

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	11mΩ@10V	16A
	15mΩ@4.5V	
-30V	28mΩ@-10V	-8A
	38mΩ@-4.5V	


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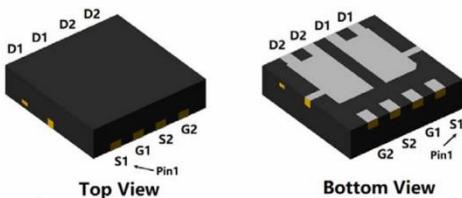
Feature

- Fast switching speed
- Surface mount package
- ROHS Compliant & Halogen-Free
- 100% Single Pulse avalanche energy Test

Applications

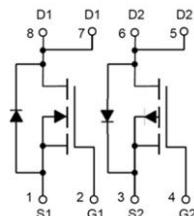
- DC-DC Converters.
- Motor Control.

Package

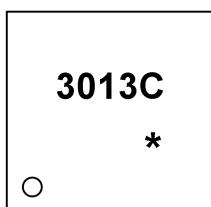


PDFN3X3-8L

Circuit diagram



Marking


 3013C :Device Code
 * :Month Code

Order Information

Device	Package	Unit/Tape
SP3013CNJ	PDFN3X3-8L	5000

Absolute maximum ratings (Ta=25°C,unless otherwise noted)

Parameter	Symbol	Rating		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V _{DS}	30	-30	V
Gate-Source Voltage	V _{GS}	±20	±20	V
Continuous Drain Current(Tc=25°C)	I _D	16	-8	A
Pulse Drain Current Tested	I _{DM}	64	-32	A
Single pulsed avalanche energy ¹	E _{AS}	42	36	mJ
Power Dissipation(Tc=25°C)	P _D	14		W
Thermal Resistance Junction-to-Case	R _{θJC}	8.9		°C/W
Storage Temperature Range	T _{STG}	-55 to 150		°C
Operating Junction Temperature Range	T _J	-55 to 150		°C

N-Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	30	-	-	V
Drain-Source Leakage Current	I _{DSS}	VDS=24V , VGS=0V , TJ=25°C	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	VGS=VDS , ID =250uA	1.0	1.5	2.2	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS = 10V, ID = 8A	-	11	15	mΩ
		VGS = 4.5V, ID = 6A	-	15	28	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=15V , VGS=0V , f=1MHz	-	940	-	pF
Output Capacitance	C _{oss}		-	131	-	
Reverse Transfer Capacitance	C _{rss}		-	109	-	
Total Gate Charge	Q _g	VDS=15V , VGS=4.5V , ID=8A	-	9.6	-	nC
Gate-Source Charge	Q _{gs}		-	3.9	-	
Gate-Drain Charge	Q _{gd}		-	3.4	-	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	VDD=15V VGS=10V , RG=3Ω, ID=8A	-	4.2	-	nS
Rise Time	T _r		-	8.2	-	
Turn-Off Delay Time	T _{d(off)}		-	31	-	
Fall Time	T _f		-	4	-	
Diode Characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=1A , TJ=25°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _s		-	-	16	A
Reverse recover time	T _{rr}	Is=20A, di/dt=100A/us, Tj=25°C	-	1.2	-	nS
Reverse recovery charge	Q _{rr}		-	9	-	nC

Note:

1. The EAS Test condition is VDD=15V,VGS =10V,L = 0.1mH, Rg=25Ω

P-Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=-250uA	-30	-	-	V
Drain-Source Leakage Current	I _{DSS}	VDS=-24V , VGS=0V , TJ=25°C	-	-	-1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	VGS=VDS , ID =-250uA	-1.0	-1.6	-2.5	V
Static Drain-Source On-Resistance	R _{D(on)}	VGS =-10V, ID =-6.5A	-	28	42	mΩ
		VGS =-4.5V, ID =-5A	-	38	55	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=-15V , VGS=0V , f=1MHz	-	850	-	pF
Output Capacitance	C _{oss}		-	116	-	
Reverse Transfer Capacitance	C _{rss}		-	112	-	
Total Gate Charge	Q _g	VDS=-15V , VGS=-10V , ID=-6.5A	-	13	-	nC
Gate-Source Charge	Q _{gs}		-	2.6	-	
Gate-Drain Charge	Q _{gd}		-	2.2	-	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	VDD=-15V VGS=-10V , RG=3Ω, ID=-4A	-	7.5	-	nS
Rise Time	T _r		-	5.5	-	
Turn-Off Delay Time	T _{d(off)}		-	19	-	
Fall Time	T _f		-	7	-	
Diode Characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=-1A , TJ=25°C	-	-	-1.2	V
Maximum Body-Diode Continuous Current	I _S	IS=-20A, di/dt=-100A/us, TJ=25°C	-	-	-8	A
Reverse recover time	T _{rr}		-	0.9	-	nS
Reverse recovery charge	Q _{rr}		-	7	-	nC

Note:

2. The EAS Test condition is VDD=-15V,VGS =-10V,L = 0.5mH, Rg=25Ω



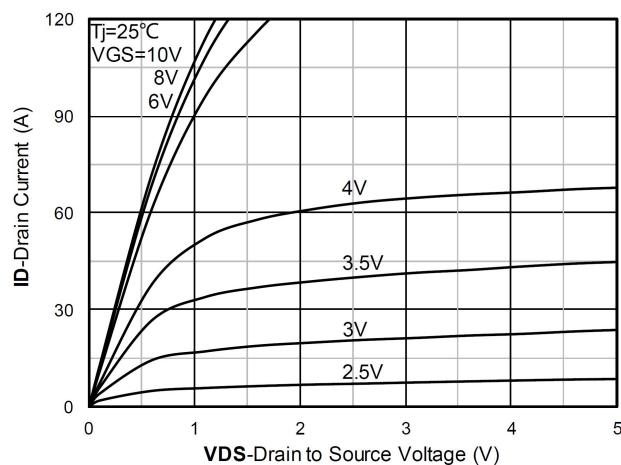
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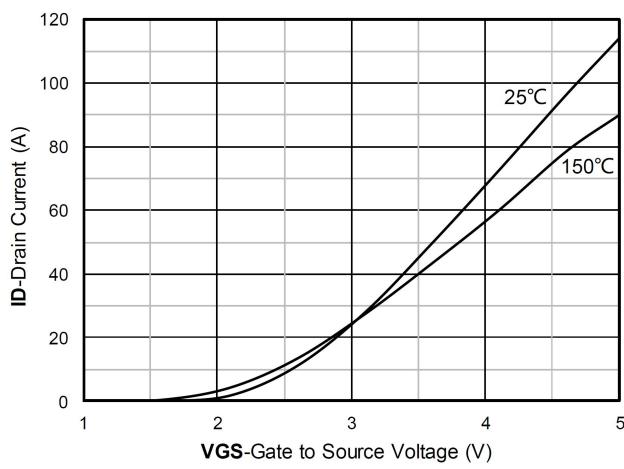
SP3013CNJ

30V Complementary MOSFET

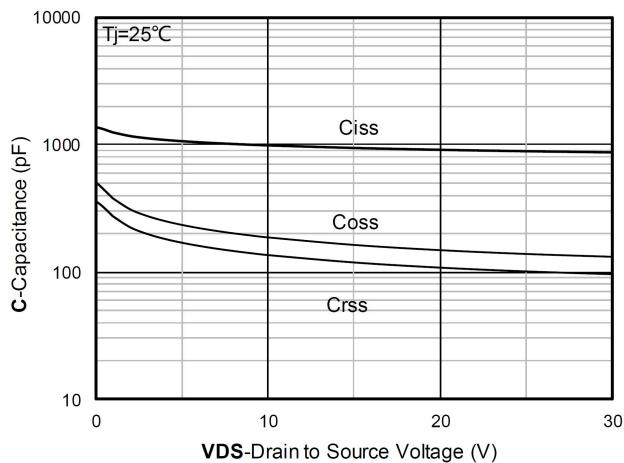
N-Channel Typical Characteristics



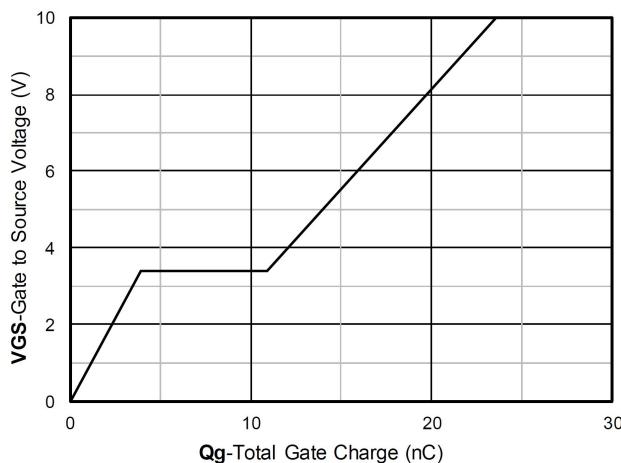
Output Characteristics



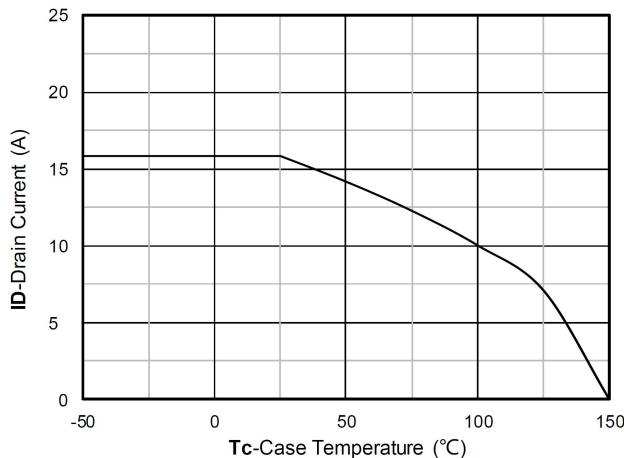
Transfer Characteristics



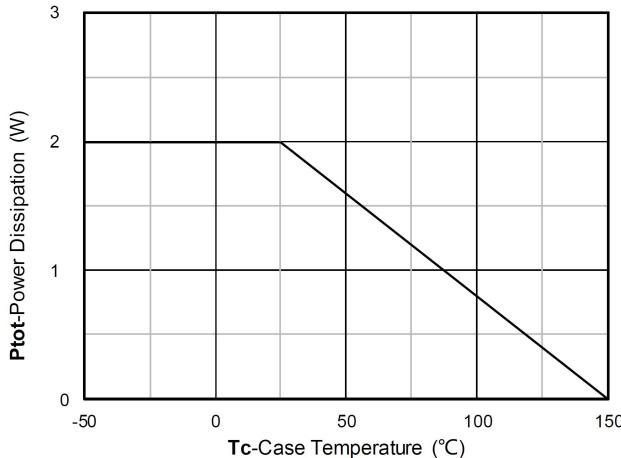
Capacitance Characteristics



Gate Charge



Current dissipation



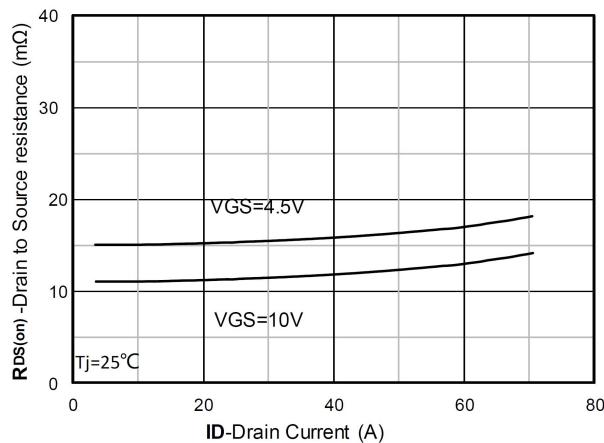
Power dissipation



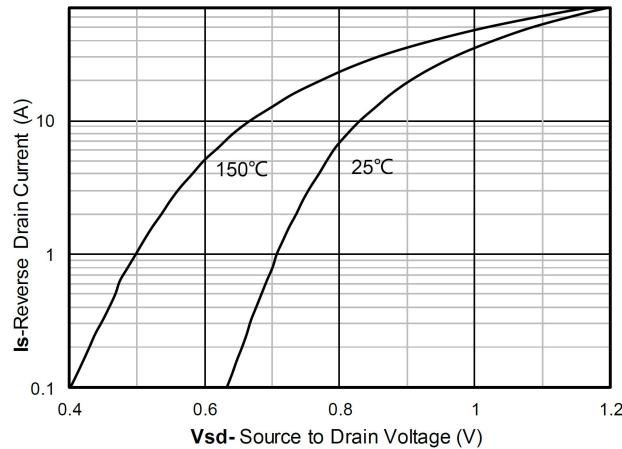
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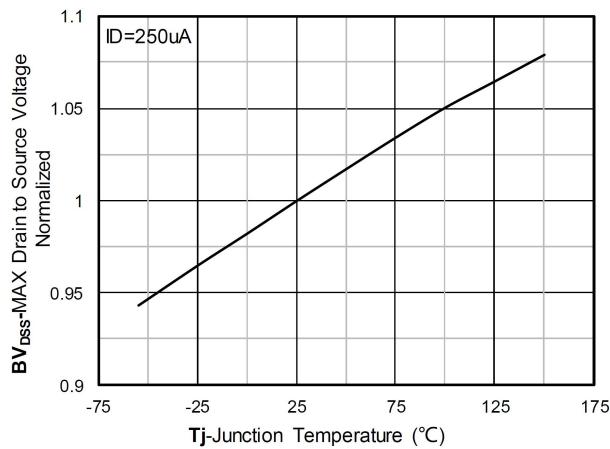
30V Complementary MOSFET



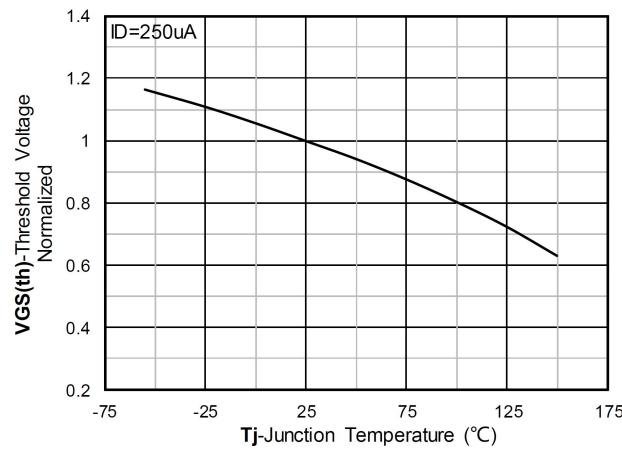
R_{DS(on)} VS Drain Current



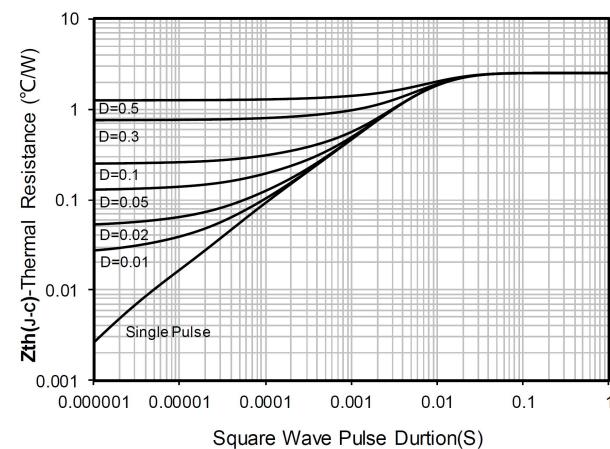
Forward characteristics of reverse diode



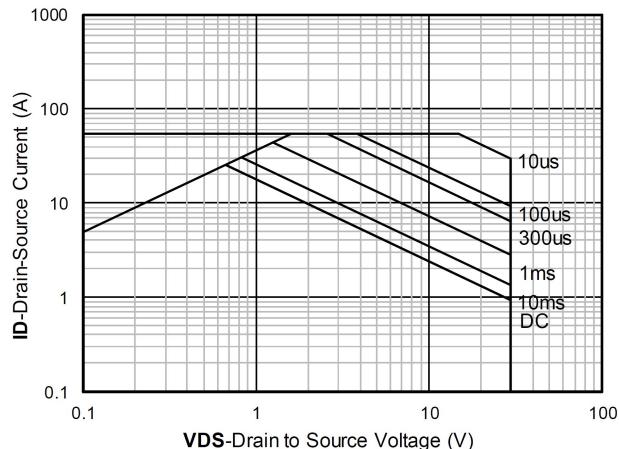
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area



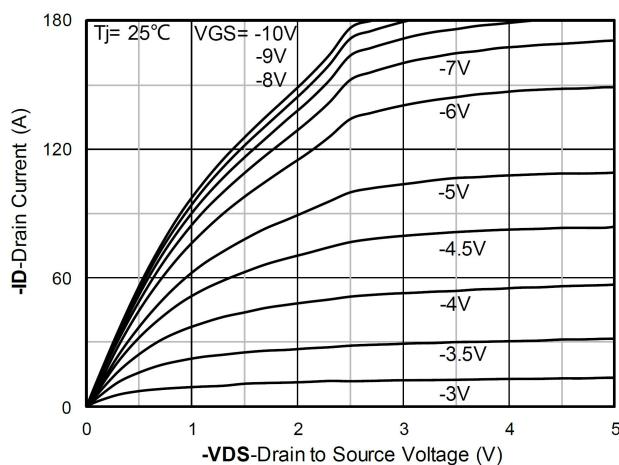
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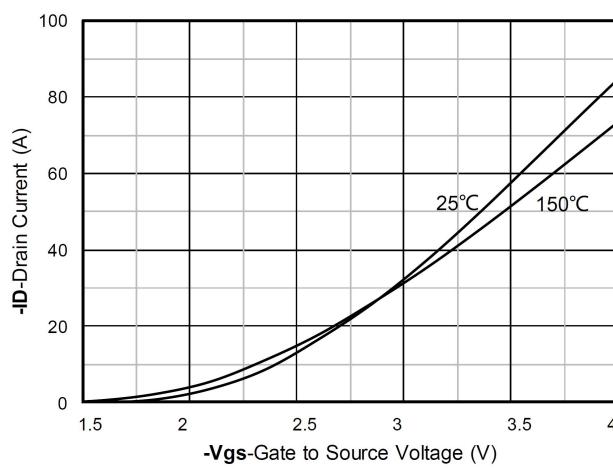
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30V Complementary MOSFET

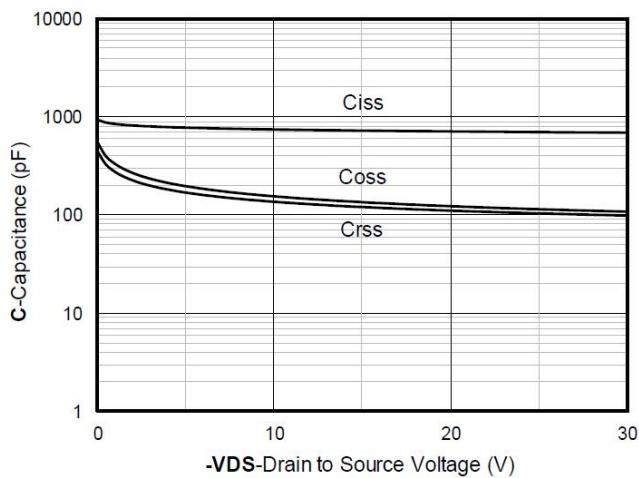
P-Channel Typical Characteristics



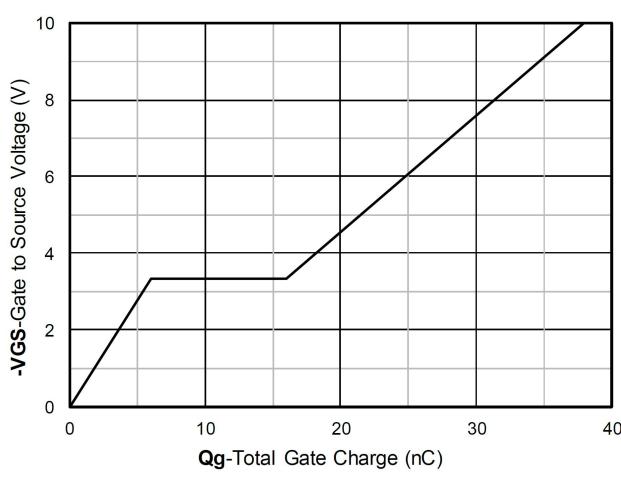
Output Characteristics



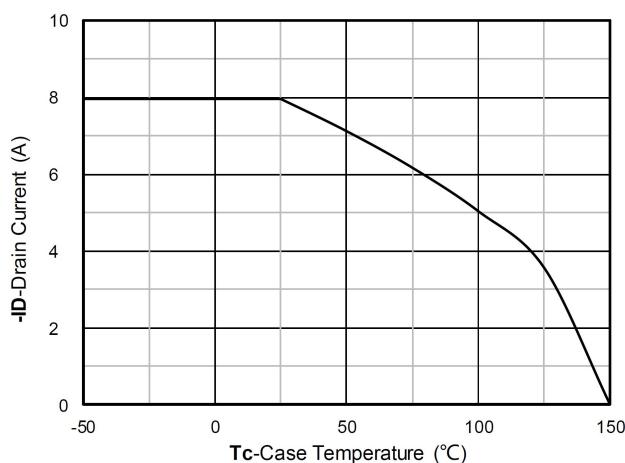
Transfer Characteristics



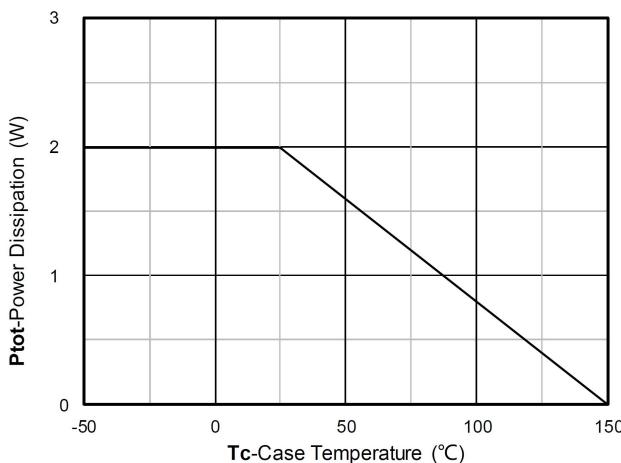
Capacitance Characteristics



Gate Charge



Current dissipation



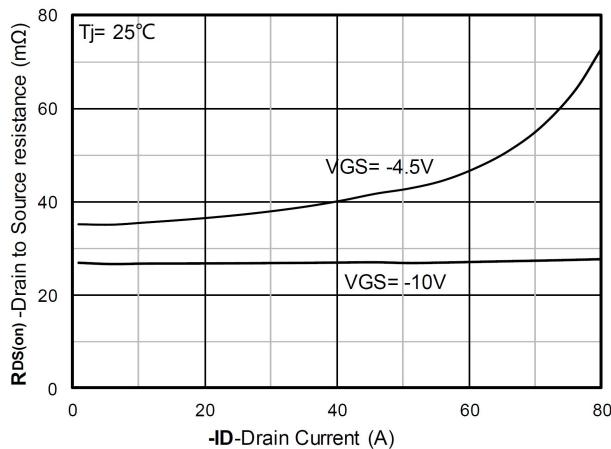
Power dissipation



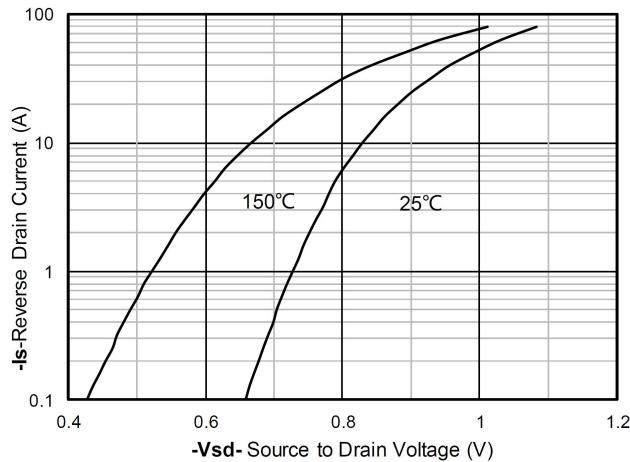
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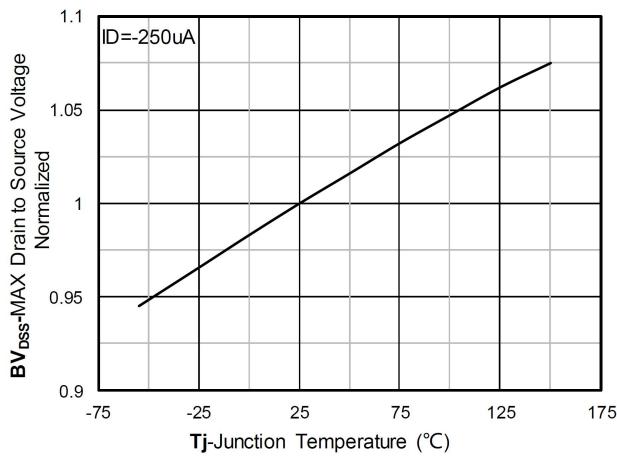
30V Complementary MOSFET



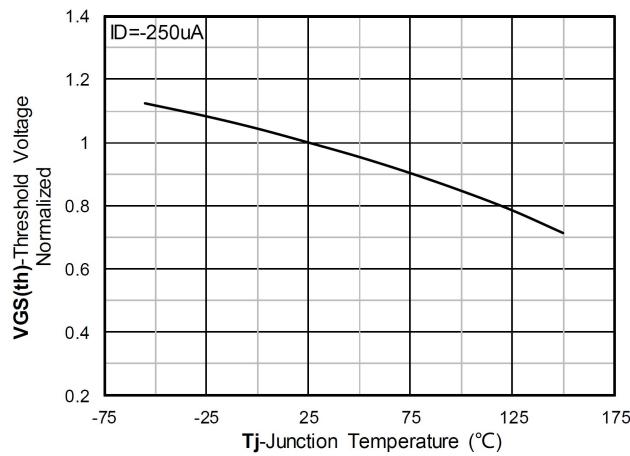
$R_{DS(on)}$ VS Drain Current



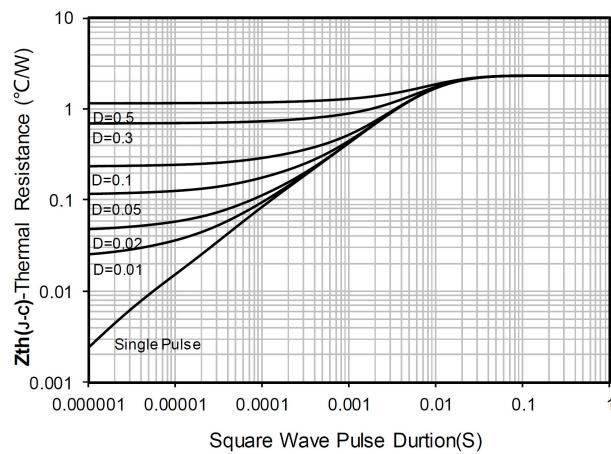
Forward characteristics of reverse diode



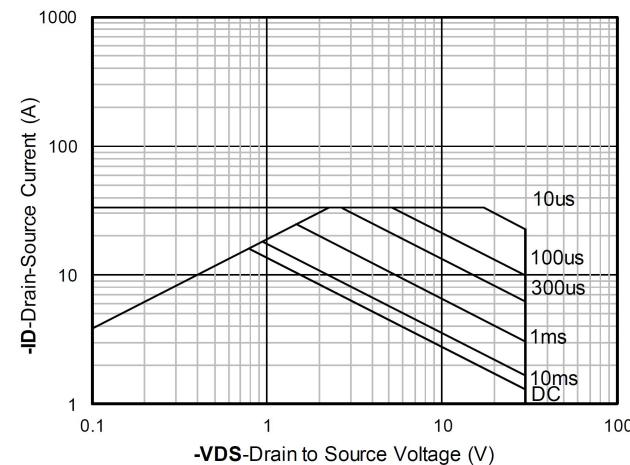
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

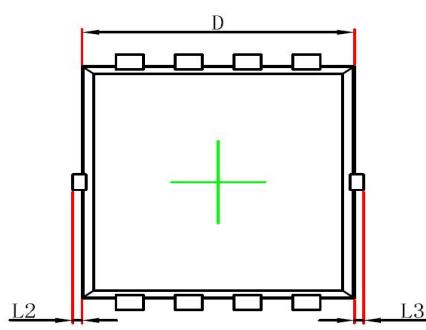


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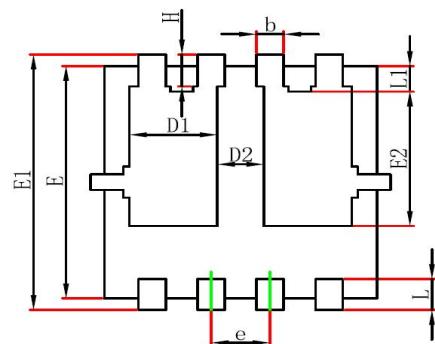
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30V Complementary MOSFET

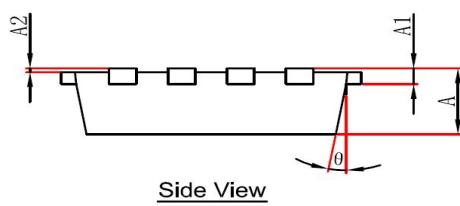
PDFN3X3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05			0~0.002
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100			0~0.004
L3	0~0.100			0~0.004
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°