PE2306A

N-Channel Enhancement Mode Power MOSFET

Description

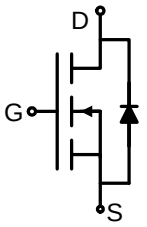
The PE2306A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltage. This device is suitable for use as a battery protection or in other switching application.

General Features

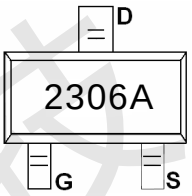
- V_{DS} > 20V,I_D =1.6A
  $R_{DS(ON)}$ <85mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ <110mΩ @ V_{GS}=2.5V
- Surface Mount Package

Application

- Load/ power switching cell phones pagers
- Power supply converter circuits



Schematic diagram



Marking and pin assignment

SOT-23 top view

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous	I_D	1.6	A
Drain Current-Pulsed (Note 1)	I_{DM}	3	A
Maximum Power Dissipation	P_D	0.75	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	166.6	℃/W

Electrical Characteristics (T_A=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	20	-	-	V

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Parameter	Symbol	Condition	Min	Typ	Max	Unit
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	100	nA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±4.5V,V_{DS}=0V	-	-	±1	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.5	0.75	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.6A	-	70	85	mΩ
		V_{GS}=2.5V, I_D=0.3A	-	90	110	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.4A	-	1	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = 10 V	-	96	-	pF
Output Capacitance	C_{oss}		-	18	-	pF
Reverse Transfer Capacitance	C_{rss}		-	9	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V = 10 V, R = 47Ω ID= 200 mA, VGEN = 4.5 V, RG = 10Ω	-	5	-	nS
Turn-on Rise Time	t_r		-	5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	nS
Turn-Off Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g	VDS = 10 V, VGS = 4.5 V, ID = 250 mA	-	800	-	pC
Gate-Source Charge	Q_{gs}		-	75	-	pC
Gate-Drain Charge	Q_{gd}		-	225	-	pC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=0.2A	-	0.75	1.2	V

