

Power MOSFET

GENERAL DESCRIPTION

The XP133A1145SR is an N-channel Power MOSFET 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 : $R_{ds(on)}=0.033\Omega$ ($V_{gs}=10V$)
 : $R_{ds(on)}=0.045\Omega$ ($V_{gs}=4.5V$)

Ultra High-Speed Switching

Driving Voltage : 4.5V

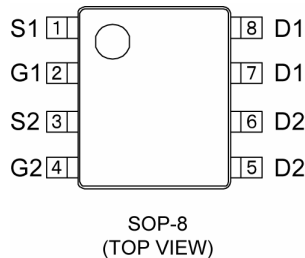
N-Channel Power MOSFET

DMOS Structure

Two FET Devices Built-in

Package : SOP-8

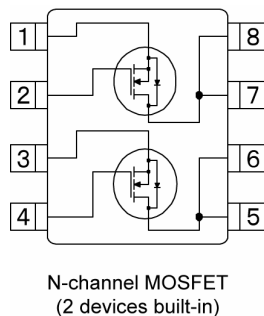
PIN CONFIGURATION



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

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS

$T_a = 25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V_{dss}	30	V
Gate-Source Voltage	V_{gss}	± 20	V
Drain Current (DC)	I_d	6	A
Drain Current (Pulse)	I_{dp}	20	A
Reverse Drain Current	I_{dr}	6	A
Channel Power Dissipation *	P_d	2	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$

* 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=30V, Vgs=0V	-	-	10	μA
Gate-Source Leak Current	Igss	Vgs=±20V, Vds=0V	-	-	±1	μA
Gate-Source Cut-Off Voltage	Vgs(off)	Id=1mA, Vds=10V	1.0	-	2.5	V
Drain-Source On-State Resistance *	Rds(on)	Id=3A, Vgs=10V	-	0.026	0.033	Ω
		Id=3A, Vgs=4.5V	-	0.035	0.045	Ω
Forward Transfer Admittance *	Yfs	Id=3A, Vds=10V	-	12	-	S
Body Drain Diode Forward Voltage	Vf	If=6A, Vgs=0V	-	0.85	1.1	V

* 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	-	620	-	pF
Output Capacitance	Coss		-	350	-	pF
Feedback Capacitance	Crss		-	120	-	pF

Switching Characteristics

Ta = 25°C

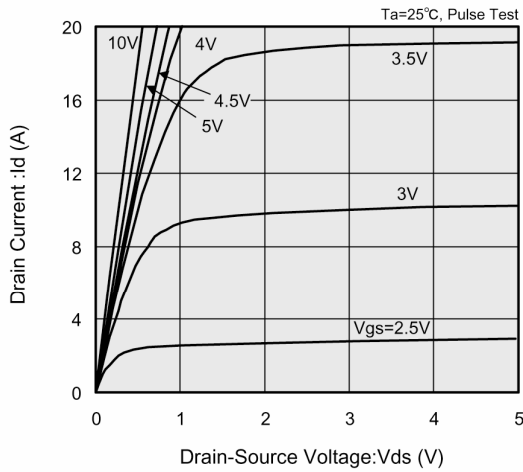
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Turn-On Delay Time	td (on)	Vgs=5V, Id=3A Vdd=10V	-	15	-	ns
Rise Time	tr		-	20	-	ns
Turn-Off Delay Time	td (off)		-	30	-	ns
Fall Time	tf		-	10	-	ns

Thermal Characteristics

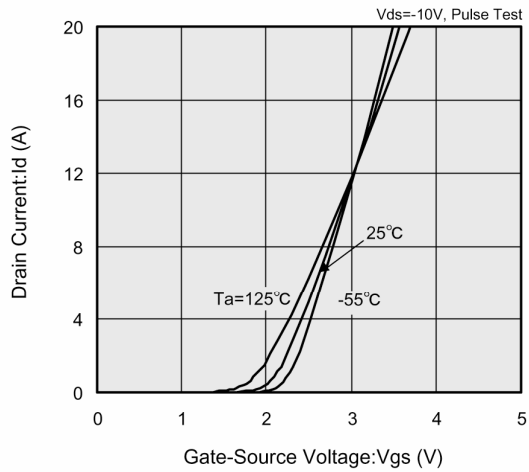
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal Resistance (Channel-Ambience)	Rth (ch-a)	Implement on a glass epoxy resin PCB	-	62.5	-	°C/W

