FH25P03AC

P-Channel Enhancement Mode MOSFET

Description

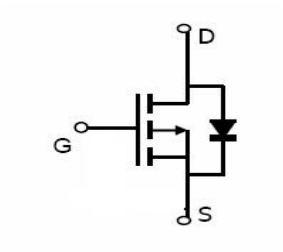
The FH25P03AC is the P-Channel enhancement mode MOSFET in a plastic package (SO-8) using the Trench technology.

Applications

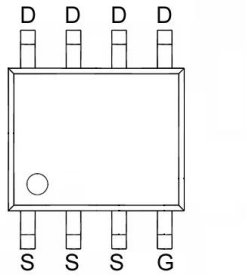
- High Speed Switch
- DC-DC Converters
- Lithium-Ion Battery

Features

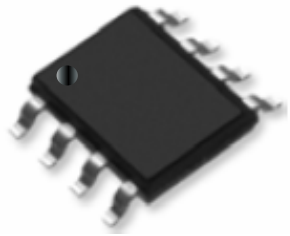
- V_{DS} = -30V ; I_D = -7.1A
  $R_{DS(ON)}$ < 40mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ < 55mΩ @ V_{GS} = -4.5V
- Logic Level Compatible
- SMD Package (SO-8)
- Trench Technology
- Fast Switching



Schematic diagram



Marking and Pin Assignment



SO-8 top view

Absolute Maximum Ratings (T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_J= 150°C)	I_D	-7.1	A
Pulsed Drain Current **(Note 2)**	I_{DM}	-28.4	A
Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Thermal Resistance-Junction to Ambient **(Note 1)**	R_{thJA}	48	°C/W

Note: 1. Mounted on FR4 board, t ≤ 10sec.

2.Repetitive Rating: Pulse width limited by maximum junction temperature.

■ 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	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},, I_D = -250μA	-1.0	-1.6	-2.5	V
Gate-Body Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V			-1	μA
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = - 5.5A		30	40	mΩ
		V_{GS} = -4.5V, I_D = - 4.0A		38	55	
Forward Transconductance	g_{FS}	V_{DS} = -5V, I_D = -5.0A	8	13		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				-4.0	A
Dynamic (Note 3)						
Total Gate Charge	Q_g	V_{DS} = -15V, V_{GS} = -10V, I_D = -1A		24		nC
Gate-Source Charge	Q_{gs}			3.2		
Gate-Drain Charge	Q_{gd}			2.72		
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1MHz		990		pF
Output Capacitance	C_{oss}			182		
Reverse Transfer Capacitance	C_{rss}			118		
Switching (Note 3)						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -15V, R_L = 15Ω, I_D = -1A, V_{GS} = -4.5V, R_{GEN} = 10Ω		8		nS
Rise Time	t_r			3		
Turn-Off Delay Time	$t_{d(off)}$			32		
Fall-Time	t_f			10		

Note: 1. Mounted on FR4 board, t ≤ 5sec.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3.Guaranteed by design.not subject to production

