100V N-Channel SGT Enhancement Mode MOSFET

Description

The PECN1045G uses Shield Gate Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.

General Features

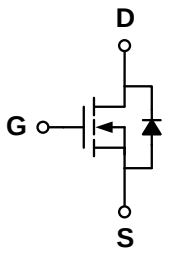
- V_{DS} =100V I_D =45A
  $R_{DS(ON)}$(Typ.)=14.0mΩ @V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=18.5mΩ @V_{GS}=4.5V
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- 100% UIS tested

100% UIS TESTED!
100% ΔVds TESTED!

Application

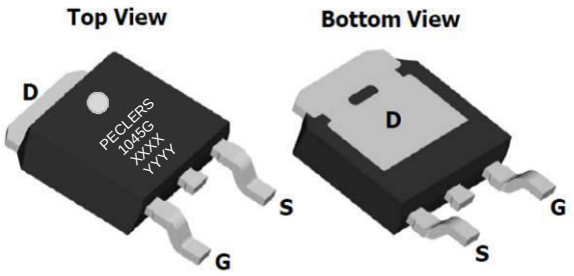
- Synchronus Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

Schematic diagram



Marking and pin assignment

TO-252-2L



Note:
XXXX—Wafer Information
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN1045G	-55°C to +150°C	TO-252-2L	2500

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	45	A
	TC=70°C		36	
Pulsed Drain Current		I_{DP}	180	A
Avalanche energy(L=0.5mH) (note1)		E_{AS}	200	mJ
Power Dissipation	TC=25°C	P_D	85	W
	TC=70°C		45	
Operating junction Temperature range		Tj	-55—150	℃

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	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=55°C	-	-	5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.75	2.5	V
Drain-source on-state resistance [1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=45A	-	14.0	18	mΩ
		V_{GS}=4.5V, I_D=30A		18.5	24	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	-	35	-	S
Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_{SD}=1A,V_{GS}=0V	-	0.7	1.2	V
Diode Continuous Forward Current	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =45A di/dt = 100A/μs	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	80	-	nC
Dynamic Characteristics [2]						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	1.2	1.8	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=50V f=1.0MHz	-	1600	-	pF
Output capacitance	C_{OSS}		-	140	-	
Reverse transfer capacitance	C_{RSS}		-	11	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=50V, R_L=2.5Ω, R_G=3Ω	-	6	-	ns
Turn-on Rise time	tr		-	2	-	
Turn-off delay time	$t_{D(OFF)}$		-	18	-	
Turn-off Fall time	t_f		-	2	-	
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=50V，I_D=20A	-	26	-	nC
Gate-source charge	Q_{gs}		-	7.4	-	
Gate-drain charge	Q_{gd}		-	3.8	-	

Note: 1：Pulse test; pulse width ≦ 300ns, duty cycle ≦ 2%.

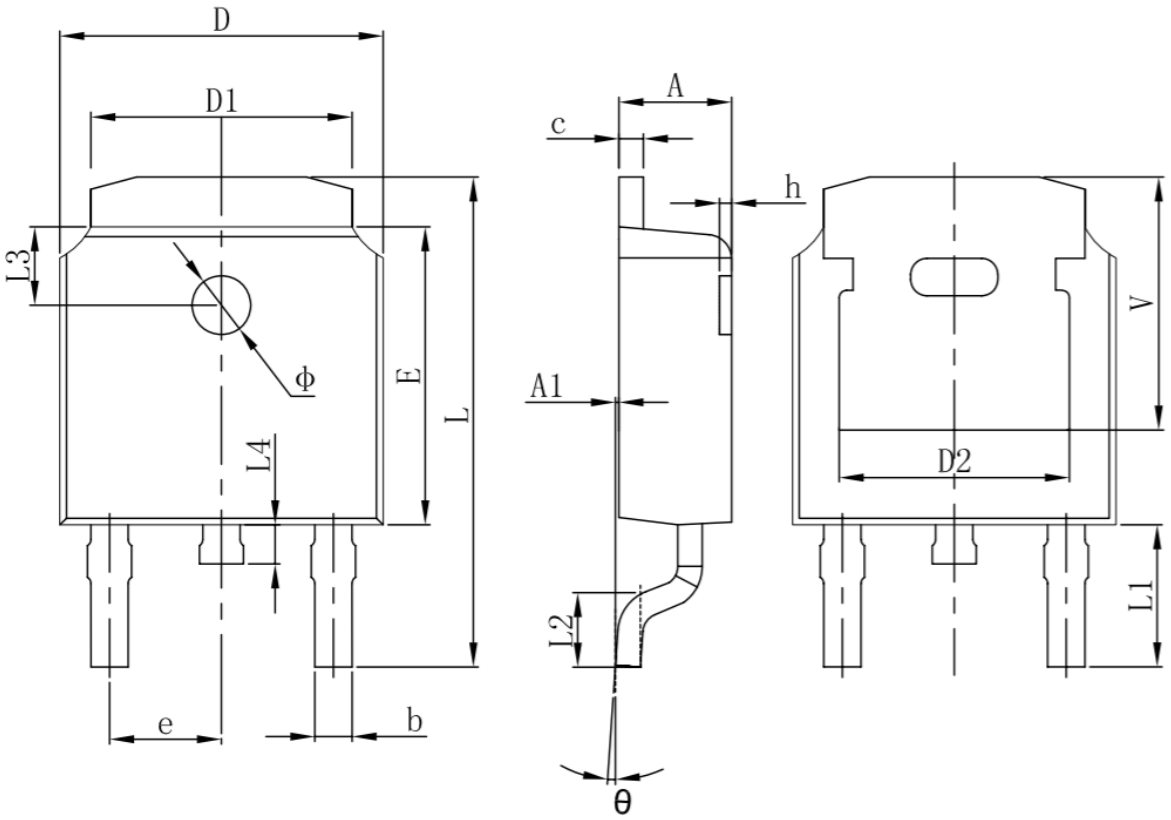
2：Guaranteed by design, not subject to production testing.

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	$R_{\theta JC}$	1.7	℃/W
Thermal Resistance junction-to ambient	$R_{\theta JA}$	62.5	

Package Information

- **TO-252-2L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	