

Product Summary

N and P-Channel Complementary Power MOSFET

N-Channel

- $V_{DS} = 30V, I_D = 35A$
- $R_{DS(on)} < 11m\Omega @ V_{GS} = 10V$
- $R_{DS(on)} < 16m\Omega @ V_{GS} = 4.5V$

P-Channel

- $V_{DS} = -30V, I_D = -30A$
- $R_{DS(on)} < 18m\Omega @ V_{GS} = -10V$
- $R_{DS(on)} < 25m\Omega @ V_{GS} = -4.5V$

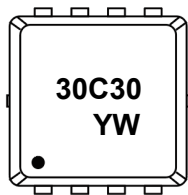
Features

- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

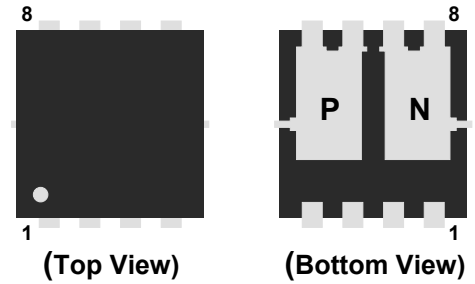
Application

- Boost driver
- Wireless charging
- Brushless motor

Marking Code

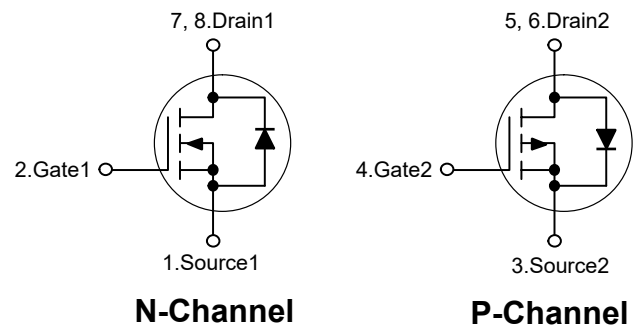


PDFN3x3A-8L



Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_c=25^\circ C$	35	-30	A
	Continuous Drain Current- $T_c=100^\circ C$	21.5	-18.2	
I_{DM}	Pulsed Drain Current ^{note1}	122	-104	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	20	25	mJ
P_D	Power Dissipation - $T_c=25^\circ C$	3.3	5.6	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ C$

Thermal Characteristics

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	38	22	$^\circ C/W$

N-Channel

Electrical Characteristics

(T_a=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.4	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =10V, I _D =10A	---	10	11	m Ω
		V _{GS} =4.5V, I _D =5A	---	15	17	
Dynamic Characteristics ⁴						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	580	---	pF
C _{oss}	Output Capacitance		---	110	---	
C _{rss}	Reverse Transfer Capacitance		---	92	---	
Q _g	Gate Charge	V _{GS} =10V V _{DS} =15V I _D =10A		13	---	nC
Q _{gs}	Gate-Source Charge			4.5	---	
Q _{gd}	Gate-Drain Charge			3.3	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D = 10A, R _{REN} =3 Ω ,V _{GS} =10V	---	3	---	ns
t _r	Rise Time		---	6	---	ns
t _{d(off)}	Turn-Off Delay Time		---	19	---	ns
t _f	Fall Time		---	5	---	ns
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	---	---	----	33	A
I _{SM}	Pulsed Drain to Source Diode	---	---	---	121	A
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =11A	---	0.8	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =11A, dI/dt=100A/ μ s	---	7	---	ns
Q _{rr}	Body Diode Reverse Recovery		---	5.9	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=9A
T_J=25°C, V_{DD}= -15V, V_G= -10V, L=0.5mH, R_g=25Ω, I_{AS}= -10A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

