



PE2306A

N-Channel Enhancement Mode Power MOSFET

Description

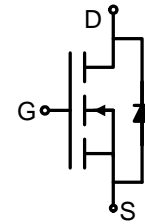
The PE2306A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltage. This device is suitable for use as a battery protection or in other switching application.

General Features

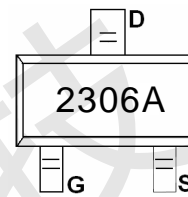
- $V_{DS} > 20V, I_D = 1.6A$
 $R_{DS(ON)} < 85m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 110m\Omega @ V_{GS}=2.5V$
- Surface Mount Package

Application

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



Schematic diagram



Marking and pin assignment



SOT-23 top view

Absolute Maximum Ratings ($T_A=25^\circ C$ 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	$^\circ C$

Thermal Characteristic

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

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}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V



PE2306A

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}	$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	-	± 1	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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	m Ω
		$V_{GS}=2.5V, I_D=0.3A$	-	90	110	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=0.4A$	-	1	-	S
Dynamic Characteristics (Note 4)						
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	$t_{d(on)}$	$V = 10 V, R = 47\Omega$ $I_D = 200 mA,$ $V_{GEN} = 4.5 V, R_G = 10\Omega$	-	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	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 250 mA$	-	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, $t \leq 10$ 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

