

40V Dual N-Channel Enhancement Mode MOSFET

Description

The CP4886BQR uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for high side switch in SMPS and general purpose applications.

General Features

- ◆ $V_{DS} = 40V$, $I_D = 20A$
 $R_{DS(ON)} = 15m\Omega$ (typical) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 21m\Omega$ (typical) @ $V_{GS} = 4.5V$
- ◆ Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

Application

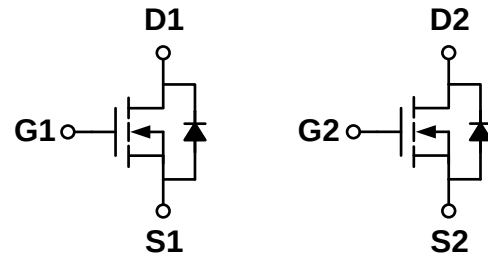
- ◆ DC/DC Converter
- ◆ Ideal for high-frequency switching and synchronous rectification

Package

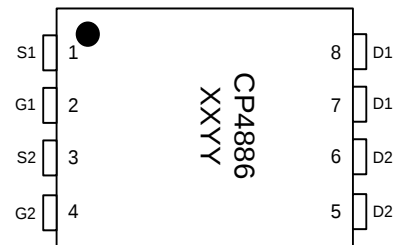
- ◆ PDFN3.3*3.3-8L



Schematic diagram



Marking and pin assignment



XXXX—Wafer Information

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP4886QR	-55°C to +150°C	PDFN3.3*3.3-8L	5000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	±20	V
Drain Current-Continuous (Silicon Limited)	$T_A = 25^\circ C$	I_D	20	A
	$T_A = 75^\circ C$		16	
Pulsed Drain Current (Package Limited)		I_{DM}	65	A
Single pulse avalanche energy		E_{AS}	30	mJ
Maximum power dissipation		P_D	5	W

	$T_A=75^{\circ}\text{C}$		1.3	
Operating junction Temperature range		T_j	-55—150	$^{\circ}\text{C}$

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
Gate-body leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.65	3.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	15	18	m Ω
		$V_{GS}=4.5V, I_D=8A$	-	21	25	
Forward transconductance	gfs	$V_{DS}=5V, I_D=10A$	-	43	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	$V_{DS}=20V, V_{GS}=0V$ $f=1.0\text{MHz}$	-	917	-	pF
Output capacitance	C_{OSS}		-	73	-	
Reverse transfer capacitance	C_{RSS}		-	61	-	
Gate resistance	Rg	$V_{GS}=0V, V_{DS}=0V,$ $f=1.0\text{MHz}$	-	1.6	2.4	Ω
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	$V_{DS}=20V$ $V_{GS}=10V$ $R_L=1.5\Omega$ $R_{GEN}=3\Omega$	-	4.4	-	ns
Rise time	tr		-	9	-	
Turn-off delay time	$t_{D(OFF)}$		-	17	-	
Fall time	tf		-	6	-	
Total gate charge	Qg	$V_{DS}=20V, I_D=10A$ $V_{GS}=10V$	-	18.4	-	nC
Gate-source charge	Qgs		-	3.6	-	
Gate-drain charge	Qgd		-	3.2	-	

Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{th JA}$	100	$^{\circ}\text{C/W}$
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Typical Performance Characteristics

