

## General Description

The WSP4626 is the highest performance trench N-ch and P-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WSP4626 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

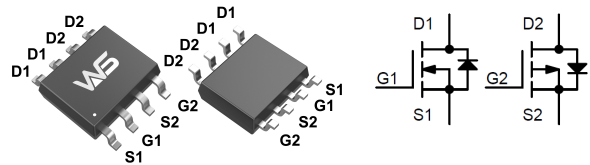
## Product Summary

BVDSS	RDSON	ID
20V	21mΩ	6.7A
-20V	48mΩ	-4.4A

## Applications

- MB/NB/UMPC/VGA
- DC-DC Power System
- Inverter

## SOP-8 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
$V_{DS}$	Drain-Source Voltage	20	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 10$	$\pm 12$	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current	6.7	-4.4	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current	5.3	-3.5	A
$I_{DM}$	Pulsed Drain Current	20	-20	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	2.0	2.0	W
$T_{STG}$	Storage Temperature Range	-55 to 150	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	-55 to 150	$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{thJA}$	Thermal Resistance Junction-Ambient	---	62.5	$^\circ\text{C}/\text{W}$

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	---	21	28	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.2A	---	28	38	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	0.4	0.72	1.2	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V.	---	---	1	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.5A.	---	10	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	1.4	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	3.2	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω, I <sub>D</sub> =1A.	---	14	---	ns
T <sub>r</sub>	Rise Time		---	10	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	34	---	
T <sub>f</sub>	Fall Time		---	11	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz.	---	910	---	pF
C <sub>oss</sub>	Output Capacitance		---	230	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	163	---	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	2.6	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A.	---	---	1.2	V

**P-Channel Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)**

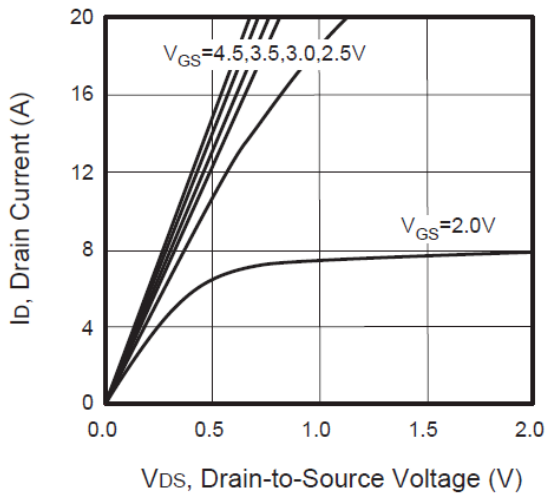
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-5A$	---	48	65	m $\Omega$
		$V_{GS}=-2.5V, I_D=-3A$	---	62	85	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.4	-0.68	-1.2	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-4A.$	---	11.5	---	nC
$Q_{gs}$	Gate-Source Charge		---	3.5	---	
$Q_{gd}$	Gate-Drain Charge		---	3.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=3\Omega, I_D=-4A.$	---	22	---	ns
$T_r$	Rise Time		---	15.7	---	
$T_{d(off)}$	Turn-Off Delay Time		---	59	---	
$T_f$	Fall Time		---	5.5	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}.$	---	1415	---	pF
$C_{oss}$	Output Capacitance		---	134	---	
$C_{riss}$	Reverse Transfer Capacitance		---	102	---	
$I_S$	Continuous Source Current	$T_A=25^\circ\text{C}$	---	---	-2.4	A
$V_{SD}$	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V.$	---	---	-1.2	V

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

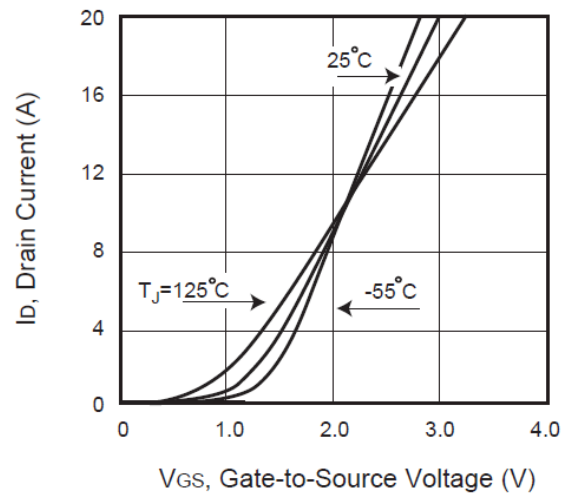
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the  $t \leq 10s$  junction to ambient thermal resistance rating.

