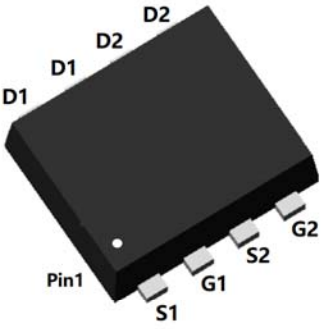
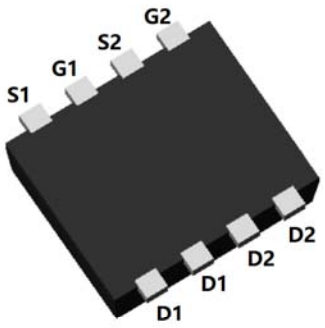
N-Channel and P-Channel Complementary MOSFET

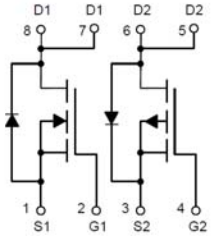


Top View



Bottom View

PDFN3030-8L



Product Summary

NMOS

- V_{DS} 100V
- I_D 1A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜270mΩ
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜344mΩ

PMOS

- V_{DS} -100V
- I_D -0.9A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜565mΩ
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜640mΩ

General Description

- Voltage controlled small signal switch
- Fast Switching Speed
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power Management Functions
- Motor Control
- DC-DC convertor

■ Absolute Maximum Ratings (T_J=25℃ unless otherwise noted)

Parameter			Symbol	NMOS	PMOS	Unit
Drain-source Voltage			V_{DS}	100	-100	V
Gate-source Voltage			V_{GS}	±20	±20	V
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃	I_D	1	-0.9	A
		T_A=100℃		0.63	-0.57	
Pulsed Drain Current	T_C=25℃, t_p=100μs		I_{DM}	8	-7	A
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	1.19	1.13	W
		T_A=100℃		0.47	0.45	
Junction and Storage Temperature Range			T_J ,T_{STG}	-55～+150	-55～+150	℃

■Thermal resistance

Parameter		Symbol	NMOS		PMOS		Units
			Typ	Max	Typ	Max	
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	85	105	90	110	℃/W

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
UA320NP10AJ	F1	Q320NP10A	3000	30000	120000	7“ reel

■ NMOS Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		V_{DS}=100V, V_{GS}=0V, Tj=150℃	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.3	1.8	2.3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=1A	-	200	270	mΩ
		V_{GS}=4.5V, I_D=1A	-	215	344	
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V	-	-	1.2	V
Gate resistance	R_G	f=1MHz	-	1.7	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	1	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1MHz	-	330	-	pF
Output Capacitance	C_{oss}		-	12.5	-	
Reverse Transfer Capacitance	C_{rss}		-	10.8	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=50V, I_D=2A	-	8.7	-	nC
Gate-Source Charge	Q_{gs}		-	0.5	-	
Gate-Drain Charge	Q_{gd}		-	0.87	-	
Reverse Recovery Charge	Q_{rr}	I_F=2A, di/dt=100A/us	-	21.7	-	nC
Reverse Recovery Time	t_{rr}		-	20.5	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V, I_D=2A R_{GEN}=2.7Ω	-	5.5	-	ns
Turn-on Rise Time	t_r		-	3	-	
Turn-off Delay Time	$t_{D(off)}$		-	15.7	-	
Turn-off fall Time	t_f		-	3.1	-	

■ PMOS Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	-100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V	-	-	-1	μA
		V_{DS}=-100V, V_{GS}=0V, Tj=150℃	-	-	-100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	-1.2	-1.7	-2.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-0.5A	-	435	565	mΩ
		V_{GS}=-4.5V, I_D=-0.5A	-	475	640	
Diode Forward Voltage	V_{SD}	I_S=-0.5A, V_{GS}=0V	-	-	-1.2	V
Gate resistance	R_G	f=1MHz	-	22	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	-0.9	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-50V, V_{GS}=0V, f=1MHz	-	486	-	pF
Output Capacitance	C_{oss}		-	13.3	-	
Reverse Transfer Capacitance	C_{rss}		-	10.7	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-50V, I_D=-0.5A	-	10.5	-	nC
Gate-Source Charge	Q_{gs}		-	0.74	-	
Gate-Drain Charge	Q_{gd}		-	1.33	-	
Reverse Recovery Charge	Q_{rr}	I_F=-0.5A, di/dt=100A/us	-	18.3	-	nC
Reverse Recovery Time	t_{rr}		-	18.2	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-50V, ID=-0.5A R_{GEN}=2.7Ω	-	5.2	-	ns
Turn-on Rise Time	t_r		-	25	-	
Turn-off Delay Time	$t_{D(off)}$		-	50	-	
Turn-off fall Time	t_f		-	132	-	

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, in the still air environment with TA =25℃.The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■ NMOS Typical Electrical and Thermal Characteristics Diagrams

