PS8205A

20V Dual Channel NMOSEFT

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 Rds(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

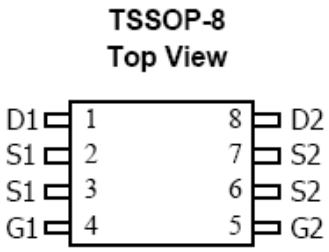
2. Applications

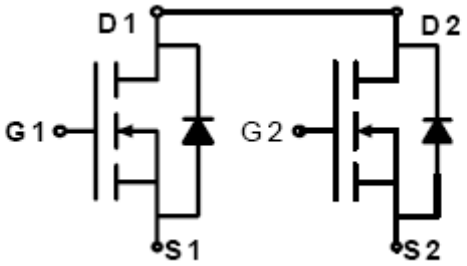
- Battery management in nomadic equipment
- DC motor control
- DC-DC converters
- Power management in portable/desktop PCs

3. Features

- Vds=20V
- Id=6A (Vgs=8V)
- Rds(on)=<28mohm (Vgs=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°C (Note 3)	I_D	6	A
	T_C=70°C(Note 3)		4.8	
Pulsed Drain Current (Note 1)		I_{DM}	20	A
Power Dissipation T_C=25°C		P_D	1.14	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Electrical Specifications

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

Gate Drain Charge	Q_{gd}			7		nC
Turn-On Delay Time	$t_{D(on)}$	I_D=1A, V_{DD}=10V, R_G=10Ω(Note 2)		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 <= 300us, Duty Cycle <=2%
3. Surface mounted on 1 in^2 copper pad of FR4 board, t <= 5sec; 180°C/W when mounted on min. copper pad.

