

N-Channel Enhancement Mode Power MOSFET

DESCRIPTION

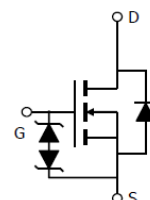
The PE1012A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

GENERAL FEATURES

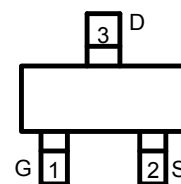
- $V_{DS} = 20V, I_D = 0.8A$
- $R_{DS(ON)} < 300m\Omega @ V_{GS}=4.5V$
- $R_{DS(ON)} < 350m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} < 600m\Omega @ V_{GS}=1.8V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23 top view

Absolute Maximum Ratings

($T_A=25^\circ C$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate -Source Voltage	V_{GSS}	± 10	V
Continuous Drain Current($T_J=150^\circ C$)	I_D	0.8	A
		0.4	
Pulsed Drain Current	I_{DM}	2.8	A
Continuous Source Current(Diode Conduction)	I_S	0.8	A
Power Dissipation	P_D	0.5	W
		0.2	
Operating Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{STG}	-55/150	$^\circ C$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^\circ C/W$

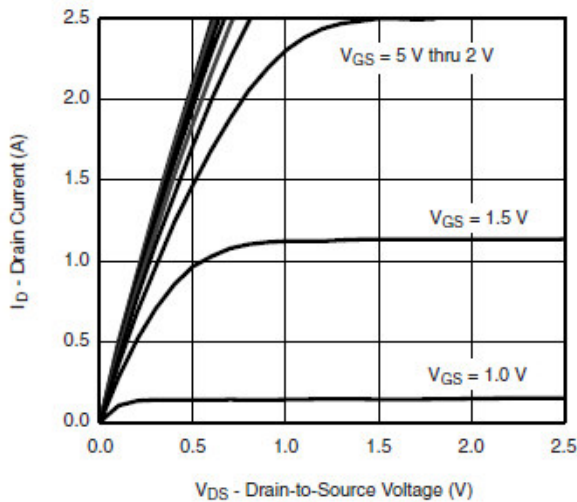
Electrical Characteristics (T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.3		0.8	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	uA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	uA
		V _{DS} =16V, V _{GS} =0V T _J =85°C			5	
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 5V, V _{GS} =4.5V	0.8			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =0.8A		220	300	mΩ
		V _{GS} =2.5V, I _D =0.5A		260	350	
		V _{GS} =1.8V, I _D =0.3A		500	600	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =0.8A		1		S
Diode Forward Voltage	V _{SD}	I _S =0.8A, V _{GS} =0V		0.65	1.2	V
Dynamic						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V f=1MHz		70		pF
Output Capacitance	C _{oss}			20		
Reverse Transfer Capacitance	C _{rss}			8		
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V I _D ≅0.8A		1.06	1.38	nC
Gate-Source Charge	Q _{gs}			0.18		
Gate-Drain Charge	Q _{gd}			0.32		
Turn-On Time	t _{d(on)}	V _{DD} =10V, R _L =20Ω I _D ≅0.8A, V _{GEN} =4.5V R _G =1Ω		18	26	ns
	t _r			20	28	
Turn-Off Time	t _{d(off)}			70	110	
	t _f			25	40	

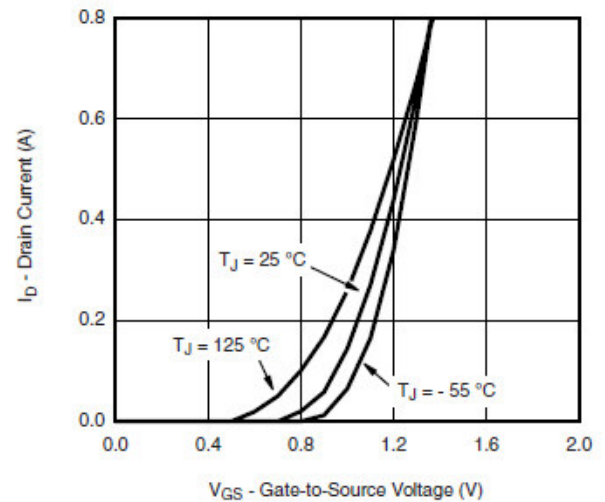
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

