20V N-Channel Enhancement Mode MOSFET

Description

The PECN3418EMR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =20V，I_D =5A
  $R_{DS(ON)}$(Typ.)=25mΩ @V_{GS}=2.5V
  $R_{DS(ON)}$(Typ.)=20mΩ @V_{GS}=4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package
- ESD Rating: 2000V HBM

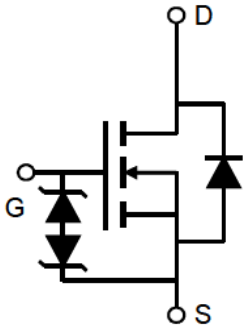
Application

- PWM applications
- Load switch

Package

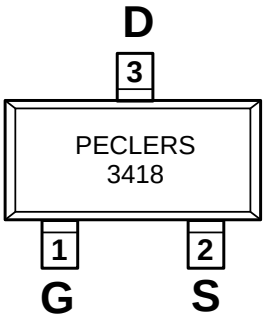
- SOT-23-3L

Schematic diagram



Marking and pin assignment

SOT-23-3L
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN3418EMR	-55°C to +150°C	SOT-23-3L	3000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±8	V
Drain current-continuous[a]@Tj=125℃		I_D	5	A
-pulse *d*[b]		I_{DM}	20	A
Maximum power dissipation	T_A=25℃	P_D	1.4	W
	T_A=70℃		0.9	
Operating junction Temperature range		Tj	-55—150	℃

Notes:

a. surface mounted on FR4 board,t≤10sec

b. pulse test: pulse width≤300μs,duty≤2%

Electrical Characteristics (TA=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	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}=±8V	-	-	±1	μA
		V_{DS}=0V, V_{GS}=±10V			±3	
		V_{DS}=0V, V_{GS}=±12V			±10	
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.45	0.62	1.00	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5A	-	20	26	mΩ
		V_{GS}=2.5V, I_D=4A	-	25	32	
		V_{GS}=1.8V, I_D=3A	-	30	40	
Forward transconductance	gfs	V_{DS}=5V, I_D=5A	-	50	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=10V ,V_{GS}=0V f=1.0MHz	-	836	-	pF
Output capacitance	C_{OSS}		-	96	-	
Reverse transfer capacitance	C_{RSS}		-	80	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=10V V_{GS}=4.5V I_D=1A R_{GEN}=3ohm	-	24	-	ns
Rise time	tr		-	46	-	
Turn-off delay time	$t_{D(OFF)}$		-	220	-	
Fall time	tf		-	300	-	
Total gate charge	Qg	V_{DS}=10V,I_D=5A V_{GS}=4.5V	-	8.6	-	nC
Gate-source charge	Qgs		-	1.1	-	
Gate-drain charge	Qgd		-	1.1	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=4A	-	-0.82	-1.2	V

Thermal Characteristics

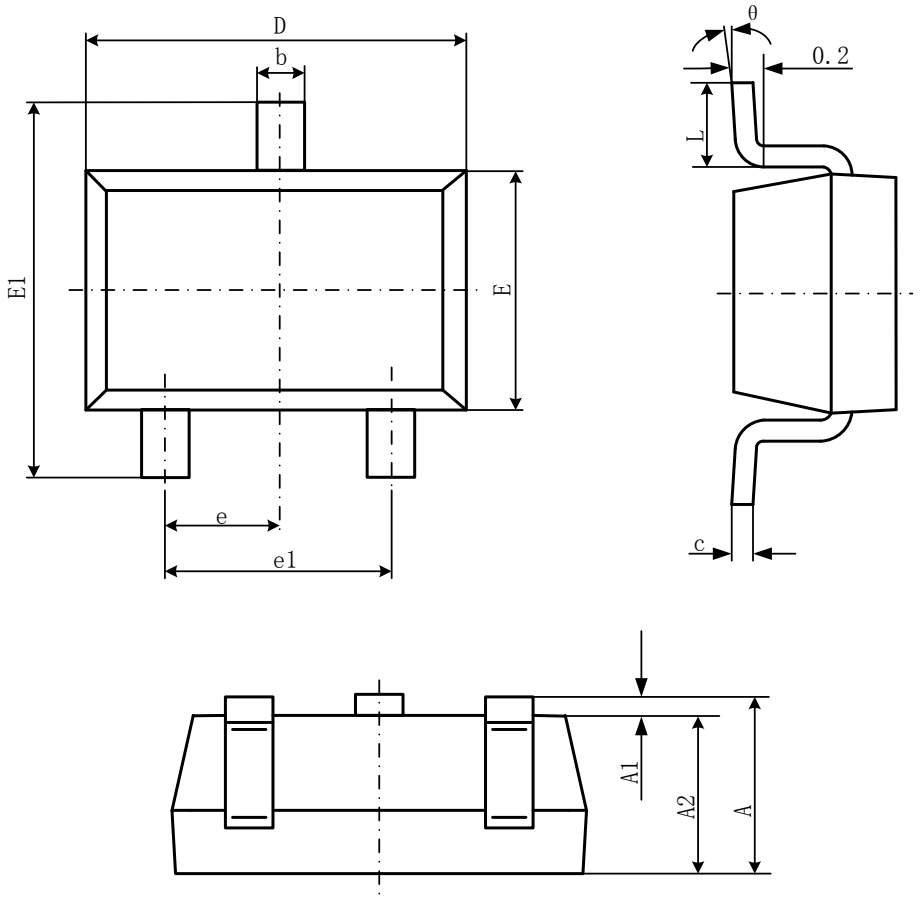
Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[A]	≤ 10s	$R_{\theta JA}$	70	90	℃/W
Maximum Junction-to-Ambient[A]	Steady-State		100	125	
Maximum Junction-to-Lead[B]	Steady-State	$R_{\theta JL}$	63	80	

c. A:The value of R qJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

d. B: The R qJA is the sum of the thermal impedence from junction to lead R qJL and lead to ambient.

Package Information

- **SOT-23-3L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°