



Product Summary

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

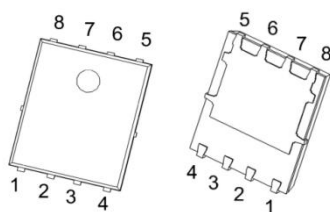
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Applications

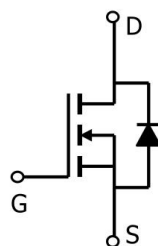
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

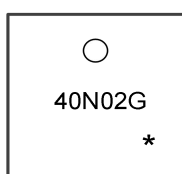


PDFNWB5X6-8L

Circuit diagram



Marking



40N02G
*

=Device Code
=Month Code

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

Parameter	Symbol	Rating	Units
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
Continuous Drain Current ¹ (T _c =25°C, Silicon limit)	I_D	210	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	$R_{\theta JC}$	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 (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	40	---	---	V
Drain-Source Leakage Current	IDSS	VDS=32V , VGS=0V , TJ=25℃	---	---	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	---	---	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	2	3	4	V
Static Drain-Source On-Resistance ²	RDS(ON)	VGS=10V , ID=30A	---	1.9	2.4	mΩ
		VGS=4.5V , ID=20A	---	2.7	3.6	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=20V , VGS=0V , f=1MHz	---	3485	---	pF
Output Capacitance	Coss		---	1208	---	
Reverse Transfer Capacitance	Crss		---	59	---	
Switching Characteristics						
Total Gate Charge	Qg	VDS=20V , VGS=10V , ID=65A	---	57	---	nC
Gate-Source Charge	Qgs		---	9.5	---	
Gate-Drain Charge	Qgd		---	11	---	
Turn-On Delay Time	Td(on)	VDD=20V , VGS=10V , RG=1.6Ω, ID=65A	---	10	---	ns
Rise Time	Tr		---	3	---	
Turn-Off Delay Time	Td(off)		---	35	---	
Fall Time	Tf		---	4	---	
Diode Characteristics						
Diode Forward Voltage ²	VSD	VGS=0V , IS=20A , TJ=25℃	---	---	1.2	V

Note :

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 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

