

- ◆ N-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance: 0.026Ω MAX
- ◆ Ultra High-Speed Switching
- ◆ SOP-8 Package

General Description

The XP131A0526SR is a 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.

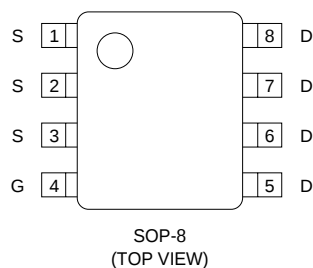
Applications

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

Features

Low on-state resistance: $R_{ds(on)}=0.017\Omega(V_{gs}=10V)$
 $R_{ds(on)}=0.026\Omega(V_{gs}=4.5V)$
Ultra high-speed switching
Operational Voltage: 4.5V
High density mounting: SOP-8

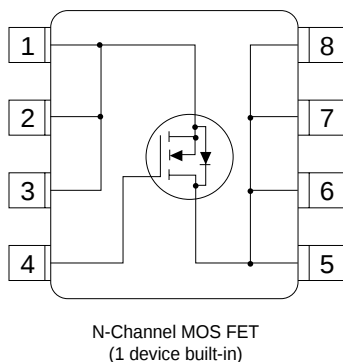
Pin Configuration



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}	30	V
Gate-Source Voltage	V_{gs}	± 20	V
Drain Current (DC)	I_d	10	A
Drain Current (Pulse)	I_{dp}	30	A
Reverse Drain Current	I_{dr}	10	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}	$V_{ds}=30V, V_{gs}=0V$			10	μA
Gate-Source Leakage Current	I_{gss}	$V_{gs}=\pm 20V, V_{ds}=0V$			± 1	μA
Gate-Source Cut-off Voltage	$V_{gs(off)}$	$I_d=1mA, V_{ds}=10V$	1.0		2.5	V
Drain-Source On-state Resistance (note)	$R_{ds(on)}$	$I_d=5A, V_{gs}=10V$			0.017	Ω
		$I_d=5A, V_{gs}=4.5V$			0.026	Ω
Forward Transfer Admittance (note)	$ Y_{fs} $	$I_d=5A, V_{ds}=10V$		15		S
Body Drain Diode Forward Voltage	V_f	$I_f=10A, V_{gs}=0V$		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_{iss}	$V_{ds}=10V, V_{gs}=0V$ $f=1MHz$		1350		pF
Output Capacitance	C_{oss}			800		pF
Feedback Capacitance	C_{rss}			300		pF

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Switching characteristics

Ta=25°C

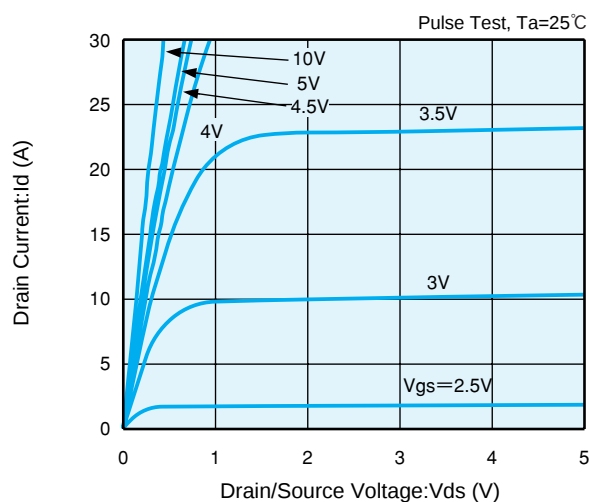
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	$t_d(on)$	$V_{gs}=5V, I_d=5A$ $V_{dd}=10V$		20		ns
Rise Time	t_r			35		ns
Turn-off Delay Time	$t_d(off)$			35		ns
Fall Time	t_f			20		ns

Thermal characteristics

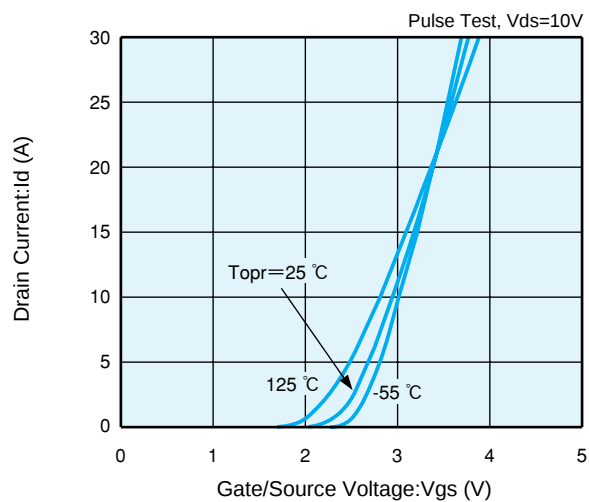
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-surroundings)	$R_{th(ch-a)}$	Implement on a glass epoxy resin PCB		50		$^{\circ}C/W$

