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.)=4.7mΩ @V_{GS}=4.5V
  $R_{DS(ON)}$(Typ.)=5.1mΩ @V_{GS}=2.5V
  $R_{DS(ON)}$(Typ.)=6.8mΩ @V_{GS}=1.8V
- High density cell design for ultra low Rdson
- 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

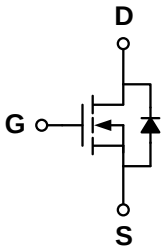
- Automotive applications
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

- SOP-8

100% UIS TESTED!
100% ΔVds TESTED!

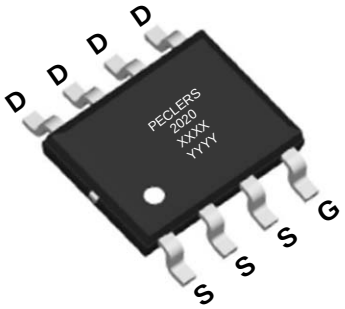
Schematic diagram



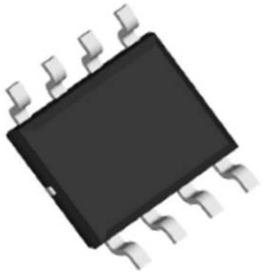
Marking and pin assignment

SOP-8

Top View



Bottom View



PECLERS 2020—Product Name
XXXX—Wafer Lot No.
YYYY—Date Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2020SR	-55°C to +150°C	SOP-8	4000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±12	V
Continuous Drain Current	TC=25°C	I_D	20	A
	TC=70°C		16	
Pulsed Drain Current		I_{DP}	140	A
Avalanche energy(L=0.5mH) (note1)		E_{AS}	160	mJ
Maximum power dissipation	TC=25°C	P_D	3.1	W
	TC=70°C		2	

Operating junction Temperature range	Tj	-55—150	℃

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[A]	≤ 10s	$R_{\theta JA}$	33	40	℃/W
Maximum Junction-to-Ambient[A]	Steady-State		59	75	
Maximum Junction-to-Lead[B]	Steady-State	$R_{\theta JC}$	16	24	

A:The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^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.

B: The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JC}$ and lead to ambient.

C:Eas test：VDD=10V，RG=25ohm，L=500Uh

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

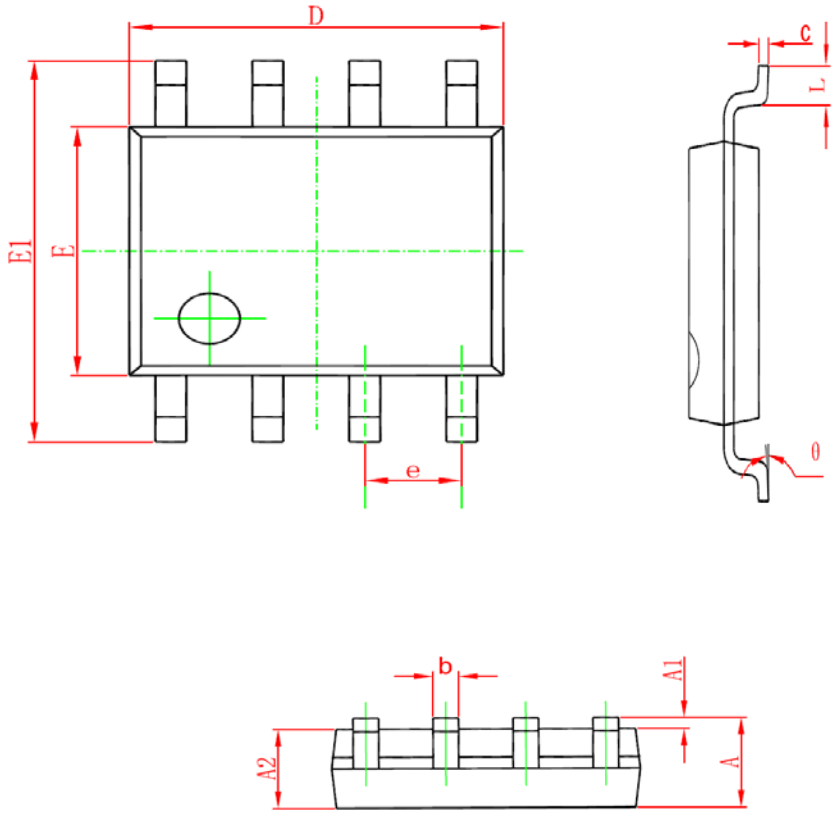
E:Guaranteed by design, not subject to production testing.

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Static 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	T_J=25°C	-	-	1	μA
			T_J=85°C	-	-	5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V		-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA		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	mΩ
		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 Characteristics[2]							
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	tr			-	17	-	
Turn-off delay time	$t_{D(OFF)}$			-	29.5	-	
Turn-off Fall time	tf			-	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

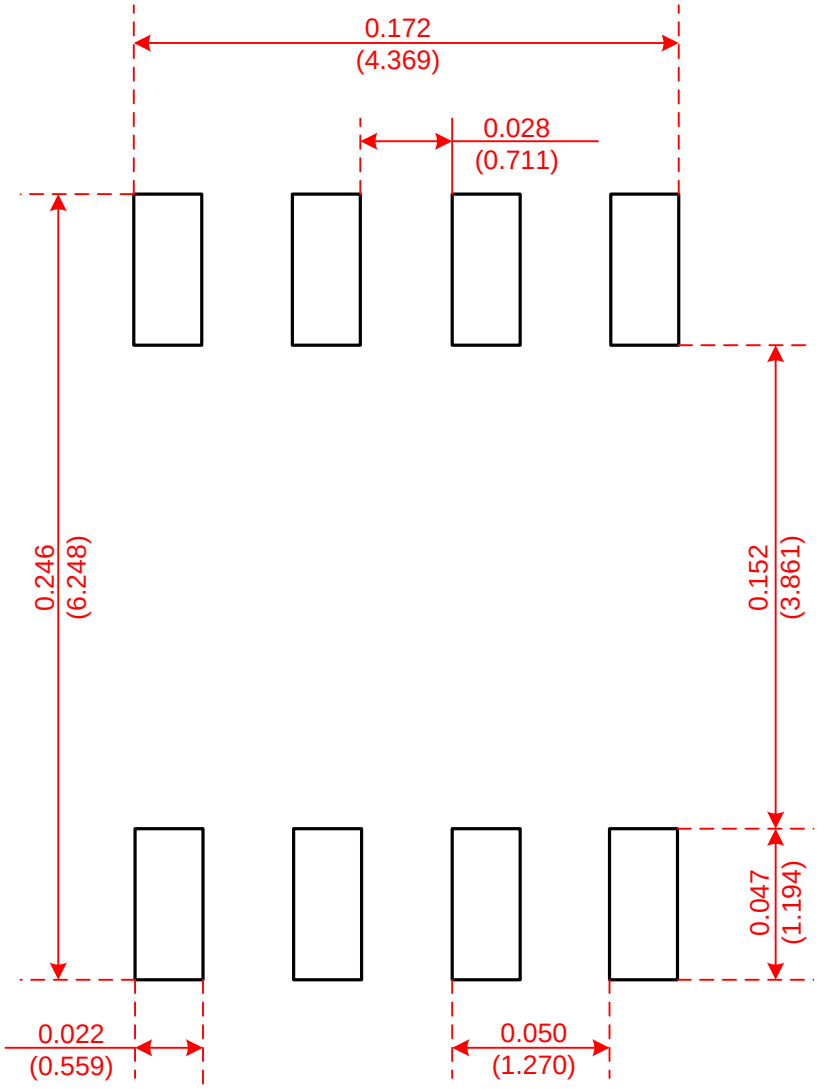
- **SOP-8**



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

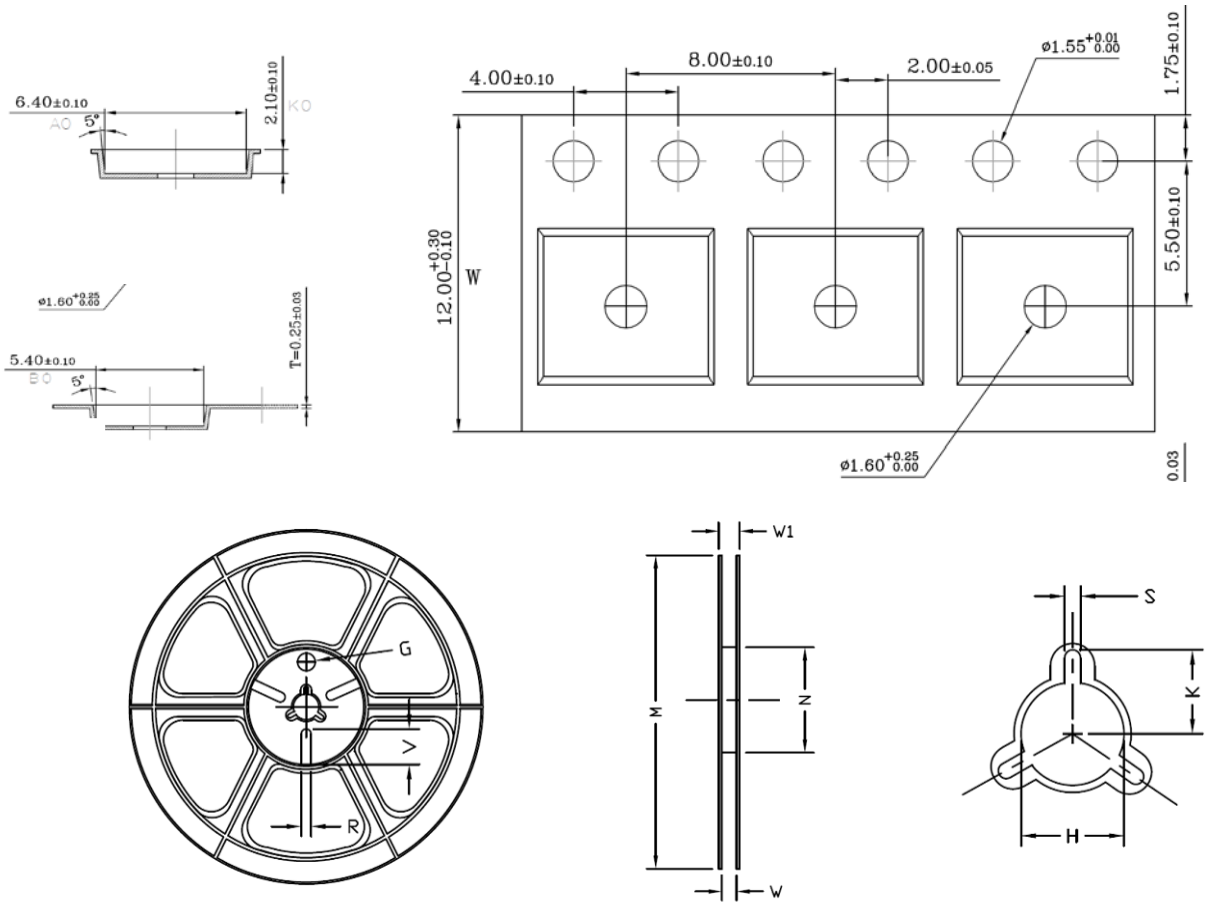
- **SOP-8**



Recommended Minimum Pads
Dimensions in Inches/(mm)

Tape and Reel

- **SOP-8**



Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
12mm	Φ330	Φ330.00 ±0.50	Φ97.00 ±0.30	13.00 ±0.30	17.40 ±1.00	Φ13.00 ±0.5	10.6	2.00 ±0.50	—	—	—

Unit Per Reel:
4000pcs