

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.

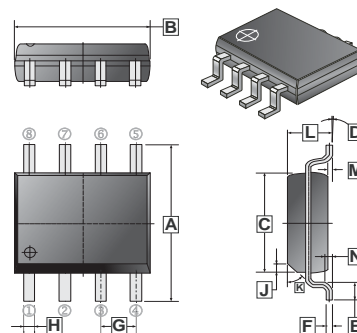
## FEATURES

- 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.

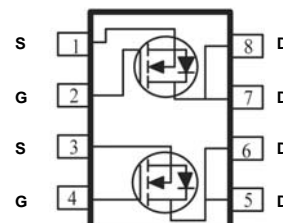
## PACKAGE INFORMATION

| Package | MPQ  | LeaderSize |
|---------|------|------------|
| SOP-8   | 2.5K | 13' inch   |

### 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.  |      |      |            |      |



## 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  | $V_{GS}$                       | $\pm 12$  | V                           |
| Continuous Drain Current <sup>1</sup>                                  | $I_D @ T_A = 25^\circ\text{C}$ | 10        | A                           |
|  | $I_D @ T_A = 70^\circ\text{C}$ | 8.2       | A                           |
| Pulsed Drain Current <sup>2</sup>                                      | $I_{DM}$                       | $\pm 50$  | A                           |
| Continuous Source Current (Diode Conduction) <sup>1</sup>              | $I_S$                          | 2.3       | A                           |
| Total Power Dissipation <sup>1</sup>                                   | $P_D @ T_A = 25^\circ\text{C}$ | 2.1       | W                           |
|  | $P_D @ T_A = 70^\circ\text{C}$ | 1.3       | W                           |
| Operating Junction & Storage Temperature Range                         | $T_J, T_{STG}$                 | -55 ~ 150 | $^\circ\text{C}$            |
| <b>Thermal Resistance Ratings</b>                                      |                                |           |                             |
| Thermal Resistance Junction-Case (Max.) <sup>1</sup> $t \leq 5$ sec    | $R_{\theta JC}$                | 40        | $^\circ\text{C} / \text{W}$ |
| Thermal Resistance Junction-ambient (Max.) <sup>1</sup> $t \leq 5$ sec | $R_{\theta JA}$                | 60        | $^\circ\text{C} / \text{W}$ |

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       | Teat Conditions   |
|---|---------------|------|------|-----------|------------|---|
| <b>Static</b>                           |               |      |      |           |            |   |
| Drain-Source Breakdown Voltage          | $V_{(BR)DSS}$ | 100  | -    | -         | V          | $V_{GS} = 0V, I_D = 250\mu A$                                       |
| Gate Threshold Voltage                  | $V_{GS(th)}$  | 1    | -    | -         | V          | $V_{DS} = V_{GS}, I_D = 250\mu A$                                   |
| Gate-Body Leakage Current               | $I_{GSS}$     | -    | -    | $\pm 100$ | nA         | $V_{DS} = 0V, V_{GS} = 12V$   |
| Zero Gate Voltage Drain Current         | $I_{DSS}$     | -    | -    | 1         | $\mu A$    | $V_{DS} = 80V, V_{GS} = 0V$   |
|   |               | -    | -    | 25        | $\mu A$    | $V_{DS} = 80V, V_{GS} = 0V, T_J = 55^\circ C$                       |
| On-State Drain Current <sup>1</sup>     | $I_{D(on)}$   | 20   | -    | -         | A          | $V_{DS} = 5V, V_{GS} = 10V$   |
| Drain-Source On-Resistance <sup>1</sup> | $R_{DS(ON)}$  | -    | -    | 13.5      | m $\Omega$ | $V_{GS} = 4.5V, I_D = 10A$  |
|   |               | -    | -    | 20        |            | $V_{GS} = 2.5V, I_D = 8A$   |
| Forward Transconductance <sup>1</sup>   | $g_{fs}$      | -    | 40   | -         | S          | $V_{DS} = 15V, I_D = 10A$   |
| Diode Forward Voltage                   | $V_{SD}$      | -    | 0.7  | -         | V          | $I_S = 2.3A, V_{GS} = 0V$   |
| <b>Dynamic <sup>2</sup></b>             |               |      |      |           |            |   |
| Total Gate Charge                       | $Q_g$         | -    | 20   | -         | nC         | $I_D = 10A$<br>$V_{DS} = 15V$<br>$V_{GS} = 5V$                      |
| Gate-Source Charge                      | $Q_{gs}$      | -    | 7.0  | -         |            |   |
| Gate-Drain Charge                       | $Q_{gd}$      | -    | 7.0  | -         |            |   |
| <b>Switching</b>                        |               |      |      |           |            |   |
| Turn-On Delay Time                      | $T_{d(on)}$   | -    | 20   | -         | nS         | $V_{DD} = 25V$<br>$I_D = 1A$<br>$V_{GEN} = 10V$<br>$R_L = 25\Omega$ |
| Rise Time                               | $T_r$         | -    | 9    | -         |            |   |
| Turn-Off Delay Time                     | $T_{d(off)}$  | -    | 70   | -         |            |   |
| Fall Time                               | $T_f$         | -    | 20   | -         |            |   |

Notes:

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