XP151A12A2MR

TOREX

Power MOS FET

◆**N-Channel Power MOS FET**
◆**DMOS Structure**
◆**Low On-State Resistance : 0.1Ω (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

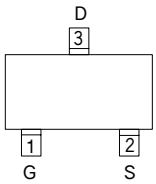
■General Description

The XP151A12A2MR is an 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.
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) = 0.1Ω (Vgs = 4.5V)
: Rds (on) = 0.16Ω (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

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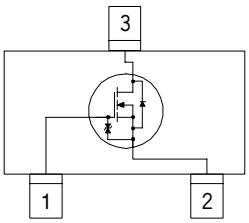
■Equivalent Circuit



N-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	1	A
Drain Current (Pulse)	Idp	4	A
Reverse Drain Current	Idr	1	A
Continuous Channel Power Dissipation (note)	Pd	0.5	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55 ~ 150	°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	0.7		1.4	V
Drain-Source On-state Resistance (note)	Rds (on)	Id = 0.5A , Vgs = 4.5V		0.075	0.1	Ω
		Id = 0.5A , Vgs = 2.5V		0.12	0.16	Ω
Forward Transfer Admittance (note)	| Yfs |	Id = 0.5A , Vds = 10V		3.3		S
Body Drain Diode Forward Voltage	Vf	If = 1A , 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			45		pF

Switching Characteristics

Ta=25°C

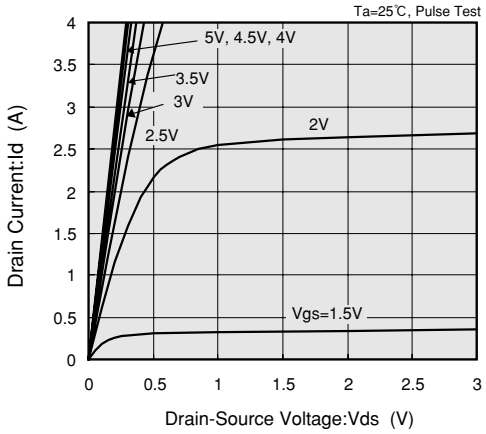
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs = 5V , Id = 0.5A Vdd = 10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			50		ns
Fall Time	tf			45		ns

Thermal Characteristics

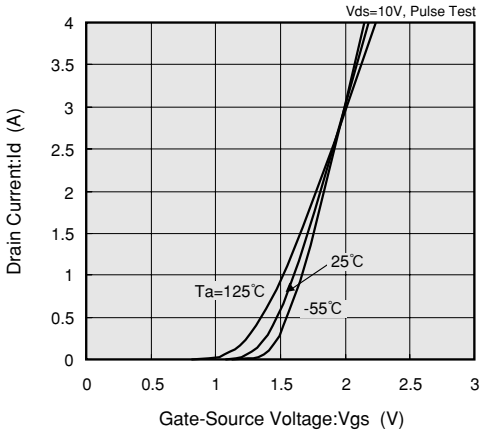
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a ceramic PCB		250		°C / W

■Typical Performance Characteristics

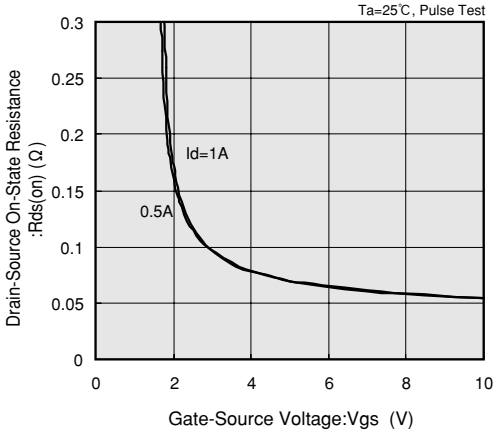
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



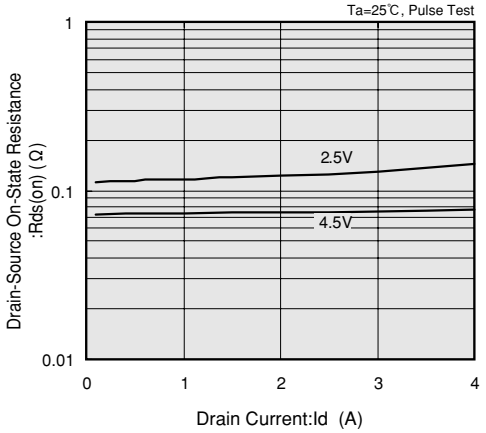
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



