

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

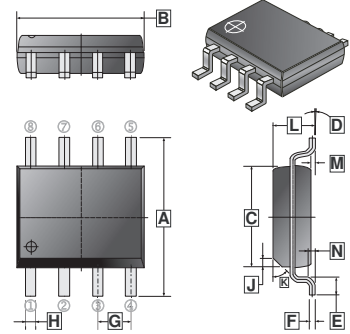
## DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $R_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

## FEATURES

- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe SOP-8 saves board space.
- Fast switching speed.
- High performance trench technology.

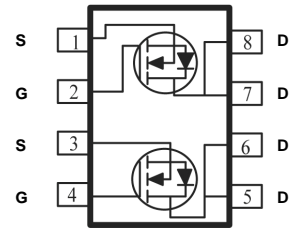
### SOP-8



| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 5.80       | 6.20 | H    | 0.35       | 0.49 |
| B    | 4.80       | 5.00 | J    | 0.375 REF. |      |
| C    | 3.80       | 4.00 | K    | 45°        |      |
| D    | 0°         | 8°   | L    | 1.35       | 1.75 |
| E    | 0.40       | 0.90 | M    | 0.10       | 0.25 |
| F    | 0.19       | 0.25 | N    | 0.25 REF.  |      |
| G    | 1.27 TYP.  |      |      |            |      |

## PACKAGE INFORMATION

| Package | MPQ  | Leader Size |
|---------|------|-------------|
| SOP-8   | 2.5K | 13 inch     |



## MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter   | Symbol                  | Ratings                  | Unit             |
|---|-------------------------|--------------------------|------------------|
| Drain-Source Voltage                                      | $V_{DS}$                | 30                       | V                |
| Gate-Source Voltage                                       | $V_{GS}$                | $\pm 20$                 | V                |
| Continuous Drain Current <sup>1</sup>                     | $I_D$                   | $T_A = 25^\circ\text{C}$ | 8.9              |
|   |                         | $T_A = 70^\circ\text{C}$ | 7.3              |
| Pulsed Drain Current <sup>2</sup>                         | $I_{DM}$                | 30                       | A                |
| Continuous Source Current (Diode Conduction) <sup>1</sup> | $I_S$                   | 2.6                      | A                |
| Total Power Dissipation <sup>1</sup>                      | $P_D$                   | $T_A = 25^\circ\text{C}$ | 2.1              |
|   |                         | $T_A = 70^\circ\text{C}$ | 1.3              |
| Operating Junction & Storage Temperature Range            | $T_J, T_{STG}$          | -55 ~ 150                | $^\circ\text{C}$ |
| <b>Thermal Resistance Ratings</b>                         |                         |                          |                  |
| Thermal Resistance Junction-Ambient (Max.) <sup>1</sup>   | $t \leq 10 \text{ sec}$ | $R_{\theta JA}$          | 62.5             |
|   | Steady State            |                          | 110              |

Notes:

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

| Parameter                               | Symbol       | Min. | Typ. | Max.      | Unit          | Test Conditions  |
|---|--------------|------|------|-----------|---------------|--|
| <b>Static</b>                           |              |      |      |           |               |  |
| Gate Threshold Voltage                  | $V_{GS(th)}$ | 1    | -    | -         | V             | $V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$   |
| Gate-Body Leakage Current               | $I_{GSS}$    | -    | -    | $\pm 100$ | nA            | $V_{DS}=0$ , $V_{GS}=\pm 20\text{V}$   |
| Zero Gate Voltage Drain Current         | $I_{DSS}$    | -    | -    | 1         | $\mu\text{A}$ | $V_{DS}=24\text{V}$ , $V_{GS}=0$   |
|   |              | -    | -    | 10        |               | $V_{DS}=24\text{V}$ , $V_{GS}=0$ , $T_J=55^\circ\text{C}$  |
| On-State Drain Current <sup>1</sup>     | $I_{D(on)}$  | 20   | -    | -         | A             | $V_{DS}=5\text{V}$ , $V_{GS}=10\text{V}$   |
| Drain-Source On-Resistance <sup>1</sup> | $R_{DS(ON)}$ | -    | -    | 18        | m $\Omega$    | $V_{GS}=10\text{V}$ , $I_D=5\text{A}$  |
|   |              | -    | -    | 26        |               | $V_{GS}=4.5\text{V}$ , $I_D=4.4\text{A}$   |
| Forward Transconductance <sup>1</sup>   | $g_{fs}$     | -    | 20   | -         | S             | $V_{DS}=15\text{V}$ , $I_D=5\text{A}$  |
| Diode Forward Voltage                   | $V_{SD}$     | -    | 0.77 | -         | V             | $I_S=1.3\text{A}$ , $V_{GS}=0$   |
| <b>Dynamic <sup>2</sup></b>             |              |      |      |           |               |  |
| Total Gate Charge                       | $Q_g$        | -    | 3.8  | -         | nC            | $I_D=5\text{A}$<br>$V_{DS}=15\text{V}$<br>$V_{GS}=4.5\text{V}$                                       |
| Gate-Source Charge                      | $Q_{gs}$     | -    | 1.3  | -         |               |  |
| Gate-Drain Charge                       | $Q_{gd}$     | -    | 2    | -         |               |  |
| Input Capacitance                       | $C_{iss}$    | -    | 327  | -         | pF            | $V_{DS}=15\text{V}$<br>$V_{GS}=0$<br>$f=1\text{MHz}$   |
| Output Capacitance                      | $C_{oss}$    | -    | 65   | -         |               |  |
| Reverse Transfer Capacitance            | $C_{rss}$    | -    | 49   | -         |               |  |
| Turn-On Delay Time                      | $T_{d(on)}$  | -    | 1.9  | -         | nS            | $V_{DD}=15\text{V}$<br>$I_D=5\text{A}$<br>$V_{GEN}=10\text{V}$<br>$R_L=3\Omega$<br>$R_{GEN}=6\Omega$ |
| Rise Time                               | $T_r$        | -    | 4    | -         |               |  |
| Turn-Off Delay Time                     | $T_{d(off)}$ | -    | 13   | -         |               |  |
| Fall Time                               | $T_f$        | -    | 6    | -         |               |  |

Notes:

1. Pulse test :  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing.