

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	7.5mΩ@10V	40A
	10mΩ@4.5V	

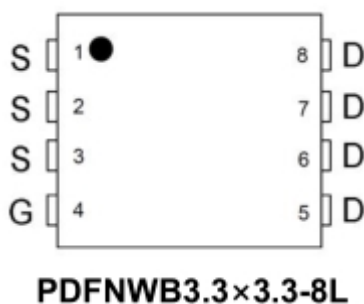
Feature

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent reliability and uniformity
- Fast switching and soft recovery

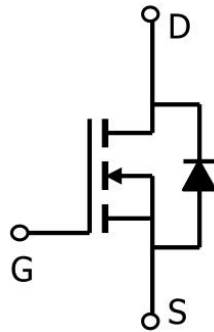
Applications

- PD charger
- Motor driver
- Switching voltage regulator
- DC-DC convertor
- Switched mode power supply

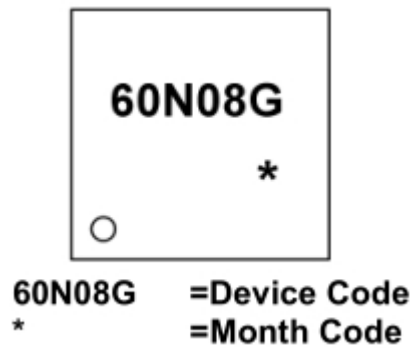
Package



Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	60	V
Gate-source voltage	V _{GS}	±20	V
Continuous drain current ¹⁾ , T _C =25 °C	I _D	40	A
Pulsed drain current ²⁾ , T _C =25 °C	I _{D, pulse}	160	A
Power dissipation ³⁾ , T _C =25 °C	P _D	81	W
Single pulsed avalanche energy ⁴⁾	E _{AS}	91	mJ
Thermal resistance, junction-case	R _{θJC}	1.54	°C/ W
Operation and storage temperature	T _{STG} , T _J	-55~ +150	°C

Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

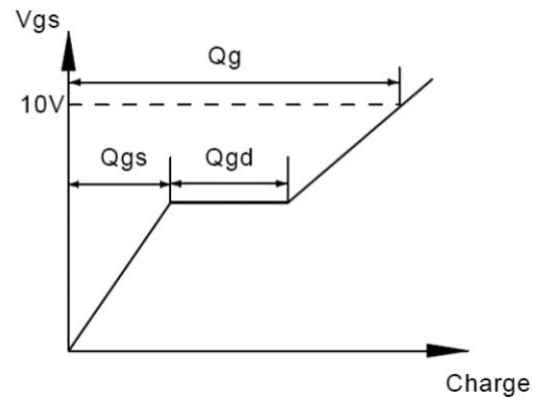
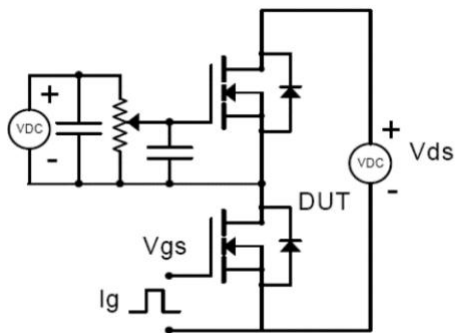
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	60			V
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	uA
Drain-source leakage current	I _{DSS}	V _{DS} =48V,V _{GS} = 0V			1	uA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1		2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		7.5	10	mΩ
		V _{GS} =4.5V, I _D =10A		10	13	
Dynamic Characteristics Reverse						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=100KHz		1204		pF
Output Capacitance	C _{oss}			194.1		
Reverse transfer capacitance	C _{rss}			9.9		
Total Gate Charge	Q _g	V _{GS} =10V ,V _{DS} =50V , I _D =25A		17.9		pF
Gate-Source Charge	Q _{gs}			3.8		
Gate-Drain Charge	Q _{gd}			4.2		
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =50V, R _G =2Ω, I _D =25A		23.9		nS
Rise Time	T _r			4.6		
Turn-Off Delay Time	T _{d(off)}			37.8		
Fall Time	t _f			6.4		
Drain-Source Body Diode Characteristics						
Diode forward voltage	V _{SD}	V _{GS} =0V ,I _S =20A			1.2	V
Reverse recovery time	t _{rr}	V _R =50 V, I _S =25 A,		42.6		ns
Reverse recovery charge	Q _{rr}	di/dt=100 A/μs		36.3		nC

Note :