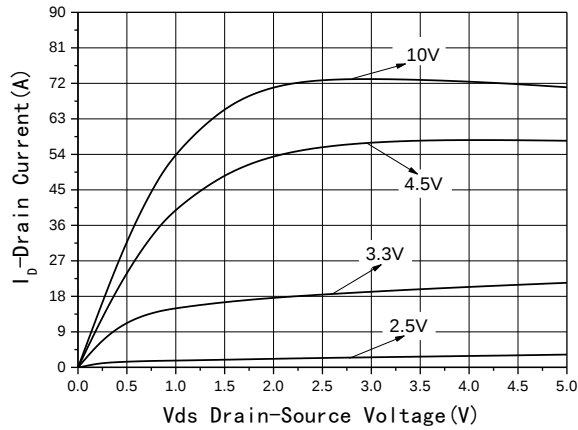


Fig1 Output Characteristics

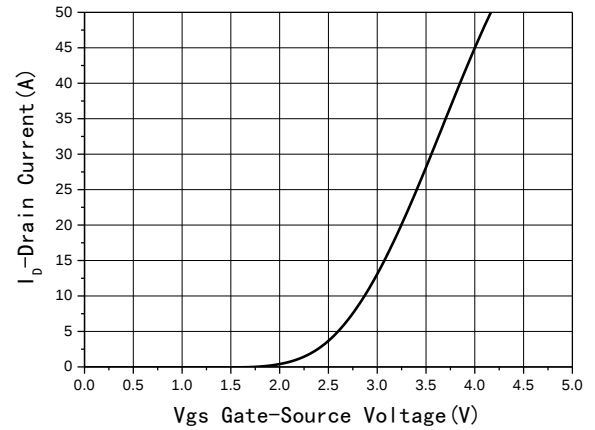


Fig2 Transfer Characteristics

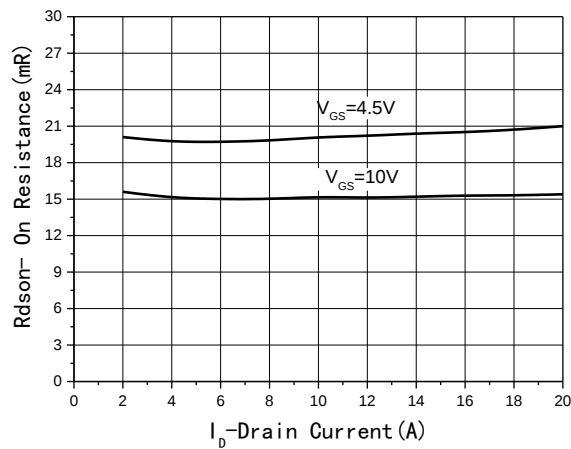


Fig3 $R_{DS(on)}$ -Drain current

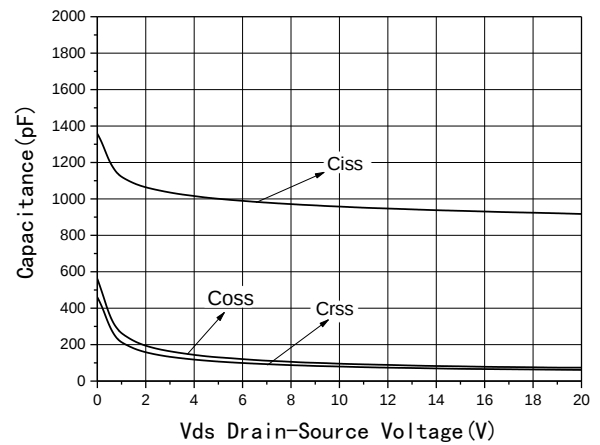


Fig4 Capacitance vs V_{DS}

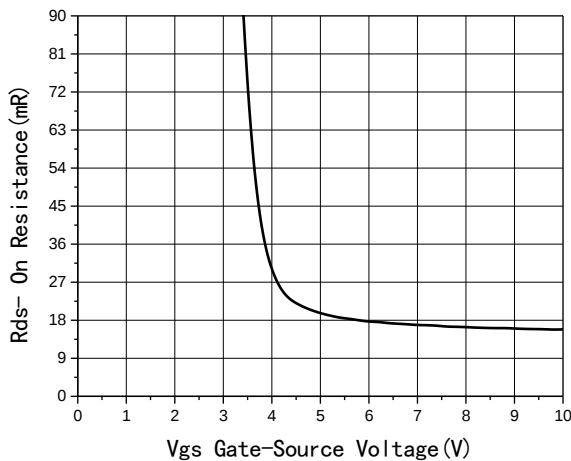


Fig5 $R_{DS(on)}$ -Gate Drain voltage

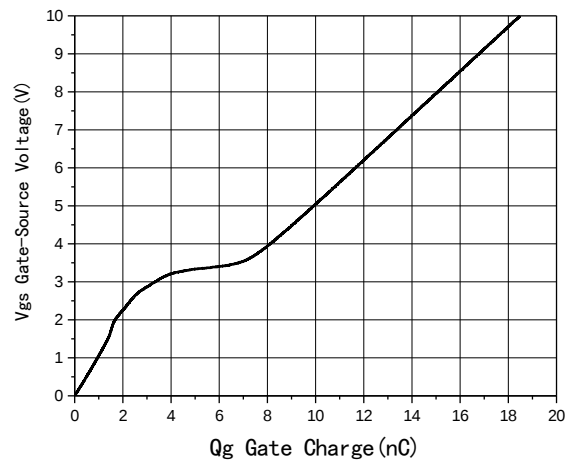
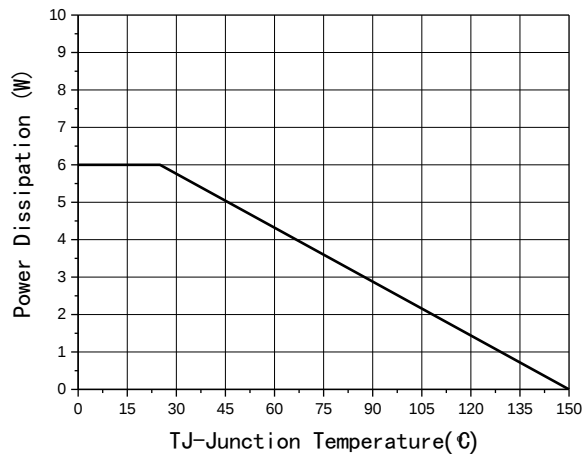