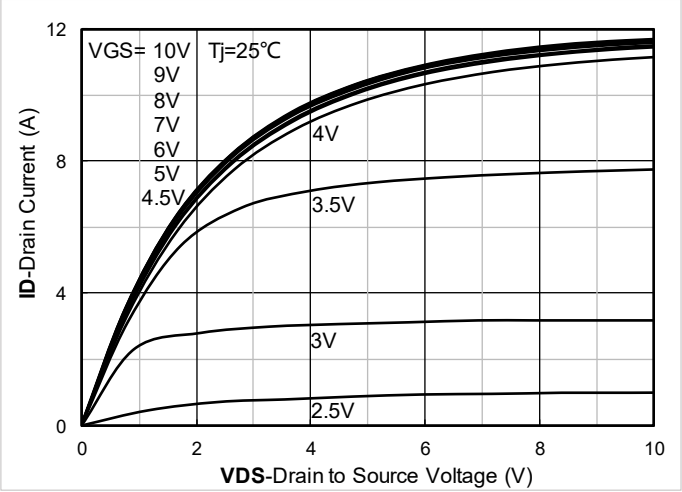


Figure 1. Output Characteristics

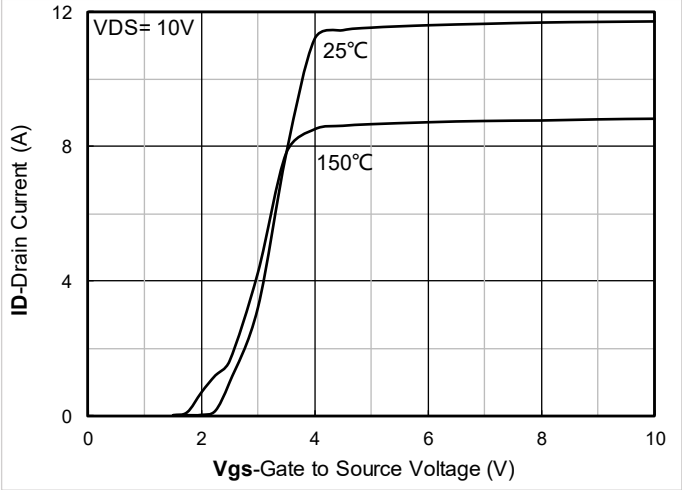


Figure 2. Transfer Characteristics

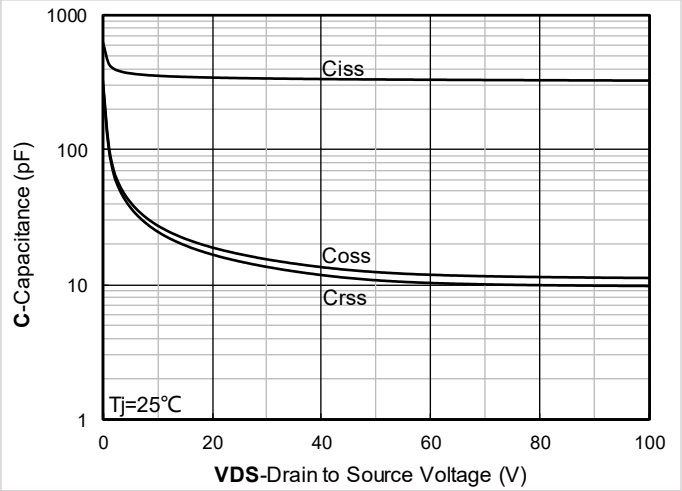


Figure 3. Capacitance Characteristics

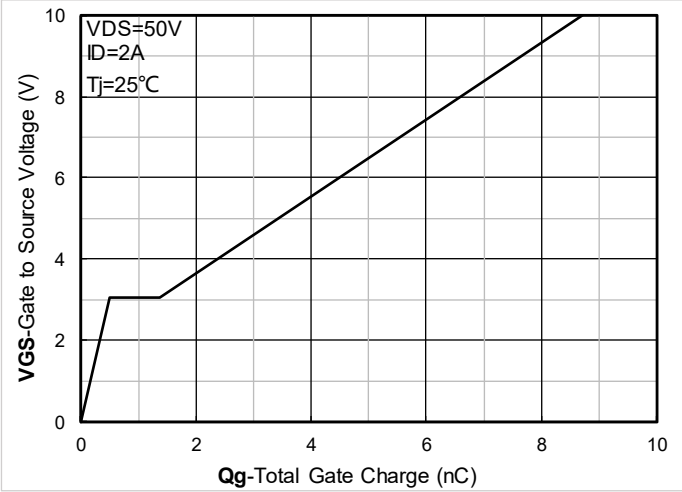


Figure 4. Gate Charge

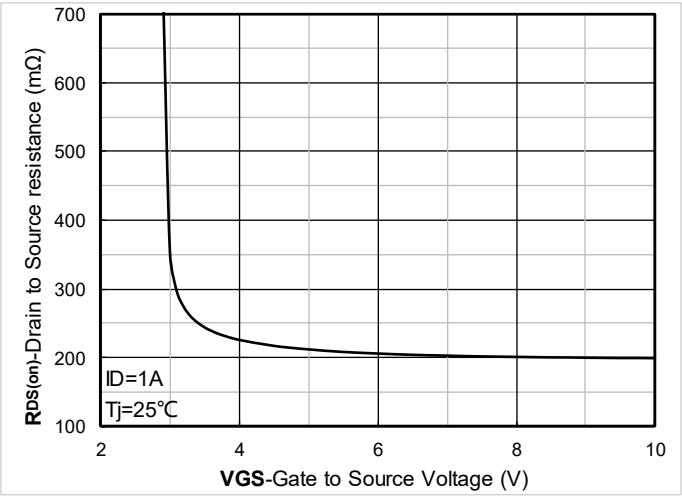


Figure 5. On-Resistance vs Gate to Source Voltage

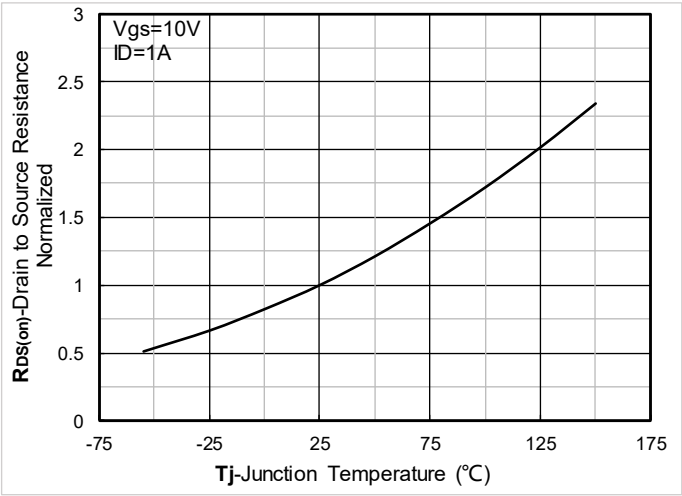


Figure 6. Normalized On-Resistan