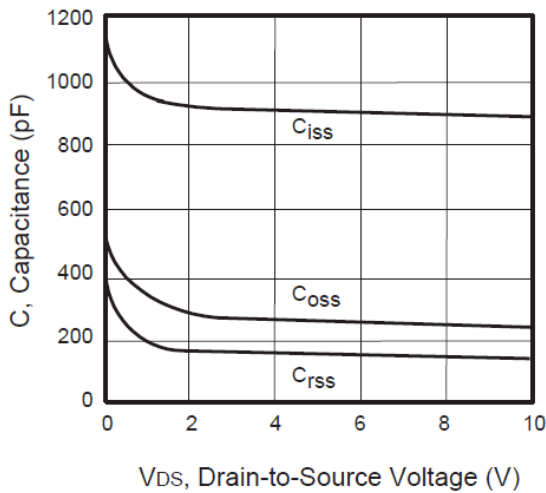
**N-Channel Typical Characteristics**



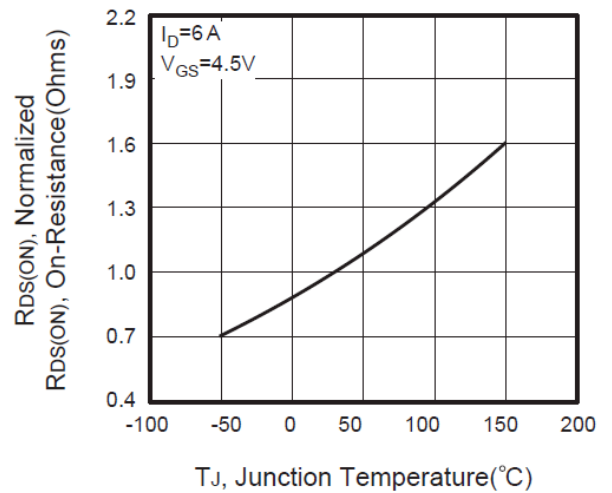
**Figure 1. Output Characteristics**



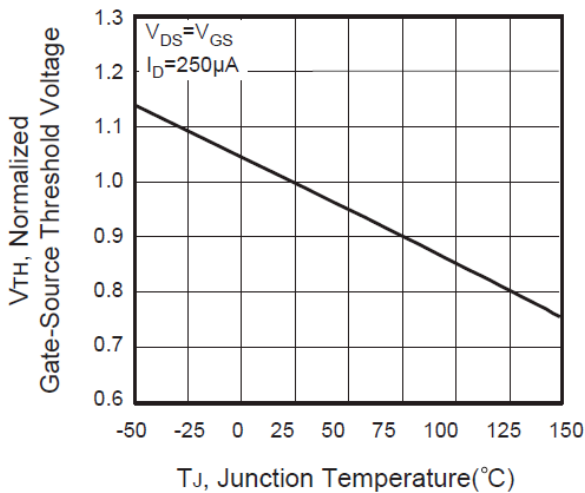
**Figure 2. Transfer Characteristics**



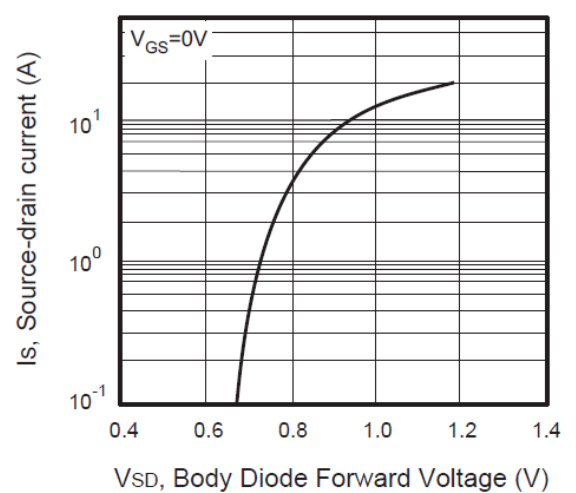
**Figure 3. Capacitance**



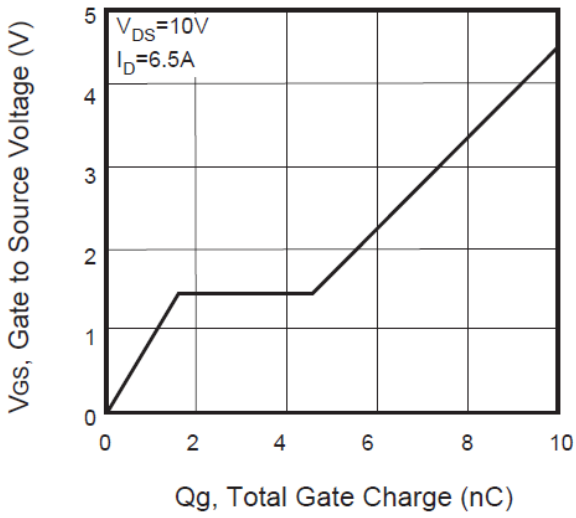
**Figure 4. On-Resistance Variation with Temperature**



