

Power MOSFET

GENERAL DESCRIPTION

The XP133A1235SR is an N-channel Power MOSFET with low on-state resistance and ultra high-speed switching characteristics. Two FET devices are built into the one package
 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.

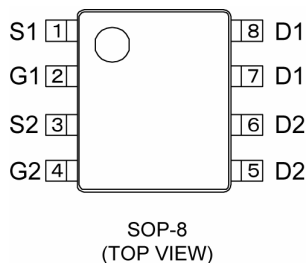
APPLICATIONS

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

FEATURES

- Low On-State Resistance** : $R_{ds(on)}=0.035\ \Omega$ ($V_{gs}= 4.5V$)
 : $R_{ds(on)}=0.048\ \Omega$ ($V_{gs}= 2.5V$)
- Ultra High-Speed Switching**
- Driving Voltage** : 2.5V
- N-Channel Power MOSFET**
- DMOS Structure**
- Two FET Devices Built-in**
- Package** : SOP-8

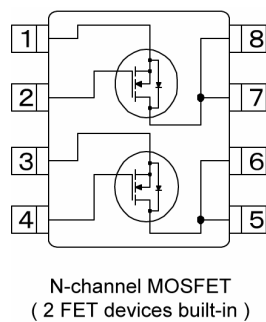
PIN CONFIGURATION



PIN ASSIGNMENT

| PIN NUMBER | PIN NAME | FUNCTION |
|------------|----------|----------|
| 1 | S1 | Source |
| 2 | G1 | Gate |
| 3 | S2 | Source |
| 4 | G2 | Gate |
| 5~6 | D2 | Drain |
| 7~8 | D1 | Drain |

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Ta = 25°C

| PARAMETER | SYMBOL | RATINGS | UNITS |
|-----------------------------|--------|---------|-------|
| Drain-Source Voltage | Vdss | 20 | V |
| Gate-Source Voltage | Vgss | ±12 | V |
| Drain Current (DC) | Id | 6 | A |
| Drain Current (Pulse) | Idp | 20 | A |
| Reverse Drain Current | Idr | 6 | A |
| Channel Power Dissipation * | Pd | 2 | W |
| Channel Temperature | Tch | 150 | °C |
| Storage Temperature Range | Tstg | -55~150 | °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=3A, Vgs=4.5V | - | 0.026 | 0.035 | Ω |
| | | Id=3A, Vgs=2.5V | - | 0.035 | 0.048 | Ω |
| Forward Transfer Admittance * | Yfs | Id=4A, Vds=10V | - | 14 | - | S |
| Body Drain Diode Forward Voltage | Vf | If=6A, 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 f=1MHz | - | 760 | - | pF |
| Output Capacitance | Coss | | - | 430 | - | pF |
| Feedback Capacitance | Crss | | - | 200 | - | pF |