TYPICAL PERFORMANCE CHARACTERISTICS

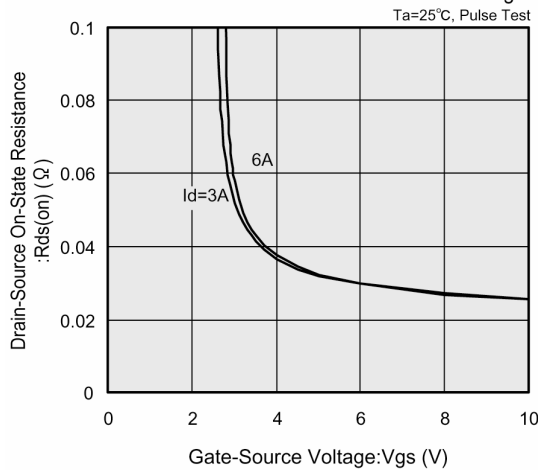
(1) Drain Current vs. Drain-Source Voltage



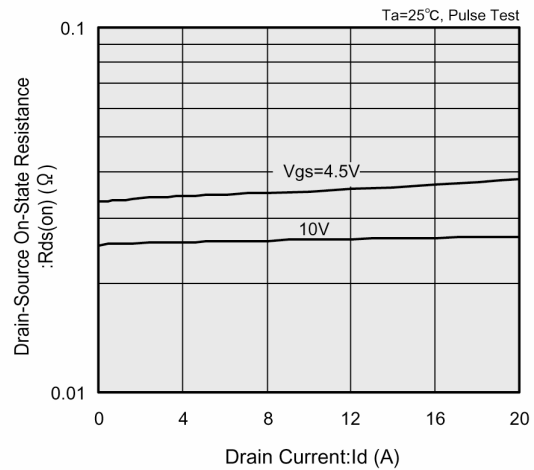
(2) Drain Current vs. Gate-Source Voltage



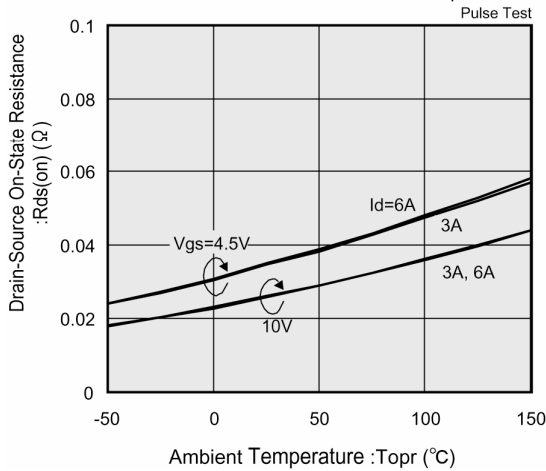
(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



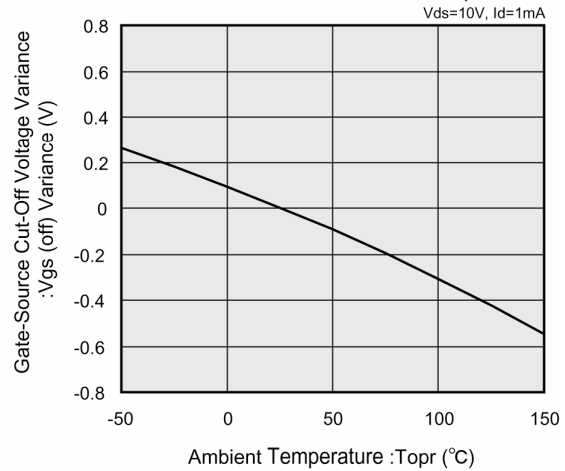
(4) Drain-Source On-State Resistance vs. Drain Current



