

XP131A1330SR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance : 0.03Ω (max)
- ◆Ultra High-Speed Switching
- ◆SOP-8 Package

General Description

The XP131A1330SR 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

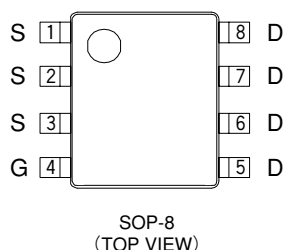
Low on-state resistance : $R_{ds(on)} = 0.03\Omega$ ($V_{gs} = 4.5V$)
: $R_{ds(on)} = 0.04\Omega$ ($V_{gs} = 2.5V$)
: $R_{ds(on)} = 0.07\Omega$ ($V_{gs} = 1.5V$)

Ultra high-speed switching

Operational Voltage : 1.5V

High density mounting : SOP-8

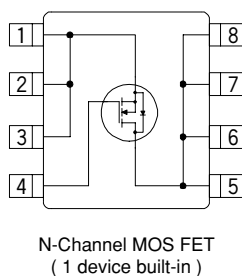
Pin Configuration



Pin Assignment

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

Equivalent Circuit



Absolute Maximum Ratings

$T_a = 25^\circ\text{C}$			
PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	V_{ds}	20	V
Gate - Source Voltage	V_{gs}	± 8	V
Drain Current (DC)	I_d	8	A
Drain Current (Pulse)	I_{dp}	30	A
Reverse Drain Current	I_{dr}	8	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°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Drain Cut-Off Current	I _{dss}	V _{ds} = 20V , V _{gs} = 0V			10	μA
Gate-Source Leakage Current	I _{gss}	V _{gs} = ±8V , V _{ds} = 0V			±1	μA
Gate-Source Cut-Off Voltage	V _{gs} (off)	I _d = 1mA , V _{ds} = 10V	0.5		1.2	V
Drain-Source On-State Resistance (note)	R _{ds} (on)	I _d = 4A , V _{gs} = 4.5V		0.025	0.03	Ω
		I _d = 4A , V _{gs} = 2.5V		0.03	0.04	Ω
		I _d = 4A , V _{gs} = 1.5V		0.045	0.07	Ω
Forward Transfer Admittance (note)	Y _{fs}	I _d = 4A , V _{ds} = 10V		22		S
Body Drain Diode Forward Voltage	V _f	I _f = 8A , V _{gs} = 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	C _{iss}	V _{ds} = 10V , V _{gs} = 0V f = 1 MHz		950		pF
Output Capacitance	C _{oss}			430		pF
Feedback Capacitance	C _{rss}			180		pF

Switching Characteristics

Ta=25°C

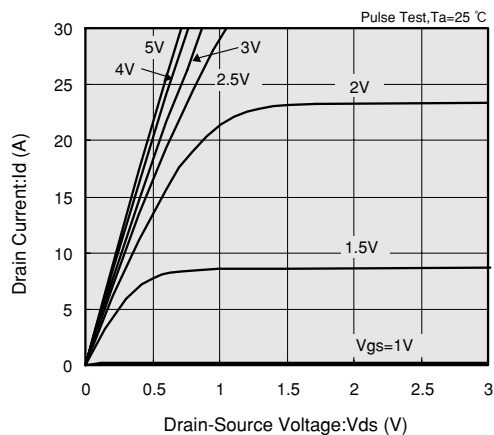
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	t _d (on)	V _{gs} = 5V , I _d = 4A V _{dd} = 10V		15		ns
Rise Time	t _r			20		ns
Turn-off Delay Time	t _d (off)			80		ns
Fall Time	t _f			15		ns

Thermal Characteristics

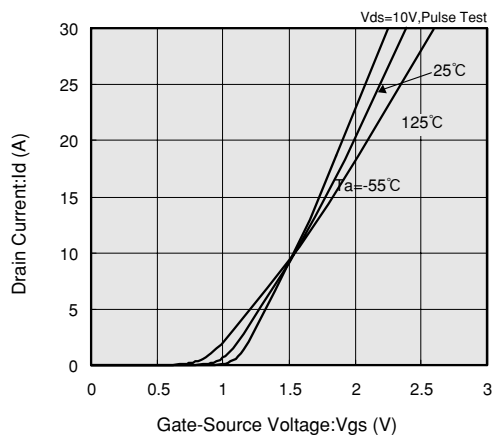
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R _{th} (ch-a)	Implement on a glass epoxy resin PCB		50		°C / W

Typical Performance Characteristics

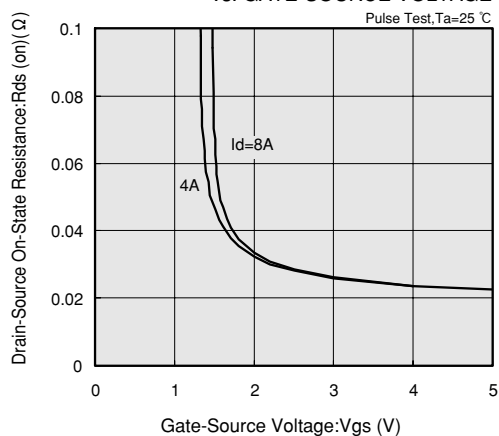
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



