

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



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MOV



GDT



PLED

## MS8205A

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### Product specification

### General Description

The MS8205A is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent R<sub>DS(ON)</sub> and gate charge for most of the small power switching and load switch applications. They meet the RoHS and Product requirement with full function reliability approved.

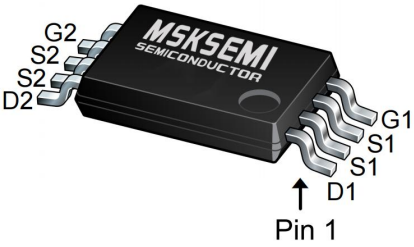
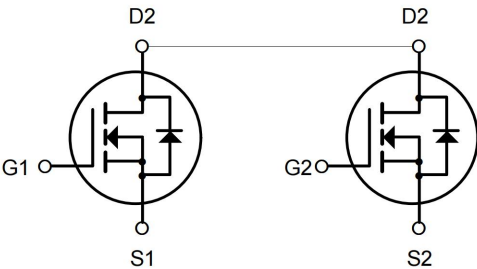
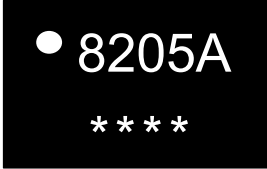
### General Features

- V<sub>DS</sub> = 20V I<sub>D</sub> = 6A
- R<sub>DS(ON)</sub> < 27mΩ @ V<sub>GS</sub>=4.5V
- R<sub>DS(ON)</sub> < 37mΩ @ V<sub>GS</sub>=2.5V

### Application

- Battery protection
- Load switch
- Uninterruptible power supply

### Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
		
TSSOP-8	Dual N-Channel MOSFET	

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Drain Current-Continuous	6	A
I <sub>DM</sub>	Drain Current-Pulsed (Note 1)	25	A
P <sub>D</sub>	Maximum Power Dissipation	1.5	W
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 To 150	°C
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient (Note 2)	83	°C/W

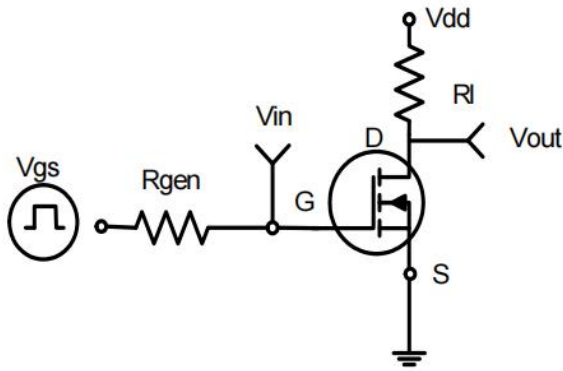
**Electrical Characteristics** (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	21	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=19.5V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.5A$	-	21	27	m $\Omega$
		$V_{GS}=2.5V, I_D=3.5A$	-	27	37	m $\Omega$
Forward Transconductance	$f_S$	$V_{DS}=5V, I_D=4.5A$	-	10	-	S
Input Capacitance	$C_{iss}$	$V_{DS}=8V, V_{GS}=0V,$ $V,$ $F=1.0MHz$	-	600	-	PF
Output Capacitance	$C_{oss}$		-	330	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	140	-	PF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A$ $V_{GS}=4.5V, R_{GEN}=6\Omega$	-	10	20	nS
Turn-on Rise Time	$t_r$		-	11	25	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35	70	nS
Turn-Off Fall Time	$t_f$		-	30	60	nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=6A,$ $V_{GS}=4.5V$	-	10	15	nC
Gate-Source Charge	$Q_{gs}$		-	2.3	-	nC
Gate-Drain Charge	$Q_{gd}$		-	1.5	-	nC
Diode Forward Voltage <sup>(Note 3)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=1.7A$	-	0.75	1.2	V
Diode Forward Current <sup>(Note 2)</sup>	$I_S$		-	-	1.7	A

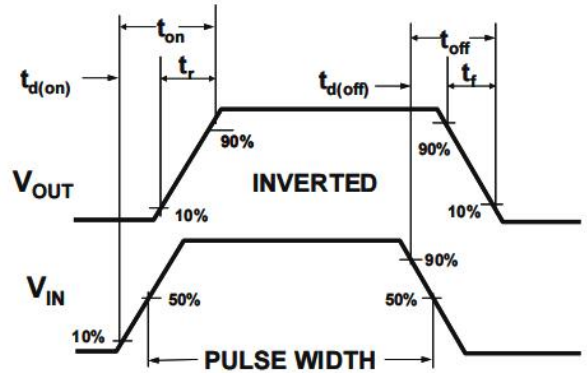
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

