

20V Dual P-Channel Enhancement Mode MOSFET

Description

The PECN20D03P uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

- ◆ $V_{DS} = -20V$, $I_D = -3A$
 $R_{DS(ON)}(Typ.) = 110m\Omega$ @ $V_{GS} = -2.5V$
 $R_{DS(ON)}(Typ.) = 90m\Omega$ @ $V_{GS} = -4.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

Application

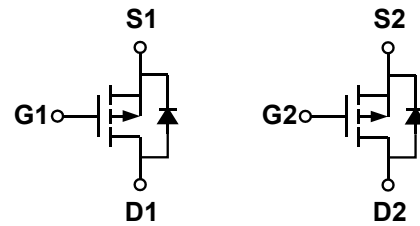
- ◆ PWM applications
- ◆ Load switch

Package

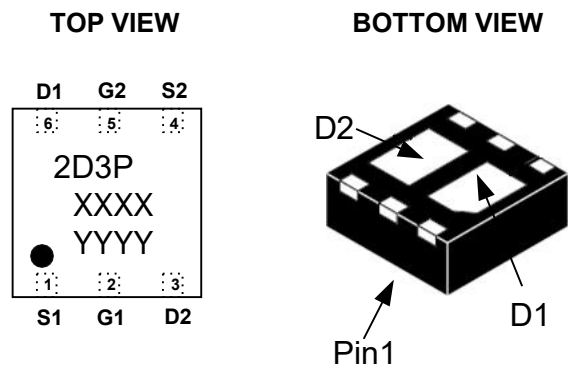
- ◆ DFN2*2-6L-D



Schematic diagram



Marking and pin assignment



Note: PECN—Natlinear Power 2—BVDSS=20V;D—Dual;3—ID=3A;P—PMOS
 XXXX is the date code , YYYY is the Quality Code.

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN20D03PD R-G	-55°C to +150°C	DFN2*2-6L-D	4000

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	
Drain Current-Continuous (Silicon Limited)	I_D	$T_A = 25^\circ C$	-3	A
		$T_A = 75^\circ C$	-2	
Pulsed Drain Current (Package Limited)	I_{DM}	-12	A	
Maximum power dissipation	P_D	$T_A = 25^\circ C$	1.5	W
		$T_A = 75^\circ C$	0.95	
Operating junction Temperature range	T_j	-55—150	°C	

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	-	1	μA
Gate-body leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	± 100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.75	-1.2	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-3A$	-	90	100	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	-	110	130	
Forward transconductance	gfs	$V_{GS}=-5V, I_D=-3A$	-	5	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	$V_{DS}=-10V, V_{GS}=0V$ $f=1.0MHz$	-	325	-	pF
Output capacitance	C_{OSS}		-	63	-	
Reverse transfer capacitance	C_{RSS}		-	37	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=-10V$ $I_D=-3A$ $V_{GEN}=-4.5V$ $R_L=10ohm$ $R_{GEN}=-60ohm$	-	11	-	ns
Rise time	t_r		-	5,5	-	
Turn-off delay time	$t_{D(OFF)}$		-	22	-	
Fall time	t_f		-	8	-	
Total gate charge	Qg	$V_{DS}=-10V, I_D=-3A$ $V_{GS}=-4.5V$	-	3.2	-	nC
Gate-source charge	Qgs		-	0.6	-	
Gate-drain charge	Qgd		-	0.9	-	

Thermal Characteristics

Thermal Resistance junction-to ambient	Rth JA	100	°C/W
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Typical Performance Characteristics

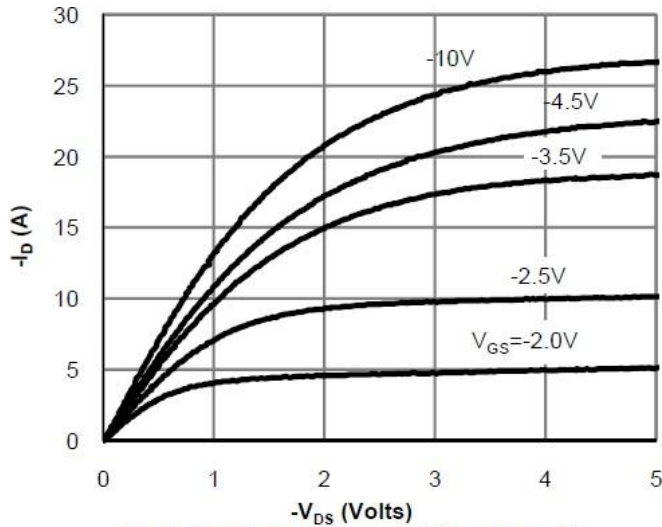


Fig 1: On-Region Characteristics (Note E)

