



芯嘉铭科技

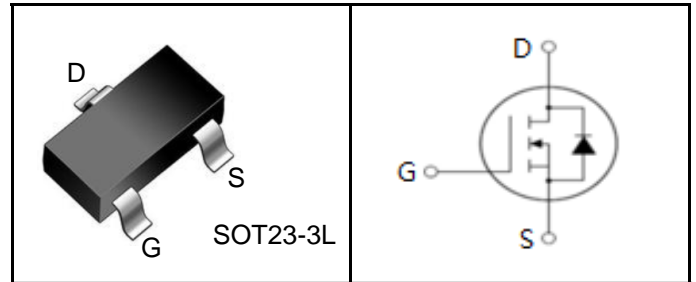
MPTO2N10

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}	± 20	V
Drain Current-Continuous	I_D	2	A
Drain Current-Pulsed ^(Note 1)	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_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	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	1.8	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2A	-	190	240	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =1A	1	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, F=1.0MHz	-	449	-	PF
Output Capacitance	C _{oss}		-	20	-	PF
Reverse Transfer Capacitance	C _{rss}		-	8	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V, I _D =2A, R _L =25Ω V _{GS} =10V, R _G =1Ω	-	6	-	nS
Turn-on Rise Time	t _r		-	10	-	nS
Turn-Off Delay Time	t _{d(off)}		-	10	-	nS
Turn-Off Fall Time	t _f		-	6	-	nS
Total Gate Charge	Q _g	V _{DS} =50V, I _D =2A, V _{GS} =10V	-	10	-	nC
Gate-Source Charge	Q _{gs}		-	1.0	-	nC
Gate-Drain Charge	Q _{gd}		-	2.0	-	nC
Drain-Source Diode Characteristics						
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 ≤ 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 1. Output Characteristics($T_J=25^\circ\text{C}$)

