

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	18mΩ@10V	50A
	36mΩ@4.5V	

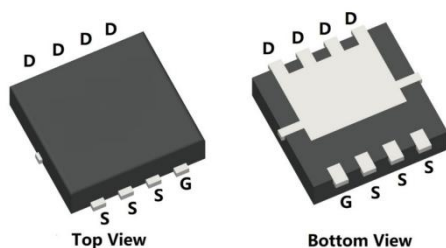
Feature

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

Application

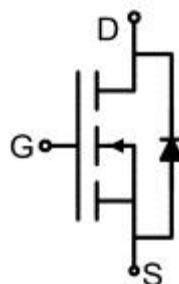
- VBUS
- Wireless impact
- Mobile phone fast charging

Package

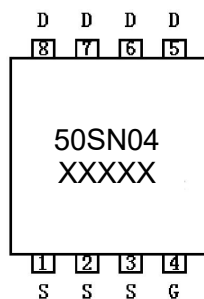


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$)	I_D	50	A
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$, $T_c=100^\circ\text{C}$)	$I_D (100^\circ\text{C})$	25	A
Pulsed Drain Current ²⁾	I_{DM}	180	A
Single Pulse Avalanche Energy ³⁾	E_{AS}	313	mJ
Power Dissipation ⁴⁾	P_D	31.3	W
Thermal Resistance Junction to Case ¹⁾	$R_{\theta JC}$	4	$^\circ\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

