



## UT2305A

Power MOSFET

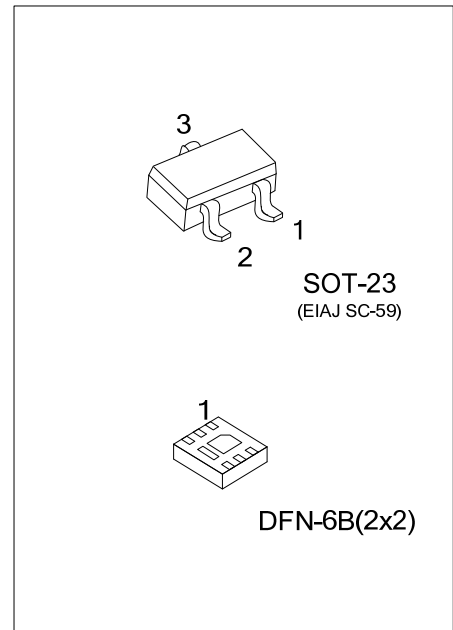
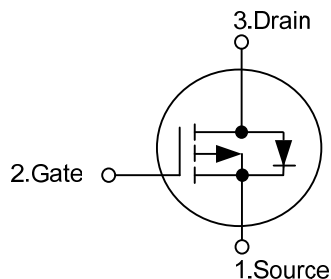
### P-CHANNEL ENHANCEMENT MODE

#### DESCRIPTION

The UTC **UT2305A** is P-channel enhancement mode Power MOSFET, designed in serried ranks. With fast switching speed, low on-resistance, favorable stabilization.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

#### SYMBOL



#### ORDERING INFORMATION

| Ordering Number      | Package     | Pin Assignment |   |   |   |   |   |   |   | Packing   |
|----------------------|-------------|----------------|---|---|---|---|---|---|---|-----------|
|                      |             | 1              | 2 | 3 | 4 | 5 | 6 | 7 | 8 |           |
| UT2305AG-AE3-R       | SOT-23      | S              | G | D | - | - | - | - | - | Tape Reel |
| UT2305AG-K06B-2020-R | DFN-6B(2x2) | D              | D | G | S | D | D | D | S | Tape Reel |

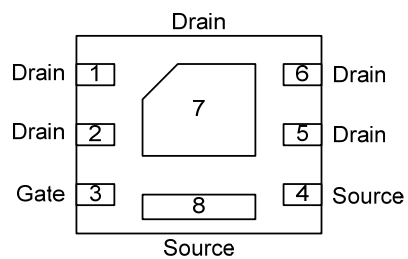
Note: Pin Assignment: G: Gate D: Drain S: Source

|                |                                                        |                                                                                                  |
|----------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| UT2305AG-AE3-R | (1)Packing Type<br>(2)Package Type<br>(3)Green Package | (1) R: Tape Reel<br>(2) AE3: SOT-23, K06B-2020: DFN-6B(2x2)<br>(3) G: Halogen Free and Lead Free |
|----------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------|

#### MARKING

| SOT-23 | DFN-6B(2x2) |
|--------|-------------|
|        |             |

## ■ PIN CONFIGURATION (For DFN-6B(2×2))



## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                                                    | SYMBOL      | RATING     | UNIT             |
|--------------------------------------------------------------|-------------|------------|------------------|
| Drain-Source Voltage                                         | $V_{DSS}$   | - 30       | V                |
| Gate-Source Voltage                                          | $V_{GSS}$   | $\pm 12$   | V                |
| Continuous Drain Current (Note 3) ( $T_A=25^\circ\text{C}$ ) | $I_D$       | -4.2       | A                |
| Pulsed Drain Current (Note 1, 2)                             | $I_{DM}$    | -10        | A                |
| Total Power Dissipation ( $T_A=25^\circ\text{C}$ )           | SOT-23      | 1.38       | W                |
|                                                              | DFN-6B(2×2) | 1.48       | W                |
| Junction Temperature                                         | $T_J$       | +150       | $^\circ\text{C}$ |
| Storage Temperature                                          | $T_{STG}$   | -55 ~ +150 | $^\circ\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER                    | SYMBOL      | RATING | UNIT               |
|------------------------------|-------------|--------|--------------------|
| Junction to Ambient (Note 3) | SOT-23      | 90     | $^\circ\text{C/W}$ |
|                              | DFN-6B(2×2) | 86     | $^\circ\text{C/W}$ |