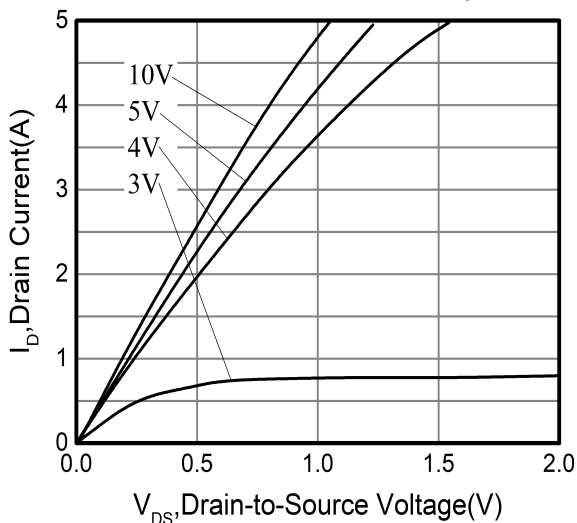


Figure 2. Transfer Characteristics

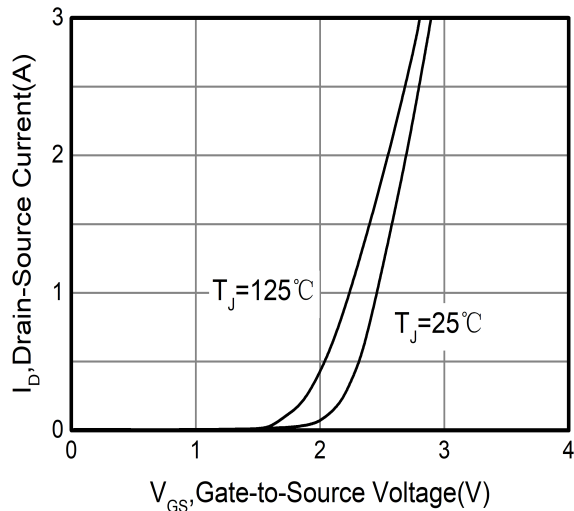


Figure 3. On-Resistance vs Drain Current

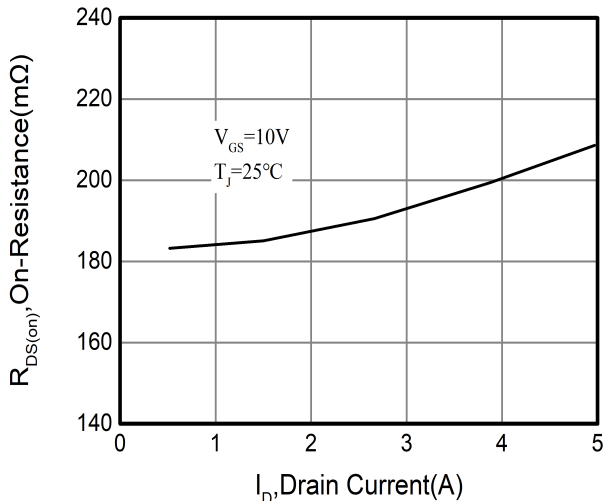


Figure 4. Capacitance

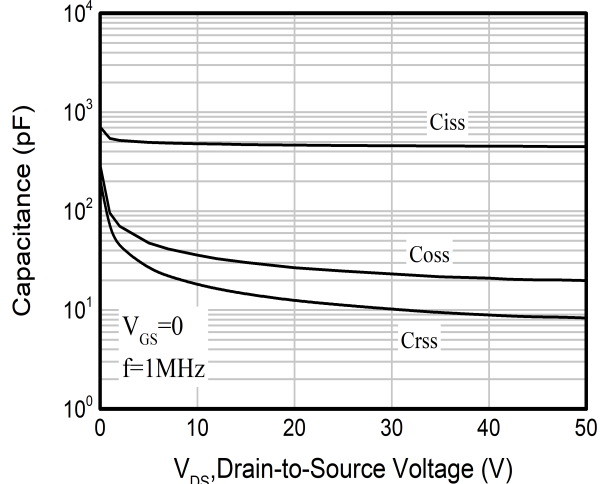


Figure 5. Gate Charge

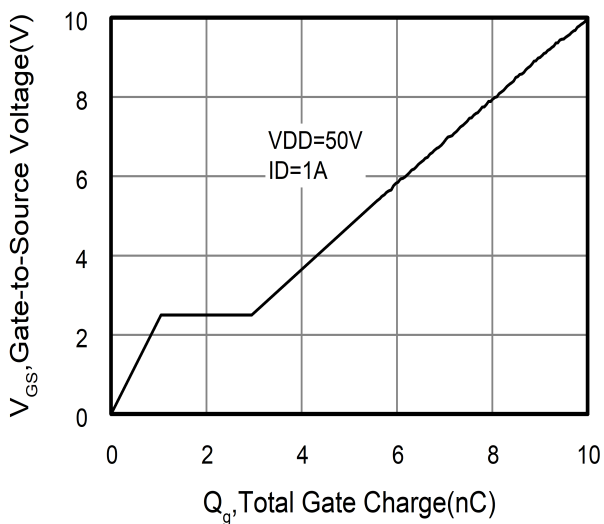


Figure 6. Body Diode Forward

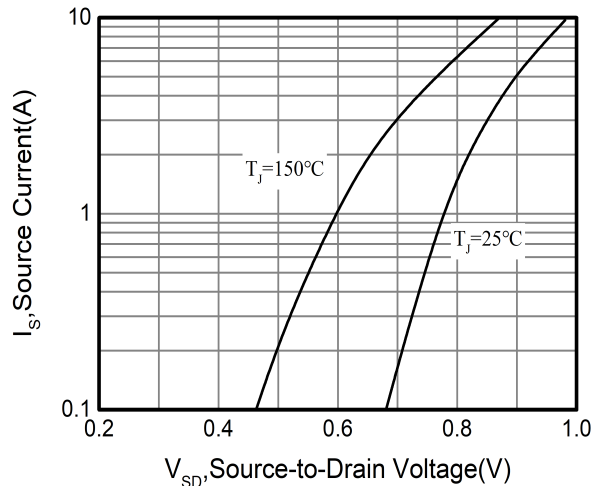