Typical Performance Characteristics

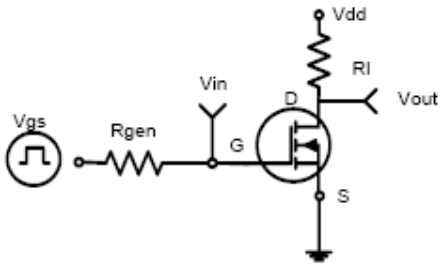


Figure 1:Switching Test Circuit

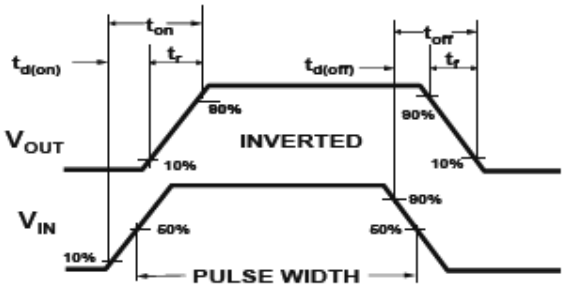


Figure 2:Switching Waveforms

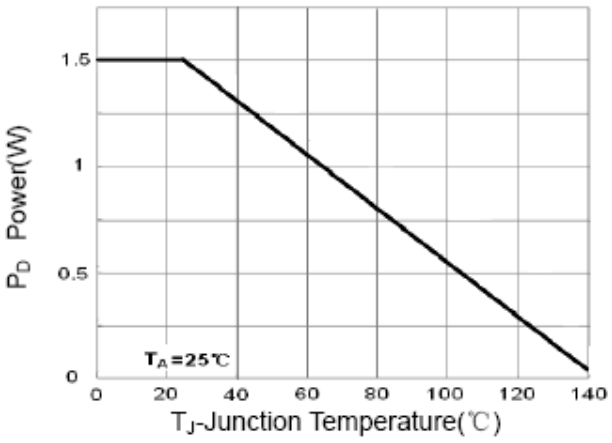


Figure 3 Power Dissipation

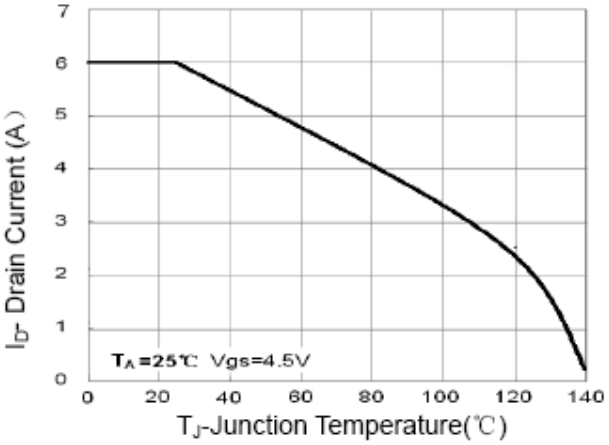


Figure 4 Drain Current

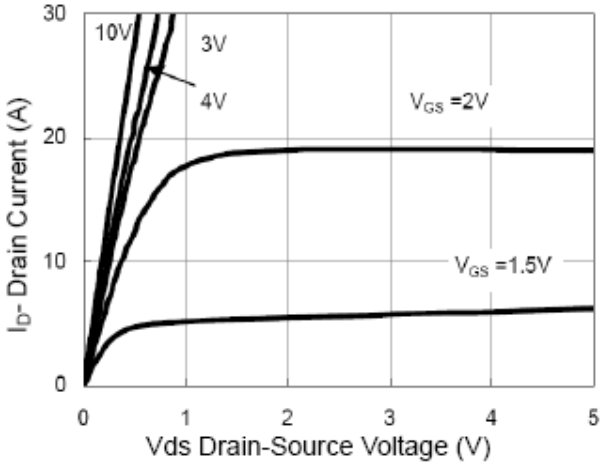


Figure 5 Output CHARACTERISTICS

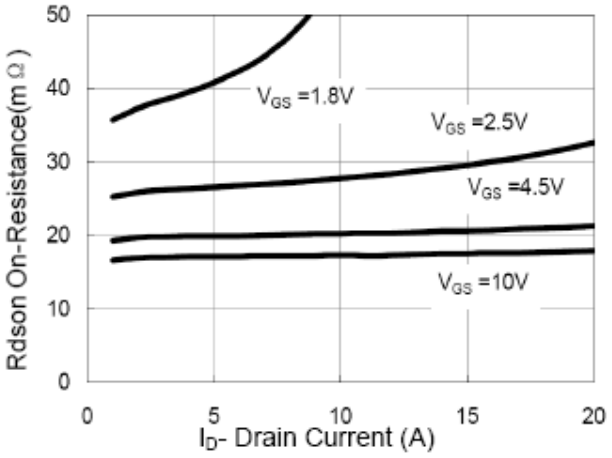


Figure 6 Drain-Source On-Resistance

Typical Performance Characteristics (contd.)

