

XP161A11A1PR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance: 0.105Ω (max)
- ◆Gate Protect Diode Built-in
- ◆Ultra High-Speed Switching
- ◆SOT-89 Package

General Description

The XP161A11A1PR is an 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.

A gate protect diode is built-in to prevent static damage.

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: $R_{ds(on)}=0.065\Omega$ ($V_{gs}=10V$)
: $R_{ds(on)}=0.105\Omega$ ($V_{gs}=4.5V$)

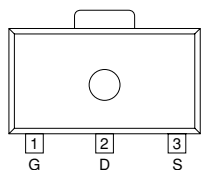
Ultra high-speed switching

Gate Protect Diode Built-in

Operational Voltage : 4.5V

High density mounting : SOT-89

Pin Configuration

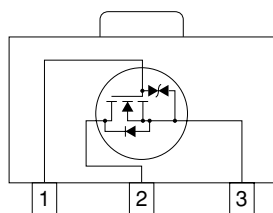


SOT-89
(TOP VIEW)

Pin Assignment

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

Equivalent Circuit



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

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	4	A
Drain Current (Pulse)	I_{dp}	16	A
Reverse Drain Current	I_{dr}	4	A
Continuous Channel Power Dissipation (note)	P_d	2	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

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	I _{dss}	V _{ds} =30V, V _{gs} =0V			10	μA
Gate-Source Leakage Current	I _{gss}	V _{gs} =±20V, V _{ds} =0V			±10	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 (note)	R _{ds(on)}	I _d =2A, V _{gs} =10V		0.05	0.065	Ω
		I _d =2A, V _{gs} =4.5V		0.075	0.105	Ω
Forward Transfer Admittance (note)	Y _{fs}	I _d =2A, V _{ds} =10V		5.5		S
Body Drain Diode Forward Voltage	V _f	I _f =4A, V _{gs} =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	C _{iss}	V _{ds} =10V, V _{gs} =0V f=1MHz		270		pF
Output Capacitance	C _{oss}			150		pF
Feedback Capacitance	C _{rss}			55		pF

Switching Characteristics

Ta=25°C

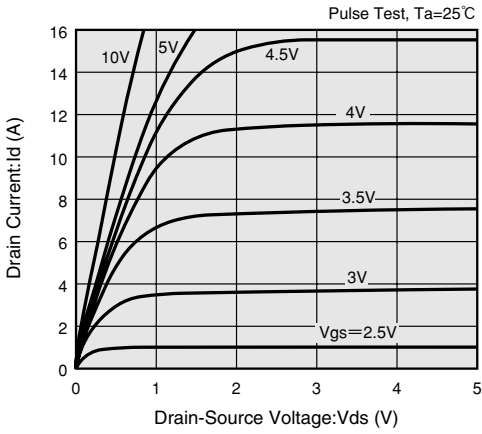
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	
Turn-on Delay Time	t _{d (on)}	V _{gs} =5V, I _d =2A V _{dd} =10V		10		ns	
Rise Time	t _r			15		ns	
Turn-off Delay Time	t _{d (off)}				35		ns
Fall Time	t _f				15		ns

Thermal Characteristics

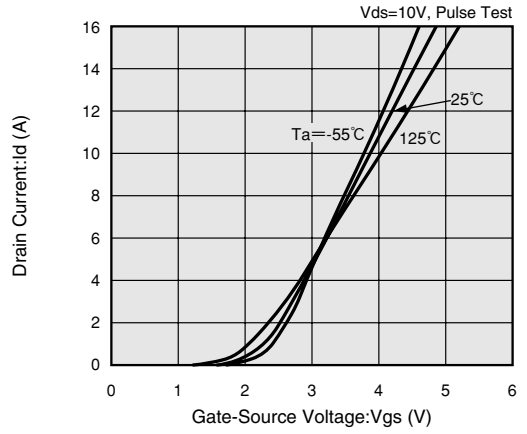
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R _{th (ch-a)}	Implement on a ceramic PCB		62.5		°C/W

Typical Performance Characteristics

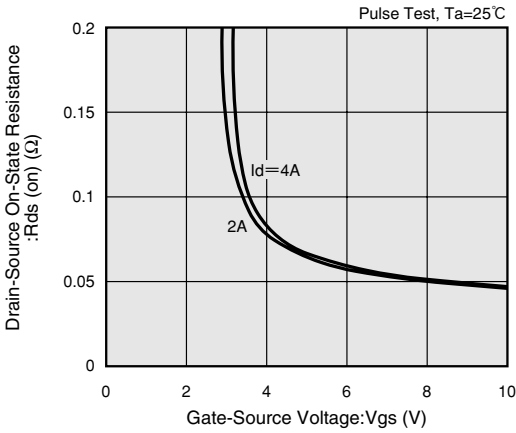
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



