

N+P Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- Surface-mounted package
- Advanced trench cell design

1.2 Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

1.3 Quick reference

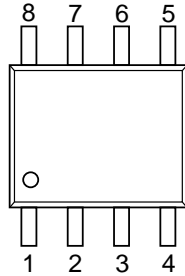
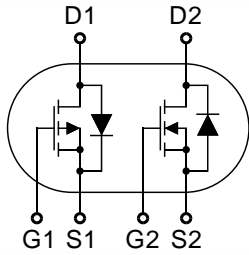
• N-Channel

- $BV \geq 20\text{ V}$
- $R_{DS(ON)} \leq 35\text{ m}\Omega @V_{GS} = 4.5\text{ V}$
- $P_D \leq 2\text{ W}$
- $R_{DS(ON)} \leq 45\text{ m}\Omega @V_{GS} = 2.5\text{ V}$
- $I_D \leq 5\text{ A}$

• P-Channel

- $BV \leq -20\text{ V}$
- $R_{DS(ON)} \leq 65\text{ m}\Omega @V_{GS} = -4.5\text{ V}$
- $P_D \leq 2\text{ W}$
- $R_{DS(ON)} \leq 80\text{ m}\Omega @V_{GS} = -2.5\text{ V}$
- $I_D \geq -5\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Source (S2)		
2	Gate (G2)		
3	Source (S1)		
4	Gate (G1)		
4,5	Drain (D1)		
7,8	Drain (D2)		

Top View
SOP8

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
• N-Channel					
V _{DS}	Drain-Source Voltage	T _A =25°C	-	20	V
V _{GS}	Gate-Source Voltage	T _A =25°C	-	±12	V
I _D *	Drain Current	T _A =25°C, V _{GS} =4.5 V	-	5	A
		T _A =75°C, V _{GS} =4.5 V	-	3.2	A
I _{DM} *, **	Pulsed Drain Current	T _A =25°C, V _{GS} =4.5 V	-	23.6	A
• P-Channel					
V _{DS}	Drain-Source Voltage	T _A =25°C	-	-20	V
V _{GS}	Gate-Source Voltage	T _A =25°C	-	±12	V
I _D *	Drain Current	T _A =25°C, V _{GS} =-4.5 V	-	-5	A
		T _A =75°C, V _{GS} =-4.5 V	-	-3	A
I _{DM} *, **	Pulsed Drain Current	T _A =25°C, V _{GS} =-4.5 V	-	-20	A
P _{tot}	Total Power Dissipation	T _A =25°C	-	2	W
		T _A =75°C	-	1.3	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	150	°C
R _{θJA} *	Thermal Resistance-Junction to Ambient		-	110	°C/W
R _{θJC}	Thermal Resistance-Junction to Case		-	50	°C/W

Notes :

- * Surface mounted on 1 in² pad area, t ≤ 10 sec
- ** Pulse width ≤ 300 μs, duty cycle ≤ 1 %

4. Marking Information

Product Name	Marking
KJ4606B	4606B YYWW YYWW: Date Code

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ4606B	SOP8	13"	12 mm	4000

Note: KJ4606B defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

6. Electrical Characteristics (T_A=25°C unless otherwise noted)

• N-Channel

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	20	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	0.5	0.8	1.2	V
I _{DSS}	Drain Leakage Current	V _{DS} =20 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±12 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =4.5 V, I _D =5 A	-	25	35	mΩ
		V _{GS} =2.5 V, I _D =3 A	-	35	45	
Dynamic Characteristics^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =10 V, f=1 MHz	-	396	-	pF
C _{oss}	Output Capacitance		-	54	-	
C _{rss}	Reverse Transfer Capacitance		-	40	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =10 V, V _{GEN} =4.5 V, R _G =3.3 Ω, I _D =5 A	-	14	-	ns
t _r	Turn-on Rise Time		-	10	-	
t _{d(off)}	Turn-off Delay Time		-	30	-	
t _f	Turn-off Fall Time		-	7	-	
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{DS} =10 V, V _{GS} =4.5 V, I _{DS} =5 A	-	4.1	-	nC
Q _{gs}	Gate-Source Charge		-	1.1	-	
Q _{gd}	Gate-Drain Charge		-	0.7	-	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1 A, V _{GS} =0 V	-	-	1.2	V

Notes:

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

7. Electrical Characteristics (T_A=25°C unless otherwise noted)

• P-Channel

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =-250 μA	-20	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250 μA	-0.5	-0.7	-1.2	V
I _{DSS}	Drain Leakage Current	V _{DS} =-20 V, V _{GS} =0 V	-	-	-1.0	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±12 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =-4.5 V, I _{DS} =-5 A	-	55	65	mΩ
		V _{GS} =-2.5 V, I _{DS} =-3 A	-	65	80	
Dynamic Characteristics^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-10 V f=1 MHz	-	665	-	pF
C _{oss}	Output Capacitance		-	140	-	
C _{rss}	Reverse Transfer Capacitance		-	115	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-10 V, V _{GEN} =-4.5 V, R _G =1 Ω, R _L =9.1 Ω, I _{DS} =-5 A	-	6	-	ns
t _r	Turn-on Rise Time		-	15	-	
t _{d(off)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	9	-	
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{DS} =-10 V, V _{GS} =-4.5V, I _{DS} =-5 A	-	25	-	nC
Q _{gs}	Gate-Source Charge		-	5.8	-	
Q _{gd}	Gate-Drain Charge		-	3.1	-	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-1 A, V _{GS} =0 V	-	-	-1.2	V

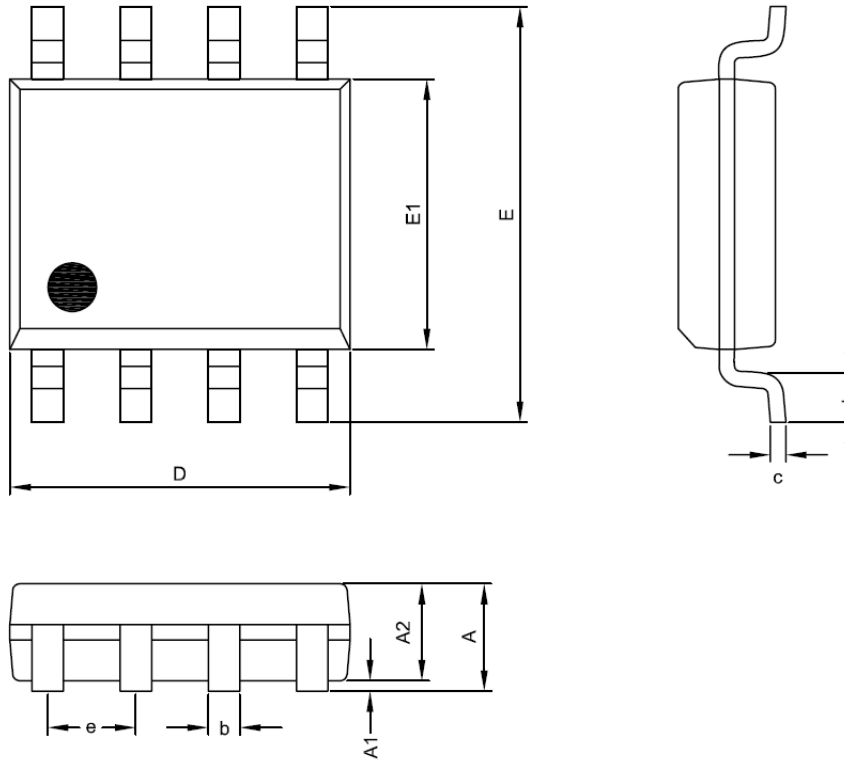
Notes:

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

b. Guaranteed by design, not subject to production testing.

8. Package Dimensions

SOP8 Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	1.35	1.75
A1	0.00	0.25
A2	1.15	1.50
D	4.80	5.00
E	5.80	6.20
E1	3.80	4.00
c	0.19	0.27
b	0.33	0.53
e	1.27 BSC	
L	0.40	1.27