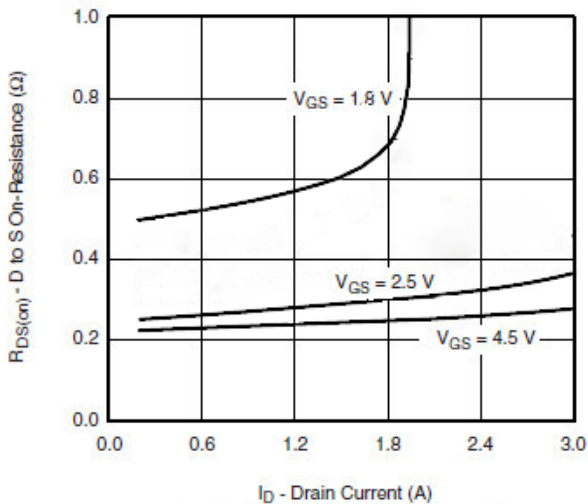
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



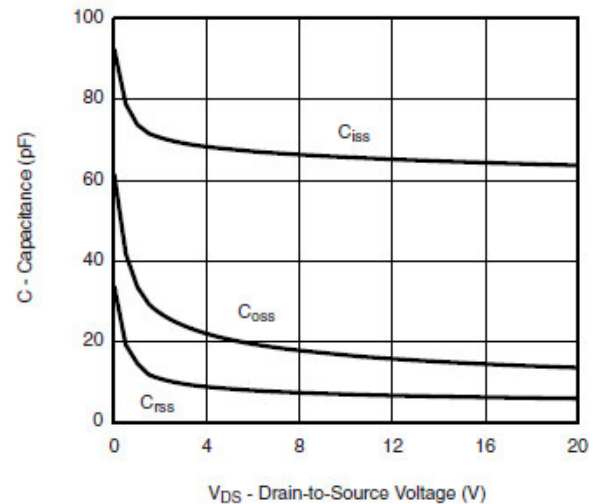
Output Characteristics



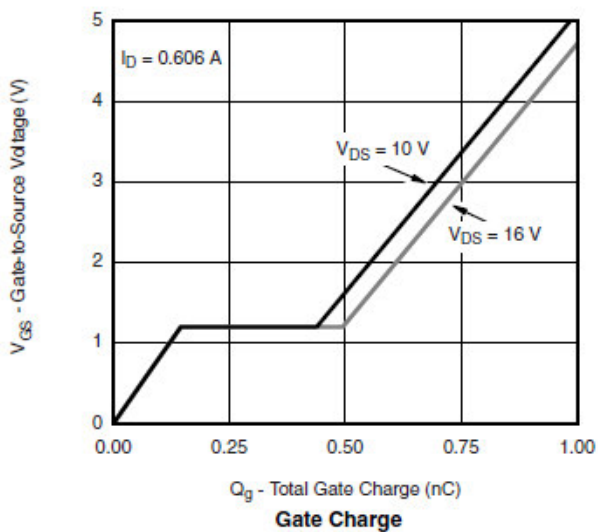
Transfer Characteristics



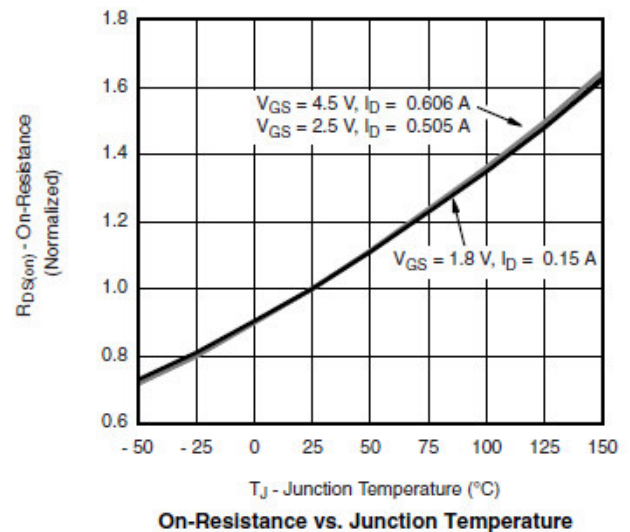
