

# XP131A1715SR



## Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance : 0.012 Ω (max)
- ◆Ultra High-Speed Switching
- ◆SOP-8 Package

### General Description

The XP131A1715SR is an N-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.

### Applications

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

### Features

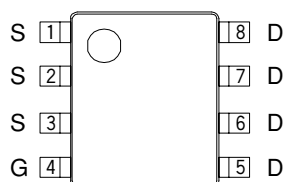
**Low on-state resistance** : Rds (on) = 0.012Ω ( Vgs = 4.5V )  
 : Rds (on) = 0.015Ω ( Vgs = 2.5V )  
 : Rds (on) = 0.025Ω ( Vgs = 1.5V )

**Ultra high-speed switching**

**Operational Voltage** : 1.5V

**High density mounting** : SOP-8

### Pin Configuration

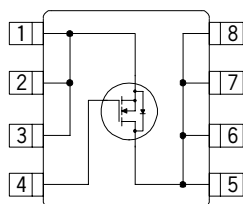


SOP-8  
(TOP VIEW)

### Pin Assignment

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

### Equivalent Circuit



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

### Absolute Maximum Ratings

Ta=25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	Vdss	20	V
Gate - Source Voltage	Vgss	± 8	V
Drain Current (DC)	Id	10	A
Drain Current (Pulse)	Idp	40	A
Reverse Drain Current	Idr	10	A
Continuous Channel Power Dissipation (note)	Pd	2.5	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55 ~ 150	°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 = 20V , Vgs = 0V			10	μA
Gate-Source Leakage Current	Igss	Vgs = ±8V , 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 (note)	Rds (on)	Id = 5A , Vgs = 4.5V		0.009	0.012	Ω
		Id = 5A , Vgs = 2.5V		0.011	0.015	Ω
		Id = 5A , Vgs = 1.5V		0.017	0.025	Ω
Forward Transfer Admittance (note)	Yfs	Id = 5A , Vds = 10V		34		S
Body Drain Diode Forward Voltage	Vf	If = 10A , Vgs = 0V		0.8	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		2000		pF
Output Capacitance	Coss			1000		pF
Feedback Capacitance	Crss			450		pF

### Switching Characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs = 5V , Id = 5A Vdd = 10V		15		ns
Rise Time	tr			25		ns
Turn-off Delay Time	td (off)			95		ns
Fall Time	tf			15		ns

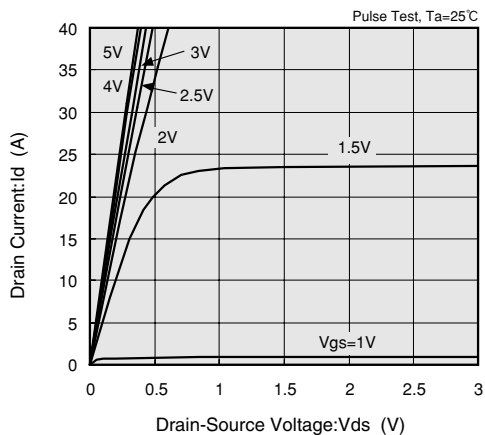
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### Thermal Characteristics

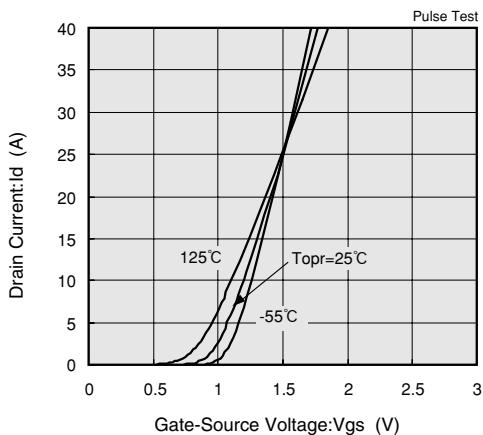
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a glass epoxy resin PCB		50		°C / W

## Typical Performance Characteristics

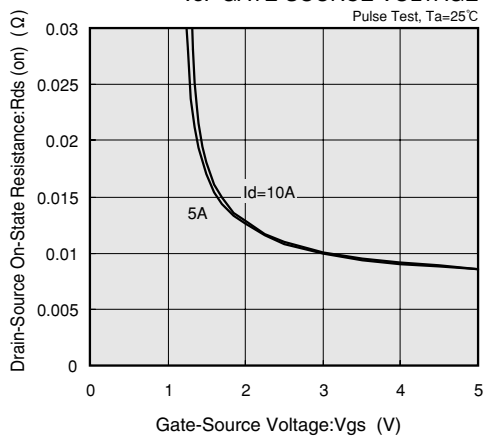
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



