

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ 100% EAS Guaranteed

Product Summary

RoHS

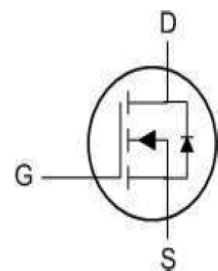
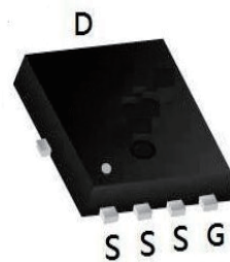
BVDSS	RDS(on)	ID
20V	3.5mΩ	80A

Description

The 80N02F is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The 80N02F meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_{D@T_C=25^\circ C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	80	A
$I_{D@T_C=100^\circ C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	35	A
I_{DM}	Pulsed Drain Current ²	200	A
EAS	Single Pulse Avalanche Energy ³	58	mJ
I_{AS}	Avalanche Current	41	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	58	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.6	$^\circ C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V,	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1.1	V
R _{DS(on)}	Static Drain-Source on-Resistance note ³	V _{GS} =4.5V, I _D =30A	-	3.5	5	mΩ
		V _{GS} =2.5V, I _D =20A	-	6.5	9	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f = 1.0MHz	-	2500	-	pF
C _{oss}	Output Capacitance		-	407	-	pF
C _{rss}	Reverse Transfer Capacitance		-	386	-	pF
Q _g	Total Gate Charge	V _{DS} =10V, I _D =30A, V _{GS} =4.5V	-	32	-	nC
Q _{gs}	Gate-Source Charge		-	3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	11	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V, I _D =30A, R _{GEN} =3Ω, V _{GS} =4.5V	-	17	-	ns
t _r	Turn-on Rise Time		-	49	-	ns
t _{d(off)}	Turn-off Delay Time		-	74	-	ns
t _f	Turn-off Fall Time		-	26	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	80	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	300	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =30A	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=10V$, $V_G=4.5V$, $L=0.5mH$, $R_G=25\Omega$, $I_{AS}=15A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Electrical and Thermal Characteristics (Curves)

