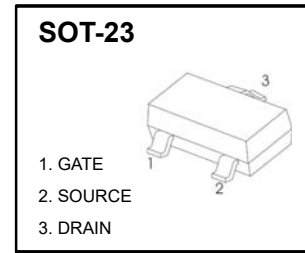


**Description**

The PAM2N10 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

**Features**

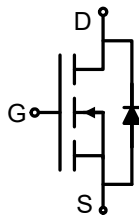
- ◆ VDS = 100V, ID = 2A  
RDS(ON) <320mΩ @ VGS=10V  
RDS(ON) <450mΩ @ VGS=4.5V
- ◆ High density cell design for ultra low Rdson
- ◆ Fully characterized avalanche voltage and current
- ◆ Excellent package for good heat dissipation



**Applications**

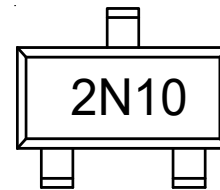
- ◆ Power switching application
- ◆ Hard switched and high frequency circuits
- ◆ Uninterruptible power supply

**Dimensions and Pin Configuration**



Circuit and Pin Schematic

**Marking Information**



Device Marking Code : 2N10

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

Parameter	ymbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous	I <sub>D</sub>	2	A
Drain Current-Pulsed <sup>(Note 1)</sup>	I <sub>DM</sub>	5	A
Maximum Power Dissipation	P <sub>D</sub>	1.25	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 To 150	°C

**Thermal Characteristic**

Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	R <sub>θJA</sub>	100	°C/W
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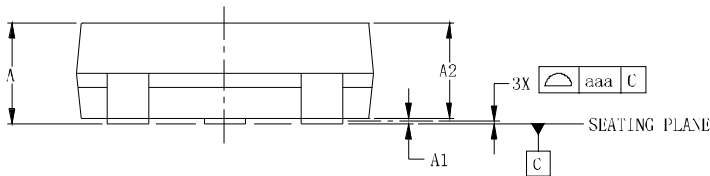
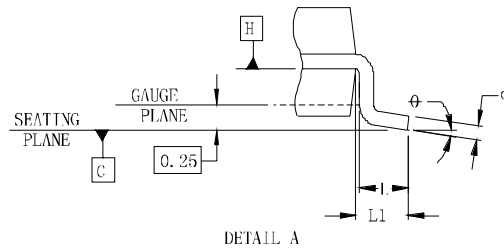
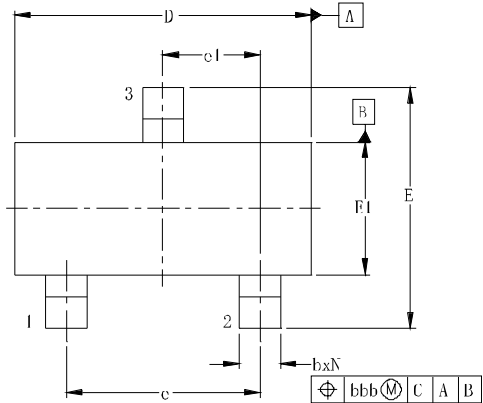
## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100		-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.80	0.95	1.60	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$	-	220	320	m $\Omega$
		$V_{GS}=4.5V, I_D=1A$	-	300	450	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=50V, I_D=1.6A$	5.7	-	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	290	-	PF
Output Capacitance	$C_{oss}$		-	27	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	13	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=50V, R_L=25\Omega$ $V_{GS}=104.5R_G=1\Omega$	-	2.2	-	nS
Turn-on Rise Time	$t_r$		-	2.1	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	9.0	-	nS
Turn-Off Fall Time	$t_f$		-	3.6	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=50V, I_D=1.6$ $A, V_{GS}=4.5V$	-	2.5	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.5	-	nC
Gate-Drain Charge	$Q_{gd}$		-	1.2	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=2A$	-	-	1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	2	A

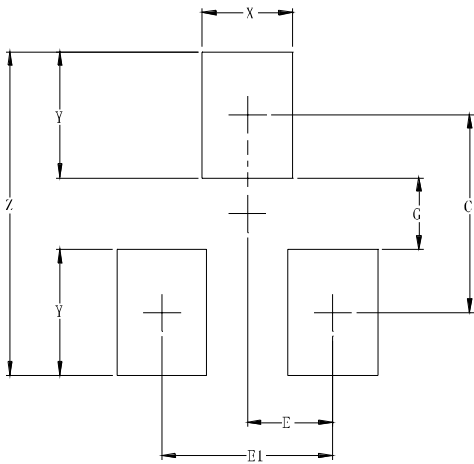
### Notes:

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

### SOT-23 Package Outline Drawing



### Suggested Land Pattern



DIMENSIONS						
SYM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	-	0.044	0.89	-	1.12
A1	0.000	-	0.004	0.01	-	0.10
A2	0.035	0.037	0.040	0.88	0.95	1.02
b	0.012	-	0.020	0.30	-	0.51
c	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	0.055	1.20	1.30	1.40
e	0.075			1.90BSC		
e1	0.037			0.95BSC		
L	0.015	0.020	0.024	0.40	0.50	0.60
L1	0.022			0.55		
N	3			3		
ϕ	0°	-	8°	0°	-	8°
aaa	0.004			0.10		
bbb	0.008			0.20		

DIMENSIONS		
SYM	INCHES	MILLIMETERS
C	0.087	2.20
E	0.037	0.95
E1	0.075	1.90
G	0.031	0.80
X	0.039	1.00
Y	0.055	1.40
Z	0.141	3.60

### Contact Information

Changzhou D-first Electronics CO.,Ltd.

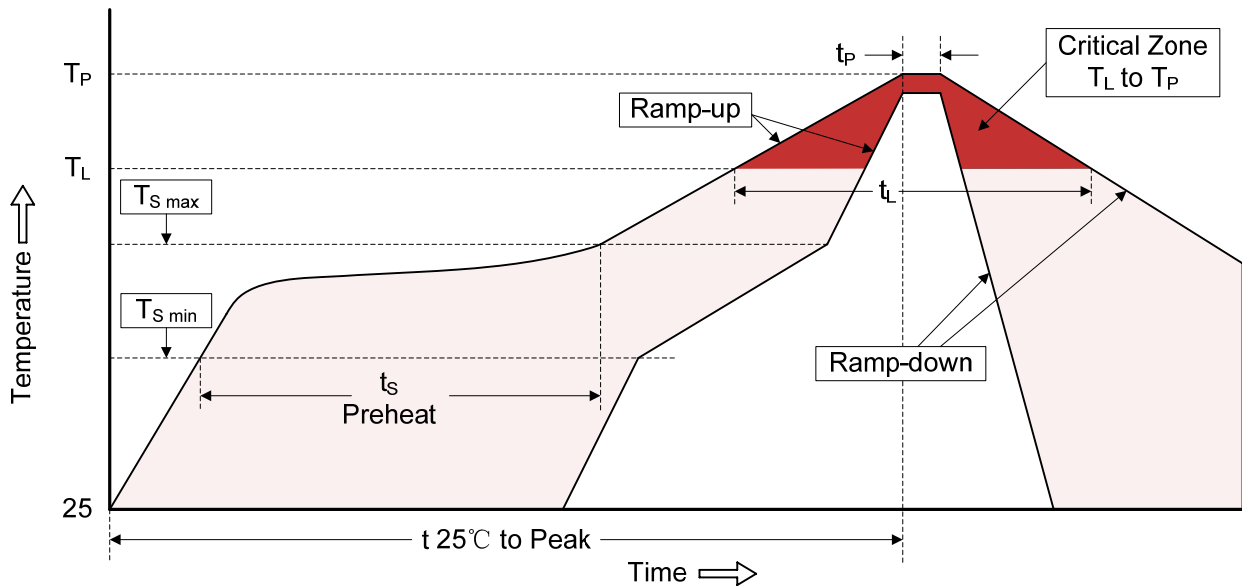
www.first-electronic.com

Email: xhf@first-electronic.cn

Phone: +86 (0519) -8817 1671

## Recommended Soldering Conditions

### Reflow Soldering



### Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T <sub>L</sub> to T <sub>P</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>S min</sub> )	150°C
-Temperature Max (T <sub>S max</sub> )	200°C
-Time (min to max) (t <sub>s</sub> )	60-180 seconds
T <sub>S max</sub> to T <sub>L</sub>	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (t <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>P</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>P</sub> )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.