

FH3415P

P-Channel Enhancement Mode MOSFET

Description

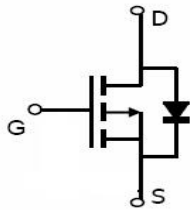
The FH3415P is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23) using the Trench technology.

Applications

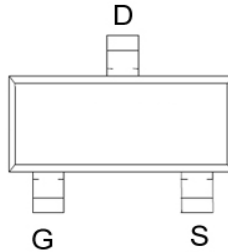
- Low Switch
- DC-DC Converters
- Lithium-Ion Battery Protection

Features

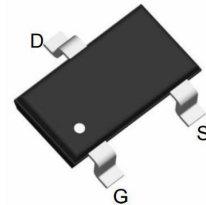
- $V_{DS} = -20V$; $I_D = -4.6A$
 $R_{DS(ON)}(Typ.) = 28m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)}(Typ.) = 38m\Omega$ @ $V_{GS} = -2.5V$
- Trench Technology
- Fast Switching
- High Power and Current Handling Capability
- SMD Package (SOT-23)
- MSL-3 compliant



Schematic diagram



Marking and Pin Assignment



SOT-23 top view

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	-4.6
		$T_C = 100^\circ C$	-3.8
I_{DM}	Pulsed Drain Current ^A	-18.4	A
P_D	Power Dissipation	$T_C = 25^\circ C$	1.2
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ^B	84	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V, T _C =25°C			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = -4.5V, I _D =-4.5A		28	39	mΩ
		V _{GS} = -2.5V, I _D =-4.0A		38	54	
		V _{GS} = -1.8V, I _D =-3.0A		45	74	
Diode Forward Voltage	V _{SD}	I _S = -4.6A, V _{GS} =0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S				-4.6	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHZ		830		pF
Output Capacitance	C _{oss}			132		
Reverse Transfer Capacitance	C _{rss}			85		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-4A		7.2		nC
Gate Source Charge	Q _{gs}			1.2		
Gate Drain Charge	Q _{gd}			1.6		
Turn-on Delay Time	t _{D(on)}	V _{GS} =-4.5V, V _{DD} =-10V, R _L =2.5Ω, R _{GEN} =3Ω		15		ns
Turn-on Rise Time	t _r			63		
Turn-off Delay Time	t _{D(off)}			21		
Turn-off Fall Time	t _f			12		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