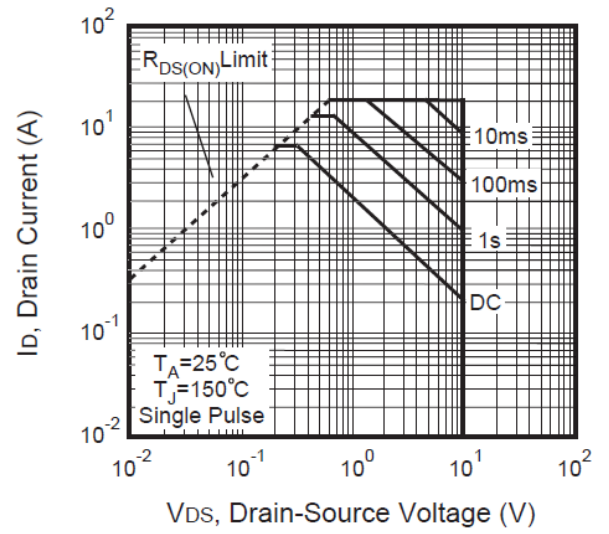
**Figure 5. Gate Threshold Variation with Temperature**



**Figure 6. Body Diode Forward Voltage Variation with Source Current**

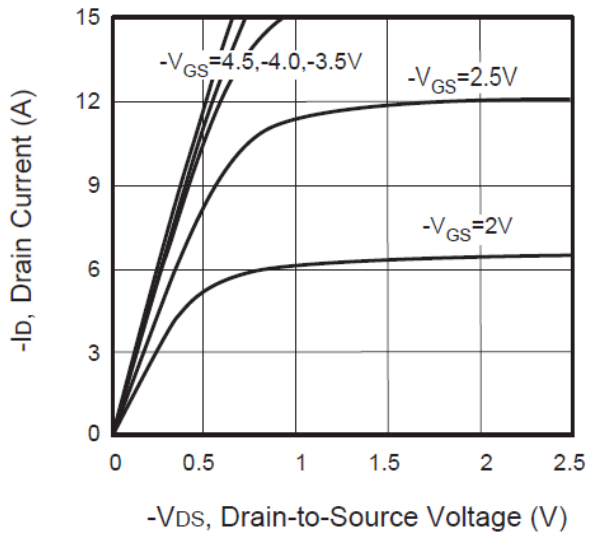


**Figure 7 . Gate Charge**

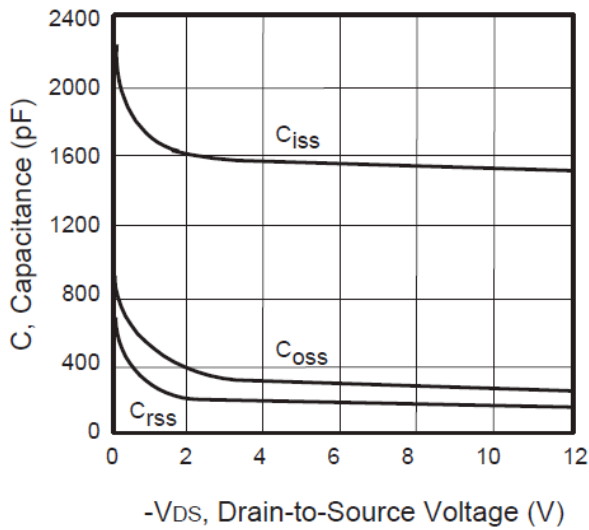


**Figure 8 . Maximum Safe Operating Area**

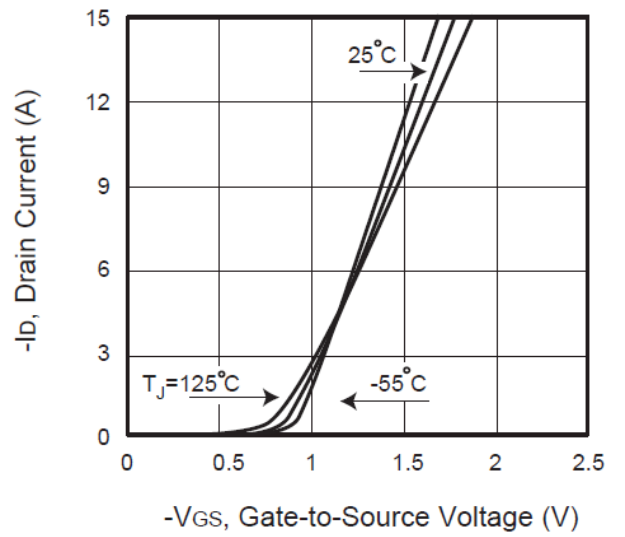
