

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	6.3m $\Omega$ @10V	60A

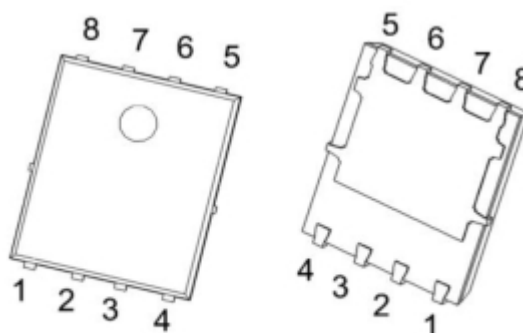
## Feature

- Low On-Resistance
- Low Input Capacitance

## Application

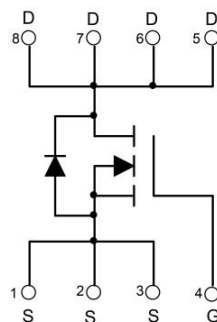
- Power Management Functions
- DC-DC Converters

## Package

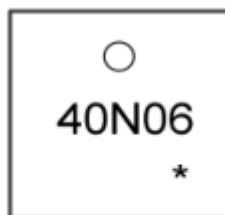


PDFNWB5X6-8L

## Circuit diagram



## Marking



40N06 : Product code  
\* : 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
Drain Current-Continuous	I <sub>D</sub>	60	A
Pulsed Drain Current	I <sub>DM</sub>	120	A
Maximum Power Dissipation	P <sub>D</sub>	46	W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	2.7	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

## Electrical characteristics

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =40V,V <sub>GS</sub> = 0V			1	uA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
Drain-Source On-State Resistance <sup>3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		6.3	8.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		9.5	12	
Dynamic Characteristics						
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz		1179		pF
Output Capacitance	C <sub>oSS</sub>			384		
Reverse Transfer Capacitance	C <sub>rSS</sub>			42		
Switching Characteristics						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =20V, I <sub>D</sub> =2A, R <sub>L</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω		3.5		nS
Rise Time	T <sub>r</sub>			3.7		
Turn-Off Delay Time	T <sub>d(off)</sub>			17.1		
Fall Time	T <sub>f</sub>			6.4		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V		8.3		pF
Gate-Source Charge	Q <sub>gs</sub>			2.4		
Gate-Drain Charge	Q <sub>gd</sub>			3.4		
Diode Characteristics						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = 20A di/dt = 100A/μs <sup>(3)</sup>		19.8		nS
Reverse Recovery Charge	Q <sub>rr</sub>			8.8		nC
Forward Turn-On Time	t <sub>on</sub>	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

