

110V N-Channel Enhancement Mode MOSFET

Description

The PECN1102 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

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

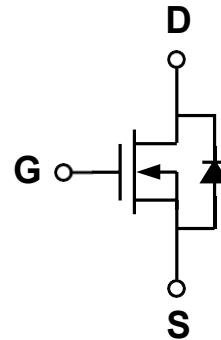
Application

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

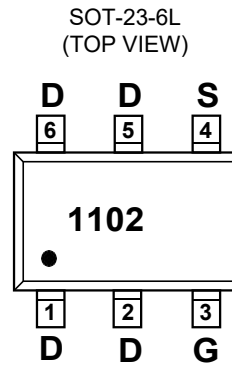
Package

- ◆ SOT-23-6L

Schematic diagram



Marking and pin assignment



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN1102M R	-55°C to +150°C	SOT-23-6L	3000

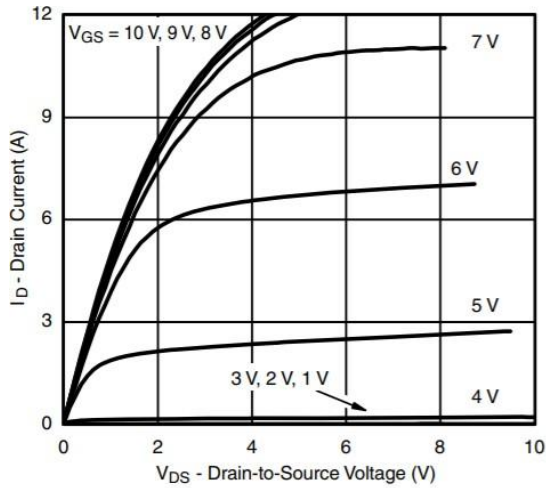
Absolute Maximum Ratings (TA=25°C unless otherwise noted)

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) (Note 1b)	P_D	1.6	W
		0.8	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	°C

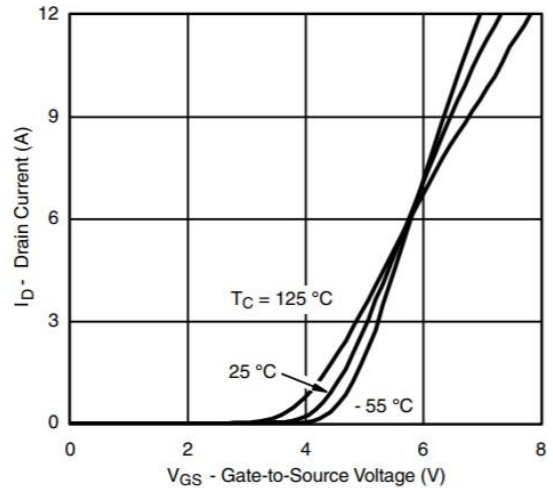
Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	110	-	-	V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$V_D=20V, I_D=0.1A, V_{GS}=20V, P_T=30mS, D_T=50\mu S, I_M=10mA$	-	80	200	mV/°C
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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2.2	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	$I_D=250\mu A$, Referenced to 25°C	-	-6	-	mV/°C
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	$t_{D(on)}$	$V_{DD}=55V$ $R_L=39\text{ ohm}$ $V_{GS}=10V$ $R_G=1\text{ohm}$	-	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	I_S		-	-	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	t_{rr}	$I_F = 2.5A,$ $dI_F/dt = 100A/\mu s$		40	-	ns
Reverse Recovery Charge	Q_{rr}				22	-
Thermal Characteristics						
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$		-	78	-	°C /W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		-	30	-	°C /W

