Features

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

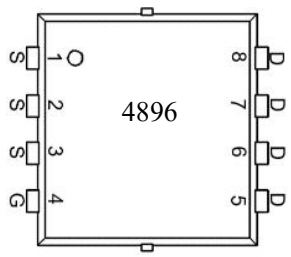
Bvdss	Rdson	ID
40V	7.2mΩ	40A

Application

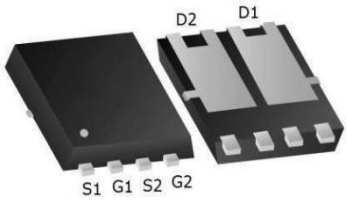
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

RoHS

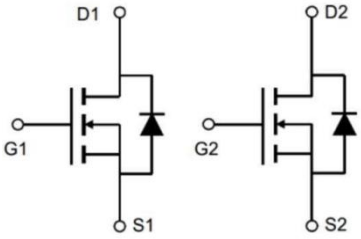
Package



Marking and pin assignment



PDFN3x3-8L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
4896	S4896D	PDFN3x3-8L	5000

Absolute Maximum Ratings (T_C=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,V_{GS}@10[1]	T_A=25℃	I_D	40	A
	T_A=100℃		20	A
Pulsed Drain Current[2]		I_{DM}	180	A
Single Pulsed Avalanche Energy[3]		EAS	26.1	mJ
Avalanche Current		I_{AS}	15	A
Total Power Dissipation[4]		P_D	43.6	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]	$R_{\theta JC}$	--	2.8	℃/W
Thermal Resistance,Junction-to-Ambient[1]	$R_{\theta JA}$	--	62	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment						Packing
Halogen Free		G1	G2	D1	D2	S1	S2	
HLS4896D	PDFN3x3-8L	2	4	7,8	5,6	1	3	Tape Reel

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{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 to 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	1.35	-	3	V
Static Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=10V, I_D=12A	-	7.2	9.5	mΩ
		V_{GS}=4.5V, I_D=10A	-	10	15	
gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	1.7	-	Ω
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, f=1MHz	-	690	-	pF
Output Capacitance	C_{oss}		-	193	-	
Reverse Transfer Capacitance	C_{rss}		-	38	-	
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=4.5V, I_D=12A	-	5.8	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	
Gate-Drain Charge	Q_{gd}		-	1.2	-	
Turn-on Delay Time	$T_{d(on)}$	V_{GS}=10V,V_{DD}=15V, R_G=3.3Ω,I_D=1A	-	14.3	-	nS
Turn-on Rise Time	t_r		-	5.6	-	
Turn-Off Delay Time	$T_{d(off)}$		-	20	-	
Turn-Off Fall Time	T_f		-	11	-	
Maximum Continuous Drain to Source Diode Forward Current[1,5]	I_S	V_G=V_D=0V,Force Current	-	-	40	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}	-	-	-	-	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1A	-	-	1	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 EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=31A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM}, in real applications , should be limited by total power dissipation.

