

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

Product Summary

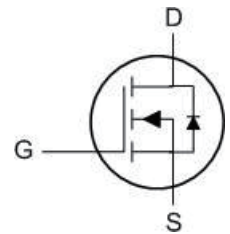
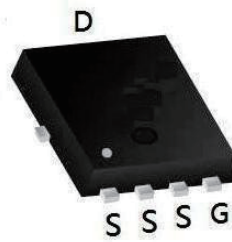
BVDSS	RDS(ON)	ID
30V	5.2mΩ	80A

Description

The 80N03D is the high cell density trenched N-ch MOSFETs, which provide excellent RDS(ON) and gate charge for most of the synchronous buck converter applications.

The 80N03D meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

PDFN3*3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V _{DS}	Drain-Source Voltage	30		V
V _{GS}	Gate-Source Voltage	±20		V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	80		A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ¹	50		A
I _{DM}	Pulsed Drain Current ²	192		A
EAS	Single Pulse Avalanche Energy ³	306		mJ
I _{AS}	Avalanche Current	53.8		A
P _D @T _C =25°C	Total Power Dissipation ⁴	82.5		W
T _{STG}	Storage Temperature Range	-55 to 175		°C
T _J	Operating Junction Temperature Range	-55 to 175		°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance Junction-Case ²	---	1.8	°C/W

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=30A$	-	5.2	6.5	m Ω
		$V_{GS}=5V, I_D=24A$	-	7.5	10	
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=24A$	20	-	-	S
Dynamic Characteristics (Note 4)						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1.0\text{MHz}$	-	2016	-	PF
C_{oss}	Output Capacitance		-	251	-	PF
C_{rss}	Reverse Transfer Capacitance		-	230	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=10V, I_D=30A$ $V_{GS}=10V, R_{GEN}=2.7\Omega$	-	20	-	nS
t_r	Turn-on Rise Time		-	15	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	60	-	nS
t_f	Turn-Off Fall Time		-	10	-	nS
Q_g	Total Gate Charge	$V_{DS}=10V, I_D=30A, V_{GS}=10V$	-	60.5	-	nC
Q_{gs}	Gate-Source Charge		-	8.1	-	nC
Q_{gd}	Gate-Drain Charge		-	7.8	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	$V_{GS}=0V, I_S=24A$	-	-	1.2	V
I_S	Diode Forward Current (Note 2)		-	-	80	A
t_{rr}	Reverse Recovery Time	$T_J = 25^\circ\text{C}, I_F = 80A$ $di/dt = 100A/\mu s$ (Note 3)	-	32	50	nS
Q_{rr}	Reverse Recovery Charge		-	12	20	nC
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^\circ\text{C}, V_{DD}=15V, V_G=10V, L=0.5\text{mH}, R_g=25\Omega, I_{AS}=35A$

