18V N And P-Channel Enhancement Mode MOSFET

Description

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

General Features

- **N-channel:**
  V_{DS} =18V,ID =5A
  $R_{DS(ON)}$=21mΩ (typical) @V_{GS} =4.5V
  $R_{DS(ON)}$=26mΩ (typical) @ V_{GS}=2.5V
  P-Channel:
  V_{DS} =-18V,ID =-4A
  $R_{DS(ON)}$=45mΩ (typical) @ V_{GS}=-4.5V
  $R_{DS(ON)}$=60mΩ (typical) @ V_{GS}=-2.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

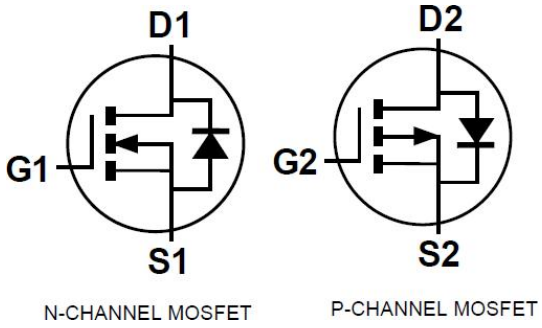
Application

- PWM applications
- Load switch

Package

- DFN2*2-6L-A

Schematic diagram

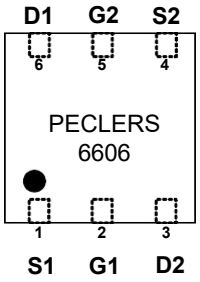


N-CHANNEL MOSFET P-CHANNEL MOSFET

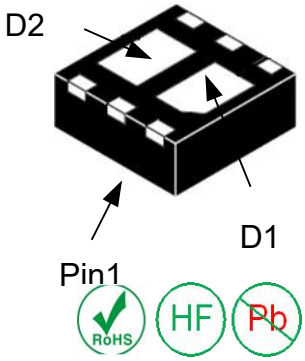
Marking and pin assignment

DFN2*2-6L-A

TOP VIEW



BOTTOM VIEW



Note:

6606—PECLERS 6606D2

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN6606D2	-55°C to +150°C	PDFN2*2	4000

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

Parameter		Symbol	Limit N	Limit P	Unit
Drain-source voltage		V_{DS}	18	-18	V
Gate-source voltage		V_{GS}	±12	±12	V
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	5[a]	-4[a]	A
	T_C = 70 °C		5[a]	-4[a]	
	T_A = 25 °C		5[a,b,c]	-4[a,b,c]	
	T_A = 70 °C		5[a,b,c]	-4[a,b,c]	

Pulsed Drain Current (t=100μm)		I_{DM}	20	-16	A
Source Drain Current Diode Current	T_C = 25°C	I_S	5[a]	-4[a]	
	T_A = 25°C		1.85[b,c]	-1.5[b,c]	
Maximum Power Dissipation	T_C = 25°C	P_D	7.8	7.8	W
	T_C = 70°C		5	5	
	T_A = 25°C		1.9[b,c]	1.9[b,c]	
	T_A = 70°C		1.2[b,c]	1.2[b,c]	
Junction and Storage Temperature Range		T_J, T_{STG}	-55—150		℃

Thermal Characteristics

Parameter		Symbol	N-Channel		P-Channel		Unit
			Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient [b]	≤ 5s	$R_{\theta JA}$	52	65	52	65	℃/W
Maximum Junction-to-Ambient [b]	Steady-State		86	92	86	92	
Maximum Junction-to-Lead [b]	Steady-State	$R_{\theta JC}$	12.5	16	12.5	16	

Notes:

a. Package limited.

b. Surface mounted on 1" x 1" FR4 board.

c. t = 5 s.

N-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

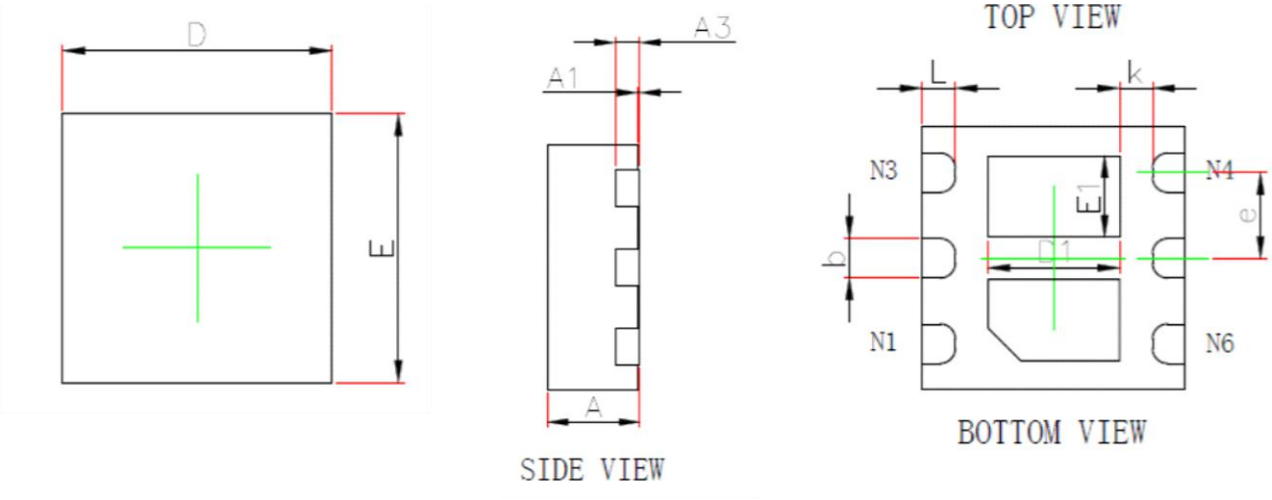
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} =0V, I_D=250μA	18	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=18V, V_{GS}=0V	-	-	1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.45	0.65	0.9	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS} =4.5V, I_D=5A	-	21	25	mΩ
		V_{GS} =2.5V, I_D=4A		26	32	
Forward transconductance	G_{FS}	V_{DS}=5V, I_D=5A	-	6	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=10V, V_{GS} =0V f=1.0MHz	-	800	-	pF
Output capacitance	C_{OSS}		-	124	-	
Reverse transfer capacitance	C_{RSS}		-	110	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=9V R_L=3.3 ohm V_{GEN}=4.5V R_{GEN}=6ohm	-	5	-	ns
Rise time	tr		-	10.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	16.6	-	
Fall time	tf		-	4.1	-	
Total gate charge	Qg	V_{DS}=9V I_D=5A V_{GS}=4.5V	-	10.5	-	nC
Gate-source charge	Qgs		-	1.2	-	
Gate-drain charge	Qgd		-	1.6	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V, Is=3A	-	0.76	1.16	V

P-Channel Electrical Characteristics (T_J=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	-18	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-18V, 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	-0.45	-0.7	-1.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS} =-4.5V, I_D=-4A	-	45	55	mΩ
		V_{GS} =-2.5V, I_D=-3A	-	60	70	
Forward transconductance	G_{FS}	V_{DS}=-5V, I_D=-4A	-	5	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-9V, V_{GS} =0V f=1.0MHz	-	900	-	pF
Output capacitance	C_{OSS}		-	220	-	
Reverse transfer capacitance	C_{RSS}		-	175	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=-9V I_D=-4A V_{GEN}=-4.5V R_L=10ohm R_{GEN}=-60ohm	-	5.7	-	ns
Rise time	tr		-	11	-	
Turn-off delay time	$t_{D(OFF)}$		-	25	-	
Fall time	tf		-	26	-	
Total gate charge	Q_g	V_{DS}=-9V, I_D=-4A V_{GS}=-4.5V	-	10	-	nC
Gate-source charge	Q_{gs}		-	1.6	-	
Gate-drain charge	Q_{gd}		-	3.0	-	

Package Information

- **DFN2*2-6L-A**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.900	1.100	0.035	0.043
E1	0.520	0.720	0.020	0.028
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
k	0.200MIN.		0.008MIN.	
L	0.200	0.300	0.008	0.012