40V P-Channel Enhancement Mode MOSFET

Description

The PECN14P04SR uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in load switch and battery protection applications.

General Features

- V_{DS} =-40V，I_D =-14A
  $R_{DS(ON)}$(Typ.)=12mΩ @V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=8.5mΩ @V_{GS}=-10V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

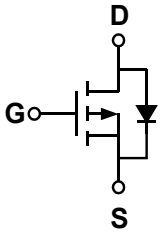
- Adapter switch
- Load switch
- Battery switch
- Motor drive control

Package

- SOP-8

100% UIS TESTED!
100% ΔVds TESTED!

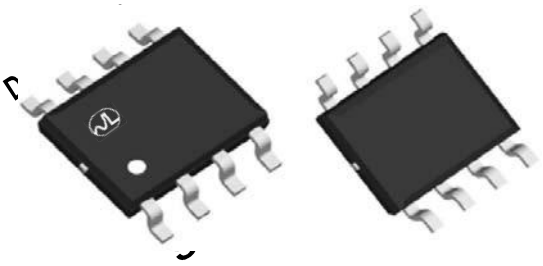
Schematic diagram



Marking and pin assignment

SOP-8

Top View Bottom View



XXXX—Wafer Lot No.

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN14P04S R-G	-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}	-40	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	-14	A
	T_C=70°C		-11[b,c]	
	T_A=25°C		-9.9[b,c]	
	T_A=70°C		-7.9	
Pulsed Drain Current		I_{DP}	-80[a]	
Continuous source-drain diode current	T_C=25°C	I_S	-4.5	

	T_A=70°C		-2.2[b,c]	
Single pulse avalanche current	L=0.1mH	I_{AS}	-20	A
Single pulse avalanche energy		E_{AS}	20	mJ
Maximum power dissipation	T_C=25°C	P_D	5	W
	T_C=70°C		3,2	
	T_A=25°C		2.5[b,c]	
	T_A=70°C		1.6[b,c]	
Operating junction and storage temperature range		T_J,T_{STG}	-55—150	℃

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[b,d]	≤ 10s	$R_{\theta JA}$	40	50	℃/W
Maximum Junction-to-Ambient[a]	Steady-State		59	75	
Maximum Junction-to-Lead[b]	Steady-State	$R_{\theta JC}$	21	25	

a. Package limited b. Surface mounted on 1" x 1" FR4 board

c. t = 10 s d. Maximum under steady state conditions is 85 °C/W

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	-40	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0	-1.4	-2.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-10A	-	8.5	14	mΩ
		V_{GS}=-4.5V, I_D=-10A		12	18	
Forward transconductance	g_{fs}	V_{DS}=-10V, I_D=-10A	-	45	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-20V ,V_{GS}=0V f=1.0MHz	-	3670	-	pF
Output capacitance	C_{OSS}		-	299	-	
Reverse transfer capacitance	C_{RSS}		-	237	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=-20V R_L=2Ω V_{GS}=-10V R_{GEN}=1Ω	-	12	-	ns
Rise time	tr		-	6	-	
Turn-off delay time	$t_{D(OFF)}$		-	44	-	
Fall time	tf		-	6	-	
Total gate charge	Qg	V_{DS}=-20V,I_D=-14A V_{GS}=-10V	-	66	-	nC
Gate-source charge	Qgs		-	9.8	-	

Gate-drain charge	Qgd		-	10	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-1.0A	-	-0.8	-1.1	V