■ Typical Electrical and Thermal Characteristics

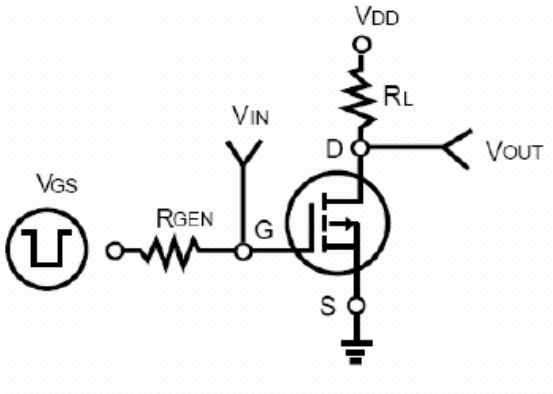


Figure 1: Switching Test Circuit

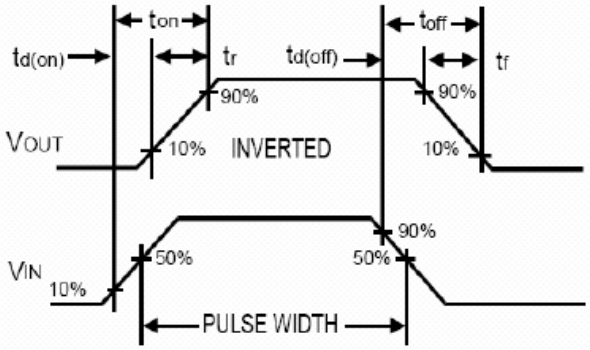
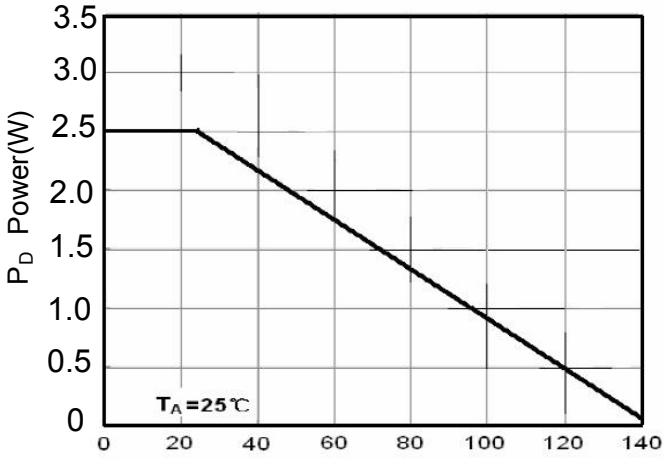
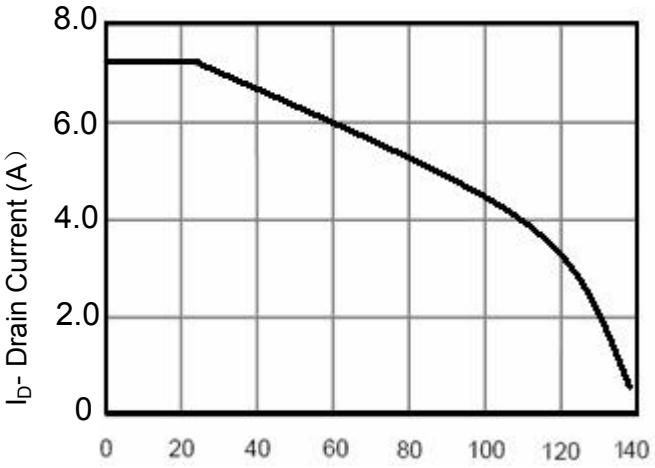


Figure 2: Switching Waveforms



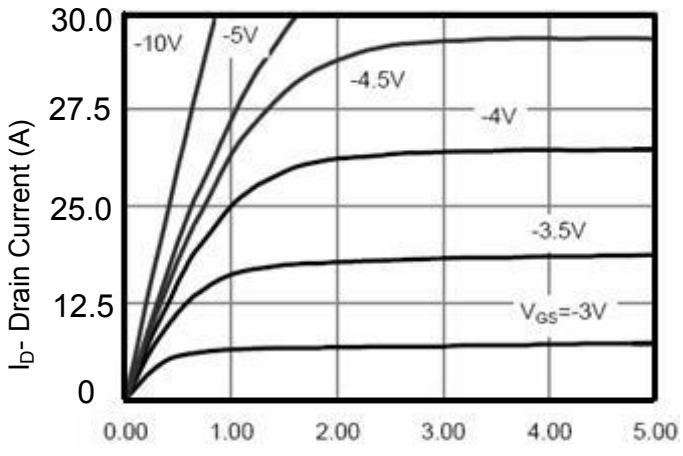
TJ-Junction Temperature(℃)

Figure 3 Power Dissipation



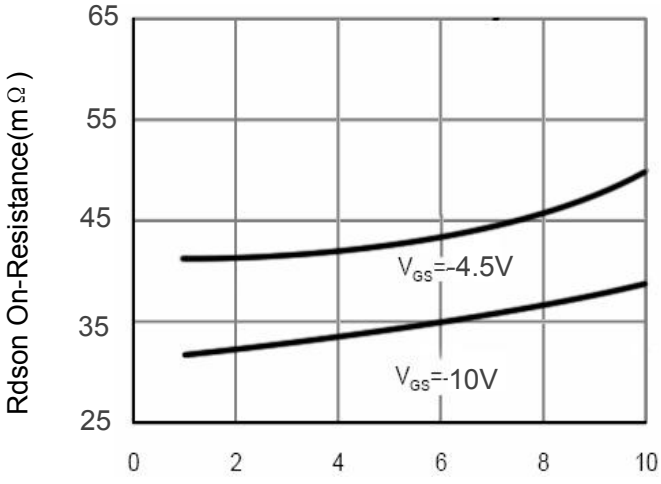
TJ-Junction Temperature(℃)

