

XP162A01B5PR



Power MOS FET

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance: 0.25Ω (max)
- ◆ Ultra High-Speed Switching
- ◆ SOT-89 Package

Applications

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

General Description

The XP162A01B5PR 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.

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

Features

Low on-state resistance : $R_{ds(on)}=0.25\Omega(V_{gs}=-4.5V)$

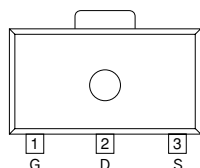
: $R_{ds(on)}=0.4\Omega(V_{gs}=-2.5V)$

Ultra high-speed switching

Operational Voltage : $-2.5V$

High density mounting : SOT-89

Pin Configuration



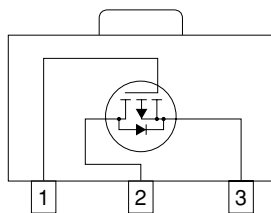
SOT-89
(TOP VIEW)

Pin Assignment

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

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Equivalent Circuit



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

Absolute Maximum Ratings

$T_a=25^\circ C$

| PARAMETER | SYMBOL | RATINGS | UNITS |
|---|-----------|----------|------------|
| Drain-Source Voltage | V_{ds} | -20 | V |
| Gate-Source Voltage | V_{gs} | ± 12 | V |
| Drain Current (DC) | I_d | -2 | A |
| Drain Current (Pulse) | I_{dp} | -6 | A |
| Reverse Drain Current | I_{dr} | -2 | A |
| Continuous Channel Power Dissipation (note) | P_d | 2 | W |
| Channel Temperature | T_{ch} | 150 | $^\circ C$ |
| Storage Temperature | T_{stg} | -55~150 | $^\circ C$ |

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=-20V, Vgs=0V | | | -10 | μA |
| Gate-Source Leakage Current | Igss | Vgs=±12V, Vds=0V | | | ±10 | μA |
| Gate-Source Cut-off Voltage | Vgs(off) | Id=-1mA, Vds=-10V | -0.5 | | | V |
| Drain-Source On-state Resistance (note) | Rds(on) | Id=-1A, Vgs=-4.5V | | 0.19 | 0.25 | Ω |
| | | Id=-1A, Vgs=-2.5V | | 0.3 | 0.4 | Ω |
| Forward Transfer Admittance (note) | Yfs | Id=-1A, Vds=-10V | | 2.5 | | S |
| Body Drain Diode Forward Voltage | Vf | If=-2A, 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=1MHz | | 320 | | pF |
| Output Capacitance | Coss | | | 180 | | pF |
| Feedback Capacitance | Crss | | | 65 | | pF |

Switching Characteristics

Ta=25°C

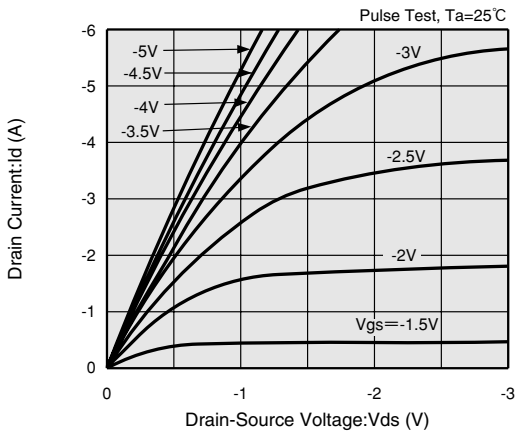
| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------|----------|-----------------------------|-----|-----|-----|-------|
| Turn-on Delay Time | td (on) | Vgs=-5V, Id=-1A Vdd=-10V | | 10 | | ns |
| Rise Time | tr | | | 15 | | ns |
| Turn-off Delay Time | td (off) | | | 40 | | ns |
| Fall Time | tf | | | 50 | | ns |

Thermal Characteristics

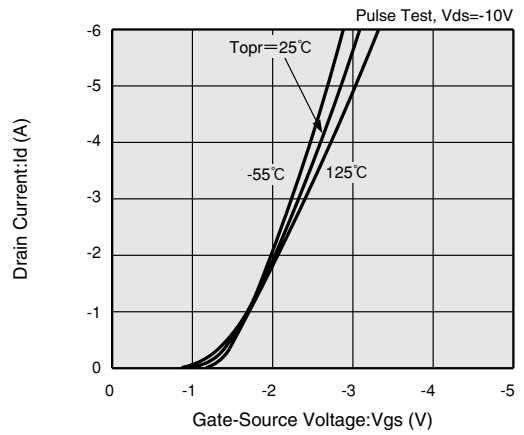
| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------------|------------|----------------------------|-----|------|-----|-------|
| Thermal Resistance (channel-ambience) | Rth (ch-a) | Implement on a ceramic PCB | | 62.5 | | °C/W |

Typical Performance Characteristics

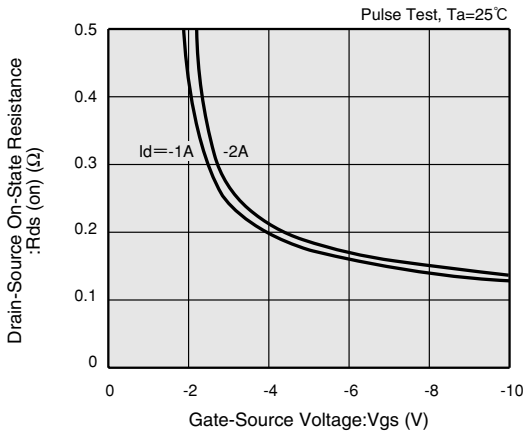
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



