

General Description

The WSM350N04 is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The WSM350N04 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 Summary

BV _{DSS}	R _{DS(on)}	I _D
40V	1.0mΩ	350A

Applications

- Synchronous Rectification
- Networking DC-DC Power System
- Load Switch

TOLLA-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V	350	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V	210	A
I _{DM}	Pulsed Drain Current T _C =25°C	585	A
EAS	Avalanche Energy, Single pulse, L=0.1mH	1125	mJ
I _{AS}	Avalanche Current, Single pulse, L=0.1mH	150	A
P _D @T _C =25°C	Total Power Dissipation	104	W
P _D @T _C =100°C	Total Power Dissipation	42	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient	---	58	°C/W
R _{θJC}	Thermal Resistance Junction-Case	---	1.2	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.096	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =25A	---	1.0	1.5	mΩ
		V _{GS} =4.5V, I _D =15A	---	1.5	2.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.3	1.7	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5.5	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V, T _J =25°C	---	---	1	μA
		V _{DS} =40V, V _{GS} =0V, T _J =55°C	---	---	10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±25V, V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.0	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =20V, V _{GS} =10V, I _D =25A	---	50	---	nC
Q _{gs}	Gate-Source Charge		---	12	---	
Q _{gd}	Gate-Drain Charge		---	11	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =20V, V _{GS} =10V, R _G =6Ω, R _L =20Ω, I _{DS} =1A.	---	19	---	ns
T _r	Rise Time		---	10	---	
T _{d(off)}	Turn-Off Delay Time		---	58	---	
T _f	Fall Time		---	51	---	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	9500	---	pF
C _{oss}	Output Capacitance		---	4500	---	
C _{rss}	Reverse Transfer Capacitance		---	3200	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	200	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =25A, T _J =25°C	---	---	1.2	V

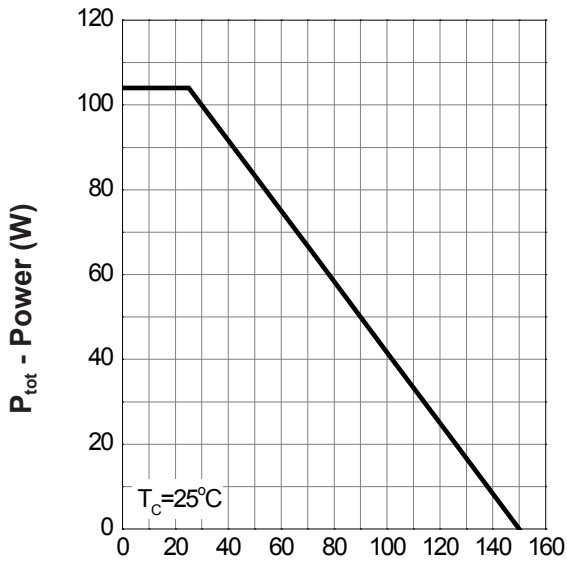
A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t_s 10s junction to ambient thermal resistance rating.

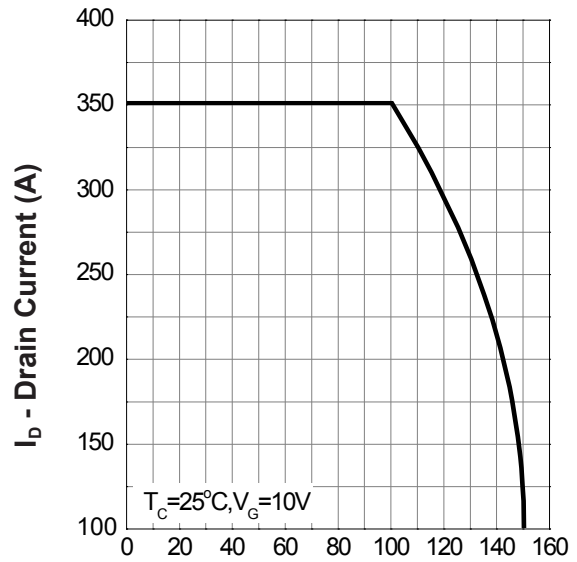
Typical Operating Characteristics

Power Dissipation



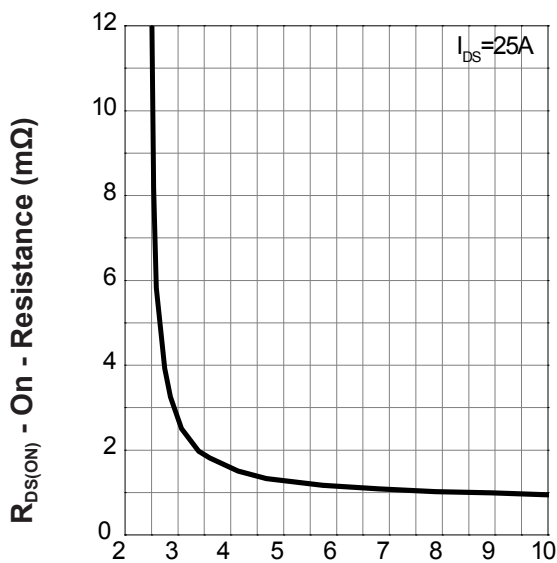
T_j - Junction Temperature (°C)