## ■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

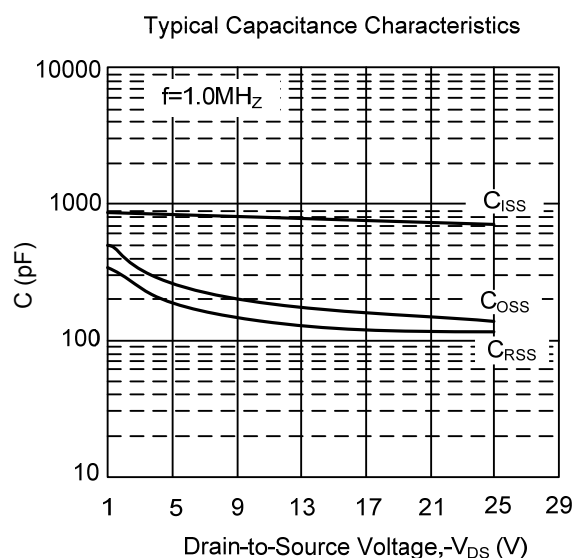
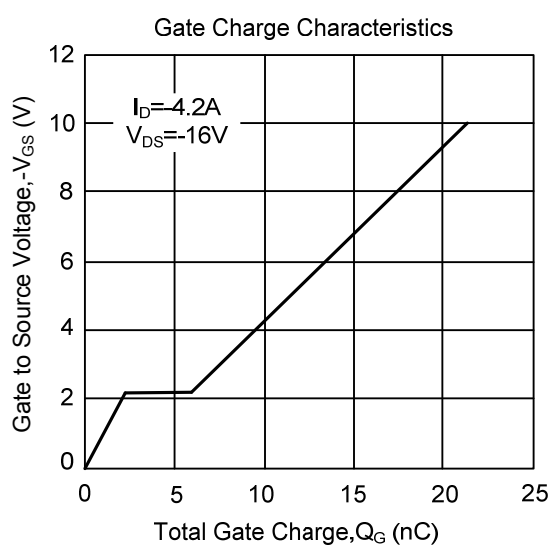
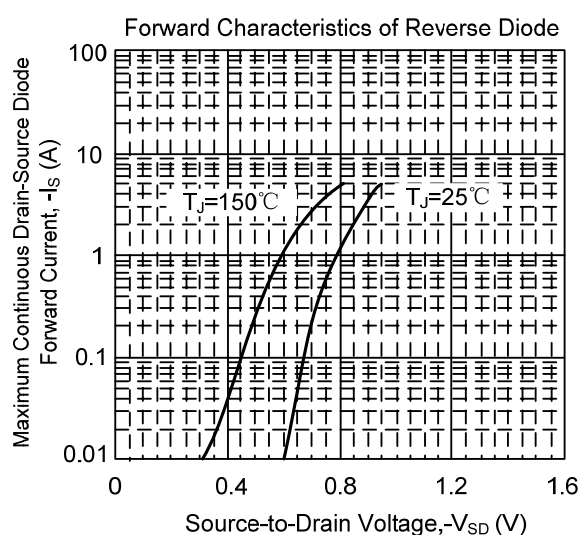
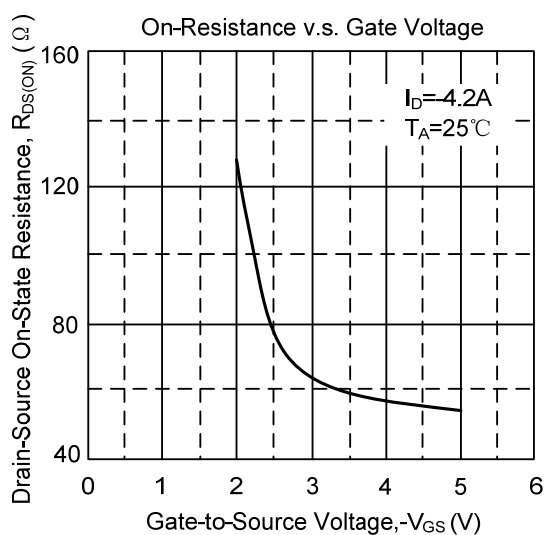
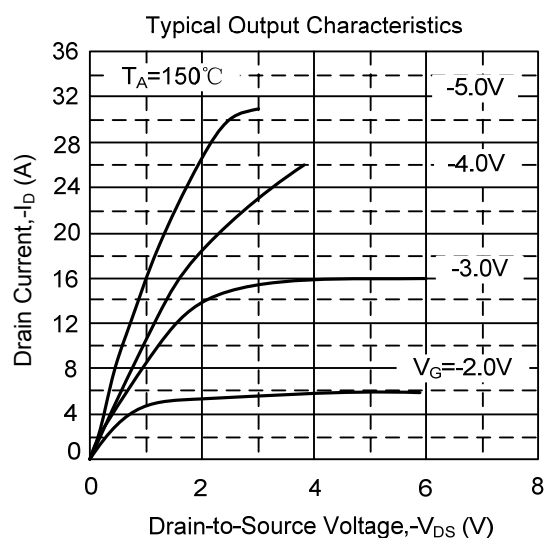
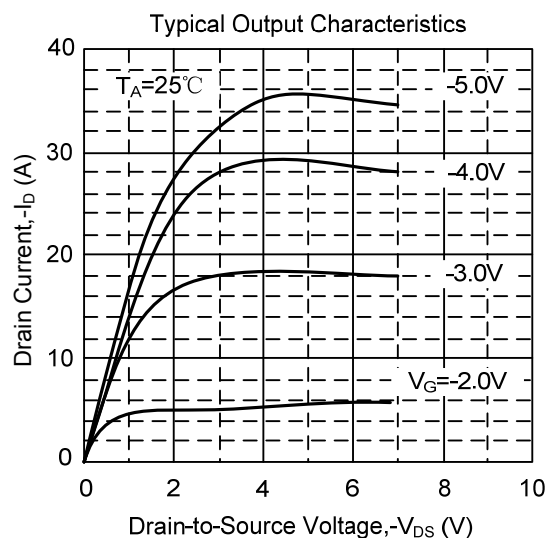
| PARAMETER                                       | SYMBOL                              | TEST CONDITIONS                                                                                                  | MIN  | TYP  | MAX  | UNIT |
|-------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------|------|------|------|------|
| OFF CHARACTERISTICS                             |                                     |                                                                                                                  |      |      |      |      |
| Drain-Source Breakdown Voltage                  | BV <sub>DSS</sub>                   | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                                                      | -30  |      |      | V    |
| Drain-Source Leakage Current                    | I <sub>DSS</sub>                    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V                                                                       |      |      | -1   | μA   |
| Gate-Source Leakage Current                     | I <sub>GSS</sub>                    | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V                                                                       |      |      | ±100 | nA   |
| Breakdown Voltage Temperature Coefficient       | ΔBV <sub>DSS</sub> /ΔT <sub>J</sub> | Reference to 25°C, I <sub>D</sub> =-1mA                                                                          |      | -0.1 |      | V/°C |
| ON CHARACTERISTICS                              |                                     |                                                                                                                  |      |      |      |      |
| Gate Threshold Voltage                          | V <sub>GS(TH)</sub>                 | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                                        | -0.5 |      | -1.2 | V    |
| Drain-Source On-State Resistance (Note 2)       | R <sub>DS(ON)</sub>                 | V <sub>GS</sub> =-10V, I <sub>D</sub> =-3.2A                                                                     |      |      | 60   | mΩ   |
|                                                 |                                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.0A                                                                    |      |      | 80   | mΩ   |
|                                                 |                                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.0A                                                                    |      |      | 150  | mΩ   |
|                                                 |                                     | V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-1.0A                                                                    |      |      | 250  | mΩ   |
| DYNAMIC CHARACTERISTICS                         |                                     |                                                                                                                  |      |      |      |      |
