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**

■ **Applications**
● Notebook PCs
● Cellular and portable phones
● On - board power supplies
● Li - ion battery systems

■ **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.

■ **Features**

Low on-state resistance : Rds (on) = 0.3Ω (Vgs = -4.5V)

Rds (on) = 0.5Ω (Vgs = -2.5V)

Ultra high-speed switching
Gate Protect Diode Built-in
Operational Voltage : -2.5V
**High density mounting** : SOT - 23

■ **Pin Configuration**
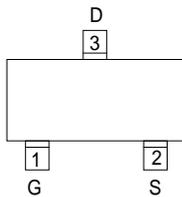
SOT - 23 Top View

■ **Pin Assignment**

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

■ **Equivalent Circuit**
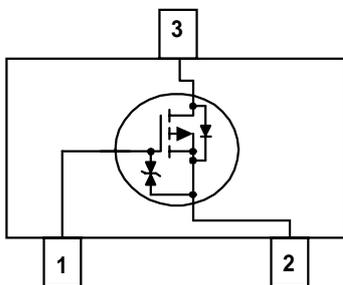
P - Channel MOS FET
(1 device built-in)

■ **Absolute Maximum Ratings**

Ta=25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	Vdss	-20	V
Gate - Source Voltage	Vgss	± 12	V
Drain Current (DC)	Id	-0.4	A
Drain Current (Pulse)	Idp	-2.8	A
Reverse Drain Current	Idr	-0.7	A
Continuous Channel Power Dissipation (note)	Pd	0.5	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55 to 150	°C

(note) : When implemented on a ceramic PCB

■ **Electrical Characteristics**

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DC characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Drain Cut-off Current	Idss	Vds = - 20 , Vgs = 0V			- 1	μA
Gate-Source Leakage Current	Igss	Vgs = ± 12 , Vds = 0V			± 0.1	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 - surroundings)	Rth (ch - a)	Implement on a ceramic PCB		250		°C / W

XP152A12C0MR   Power MOS FET

■ Electrical Characteristics

Drain Current vs. Drain/Source Voltage

Ta=25℃, Pulse Test

Drain Current:Id (A)

Drain/Source Voltage:Vds (V)

-5V -3.5V -4.5V -3V -2.5V -4V -2V Vgs=-1.5V
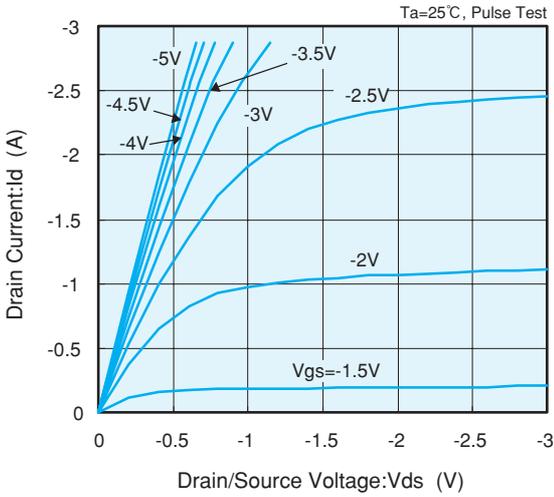
Drain Current vs. Gate/Source Voltage

Vds=-10V, Pulse Test

Drain Current:Id (A)

Gate/Source Voltage:Vgs (V)

25℃ Ta=-55℃ 125℃
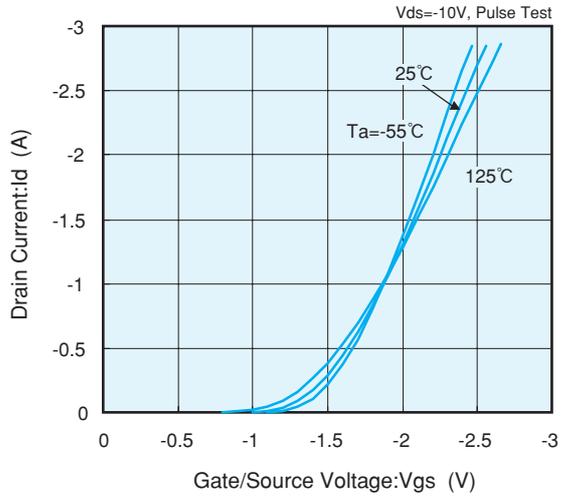
Drain/Source On State Resistance vs. Gate/Source Voltage

Ta=25℃, Pulse Test

Drain/Source On State Resistance :Rds (on) (Ω)

Gate/Source Voltage:Vgs (V)