Drain Current



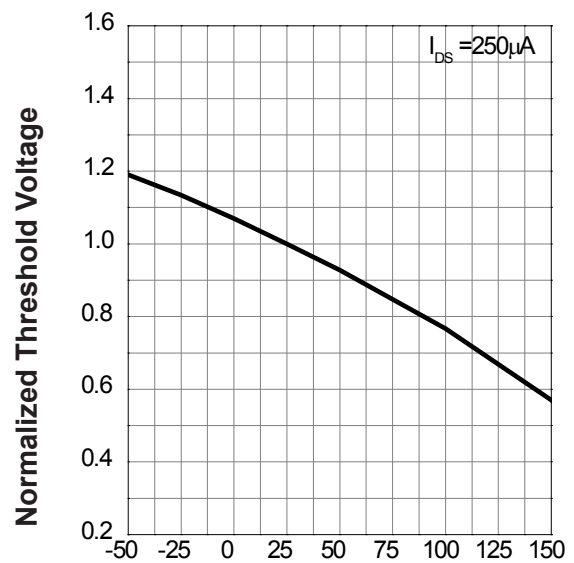
T_j - Junction Temperature (°C)

Gate-Source On Resistance



V_{GS} - Gate - Source Voltage (V)

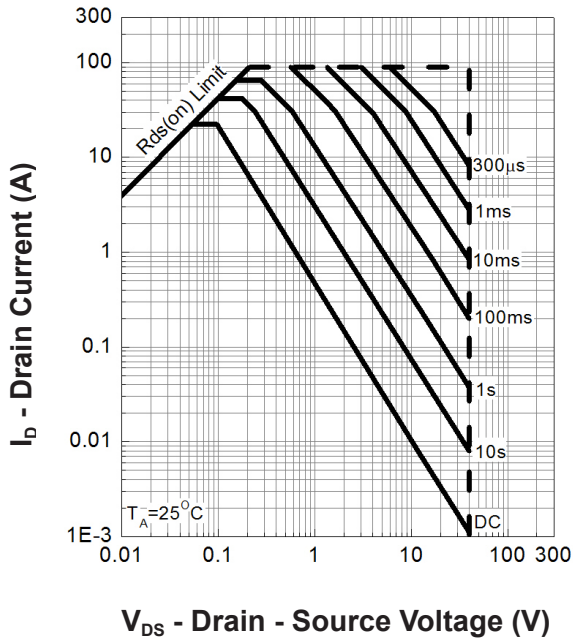
Gate Threshold Voltage



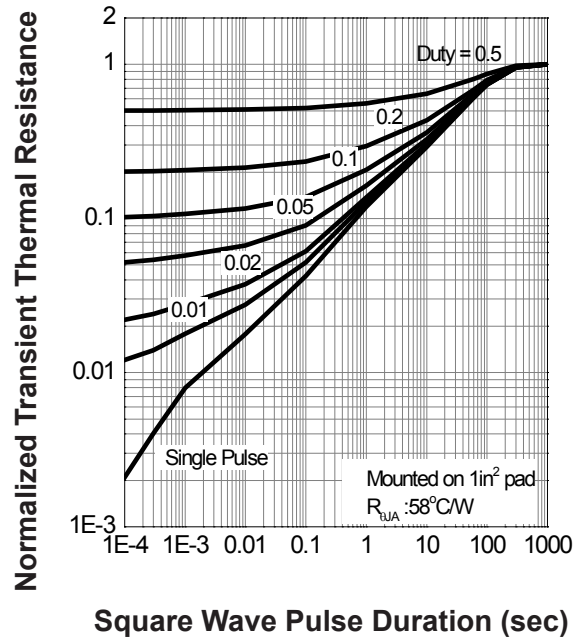
T_j - Junction Temperature (°C)