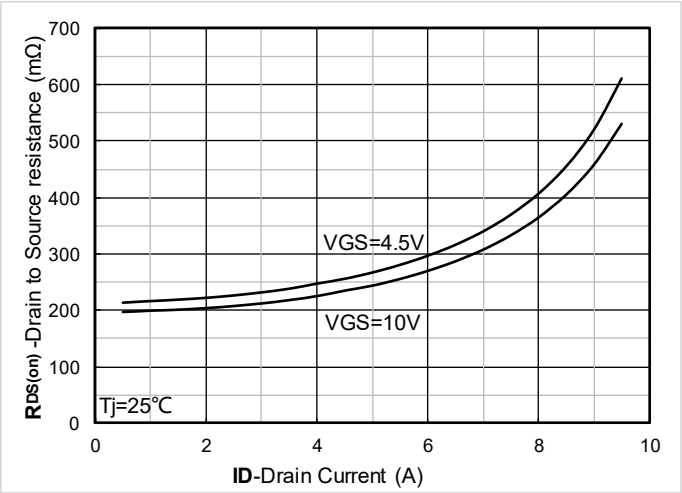


Figure 7. $R_{DS(on)}$ VS Drain Current

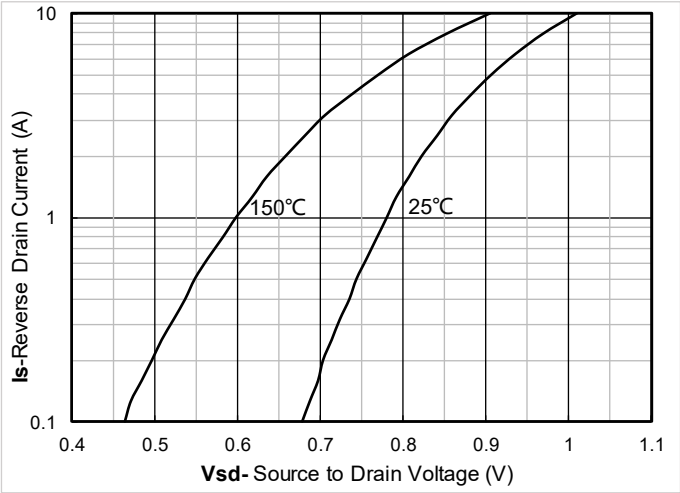


Figure 8. Forward characteristics of reverse diode

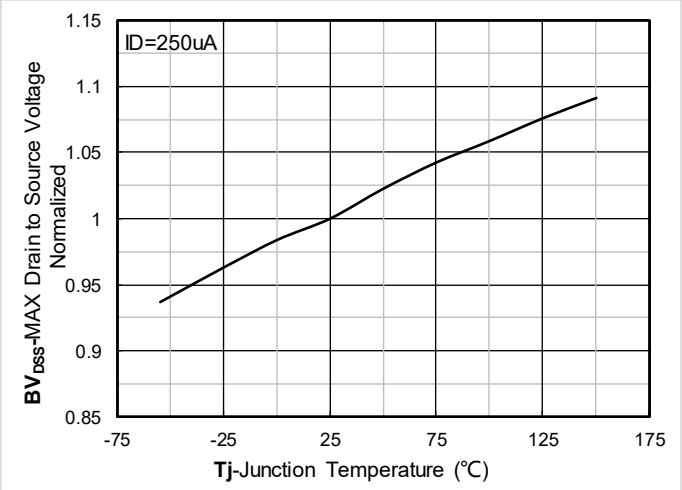


Figure 9. Normalized breakdown voltage

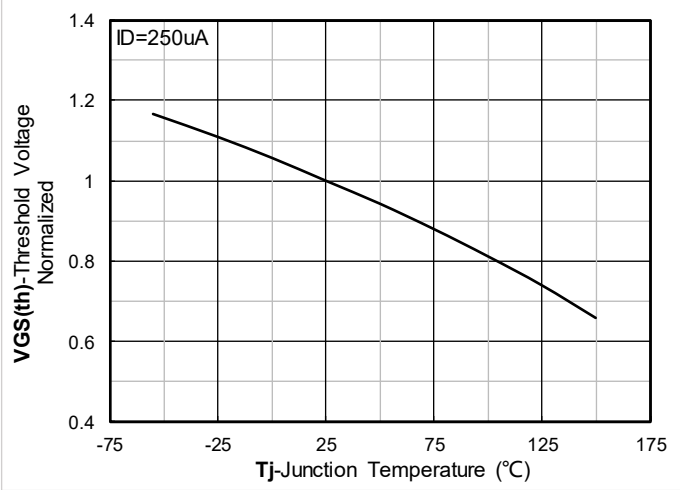


Figure 10. Normalized Threshold voltage

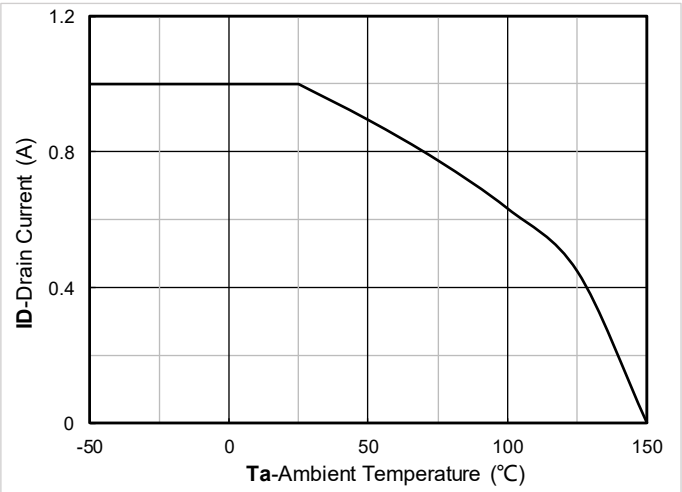


Figure 11. Current dissipation

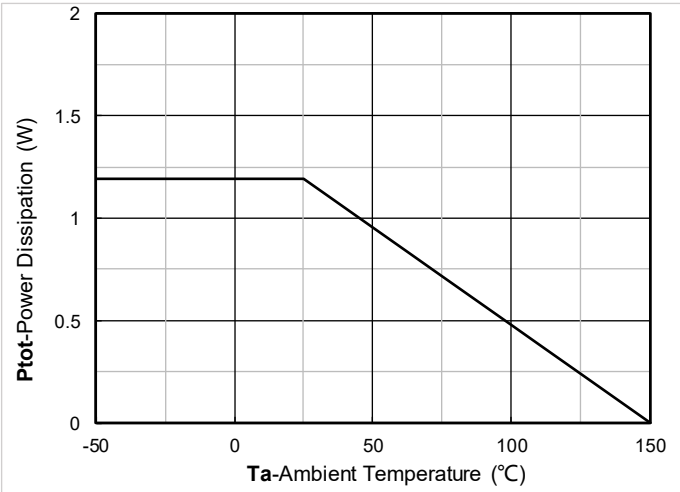


Figure 12. Power dissipation

