XP161A01A8PR

Power MOS FET

◆ **N-Channel Power MOS FET**
◆ **DMOS Structure**
◆ **Low On-State Resistance: 0.18Ω MAX**
◆ **Ultra High-Speed Switching**
◆ **SOT-89 Package**

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

■ General Description

The XP161A01A8PR 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 SOT-89 package makes high density mounting possible.

■ Features

Low on-state resistance: Rds(on)=0.11Ω(Vgs=10V)
Rds(on)=0.18Ω(Vgs=4.5V)
Ultra high-speed switching
Operational Voltage: 4.5V
**High density mounting:** SOT-89

■ Pin Configuration

1 2 3
G D S
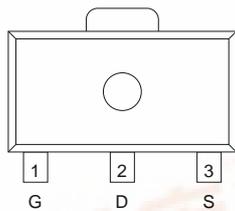
SOT-89
(TOP VIEW)

■ Pin Assignment

PIN NUMBER	PIN NAME	FUNCTION
1	G	Gate
2	D	Drain
3	S	Source

■ Equivalent Circuit

1 2 3
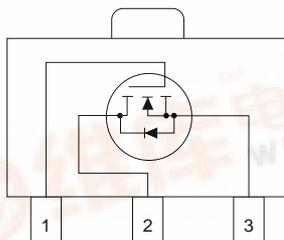
N-Channel MOS FET
(1 device built-in)

■ 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	3	A
Drain Current (Pulse)	Idp	9	A
Reverse Drain Current	Idr	3	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℃

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			±10	μA
Gate-Source Cut-off Voltage	Vgs(off)	Id=1mA, Vds=10V	1.0			V
Drain-Source On-state Resistance (note)	Rds(on)	Id=1.5A, Vgs=10V		0.08	0.11	Ω
		Id=1.5A, Vgs=4.5V		0.14	0.18	Ω
Forward Transfer Admittance (note)	|Yfs|	Id=1.5A, Vds=10V		3.5		S
Body Drain Diode Forward Voltage	Vf	If=3A, 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		220		pF
Output Capacitance	Coss			140		pF
Feedback Capacitance	Crss			55		pF

Switching characteristics

Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=1.5A Vdd=10V		15		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			25		ns
Fall Time	tf			15		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

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■ Electrical Characteristics

Drain Current vs. Drain /Source Voltage

Pulse Test, Ta=25℃
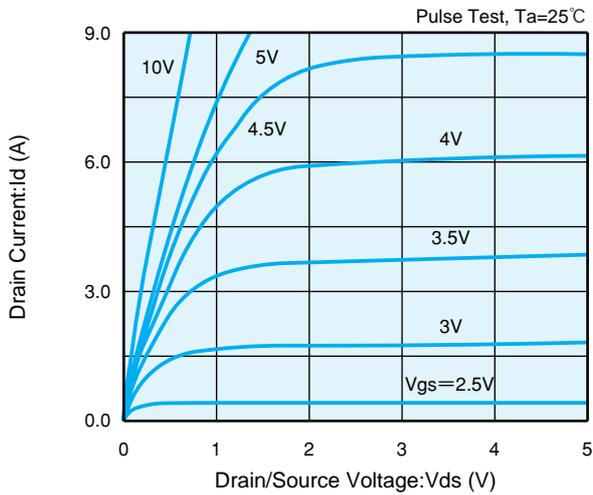
Drain Current vs. Gate/Source Voltage

Pulse Test, Vds=10V
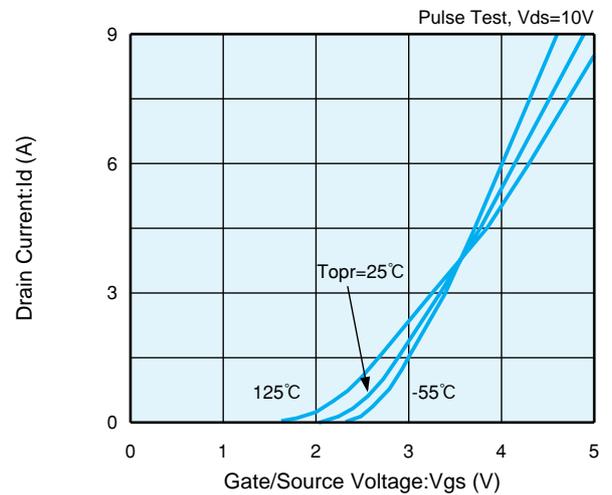
Drain/Source On-State Resistance vs. Gate/Source Voltage

