

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance : 0.17 Ω (max)
- ◆ Ultra High-Speed Switching
- ◆ Gate Protect Diode Built-in
- ◆ SOT - 89 Package

### ■ General Description

The XP162A12A6PR is a P-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.

In order to counter static, a gate protect diode is built-in.

The small SOT-89 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** :  $R_{ds(on)} = 0.17\Omega$  (  $V_{gs} = -4.5V$  )  
 $R_{ds(on)} = 0.3\Omega$  (  $V_{gs} = -2.5V$  )

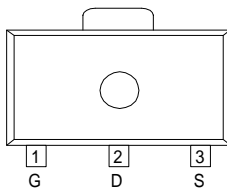
**Ultra high-speed switching**

**Operational Voltage** : -2.5V

**Gate protect diode built-in**

**High density mounting** : SOT - 89

### ■ Pin Configuration

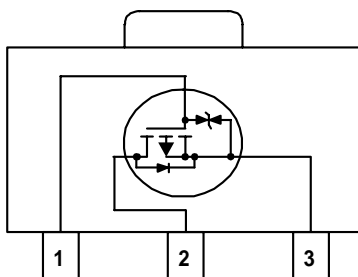


SOT - 89 Top View

### ■ Pin Assignment

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

### ■ Equivalent Circuit



P - Channel MOS FET  
( 1 device built-in )

### ■ Absolute Maximum Ratings

Ta=25°C			
PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	V <sub>dss</sub>	-20	V
Gate - Source Voltage	V <sub>gss</sub>	± 12	V
Drain Current (DC)	I <sub>d</sub>	-2.5	A
Drain Current (Pulse)	I <sub>dp</sub>	-10	A
Reverse Drain Current	I <sub>dr</sub>	-2.5	A
Continuous Channel Power Dissipation (note)	P <sub>d</sub>	2	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to 150	°C

( note ) : When implemented on a ceramic PCB

## ■ Electrical Characteristics

### DC characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Drain Cut-off Current	Idss	Vds = - 20 , Vgs = 0V			- 10	μA
Gate-Source Leakage Current	Igss	Vgs = ± 12 , Vds = 0V			± 10	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 = - 1.5A , Vgs = - 4.5V		0.13	0.17	Ω
		Id = - 1.5A , Vgs = - 2.5V		0.22	0.3	Ω
Forward Transfer Admittance ( note )	Yfs	Id = - 1.5A , Vds = - 10V		4		S
Body Drain Diode Forward Voltage	Vf	If = - 2.5A , 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 = 1 MHz		310		pF
Output Capacitance	Coss			200		pF
Feedback Capacitance	Crss			90		pF

### Switching characteristics

Ta=25°C

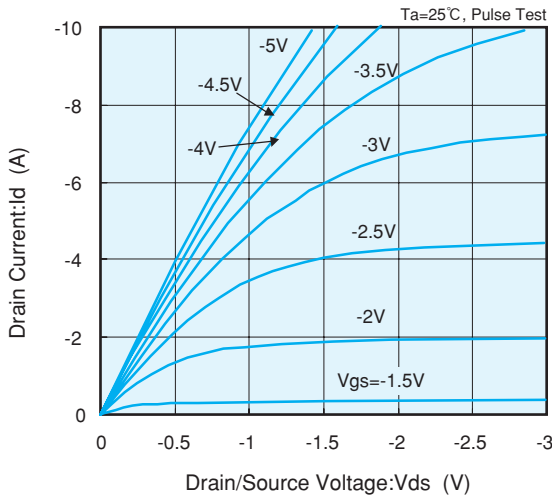
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td ( on )	Vgs = - 5V , Id = - 1.5A Vdd = - 10V		5		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td ( off )			55		ns
Fall Time	tf			55		ns

