



H8205A

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

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

- $R_{DS(on)}=40m\Omega @ V_{GS}=2.5V, I_D=5.2A$; $R_{DS(on)}=25m\Omega @ V_{GS}=4.5V, I_D=6A$
- High Density Cell Design for Ultra Low On-Resistance
- High Power and Current Handling Capability
- Fully Characterized Avalanche Voltage and Current
- Ideal for Li ion Battery Pack Applications

Applications

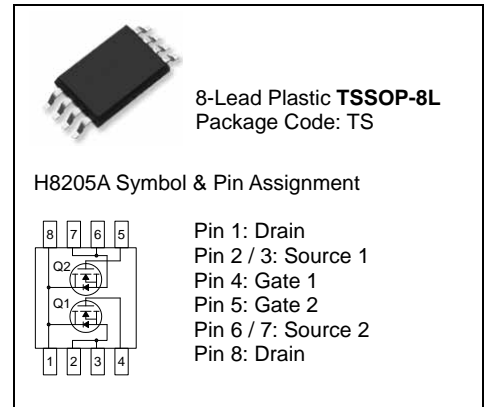
- Battery Protection
- Load Switch
- Power Management

Absolute Maximum Ratings ($T_A=25^\circ C$, unless otherwise noted)

| Symbol | Parameter | Ratings | Units |
|-----------------|------------------------------------------------------|-------------|--------------|
| V_{DS} | Drain-Source Voltage | 20 | V |
| V_{GS} | Gate-Source Voltage | ± 8 | V |
| I_D | Drain Current | 6 | A |
| I_{DM} | Drain Current (Pulsed) ^{*1} | 30 | A |
| P_D | Total Power Dissipation @ $T_A=25^\circ C$ | 1.5 | W |
| | Total Power Dissipation @ $T_A=75^\circ C$ | 0.96 | W |
| T_j, T_{stg} | Operating and Storage Temperature Range | -55 to +150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient ^{*2} | 83 | $^\circ C/W$ |

*1: Maximum DC current limited by the package

*2: 1-in² 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 | 18 | 20 | - | V |
| R _{DS(on)} | Drain-Source On-State Resistance | V _{GS} =2.5V, I _D =5.2A | - | | 40 | mΩ |
| | | V _{GS} =4.5V, I _D =6A | - | | 25 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 0.5 | - | 1.5 | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =16V, V _{GS} =0V | - | - | 1 | uA |
| I _{GSS} | Gate-Body Leakage Current | V _{GS} =±8V, V _{DS} =0V | - | - | ±100 | nA |
| g _{FS} | Forward Transconductance | V _{DS} =10V, I _D =6A | 7 | 13 | - | S |

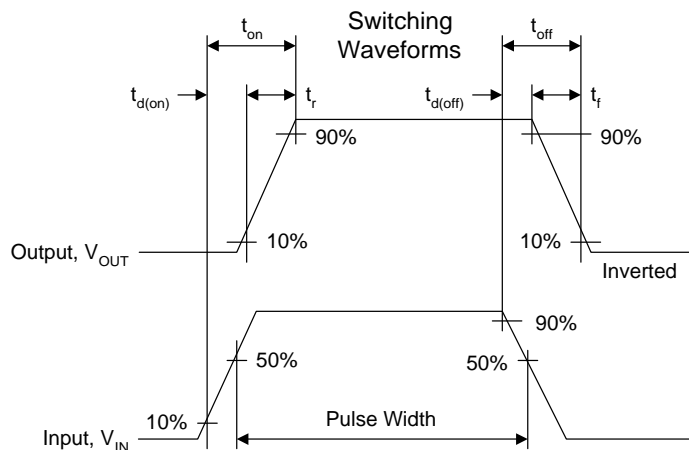
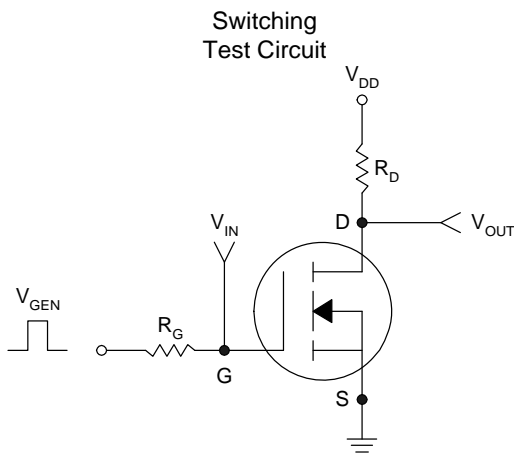
• **Dynamic**

| | | | | | | |
|---------------------|------------------------------|-----------------------------------------------------------------------------------------|---|-------|---|----|
| 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
HSMC Package Code: TS

