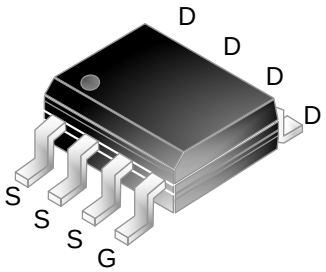
WMS13N10T2

100V N-Channel Enhancement Mode Power MOSFET

Description

WMS13N10T2 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

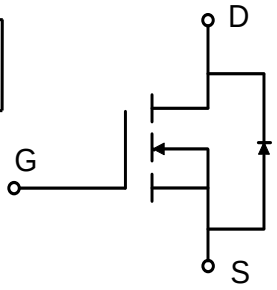


SOP-8L

Features

- V_{DS}= 100V, I_D = 13.5A
  $R_{DS(on)}$ < 8.0mΩ @ V_{GS} = 10V
  $R_{DS(on)}$ < 10.5mΩ @ V_{GS} = 4.5V
- Low $R_{DS(on)}$
- Low Gate Charge
- 100% EAS Guaranteed

RoHS compliant



Applications

- Power Management Switches
- Synchronous Rectification for AC/DC Quick Charger

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V[1]	T_A=25℃	I_D	13.5	A
	T_A=70℃		10.5	
Pulsed Drain Current[2]		I_{DM}	55	A
Single Pulse Avalanche Energy[3]		EAS	11.2	mJ
Avalanche Current		I_{AS}	15	A
Total Power Dissipation[4]	T_A=25℃	P_D	3.1	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to+150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[1]	$R_{\theta JA}$	75	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{\theta JC}$	24	°C/W

Electrical Characteristics T_c = 25°C, unless otherwise noted

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V	-	-	1	μA
	T_J=55℃			-	-	5	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.2	-	2.3	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 13.5A	-	6.6	8	mΩ
			V_{GS} = 4.5V, I_D = 11.5A	-	8.7	10.5	
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	3320	-	pF
Output Capacitance		C_{oss}		-	405	-	
Reverse Transfer Capacitance		C_{rss}		-	10	-	
Switching Characteristics							
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 50V, I_D= 13.5A	-	19.3	-	nC
Total Gate Charge		Q_g	V_{GS} = 10V,V_{DS} = 50V, I_D= 13.5A	-	45	-	
Gate-Source Charge		Q_{gs}		-	9.5	-	
Gate-Drain Charge		Q_{gd}		-	4.8	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 50V,R_G = 3Ω, I_D= 13.5A	-	10	-	nS
Rise Time		t_r		-	6..5	-	
Turn-Off Delay Time		$t_{d(off)}$		-	45	-	
Fall Time		t_f		-	7.5	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.1	V
Continuous Source Current[1,5]		I_S	V_G=V_D=0V , Force Current	-	-	5	A
Body Diode Reverse Recovery Time		t_{rr}	I_F = 13.5A, dI/dt = 100A/μs	-	33	-	nS
Body Diode Reverse Recovery Charge		Q_{rr}		-	150	-	nC

Notes:

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

3. The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=15A

4.The power dissipation is limited by 150℃ junction temperature

5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

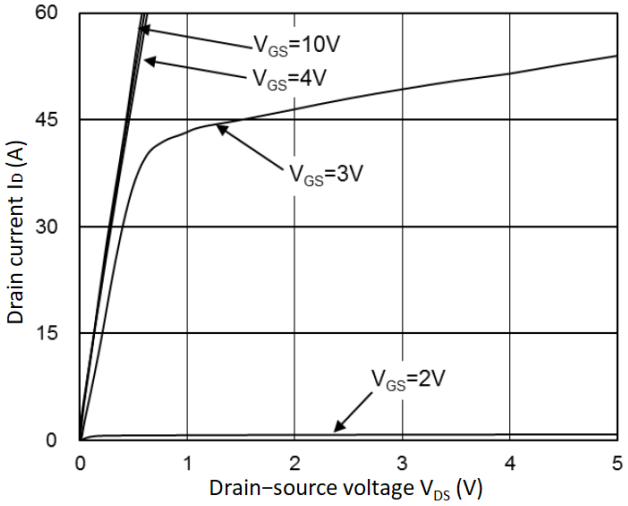


Figure 1. Typical Output Characteristics

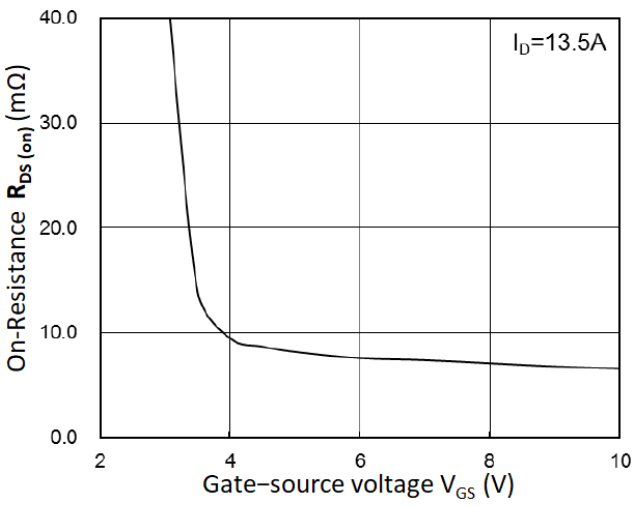


Figure 2. $R_{DS(on)}$ vs. V_{GS}

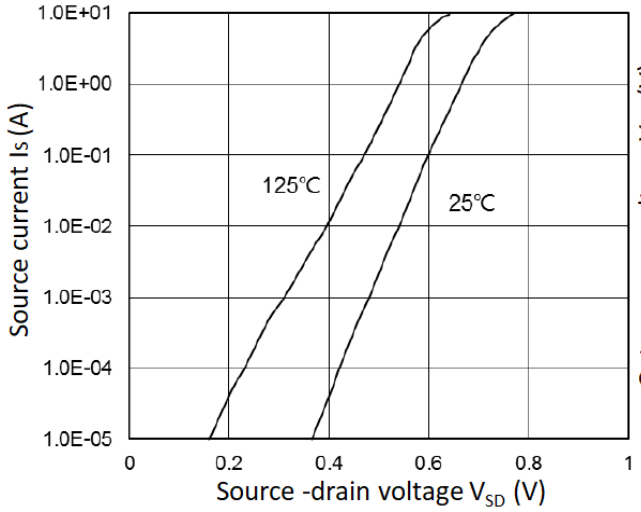


Figure 3. Forward Characteristics of Reverse

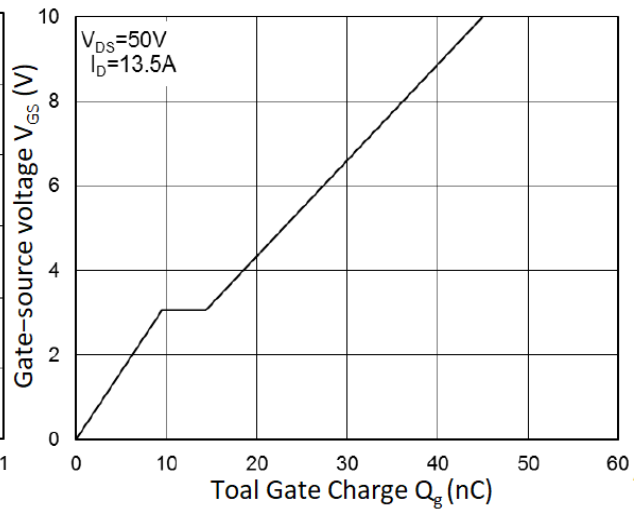


Figure 4. Gate Charge Characteristics

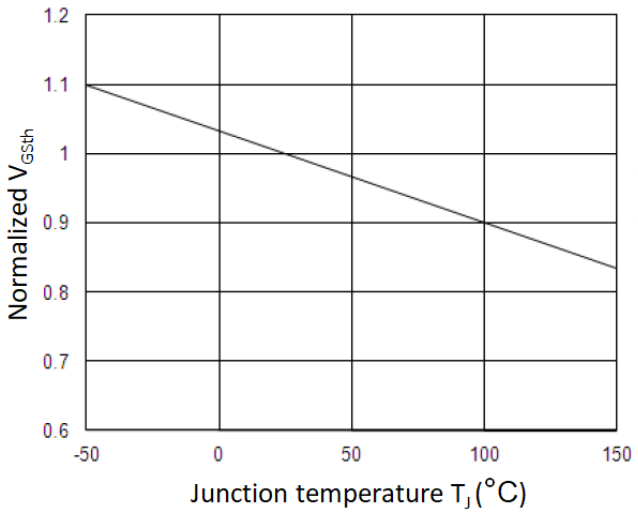


