XP151A02B0MR

Power MOS FET

- **N-Channel Power MOS FET**
- **DMOS Structure**
- **Low On-State Resistance: 0.2Ω 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 XP151A02B0MR is a N-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: Rds(on)=0.2Ω(Vgs=4.5V)
Rds(on)=0.32Ω(Vgs=2.5V)
Ultra high-speed switching
Operational Voltage: 2.5V
High density mounting: SOT-23

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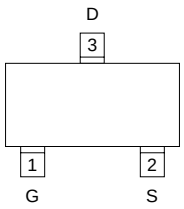
Pin Configuration

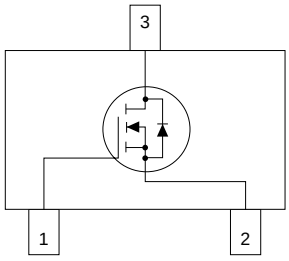


SOT-23
(TOP VIEW)

Pin Assignment

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

Equivalent Circuit



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

Absolute Maximum Ratings

Ta=25℃

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	Vdss	20	V
Gate-Source Voltage	Vgss	±12	V
Drain Current (DC)	Id	0.8	A
Drain Current (Pulse)	Idp	2.5	A
Reverse Drain Current	Idr	0.8	A
Continuous Channel Power Dissipation (note)	Pd	0.5	W
Channel Temperature	Tch	150	℃
Storage Temperature	Tstg	-55~150	℃

Note: When implemented on a glass epoxy PCB

■ Electrical Characteristics

DC characteristics

Ta=25℃

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	0.7			V
Drain-Source On-state Resistance (note)	Rds(on)	Id=0.4A, Vgs=4.5V		0.15	0.2	Ω
		Id=0.4A, Vgs=2.5V		0.24	0.32	Ω
Forward Transfer Admittance (note)	|Yfs|	Id=0.4A, Vds=10V		2.5		S
Body Drain Diode Forward Voltage	Vf	If=0.8A, Vgs=0V		0.8	1.1	V

Note: Effective during pulse test.

Dynamic characteristics

Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Capacitance	Ciss	Vds=10V, Vgs=0V f=1MHz		180		pF
Output Capacitance	Coss			100		pF
Feedback Capacitance	Crss			30		pF

Switching characteristics

Ta=25℃

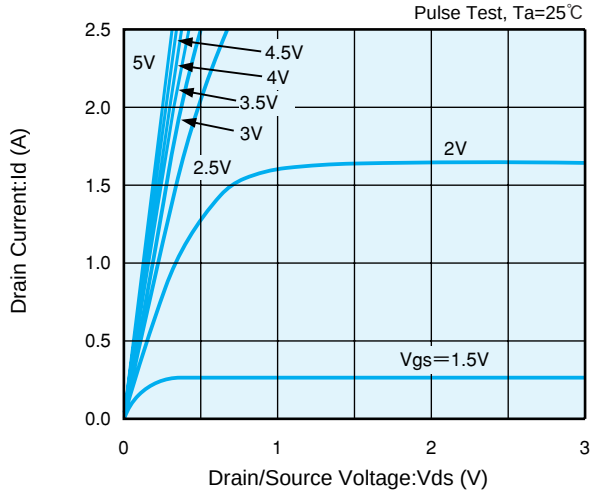
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=0.4A Vdd=10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			30		ns
Fall Time	tf			55		ns

Thermal characteristics

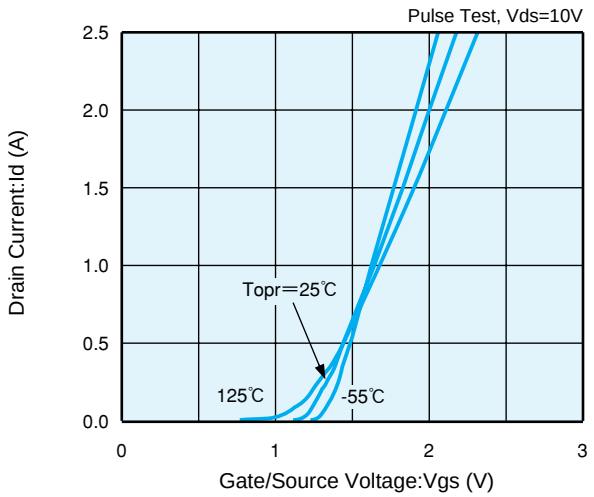
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-surroundings)	Rth (ch-a)	Implement on a glass epoxy resin PCB		250		℃/W

