

General Description

The WSP4984 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charges for most of the synchronous buck converter applications .

The WSP4984 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

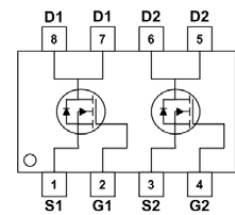
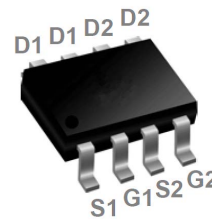
Product Summary

BVDSS	RDSON	ID
40V	18mΩ	10A

Application

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

SOP-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	10	A
$I_D@T_C=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	8	A
I_{DM}	Pulsed Drain Current ²	50	A
$P_D@T_A=25^\circ C$	Total Power Dissipation $T_A=25^\circ C$	2.0	W
$P_D@T_A=70^\circ C$	Total Power Dissipation $T_A=70^\circ C$	1.3	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	90	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	40	$^\circ C/W$

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

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 =250uA	40	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =6.6A	---	15	20	mΩ
		V _{GS} =4.5V, I _D =5.9A	---	17.7	21	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.55	2.2	2.7	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =15V, I _D =6.6A	---	50	---	S
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V, V _{GS} =4.5V, I _D =8.8A	10	13.6	16	nC
Q _{gs}	Gate-Source Charge		3.6	4.5	5.4	
Q _{gd}	Gate-Drain Charge		3.8	6.4	9	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GEN} =10V, R _G =6Ω, I _D =1A, R _L =15Ω.	---	6.4	---	ns
T _r	Rise Time		---	17	---	
T _{d(off)}	Turn-Off Delay Time		---	29.6	---	
T _f	Fall Time		---	16.8	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	1200	1500	1950	pF
C _{oss}	Output Capacitance		150	250	---	
C _{rss}	Reverse Transfer Capacitance		---	135	---	

Note :

1. Pulse test: PW ≤ 300us duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.

Typical Characteristics

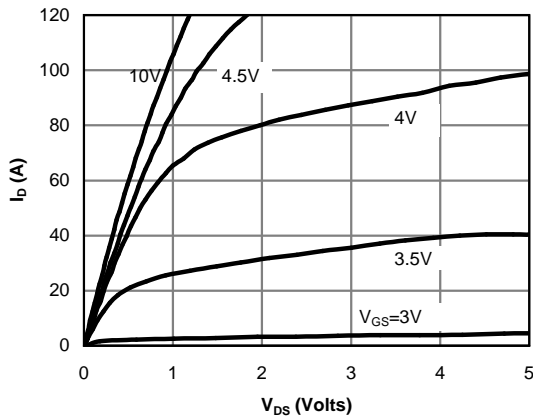


Fig 1: On-Region Characteristics (Note E)

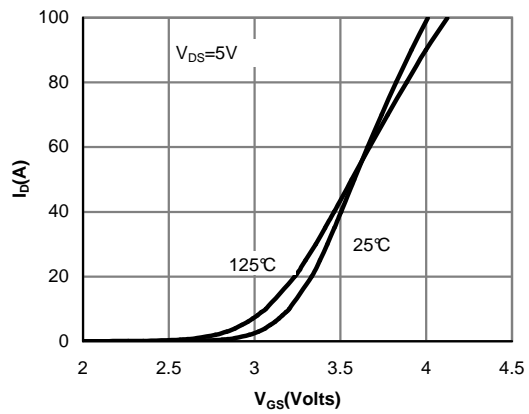


Figure 2: Transfer Characteristics (Note E)

