

20V Dual N-Channel Enhancement Mode MOSFET

Description

The PECN8205MR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

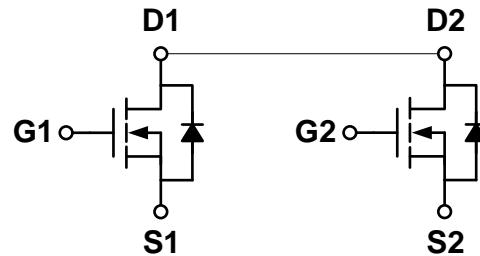
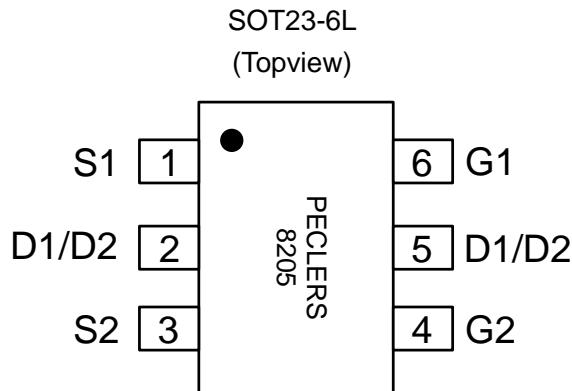
- ◆ $V_{DS} = 20V, ID = 6.5A$
 $R_{DS(ON)} = 14.6m\Omega$ (typical) @ $VGS = 4.5V$
 $R_{DS(ON)} = 18.4m\Omega$ (typical) @ $VGS = 2.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Power management

Package

- ◆ SOT23-6L

**Schematic diagram****Marking and pin assignment****Ordering Information**

Part Number	Storage Temperature	Package	Devices Per Reel
PECN8205MR	-55°C to +150°C	SOT-23	3000

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	6.5	A
		4	
Pulsed Drain Current (Package Limited)	I_{DM}	25	A
Maximum power dissipation	P_D	1.5	W
		1	
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 =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} =±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.2	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6A	-	14.6	22	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	18.4	27	
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =6A	-	10	-	S
Dynamic Characteristics						
Input capacitance	C _{ISS}	V _{DS} =10V, V _{GS} =0V f=1.0MHz	-	900	-	pF
Output capacitance	C _{OSS}		-	215	-	
Reverse transfer capacitance	C _{RSS}		-	105	-	
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DS} =10V V _{GS} =4.5V I _D =6A R _{GEN} =6Ω	-	10	-	ns
Rise time	tr		-	11	-	
Turn-off delay time	t _{D(OFF)}		-	34	-	
Fall time	tf		-	29	-	
Total gate charge	Q _g	V _{DS} =10V, I _D =6A V _{GS} =4.5V	-	12	-	nC
Gate-source charge	Q _{gs}		-	2.4	-	
Gate-drain charge	Q _{gd}		-	1	-	

Thermal Characteristics

Thermal Resistance junction-to ambient	R _{th JA}	100	°C/W
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Typical Performance Characteristics

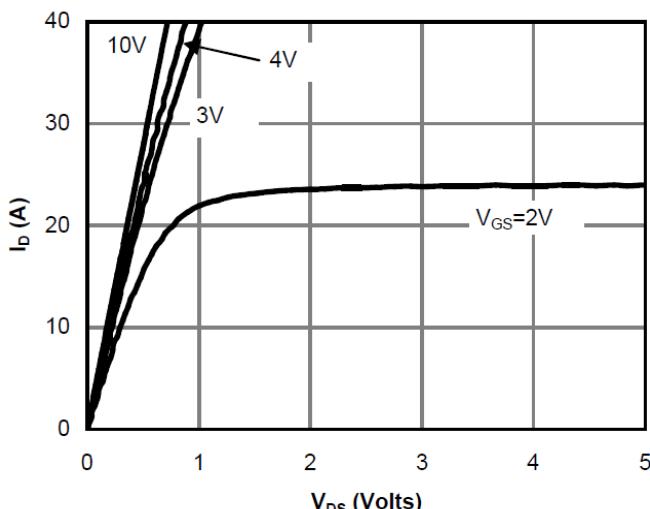


Fig 1: On-Region Characteristics (Note E)

