FH3415P

P-Channel Enhancement Mode MOSFET

Description

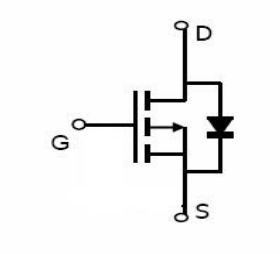
The FH3415P is the P-Channel enhancement mode MOSFET in a plastic package (SOT-23) using the Trench technology.

Applications

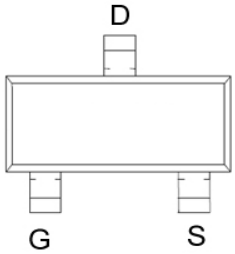
- LowSwitch
- DC-DCConverters
- Lithium-IonBatteryProtection

Features

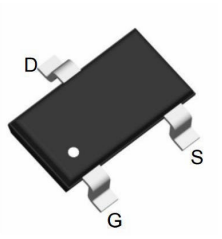
- V_{DS} = -20V ; I_D = -4.6A
  $R_{DS(ON)}$(Typ.)= 28mΩ @V_{GS} = -4.5V
  $R_{DS(ON)}$(Typ.)= 38mΩ @V_{GS} = -2.5V
- TrenchTechnology
- FastSwitching
- High Power and Current Handing Capability
- SMDPackage(SOT-23)
- MSL-3 compliant



Schematic diagram



Marking and Pin Assignment



SOT-23 top view

Absolute Maximum Ratings (T_C=25℃ 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℃	-4.6	A
		T_C = 100℃	-3.8	
I_{DM}	Pulsed Drain Current [A]		-18.4	A
P_D	Power Dissipation	T_C = 25℃	1.2	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient [B]		84	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

■ Electrical Characteristics (T_J=25℃ 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℃			-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