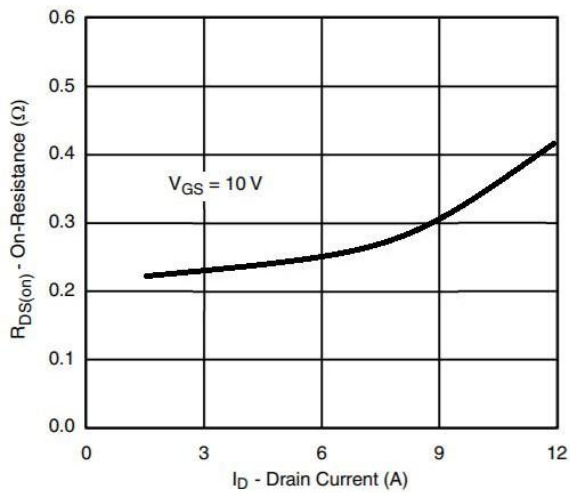
Typical Performance Characteristics



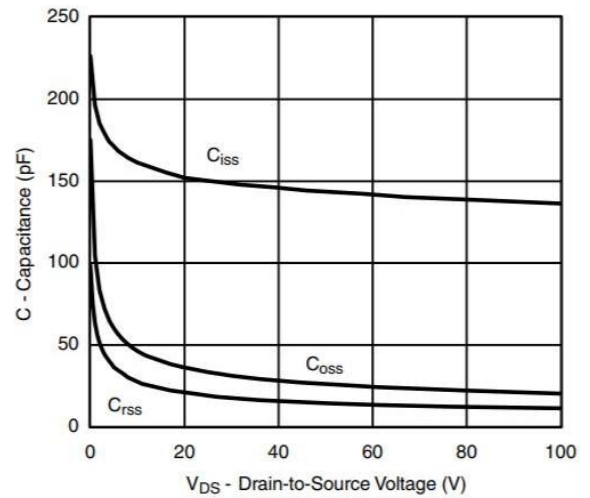
Output Characteristics



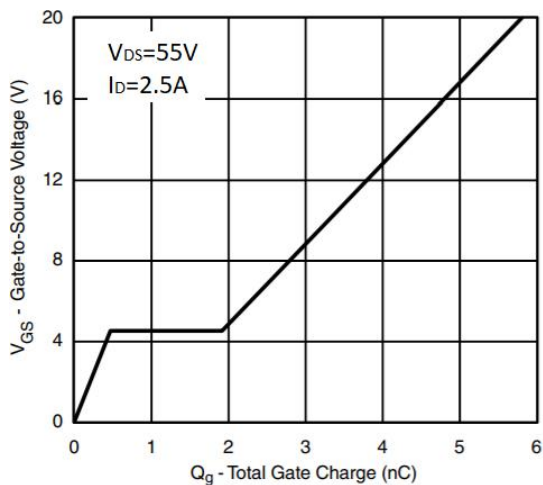
Transfer Characteristics



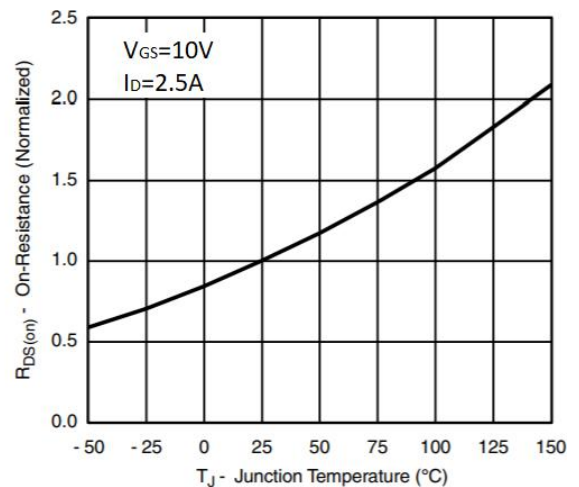
On-Resistance vs. Drain Current



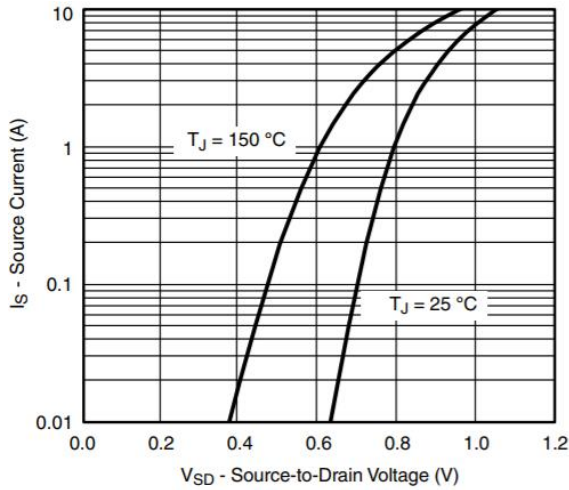