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

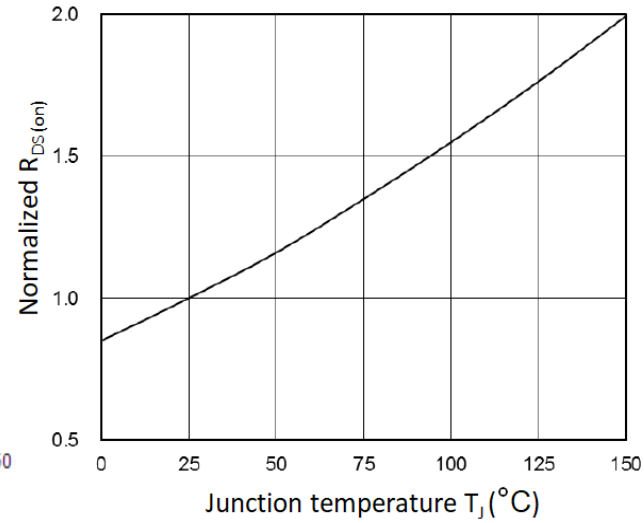


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

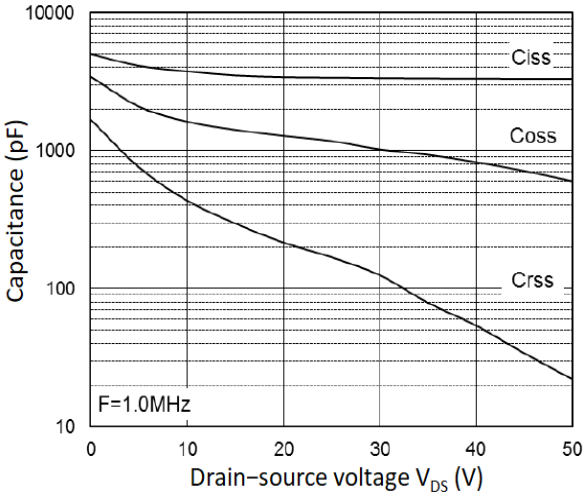


Figure 7. Capacitance Characteristics

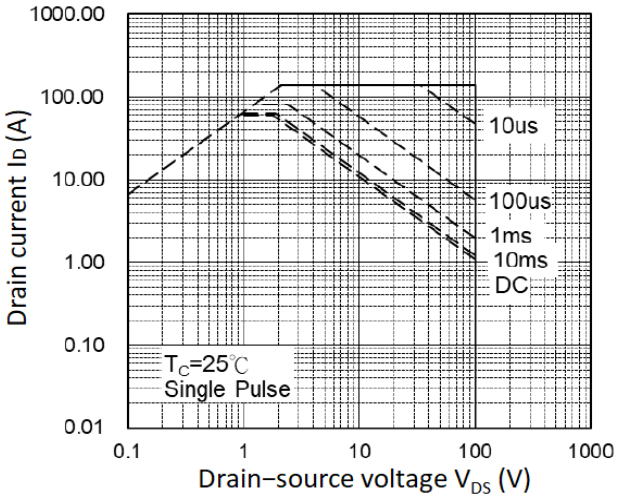


Figure 8. Safe Operating Area

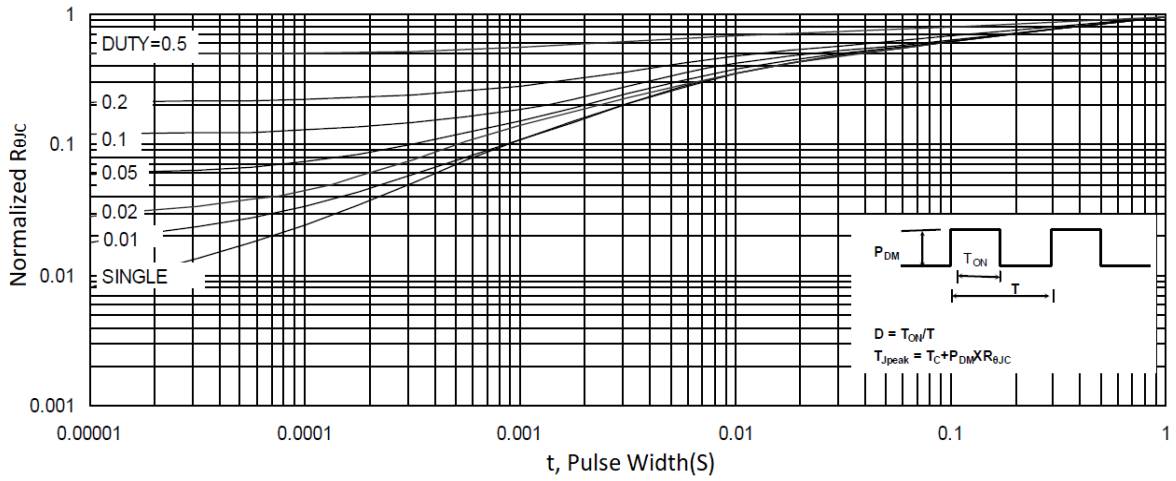


Figure 9. Normalized Maximum Transient Thermal Impedance

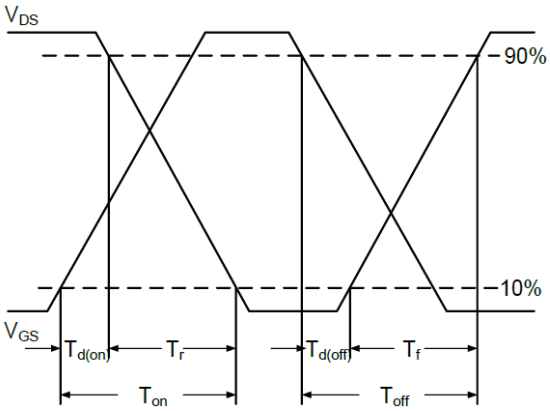


Figure 10. Switching Time Waveform

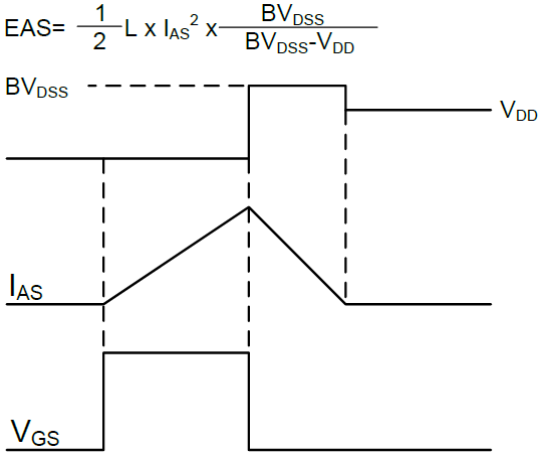
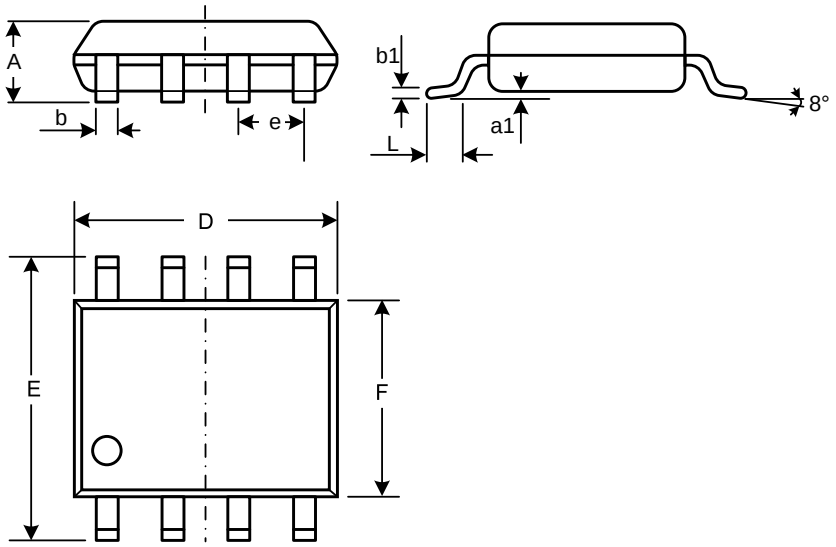


Figure 11. Unclamped Inductive Switching Waveform

Mechanical Dimensions for SOP-8L



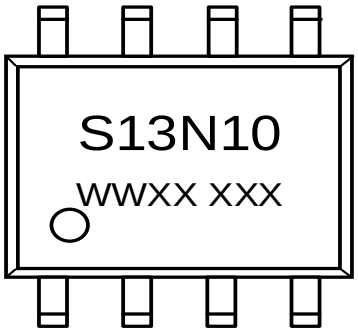
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	1.23	1.75
a1	0.05	0.25
b	0.31	0.51
b1	0.16	0.25
D	4.70	5.15
E	5.75	6.25
e	1.07	1.47
F	3.70	4.10
L	0.4	1.27

Ordering Information

Part	Package	Marking	Packing method
WMS13N10T2	SOP-8L	S13N10	Tape and Reel

Marking Information



S13N10 = Device code

WWXX XX= Date code

Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201202
Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com
WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

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