

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance : 0.033Ω (max)
- ◆ Ultra High-Speed Switching
- ◆ SOP - 8 Package

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

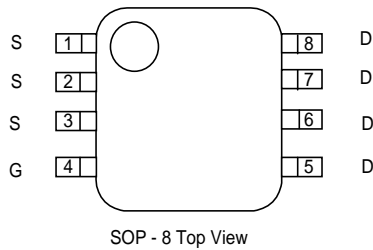
### ■ General Description

The XP132A1635SR 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 SOP-8 package makes high density mounting possible.

### ■ 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**
- Operational Voltage** : -2.5V
- High density mounting** : SOP - 8

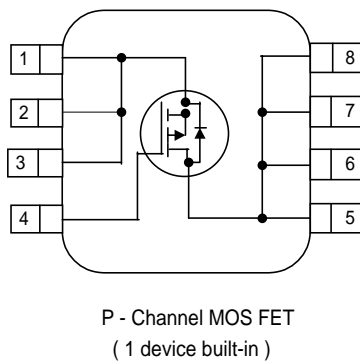
### ■ Pin Configuration



### ■ Pin Assignment

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

### ■ Equivalent Circuit



### ■ Absolute Maximum Ratings

| 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           |
| Continuous Channel Power Dissipation (note) | $P_d$     | 2.5        | W           |
| Channel Temperature                         | $T_{ch}$  | 150        | $^{\circ}C$ |
| Storage Temperature                         | $T_{stg}$ | -55 to 150 | $^{\circ}C$ |

$T_a=25^{\circ}C$

( note ) : 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 = - 20 , Vgs = 0V    |       |        | - 10  | μA    |
| Gate-Source Leakage Current                  | Igss        | Vgs = ± 12 , 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<br>( note ) | Rds ( on )  | Id = - 4A , Vgs = - 4.5V |       | 0.025  | 0.033 | Ω     |
|  |             | Id = - 4A , Vgs = - 2.5V |       | 0.04   | 0.055 | Ω     |
| Forward Transfer Admittance<br>( note )      | Yfs         | Id = - 4A , Vds = - 10V  |       | 16     |       | S     |
| Body Drain Diode<br>Forward Voltage          | Vf          | If = - 8A , 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<br>f = 1 MHz |     | 1700 |     | pF    |
| Output Capacitance   | Coss   |                                     |     | 1000 |     | pF    |
| Feedback Capacitance | Crss   |                                     |     | 500  |     | pF    |

#### Switching characteristics

Ta=25°C

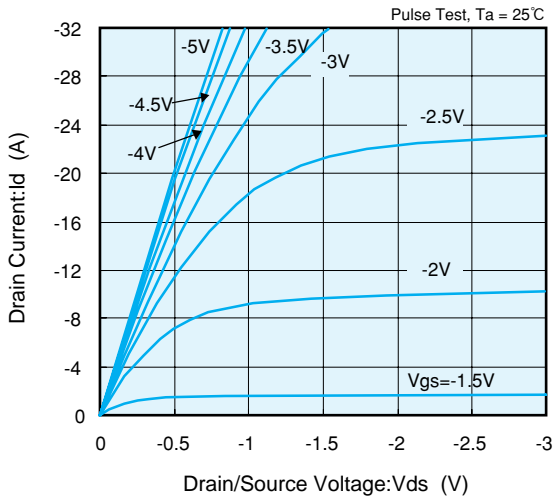
| PARAMETER           | SYMBOL     | CONDITIONS                            | MIN | TYP | MAX | UNITS |
|---------------------|------------|---------------------------------------|-----|-----|-----|-------|
| Turn-on Delay Time  | td ( on )  | Vgs = - 5V , Id = - 4A<br>Vdd = - 10V |     | 15  |     |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

#### Thermal characteristics

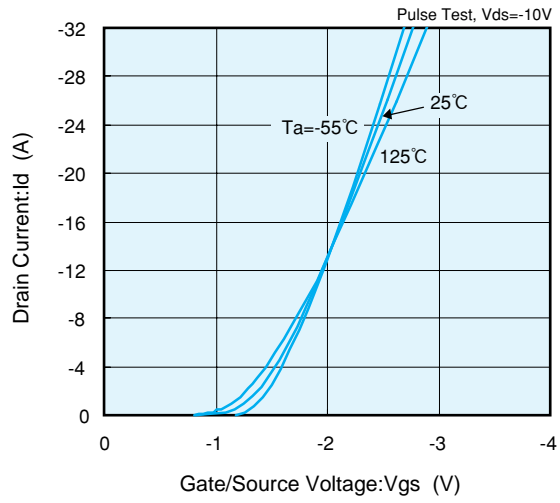
| PARAMETER  | SYMBOL         | CONDITIONS                              | MIN | TYP | MAX | UNITS  |
|--|----------------|---|-----|-----|-----|--------|
| Thermal Resistance<br>( channel - surroundings ) | Rth ( ch - a ) | Implement on a glass epoxy<br>resin PCB |     | 50  |     | °C / W |