Pulse Test, Ta=25℃
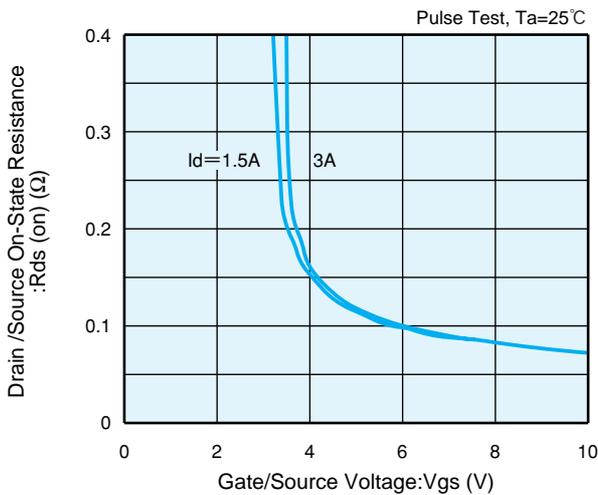
Drain/Source On-State Resistance vs. Drain Current

Pulse Test, Ta=25℃
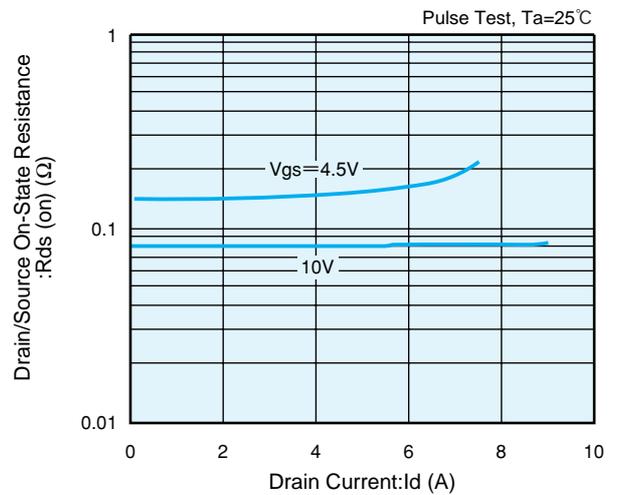
Drain/Source On-State Resistance vs. Ambient Temp.

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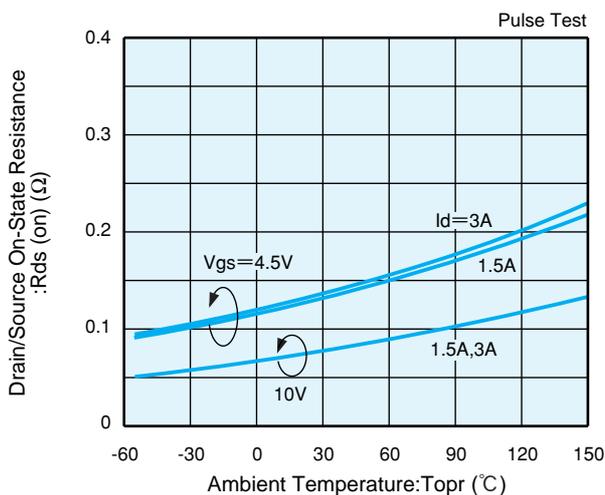
Gate/Source Cut Off Voltage Variance vs. Ambient Temp.

Vds=10V , Id=1mA

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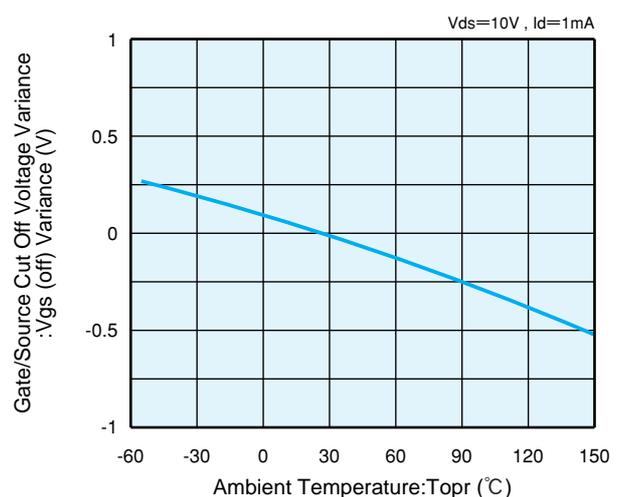
■ Electrical Characteristics

Drain/Source Voltage vs. Capacitance

Vgs=0V, f=1MHz

Capacitance:Ciss, Coss, Crss (pF) vs. Drain/Source Voltage:Vds (V)