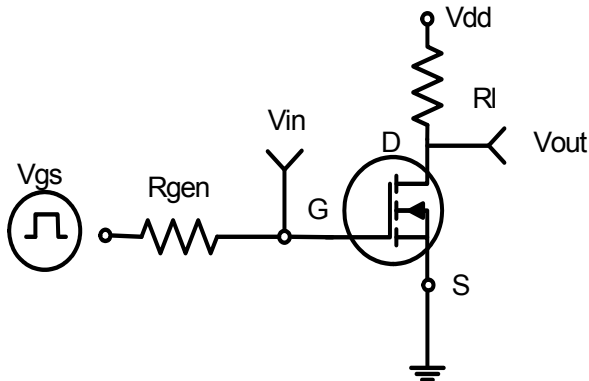


Figure 1: Switching Test Circuit

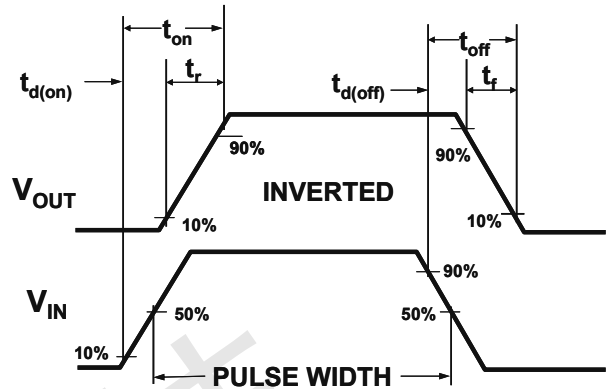


Figure 2: Switching Waveforms

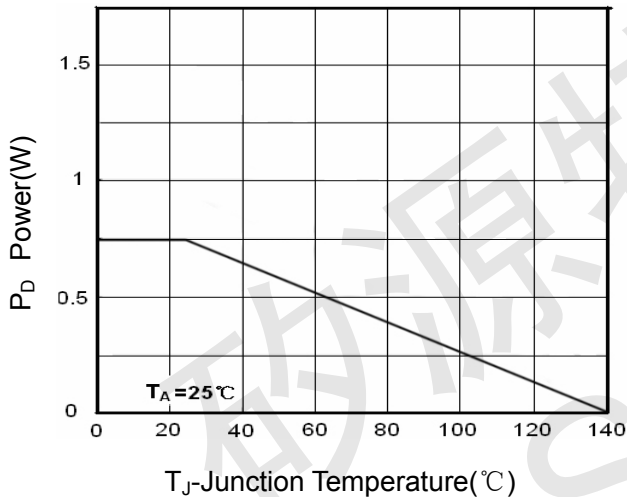


Figure 3 Power Dissipation

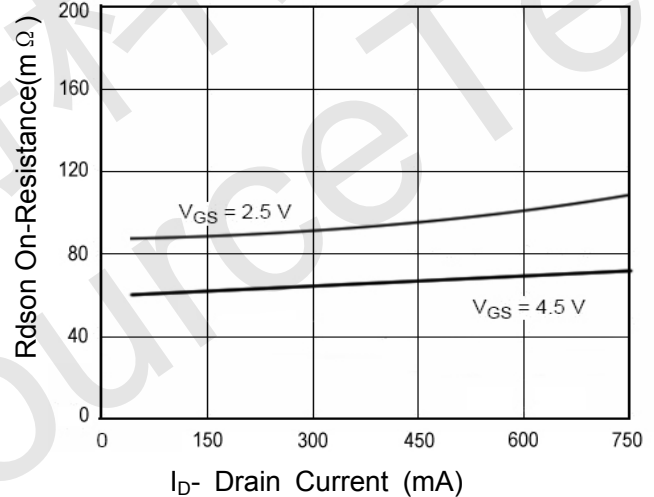


Figure 6 Drain-Source On-Resistance

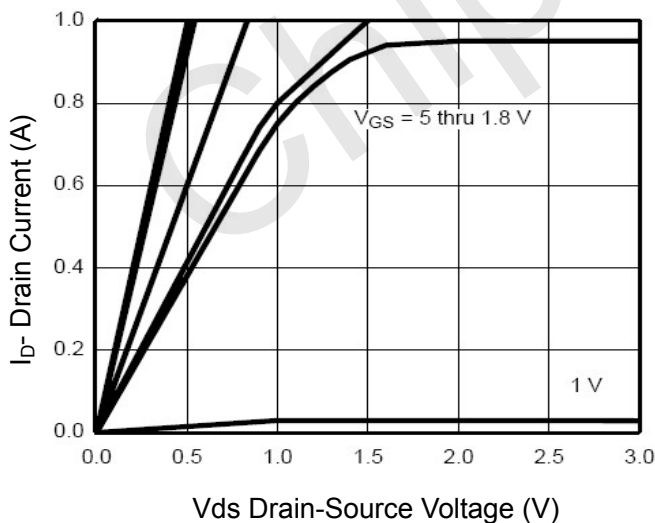


Figure 5 Output Characteristics

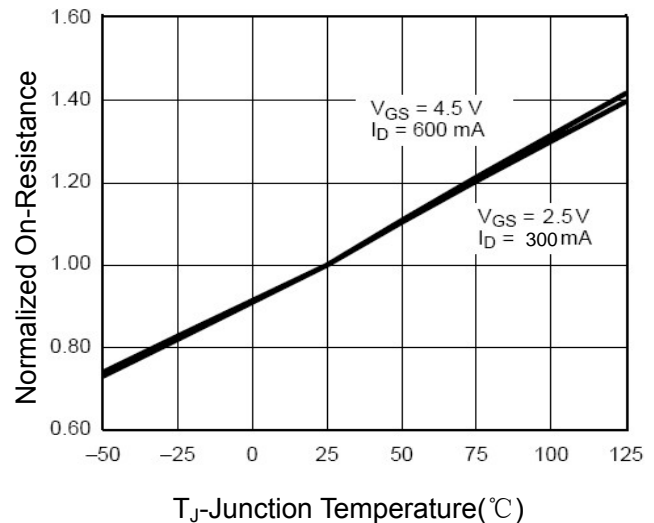
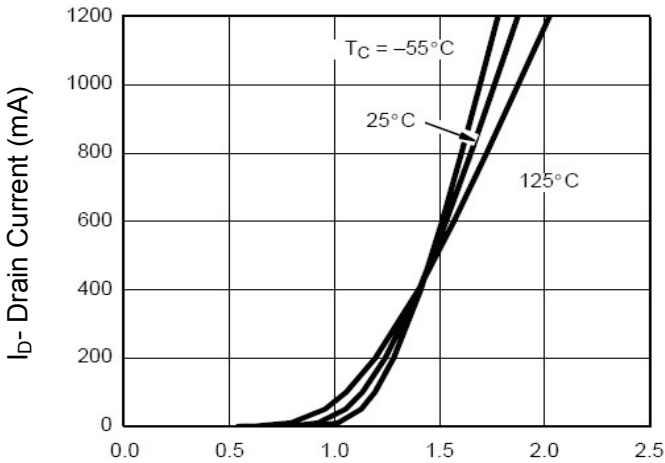