## Typical Characteristics

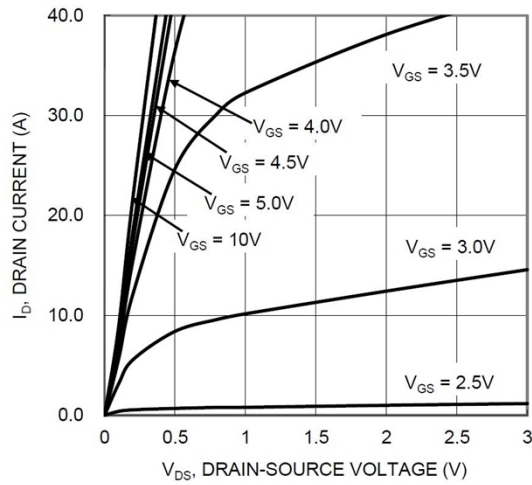


Figure 1. Typical Output Characteristic

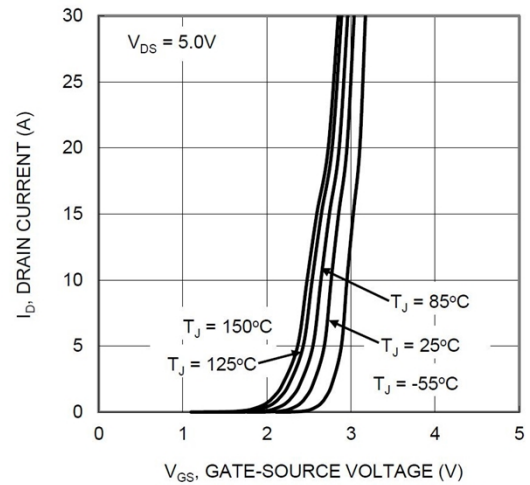


Figure 2. Typical Transfer Characteristic

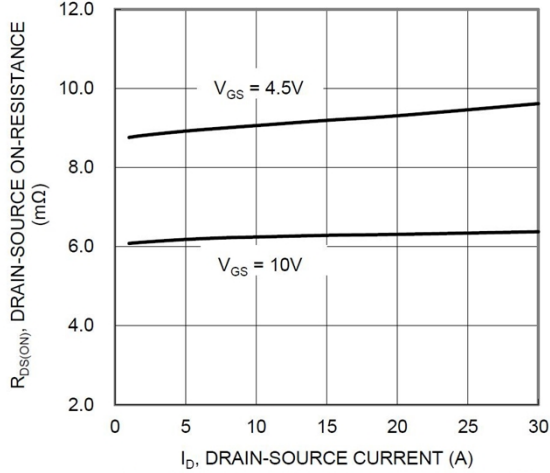


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

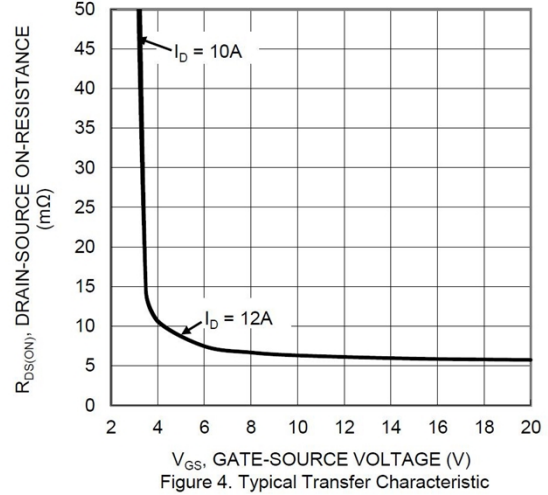


