XP133A1145SR Power MOS FET

◆ **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**

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

■ General Description

The XP133A1145SR 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.

■ Features

Low on-state resistance: $Rds(on)=0.033\Omega(Vgs=10V)$
$\qquad\qquad\qquad\qquad Rds(on)=0.045\Omega(Vgs=4.5V)$
Ultra high-speed switching
Operational Voltage: 4.5V
High density mounting: SOP-8

7

■ Pin Configuration

SOP-8
(TOP VIEW)
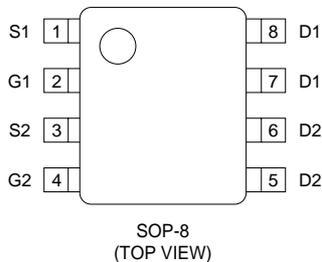
■ Pin Assignment

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

N-Channel MOS FET
(2 devices built-in)
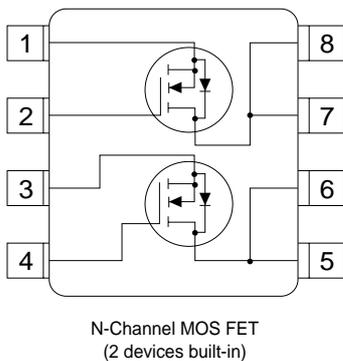
■ Absolute Maximum Ratings

Ta=25℃

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
Continuous Channel Power Dissipation (note)	Pd	2	W
Channel Temperature	Tch	150	℃
Storage Temperature	Tstg	-55~150	℃

Note: When implemented on a glass epoxy PCB

TOREX

■ Electrical Characteristics

DC characteristics
Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Drain Cut-off Current	Idss	Vds=30V, Vgs=0V			10	μA
Gate-Source Leakage 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 (note)	Rds(on)	Id=3A, Vgs=10V		0.026	0.033	Ω
		Id=3A, Vgs=4.5V		0.035	0.045	Ω
Forward Transfer Admittance (note)	|Yfs|	Id=3A, Vds=10V		12		S
Body Drain Diode Forward Voltage	Vf	If=6A, Vgs=0V		0.85	1.1	V

Note: Effective during pulse test.

Dynamic characteristics
Ta=25℃

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℃

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-surroundings)	Rth (ch-a)	Implement on a glass epoxy resin PCB		62.5		℃/W

■ Electrical Characteristics

Drain Current vs. Drain/Source Voltage

Ta=25℃, Pulse Test

Drain Current :Id (A) vs Drain/Source Voltage:Vds (V)

Curves labeled: 10V, 4V, 4.5V, 5V, 3.5V, 3V, Vgs=2.5V
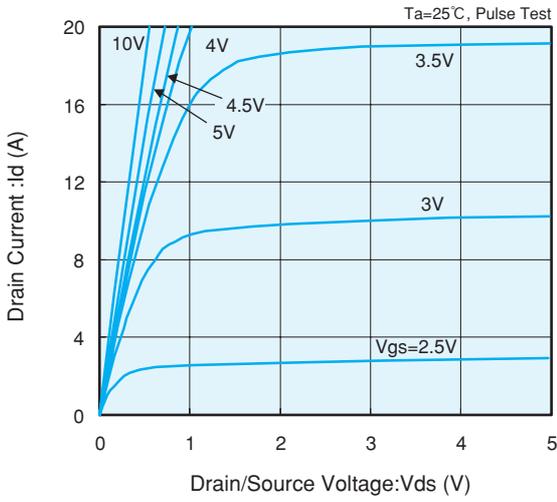
Drain Current vs. Gate/Source Voltage

Vds=-10V, Pulse Test

Drain Current:Id (A) vs Gate/Source Voltage:Vgs (V)

Curves labeled: 25℃, Ta=125℃, -55℃
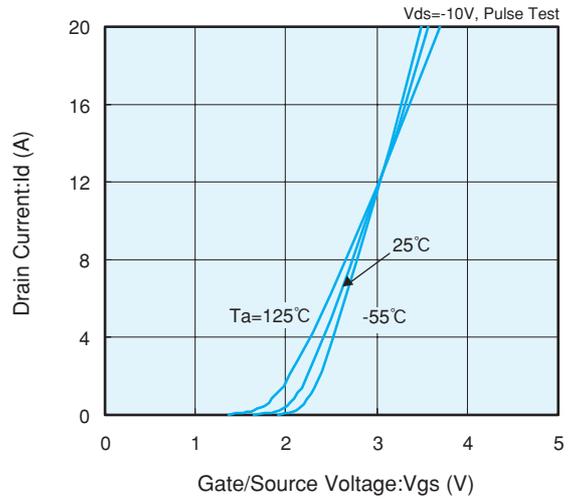
Drain/Source On-State Resistance vs. Gate/Source Voltage