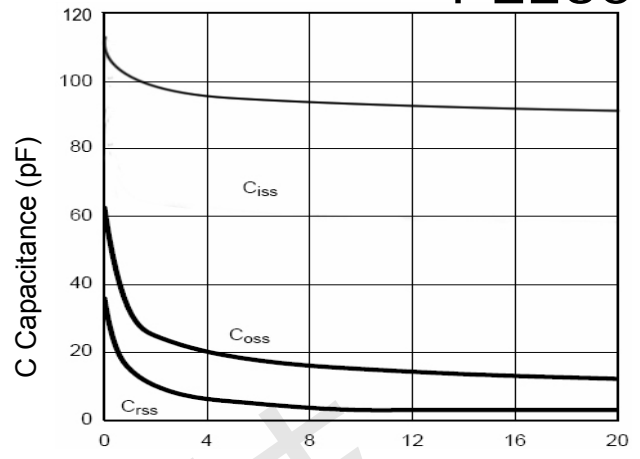
Figure 8 Drain-Source On-Resistance



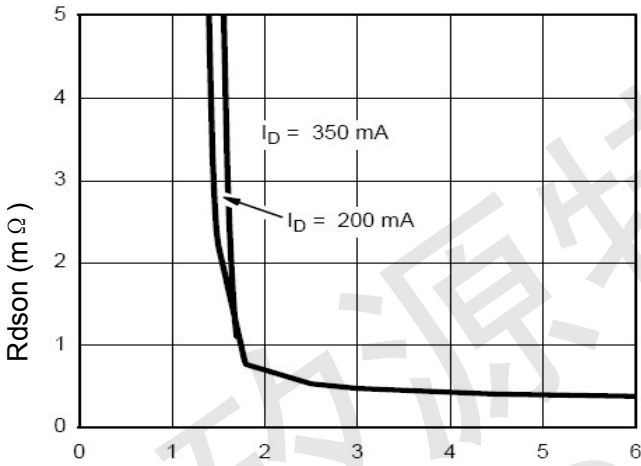
PE2306A



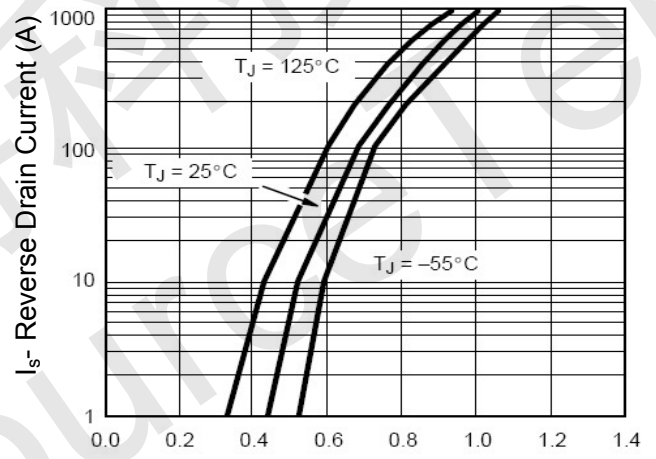
Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



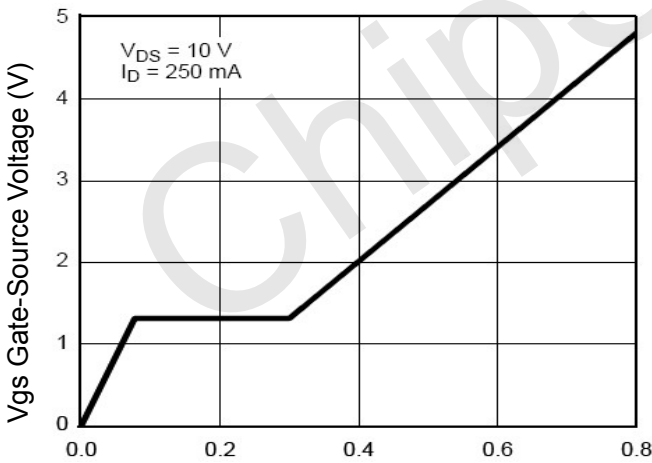
Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 11 Gate Charge

