



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 : $R_{ds(on)} = 0.03\Omega$ ($V_{gs} = 4.5V$)

: $R_{ds(on)} = 0.04\Omega$ ($V_{gs} = 2.5V$)

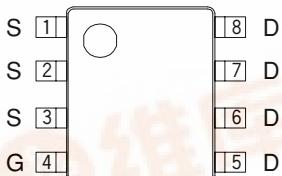
: $R_{ds(on)} = 0.07\Omega$ ($V_{gs} = 1.5V$)

Ultra high-speed switching

Operational Voltage : 1.5V

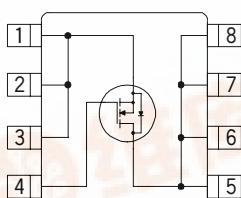
High density mounting : SOP-8

Pin Configuration



SOP-8
(TOP VIEW)

Equivalent Circuit



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

Pin Assignment

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

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	8	A
Drain Current (Pulse)	Idp	30	A
Reverse Drain Current	ldr	8	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

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■ Electrical Characteristics

DC Characteristics

T_a=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

T_a=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

T_a=25°C

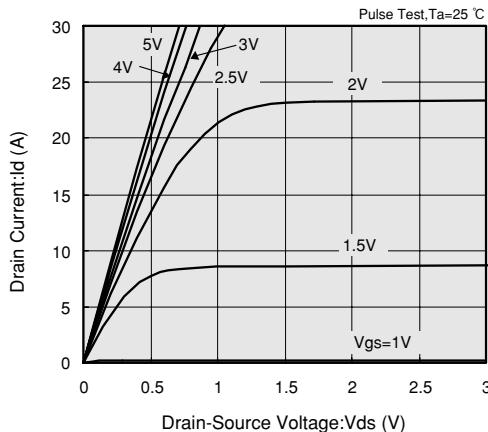
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	t _d (on)	V _{gs} = 5V , I _d = 4A V _{dd} = 10V		15		ns
Rise Time	t _r			20		ns
Turn-off Delay Time	t _d (off)			80		ns
Fall Time	t _f			15		ns

Thermal Characteristics

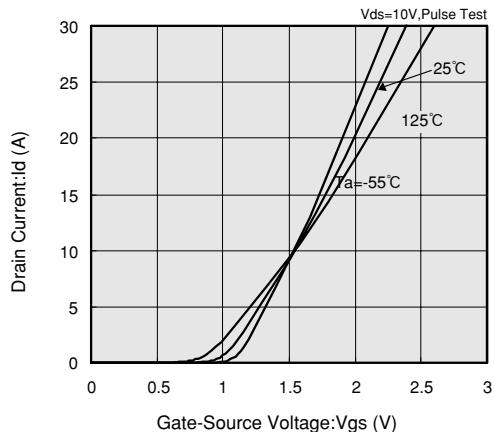
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R _{th} (ch-a)	Implement on a glass epoxy resin PCB		50		°C / W

■ Typical Performance Characteristics

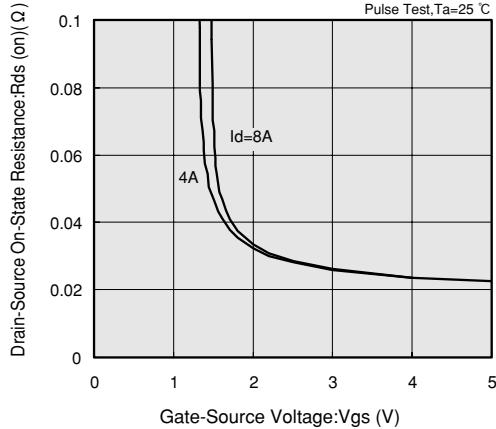
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



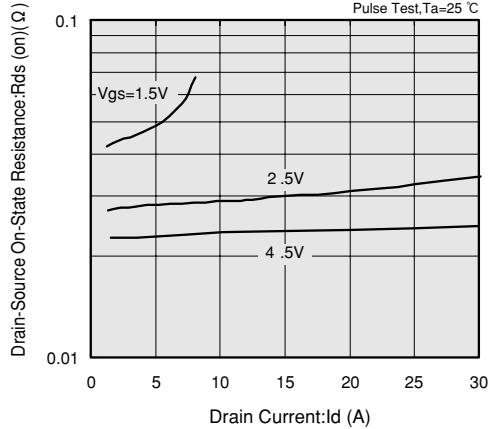
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