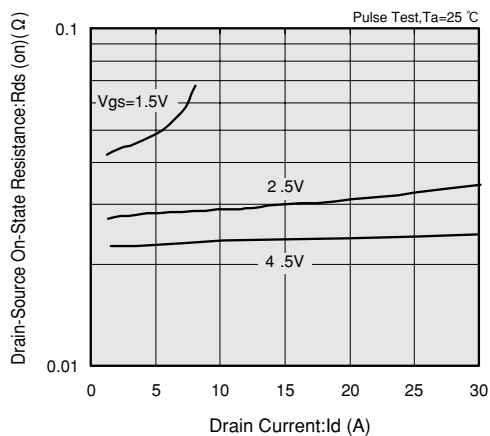
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



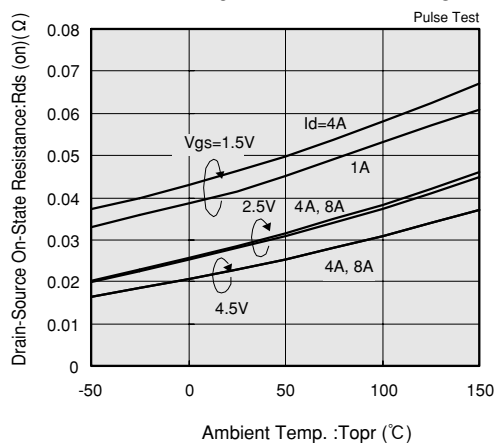
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



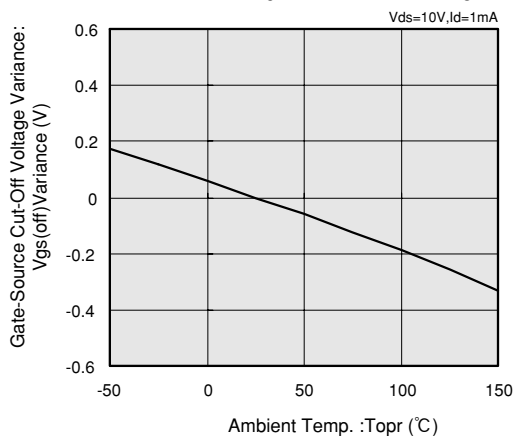
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



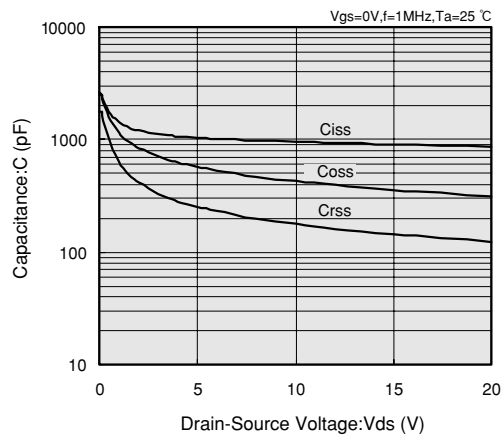
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



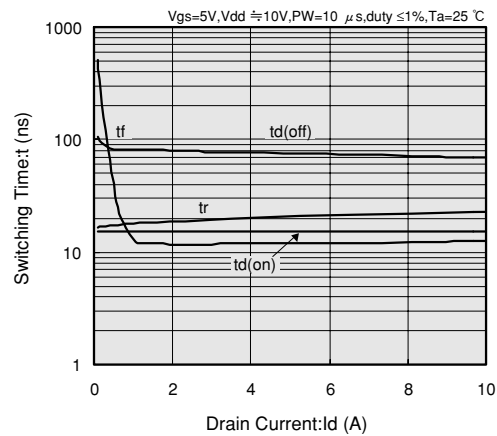
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



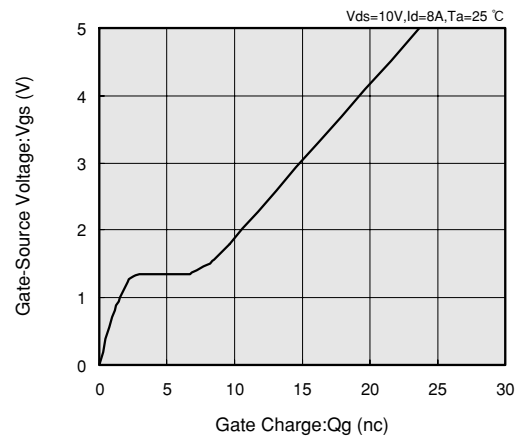
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



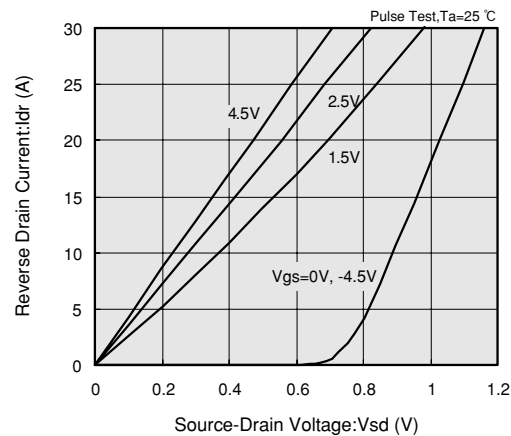
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

