

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:**
 - $V_{DS} = 18V, I_D = 5A$
 - $R_{DS(ON)} = 21m\Omega$ (typical) @ $V_{GS} = 4.5V$
 - $R_{DS(ON)} = 26m\Omega$ (typical) @ $V_{GS} = 2.5V$
- ◆ **P-Channel:**
 - $V_{DS} = -18V, I_D = -4A$
 - $R_{DS(ON)} = 45m\Omega$ (typical) @ $V_{GS} = -4.5V$
 - $R_{DS(ON)} = 60m\Omega$ (typical) @ $V_{GS} = -2.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

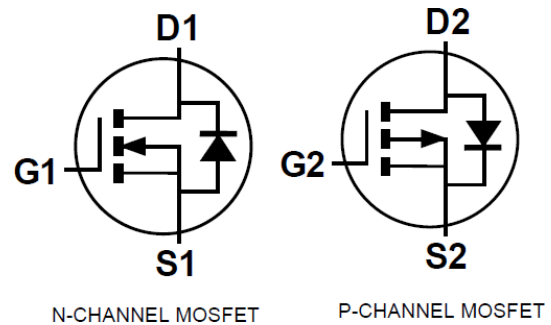
Application

- ◆ PWM applications
- ◆ Load switch

Package

- ◆ DFN2*2-6L-A

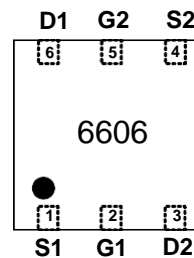
Schematic diagram



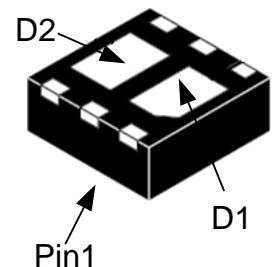
Marking and pin assignment

DFN2*2-6L-A

TOP VIEW



BOTTOM VIEW



Note:

6606—PECN6606D2



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN6606D2-G	-55°C to +150°C	DFN2*2-6L-A	4000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

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

Thermal Characteristics

Parameter		Symbol	N-Channel		P-Channel		Unit
			Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient ^b	≤ 5s	R _{θJA}	52	65	52	65	°C/W
Maximum Junction-to-Ambient ^b	Steady-State		86	92	86	92	
Maximum Junction-to-Lead ^b	Steady-State	R _{θJC}	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°C unless otherwise noted)

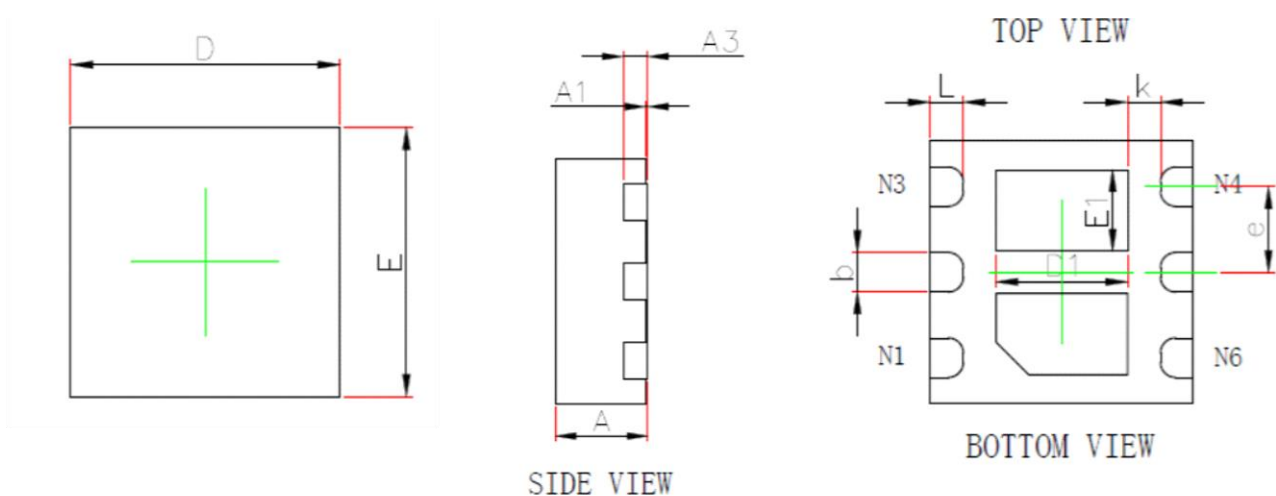
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	18	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =18V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
ON Characteristics						
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	t _r		-	10.5	-	
Turn-off delay time	t _{D(OFF)}		-	16.6	-	
Fall time	t _f		-	4.1	-	
Total gate charge	Q _g	V _{DS} =9V I _D =5A V _{GS} =4.5V	-	10.5	-	nC
Gate-source charge	Q _{gs}		-	1.2	-	
Gate-drain charge	Q _{gd}		-	1.6	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V _{SD}	V _{GS} =0V, I _s =3A	-	0.76	1.16	V

P-Channel Electrical Characteristics (T_J=25°C 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	t _r		-	11	-	
Turn-off delay time	t _{D(OFF)}		-	25	-	
Fall time	t _f		-	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