P-Channel

Electrical Characteristics

(T_a=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1	-1.5	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =-10V,I _D =-10A	---	18	25	m Ω
		V _{GS} =-4.5V,I _D =-5A	---	25	38	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1150	---	pF
C _{OSS}	Output Capacitance		---	150	---	
C _{rSS}	Reverse Transfer Capacitance		---	135	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DD} = -15V, I _D = --1A, V _{GS} = -10V, R _{GEN} =6 Ω R _D =15 Ω	---	12	---	ns
t _r	Rise Time		---	13	---	ns
t _{d(off)}	Turn-Off Delay Time		---	195	---	ns
t _f	Fall Time		---	95	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V,V _{DS} =-15V,I _D =-8A	---	50	---	nC
Q _{gs}	Gate-Source Charge		---	9.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	8.3	---	nC
Drain-Source Diode Characteristics						
I _s	Continuous Drain to Source Diode	---	---	---	-28	A
I _{SM}	Pulsed Drain to Source Diode	---	---	---	-104	A
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V,I _S =-11A	---	-0.8	-1.2	V
T _{rr}	Reverse Recovery Time	T _J =25 °C ,	---	37	---	ns
Q _{rr}	Reverse Recovery Charge	I _F =-2A,dI/dt=-100A/ μ s	---	36	---	nC