Ta=25℃, Pulse Test

Drain/Source On State Resistance :Rds(on) (Ω) vs Gate/Source Voltage:Vgs (V)

Curves labeled: 6A, Id=3A
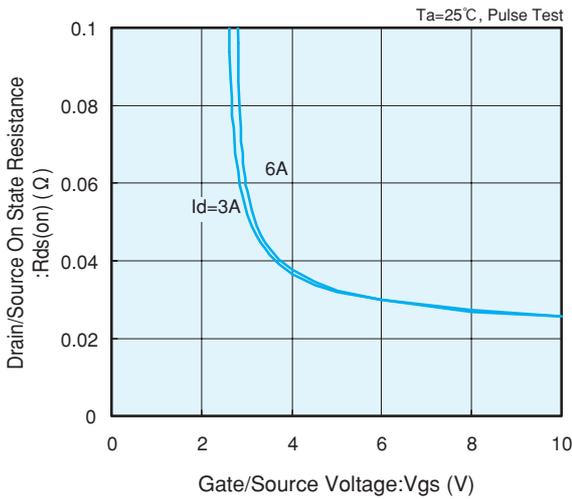
Drain/Source On-State Resistance vs. Drain Current

Ta=25℃, Pulse Test

Drain/Source On State Resistance :Rds(on) (Ω) vs Drain Current:Id (A)

Curves labeled: Vgs=4.5V, 10V
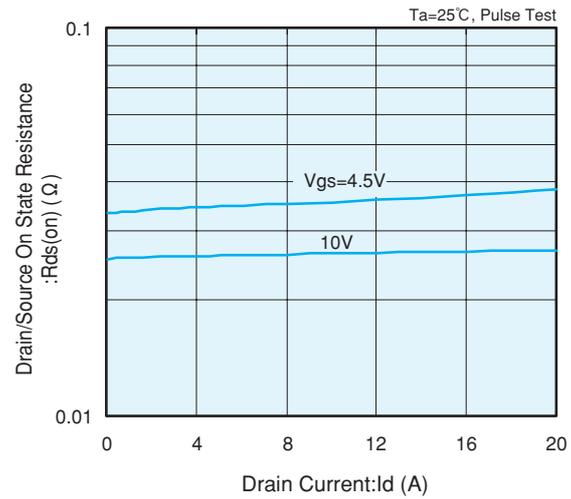
Drain/Source On-State Resistance vs. Ambient Temperature

Pulse Test

Drain/Source On State Resistance :Rds(on) (Ω) vs Ambient Temp. :Topr (℃)

Curves labeled: Id=6A, 3A, Vgs=4.5V, 3A, 6A, 10V
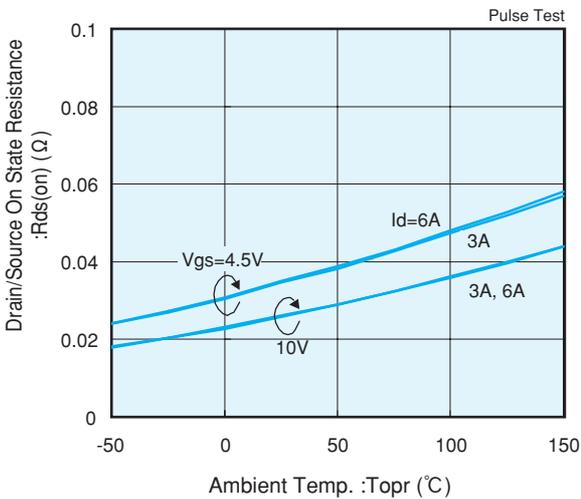
Gate/Source Cut-Off Voltage Variance vs. Ambient Temperature

Vds=10V, Id=1mA

Gate/Source Cut-Off Voltage Variance :Vgs (off) Variance (V) vs Ambient Temp. :Topr (℃)

TOREX

Power MOS FET
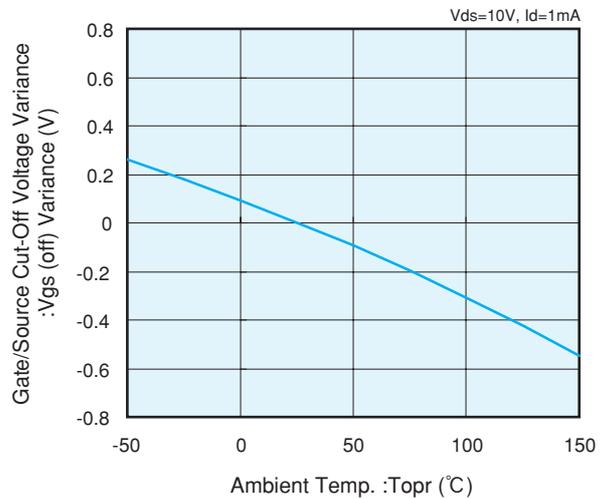
■ Electrical Characteristics

