20V P-Channel Enhancement Mode MOSFET

Description

The PECN2309EFR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =-20V，I_D =-2A
  $R_{DS(ON)}$(Typ.)=70mΩ @V_{GS}=-2.5V
  $R_{DS(ON)}$(Typ.)=60mΩ @V_{GS}=-4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package
- ESD Rating: 2500V HBM

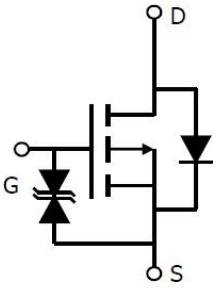
Application

- PWM applications
- Load switch

Package

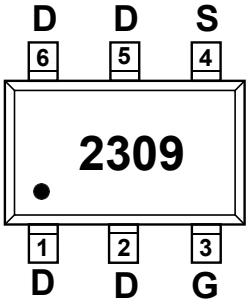
- SOT-363

Schematic diagram



Marking and pin assignment

SOT-363
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2309EF R-G	-55°C to +150°C	SOT-363	3000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-20	V
Gate-source voltage		V_{GS}	±8	V
Drain current-continuous[a]@Tj=125℃		I_D	-2	A
-pulse *d*[b]		I_{DM}	-8	A
Maximum power dissipation	T_A=25℃	P_D	1.6	W
	T_A=70℃		1.4	
Operating junction Temperature range		Tj	-55—150	℃

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	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±8V	-	-	±10	μA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.59	-0.9	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A	-	45	55	mΩ
		V_{GS}=-2.5V, I_D=-3A	-	55	65	
Forward transconductance	gfs	V_{GS}=-5V, I_D=-4A	8	-	-	S
Dynamic Characteristics						
IPECNut capacitance	C_{ISS}	V_{DS}=-10V ,V_{GS}=0V f=1.0MHz	-	751	-	pF
Output capacitance	C_{OSS}		-	115	-	
Reverse transfer capacitance	C_{RSS}		-	80	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DD}=-10V I_D=-2.8A V_{GEN}=-4.5V R_L=10ohm R_{GEN}=-60ohm	-	13	-	ns
Rise time	tr		-	9	-	
Turn-off delay time	$t_{D(OFF)}$		-	19	-	
Fall time	tf		-	29	-	
Total gate charge	Qg	V_{DS}=-10V,I_D=-3A V_{GS}=-4.5V	-	9.3	-	nC
Gate-source charge	Qgs		-	1	-	
Gate-drain charge	Qgd		-	2.2	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-1.25A	-	-0.81	-1.2	V

Notes:

a. surface mounted on FR4 board,t≤10sec

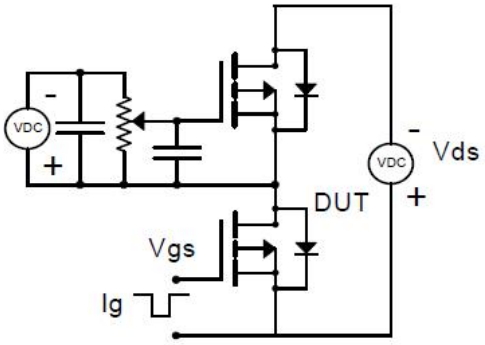
b. pulse test: pulse width≤300μs,duty≤2%

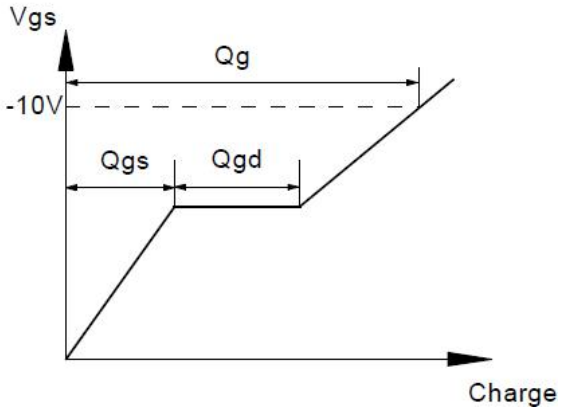
c. guaranteed by design, not subject to production testing

