

## Power MOSFET

### ■ GENERAL DESCRIPTION

The XP132A1635SR is a P-channel Power MOSFET 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 SOP-8 package makes high density mounting possible.

### ■ APPLICATIONS

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

### ■ FEATURES

**Low On-State Resistance** :  $R_{ds(on)}=0.033\Omega$  ( $V_{gs}=-4.5V$ )  
:  $R_{ds(on)}=0.055\Omega$  ( $V_{gs}=-2.5V$ )

**Ultra High-Speed Switching**

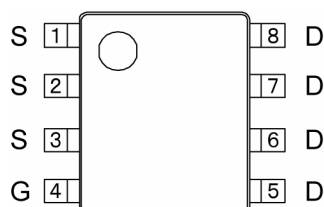
**Driving Voltage** : -2.5V

**P-Channel Power MOSFET**

**DMOS Structure**

**Package** : SOP-8

### ■ PIN CONFIGURATION

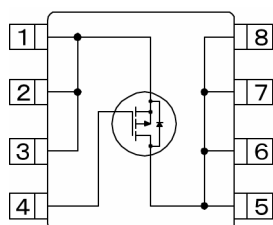


SOP-8  
(TOP VIEW)

### ■ PIN ASSIGNMENT

| PIN NUMBER | PIN NAME | FUNCTION |
|------------|----------|----------|
| 1~3        | S        | Source   |
| 4          | G        | Gate     |
| 5~8        | D        | Drain    |

### ■ EQUIVALENT CIRCUIT



P-channel MOSFET  
( 1 device built-in )

### ■ ABSOLUTE MAXIMUM RATINGS

$T_a = 25^\circ C$

| PARAMETER                   | SYMBOL    | RATINGS  | UNITS      |
|-----------------------------|-----------|----------|------------|
| Drain-Source Voltage        | $V_{dss}$ | -20      | V          |
| Gate-Source Voltage         | $V_{gss}$ | $\pm 12$ | V          |
| Drain Current (DC)          | $I_d$     | -8       | A          |
| Drain Current (Pulse)       | $I_{dp}$  | -32      | A          |
| Reverse Drain Current       | $I_{dr}$  | -8       | A          |
| Channel Power Dissipation * | $P_d$     | 2.5      | W          |
| Channel Temperature         | $T_{ch}$  | 150      | $^\circ C$ |
| Storage Temperature Range   | $T_{stg}$ | -55~150  | $^\circ C$ |

\* When implemented on a glass epoxy 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 Leak Current           | Igss     | Vgs=±12V, Vds=0V  | -    | -     | ±1    | μA    |
| Gate-Source Cut-Off Voltage        | Vgs(off) | Id=-1mA, Vds=-10V | -0.5 | -     | -1.2  | V     |
| Drain-Source On-State Resistance * | Rds(on)  | Id=-4A, Vgs=-4.5V | -    | 0.025 | 0.033 | Ω     |
|                                    |          | Id=-4A, Vgs=-2.5V | -    | 0.040 | 0.055 | Ω     |
| Forward Transfer Admittance *      | Yfs      | Id=-4A, Vds=-10V  | -    | 16    | -     | S     |
| Body Drain Diode Forward Voltage   | Vf       | If=-8A, Vgs=0V    | -    | -0.85 | -1.1  | V     |

\* Effective during pulse test.

### Dynamic Characteristics

Ta = 25°C

| PARAMETER            | SYMBOL | CONDITIONS                 | MIN. | TYP. | MAX. | UNITS |
|----------------------|--------|----------------------------|------|------|------|-------|
| Input Capacitance    | Ciss   | Vds=-10V, Vgs=0V<br>f=1MHz | -    | 1700 | -    | pF    |
| Output Capacitance   | Coss   |                            | -    | 1000 | -    | pF    |
| Feedback Capacitance | Crss   |                            | -    | 500  | -    | pF    |

