Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13mΩ@10V	18A
	16mΩ@4.5V	

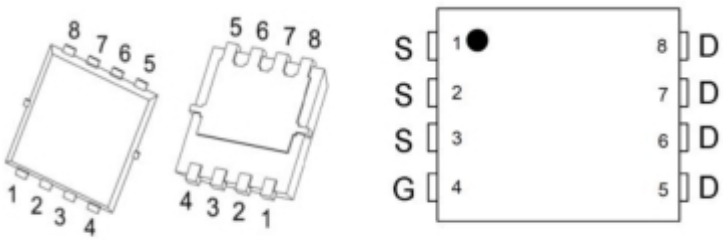
Feature

- Fast switching speed
- Surface mount package
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

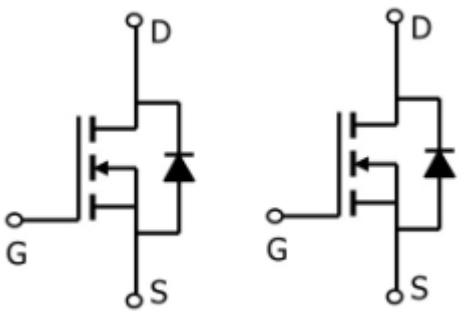
- DC-DC Converters.
- Motor Control.

Package



PDFNWB3.3×3.3-8L

Circuit diagram



Marking

60N13GD =Device Code
* =Month Code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(Tc=25°C)	I_D	18	A
Pulse Drain Current Tested	I_{DM}	72	A
Maximum Power Dissipation(Tc=25°C)	P_D	50	W
Thermal Resistance-Junction to Case	$R_{\theta JC}$	2.5	°C/W
Maximum Junction Temperature	T_J	-55 to 150	°C
Storage Temperature Range	$T_{STG,}$	-55 to 150	°C

Electrical characteristics

(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =60V, V_{GS} = 0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =10A		13	16	mΩ
		V_{GS} =4.5V, I_D =10A		16	21	
Dynamic and Switching Characteristics						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz		426		pF
Output capacitance	C_{oss}			103		
Reverse transfer capacitance	C_{rss}			8		
Turn-on Delay Time	$T_{d(on)}$	V_{DD}=30V, I_D =10A, V_{GS}=10V, R_G =1.6Ω		8		nS
Turn-on Rise Time	T_r			5		
Turn-Off Delay Time	$T_{d(off)}$			24		
Turn-Off Fall Time	t_f			3.5		
Total Gate Charge	Q_g	V_{DS}=30V , V_{GS}=10V, I_D =10A		35		pF
Gate-Source Charge	Q_{gs}			6.4		
Gate-Drain Charge	Q_{gd}			3.5		
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V ,I_S=1A			1.2	V

