110V N-Channel Enhancement Mode MOSFET

Description

The PECN1102MR 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

- I_D =2.5A,V_{DS}=110V
  $R_{DS(ON)}$(Typ.)=225mΩ@V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=245mΩ@V_{GS}=4.5V
- 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

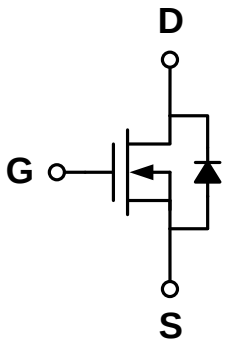
Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

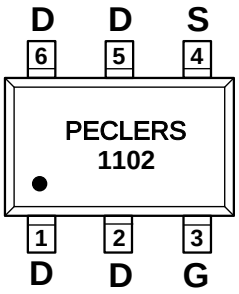
- SOT-23-6L

Schematic diagram



Marking and pin assignment

SOT-23-6L
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN1102MR	-55°C to +150°C	SOT-23-6L	3000

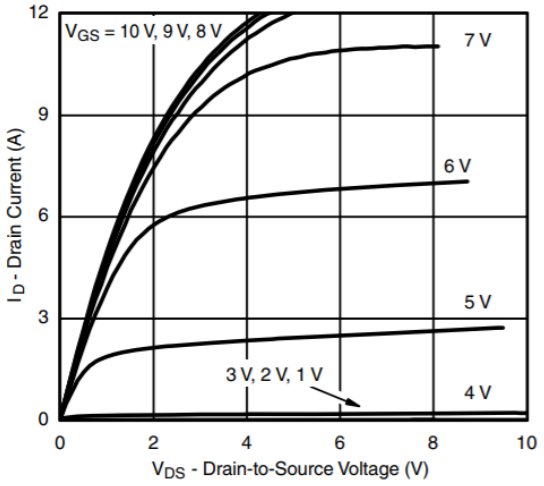
Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

parameter		symbol	limit	unit
Drain-Source Voltage		V_{DSS}	110	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current —Continuous	(Note 1a)	I_D	2.5	A
—Pulsed			10	
Maximum Power Dissipation	(Note 1a)	P_D	1.6	W
	(Note 1b)		0.8	
Operating and Storage Junction Temperature Range		T_J,T_{STG}	-55 to +150	℃

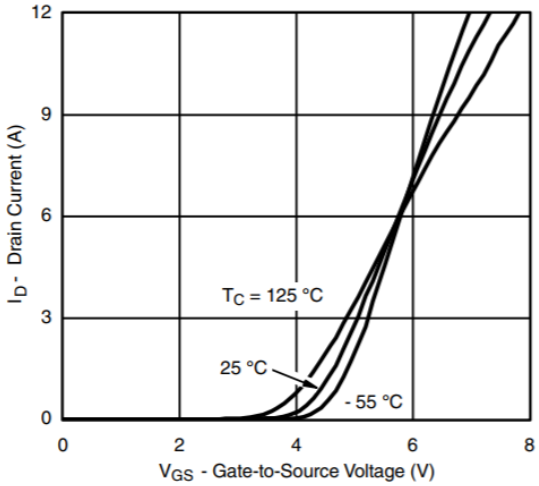
Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	110	-	-	V
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	VD=20V,Id=0.1A,V_{GS}=20V,PT=30mS,DT=50uS,I_M=10mA	-	80	200	mV/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=110V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage, Forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V	-	-	100	nA
Gate-Body Leakage, Reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V	-	-	-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.6	2.2	V
Gate Threshold Voltage Temperature Coefficient	$\triangle V_{GS(th)}/\triangle T_J$	I_D=250μA, Referenced to 25℃	-	-6	-	mV/℃
Static Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.5A	-	225	250	mΩ
		V_{GS}=4.5V, I_D=2.5A		245	280	
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=10V	2.5	-	-	A
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=2.6A	-	10	-	S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=55V ,V_{GS}=0V f=1.0MHz	-	190	-	pF
Output Capacitance	C_{OSS}		-	22	-	
Reverse Transfer Capacitance	C_{RSS}		-	13	-	
Gate Resistance	R_G		0.1	1.35	3.0	Ω
Switching Characteristics						
Turn-on Delay Time	$t_{D(ON)}$	V_{DD}=55V R_L=39 ohm V_{GS}=10V R_G=1ohm	-	6	-	ns
Turn-on Rise time	t_r		-	10	-	
Turn-off delay time	$t_{D(OFF)}$		-	10	-	
Turn-off Fall time	t_f		-	6	-	
Total Gate Charge	Q_g	V_{DS}=55V I_D=2.5A V_{GS}=10V	-	3.3	-	nC
Gate-Source Charge	Q_{gs}		-	0.47	-	
Gate-Drain Charge	Q_{gd}		-	1.45	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Current	IS		-	-	2.5	A
Drain-Source Diode Forward Voltage	V_{SD}	I_{SD} = 2.5A, V_{GS} = 0V	-	0.76	1.2	V
Reverse Recovery Time	trr	I_F = 2.5A, d_{IF}/d_t = 100A/μs		40	-	ns
Reverse Recovery Charge	Qrr			22	-	nC
Thermal Characteristics						
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$		-	78	-	ºC /W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		-	30	-	ºC /W

