XP151A02B0MR

TOREX

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

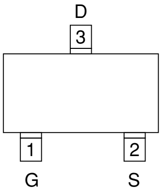
■General Description

The XP151A02B0MR is 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.
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

■Pin Configuration

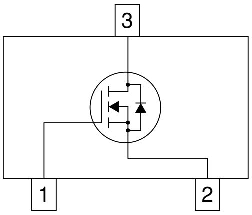


SOT-23
（TOP VIEW）

■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 ceramic 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℃

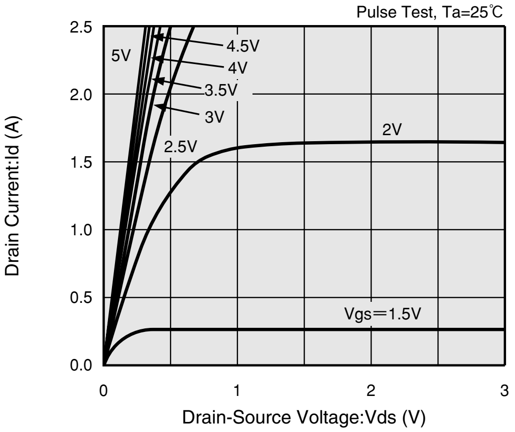
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=0.4A Vdd=10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			30		ns
Fall Time	tf			55		ns

Thermal Characteristics

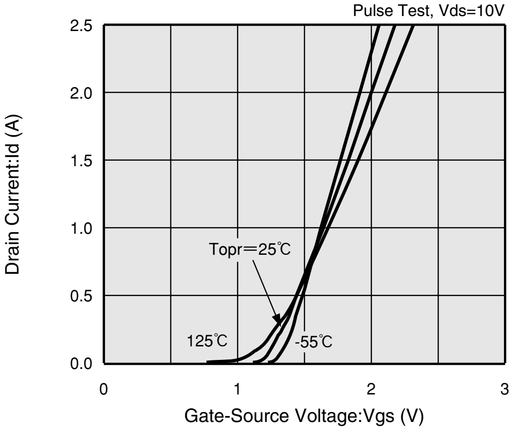
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a ceramic PCB		250		℃/W

■Typical Performance Characteristics

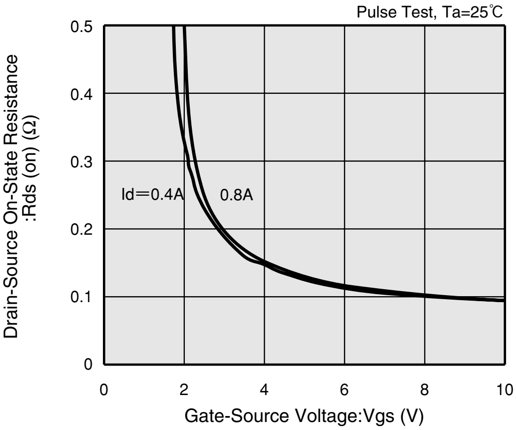
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



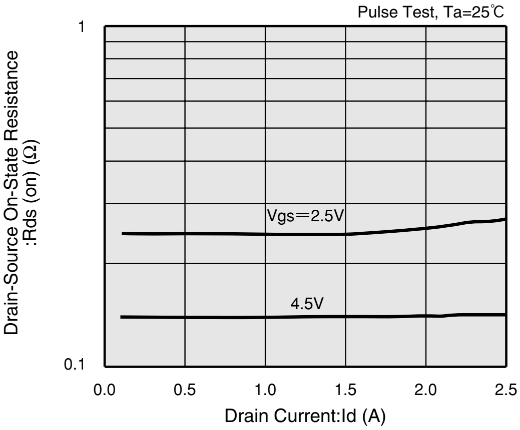
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



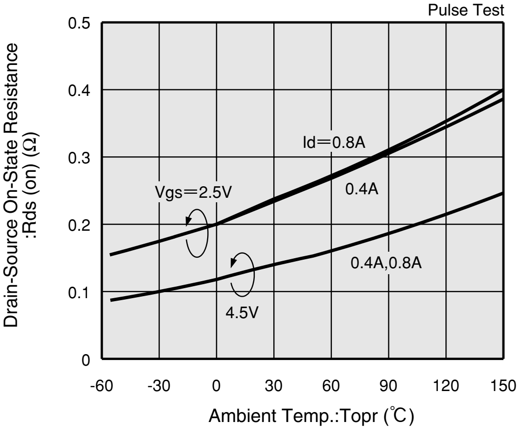
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