Figure 4 Drain Current



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



ID- Drain Current (A)

Figure 6 Drain-Source On-Resistance

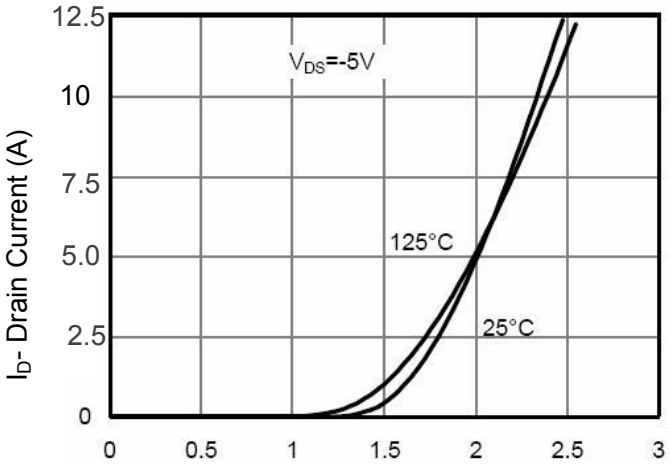


Figure 7 Transfer Characteristics

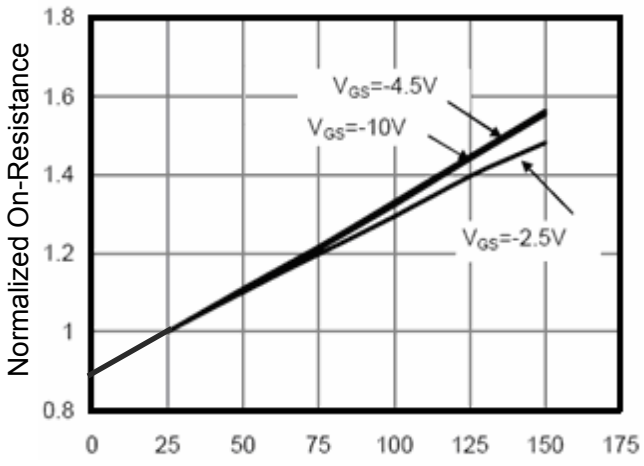


Figure 8 Drain-Source On-Resistance