Thermal Characteristics

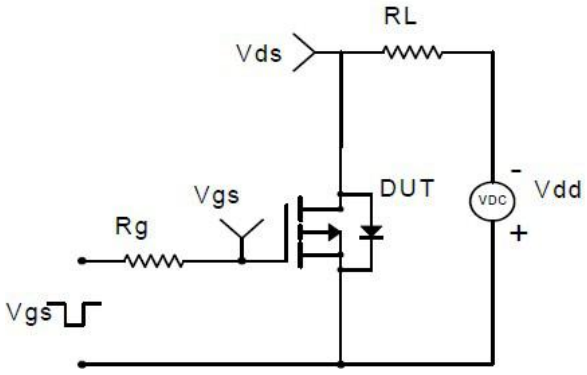
Thermal Resistance junction-to ambient	$R_{\theta JA}$	80	℃/W

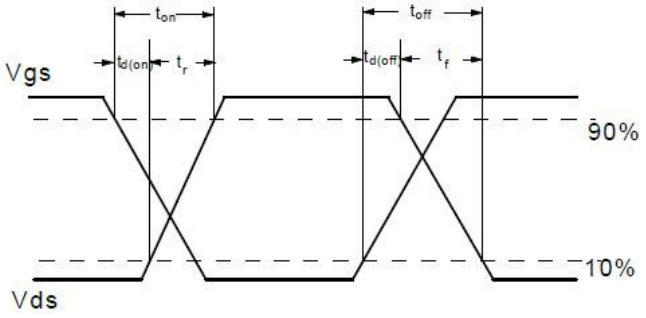
Gate Charge Test Circuit & Waveform



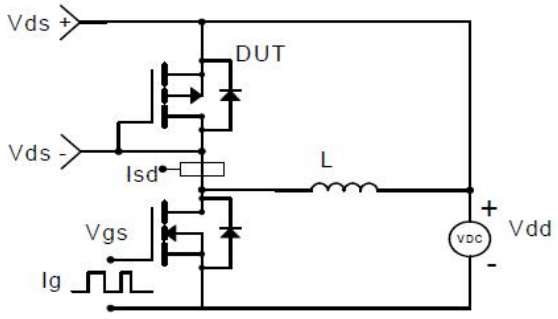


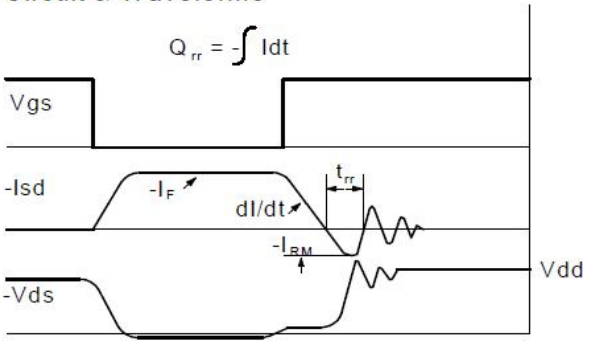
Resistive Switching Test Circuit & Waveforms





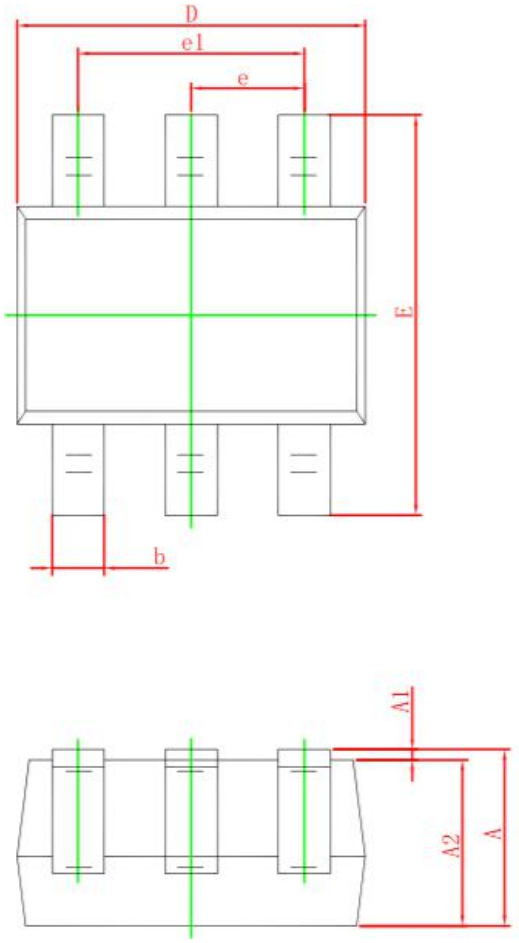
Diode Recovery Test Circuit & Waveforms





Package Information

- **SOT-363**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	2.150	2.450	0.085	0.096
E1	1.150	1.350	0.045	0.053
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525 REF.		0.021 REF.	
θ	0°	8°	0°	8°