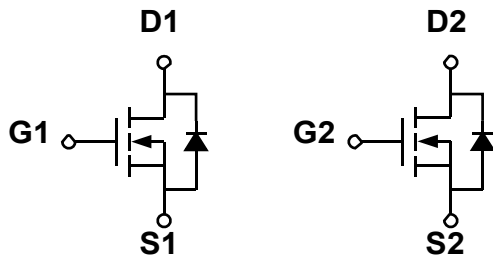
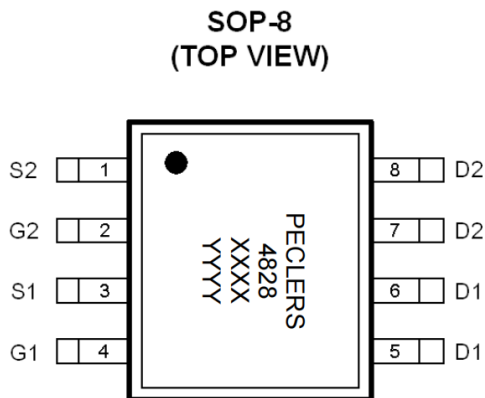


## 60V Dual N-Channel Enhancement Mode MOSFET

### Schematic diagram



### Marking and pin assignment



XXXX—Wafer Information

YYYY—Quality Code

### Description

The PECN4828SR uses advanced trench technology to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for high side switch in SMPS and general purpose applications.

### General Features

- ◆  $V_{DS} = 60V$ ,  $I_D = 7.5A$   
 $R_{DS(ON)} = 32.1m\Omega$  (typical) @  $V_{GS} = 10V$   
 $R_{DS(ON)} = 35.7m\Omega$  (typical) @  $V_{GS} = 4.5V$
- ◆ Excellent gate charge x  $R_{DS(ON)}$  product (FOM)
- ◆ Very low on-resistance  $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

### Application

- ◆ DC/DC Converter
- ◆ Ideal for high-frequency switching and synchronous rectification

### Package

- ◆ SOP-8



### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN4828SR	-55°C to +150°C	SOP-8	4000

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	60	V
Gate-source voltage	$V_{GS}$	±20	V
Drain Current-Continuous (Silicon Limited)	$I_D$	$T_C = 25^\circ C$	7.5
		$T_C = 70^\circ C$	5.7
		$T_A = 25^\circ C$	5.4 <sup>A,B</sup>
		$T_A = 70^\circ C$	4.5 <sup>A,B</sup>
Pulsed Drain Current (Package Limited)	$I_{DM}$	30	A
Single pulse avalanche energy (L=0.1mH)	$E_{AS}$	30	mJ

Maximum power dissipation	$T_C=25^{\circ}\text{C}$	$P_D$	3.7	W
	$T_C=70^{\circ}\text{C}$		2.6	
	$T_A=25^{\circ}\text{C}$		2.4 <sup>A,B</sup>	
	$T_A=70^{\circ}\text{C}$		1.7 <sup>A,B</sup>	
Operating junction Temperature range		$T_j$	-55—150	$^{\circ}\text{C}$

### Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient <sup>A</sup>	$\leq 10\text{s}$	$R_{\theta JA}$	33	40	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient <sup>A</sup>	Steady-State		59	75	
Maximum Junction-to-Lead <sup>D</sup>	Steady-State	$R_{\theta JC}$	16	24	

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10\text{s}$  thermal resistance rating.

B:  $t=10\text{s}$

C: Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

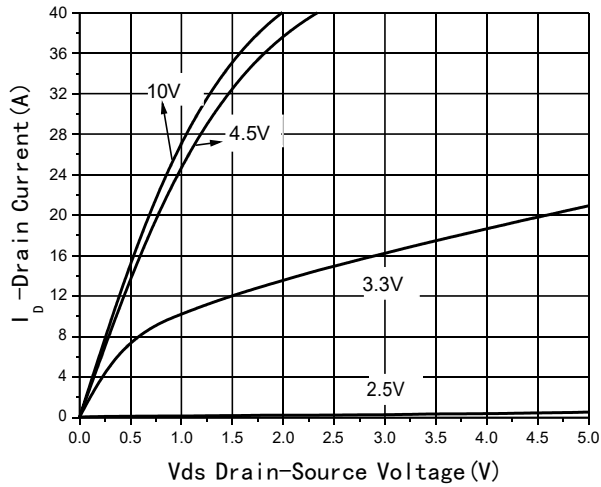
D: The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to lead  $R_{\theta JC}$  and lead to ambient.

