KJ4002NP8

Full-Bridge of MOSFET

1. Product Information

Features

- Surface-mounted package
- Excellent $R_{DS(ON)}$
- Low gate charge
- High power and current handing capability

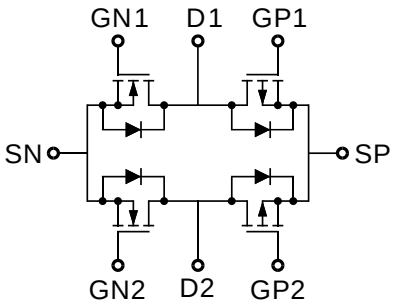
Applications

- Full bridge driver
- PWM applications
- Load switch

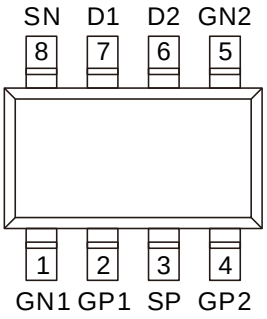
Quick reference

- **N-Channel**
  V_{DS} = 20 V, I_D = 2 A
  $R_{DS(ON)}$ ≦ 90 mΩ @V_{GS} = 4.5 V (Type: 60 mΩ)
  $R_{DS(ON)}$ ≦ 110 mΩ @V_{GS} = 2.5 V (Type: 80 mΩ)
- **P-Channel**
  V_{DS} = -20 V, I_D = -2 A
  $R_{DS(ON)}$ ≦ 150 mΩ @V_{GS} = -4.5 V (Type: 120 mΩ)
  $R_{DS(ON)}$ ≦ 170 mΩ @V_{GS} = -2.5 V (Type: 140 mΩ)

Schematic Diagram



Pin Assignment



SOT23-8L

Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Quantity
KJ4002NP8	SOT23-8L	4002	7"	3000

2. Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter		Symbol	Limit		Unit
			N	P	
Drain-source voltage		V_{DS}	20	-20	V
Gate-source voltage		V_{GS}	±12	±12	V
Continuous drain current [a]	T_A = 25°C	I_D	2	-2	A
	T_A = 70°C		1.6	-1.6	
Pulsed drain current (Package Limited)		I_{DM}	8	-8	
Power dissipation		P_D	1.4		W
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150		°C

3. Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient [a]	t ≤ 10 s	$R_{\theta JA}$	70	90	℃/W
	Steady-State		100	125	
Maximum Junction-to-Foot	Steady-State	$R_{\theta JC}$	63	80	

Notes:
a. Surface mounted on 1"x1" FR4 board.
b. Pulse width limited by maximum junction temperature.

4. Electrical Characteristics (T_A=25℃, unless otherwise noted)

- **N-Channel**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=250 μA	20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=20 V, V_{GS}=0 V	-	-	1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0 V, V_{GS}=±12 V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250 μA	0.45	0.65	1.0	V
Drain-source on-state resistance [a]	$R_{DS(ON)}$	V_{GS}=4.5 V, I_D=2 A	-	60	90	mΩ
		V_{GS}=2.5 V, I_D=1 A	-	80	110	
Forward transconductance [a]	gfs	V_{DS}=5 V, I_D=2 A	-	8	-	S
Dynamic Characteristics [b]						
Input capacitance	C_{iss}	V_{DS}=10 V, V_{GS}=0 V, F=1.0 MHz	-	140	-	pF
Output capacitance	C_{oss}		-	32	-	
Reverse transfer capacitance	C_{rss}		-	28	-	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10 V, V_{GEN}=4.5 V, R_{GEN}=3.3 Ω, I_D=2 A	-	9	-	ns
Turn-on Rise Time	t_r		-	7	-	
Turn-off Delay Time	$t_{d(off)}$		-	18	-	
Turn-off Fall Time	t_f		-	6	-	
Total Gate Charge	Q_g	V_{DS}=10 V, I_D=2 A, V_{GS}=4.5 V	-	3.2	-	nC
Gate-Source Charge	Q_{gs}		-	0.9	-	
Gate-Drain Charge	Q_{gd}		-	0.7	-	
Drain-source Diode Characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_S=1 A	-	-	1.2	V

