

60V P-Channel Enhancement Mode MOSFET

Description

The CP50P06G 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

- ◆ $V_{DS} = -60V$, $I_D = -50A$
 $R_{DS(ON)}(Typ.) = 27.5m\Omega$ @ $V_{GS} = -10V$
 $R_{DS(ON)}(Typ.) = 33.3m\Omega$ @ $V_{GS} = -4.5V$
- ◆ 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

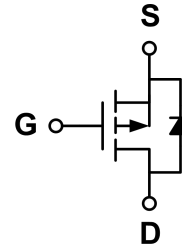
- ◆ Load switch

Package

- ◆ TO-252-2L

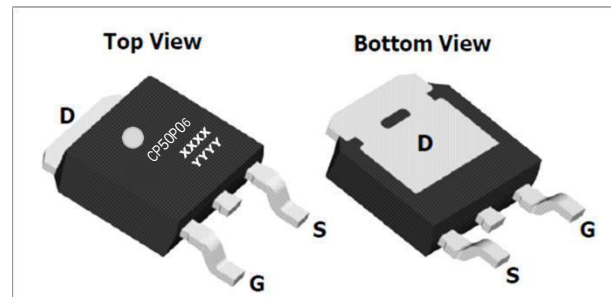


Schematic diagram



Marking and pin assignment

TO-252-2L



XXXX: Wafer Information YYYY:
Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP50P06G-G	-55°C to +150°C	TO-252-2L	2500

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

parameter		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 Current		I_{AS}	-50	A
Avalanche energy(L=1mH) ^(note1)		E_{AS}	600	mJ
Maximum power dissipation	TC=25°C	P_D	85	W
	TC=100°C		44	
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}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	μA
		$T_J=85^\circ C$	-	-	-30	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.7	-2.5	V
Drain-source on-state resistance ¹	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$	-	27.5	33	m Ω
		$V_{GS}=-4.5V, I_D=-20A$	-	33.3	40	
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-20A$	-	25	-	S
Diode Characteristics						
Diode Forward Voltage ¹	V_{SD}	$I_{SD}=-1A, V_{GS}=0V$	-	-0.72	-1.4	V
Diode Continuous Forward Current	I_S		-	-	-50	A
Reverse Recovery Time	t_{rr}	$I_F=-20A,$	-	47	-	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=-100A/\mu s$	-	58	-	nC
Dynamic Characteristics²						
Gate Resistance	R_G	$V_{GS}=0V,$ $V_{DS}=0V, f=1MHz$	-	4.8	-	Ω
Input capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=-30V$ $f=1.0MHz$	-	6217	-	pF
Output capacitance	C_{OSS}		-	159	-	
Reverse transfer capacitance	C_{RSS}		-	2	-	
Turn-on delay time	$t_{D(ON)}$	$V_{GS}=-10V, V_{DS}=-30V,$ $R_L=1.5\Omega, R_G=3\Omega$	-	15	-	ns
Turn-on Rise time	t_r		-	17	-	
Turn-off delay time	$t_{D(OFF)}$		-	37	-	
Turn-off Fall time	t_f		-	44	-	
Total gate charge	Q_g	$V_{GS}=-10V, I_D=-20A$ $V_{DS}=-20V$	-	61.8	-	nC
Gate-source charge	Q_{gs}		-	55.3	-	
Gate-drain charge	Q_{gd}		-	7.7	-	

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

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

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	$R_{\theta JC}$	1.7	$^\circ C/W$
Thermal Resistance junction-to ambient	$R_{\theta JA}$	62.5	