Typical Operating Characteristics

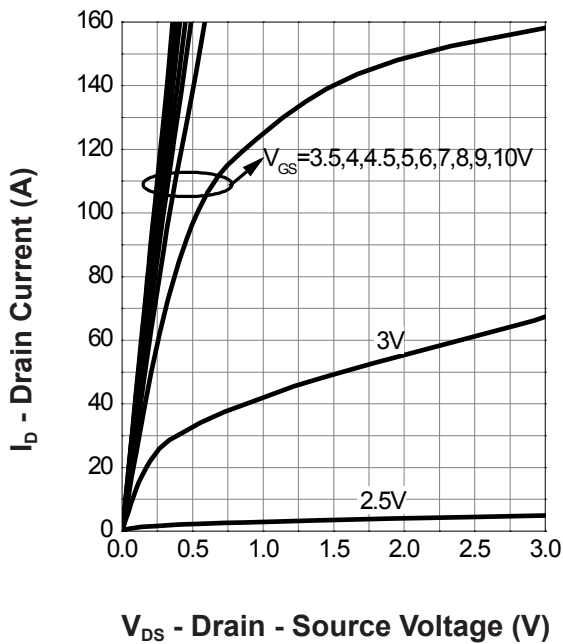
Safe Operation Area



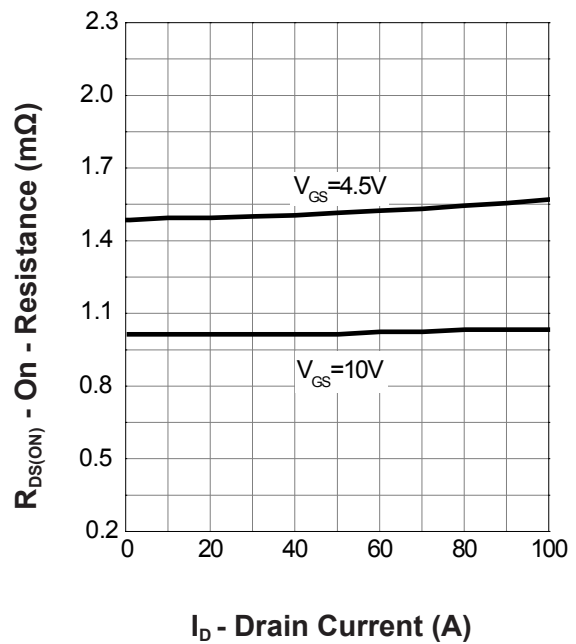
Thermal Transient Impedance



Output Characteristics

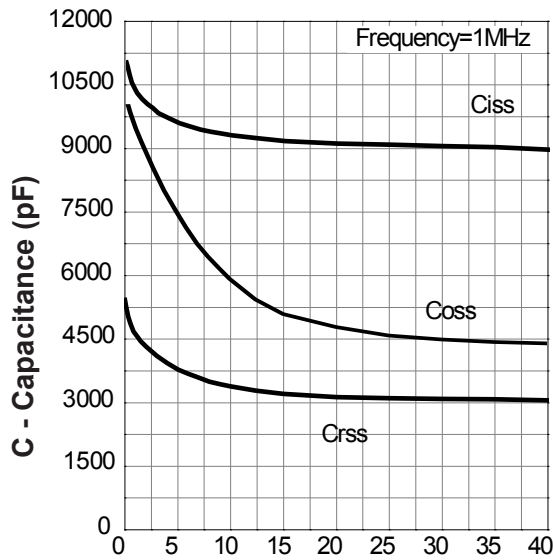


Drain-Source On Resistance



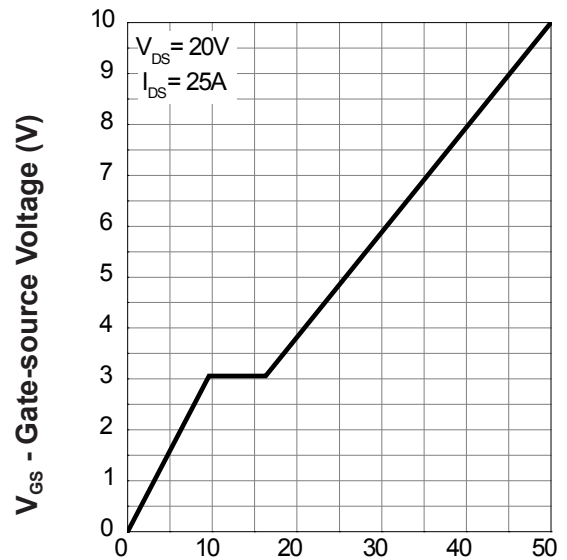
Typical Operating Characteristics

Capacitance



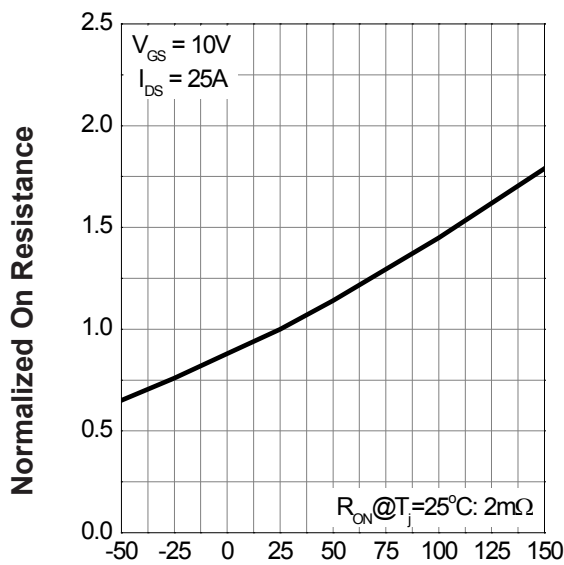
V_{DS} - Drain-Source Voltage (V)