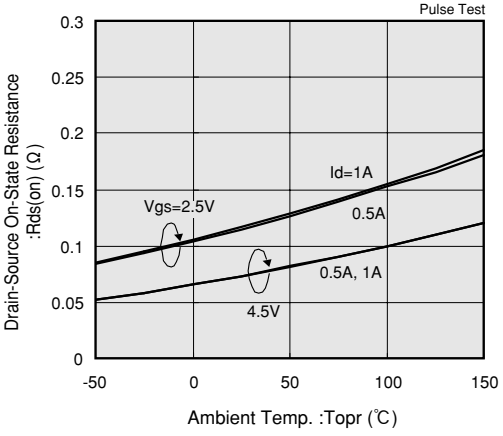
DRAIN-SOURCE ON-STATE RESISTANCE
vs. GATE-SOURCE VOLTAGE



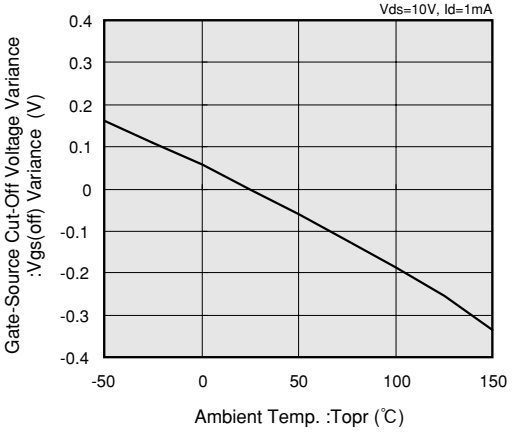
DRAIN-SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE
vs. AMBIENT TEMPERATURE



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



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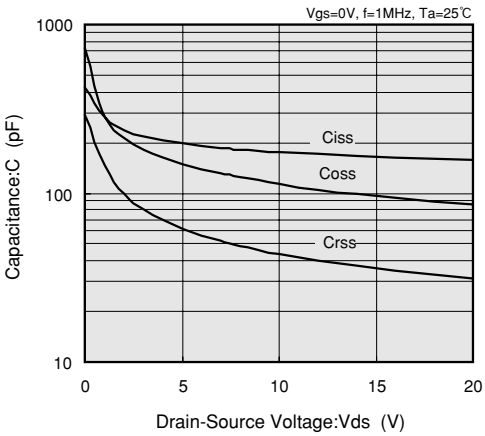
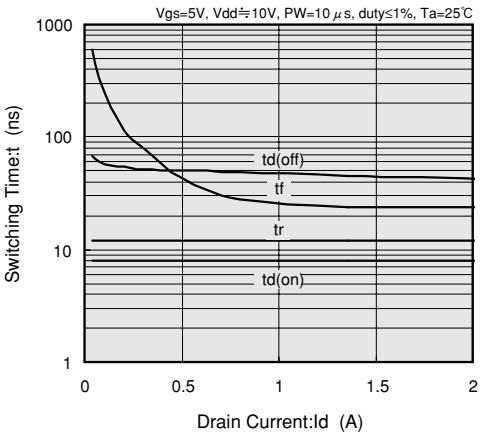
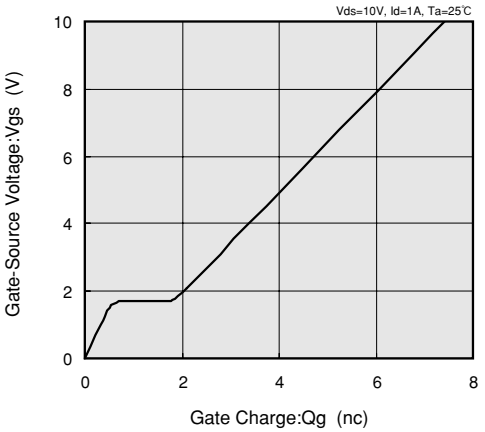
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



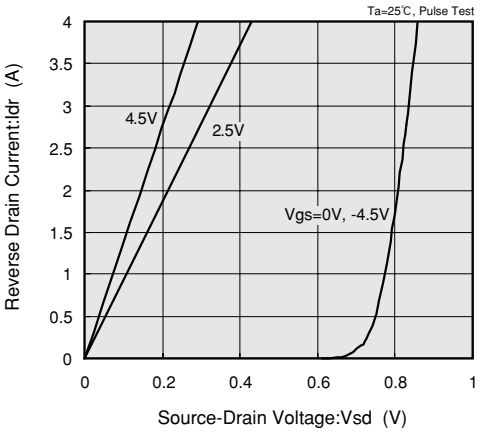
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT
vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH