

P-Channel 30V (D-S) MOSFET

- Features**

-30V/-4.5A, $R_{DS(ON)}=60m\Omega@V_{GS}=-10V$

-30V/-3.7A, $R_{DS(ON)}=90m\Omega@V_{GS}=-4.5V$

Super high density cell design for

extremely low $R_{DS(ON)}$

Exceptional on-resistance and maximum DC current capability

- General Description**

The FS5905 is the Dual P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

- Applications**

Power Management in Note book

Portable Equipment

Battery Powered System

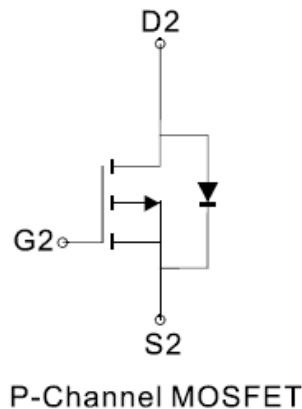
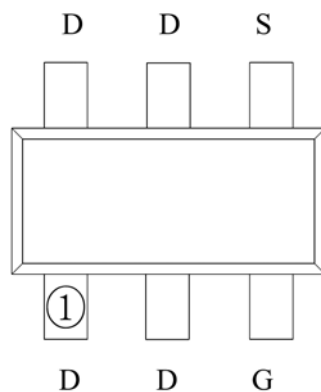
DC/DC Converter