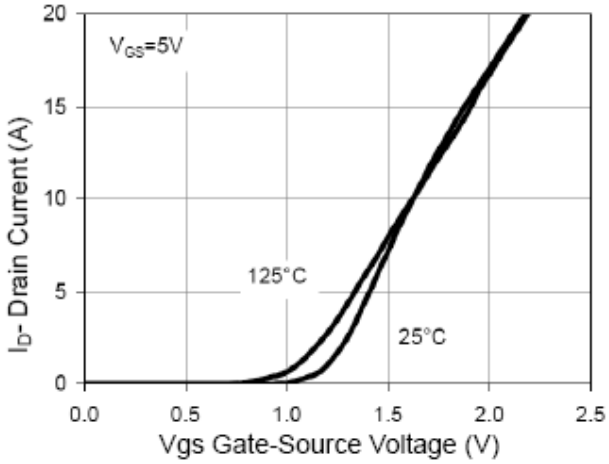


Figure 7 Transfer Characteristics

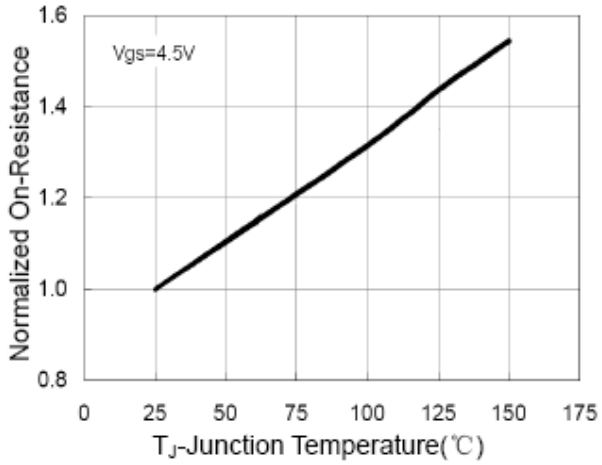


Figure 8 Drain-Source On-Resistance

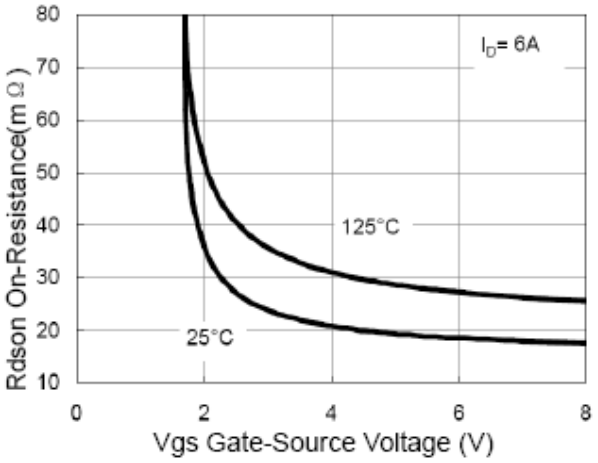


Figure 9 Rdson vs Vgs

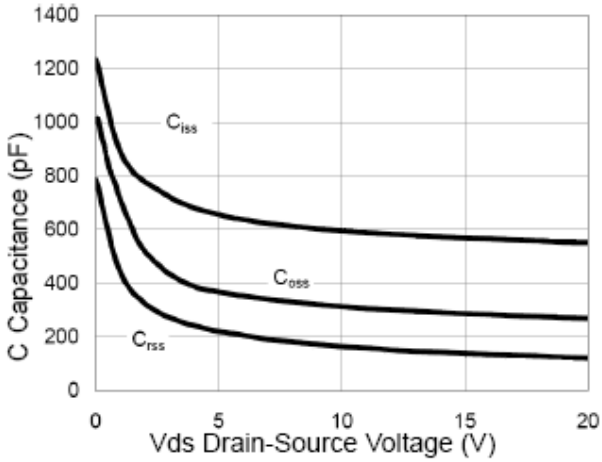


Figure 10 Capacitance vs Vds

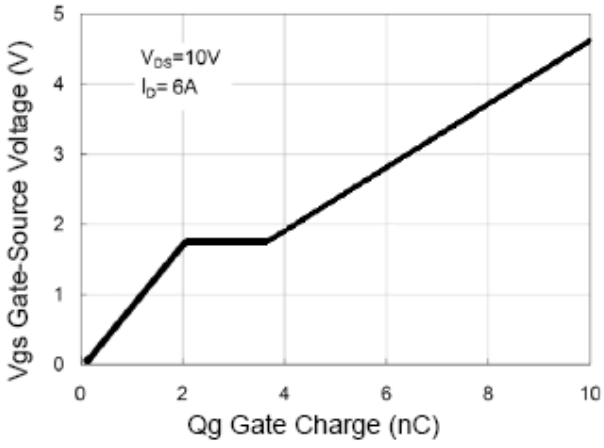


Figure 11 Gate Charge

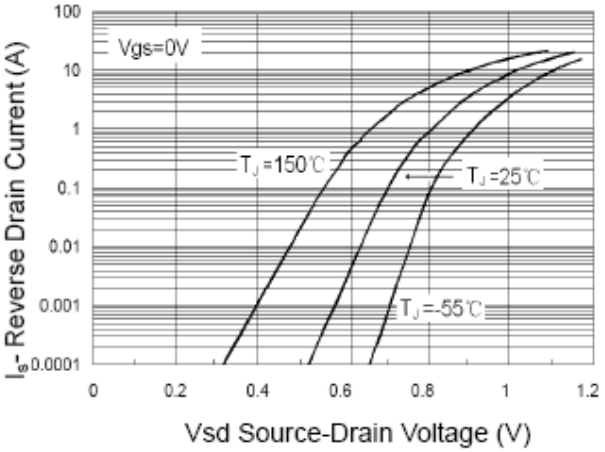


Figure 12 Source- Drain Diode Forward

Typical Performance Characteristics (contd.)