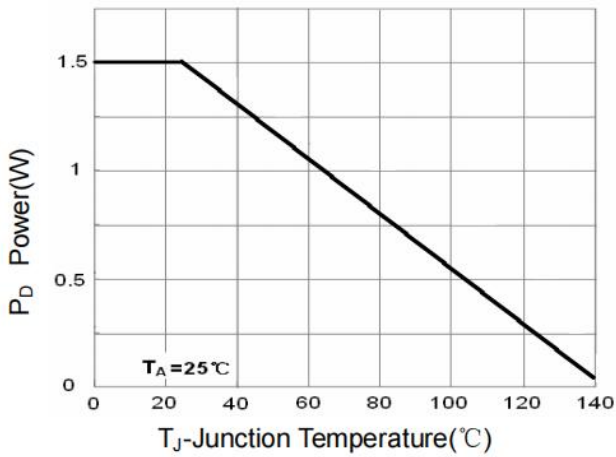
**Typical Characteristics**



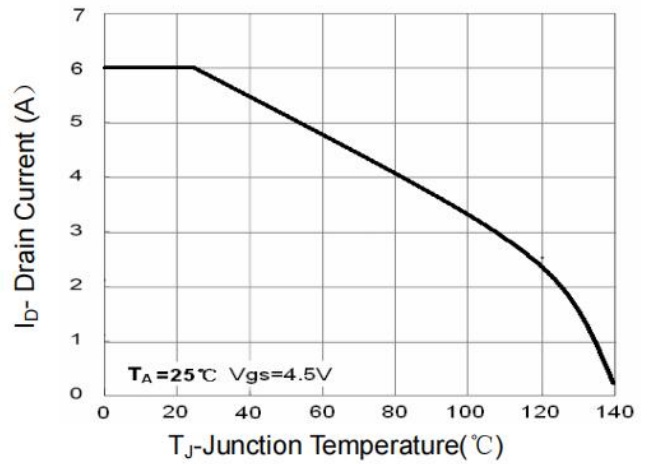
**Figure 1: Switching Test Circuit**



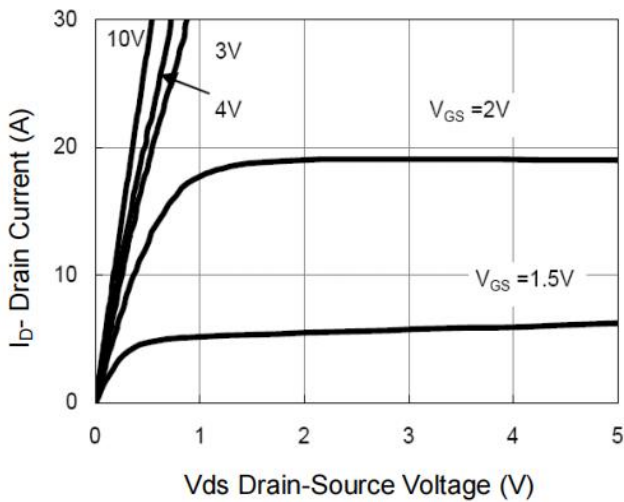
**Figure 2: Switching Waveforms**



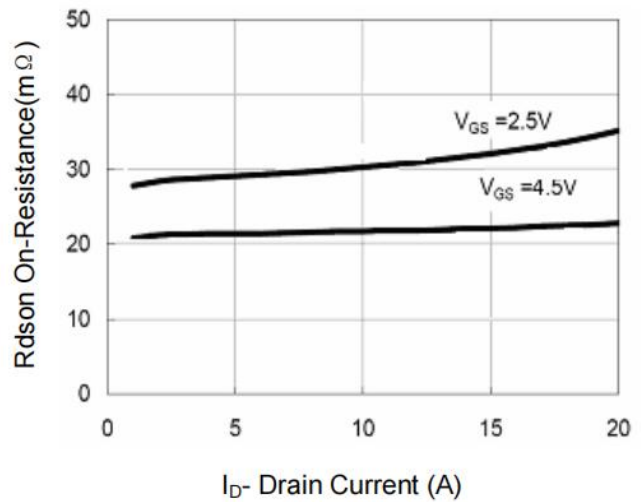
**Figure 3 Power Dissipation**



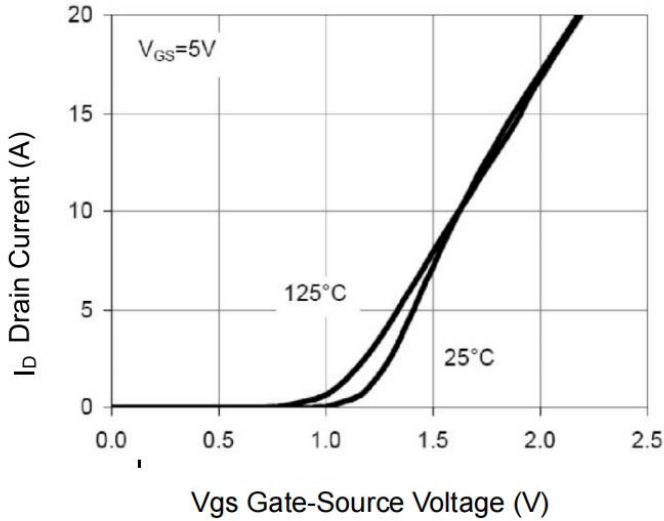
