

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance : 0.28 Ω (max)
- ◆ Ultra High-Speed Switching
- ◆ Gate Protect Diode Built-in
- ◆ SOT - 89 Package

- Applications
- Notebook PCs
- Cellular and portable phones
- On - board power supplies
- Li - ion battery systems

■ General Description

The XP162A11COPR is a P-Channel Power MOS FET with low on-state resistance and ultra high-speed switching characteristics.

Because high-speed switching is possible, the IC can be efficiently set thereby saving energy.

In order to counter static, a gate protect diode is built-in.

The small SOT-89 package makes high density mounting possible.

■ Features

Low on-state resistance : $R_{ds(on)} = 0.15\Omega$ ($V_{gs} = -10V$)

$R_{ds(on)} = 0.28\Omega$ ($V_{gs} = -4.5V$)

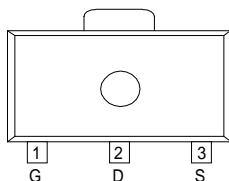
Ultra high-speed switching

Operational Voltage : -4.5V

Gate protect diode built-in

High density mounting : SOT - 89

■ Pin Configuration

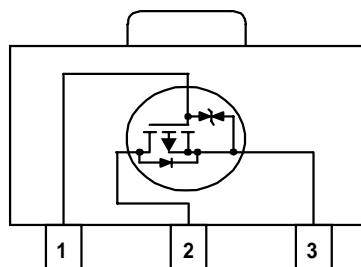


SOT - 89 Top View

■ Pin Assignment

| PIN NUMBER | PIN NAME | FUNCTION |
|------------|----------|----------|
| 1 | G | Gate |
| 2 | D | Drain |
| 3 | S | Source |

■ Equivalent Circuit



P - Channel MOS FET
(1 device built-in)

■ Absolute Maximum Ratings

| $T_a = 25^\circ\text{C}$ | | | |
|---|-----------|------------|------------------|
| PARAMETER | SYMBOL | RATINGS | UNITS |
| Drain - Source Voltage | V_{dss} | -30 | V |
| Gate - Source Voltage | V_{gss} | ± 20 | V |
| Drain Current (DC) | I_d | -2.5 | A |
| Drain Current (Pulse) | I_{dp} | -10 | A |
| Reverse Drain Current | I_{dr} | -2.5 | A |
| Continuous Channel Power Dissipation (note) | P_d | 2 | W |
| Channel Temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

(note) : When implemented on a ceramic PCB

■ Electrical Characteristics

DC characteristics

Ta=25°C

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|--|-------------|----------------------------|-------|--------|-------|-------|
| Drain Cut-off Current | Idss | Vds = - 30 , Vgs = 0V | | | - 10 | μA |
| Gate-Source Leakage Current | Igss | Vgs = ± 20 , Vds = 0V | | | ± 10 | μA |
| Gate-Source Cut-off Voltage | Vgs (off) | Id = -1mA , Vds = - 10V | - 1.0 | | - 2.5 | V |
| Drain-Source On-state Resistance (note) | Rds (on) | Id = - 1.5A , Vgs = - 10V | | 0.11 | 0.15 | Ω |
| | | Id = - 1.5A , Vgs = - 4.5V | | 0.2 | 0.28 | Ω |
| Forward Transfer Admittance (note) | Yfs | Id = - 1.5A , Vds = - 10V | | 2.5 | | S |
| Body Drain Diode Forward Voltage | Vf | If = - 2.5A , Vgs = 0V | | - 0.85 | - 1.1 | V |

(note) : Effective during pulse test.

Dynamic characteristics

Ta=25°C

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|----------------------|--------|-------------------------------------|-----|-----|-----|-------|
| Input Capacitance | Ciss | Vds = - 10V , Vgs = 0V f = 1 MHz | | 280 | | pF |
| Output Capacitance | Coss | | | 200 | | pF |
| Feedback Capacitance | Crss | | | 90 | | pF |

Switching characteristics

Ta=25°C

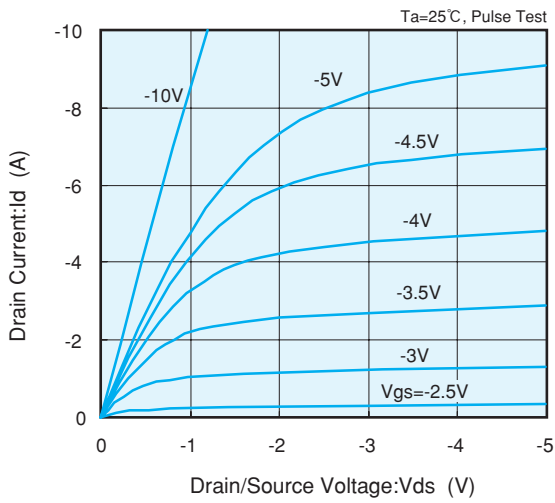
| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------|------------|---|-----|-----|-----|-------|
| Turn-on Delay Time | td (on) | Vgs = - 5V , Id = - 1.5A Vdd = - 10V | | 10 | | ns |
| Rise Time | tr | | | 30 | | ns |
| Turn-off Delay Time | td (off) | | | 20 | | ns |
| Fall Time | tf | | | 35 | | ns |

Thermal characteristics

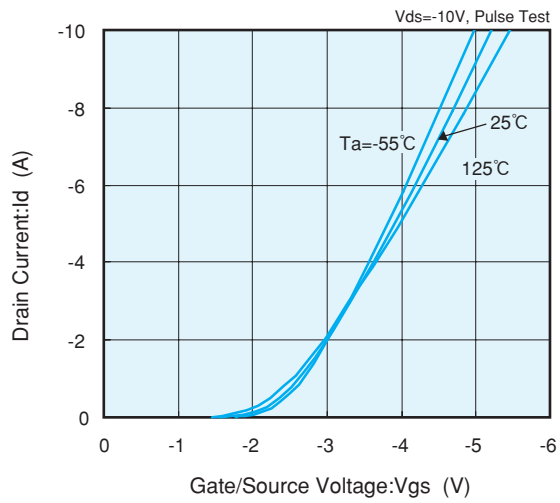
| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|--|----------------|-------------------------------|-----|------|-----|--------|
| Thermal Resistance (channel - surroundings) | Rth (ch - a) | Implement on a ceramic PCB | | 62.5 | | °C / W |

Electrical Characteristics

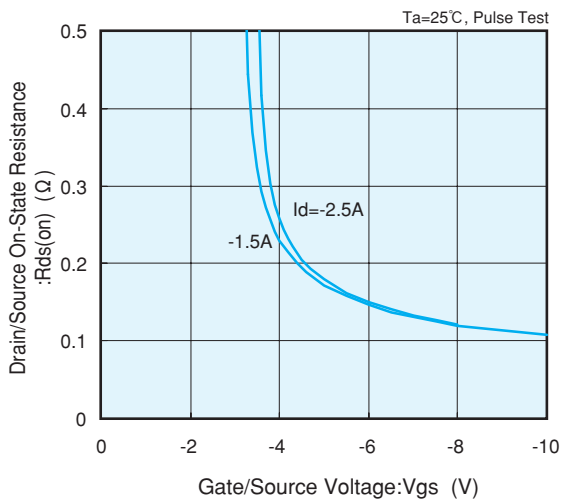
Drain Current vs. Drain/Source Voltage



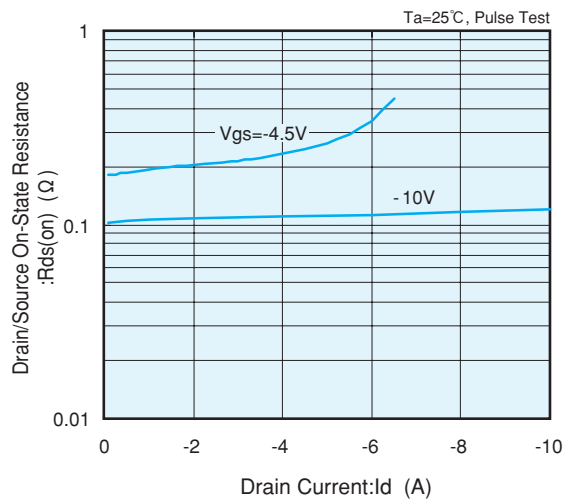
Drain Current vs. Gate/Source Voltage



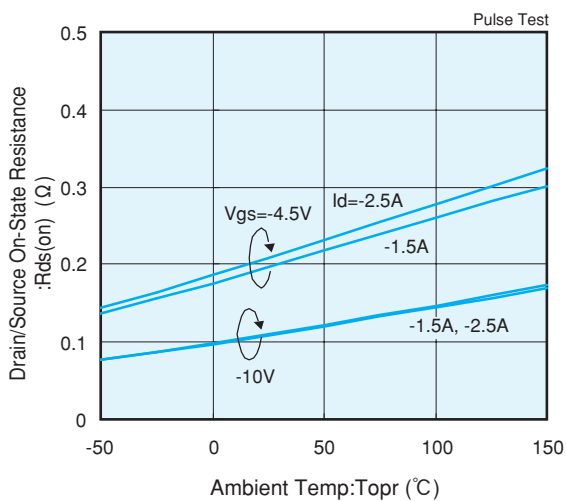
Drain/Source On-State Resistance vs. Gate/Source Voltage