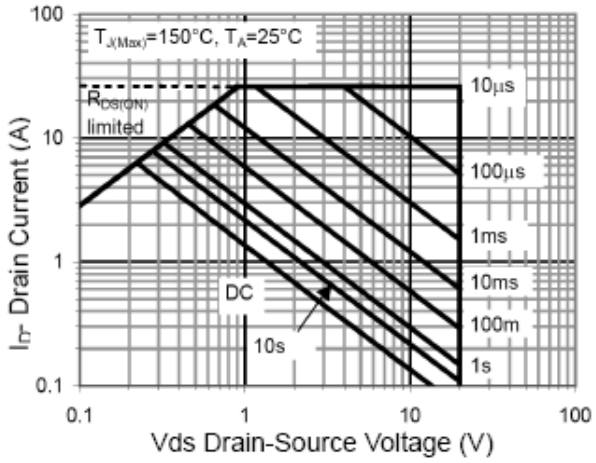


Figure 13 Safe Operation Area

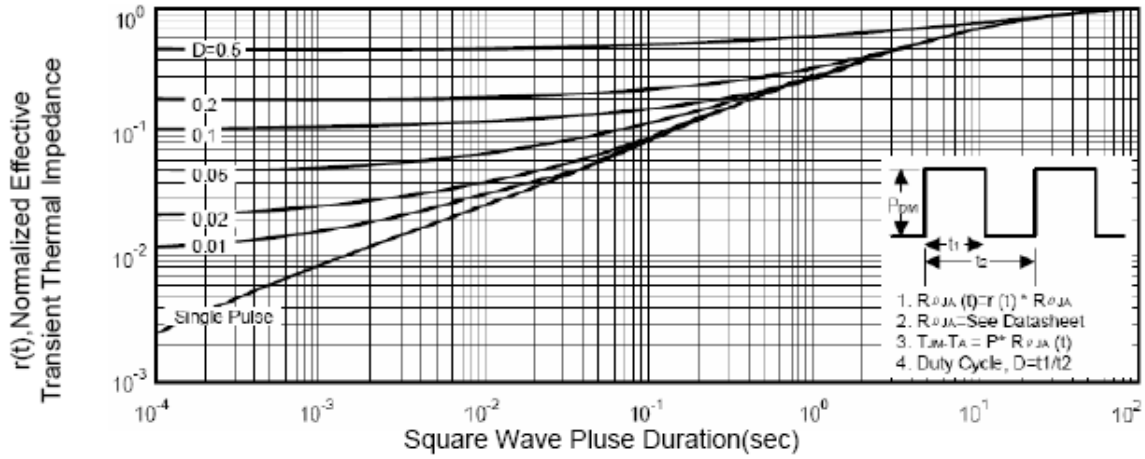
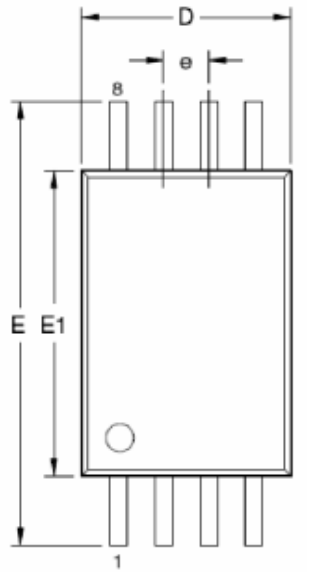


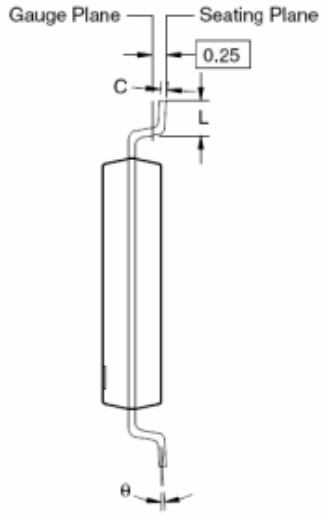
Figure 14 Normalized Maximum Transient Thermal Impedance

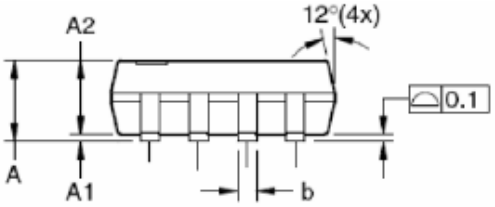
Package Dimensions

TSSOP-8

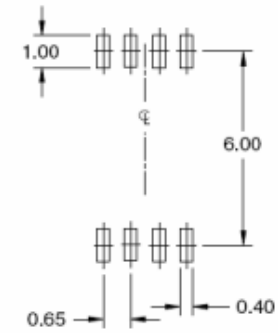


Dimensions in Millimeters (UNIT:mm)





RECOMMENDED LAND PATTERN



UNIT: mm

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_j	PKG Type	Wrap	Order Number
PS8205A	-55C° ≤150C°	TSSOP8	T&R	PS8205A-T8-TL

Note: Lead Free and RoHS compliant.