



**ProsPower**

**PS8205A**

**20V Dual Channel NMOSFET**

Revision : 1.0  
Update Date : Apr. 2011

**ProsPower Microelectronics Co., Ltd**

### 1. General Description

The PS8205A uses advanced trench technology and design to provide excellent  $R_{ds(on)}$  with low gate charge. This device is suitable for use in high efficiency switching applications, DC/DC conversion, CPU power delivery and Synchronous rectification. Standard Product PS8205A is Pb-free (meets ROHS & Sony 259 specifications). It is offered in the very popular TSSOP8 package

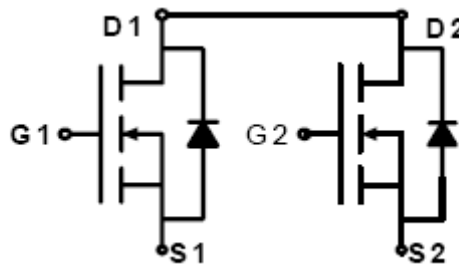
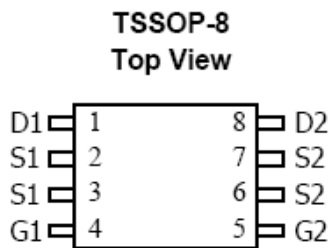
### 2. Applications

- Battery management in nomadic equipment
- DC motor control
- DC-DC converters
- Power management in portable/desktop PCs

### 3. Features

- $V_{ds}=20V$
- $I_d=6A$  ( $V_{gs}=8V$ )
- $R_{ds(on)}<28m\Omega$  ( $V_{gs}=4.5V$ )
- Low capacitance minimizes driver loss
- Optimized gate charge minimizes switching loss

### Pin Configuration



### Pin Descriptions

Pin Name	Symbol	Function
Gate(4,5)	G1/G2	Device Gate terminal
Drain(1,8)	D1/D2	Device drain terminal
Source(2,3,6,7)	S1/S2	Device source terminal

**Absolute Maximum Ratings**

Stress greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These stress ratings only, and functional operation of the device at these or any conditions beyond those indicated under recommended Operating Conditions is not implied. Exposure to “Absolute Maximum Rating” for extended periods may affect device reliability. Use of standard ESD handling precautions is required..

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		$V_{DS}$	20	V
Gate-Source Voltage		$V_{GS}$	±8	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$ (Note 3)	$I_D$	6	A
	$T_C=70^{\circ}\text{C}$ (Note 3)		4.8	
Pulsed Drain Current (Note 1)		$I_{DM}$	20	A
Power Dissipation $T_C=25^{\circ}\text{C}$		$P_D$	1.14	W
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^{\circ}\text{C}$

**Electrical Specifications**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$BVD_{SS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}, T_J=25^{\circ}\text{C}$			1	$\mu\text{A}$
Gate-Body leakage current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 8\text{V}$			0.1	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.5		1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{V}, I_D=6\text{A}$		22	28	m $\Omega$
		$V_{GS}=2.5\text{V}, I_D=5.2\text{A}$		28	38	
Diode Forward Voltage	$V_{SD}$	$I_S=1.5\text{A}, V_{GS}=0\text{V}$			1.2	V
Maximum Body-Diode Continuous Current	$I_S$				6	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				20	A
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0\text{V}, V_{DS}=20\text{V}, f=1\text{MHz}$		1030		pF
Output Capacitance	$C_{oss}$			320		pF
Reverse Transfer Capacitance	$C_{rss}$			150		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_g$	$V_{GS}=5\text{V}, V_{DD}=20\text{V}, I_D=6\text{A}$ (Note 2)		22		nC
Gate Source Charge	$Q_{gs}$			4		nC

Gate Drain Charge	$Q_{gd}$	$I_D=1A, V_{DD}=10V,$ $R_G=10\Omega(\text{Note } 2)$		7		nC
Turn-On Delay Time	$t_{D(on)}$			30		ns
Turn-On Rise Time	$t_r$			70		ns
Turn-Off Delay Time	$t_{D(off)}$			40		ns
Turn-Off Fall Time	$t_f$			60		ns

Notes

1. Pulse width limited by max. junction temperature
2. Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board,  $t \leq 5\text{sec}$ ; 180°C/W when mounted on min. copper pad.

