

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-16V	13m Ω @-4.5V	-20A
	16m Ω @-2.5V	



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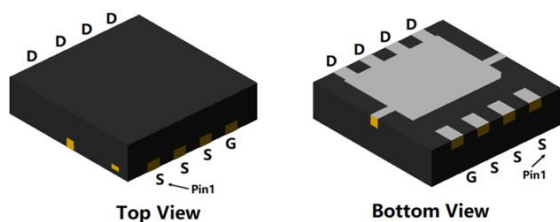
Feature

- Fast switching speed
- Low On-Resistance
- 100% Single Pulse avalanche energy Test

Applications

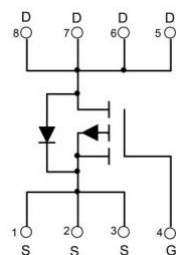
- DC-DC Converters.
- Power Management

Package

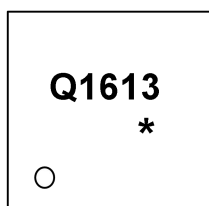


PDFN3X3-8L

Circuit diagram



Marking



Q1613 :Device Code
* :Month Code

Order Information

Device	Package	Unit/Tape
SP1613NJ	PDFN3X3-8L	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-16	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current (Tc=25°C)	I_D	-20	A
Continuous Drain Current (Tc=100°C)	I_D	-13	A
Pulse Drain Current Tested	I_{DM}	-80	A
Single Pulse Avalanche Energy ¹	E_{AS}	39	mJ
Power Dissipation (Tc=25°C)	P_D	23	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	5.4	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

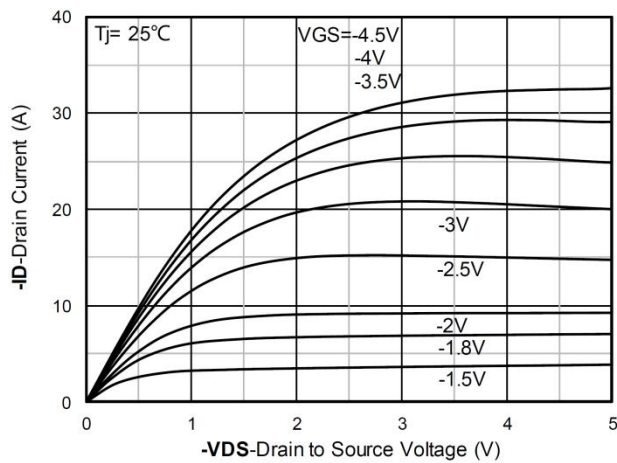
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=-250uA	-16	-	-	V
Drain-Source Leakage Current	IDSS	VDS=-12V , VGS=0V , TJ=25℃	-	-	-1	uA
Gate-Source Leakage Current	IGSS	VGS=±12V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =-250uA	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=-4.5V , ID=-5A	-	13	18	mΩ
		VGS=-2.5V , ID=-4A	-	16	22	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=-10V , VGS=0V , f=1MHz	-	2050	-	pF
Output Capacitance	Coss		-	411	-	
Reverse Transfer Capacitance	Crss		-	362	-	
Total Gate Charge	Qg	VDS=-16V , VGS=-10V , ID=-10A	-	30	-	nC
Gate-Source Charge	Qgs		-	5.3	-	
Gate-Drain Charge	Qgd		-	7.6	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=-16V, VGS=-10V ,RG=3Ω, ID=-6A	-	14	-	nS
Rise Time	Tr		-	20	-	
Turn-Off Delay Time	Td(off)		-	95	-	
Fall Time	Tf		-	65	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V

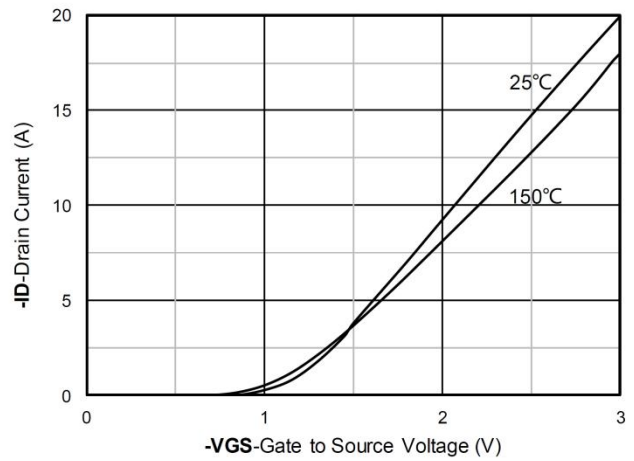
Note:

- The EAS test condition is $V_{DD}=-15V, V_G=-10V, L=0.1mH, R_G=25\Omega$

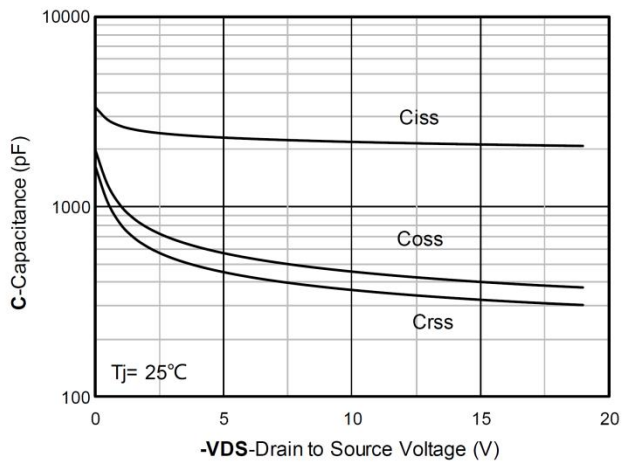
Typical Characteristics



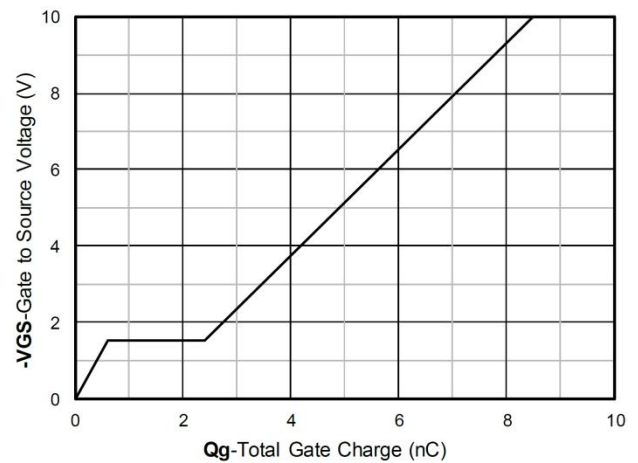
Output Characteristics



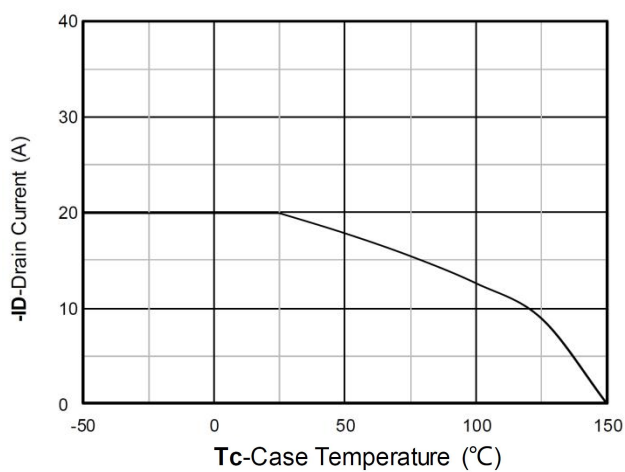
Transfer Characteristics



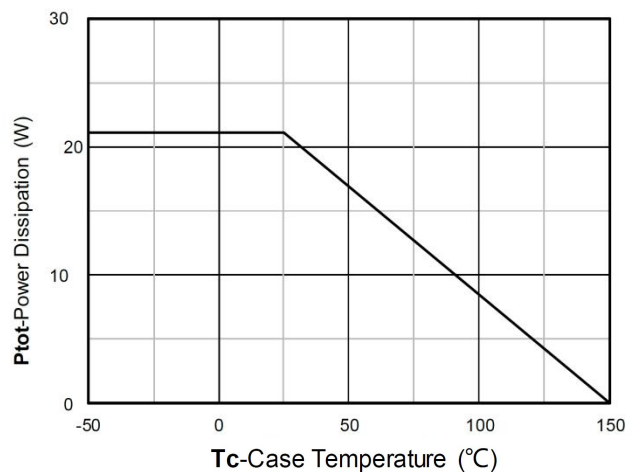
Capacitance Characteristics



