

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	15mΩ@10V	20A
	19mΩ@4.5V	
-20V	25mΩ@-10V	-19A
	30mΩ@-4.5V	



合肥矽普半导体

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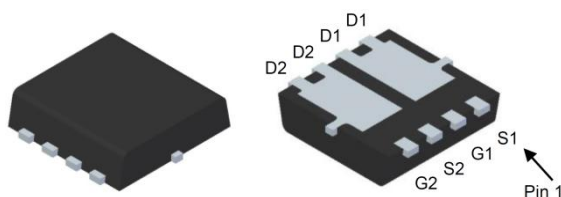
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge

Application

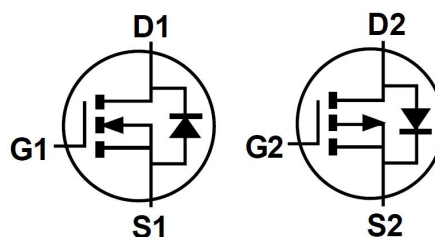
- Bridge
- Inverters

Package

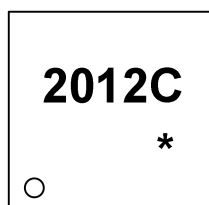


PDFN3X3-8L

Circuit diagram



Marking



2012C = Device code
* = Month Code

Order Information

Device	Package	Unit/Tape
SP2012CNJ	PDFN3 × 3-8L	5000

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

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Continuous Drain Current($t \leq 10s$)	I_D	20	-19	A
Power Dissipation($t \leq 10s$)	P_D	14		W
Thermal Resistance from Junction to Cassette($t \leq 10s$)	$R_{\theta JC}$	8.9		$^{\circ}C/W$
Junction Temperature	T_J	150		$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}C$

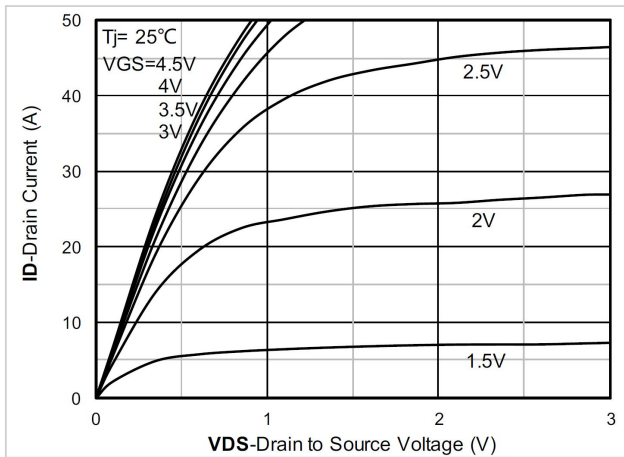
N-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V,V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V,V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	0.5	0.7	1.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =8A		15	19	mΩ
		V _{GS} =2.5V, I _D =6A		19	25	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V,V _{GS} =0V, f=1.0MHz		630		pF
Output Capacitance	C _{oss}			131		pF
Reverse Transfer Capacitance	C _{rss}			112		pF
Switching Times						
Turn-on Delay Time	t _{d(on)}	V _{GS} =4.5V, V _{DS} =12V, I _D =10A,R _{GEN} =3.0Ω		4.2		nS
Turn-on Rise Time	t _r			16		nS
Turn-Off Delay Time	t _{d(off)}			18		nS
Turn-Off Fall Time	t _f			7.4		nS
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =12V, I _D =10A		12.6		nC
Gate-Source Charge	Q _{gs}			2.2		nC
Gate-Drain Charge	Q _{gd}			3.1		nC
Source-Drain Diode Characteristics						
Gate-Drain Charge	V _{SD}	V _{GS} =0V,I _S =1A			1.2	V

