General Description

The WSM180N15 is the highest performance trench N-ch MOSFET with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The WSM180N15 meet the RoHS and Green Product requirement , 100% EAS guaranteed with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summery

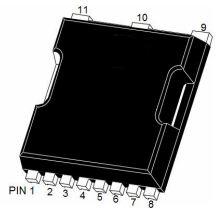
BVDSS	RDSON	ID
150V	6.2mΩ	180A

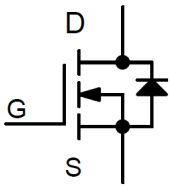
Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System

TOLLA-8-XZ Pin Configuration

9,10,11:D





1:G 2,3,4,5,6,7,8:S

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current, V_{GS} @ 10V(T_C=25℃)	180	A
I_{DM}	Pulsed Drain Current	550	A
EAS	Single Pulse Avalanche Energy	506	mJ
P_D	Total Power Dissipation... $_C$=25℃)	210	W
RθJA	Thermal resistance, junction-ambient	40	℃/W
RθJC	Thermal resistance, junction-case	0.84	℃/W
T_{STG}	Storage Temperature Range	-55 to 155	℃
T_J	Operating Junction Temperature Range	-55 to 155	℃

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	6.2	7.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	2.9	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=20A	---	72	---	nC
Q_{gs}	Gate-Source Charge		---	18	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V R_G=3Ω, I_D=20A	---	22	---	ns
T_r	Rise Time		---	115	---	
$T_{d(off)}$	Turn-Off Delay Time		---	44	---	
T_f	Fall Time		---	105	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	5240	---	pF
C_{oss}	Output Capacitance		---	412	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	150	A
I_{SM}	Pulsed Source Current[2,6]		---	---	500	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=20A , T_J=25℃	---	---	1.3	V

■ Note

[1]) Repetitive rating; pulse width limited by max. junction temperature.
[2]) Pd is based on max. junction temperature, using junction-case thermal resistance.
[3]) The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 ℃.

[4]) VDD=50 V, RG=50 Ω, L=0.5 mH, starting Tj=25 ℃.

[5]) Calculated continuous current based on maximum allowable junction temperature.