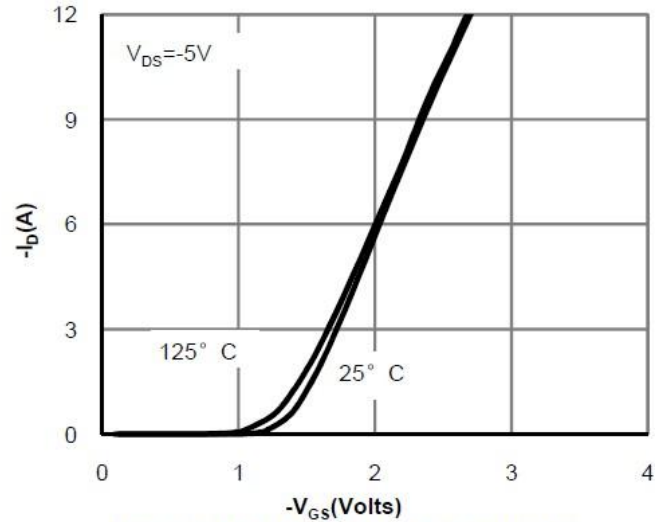


Figure 2: Transfer Characteristics (Note E)

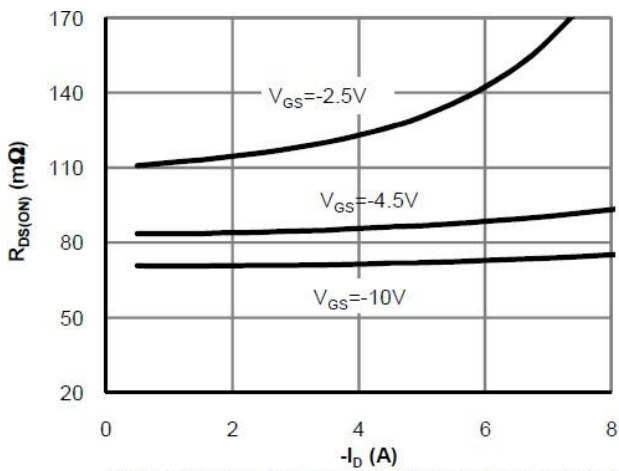


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

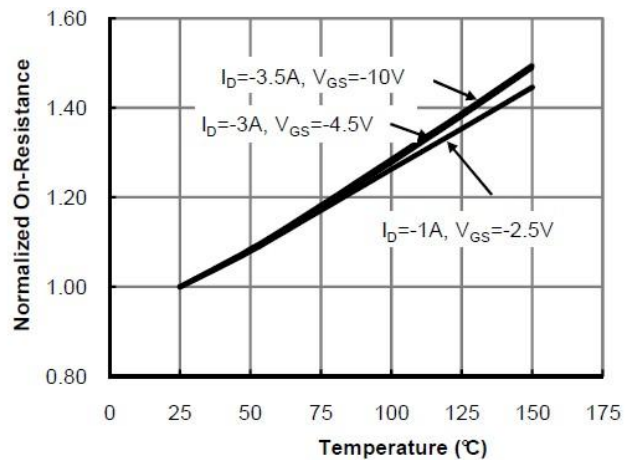


Figure 4: On-Resistance vs. Junction Temperature (Note E)

