

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	0.75m $\Omega$ @10V	200A
	1.2m $\Omega$ @4.5V	

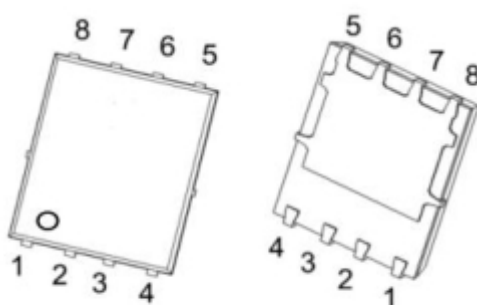
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Application

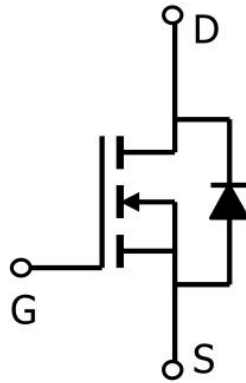
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package



PDFNWB5X6-8L

## Circuit diagram



## Marking



**40N01G** =Device Code  
**P** =Clip Process  
**\*** =Month Code

## Absolute maximum ratings

(T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current(Tc=25°C)	I <sub>D</sub>	200	A
Pulsed Drain Current	I <sub>DM</sub>	800	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	420	mJ
Avalanche Current	I <sub>AS</sub>	41	A
Total Power Dissipation <sup>2</sup> (Tc=25°C)	P <sub>D</sub>	180	W
Thermal Resistance Junction-Case	R <sub>θJC</sub>	0.67	°C/W
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 150	°C

## Electrical characteristics

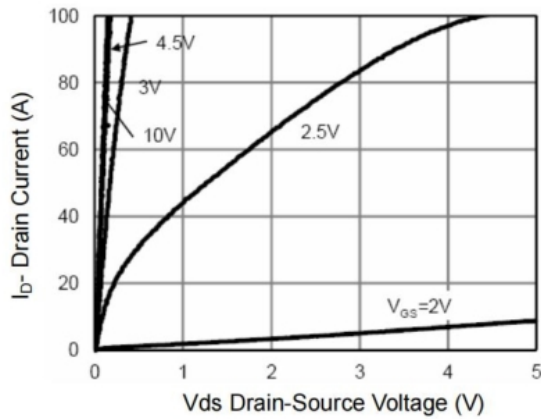
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =32V,V <sub>GS</sub> = 0V, T <sub>J</sub> =25°C			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	μA
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.6	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A		0.75	1.1	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		1.2	1.8	
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz		7515		pF
Output Capacitance	C <sub>oss</sub>			1854		
Reverse Transfer Capacitance	C <sub>rss</sub>			122		
Switching Characteristics						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =85A		128		pF
Gate-Source Charge	Q <sub>gs</sub>			19		
Gate-Drain Charge	Q <sub>gd</sub>			12		
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, R <sub>G</sub> =1.6Ω, I <sub>D</sub> =85A		13.5		nS
Rise Time	T <sub>r</sub>			8.8		
Turn-Off Delay Time	T <sub>d(off)</sub>			52		
Fall Time	T <sub>f</sub>			9.6		
Diode Characteristics						
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A,T <sub>J</sub> =25°C			1.2	V

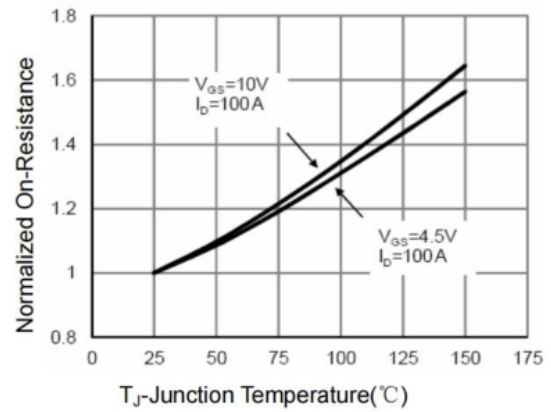
**Note:**

1. The EAS data shows Max. rating . The test condition is  $V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$
2. The power dissipation is limited by  $150^{\circ}\text{C}$  junction temperature