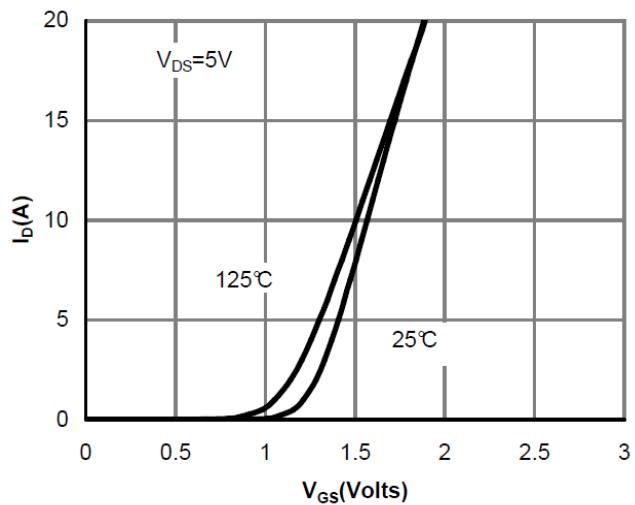


Figure 2: Transfer Characteristics (Note E)

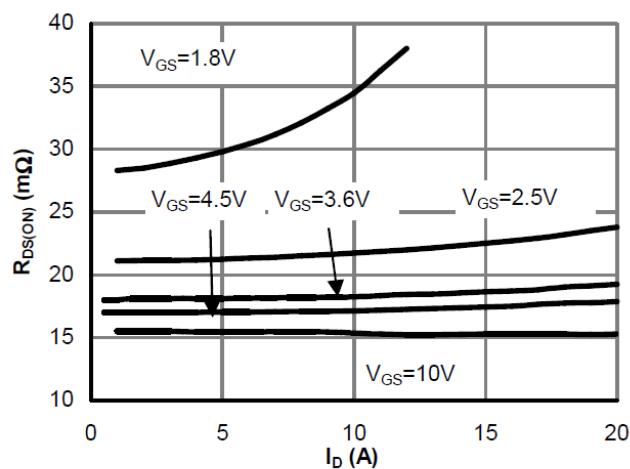


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

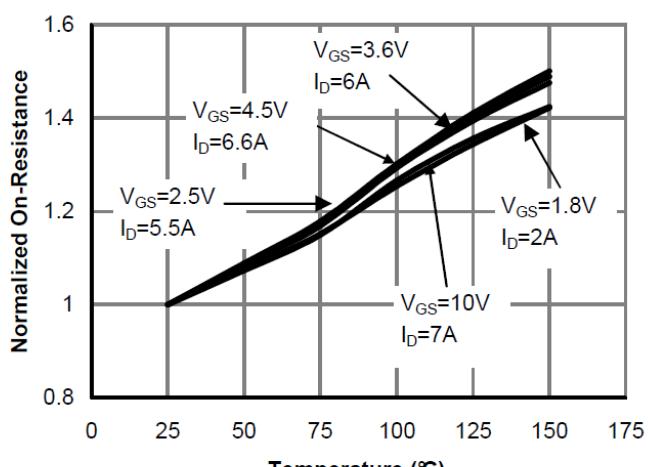


Figure 4: On-Resistance vs. Junction Temperature (Note E)