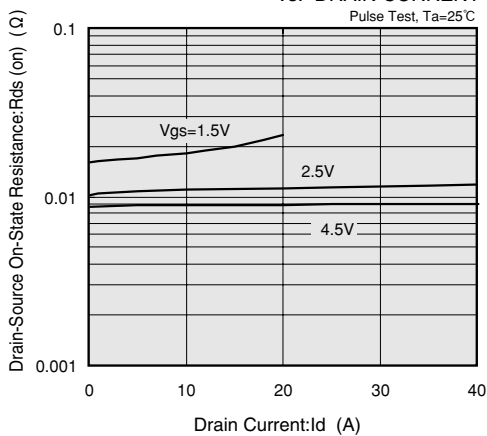
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



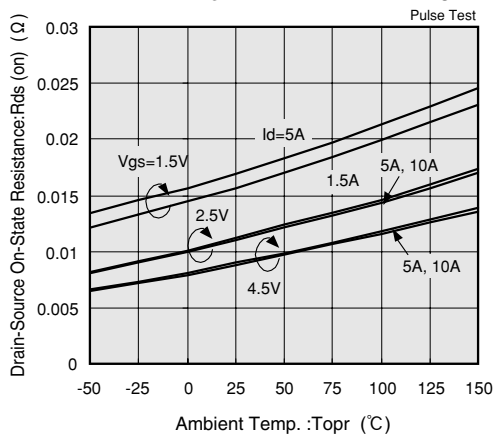
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



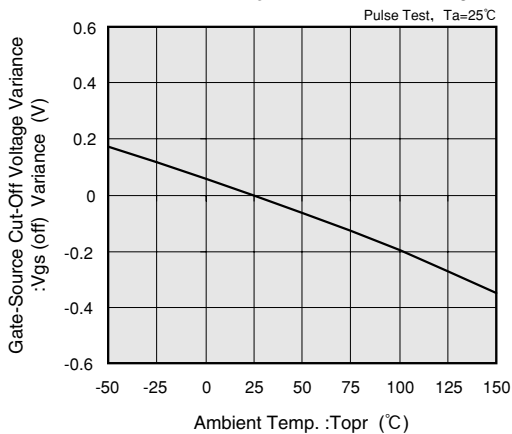
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

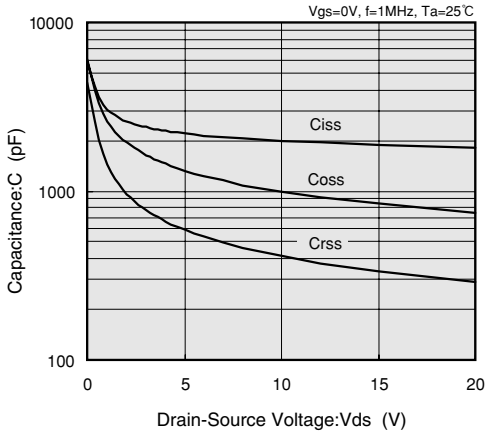


GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE

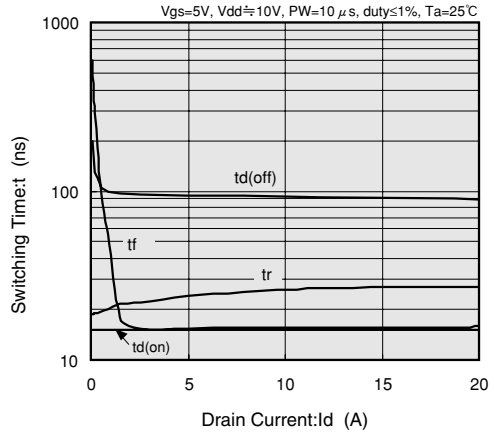


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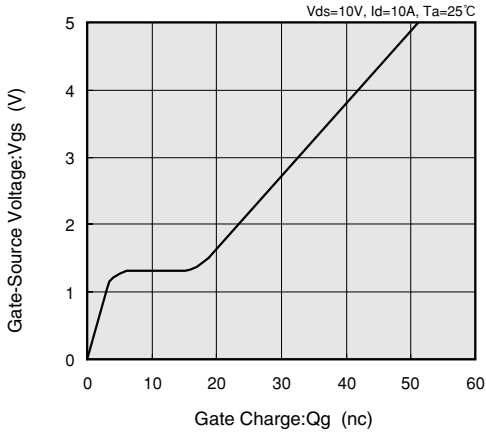
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



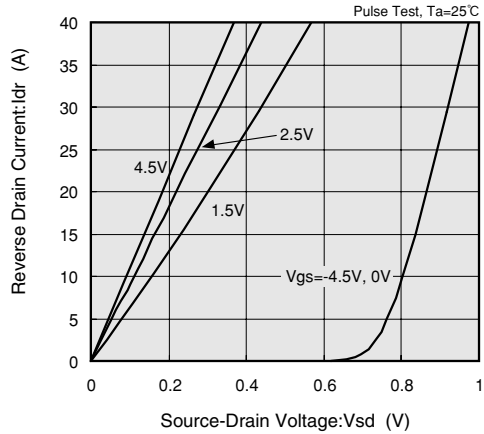
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