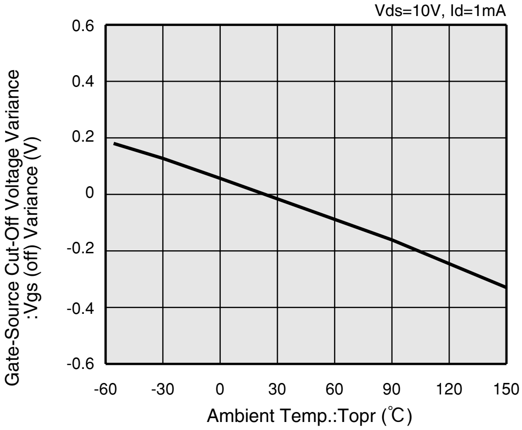
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



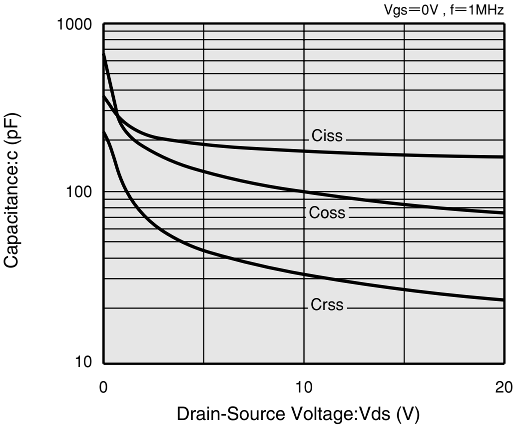
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



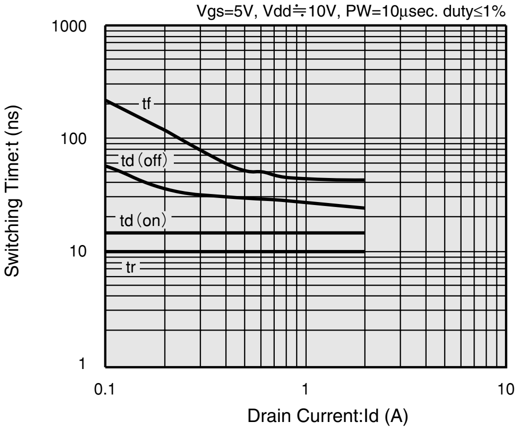
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



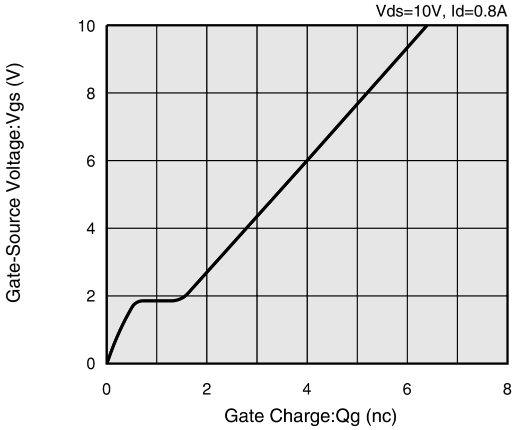
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



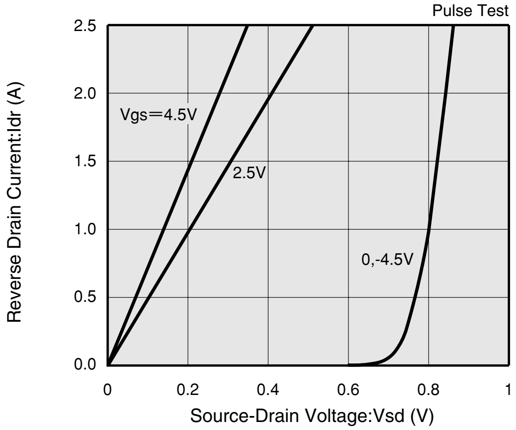
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH