

XP152A12C0MR



Power MOS FET

- ◆ P-Channel Power MOS FET
- ◆ DMOS Structure
- ◆ Low On-State Resistance : 0.3Ω (max)
- ◆ Ultra High-Speed Switching
- ◆ Gate Protect Diode Built-in
- ◆ SOT-23 Package

General Description

The XP152A12C0MR 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-23 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 : $R_{ds(on)} = 0.3\Omega$ ($V_{gs} = -4.5V$)
 : $R_{ds(on)} = 0.5\Omega$ ($V_{gs} = -2.5V$)

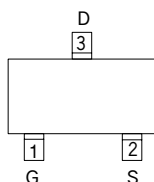
Ultra high-speed switching

Gate Protect Diode Built-in

Operational Voltage : $-2.5V$

High density mounting : SOT-23

Pin Configuration

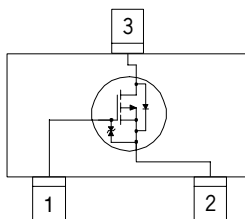


SOT-23
(TOP VIEW)

Pin Assignment

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

11 Equivalent Circuit



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

Absolute Maximum Ratings

$T_a = 25^\circ C$			
PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	V_{dss}	-20	V
Gate - Source Voltage	V_{gss}	± 12	V
Drain Current (DC)	I_d	-0.7	A
Drain Current (Pulse)	I_{dp}	-2.8	A
Reverse Drain Current	I_{dr}	-0.7	A
Continuous Channel Power Dissipation (note)	P_d	0.5	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ 150	$^\circ C$

(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 = - 20V , Vgs = 0V			- 10	μA
Gate-Source Leakage Current	Igss	Vgs = ± 12V , 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 = - 0.4A , Vgs = - 4.5V		0.23	0.3	Ω
		Id = - 0.4A , Vgs = - 2.5V		0.37	0.5	Ω
Forward Transfer Admittance (note)	Yfs	Id = - 0.4A , Vds = - 10V		1.5		S
Body Drain Diode Forward Voltage	Vf	If = - 0.7A , Vgs = 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	Ciss	Vds = - 10V , Vgs = 0V f = 1 MHz		180		pF
Output Capacitance	Coss			120		pF
Feedback Capacitance	Crss			60		pF

Switching Characteristics

Ta=25°C

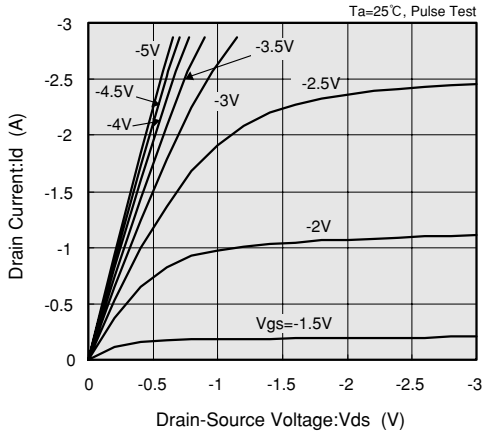
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs = - 5V , Id = - 0.4A Vdd = - 10V		5		ns
Rise Time	tr			20		ns
Turn-off Delay Time	td (off)			55		ns
Fall Time	tf			70		ns

Thermal Characteristics

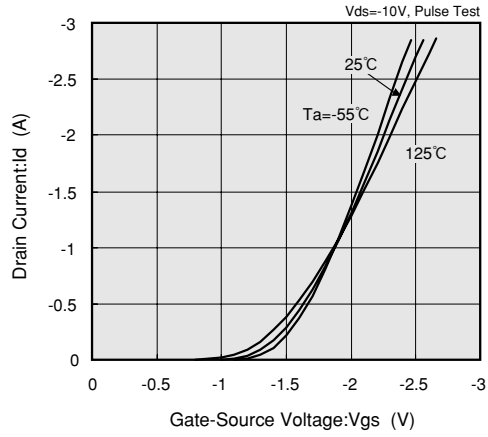
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a ceramic PCB		250		°C / W

Typical Performance Characteristics

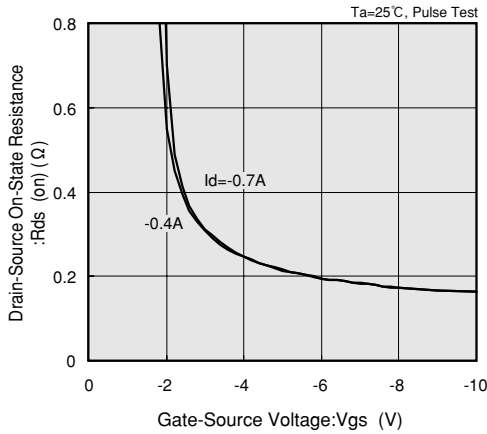
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