Load Switch

DSC

LCD Display inverter

- Pin Configurations**



● **Absolute Maximum Ratings @ $T_A=25^\circ\text{C}$ unless otherwise noted**

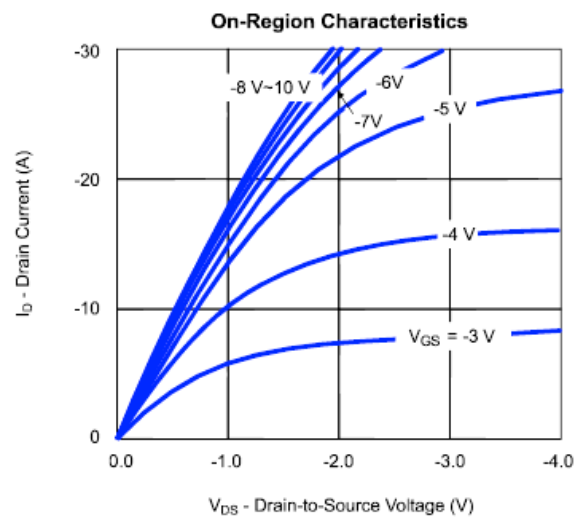
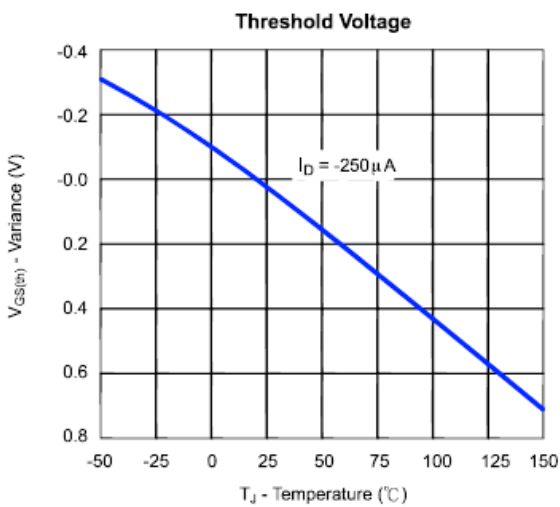
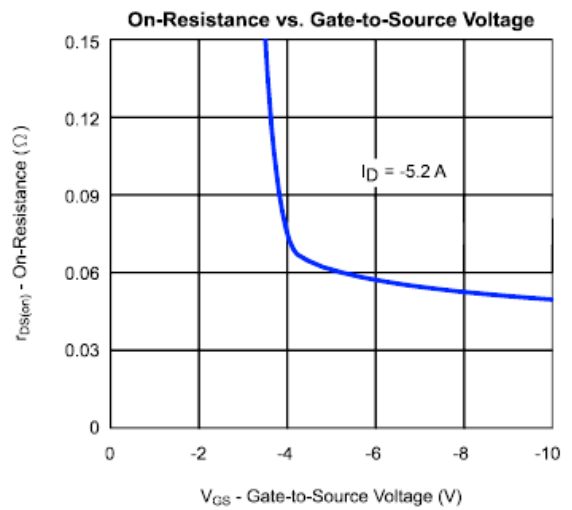
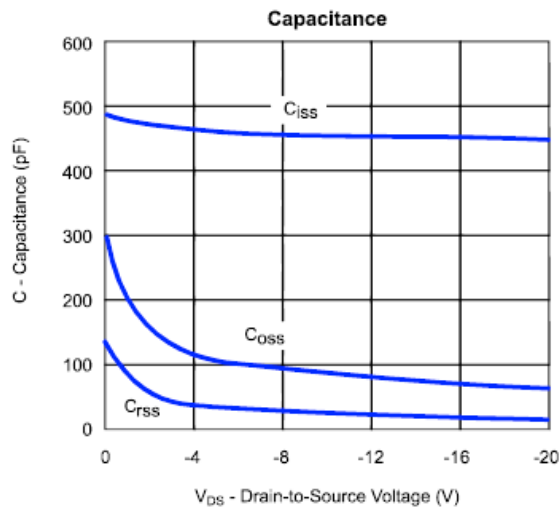
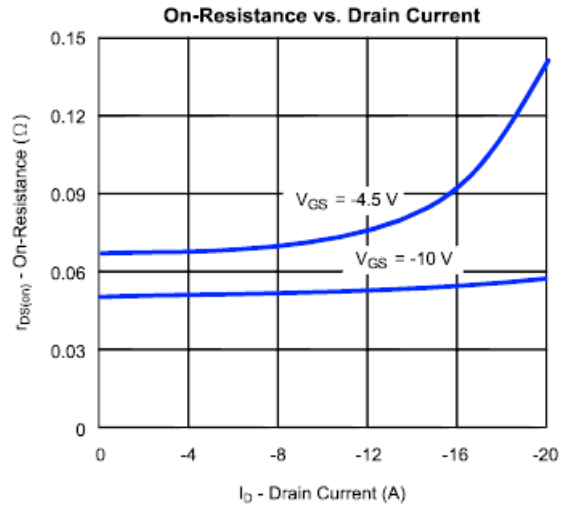
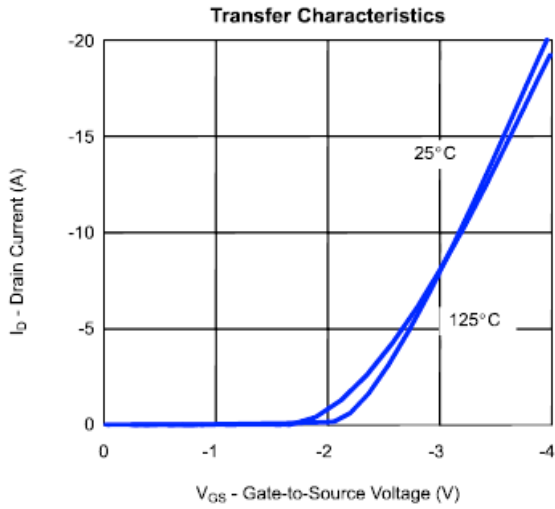
| Parameter | Symbol | Limits | Units |
|---|-----------|--------------|------------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($t_j=150$) | I_D | $T_a=25$ | -4.5 |
| | | $T_a=70$ | -3.6 |
| Pulsed Drain Current ¹⁾ | I_{DM} | -30 | A |
| Continuous Drain Current (Diode Conduction) | I_s | -1.7 | A |
| Maximum Power Dissipation | P_D | $T_A=25$ | 1.25 |
| | | $T_A=70$ | 0.8 |
| Operating Junction Temperature | T_J | -55 to 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55 to 150 | |
| Thermal Resistance- Junction-to-Ambient * | R_{JA} | | 42 |
| | | Steady State | 55 |
| Thermal Resistance- Junction-to-Case | R_{Jc} | 35 | W |

Notes: *The device mounted on 1in2 FR4 board with 2 oz copper

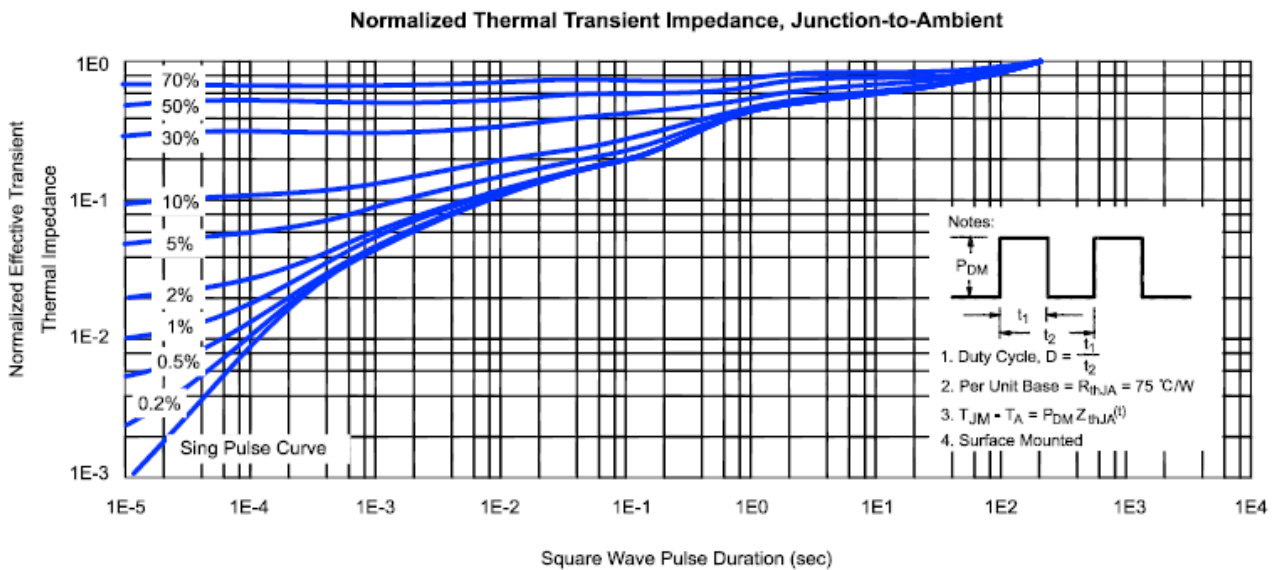
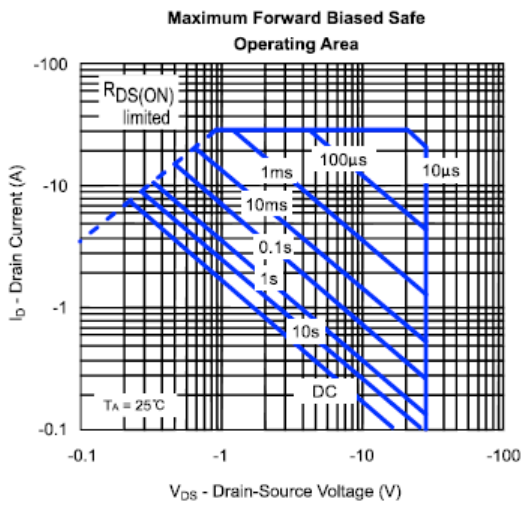
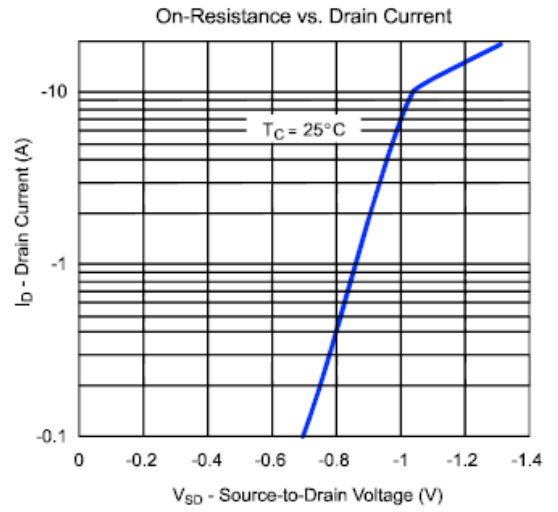
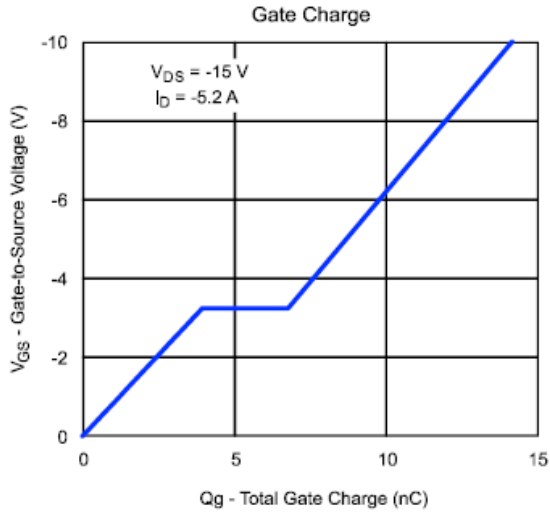
● **Electrical Characteristics @ $T_A=25^\circ\text{C}$ unless otherwise Specified**

