Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

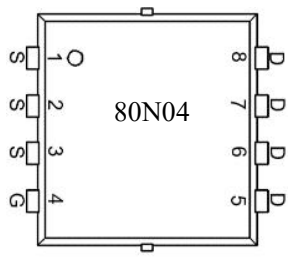
Bvdss	Rdson	ID
40V	3.4mΩ	80A

Application

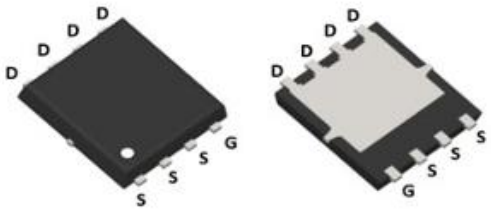
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

RoHS

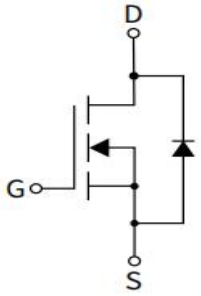
Package



Marking and pin assignment



PDFN3*3-8L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
80N04	S80N04D	PDFN3*3-8L	5000

Absolute Maximum Ratings (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C=25℃	I_D	80	A
	T_C=100℃	I_D	50	A
Pulsed Drain Current[2]		I_{DM}	320	A
Single Pulsed Avalanche Energy[3]		EAS	125	mJ
Avalanche Current		I_{AS}	18	A
Total Power Dissipation[4]		P_D@T_C=25℃	65.8	W
Operating Junction Temperature Range		T_J	-55~+150	℃
Storage Temperature Range		T_{STG}	-55~+150	℃

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case[1]	$R_{\theta JC}$	--	1.9	℃/W
Thermal Resistance Junction-to-Ambient(Steady State)[1]	$R_{\theta JA}$	--	62	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS80N04D	PDFN3*3-8L	4	5,6,7,8	1,2,3	Tape Reel

Electrical Characteristics (T_J=25℃,unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V,T_J=25℃	-	-	1	μA
		V_{DS}=40V,V_{GS}=0V,T_J=100℃	-	-	100	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.55	2.2	V
Static Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=10V, I_D=14A	-	3.4	4.5	mΩ
		V_{GS}=4.5V, I_D=7A	-	4.1	5.4	
Forward Transconductance	gfs	V_{DS}=10V,I_D=14A	-	126	-	S
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	1.7	-	Ω
Input Capacitance	C_{lss}	V_{DS}=20V,V_{GS}=0V, f=1MHz	-	1980	-	pF
Output Capacitance	C_{oss}		-	455	-	
Reverse Transfer Capacitance	C_{rss}		-	29	-	
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=10V, I_D=14A	-	32	-	nC
Gate-Source Charge	Q_{gs}		-	4.7	-	
Gate-Drain Charge	Q_{gd}		-	5.3	-	
Turn-on Delay Time	$T_{d(on)}$	V_{GS}=10V,V_{DD}=20V, R_G=3Ω,I_D=14A	-	7.4	-	nS
Turn-on Rise Time	T_r		-	4.7	-	
Turn-Off Delay Time	$T_{d(off)}$		-	29.2	-	
Turn-Off Fall Time	T_f		-	7.3	-	
Maximum Continuous Drain to Source Diode Forward Current[1,4]	I_S	V_G=V_D=0V,Force Current	-	-	80	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V,I_S=14A,T_J=25℃	-	-	1.2	V
Reverse Recovery Time	t_{rr}	IF=14A,di/dt=100A/μs, T_J=25℃	-	36	-	nS
Reverse Recovery Charge	Q_{rr}		-	12.6	-	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.
2. The test condition is V_{DD}=25V,V_{GS}=10V,L=0.4mH，I_{AS}=18A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the

user's specific board design.

4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

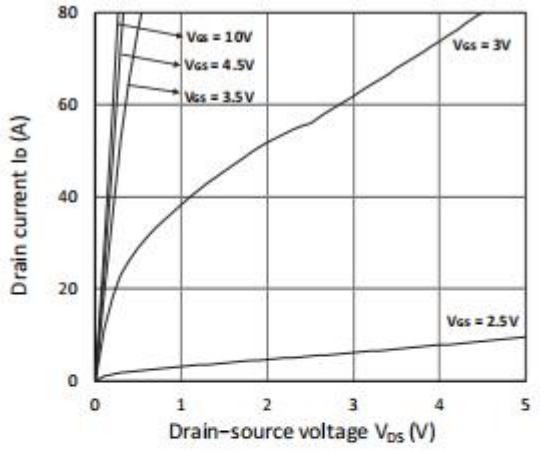


Figure 1. Output Characteristics

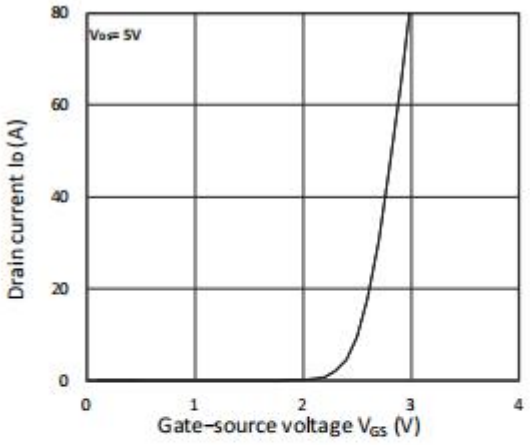


Figure 2. Transfer Characteristics

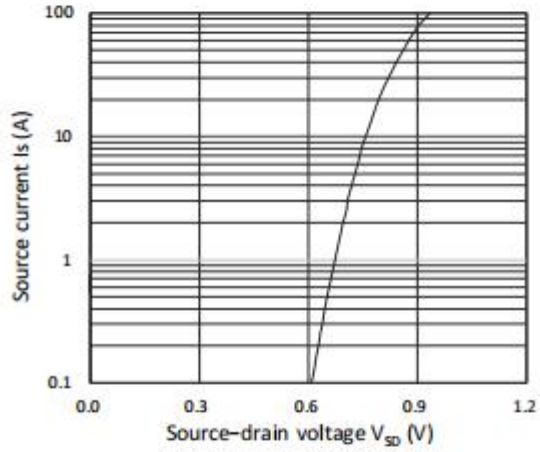


Figure 3. Forward Characteristics of Reverse

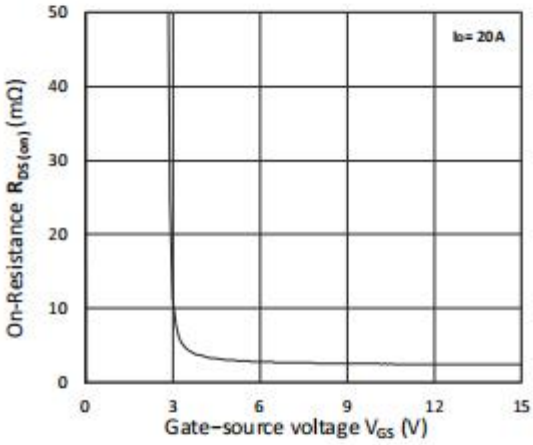


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

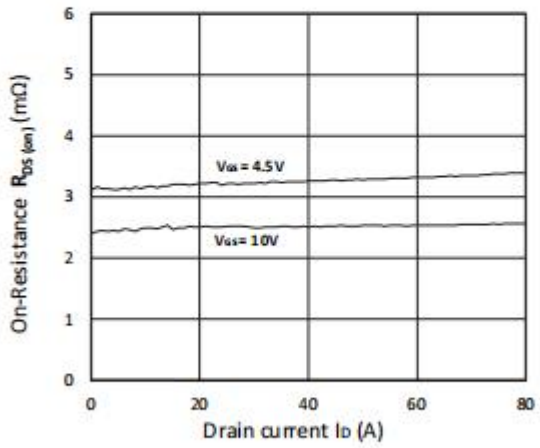


Figure 5. $R_{DS(ON)}$ vs. I_D

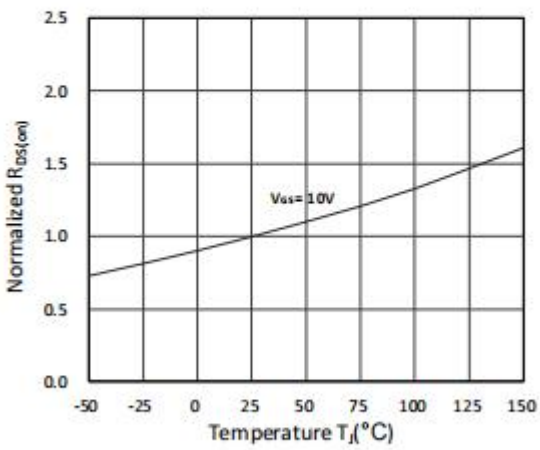