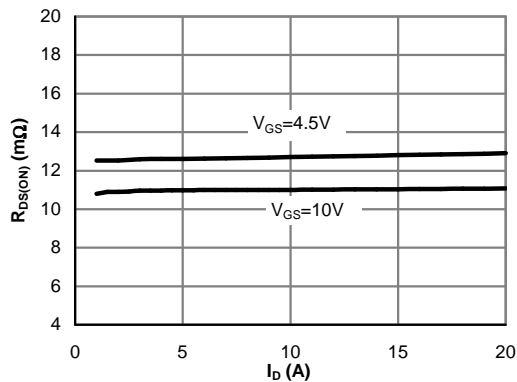


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

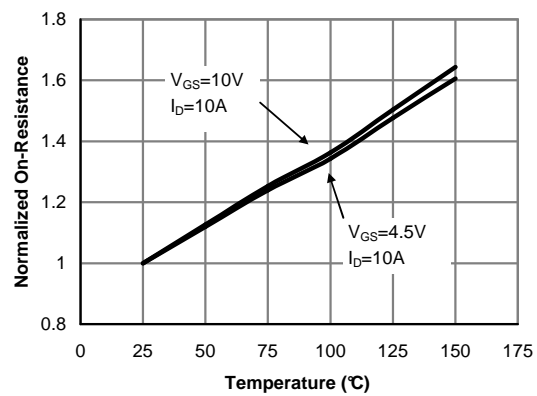


Figure 4: On-Resistance vs. Junction Temperature (Note E)

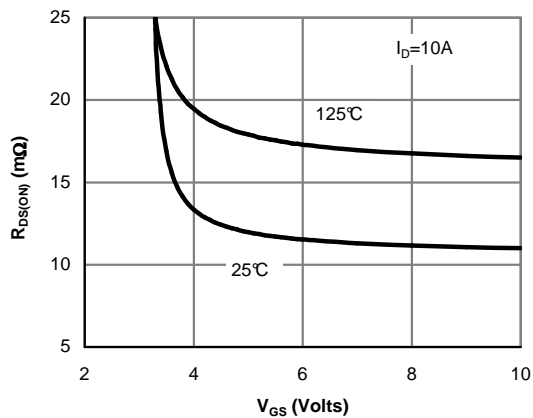


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

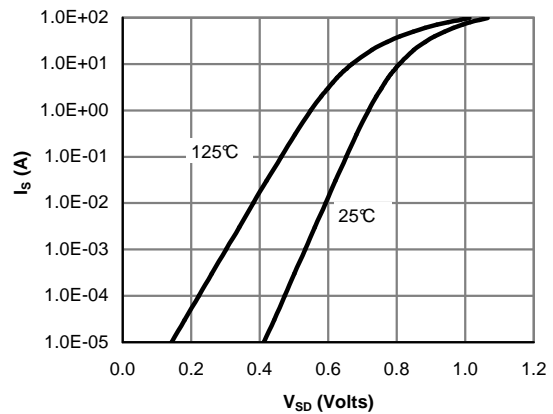


Figure 6: Body-Diode Characteristics (Note E)

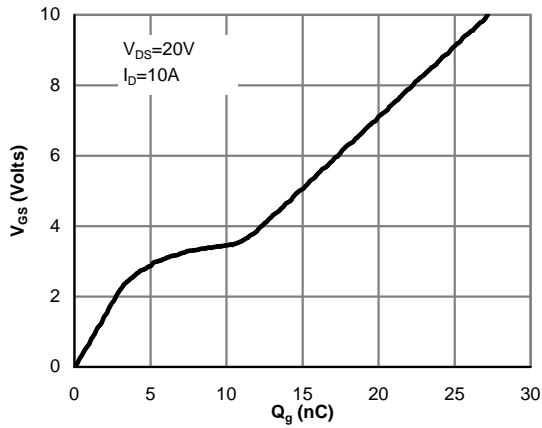


Figure 7: Gate-Charge Characteristics

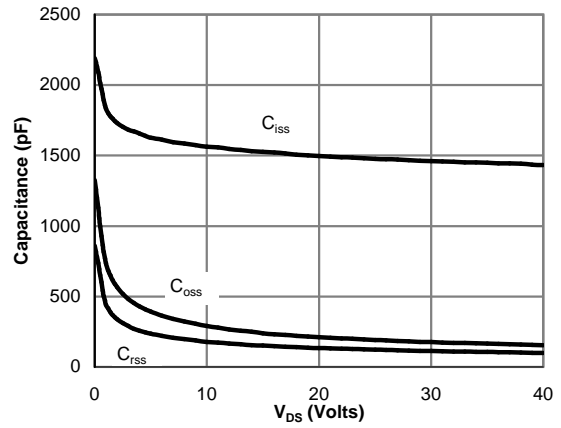


Figure 8: Capacitance Characteristics

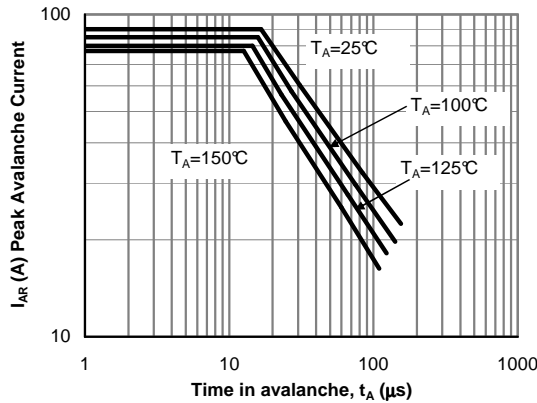


Figure 9: Single Pulse Avalanche capability (Note C)

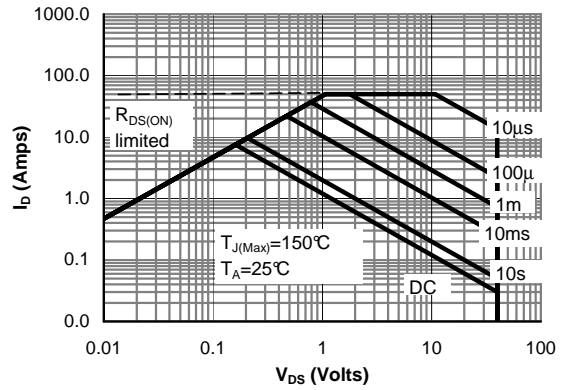


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

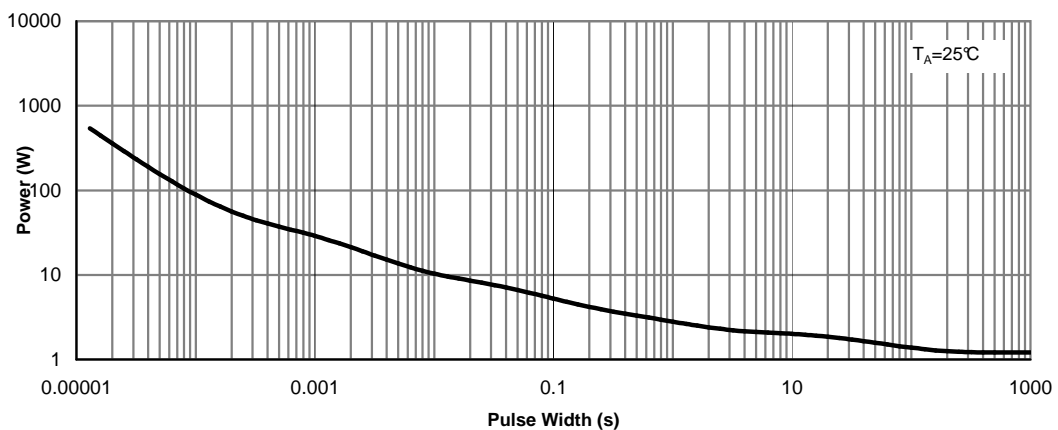


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

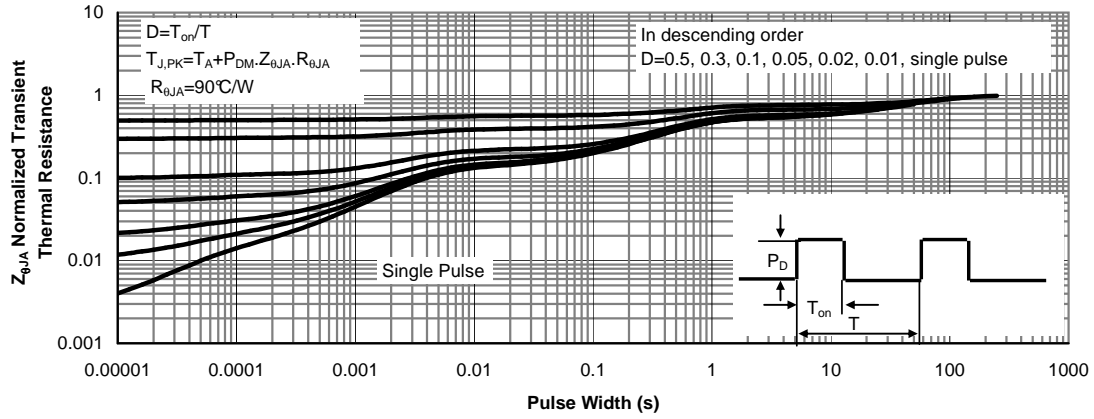


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)



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