### Switching Characteristics

Ta = 25°C

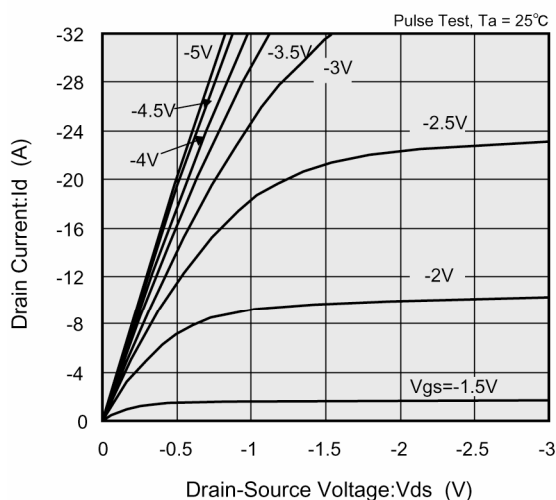
| PARAMETER           | SYMBOL   | CONDITIONS                  | MIN. | TYP. | MAX. | UNITS |
|---------------------|----------|-----------------------------|------|------|------|-------|
| Turn-On Delay Time  | td (on)  | Vgs=-5V, Id=-4A<br>Vdd=-10V | -    | 15   | -    | ns    |
| Rise Time           | tr       |                             | -    | 45   | -    | ns    |
| Turn-Off Delay Time | td (off) |                             | -    | 70   | -    | ns    |
| Fall Time           | tf       |                             | -    | 65   | -    | ns    |

### Thermal Characteristics

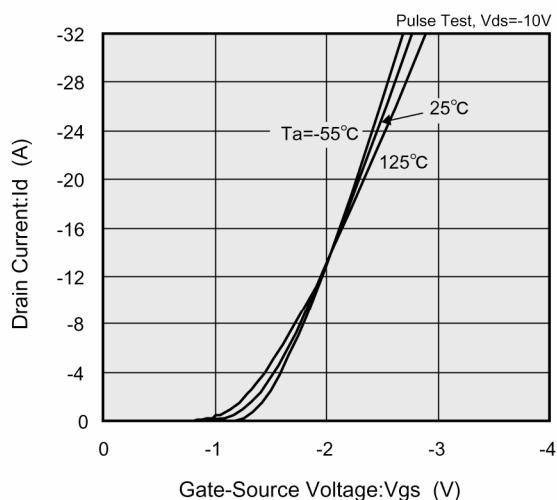
| PARAMETER                             | SYMBOL     | CONDITIONS                           | MIN. | TYP. | MAX. | UNITS |
|---------------------------------------|------------|--------------------------------------|------|------|------|-------|
| Thermal Resistance (Channel-Ambience) | Rth (ch-a) | Implement on a glass epoxy resin PCB | -    | 50   | -    | °C/W  |

## TYPICAL PERFORMANCE CHARACTERISTICS

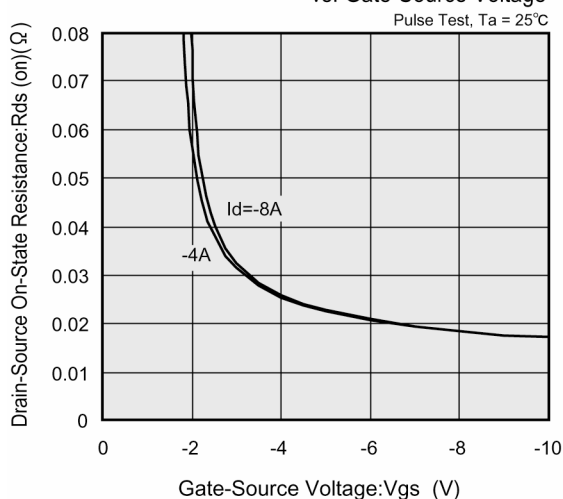
(1) Drain Current vs. Drain-Source Voltage



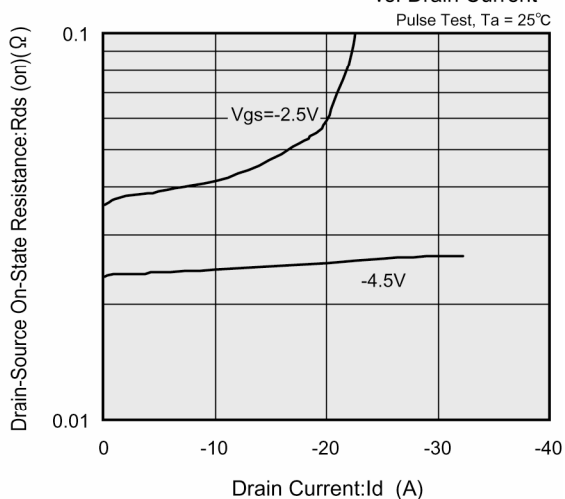
(2) Drain Current vs. Gate-Source Voltage