Figure 7. On-Resistance vs Junction Temperature

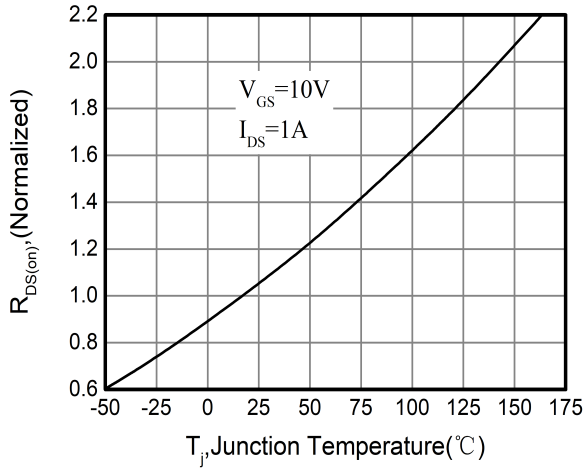


Figure 8. Threshold Voltage vs Junction Temperature

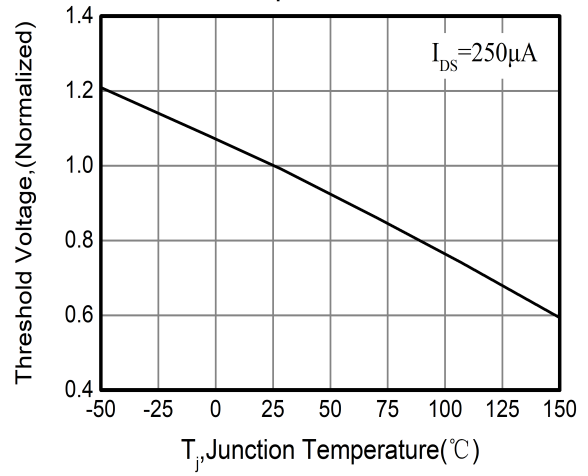


Figure 9. Thermal Transient Impedance

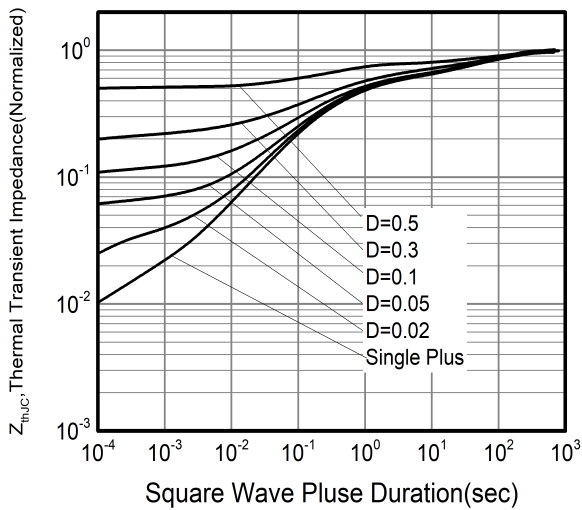


Figure 10. Safe Operation Area

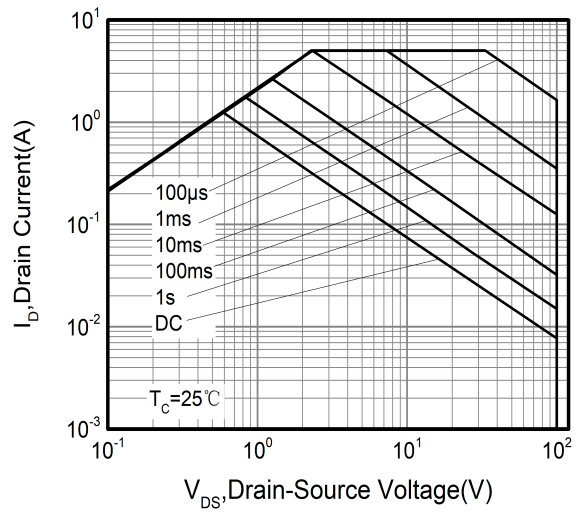


Figure A: Gate Charge Test Circuit and Waveform