Typical Performance Characteristics

Figure 1: Output Characteristics

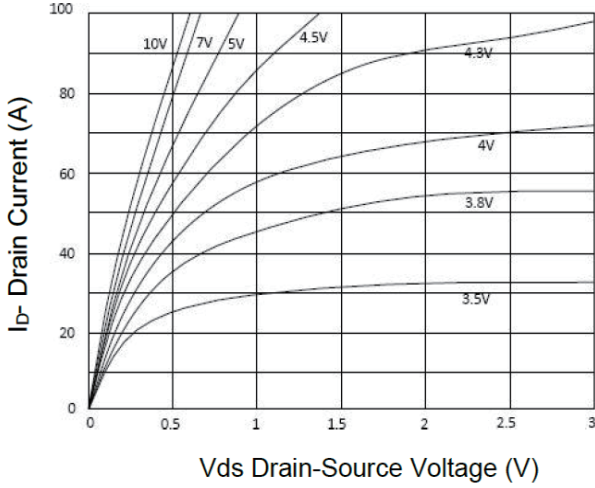


Figure 4: $R_{DS(on)}$ -Junction Temperature

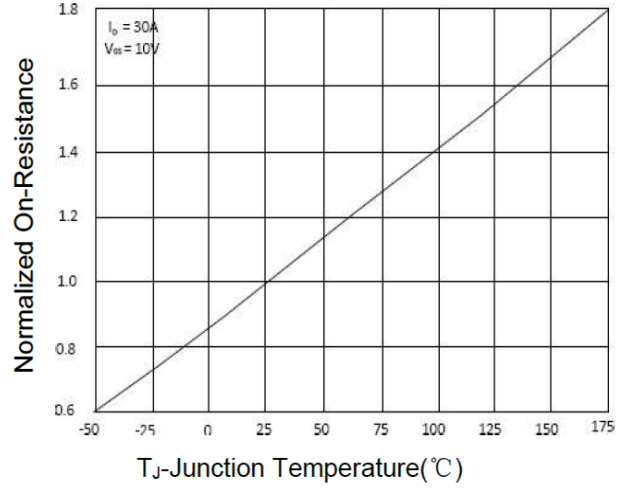


Figure 2: Transfer Characteristics

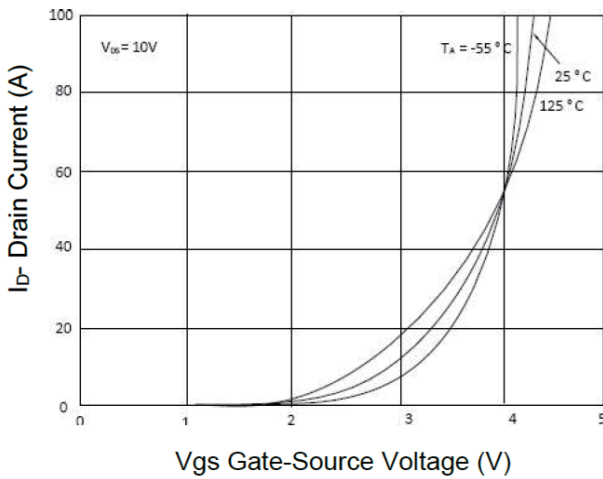


Figure 5: Gate Charge

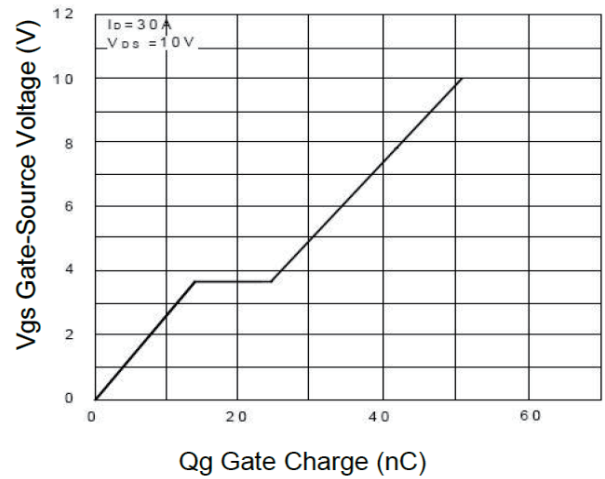


Figure 3: $R_{DS(on)}$ - Drain Current

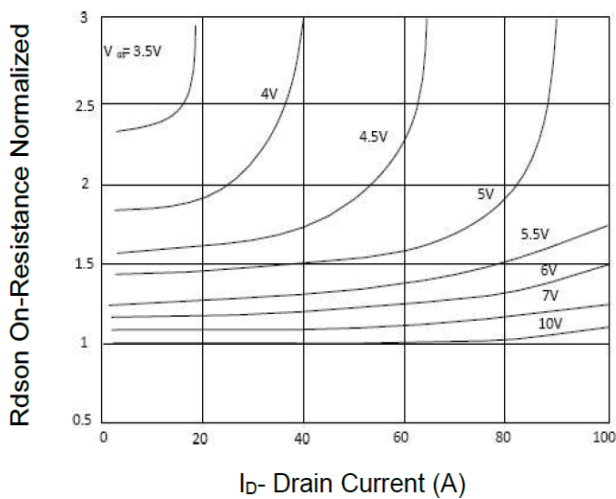
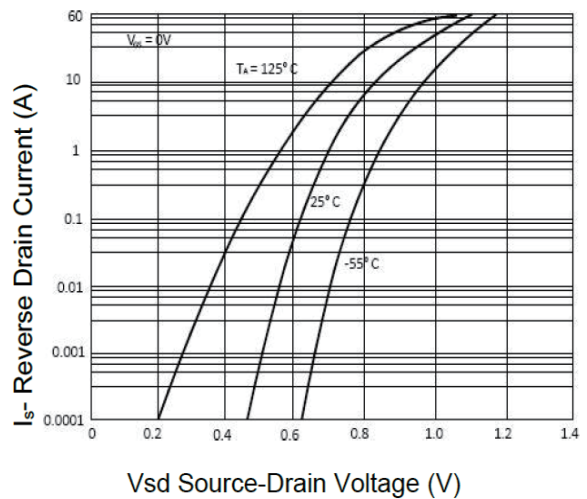