Typical Characteristics

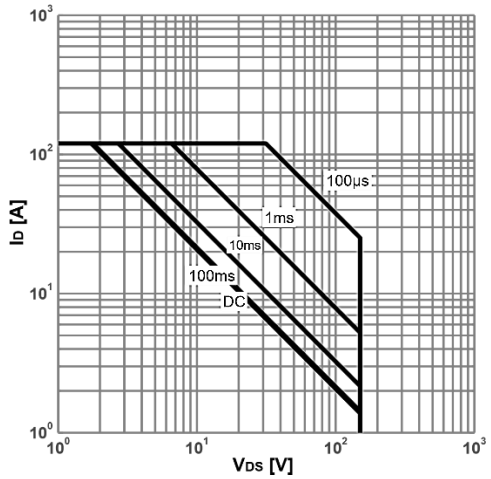


Figure 1. Power dissipation

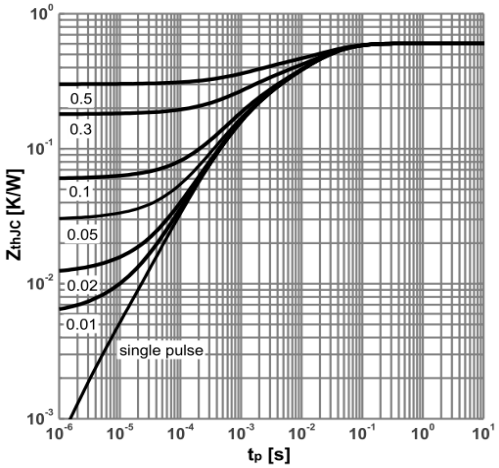


Figure 2. Max. transient thermal impedance

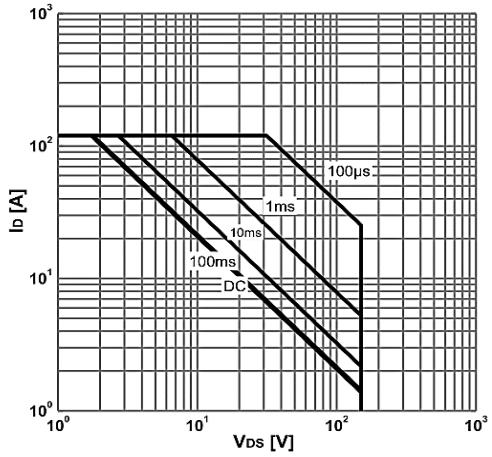


Figure 3. Safe operating area

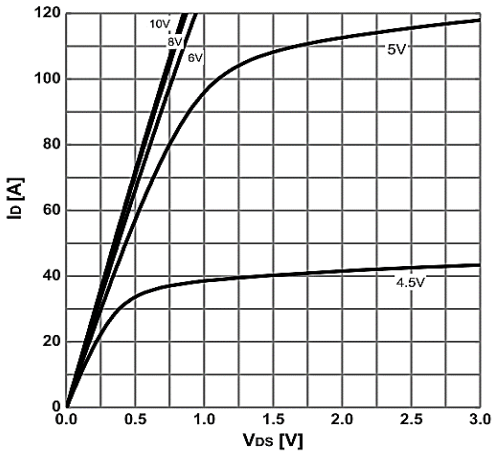


Figure 4. Typ. output characteristics

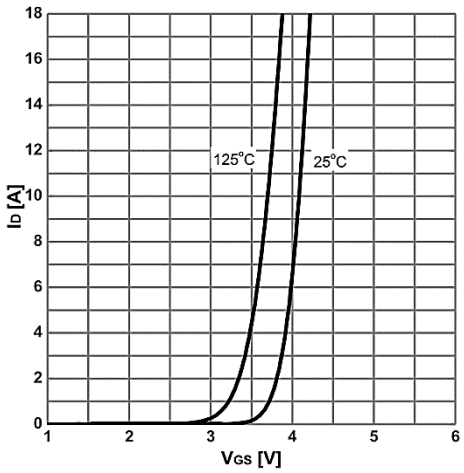


Figure 5. Typ. transfer characteristics

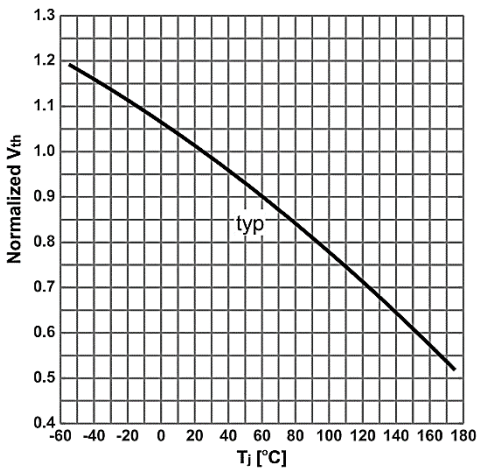


Figure 6. Gate threshold voltage vs. Junction Temperature

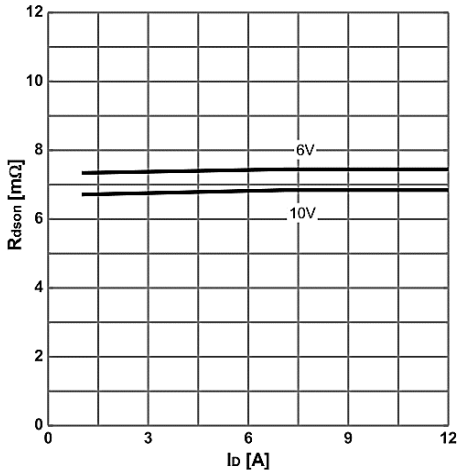


