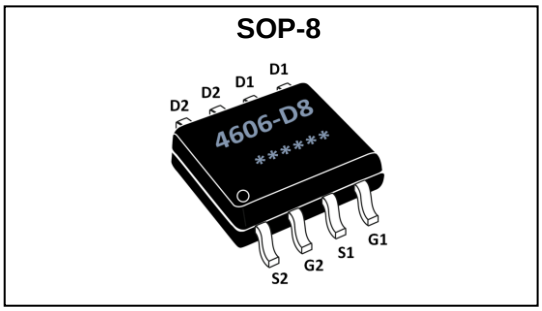
KL Silicon N+P Channel Power MOSFET

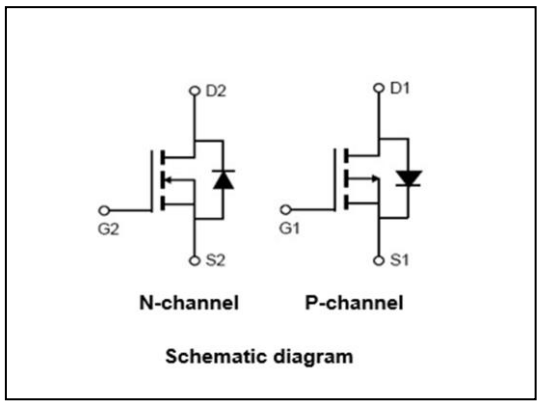
General Description：

The KL4606-D8 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is SOP-8, which accords with the RoHS standard.



Features：

- **N-Channel**
  - V_{DS} = 30V,I_D = 8A
  - $R_{DS(ON)}$ <20mΩ @ VGS=10V
  - $R_{DS(ON)}$ < 30mΩ @ VGS=4.5V
  - $R_{DS(ON)}$ < 40mΩ @ VGS=2.5V
- **P-Channel**
  - V_{DS} = -30V,ID = -8.0A
  - $R_{DS(ON)}$ < 30mΩ @ VGS=-10V
  - $R_{DS(ON)}$ < 50mΩ @ VGS=-4.5V
  - $R_{DS(ON)}$ < 65mΩ @ VGS=-2.5V
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage



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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±12	±12	V
Continuous Drain Current	T_A=25℃	I_D	8	-8	A
	T_A=70℃		7.2	-7.2	
Pulsed Drain Current (Note 1)		I_{DM}	32	-32	A
Maximum Power Dissipation	T_A=25℃	P_D	2.0	2.0	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	℃/W
Thermal Resistance,Junction-to-Ambient (Note2)	$R_{\theta JA}$	P-Ch	62.5	℃/W

N-CH Electrical Characteristics (T_A=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	33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±1	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.6	1.0	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A	-	14	20	mΩ
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5A	-	21	30	mΩ
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=2.5V, I_D=4A	-	30	40	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=8A	15	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	320	-	PF
Output Capacitance	C_{oss}		-	54	-	PF
Reverse Transfer Capacitance	C_{rss}		-	41	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=2.5Ω V_{GS}=10V,R_{GEN}=3Ω	-	5.5	-	nS
Turn-on Rise Time	t_r		-	3.0	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	16.5	-	nS
Turn-Off Fall Time	t_f		-	4.5	-	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=8A, V_{GS}=10V	-	15	-	nC
Gate-Source Charge	Q_{gs}		-	6.5	-	nC
Gate-Drain Charge	Q_{gd}		-	4.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=8A	-	0.8	1.2	V

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P-CH Electrical Characteristics (T_A=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	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	-1	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.6	-1.0	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6.0 A	-	22	30	mΩ
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-5.0A	-	30	50	mΩ
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-2.5V, I_D=-4.0A	-	45	60	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-8A	10	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	630	-	PF
Output Capacitance	C_{oss}		-	110	-	PF
Reverse Transfer Capacitance	C_{rss}		-	76	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, R_L=2.3Ω V_{GS}=-10V,R_{GEN}=6Ω	-	8.5	-	nS
Turn-on Rise Time	t_r		-	6.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	21	-	nS
Turn-Off Fall Time	t_f		-	8.5	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-8A V_{GS}=-10V	-	10.2	-	nC
Gate-Source Charge	Q_{gs}		-	1.9	-	nC
Gate-Drain Charge	Q_{gd}		-	2.4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-8A	-	-	-1.2	V

Notes:

1. *Repetitive Rating: Pulse width limited by maximum junction temperature.*
2. *Surface Mounted on FR4 Board, t ≤ 10 sec.*
3. *Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.*
4. *Guaranteed by design, not subject to production*