Id=-0.7A -0.4A
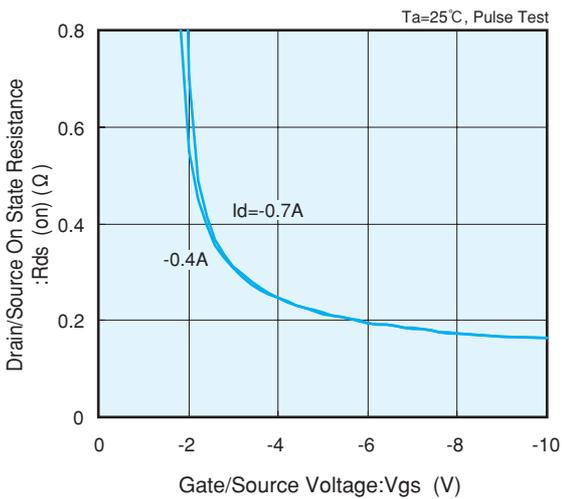
Drain/Source On State Resistance vs. Drain Current

Ta=25℃, Pulse Test

Drain/Source On State Resistance :Rds (on) (Ω)

Drain Current:Id (A)

Vgs=-2.5V -4.5V
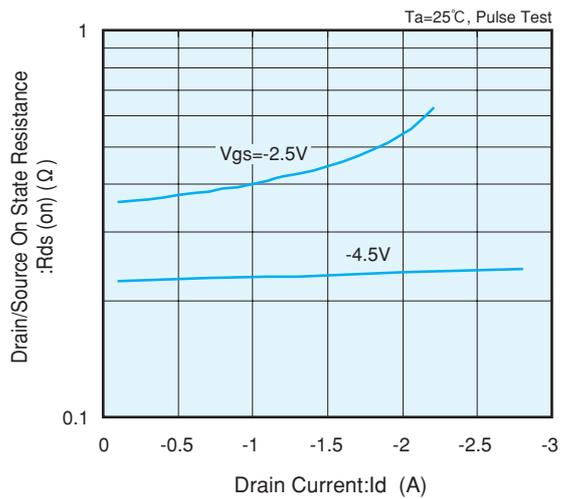
Drain/Source On State Resistance vs. Ambient Temperature

Pulse Test

Drain/Source On State Resistance :Rds (on) (Ω)

Ambient Temp.:Topr (℃)

Id=-0.7A Vgs=-2.5V -0.4A -0.4A, -0.7A -4.5V
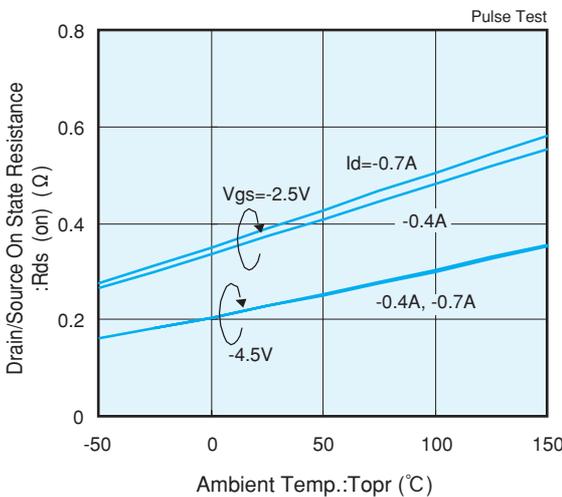
Gate/Source Cut off Voltage Variance vs. Ambient Temperature

Vds=-10V, Id=-1mA

Gate/Source Cut-Off Voltage Variance :Vgs(off) Variance (V)

Ambient Temp.:Topr (℃)
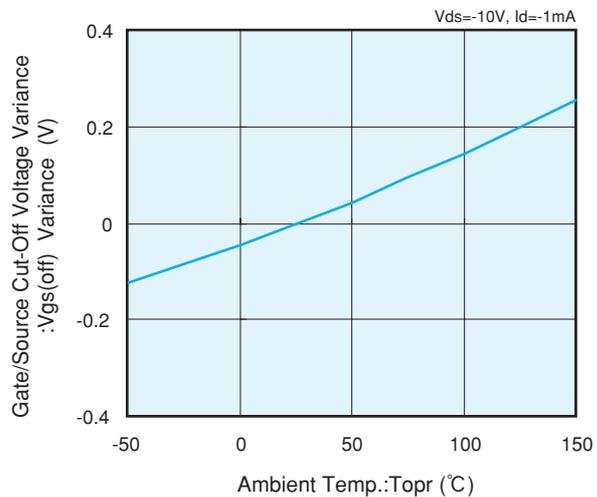
XP152A12C0MR

## ■ Electrical Characteristics

Capacitance vs. Drain/Source Voltage

Vgs=0V, f=1MHz, Ta=25℃

Capacitance:C (pF) vs. Drain/Source Voltage:Vds (V)

