

XP151A03A7MR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance: 0.17Ω (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 XP151A03A7MR 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

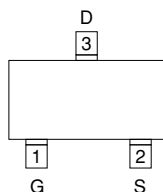
Low on-state resistance : $R_{ds(on)}=0.17\Omega$ ($V_{gs}=4.5V$)
: $R_{ds(on)}=0.24\Omega$ ($V_{gs}=2.5V$)
: $R_{ds(on)}=0.5\Omega$ ($V_{gs}=1.5V$)

Ultra high-speed switching

Operational Voltage : 1.5V

High density mounting : SOT-23

Pin Configuration

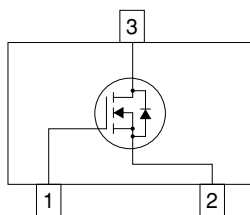


SOT-23
(TOP VIEW)

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

$T_a=25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V_{ds}	20	V
Gate-Source Voltage	V_{gs}	± 8	V
Drain Current (DC)	I_d	0.8	A
Drain Current (Pulse)	I_{dp}	2.5	A
Reverse Drain Current	I_{dr}	0.8	A
Continuous Channel Power Dissipation (note)	P_d	0.5	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

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=±8V, Vds=0V			±10	μA
Gate-Source Cut-off Voltage	Vgs(off)	Id=1mA, Vds=10V	0.5			V
Drain-Source On-state Resistance (note)	Rds(on)	Id=0.4A, Vgs=4.5V		0.13	0.17	Ω
		Id=0.4A, Vgs=2.5V		0.18	0.24	Ω
		Id=0.4A, Vgs=1.5V		0.3	0.5	Ω
Forward Transfer Admittance (note)	Yfs	Id=0.4A, Vds=10V		3.5		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°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Capacitance	Ciss	Vds=10V, Vgs=0V f=1MHz		220		pF
Output Capacitance	Coss			100		pF
Feedback Capacitance	Crss			30		pF

Switching Characteristics

Ta=25°C

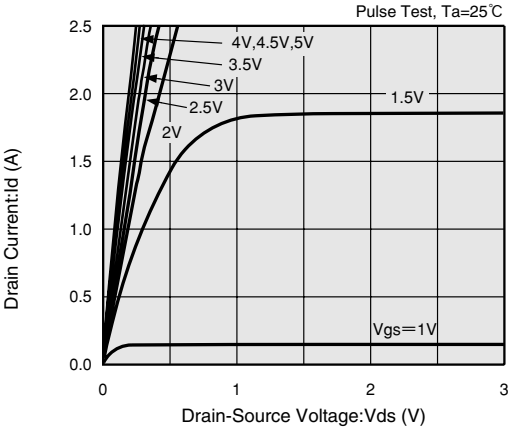
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=0.4A Vdd=10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			45		ns
Fall Time	tf			60		ns

Thermal Characteristics

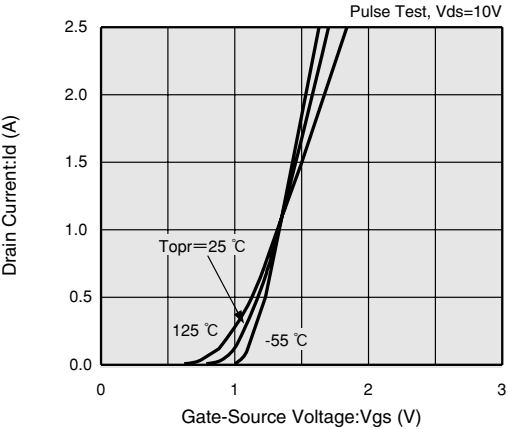
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a ceramic PCB		250		°C/W

Typical Performance Characteristics

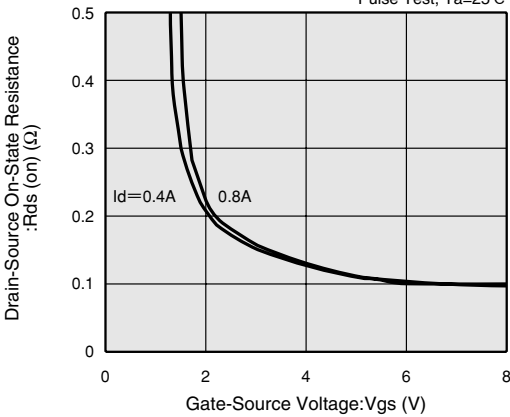
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



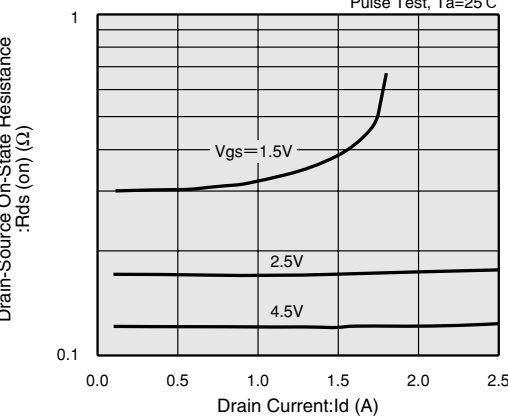
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