■ XP151A02B0MR Characteristics

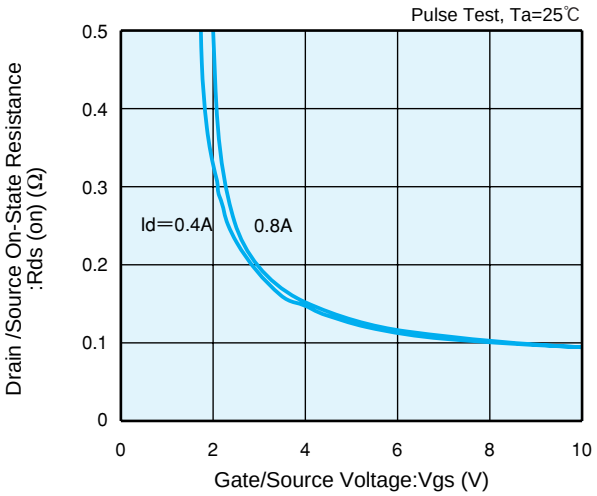
Drain Current vs. Drain /Source Voltage



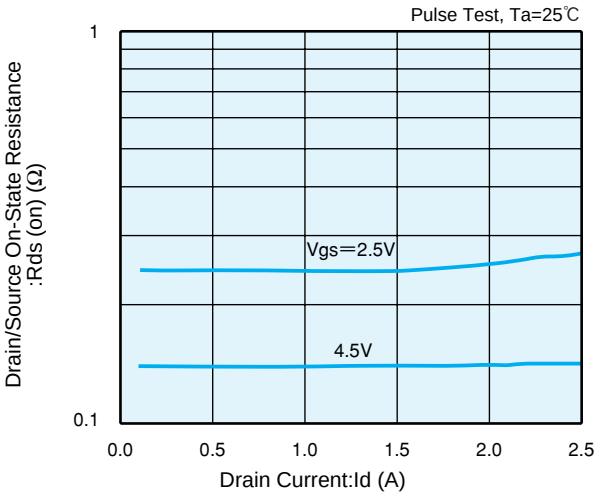
Drain Current vs. Gate/Source Voltage



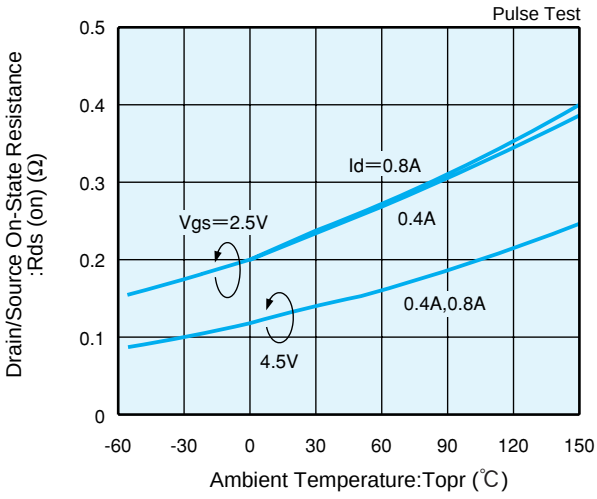
Drain/Source On-State Resistance vs. Gate/Source Voltage



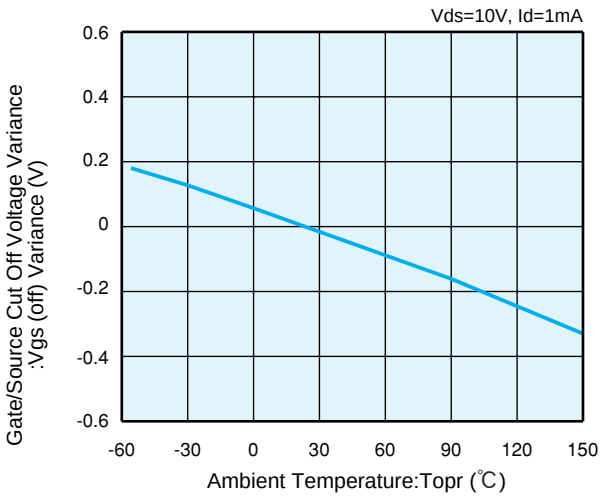
Drain/Source On-State Resistance vs. Drain Current



Drain/Source On-State Resistance vs. Ambient Temp.