- **P-Channel**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=-250 μA	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V, 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=-250 μA	-0.45	-0.65	-1.0	V
Drain-source on-state resistance [a]	$R_{DS(ON)}$	V_{GS}=-4.5 V, I_D=-2 A	-	120	150	mΩ
		V_{GS}=-2.5 V, I_D=-1 A	-	140	170	
Forward transconductance [a]	gfs	V_{DS}=-5V, I_D=-2 A	-	9.5	-	S
Dynamic Characteristics [b]						
Input capacitance	C_{iss}	V_{DS}=-10 V, V_{GS}=0 V, F=1.0 MHz	-	140	-	pF
Output capacitance	C_{oss}		-	32	-	
Reverse transfer capacitance	C_{rss}		-	28	-	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10 V, V_{GEN}=-4.5 V R_{GEN}=-3.3 Ω, I_D=-2 A	-	9	-	ns
Turn-on Rise Time	t_r		-	7	-	
Turn-off Delay Time	$t_{d(off)}$		-	18	-	
Turn-off Fall Time	t_f		-	6	-	
Total Gate Charge	Q_g	V_{DS}=-10 V, I_D=-2 A V_{GS}=-4.5 V	-	3.2	-	nC
Gate-Source Charge	Q_{gs}		-	0.9	-	
Gate-Drain Charge	Q_{gd}		-	0.7	-	
Drain-source Diode Characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_S=-1 A	-	-	-1.2	V

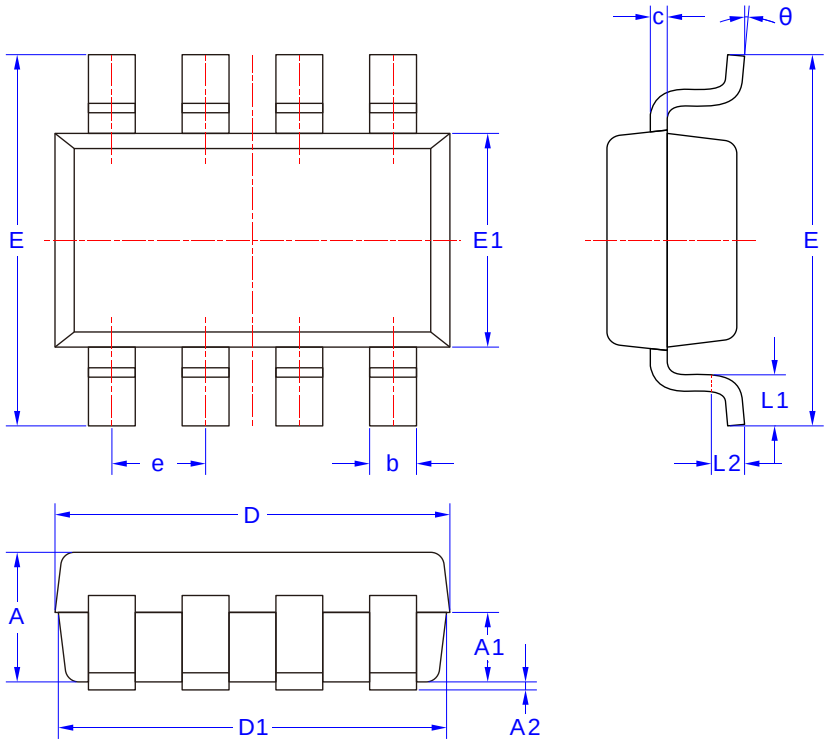
Notes:

a. Pulse test: Pulse width ≤ 300 μs, duty cycle ≤ 2%

b. Guaranteed by design, not subject to production testing

5. Package Mechanical Data

SOT23-8L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.90	1.04
A1	0.47	0.57
A2	0.01	0.11
b	0.30	0.40
c	0.127 BSC	
D	2.90	3.00
D1	2.90 BSC	
E	2.68	2.88
E1	1.55	1.65
e	0.70 BSC	
L1	0.32	0.48
L2	0.20	0.30
θ	3°	8°