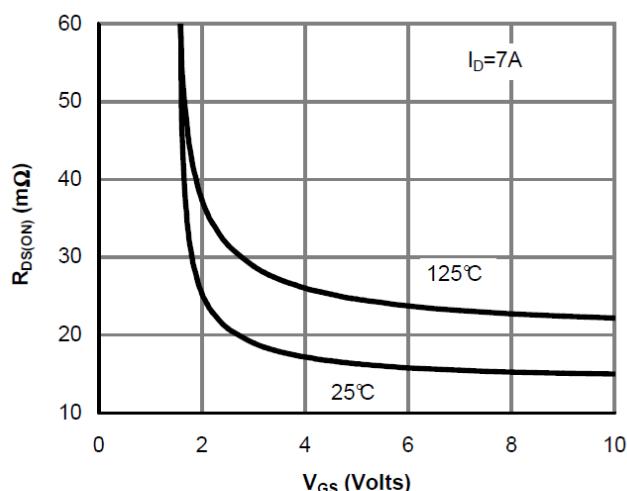


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

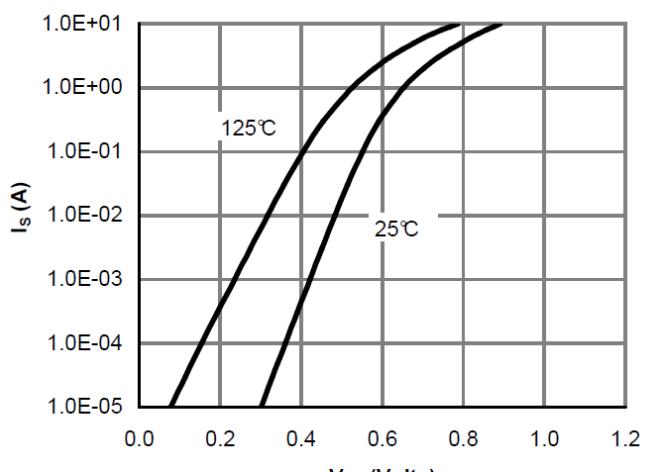


Figure 6: Body-Diode Characteristics (Note E)