**P-Channel Typical Characteristics**



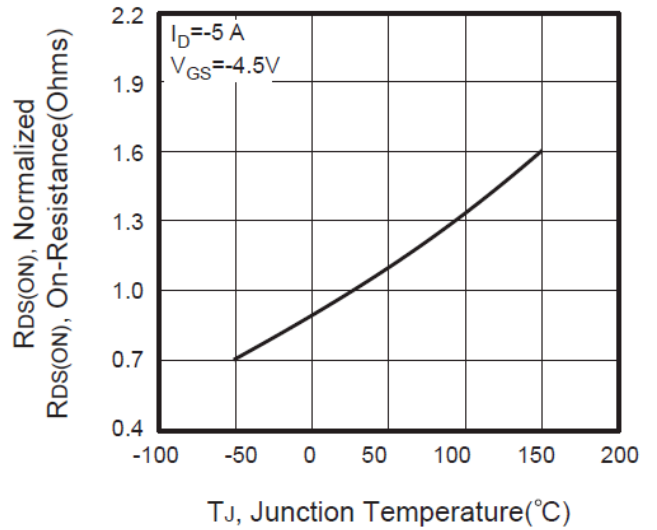
**Figure 9. Output Characteristics**



**Figure 11. Capacitance**



**Figure 10. Transfer Characteristics**



**Figure 12. On-Resistance Variation with Temperature**

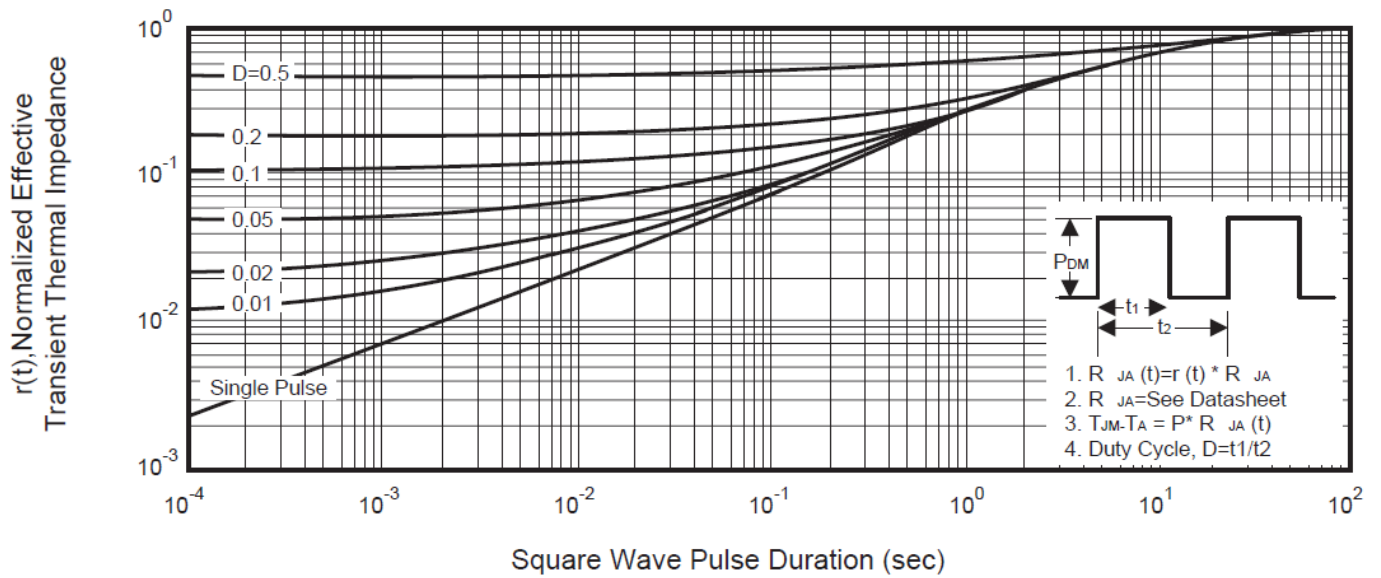


Figure 19. Normalized Thermal Transient Impedance Curve



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