Gate Charge



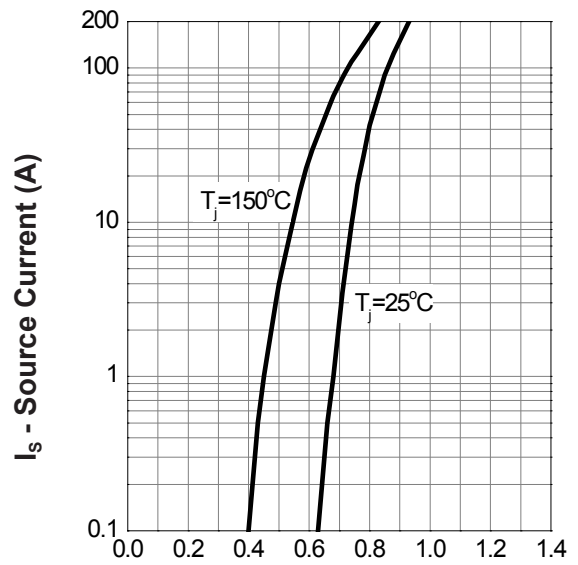
Q_G - Gate Charge (nC)

Drain-Source On Resistance

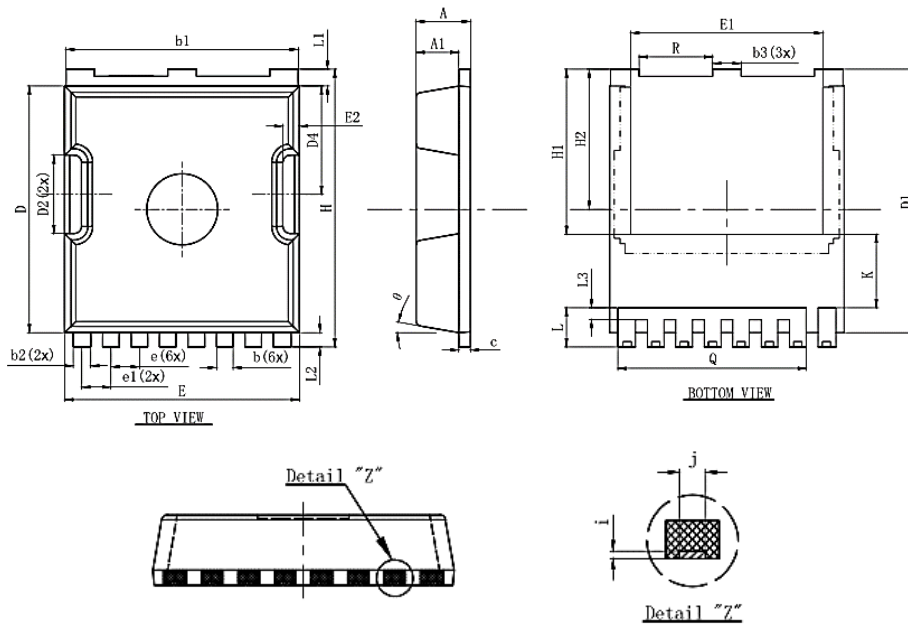


T_j - Junction Temperature (°C)

Source-Drain Diode Forward



V_{SD} - Source - Drain Voltage (V)

Packaging information


Symbol	Dimensions In Millimeters		
	Min.	Nom	Max.
A	2.2	2.3	2.4
A1	1.7	1.8	1.9
b	0.6	0.7	0.8
b1	9.7	9.8	9.9
b2	0.65	0.75	0.85
b3	1.1	1.2	1.3
C	0.4	0.5	0.6
D	10.3	10.4	10.5
D1	11.0	11.1	11.2
D2	3.2	3.3	3.4
D4	4.47	4.57	4.67
E	9.8	9.9	10.0
E1	8.0	8.1	8.2
E2	0.5	0.6	0.7
e	1.200 (BSC)		
e1	1.225 (BSC)		
H	11.6	11.7	11.8
H1	6.95BSC		
H2	5.9BSC		
i	0.1REF		
j	0.350REF		
K	3.100REF		
L	1.55	1.65	1.75
L1	0.6	0.7	0.8
L2	0.5	0.6	0.7
L3	0.4	0.5	0.6
Q	7.95REF		
R	3.0	3.1	3.2
θ	10°REG		



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