Figure 6: Source- Drain Diode Forward



Typical Performance Characteristics

Figure 7: Capacitance vs Vds

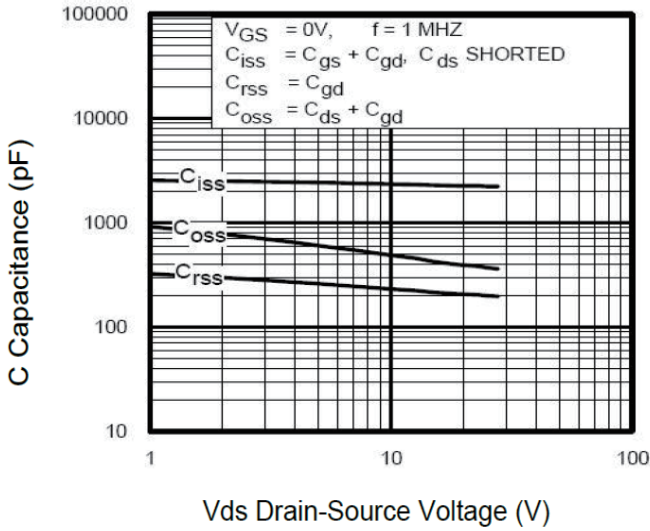


Figure 9: BVdss vs Junction Temperature

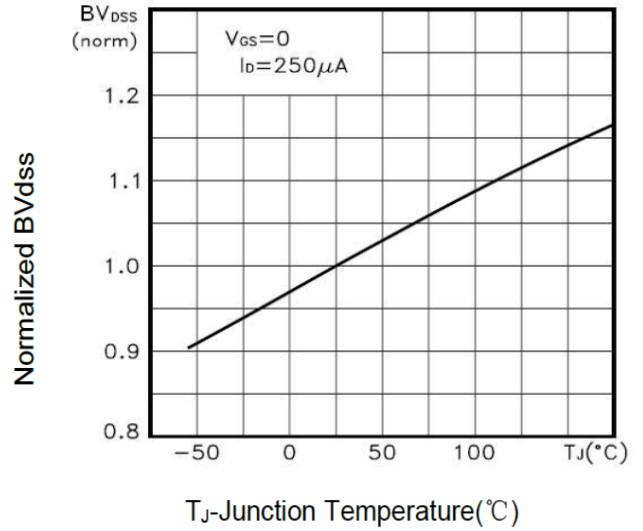


Figure 8: Safe Operation Area

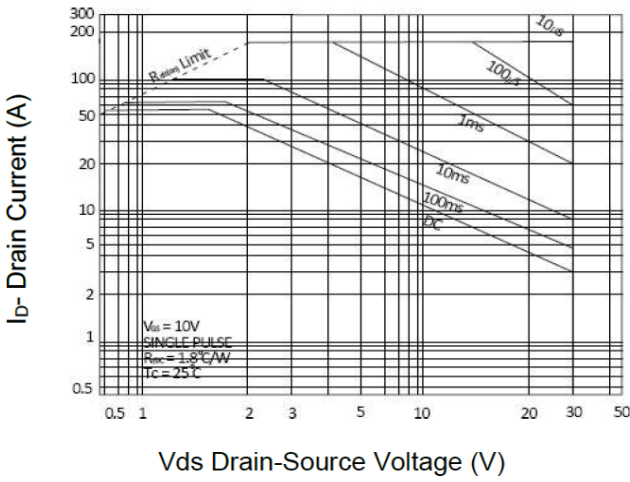


Figure 10: VGS(th) vs Junction Temperature

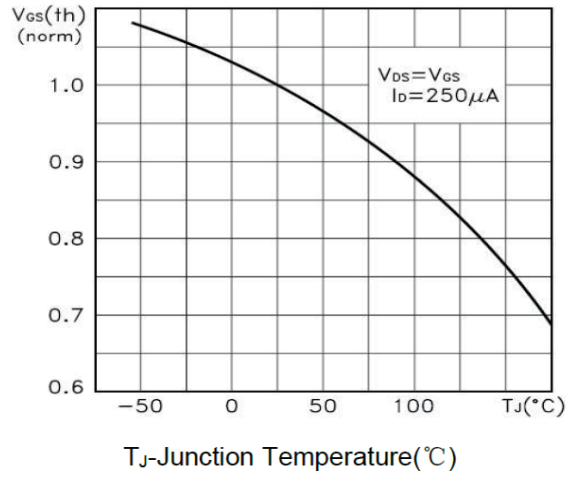
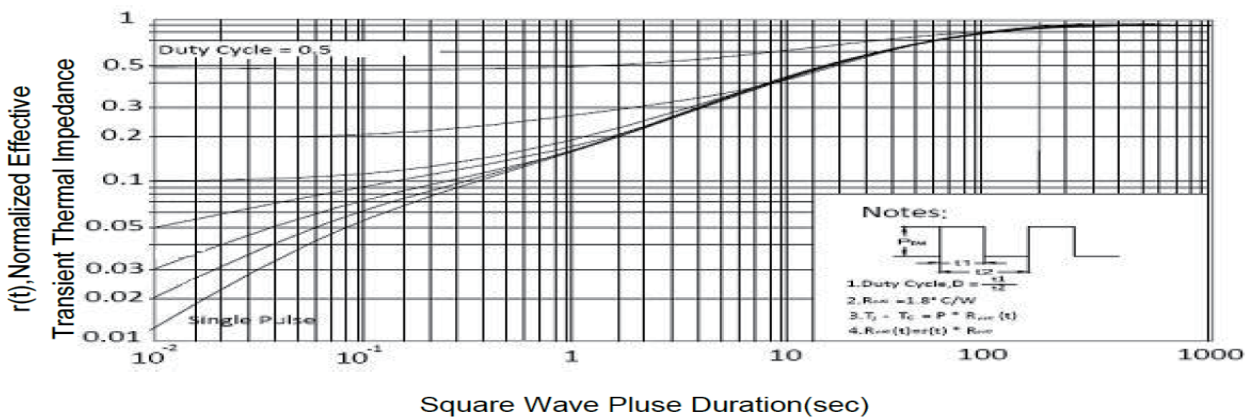
