
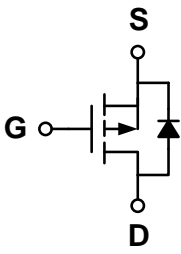
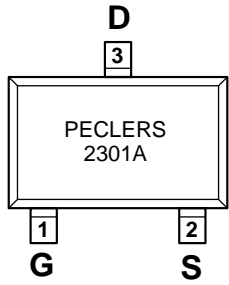


### 20V P-Channel Enhancement Mode MOSFET

<p><b>Description</b></p> <p>The PECN2301AMR uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>◆ <math>V_{DS} = -20V</math>, <math>I_D = -2.8A</math>  <math>R_{DS(ON)}(Typ.) = 75m\Omega @ V_{GS} = -2.5V</math>  <math>R_{DS(ON)}(Typ.) = 60m\Omega @ V_{GS} = -4.5V</math></li> <li>◆ High power and current handling capability</li> <li>◆ Lead free product is acquired</li> <li>◆ Surface mount package</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>◆ PWM applications</li> <li>◆ Load switch</li> </ul> <p><b>Package</b></p> <ul style="list-style-type: none"> <li>◆ SOT-23-3L</li> </ul> <div style="text-align: center;">  </div>	<p><b>Schematic diagram</b></p>  <p><b>Marking and pin assignment</b></p> <p style="text-align: center;">SOT-23-3L (TOP VIEW)</p>  <p style="text-align: center;">23A----PECLERS 2301A</p>
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### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2301AMR	-55°C to +150°C	SOT-23-3L	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 <sup>a</sup> @ Tj=125°C -pulse <sup>b</sup>	$I_D$	-2.8	A
	$I_{DM}$	-11	A
Drain-source Diode forward current	$I_S$	-1.25	A
Maximum power dissipation	$P_D$	1.2	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
<b>OFF Characteristics</b>						
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	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.65	-1.2	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2.8A$	-	60	90	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2.8A$	-	75	120	
Forward transconductance	$g_{fs}$	$V_{GS}=-5V, I_D=-5A$	-	5	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=-10V, V_{GS}=0V$ $f=1.0MHz$	-	561	-	pF
Output capacitance	$C_{OSS}$		-	61	-	
Reverse transfer capacitance	$C_{RSS}$		-	52	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(on)}$	$V_{DD}=-10V$ $I_D=-2.8A$ $V_{GEN}=-4.5V$ $R_L=10ohm$ $R_{GEN}=-60ohm$	-	12.5	-	ns
Rise time	$t_r$		-	6.6	-	
Turn-off delay time	$t_{D(off)}$		-	113	-	
Fall time	$t_f$		-	46.6	-	
Total gate charge	$Q_g$	$V_{DS}=-10V, I_D=-3A$ $V_{GS}=-4.5V$	-	6.1	-	nC
Gate-source charge	$Q_{gs}$		-	1.7	-	
Gate-drain charge	$Q_{gd}$		-	1.2	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1.25A$	-	-0.81	-1.2	V

#### Notes:

- surface mounted on FR4 board,  $t \leq 10sec$
- pulse test: pulse width  $\leq 300\mu s$ , duty  $\leq 2\%$
- guaranteed by design, not subject to production testing

### Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{\theta JA}$	100	$^{\circ}C/W$
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### Typical Performance Characteristics

