

RoHS Compliant Product  
A suffix of "-C" specifies halogen and 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.

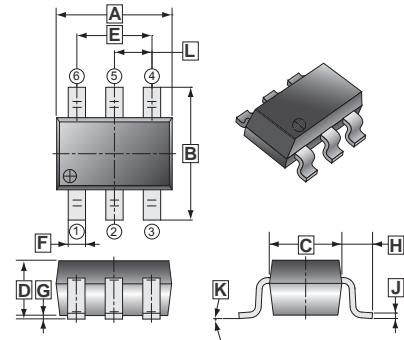
## FEATURES

- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe TSOP-6 saves board space.
- Fast switching speed
- High performance trench technology

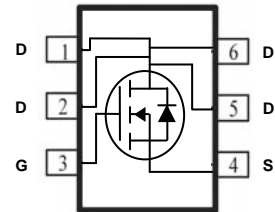
## PACKAGE INFORMATION

| Package | MPQ | LeaderSize |
|---------|-----|------------|
| TSOP-6  | 3K  | 7' inch    |

### TSOP-6



| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 2.70       | 3.10 | G    | 0          | 0.10 |
| B    | 2.60       | 3.00 | H    | 0.60 REF.  |      |
| C    | 1.40       | 1.80 | J    | 0.12 REF.  |      |
| D    | 1.10 MAX.  |      | K    | 0°         | 10°  |
| E    | 1.90 REF.  |      | L    | 0.95 REF.  |      |
| F    | 0.30       | 0.50 |      |            |      |



## ABSOLUTE 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>                     | $I_D$           | $T_A=25^\circ\text{C}$ | 6.0              |
|   |                 | $T_A=70^\circ\text{C}$ | 4.6              |
| Pulsed Drain Current <sup>2</sup>                         | $I_{DM}$        | 20                     | A                |
| Continuous Source Current (Diode Conduction) <sup>1</sup> | $I_S$           | 1.6                    | A                |
| Power Dissipation <sup>1</sup>                            | $P_D$           | $T_A=25^\circ\text{C}$ | 2                |
|   |                 | $T_A=70^\circ\text{C}$ | 1.3              |
| Operating Junction and Storage Temperature Range          | $T_j, T_{stg}$  | -55 ~ 150              | $^\circ\text{C}$ |
| <b>Thermal Resistance Ratings</b>                         |                 |                        |                  |
| Maximum Junction to Ambient <sup>1</sup>                  | $R_{\theta JA}$ | $t \leq 5$ sec         | 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                  | $V_{GS(th)}$ | 0.7  | -    | 1.5       | V             | $V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$  |
| Gate-Body Leakage                       | $I_{GSS}$    | -    | -    | $\pm 100$ | nA            | $V_{DS}=0\text{V}$ , $V_{GS}=\pm 8\text{V}$                                       |
| Zero Gate Voltage Drain Current         | $I_{DSS}$    | -    | -    | 1         | $\mu\text{A}$ | $V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$  |
|   |              | -    | -    | 10        |               | $V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=55^\circ\text{C}$                 |
| On-State Drain Current <sup>1</sup>     | $I_{D(on)}$  | 10   | -    | -         | A             | $V_{DS}=5\text{V}$ , $V_{GS}=4.5\text{V}$   |
| Drain-Source On-Resistance <sup>1</sup> | $R_{DS(ON)}$ | -    | -    | 32        | m $\Omega$    | $V_{GS}=4.5\text{V}$ , $I_D=6.0\text{A}$  |
|   |              | -    | -    | 44        |               | $V_{GS}=2.5\text{V}$ , $I_D=5.0\text{A}$  |
| Forward Transconductance <sup>1</sup>   | $g_{fs}$     | -    | 11.3 | -         | S             | $V_{DS}=10\text{V}$ , $I_D=4.0\text{A}$   |
| Diode Forward Voltage                   | $V_{SD}$     | -    | 0.75 | -         | V             | $I_S=1.6\text{A}$ , $V_{GS}=0\text{V}$  |
| <b>Dynamic <sup>2</sup></b>             |              |      |      |           |               |   |
| Total Gate Charge                       | $Q_g$        | -    | 6    | -         | nC            | $V_{DS}=10\text{V}$ , $V_{GS}=4.5\text{V}$ ,<br>$I_D=4.0\text{A}$                 |
| Gate-Source Charge                      | $Q_{gs}$     | -    | 1    | -         |               |   |
| Gate-Drain Charge                       | $Q_{gd}$     | -    | 1.5  | -         |               |   |
| Turn-on Delay Time                      | $T_{d(on)}$  | -    | 8    | -         | nS            | $V_{DD}=10\text{V}$ , $V_{GEN}=4.5\text{V}$ ,<br>$R_L=15\Omega$ , $I_D=1\text{A}$ |
| Rise Time                               | $T_r$        | -    | 24   | -         |               |   |
| Turn-off Delay Time                     | $T_{d(off)}$ | -    | 35   | -         |               |   |
| Fall Time                               | $T_f$        | -    | 10   | -         |               |   |

Notes:

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