100V P-Channel Enhancement Mode MOSFET

Description

The PECN30P10G uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} =-100V I_D =-30A
  $R_{DS(ON)}$(Typ.)=36mΩ @V_{GS}=-10V
  $R_{DS(ON)}$(Typ.)=40mΩ @V_{GS}=-4.5V
  High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

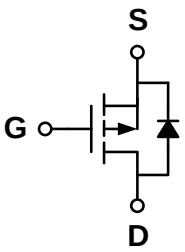
- Load switch

Package

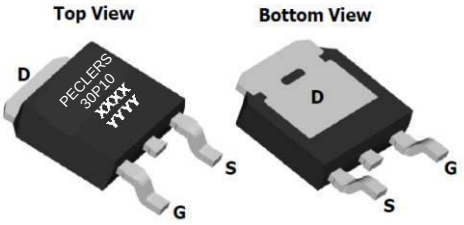
- TO-252-2L

100% UIS TESTED!
100% ΔVds TESTED!

Schematic diagram



Marking and pin assignment



30P10—PECN30P10
XXXX—Wafer Lot No.
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN30P10G	-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 (T_J = 150 °C)[b]	T_C=25°C	I_D	-36	A
	T_C=70°C		-29	
	T_A=25°C		-9[b,c]	
	T_A=70°C		-7.2[b,c]	
Pulsed Drain Current		I_{DM}	-40	
Continuous Source Current (Diode Conduction)	T_C=25°C	I_S	-50[a]	
	T_A=25°C		-5.75[b,c]	
Avalanche Current	L = 0.1 mH	I_{AS}	-35	
Single Pulse Avalanche Energy		E_{AS}	61	mJ

Maximum power dissipation	T_C=25°C	P_D	113	W
	T_C=70°C		72	
	T_A=25°C		6.9[b,c]	
	T_A=70°C		4.4[b,c]	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55—150	℃

Thermal Characteristics

Parameter		Symbol	Typical	Maximum	Unit
Thermal Resistance-Junction to Case		$R_{\theta JC}$	0.85	1.1	℃/W
Thermal Resistance junction-to ambient [a]	t≤10s	$R_{\theta JA}$	15	18	
	Steady State		40	50	

Notes:

a. Package limited.

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

c. t = 10 s.

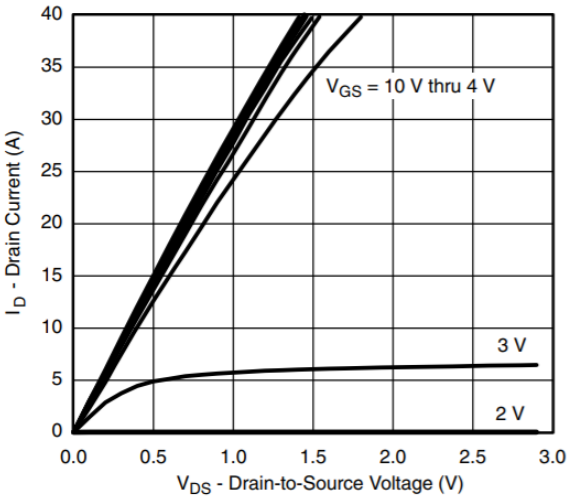
d. Maximum under steady state conditions is 50 °C/W.

Electrical Characteristics (TA=25℃ unless otherwise noted)

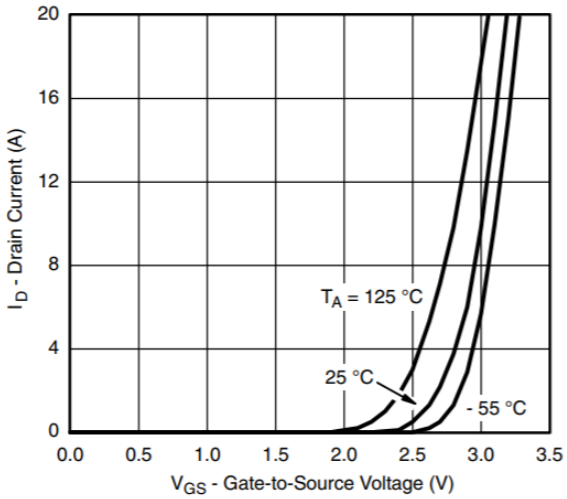
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V	-	-	-25	μA
		V_{DS}=-80V, V_{GS}=0V,T_J=150°C	-	-	-100	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0	-1.9	-3.0	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-30A	-	36	43	mΩ
		V_{GS}=-4.5V, I_D=-10A	-	40	48	
Forward Transconductance	G_{FS}	V_{DS}=-15V, I_D=-10A	-	38	-	S
Diode Characteristics						
Diode Forward Voltage[1]	V_{SD}	I_{SD}=-7.7A,V_{GS}=0V	-	-0.8	-1.2	V
Diode Continuous Forward Current	I_S	T_C = 25 °C	-	-	-50	A
Reverse Recovery Time	t_{rr}	I_F=-7A, dI/dt=-100A/us	-	60	-	ns
Reverse Recovery Charge	Q_{rr}		-	150	-	nC
Dynamic Characteristics[2]						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	4	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=-50V f=1.0MHz	-	4600	-	pF
Output capacitance	C_{OSS}		-	230	-	
Reverse transfer capacitance	C_{RSS}		-	175	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=-10V, V_{DD}=-50V,	-	15	-	ns