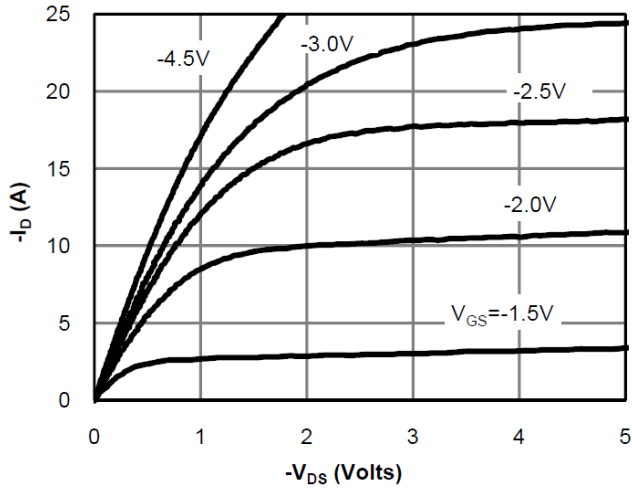


Figure 1: On-Region Characteristics

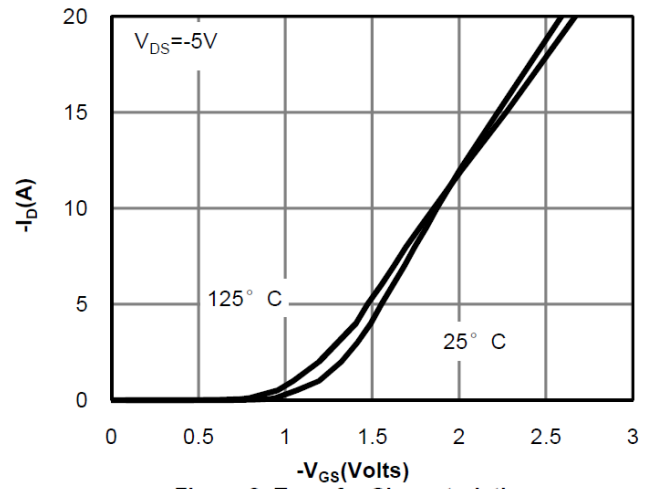


Figure 2: Transfer Characteristics

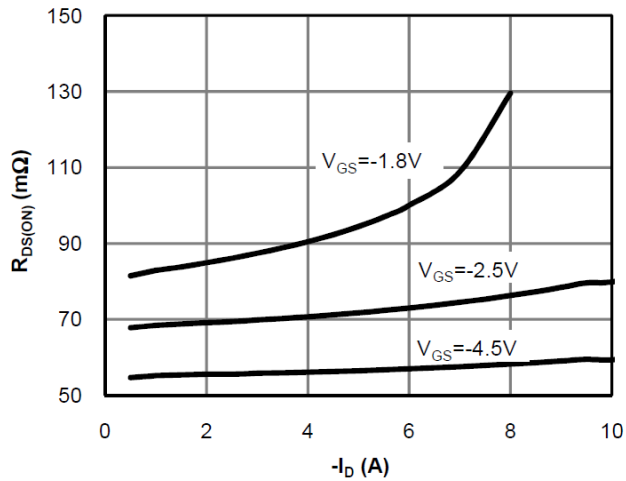


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

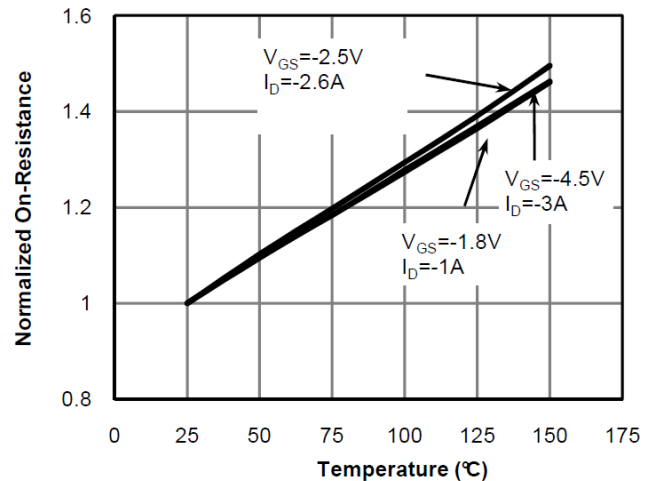


Figure 4: On-Resistance vs. Junction Temperature

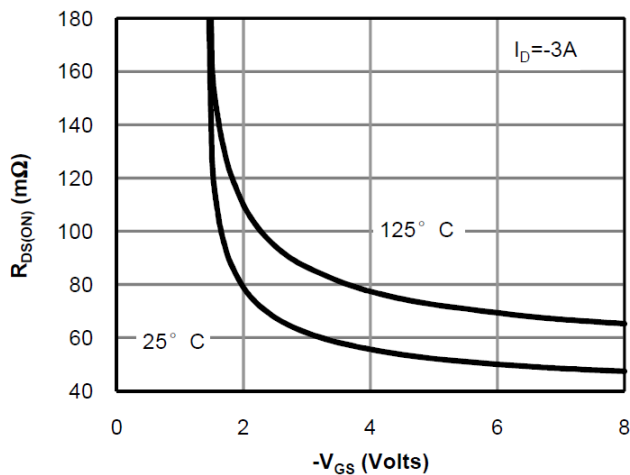


