

# XP151A12A2MR-G

## Power MOSFET

### ■ GENERAL DESCRIPTION

The XP151A12A2MR-G is an N-channel Power MOSFET 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.

### ■ APPLICATIONS

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

### ■ FEATURES

**Low On-State Resistance** :  $R_{ds(on)} = 0.1 \Omega @ V_{gs} = 4.5V$   
 :  $R_{ds(on)} = 0.16 \Omega @ V_{gs} = 2.5V$

**Ultra High-Speed Switching**

**Gate Protect Diode Built-in**

**Driving Voltage** : 2.5V

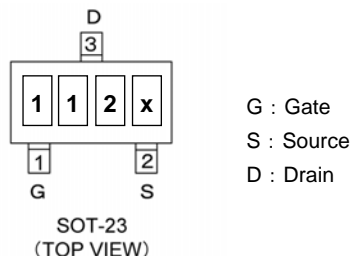
**N-Channel Power MOSFET**

**DMOS Structure**

**Small Package** : SOT-23

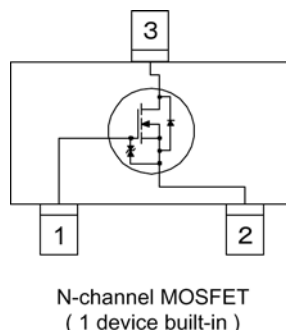
**Environmentally Friendly** : EU RoHS Compliant, Pb Free

### ■ PIN CONFIGURATION/MARKING



\* x represents production lot number.

### ■ EQUIVALENT CIRCUIT



### ■ PRODUCT NAMES

PRODUCTS	PACKAGE	ORDER UNIT
XP151A12A2MR	SOT-23	3,000/Reel
XP151A12A2MR-G <sup>(*)</sup>	SOT-23	3,000/Reel

<sup>(\*)</sup> The “-G” suffix denotes Halogen and Antimony free as well as being fully RoHS compliant.

### ■ ABSOLUTE MAXIMUM RATINGS

Ta = 25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Drain - Source Voltage	V <sub>dss</sub>	20	V
Gate - Source Voltage	V <sub>gss</sub>	±12	V
Drain Current (DC)	I <sub>d</sub>	1	A
Drain Current (Pulse)	I <sub>dp</sub>	4	A
Reverse Drain Current	I <sub>dr</sub>	1	A
Channel Power Dissipation *	P <sub>d</sub>	0.5	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

\* When implemented on a ceramic PCB

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## ELECTRICAL CHARACTERISTICS

### DC Characteristics

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

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Drain Cut-Off Current	$I_{dss}$	$V_{ds} = 20V, V_{gs} = 0V$	-	-	10	$\mu A$
Gate-Source Leak Current	$I_{gss}$	$V_{gs} = \pm 12V, V_{ds} = 0V$	-	-	$\pm 10$	$\mu A$
Gate-Source Cut-Off Voltage	$V_{gs(off)}$	$I_d = 1mA, V_{ds} = 10V$	0.7	-	1.4	V
Drain-Source On-State Resistance *1	$R_{ds(on)}$	$I_d = 0.5A, V_{gs} = 4.5V$	-	0.075	0.1	$\Omega$
		$I_d = 0.5A, V_{gs} = 2.5V$	-	0.120	0.160	$\Omega$
Forward Transfer Admittance *1	$ Y_{fs} $	$I_d = 0.5A, V_{ds} = 10V$	-	3.3	-	S
Body Drain Diode Forward Voltage	$V_f$	$I_f = 1A, V_{gs} = 0V$	-	0.8	1.1	V

\*1 Effective during pulse test.

### Dynamic Characteristics

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

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Capacitance	$C_{iss}$	$V_{ds} = 10V, V_{gs} = 0V$ $f = 1MHz$	-	180	-	pF
Output Capacitance	$C_{oss}$		-	120	-	pF
Feedback Capacitance	$C_{rss}$		-	45	-	pF

### Switching Characteristics

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

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Turn-On Delay Time	$t_d(on)$	$V_{gs} = 5V, I_d = 0.5A$ $V_{dd} = 10V$	-	10	-	ns
Rise Time	$t_r$		-	15	-	ns
Turn-Off Delay Time	$t_d(off)$		-	50	-	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	-	250	-	$^\circ\text{C/W}$