Switching Characteristics

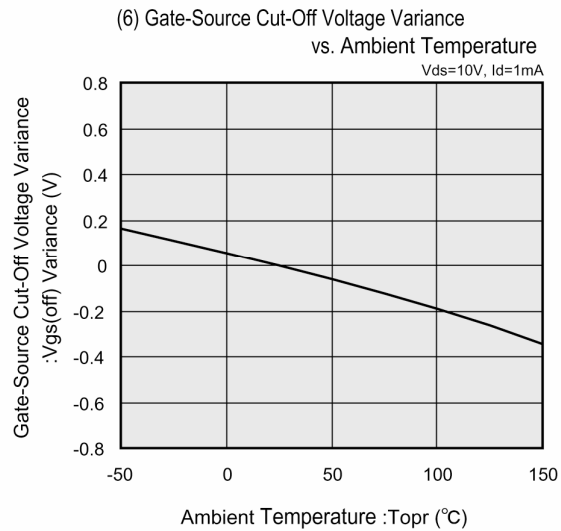
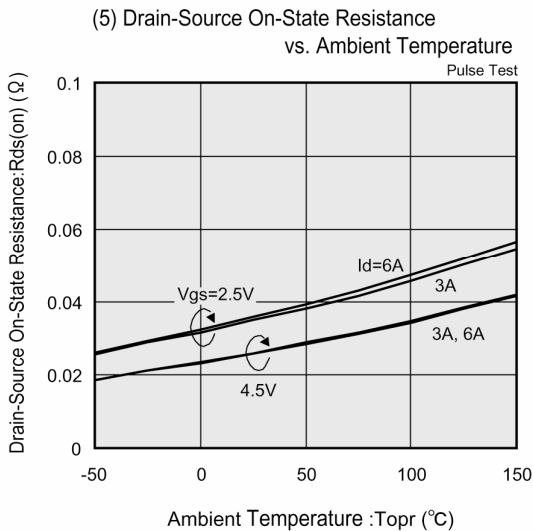
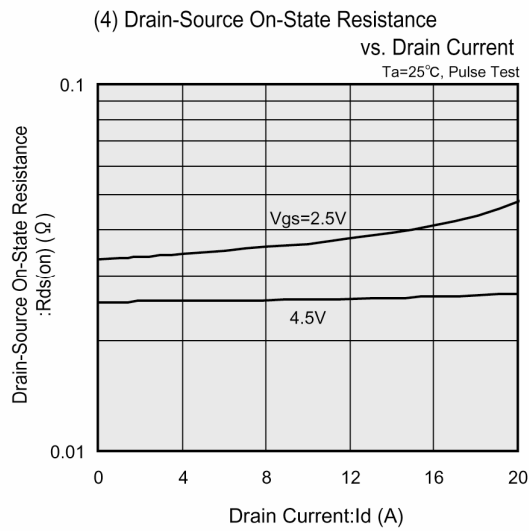
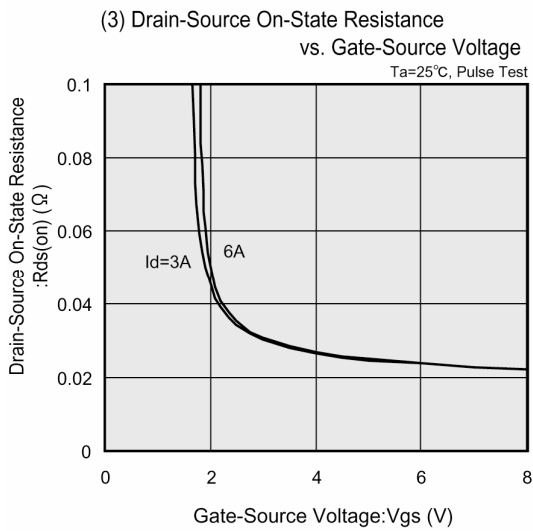
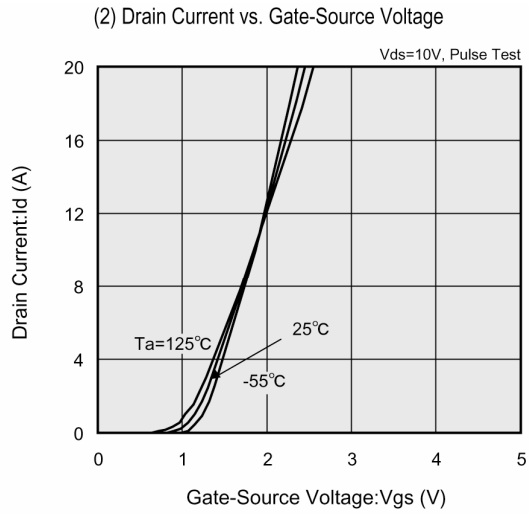
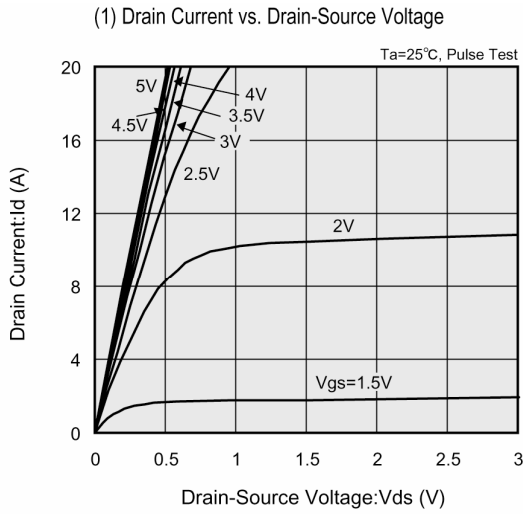
Ta = 25°C

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---------------------|----------|--------------------------|------|------|------|-------|
| Turn-On Delay Time | td (on) | Vgs=5V, Id=3A Vdd=10V | - | 10 | - | ns |
| Rise Time | tr | | - | 20 | - | ns |
| Turn-Off Delay Time | td (off) | | - | 55 | - | ns |
| Fall Time | tf | | - | 15 | - | ns |

Thermal Characteristics

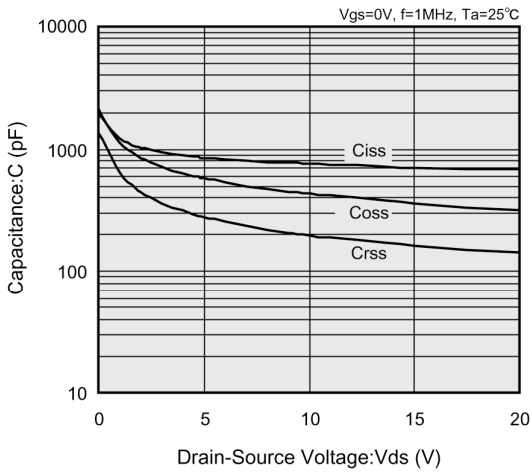
| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---------------------------------------|------------|--------------------------------------|------|------|------|-------|
| Thermal Resistance (Channel-Ambience) | Rth (ch-a) | Implement on a glass epoxy resin PCB | - | 62.5 | - | °C/W |