On-Resistance vs. Drain Current



Capacitance

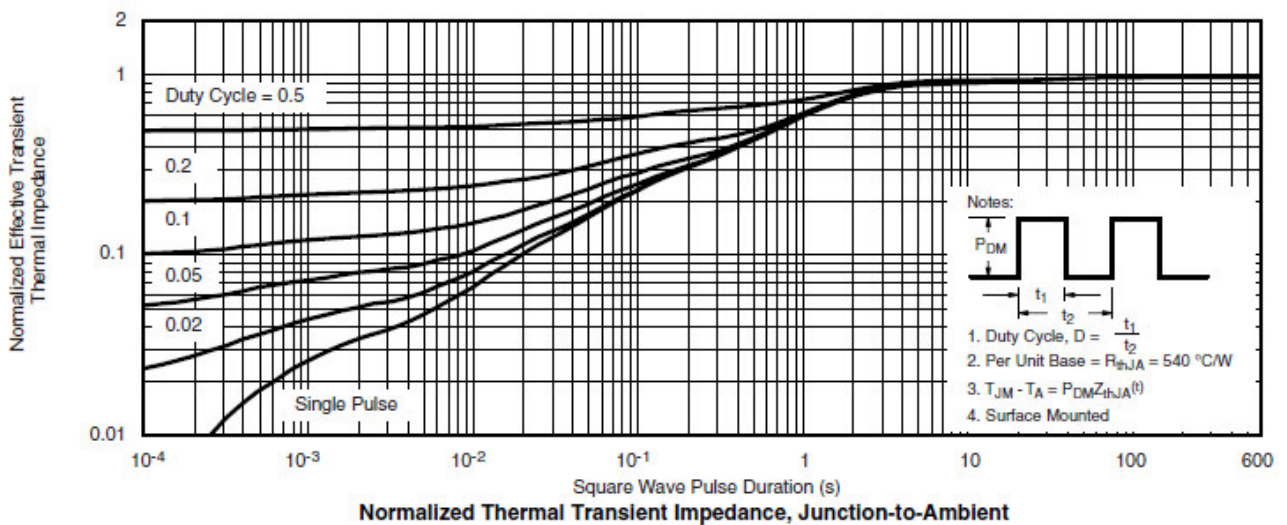
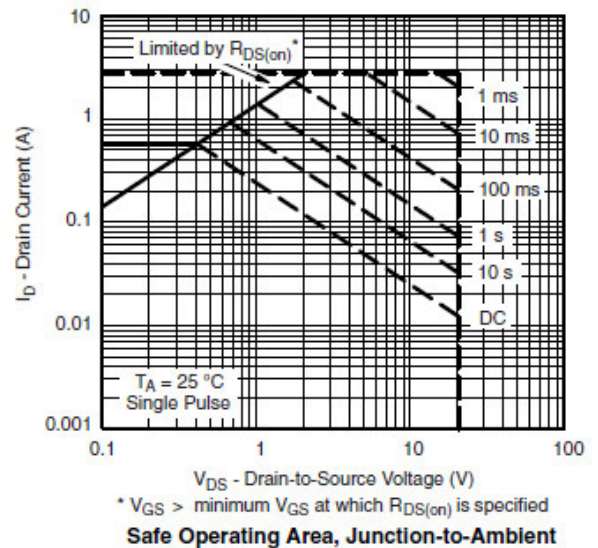
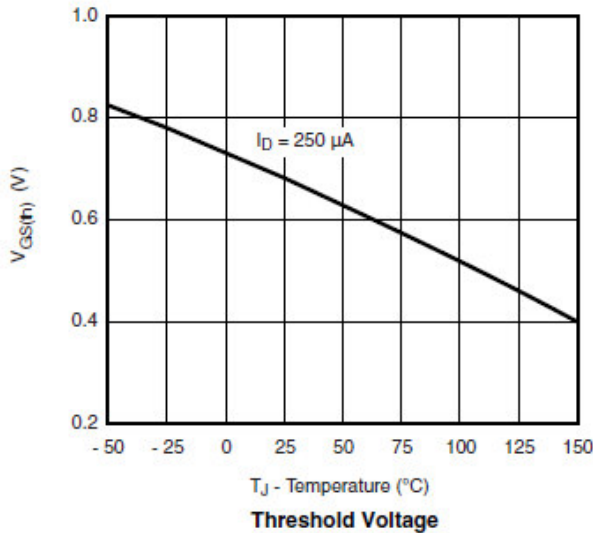
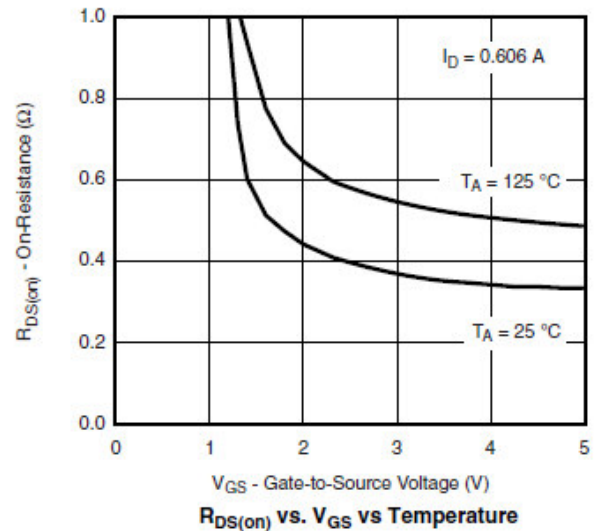
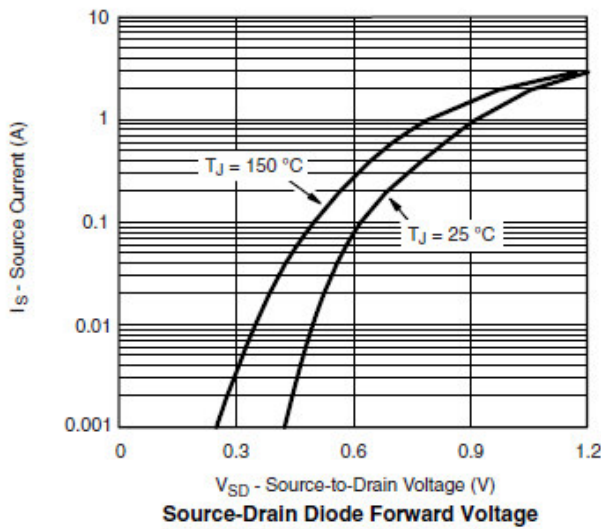


