

- ◆ 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 XP152A12COMR 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 : $R_{ds(on)} = 0.3\Omega$ ($V_{gs} = -4.5V$)
 $R_{ds(on)} = 0.5\Omega$ ($V_{gs} = -2.5V$)

Ultra high-speed switching

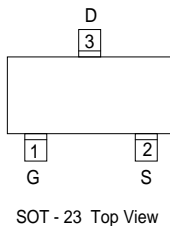
Gate Protect Diode Built-in

Operational Voltage : $-2.5V$

High density mounting : SOT - 23



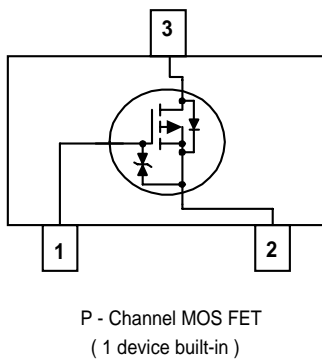
■ Pin Configuration



■ Pin Assignment

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

■ Equivalent Circuit



■ 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 to 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	I _{dss}	V _{ds} = - 20 , V _{gs} = 0V			- 10	μA
Gate-Source Leakage Current	I _{gss}	V _{gs} = ± 12 , V _{ds} = 0V			± 10	μA
Gate-Source Cut-off Voltage	V _{gs (off)}	I _d = -1mA , V _{ds} = - 10V	- 0.5		- 1.2	V
Drain-Source On-state Resistance (note)	R _{ds (on)}	I _d = - 0.4A , V _{gs} = - 4.5V		0.23	0.3	Ω
		I _d = - 0.4A , V _{gs} = - 2.5V		0.37	0.5	Ω
Forward Transfer Admittance (note)	Y _{fs}	I _d = - 0.4A , V _{ds} = - 10V		1.5		S
Body Drain Diode Forward Voltage	V _f	I _f = - 0.7A , V _{gs} = 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 _{iss}	V _{ds} = - 10V , V _{gs} = 0V f = 1 MHz		180		pF
Output Capacitance	C _{oss}			120		pF
Feedback Capacitance	C _{rss}			60		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 = - 0.4A V _{dd} = - 10V		5		ns	
Rise Time	t _r			20		ns	
Turn-off Delay Time	t _{d (off)}				55		ns
Fall Time	t _f				70		ns

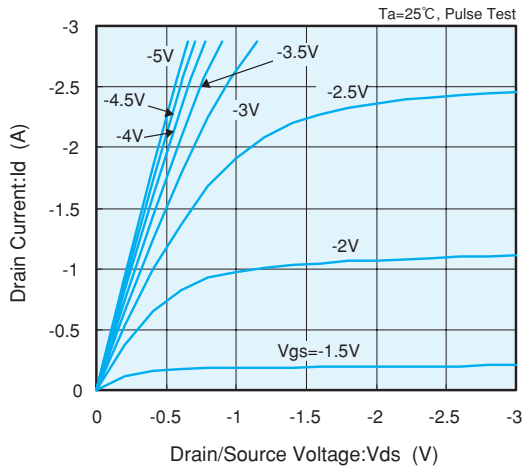
Thermal characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel - surroundings)	R _{th (ch - a)}	Implement on a ceramic PCB		250		°C / W

