

N-Channel Enhancement Mode Power MOSFET

Description

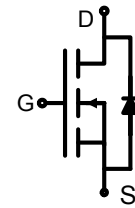
The PE0102A uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

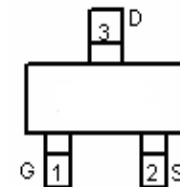
- $V_{DS} = 100V, I_D = 2A$
 $R_{DS(ON)} < 230m\Omega @ V_{GS} = 10V$ (Typ: 190m Ω)

Application

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



Schematic diagram



Marking and pin Assignment



SOT-23 top view

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	2.0	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D(100^\circ C)$	1.2	A
Pulsed Drain Current	I_{DM}	7.5	A
Maximum Power Dissipation	P_D	1.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient(Note 2)	$R_{\theta JA}$	62.5	$^\circ C/W$
---	-----------------	------	--------------

Electrical Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

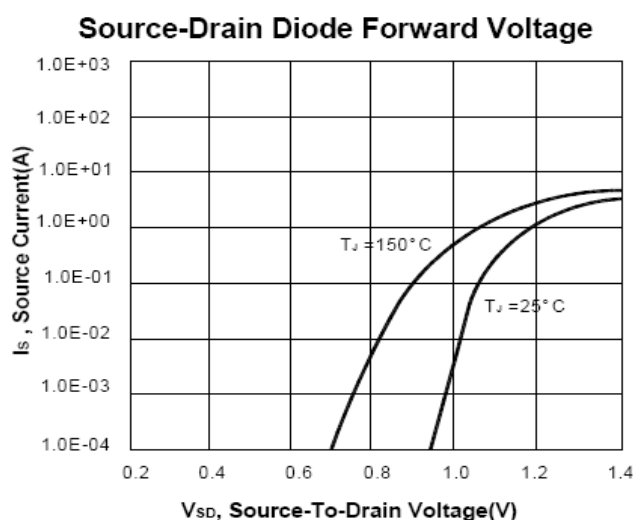
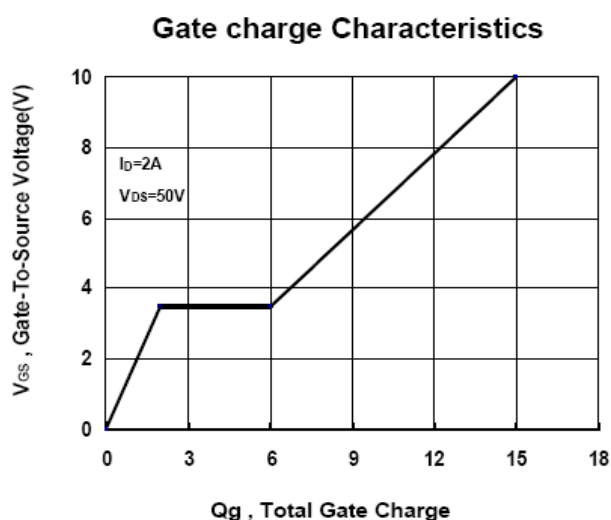
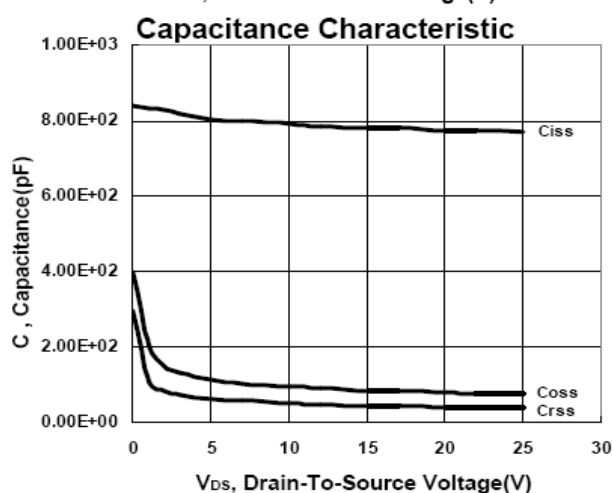
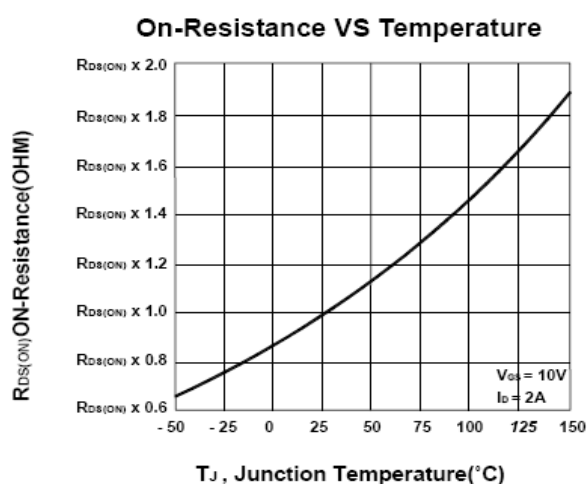
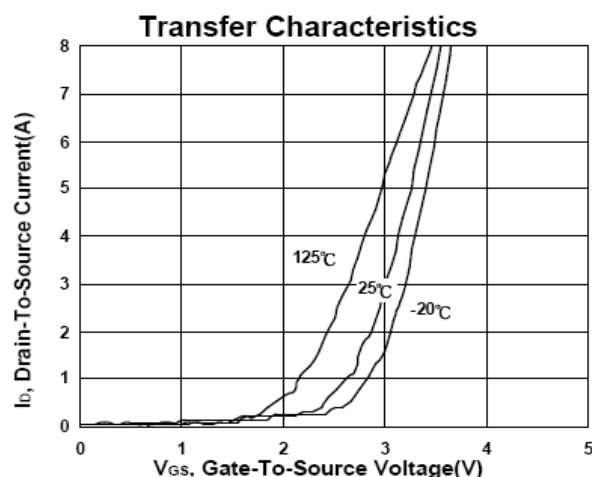
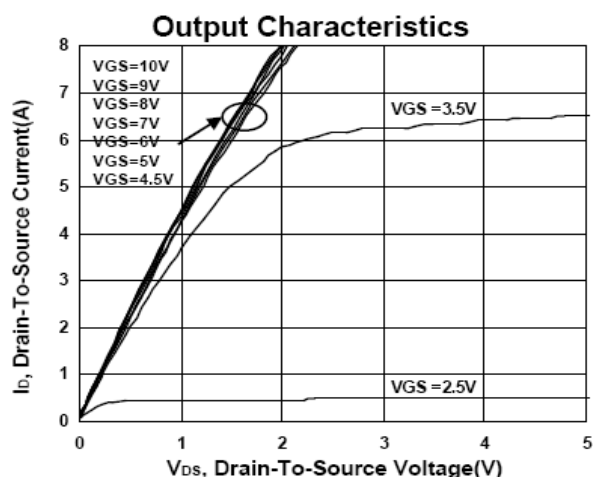
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA

Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.9	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.0A		190	230	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =2.0A	-	10	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz		802		PF
Output Capacitance	C _{oss}			80		PF
Reverse Transfer Capacitance	C _{rss}			41		PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DS} =50V, I _D =2.0A V _{GS} =10V, R _{GEN} =3Ω	-	16	-	nS
Turn-on Rise Time	t _r		-	330	-	nS
Turn-Off Delay Time	t _{d(off)}		-	39	-	nS
Turn-Off Fall Time	t _f		-	111	-	nS
Total Gate Charge	Q _g	V _{DS} =50V, I _D =2.0A, V _{GS} =10V	-	15	-	nC
Gate-Source Charge	Q _{gs}		-	2	-	nC
Gate-Drain Charge	Q _{gd}		-	4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =2.0A	-	-	1.4	V
Diode Forward Current (Note 2)	I _S		-	-	2	A

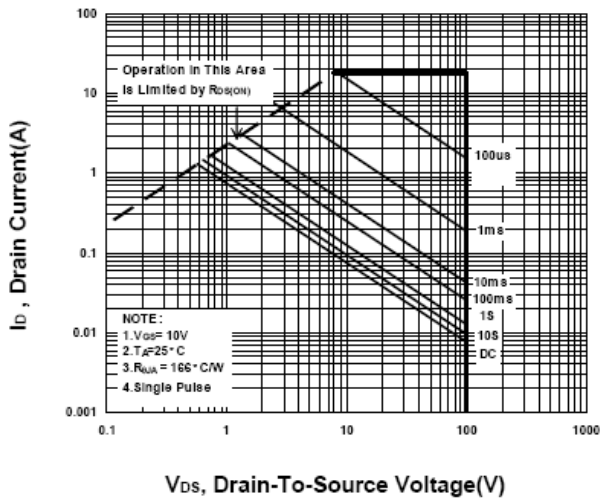
Notes:

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

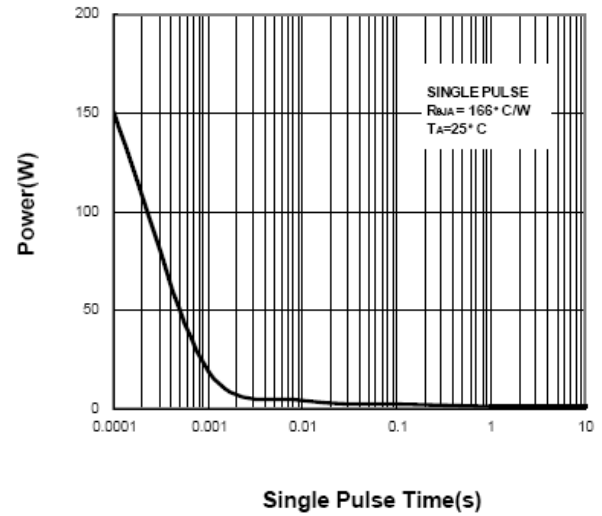
Typical Electrical and Thermal Characteristics (Curves)



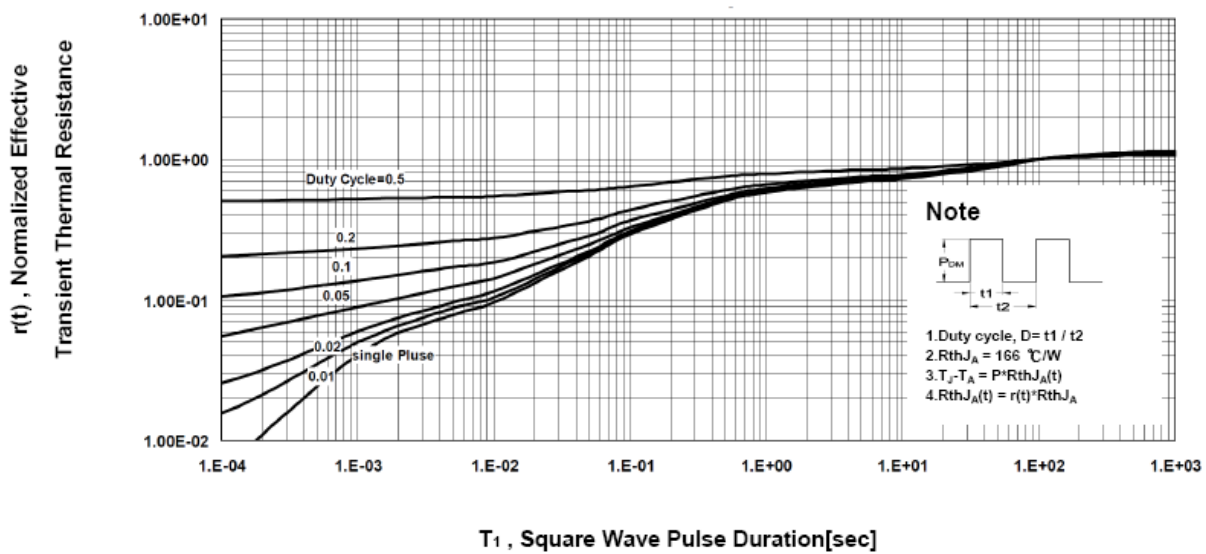
Safe Operating Area



Single Pulse Maximum Power Dissipation

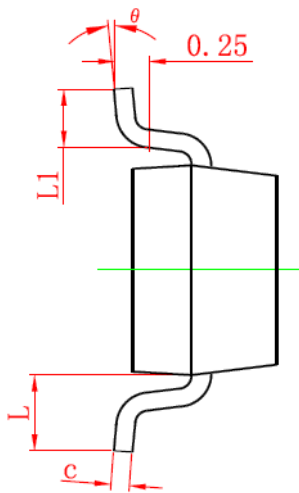
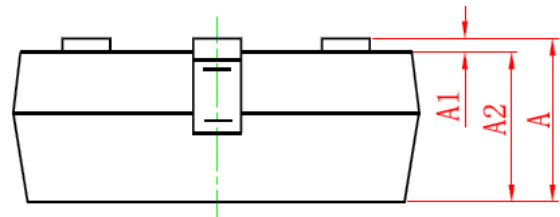
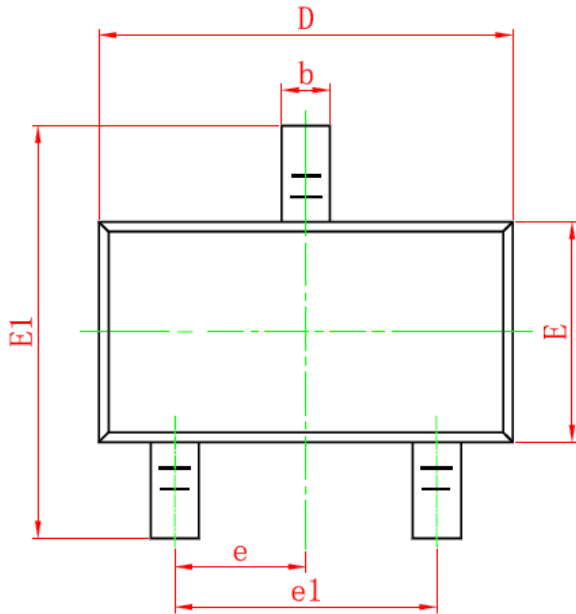


Transient Thermal Response Curve



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°