Turn-on Rise time	t_r	R_D=2.4Ω, I_D=-7.7A, R_G=1Ω	-	20	-	
Turn-off delay time	$t_{D(OFF)}$		-	110	-	
Turn-off Fall time	tf		-	100	-	
Total gate charge	Q_g	V_{GS}=-4.5V,I_D=-9A V_{DS}=-50V	-	54		nC
Gate-source charge	Q_{gs}			14		
Gate-drain charge	Q_{gd}		-	26	-	

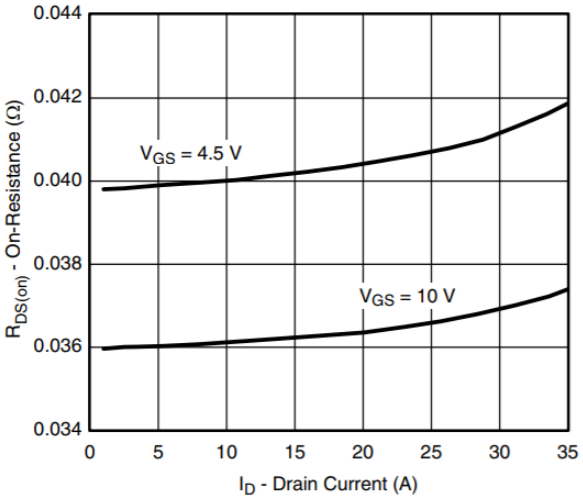
Typical Performance Characteristics



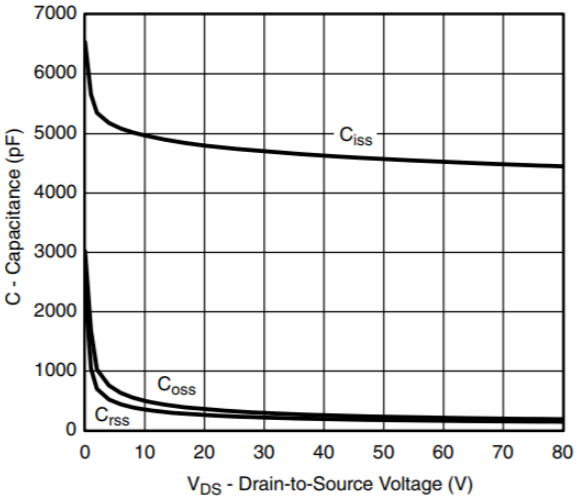
Output Characteristics



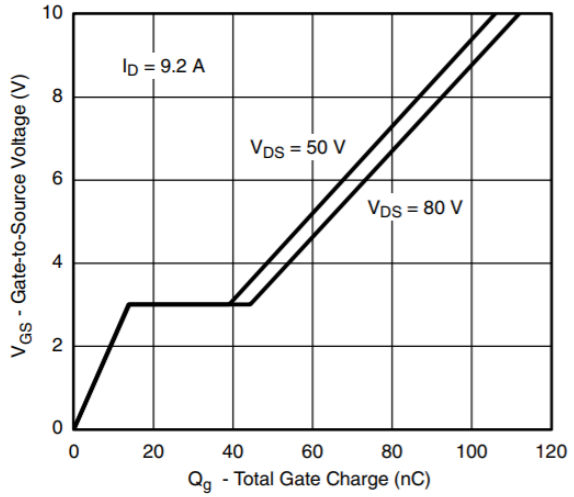
Transfer Characteristics



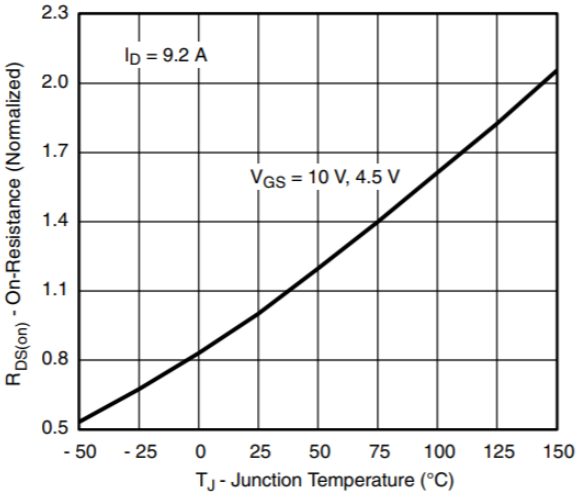
On-Resistance vs. Drain Current and Gate Voltage