Typical Performance Characteristics

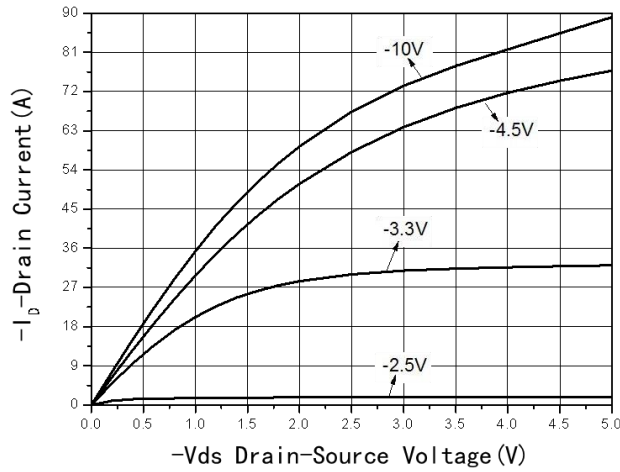


Fig1 Output Characteristics

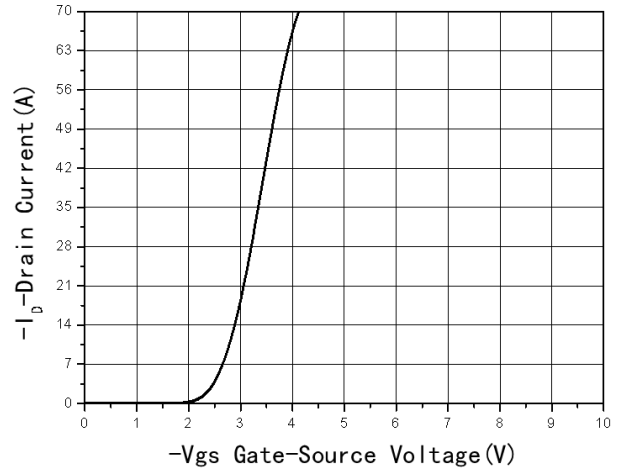


Fig2 Transfer Characteristics

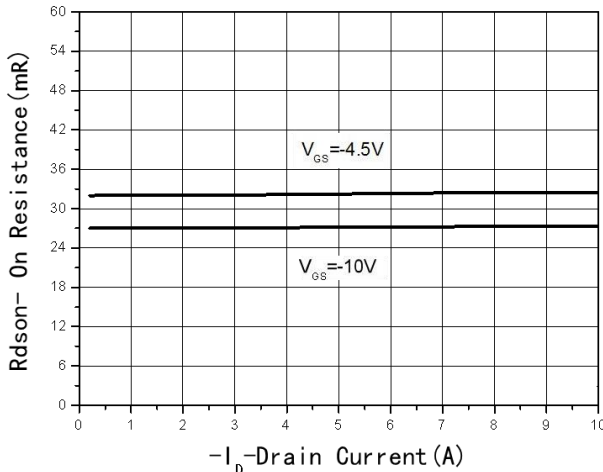


Fig3 $R_{DS(on)}$ -Drain current

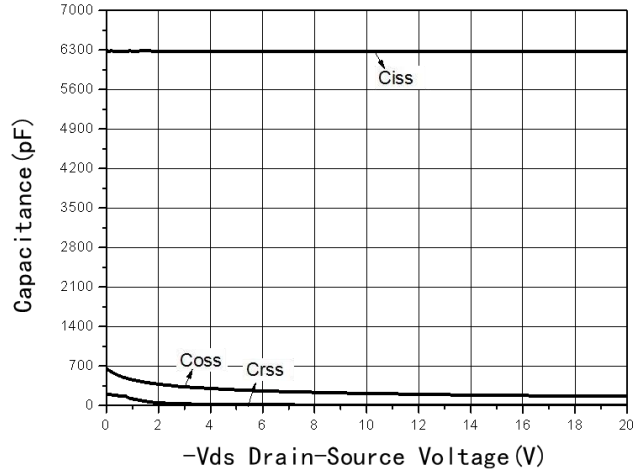


Fig4 Capacitance vs V_{DS}

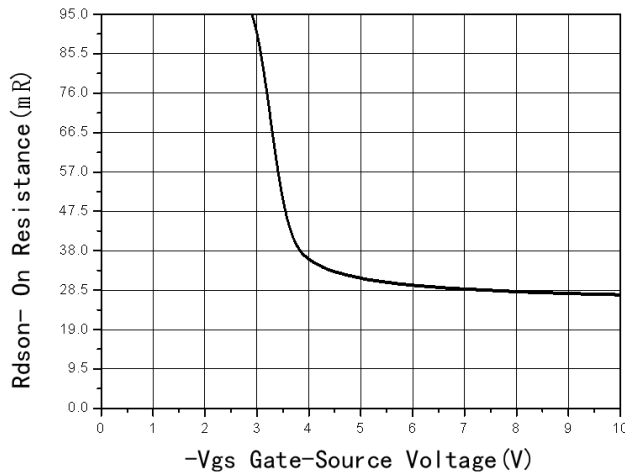


Fig5 $R_{DS(on)}$ -Gate Drain voltage

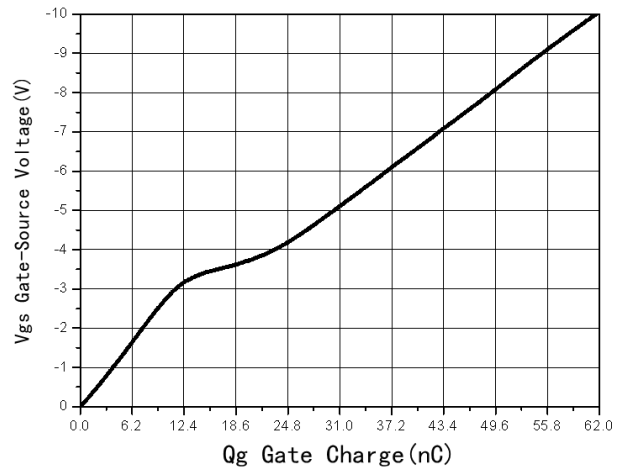
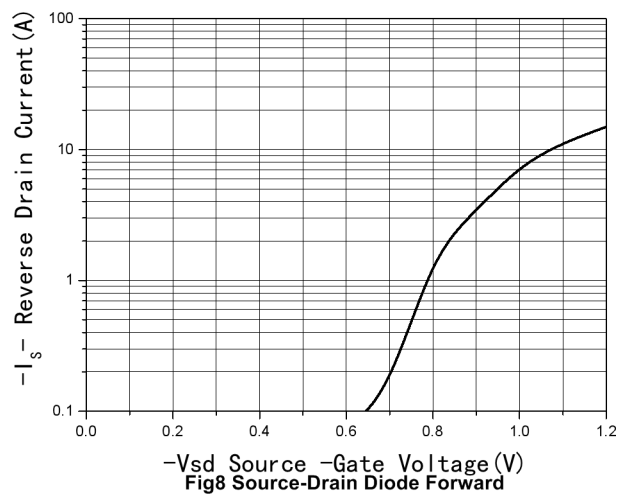
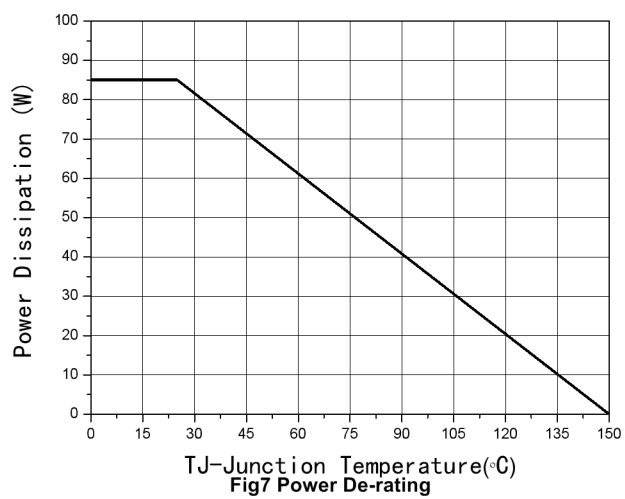
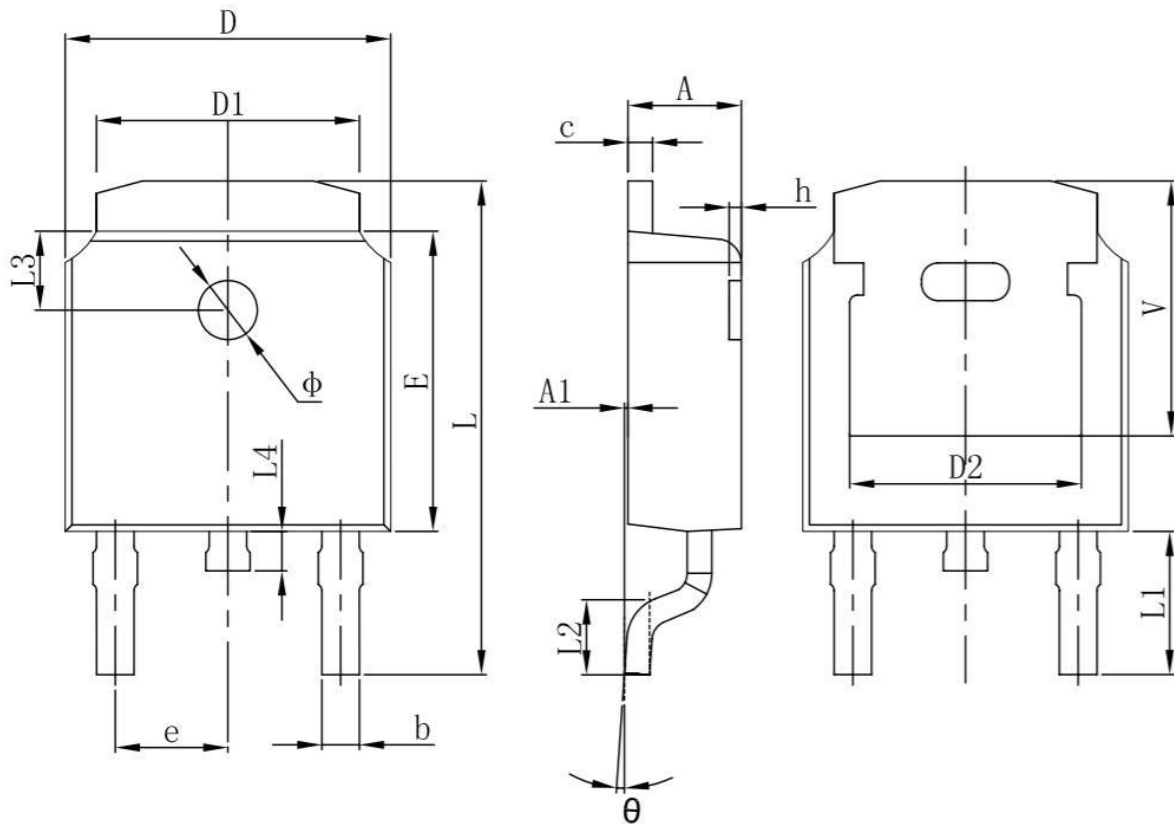


Fig6 Gate Charge



Package Information

- TO-252-2L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	