

XP161A1355PR



Power MOS FET

- ◆N-Channel Power MOS FET
- ◆DMOS Structure
- ◆Low On-State Resistance : 0.05Ω (max)
- ◆Ultra High-Speed Switching
- ◆SOT-89 Package
- ◆Gate Protect Diode Built-in

Applications

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

General Description

The XP161A1355PR 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.

A gate protect diode is built-in to prevent static damage.

The small SOT-89 package makes high density mounting possible.

Features

Low on-state resistance: Rds (on) = 0.05Ω (Vgs = 4.5V)
 : Rds (on) = 0.07Ω (Vgs = 2.5V)
 : Rds (on) = 0.15Ω (Vgs = 1.5V)

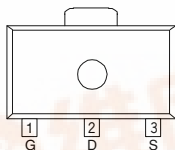
Ultra high-speed switching

Gate protect diode built-in

Operational Voltage : 1.5V

High density mounting : SOT-89

Pin Configuration



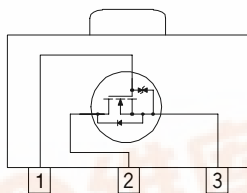
SOT-89
(TOP VIEW)

Pin Assignment

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

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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	±8	V
Drain Current (DC)	Id	4	A
Drain Current (Pulse)	Idp	16	A
Reverse Drain Current	Idr	4	A
Continuous Channel Power Dissipation (note)	Pd	2	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	I _{dss}	V _{ds} = 20V , V _{gs} = 0V			10	μA
Gate-Source Leakage Current	I _{gss}	V _{gs} = ± 8V , V _{ds} = 0V			± 10	μA
Gate-Source Cut-off Voltage	V _{gs (off)}	I _d = 1mA , V _{ds} = 10V	0.5		1.2	V
Drain-Source On-state Resistance (note)	R _{ds (on)}	I _d = 2A , V _{gs} = 4.5V		0.37	0.05	Ω
		I _d = 2A , V _{gs} = 2.5V		0.05	0.07	Ω
		I _d = 0.5A , V _{gs} = 1.5V		0.1	0.15	Ω
Forward Transfer Admittance (note)	Y _{fs}	I _d = 2A , V _{ds} = 10V		10		S
Body Drain Diode Forward Voltage	V _f	I _f = 4A , V _{gs} = 0V		0.85	1.1	V

(note) : Effective during pulse test.

Dynamic Characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Capacitance	C _{iss}	V _{ds} = 10V , V _{gs} = 0V f = 1 MHz		390		pF
Output Capacitance	C _{oss}			210		pF
Feedback Capacitance	C _{rss}			90		pF

Switching Characteristics

Ta=25°C

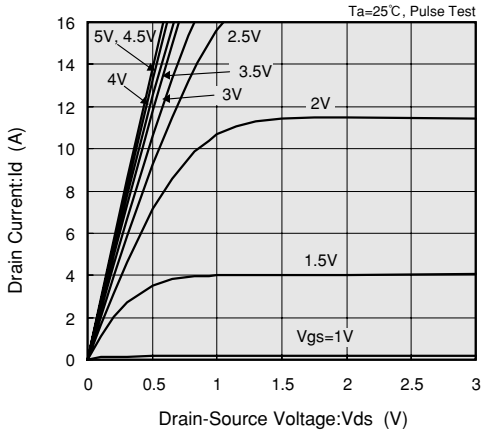
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Turn-on Delay Time	t _{d (on)}	V _{gs} = 5V , I _d = 2A V _{dd} = 10V		10		ns
Rise Time	t _r			15		ns
Turn-off Delay Time	t _{d (off)}			85		ns
Fall Time	t _f			45		ns

Thermal Characteristics

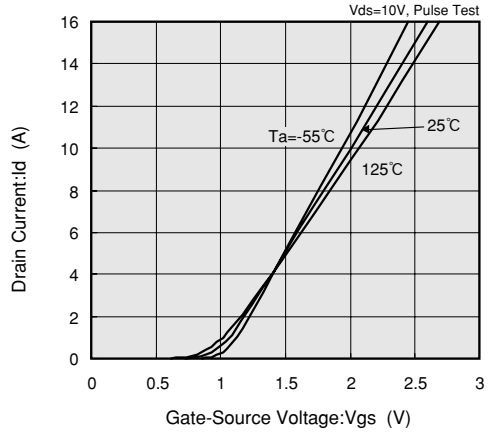
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Thermal Resistance (channel-ambience)	R _{th (ch-a)}	Implement on a ceramic PCB		62.5		°C / W

Typical Performance Characteristics

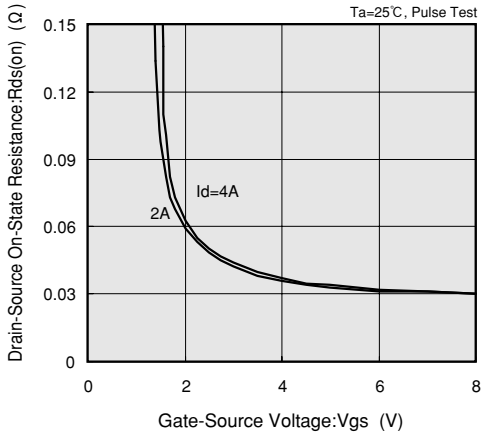
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