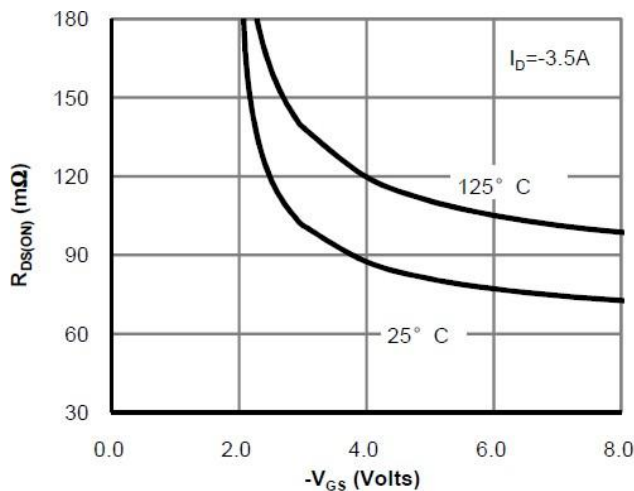


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

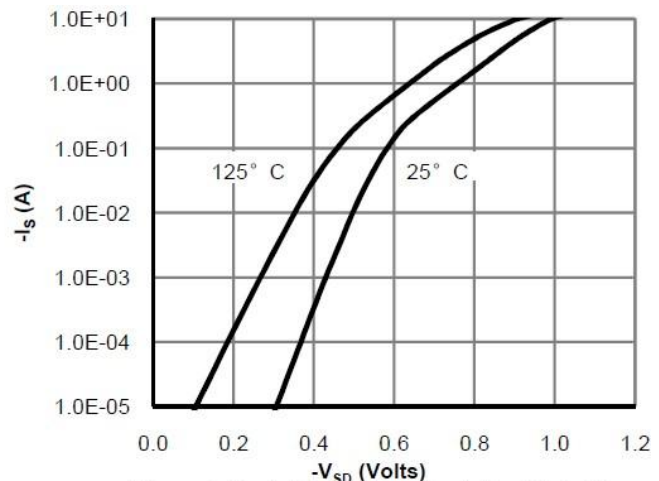


Figure 6: Body-Diode Characteristics (Note E)

