

- ◆ N-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance: 0.045Ω MAX
- ◆ Ultra High-Speed Switching
- ◆ SOP-8 Package
- ◆ Two FET Devices built-in

## ■ General Description

The XP133A0245SR is a N-Channel Power MOS FET with low on-state resistance and ultra high-speed switching characteristics. Two FET devices are built into the one package. 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

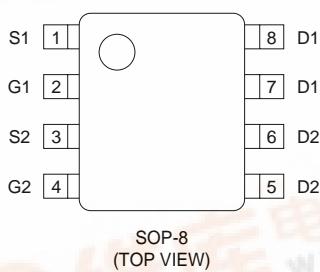
**Low on-state resistance:**  $R_{ds(on)}=0.045\Omega(V_{gs}=4.5V)$   
 $R_{ds(on)}=0.060\Omega(V_{gs}=2.5V)$   
 $R_{ds(on)}=0.1\Omega(V_{gs}=1.5V)$

**Ultra high-speed switching**

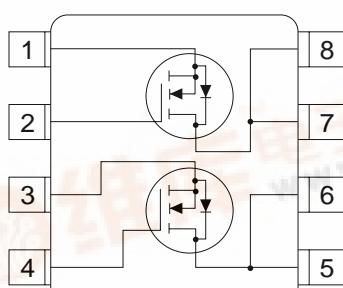
**Operational Voltage:** 1.5V

**High density mounting:** SOP-8

## ■ Pin Configuration



## ■ Equivalent Circuit



N-Channel MOS FET  
(2 devices built-in)

## ■ Pin Assignment

PIN NUMBER	PIN NAME	FUNCTION
1	S1	Source
2	G1	Gate
3	S2	Source
4	G2	Gate
5~6	D2	Drain
7~8	D1	Drain

## ■ Absolute Maximum Ratings

Ta=25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	Vdss	20	V
Gate-Source Voltage	Vgss	$\pm 8$	V
Drain Current (DC)	Id	5	A
Drain Current (Pulse)	Idp	15	A
Reverse Drain Current	ldr	5	A
Continuous Channel Power Dissipation (note)	Pd	2	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55~150	°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	Idss	Vds=20V, Vgs=0V			10	µA
Gate-Source Leakage Current	Igss	Vgs=±8V, Vds=0V			±1	µA
Gate-Source Cut-off Voltage	Vgs(off)	Id=1mA, Vds=10V	0.5		1.2	V
Drain-Source On-state Resistance (note)	Rds(on)	Id=3A, Vgs=4.5V		0.035	0.045	Ω
		Id=3A, Vgs=2.5V		0.047	0.06	Ω
		Id=1A, Vgs=1.5V		0.078	0.1	Ω
Forward Transfer Admittance (note)	Yfs	Id=3A, Vds=10V		12		S
Body Drain Diode Forward Voltage	Vf	If=5A, Vgs=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	Ciss	Vds=10V, Vgs=0V f=1MHz		880		pF
Output Capacitance	Coss			460		pF
Feedback Capacitance	Crss			150		pF

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### Switching characteristics

Ta=25°C

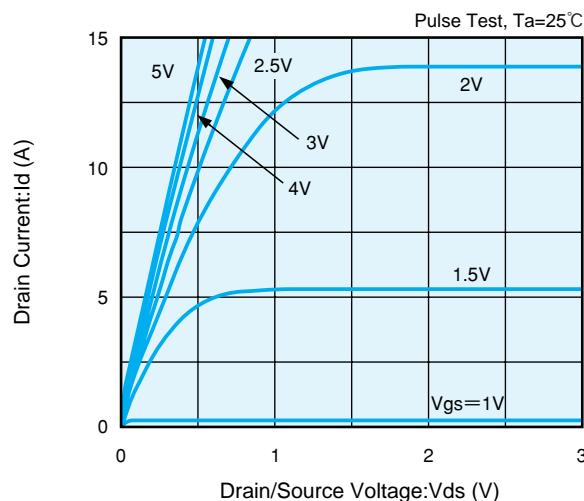
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=3A Vdd=10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			65		ns
Fall Time	tf			10		ns