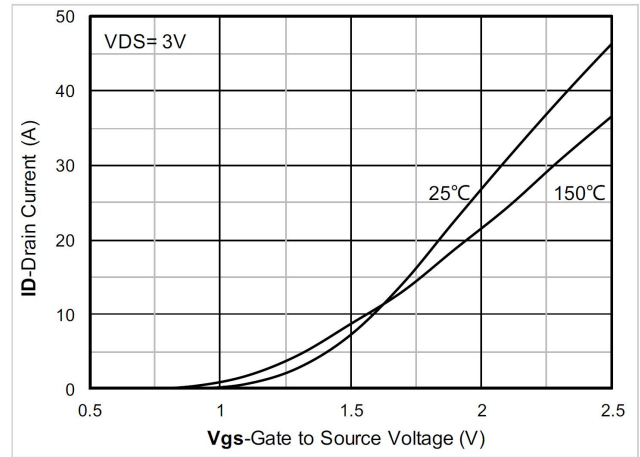
P-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=-250uA	-20			V
Drain-Source Leakage Current	I _{DSS}	VDS=-20V , VGS=0V , TJ=25℃			1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±12V , VDS=0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	VGS=VDS , ID =-250uA	-0.5	-0.7	-1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS=-4.5V , ID=-6A		25	31	mΩ
		VGS=-2.5V , ID=-4A		30	40	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=-10V , VGS=0V , f=1MHz		868		pF
Output Capacitance	C _{oss}			151		
Reverse Transfer Capacitance	C _{rss}			115		
Total Gate Charge (-4.5V)	Q _g	VDS=-10V , VGS=-4.5V , ID=-12A		40.1		nC
Gate-Source Charge	Q _{gs}			8.3		
Gate-Drain Charge	Q _{gd}			9.1		
Turn-On Delay Time	T _{d(on)}	VDD=-12V , VGS=-4.5V , RG=3.0Ω, ID=-1A		9		ns
Rise Time	T _r			19		
Turn-Off Delay Time	T _{d(off)}			75		
Fall Time	T _f			48		
Source-Drain Diode characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=-1A , TJ=25℃			-1.2	V

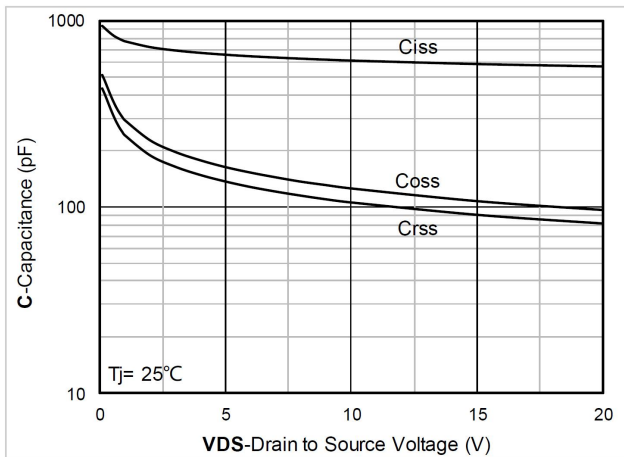
N-Channel Typical Characteristics



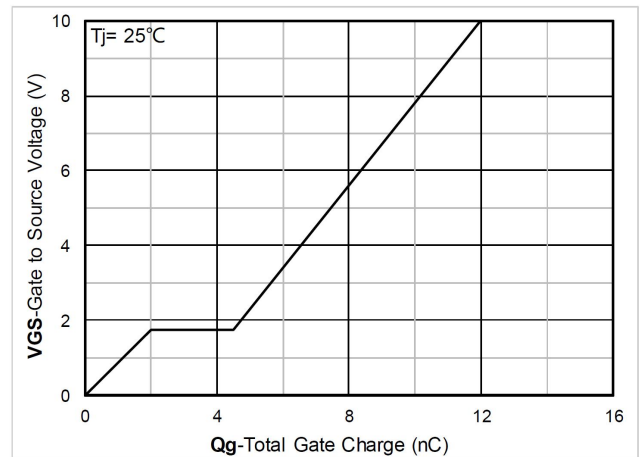
Output Characteristics



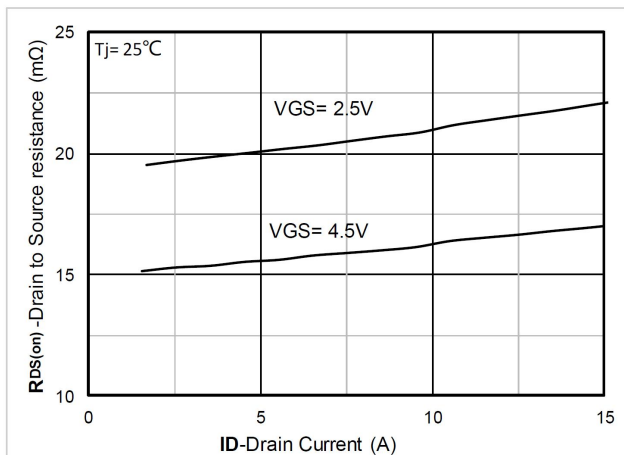
Transfer Characteristics



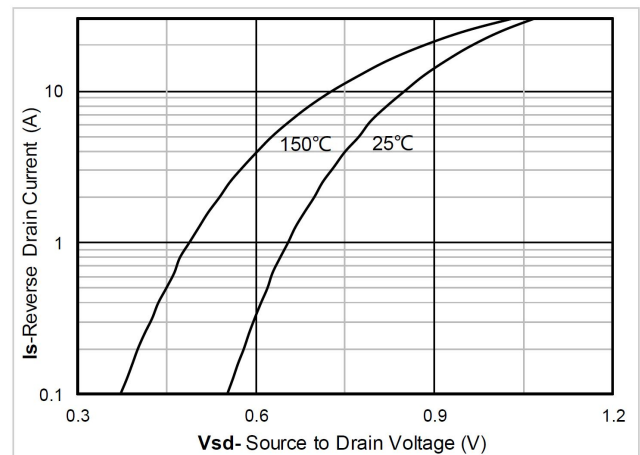
Capacitance Characteristics



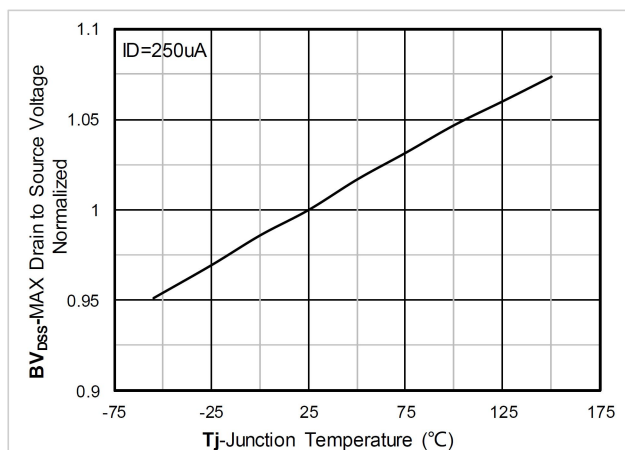
Gate Charge



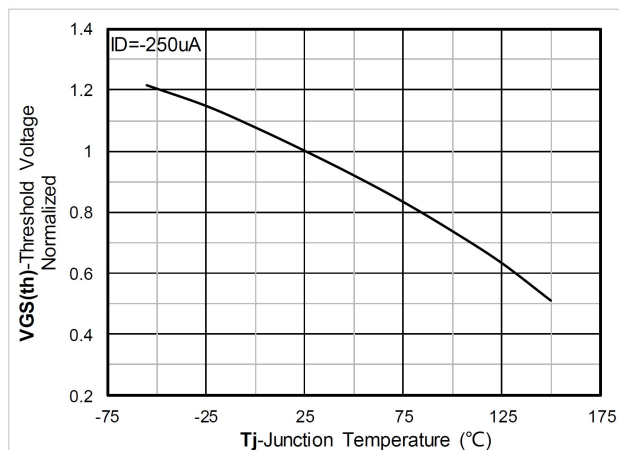
RDS(on) VS Drain Current



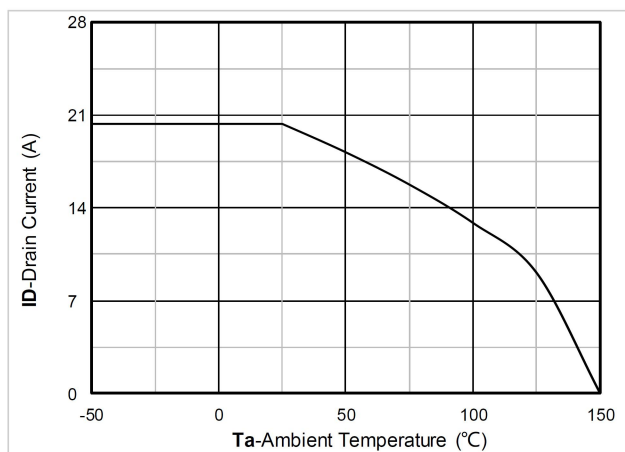
Forward characteristics of reverse diode



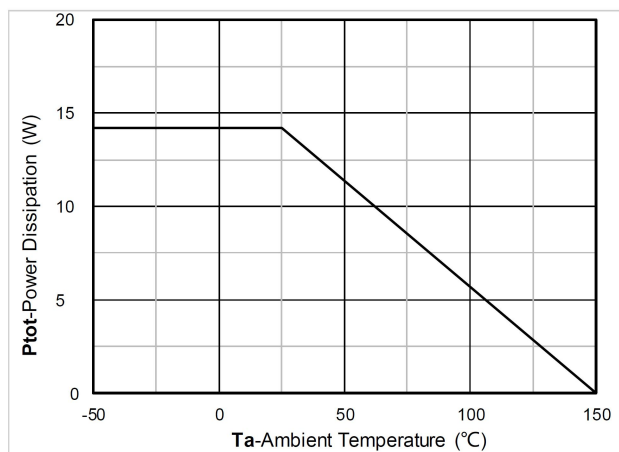
Normalized breakdown voltage



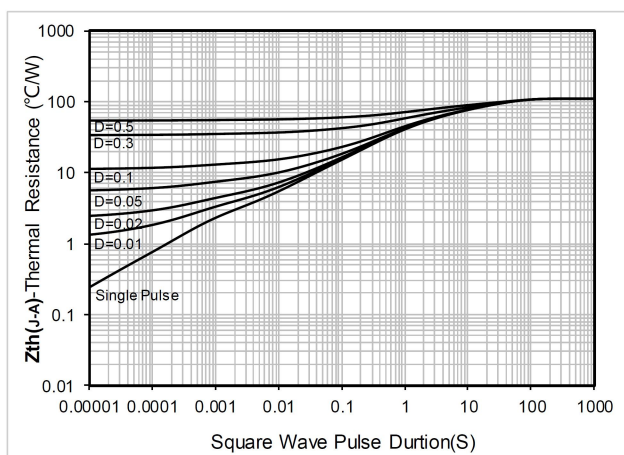
Normalized Threshold voltage



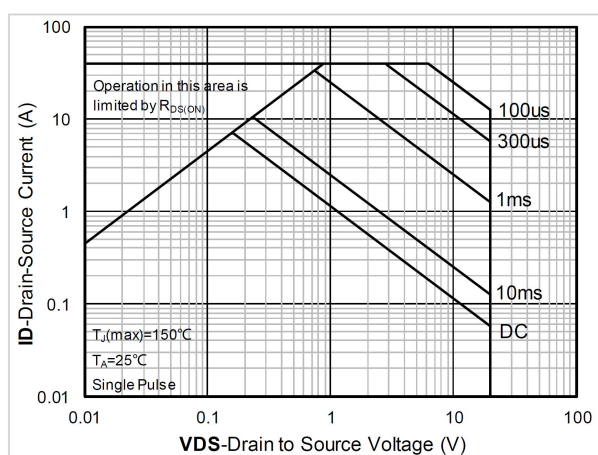
Current dissipation



Power dissipation

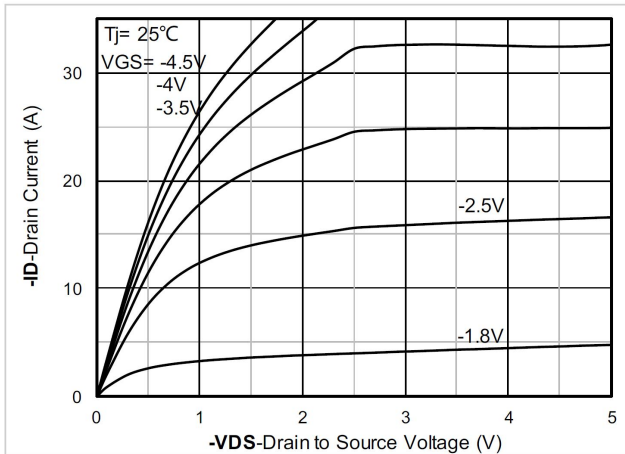


Maximum Transient Thermal Impedance

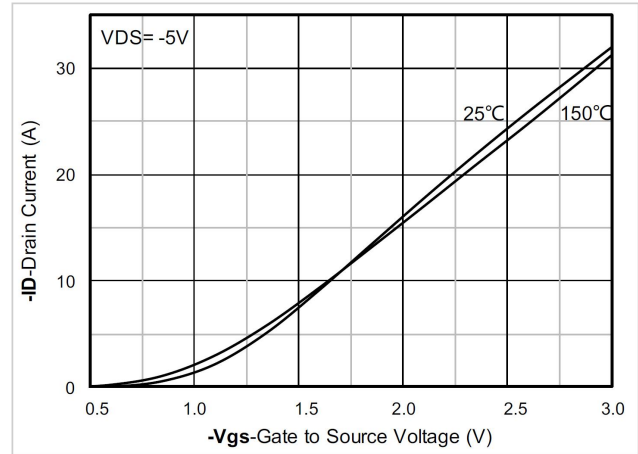


Safe Operation Area

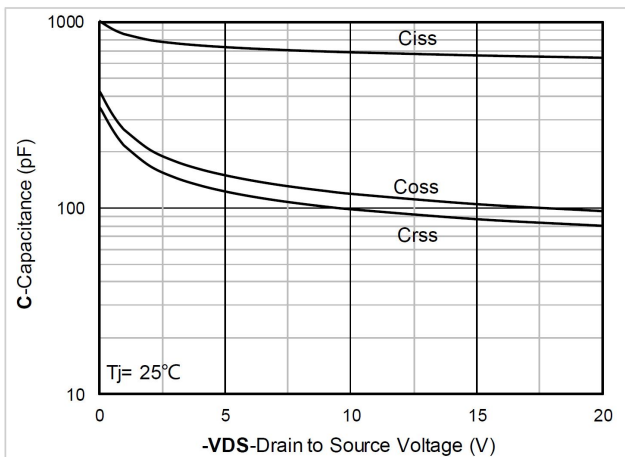
P-Channel Typical Characteristics



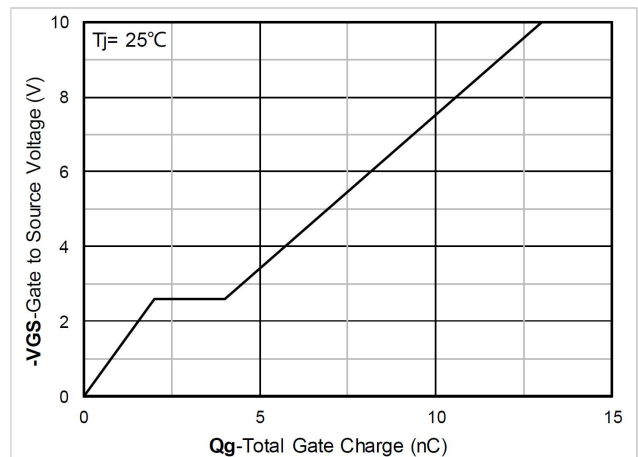
Output Characteristics



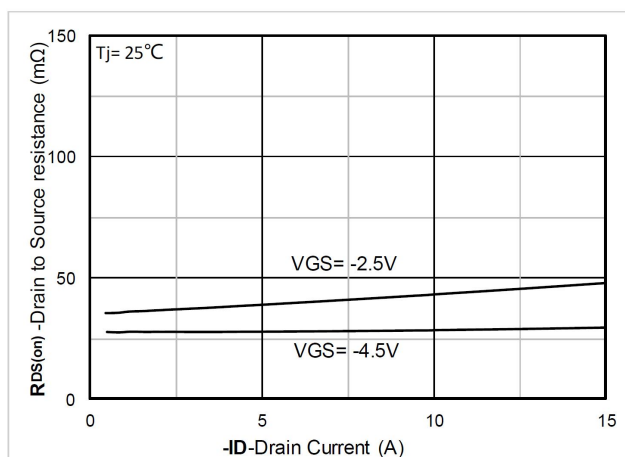
Transfer Characteristics



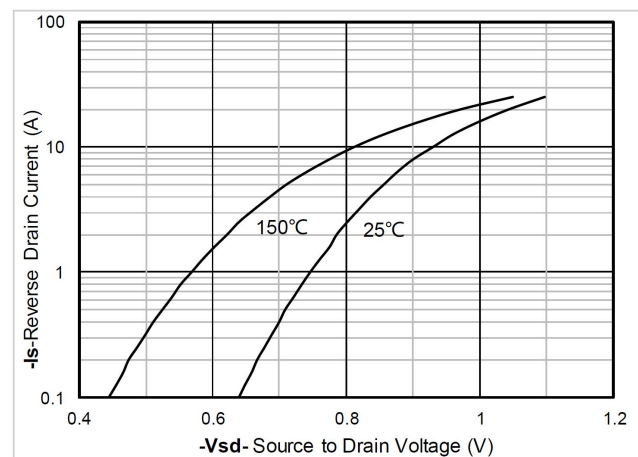
Capacitance Characteristics



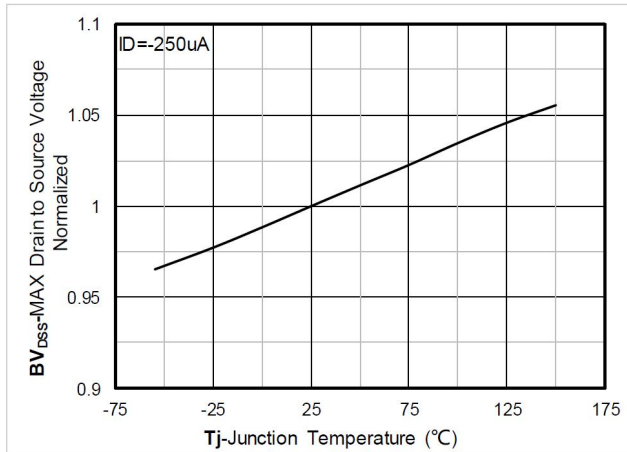
Gate Charge



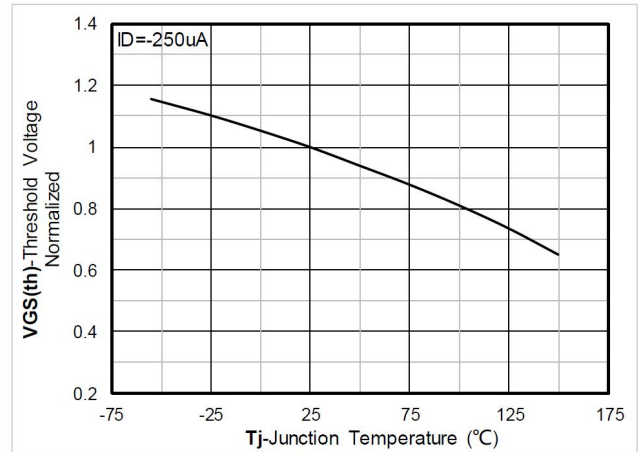
$R_{DS(on)}$ VS Drain Current



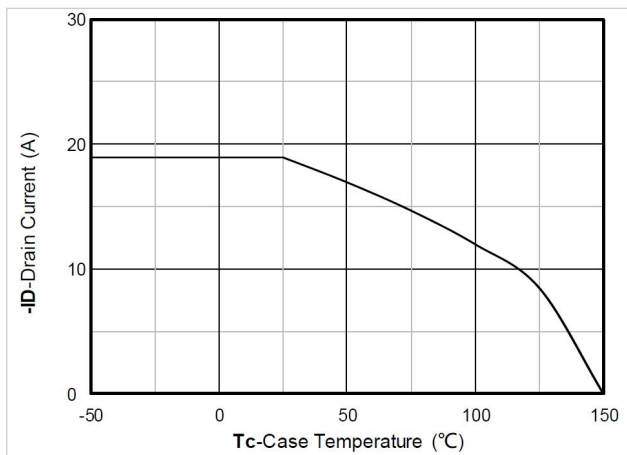
Forward characteristics of reverse diode