N-Channel

Typical Characteristics Curves

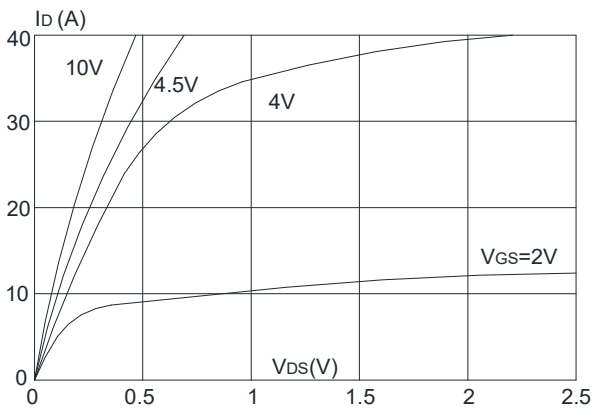


Figure1: Output Characteristics

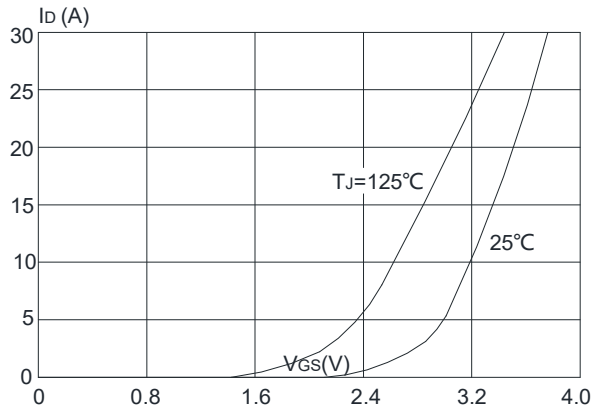


Figure 2: Typical Transfer Characteristics

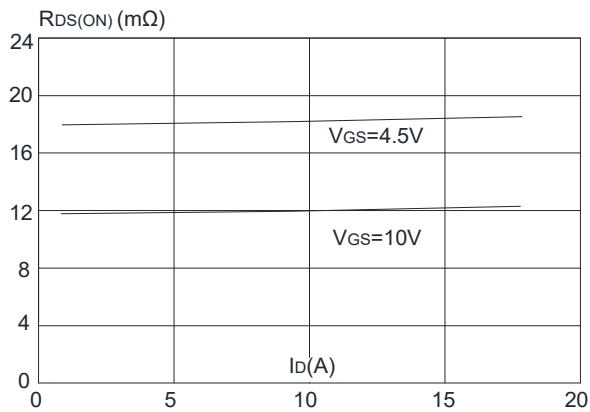


Figure 3: On-resistance vs. Drain Current

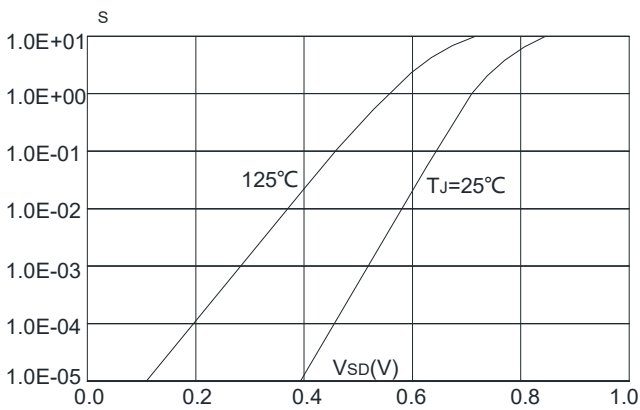


Figure 4: Body Diode Characteristics

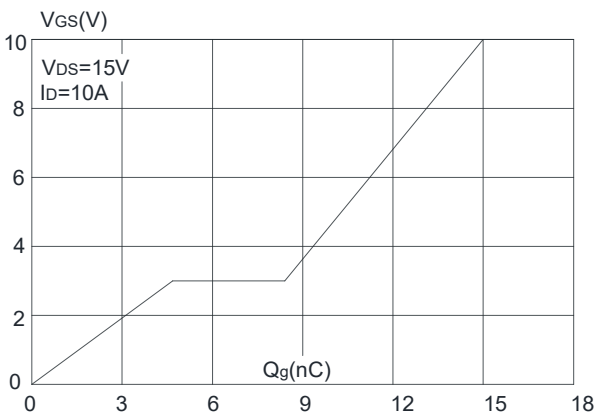


Figure 5: Gate Charge Characteristics

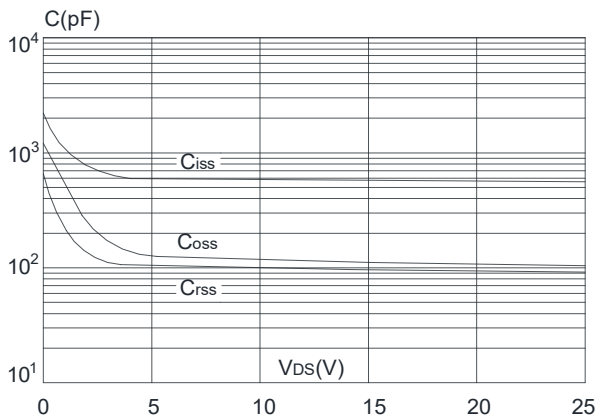