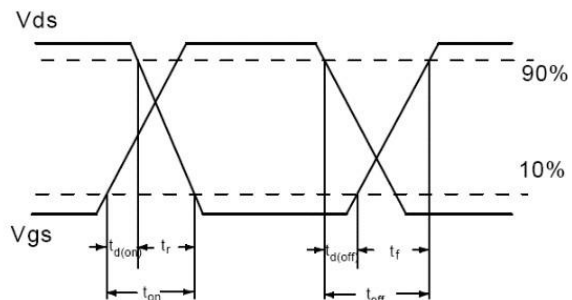
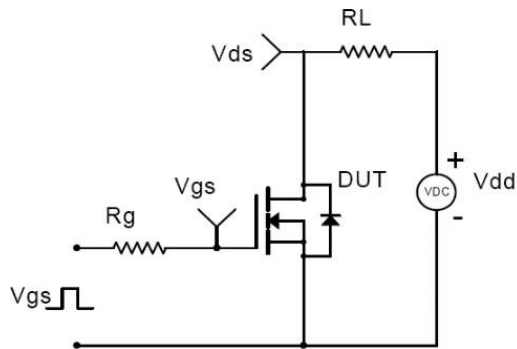
1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. P_d is based on max. junction temperature, using junction-case thermal resistance.
4. $V_{DD}=30V, V_{GS}=10V, L=0.3mH$, starting $T_j=25^{\circ}\text{C}$.

Test circuits and waveforms

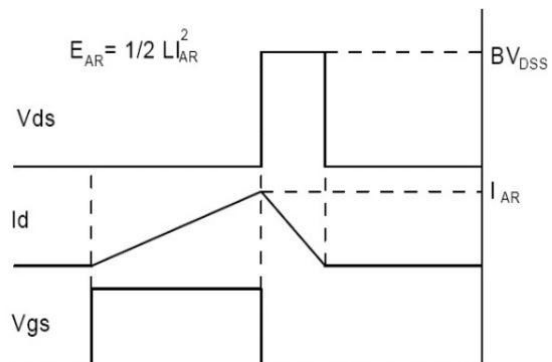
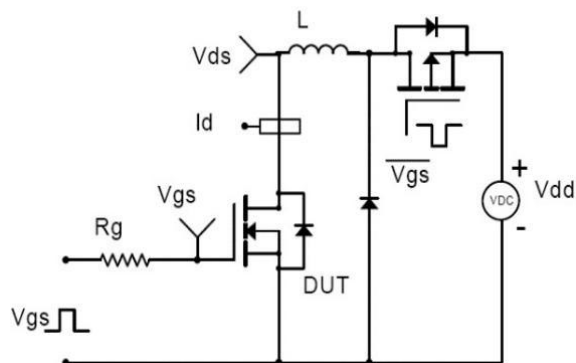
- Gate charge test circuit & waveform



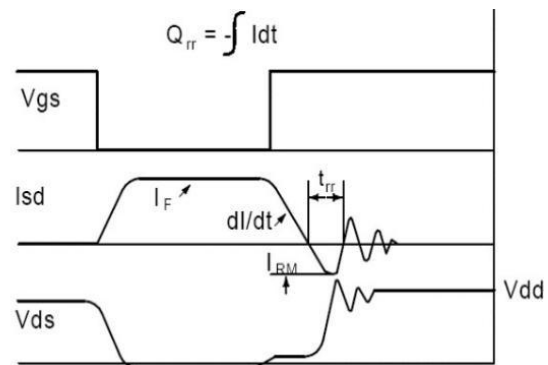
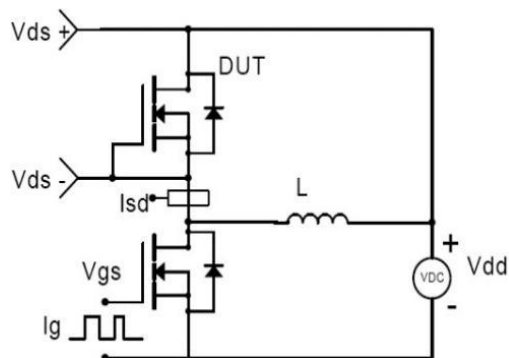
- Switching time test circuit & waveforms



