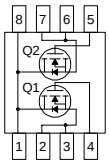
8205A

Dual N-Channel Enhancement-Mode MOSFET (20V, 6A)

8-Lead Plastic **TSSOP-8L**

8205A Symbol & Pin Assignment



Pin 1: Drain
Pin 2 / 3: Source 1
Pin 4: Gate 1
Pin 5: Gate 2
Pin 6 / 7: Source 2
Pin 8: Drain

Description

This N-Channel 2.5V specified MOSFET is a rugged gate version of advanced trench process. It has been optimized for power management applications with a wide range of gate drive voltage (2.5V-10V)

Features

- $R_{DS(on)}$=38mΩ@V_{GS}=2.5V, I_D=5.2A; $R_{DS(on)}$=25mΩ@V_{GS}=4.5V, I_D=6A
- High Density Cell Design for Ultra Low On-Resistance
- High Power and Current Handing Capability
- Fully Characterized Avalanche Voltage and Current
- Ideal for Li ion Battery Pack Applications

Applications

- Battery Protection
- Load Switch
- Power Management

Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

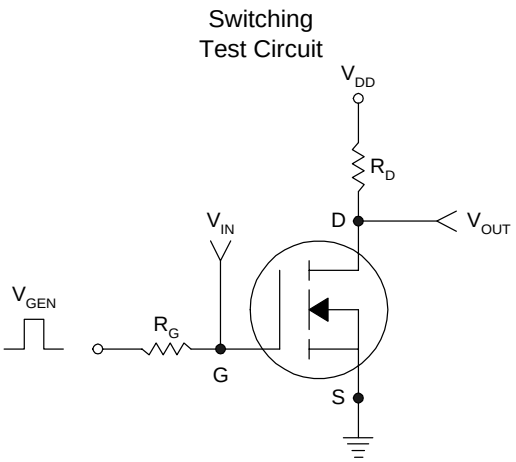
Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current (Continuous)	6	A
I_{DM}	Drain Current (Pulsed) *1	30	A
P_D	Total Power Dissipation @T_A=25°C	1.5	W
	Total Power Dissipation @T_A=75°C	0.96	W
T_j, T_{stg}	Operating and Storage Temperature Range	-55 to +150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient *2	83	°C/W

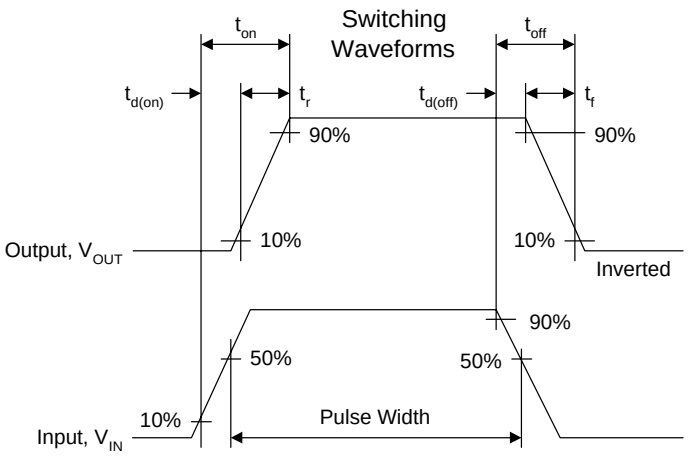
*1: Maximum DC current limited by the package
*2: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25°C, unless otherwise noted)