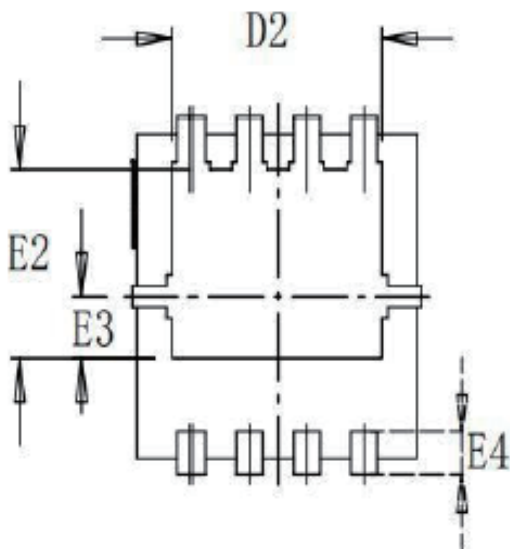
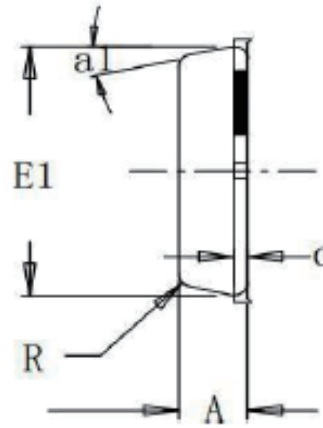
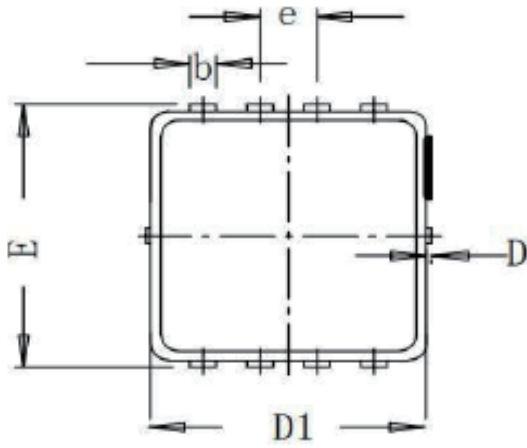


Figure 11: Normalized Maximum Transient Thermal Impedance





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.75	0.78	0.81
b	0.297	0.3	0.35
c	—	0.152	—
D	0.00	0.05	0.1
D1	3.12	3.15	3.18
D2	—	2.35	—
E	3.2	3.3	3.4
E1	3.09	3.12	3.15
E2	—	1.75	—
E3	—	0.575	—
E4	—	0.4	—
R	—	0.15	—
e	0.65BSC		
a1°	—	12°	—