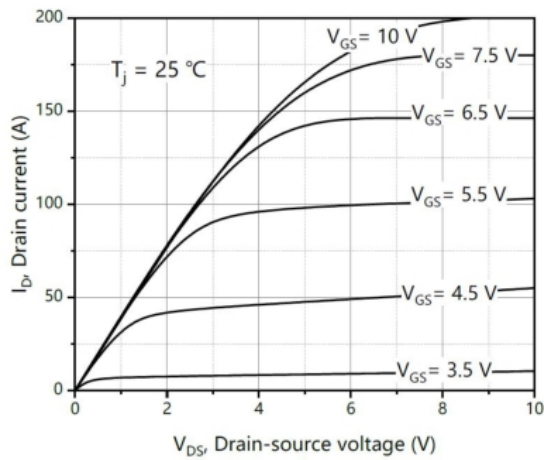
- Unclamped inductive switching (UIS) test circuit & waveforms



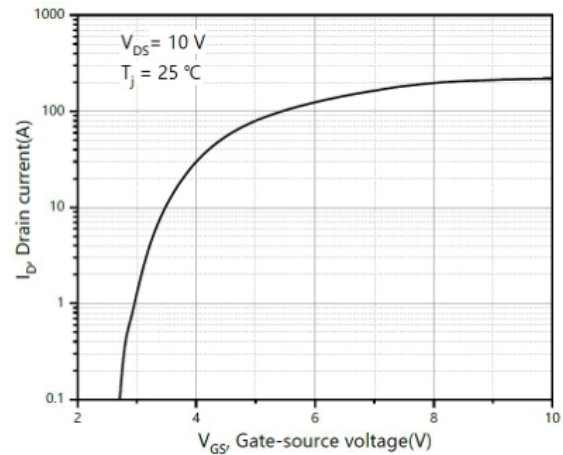
- Diode reverse recovery test circuit & waveforms