Figure 7. On-state resistance vs. Drain current

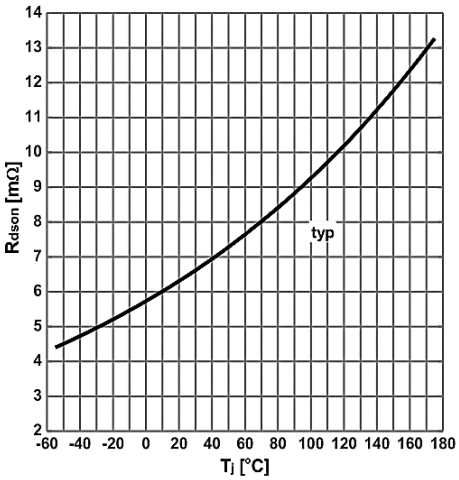


Figure 8. On-state resistance vs. Junction temperature

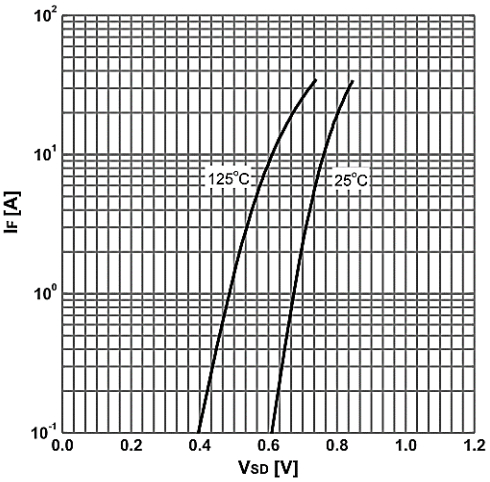


Figure 9. Forward characteristics of reverse diode

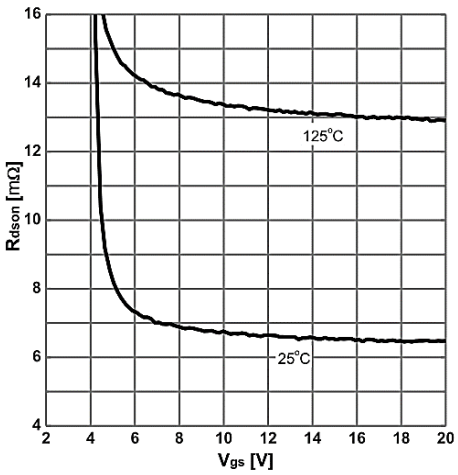


Figure10. On-state resistance vs. Vgs characteristics

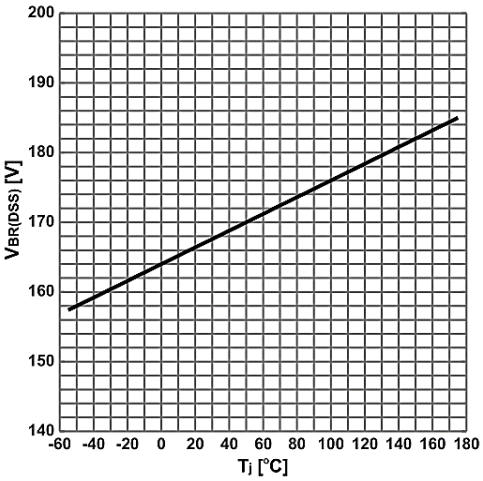


Figure 10：Breakdown Voltage Variation vs. Temperature

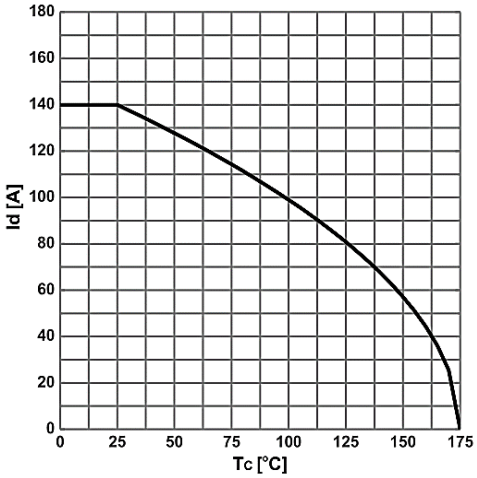


Figure 11：Maximum Drain Current

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