Typical Characteristics

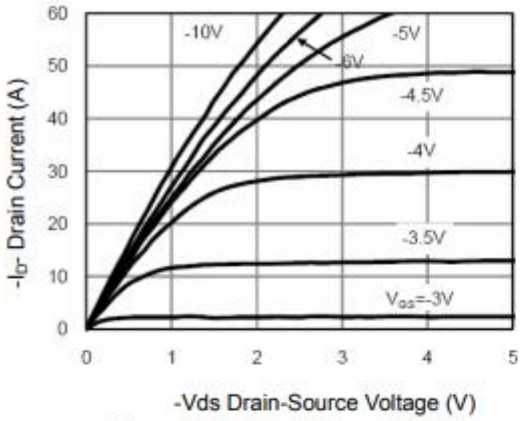


Figure 1 Output Characteristics

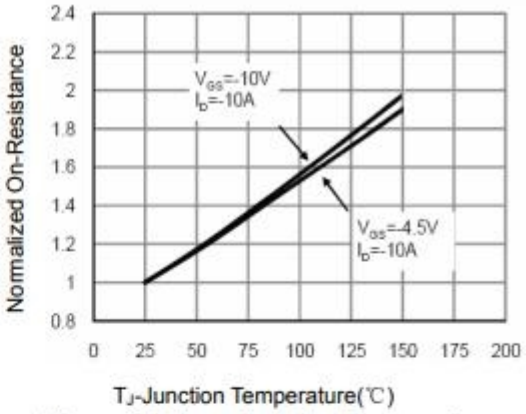


Figure 4 Rdson-JunctionTemperature

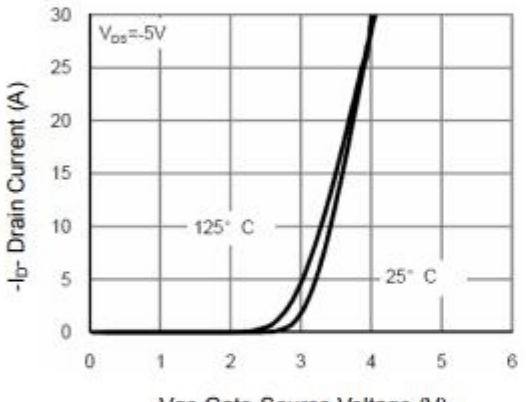


Figure 2 Transfer Characteristics

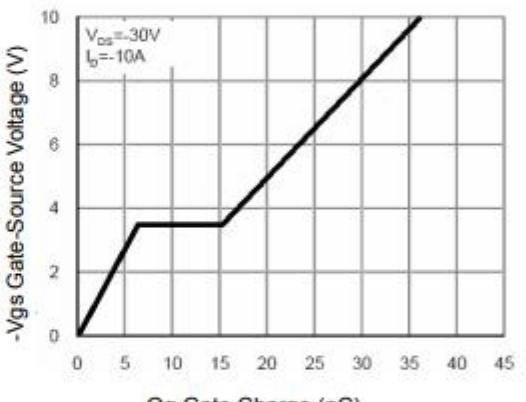


Figure 5 Gate Charge

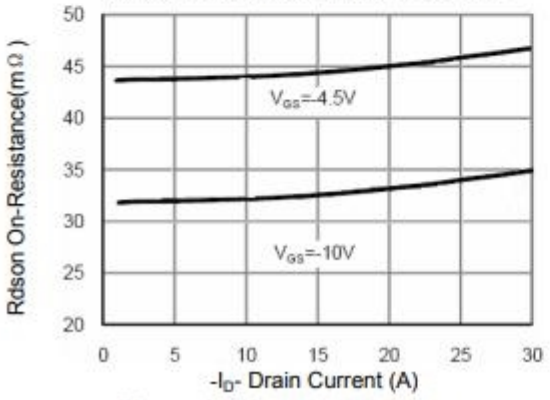


Figure 3 Rdson- Drain Current

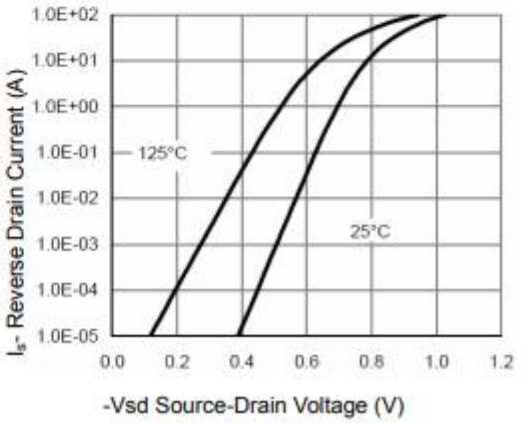


Figure 6 Source- Drain Diode Forward

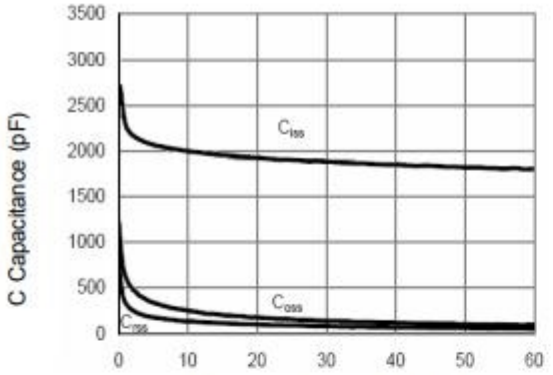


Figure 7 Capacitance vs Vds