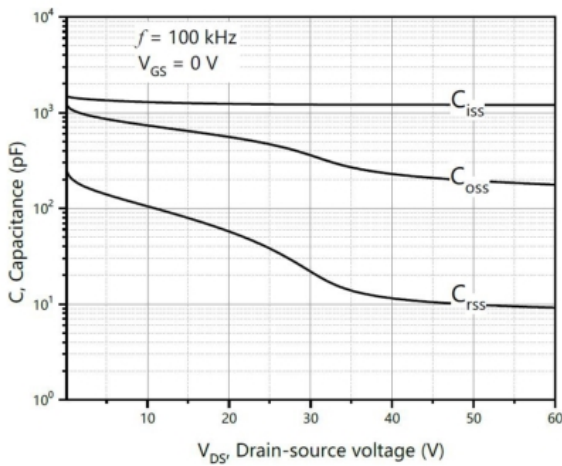
Typical Characteristics



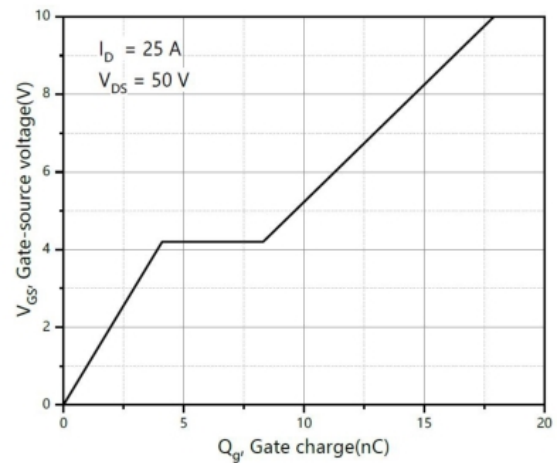
Output characteristics



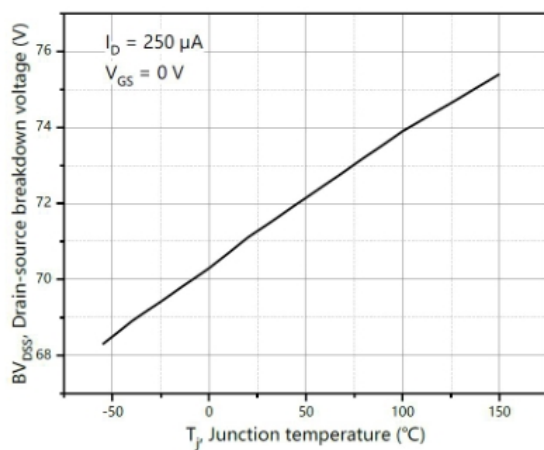
Transfer characteristics



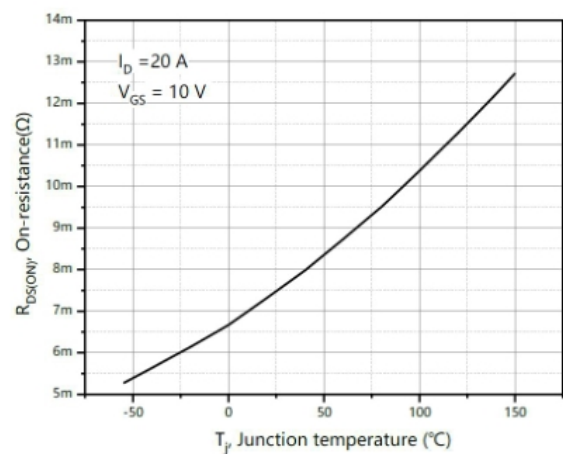
Capacitances



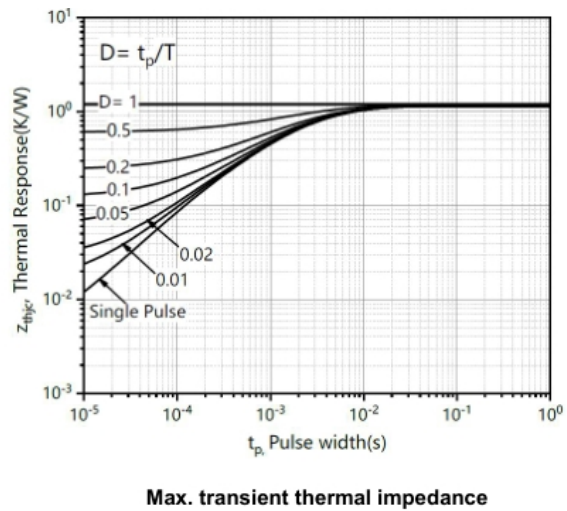
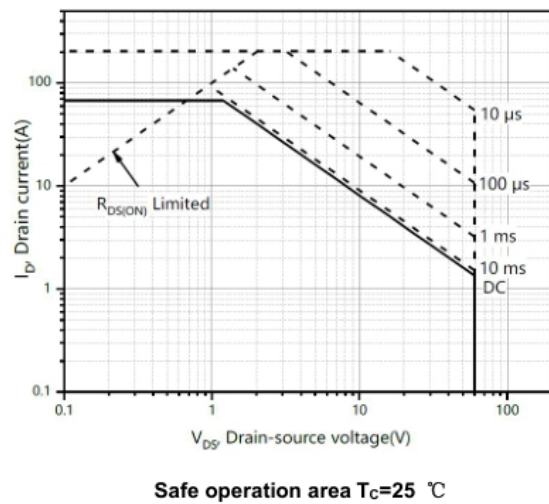
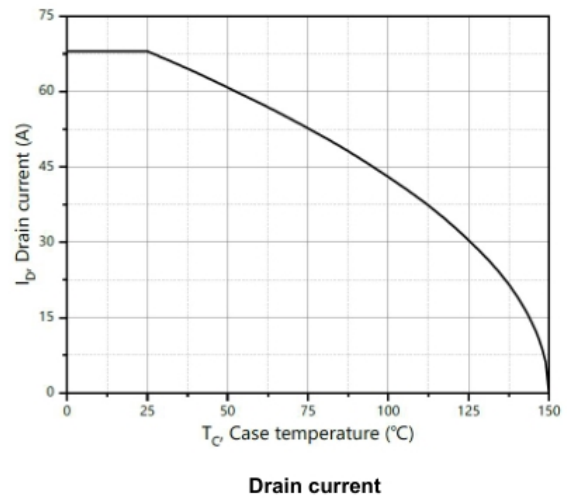
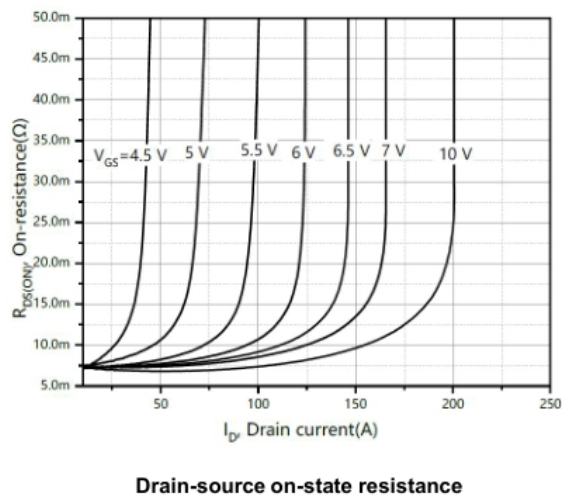
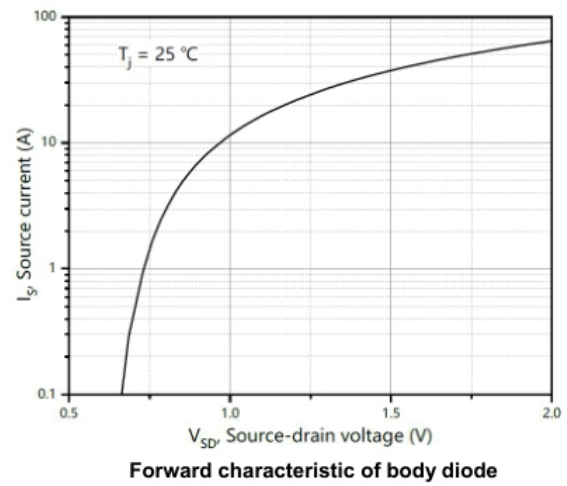
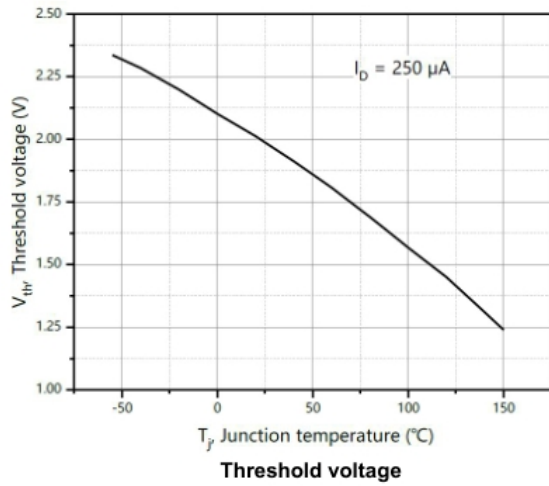
Gate charge