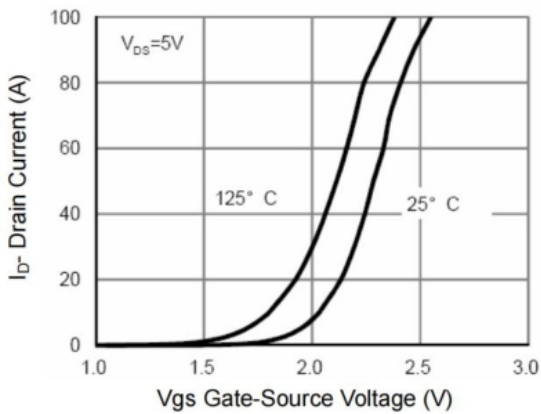
## Typical Characteristics



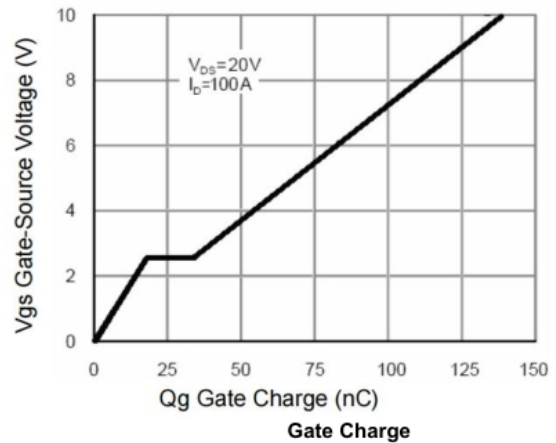
Output Characteristics



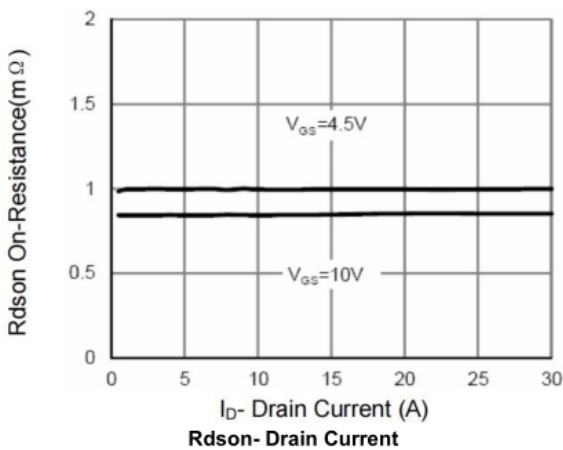
$R_{ds(on)}$ -Junction Temperature



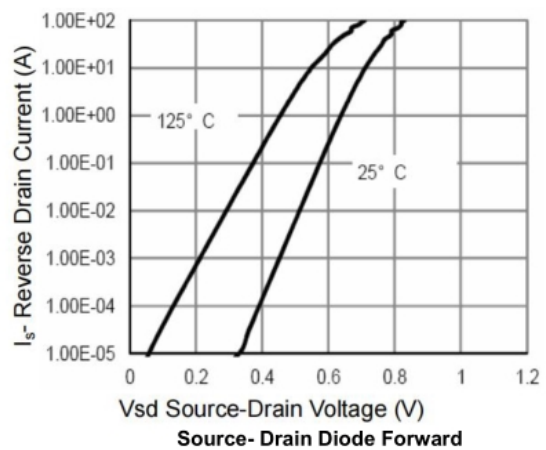
Transfer Characteristics



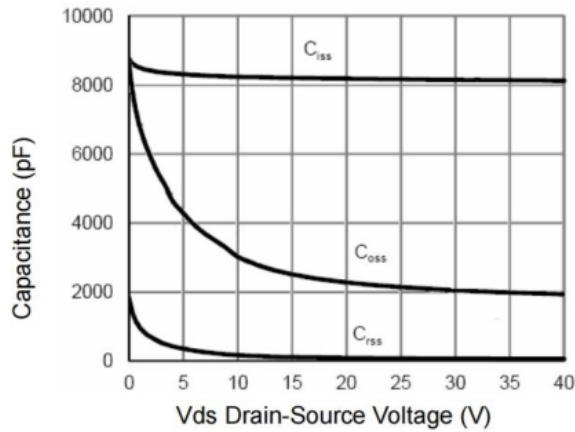
Gate Charge



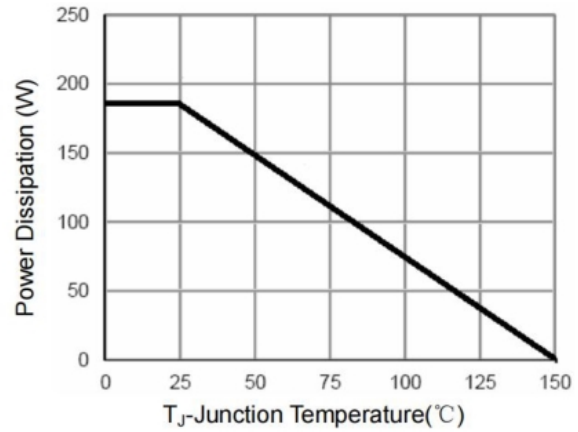
$R_{ds(on)}$ - Drain Current



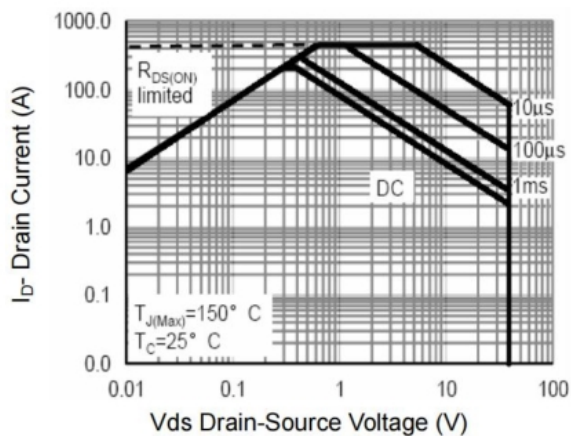
Source- Drain Diode Forward



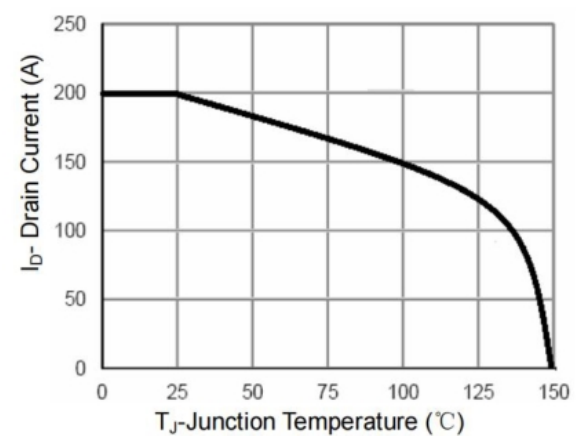
Capacitance vs Vds



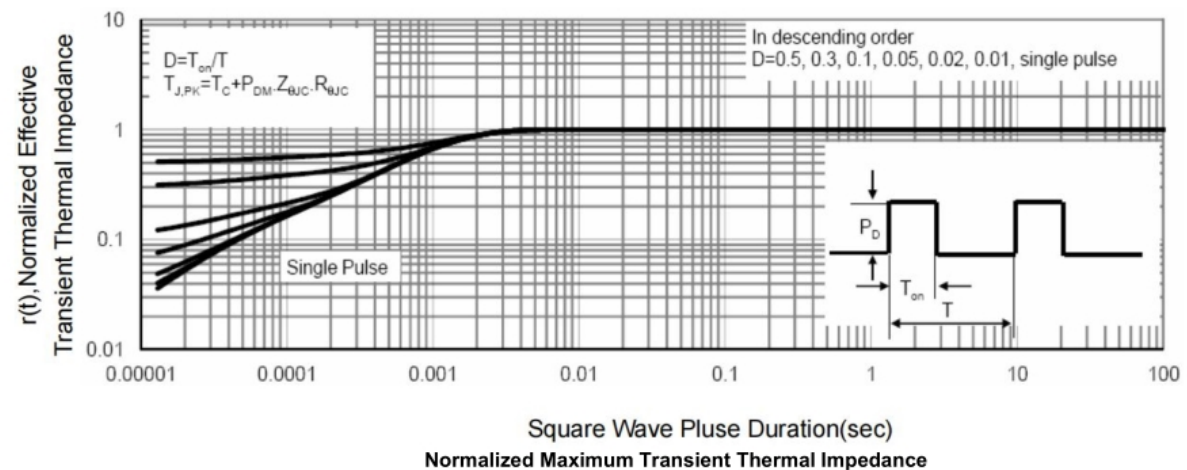
Power De-rating



Safe Operation Area

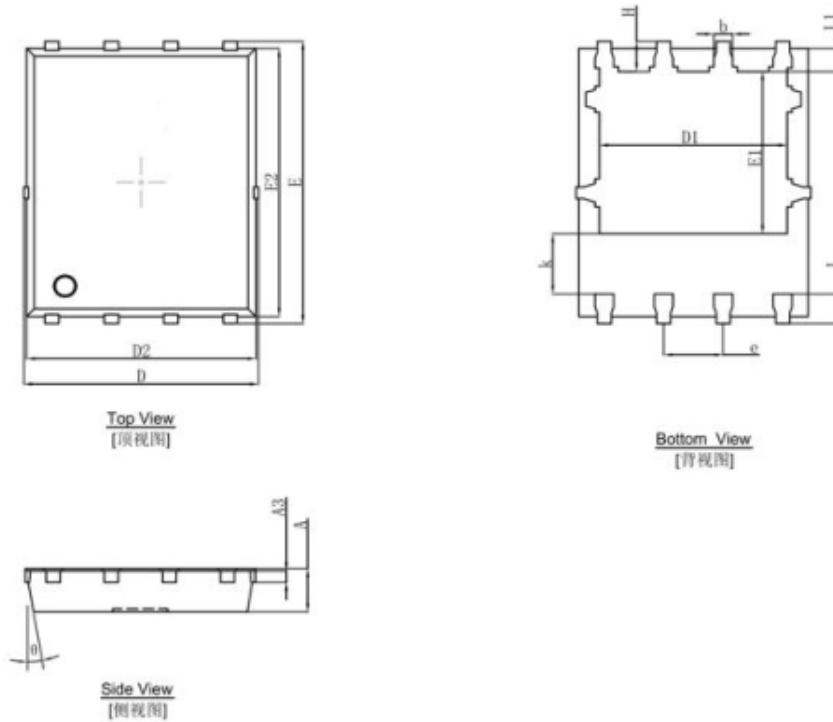


Current De-rating



Normalized Maximum Transient Thermal Impedance

## PDFNWB5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
$\theta$	10°	12°	10°	12°