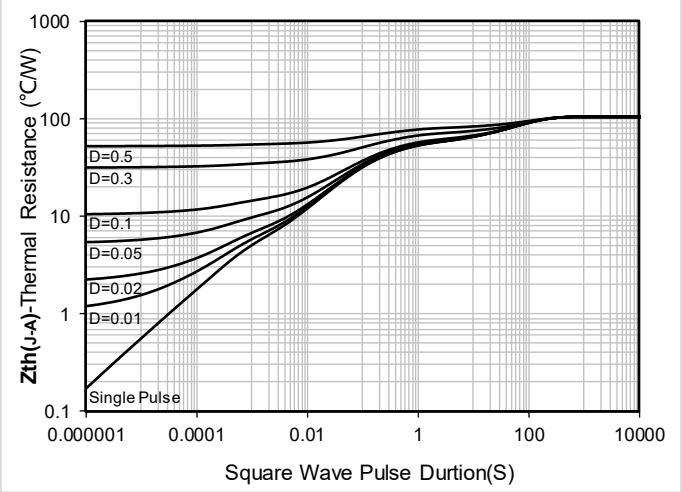


Figure 13. Maximum Transient Thermal Impedance

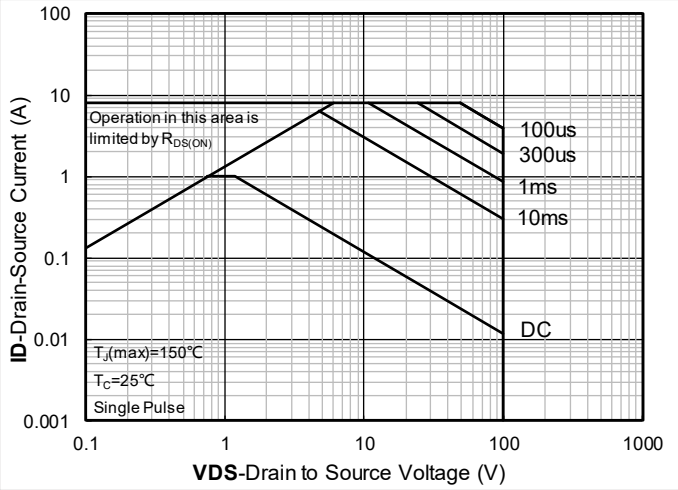


Figure 14. Safe Operation Area

■ PMOS Typical Electrical and Thermal Characteristics Diagrams

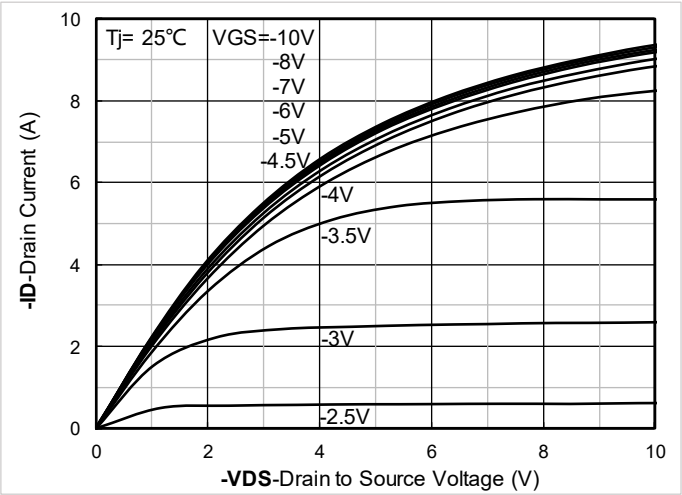


Figure 1. Output Characteristics

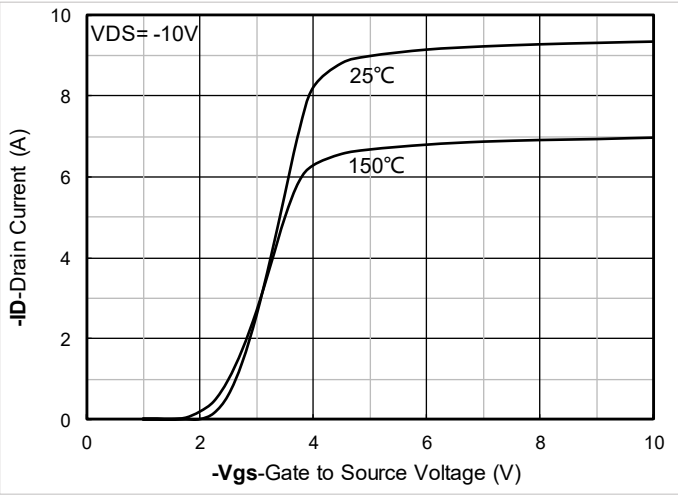


Figure 2. Transfer Characteristics

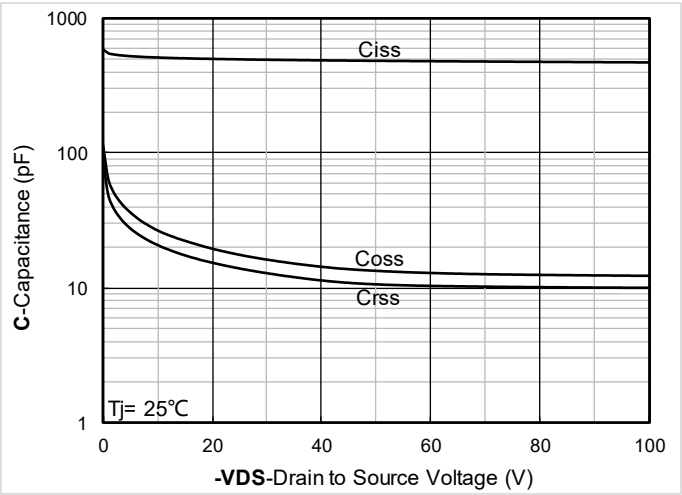


Figure 3. Capacitance Characteristics