Gate Charge



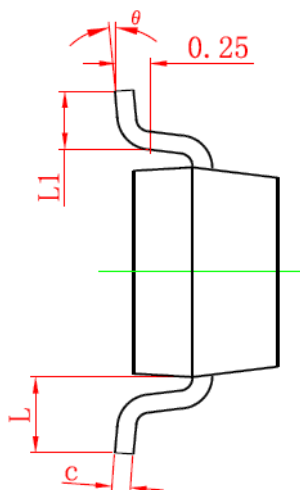
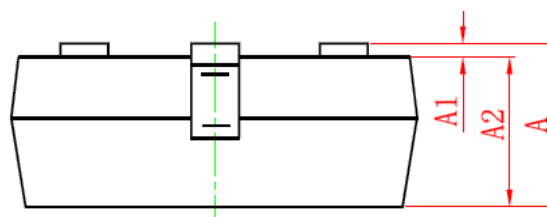
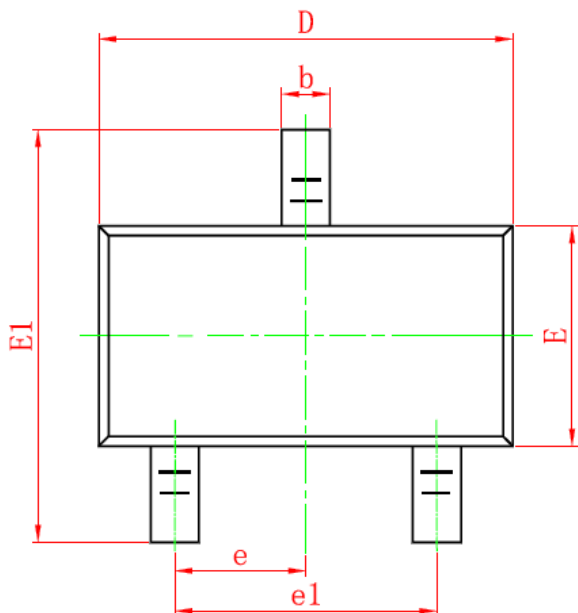
On-Resistance vs. Junction Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

NOTES

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.