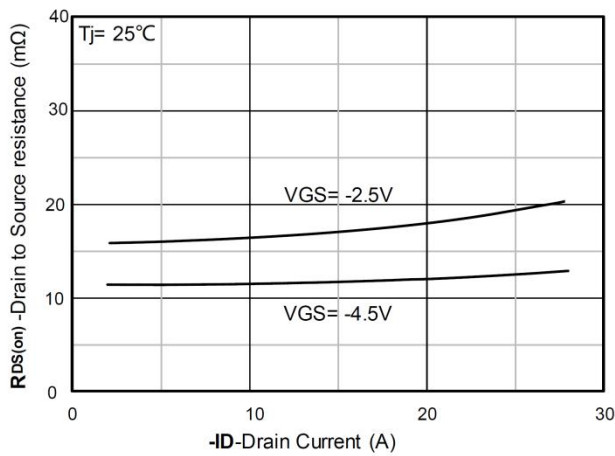
Gate Charge



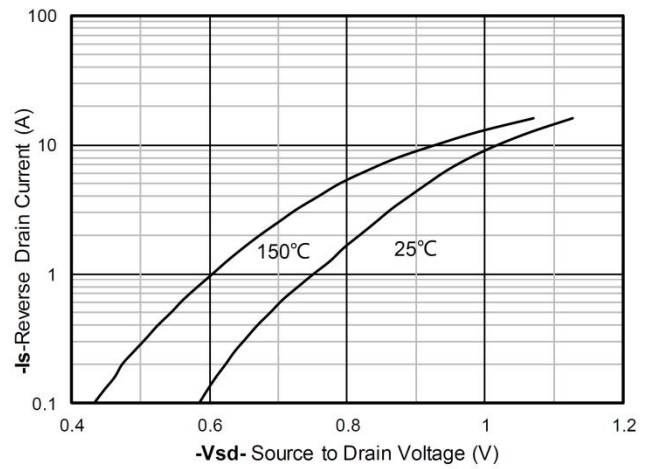
Current dissipation



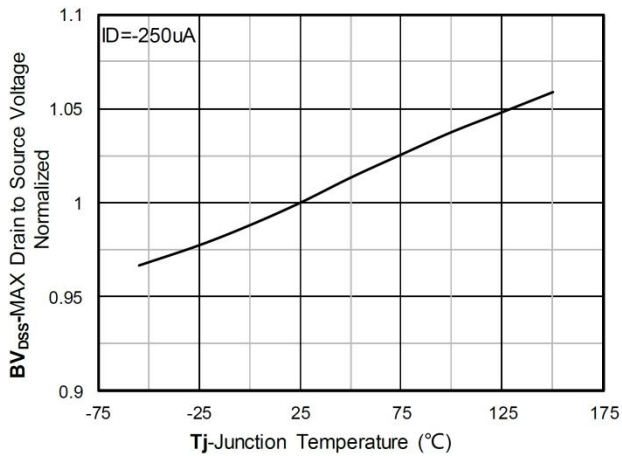
Power dissipation



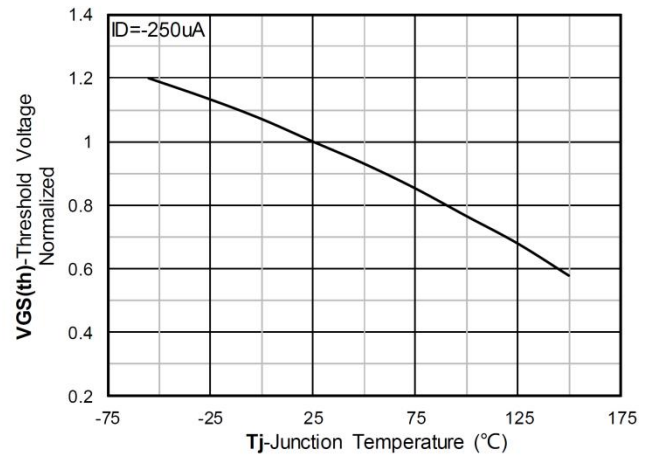
$R_{DS(on)}$ VS Drain Current



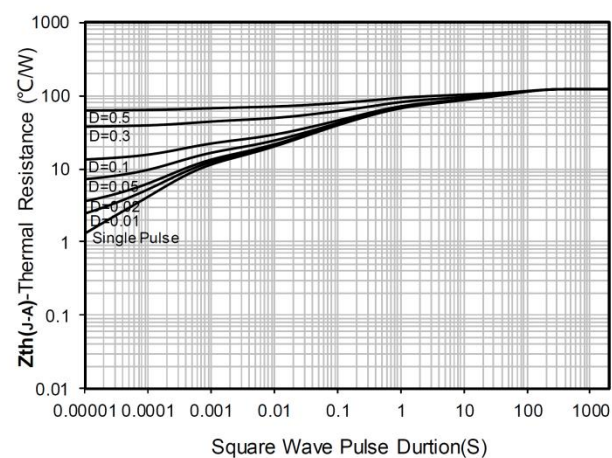
Forward characteristics of reverse diode



