

# XP152A01D8MR



## Power MOS FET

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance:  $0.48\Omega$  (max)
- ◆ Ultra High-Speed Switching
- ◆ SOT-23 Package

## Applications

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

## General Description

The XP152A01D8MR 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.

The small SOT-23 package makes high density mounting possible.

## Features

**Low on-state resistance** :  $R_{ds(on)}=0.48\Omega(V_{gs}=-4.5V)$

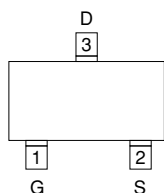
:  $R_{ds(on)}=0.80\Omega(V_{gs}=-2.5V)$

**Ultra high-speed switching**

**Operational Voltage** :  $-2.5V$

**High density mounting** : SOT-23

## Pin Configuration

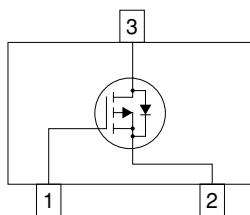


SOT-23  
(TOP VIEW)

## Pin Assignment

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

## Equivalent Circuit



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

## Absolute Maximum Ratings

$T_a=25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	$V_{dss}$	-20	V
Gate-Source Voltage	$V_{gss}$	$\pm 12$	V
Drain Current (DC)	$I_d$	-0.5	A
Drain Current (Pulse)	$I_{dp}$	-1.5	A
Reverse Drain Current	$I_{dr}$	-0.5	A
Continuous Channel Power Dissipation (note)	$P_d$	0.5	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 <sub>dss</sub>	V <sub>ds</sub> =-20V, V <sub>gs</sub> =0V			-10	μA
Gate-Source Leakage Current	I <sub>gss</sub>	V <sub>gs</sub> =±12V, V <sub>ds</sub> =0V			±10	μA
Gate-Source Cut-off Voltage	V <sub>gs(off)</sub>	I <sub>d</sub> =-1mA, V <sub>ds</sub> =-10V	-0.5			V
Drain-Source On-state Resistance (note)	R <sub>ds(on)</sub>	I <sub>d</sub> =-0.3A, V <sub>gs</sub> =-4.5V		0.36	0.48	Ω
		I <sub>d</sub> =-0.3A, V <sub>gs</sub> =-2.5V		0.6	0.8	Ω
Forward Transfer Admittance (note)	Y <sub>fs</sub>	I <sub>d</sub> =-0.3A, V <sub>ds</sub> =-10V		1		S
Body Drain Diode Forward Voltage	V <sub>f</sub>	I <sub>f</sub> =-0.5A, V <sub>gs</sub> =0V		-0.8	-1.1	V

Note: Effective during pulse test.

### Dynamic Characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Capacitance	C <sub>iss</sub>	V <sub>ds</sub> =-10V, V <sub>gs</sub> =0V f=1MHz		180		pF
Output Capacitance	C <sub>oss</sub>			100		pF
Feedback Capacitance	C <sub>rss</sub>			35		pF

### Switching Characteristics

Ta=25°C

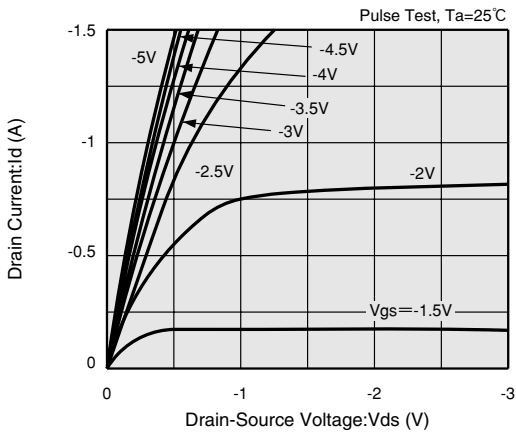
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	t <sub>d (on)</sub>	V <sub>gs</sub> =-5V, I <sub>d</sub> =-0.3A V <sub>dd</sub> =-10V		10		ns
Rise Time	t <sub>r</sub>			15		ns
Turn-off Delay Time	t <sub>d (off)</sub>			30		ns
Fall Time	t <sub>f</sub>			70		ns

### Thermal Characteristics

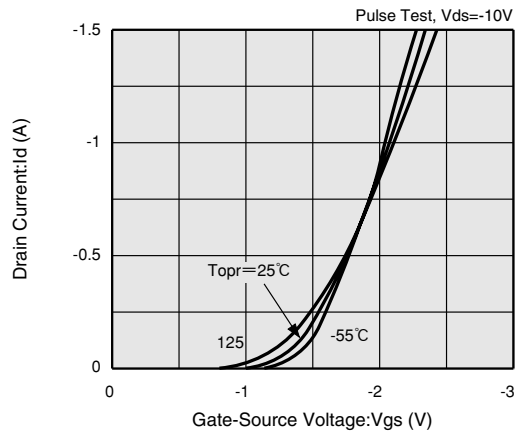
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R <sub>th (ch-a)</sub>	Implement on a ceramic PCB		250		°C/W

## Typical Performance Characteristics

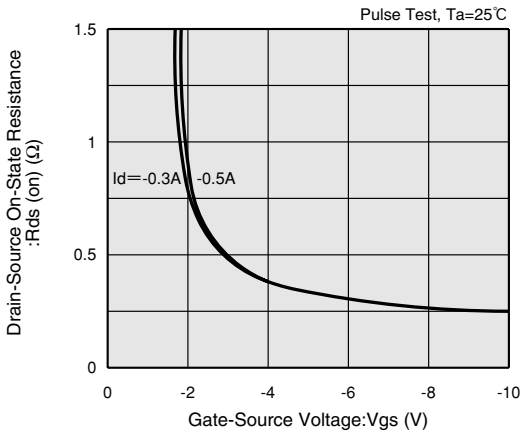
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



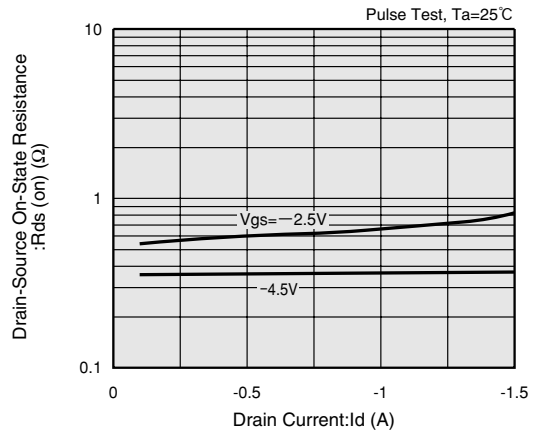
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



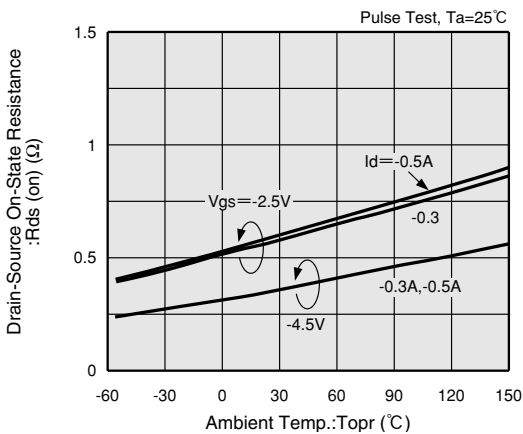
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



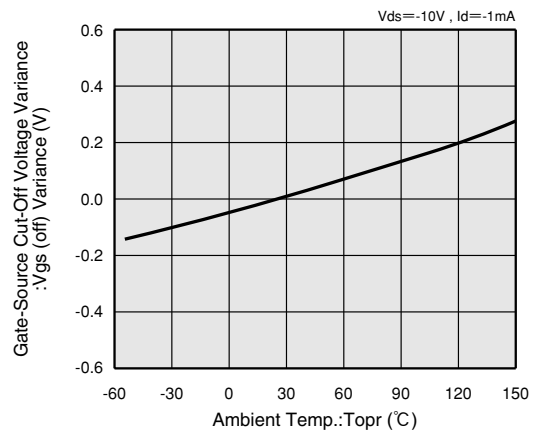
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



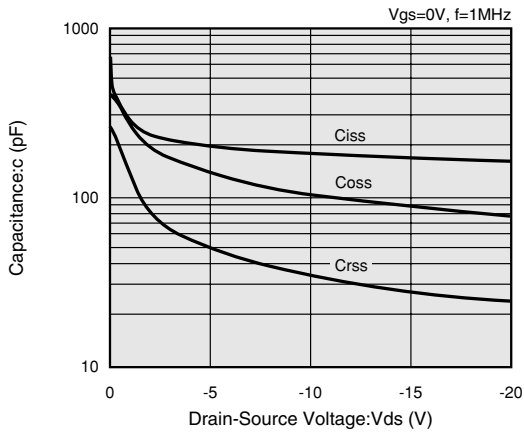
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



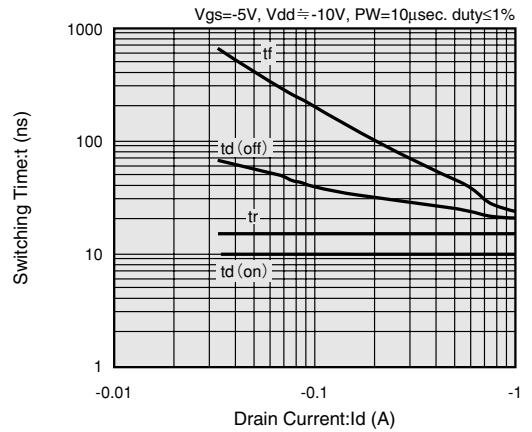
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



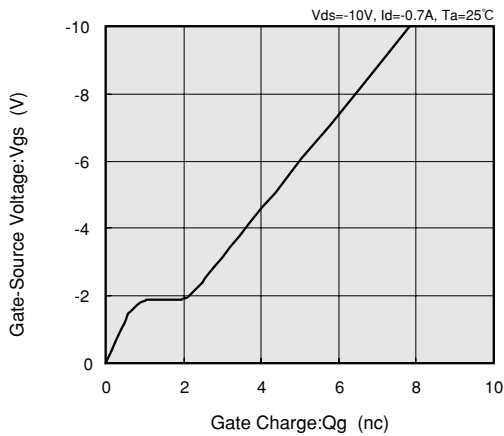
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



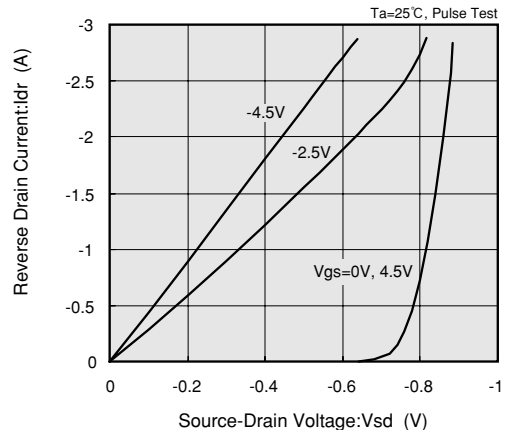
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