### Thermal characteristics

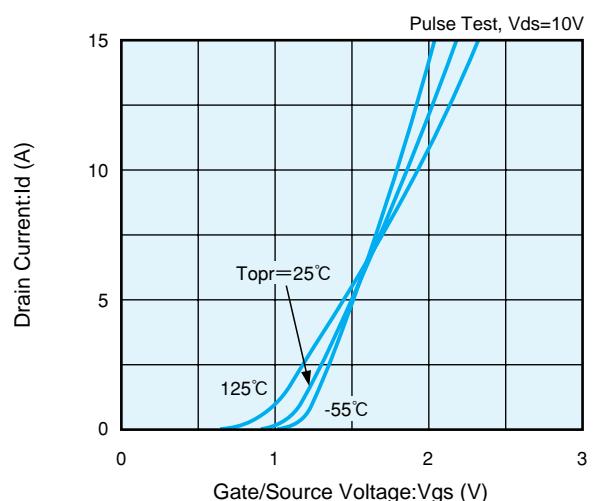
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-surroundings)	Rth (ch-a)	Implement on a glass epoxy resin PCB		62.5		°C/W

## ■ Electrical Characteristics

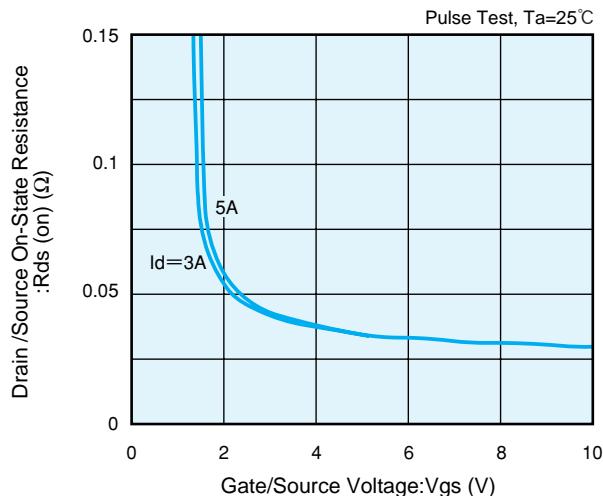
Drain Current vs. Drain /Source Voltage



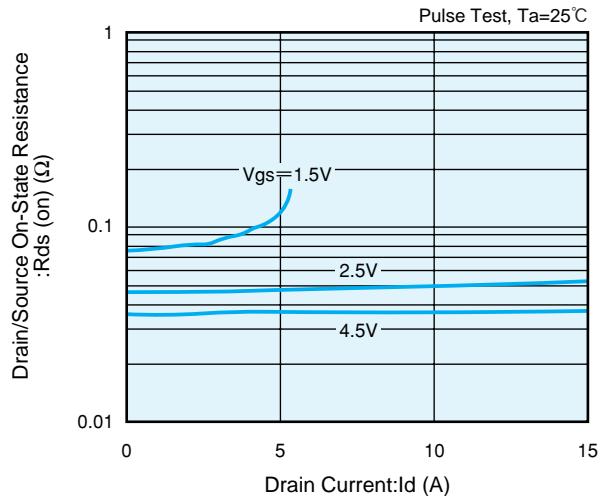
Drain Current vs. Gate/Source Voltage



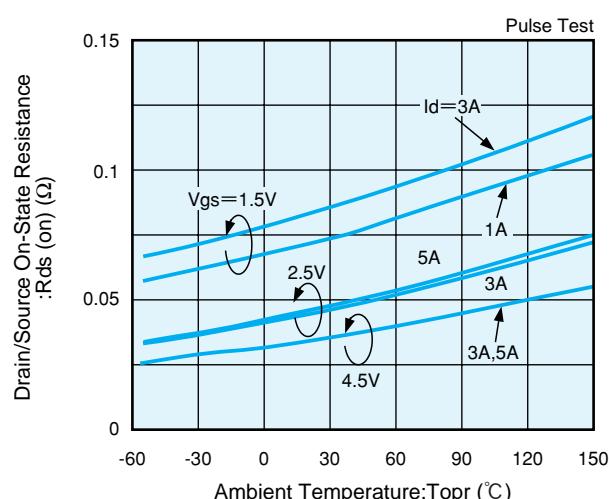
Drain/Source On-State Resistance vs. Gate/Source Voltage



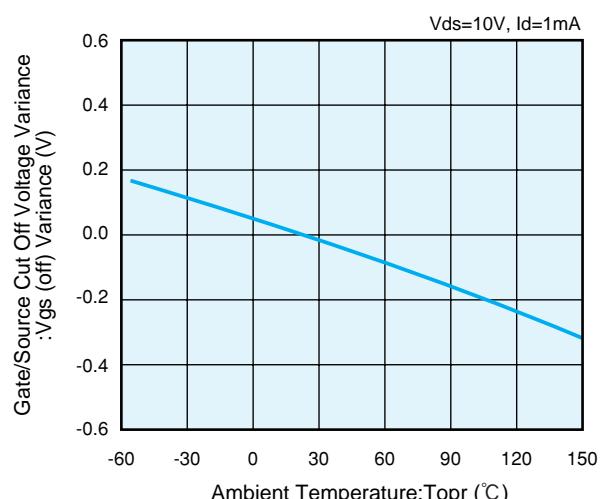
Drain/Source On-State Resistance vs. Drain Current