Typical Characteristics

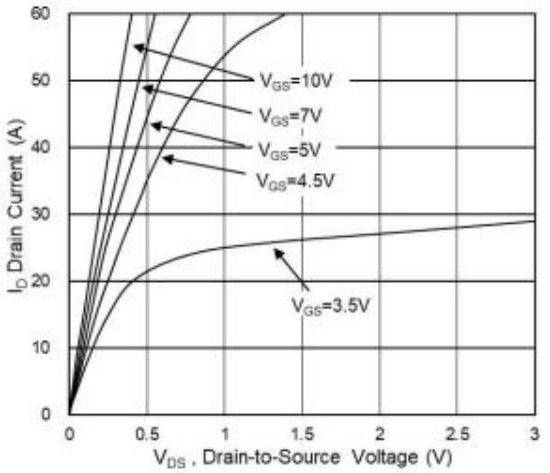


Fig.1 Typical Output Characteristics

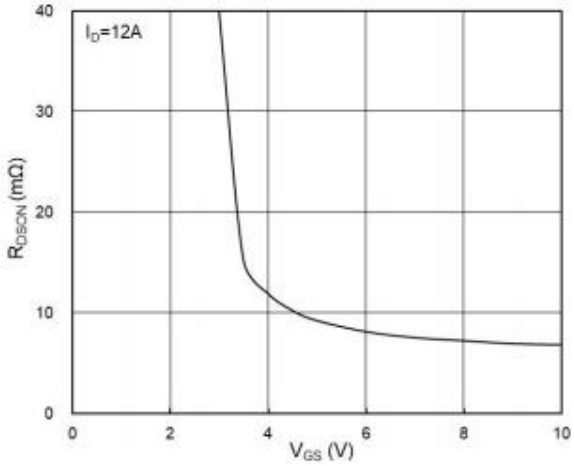


Fig.2 On-Resistance vs G-S Voltage

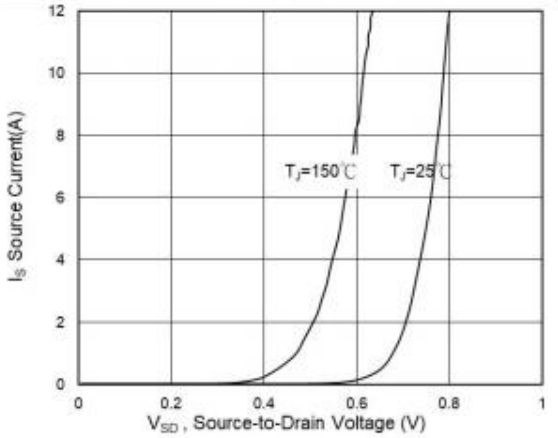


Fig.3 Source Drain Forward Characteristics

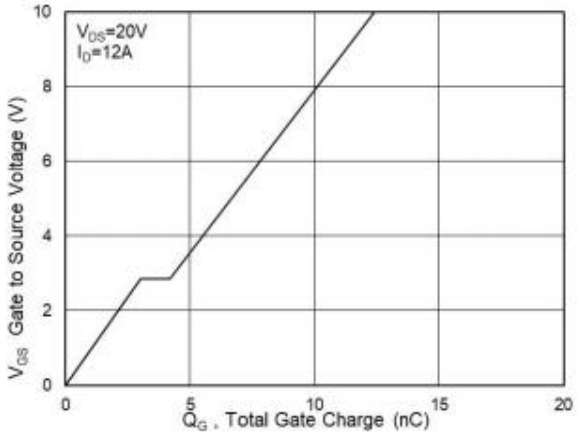


Fig.4 Gate-Charge Characteristics

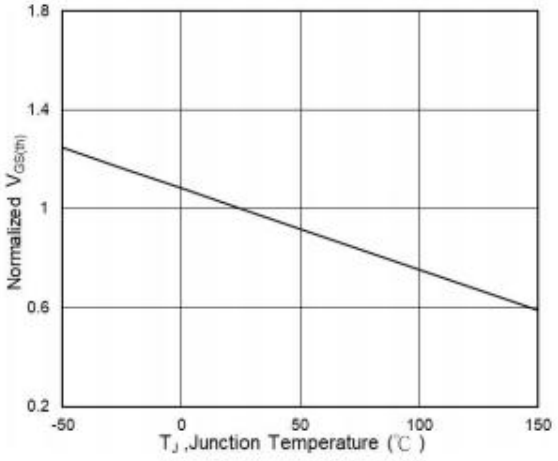


Fig.5 Normalized $V_{GS(th)}$ vs T_J

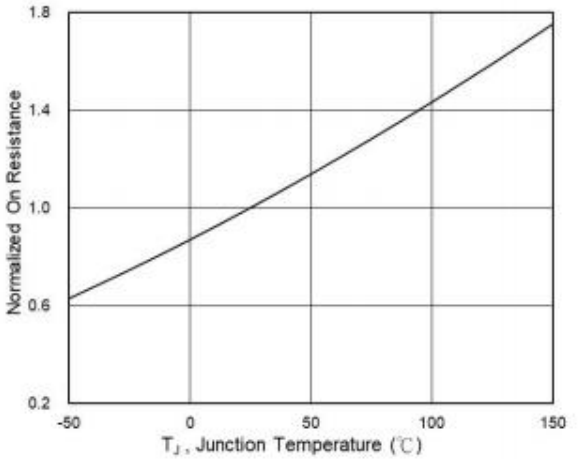


Fig.6 Normalized R_{DSON} vs T_J

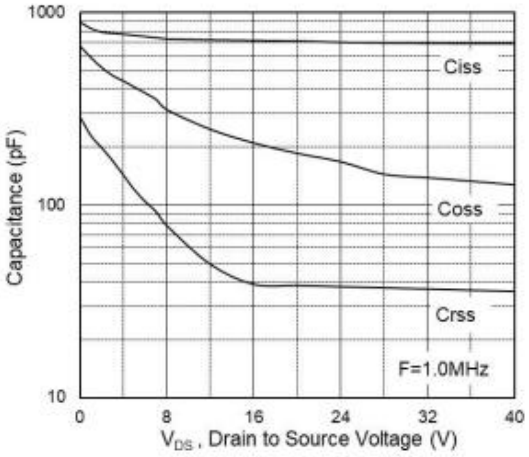


Fig.7 Capacitance

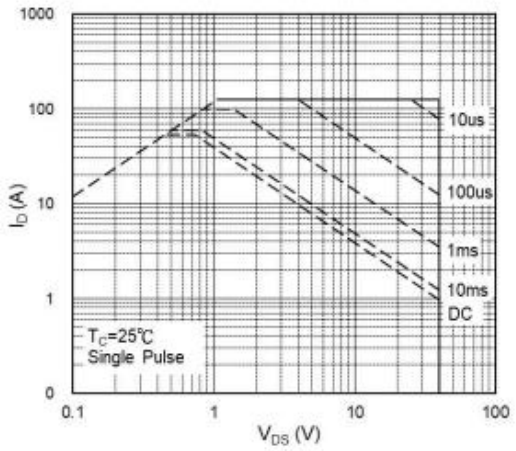


