CP60P02BG

20V P-Channel Enhancement Mode MOSFET

Description

The CP60P02BG 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} =-20V I_D =-60A
  $R_{DS(ON)}$(Typ.)=8.7mΩ @V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=11.8mΩ @V_{GS}=-2.5V
- 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

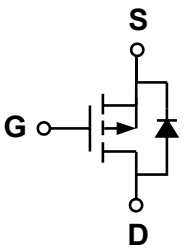
Application

- Load switch

Package

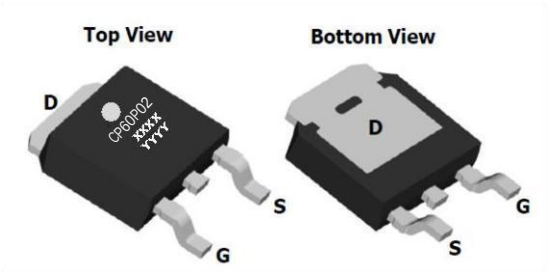
- TO-252-2L

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
CP60P02BG-G	-55°C to +150°C	TO-252-2L	2500

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-20	V
Gate-source voltage		V_{GS}	±12	V
Continuous Drain Current	TC=25°C	I_D	-60	A
	TC=125°C		-30	
Pulsed Drain Current		I_{DP}	-240	A
Avalanche Current		I_{AS}	-60	A
Avalanche energy(L=1mH) (note1)		E_{AS}	102	mJ
Maximum power dissipation	TC=25°C	P_D	70	W
	TC=100°C		28	
Operating junction Temperature range		Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-30	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.5	-0.9	-1.2	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-20A	-	8.7	10.5	mΩ
		V_{GS}=-2.5V, I_D=-20A	-	11.8	14	
Forward Transconductance	g_{FS}	V_{DS}=-10V, I_D=-20A	-	90	-	S
Diode Characteristics						
Diode Forward Voltage[1]	V_{SD}	I_{SD}=-20A,V_{GS}=0V	-	-0.75	-1.2	V
Diode Continuous Forward Current	I_S		-	-	-60	A
Reverse Recovery Time	t_{rr}	I_F=-20A, dI/dt=-100A/us	-	20	-	ns
Reverse Recovery Charge	Q_{rr}		-	10	-	nC
Dynamic Characteristics[2]						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	6.1	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=-10V f=1.0MHz	-	2714	-	pF
Output capacitance	C_{OSS}		-	274	-	
Reverse transfer capacitance	C_{RSS}		-	242	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=-10V, V_{DD}=-10V, R_L=1.5Ω, R_G=3Ω	-	7	-	ns
Turn-on Rise time	tr		-	40	-	
Turn-off delay time	$t_{D(OFF)}$		-	110	-	
Turn-off Fall time	tf		-	40	-	
Total gate charge	Q_g	V_{GS}=-10V,I_D=-60A V_{DS}=-10V	-	27.7		nC
Gate-source charge	Q_{gs}			4.1		
Gate-drain charge	Q_{gd}		-	6.8	-	

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	$R_{\theta JC}$	2.0	℃/W
Thermal Resistance junction-to ambient	$R_{\theta JA}$	70	

