30V P-Channel Enhancement Mode MOSFET

Description

The CP4407BSR uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in load switch and battery protection applications.

General Features

- V_{DS} =-30V，I_D =-14A
  $R_{DS(ON)}$(Typ.)= 9.5mΩ @V_{GS}=-10V
  $R_{DS(ON)}$(Typ.)= 12.5mΩ @V_{GS}=-4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

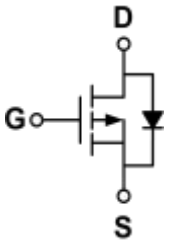
Application

- Battery protection
- Load switch

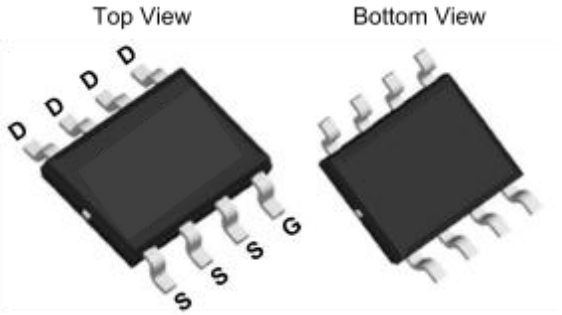
Package

- SOP-8

Schematic diagram



Marking and pin assignment



XXXX—Wafer Information

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP4407BSR-G	-55°C to +150°C	SOP8	4000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±25	V
Continuous Drain Current	TC=25°C	I_D	-14	A
	TC=70°C		-10	
Pulsed Drain Current		I_{DP}	-60	A
Avalanche energy(L=0.3mH)		E_{AS}	100	mJ
Power Dissipation	TC=25°C	P_D	3	W
	TC=70°C		2.1	
Operating junction Temperature range		Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±25V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.00	-1.7	-2.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=-14A	-	9.5	17	mΩ
		V_{GS}=4.5V, I_D=-14A	-	12.5	20	
Forward transconductance	gfs	V_{GS}=-5V, I_D=-14A	-	24	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-15V ,V_{GS}=0V f=1.0MHz	-	1815		pF
Output capacitance	C_{OSS}		-	238	-	
Reverse transfer capacitance	C_{RSS}		-	215	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=-15V R_L=2.2 Ω V_{GS}=-10V R_{GEN}=3 Ω	-	11	-	ns
Rise time	tr		-	9.4	-	
Turn-off delay time	$t_{D(OFF)}$		-	24	-	
Fall time	tf		-	12	-	
Total gate charge	Qg	V_{DS}=-15V,I_D=-14A V_{GS}=-4.5V	-	36.8	-	nC
Gate-source charge	Qgs		-	4.9	-	
Gate-drain charge	Qgd		-	6.6	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-1.0A	-	-0.8	-1.0	V

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[A]	≤ 10s	$R_{\theta JA}$	33	40	℃/W
Maximum Junction-to-Ambient[A]	Steady-State		59	75	
Maximum Junction-to-Lead[B]	Steady-State	$R_{\theta JC}$	16	24	

A:The value of R qJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: The R qJA is the sum of the thermal impedence from junction to lead R qJL and lead to ambient.