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

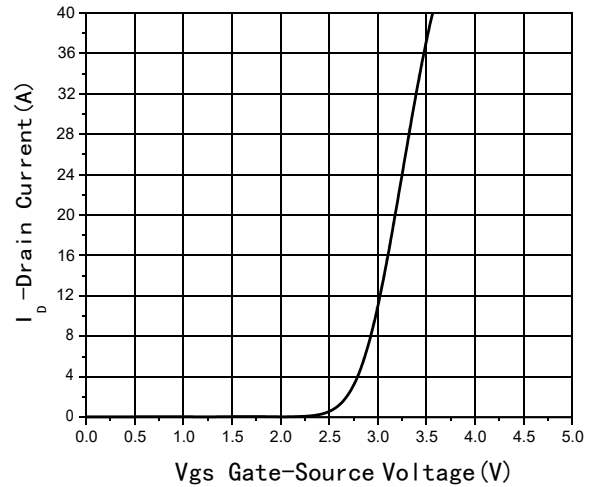
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	60	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$	-	-	1	$\mu\text{A}$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$	-	-	$\pm 100$	nA
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.2	1.9	2.5	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=4\text{A}$	-	32.1	35	m $\Omega$
		$V_{GS}=4.5\text{V}, I_D=3\text{A}$	-	35.7	40	
Forward transconductance	$g_{fs}$	$V_{DS}=5\text{V}, I_D=4\text{A}$	-	28	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$	-	967	-	pF
Output capacitance	$C_{OSS}$		-	54	-	
Reverse transfer capacitance	$C_{RSS}$		-	44	-	
Gate resistance	$R_g$	$V_{GS}=0\text{V}, V_{DS}=0\text{V},$ $f=1.0\text{MHz}$	-	0.68	0.8	$\Omega$
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(on)}$	$V_{DS}=30\text{V}$ $V_{GS}=10\text{V}$	-	4.7	-	ns
Rise time	$t_r$		-	2.3	-	

Turn-off delay time	$t_{D(OFF)}$	$R_L=1.5\Omega$ $R_{GEN}=3\Omega$	-	15.7	-	
Fall time	tf		-	1.9	-	
Total gate charge	Qg	$V_{DS}=30V, I_D=4A$ $V_{GS}=10V$	-	20	-	nC
Gate-source charge	Qgs		-	2.9	-	
Gate-drain charge	Qgd		-	3.7	-	

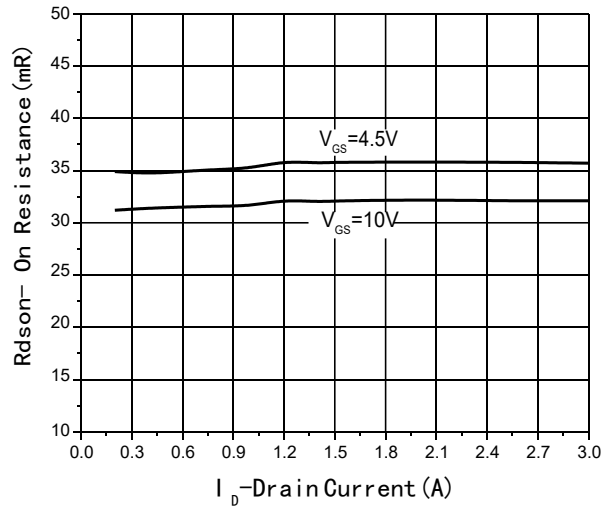
### Typical Performance Characteristics



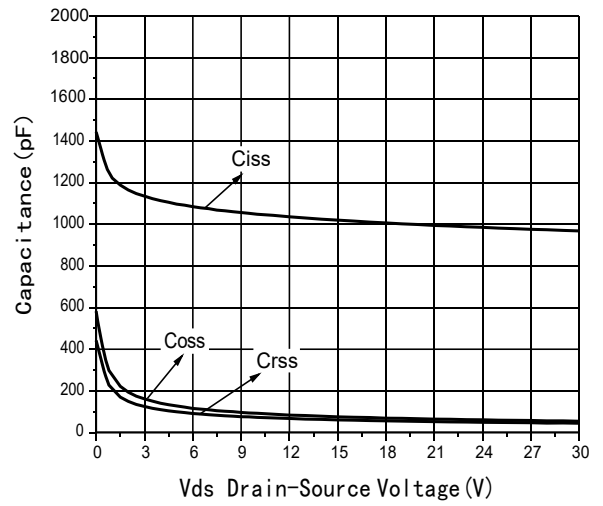
**Fig1 Output Characteristics**



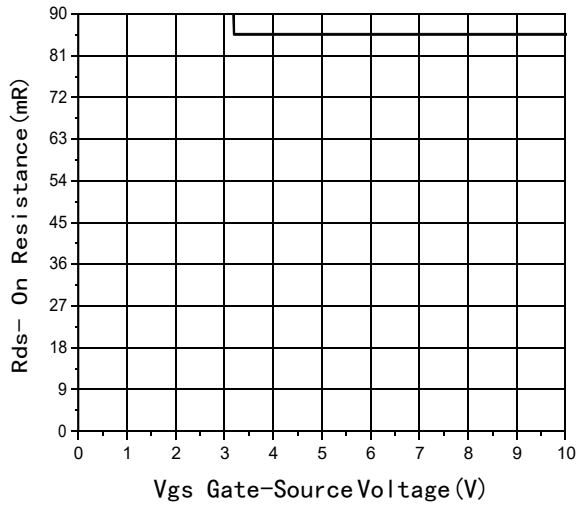
**Fig2 Transfer Characteristics**



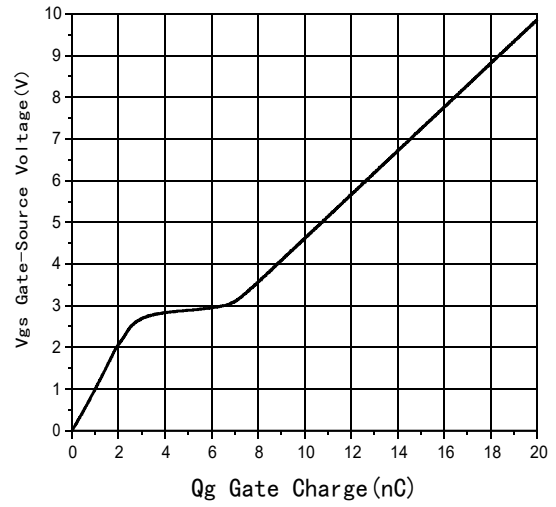
**Fig3 Rdson-Drain current**



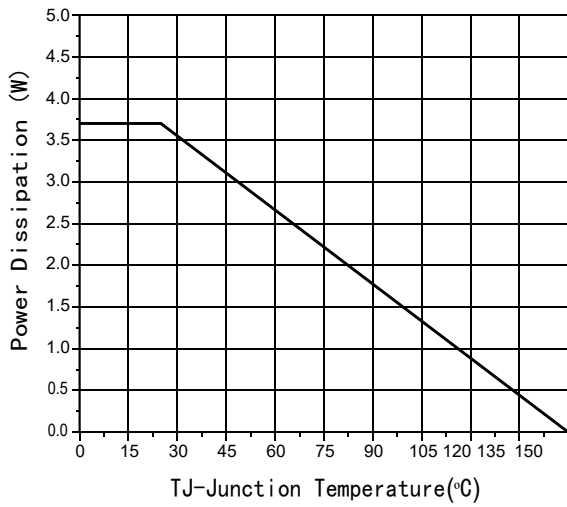