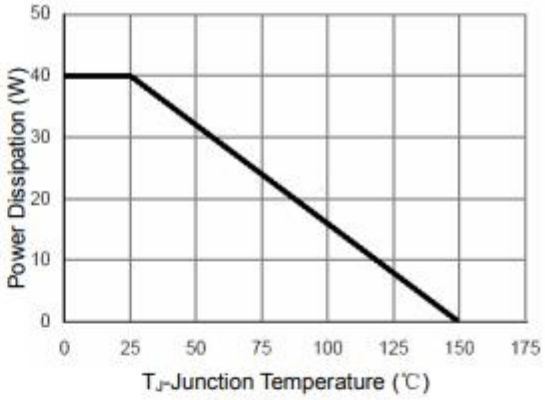


Figure 9 Power De-rating

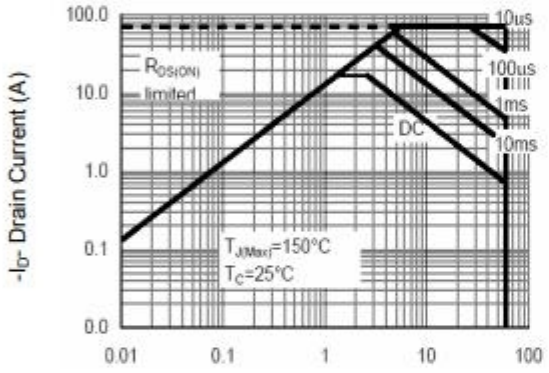


Figure 8 Safe Operation Area

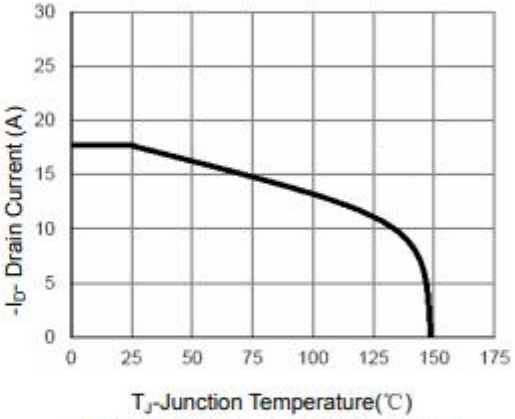


Figure 10 ID Current De-rating

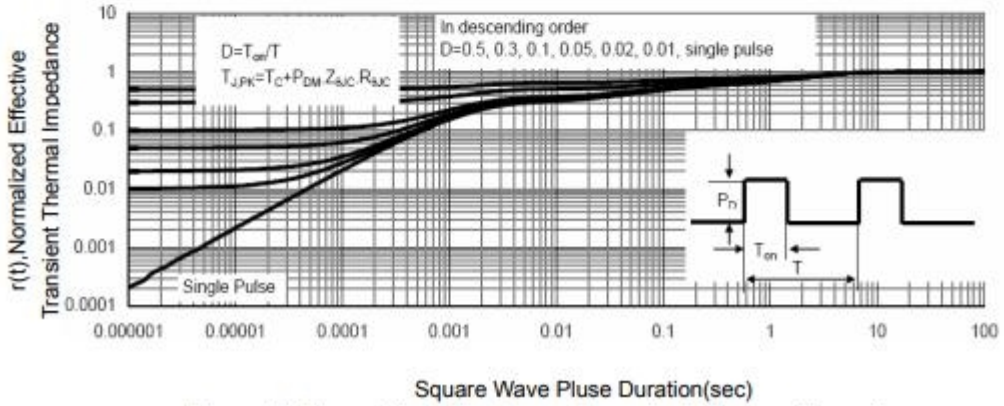
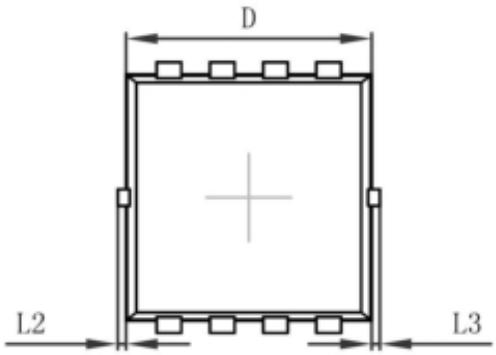
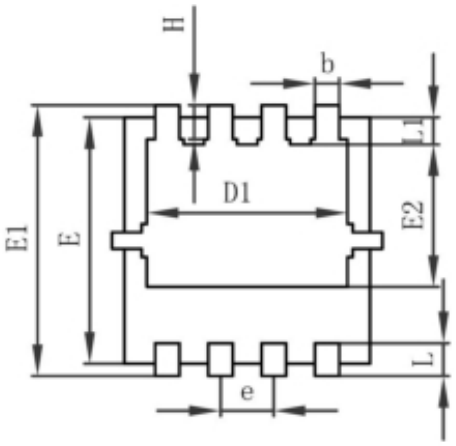


Figure 11 Normalized Maximum Transient Thermal Impedance

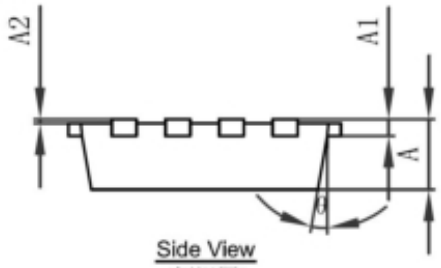
PDFNWB3.3×3.3-8L Package Information



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	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°