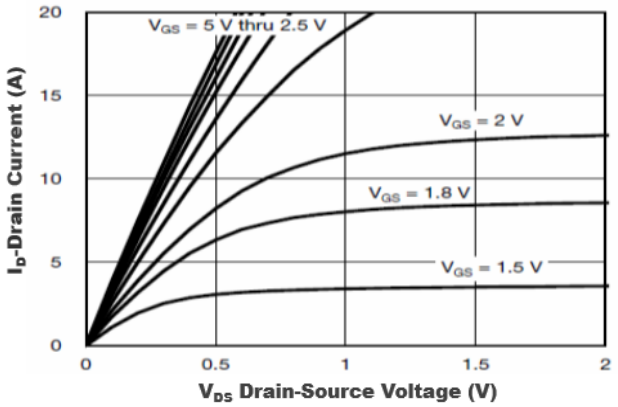


Figure1. Output Characteristics

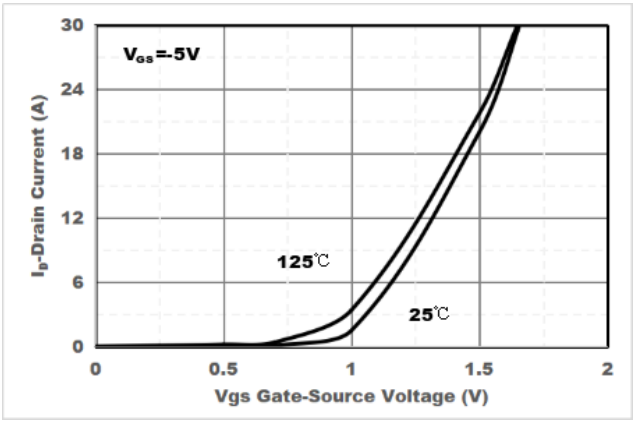


Figure2. Transfer Characteristics

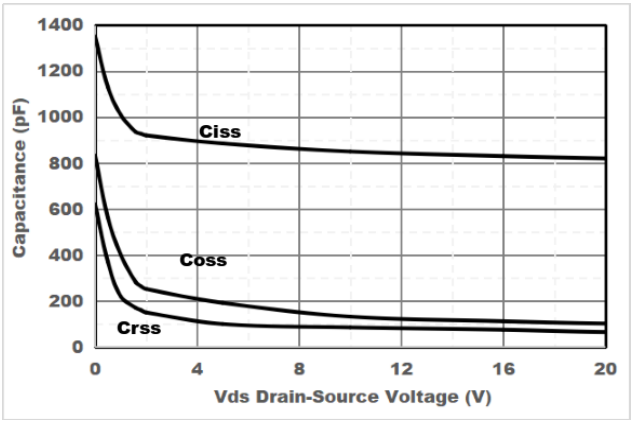


Figure3. Capacitance Characteristics

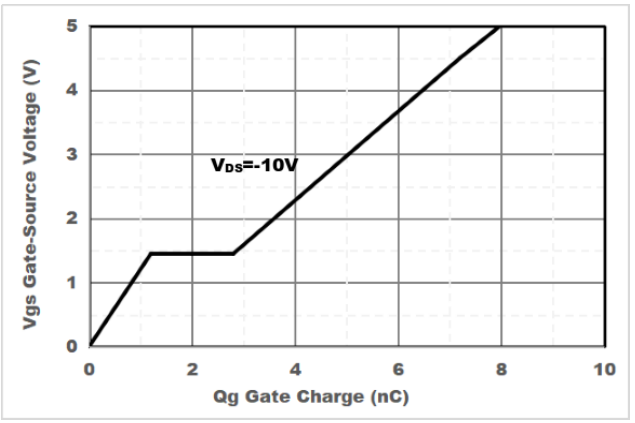


Figure4. Gate Charge

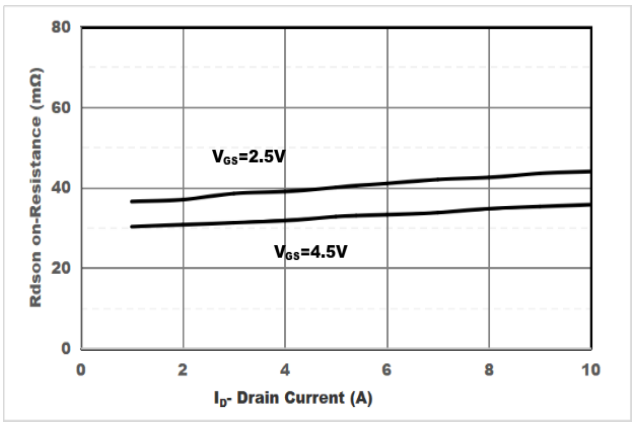