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

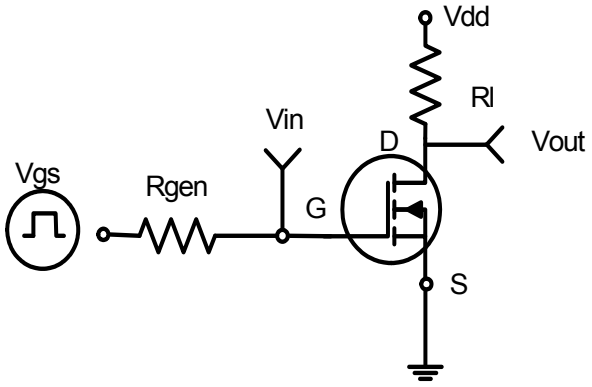

Figure 1:Switching Test Circuit

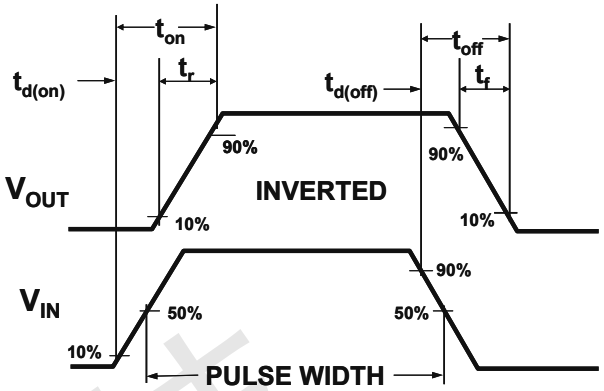

Figure 2:Switching Waveforms

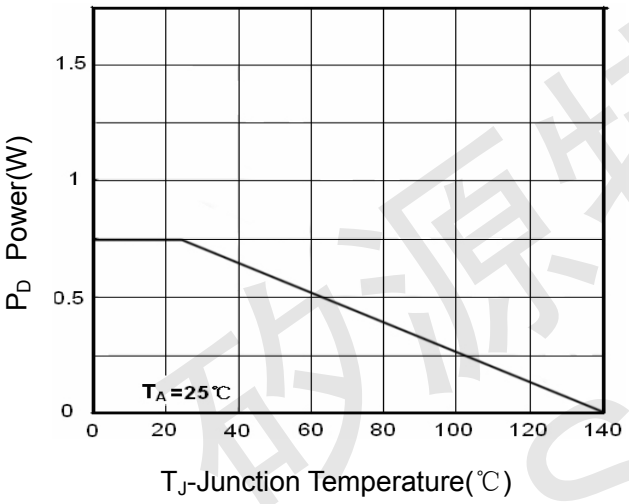

Figure 3 Power Dissipation

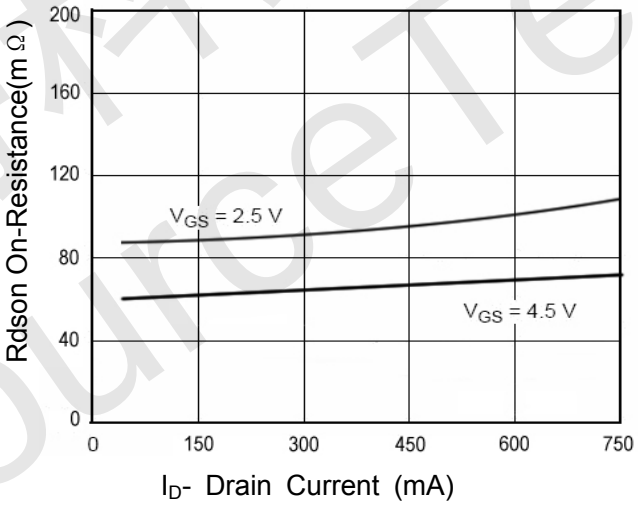

Figure 6 Drain-Source On-Resistance

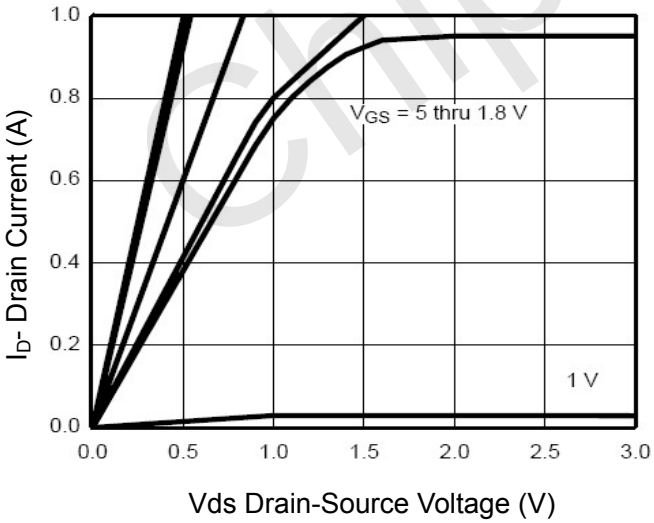

Figure 5 Output Characteristics

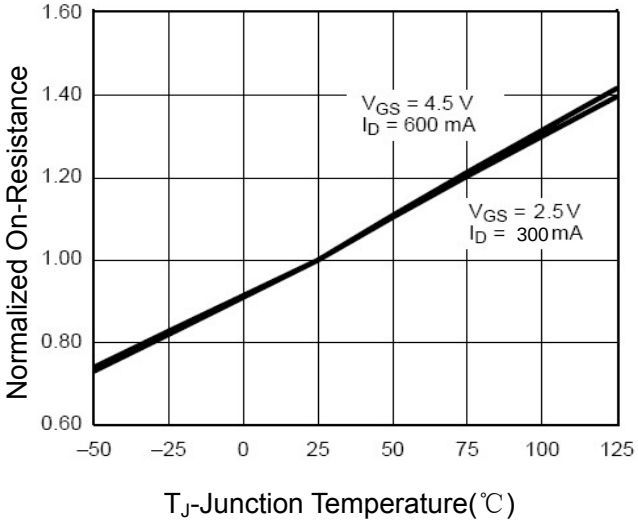

Figure 8 Drain-Source On-Resistance

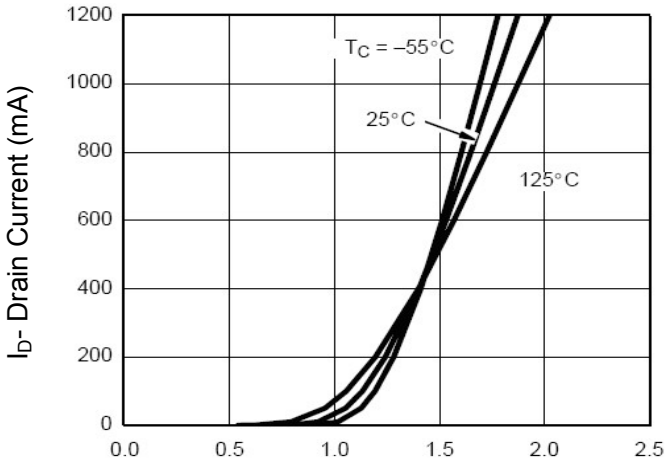

Figure 7 Transfer Characteristics

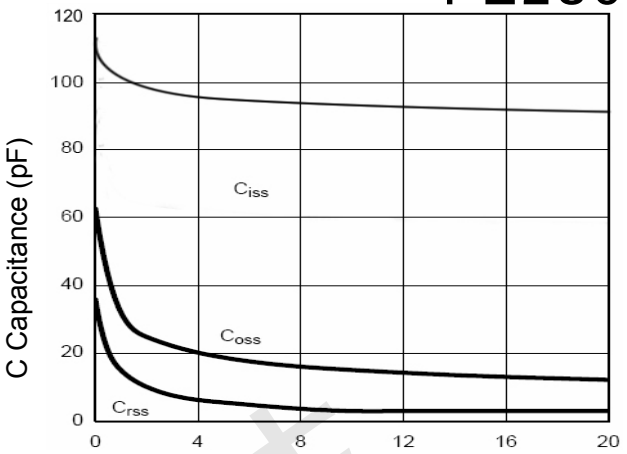

Figure 8 Capacitance vs Vds

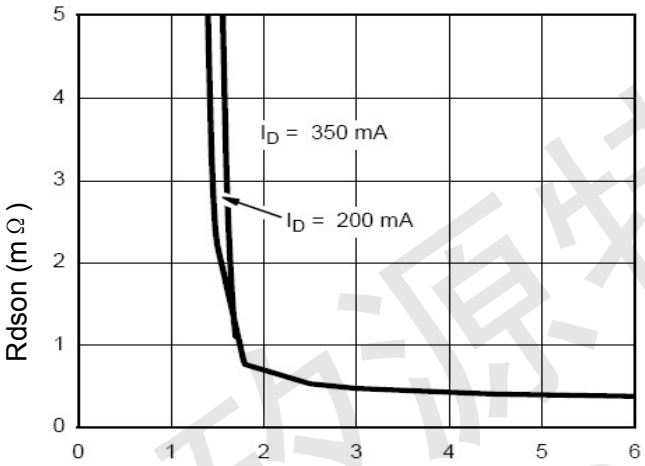

Figure 9 Rdson vs Vgs

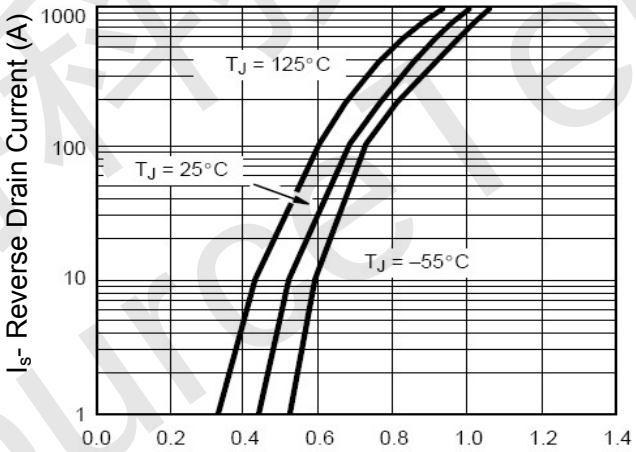

Figure 10 Capacitance vs Vds

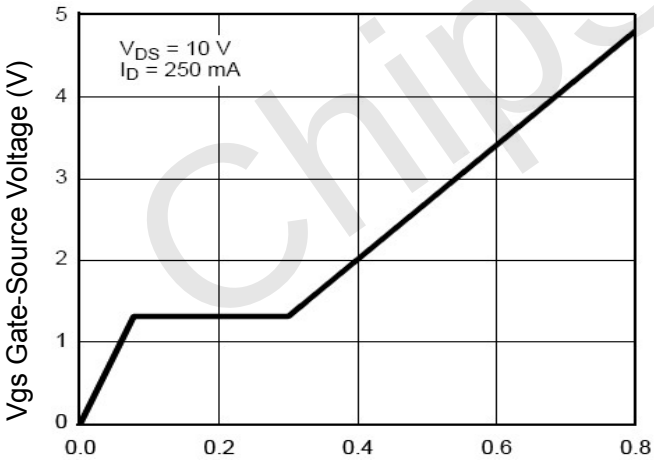

Figure 11 Gate Charge

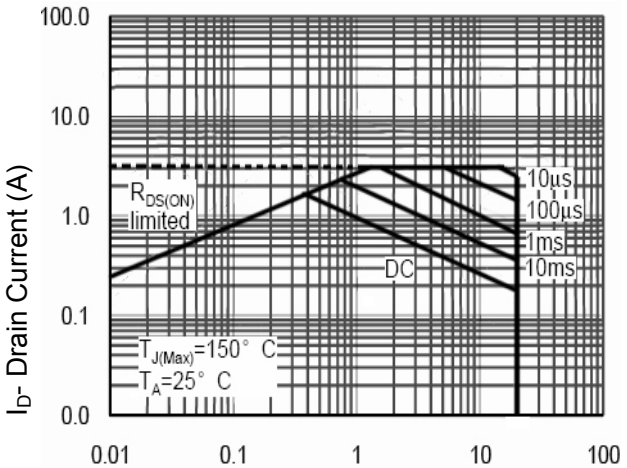

Figure 13 Safe Operation Area

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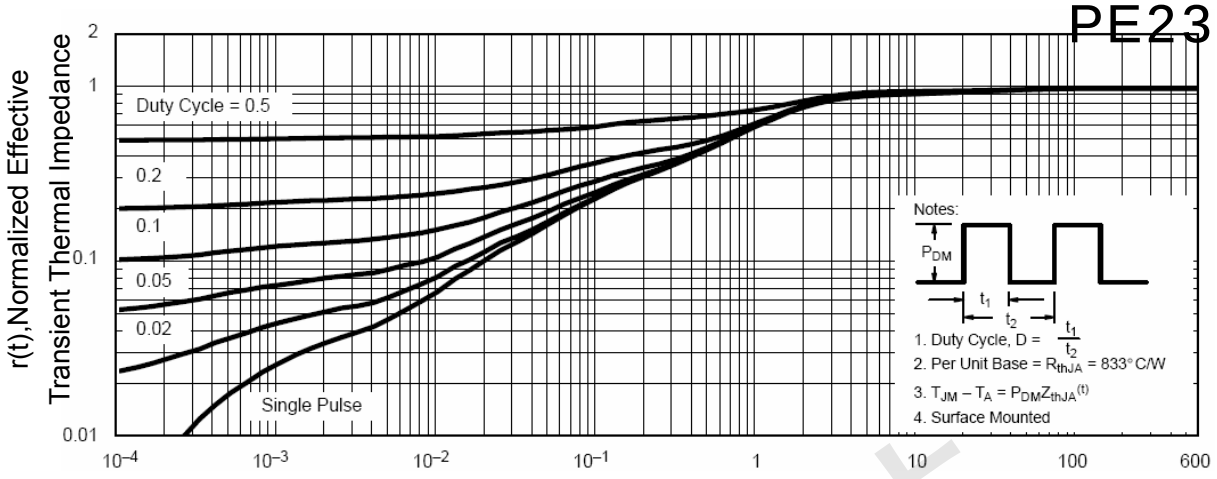
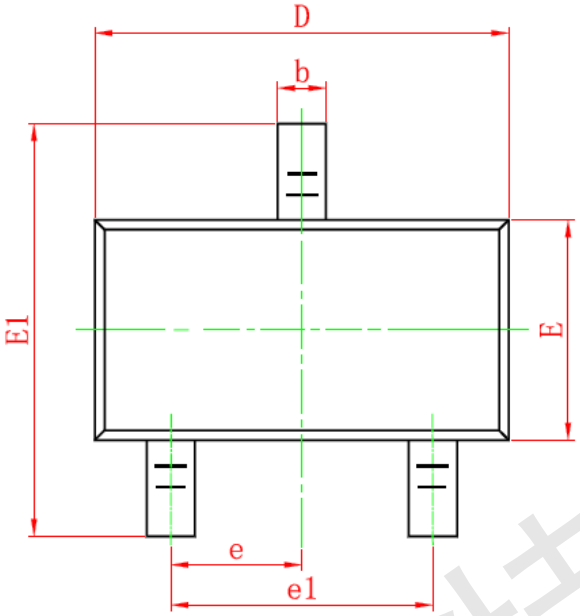


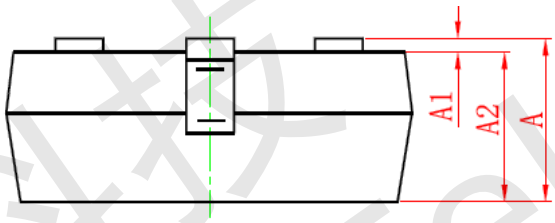
Figure 14 Normalized Maximum Transient Thermal Impedance

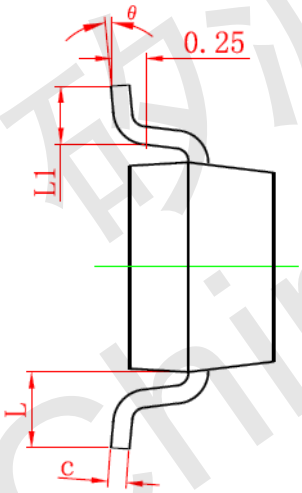
PE2306A

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°

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