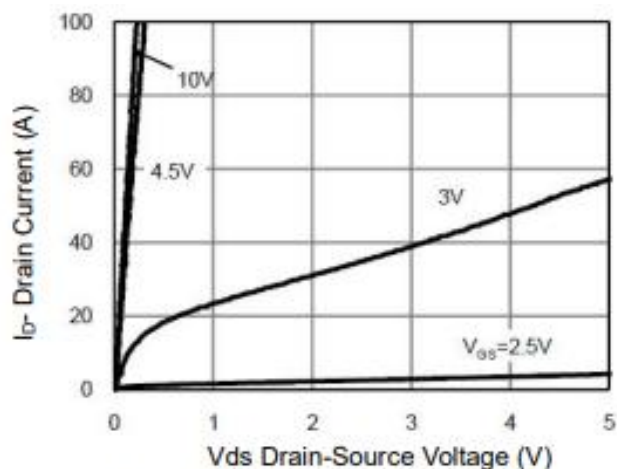


Figure 1 Output Characteristics

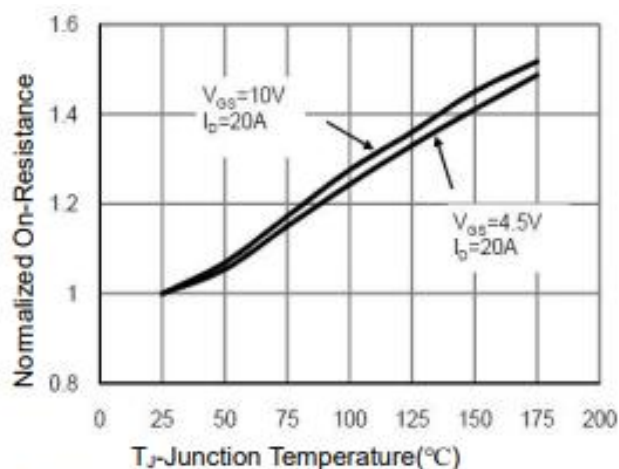


Figure 4 Rdson-Junction Temperature

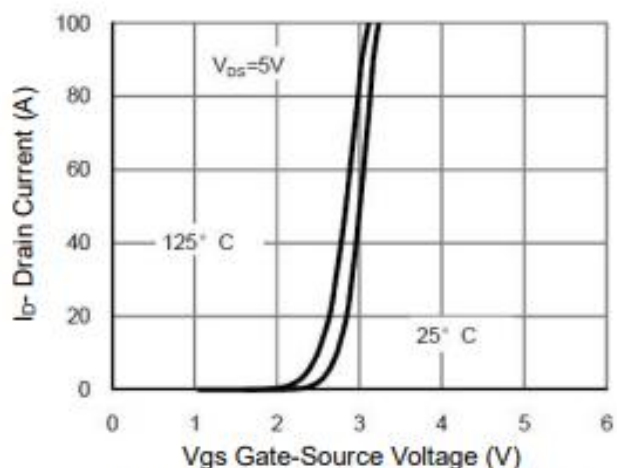


Figure 2 Transfer Characteristics

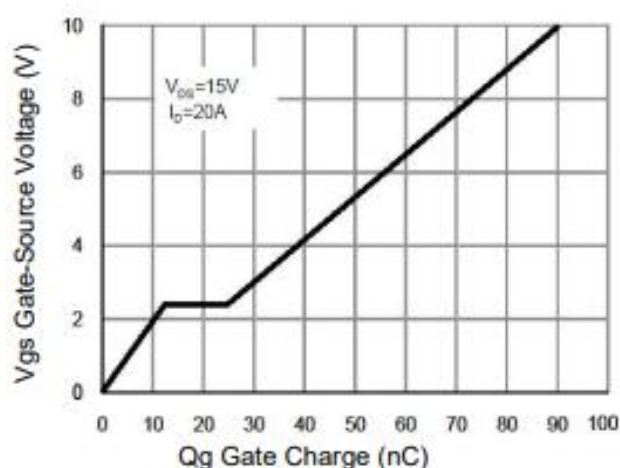


Figure 5 Gate Charge

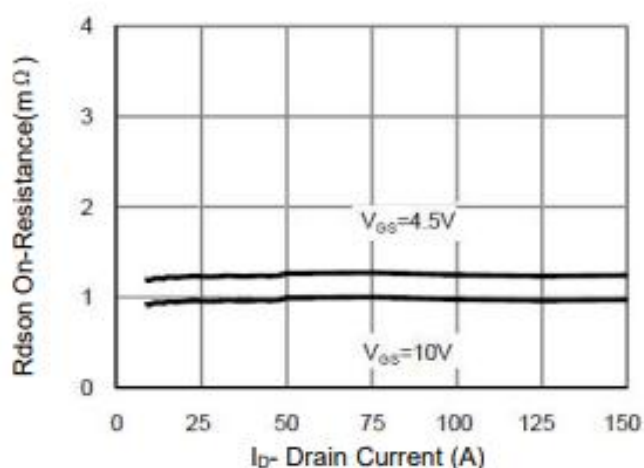


Figure 3 Rdson- Drain Current

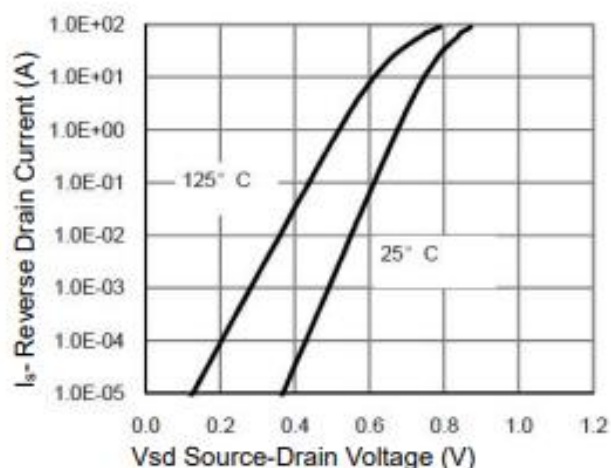


Figure 6 Source- Drain Diode Forward

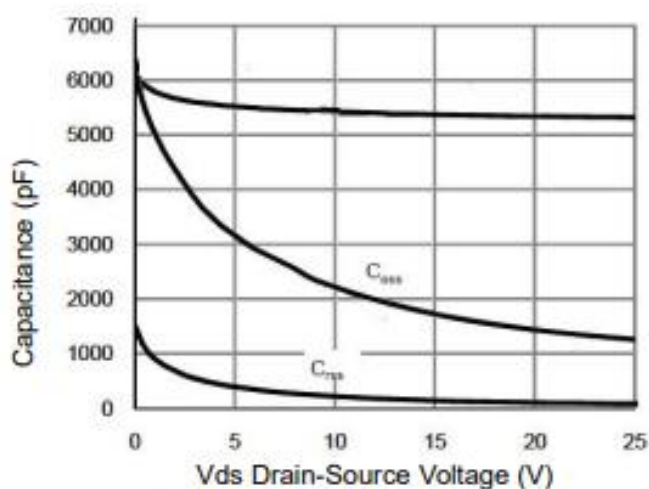


Figure 7 Capacitance vs Vds

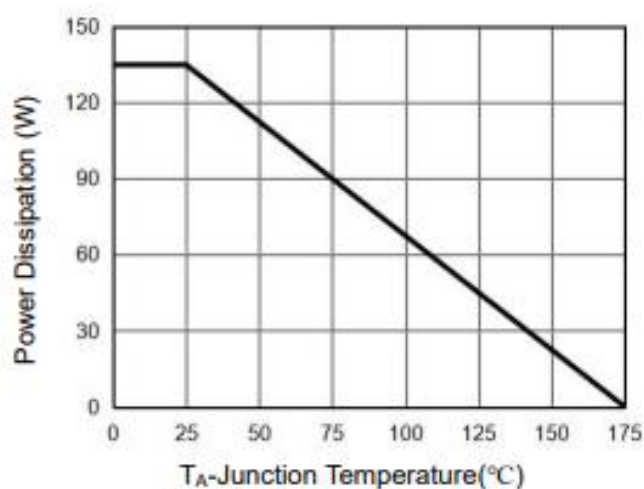


Figure 9 Power De-rating

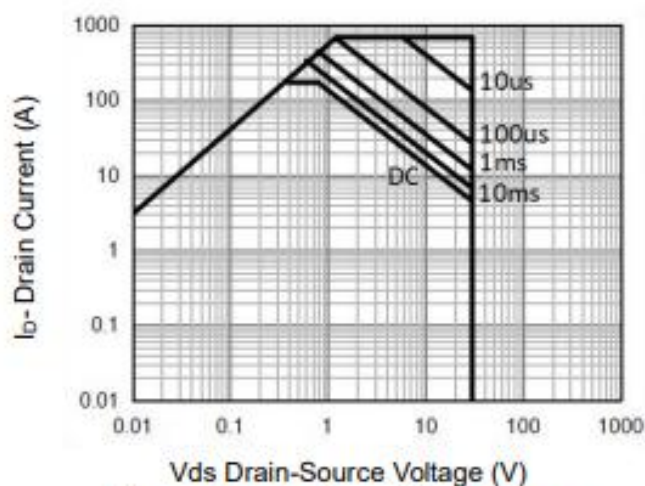


Figure 8 Safe Operation Area (Note3)

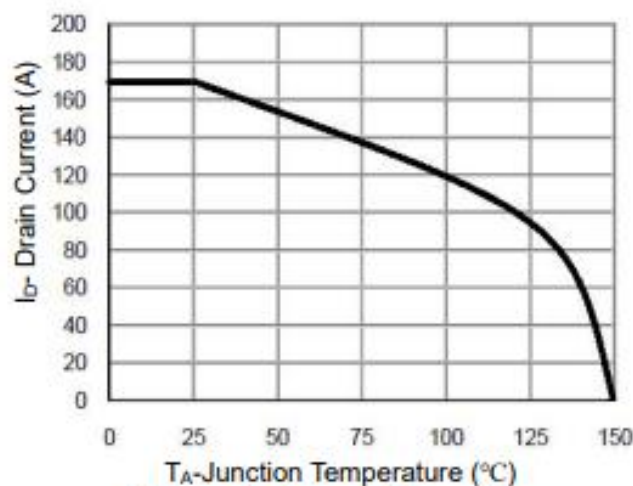


Figure 10 Current De-rating

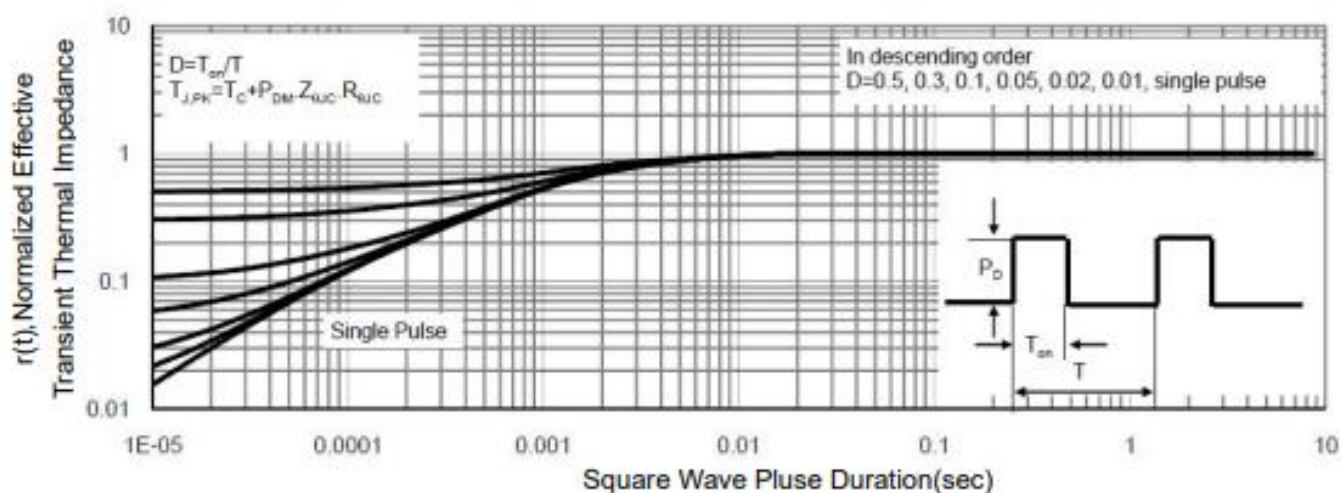
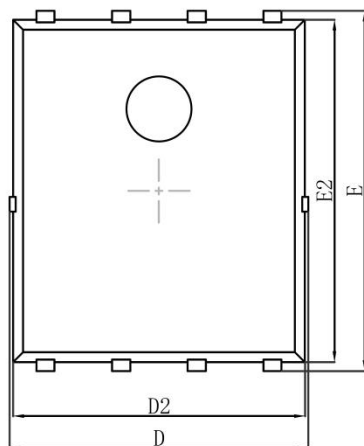
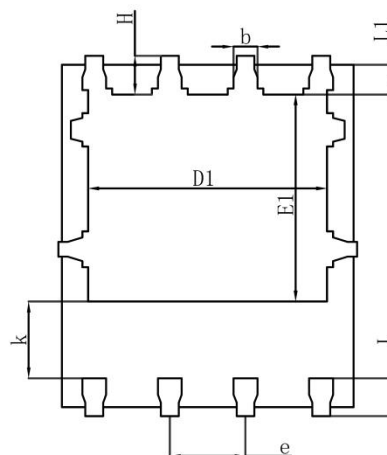


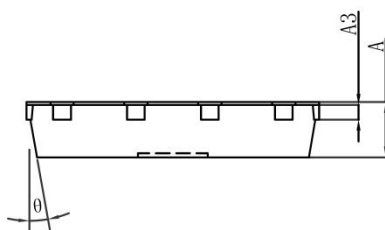
Figure 11 Normalized Maximum Transient Thermal Impedance



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

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°