| Input Capacitance                               | C <sub>ISS</sub>                    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz                                                               |      | 740  |      | pF   |
| Output Capacitance                              | C <sub>OSS</sub>                    |                                                                                                                  |      | 167  |      | pF   |
| Reverse Transfer Capacitance                    | C <sub>RSS</sub>                    |                                                                                                                  |      | 126  |      | pF   |
| SWITCHING CHARACTERISTICS                       |                                     |                                                                                                                  |      |      |      |      |
| Turn-ON Delay Time (Note 2)                     | t <sub>D(ON)</sub>                  | V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V,<br>I <sub>D</sub> =-4.2A, R <sub>G</sub> =6Ω, R <sub>D</sub> =3.6Ω |      | 5.9  |      | ns   |
| Turn-ON Rise Time                               | t <sub>R</sub>                      |                                                                                                                  |      | 3.6  |      | ns   |
| Turn-OFF Delay Time                             | t <sub>D(OFF)</sub>                 |                                                                                                                  |      | 32.4 |      | ns   |
| Turn-OFF Fall Time                              | t <sub>F</sub>                      |                                                                                                                  |      | 2.6  |      | ns   |
| Total Gate Charge (Note 2)                      | Q <sub>G</sub>                      | V <sub>DS</sub> =-16V, V <sub>GS</sub> =-4.5V,<br>I <sub>D</sub> =-4.2A                                          |      | 10.6 |      | nC   |
| Gate-Source Charge                              | Q <sub>GS</sub>                     |                                                                                                                  |      | 2.32 |      | nC   |
| Gate-Drain Charge                               | Q <sub>GD</sub>                     |                                                                                                                  |      | 3.68 |      | nC   |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS |                                     |                                                                                                                  |      |      |      |      |
| Drain-Source Diode Forward Voltage(Note2)       | V <sub>SD</sub>                     | V <sub>GS</sub> =0V, I <sub>S</sub> =-1.2A                                                                       |      |      | -1.2 | V    |
| Reverse Recovery Time                           | t <sub>RR</sub>                     | V <sub>GS</sub> =0V, I <sub>S</sub> =-4.2A,                                                                      |      | 27.7 |      | ns   |
| Reverse Recovery Charge                         | Q <sub>RR</sub>                     | di/dt=100A/μs                                                                                                    |      | 22   |      | nC   |

