30V P-Channel Enhancement Mode MOSFET

Description

The PECN3407VR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =-30V，I_D =-4A
  $R_{DS(ON)}$(Typ.)=62mΩ @V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=45mΩ @V_{GS}=-10V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

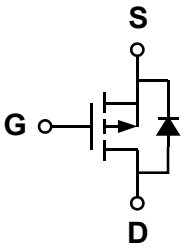
Application

- PWM applications
- Load switch

Package

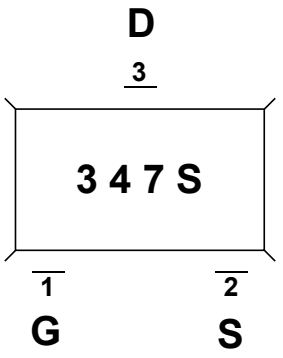
- SOT-23

Schematic diagram



Marking and pin assignment

SOT-23
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN3407V R-G	-55°C to +150°C	SOT-23	3000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current (TJ = 150 °C)	T_C=25°C	I_D	-4	A
	T_C=70°C		-3.5	
	T_A=25°C		-3.5[b,c]	
	T_A=70°C		-2.7[b,c]	
Continuous Source-Drain Diode Current	T_C=25°C	I_S	-1.4	
	T_A=25°C		-1[b,c]	
Pulsed Drain Current (t = 300 μs)		I_{DM}	-12.8	

Maximum power dissipation	T_C=25°C	P_D	1.7	W
	T_C=70°C		1.1	
	T_A=25°C		1[b,c]	
	T_A=70°C		0.6[b,c]	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55—150	℃

Thermal Characteristics

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	$R_{\theta JA}$	100	130	℃/W
Maximum Junction-to-Foot (Drain)	Steady State	$R_{\theta JF}$	60	75	

Notes:

a. TC = 25 °C.

b. Surface mounted on 1" x 1" FR4 board.

c. t = 5 s.

d. Maximum under steady state conditions is 175 °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	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-30V, 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	-0.7	-1.3	-2.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4A		45	65	mΩ
		V_{GS}=-4.5V, I_D=-3A	-	62	90	
Forward transconductance	gfs	V_{DS}=-5V, I_D=-4A	-	10	-	S
Dynamic Characteristics						
IPECNut capacitance	C_{ISS}	V_{DS}=-10V ,V_{GS}=0V f=1.0MHz	-	700	-	pF
Output capacitance	C_{OSS}		-	120	-	
Reverse transfer capacitance	C_{RSS}		-	75	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=-15V I_D=-4A V_{GEN}=-10V R_L=10ohm R_{GEN}=6ohm	-	9	-	ns
Rise time	tr		-	5	-	
Turn-off delay time	$t_{D(OFF)}$		-	28	-	
Fall time	tf		-	12.5	-	
Total gate charge	Qg	V_{DS}=-15V,I_D=-4A V_{GS}=-4.5V	-	14	-	nC
Gate-source charge	Qgs		-	3.1	-	
Gate-drain charge	Qgd		-	3	-	

DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-4.2A	-	-0.81	-1.2	V

Typical Performance Characteristics

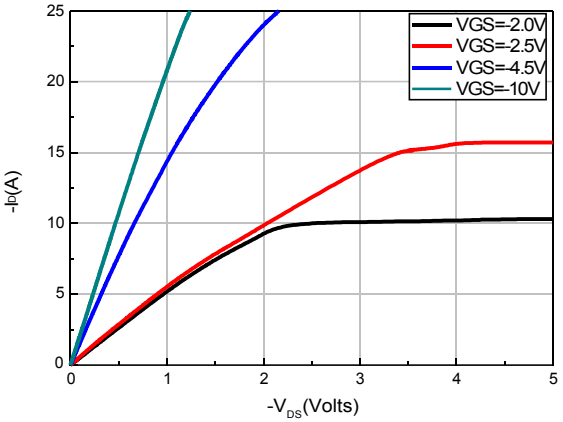


Fig 1：On-Region Characteristics

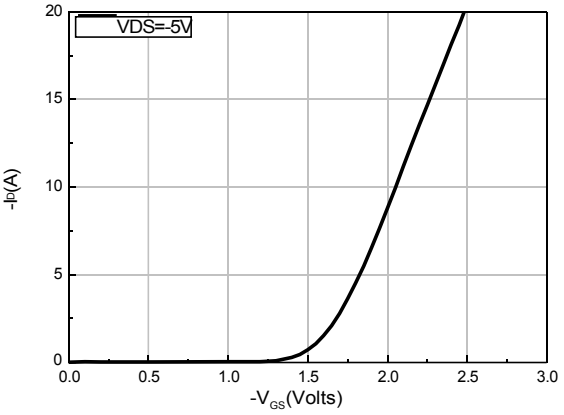


Fig 2：Transfer Characteristics

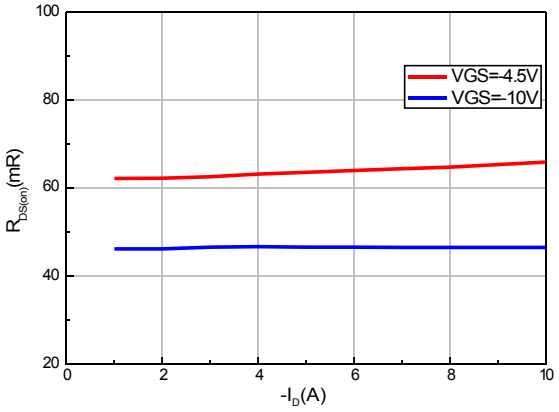


Fig 3：On-Resistance vs. Drain Current and Gate Voltage

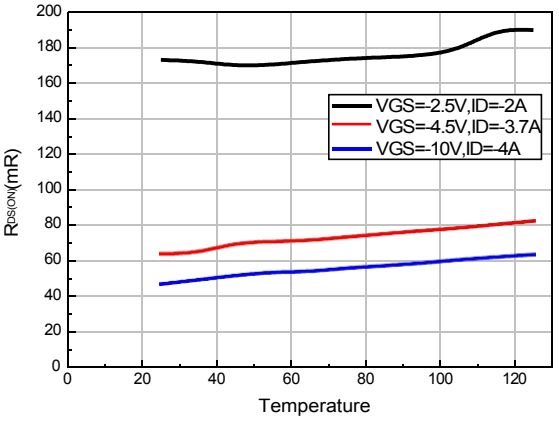


Fig 4：On-Resistance vs. Junction Temperature

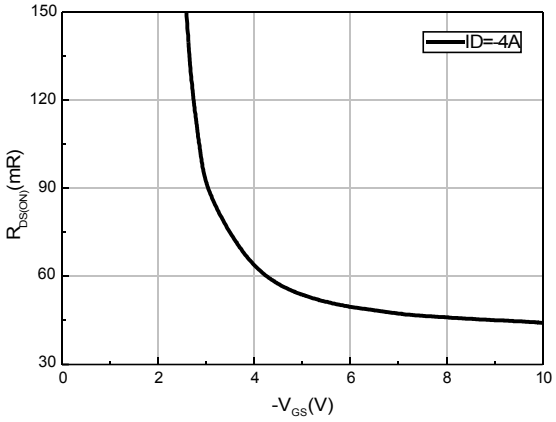


Fig 5：On-Resistance vs. Gate-Source Voltage

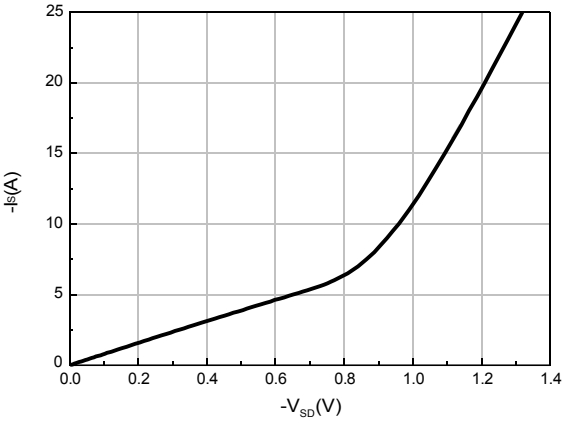
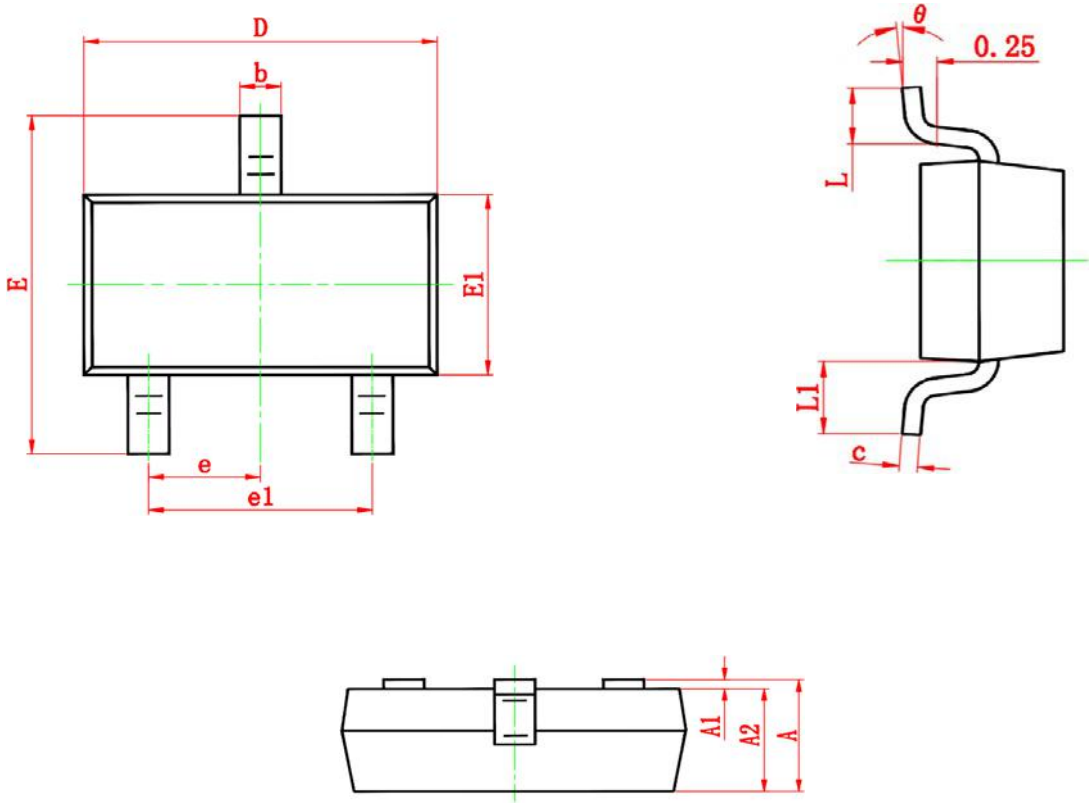


Fig 6：Body-Diode Characteristics

Package Information

- **SOT-23**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
θ	0°	8°	0°	8°