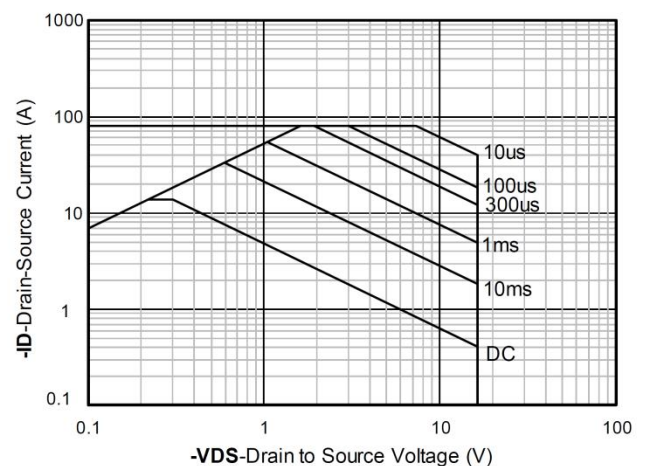
Normalized breakdown voltage



Normalized Threshold voltage



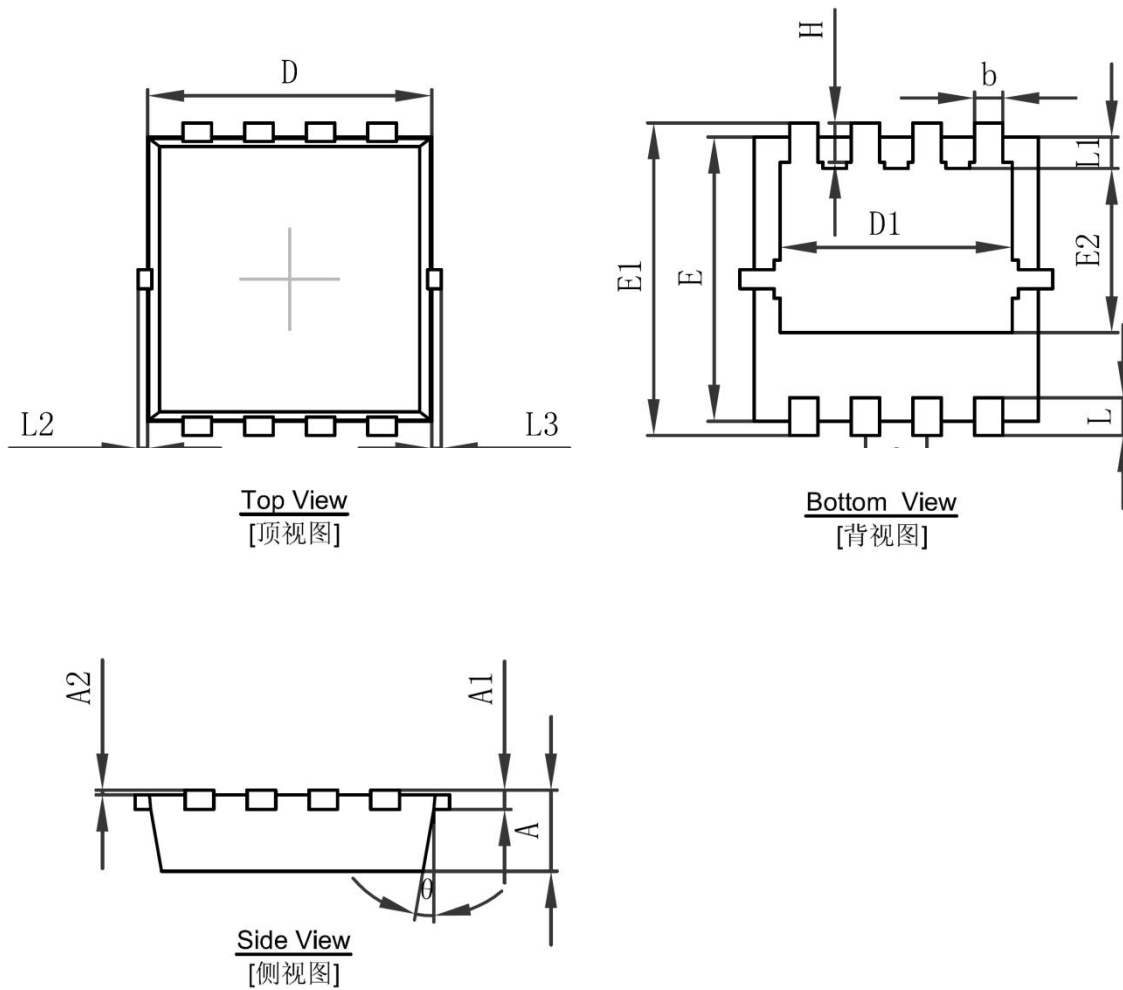
Maximum Transient Thermal Impedance



Safe Operation Area



PDFN3X3-8L Package Information



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	2.300	2.600	0.091	0.102
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°