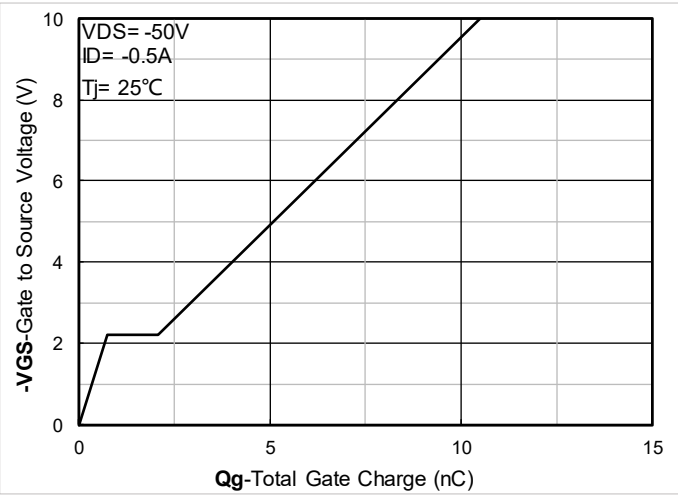


Figure 4. Gate Charge

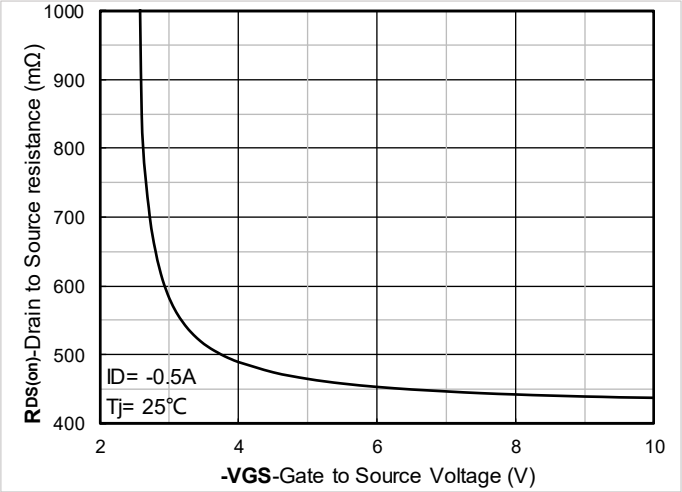


Figure 5. On-Resistance vs Gate to Source Voltage

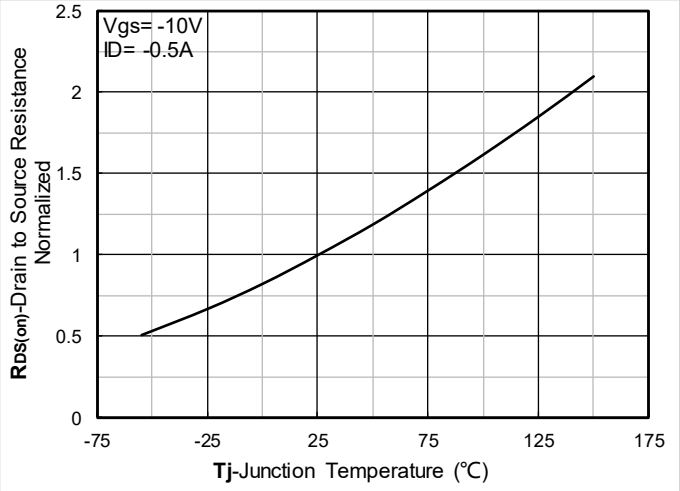


Figure 6. Normalized On-Resistance

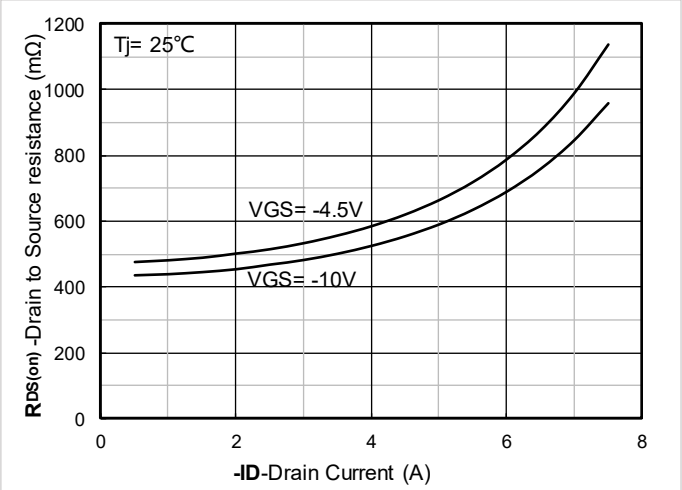


Figure 7. $R_{DS(on)}$ VS Drain Current

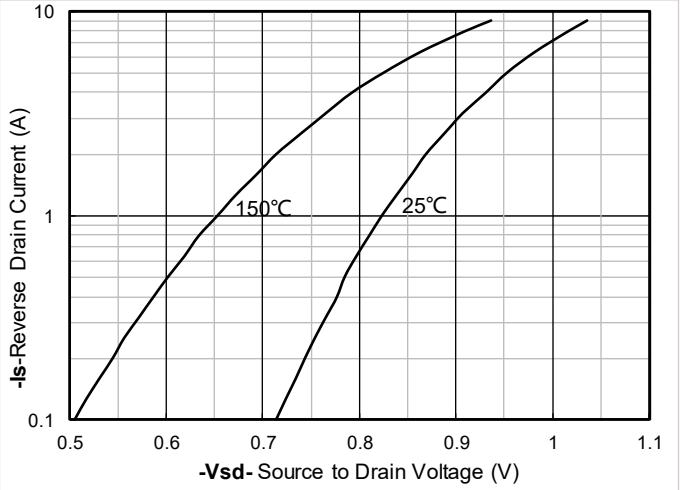


Figure 8. Forward characteristics of reverse diode

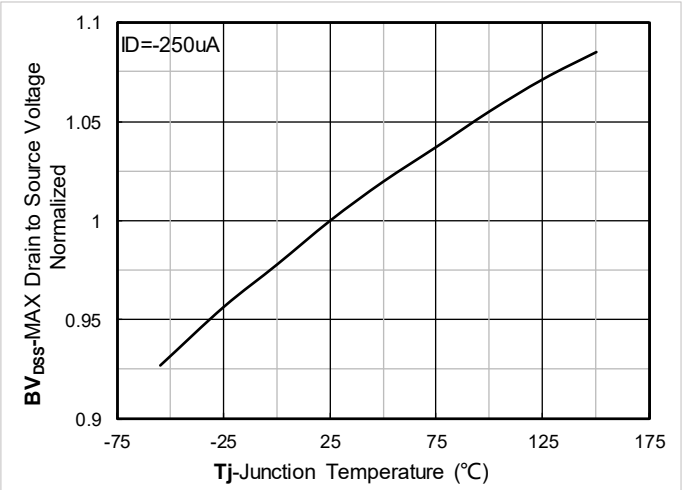


Figure 9. Normalized breakdown voltage

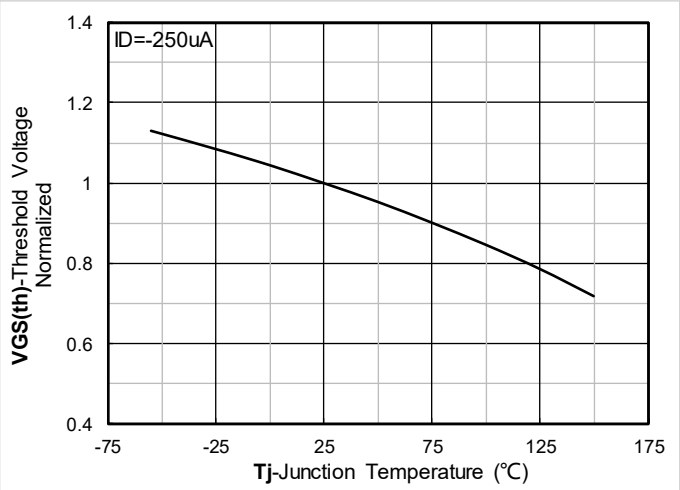


Figure 10. Normalized Threshold voltage

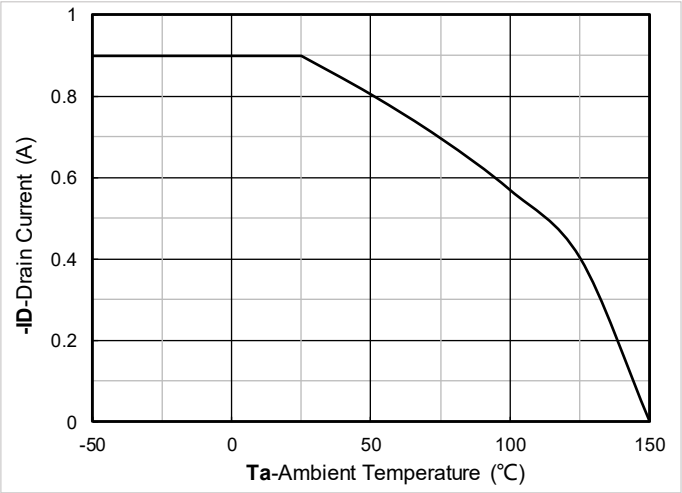


Figure 11. Current dissipation

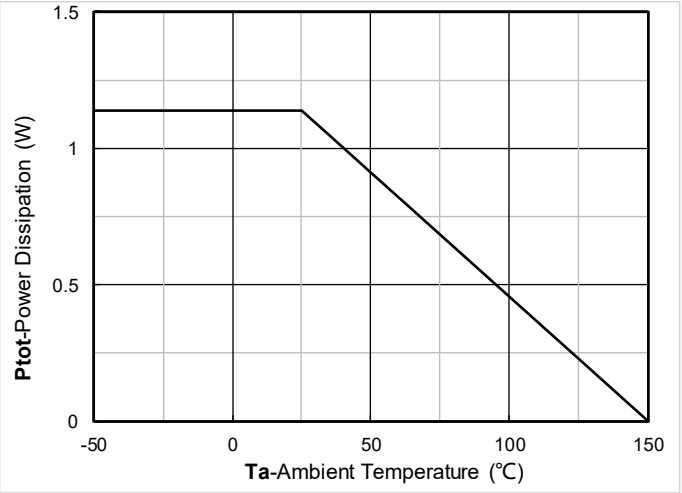


Figure 12. Power dissipation

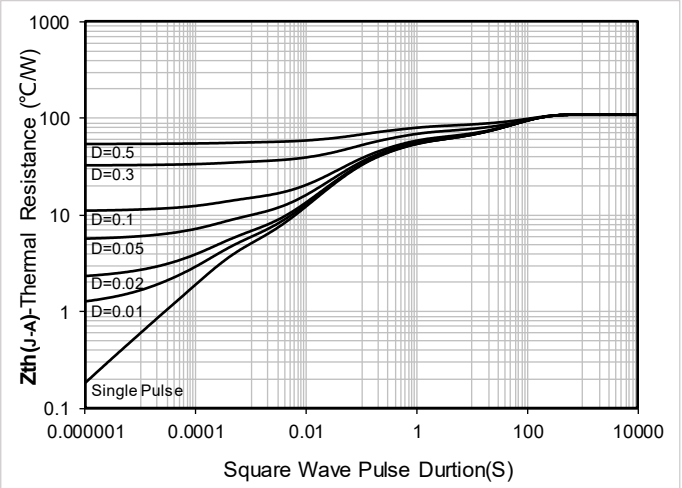


Figure 13. Maximum Transient Thermal Impedance

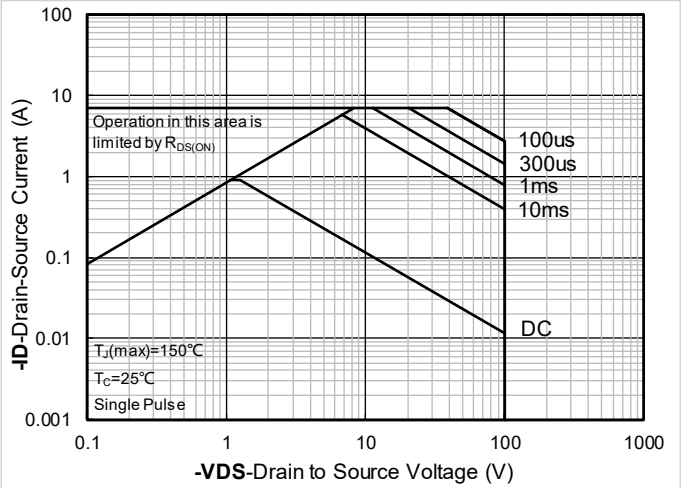
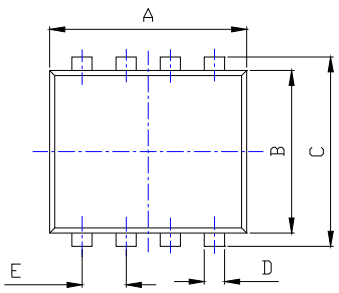
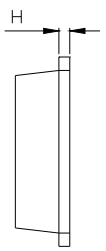


Figure 14. Safe Operation Area