Ciss
Coss
Crss
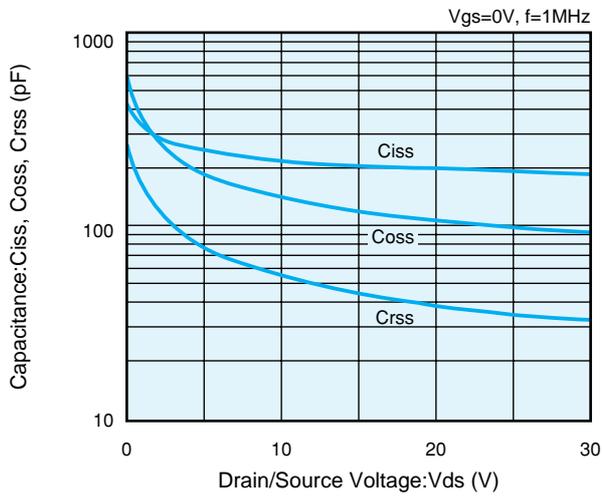
Switching Time vs. Drain Current

Vgs=5V, Vdd≒10V, PW=10μsec. duty≦1%

Switching Time:t (ns) vs. Drain Current:Id (A)

tf
td (off)
td (on) , tr
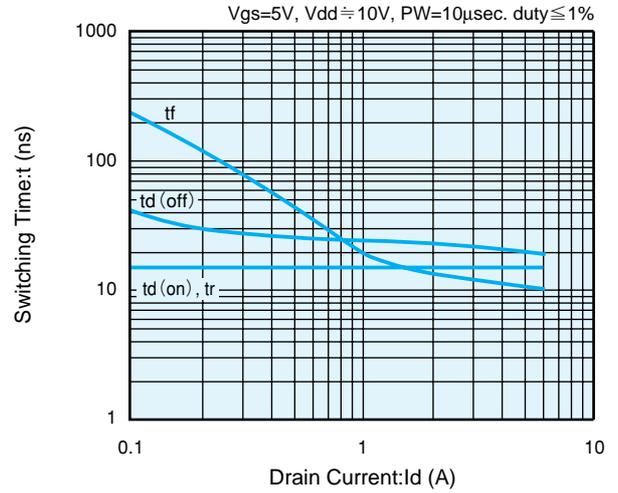
Gate/Source Voltage vs. Gate Charge

Vds=10V, Id=3A

Gate/Source Voltage:Vgs (V) vs. Gate Charge:Qg (nc)
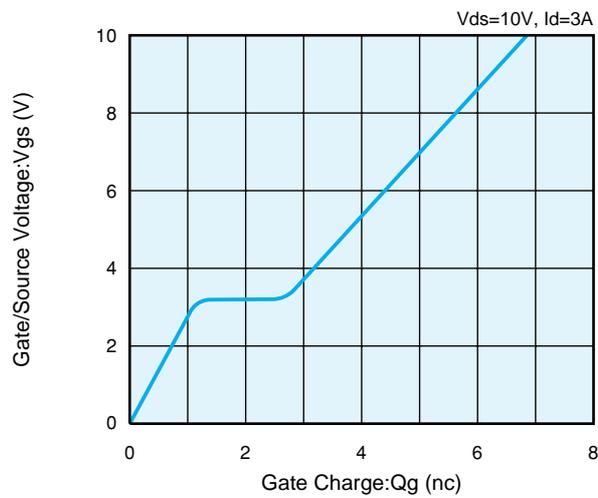
Reverse Drain Current vs. Source/Drain Voltage

Pulse Test

Reverse Drain Current:Id (A) vs. Source/Drain Voltage:Vsd (V)

Vgs=4.5V
0,-4.5A
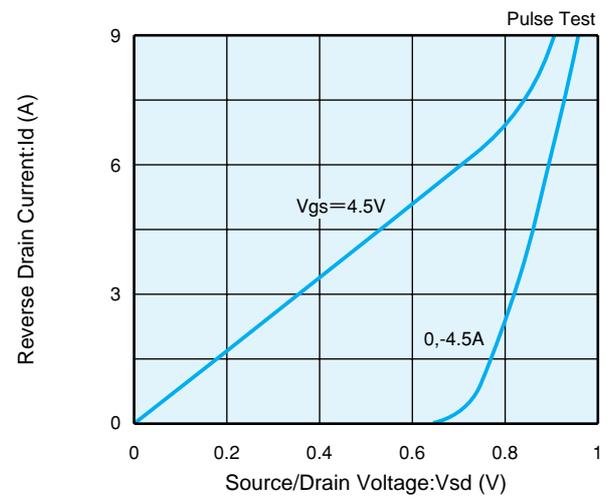
Standardized Transition Thermal Resistance vs. Pulse Width

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

Standardized Transition Thermal Resistance:γs(t) vs. Pulse Width:PW (sec)

Single Pulse

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