**Figure 4 Drain Current**



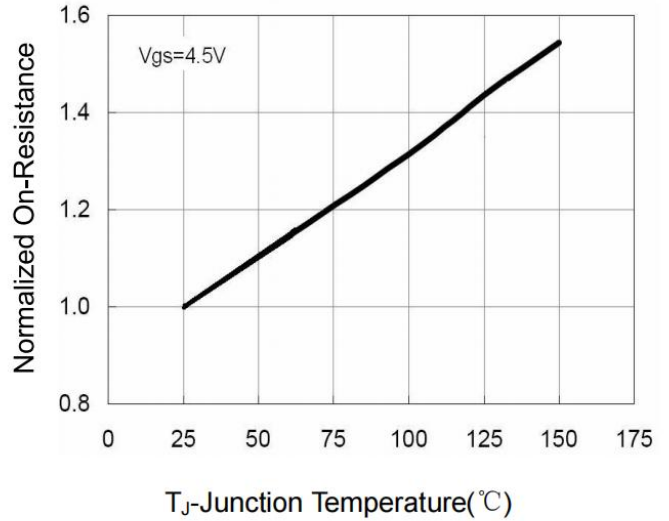
**Figure 5 Output Characteristics**



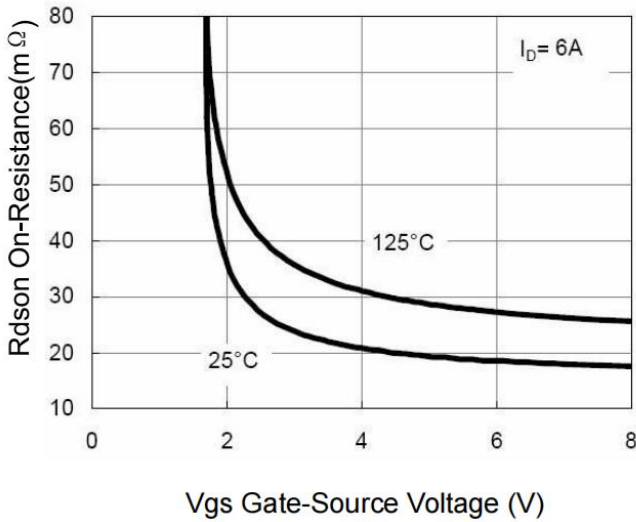
**Figure 6 Drain-Source On-Resistance**



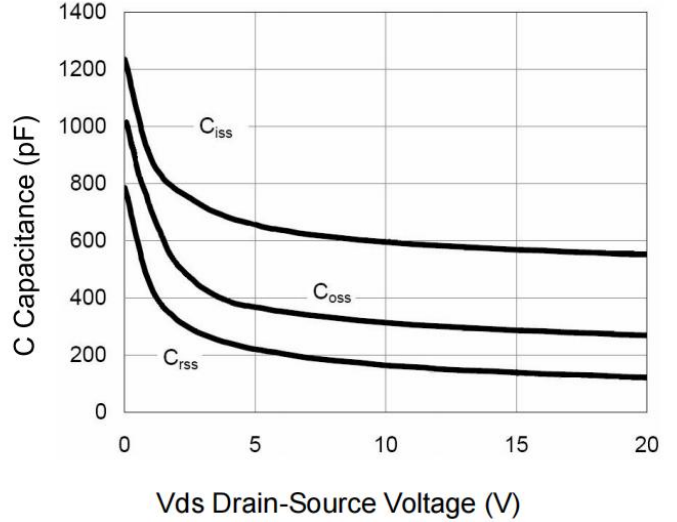
**Figure 7 Transfer Characteristics**



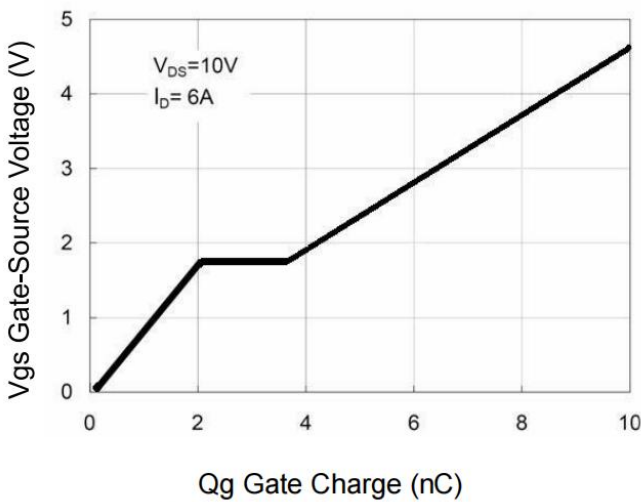
**Figure 8 Drain-Source On-Resistance**



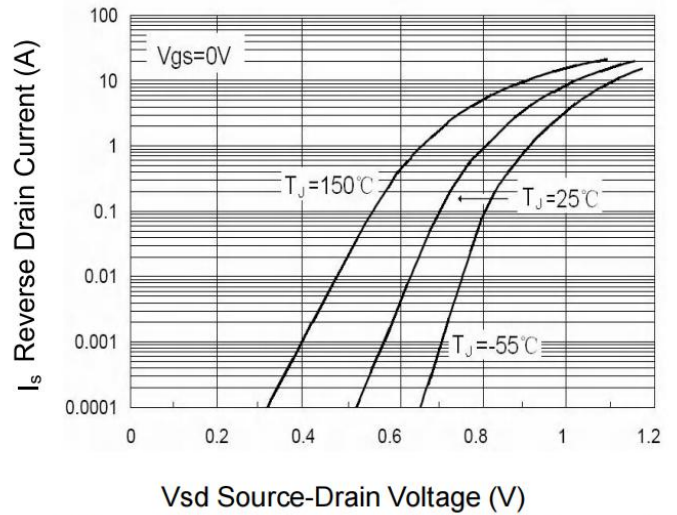
