

General Description

The WSP8205A 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 small power switching and load switch applications.

The WSP8205A meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Green Device Available

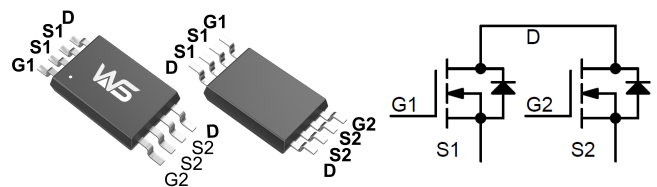
Product Summary

BVDSS	R _{DS(on)}	I _D
20V	28mΩ	5.5A

Applications

- High Frequency Point-of-Load Synchronous Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System

TSSOP-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±12	V
I _D @T _c =25°C	Continuous Drain Current, V _{GS} @ 4.5V ¹	5.5	A
I _D @T _c =70°C	Continuous Drain Current, V _{GS} @ 4.5V ¹	5.2	A
I _{DM}	Pulsed Drain Current ²	20	A
P _D @T _A =25°C	Total Power Dissipation ³	1.25	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 ¹	---	100	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	70	°C/W

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
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.022	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=6A$	18	20	27	m Ω
		$V_{GS}=4.5V, I_D=4A$	26	28	30	
		$V_{GS}=3.1V, I_D=4A$	28	32	35	
		$V_{GS}=2.5V, I_D=4A$	34	36	39	
		$V_{GS}=1.8V, I_D=2A$	38	42	55	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.4	0.7	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2.33	---	mV/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=5A$	---	25	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	4	---	Ω
Q_g	Total Gate Charge (4.5V)	$V_{DS}=10V, V_{GS}=4.5V, I_D=6A$	---	8.8	11.9	nC
Q_{gs}	Gate-Source Charge		---	0.8	2.0	
Q_{gd}	Gate-Drain Charge		---	3.3	3.2	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=10V, V_{GEN}=4.5V, R_G=6\Omega, I_D=1A, R_L=10\Omega.$	---	5	10	ns
T_r	Rise Time		---	15	26	
$T_{d(off)}$	Turn-Off Delay Time		---	30	55	
T_f	Fall Time		---	5	10	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	550	---	pF
C_{oss}	Output Capacitance		---	100	---	
C_{rss}	Reverse Transfer Capacitance		---	85	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	1.5	A
I_{SM}	Pulsed Source Current ^{2,4}		---	---	20	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1.5A, T_J=25^\circ\text{C}$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=6A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	15	---	nS
Q_{rr}	Reverse Recovery Charge		---	7	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, $t \leq 10\text{sec}$.
- 2.The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