Figure 6: Capacitance Characteristics

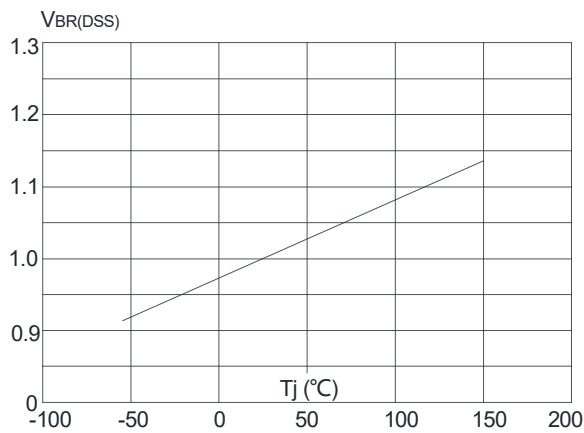


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

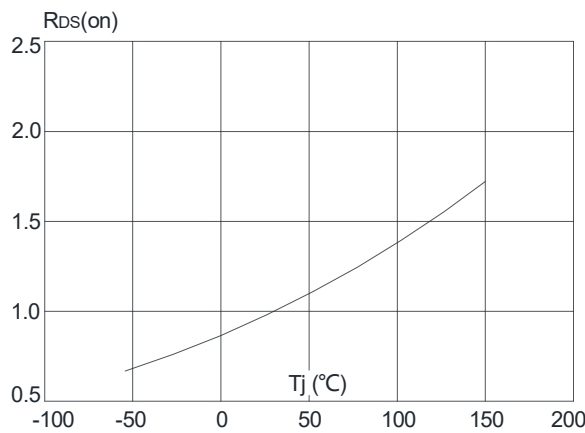


Figure 8: Normalized on Resistance vs. Junction Temperature

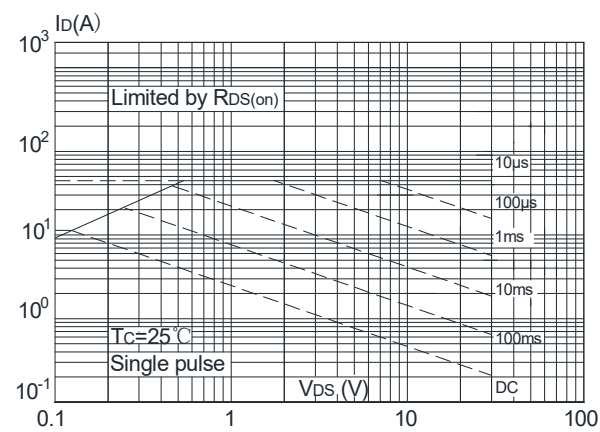


Figure 9: Maximum Safe Operating Area

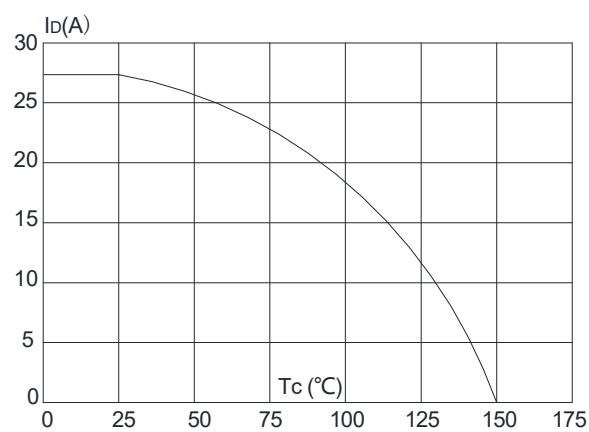


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

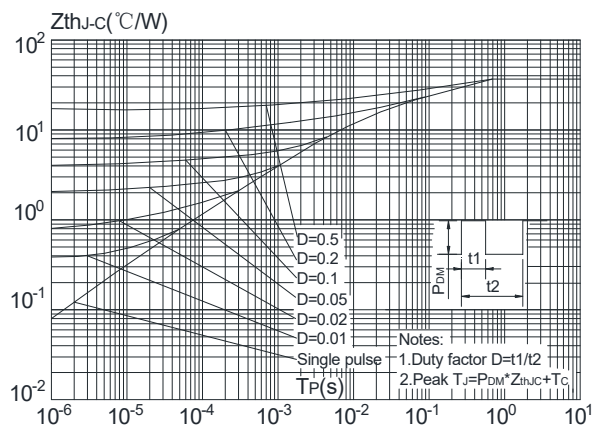


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