## Electrical Characteristics

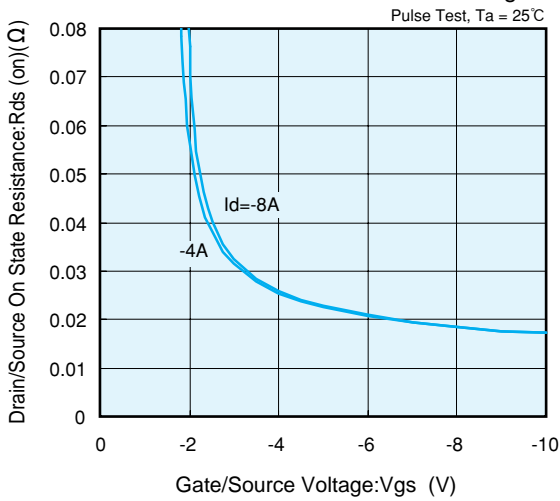
Drain Current vs. Drain/Source Voltage



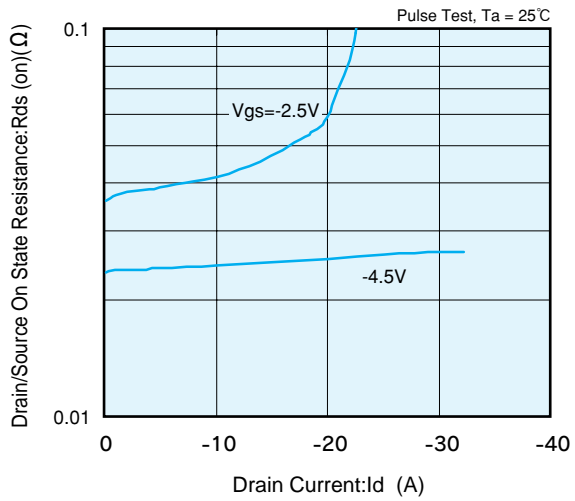
Drain Current vs. Gate/Source Voltage



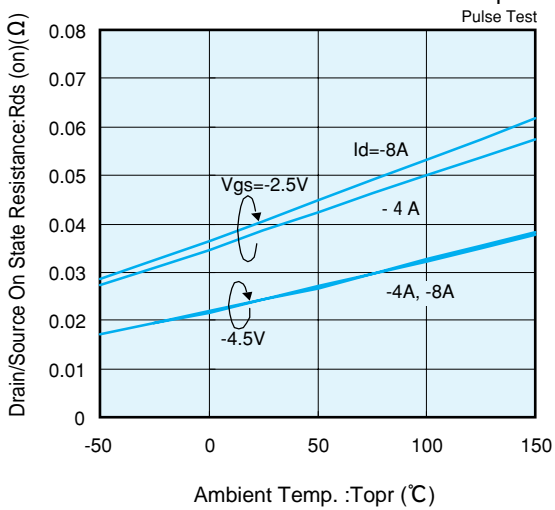
Drain/Source On-State Resistance vs. Gate/Source Voltage



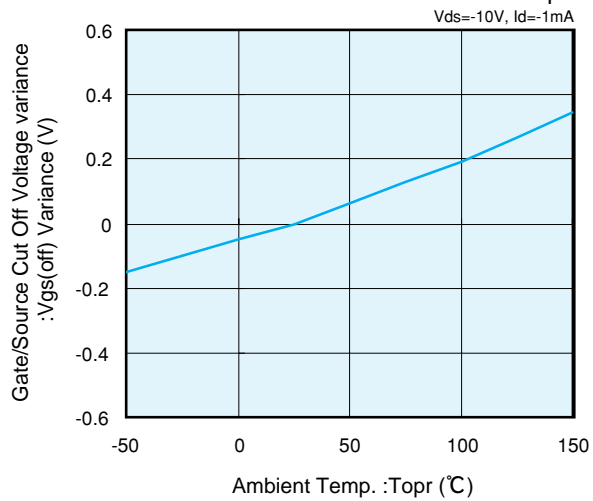
Drain/Source On-State Resistance vs. Drain Current



Drain / Source On-State Resistance vs. Ambient Temp.

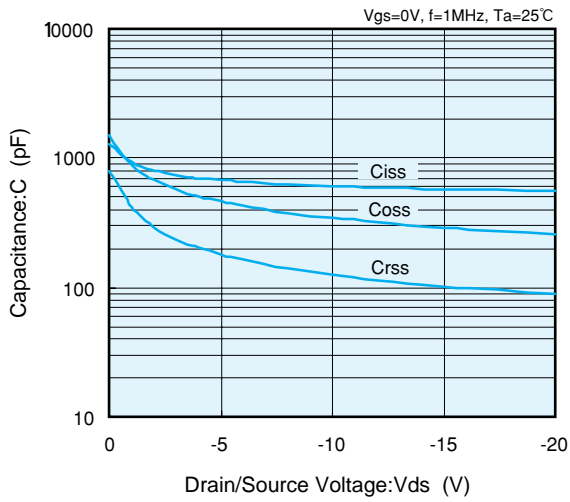


Gate / Source Cut Off Voltage Variance vs. Ambient Temp.