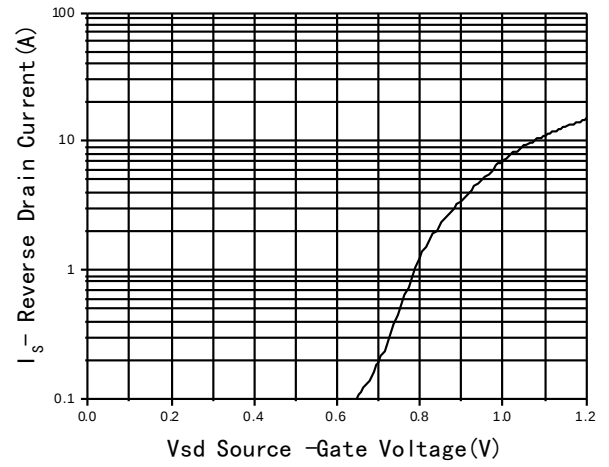
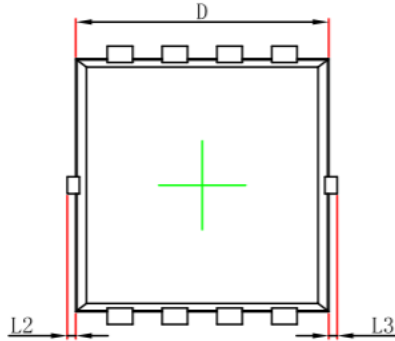


Fig6 Gate Charge

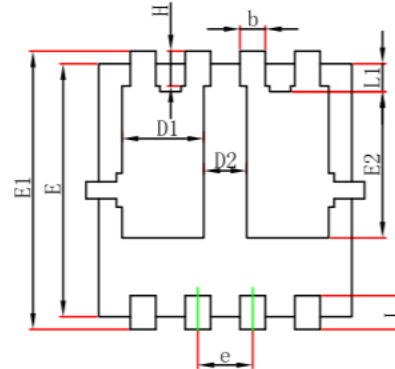

Fig7 Power De-rating

Fig8 Source-Drain Diode Forward

Package Information

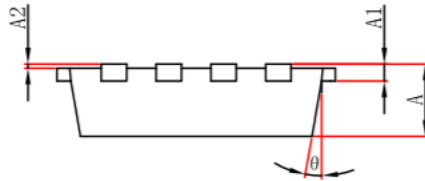
- PDFN3.3*3.3-8L



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	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
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°