■ Electrical Characteristics

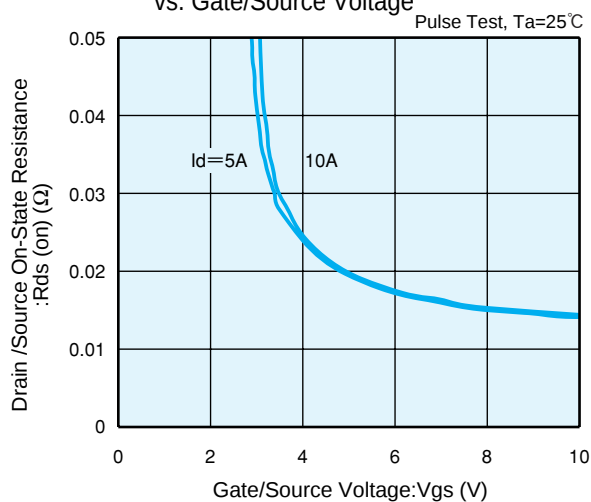
Drain Current vs. Drain /Source Voltage



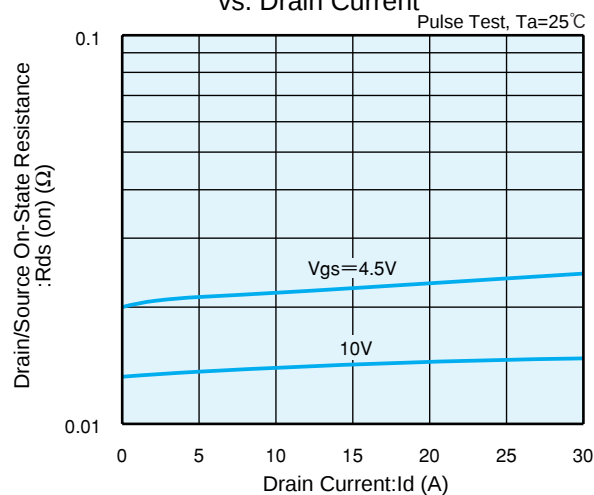
Drain Current vs. Gate/Source Voltage



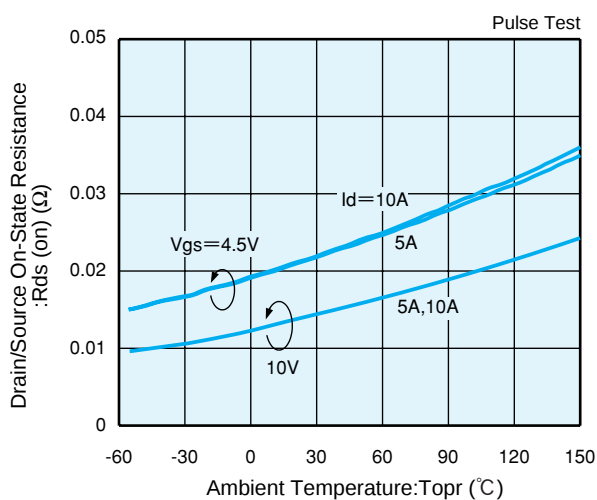
Drain/Source On-State Resistance vs. Gate/Source Voltage



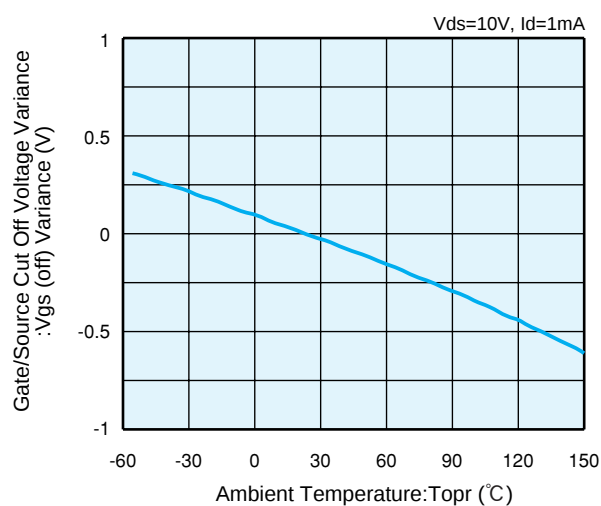
Drain/Source On-State Resistance vs. Drain Current



Drain/Source On-State Resistance vs. Ambient Temp.