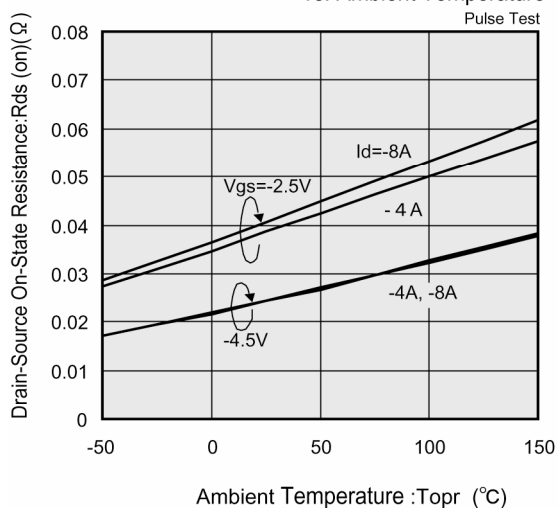
(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



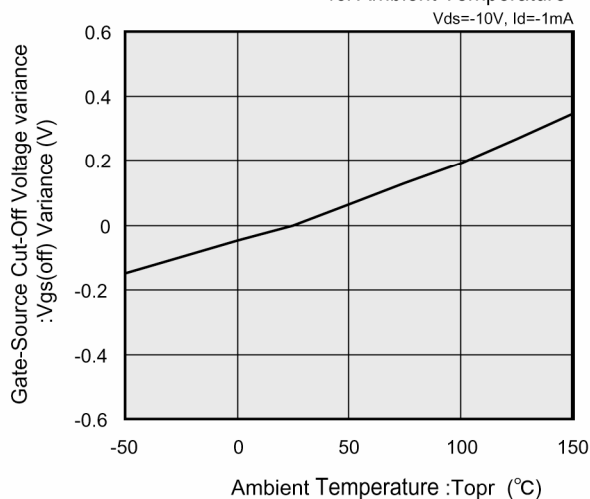
(4) Drain-Source On-State Resistance vs. Drain Current