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|----------------|---------------------------------|--|-----|------|-----------|---------------|
| Static | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS} = V_{DS}, I_D = -250\text{ A}$ | -1 | -1.4 | -2 | V |
| I_{GSS} | Gate Leakage Current | $V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$ | - | - | ± 100 | nA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$ | - | - | -1 | μA |
| | | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}, T_J=55$ | - | - | -25 | |
| $I_{D(ON)}$ | On-State Drain Current | $V_{DS} = -5\text{V}, V_{GS} = -10\text{V}$ | -20 | - | - | A |
| $R_{D(ON)}$ | Drain-Source On-Resistance | $V_{GS} = -10\text{V}, I_D = -5.3\text{ A}$ | - | 50 | 60 | m Ω |
| | | $V_{GS} = -4.5\text{V}, I_D = -4.2\text{ A}$ | - | 69 | 90 | |
| V_{SD} | Diode Forward Voltage | $I_s = -1.7\text{A}, V_{GS} = 0\text{V}$ | - | -0.8 | -1.2 | V |
| Dynamic | | | | | | |
| R_g | Gate resistance | $V_{DS}=0\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$ | - | 3.5 | - | Ω |
| C_{iss} | Input capacitance | $V_{DS}=-15\text{V}, V_{GS}=-0\text{V}, f=1\text{MHz}$ | - | 450 | 490 | pF |
| C_{oss} | Output Capacitance | | - | 70 | - | |
| C_{rss} | Reverse Transfer Capacitance | | - | 20 | - | |
| Q_g | Total Gate Charge | $V_{DS}=-15\text{V}, V_{GS}=-10\text{V}, I_D=-5.3\text{A}$ | - | 14 | 17 | nC |
| Q_{gs} | Gate-Source Charge | | - | 4 | - | |
| Q_{gd} | Gate-Drain Charge | | - | 3 | - | |
| $t_{D(on)}$ | Turn-On Delay Time | $V_{DD} = -15\text{V}, R_L = 15\Omega$ $I_D = -1\text{A}, V_{GEN} = -10\text{V}$ $R_G = 6\Omega$ | - | 27 | 33 | ns |
| t_r | Turn-On Rise Time | | - | 11 | 15 | |
| $t_{D(off)}$ | Turn-Off Delay Time | | - | 40 | 52 | |
| t_f | Turn-Off Fall Time | | - | 4 | 6 | |

● Typical Performance Characteristics ($T_J=25$)

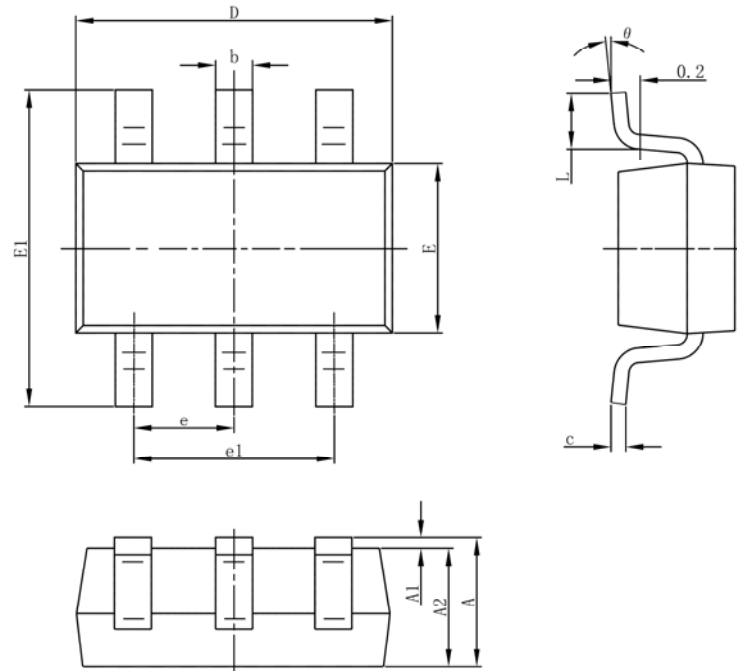


FS5905



- Package Information

SOT-23-6L PACKAGE OUTLINE DIMENSIONS



| 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 |
| theta | 0° | 8° | 0° | 8° |