### Thermal characteristics

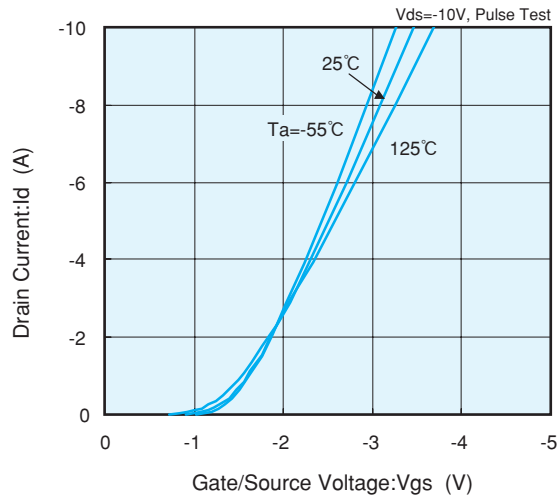
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance ( channel - surroundings )	Rth ( ch - a )	Implement on a ceramic PCB		62.5		°C / W

### Electrical Characteristics

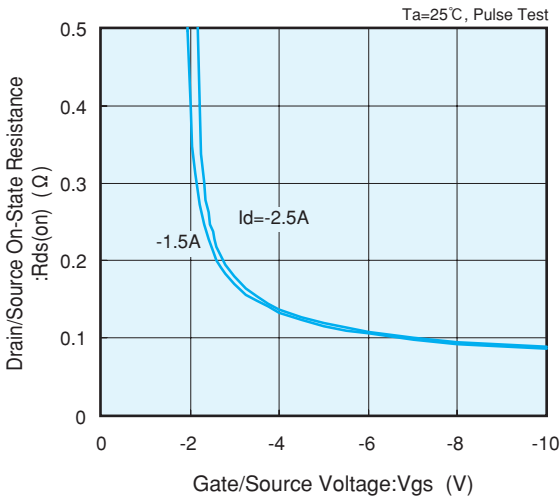
Drain Current vs. Drain/Source Voltage



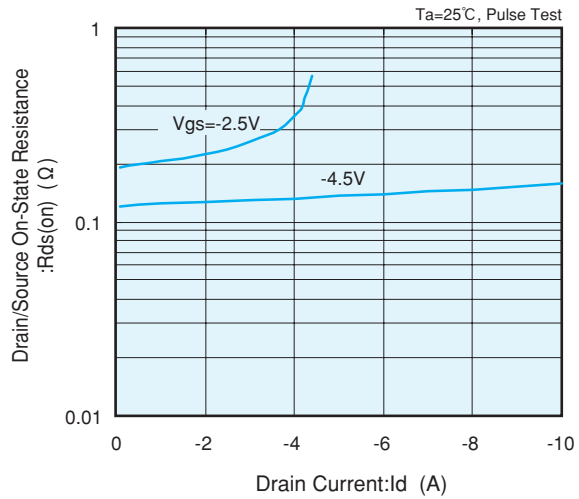
Drain Current vs. Gate/Source Voltage



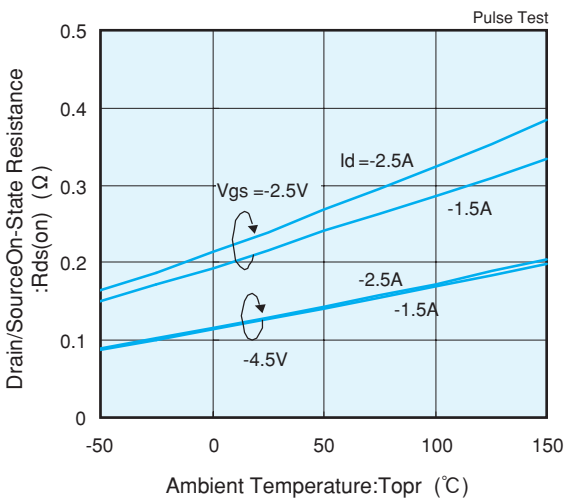
Drain/Source On-State Resistance vs. Gate/Source Voltage



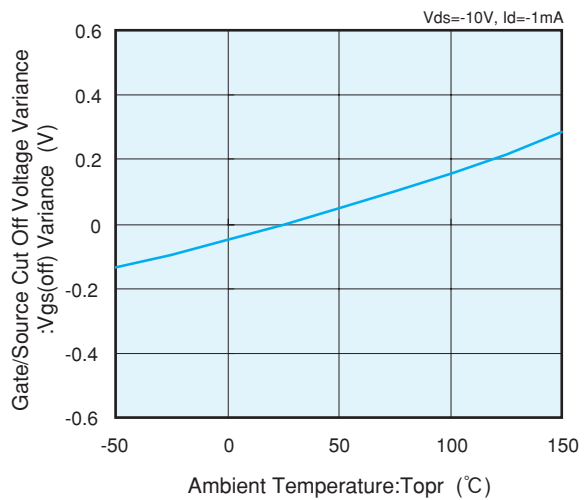
Drain/Source On-State Resistance vs. Drain Current



