

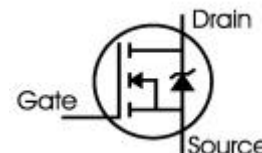
## Fast CoolMOS™ Power Transistor

### FEATURES:

- New revolutionary high voltage technology
- Ultra low gate charge
- Worlbest  $R_{DS(on)}$  per chip area
- Ultra low effective capacitances
- Improved noise immunity

### Applications:

- SMPS, resonant applications



| Chip Type   | $V_{DS}$ | $I_D$ | Die Size                    | Package      | Ordering Code |
|-------------|----------|-------|-----------------------------|--------------|---------------|
| SIPC05N60S5 | 600V     | 3A    | 2.22 x 2.21 mm <sup>2</sup> | sawn on foil | tbd           |

### MECHANICAL PARAMETER:

|                                 |                                                                         |                 |
|---------------------------------|-------------------------------------------------------------------------|-----------------|
| Raster size                     | 2.22 x 2.21                                                             | mm              |
| Source pad size                 | 1.40 x 1.79                                                             |                 |
| Gate pad size                   | 0.48 x 0.51                                                             |                 |
| Area total / active             | 4.91 / 2.82                                                             | mm <sup>2</sup> |
| Thickness                       | 175                                                                     | μm              |
| Wafer size                      | 150                                                                     | mm              |
| Flat position                   | 0                                                                       | grd             |
| Max.possible chips per wafer    | 3069                                                                    |                 |
| Passivation frontside           | Nitride                                                                 |                 |
| Emitter metallization           | 3200 nm Al Si 1%                                                        |                 |
| Collector metallization         | 1400 nm Ni Ag –system<br>suitable for epoxy and soft solder die bonding |                 |
| Die bond                        | electrically conductive glue or solder                                  |                 |
| Wire bond (proposed)            | Source: Al, ≤ 500μm; Gate: Al, ≤ 125μm                                  |                 |
| Reject Ink Dot Size             | Ø 0.30mm                                                                |                 |
| Recommended Storage Environment | store in original container, in dry nitrogen,<br>< 6 month              |                 |

**MAXIMUM RATINGS:**

| Parameter                                                                                     | Symbol         | Value        | Unit        |
|-----------------------------------------------------------------------------------------------|----------------|--------------|-------------|
| Drain-Source voltage                                                                          | $V_{DS}$       | 600          | V           |
| DC drain current, limited by $T_{jmax}$                                                       | $I_D$          | 3            | A           |
| Pulsed drain current, $t_p$ limited by $T_{jmax}$                                             | $I_{Dpuls}$    | 6            | A           |
| Gate source voltage                                                                           | $V_{GS}$       | $\pm 20$     | V           |
| Operating junction and storage temperature                                                    | $T_j, T_{stg}$ | -55 ... +150 | °C          |
| Reverse diode dv/dt<br>$I_D=3A, V_{DS} \leq V_{DSS}, di/dt=100 A/\mu s, T_{jmax}=150^\circ C$ | $dv/dt$        | 6            | KV/ $\mu s$ |

**STATIC CHARACTERISTICS (tested on chip),  $T_j=25^\circ C$ , unless otherwise specified:**

| Parameter                       | Symbol        | Conditions                    | Value |      |                    | Unit     |
|---------------------------------|---------------|-------------------------------|-------|------|--------------------|----------|
|                                 |               |                               | min.  | typ. | max.               |          |
| Drain-source breakdown voltage  | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D = 0.25mA$     |       |      | 600                | V        |
| Gate-source on-state resistance | $R_{DS(on)}$  | $V_{GS}=10V, I_D=2A$          |       | 1.4  | 1.74 <sup>1)</sup> | $\Omega$ |
| Gate threshold voltage          | $V_{GS(th)}$  | $I_D=134\mu A, V_{GS}=V_{DS}$ | 3.5   | 4.5  | 5.5                | V        |
| Zero gate voltage drain current | $I_{DSS}$     | $V_{DS}=600V, V_{GS}=0V$      |       | 0.1  | 25                 | $\mu A$  |
| Gate-source leakage current     | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=25V$       |       |      | 100                | nA       |

<sup>1)</sup> this correlates to a max.  $R_{DS(on)}$ -value of 1.4 $\Omega$  at  $V_{GS}=10V, I_D=2A$  of this chip packaged in a TO220-package

