

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

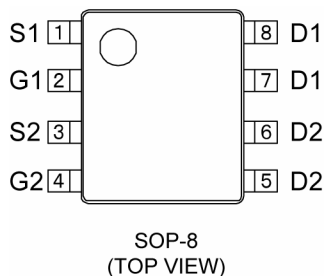
N-Channel Power MOSFET

DMOS Structure

Two FET Devices Built-in

Package : SOP-8

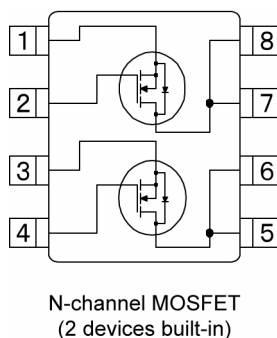
■ PIN CONFIGURATION



■ 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

Ta = 25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	Vdss	30	V
Gate-Source Voltage	Vgss	±20	V
Drain Current (DC)	Id	6	A
Drain Current (Pulse)	Idp	20	A
Reverse Drain Current	Idr	6	A
Channel Power Dissipation *	Pd	2	W
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55~150	°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	I _{dss}	V _{ds} =30V, V _{gs} =0V	-	-	10	μA
Gate-Source Leak Current	I _{gss}	V _{gs} =±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 *	R _{ds(on)}	I _d =3A, V _{gs} =10V	-	0.026	0.033	Ω
		I _d =3A, V _{gs} =4.5V	-	0.035	0.045	Ω
Forward Transfer Admittance *	Y _{fs}	I _d =3A, V _{ds} =10V	-	12	-	S
Body Drain Diode Forward Voltage	V _f	I _f =6A, V _{gs} =0V	-	0.85	1.1	V

* 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	-	620	-	pF
Output Capacitance	C _{oss}		-	350	-	pF
Feedback Capacitance	C _{rss}		-	120	-	pF

Switching Characteristics

Ta = 25°C

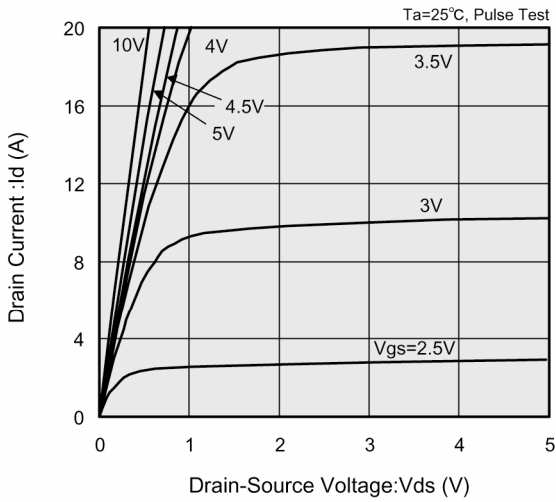
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Turn-On Delay Time	t _{d (on)}	V _{gs} =5V, I _d =3A V _{dd} =10V	-	15	-	ns
Rise Time	t _r		-	20	-	ns
Turn-Off Delay Time	t _{d (off)}		-	30	-	ns
Fall Time	t _f		-	10	-	ns

Thermal Characteristics

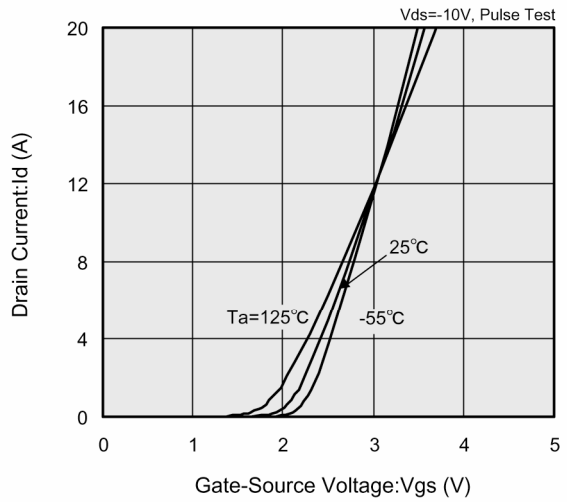
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal Resistance (Channel-Ambience)	R _{th (ch-a)}	Implement on a glass epoxy resin PCB	-	62.5	-	°C/W

TYPICAL PERFORMANCE CHARACTERISTICS

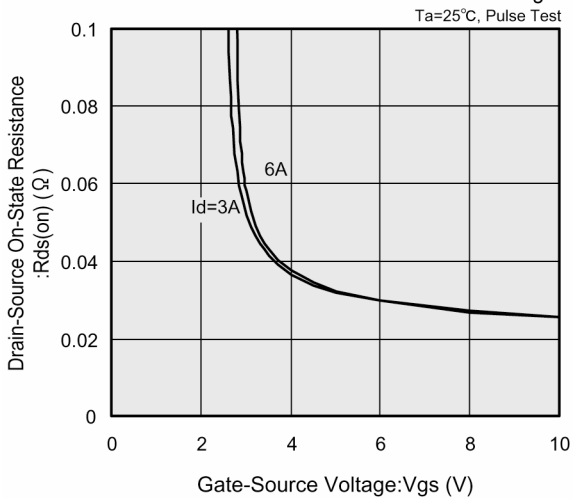
(1) Drain Current vs. Drain-Source Voltage