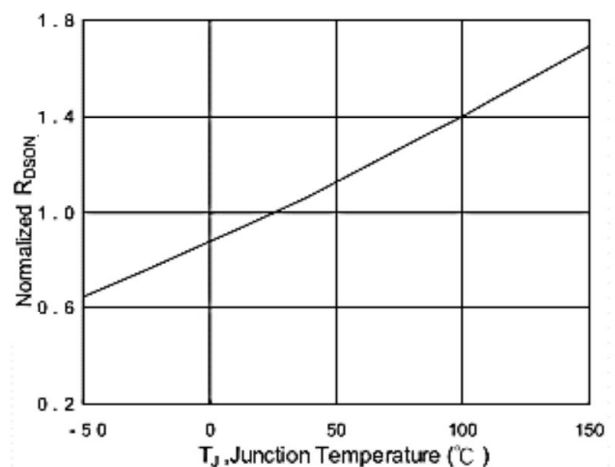
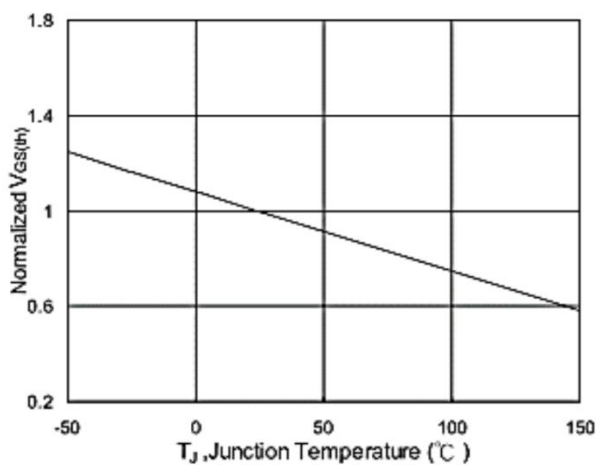
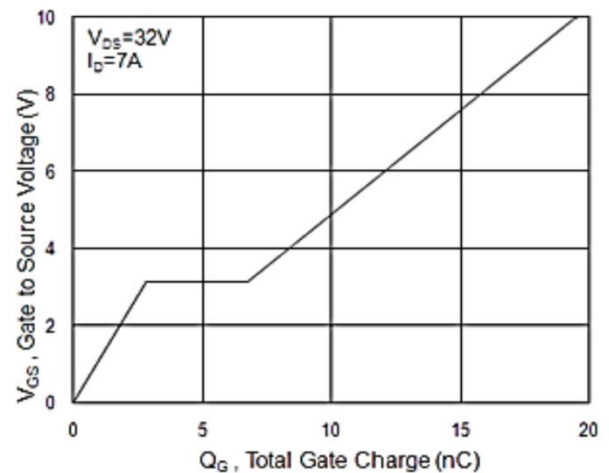
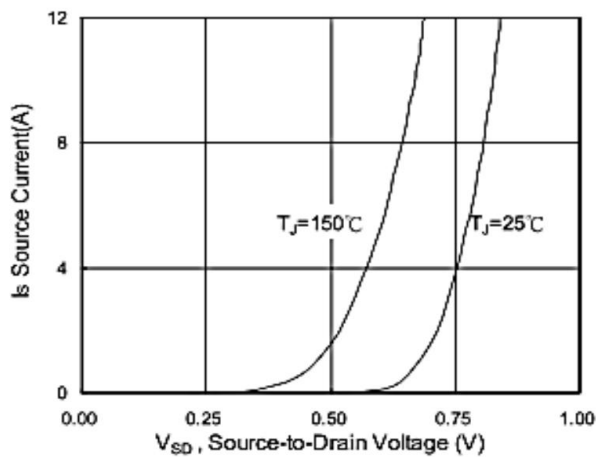
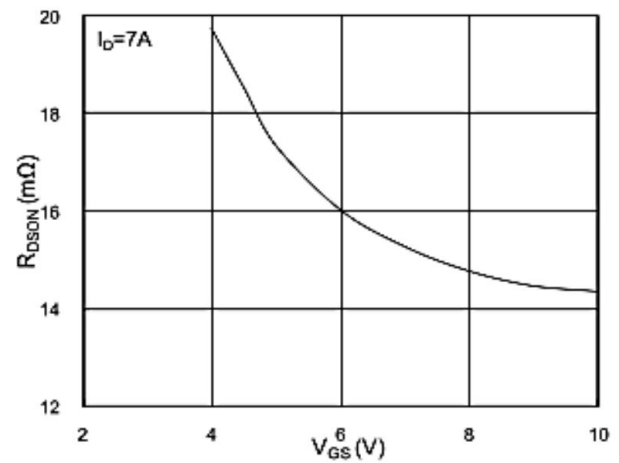
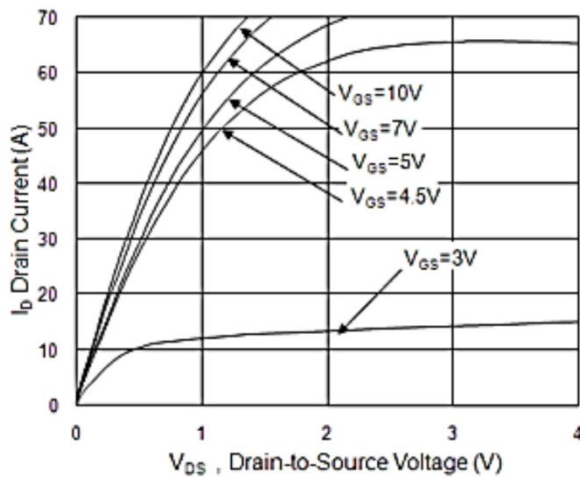
Electrical characteristics ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V, V _{GS} =0V			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	1.6	2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =5A		13	18	mΩ
		V _{GS} =4.5V, I _D =4A		18	36	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		593		pF
Output Capacitance	C _{oss}			76		
Reverse Transfer Capacitance	C _{rss}			56		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =4.5V, I _D =5A		5.5		nC
Gate-Source Charge	Q _{gs}			1.25		
Gate-Drain Charge	Q _{gd}			2.5		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =1A R _G =3.3Ω		8.9		nS
Turn-on rise time	t _r			2.2		
Turn-off delay time	t _{d(off)}			41		
Turn-off fall time	t _f			2.7		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _G =V _D =0V , Force Current			50	A
Diode Forward voltage	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 20Z copper.
- 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) The EAS data shows Max. rating. The test condition is $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=25\text{A}$.
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) Guaranteed by design, not subject to production.