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

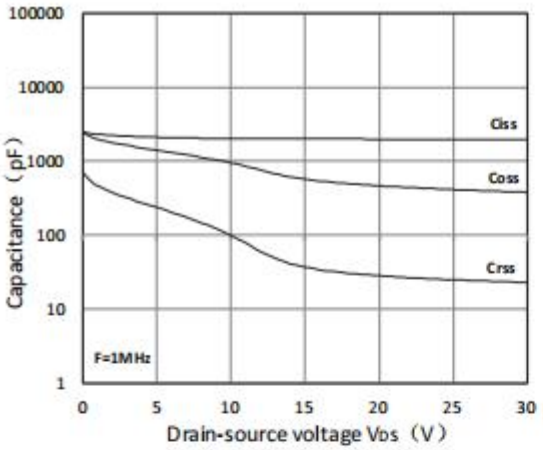


Figure 7. Capacitance Characteristics

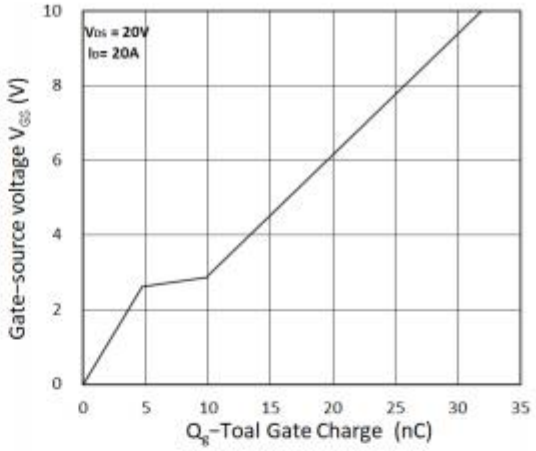


Figure 8. Gate Charge Characteristics

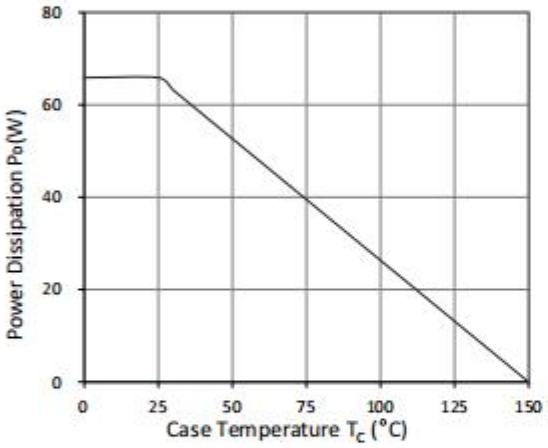


Figure 9. Power Dissipation

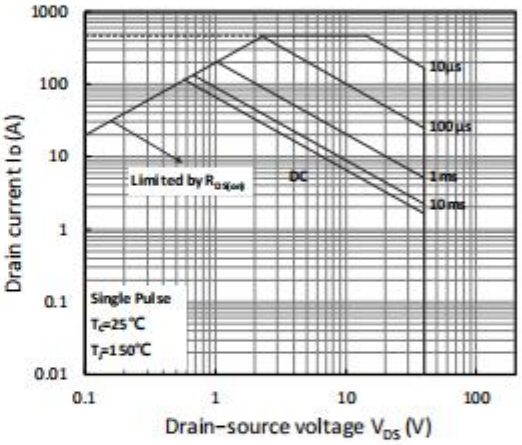


Figure10. Safe Operating Area

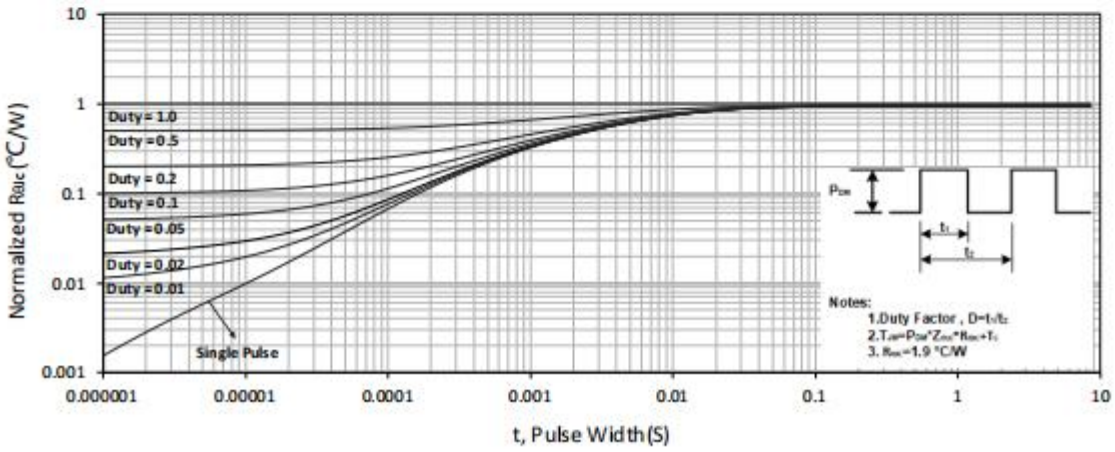
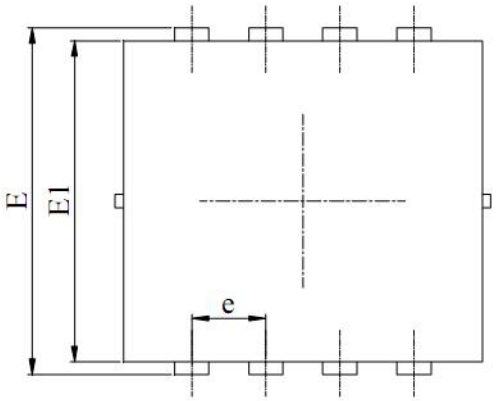
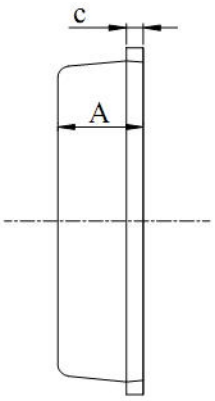


Figure 11. Normalized Maximum Transient Thermal Impedance