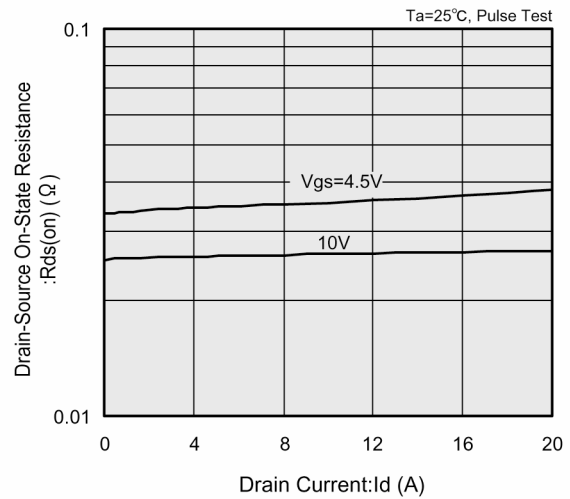
(2) Drain Current vs. Gate-Source Voltage



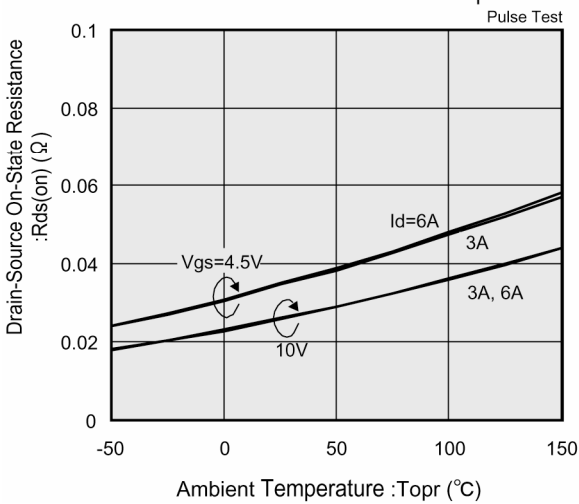
(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



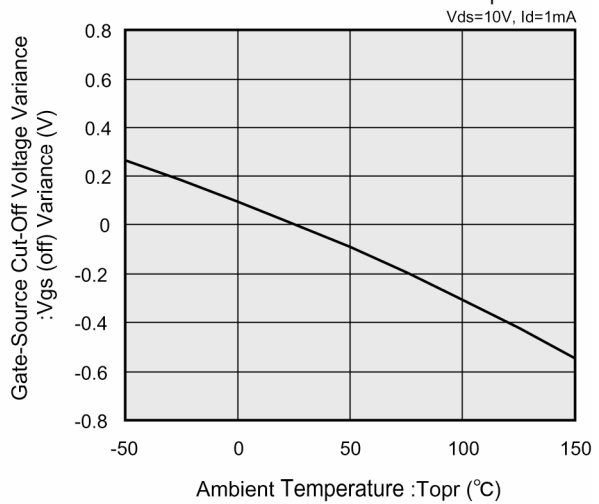
(4) Drain-Source On-State Resistance vs. Drain Current



