XP223N10013R-G

ETR11077-001

N-channel MOSFET 20V, 1A

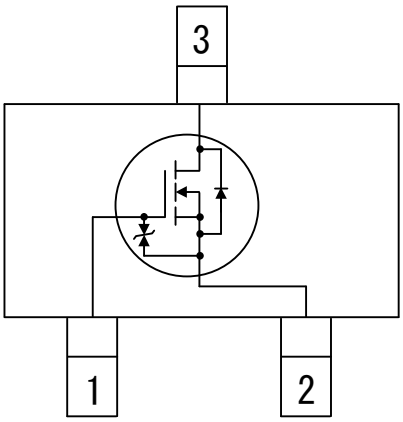
■FEATURES

On-State Resistance : $R_{DS}(on)=0.3\Omega@V_{GS}=4.5V$
Driving voltage : 1.5V
Environmentally Friendly : EU RoHS Compliant, Pb Free

■APPLICATIONS

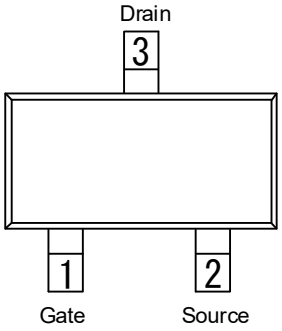
●Switching

■ EQUIVALENT CIRCUIT



■ PIN CONFIGURATION

●SOT-323-3A



■ PRODUCT NAME

PRODUCT NAME	PACKAGE	ORDER UNIT
XP223N10013R-G *	SOT-323-3A	3,000pcs/ Reel

* The “-G” suffix denotes Halogen and Antimony free as well as being fully EU RoHS compliant

■ABSOLUTE MAXIMUM RATINGS

Ta=25℃

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±8	V
Drain Current (DC)	I_D	1	A
Drain Current(Pulse) (*1)	I_{DP}	2	A
Channel Power Dissipation (*2)	P_d	0.35	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	-55~150	℃

(*1) PW≦10μs,duty cycle≦1%

(*2) When implemented on a PCB defined by JESD51-7

■ELECTRICAL CHARACTERISTICS

Ta=25℃

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D= 100μA, V_{GS}=0V	20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}= 20V, V_{GS}= 0V	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±8V, V_{DS}= 0V	-	-	±10	μA
Gate Threshold Voltage	$V_{GS(off)}$	I_D= 250uA, V_{DS}= V_{GS}	0.4	0.8	1.2	V
Drain-Source On Resistance	$R_{DS(on)}$	V_{GS}= 4.5V, I_D= 350mA	-	0.15	0.3	Ω
		V_{GS}= 2.5V, I_D= 350mA	-	0.25	0.35	Ω
		V_{GS}= 1.8V, I_D= 350mA	-	0.4	1	Ω
		V_{GS}= 1.5V, I_D= 20mA	-	0.55	10	Ω
Input Capacitance	Ciss	V_{DS}= 10V, V_{GS}= 0V f=1MHz	-	99	-	pF
Output Capacitance	Coss		-	20	-	pF
Reverse Transfer Capacitance	Crss		-	13	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 10V, I_D= 500mA V_{GS}= 4.5V	-	8	-	ns
Rise Time	t_r		-	8	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	26	-	ns
Fall Time	t_f		-	10	-	ns
Total Gate Charge	Q_g	V_{DS}=10V, I_D=500mA V_{GS}=6V	-	1.4	-	nC
Gate-Source Charge	Q_{gs}		-	0.14	-	nC
Gate-Drain Charge	Q_{gd}		-	0.36	-	nC
Diode Forward Voltage	V_{SD}	I_S= 350mA, V_{GS}= 0V	-	0.75	1.2	V

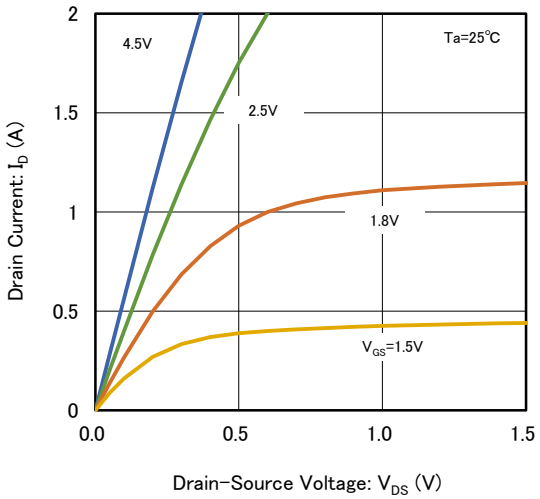
■NOTES ON USE

1. Please use this IC within the absolute maximum ratings.
Even within the ratings, in case of high load use continuously such as high temperature, high voltage, high current and thermal stress may cause reliability degradation of the IC.