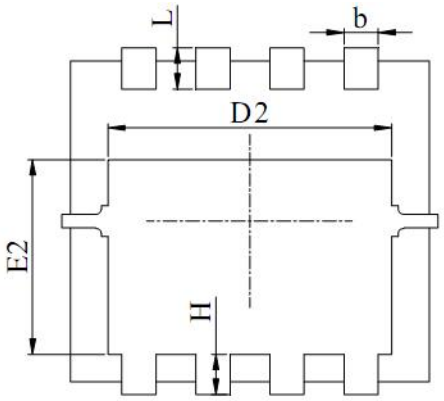
Package Mechanical Data PDFN3x3-8L



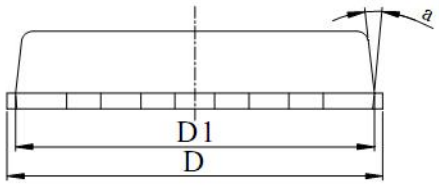
Top View



Side View



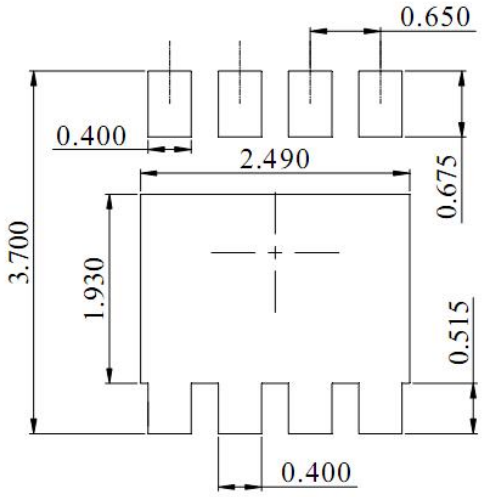
Bottom View



Front View

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.20	0.25
D	3.00	3.15	3.25
D1	2.95	3.05	3.15
D2	2.39	2.49	2.59
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.70	1.80	1.90
e	0.65 BSC		
H	0.30	0.40	0.50
L	0.25	0.40	0.50
a	---	---	15°



DIMENSIONS:MILLIMETERS

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