H8205A Marking:

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

*: Typical, Unit: mm

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of HSMC.
- HSMC reserves the right to make changes to its products without notice.
- **HSMC semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- HSMC assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

Head Office And Factory:

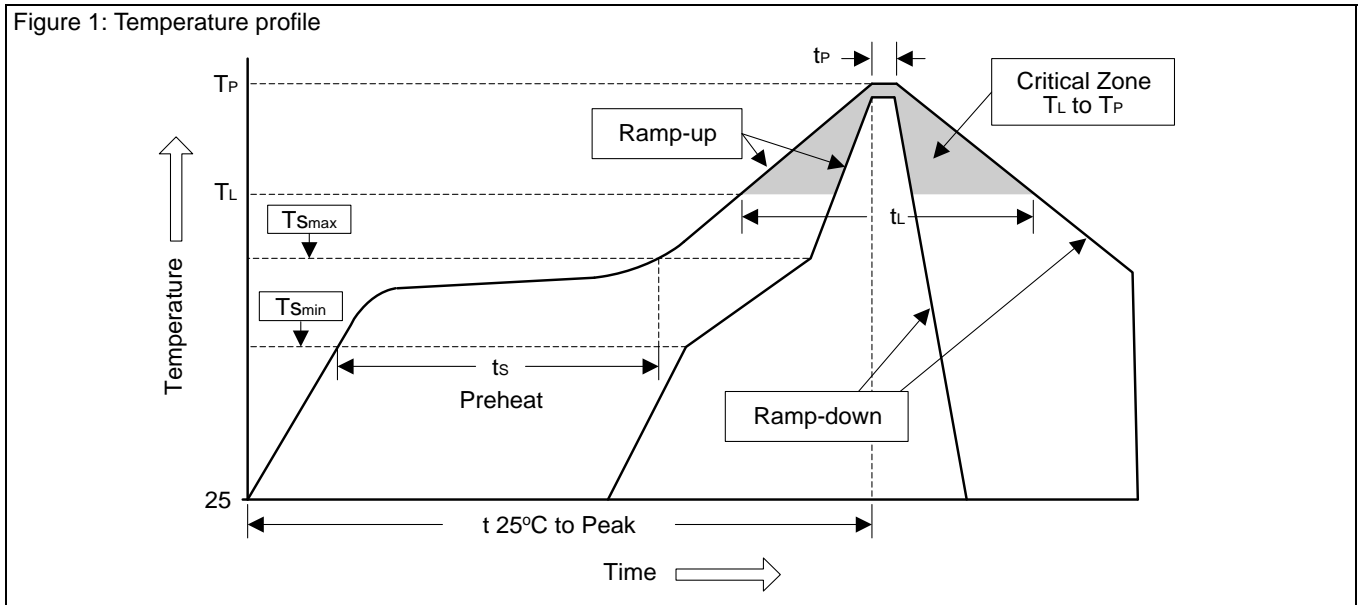
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F., No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
Tel: 886-3-5983621~5 Fax: 886-3-5982931



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 (T_{Smin}) | 100°C | 150°C |
| - Temperature Max (T_{Smax}) | 150°C | 200°C |
| - Time (min to max) (t_s) | 60~120 sec | 60~180 sec |
| T_{Smax} to T_L | | |
| - Ramp-up Rate | <3°C/sec | <3°C/sec |
| Time maintained above: | | |
| - Temperature (T_L) | 183°C | 217°C |
| - Time (t_L) | 60~150 sec | 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 | 5sec ±1sec |
| Pb-Free devices. | 260°C +0/-5°C | 5sec ±1sec |