Typical Performance Characteristics

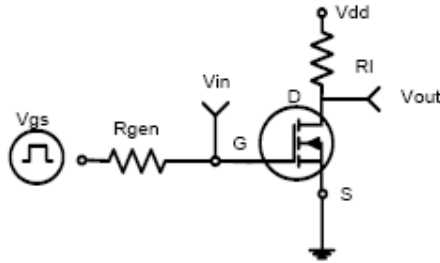


Figure 1: Switching Test Circuit

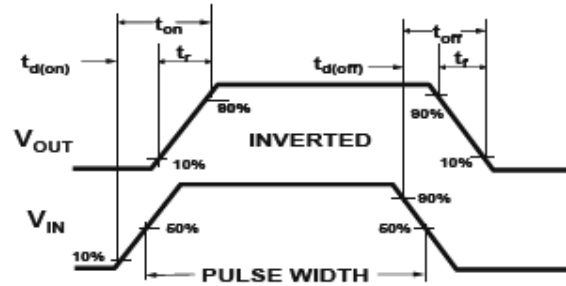


Figure 2: Switching Waveforms

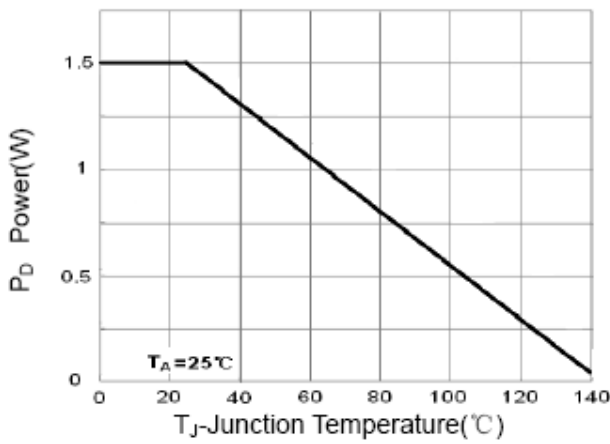


Figure 3 Power Dissipation

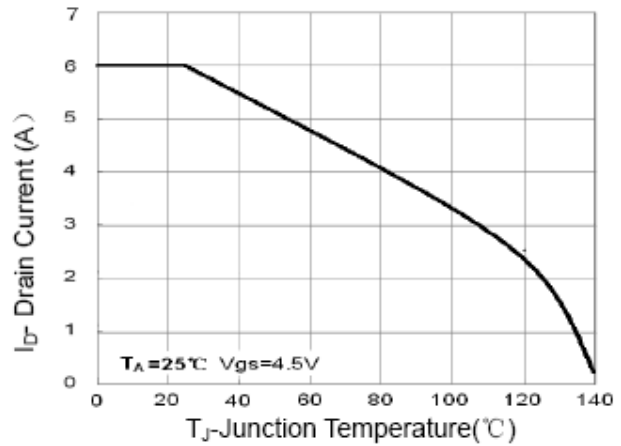


Figure 4 Drain Current

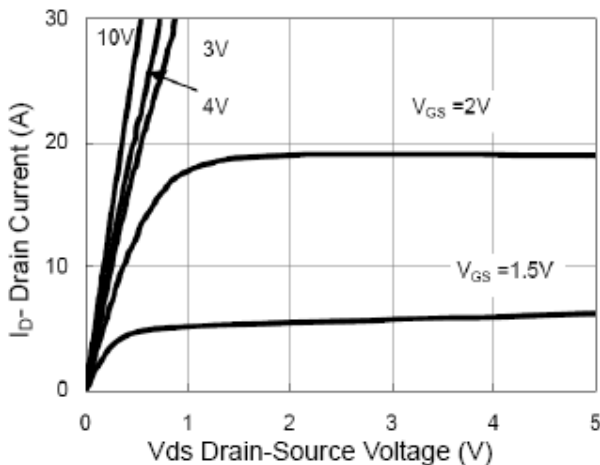


Figure 5 Output CHARACTERISTICS

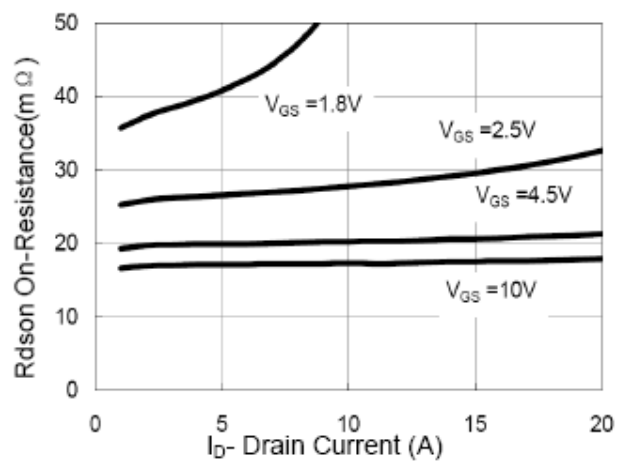


Figure 6 Drain-Source On-Resistance



Typical Performance Characteristics (contd.)