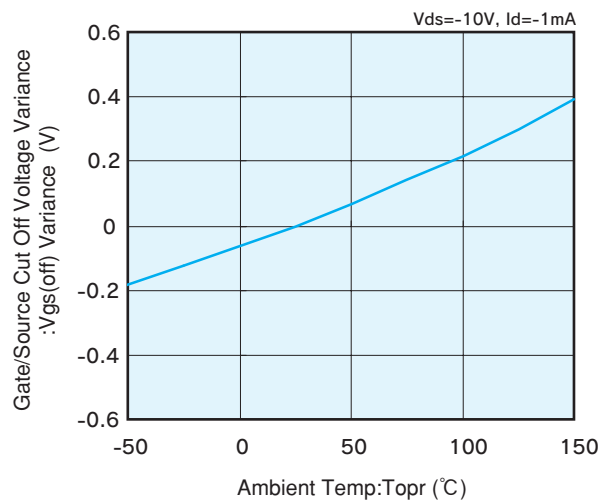
Drain/Source On-State Resistance vs. Drain Current



Drain/Source On-State Resistance vs. Ambient Temp



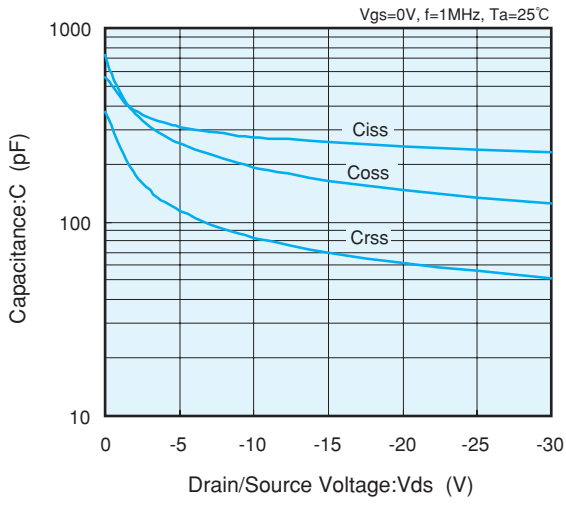
Gate/Source Cut Off Voltage Variance vs. Ambient Temp.



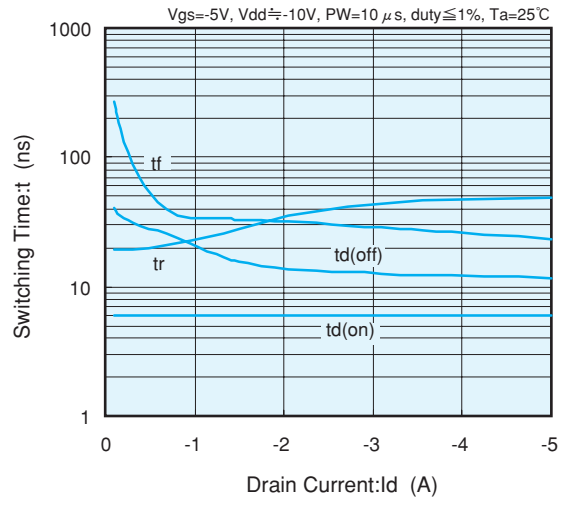
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Electrical Characteristics

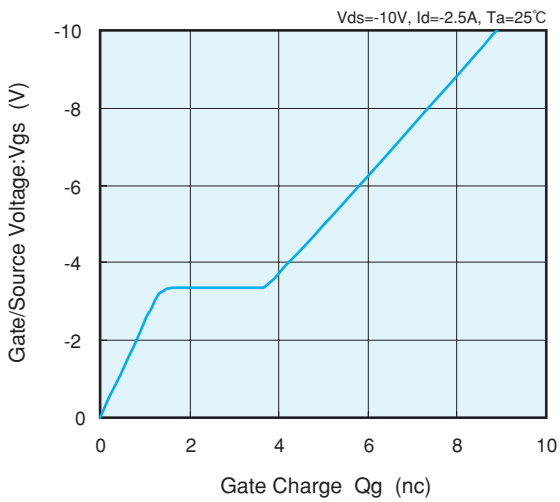
Drain/Source Voltage vs. Capacitance



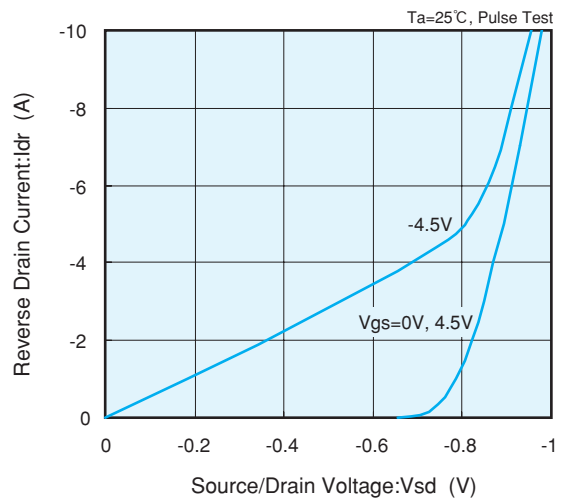
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width