Typical Performance Characteristics

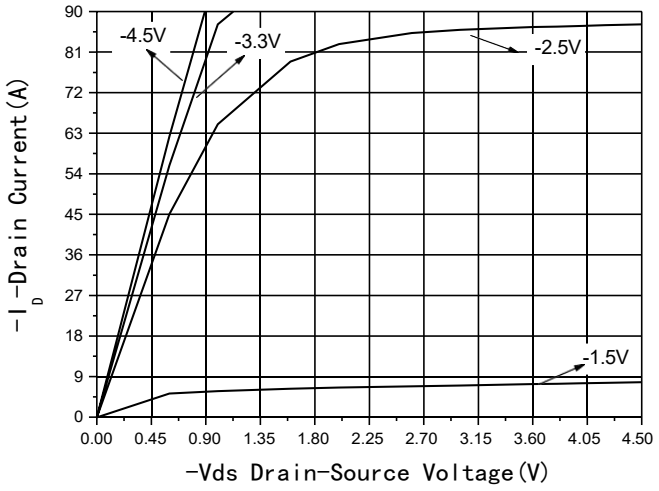


Fig1 Output Characteristics

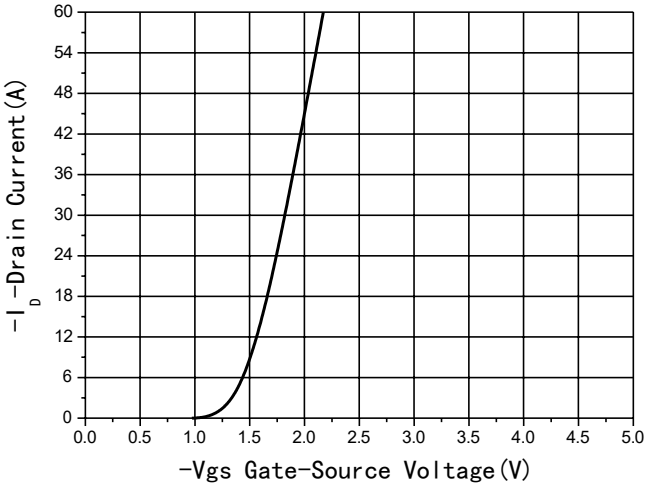


Fig2 Transfer Characteristics

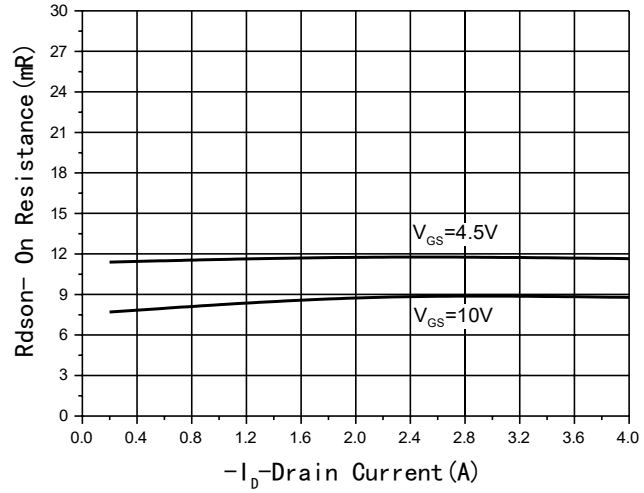


Fig3 Rdson-Drain current

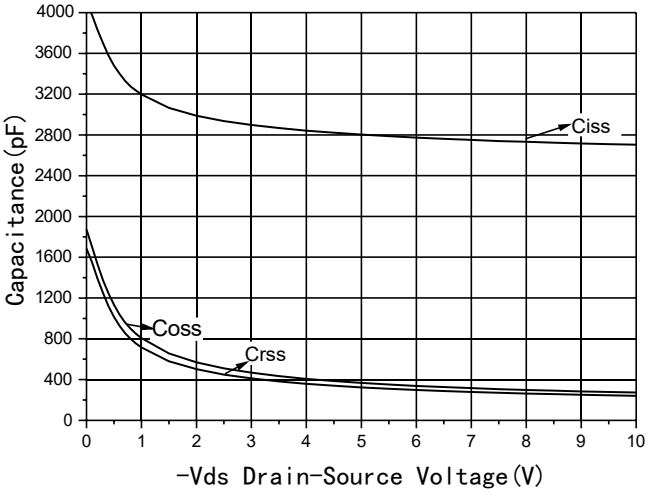


Fig4 Capacitance vs Vds

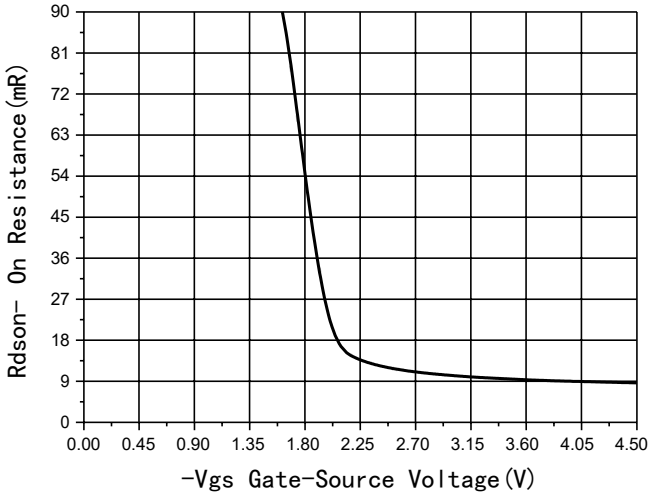


Fig5 Rdson-Gate Drain voltage

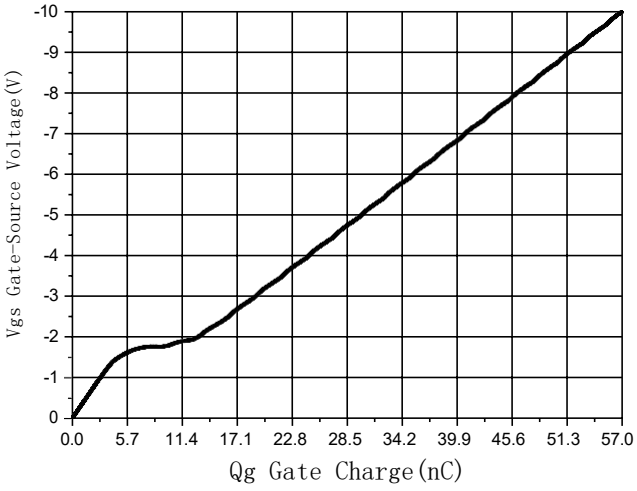


Fig6 Gate Charge

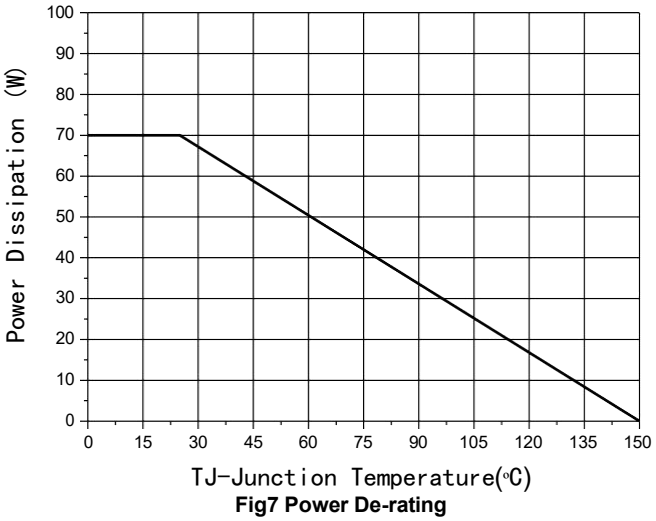


Fig7 Power De-rating

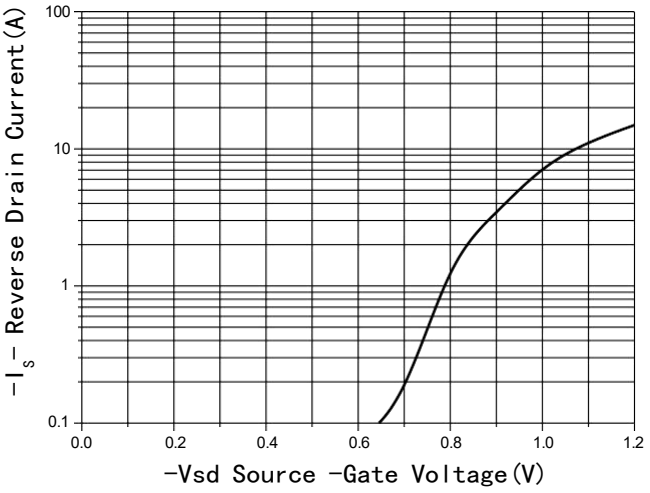


Fig8 Source-Drain Diode Forward

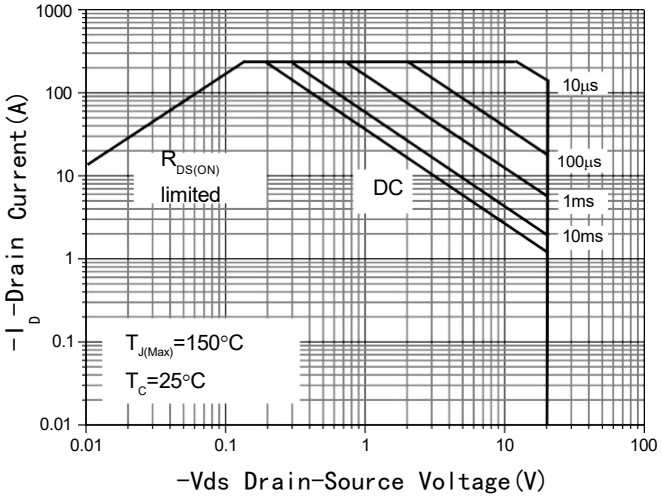


Fig9 Safe Operating Area

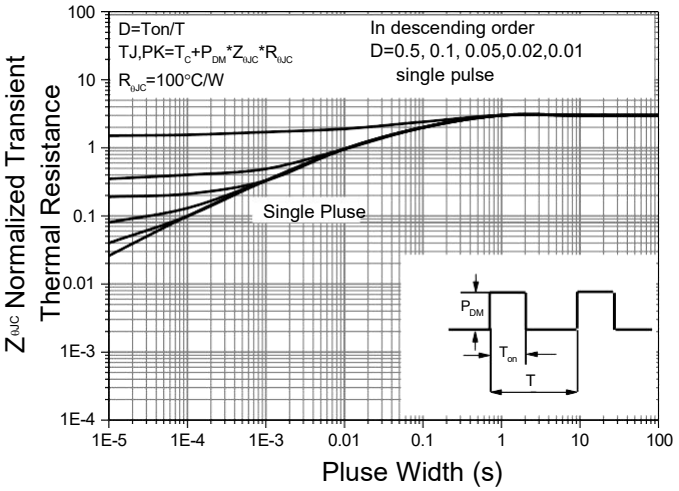
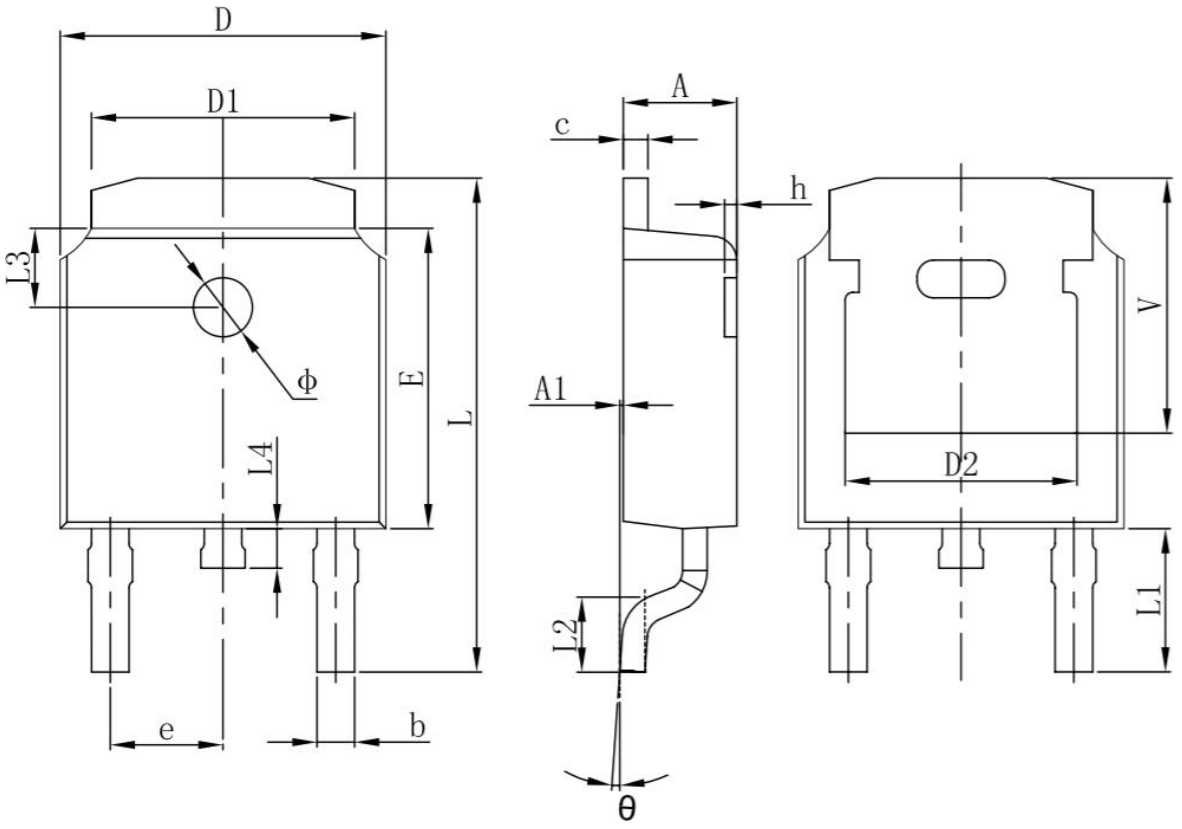


Fig10 Transient Thermal Response Curve

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.	