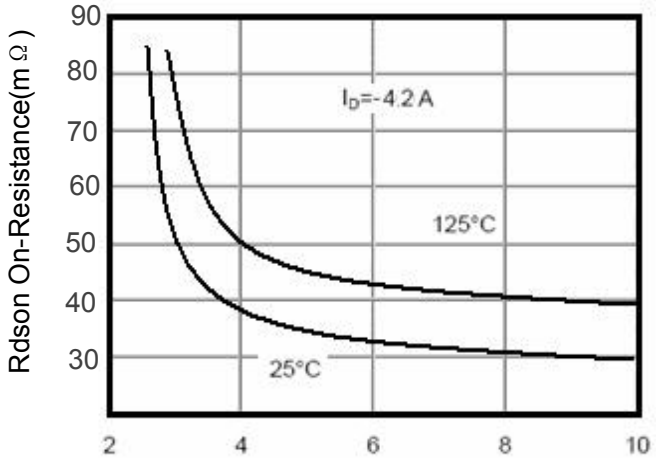


Figure 9 Rdson vs Vgs

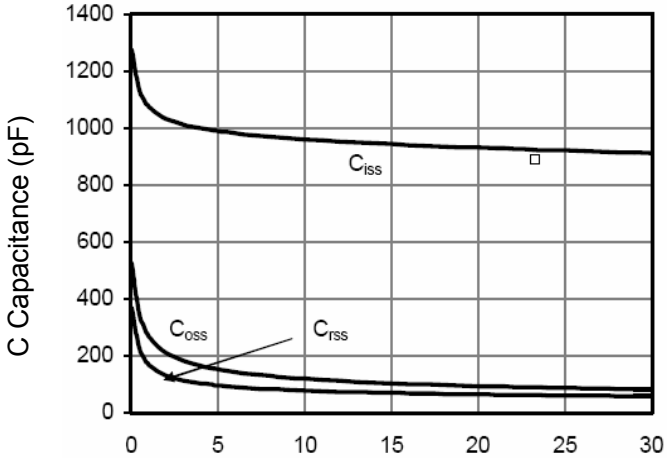


Figure 10 Capacitance vs Vds

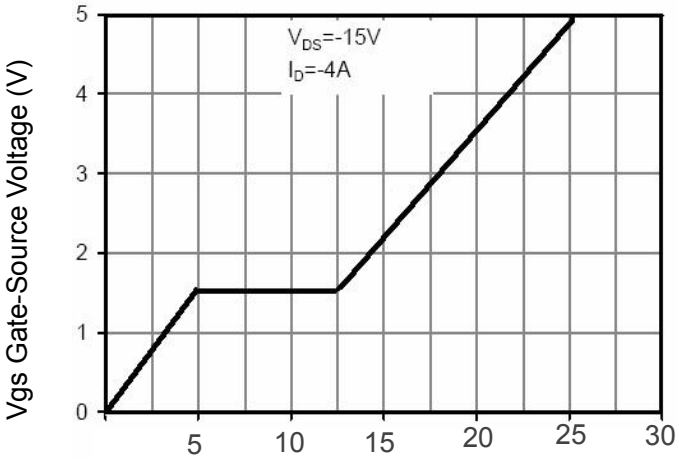


Figure 11 Gate Charge

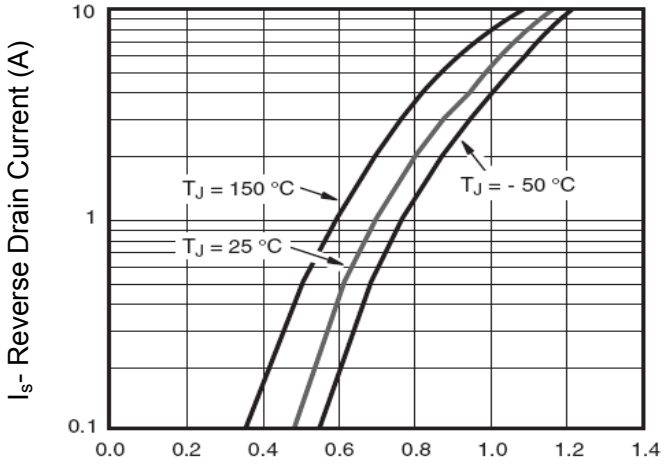


Figure 12 Source- Drain Diode Forward

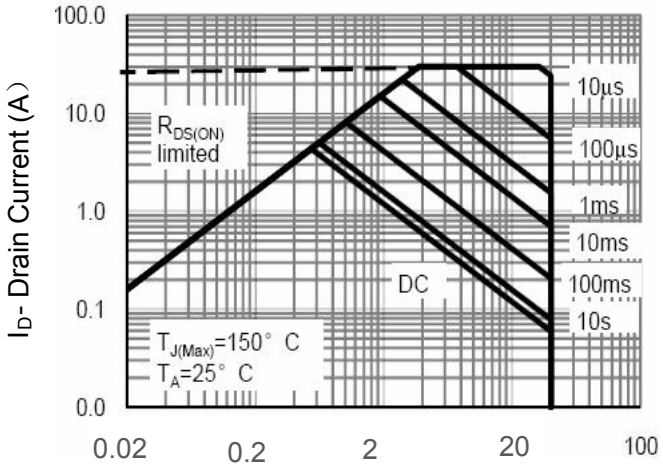