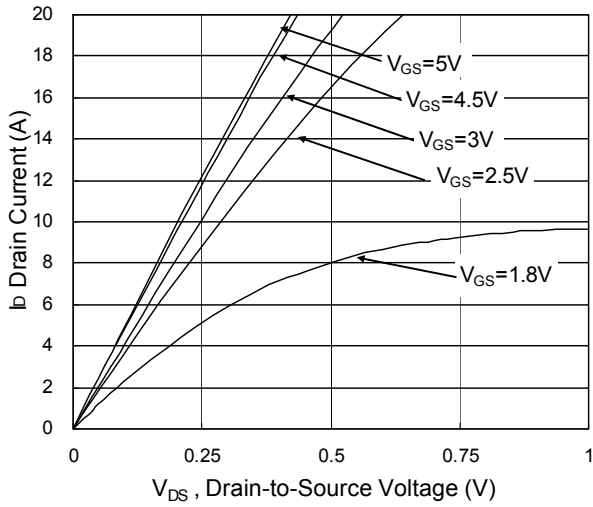


Fig.1 Typical Output Characteristics

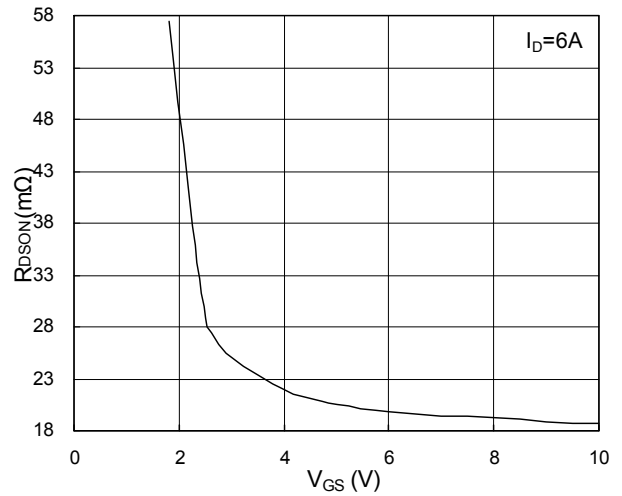
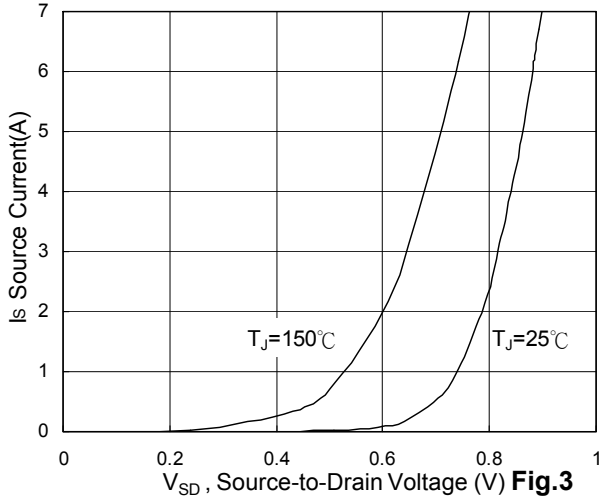