Notes: 1. Pulse width limited by  $T_{J(MAX)}$

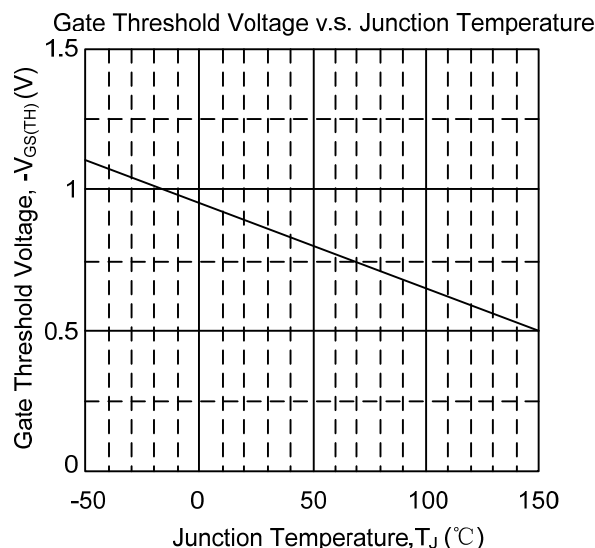
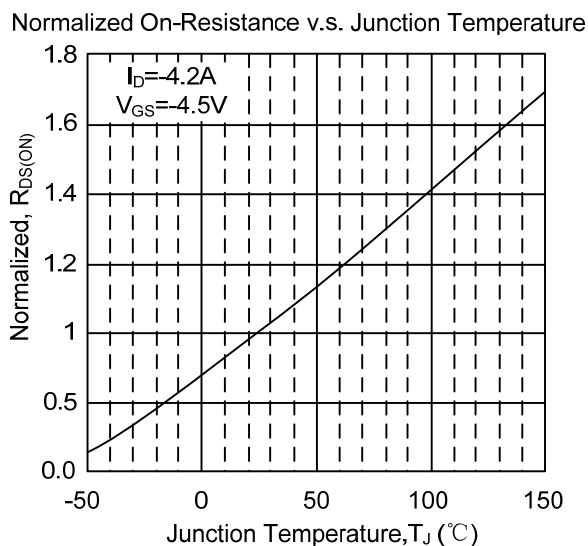
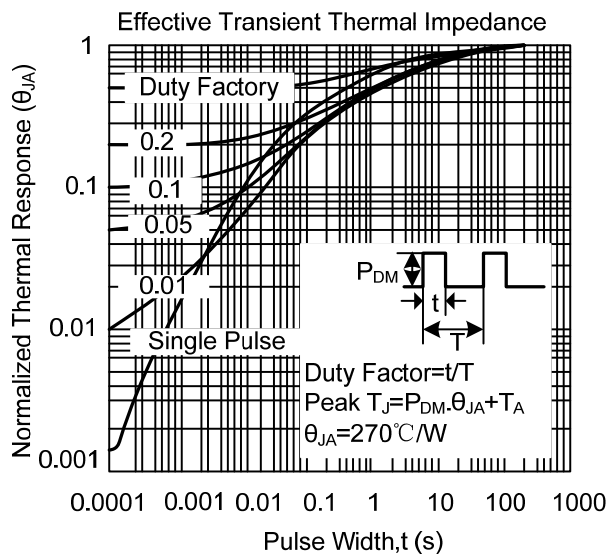
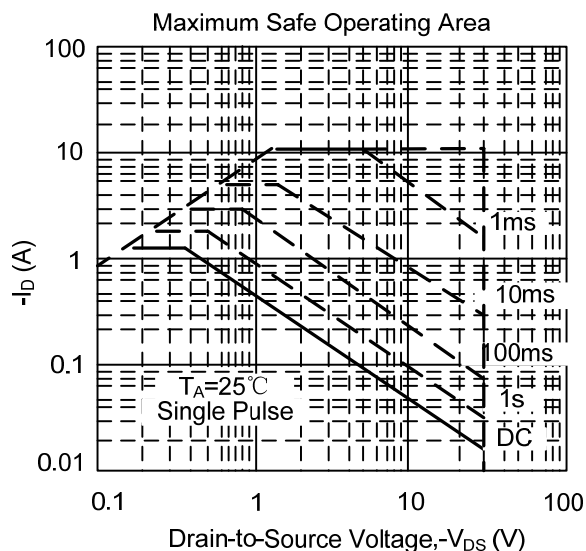
2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board.

## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS(Cont.)



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