



芯普科技

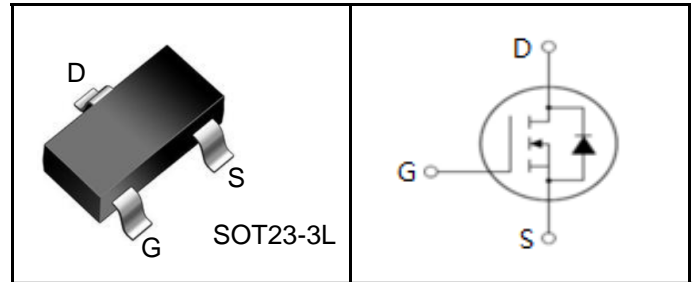
# MPTO2N10

## Features

- $BV_{DSS}=100\text{ V}$ ,  $I_D=2\text{ A}$
- $R_{DS(on)}:240\text{ m}\Omega$  (Max) @  $V_{GS}=10\text{ V}$
- Enhancement mode
- Fully characterized avalanche voltage and current
- Ultra low  $R_{dson}$

## Application

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



## Device Marking and Package Information

Ordering code	Package	Marking
MPTO2N10	SOT23-3L	MPTO2N10

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	2	A
Drain Current-Pulsed <sup>(Note 1)</sup>	$I_{DM}$	5	A
Maximum Power Dissipation	$P_D$	1.25	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{thJC}$	65	K/W
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	100	

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	100	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2A	-	190	240	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =1A	1	-	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, F=1.0MHz	-	449	-	PF
Output Capacitance	C <sub>OSS</sub>		-	20	-	PF
Reverse Transfer Capacitance	C <sub>rSS</sub>		-	8	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =2A, R <sub>L</sub> =25Ω V <sub>GS</sub> =10V, R <sub>G</sub> =1Ω	-	6	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	10	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	10	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	6	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =2A, V <sub>GS</sub> =10V	-	10	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.0	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	2.0	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =2A	-	-	1.2	V
Diode Forward Current (Note 2)	I <sub>S</sub>		-	-	2	A

### 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 (Curves)**



Figure A: Gate Charge Test Circuit and Waveform

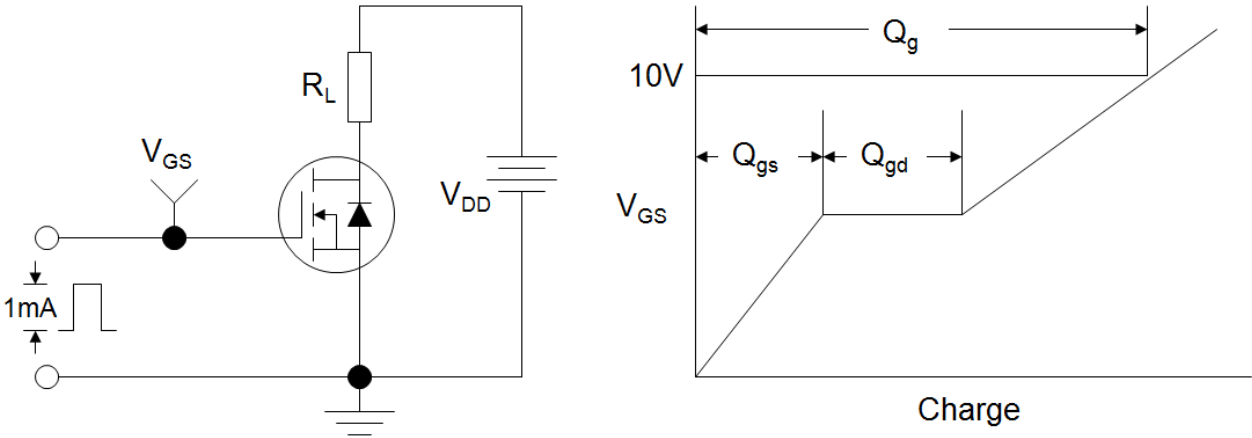


Figure B: Resistive Switching Test Circuit and Waveform

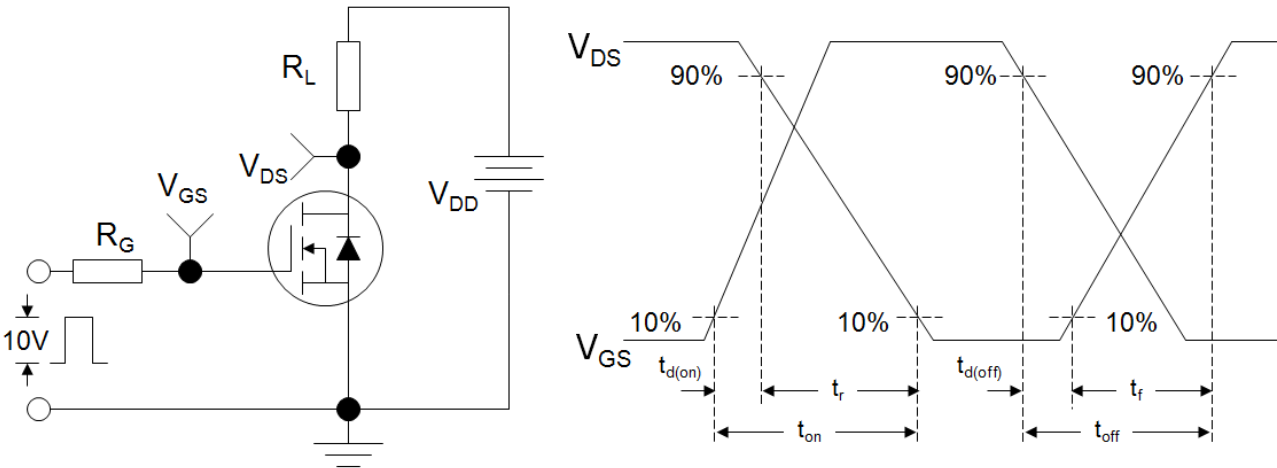
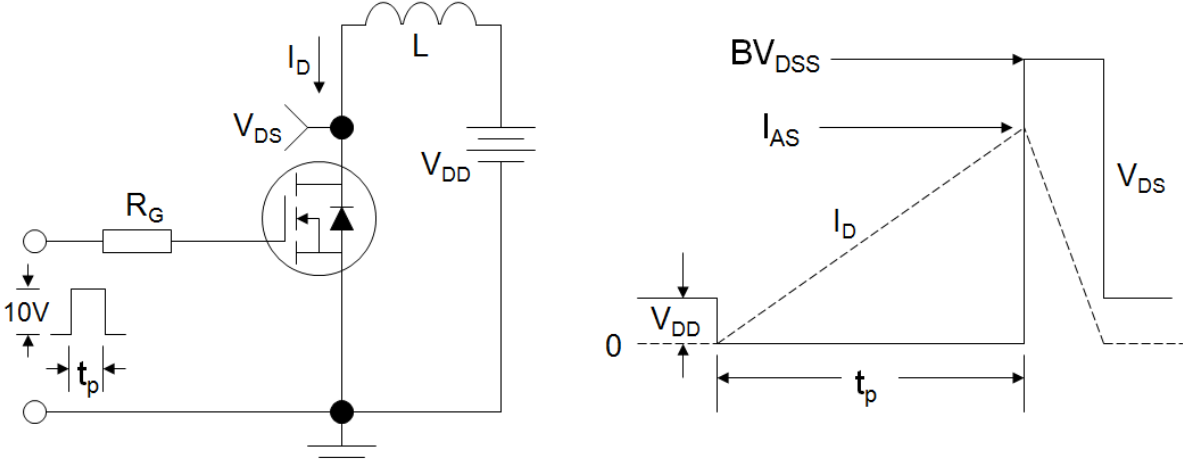
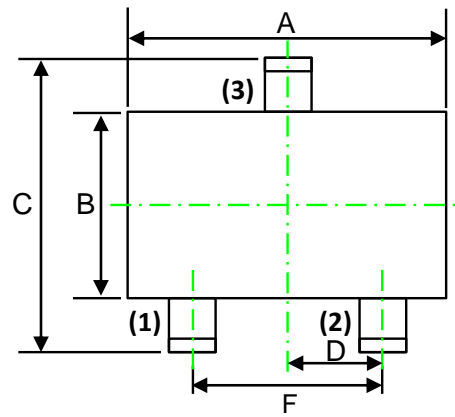


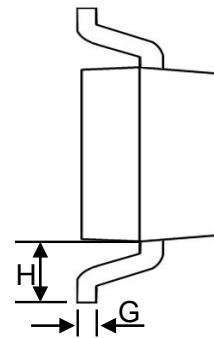
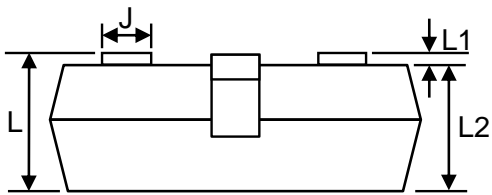
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



## SOT-23 PACKAGE OUTLINE DIMENSIONS



**TOP VIEW**  
[顶视图]



**SIDE VIEW**  
[侧视图]

Symbol	Dimensions In Millimeters (mm)		
	Min.	Typ.	Max.
A	2.80	2.90	3.00
B	1.20	1.30	1.40
C	2.10	2.30	2.55
D	-	0.95	-
F	1.78	1.90	2.04
G	0.08	0.13	0.18
H	-	0.55	-
J	0.30	0.40	0.50
L	0.90	1.00	1.15
L1	0.00	0.05	0.10
L2	0.89	1.00	1.11