

20V N-Channel Enhancement Mode MOSFET

Description

The PECN2020SR uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

General Features

- ◆ $V_{DS} = 20V$ $I_D = 20A$
 $R_{DS(ON)}(Typ.) = 4.7m\Omega$ @ $V_{GS} = 4.5V$
 $R_{DS(ON)}(Typ.) = 5.1m\Omega$ @ $V_{GS} = 2.5V$
 $R_{DS(ON)}(Typ.) = 6.8m\Omega$ @ $V_{GS} = 1.8V$
- ◆ High density cell design for ultra low R_{dson}
- ◆ Fully characterized avalanche voltage and current
- ◆ Good stability and uniformity with high E_{AS}
- ◆ Excellent package for good heat dissipation
- ◆ Special process technology for high ESD capability
- ◆ 100% UIS tested

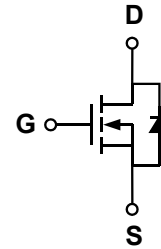
Application

- ◆ Automotive applications
- ◆ Hard switched and high frequency circuits
- ◆ Uninterruptible power supply

Package

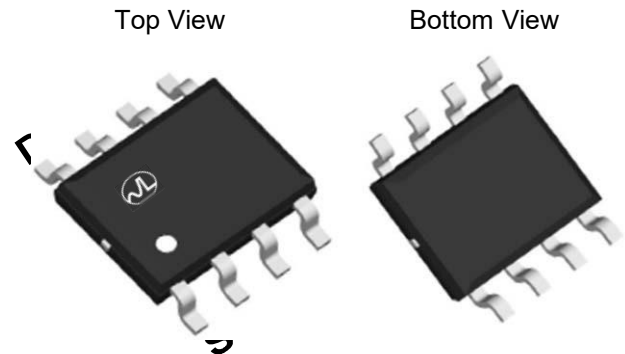
- ◆ SOP-8 *100% UIS TESTED!*
100% ΔV_{ds} TESTED!

Schematic diagram



Marking and pin assignment

SOP-8



PECN2020—Product Name

XXXX—Wafer Lot No.

YYYY—Date Code



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2020S R-G	-55°C to +150°C	SOP-8	4000

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}	± 12	V
Continuous Drain Current	I_D	TC=25°C	20
		TC=70°C	16
Pulsed Drain Current	I_{DP}	140	A
Avalanche energy(L=0.5mH) ^(note1)	E_{AS}	160	mJ
Maximum power dissipation	P_D	TC=25°C	3.1
		TC=70°C	2

Operating junction Temperature range	Tj	-55—150	°C
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Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^A	≤ 10s	R _{θJA}	33	40	°C/W
Maximum Junction-to-Ambient ^A	Steady-State		59	75	
Maximum Junction-to-Lead ^B	Steady-State	R _{θJC}	16	24	

A: The value of R_{θJA} is measured with the device mounted on 1 in² 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.

B: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJC} and lead to ambient.

C: Eas test: VDD=10V, R_G=25ohm, L=500Uh

D: Pulse test; pulse width ≤ 300ns, duty cycle ≤ 2%.

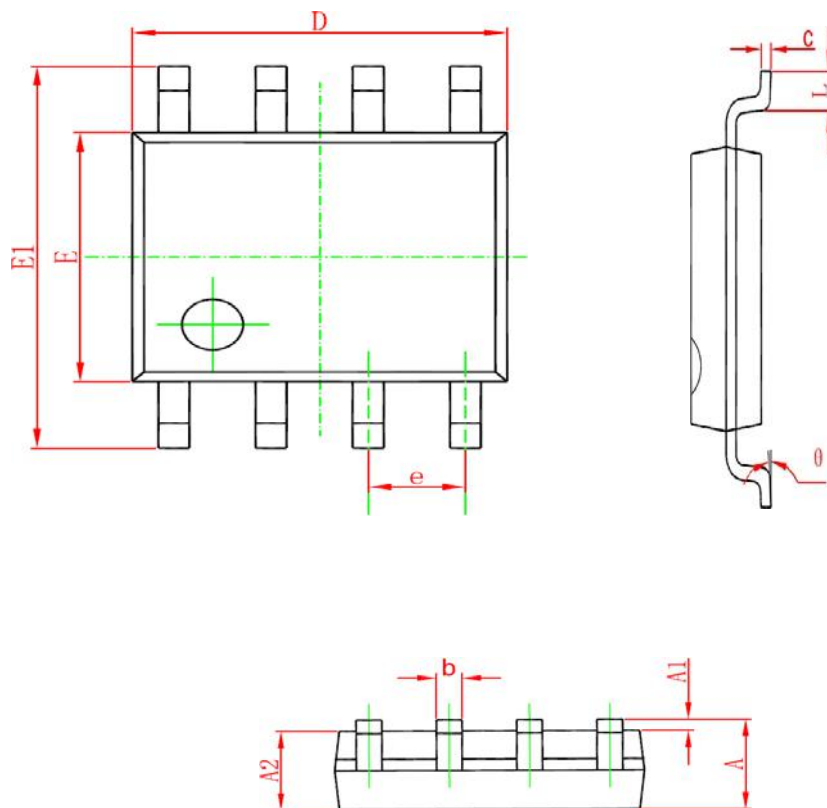
E: Guaranteed by design, not subject to production testing.

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	
Static Characteristics							
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	$T_J=25^\circ C$	-	-	1	μA
			$T_J=85^\circ C$	-	-	5	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	± 100	nA	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.75	1.2	V	
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=20A$	-	4.7	5.5	m Ω	
		$V_{GS}=2.5V, I_D=10A$	-	5.1	7		
		$V_{GS}=1.8V, I_D=10A$	-	6.8	9		
On Status Drain Current	$I_{D(ON)}$	$V_{DS}=20V, V_{GS}=4.5V$	40	-	-	A	
Diode Characteristics							
Diode Continuous Forward Current	I_S		-	-	12	A	
Reverse Recovery Time	t_{rr}	$I_F=10A, di/dt=20A/us$	-	25	-	ns	
Reverse Recovery Charge	Q_{rr}		-	24	-	nC	
Dynamic Characteristics²							
Input capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=10V, f=1.0MHz$	-	2000	-	pF	
Output capacitance	C_{OSS}		-	500	-		
Reverse transfer capacitance	C_{RSS}		-	200	-		
Turn-on delay time	$t_{D(ON)}$	$V_{GS}=4.5V, V_{DD}=10V, I_D=2A$	-	6.5	-	ns	
Turn-on Rise time	t_r		-	17	-		
Turn-off delay time	$t_{D(OFF)}$		-	29.5	-		
Turn-off Fall time	t_f		-	17	-		
Total gate charge	Q_g	$V_{GS}=4.5V, I_D=10A, V_{DS}=10V$	-	27	-	nC	
Gate-source charge	Q_{gs}		-	6.5	-		
Gate-drain charge	Q_{gd}		-	6.4	-		
Drain-Source Diode Characteristics							
Diode forward voltage	V_{SD}	$I_{SD}=10A, V_{GS}=0V$	-	0.8	1.2	V	

Package Information

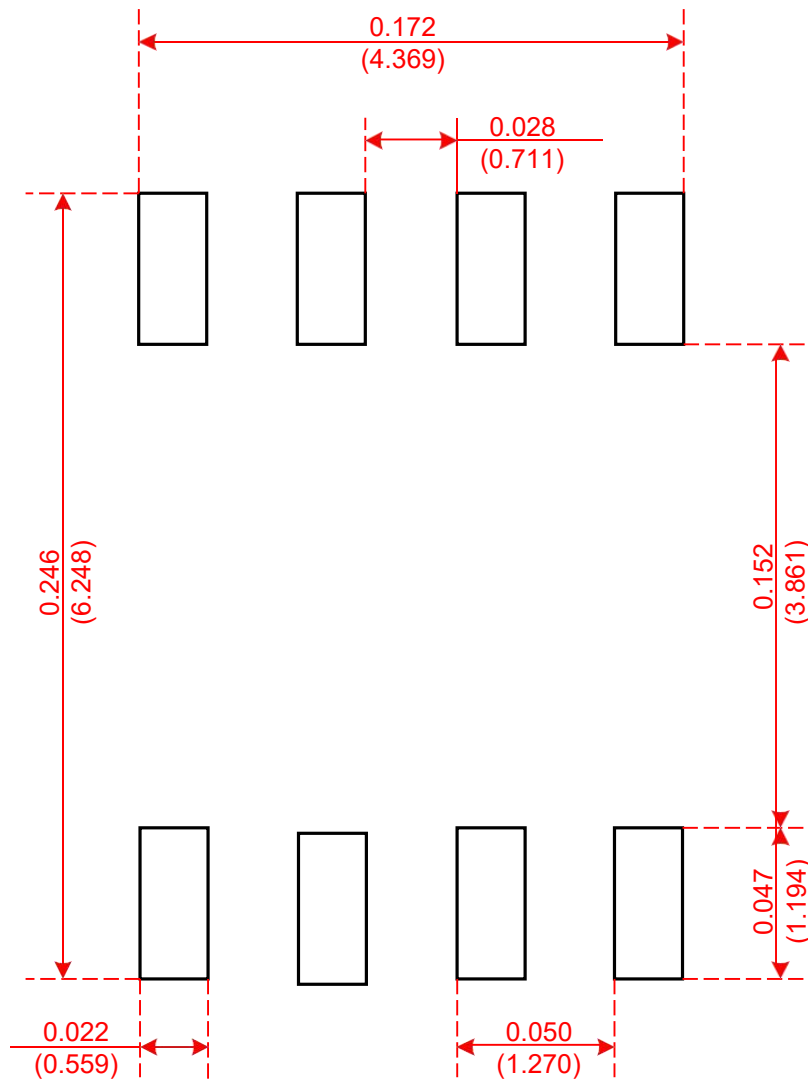
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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Recommended Minimum Pads

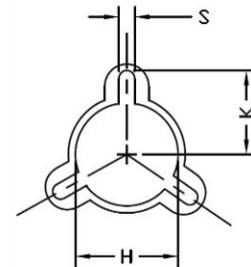
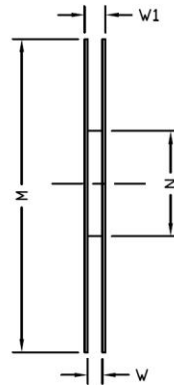
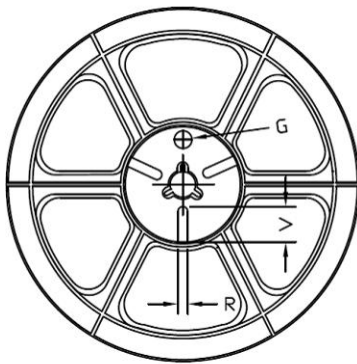
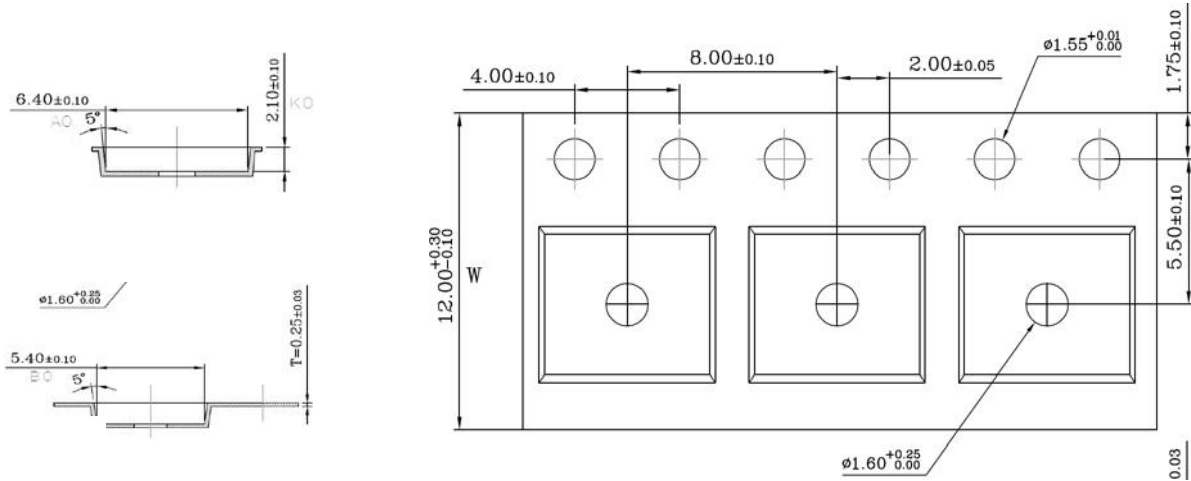
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Recommended Minimum Pads
Dimensions in Inches/(mm)

Tape and Reel

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Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
12mm	$\phi 330$	$\phi 330.00$ ± 0.50	$\phi 97.00$ ± 0.30	13.00 ± 0.30	17.40 ± 1.00	$\phi 13.00$ ± 0.5	10.6	2.00 ± 0.50	—	—	—

Unit Per Reel:
4000pcs