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



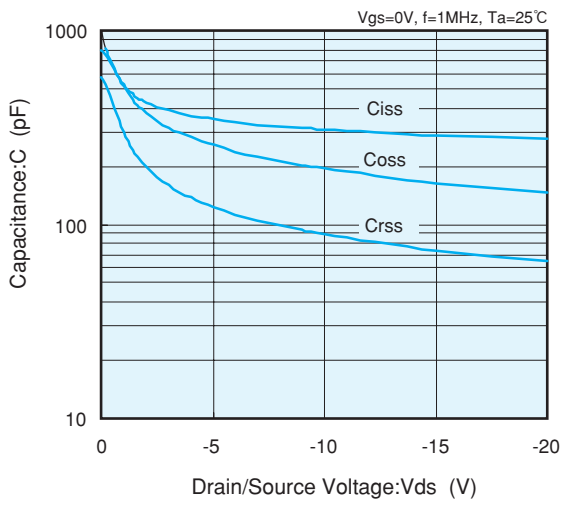
Gate/Source Cut Off Voltage Variance vs. Ambient Temp.



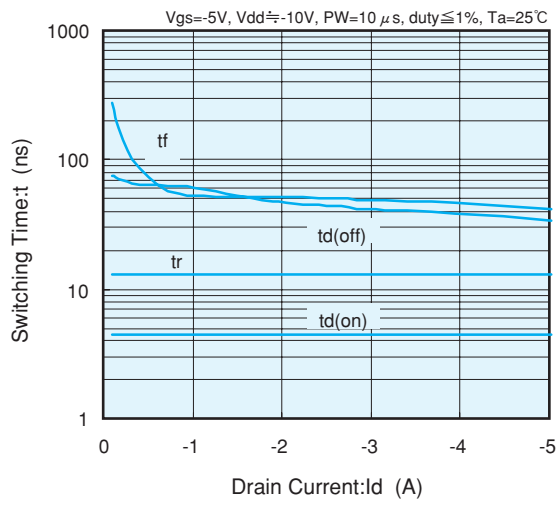
7

## Electrical Characteristics

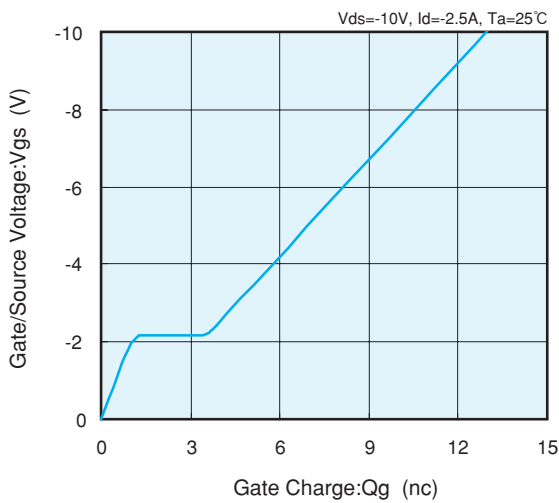
Capacitance vs. Drain/Source Voltage



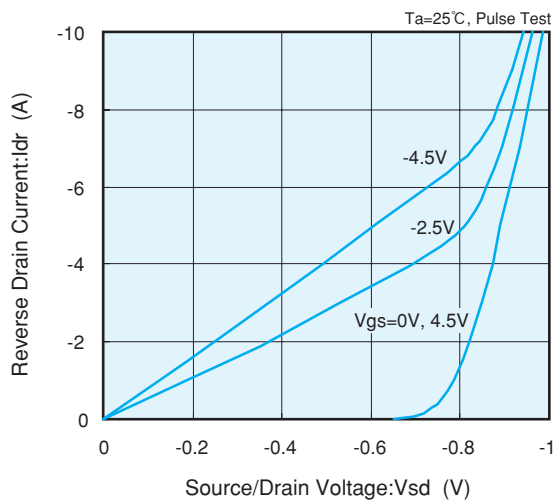
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width