Fig.8 Safe Operating Area

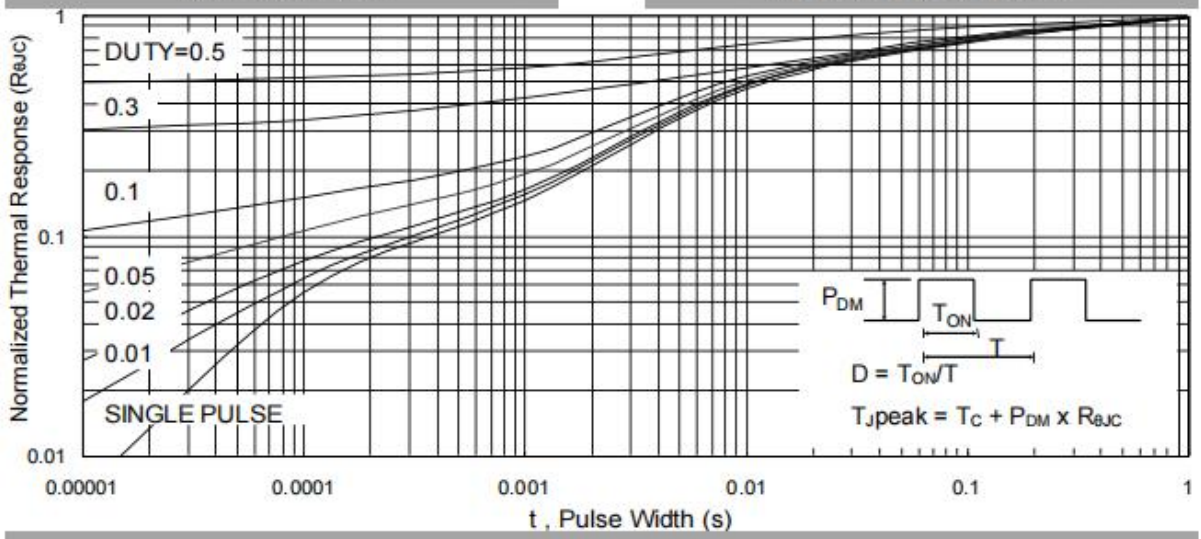
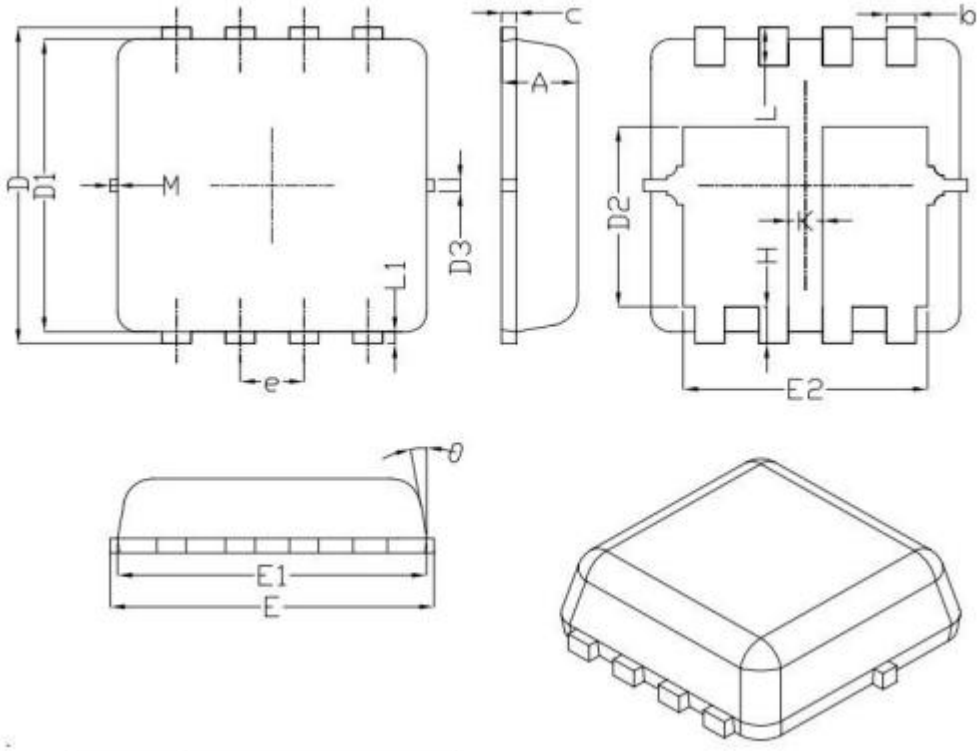


Fig.9 Normalized Maximum Transient Thermal Impedance

Package Dimensions PDFN3x3-8L



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	--	0.13	–
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	--	0.13	–
K	0.30	–	–
θ	--	10°	12°
M	*	*	0.15
* Not Specified			

Notes:
1. Refer to JEDEC MO-240 variation CA.
2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
3. Dimensions "D1" and "E1" include interterminal flash or protrusion.

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