

Product Summary

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

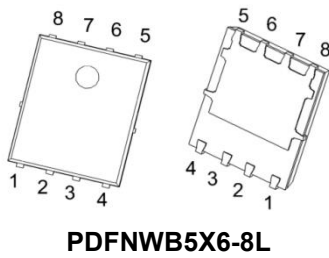
Feature

- Fast Switching
- Low Gate Charge and R_{ds(on)}
- 100% Single Pulse avalanche energy Test

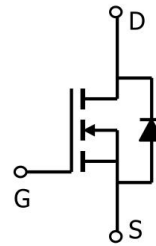
Applications

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

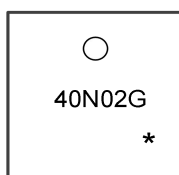
Package



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}	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3	4	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	---	1.9	2.4	m Ω
		$V_{GS}=4.5V, I_D=20A$	---	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	$V_{DS}=20V, V_{GS}=10V, I_D=65A$	---	57	---	nC
Gate-Source Charge	Q_{gs}		---	9.5	---	
Gate-Drain Charge	Q_{gd}		---	11	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, R_G=1.6\Omega, I_D=65A$	---	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}	$V_{GS}=0V, I_S=20A, T_J=25^\circ C$	---	---	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

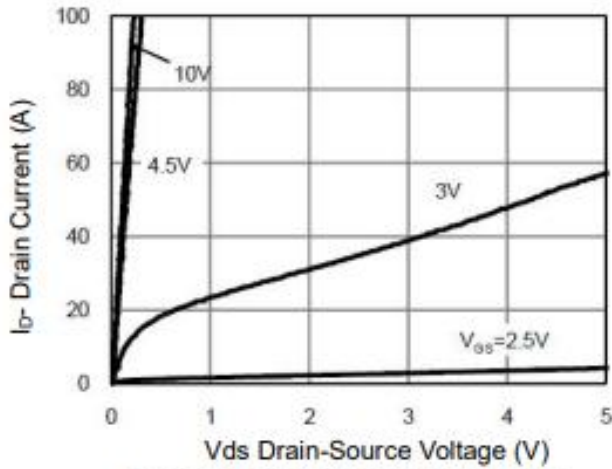


Figure 1 Output Characteristics

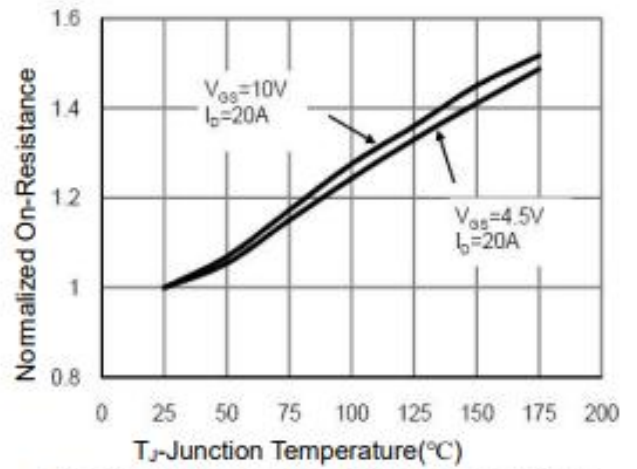


Figure 4 Rdson-Junction Temperature

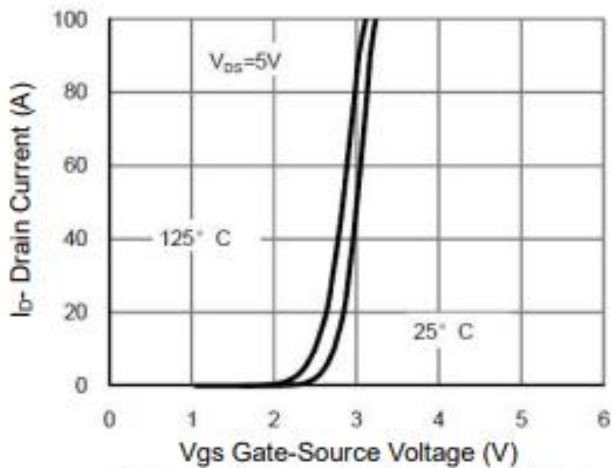


Figure 2 Transfer Characteristics

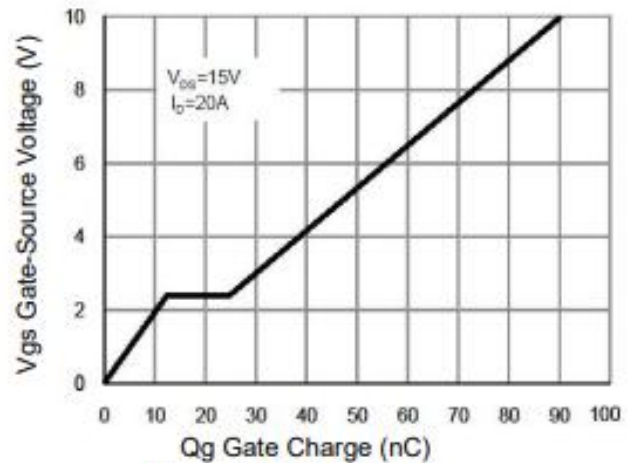


Figure 5 Gate Charge

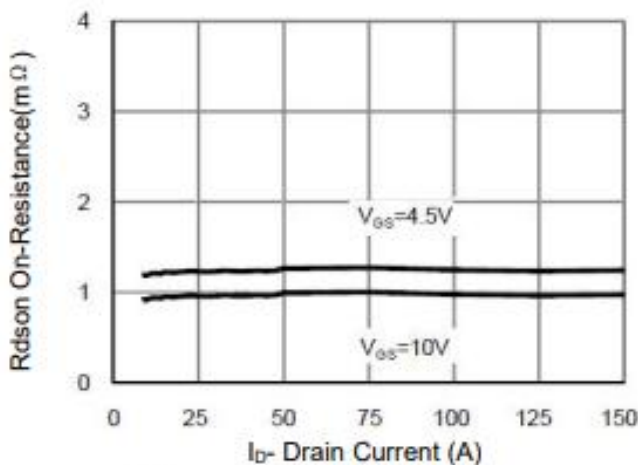


Figure 3 Rdson- Drain Current

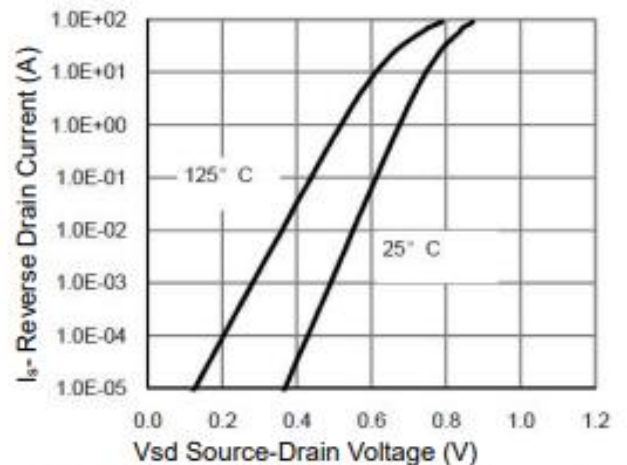


Figure 6 Source- Drain Diode Forward

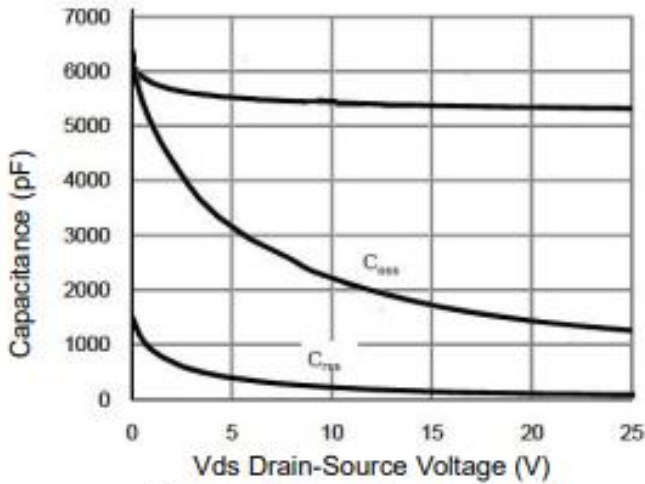


Figure 7 Capacitance vs Vds

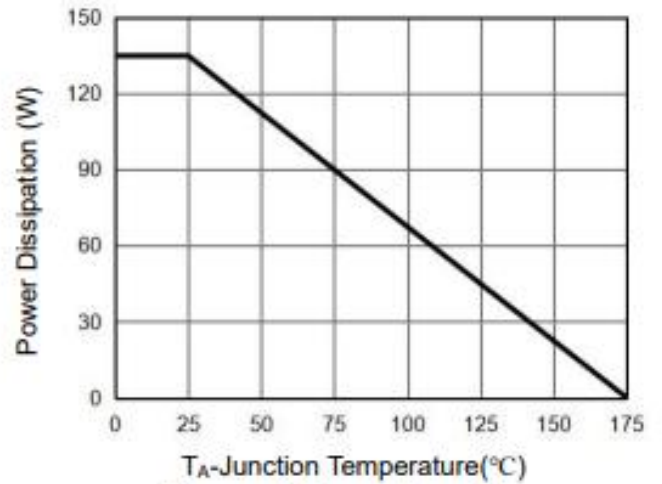


Figure 9 Power De-rating

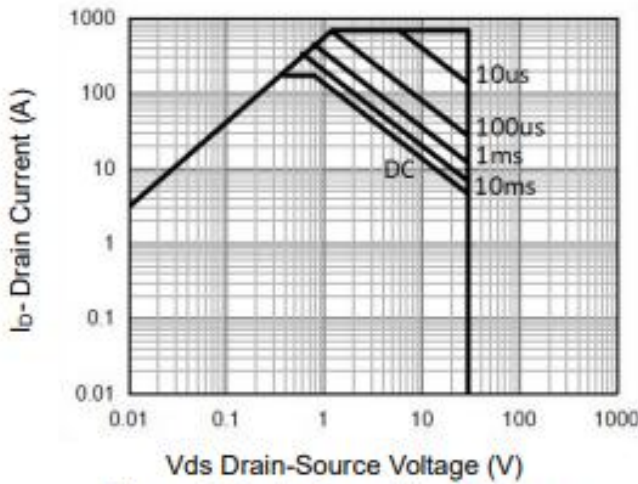


Figure 8 Safe Operation Area (Note3)

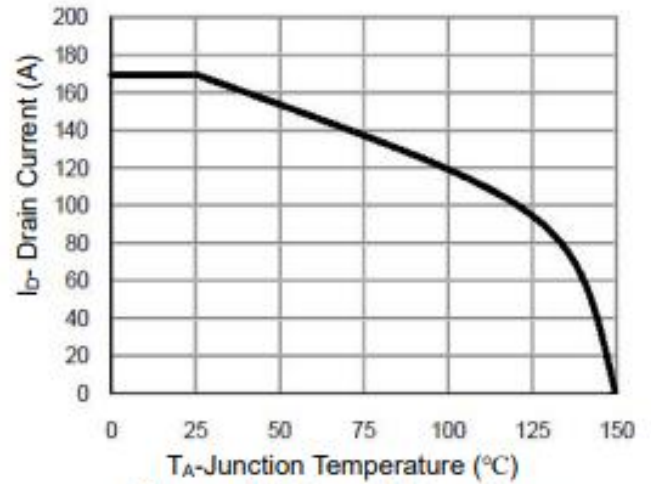


Figure 10 Current De-rating

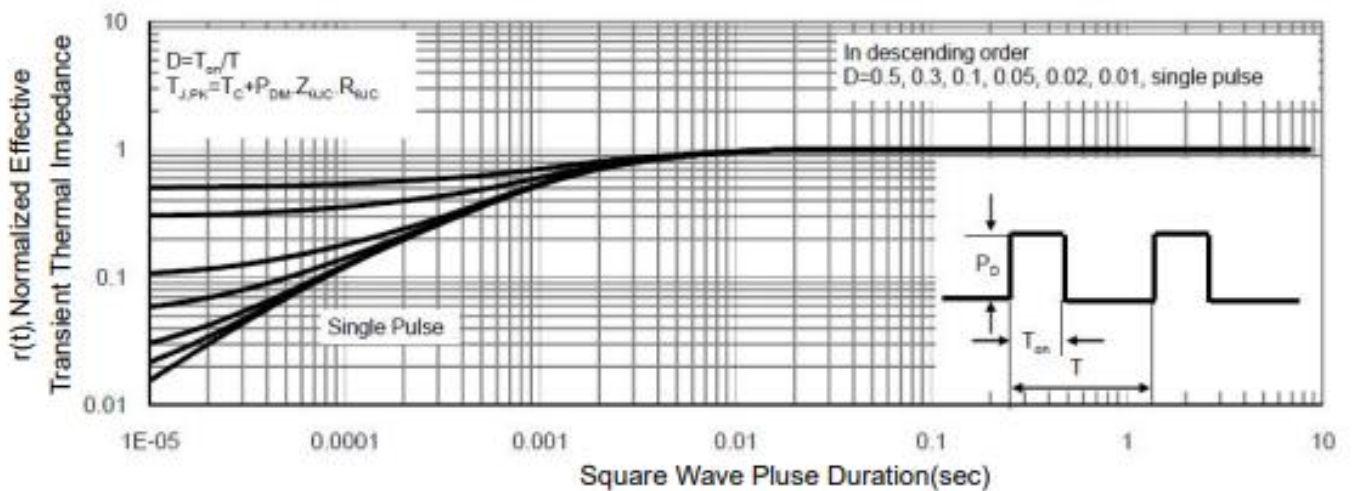
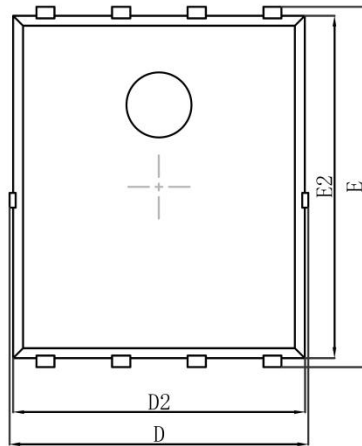
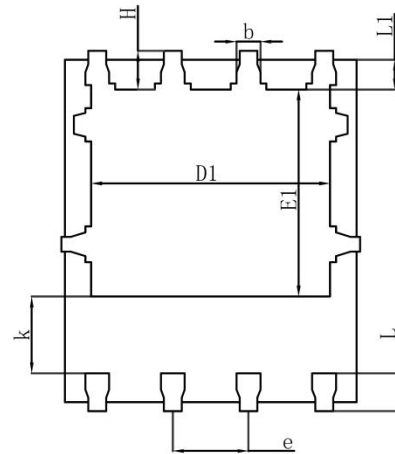


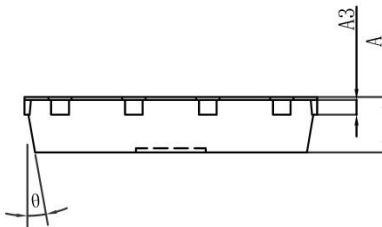
Figure 11 Normalized Maximum Transient Thermal Impedance



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°

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