XP161A0390PR

TOREX

Power MOS FET

◆N-Channel Power MOS FET
◆DMOS Structure
◆Low On-State Resistance: 0.09Ω (max)
◆Ultra High-Speed Switching
◆SOT-89 Package

■General Description

The XP161A0390PR 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-89 package makes high density mounting possible.

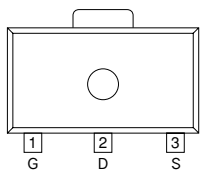
■Applications

●Notebook PCs
●Cellular and portable phones
●On-board power supplies
●Li-ion battery systems

■Features

Low on-state resistance : Rds(on)=0.09Ω(Vgs=4.5V)
: Rds(on)=0.13Ω(Vgs=2.5V)
: Rds(on)=0.3Ω(Vgs=1.5V)
Ultra high-speed switching
Operational Voltage : 1.5V
High density mounting : SOT-89

■Pin Configuration



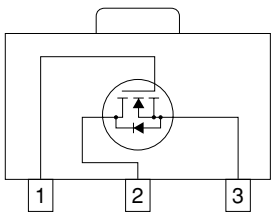
SOT-89
(TOP VIEW)

■Pin Assignment

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

11

■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	±8	V
Drain Current (DC)	Id	3	A
Drain Current (Pulse)	Idp	9	A
Reverse Drain Current	Idr	3	A
Continuous Channel Power Dissipation (note)	Pd	2	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=±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=1.5A, Vgs=4.5V		0.07	0.09	Ω
		Id=1.5A, Vgs=2.5V		0.1	0.13	Ω
		Id=1.5A, Vgs=1.5V		0.17	0.3	Ω
Forward Transfer Admittance (note)	|Yfs|	Id=1.5A, Vds=10V		6		S
Body Drain Diode Forward Voltage	Vf	If=3A, Vgs=0V		0.85	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		380		pF
Output Capacitance	Coss			170		pF
Feedback Capacitance	Crss			60		pF

Switching Characteristics

Ta=25℃

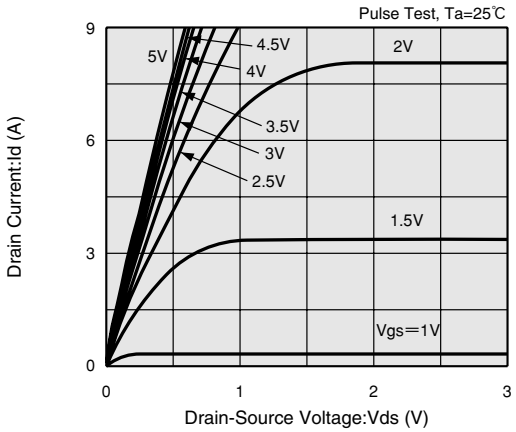
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	td (on)	Vgs=5V, Id=1.5A Vdd=10V		10		ns
Rise Time	tr			15		ns
Turn-off Delay Time	td (off)			70		ns
Fall Time	tf			40		ns

Thermal Characteristics

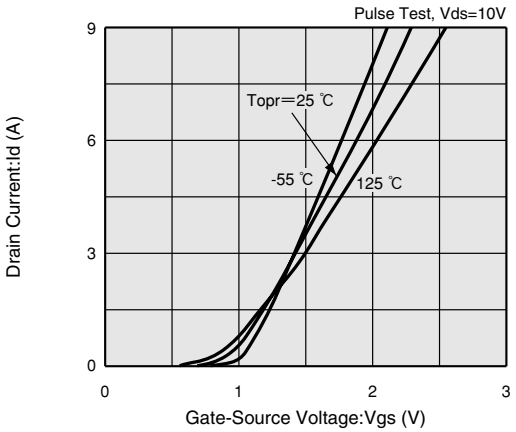
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	Rth (ch-a)	Implement on a ceramic PCB		62.5		˚C/W

■Typical Performance Characteristics

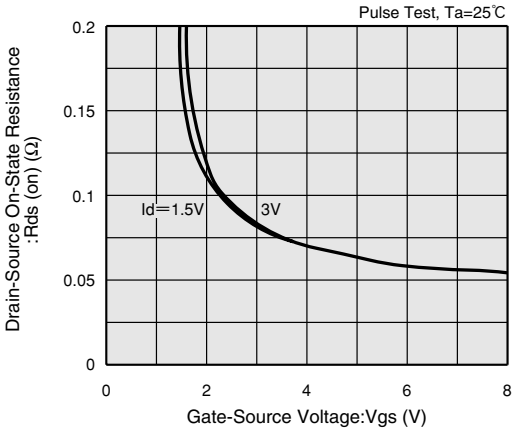
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



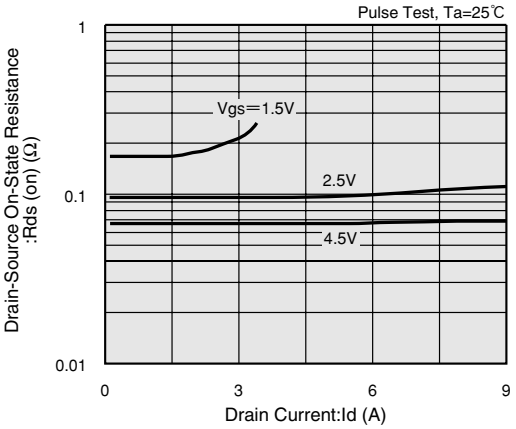
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