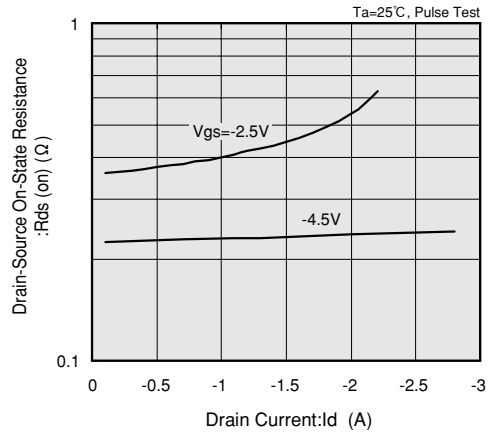
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



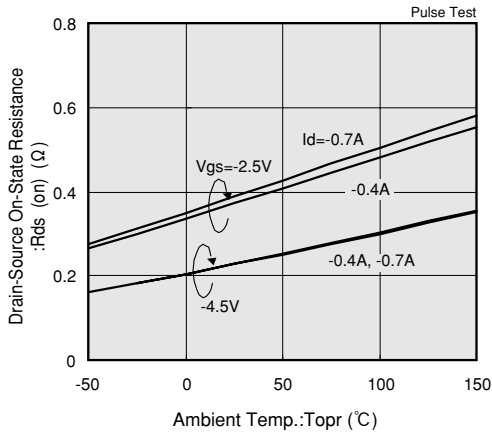
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



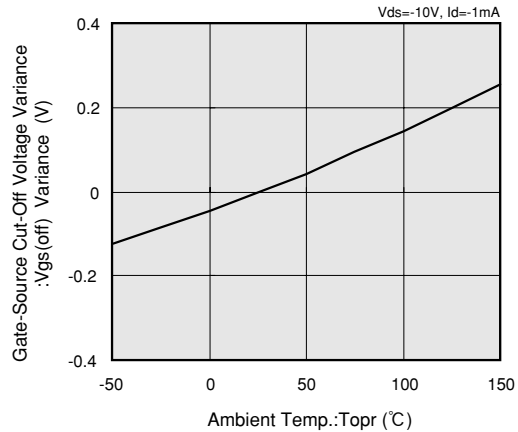
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



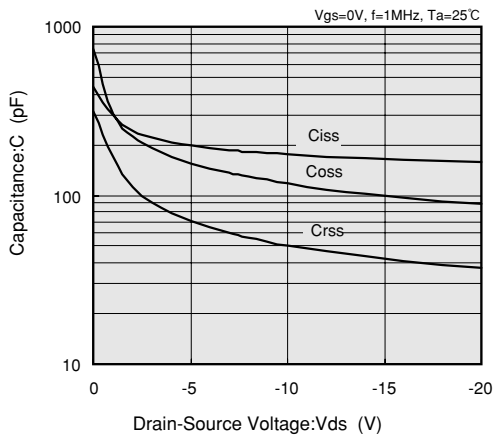
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



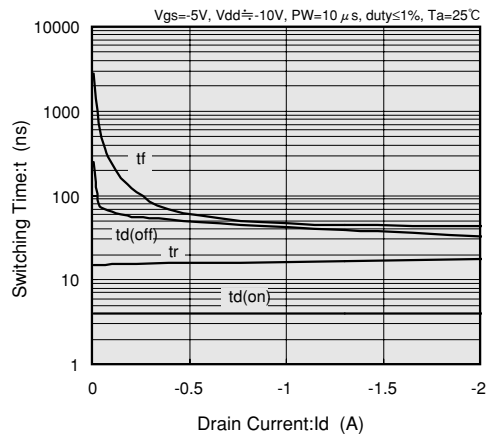
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



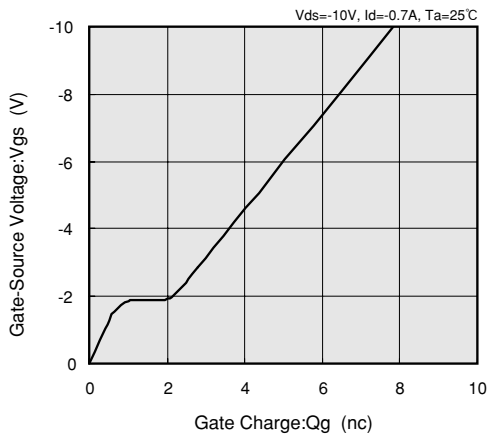
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



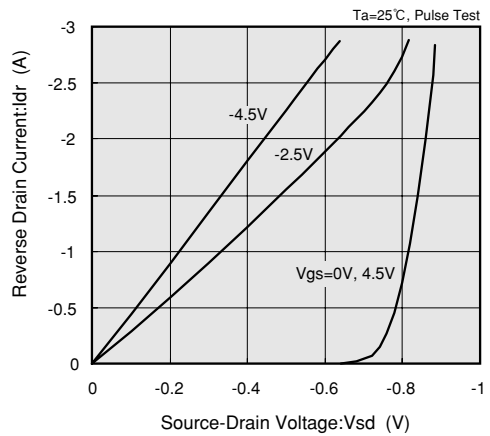
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