Figure1: Output Characteristics

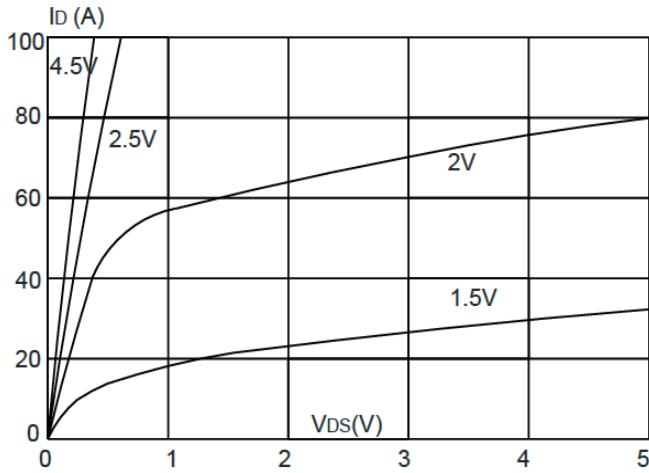


Figure 2: Typical Transfer Characteristics

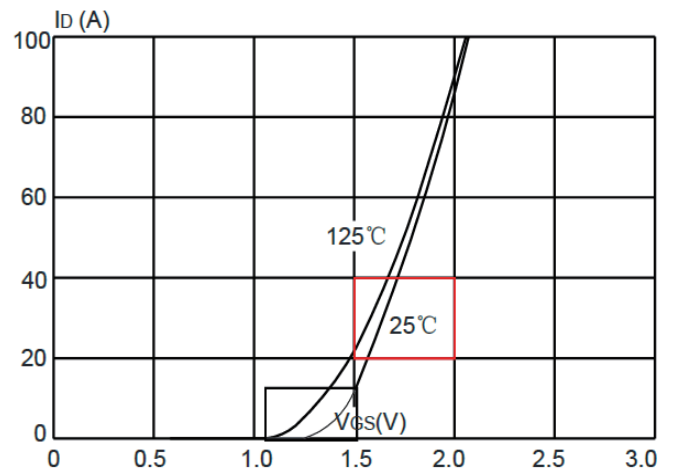


Figure 3: On-resistance vs. Drain Current

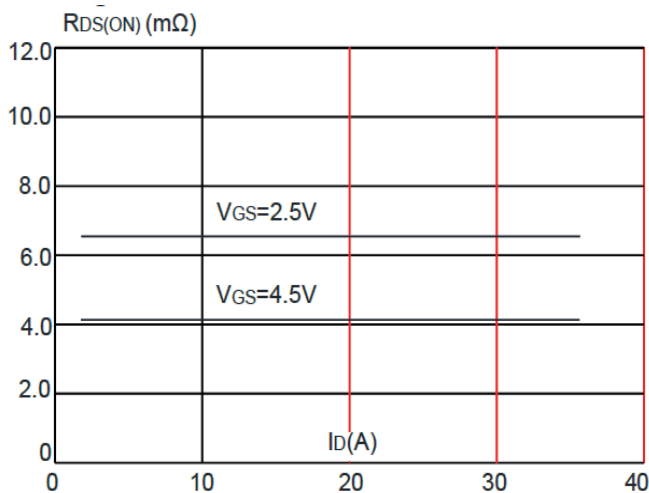


Figure 4: Body Diode Characteristics

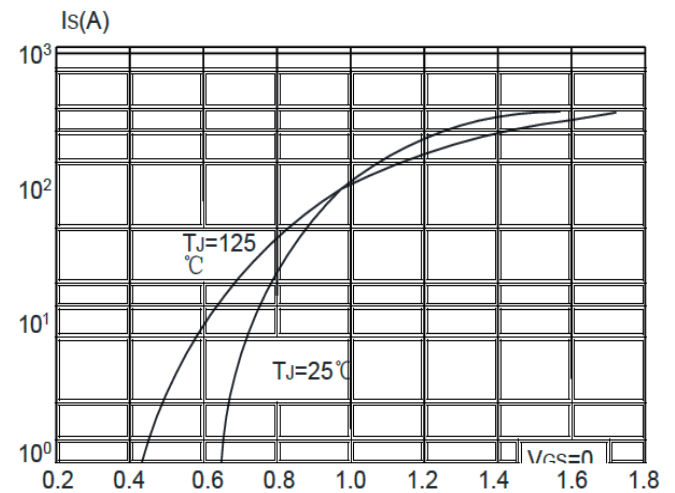


Figure 5: Gate Charge Characteristics

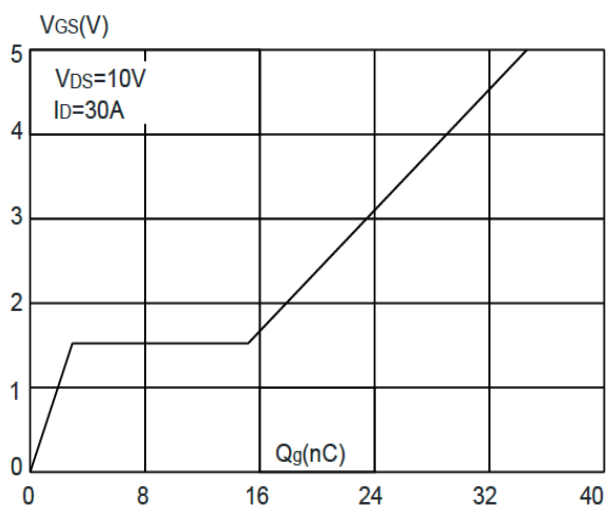
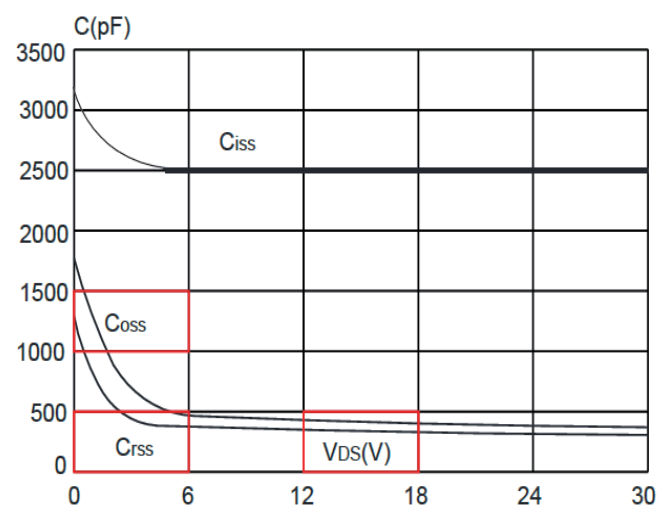