Figure5. Drain-Source on Resistance

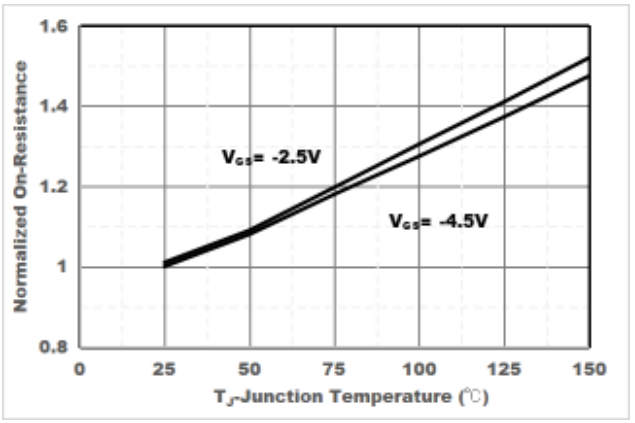


Figure6. Drain-Source on Resistance

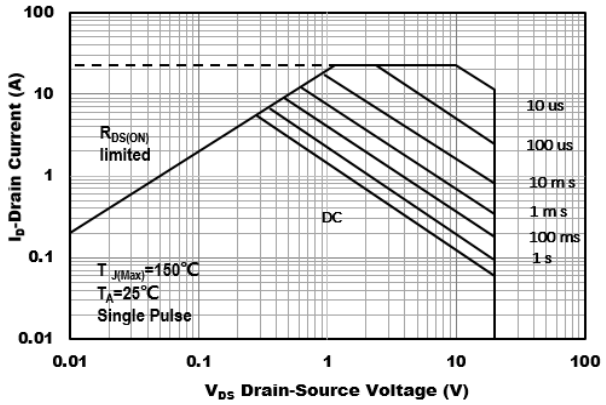


Figure7. Safe Operation Area

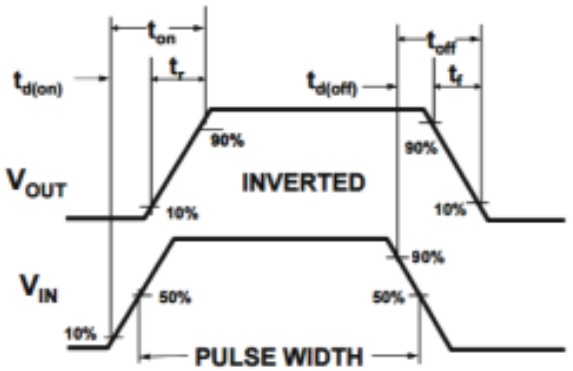


Figure8. Switching wave

Typical Electrical and Thermal Characteristics