Figure 13 Safe Operation Area

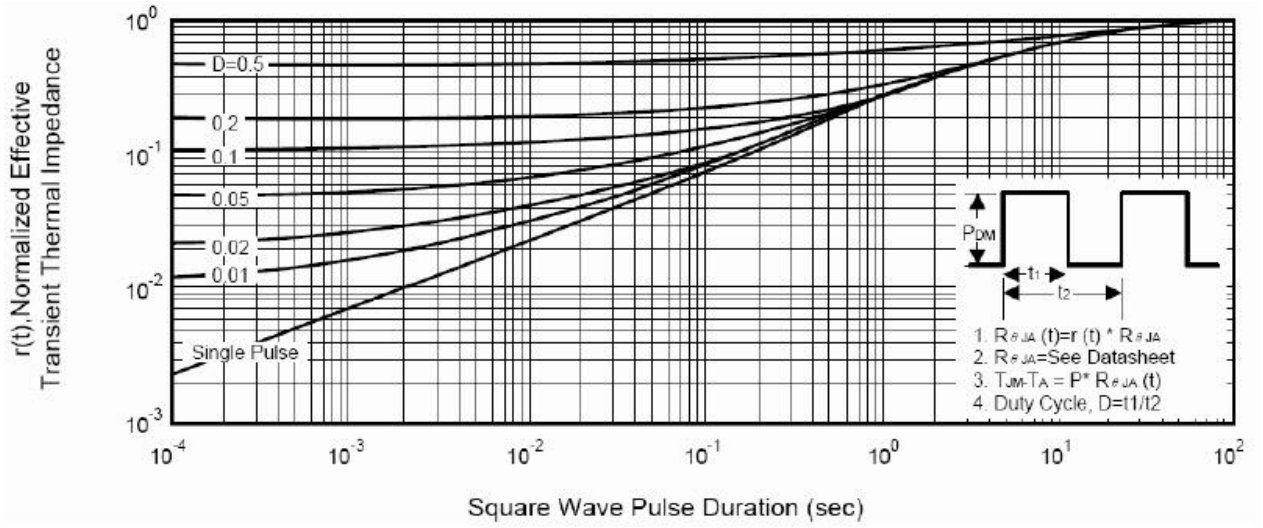
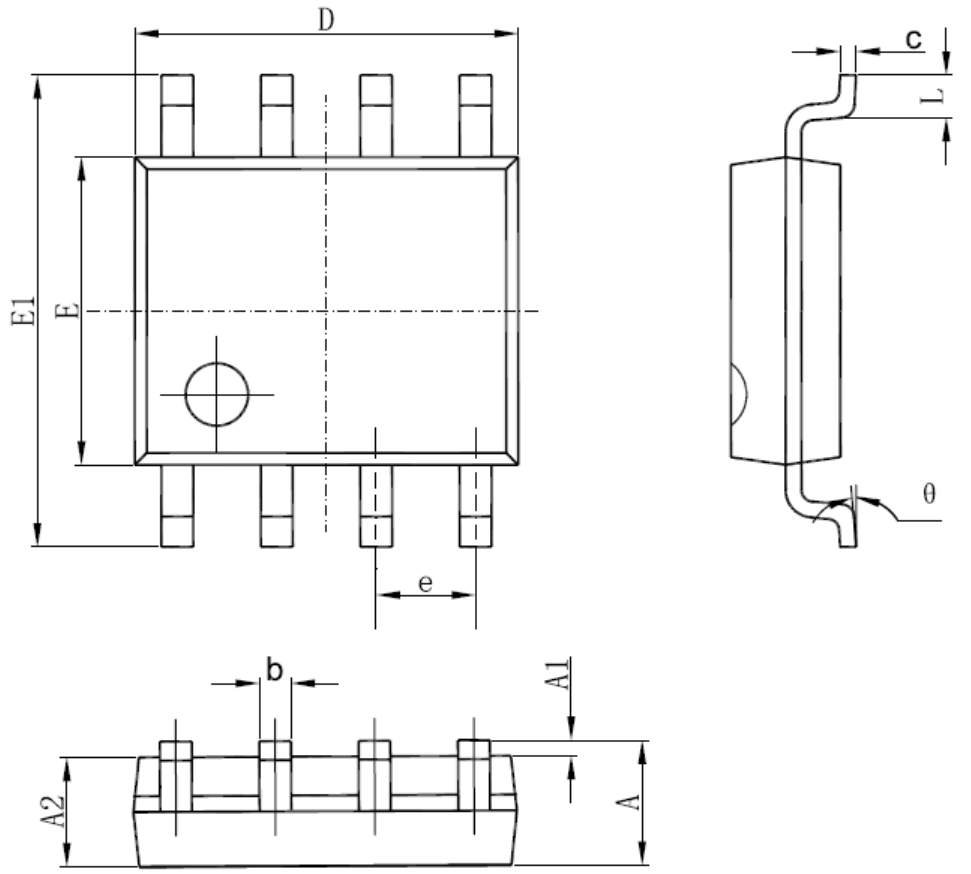


Figure 14 Normalized Maximum Transient Thermal Impedance

■ Package Dimensions : SO-8



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	θ	0°	8°	0°	8°
D	4.700	5.100	0.185	0.200					