Figure 4. Typical Transfer Characteristic

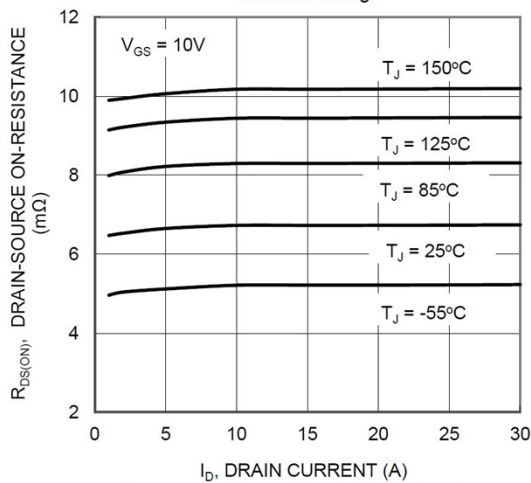


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

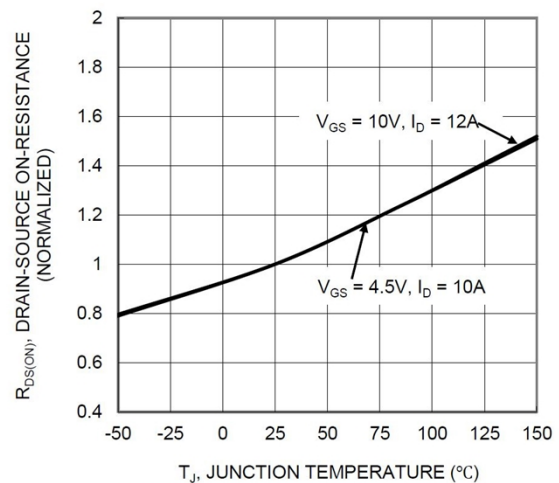


Figure 6. On-Resistance Variation with Temperature

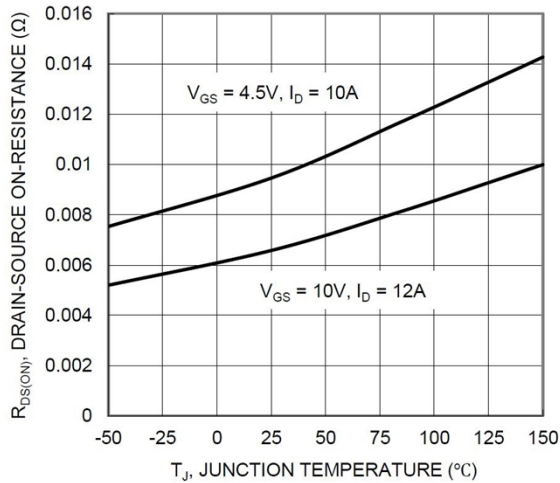


Figure 7. On-Resistance Variation with Temperature

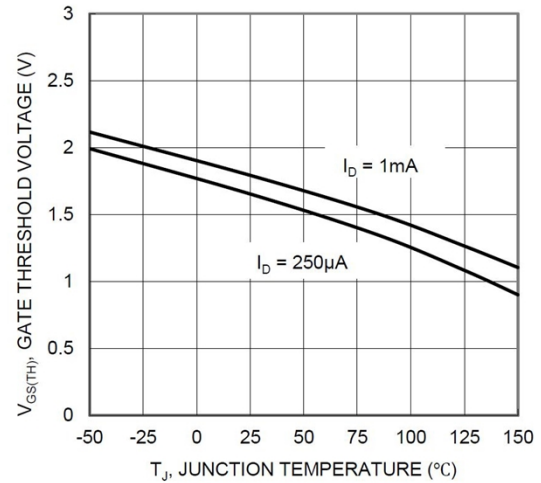


Figure 8. Gate Threshold Variation vs. Junction Temperature

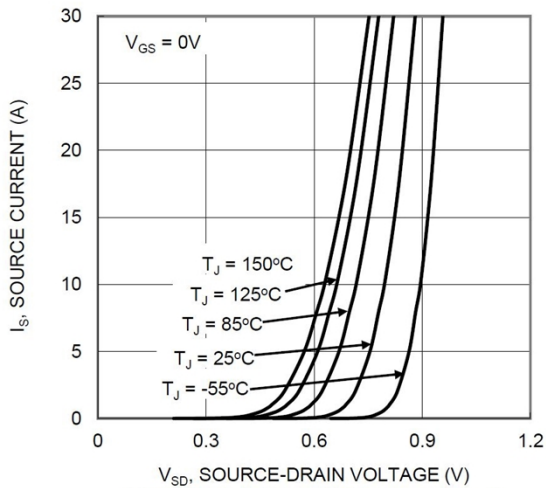


Figure 9. Diode Forward Voltage vs. Current

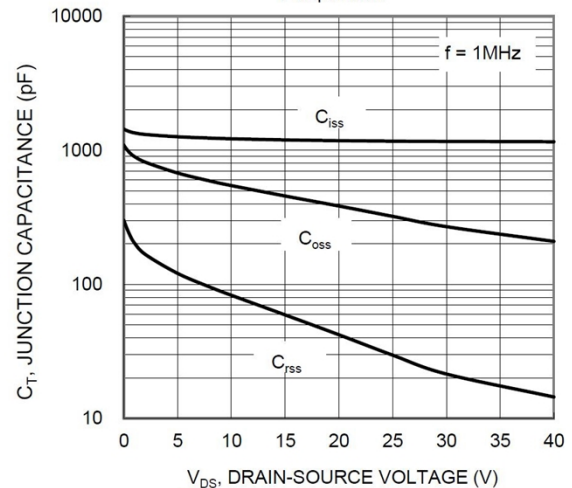


Figure 10. Typical Junction Capacitance

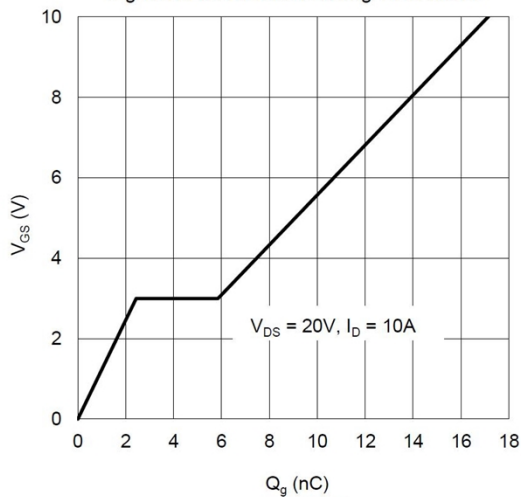


Figure 11. Gate Charge

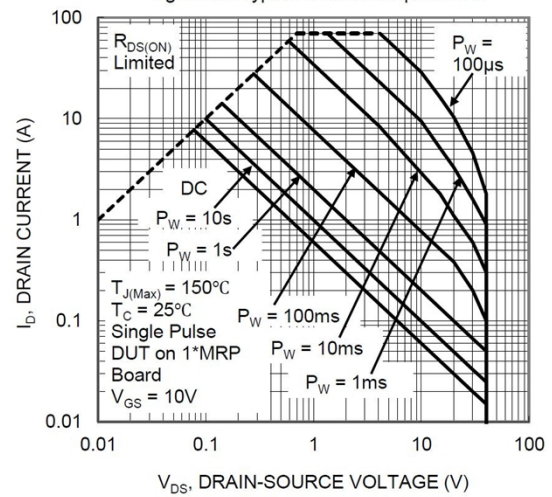


Figure 12. SOA, Safe Operation Area

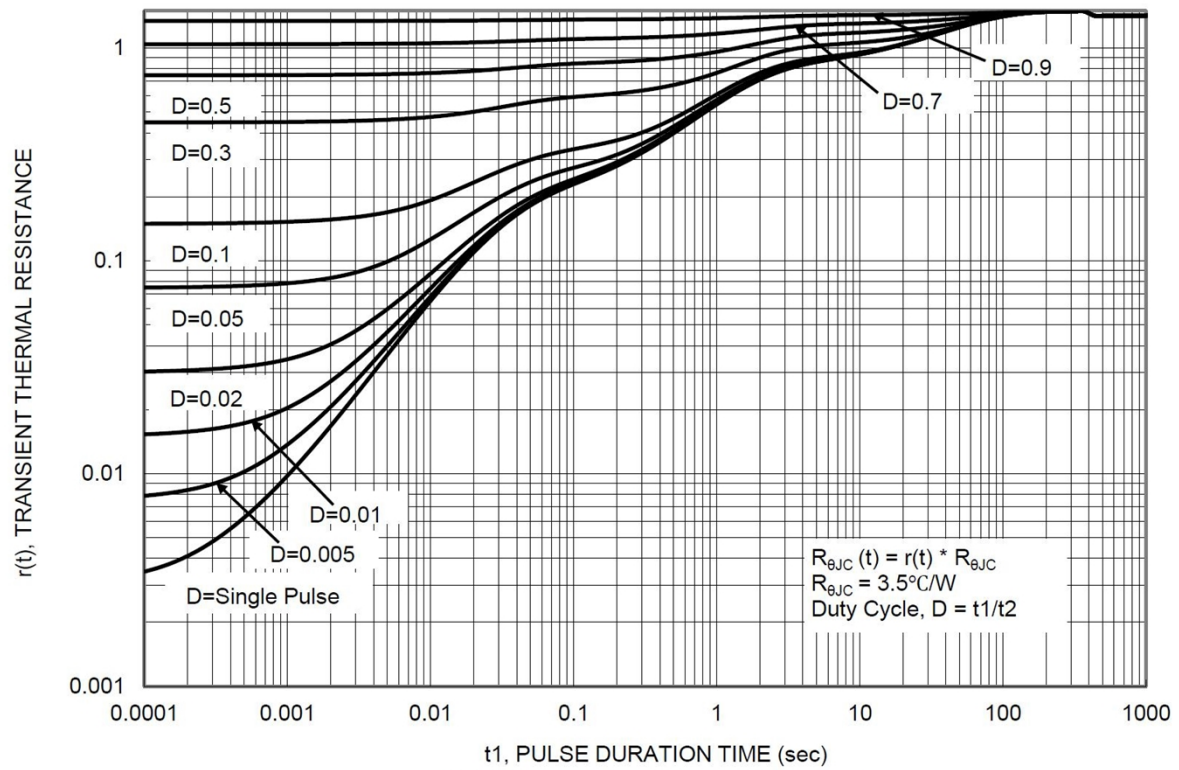
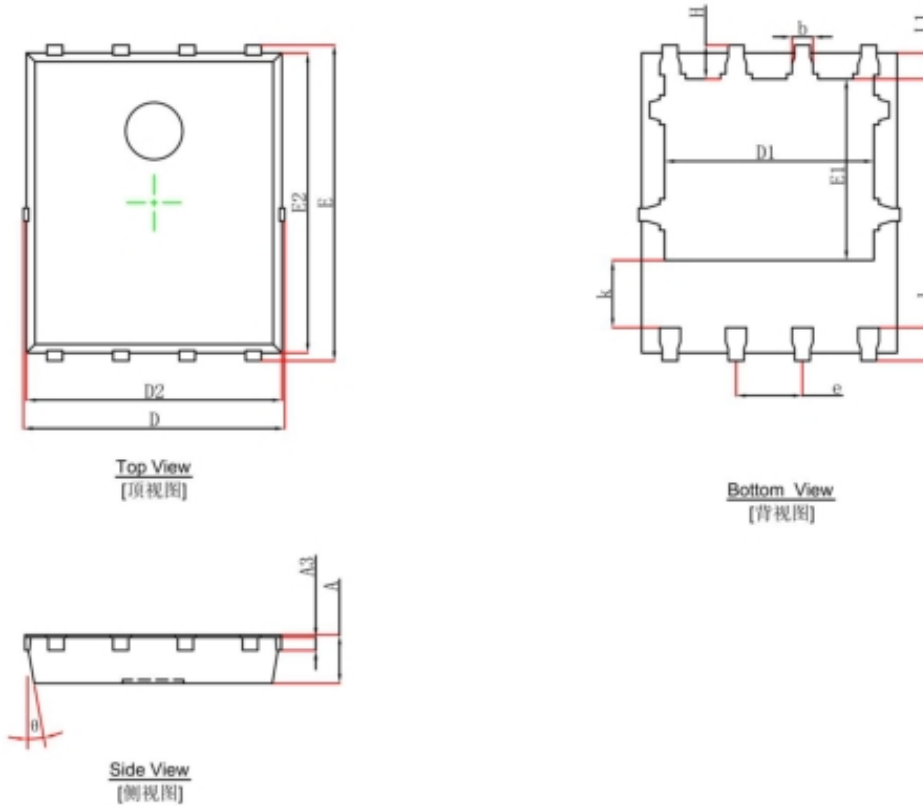


Figure 13. Transient Thermal Resistance

## 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°