

20V N-Channel Enhancement Mode MOSFET

Description

The PECN3418E 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

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

Application

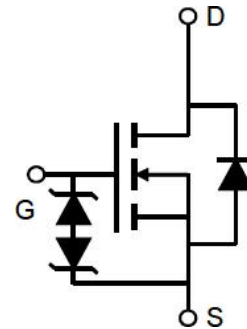
- ◆ PWM applications
- ◆ Load switch

Package

- ◆ SOT-23-3L

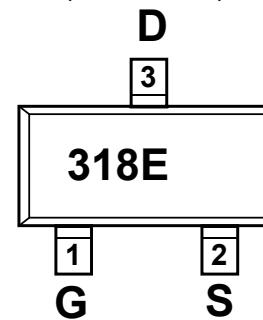


Schematic diagram



Marking and pin assignment

SOT-23-3L
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN3418EM R-G	-55°C to +150°C	SOT-23-3L	3000

Absolute Maximum Ratings (TA=25°C 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°C -pulse ^d		I_D	5	A
		I_{DM}	20	A
Maximum power dissipation	T _A =25°C	P _D	1.4	W
	T _A =70°C		0.9	
Operating junction Temperature range		T _j	-55—150	°C

Notes:

- a. surface mounted on FR4 board, t≤10sec
- b. pulse test: pulse width≤300μs, duty≤2%

Electrical Characteristics (TA=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	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						
IPECNut 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

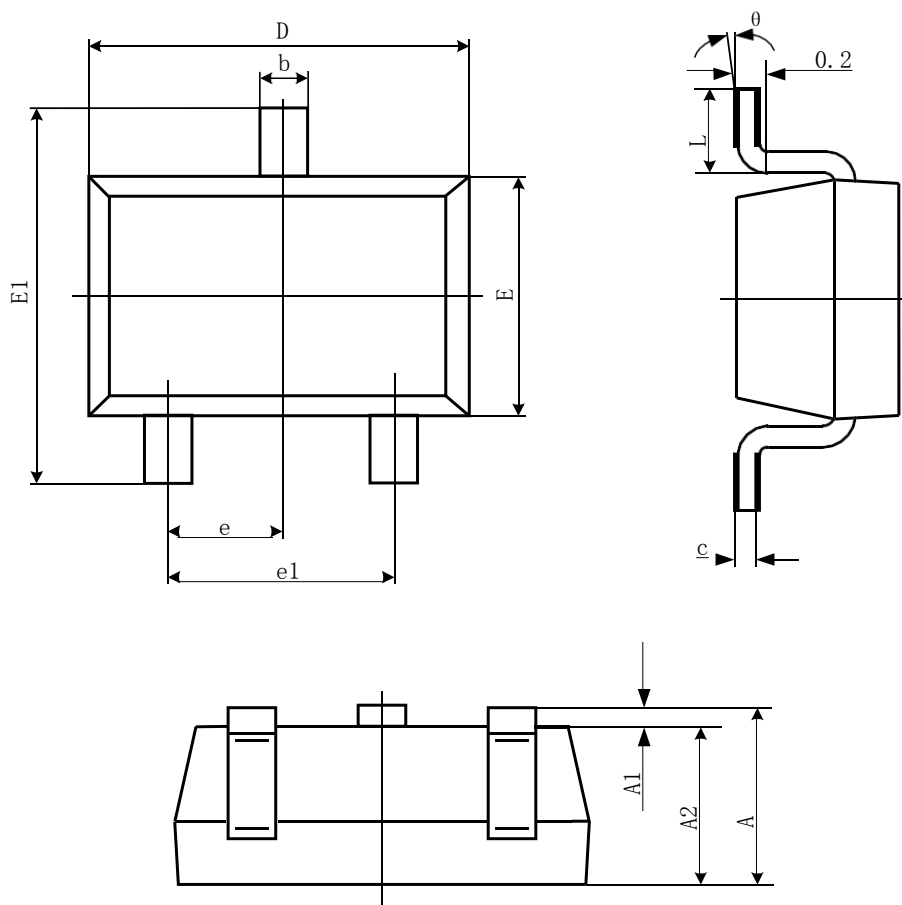
Parameter	Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^A	$\leq 10s$	70	90	$^{\circ}C/W$
Maximum Junction-to-Ambient ^A	Steady-State	100	125	
Maximum Junction-to-Lead ^B	Steady-State	63	80	

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 $T_A=25^{\circ}C$. The value in any given application depends on the user's specific board design. The current rating is based on the $t \leq 10s$ thermal resistance rating.

d. B: The R_{qJA} is the sum of the thermal impedance 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°