Typical Characteristics



Typical Characteristics

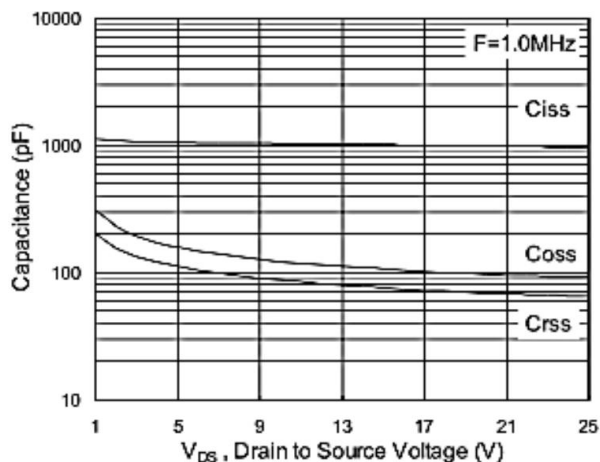


Fig.7 Capacitance

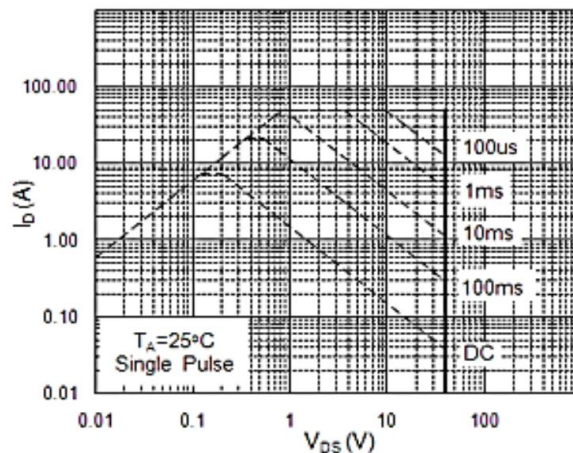


Fig.8 Safe Operating Area

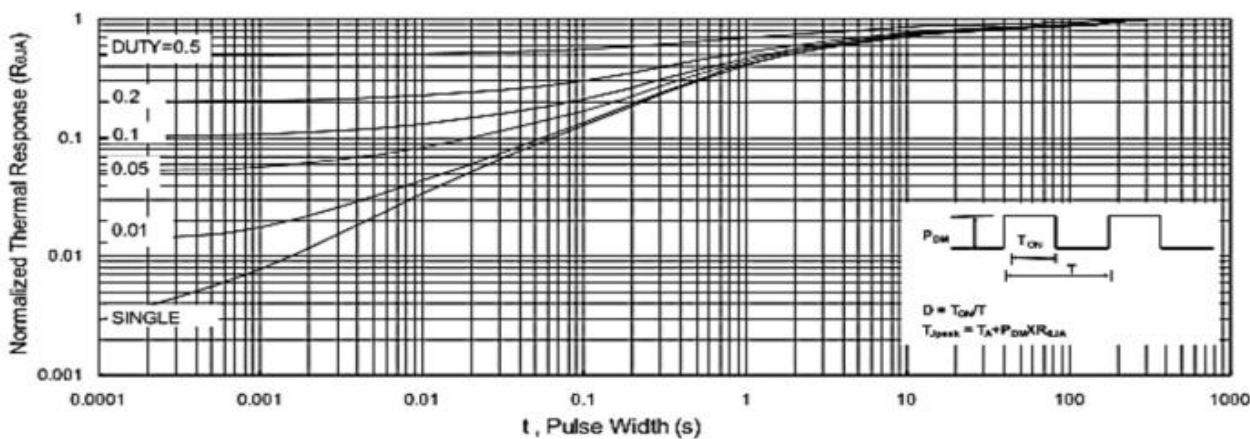


Fig.9 Normalized Maximum Transient Thermal Impedance