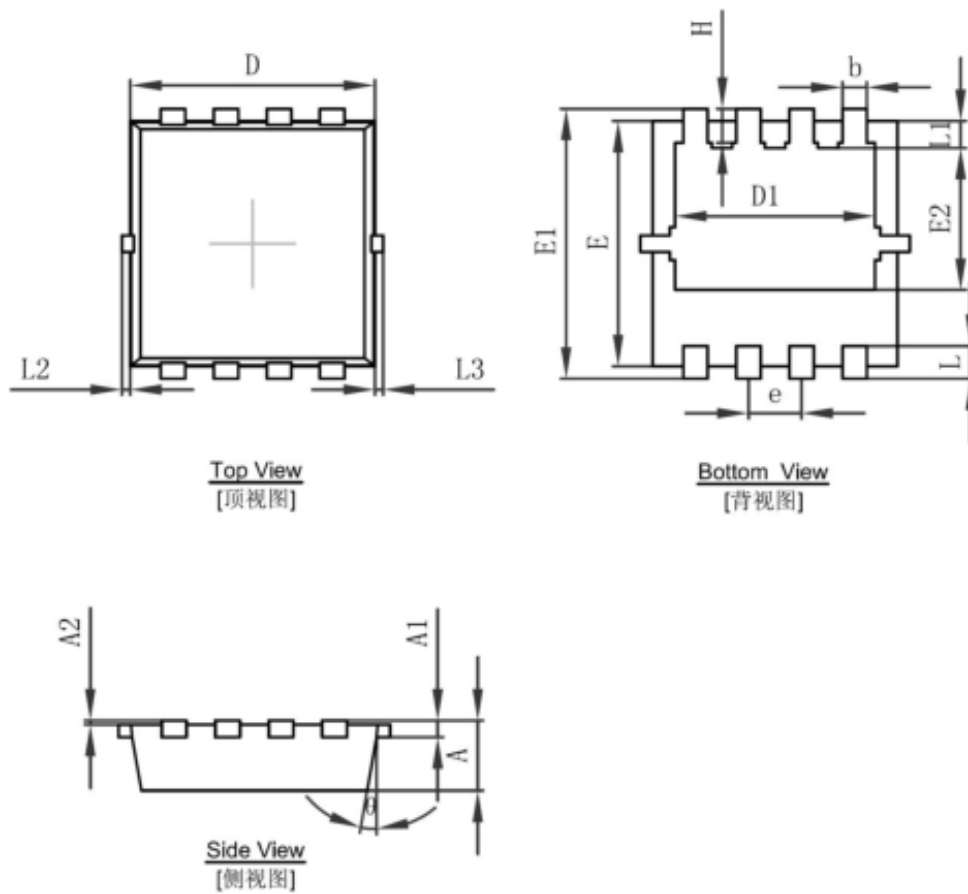
Drain-source breakdown voltage



Drain-source on-state resistance



PDFNWB3.3×3.3-8L Package Information



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°