

60V P-Channel Enhancement Mode MOSFET

Description

The CP50P06D6 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

- ◆ $V_{DS} = -60V$, $I_D = -50A$
 $R_{DS(ON)}(Typ.) = 28.3m\Omega$ @ $V_{GS} = -10V$
 $R_{DS(ON)}(Typ.) = 34.3m\Omega$ @ $V_{GS} = -4.5V$
- ◆ High density cell design for ultra low $R_{DS(ON)}$
- ◆ Fully characterized avalanche voltage and current
- ◆ Good stability and uniformity with high E_{AS}
- ◆ Excellent package for good heat dissipation

Application

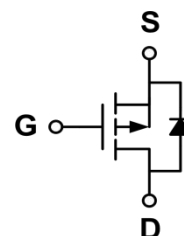
- ◆ Load switch

Package

- ◆ PDFN5*6-8L-A

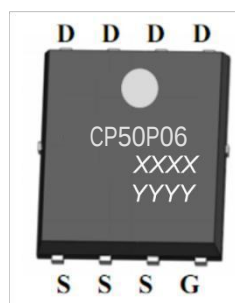


Schematic diagram

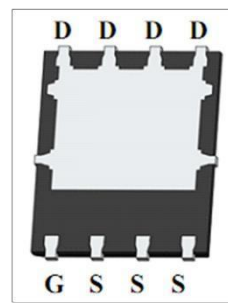


Marking and pin assignment

PDFN 5*6-8L-A



Top View



Bottom View

XXXX: Wafer Information

YYYY: Date Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP50P06D6-G	-55°C to +150°C	PDFN5*6-8L-A	5000

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

parameter °C		symbol	limit	unit
Drain-source voltage		V_{DS}	-60	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	-50	A
	TC=125°C		-25	
Pulsed Drain Current		I_{DP}	-200	A
Avalanche energy(L=1mH) ^(note1)		E_{AS}	176	mJ
Maximum power dissipation		P_D (TC=25°C)	85	W
Operating junction Temperature range		T_j	-55—150	°C

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	
Gate 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	-1.0	-1.8	-2.5	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =-10V, I _D =-20A	-	28.3	34	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	34.3	42	
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-20A	-	25	-	S
Diode Characteristics						
Diode Forward Voltage ¹	V _{SD}	I _{SD} =-20A, V _{GS} =0V	-	-0.9	-1.4	V
Diode Continuous Forward Current	I _S		-	-	-50	A
Reverse Recovery Time	t _{rr}	I _F =-20A,	-	45	-	ns
Reverse Recovery Charge	Q _{rr}	dI/dt=-100A/us	-	54	-	nC
Dynamic Characteristics²						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	4.8	-	Ω
Input capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-30V f=1.0MHz	-	3498	-	pF
Output capacitance	C _{OSS}		-	133	-	
Reverse transfer capacitance	C _{RSS}		-	122	-	
Turn-on delay time	t _{D(ON)}	V _{GS} =-10V, V _{DS} =-30V, R _L =1.5Ω, R _G =3Ω	-	14	-	ns
Turn-on Rise time	t _r		-	15	-	
Turn-off delay time	t _{D(OFF)}		-	37	-	
Turn-off Fall time	t _f		-	48	-	
Total gate charge	Q _g	V _{GS} =-10V, I _D =-20A V _{DS} =-30V	-	63	-	nC
Gate-source charge	Q _{gs}		-	15	-	
Gate-drain charge	Q _{gd}		-	8	-	

Note: 1: Pulse test; pulse width ≤ 300ns, duty cycle ≤ 2%.

2: Guaranteed by design, not subject to production testing.

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	R _{θJC}	1.7	°C/W
Thermal Resistance junction-to ambient	R _{θJA}	62.5	