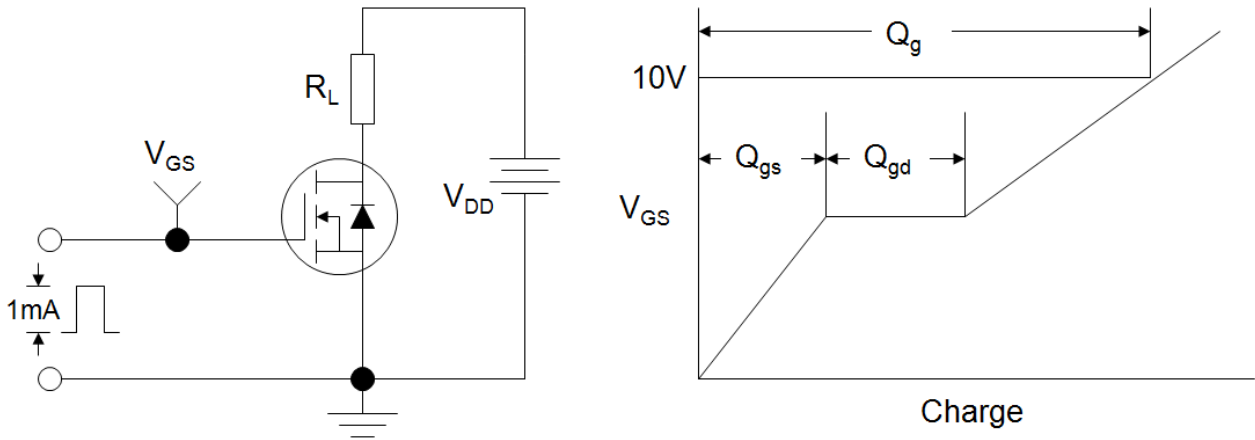


Figure B: Resistive Switching Test Circuit and Waveform

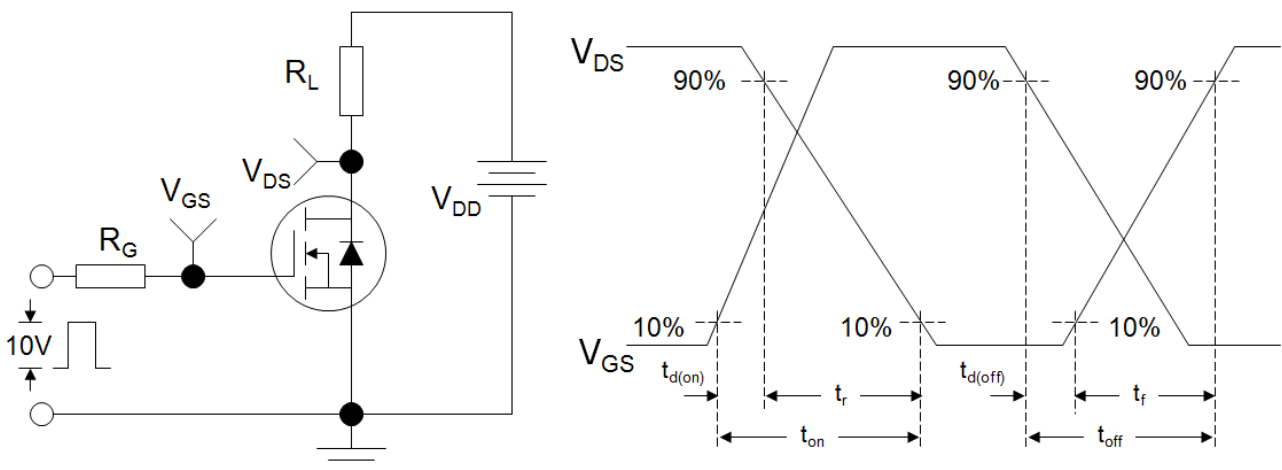
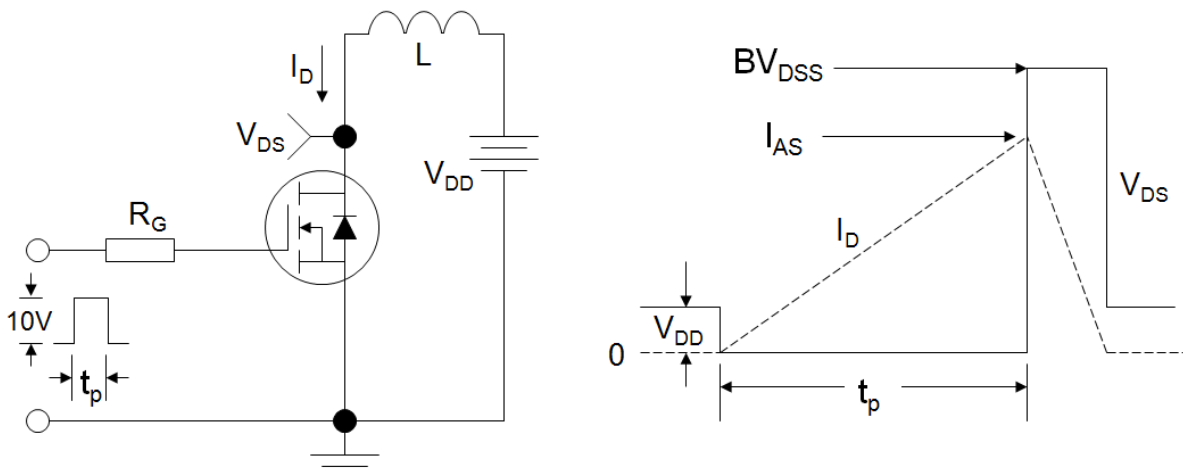
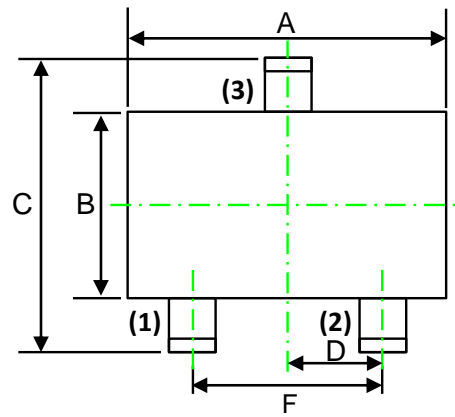


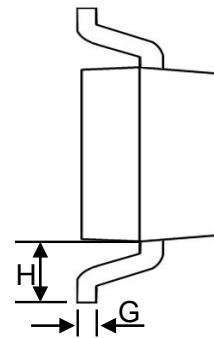
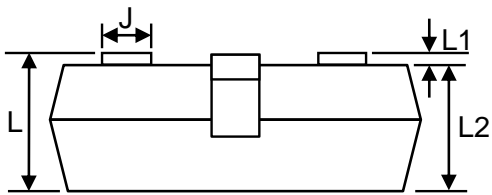
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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