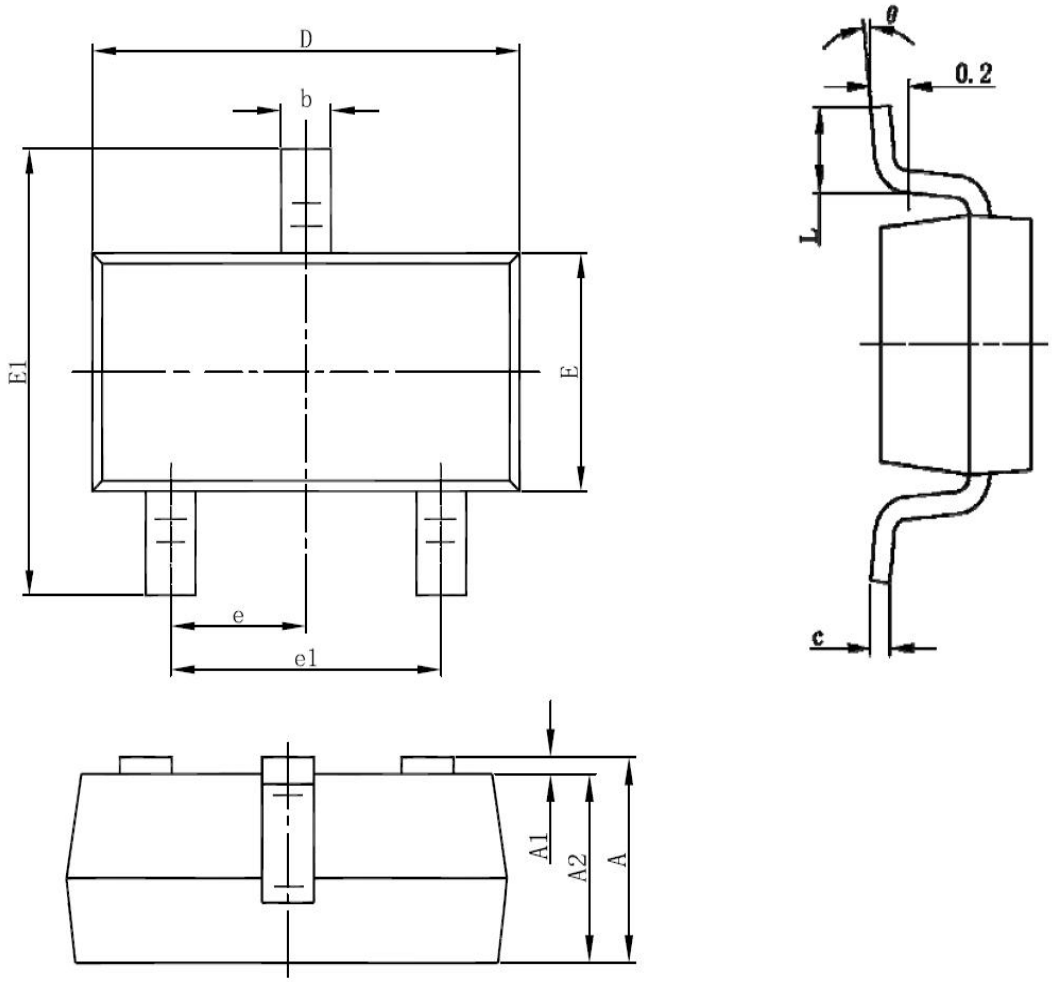


Figure 3: Normalized Maximum Transient Thermal Impedance

■ 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°