XPJ102N09N8R-G

ETR11082-001

N-channel MOSFET 100V, 9.4mΩ, 59A

■FEATURES

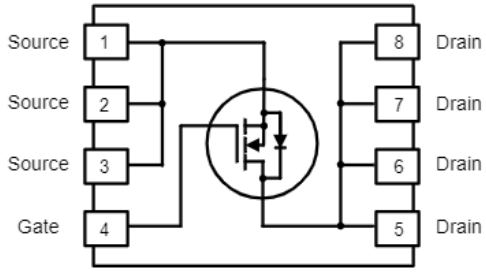
- High switching speed
- Low reverse transfer capacitance
- EU RoHS Compliant, Pb Free

■APPLICATIONS

- ●DC Motor
- ●General-purpose inverter
- ●DC Switching power supply

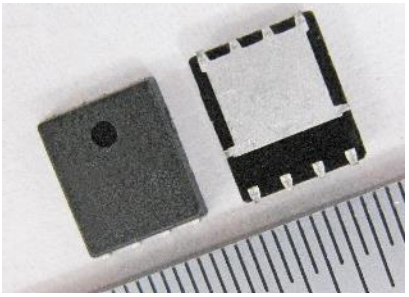
V_{DSS}	100V
$R_{DS(ON)}$ (MAX.)	9.4mΩ@V_{GS}=10V
I_D	59A
Q_g (TYP.)	19nC

■EQUIVALENT CIRCUIT



■ PIN CONFIGURATION

●DFN5060-8L



■PRODUCT NAME

PRODUCT NAME	PACKAGE	ORDER UNIT
XPJ102N09N8R-G	DFN5060-8L	6,000pcs/2reel

■ABSOLUTE MAXIMUM RATINGS (Tc=25℃ unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNITS
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (DC) (*1)	T_C=25°C	I_D	59.2	A
	T_C=100°C		37.4	A
Drain Current (Pulse) (*2)	T_C=25°C	I_{DM}	236	A
Single Pulse Avalanche Current (*3)		I_{AS}	28	A
Single Pulse Avalanche Energy (*3)		E_{AS}	98	mJ
Power Dissipation	T_C=25°C	P_d	62.5	W
	T_C=100°C		25	W
Junction Temperature		T_j	150	℃
Storage Temperature		T_{stg}	-55 ~ 150	℃

(*1) The maximum drain current calculated by maximum junction temperature and thermal impedance.
It can be varied by application and environment.

(*2) Pulse width < 300μs, Duty cycle < 2%

(*3) E_{AS} is calculated based on the condition of L=1.0mH, I_{AS}=14A, V_{DD}=50V, V_{GS}=10V. 100% test at L=0.1mH, I_{AS}=28A in production.

■THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance	Junction-to-Case (Bottom)	R_{thJC}	-	1.3	2.0	°C/W
	Junction-to-Ambient (*4)	R_{thJA}	-	37.4	50	°C/W

(*4) R_{thJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch^2 with 2oz.square pad of copper.

■ELECTRICAL CHARACTERISTICS

Tj=25℃

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=115μA	1.8	2.8	3.8	
Drain-Source On-State Resistance (*2)	$R_{DS(on)}$	V_{GS}=10V, I_D=30A	-	8.4	9.4	mΩ
		V_{GS}=6V, I_D=15A	-	11.0	14.3	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Transfer Characteristics (*2)	g_{fs}	V_{DS}=10V, I_D=30A	-	45	-	S
Dynamic Characteristics (*6)						
Total Gate Charge	Q_g	V_{DS}=50V, I_D=30A, V_{GS}=10V	-	19	25	nC
Gate-Source Charge	Q_{gs}		-	7.6	-	
Gate-Drain Charge	Q_{gd}		-	3.0	-	
Gate Plateau Voltage	$V_{plateau}$		-	5.4	-	V
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=250kHz	-	1370	1780	pF
Output Capacitance	C_{oss}		-	460	600	
Reverse Transfer Capacitance	C_{rss}		-	10	-	
Output Charge	Q_{oss}	V_{DS}=50V, V_{GS}=0V	-	34	44	nC
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=50V, I_D=30A, V_{GS}=10V, R_G=3.0Ω (*5)	-	6.2	-	ns
Rise Time	t_r		-	3.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	10.4	-	
Fall Time	t_f		-	3.3	-	
Gate Resistance	R_g	f=1.0MHz	-	1.1	2.2	Ω
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	I_S=30A, V_{GS}=0V	-	0.9	1.2	V
Reverse Recovery Charge	Q_{rr}	I_F=30A, V_{DD}=50V di/dt=100A/μs	-	45	-	nC
Reverse Recovery Time	t_{rr}		-	41	-	ns

(*2) Pulse width < 300μs, Duty cycle < 2%

(*5) Essentially independent of operating temperature typical characteristics.