Figure 5: On-Resistance vs. Gate-Source Voltage

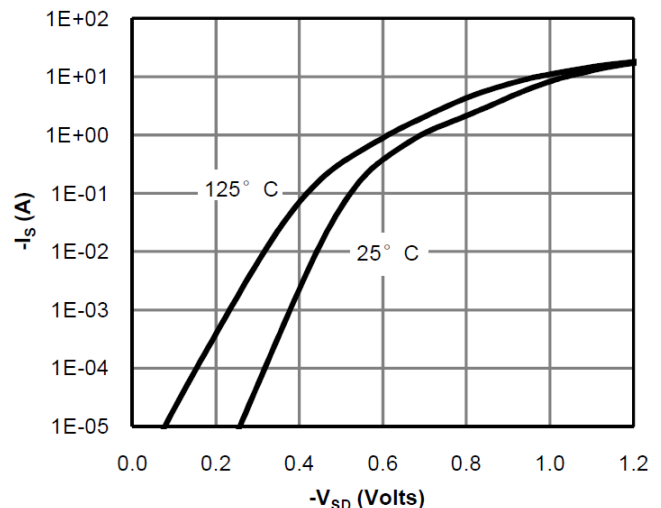


Figure 6: Body-Diode Characteristics

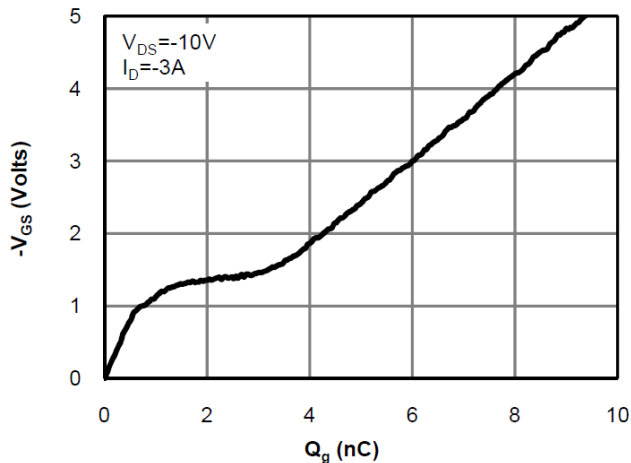


Figure 7: Gate-Charge Characteristics

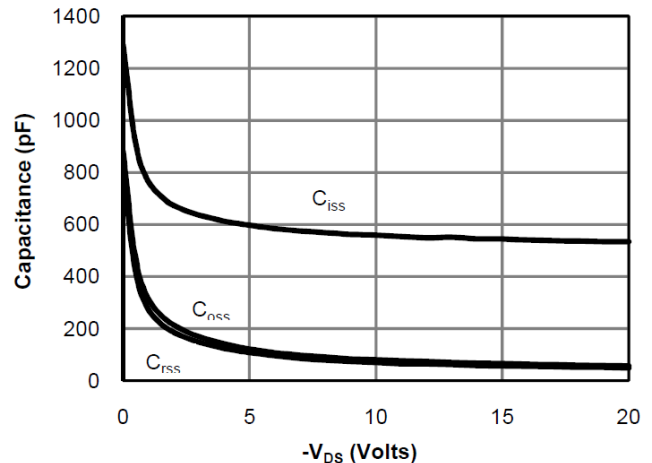


Figure 8: Capacitance Characteristics

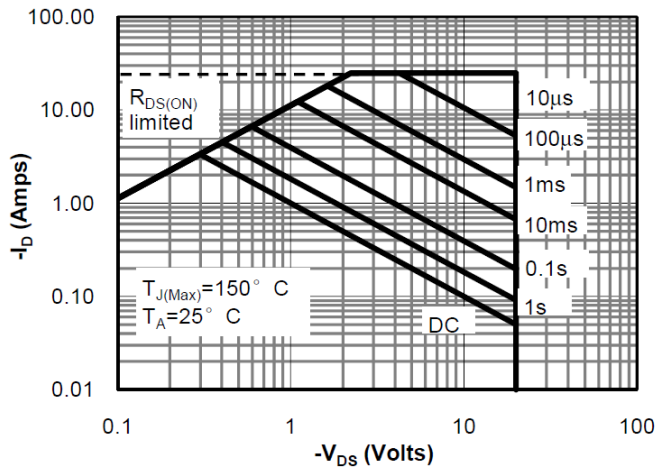