**Fig4 Capacitance vs Vds**



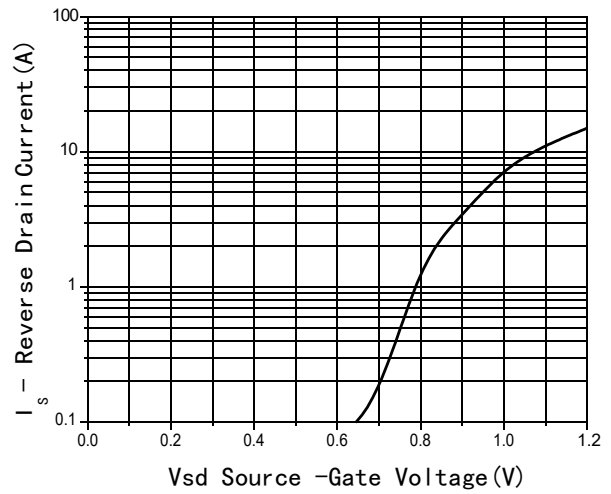
**Fig5 Rds-on-Gate Drain voltage**



**Fig6 Gate Charge**



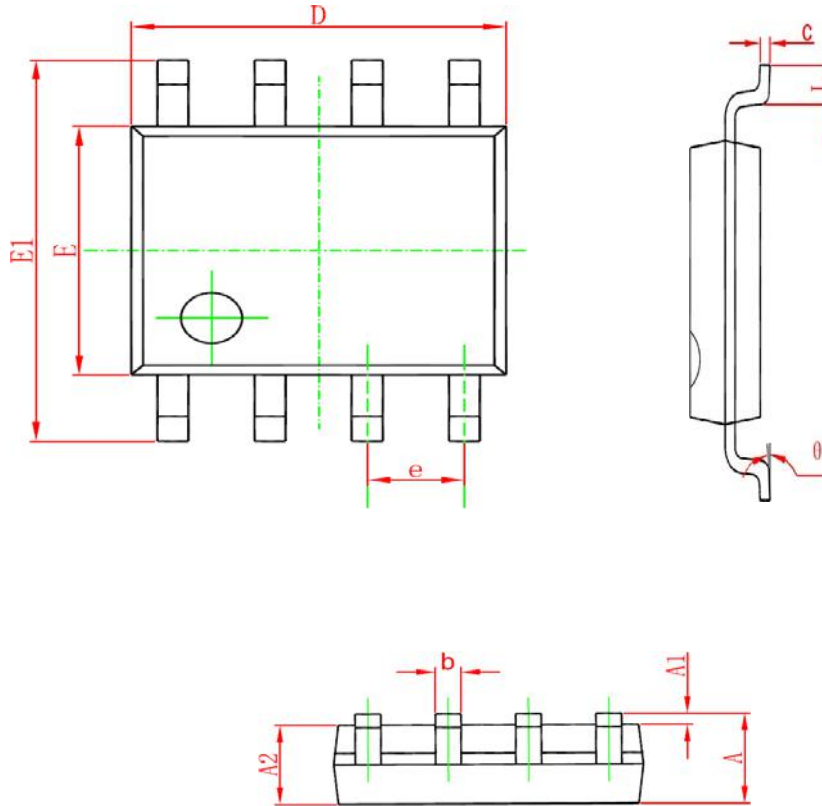
**Fig7 Power De-rating**



**Fig8 Source-Drain Diode Forward**

### Package Information

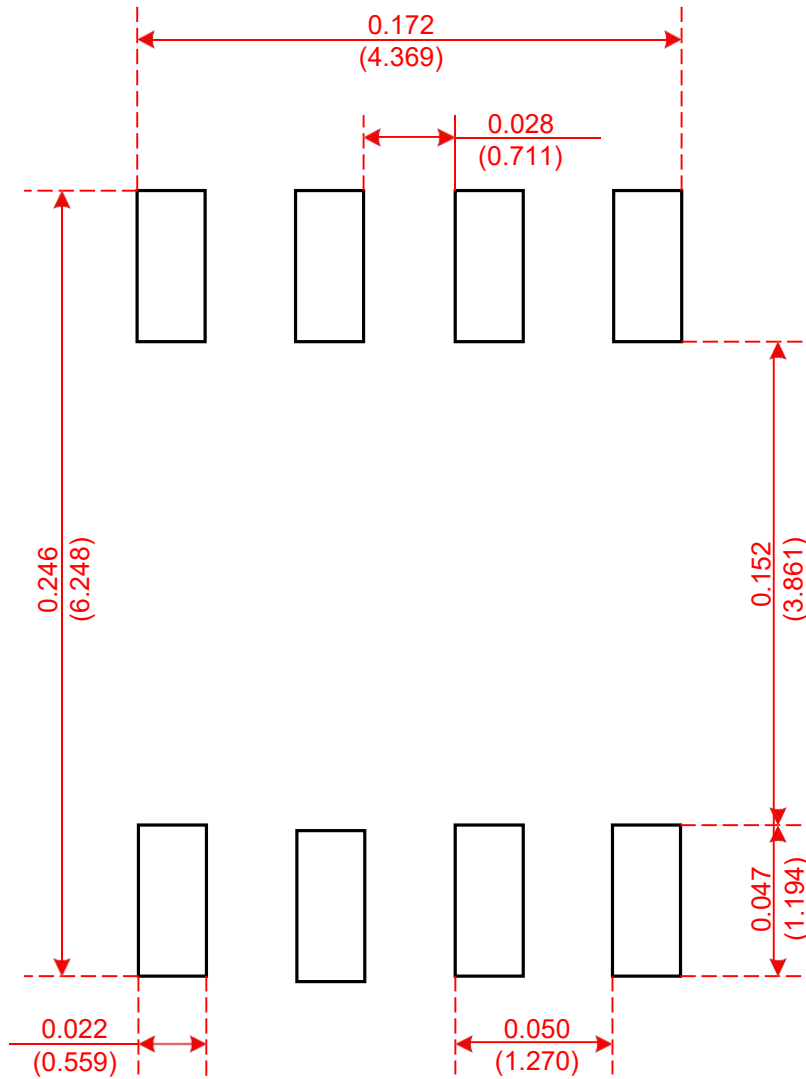
- SOP-8



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)**