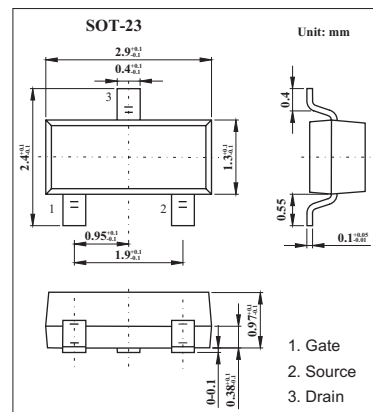
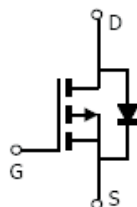


## P-Channel Enhancement Mode Field Effect Transistor KO3401

### ■ Features

- $V_{DS} (V) = -30V$
- $I_D = -4.2 A$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 50m\Omega$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 65m\Omega$  ( $V_{GS} = -4.5V$ )
- $R_{DS(ON)} < 120m\Omega$  ( $V_{GS} = -2.5V$ )



### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

| Parameter                                         | Symbol         | Rating     | Unit       |
|---------------------------------------------------|----------------|------------|------------|
| Drain-Source Voltage                              | $V_{DS}$       | -30        | V          |
| Gate-Source Voltage                               | $V_{GS}$       | $\pm 12$   | V          |
| Continuous Drain Current *1<br>$T_A = 25^\circ C$ | $I_D$          | -4.2       | A          |
| Current *1<br>$T_A = 70^\circ C$                  |                | -3.5       |            |
| Pulsed Drain Current *2                           | $I_{DM}$       | -30        |            |
| Power Dissipation *1<br>$T_A = 25^\circ C$        | $P_D$          | 1.4        | W          |
| $T_A = 70^\circ C$                                |                | 1          |            |
| Junction and Storage Temperature Range            | $T_J, T_{STG}$ | -55 to 150 | $^\circ C$ |

\*1 The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz.

Copper, in a still air environment with  $T_A = 25^\circ C$

\*2 Repetitive rating, pulse width limited by junction temperature.

### ■ Thermal Characteristics

| Parameter                                      | Symbol          | Typ | Max | Unit         |
|------------------------------------------------|-----------------|-----|-----|--------------|
| Maximum Junction-to-Ambient*1<br>$t \leq 10s$  | $R_{\theta JA}$ | 65  | 90  | $^\circ C/W$ |
| Maximum Junction-to-Ambient *1<br>Steady-State |                 | 85  | 125 | $^\circ C/W$ |
| Maximum Junction-to-Lead *2<br>Steady-State    | $R_{\theta JL}$ | 43  | 60  | $^\circ C/W$ |

\*1 The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz.

Copper, in a still air environment with  $T_A = 25^\circ C$

\*2 . The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to lead  $R_{\theta JL}$  and lead to ambient.

## KO3401

## ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Testconditions                                                                             | Min  | Typ   | Max  | Unit |
|---------------------------------------|---------------------|--------------------------------------------------------------------------------------------|------|-------|------|------|
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V                                                | -30  |       |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V                                                 |      |       | -1   | μA   |
|                                       |                     | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                           |      |       | -5   |      |
| Gate-Body leakage current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V                                                 |      |       | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA                                   | -0.7 | -1    | -1.3 | V    |
| On state drain current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V                                               | -25  |       |      | A    |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =4.2A                                                |      | 42    | 50   | mΩ   |
|                                       |                     | V <sub>GS</sub> =-10V, I <sub>D</sub> =4.2A T <sub>J</sub> =125°C                          |      |       | 75   |      |
|                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A                                                |      | 53    | 65   | mΩ   |
|                                       |                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A                                                |      | 80    | 120  | mΩ   |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A                                                  | 7    | 11    |      | S    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V                                                   |      | -0.75 | -1   | V    |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                            |      |       | -2.2 | A    |
| Pulsed Body-Diode Current *           | I <sub>SM</sub>     |                                                                                            |      |       | -30  | A    |
| Reverse Transfer Capacitance          | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz                                         |      | 954   |      | pF   |
| Gate resistance                       | C <sub>oss</sub>    |                                                                                            |      | 115   |      | pF   |
| Input Capacitance                     | C <sub>rss</sub>    |                                                                                            |      | 77    |      | pF   |
| Output Capacitance                    | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz                                           |      | 6     |      | Ω    |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A                         |      | 9.4   |      | nC   |
| Gate Source Charge                    | Q <sub>gs</sub>     |                                                                                            |      | 2     |      | nC   |
| Gate Drain Charge                     | Q <sub>gd</sub>     |                                                                                            |      | 3     |      | nC   |
| Turn-On Rise Time                     | t <sub>D(on)</sub>  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =3.6 Ω, R <sub>GEN</sub> =6 Ω |      | 6.3   |      | ns   |
| Turn-Off DelayTime                    | t <sub>r</sub>      |                                                                                            |      | 3.2   |      | ns   |
| Turn-Off Fall Time                    | t <sub>D(off)</sub> |                                                                                            |      | 38.2  |      | ns   |
| Turn-On DelayTime                     | t <sub>f</sub>      |                                                                                            |      | 12    |      | ns   |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> =-4A, dI/dt=100A/μs                                                         |      | 20.2  |      | ns   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     | I <sub>F</sub> =-4A, dI/dt=100A/μs                                                         |      | 11.2  |      | nC   |

\* Repetitive rating, pulse width limited by junction temperature.

## ■ Marking

|         |    |
|---------|----|
| Marking | A1 |
|---------|----|