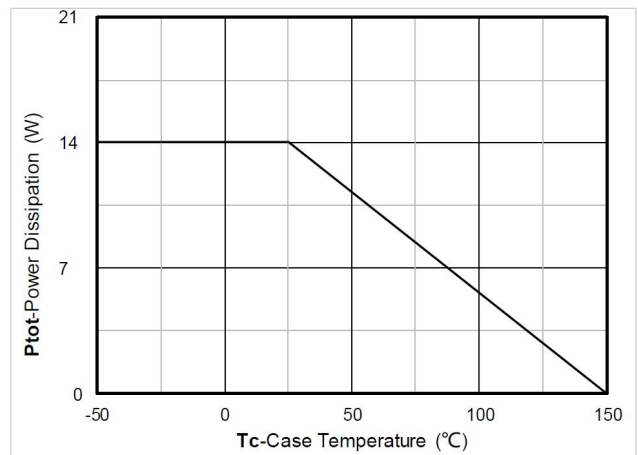
Normalized breakdown voltage



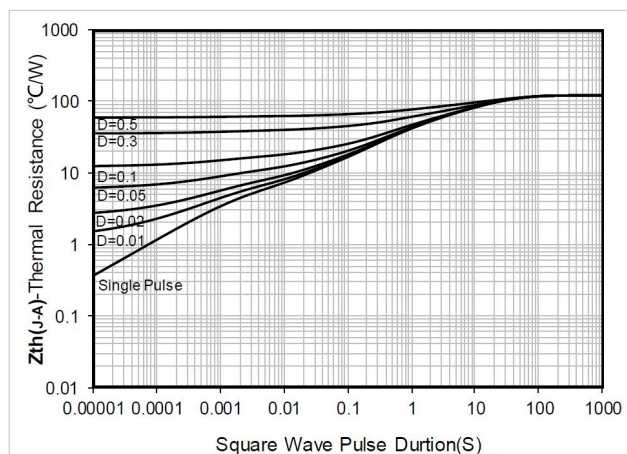
Normalized Threshold voltage



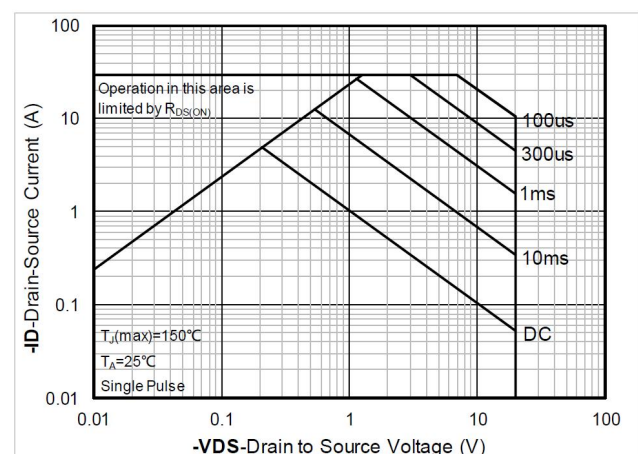
Current dissipation



Power dissipation

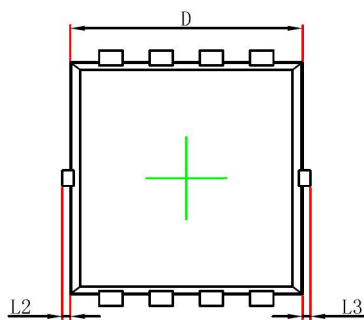


Maximum Transient Thermal Impedance

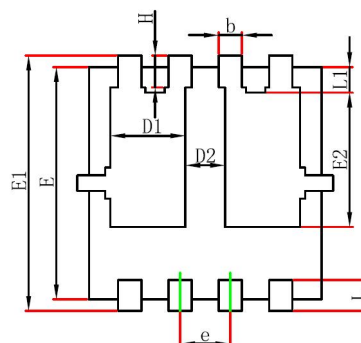


Safe Operation Area

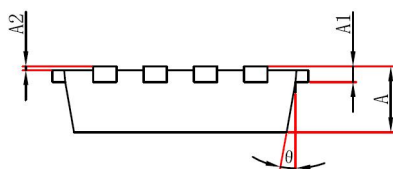
PDFN3X3-8L Package Information



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°