

# XP131A1617SR



## Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance : 0.014Ω (max)
- ◆Ultra High-Speed Switching
- ◆SOP-8 Package

### General Description

The XP131A1617SR 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.

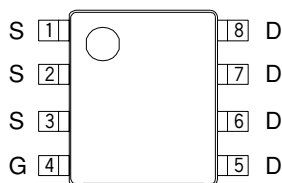
### Applications

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

### Features

- Low on-state resistance : Rds (on) = 0.014Ω ( Vgs = 4.5V )  
: Rds (on) = 0.019Ω ( Vgs = 2.5V )
- Ultra high-speed switching
- Operational Voltage : 2.5V
- High density mounting : SOP-8

### Pin Configuration

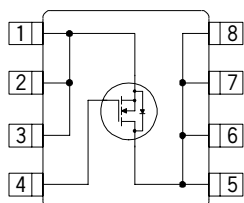


SOP-8  
(TOP VIEW)

### 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	± 12	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	I <sub>dss</sub>	V <sub>ds</sub> = 20V , V <sub>gs</sub> = 0V			10	μA
Gate-Source Leakage Current	I <sub>gss</sub>	V <sub>gs</sub> = ±8V , V <sub>ds</sub> = 0V			±1	μA
Gate-Source Cut-off Voltage	V <sub>gs (off)</sub>	I <sub>d</sub> = 1mA , V <sub>ds</sub> = 10V	0.7		1.4	V
Drain-Source On-state Resistance ( note )	R <sub>ds ( on )</sub>	I <sub>d</sub> = 5A , V <sub>gs</sub> = 4.5V		0.01	0.014	Ω
		I <sub>d</sub> = 5A , V <sub>gs</sub> = 2.5V		0.013	0.019	Ω
Forward Transfer Admittance ( note )	Y <sub>fs</sub>	I <sub>d</sub> = 5A , V <sub>ds</sub> = 10V		32		S
Body Drain Diode Forward Voltage	V <sub>f</sub>	I <sub>f</sub> = 10A , V <sub>gs</sub> = 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	C <sub>iss</sub>	V <sub>ds</sub> = 10V , V <sub>gs</sub> = 0V f = 1 MHz		1650		pF
Output Capacitance	C <sub>oss</sub>			1000		pF
Feedback Capacitance	C <sub>rss</sub>			450		pF

### Switching Characteristics

Ta=25°C

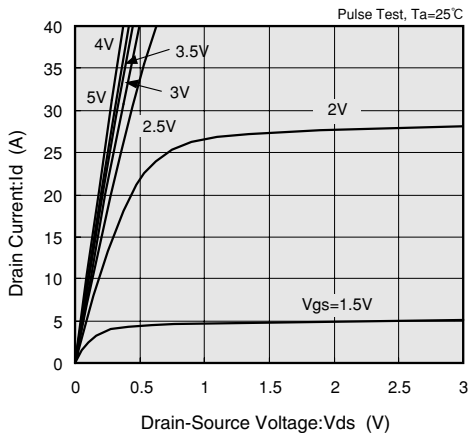
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	
Turn-on Delay Time	t <sub>d ( on )</sub>	V <sub>gs</sub> = 5V , I <sub>d</sub> = 5A V <sub>dd</sub> = 10V		15		ns	
Rise Time	t <sub>r</sub>			25		ns	
Turn-off Delay Time	t <sub>d ( off )</sub>				65		ns
Fall Time	t <sub>f</sub>				15		ns

### Thermal Characteristics

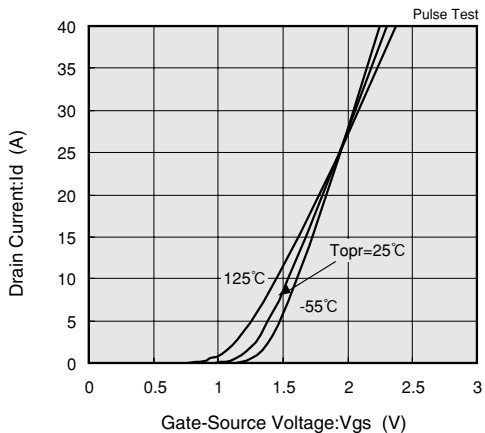
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance ( channel-ambience )	R <sub>th ( ch-a )</sub>	Implement on a glass epoxy resin PCB		50		°C / W

## Typical Performance Characteristics

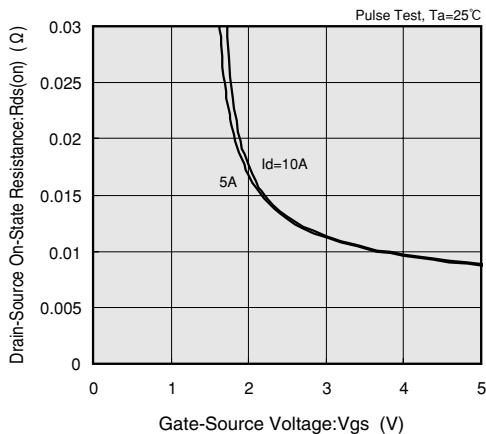
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