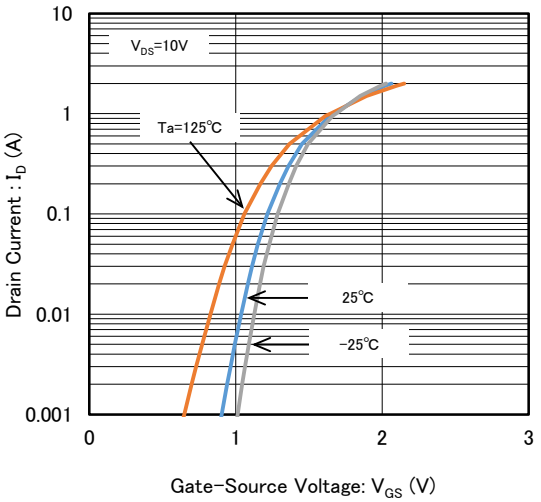
2. Torex places an importance on improving our products and their reliability.
We request that users incorporate fail-safe designs and post-aging protection treatment when using Torex products in their systems.

■TYPICAL PERFORMANCE CHARACTERISTICS

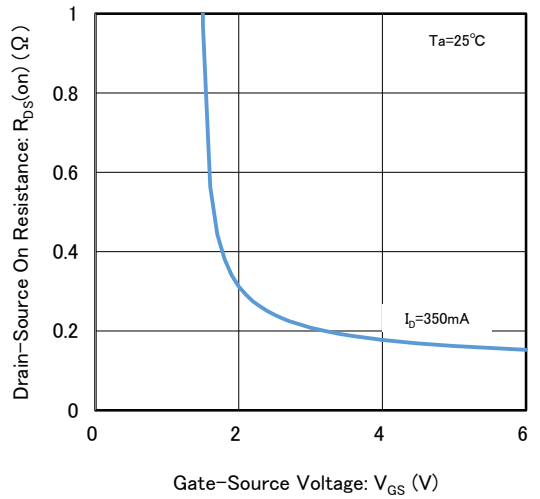
(1) Drain Current vs. Drain-Source Voltage



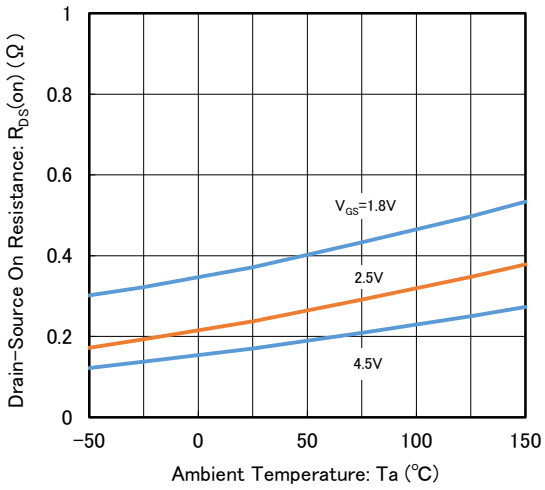
(2) Drain Current vs. Gate-Source Voltage



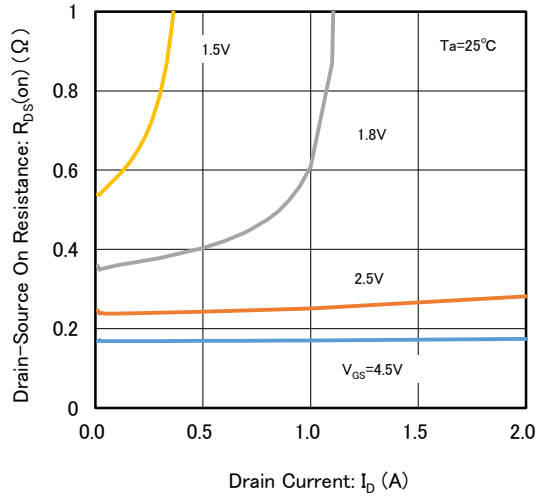
(3) Drain-Source On Resistance vs. Gate-Source Voltage



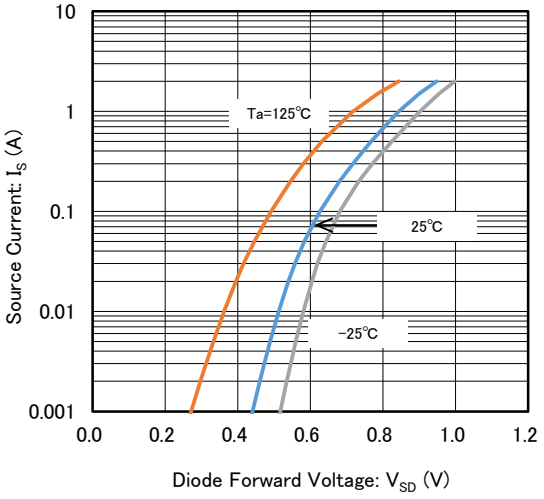
(4) Drain-Source On Resistance vs. Ambient Temperature