(*6) Guaranteed by design, not subject to production testing.

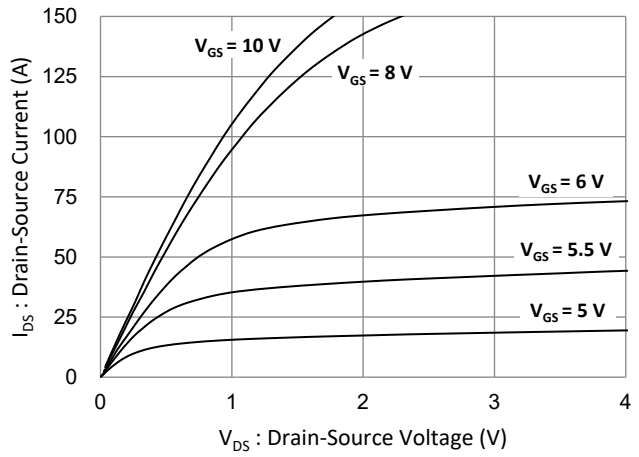
■NOTES ON USE

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.

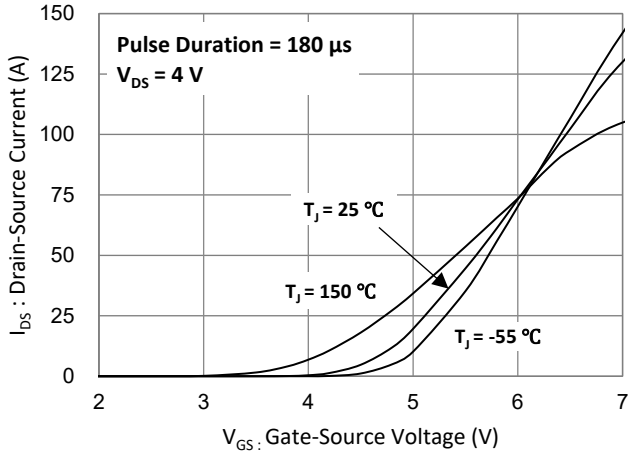
2. Torex places an importance on improving our products and their reliability.
We request that users incorporate fail-safe designs and post-aging protection treatment when using Torex products in their systems.

■TYPICAL PERFORMANCE CHARACTERISTICS

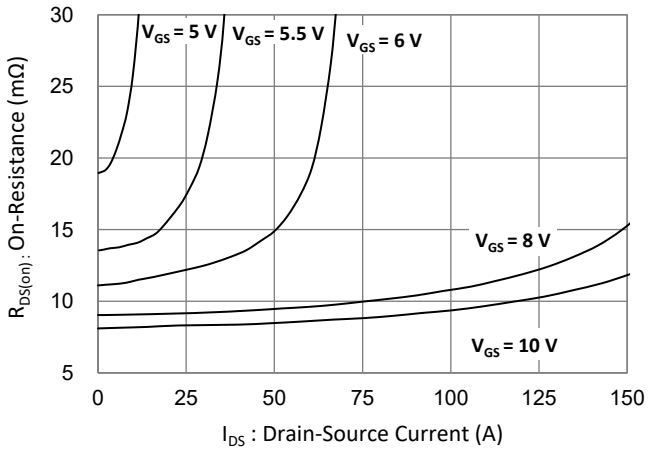
(1) Drain-Source Current vs. Drain-Source Voltage