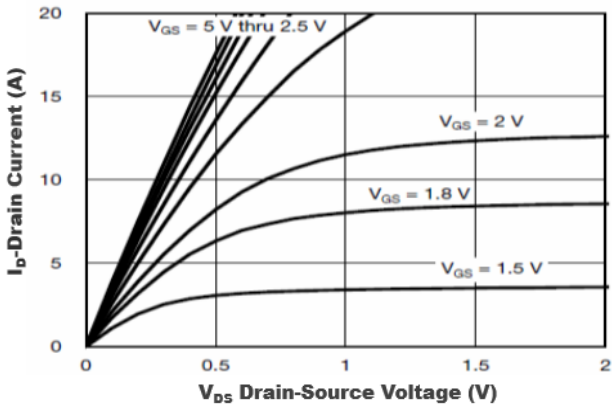


Figure1. Output Characteristics

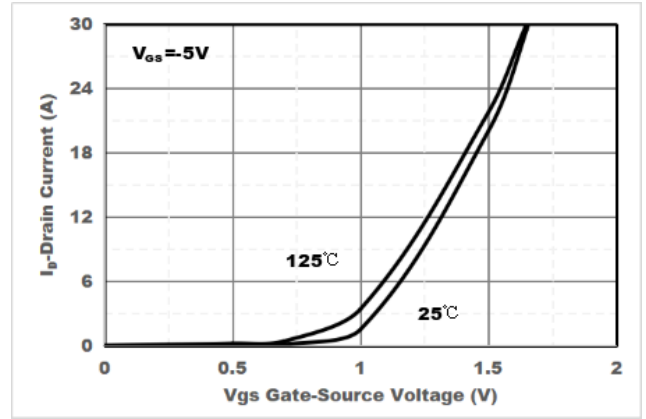


Figure2. Transfer Characteristics

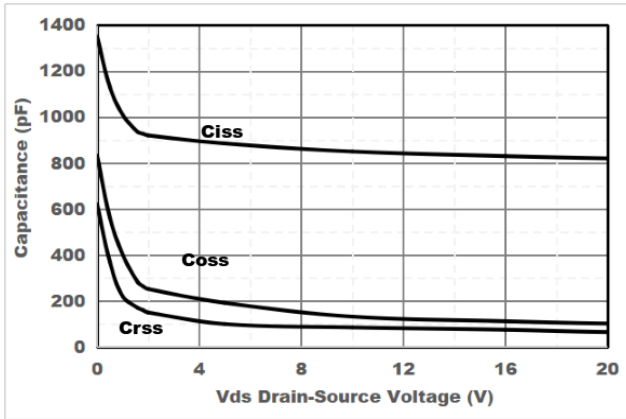


Figure3. Capacitance Characteristics

