16V P-Channel Enhancement Mode MOSFET

Description

The CP2307 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =-16V，I_D =-15A
  $R_{DS(ON)}$(Typ.)=22mΩ @V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=31mΩ @V_{GS}=-2.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

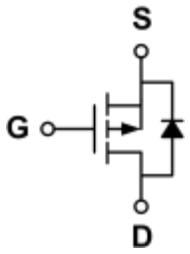
Application

- PWM applications
- Load switch

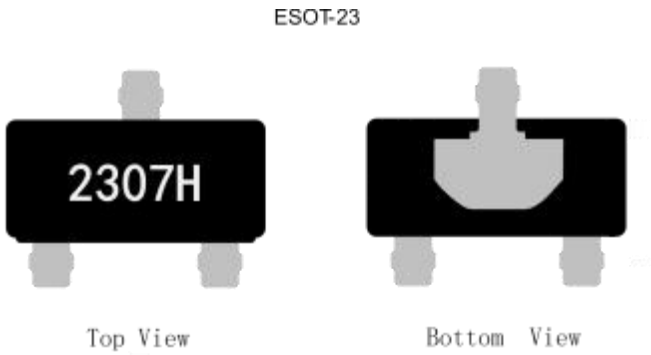
Package

- ESOT-23

Schematic diagram



Marking and pin assignment



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP2307-G	-55°C to +150°C	ESOT-23	5000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-16	V
Gate-source voltage		V_{GS}	±12	V
Continuous Drain Current	TC=25°C	I_D	-15	A
	TC=70°C		-8.6	
Pulsed Drain Current [C]		I_{DP}	-60	A
power dissipation [B]	TC=25°C	P_D	1.4	W
	TC=70°C		0.9	
Junction and Storage Temperature Range		T_J,T_{SGT}	-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	-16	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.7	-1.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A	-	22	31	mΩ
		V_{GS}=-2.5V, I_D=-3A	-	31	39	
Forward transconductance	g_{FS}	V_{DS}=-5V, I_D=-4A	-	8	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-10V ,V_{GS}=0V f=1.0MHz	-	1026	-	pF
Output capacitance	C_{OSS}		-	251	-	
Reverse transfer capacitance	C_{RSS}		-	239	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=-10V I_D=-4A V_{GEN}=-4.5V R_L=10ohm R_{GEN}=6ohm	-	25	-	ns
Rise time	tr		-	30	-	
Turn-off delay time	$t_{D(OFF)}$		-	70	-	
Fall time	tf		-	50	-	
Total gate charge	Qg	V_{DS}=-10V,I_D=-4A V_{GS}=-4.5V	-	15.8	-	nC
Gate-source charge	Qgs		-	1.7	-	
Gate-drain charge	Qgd		-	5.7	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-2A	-	-0.81	-1.2	V

Thermal Characteristics

Parameter		Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient [A]	t≤ 10s	$R_{\theta JA}$	70	90	℃/W
Maximum Junction-to-Ambient [A D]	Steady-State		100	125	
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	62	80	

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² 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.