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

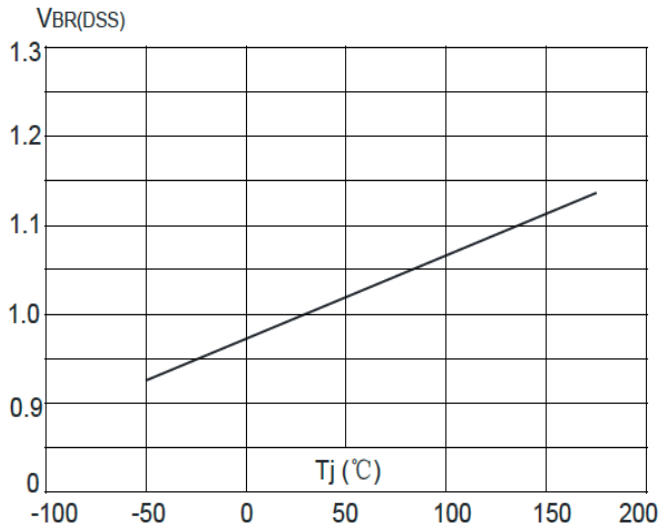


Figure 8: Normalized on Resistance vs. Junction Temperature

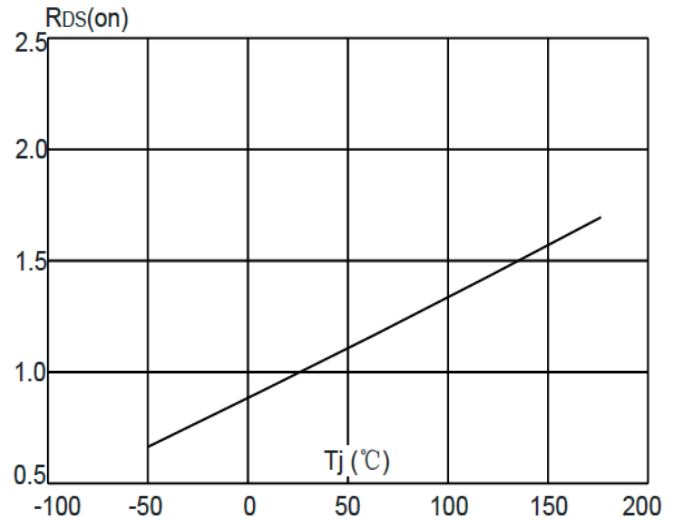


Figure 9: Maximum safe operating area

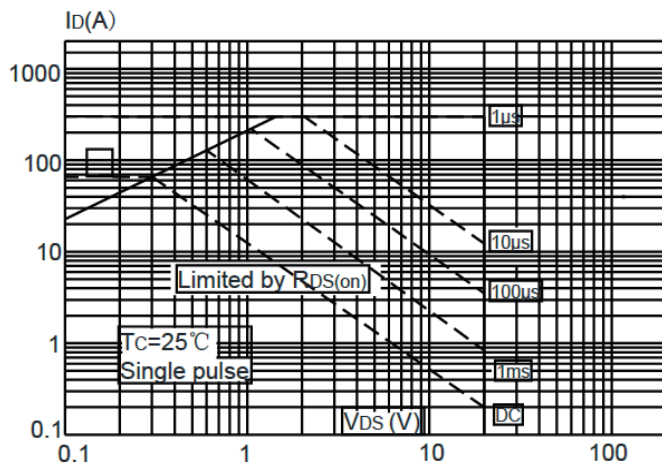


Figure 10: Maximum drain current vs. case temperature

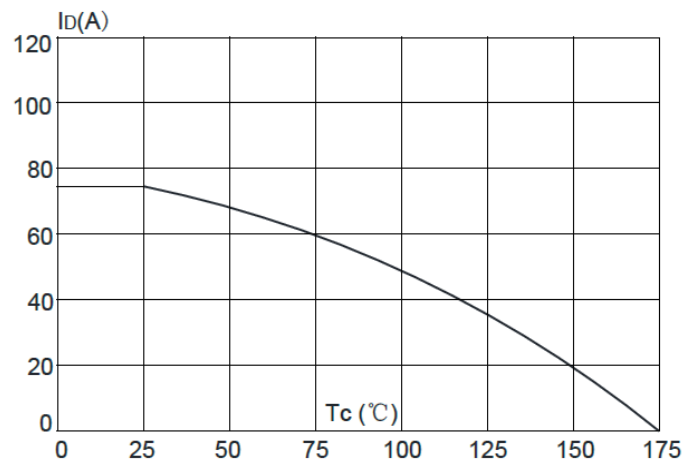
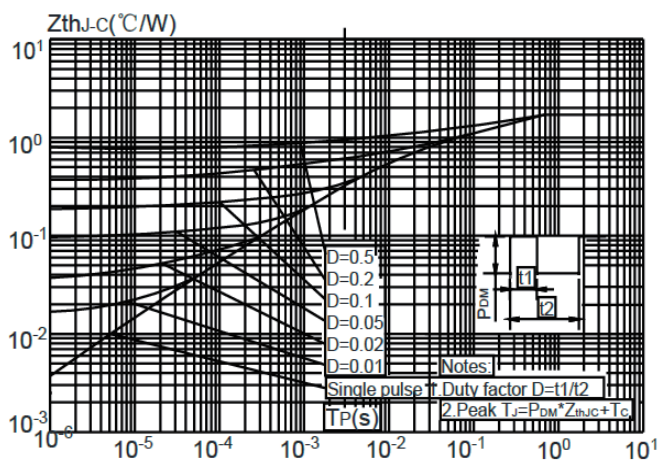
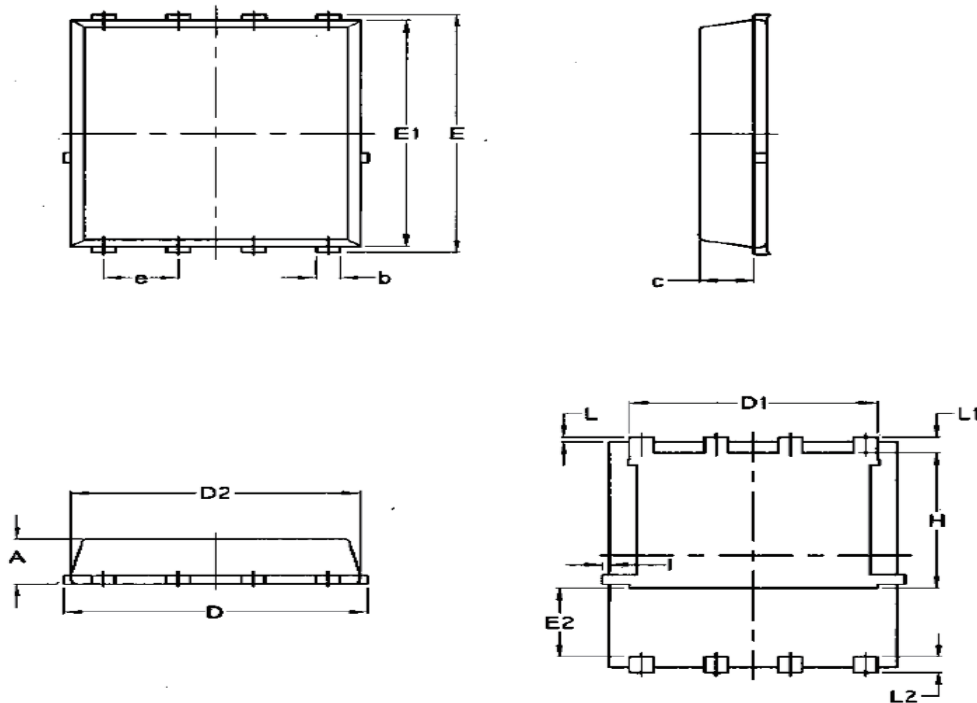


Figure 11: Maximum Effective Transient Thermal Impedance vs. Pulse Width



Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.097	0.0324	0.082
D	4.8	5.4	0.189	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.8	5	0.189	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.6	/	0.063	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.002	0.0098
L1	0.38	0.5	0.015	0.0197
L2	0.38	0.5	0.015	0.0197
H	3.3	3.5	0.1299	0.1378
I	/	0.18	/	0.007