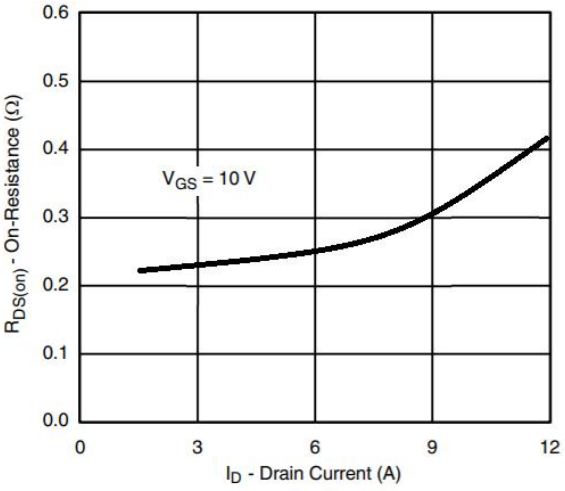
Typical Performance Characteristics



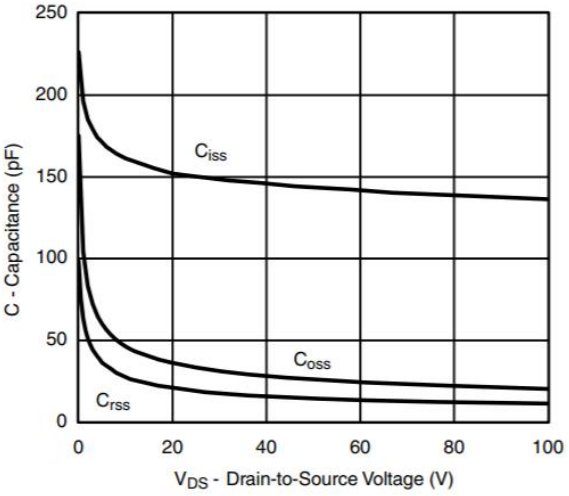
Output Characteristics



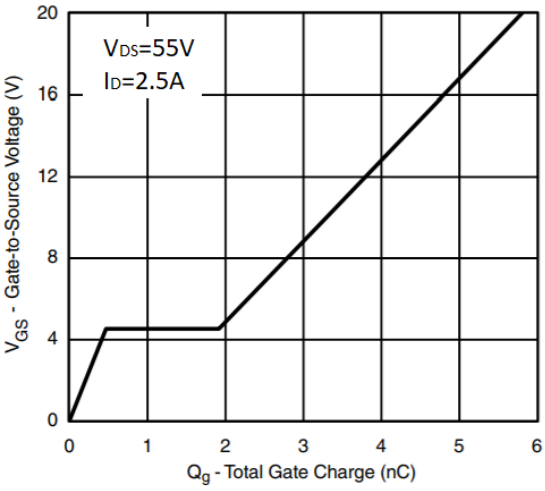
Transfer Characteristics



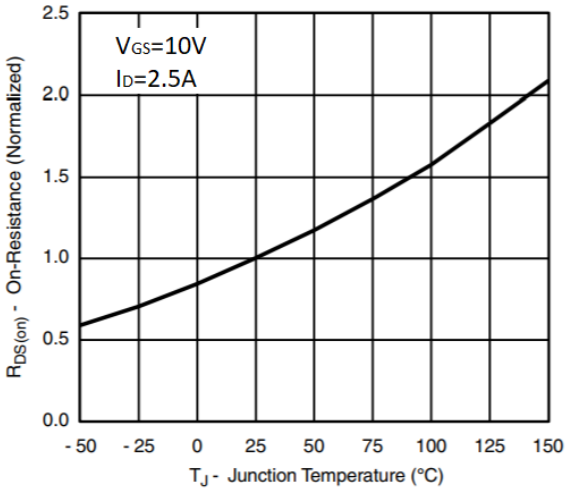
On-Resistance vs. Drain Current



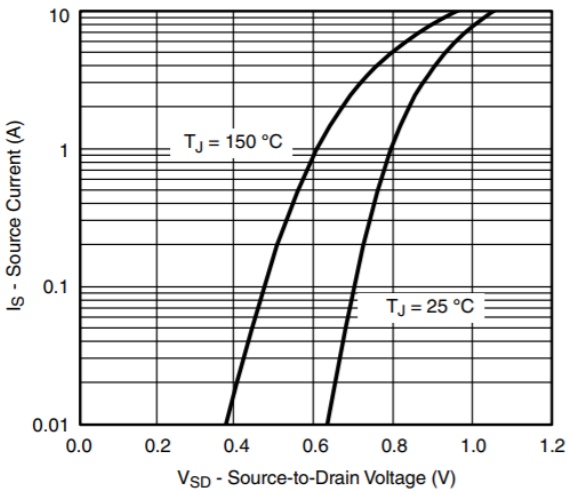