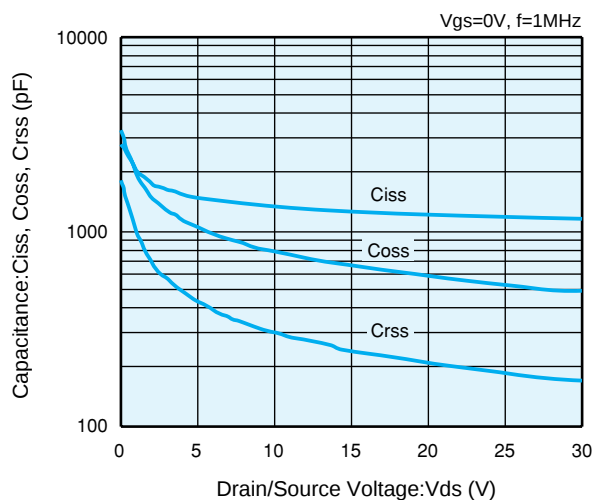


Gate/Source Cut Off Voltage Variance vs. Ambient Temp.

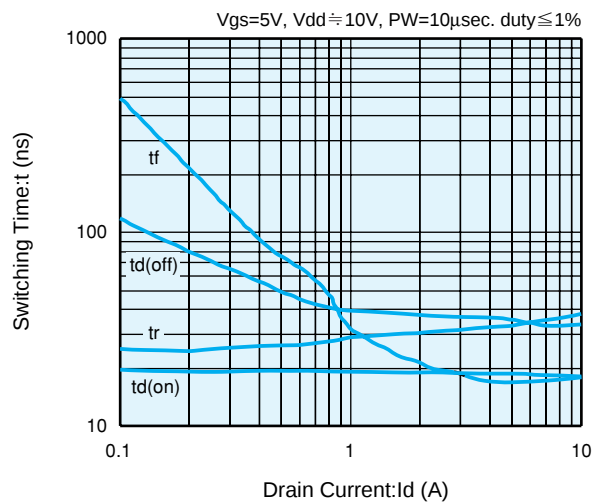


Electrical Characteristics

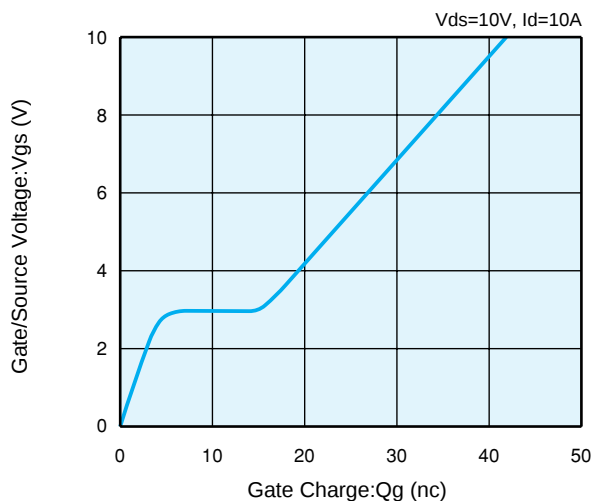
Drain/Source Voltage vs. Capacitance



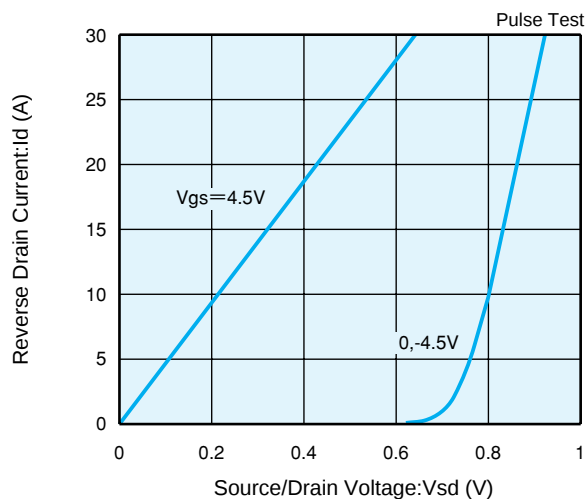
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width