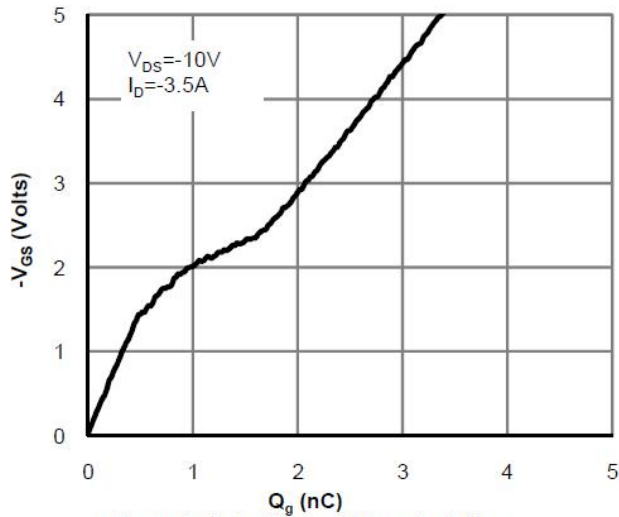


Figure 7: Gate-Charge Characteristics

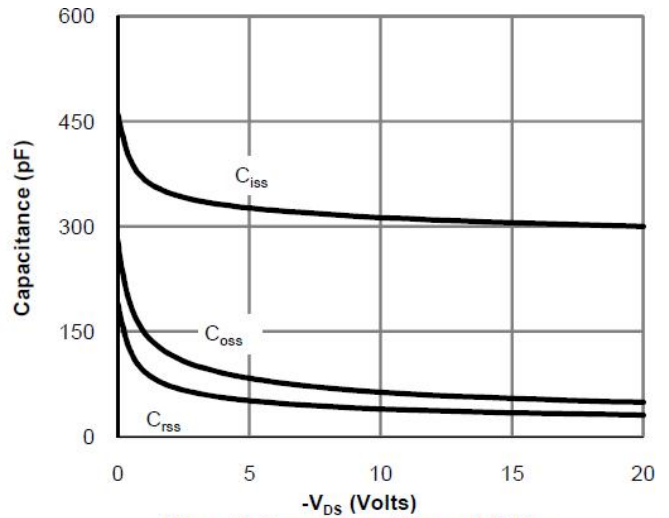


Figure 8: Capacitance Characteristics

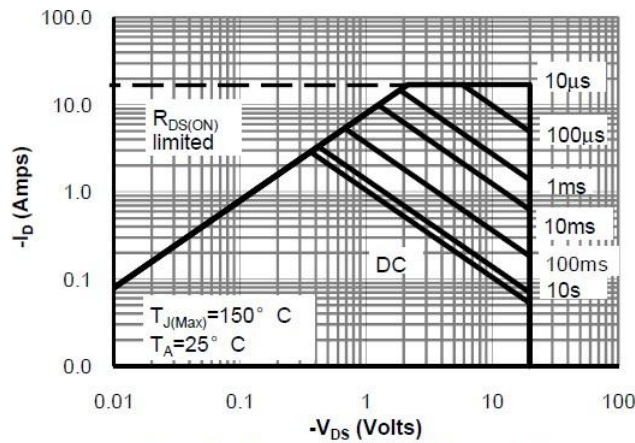


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

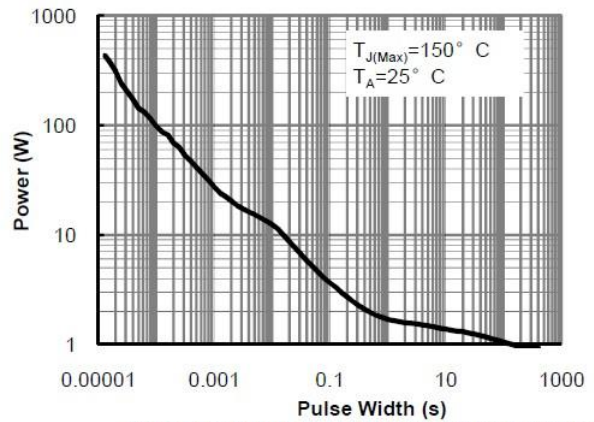


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

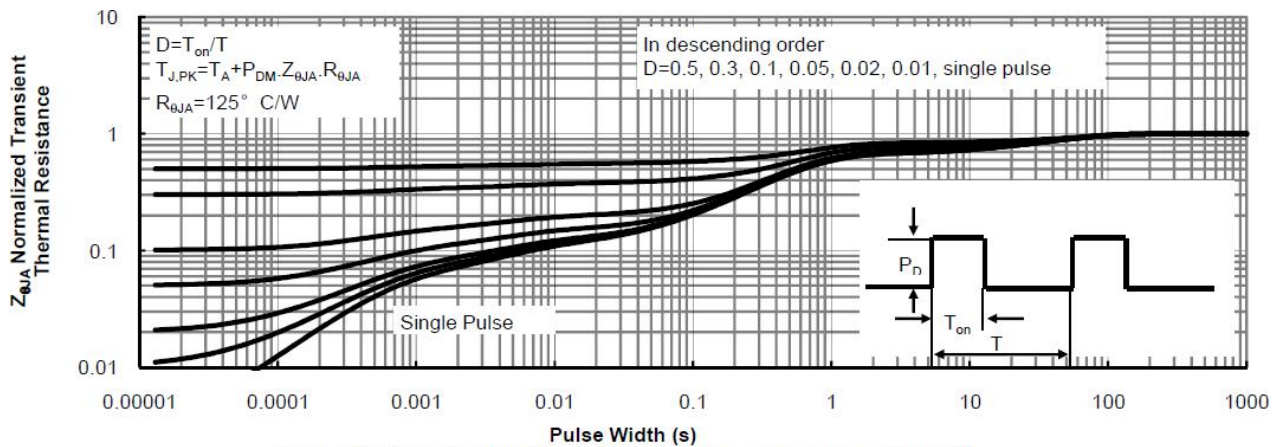
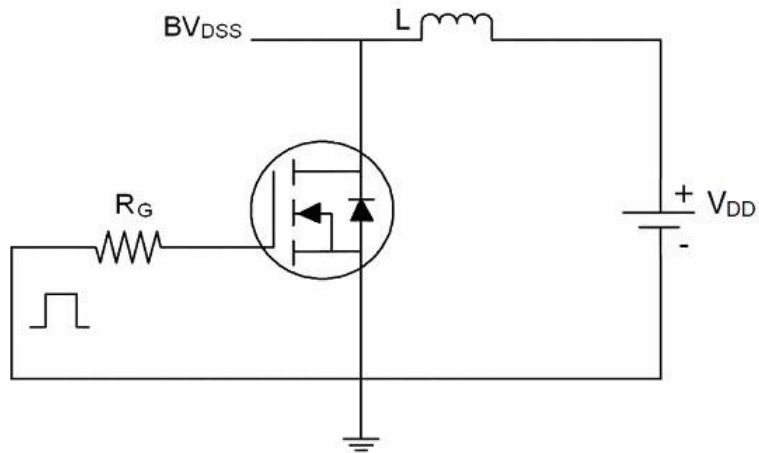


