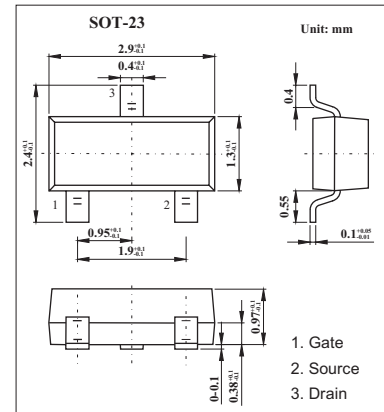
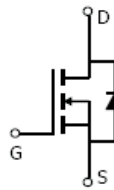


## N-Channel Enhancement Mode Field Effect Transistor KO3414(AO3414)

### ■ Features

- $V_{DS} (V) = 20V$
- $I_D = 4.2A (V_{GS}=4.5V)$
- $R_{DS(ON)} < 50m\Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 63m\Omega (V_{GS} = 2.5V)$
- $R_{DS(ON)} < 87m\Omega (V_{GS} = 1.8V)$



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

| Parameter                                       | Symbol         | Rating           | Unit         |
|---|----------------|------------------|--------------|
| Drain-Source Voltage                            | $V_{DS}$       | 20               | V            |
| Gate-Source Voltage                             | $V_{GS}$       | $\pm 8$          | V            |
| Continuous Drain Current *1<br>$T_A=25^\circ C$ | $I_D$          | 4.2              | A            |
| Current *1<br>$T_A=70^\circ C$                  |                | 3.2              |              |
| Pulsed Drain Current *2                         | $I_{DM}$       | 15               |              |
| Power Dissipation *1                            | $P_D$          | $T_A=25^\circ C$ | 1.4          |
|   |                | $T_A=70^\circ C$ | 0.9          |
| Thermal Resistance.Junction-to-Ambient *1       | $R_{thJA}$     | 125              | $^\circ C/W$ |
| Thermal Resistance.Junction-to-Case             | $R_{thJC}$     | 80               | $^\circ C/W$ |
| Junction and Storage Temperature Range          | $T_J, T_{STG}$ | -55 to 150       | $^\circ C$   |

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

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

**KO3414(AO3414)**

## ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Testconditons   | Min | Typ  | Max  | Unit |
|---------------------------------------|---------------------|---|-----|------|------|------|
| Drain-Source Breakdown Voltage        | V <sub>DSS</sub>    | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V  | 20  |      |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =16V, V <sub>GS</sub> =0V   |     |      | 1    | μA   |
|                                       |                     | V <sub>DS</sub> =16V, 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> =±8V   |     |      | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250μA                                  | 0.4 | 0.6  | 1    | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.2A   |     | 41   | 50   | mΩ   |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.2A T <sub>J</sub> =125°C                       |     | 58   | 70   |      |
|                                       |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.7A   |     | 52   | 63   |      |
|                                       |                     | V <sub>GS</sub> =1.8V, I <sub>D</sub> =3.2A   |     | 67   | 87   |      |
| On state drain current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V  | 15  |      |      | A    |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =4.2A   |     | 11   |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    |   |     | 436  |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz                                      |     | 66   |      | pF   |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |   |     | 44   |      | pF   |
| Gate resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz  |     | 3    |      | Ω    |
| Total Gate Charge                     | Q <sub>g</sub>      |   |     | 6.2  |      | nC   |
| Gate Source Charge                    | Q <sub>gs</sub>     | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =4.2A                      |     | 1.6  |      | nC   |
| Gate Drain Charge                     | Q <sub>gd</sub>     |   |     | 0.5  |      | nC   |
| Turn-On DelayTime                     | t <sub>D(on)</sub>  |   |     | 5.5  |      | ns   |
| Turn-On Rise Time                     | t <sub>r</sub>      |   |     | 6.3  |      | ns   |
| Turn-Off DelayTime                    | t <sub>D(off)</sub> | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, R <sub>L</sub> =2.7Ω, R <sub>GEN</sub> =6Ω |     | 40   |      | ns   |
| Turn-Off FallTime                     | t <sub>f</sub>      |   |     | 12.7 |      | ns   |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> =4A, di/dt=100A/μs   |     | 12.3 |      | ns   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     | I <sub>F</sub> =4A, di/dt=100A/μs   |     | 3.5  |      | nC   |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |   |     |      | 2    | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =1A, V <sub>GS</sub> =0V   |     | 0.76 | 1    | V    |