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

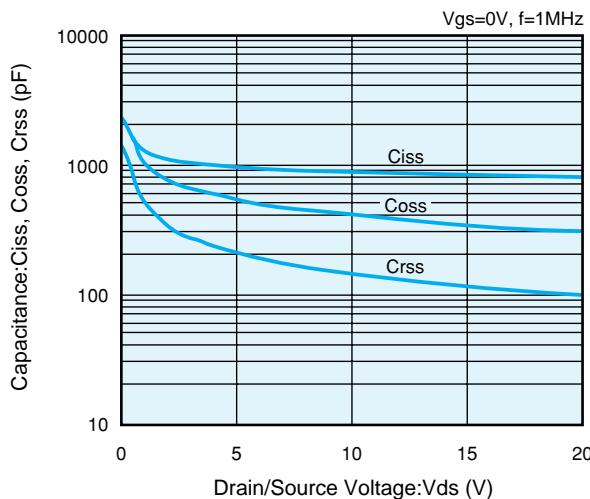


Gate/Source Cut Off Voltage Variance vs. Ambient Temp.

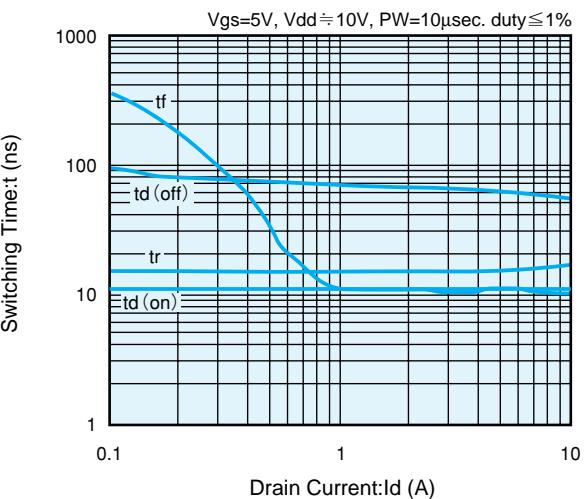


## ■ Electrical Characteristics

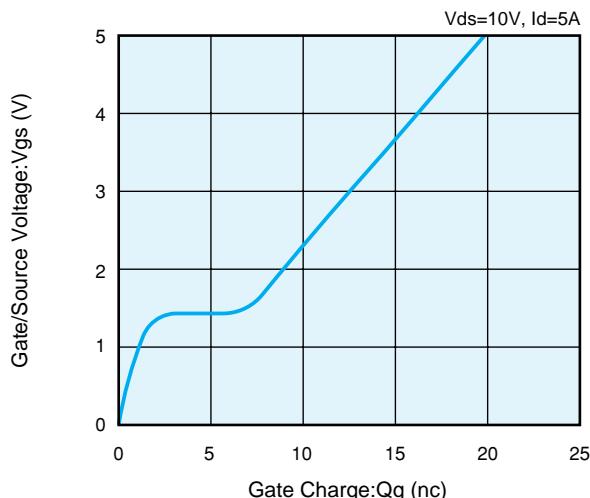
Drain/Source Voltage vs. Capacitance



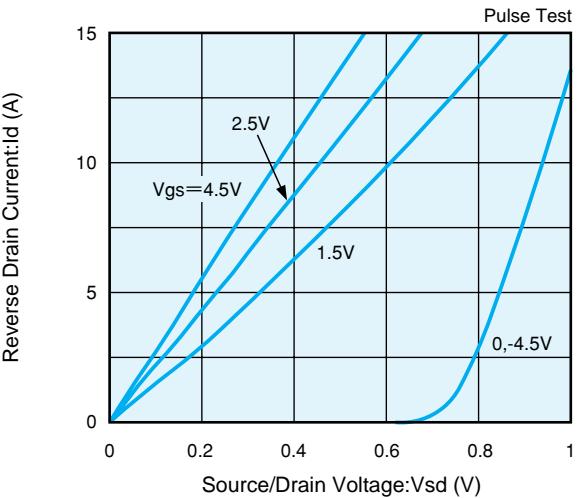
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width