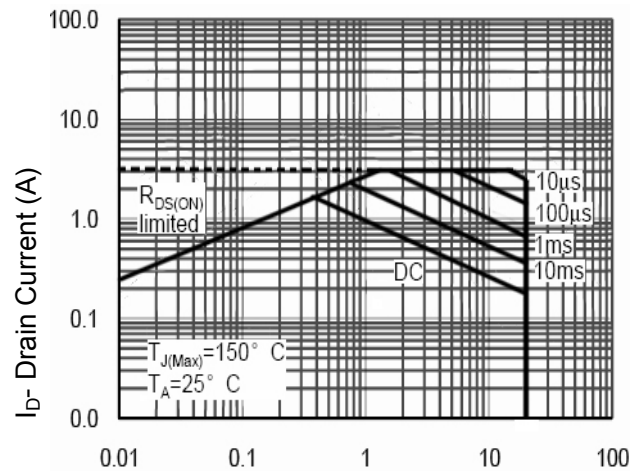


Figure 13 Safe Operation Area

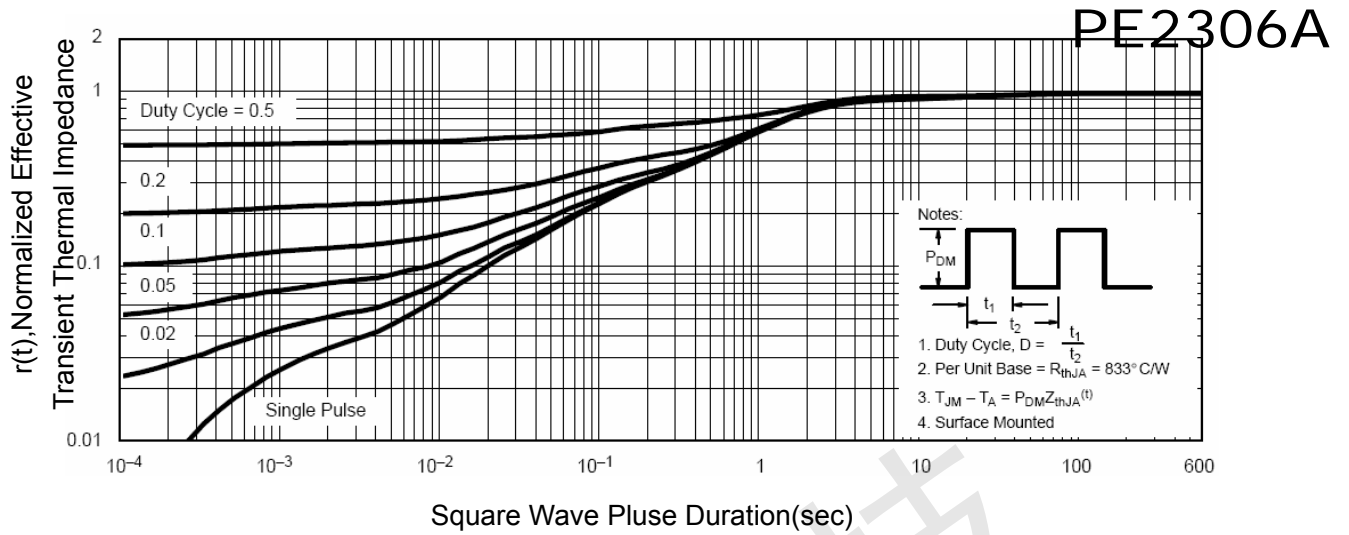


Figure 14 Normalized Maximum Transient Thermal Impedance

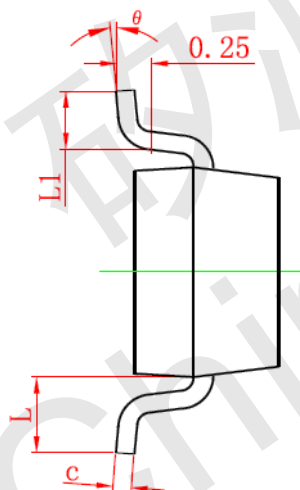
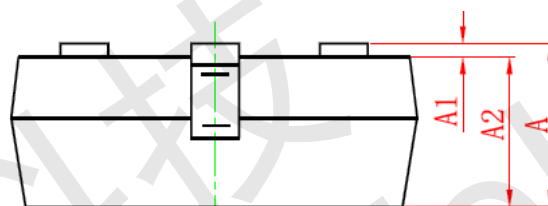
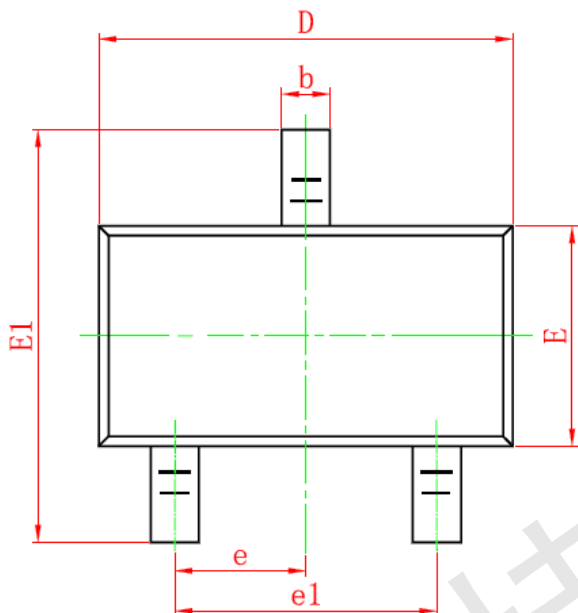
矽源特科技
ChipSourceTek



SOT-23 PACKAGE INFORMATION

PE2306A

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°