B. The power dissipation PD is based on $T_{J(MAX)}$=150°C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty

Typical Performance Characteristics

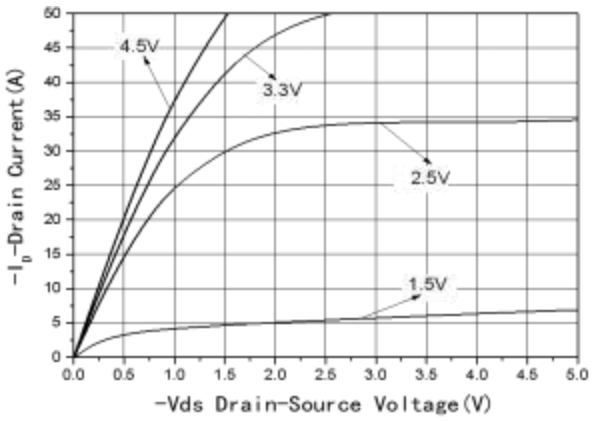


Fig1 Output Characteristics

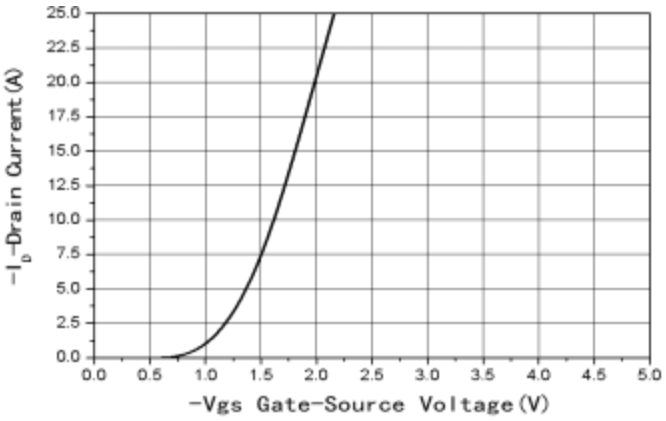


Fig2 Transfer Characteristics

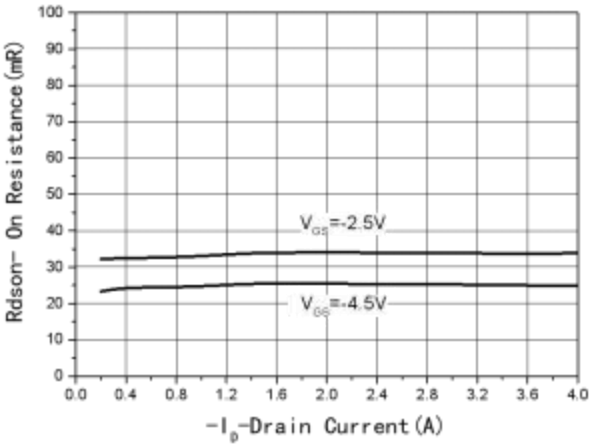


Fig3 Rdson-Drain current

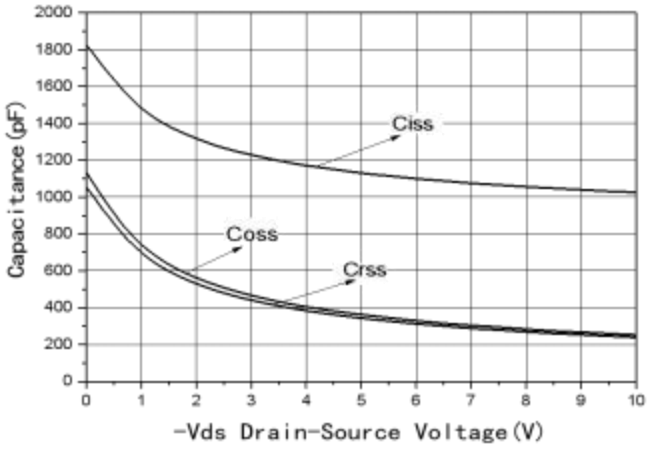


Fig4 Capacitance vs Vds

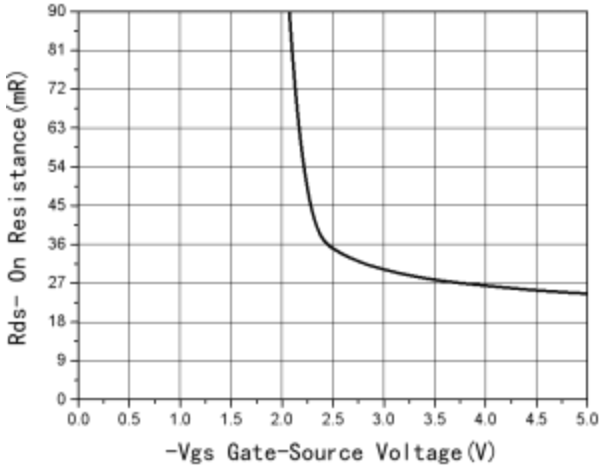


Fig5 Rdson-Gate Drain voltage

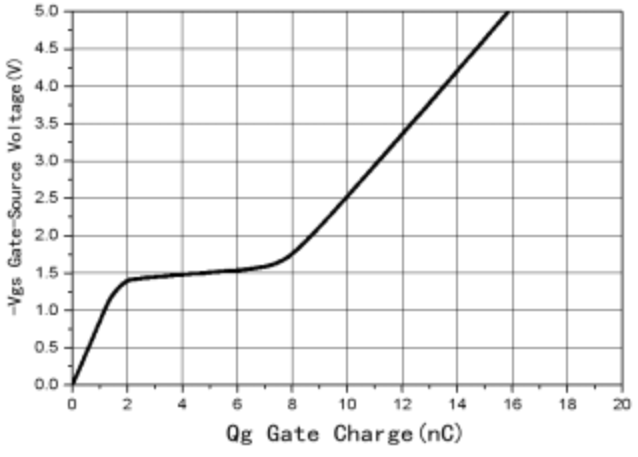


Fig6 Gate Charge

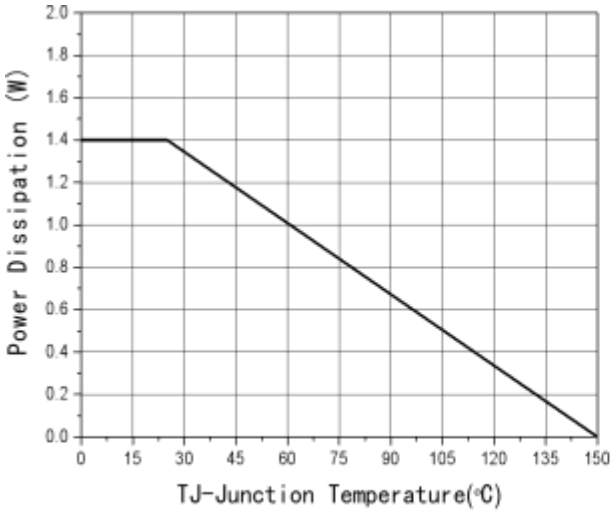


Fig7 Power De-rating

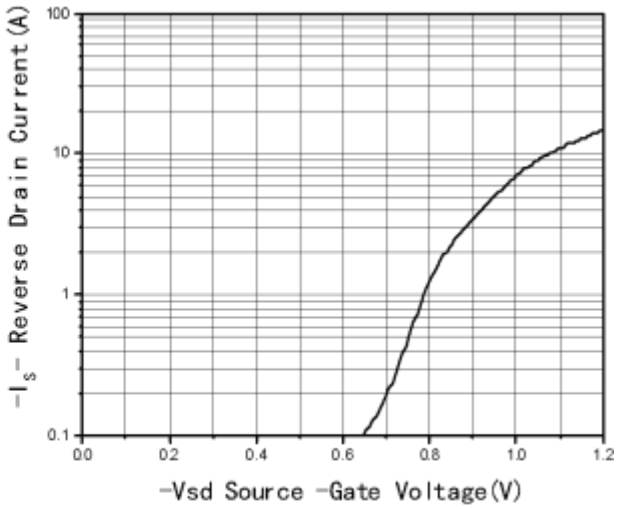
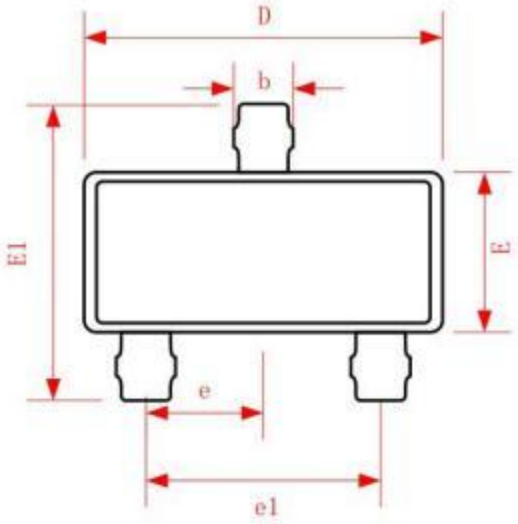


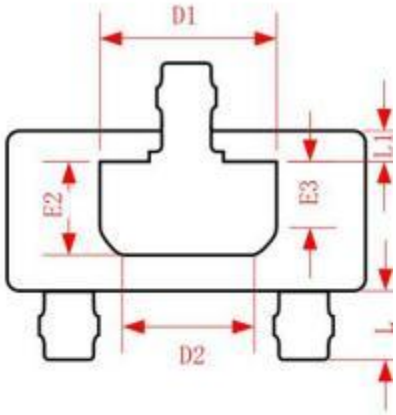
Fig8 Source-Drain Diode Forward

Package Information

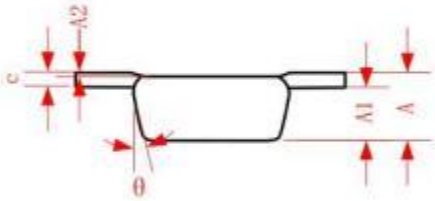
ESOT-23



Top View
【顶视图】



Bottom View
【背视图】



Side View
【侧视图】

Symbol	Dimensions In Millimeters		
	Min.	REF.	Max.
A	0.500	0.550	0.600
A1	0.368	0.398	0.428
A2	-0.030	0.000	0.030
c		0.152Ref	
D	2.850	2.900	2.950
E	1.250	1.300	1.350
E1	2.350	2.400	2.450
D1	1.405	1.430	1.455
D2	0.995	1.020	1.045
E2	0.735	0.760	0.785
E3	0.490	0.520	0.545
L	0.525	0.550	0.575
L1	0.235	0.260	0.285
e		0.950Ref	
e1	1.800	1.900	2.000
b	0.410	0.480	0.550
θ	14°	15°	16°