TYPICAL PERFORMANCE CHARACTERISTICS

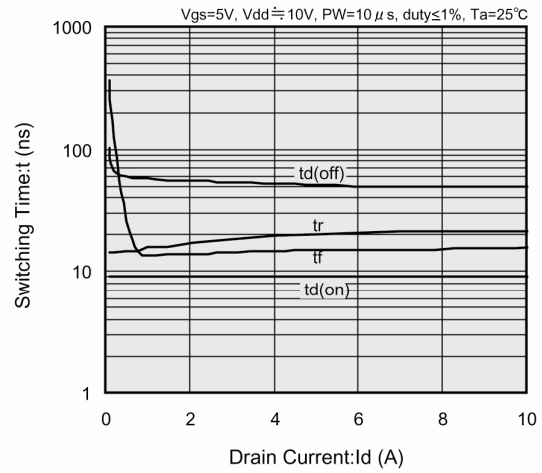


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

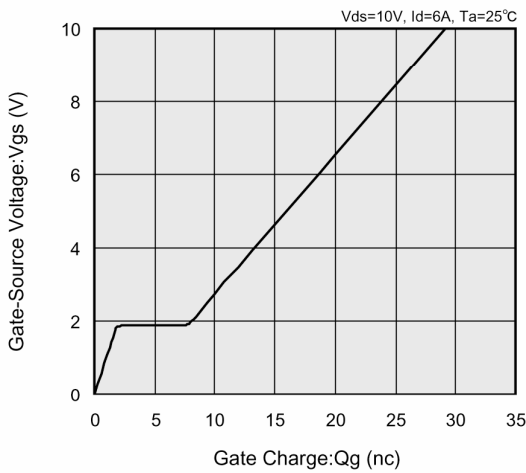
(7) Capacitance vs. Drain-Source Voltage



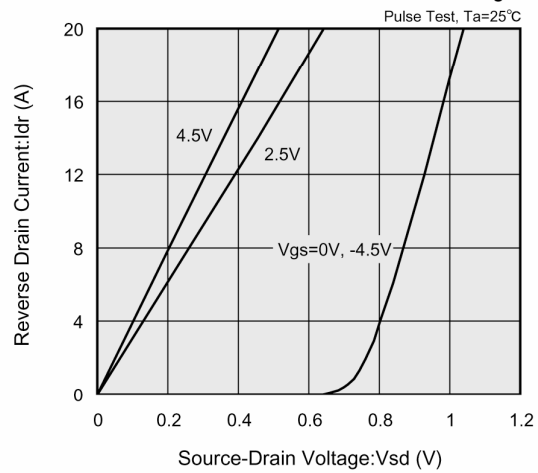
(8) Switching Time vs. Drain Current



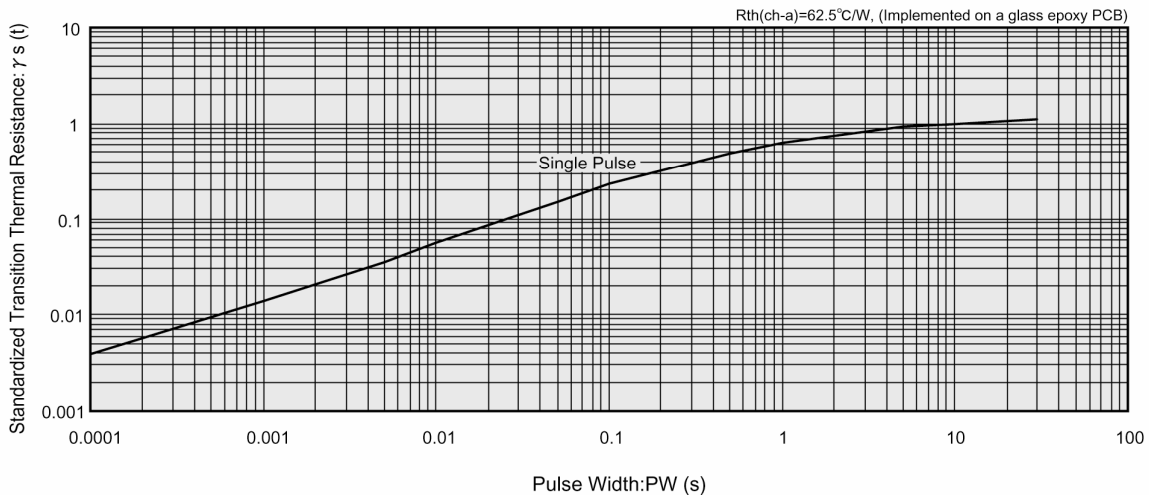
(9) Gate-Source Voltage vs. Gate Charge



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



(11) Standardized transition Thermal Resistance vs. Pulse Width



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