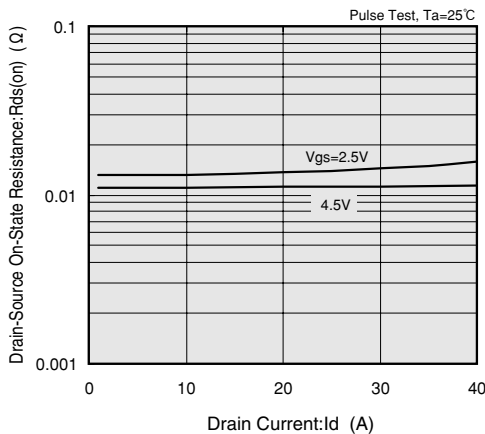
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



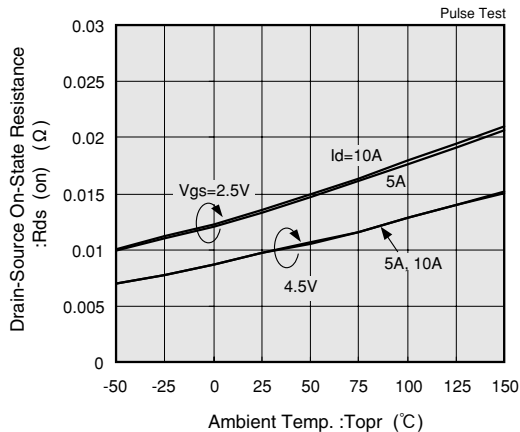
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



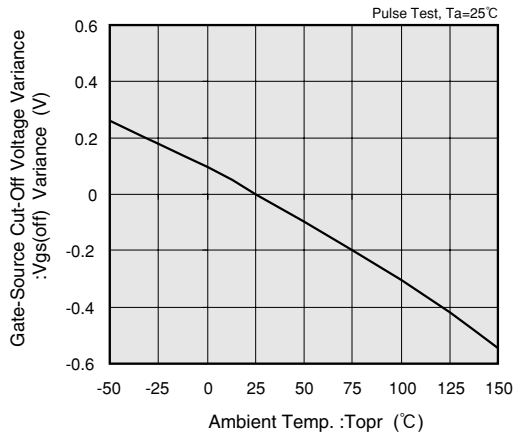
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

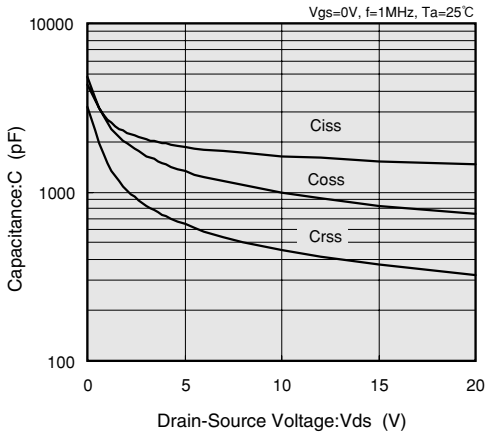


GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE

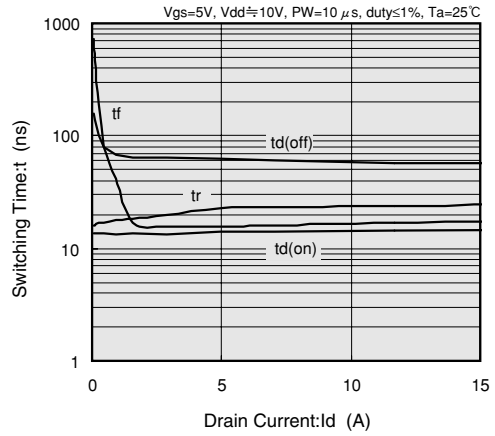


11

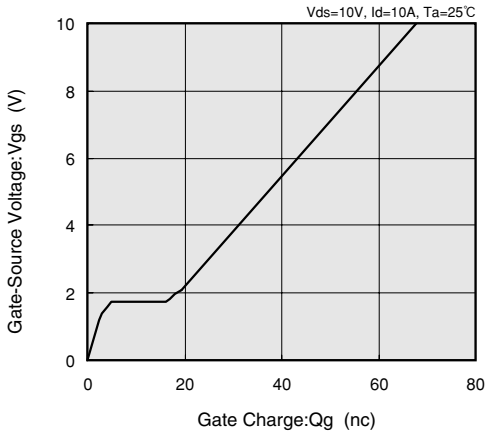
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



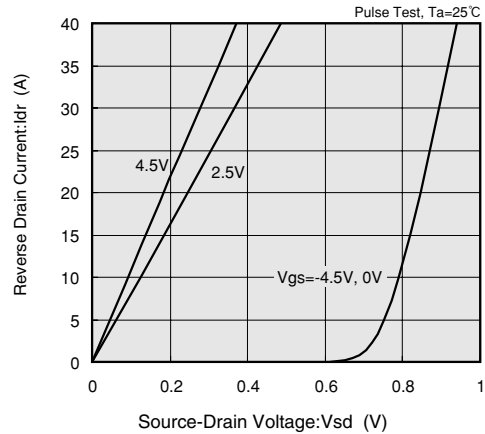
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