(5) Drain-Source On Resistance vs. Drain Current

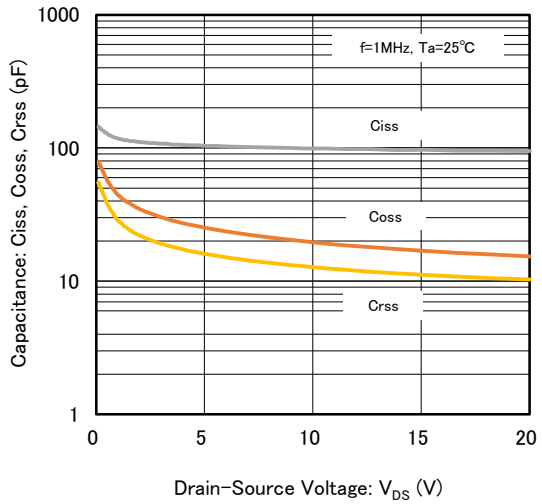


(6) Source Current vs. Diode Forward Voltage

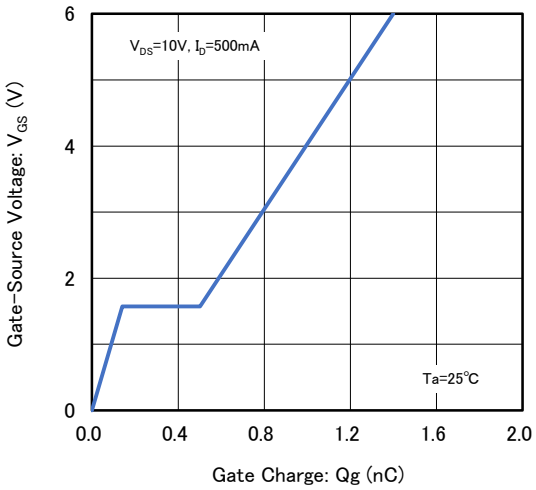


■TYPICAL PERFORMANCE CHARACTERISTICS

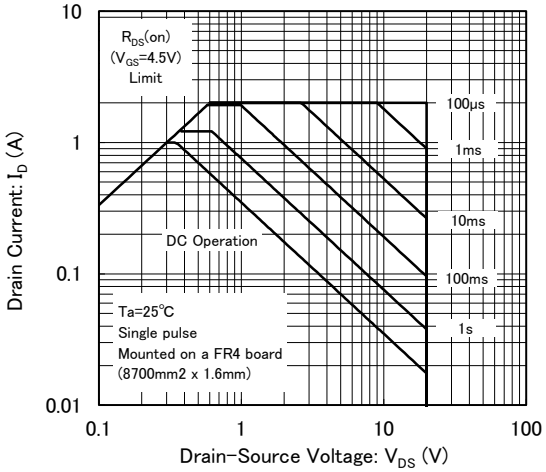
(7) Ciss, Coss, Crss vs. Drain-Source Voltage



(8) Gate-Source Voltage vs. Gate Charge



(9) Area of Safe Operation



■PACKAGING INFORMATION

For the latest package information go to, www.torexsemi.com/technical-support/packages

PACKAGE	OUTLINE / LAND PATTERN	THERMAL CHARACTERISTICS	
SOT-323-3A	SOT-323-3A PKG	JESD51-7 Board	SOT-323-3A Power Dissipation

■ MARKING RULE

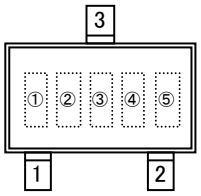
●SOT-323-3A

①,②,③represents product series

MARK			PRODUCT SERIES
①	②	③	
2	3	N	XP223N1001**-G

④,⑤ represents production lot number
01 to 09, 0A to 0Z, 11 to 9Z, A1 to A9, AA to AZ, B1 to ZZ repeated
(G, I, J, O, Q, W excluded) *No character inversion used

SOT-323-3A



1. The product and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date.

2. The information in this datasheet is intended to illustrate the operation and characteristics of our products. We neither make warranties or representations with respect to the accuracy or completeness of the information contained in this datasheet nor grant any license to any intellectual property rights of ours or any third party concerning with the information in this datasheet.

3. Applicable export control laws and regulations should be complied and the procedures required by such laws and regulations should also be followed, when the product or any information contained in this datasheet is exported.

4. The product is neither intended nor warranted for use in equipment of systems which require extremely high levels of quality and/or reliability and/or a malfunction or failure which may cause loss of human life, bodily injury, serious property damage including but not limited to devices or equipment used in 1) nuclear facilities, 2) aerospace industry, 3) medical facilities, 4) automobile industry and other transportation industry and 5) safety devices and safety equipment to control combustions and explosions. Do not use the product for the above use unless agreed by us in writing in advance.

5. Although we make continuous efforts to improve the quality and reliability of our products; nevertheless Semiconductors are likely to fail with a certain probability. So in order to prevent personal injury and/or property damage resulting from such failure, customers are required to incorporate adequate safety measures in their designs, such as system fail safes, redundancy and fire prevention features.

6. Our products are not designed to be Radiation-resistant.

7. Please use the product listed in this datasheet within the specified ranges.

8. We assume no responsibility for damage or loss due to abnormal use.

9.

TOREX SEMICONDUCTOR LTD.