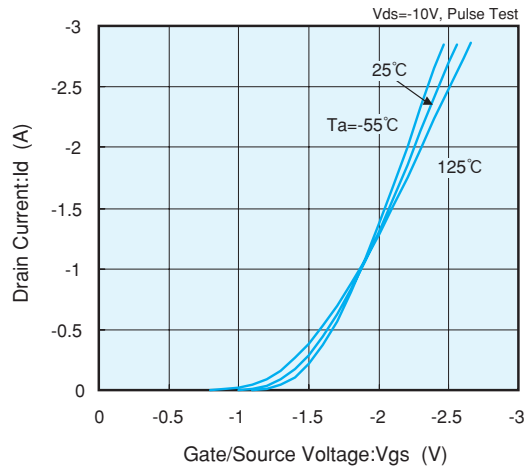


Electrical Characteristics

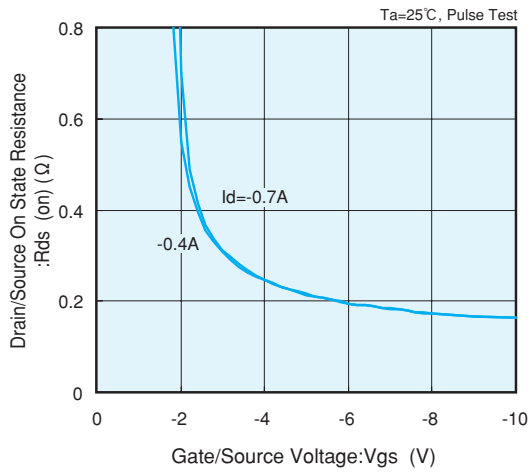
Drain Current vs. Drain/Source Voltage



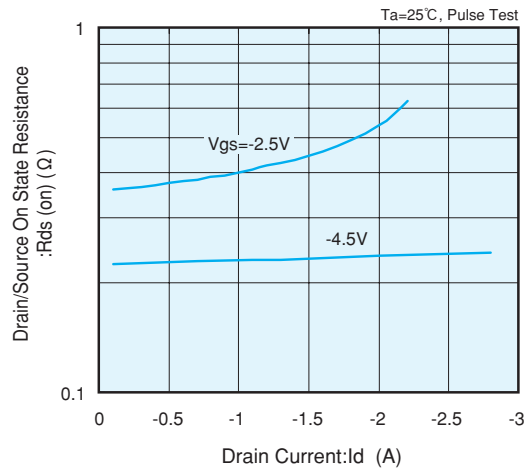
Drain Current vs. Gate/Source Voltage



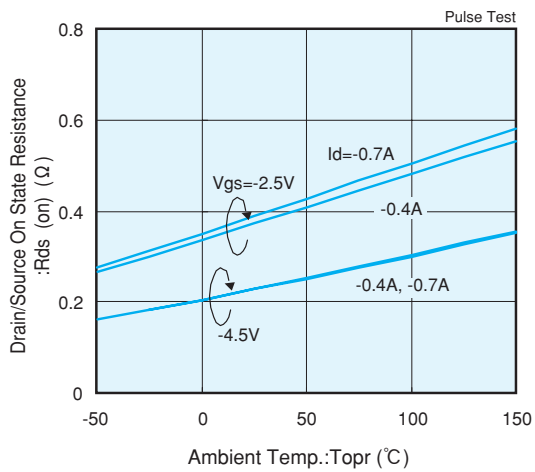
Drain/Source On State Resistance vs. Gate/Source Voltage



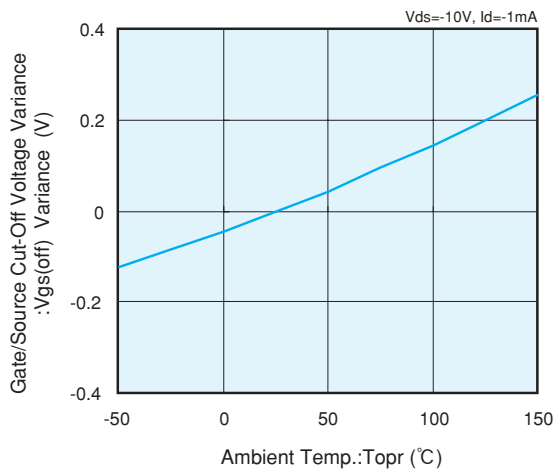
Drain/Source On State Resistance vs. Drain Current



Drain/Source On State Resistance vs. Ambient Temperature



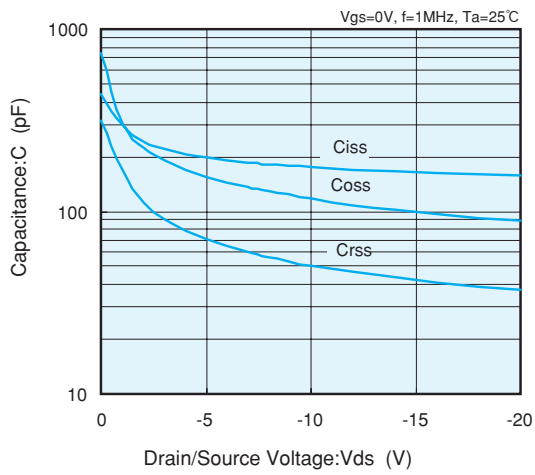
Gate/Source Cut off Voltage Variance vs. Ambient Temperature



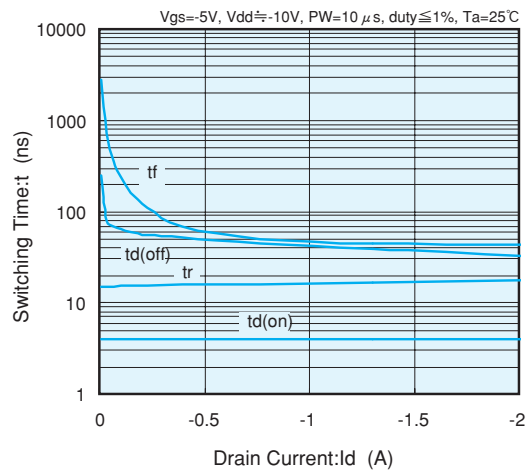
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■ Electrical Characteristics

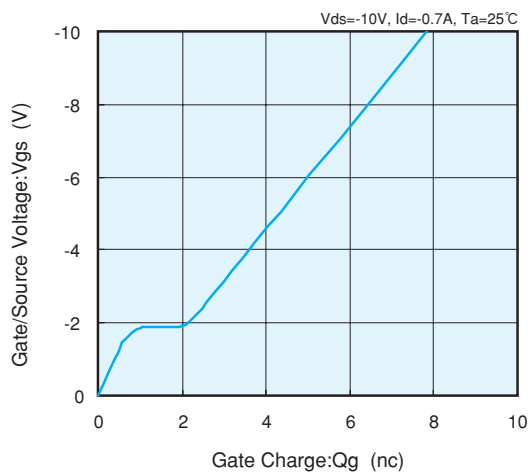
Capacitance vs. Drain/Source Voltage



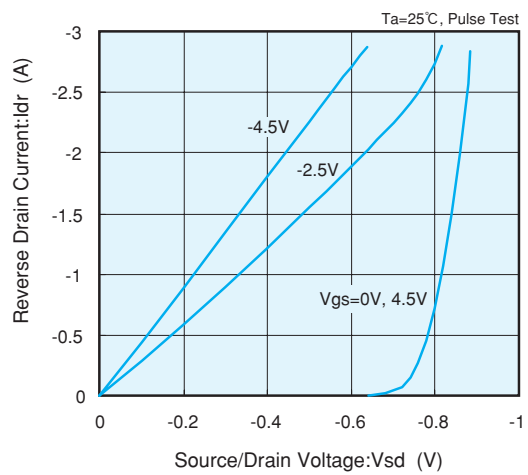
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width