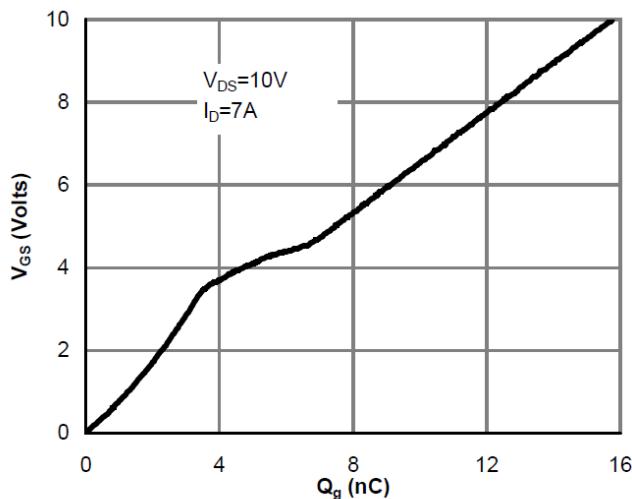


Figure 7: Gate-Charge Characteristics

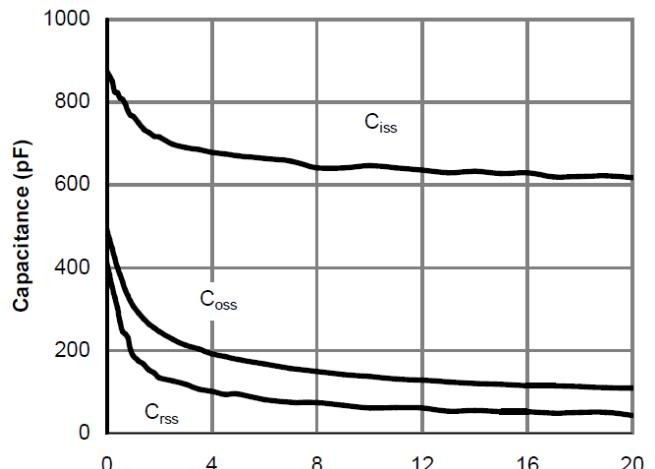


Figure 8: Capacitance Characteristics

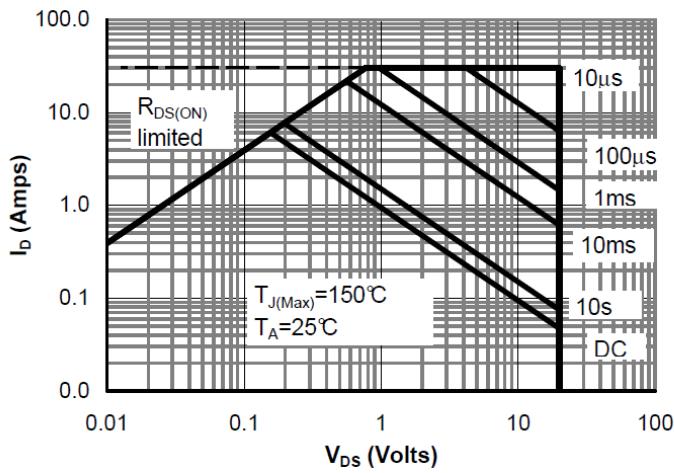


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

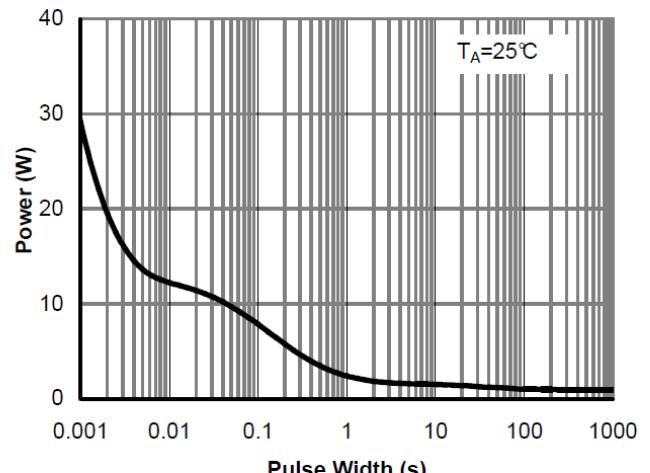


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

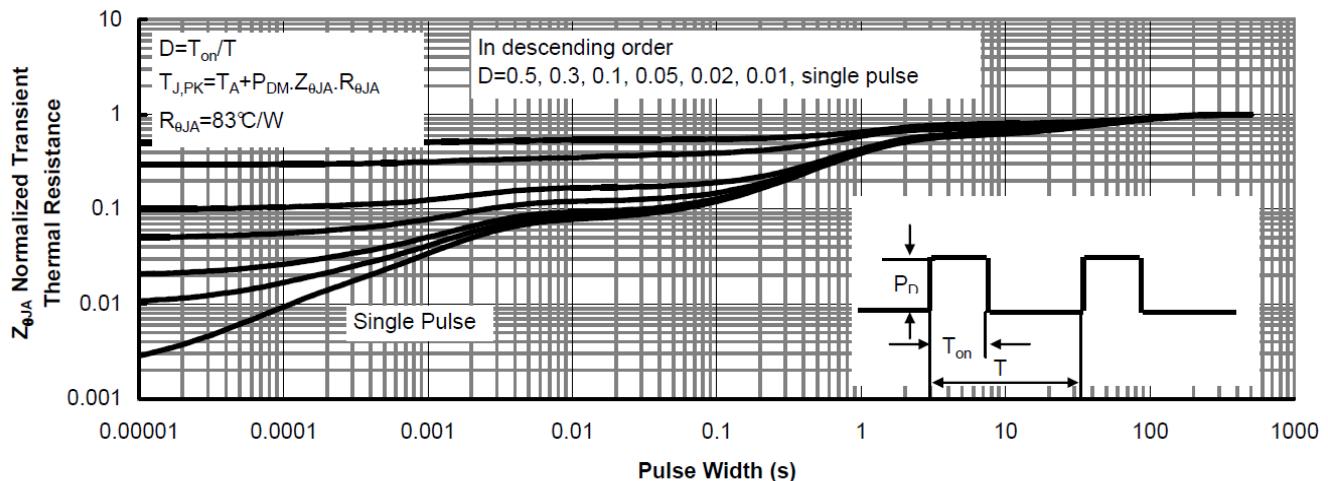
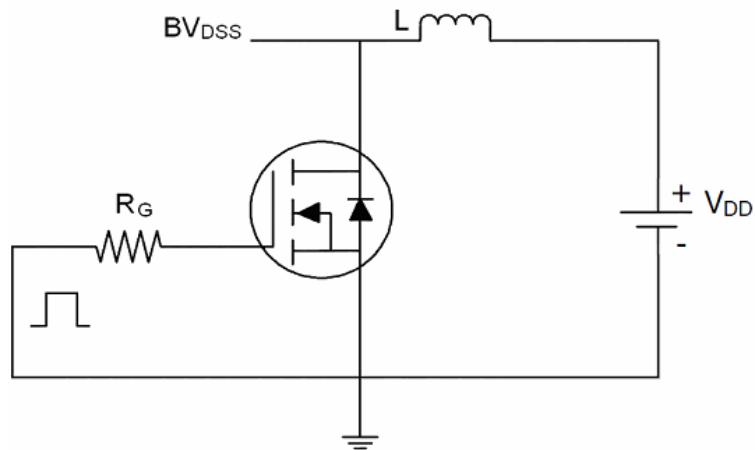


