

20V N-Channel Enhancement Mode MOSFET

Description

The PECN2040D3 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

General Features

- ◆ $V_{DS} = 20V$ $I_D = 40A$
 $R_{DS(ON)}(Typ.) = 4.5m\Omega$ @ $V_{GS} = 4.5V$
 $R_{DS(ON)}(Typ.) = 5.9m\Omega$ @ $V_{GS} = 2.5V$
- ◆ High density cell design for ultra low $R_{DS(ON)}$
- ◆ Fully characterized avalanche voltage and current
- ◆ Good stability and uniformity with high E_{AS}
- ◆ Excellent package for good heat dissipation
- ◆ Special process technology for high ESD capability
- ◆ 100% UIS tested

Application

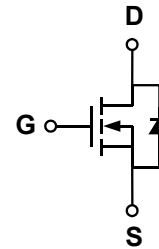
- ◆ Automotive applications
- ◆ Hard switched and high frequency circuits
- ◆ Uninterruptible power supply

Package

- ◆ PDFN3.3*3.3-8L

100% UIS TESTED!
100% ΔV_{ds} TESTED!

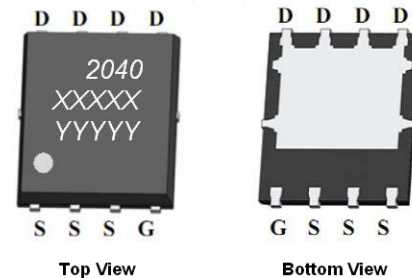
Schematic diagram



Marking and pin assignment

PDFN3.3*3.3-8L

(Top View)



PECN2040—Product

Name XXXX—Wafer Lot

No.

YYYY—Quality Code



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2040D 3-G	-55°C to +150°C	PDFN3.3*3.3-8L	5000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±12	V
Continuous Drain Current	TC=25°C	I_D	40	A
	TC=100°C		32	
Pulsed Drain Current		I_{DP}	160	A
Avalanche energy(L=0.5mH) ^(note1)		E_{AS}	200	mJ
Maximum power dissipation	TC=25°C	P_D	28	W
Operating junction Temperature range		T_j	-55—150	°C

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Static 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	T _J =25°C	-	-	1	μA
			T _J =85°C	-	-	5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V		-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA		0.5	0.75	1.2	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =4.5V, I _D =40A		-	4.5	5.5	mΩ
		V _{GS} =2.5V, I _D =20A		-	5.9	7	
On Status Drain Current	I _{D(ON)}	V _{DS} =20V, V _{GS} =4.5V		40	-	-	A
Diode Characteristics							
Diode Continuous Forward Current	I _s			-	-	12	A
Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=20A/us		-	25	-	ns
Reverse Recovery Charge	Q _{rr}			-	24	-	nC
Dynamic Characteristics ²							
IPECNut capacitance	C _{ISS}	V _{GS} =0V ,V _{DS} =10V f=1.0MHz		-	2000	-	pF
Output capacitance	C _{OSS}			-	500	-	
Reverse transfer capacitance	C _{RSS}			-	200	-	
Turn-on delay time	t _{D(ON)}	V _{GS} =4.5V, V _{DD} =10V, I _D =2A		-	6.5	-	ns
Turn-on Rise time	t _r			-	17	-	
Turn-off delay time	t _{D(OFF)}			-	29.5	-	
Turn-off Fall time	t _f			-	17	-	
Total gate charge	Q _g	V _{GS} =4.5V,I _D =20A V _{DS} =10V		-	27		nC
Gate-source charge	Q _{gs}				6.5		
Gate-drain charge	Q _{gd}			-	6.4	-	
Drain-Source Diode Characteristics							
Diode forward voltage	V _{SD}	I _{SD} =10A,V _{GS} =0V		-	0.8	1.2	V

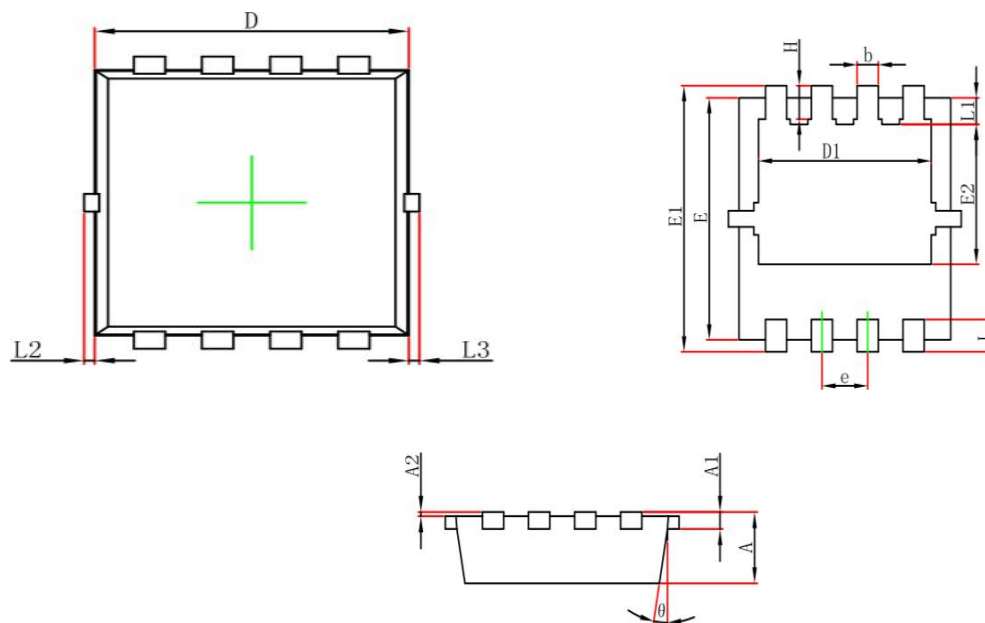
Note: 1: Eas test: VDD=10V, RG=25ohm, L=500uH 2:

Pulse test; pulse width $\leq 300ns$, duty cycle $\leq 2\%$.

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

Package Information

- PDFN3.3*3.3-8L



Symbol	Dimensions In Millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°