

## Power MOSFET

### ■ GENERAL DESCRIPTION

The XP152A12C0MR-G is a P-channel Power MOSFET 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**

**Driving Voltage** : -2.5V

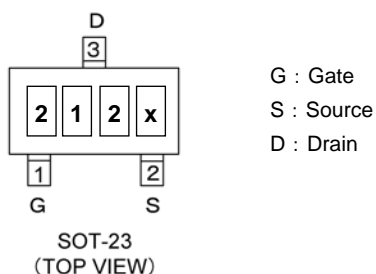
**P-Channel Power MOSFET**

**DMOS Structure**

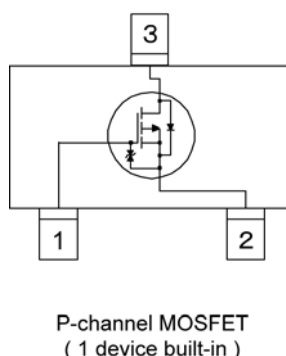
**Small Package** : SOT-23

**Environmentally Friendly** : EU RoHS Compliant, Pb Free

### ■ PIN CONFIGURATION/MARKING



### ■ EQUIVALENT CIRCUIT



### ■ PIN ASSIGNMENT

PRODUCTS	PACKAGE	ORDER UNIT
XP152A12C0MR	SOT-23	3,000/Reel
XP152A12C0MR-G <sup>(*)</sup>	SOT-23	3,000/Reel

<sup>(\*)</sup> The "-G" suffix denotes Halogen and Antimony free as well as being fully RoHS compliant.

### ■ 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>	-0.7	A
Drain Current (Pulse)	I <sub>dp</sub>	-2.8	A
Reverse Drain Current	I <sub>dr</sub>	-0.7	A
Channel Power Dissipation *	P <sub>d</sub>	0.5	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

\* 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 Leak 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 *1	Rds(on)	Id= -0.4A, Vgs= -4.5V	-	0.23	0.30	Ω
		Id= -0.4A, Vgs= -2.5V	-	0.37	0.50	Ω
Forward Transfer Admittance *1	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

\*1 Effective during pulse test.

### Dynamic Characteristics

Ta = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Capacitance	Ciss	Vds= -10V, Vgs=0V f= 1MHz	-	180	-	pF
Output Capacitance	Coss		-	120	-	pF
Feedback Capacitance	Crss		-	60	-	pF

### Switching Characteristics

Ta = 25°C

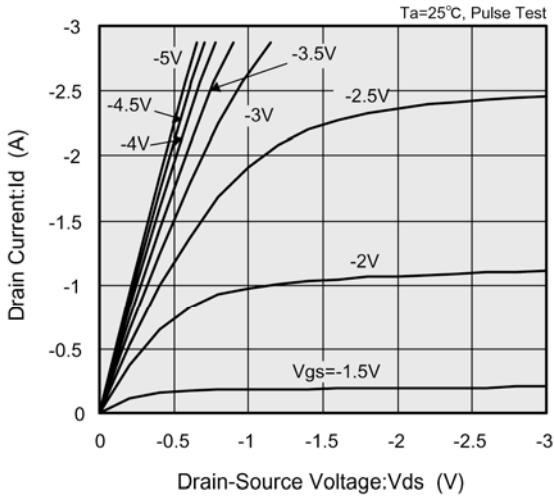
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Turn-On Delay Time	td (on)	Vgs= -5V, Id= -0.4A Vdd= -10V	-	5	-	ns
Rise Time	tr		-	20	-	ns
Turn-Off Delay Time	td (off)		-	55	-	ns
Fall Time	tf		-	70	-	ns

### Thermal Characteristics

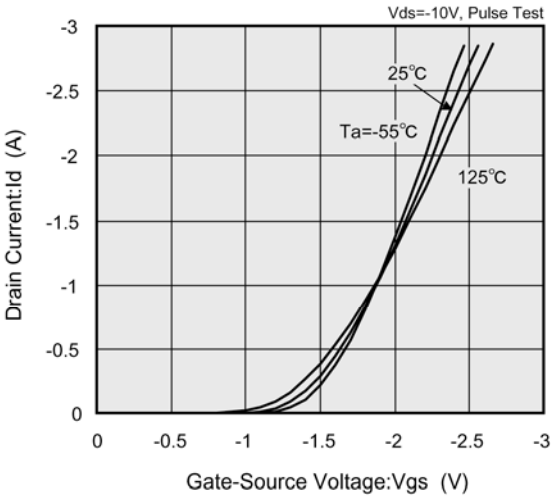
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal Resistance (Channel-Ambience)	Rth (ch-a)	Implement on a ceramic PCB	-	250	-	°C/W