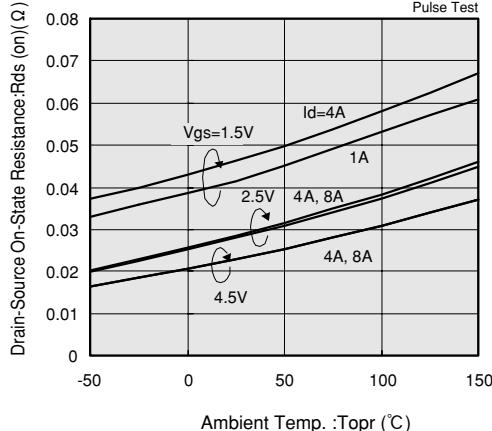
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



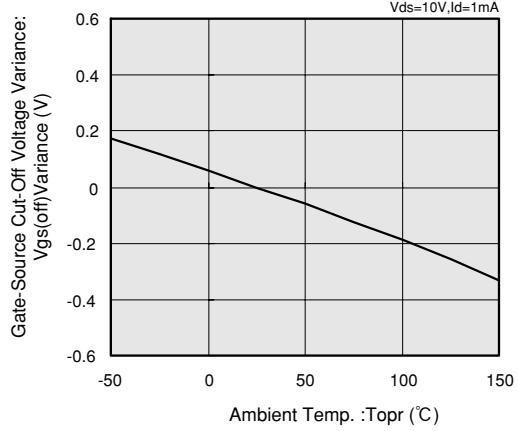
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

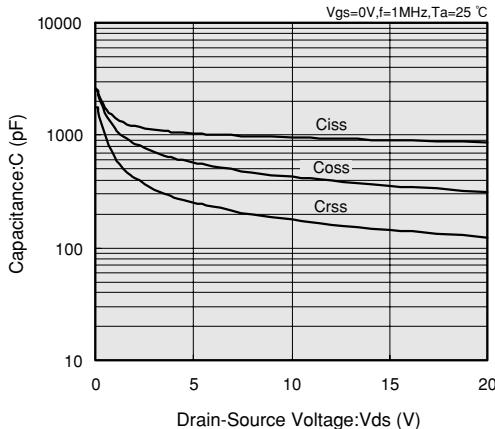


GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE

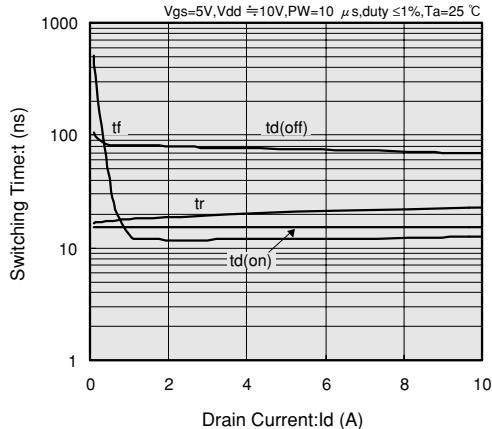


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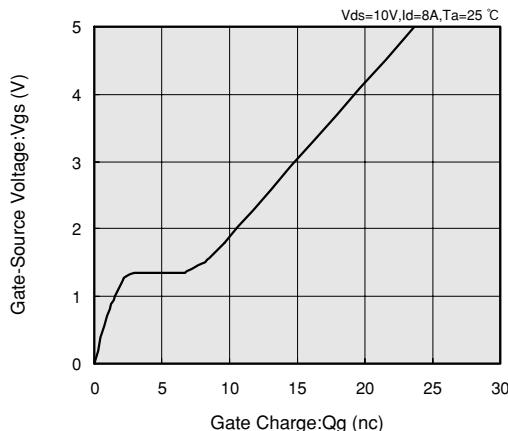
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



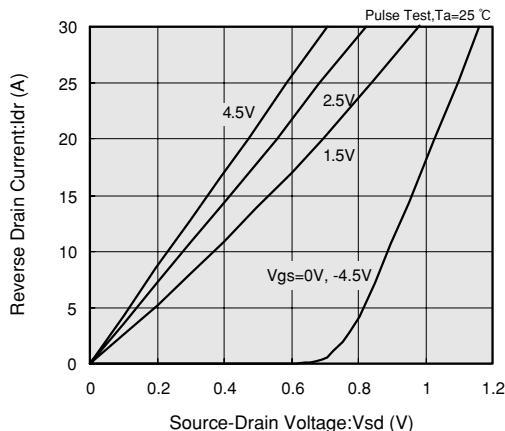
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT
vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