Fig.2 On-Resistance vs. Gate-Source



Forward Characteristics Of Reverse

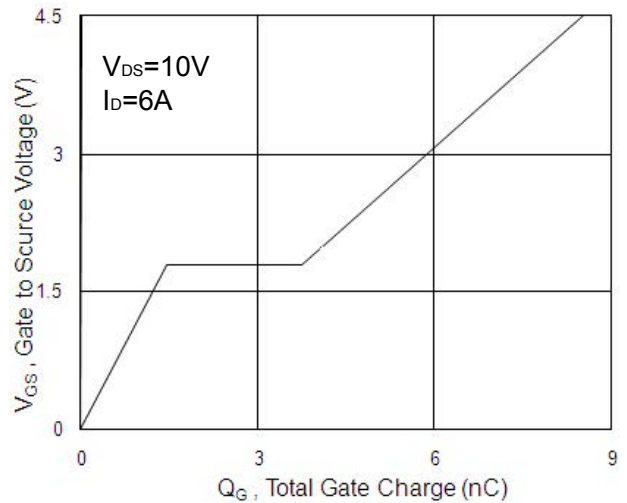


Fig.4 Gate-Charge Characteristics

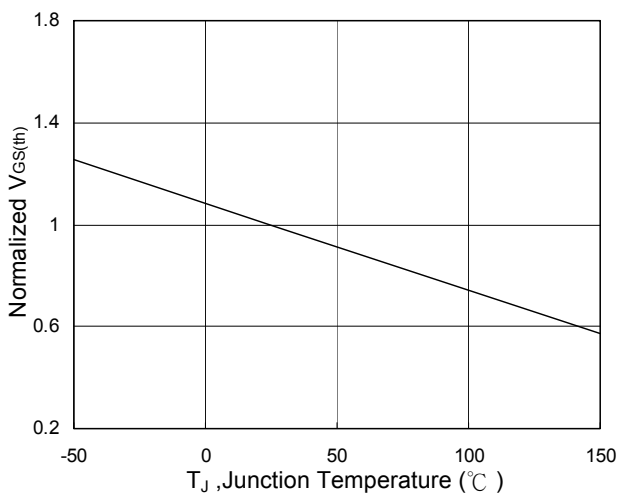


Fig.5 Normalized V_{GS(th)} vs. T_J

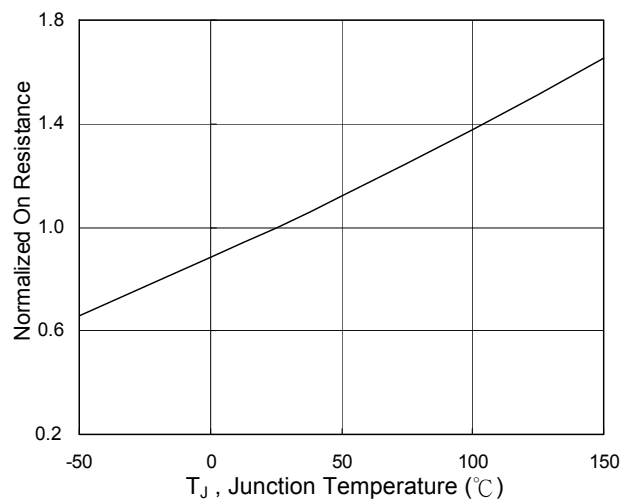


Fig.6 Normalized R_{DS(on)} vs. T_J

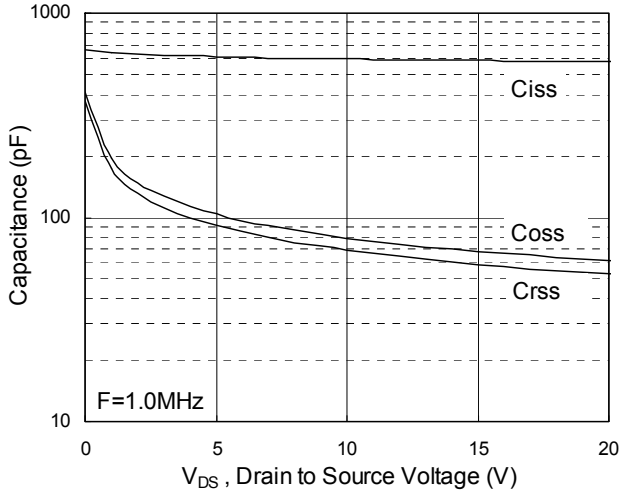


Fig.7 Capacitance