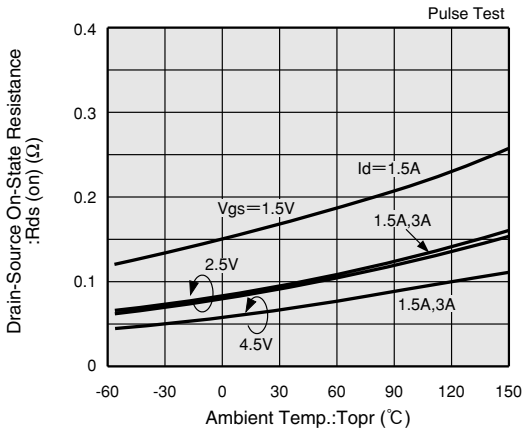
DRAIN-SOURCE ON-STATE RESISTANCE
vs. GATE-SOURCE VOLTAGE



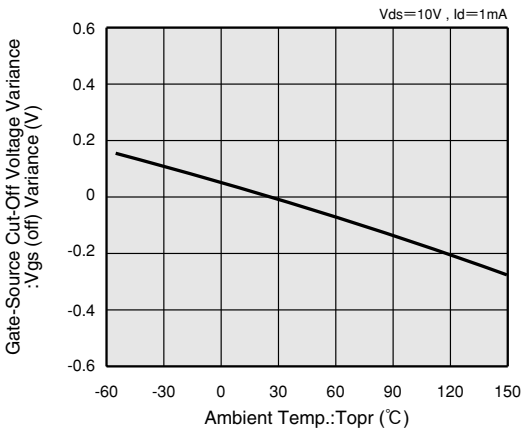
DRAIN-SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT



DRAIN-SOURCE ON-STATE RESISTANCE
vs. AMBIENT TEMPERATURE

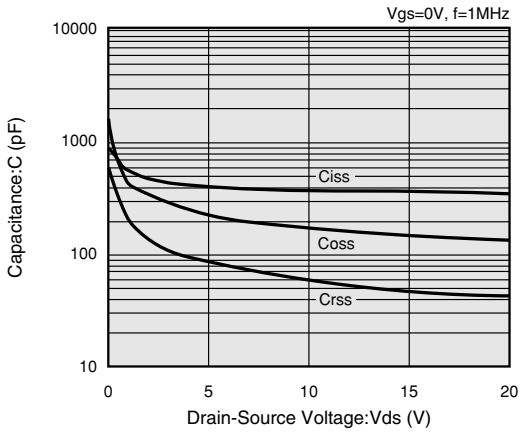


GATE-SOURCE CUT-OFF VOLTAGE VARIANCE
vs. AMBIENT TEMPERATURE

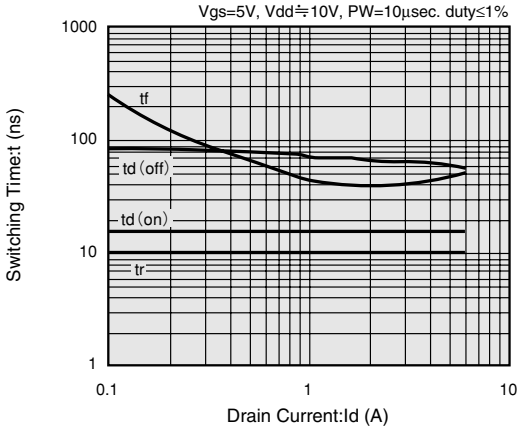


11

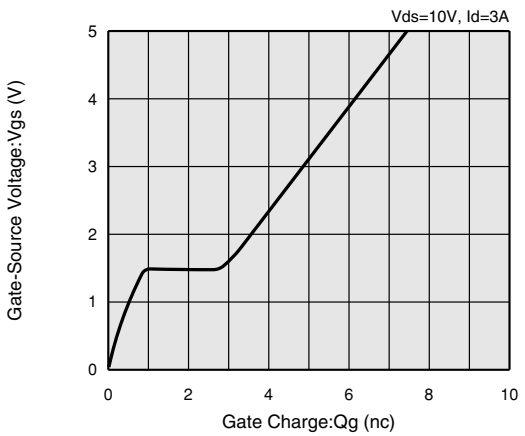
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



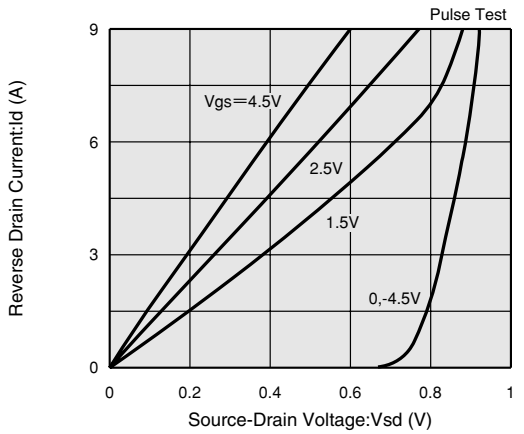
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT
vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH