

XP131A0232SR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance: 0.032Ω (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 XP131A0232SR 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

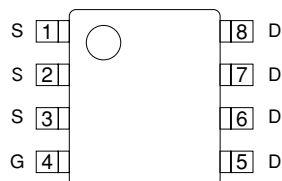
Low on-state resistance : $R_{ds(on)}=0.032\Omega$ ($V_{gs}=4.5V$)
 : $R_{ds(on)}=0.045\Omega$ ($V_{gs}=2.5V$)
 : $R_{ds(on)}=0.08\Omega$ ($V_{gs}=1.5V$)

Ultra high-speed switching

Operational Voltage : 1.5V

High density mounting : SOP-8

Pin Configuration

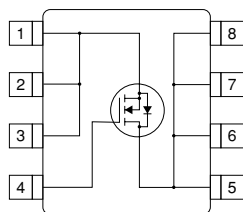


SOP-8
(TOP VIEW)

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

$T_a=25^\circ C$

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V_{dss}	20	V
Gate-Source Voltage	V_{gss}	± 8	V
Drain Current (DC)	I_d	8	A
Drain Current (Pulse)	I_{dp}	25	A
Reverse Drain Current	I_{dr}	8	A
Continuous Channel Power Dissipation (note)	P_d	2.5	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature	T_{stg}	-55~150	$^\circ C$

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			±10	μA
Gate-Source Cut-off Voltage	V _{gs(off)}	I _d =1mA, V _{ds} =10V	0.5			V
Drain-Source On-state Resistance (note)	R _{ds(on)}	I _d =4A, V _{gs} =4.5V		0.025	0.032	Ω
		I _d =4A, V _{gs} =2.5V		0.035	0.045	Ω
		I _d =4A, V _{gs} =1.5V		0.055	0.08	Ω
Forward Transfer Admittance (note)	Y _{fs}	I _d =4A, V _{ds} =10V		18		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=1MHz		1200		pF
Output Capacitance	C _{oss}			550		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			15		ns
Turn-off Delay Time	t _{d (off)}			80		ns
Fall Time	t _f			10		ns

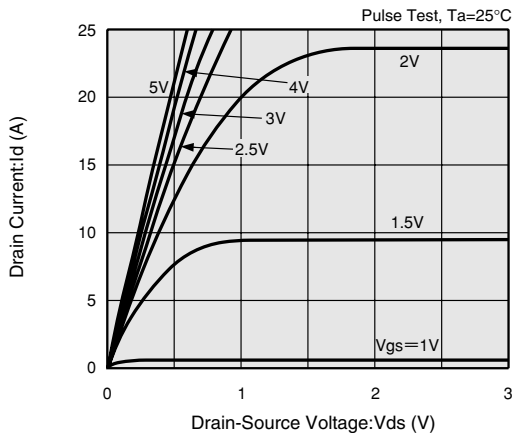
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Thermal Characteristics

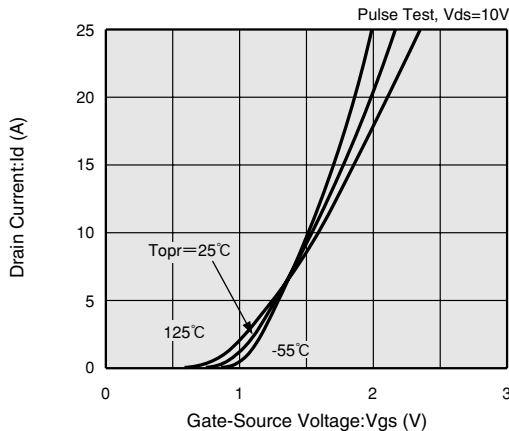
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R _{th (ch-a)}	Implement on a glass epoxy resin PCB		50		°C/W

Typical Performance Characteristics

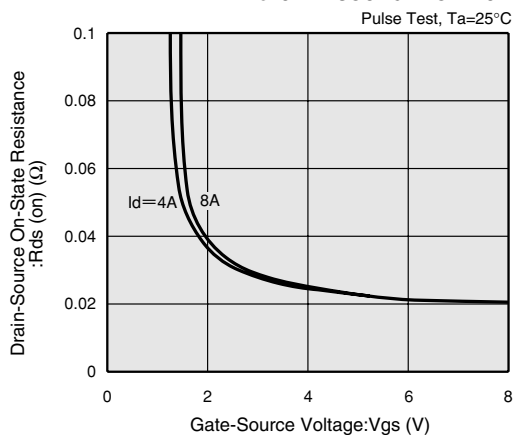
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



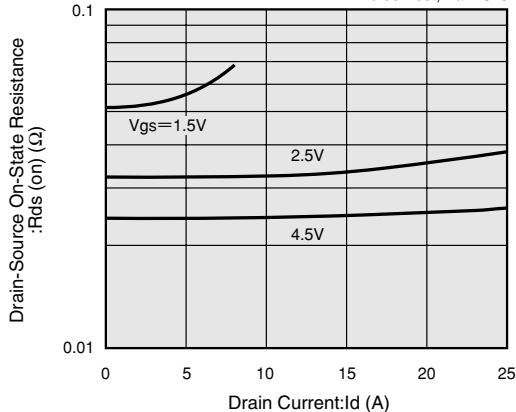
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



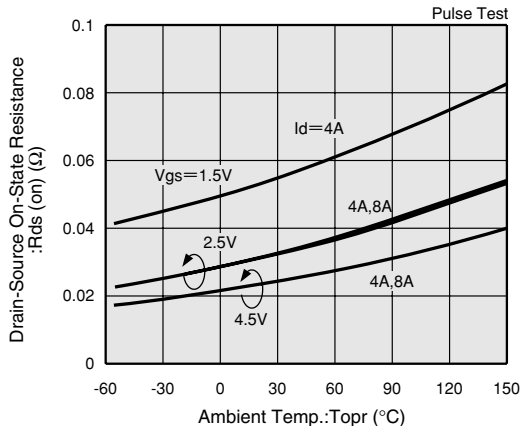
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



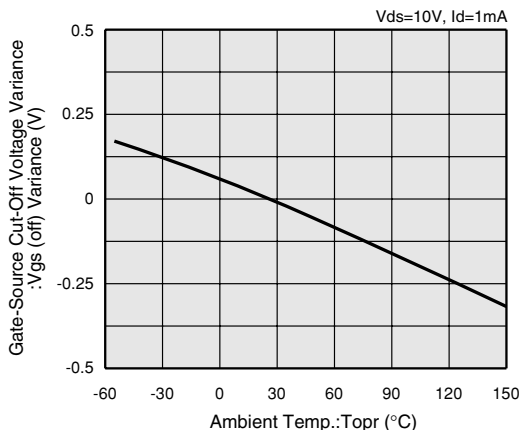
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

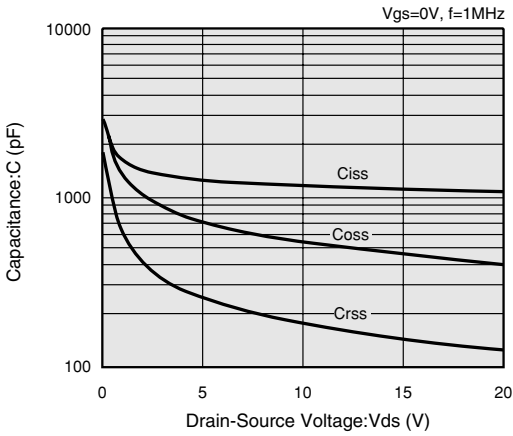


GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE

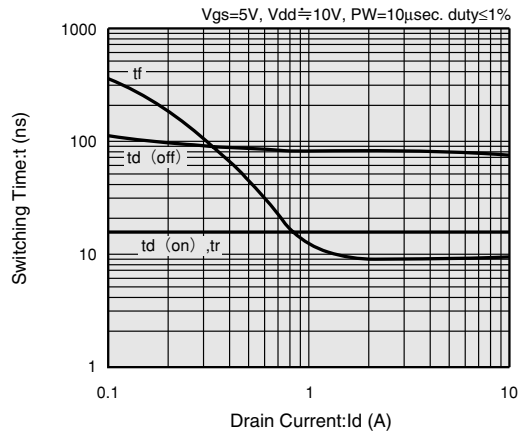


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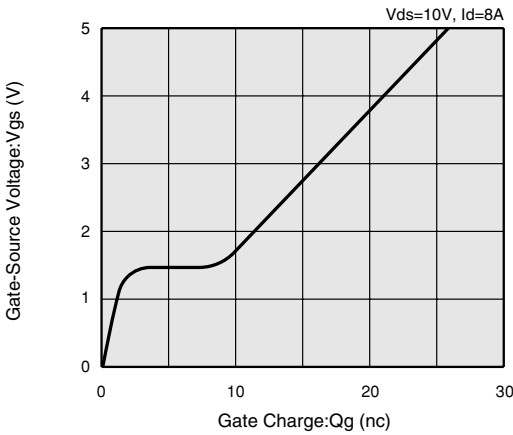
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



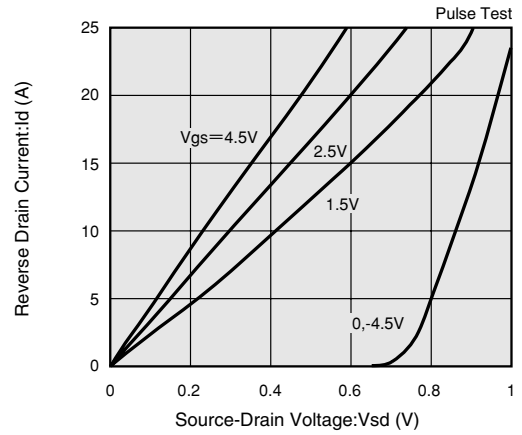
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