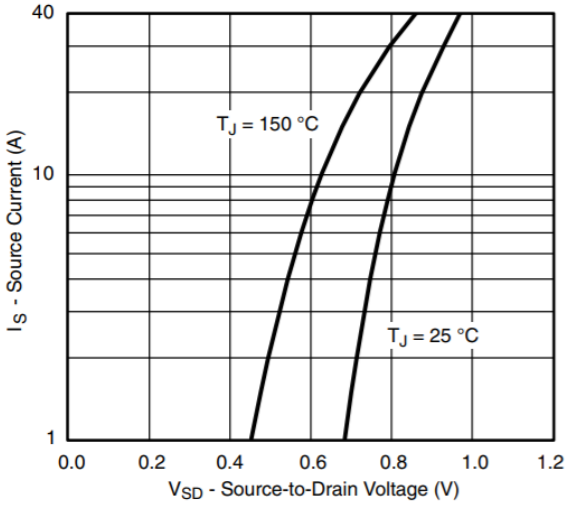
Capacitance



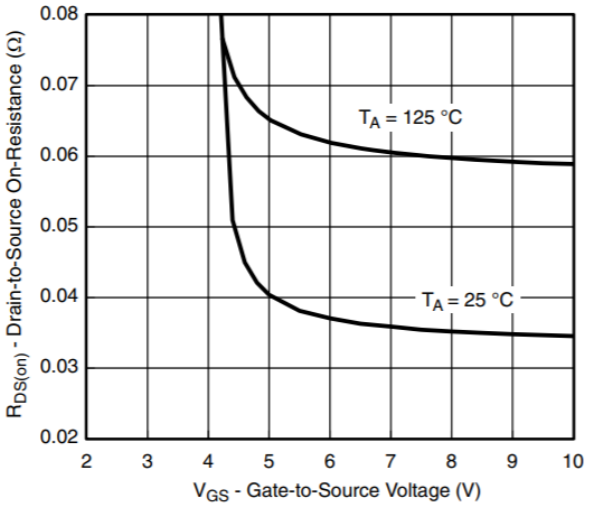
Gate Charge



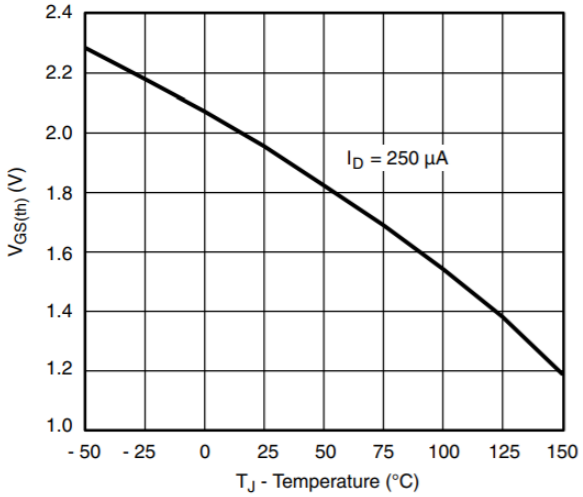
On-Resistance vs. Junction Temperature



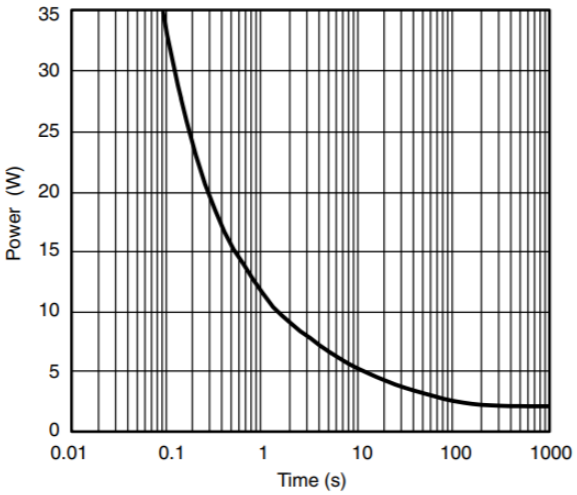
Source-Drain Diode Forward Voltage



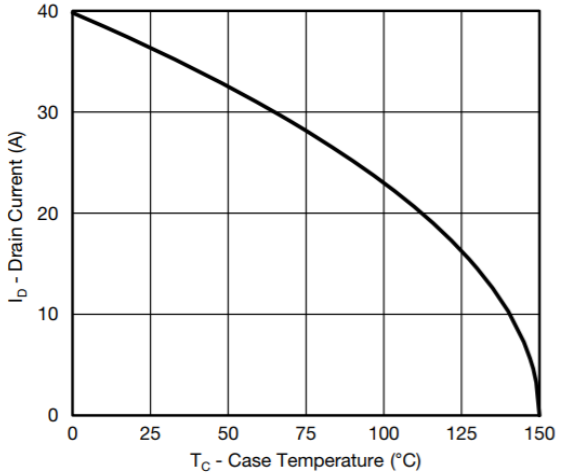
On-Resistance vs. Gate-to-Source Voltage