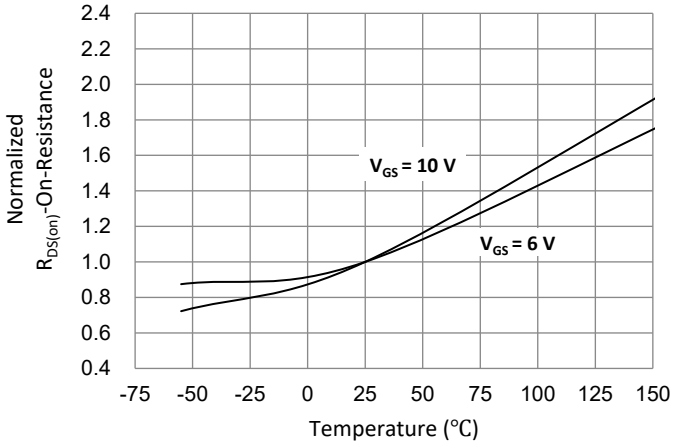
(2) Drain-Source Current vs. Gate-Source Voltage



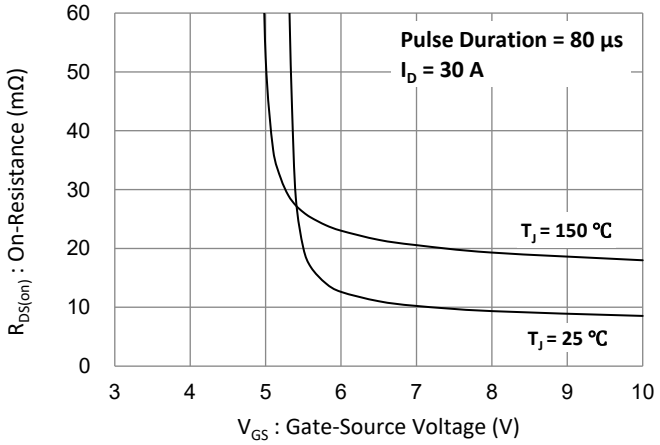
(3) Drain-Source On-State Resistance vs. Drain-Source Current



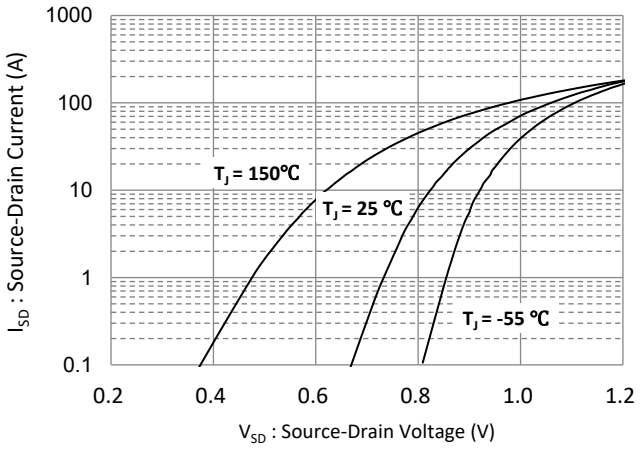
(4) Normalized Drain-Source On-State Resistance



