

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	68mΩ@-10V	-20A
	80mΩ@-4.5V	

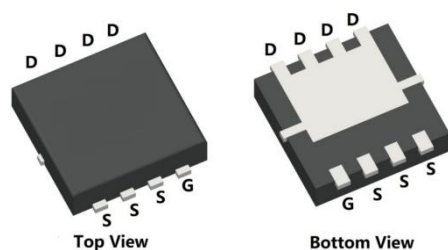
Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

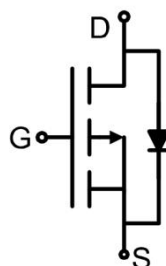
- Brushless motor
- Load switch
- Uninterruptible power supply

Package

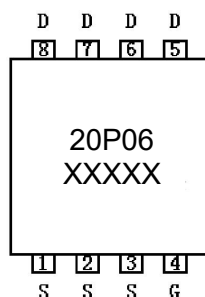


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings (T_c=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⁾ (V _{GS} = -10V, T _A = 25°C)	I _D	-20	A
Continuous Drain Current ¹⁾ (V _{GS} = -10V, T _A = 70°C)	I _D (70°C)	-13	A
Pulsed Drain Current ²⁾	I _{DM}	-60	A
Power Dissipation ³⁾ (T _A = 25°C)	P _D	1.5	W
Thermal Resistance Junction-to-Ambient ¹⁾	R _{θJA}	83	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A = 25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-48V, V _{GS} =0V, T _J =25℃			-1	μA
Gate-body 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	-1.2	-1.5	-2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-12A		55	68	mΩ
		V _{GS} =-4.5V, I _D =-8A		68	80	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f =1MHz		1447		pF
Output Capacitance	C _{oss}			97.3		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} =-48V, V _{GS} =-4.5V I _D =-10A		9.86		nC
Gate-Source Charge	Q _{gs}			3.08		
Gate-Drain Charge	Q _{gd}			2.95		
Turn-on delay time	t _{d(on)}	V _{DS} =-15V, V _{GS} =-10V I _D =-1A, R _G =3.3Ω		28.8		nS
Turn-on rise time	t _r			19.8		
Turn-off delay time	t _{d(off)}			60.8		
Turn-off fall time	t _f			7.2		
Source-Drain Diode characteristics						
Diode Forward Current ^{1,4)}	I _S	V _D =V _G =0V, Force Current			-20	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25℃			-1.2	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2) The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- 5) Guaranteed by design, not subject to production testing.