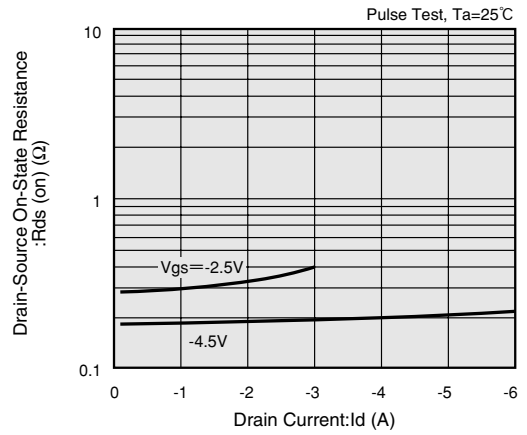
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



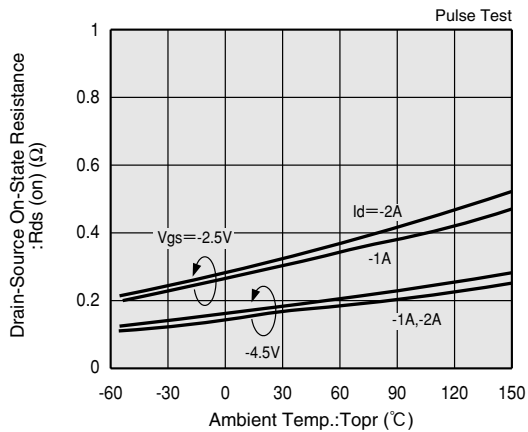
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



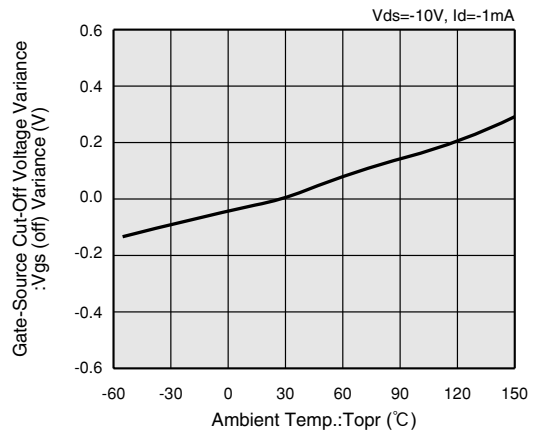
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



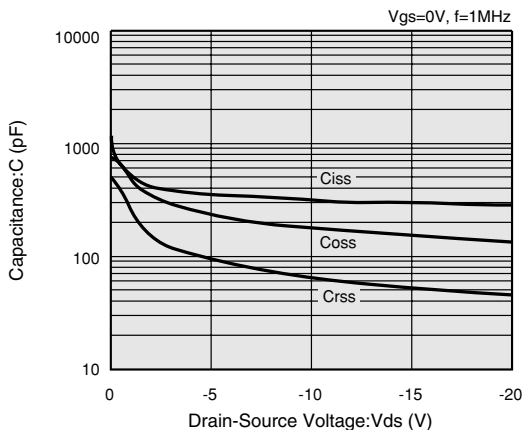
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



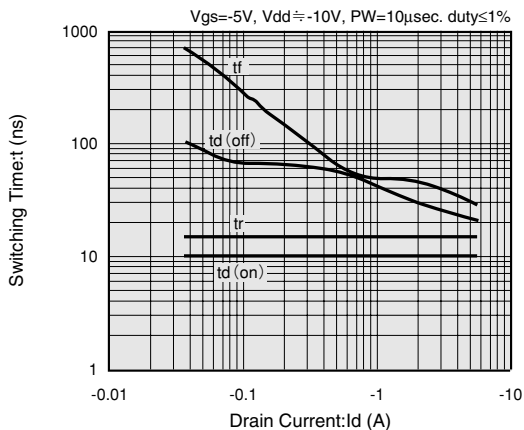
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



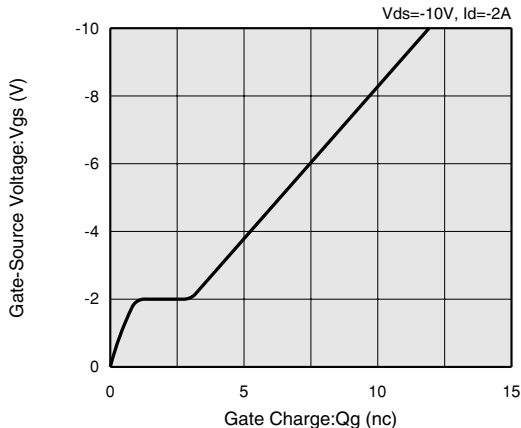
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



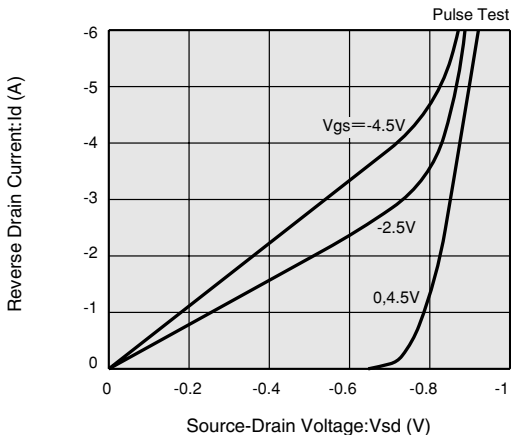
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