Typical Performance Characteristics

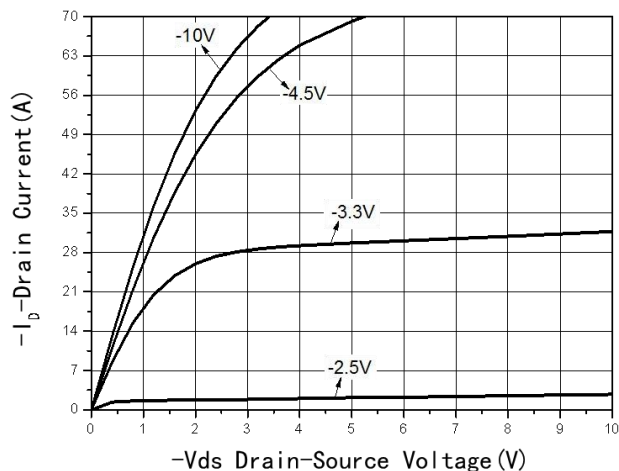


Fig1 Output Characteristics

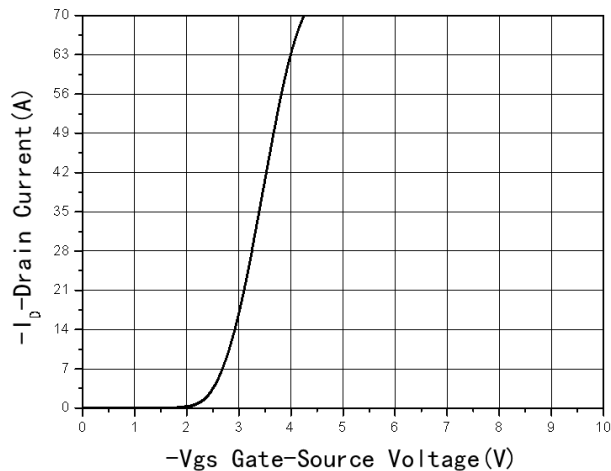


Fig2 Transfer Characteristics

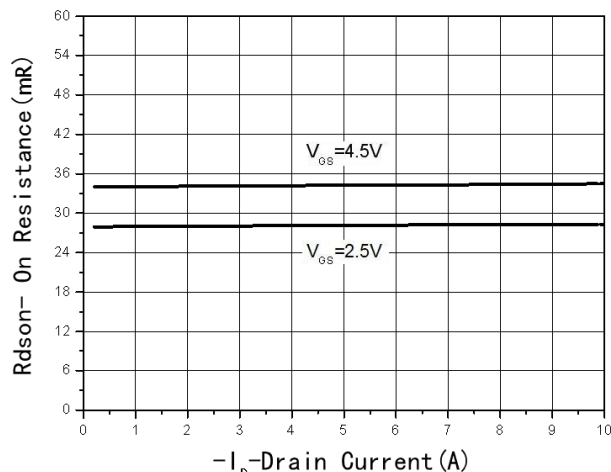


Fig3 $R_{DS(on)}$ Drain current

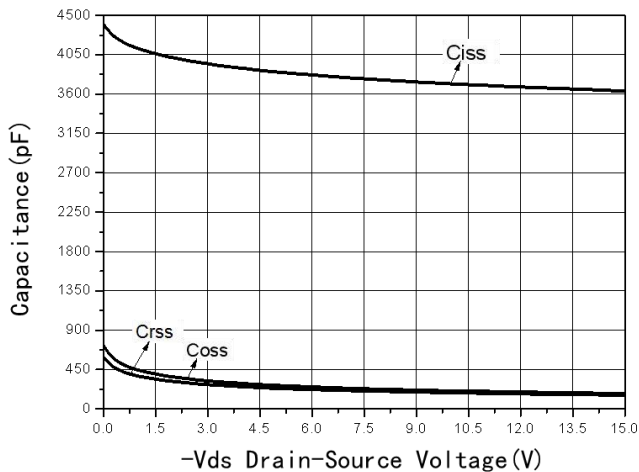


Fig4 Capacitance vs V_{DS}

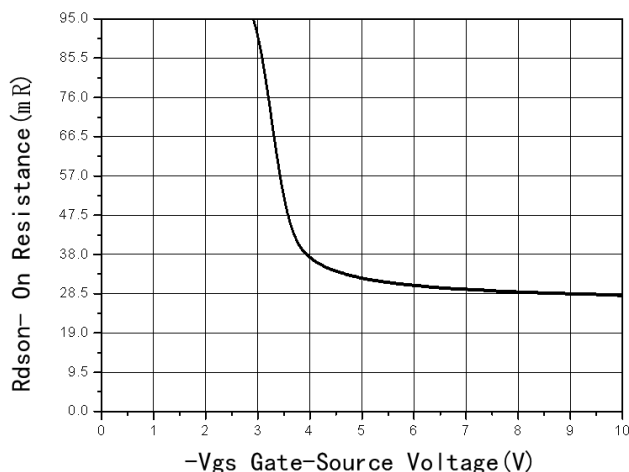


Fig5 $R_{DS(on)}$ -Gate Drain voltage

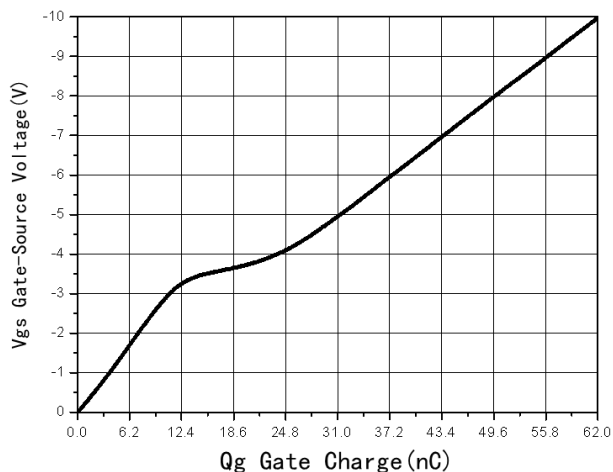
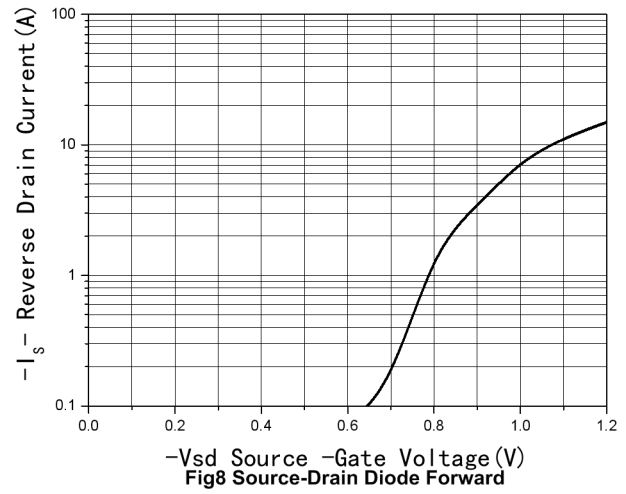
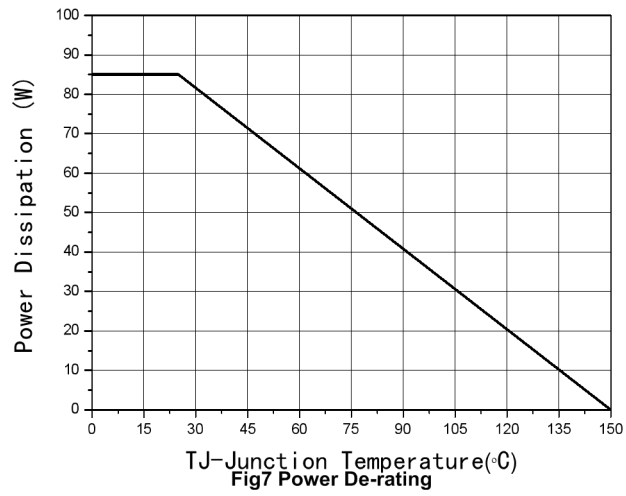


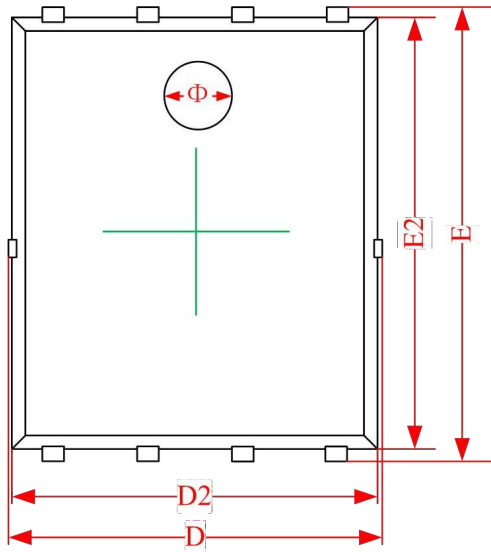
Fig6 Gate Charge



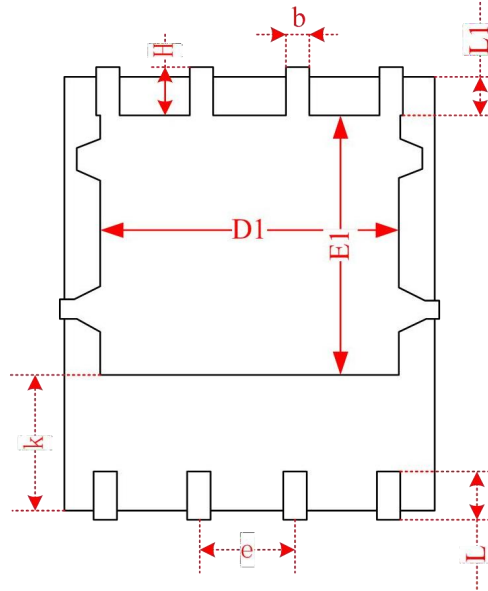
Package Information

- PDFN5*6-8L-A