**Figure 9 Rdson vs Vgs**



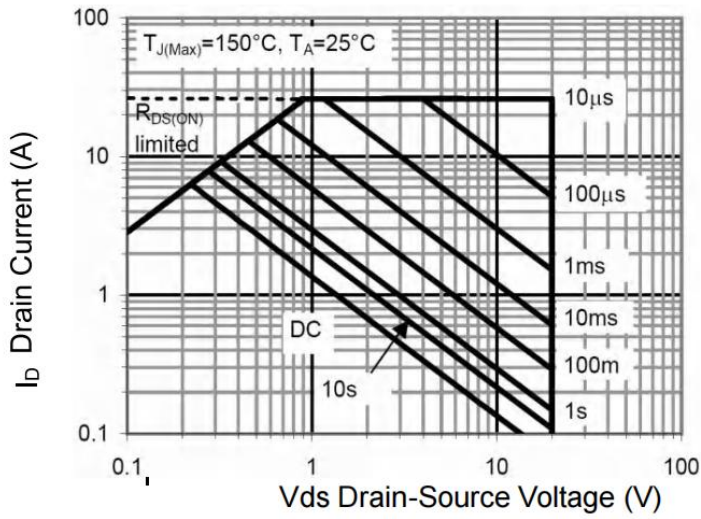
**Figure 10 Capacitance vs Vds**



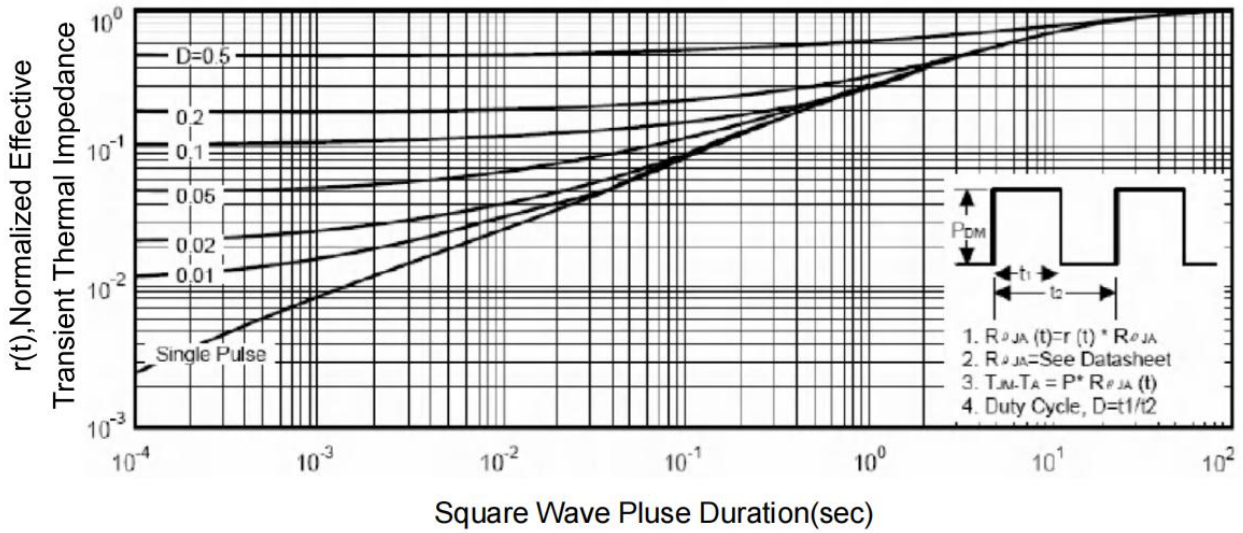
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**



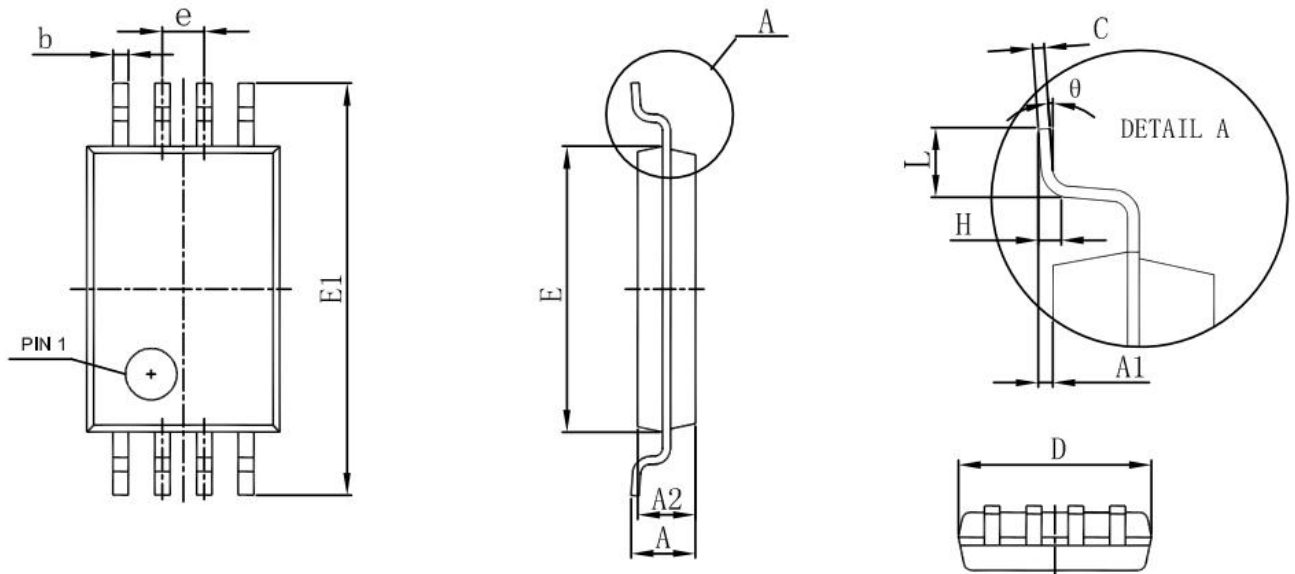
**Figure 13 Safe Operation Area**



**Figure 14 Normalized Maximum Transient Thermal Impedance**



**TSSOP-8 Package Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
D	2.900	3.100	0.114	0.122
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.65 (BSC)		0.026 (BSC)	
L	0.500	0.700	0.020	0.028
H	0.25(T YP)		0.01(T YP)	
9	1.	7.	1.	7.

**REEL SPECIFICATION**

P/N	PKG	QTY
MS8205A	TSSOP-8	5000

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