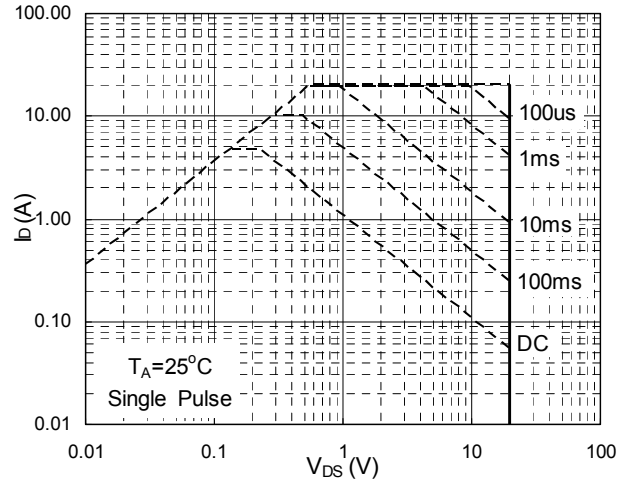


Fig.8 Safe Operating Area

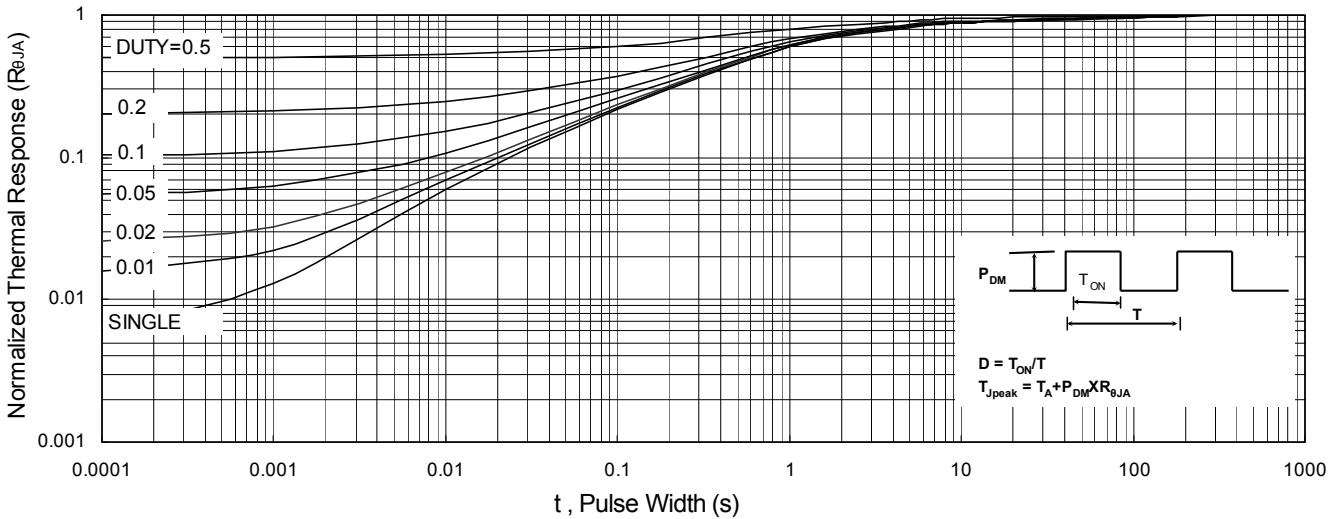


Fig.9 Normalized Maximum Transient Thermal Impedance

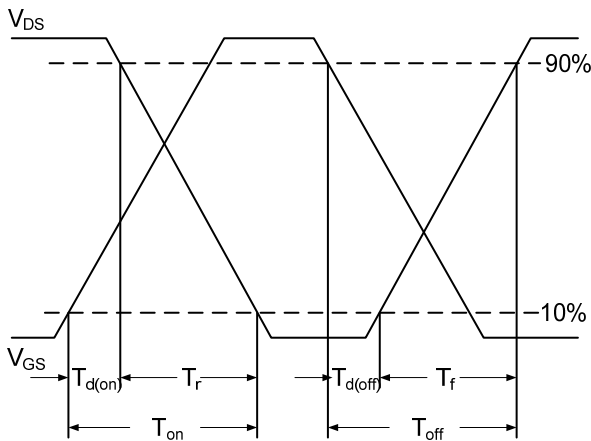


Fig.10 Switching Time Waveform

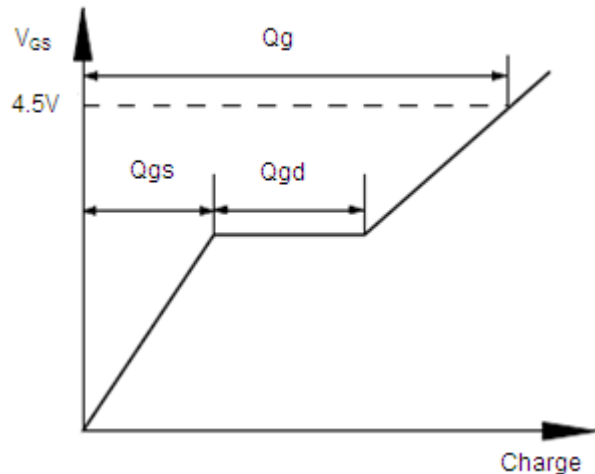


Fig.11 Gate Charge Waveform



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