■ TYPICAL PERFORMANCE CHARACTERISTICS

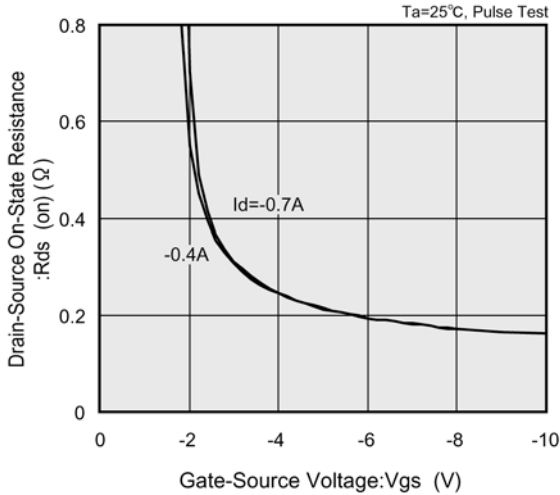
(1) Drain Current vs. Drain-Source Voltage



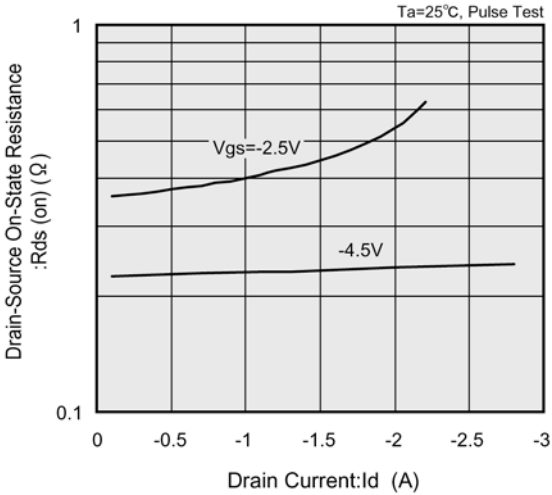
(2) Drain Current vs. Gate-Source Voltage



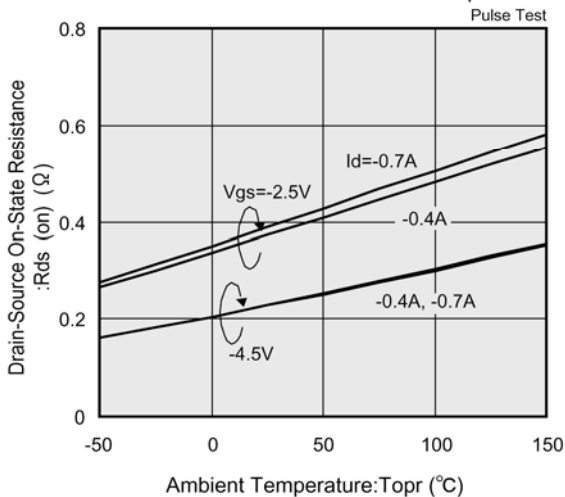
(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



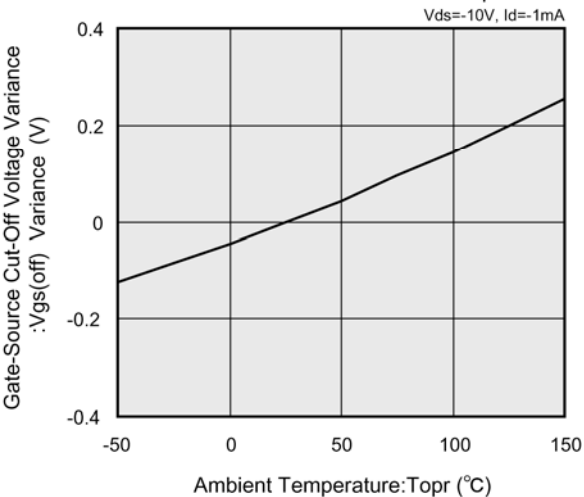
(4) Drain-Source On-State Resistance vs. Drain Current