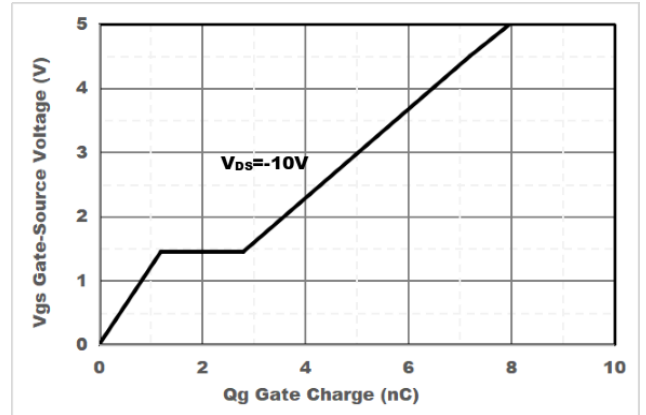


Figure4. Gate Charge

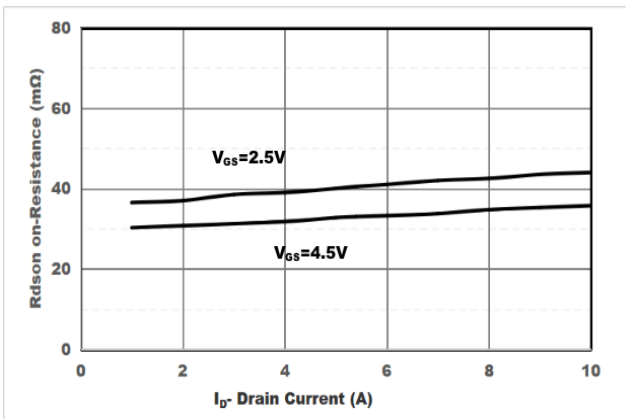


Figure5. Drain-Source on Resistance

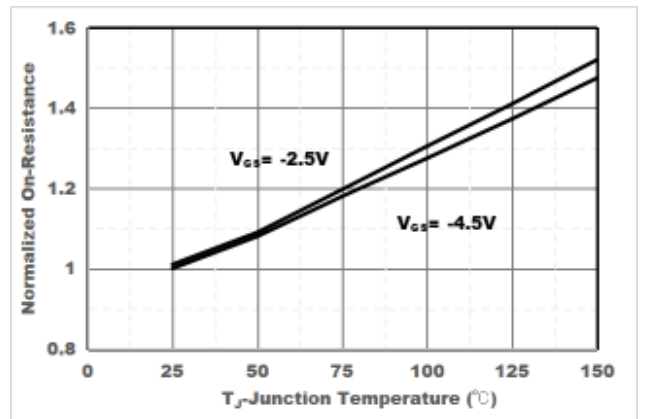
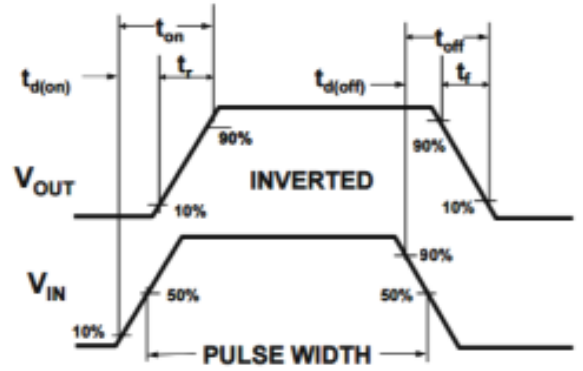
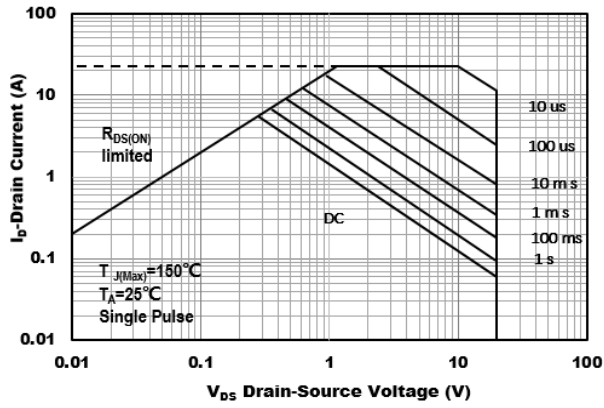