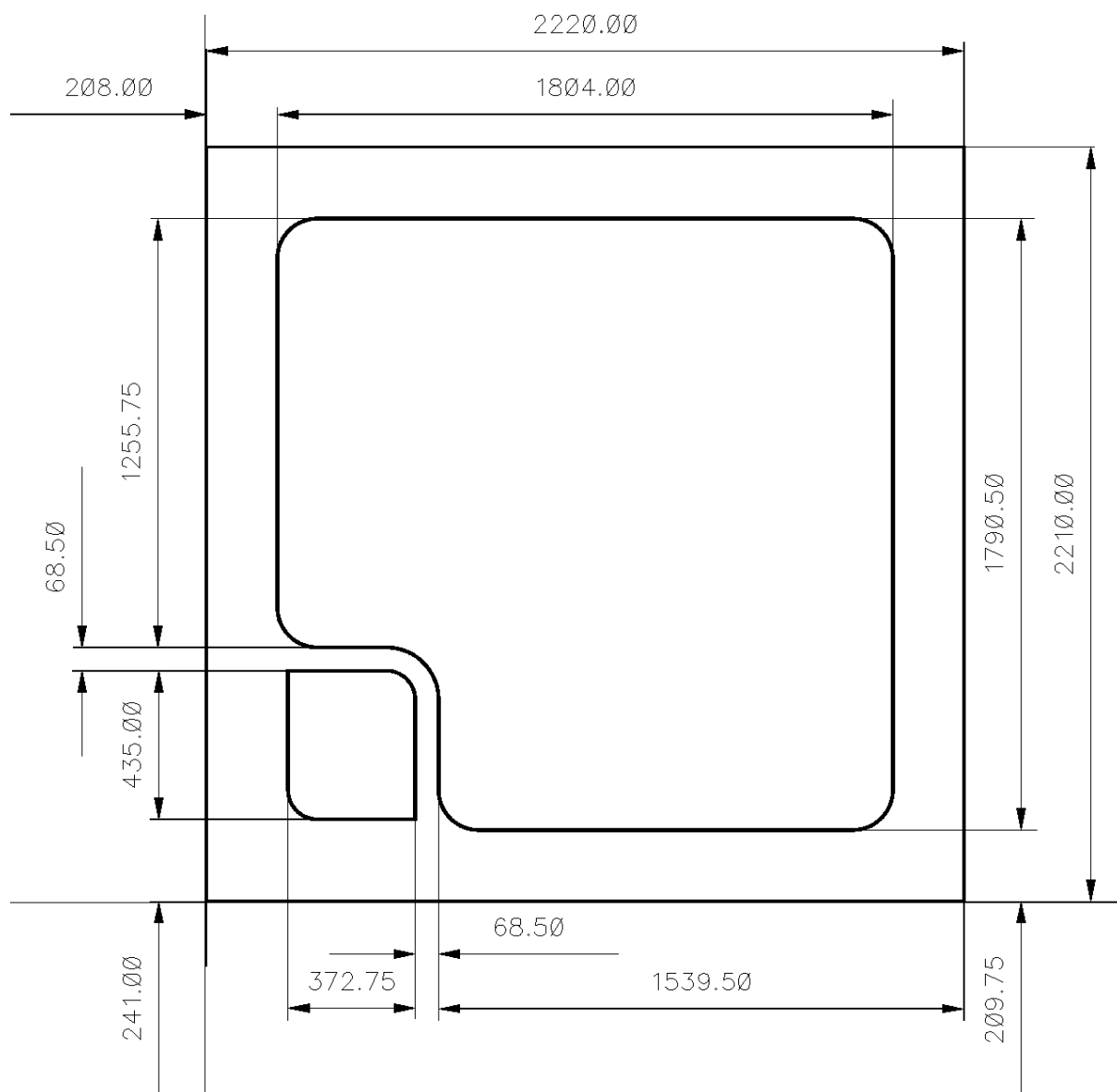
**ELECTRICAL CHARACTERISTICS (tested at component):**

| Parameter                    | Symbol    | Conditions    | Value |      |      | Unit |
|------------------------------|-----------|---------------|-------|------|------|------|
|                              |           |               | min.  | typ. | max. |      |
| Input capacitance            | $C_{iss}$ | $V_{DS}=25V,$ | -     | 420  | -    | pF   |
| Output capacitance           | $C_{oss}$ | $V_{GS}=0V,$  | -     | 150  | -    |      |
| Reverse transfer capacitance | $C_{rss}$ | $f=1MHz$      | -     | 3.6  | -    |      |

**SWITCHING CHARACTERISTICS (tested at component), Inductive Load**

| Parameter           | Symbol       | Conditions       | Value |      |      | Unit |
|---------------------|--------------|------------------|-------|------|------|------|
|                     |              |                  | min.  | typ. | max. |      |
| Turn-on delay time  | $t_{d(on)}$  | $T_j=25^\circ C$ | -     | 35   | -    | ns   |
| Rise time           | $t_r$        | $V_{DD}=350V,$   | -     | 25   | -    |      |
| Turn-off delay time | $t_{d(off)}$ | $I_D=3.2 A,$     | -     | 40   | -    |      |
| Fall time           | $t_f$        | $V_{GS}=10V,$    | -     | 15   | -    |      |
|                     |              | $R_G= 20 \Omega$ |       |      |      |      |

## CHIP DRAWING:





Preliminary

# SIPC05N60S5

## FURTHER ELECTRICAL CHARACTERISTICS:

|                                                      |  |  |
|------------------------------------------------------|--|--|
| This chip data sheet refers to the device data sheet |  |  |
|------------------------------------------------------|--|--|

## DESCRIPTION:

AQL 0,65 for visual inspection according to failure catalog

Electrostatic Discharge Sensitive Device according to MIL-STD 883

Test-Normen Villach/Prüffeld

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