

XP131A0150SR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance: 0.05Ω (max)
- ◆Ultra High-Speed Switching
- ◆SOP-8 Package

Applications

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

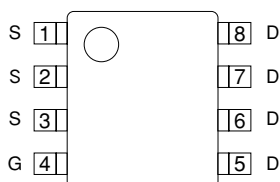
General Description

The XP131A0150SR 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.

Features

- Low on-state resistance** : $R_{ds(on)}=0.035\Omega$ ($V_{gs}=10V$)
: $R_{ds(on)}=0.050\Omega$ ($V_{gs}=4.5V$)
- Ultra high-speed switching**
- Operational Voltage** : 4.5V
- High density mounting** : SOP-8

Pin Configuration

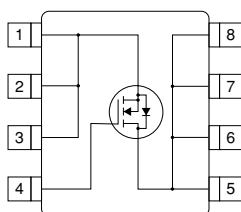


SOP-8
(TOP VIEW)

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

$T_a=25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V_{ds}	30	V
Gate-Source Voltage	V_{gs}	± 20	V
Drain Current (DC)	I_d	7	A
Drain Current (Pulse)	I_{dp}	20	A
Reverse Drain Current	I_{dr}	7	A
Continuous Channel Power Dissipation (note)	P_d	2.5	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

Note: When implemented on a glass epoxy PCB

■Electrical Characteristics

DC Characteristics
 Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Drain Cut-off Current	Idss	Vds=30V, Vgs=0V			10	μA
Gate-Source Leakage Current	Igss	Vgs=±20V, Vds=0V			±10	μA
Gate-Source Cut-off Voltage	Vgs(off)	Id=1mA, Vds=10V	1.0		2.5	V
Drain-Source On-state Resistance (note)	Rds(on)	Id=4A, Vgs=10V		0.028	0.035	Ω
		Id=4A, Vgs=4.5V		0.042	0.05	Ω
Forward Transfer Admittance (note)	Yfs	Id=4A, Vds=10V		10		S
Body Drain Diode Forward Voltage	Vf	If=7A, Vgs=0V		0.85	1.1	V

Note: Effective during pulse test.

Dynamic Characteristics
 Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Capacitance	Ciss	Vds=10V, Vgs=0V f=1MHz		720		pF
Output Capacitance	Coss			450		pF
Feedback Capacitance	Crss			180		pF

Switching Characteristics
 Ta=25℃

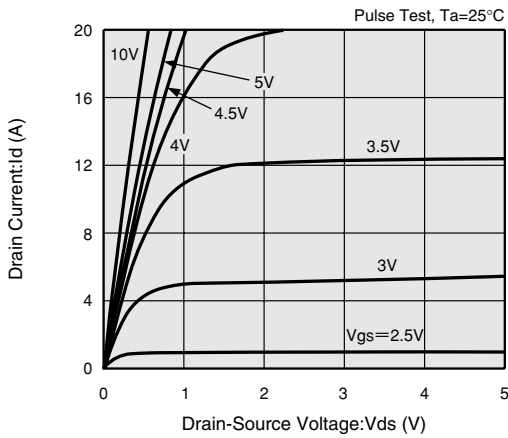
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=4A Vdd=10V		25		ns
Rise Time	tr			20		ns
Turn-off Delay Time	td (off)			35		ns
Fall Time	tf			20		ns

Thermal Characteristics

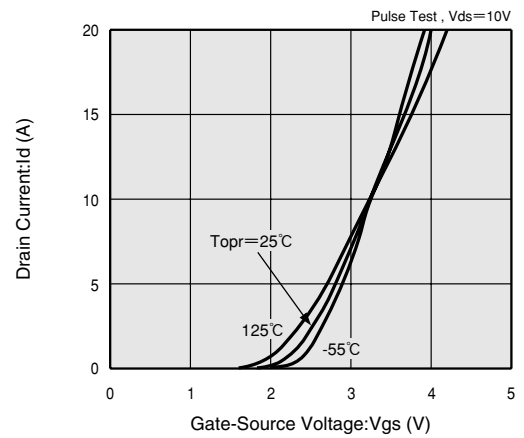
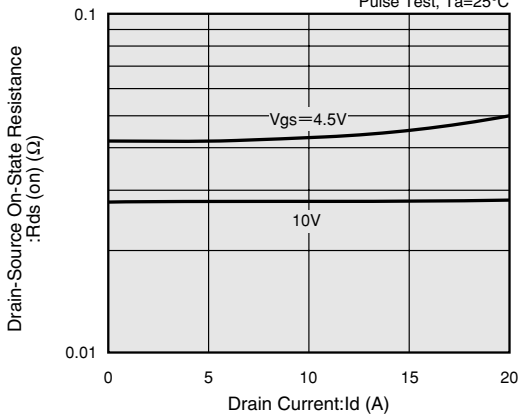
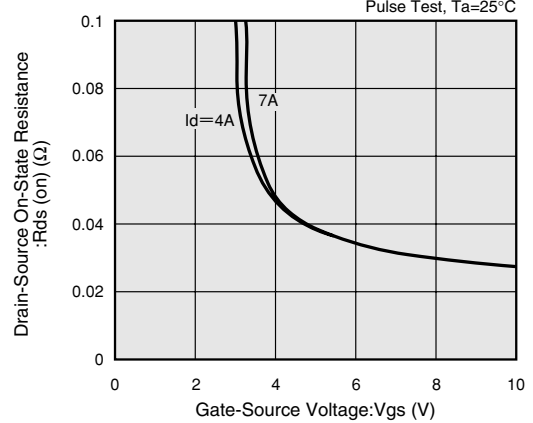
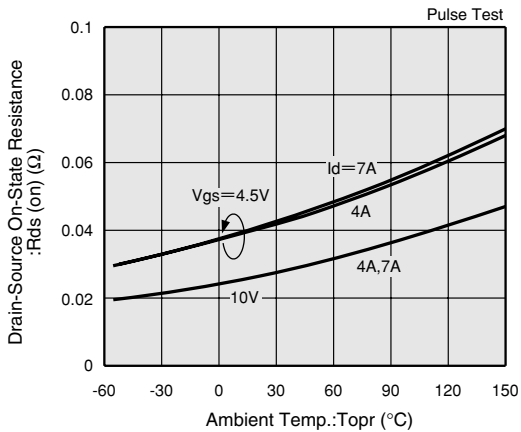
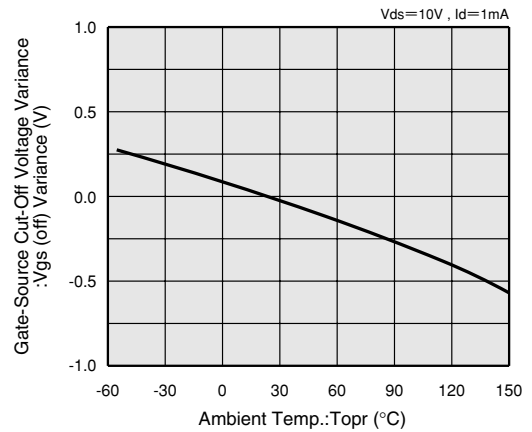
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a glass epoxy resin PCB		50		℃/W