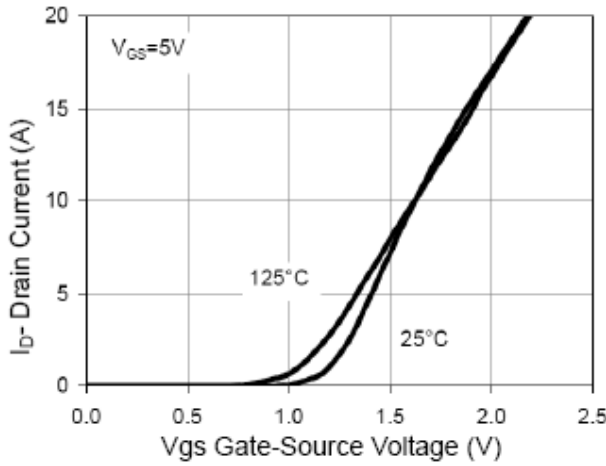


Figure 7 Transfer Characteristics

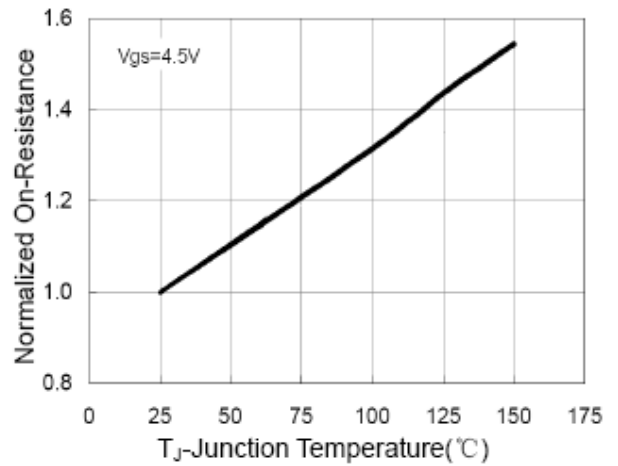


Figure 8 Drain-Source On-Resistance

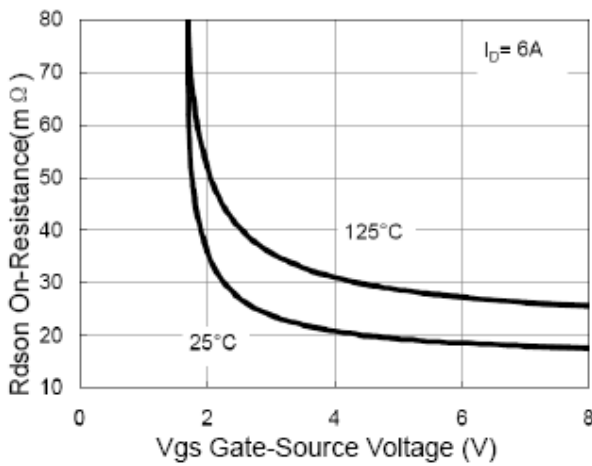


Figure 9 Rdson vs Vgs