Ciss
Coss
Crss
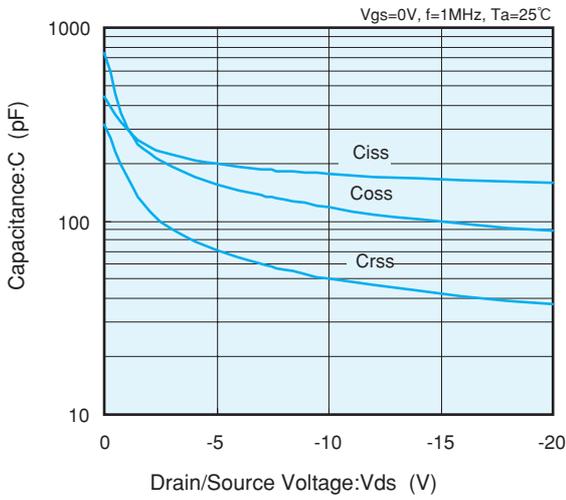
Switching Time vs. Drain Current

Vgs=-5V, Vdd≒-10V, PW=10μs, duty≦1%, Ta=25℃

Switching Time:t (ns) vs. Drain Current:Id (A)

tf
td(off)
tr
td(on)
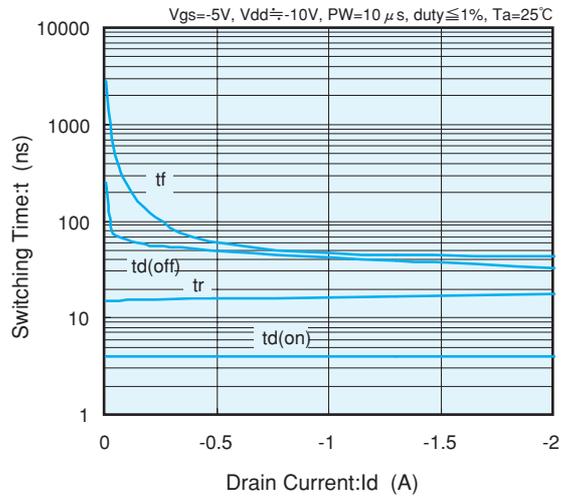
Gate/Source Voltage vs. Gate Charge

Vds=-10V, Id=-0.7A, Ta=25℃

Gate/Source Voltage:Vgs (V) vs. Gate Charge:Qg (nc)
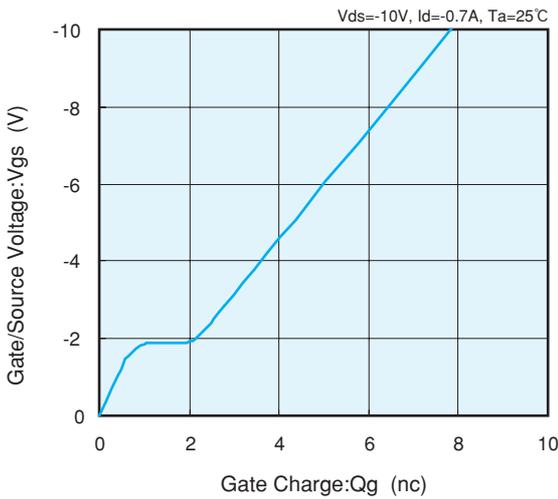
Reverse Drain Current vs. Source/Drain Voltage

Ta=25℃, Pulse Test

Reverse Drain Current:Idr (A) vs. Source/Drain Voltage:Vsd (V)

-4.5V
-2.5V
Vgs=0V, 4.5V
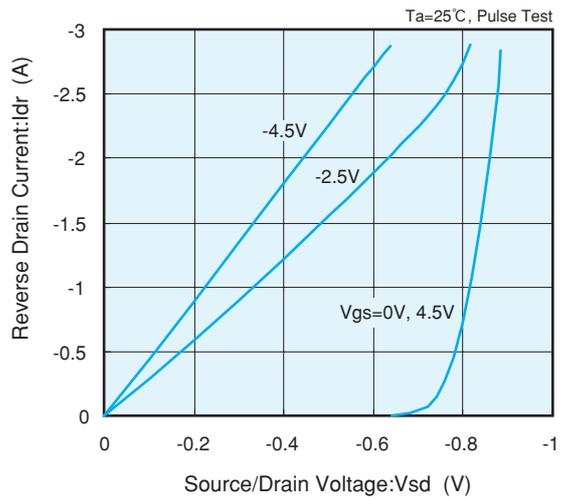
Standardized Transition Thermal Resistance vs. Pulse Width

Rth(ch-a)=250℃/W (implemented on a ceramic PCB)

Standardized Transition Thermal Resistance: γs(t) vs. Pulse Width:PW (s)

Single Pulse