Figure6. Drain-Source on Resistance



Typical Electrical and Thermal Characteristics

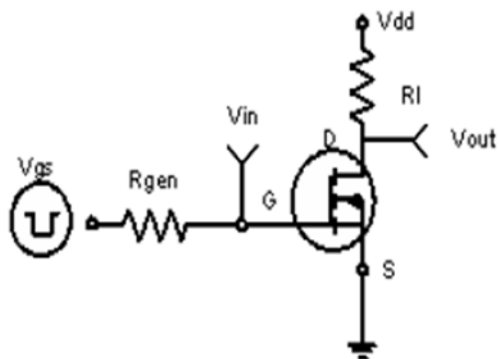


Figure1:Switching Test Circuit

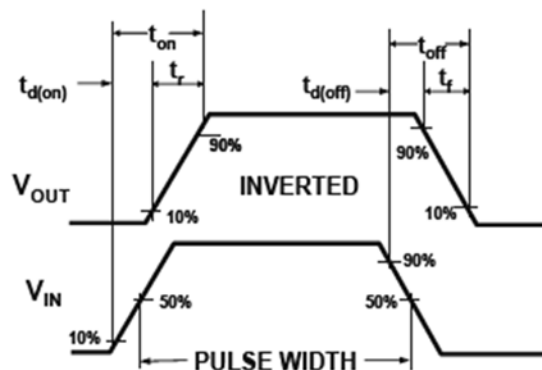


Figure2:Switching Waveforms

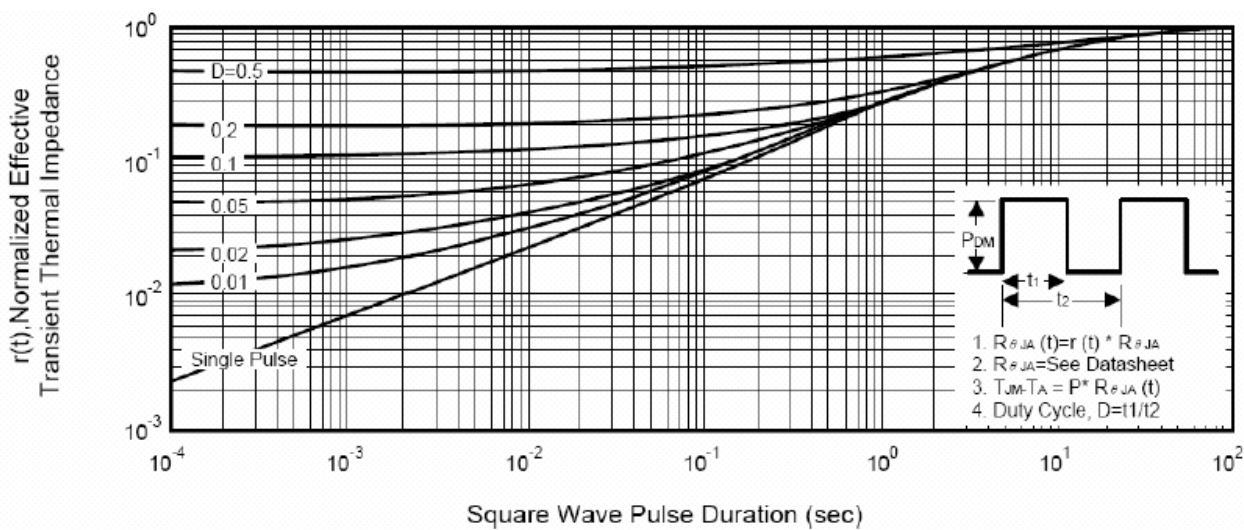
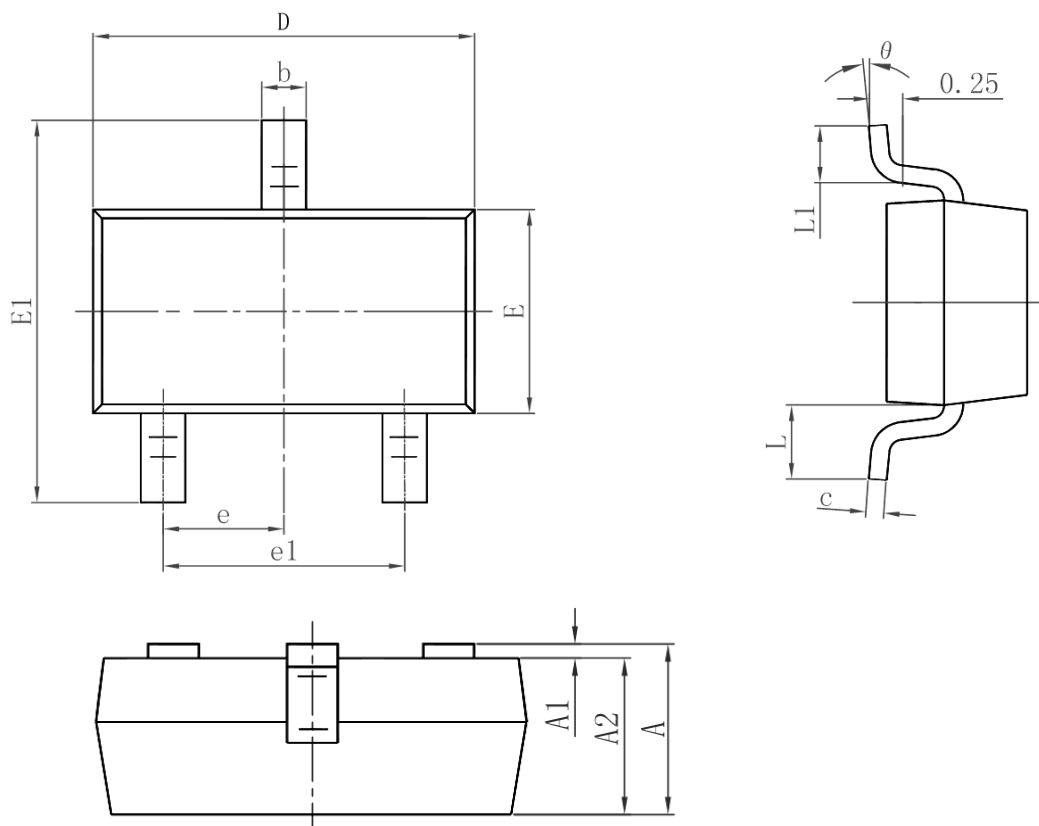


Figure 3: Normalized Maximum Transient Thermal Impedance

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
θ	0°	8°	0°	8°

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