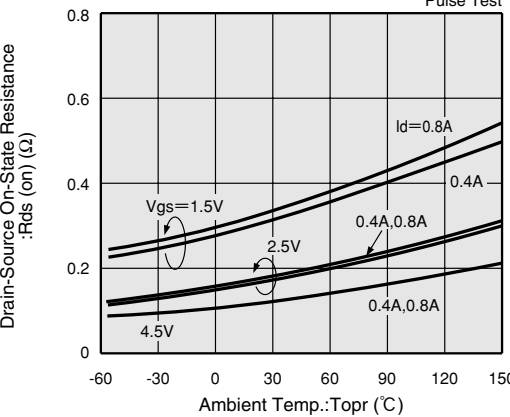
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



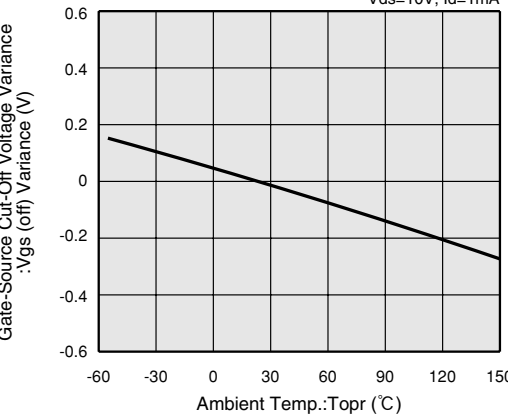
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



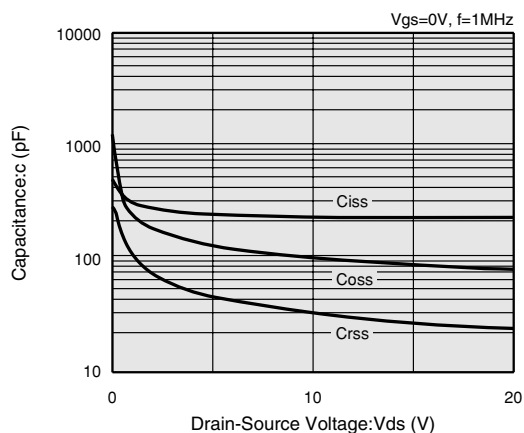
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



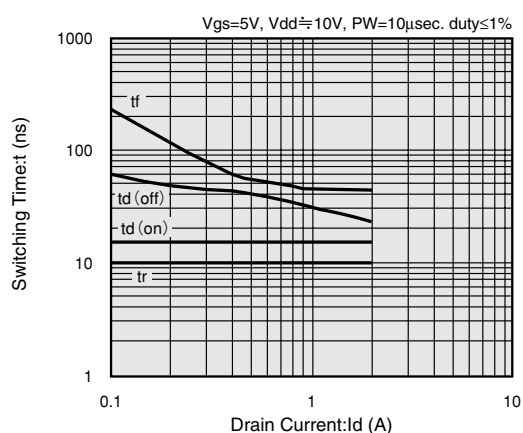
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



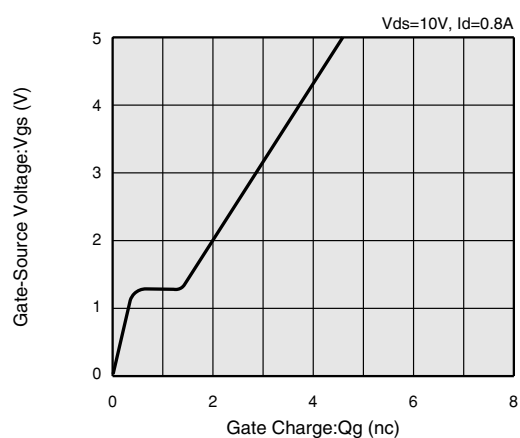
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



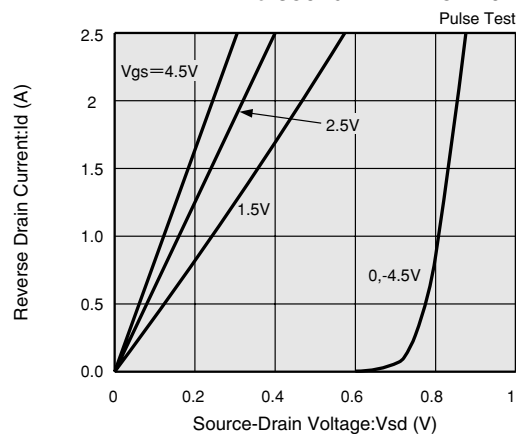
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