Typical Performance Characteristics

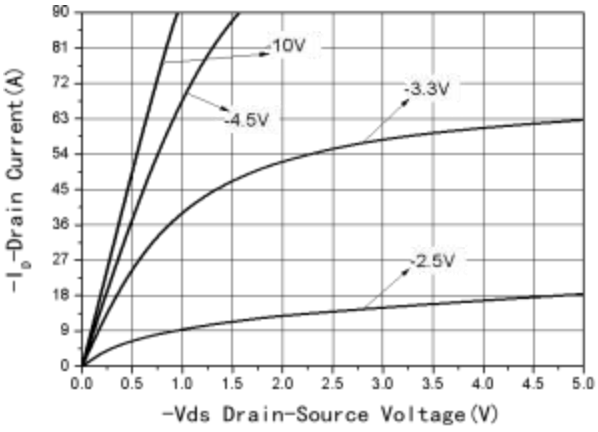


Fig1 Output Characteristics

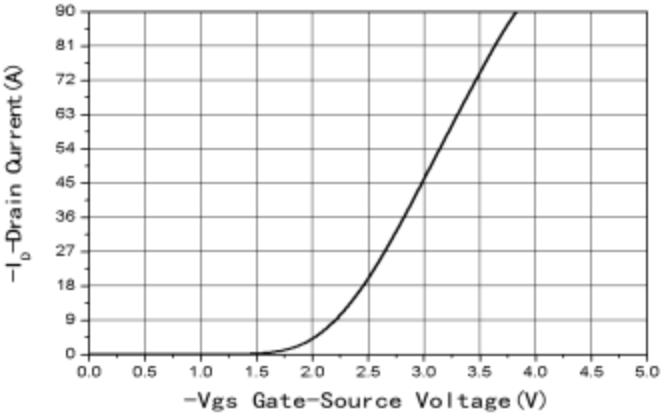


Fig2 Transfer Characteristics

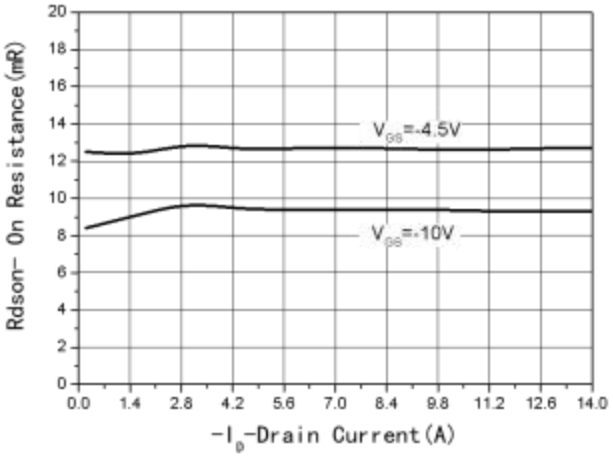


Fig3 Rdson-Drain current

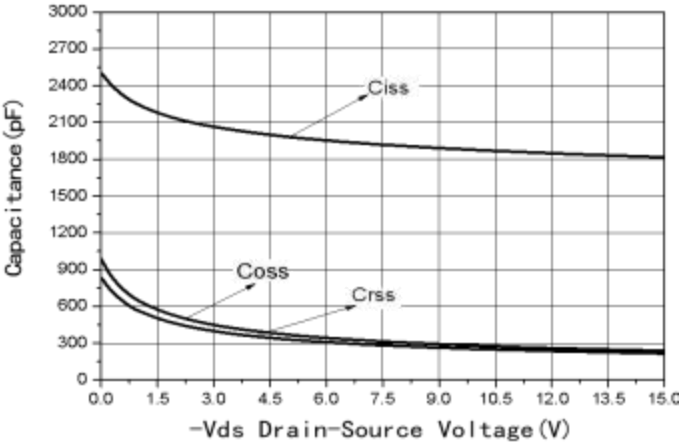


Fig4 Capacitance vs Vds

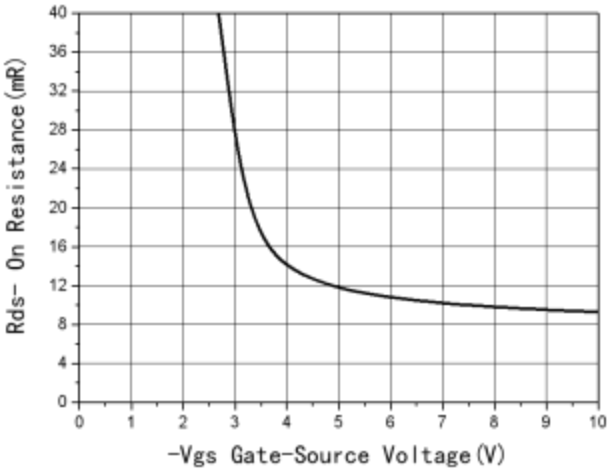


Fig5 Rdson-Gate Drain voltage

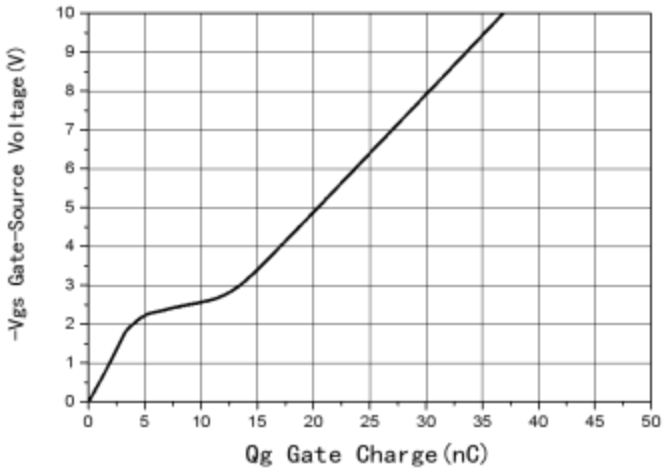


Fig6 Gate Charge

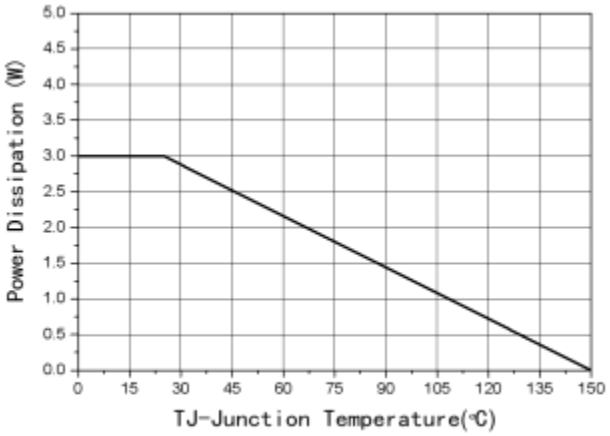


Fig7 Power De-rating

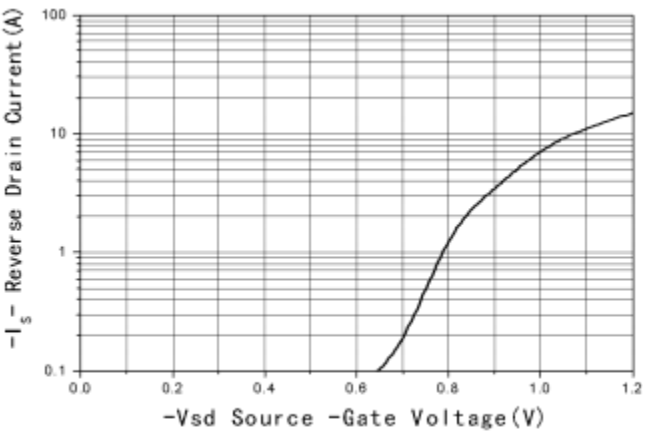
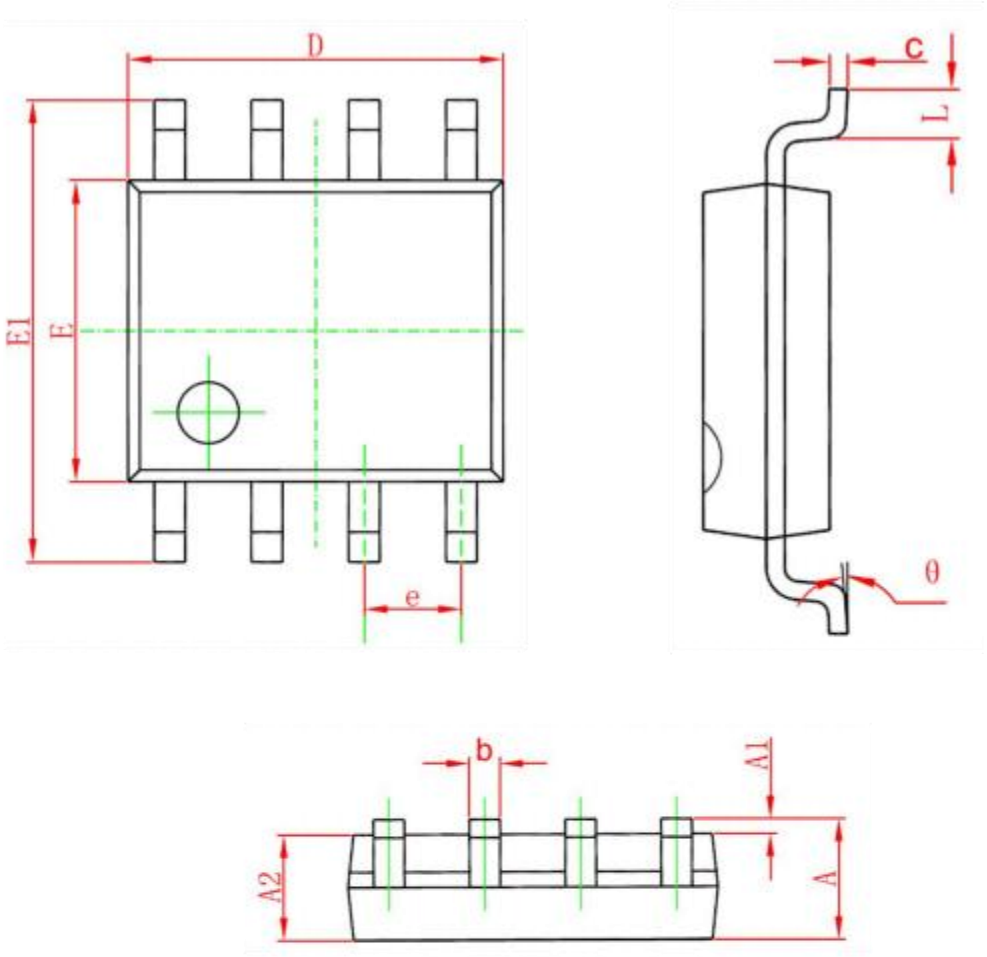


Fig8 Source-Drain Diode Forward

Package Information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°