Typical Performance Characteristics

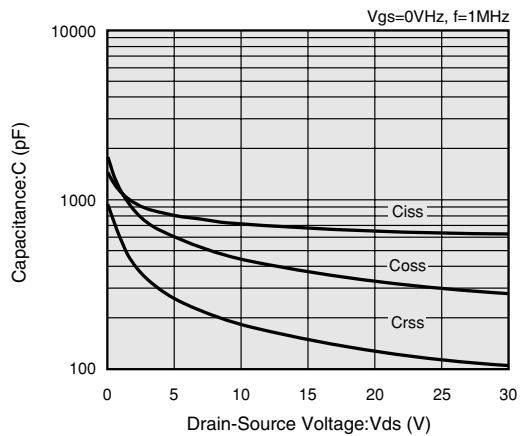
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



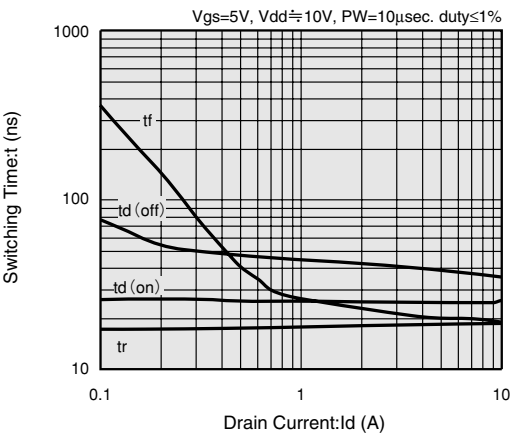
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE

DRAIN-SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENTDRAIN-SOURCE ON-STATE RESISTANCE
vs. GATE-SOURCE VOLTAGEDRAIN-SOURCE ON-STATE RESISTANCE
vs. AMBIENT TEMPERATUREGATE-SOURCE CUT-OFF VOLTAGE VARIANCE
vs. AMBIENT TEMPERATURE

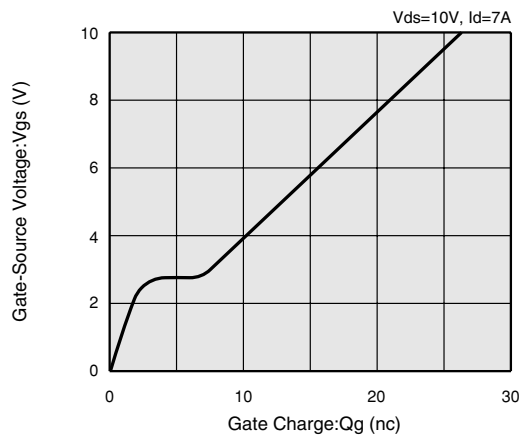
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



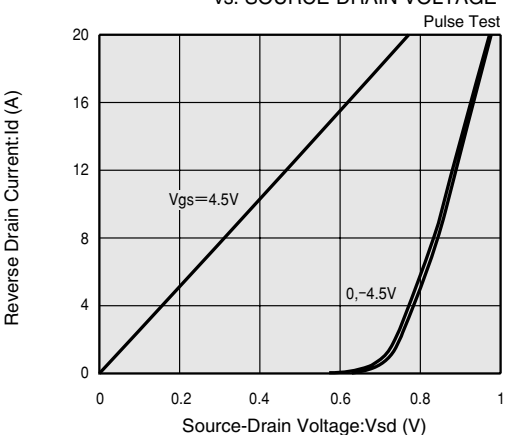
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