Capacitance



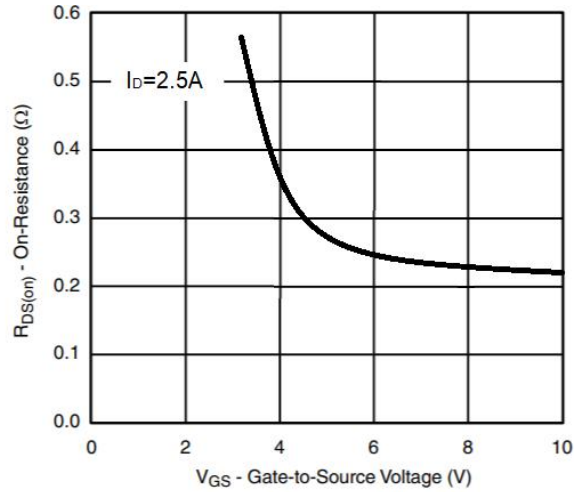
Gate Charge



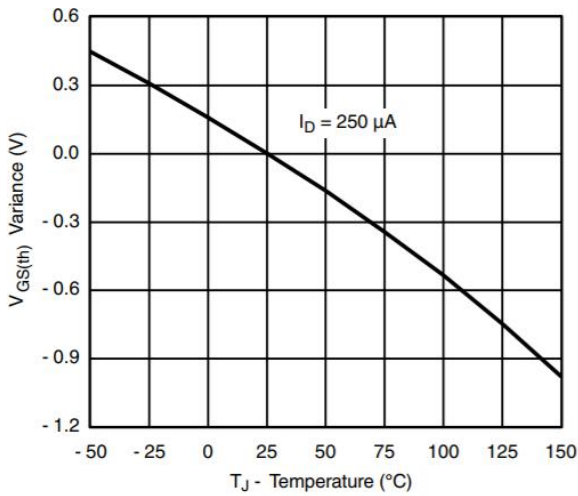
On-Resistance vs. Junction Temperature



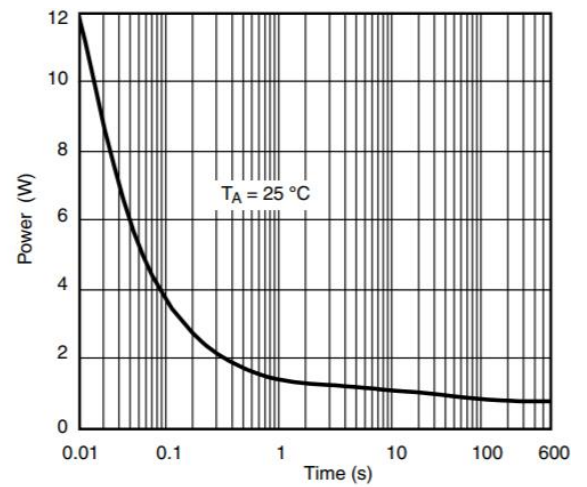
Source-Drain Diode Forward Voltage



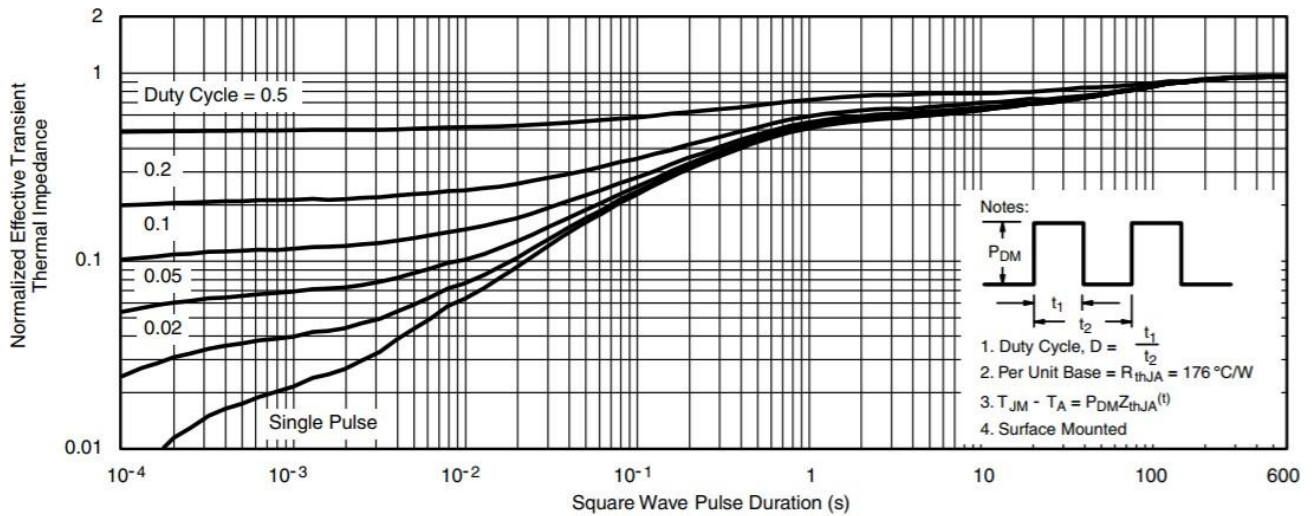
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