(5) Drain-Source On-State Resistance vs. Ambient Temperature

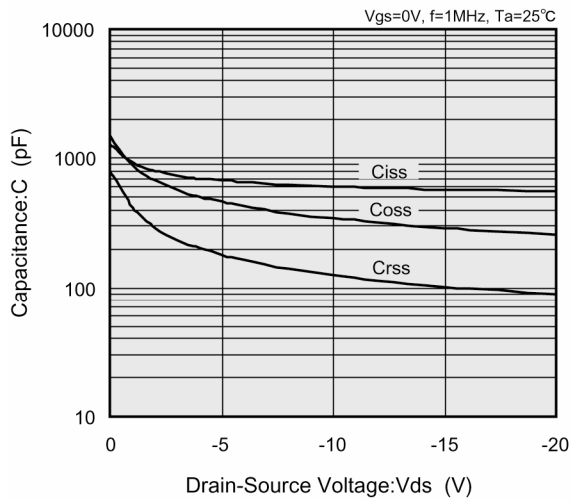


(6) Gate-Source Cut-Off Voltage Variance vs. Ambient Temperature

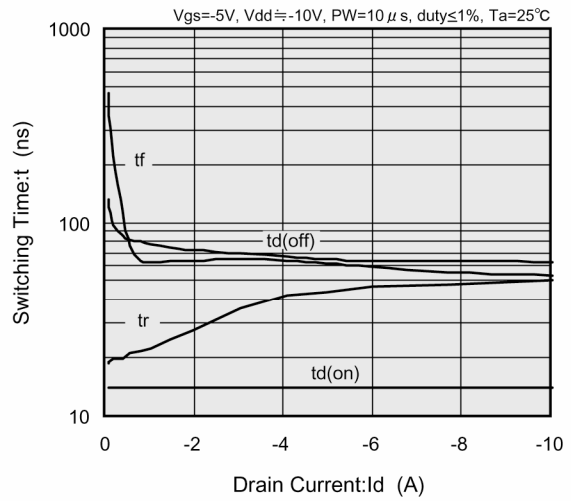


## TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

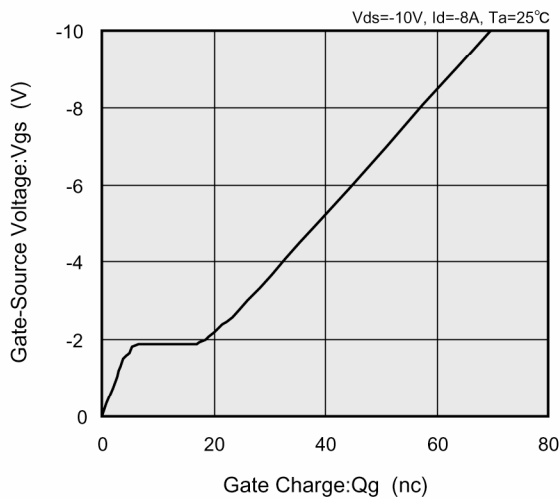
(7) Capacitance vs. Drain-Source Voltage



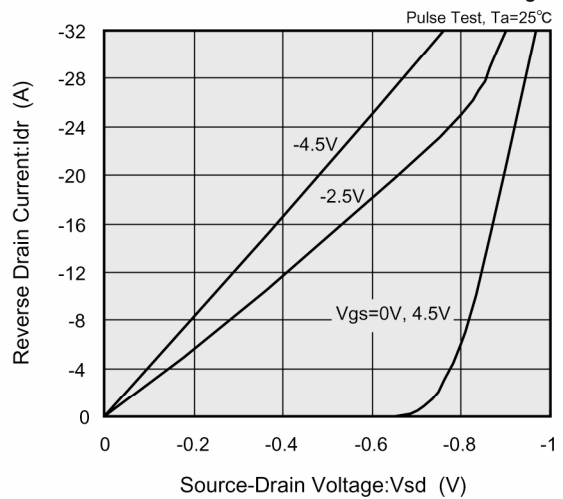
(8) Switching Time vs. Drain Current



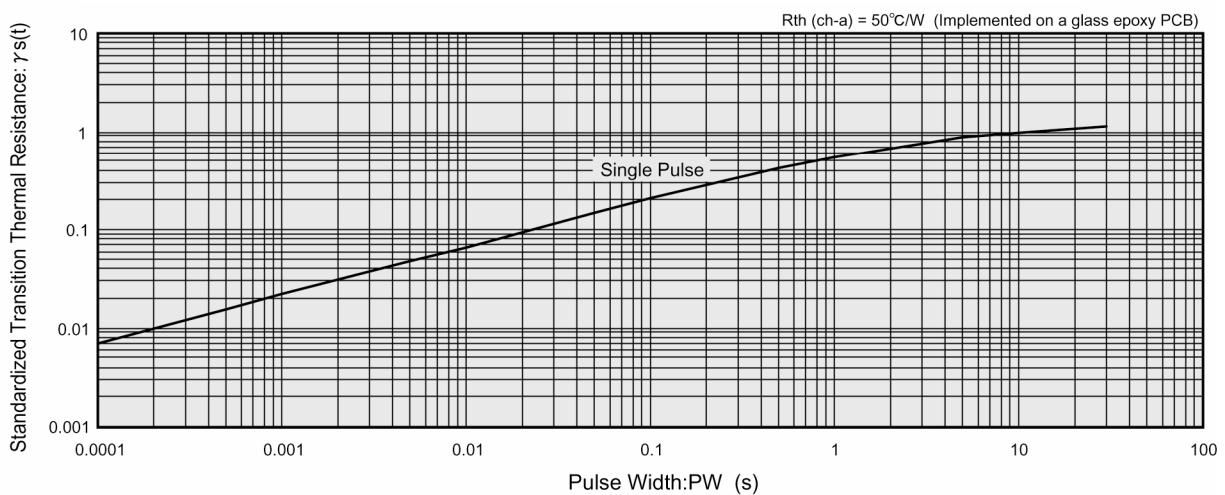
(9) Gate-Source Voltage vs. Gate Charge



(10) Reverse Drain Current vs. Source-Drain Voltage



(11) Standardized transition Thermal Resistance vs. Pulse Width



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