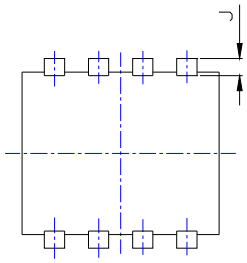
■ PDFN3030-8L Package information



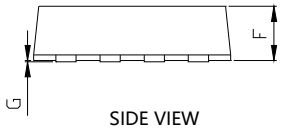
TOP VIEW



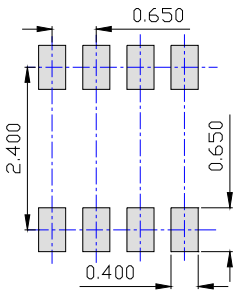
SIDE VIEW



BOTTOM VIEW



SIDE VIEW



SUGGESTED SOLDER PAD LAYOUT

UNIT：mm

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.108	0.120	2.750	3.050
B	0.089	0.100	2.250	2.550
C	0.104	0.116	2.650	2.950
D	0.008	0.016	0.200	0.400
E	0.026TYP		0.650TYP	
F	0.028	0.035	0.700	0.900
G	0.000	0.004	0.000	0.100
H	0.004	0.012	0.100	0.300
J	0.007	0.015	0.190	0.390

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

Notice

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in STARSEA's terms and conditions of sale for such products, STARSEA assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of STARSEA products including liability or warranties relating to fitness for a particular purpose, merchantability,or infringement of any patent, copyright, or other intellectual property right.