Drain/Source Voltage vs. Capacitance

Vgs=0V, f=1MHz, Ta=25℃
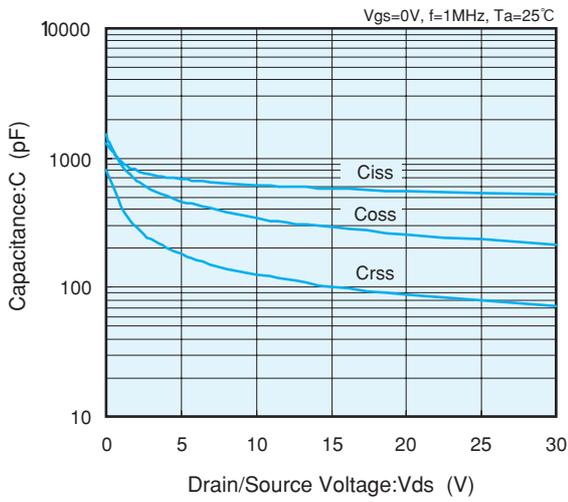
Switching Time vs. Drain Current

Vgs=5V, Vdd≒10V, PW=10μs, duty≦1%, Ta=25℃
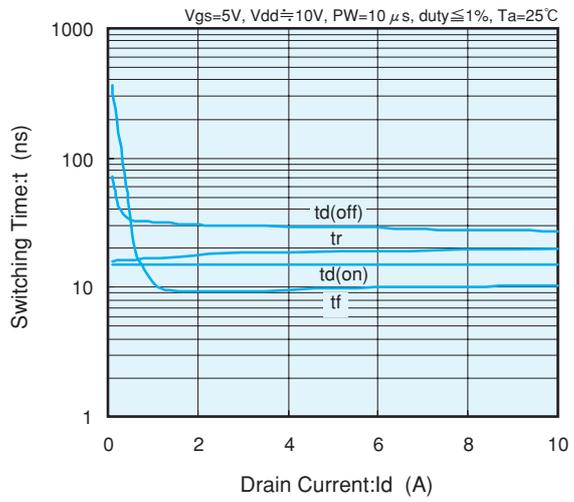
Gate/Source Voltage vs. Gate Charge

Vds=10V, Id=6A, Ta=25℃
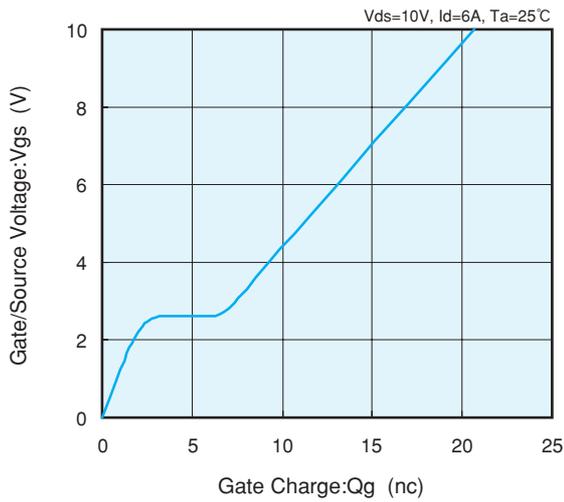
Reverse Drain Current vs. Source/Drain Voltage

Ta=25℃, Pulse Test
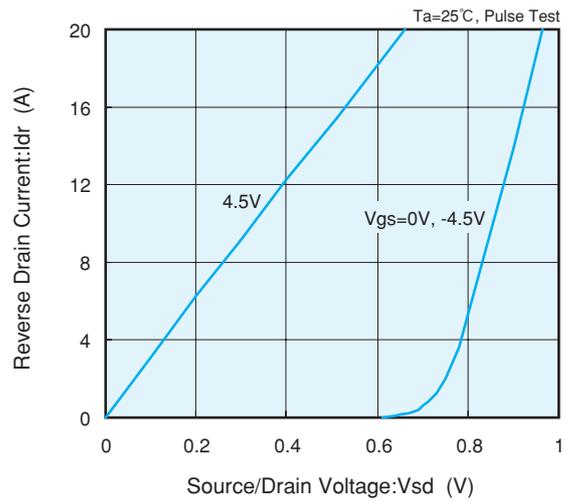
Standardized Transition Thermal Resistance vs. Pulse Width

Rth(ch-a)=62.5℃/W, (Implemented on a glass epoxy PCB)