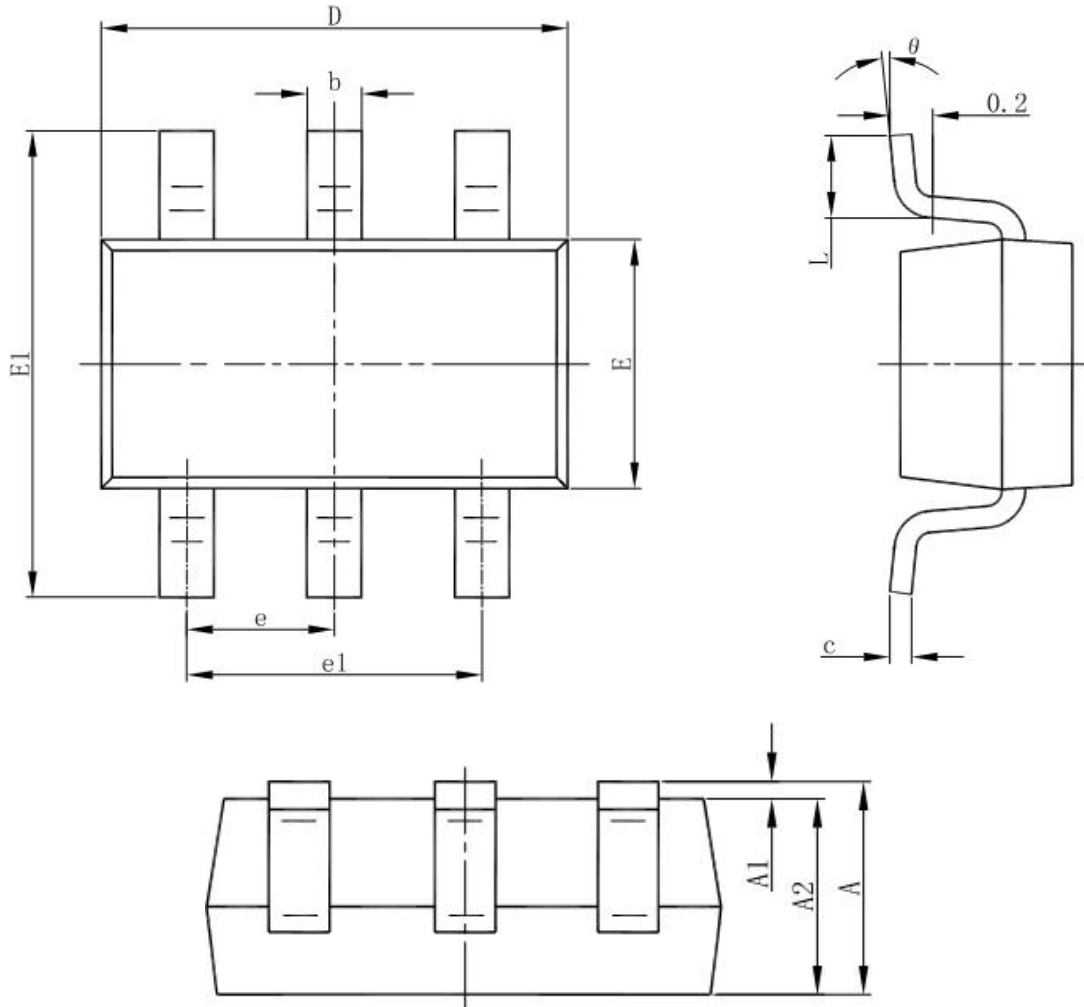
Single Pulse Power



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°