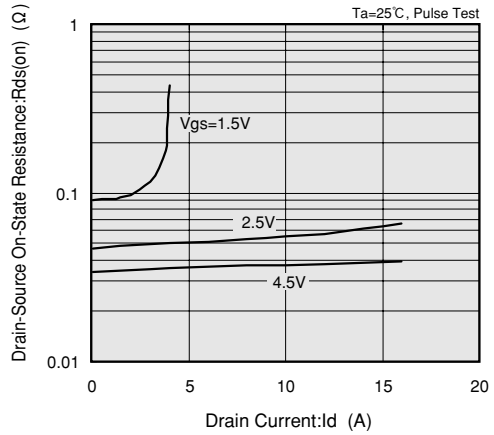
DRAIN CURRENT vs. GATE-SOURCE VOLTAGE



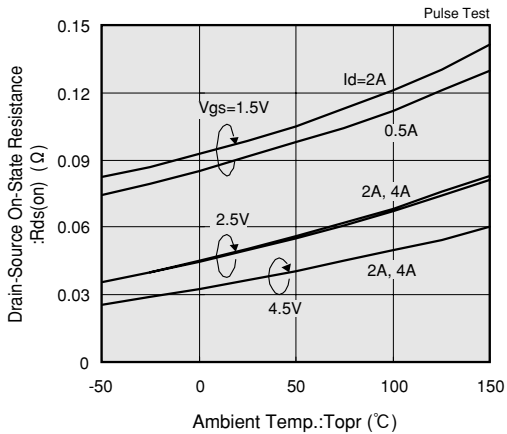
DRAIN-SOURCE ON-STATE RESISTANCE vs. GATE-SOURCE VOLTAGE



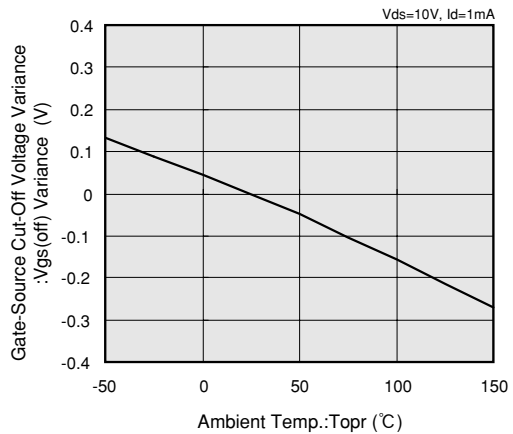
DRAIN-SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



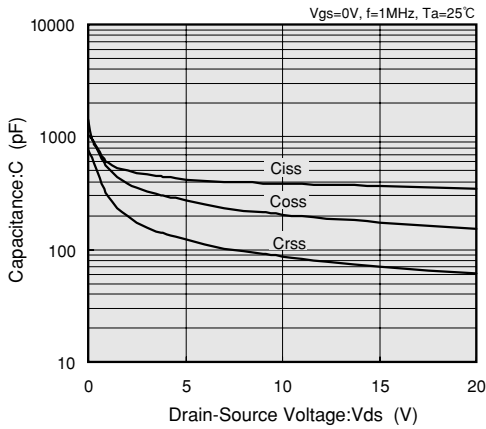
DRAIN-SOURCE ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



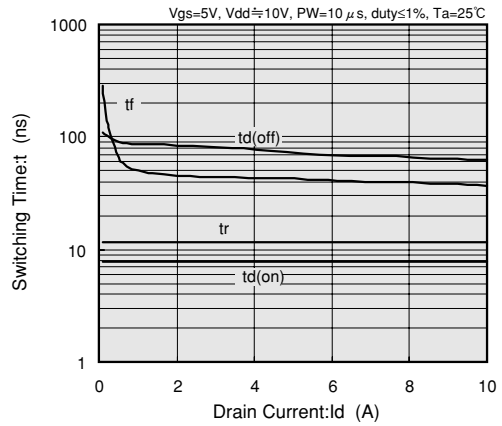
GATE-SOURCE CUT-OFF VOLTAGE VARIANCE vs. AMBIENT TEMPERATURE



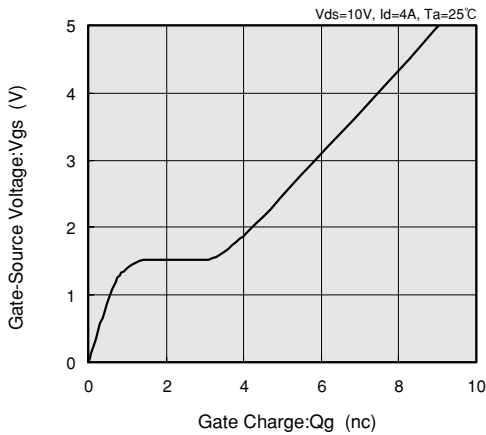
CAPACITANCE vs. DRAIN-SOURCE VOLTAGE



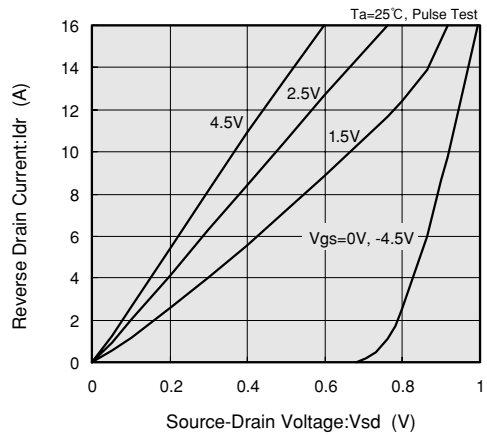
SWITCHING TIME vs. DRAIN CURRENT



GATE-SOURCE VOLTAGE vs. GATE CHARGE



REVERSE DRAIN CURRENT vs. SOURCE-DRAIN VOLTAGE



STANDARDIZED TRANSITION THERMAL RESISTANCE vs. PULSE WIDTH