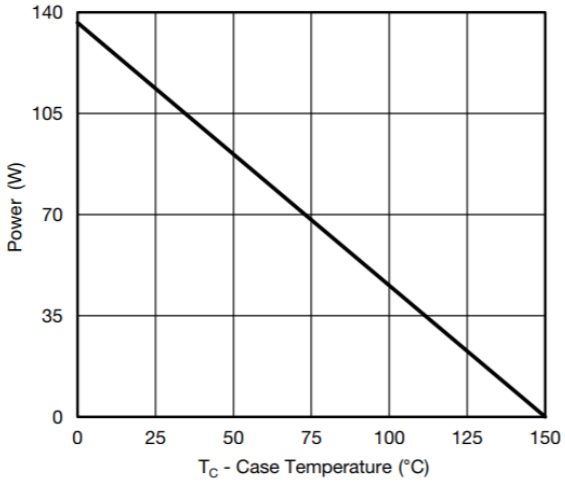
Threshold Voltage



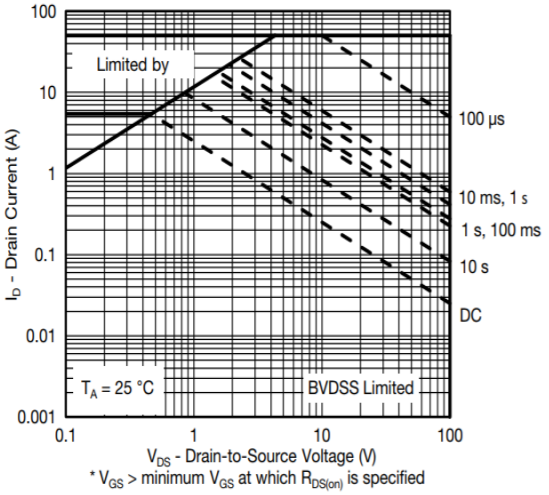
Single Pulse Power, Junction-to-Ambient



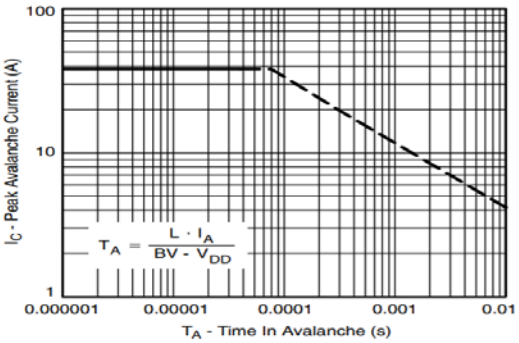
Current Derating*



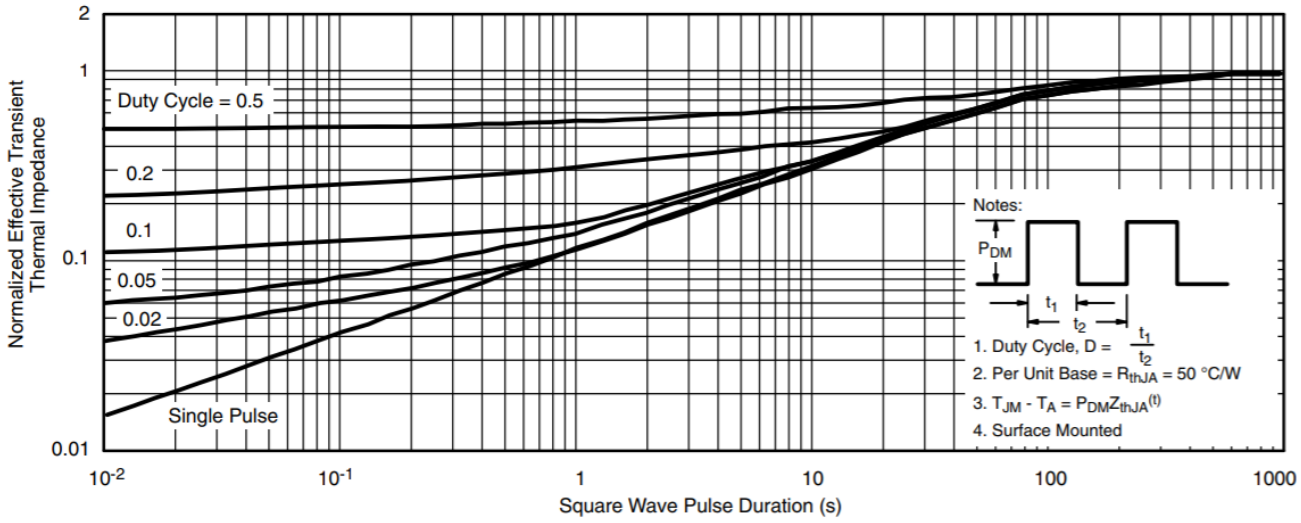
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Ambient



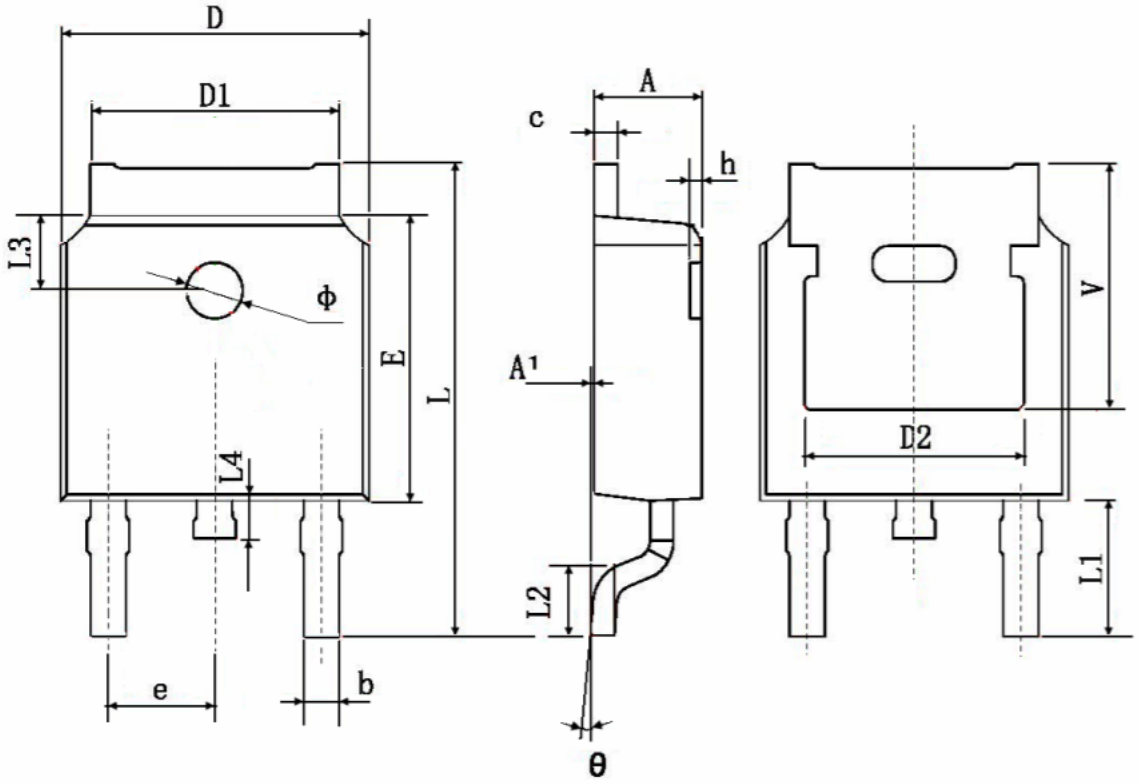
Single Pulse Avalance Capability



Normalized Thermal Transient Impedance, Junction-to-Ambient

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	0.660	0.860	0.026	0.034
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 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
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	5.350 TYP.		0.211 TYP.	