P-Channel

Typical Characteristics Curves

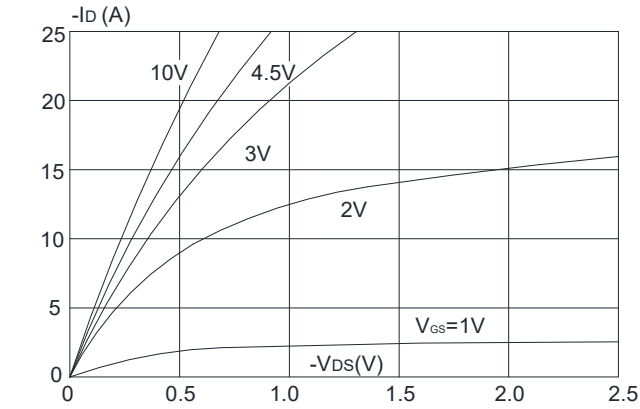


Figure1: Output Characteristics

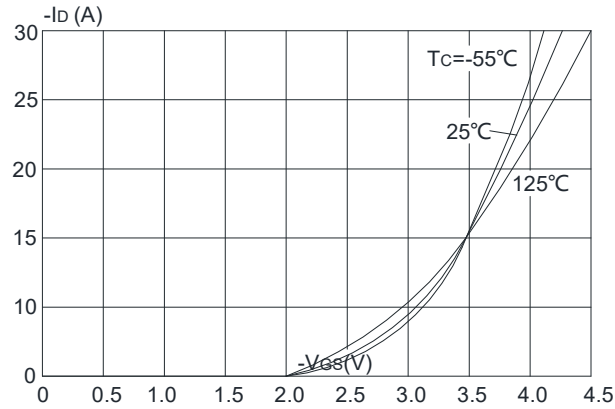


Figure 2: Typical Transfer Characteristics

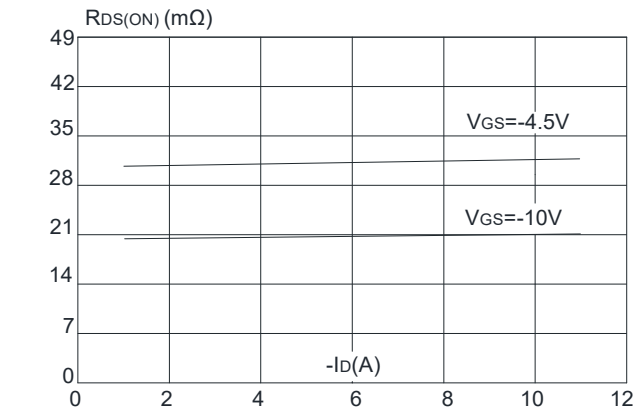


Figure 3: On-resistance vs. Drain Current

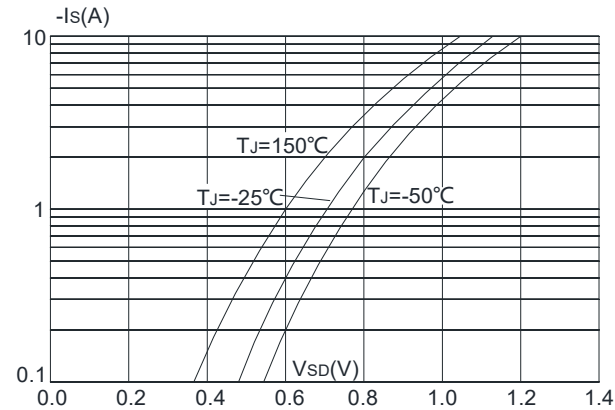


Figure 4: Body Diode Characteristics

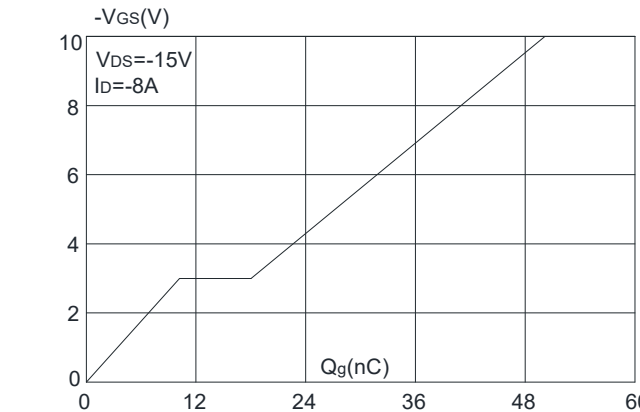


Figure 5: Gate Charge Characteristics

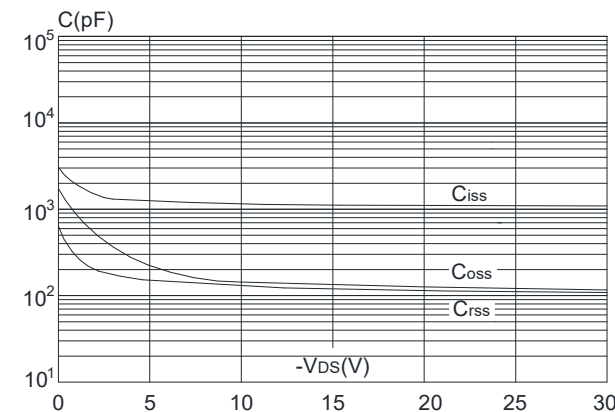