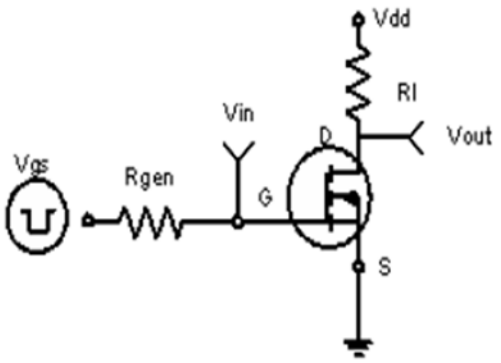


Figure1:Switching Test Circuit

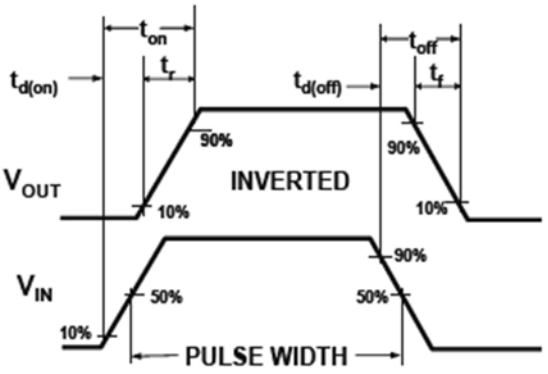


Figure2:Switching Waveforms

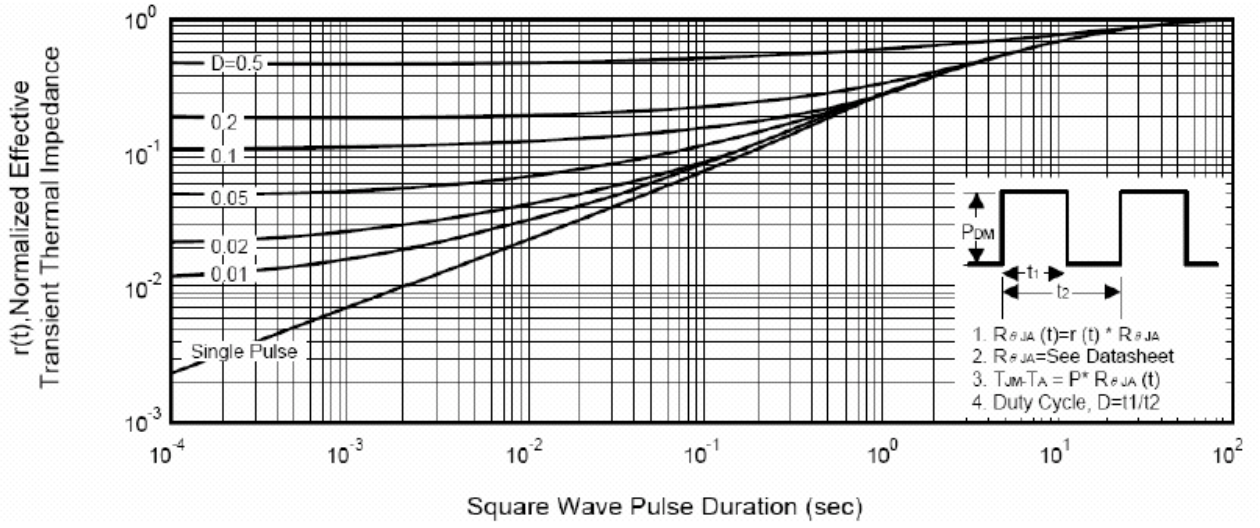
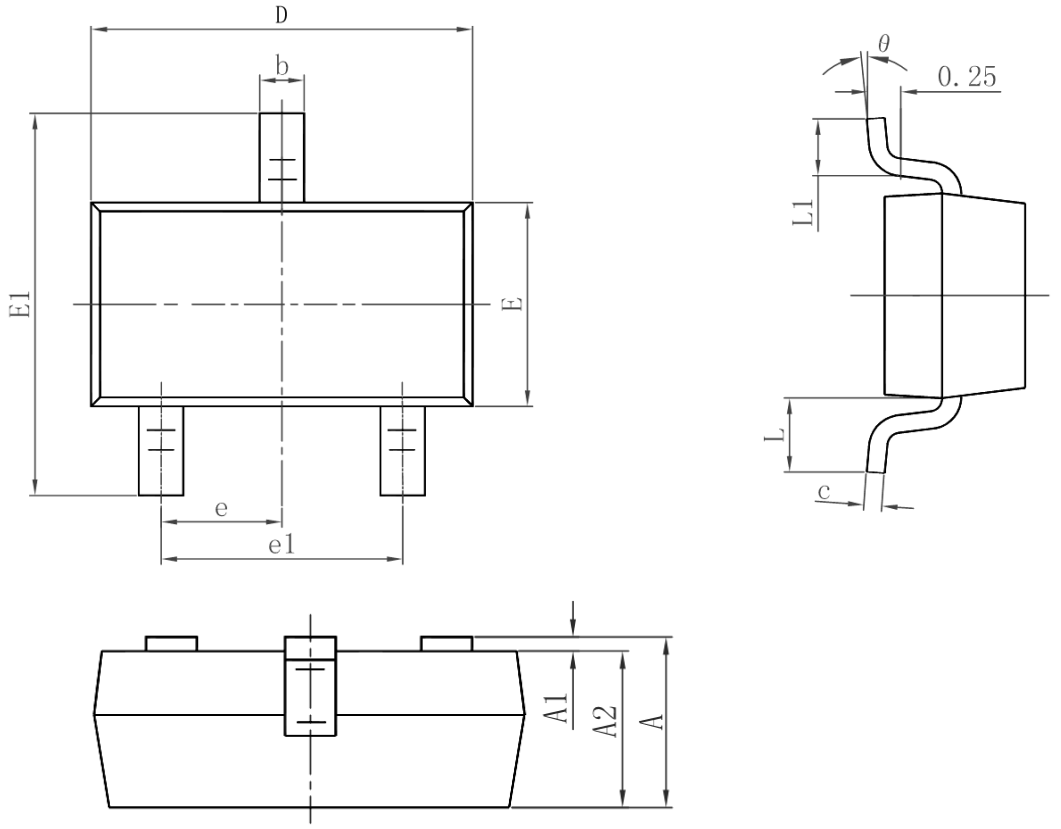


Figure 3: Normalized Maximum Transient Thermal Impedance

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°