(5) Drain-Source-On-State Resistance vs. Gate-Source Voltage

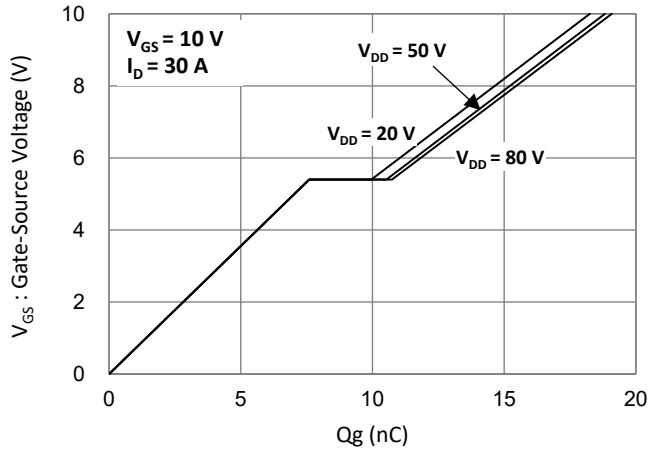


(6) Source - Drain Diode Characteristics

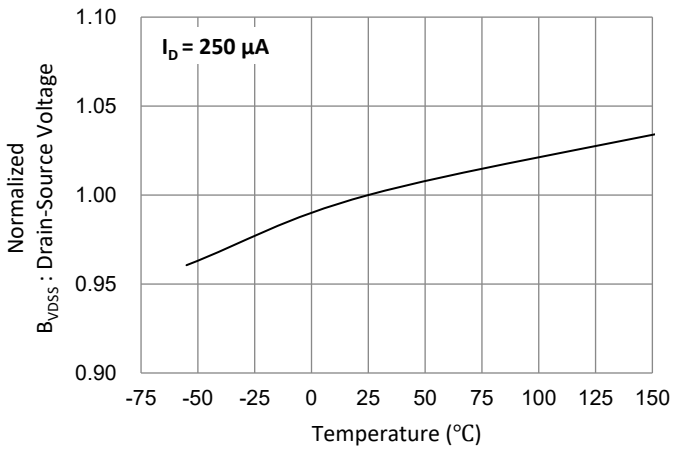


■TYPICAL PERFORMANCE CHARACTERISTICS

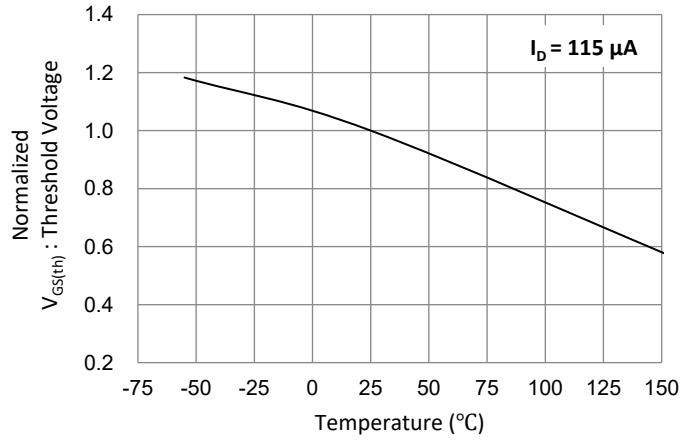
(7) Gate-Charge Characteristics



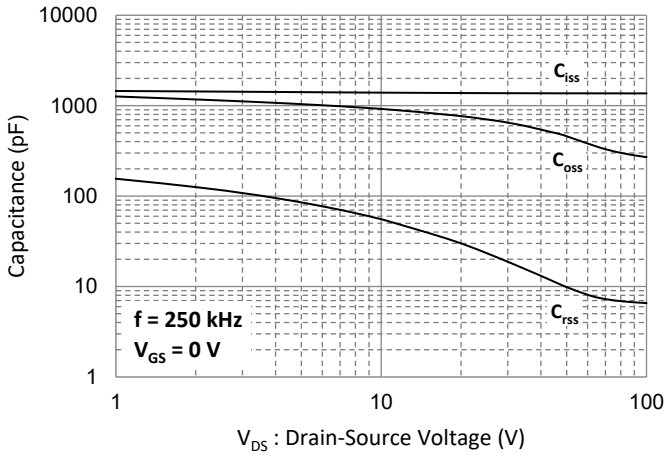
(8) Normalized Drain-Source Breakdown Voltage