Figure 6: Capacitance Characteristics

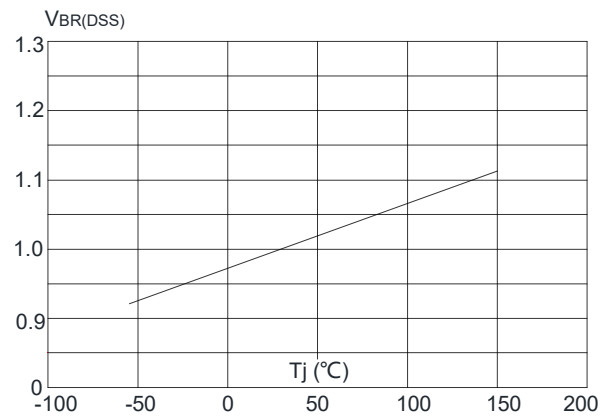


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

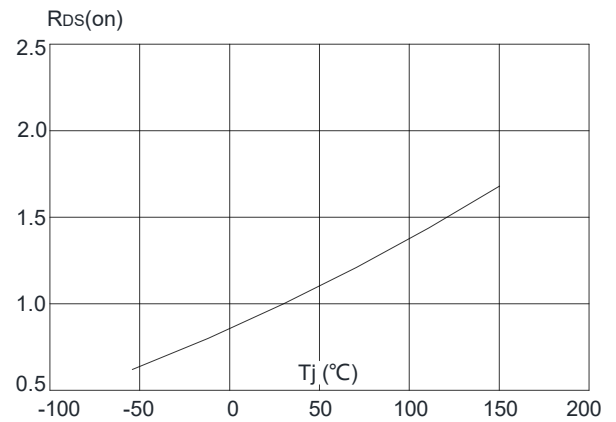


Figure 8: Normalized on Resistance vs. Junction Temperature

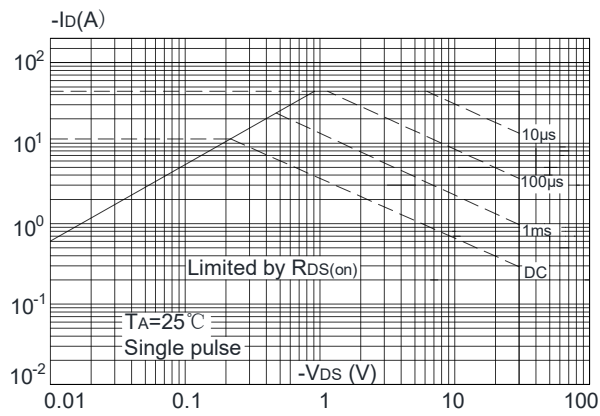


Figure 9: Maximum Safe Operating Area

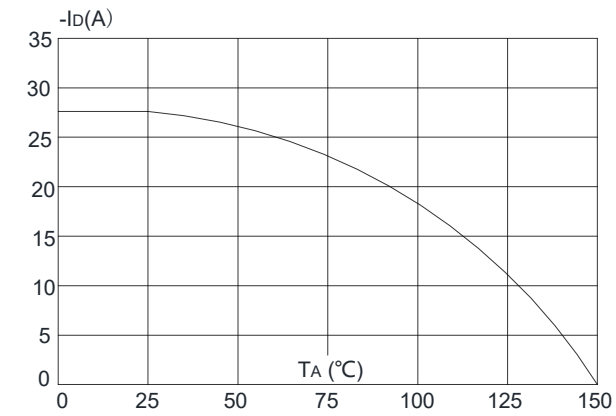


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

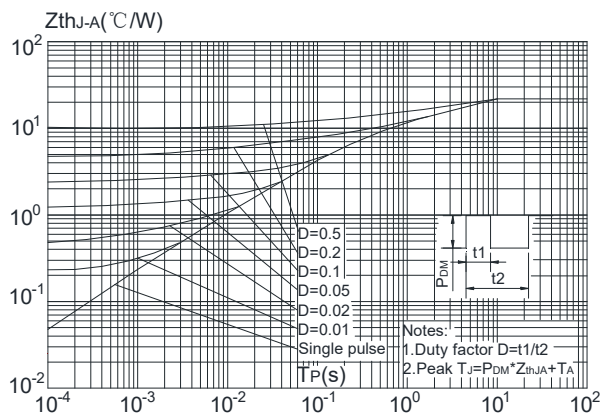
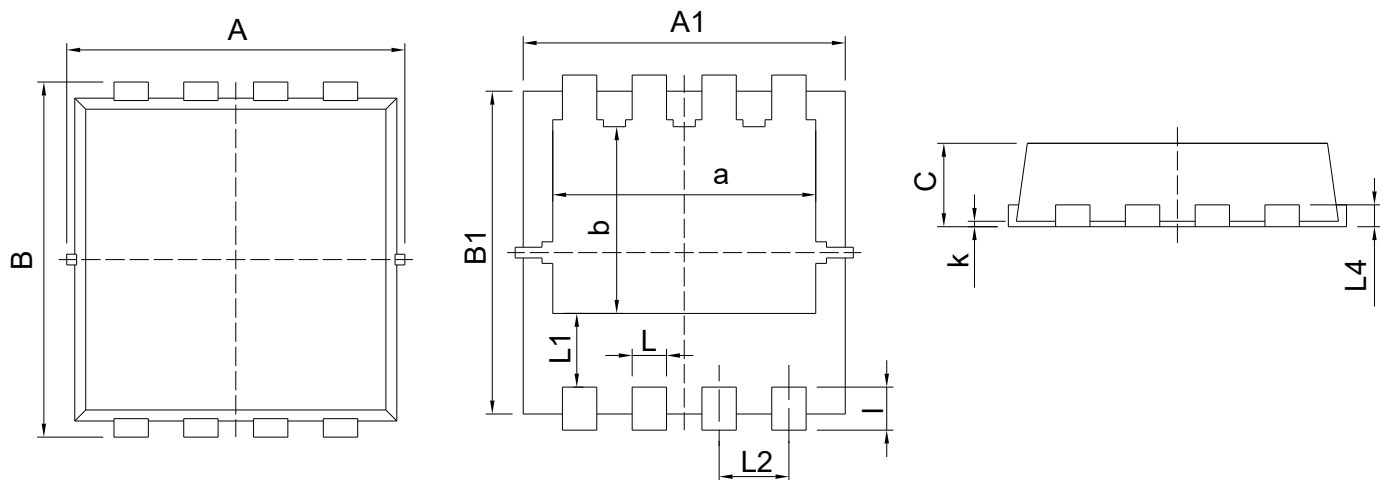


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Outline

PDFN3x3-8L Dimensions in mm




Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	3.2	3.4	L2	0.55	0.75
A1	3.1	3.2	L4	0.14	0.20
B	3.2	3.4	a	2.35	2.55
B1	2.95	3.05	b	1.635	1.835
C	0.75	0.85	k	0.0	0.05
L	0.25	0.35	l	0.3	0.5
L1	-	0.75			

Contact Information

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For additional information, please contact your local Sales Representative.

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