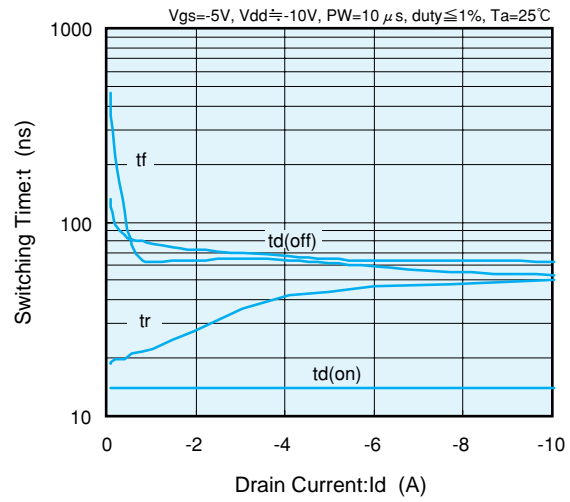


### Electrical Characteristics

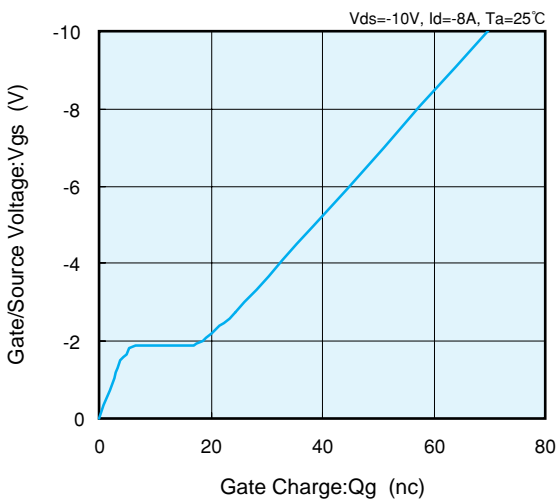
Capacitance vs. Drain/Source Voltage



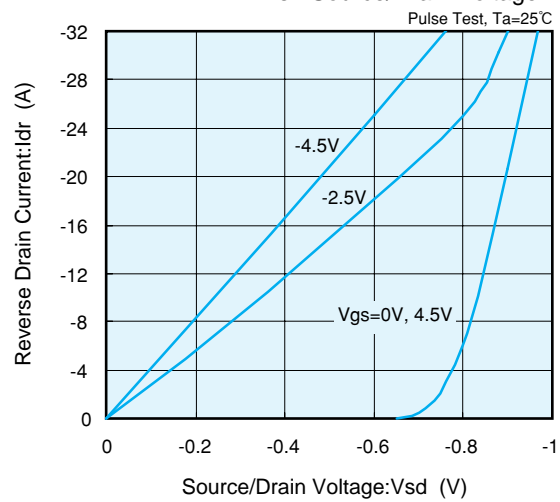
Switching Time vs. Drain Current



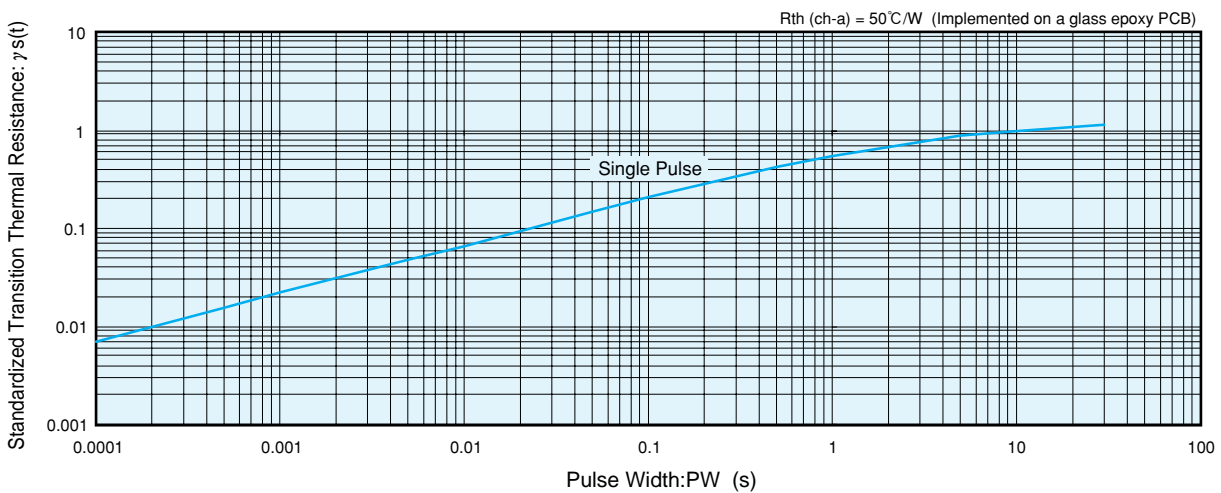
Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width



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