Capacitance



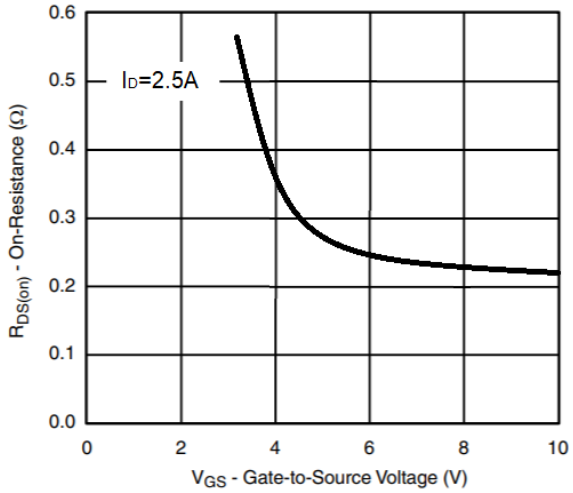
Gate Charge



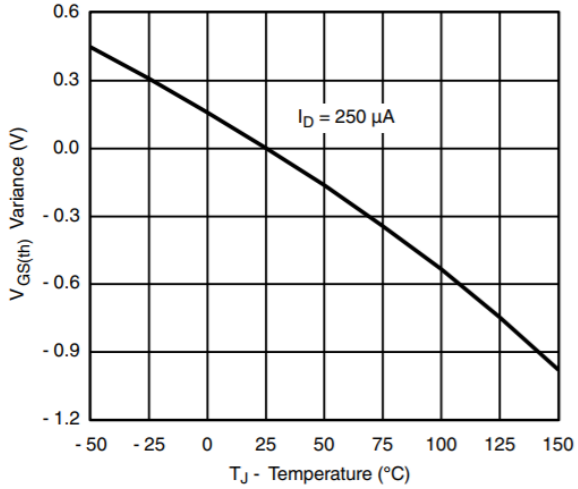
On-Resistance vs. Junction Temperature



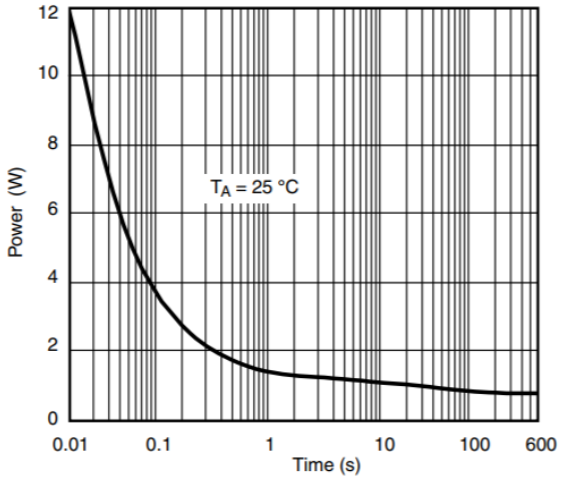
Source-Drain Diode Forward Voltage



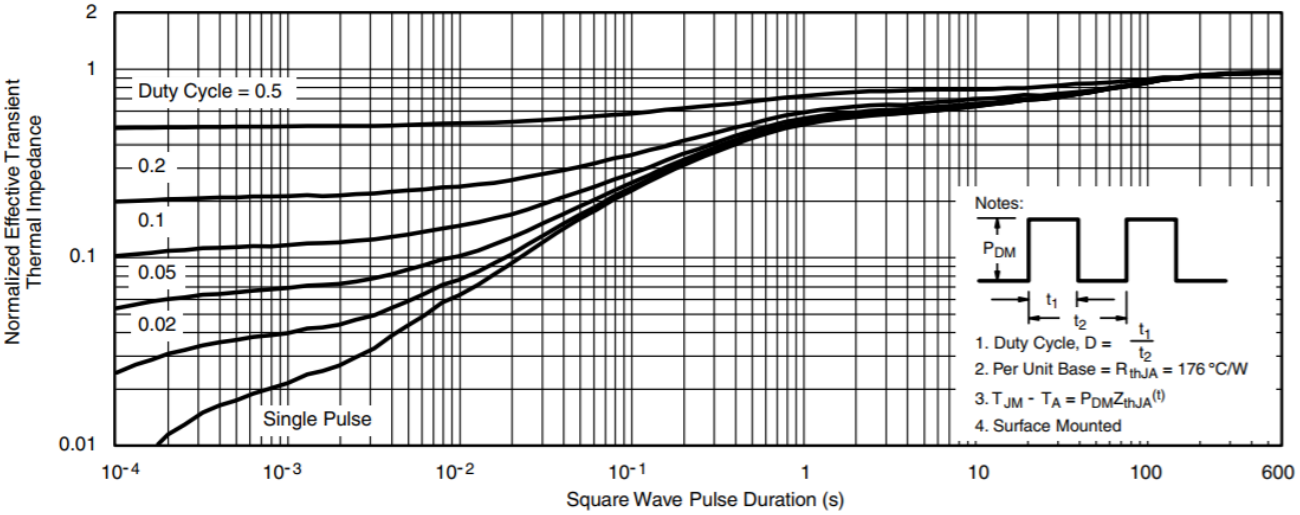
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