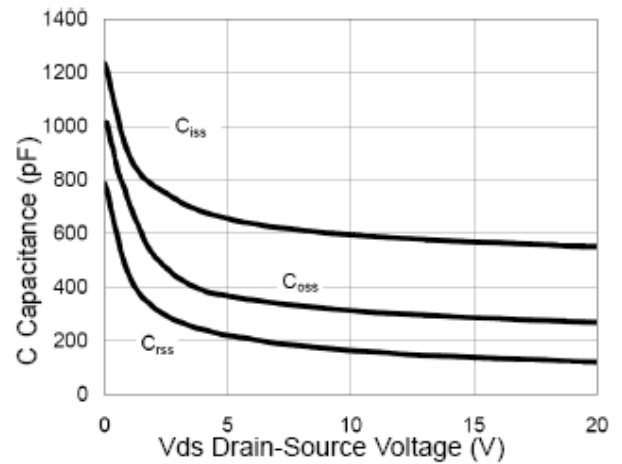


Figure 10 Capacitance vs Vds

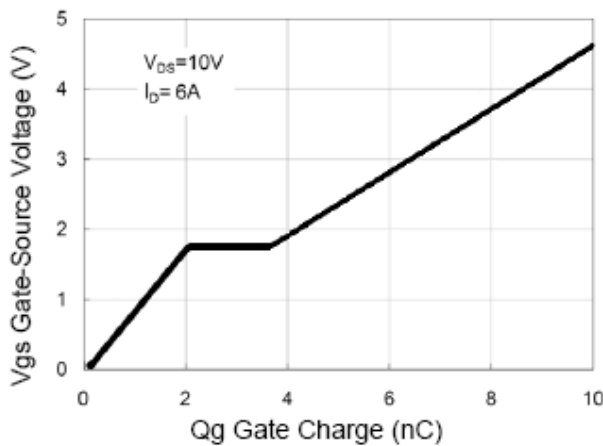


Figure 11 Gate Charge

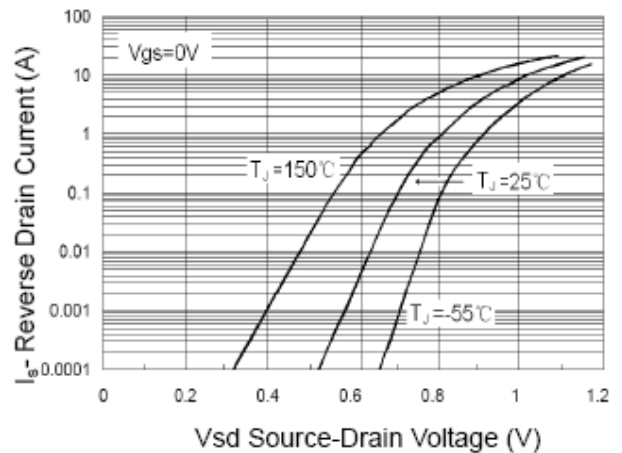


Figure 12 Source-Drain Diode Forward

Typical Performance Characteristics (contd.)