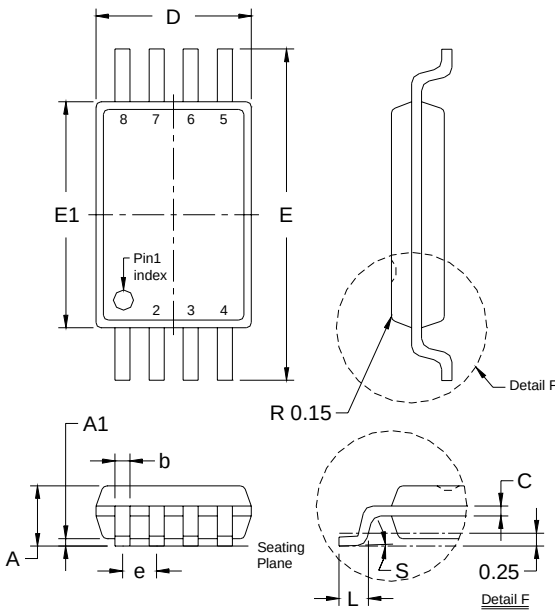
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Static						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=2.5V, I_D=5.2A	-	33	38	mΩ
		V_{GS}=4.5V, I_D=6A	-	20	25	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.6	-	1.5	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=6A	7	13	-	S
• Dynamic						
Q_g	Total Gate Charge	V_{DS}=10V, I_D=6A, V_{GS}=4.5V	-	4.86	-	nC
Q_{gs}	Gate-Source Charge		-	0.92	-	
Q_{gd}	Gate-Drain Charge		-	1.4	-	
C_{iss}	Input Capacitance	V_{DS}=8V, V_{GS}=0V, f=1MHz	-	562	-	pF
C_{oss}	Output Capacitance		-	106	-	
C_{rss}	Reverse Transfer Capacitance		-	75	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, I_D=1A, V_{GS}=4.5V R_{GEN}=6Ω	-	8.1	-	ns
t_r	Turn-on Rise Time		-	9.95	-	
$t_{d(off)}$	Turn-off Delay Time		-	21.85	-	
t_f	Turn-off Fall Time		-	5.35	-	
• Drain-Source Diode Characteristics						
I_S	Maximum Diode Forward Current		-	-	1.7	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1.7A	-	-	1.2	V

Note: Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%



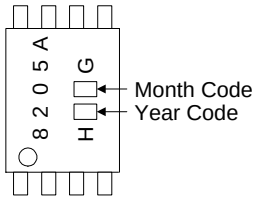


TSSOP-8L Dimension



8-Lead TSSOP-8L Plastic
Surface Mounted Package

8205A Marking:



Pin Style: 1.D 2.S1 3.S1 4.G1 5.G2 6.S2 7.S2 8.D

Note: Green label is used for pb-free packing

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	-	1.20
A1	0.05	0.15
b	0.19	0.3
C	0.09	0.20
D	2.90	3.10
E	6.20	6.60
E1	4.30	4.50
e	0.65 BSC	
L	0.45	0.75
S	0^o	8^o

*: Typical, Unit: mm

Head Office And Factory:

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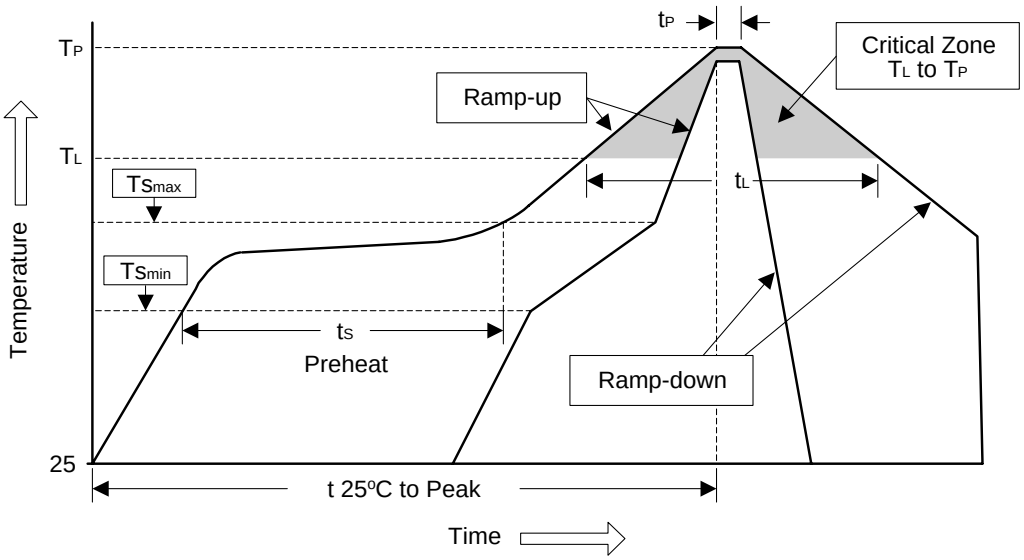
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	10sec ±1sec
Pb-Free devices.	260°C ±5°C	10sec ±1sec