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

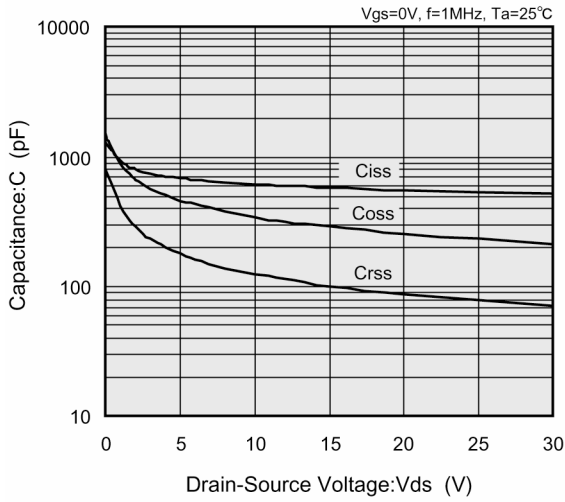


(6) Gate-Source Cut-Off Voltage Variance vs. Ambient Temperature

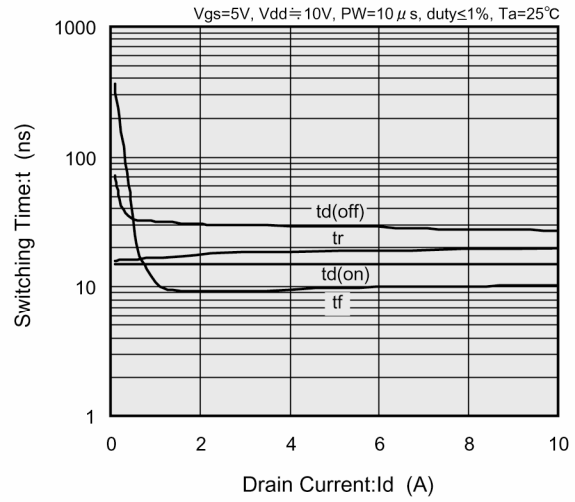


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

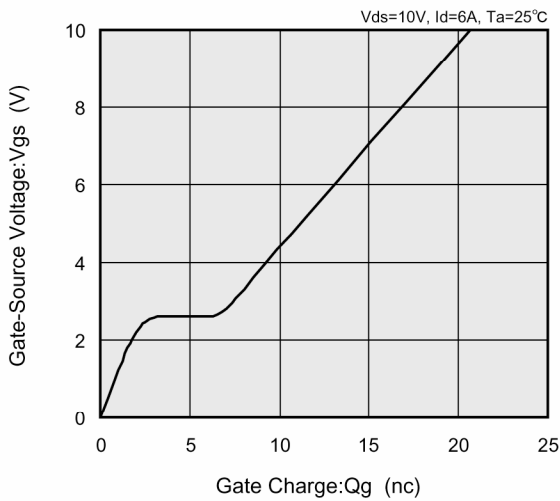
(7) Capacitance vs. Drain-Source Voltage



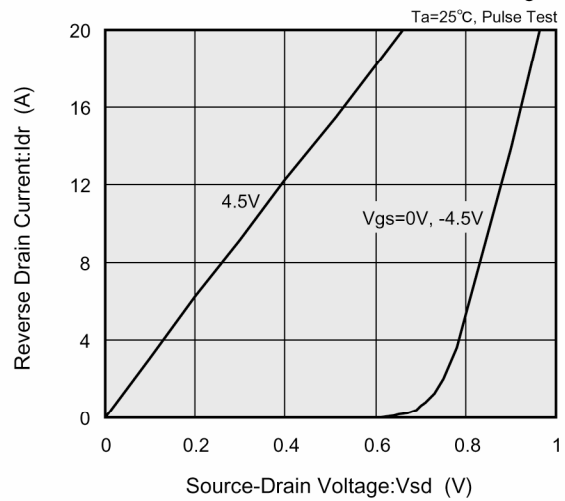
(8) Switching Time vs. Drain Current



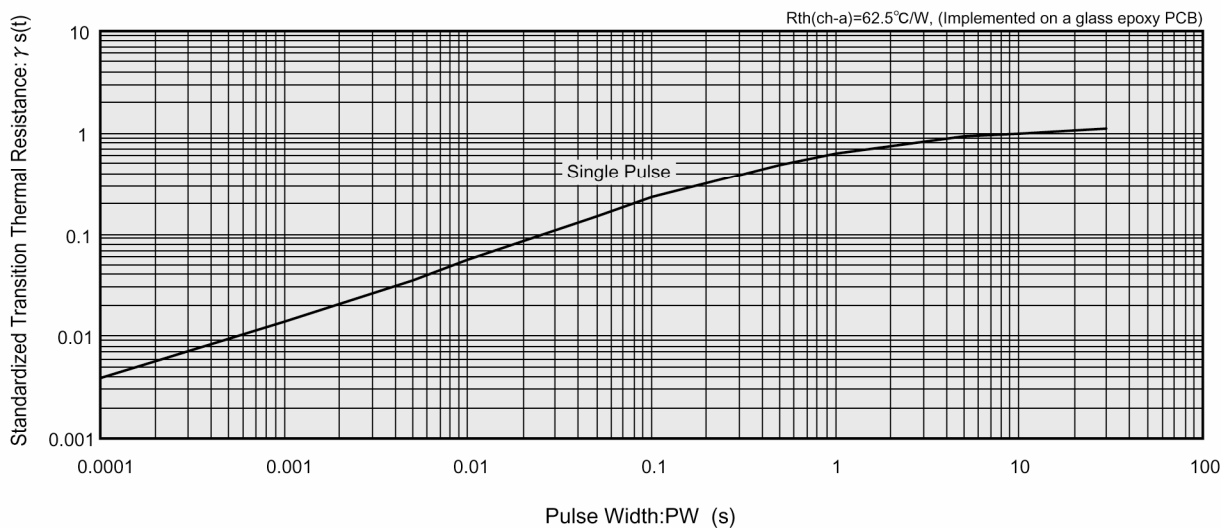
(9) Gate-Source Voltage vs. Gate Charge



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



(11) Standardized transition Thermal Resistance vs. Pulse Width



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