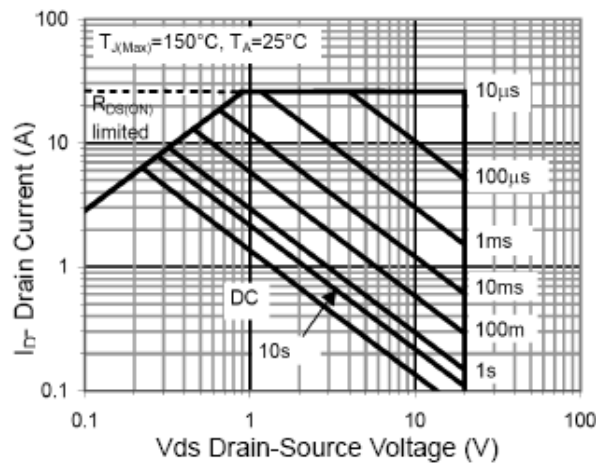


Figure 13 Safe Operation Area

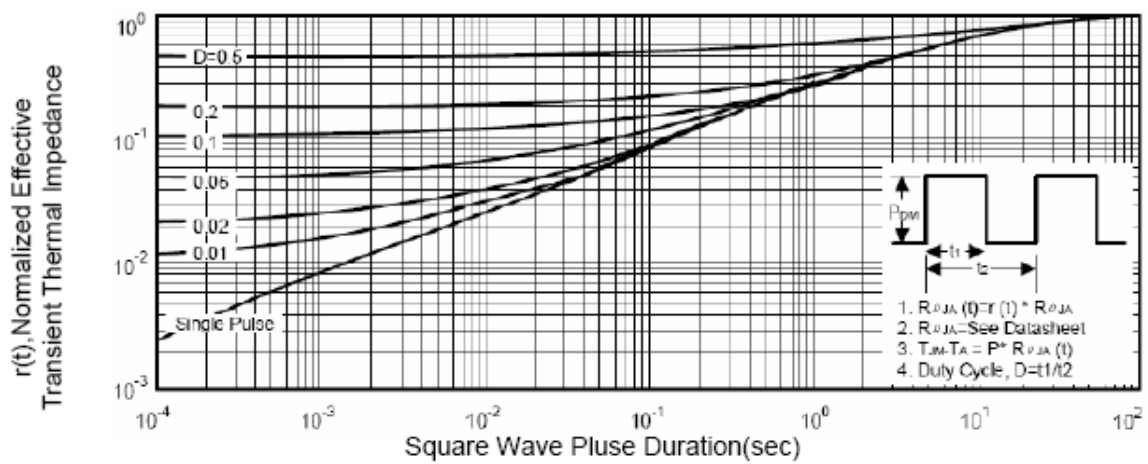
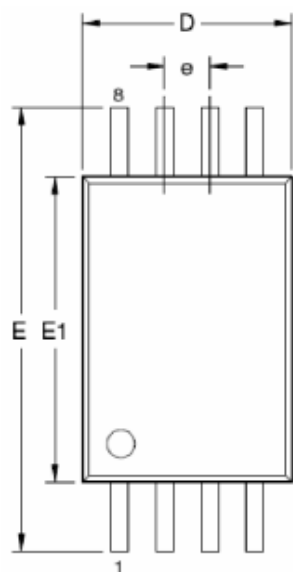
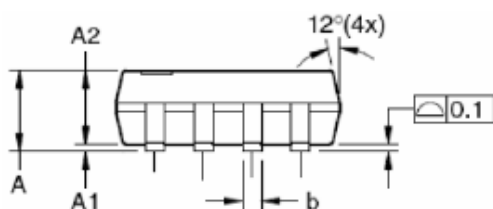
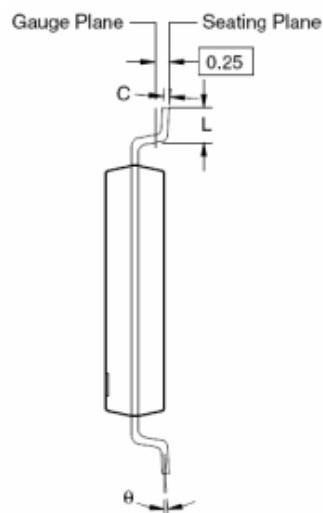


Figure 14 Normalized Maximum Transient Thermal Impedance

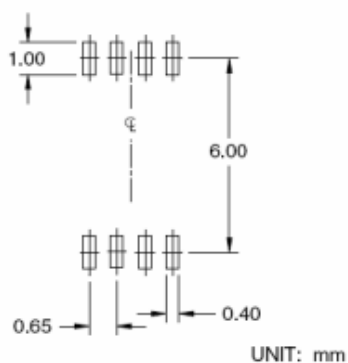
Package Dimensions  
TSSOP-8



Dimensions in Millimeters (UNIT:mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.20
A1	0.05	—	0.15
A2	0.80	1.00	1.05
b	0.19	—	0.30
C	0.09	—	0.20
D	2.90	3.00	3.10
E	6.40 BSC		
E1	4.30	4.40	4.50
e	0.65 BSC		
L	0.45	0.60	0.75
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	—	—	0.047
A1	0.002	—	0.006
A2	0.031	0.039	0.041
b	0.007	—	0.012
C	0.004	—	0.008
D	0.114	0.118	0.122
E	0.252 BSC		
E1	0.169	0.173	0.177
e	0.026 BSC		
L	0.018	0.024	0.030
θ	0°	—	8°



**Ordering Information**

Device	Operating T <sub>j</sub>	PKG Type	Wrap	Order Number
PS8205A	-55C° ≤ 150C°	TSSOP8	T&R	PS8205A-T8-TL

Note: Lead Free and RoHS compliant.

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