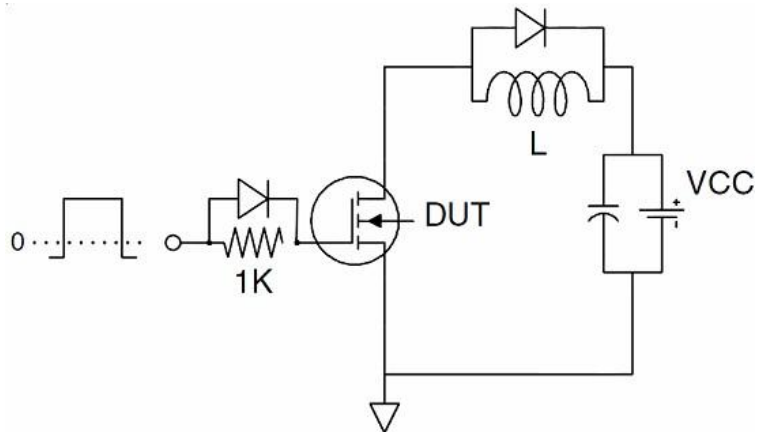
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Test Circuit:

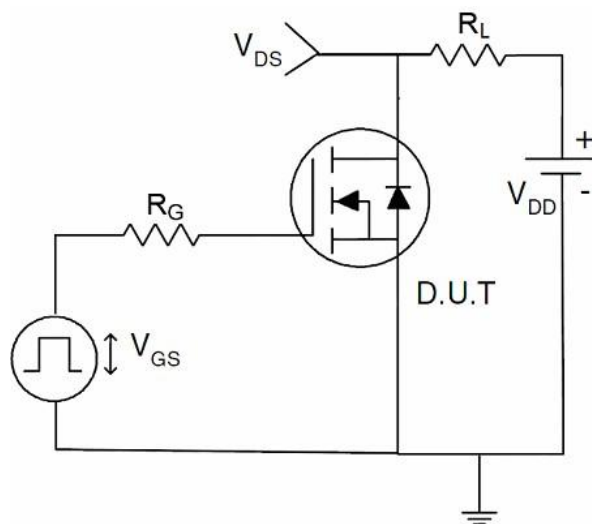
1 、 EAS Test Circuit



2 、 Gate Charge Test Circuit

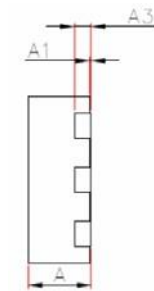
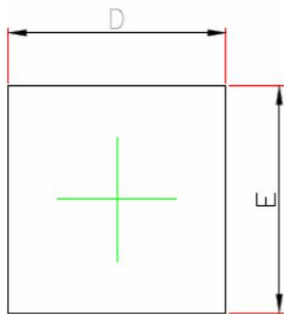


3 、 Switch Time Test Circuit

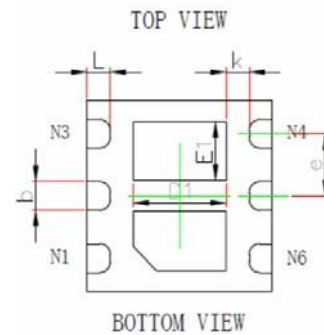


Package Information

- DFN2*2-6L-D



SIDE VIEW



BOTTOM VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.900	1.100	0.035	0.043
E1	0.520	0.720	0.020	0.028
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
k	0.200MIN.		0.008MIN.	
L	0.200	0.300	0.008	0.012