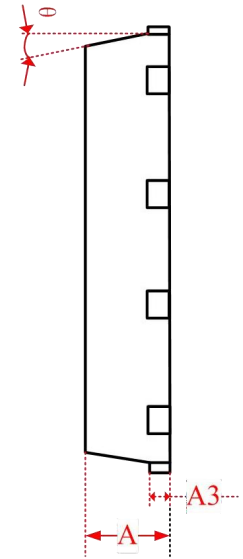
Top View



Bottom View



Side View



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.870	0.900	0.930	0.034	0.035	0.036
A3	0.203REF.			0.008REF.		
D	4.944	5.020	5.096	0.195	0.198	0.201
E	5.974	6.050	6.126	0.235	0.238	0.241
D1	3.910	4.010	4.110	0.154	0.158	0.162
E1	3.375	3.475	3.575	0.133	0.137	0.141
D2	4.870	4.900	4.930	0.192	0.193	0.194
E2	5.720	5.750	5.780	0.226	0.227	0.228
k	1.190	1.290	1.390	0.047	0.051	0.055
b	0.350	0.380	0.410	0.014	0.015	0.016
e	1.270TYP.			0.050TYP.		
L	0.559	0.635	0.711	0.022	0.025	0.028
L1	0.424	0.500	0.576	0.017	0.020	0.023
H	0.574	0.650	0.726	0.023	0.026	0.029
θ	10°	11°	12°	10°	11°	12°
Φ	1.150	1.200	1.250	0.045	0.047	0.049