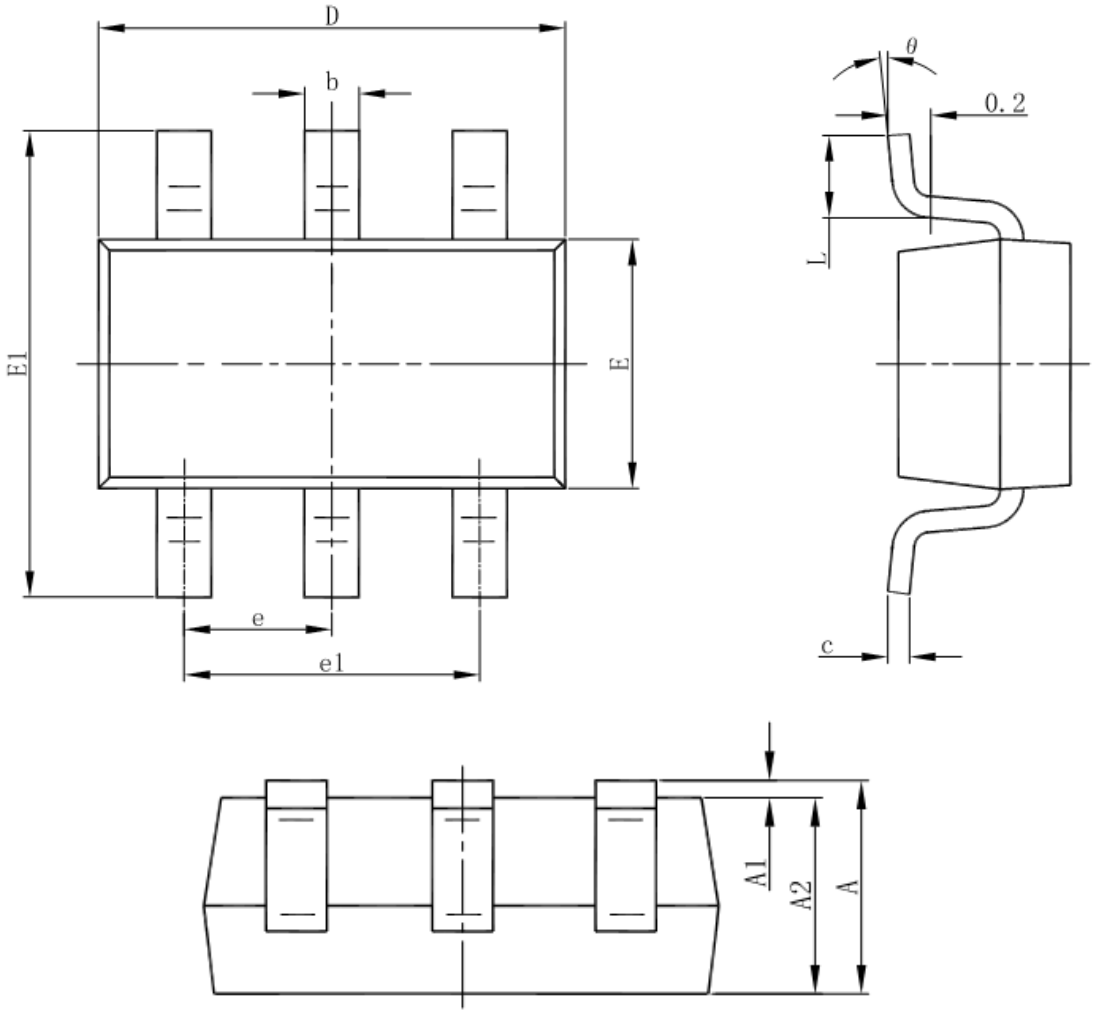
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

Package Information

- **SOT-23-6L**



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°