Typical Characteristics

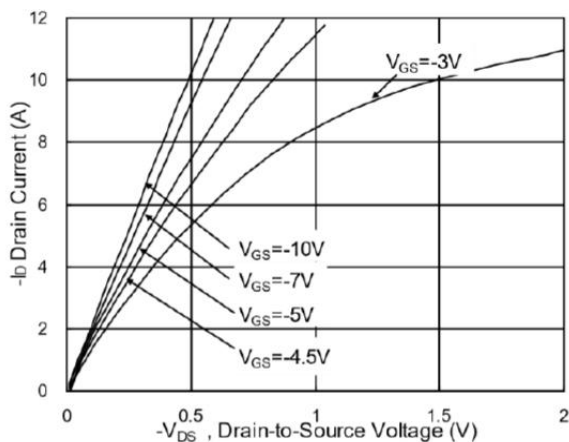


Fig.1 Typical Output Characteristics

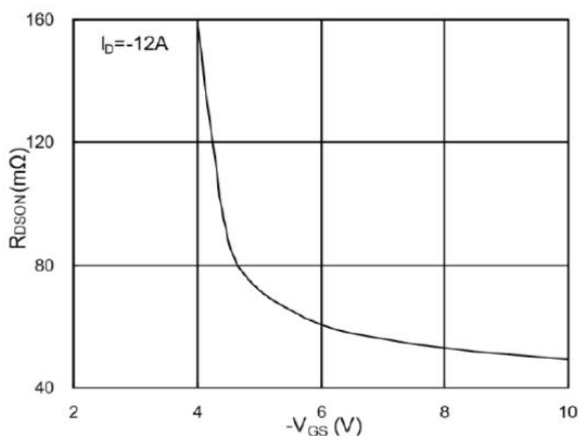


Fig.2 On-Resistance v.s Gate-Source

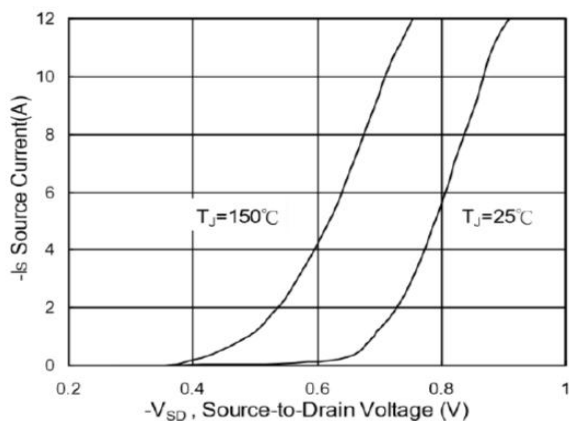


Fig.3 Forward Characteristics of Reverse

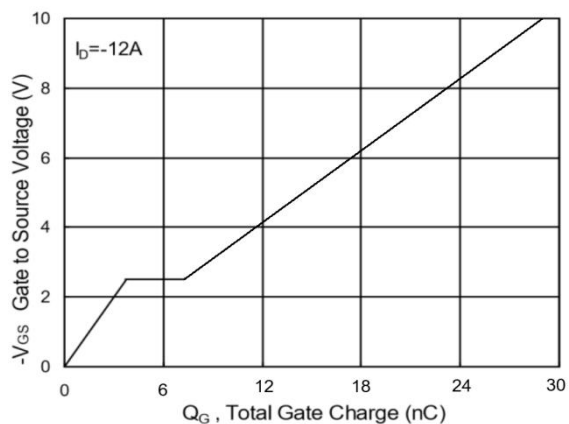


Fig.4 Gate-Charge Characteristics

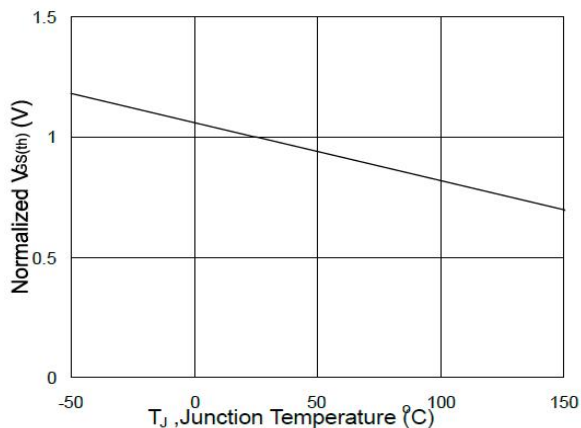


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

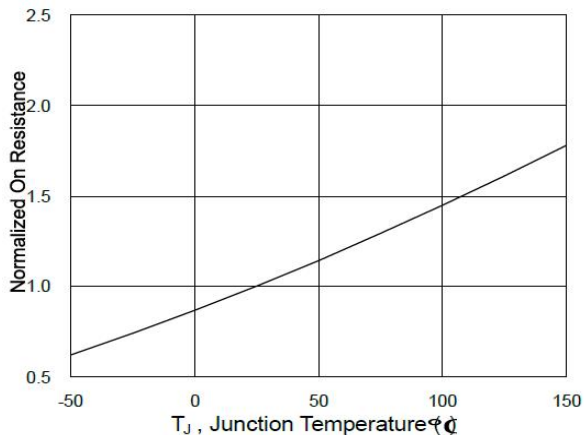