Figure 9: Maximum Forward Biased Safe Operating Area

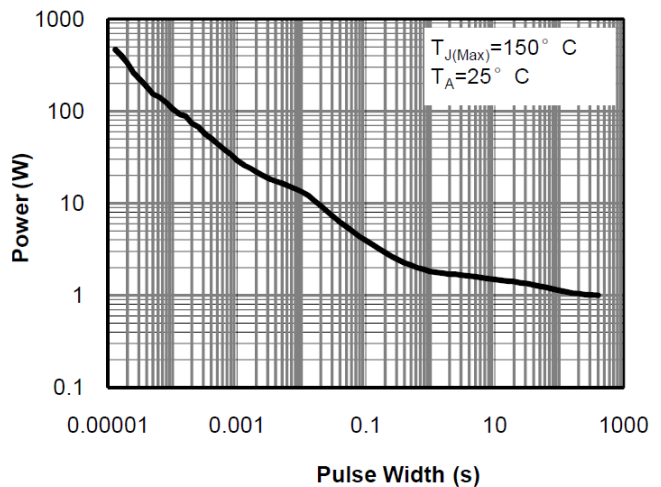


Figure 10: Single Pulse Power Rating Junction-to-Ambient

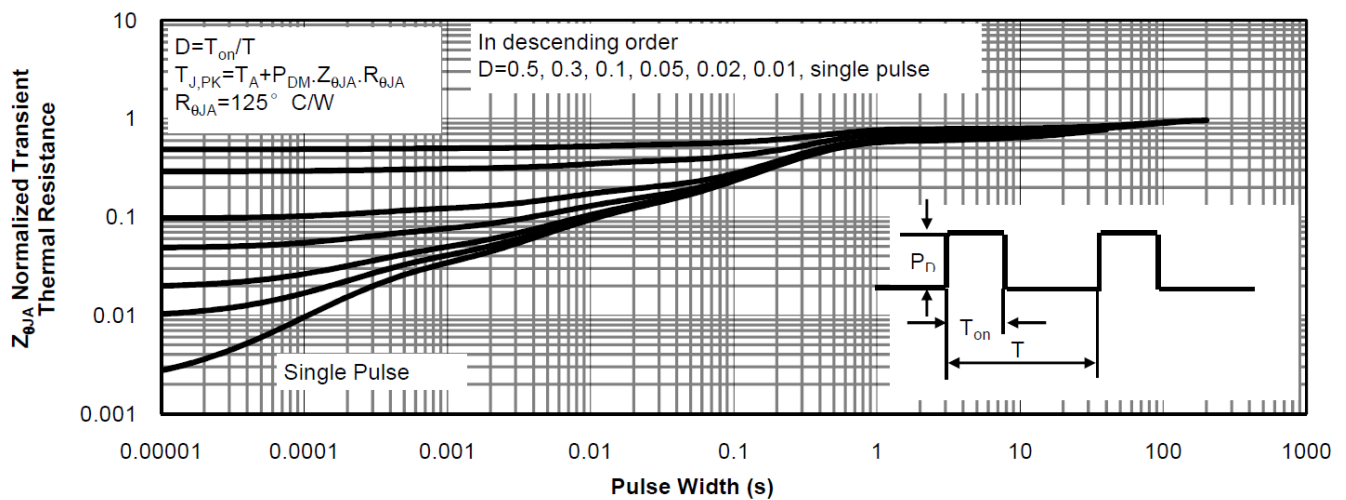
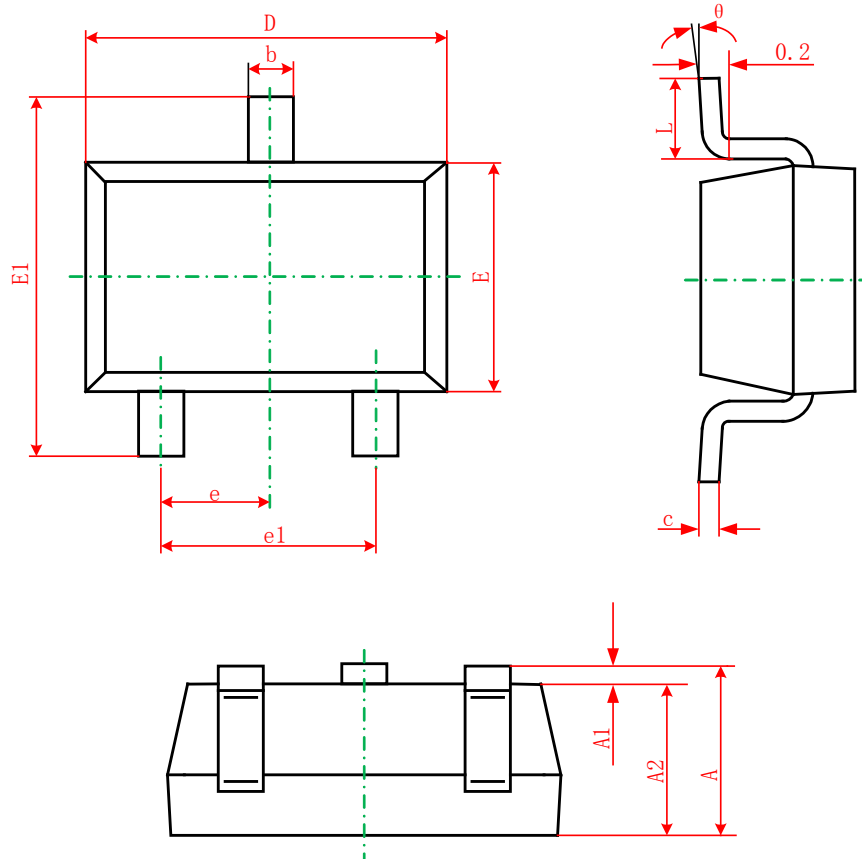


Figure 11: Normalized Maximum Transient Thermal Impedance

### Package Information

- SOT-23-3L



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°