(5) Drain-Source On-State Resistance vs. Ambient Temperature

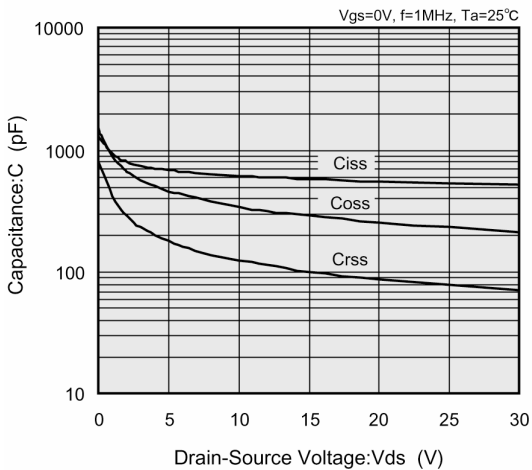


(6) Gate-Source Cut-Off Voltage Variance vs. Ambient Temperature

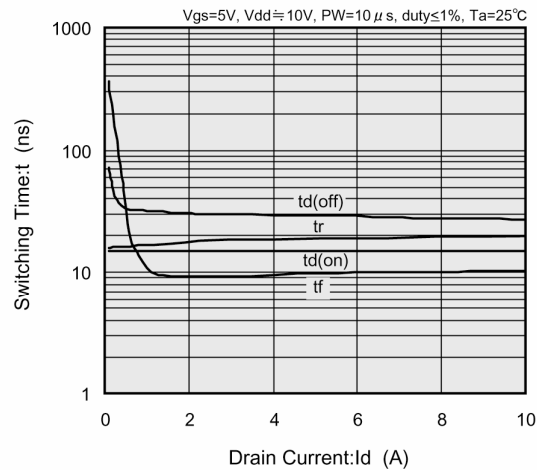


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

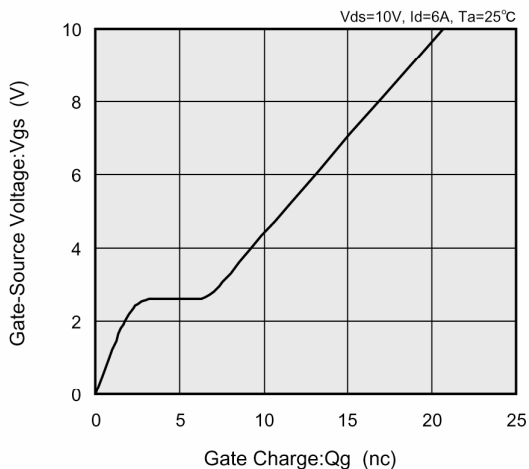
(7) Capacitance vs. Drain-Source Voltage



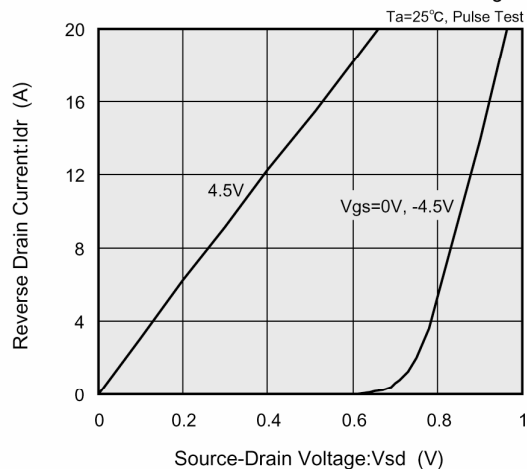
(8) Switching Time vs. Drain Current



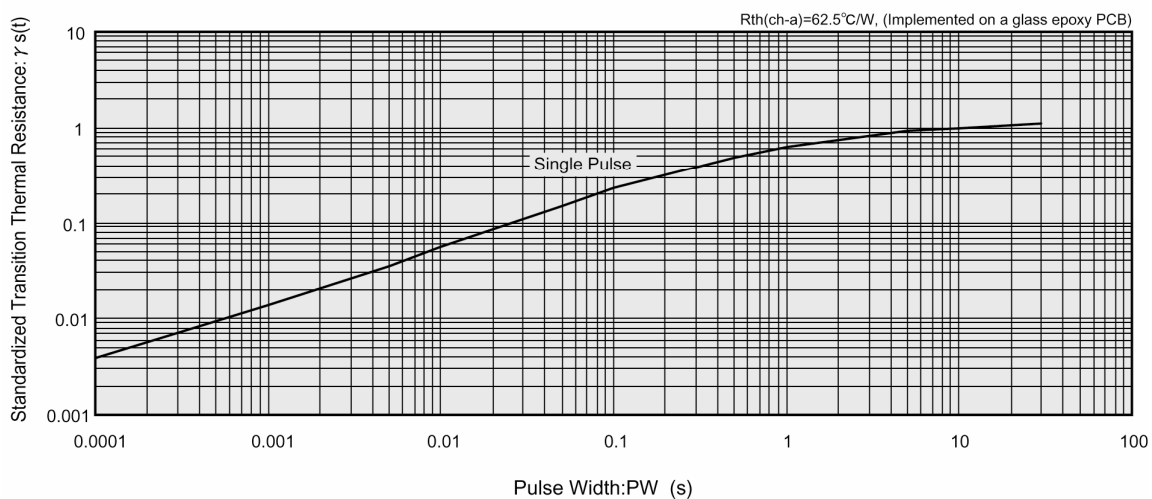
(9) Gate-Source Voltage vs. Gate Charge



(10) Reverse Drain Current vs. Source-Drain Voltage



(11) Standardized transition Thermal Resistance vs. Pulse Width



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