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

Typical Characteristics

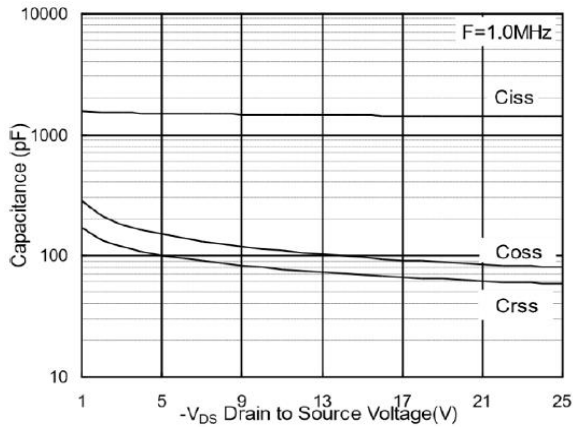


Fig.7 Capacitance

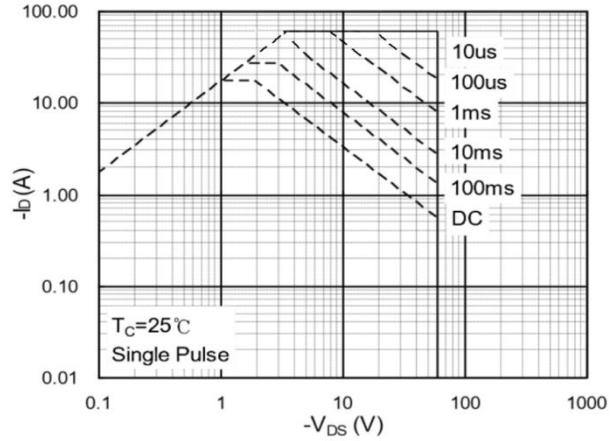


Fig.8 Safe Operating Area

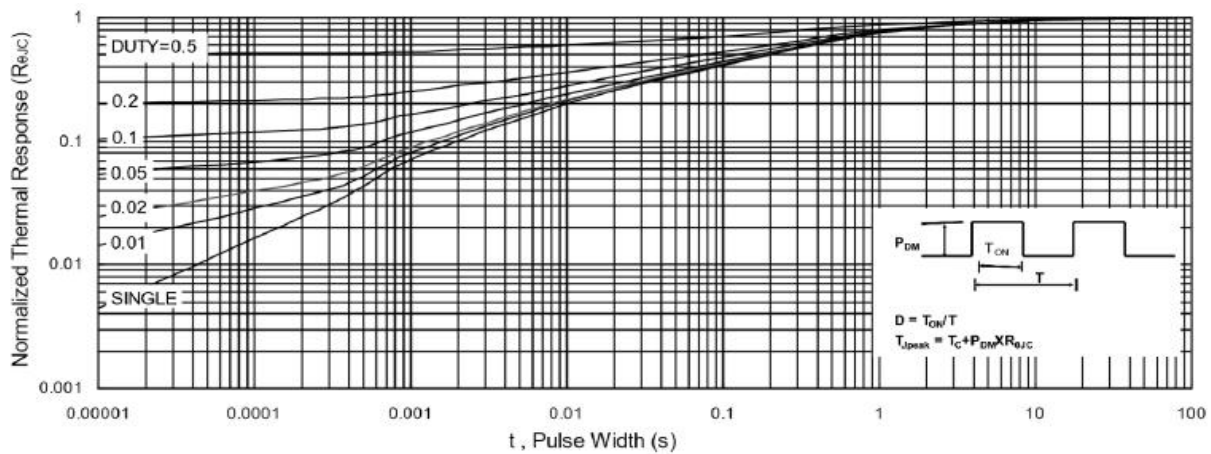


Fig.9 Normalized Maximum Transient Thermal Impedance

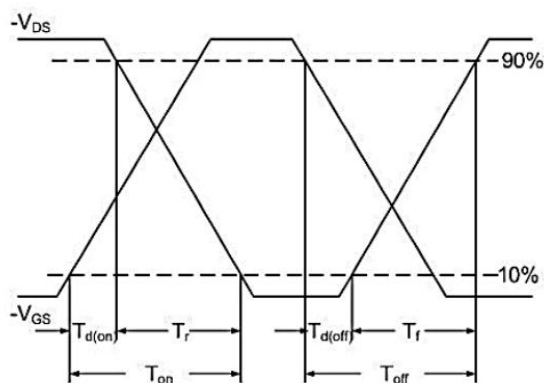


Fig.10 Switching Time Waveform

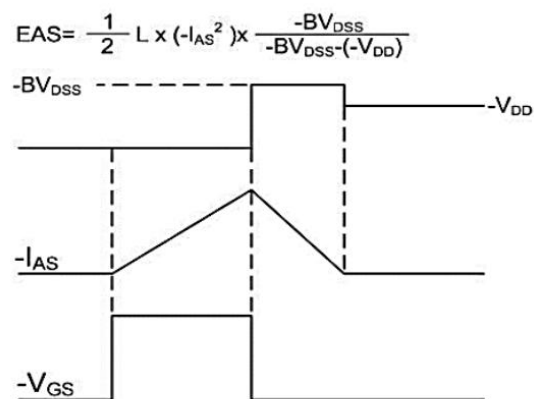
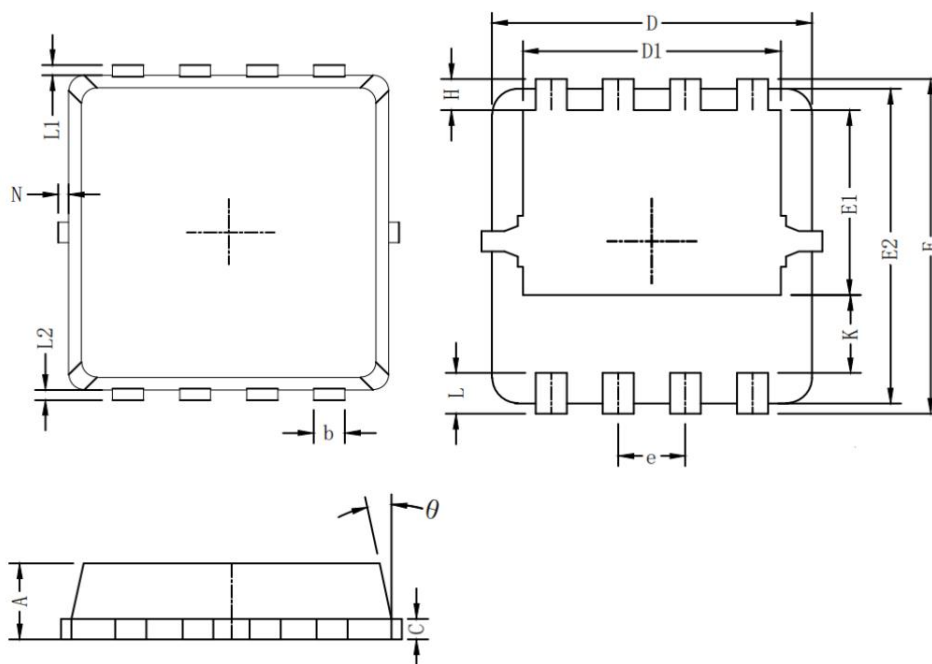


Fig.11 Unclamped Inductive Waveform

PDFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.600	0.900	0.024	0.035
b	0.200	0.400	0.008	0.016
c	0.150	0.250	0.006	0.010
D	3.000	3.200	0.118	0.126
D1	2.300	2.600	0.091	0.102
E	3.150	3.450	0.124	0.136
E1	1.430	1.930	0.056	0.076
E2	2.900	3.200	0.114	0.126
e	0.650 BSC.		0.026 BSC.	
H	0.200	0.500	0.008	0.020
K	0.570	0.870	0.022	0.034
L	0.300	0.500	0.012	0.020
L1/L2	0.100 REF.		0.004 REF.	
θ	8°	13°	8°	13°
N	0.000	0.150	0.000	0.006