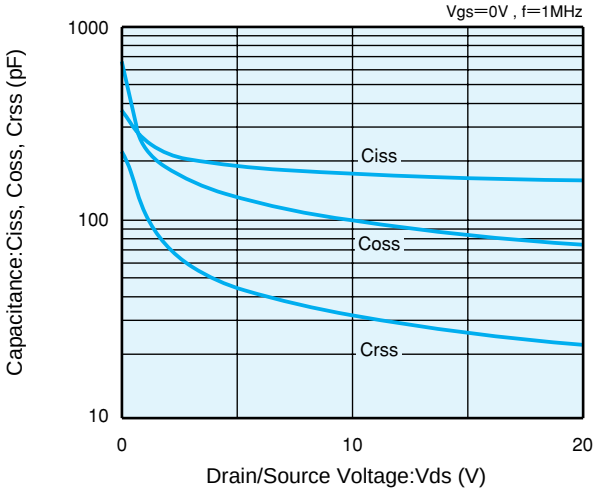


Gate/Source Cut Off Voltage Variance vs. Ambient Temp.

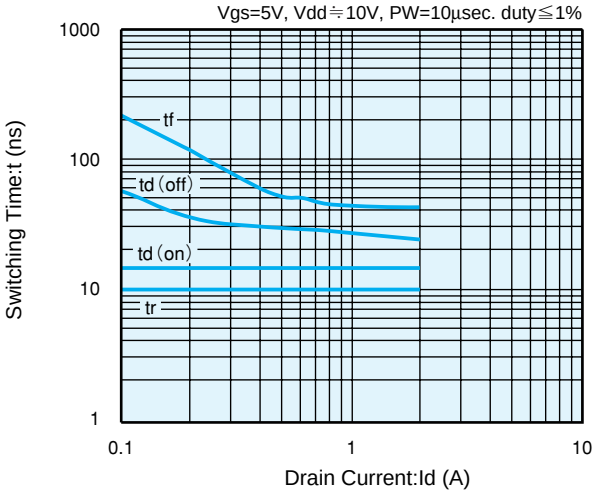


■ XP151A02B0MR Characteristics

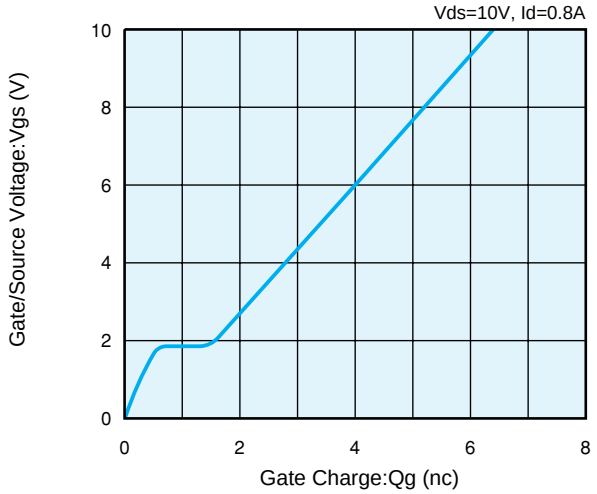
Drain/Source Voltage vs. Capacitance



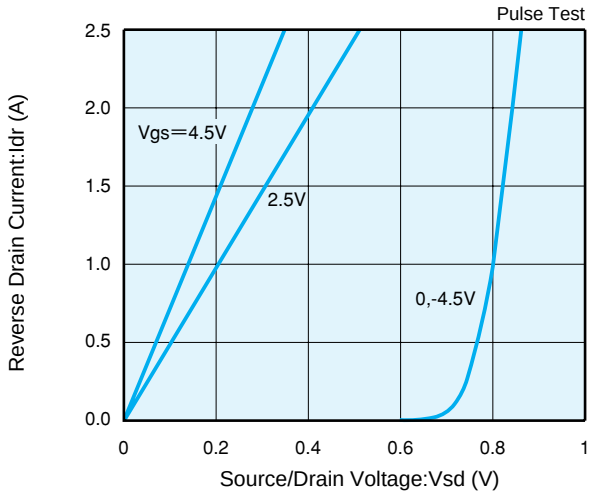
Switching Time vs. Drain Current



Gate/Source Voltage vs. Gate Charge



Reverse Drain Current vs. Source/Drain Voltage



Standardized Transition Thermal Resistance vs. Pulse Width