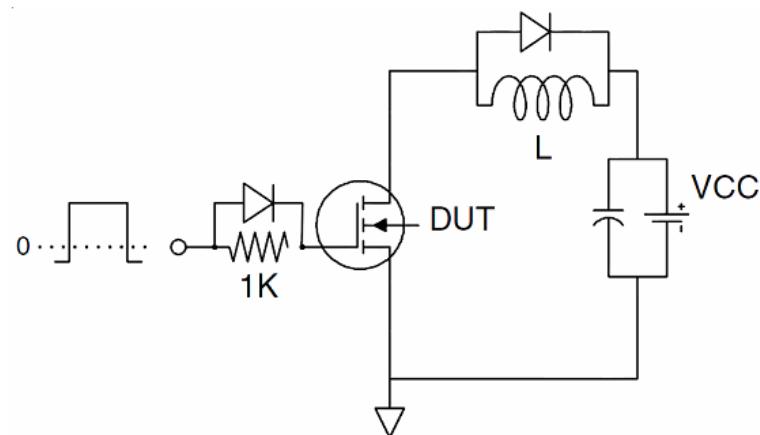
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Test Circuit:

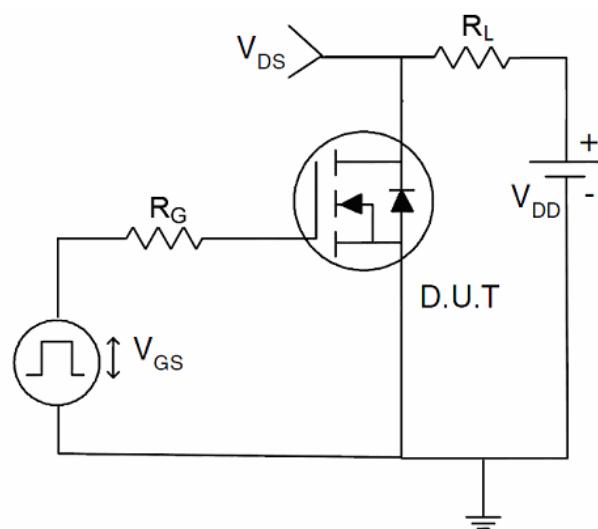
(1)、EAS Test Circuit



(2)、Gate Charge Test Circuit

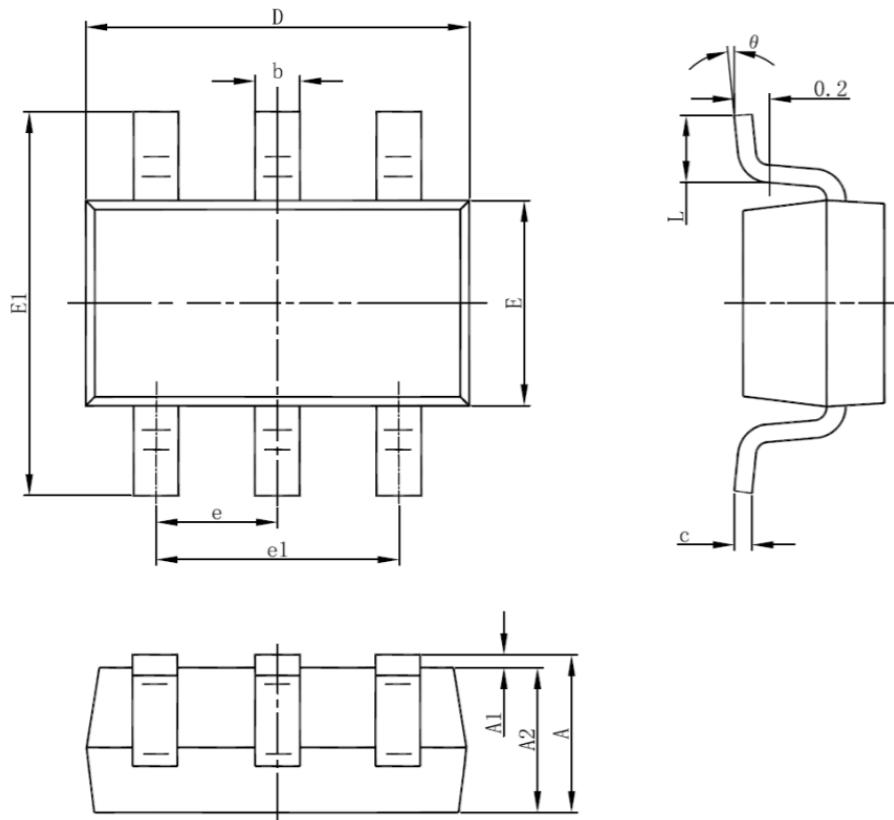


(3)、Switch Time Test Circuit



Package Information

- SOT23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°