Typical Performance Characteristics

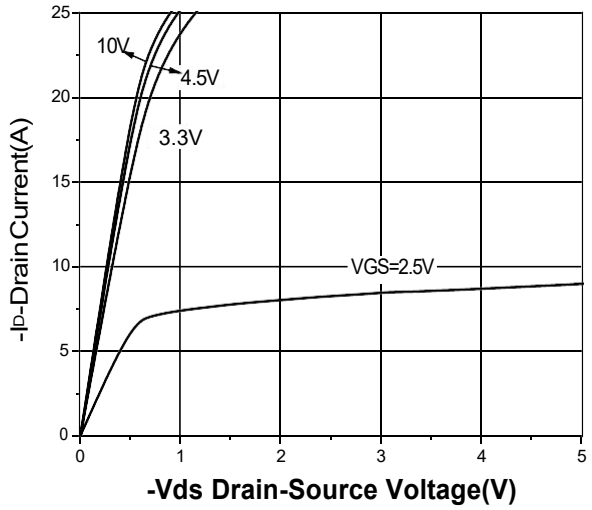


Fig1 Output Characteristics

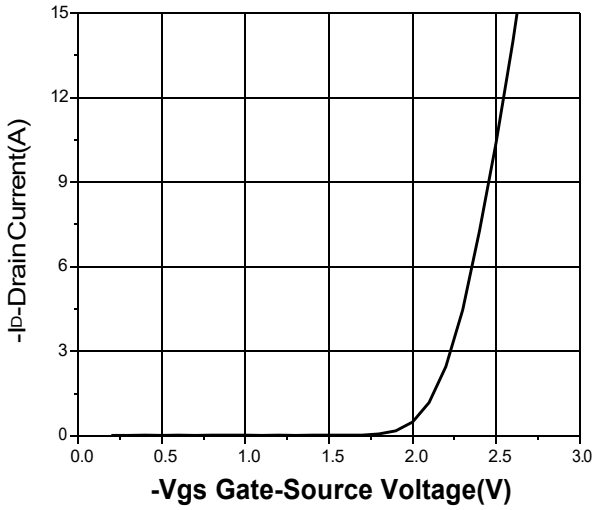


Fig2 Transfer Characteristics

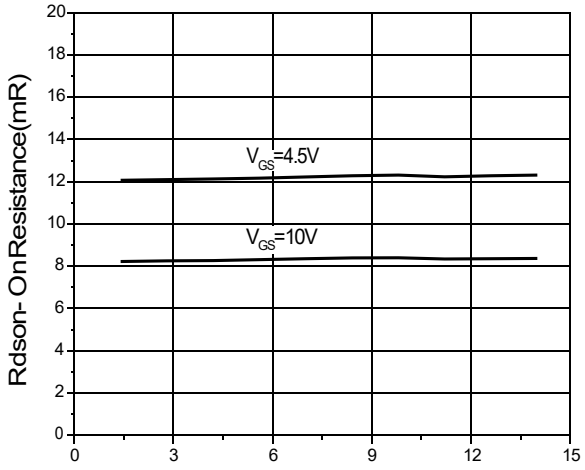


Fig3 Rdson-Drain current

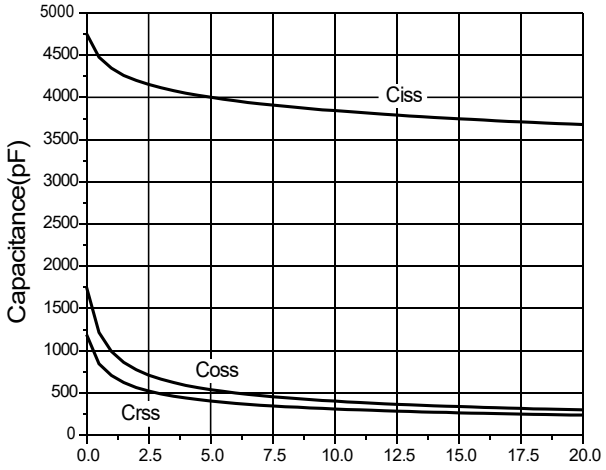


Fig4 Capacitance vs Vds

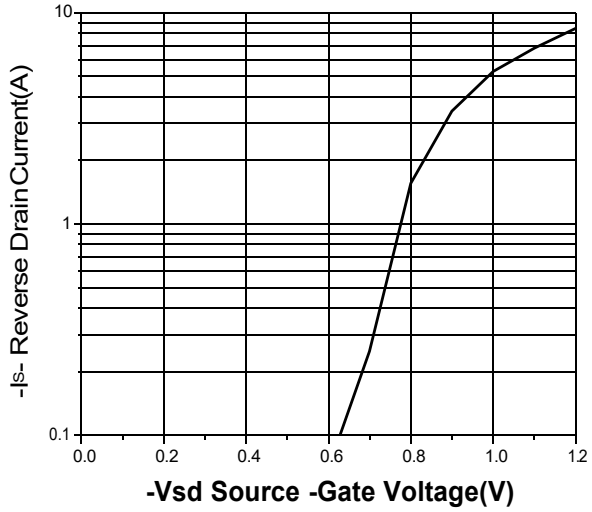


Fig5 Source-Drain Diode Forward

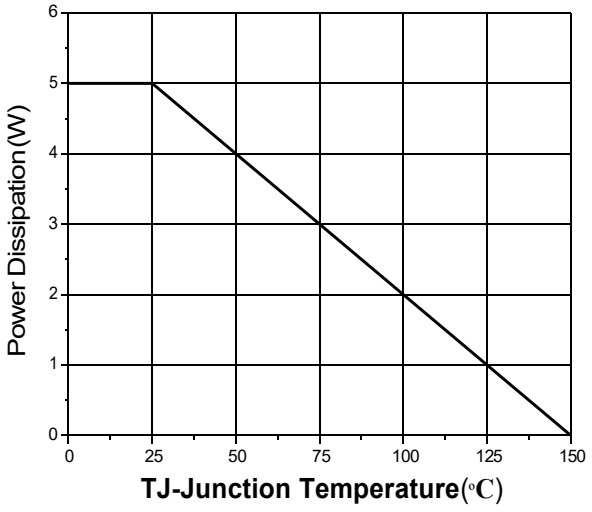


Fig6 Power De-rating

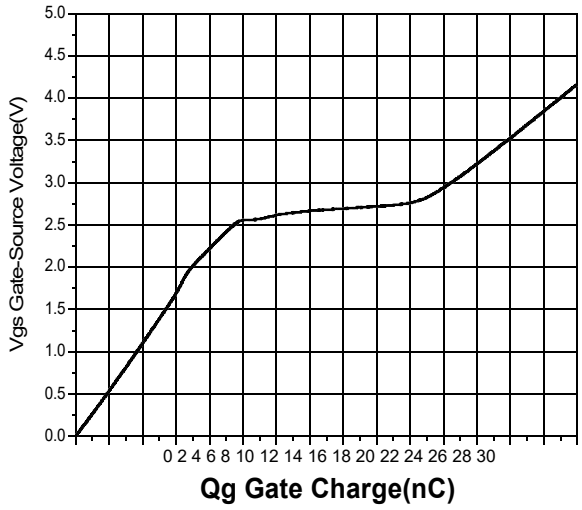


Fig7 Gate Charge

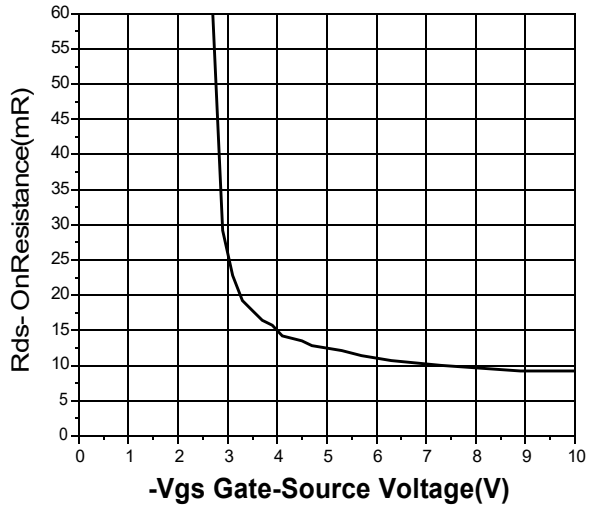
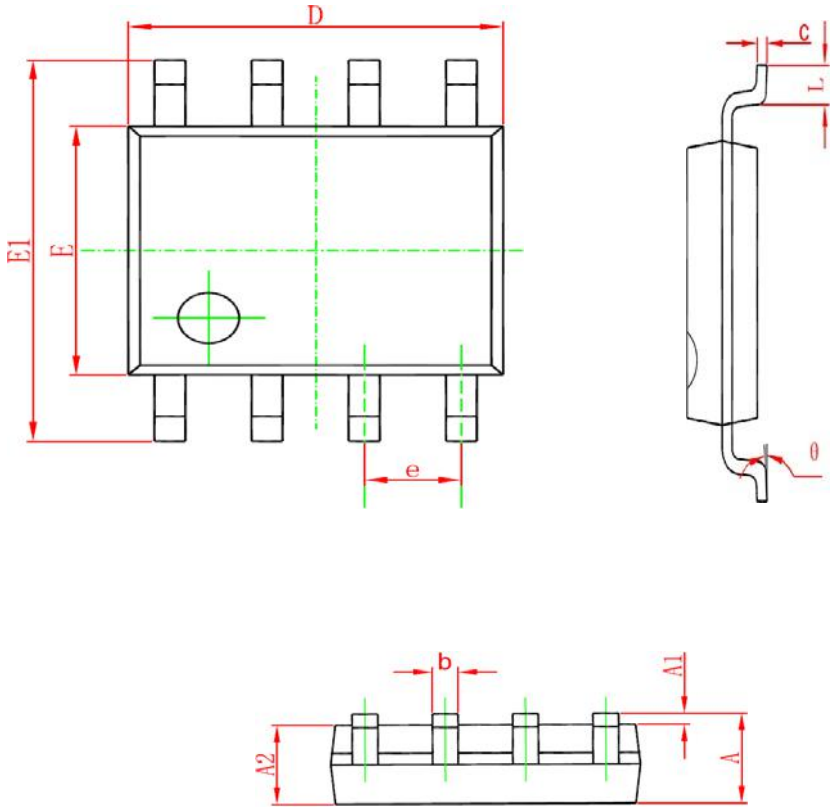


Fig8 Rdson-Gate Source voltage

Package Information

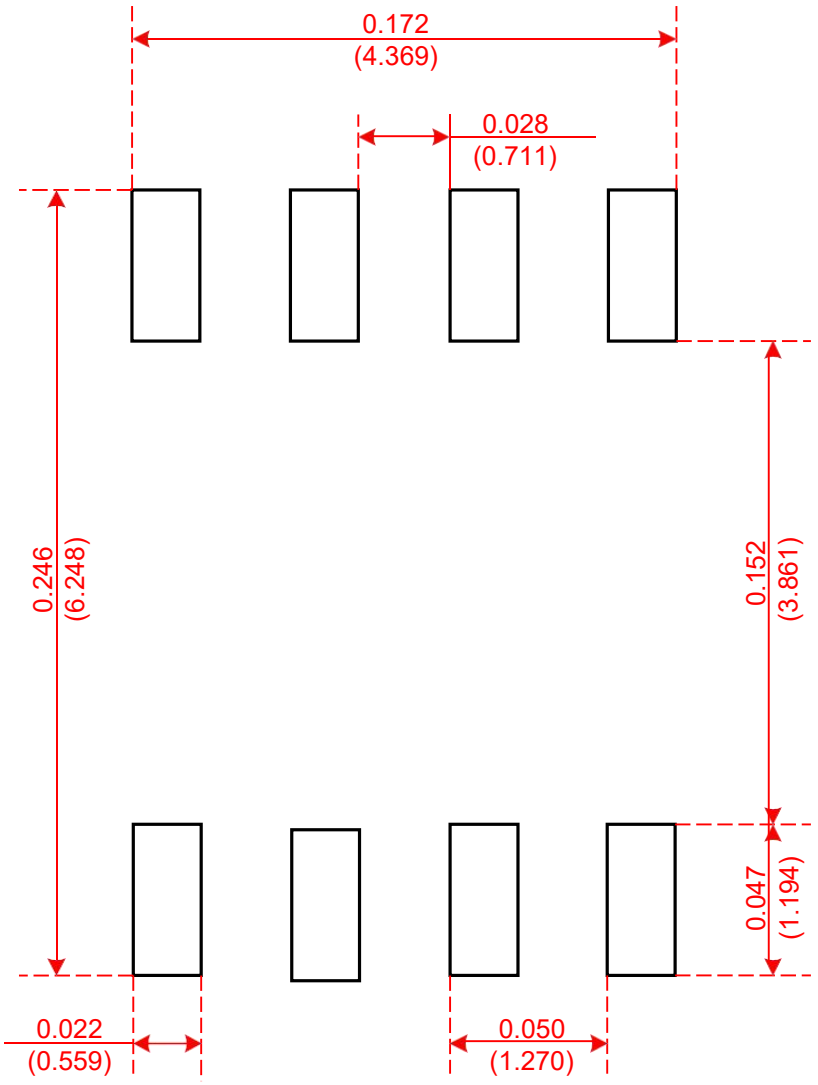
- **SOP-8**



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

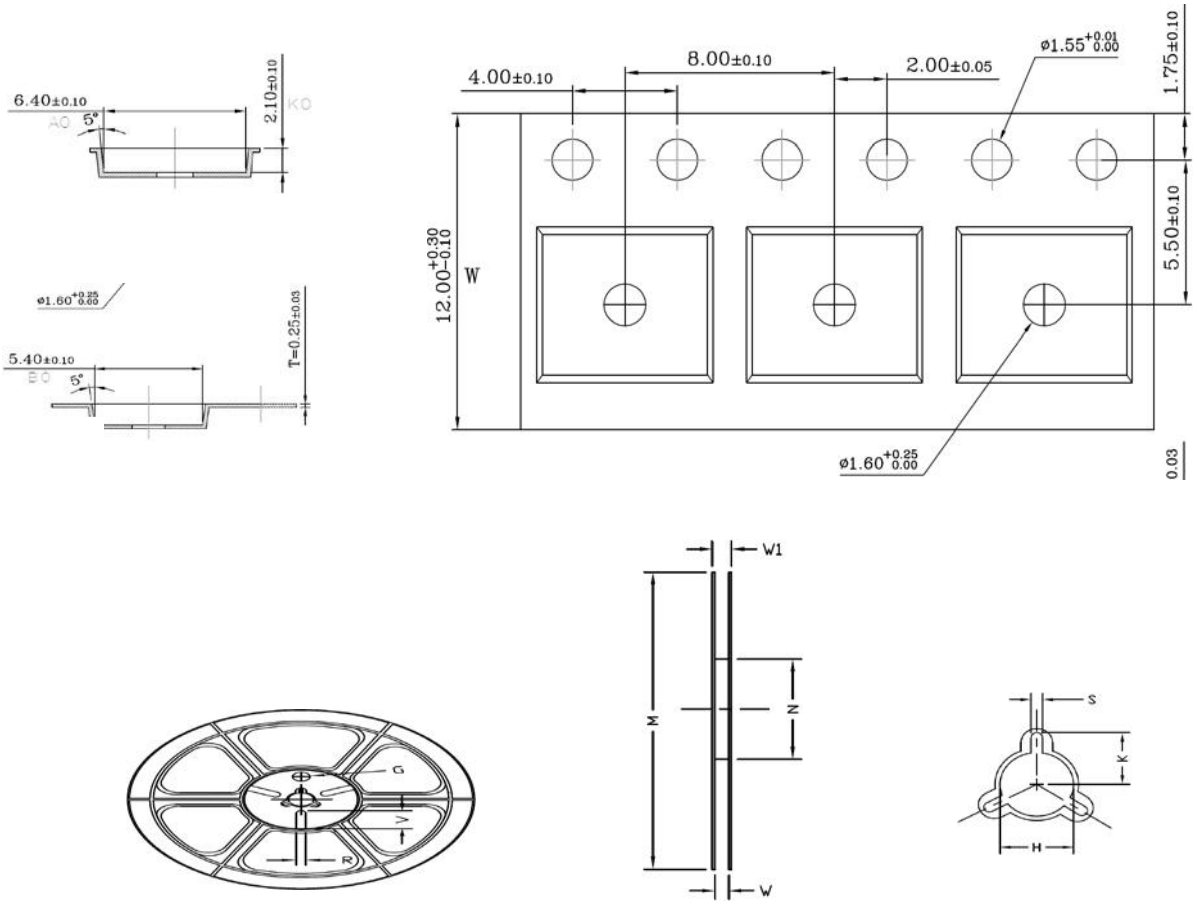
- **SOP-8**



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