

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.9m Ω @10V	120A
	2.7m Ω @4.5V	

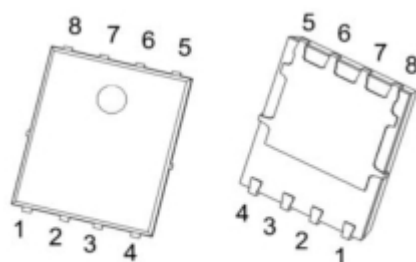
Feature

- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Application

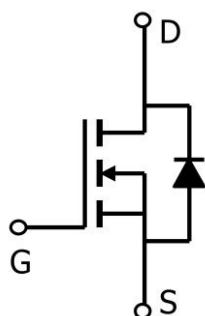
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

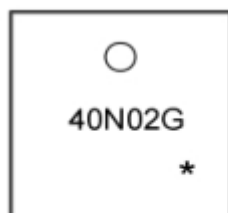


PDFNWB5X6-8L

Circuit diagram



Marking



40N02G
*

=Device Code
=Month Code

Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ¹ (T _C =25°C, Package limit)	I _D	120	A
Pulsed Drain Current ²	I _{DM}	480	A
Single Pulse Avalanche Energy ³	E _{AS}	529	mJ
Total Power Dissipation ⁴ (T _C =25°C)	P _D	120	W
Thermal Resistance Junction-Case ¹	R _{θJC}	1.04	°C/W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-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 _{GS} = 0V, I _D =250μA	40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =32V,V _{GS} = 0V, , T _J =25℃			1	uA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	uA
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Static Drain-Source On-Resistance ²	R _{DS(on)}	V _{GS} =10V, I _D =30A		1.9	2.4	mΩ
		V _{GS} =4.5V, I _D =20A		2.7	3.6	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1MHz		3485		pF
Output Capacitance	C _{OSS}			1208		
Reverse Transfer Capacitance	C _{rss}			59		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =20V, V _{DS} =10V, I _D =65A		57		pF
Gate-Source Charge	Q _{gs}			9.5		
Gate-Drain Charge	Q _{gd}			11		
Turn-On Delay Time	T _{d(on)}	V _{DD} =20V, V _{GS} =10V, R _G =1.6Ω, I _D =65A		10		nS
Rise Time	T _r			3		
Turn-Off Delay Time	T _{d(off)}			35		
Fall Time	T _f			4		
Diode Characteristics						
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _s =20A, T _J =25℃			1.2	V

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD} = 15V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$

Typical Characteristics

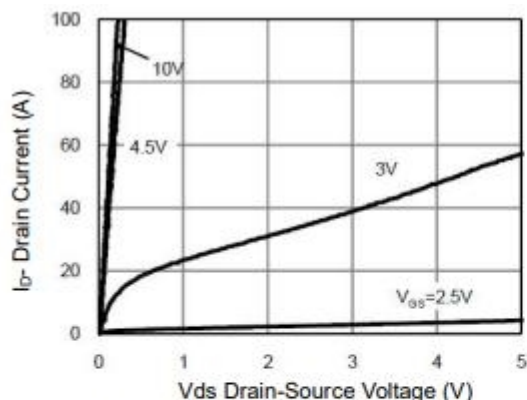


Figure 1 Output Characteristics

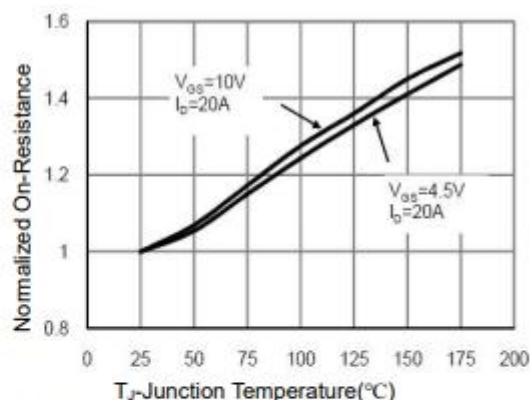


Figure 4 $R_{DS(on)}$ -Junction Temperature

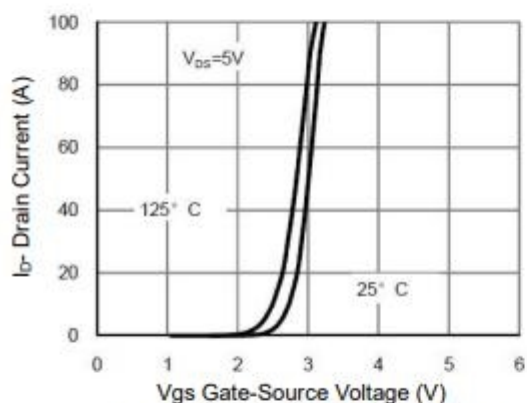


Figure 2 Transfer Characteristics

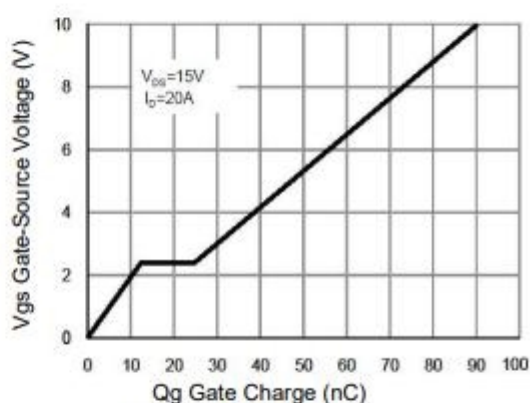


Figure 5 Gate Charge

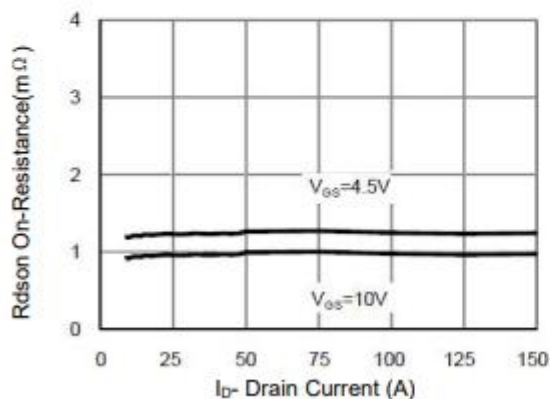


Figure 3 $R_{DS(on)}$ - Drain Current

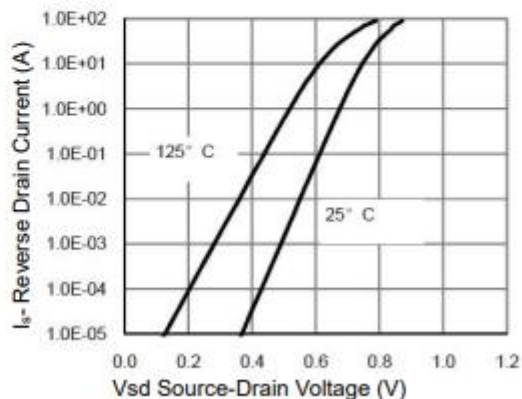


Figure 6 Source- Drain Diode Forward

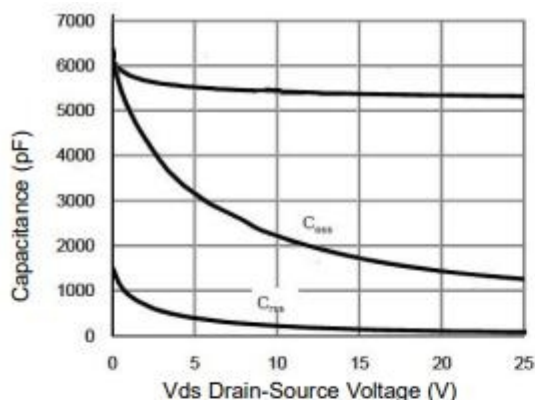


Figure 7 Capacitance vs Vds

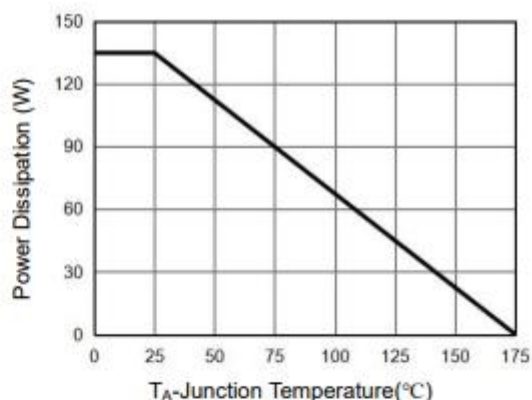


Figure 9 Power De-rating

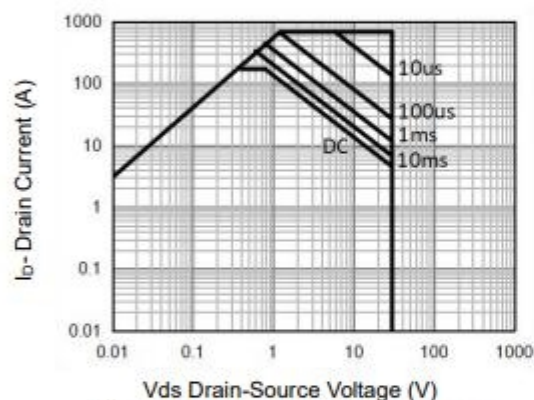


Figure 8 Safe Operation Area (Note3)

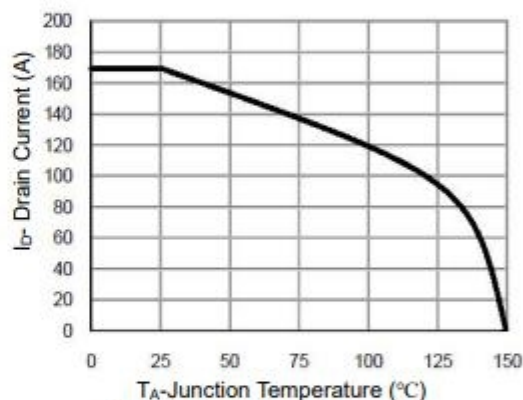


Figure 10 Current De-rating

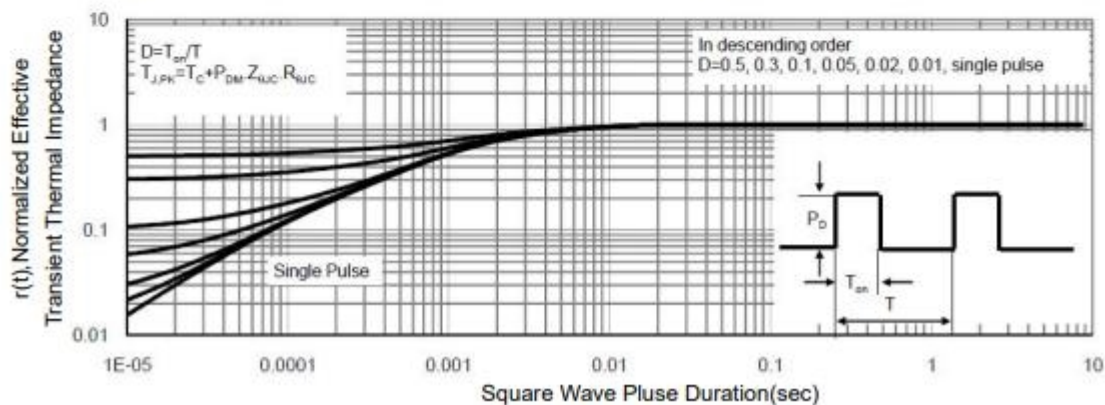
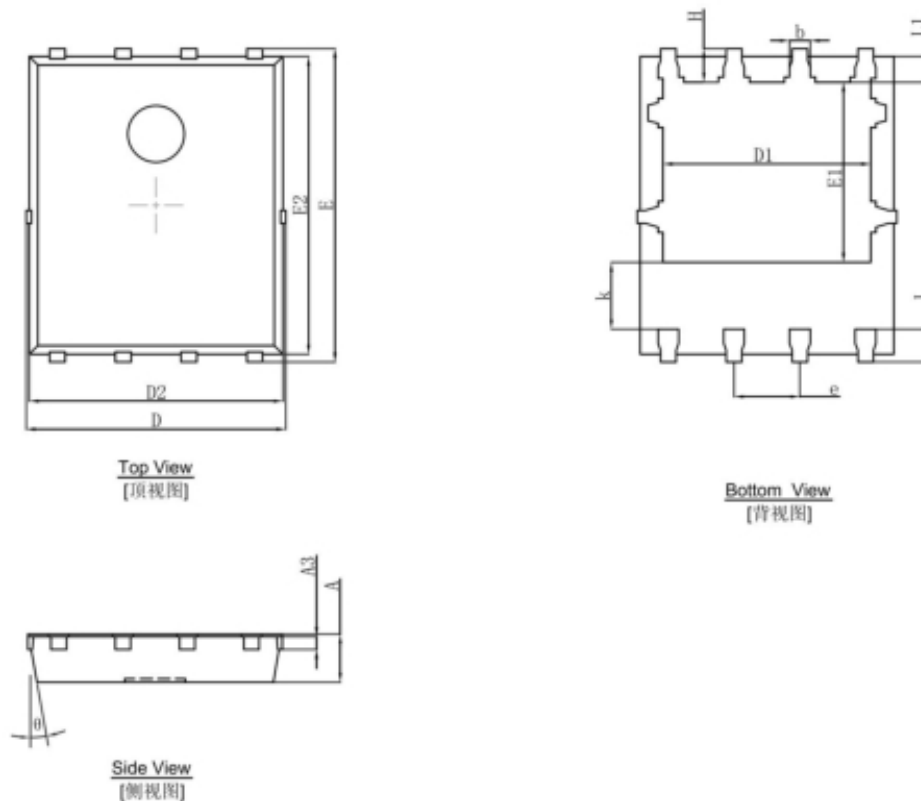


Figure 11 Normalized Maximum Transient Thermal Impedance

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
θ	10°	12°	10°	12°