(9) Normalized Gate Threshold Voltage

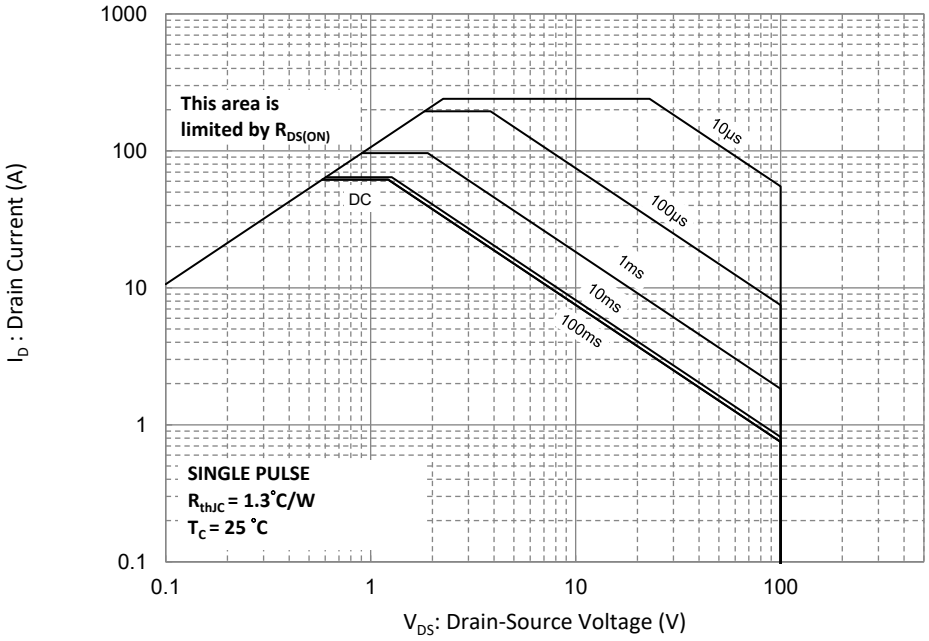


(10) Capacitance vs. Drain-Source Voltage

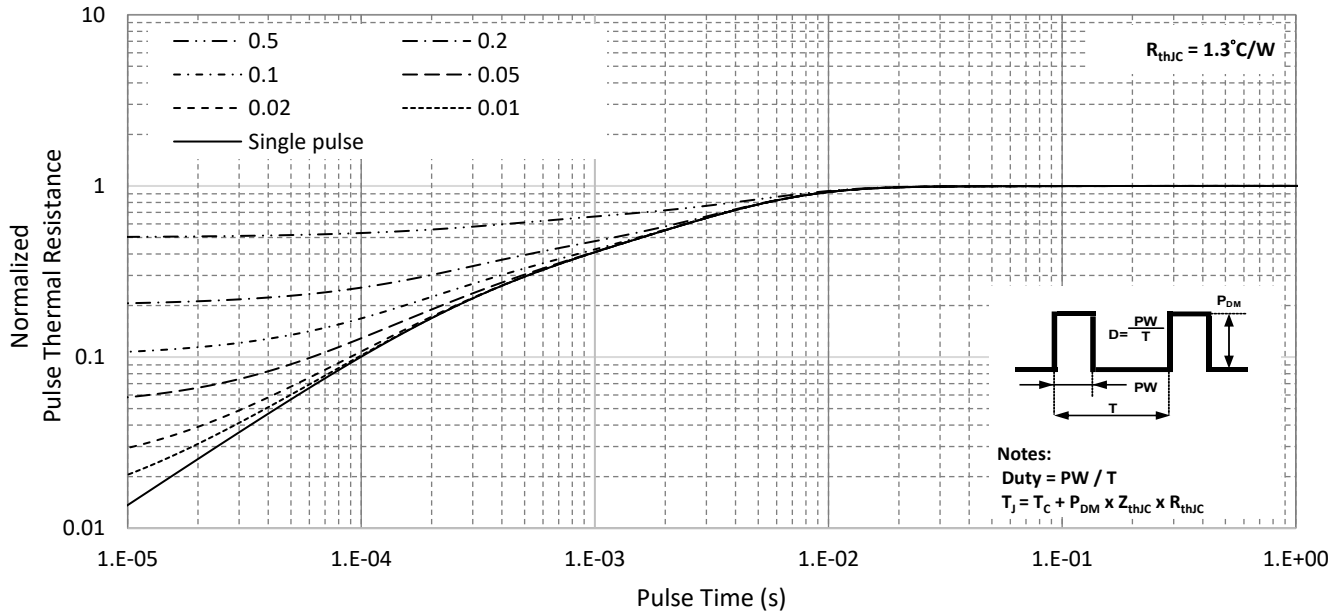


■TYPICAL PERFORMANCE CHARACTERISTICS

(11) Maximum Safe Operating Area



(12) Normalized Transient Thermal Resistance



■PACKAGING INFORMATION

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

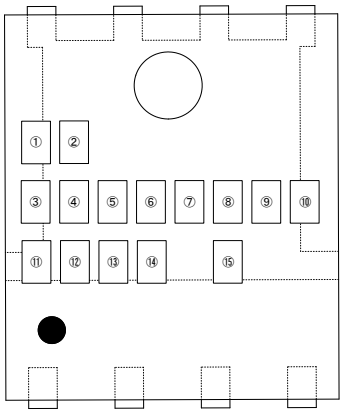
PACKAGE	OUTLINE / LAND PATTERN	THERMAL CHARACTERISTICS
DFN5060-8L	DFN5060-8L PKG	-

■MARKING RULE

①②③④⑤⑥⑦⑧⑨⑩ represents products series

	MARK
①②	PJ
③④⑤⑥⑦⑧⑨⑩	094N10NS

⑪⑫⑬⑭⑮ represents production lot number



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.