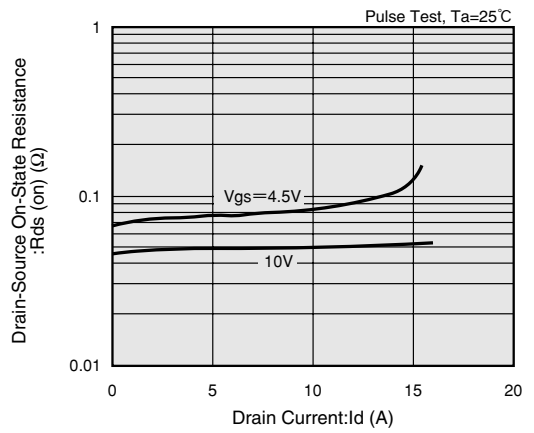
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



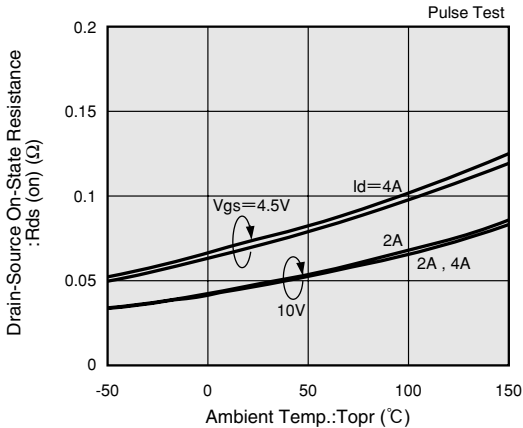
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



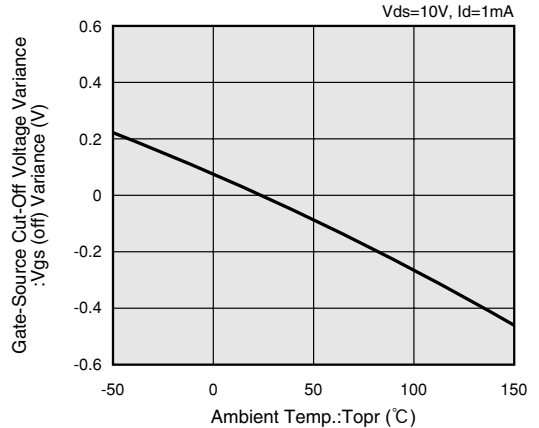
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



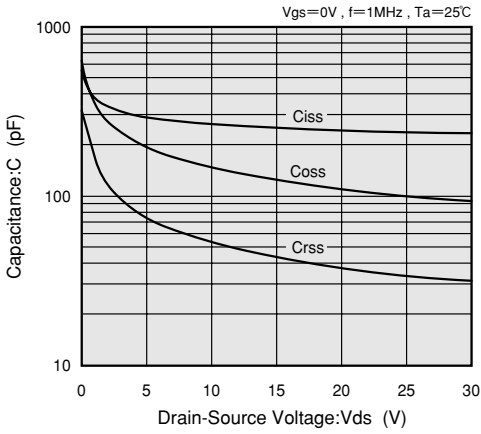
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



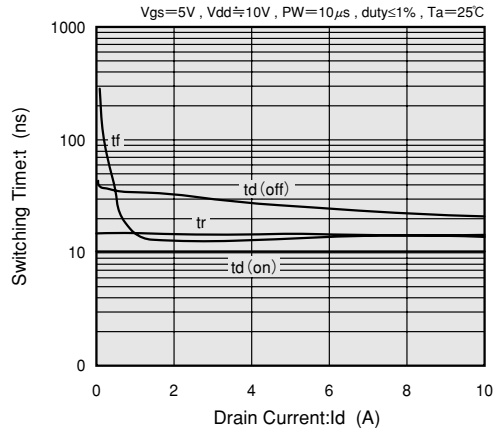
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



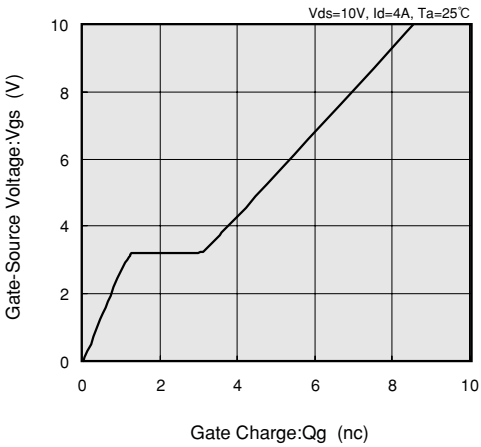
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



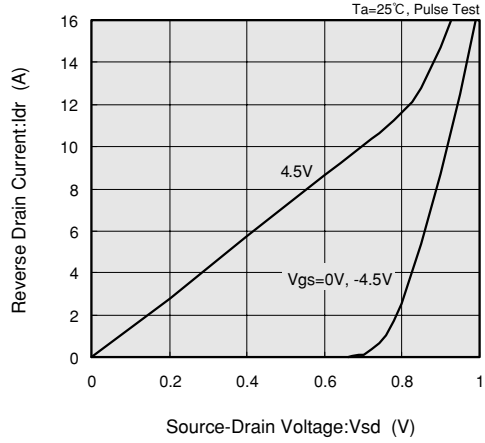
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