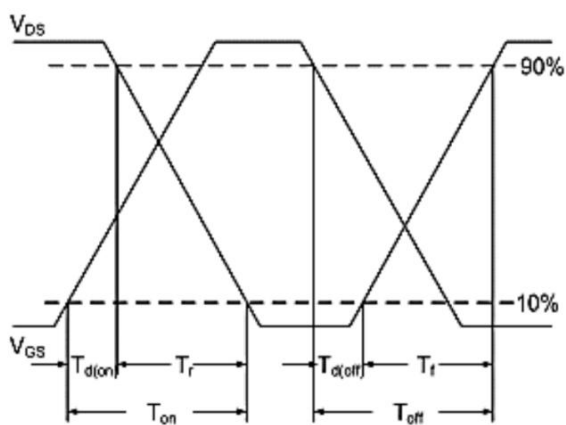


Fig.10 Switching Time Waveform

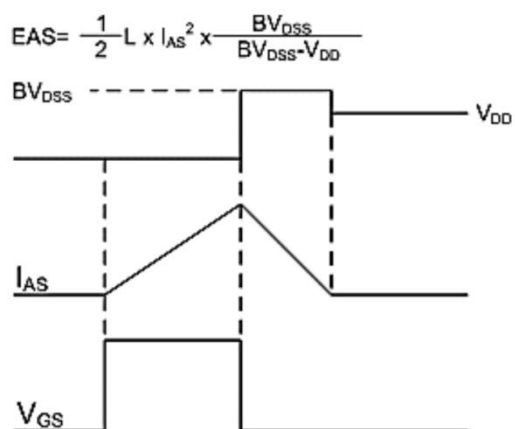
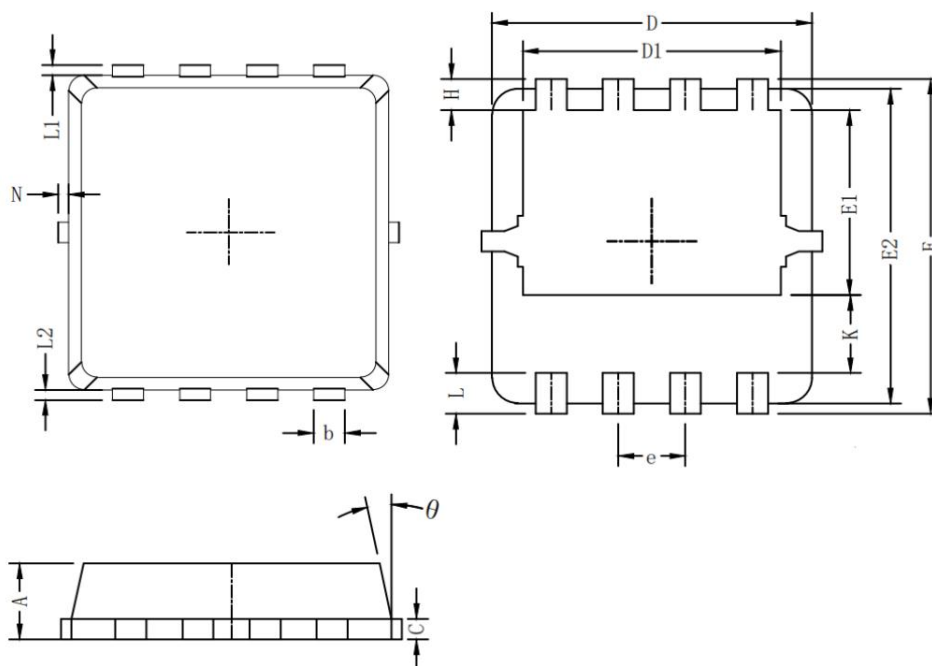


Fig.11 Unclamped Inductive Switching Waveform

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