(5) Drain-Source On-State Resistance vs. Ambient Temperature

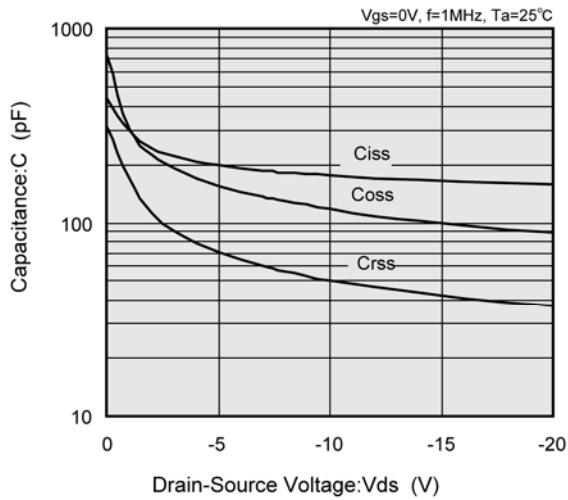


(6) Gate Source Cut-Off Voltage Variance vs. Ambient Temperature

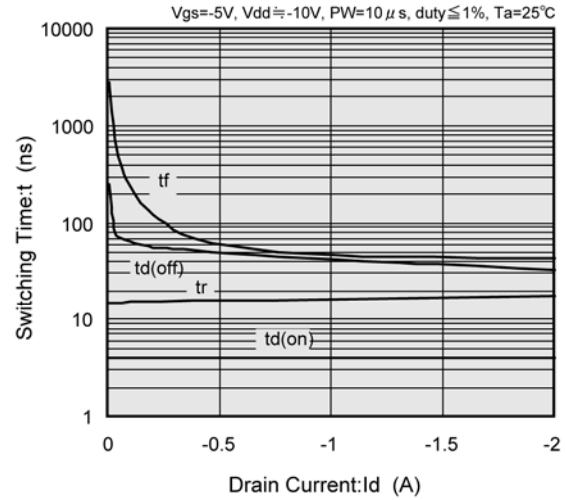


## TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

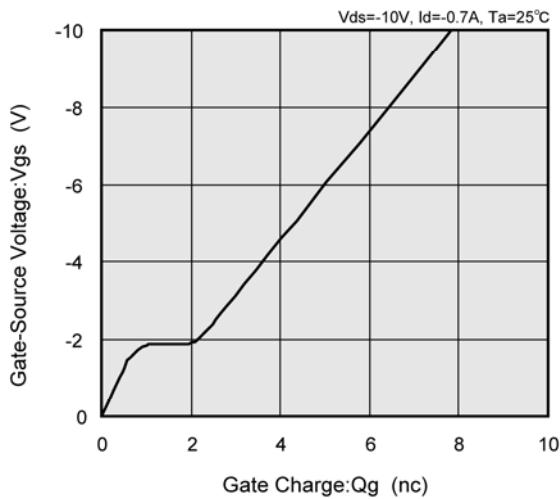
(7) Capacitance vs. Drain-Source Voltage



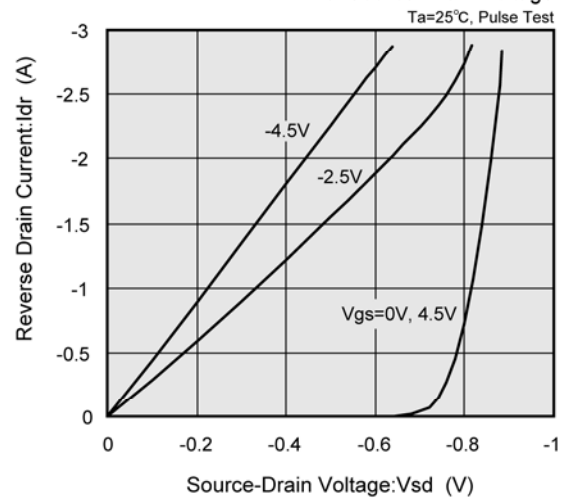
(8) Switching Time vs. Drain Current



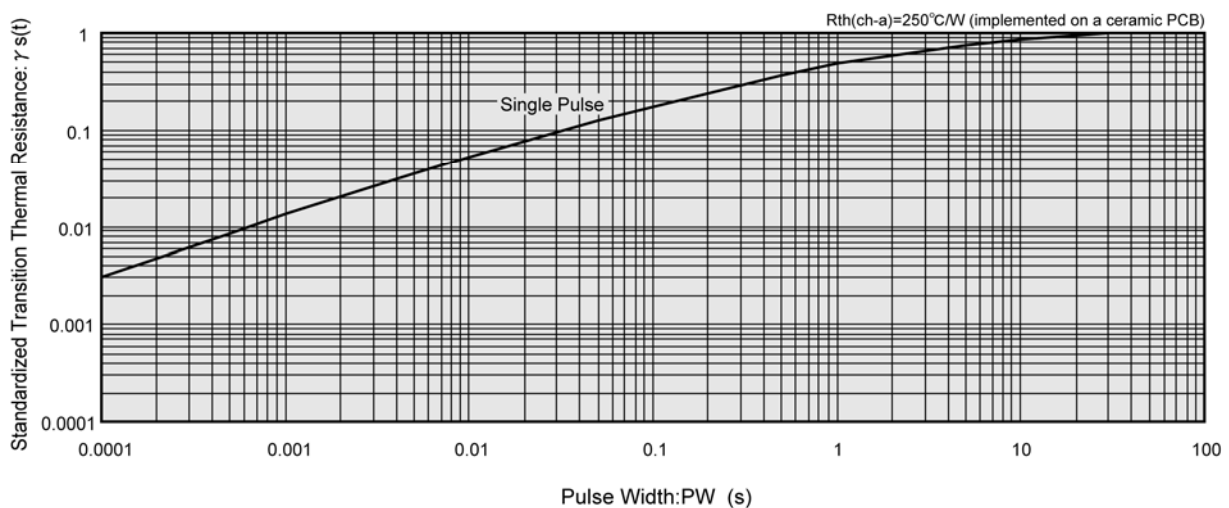
(9) Gate-Source Voltage vs. Gate Charge



(10) Reverse Drain Current vs. Source-Drain Voltage



(11) Standardized Transition Thermal Resistance vs. Pulse Width



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