



Description

The 3439KDW uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-363

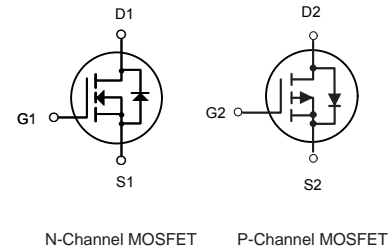
General Features

$V_{DS} = 20V$ $I_D = 0.75A$

$R_{DS(ON)} < 380m\Omega @ V_{GS}=4.5V$

$V_{DS} = -20V$ $I_D = -0.66A$

$R_{DS(ON)} < 570m\Omega @ V_{GS}=-4.5V$



Application

Wireless charging

Boost driver

Brushless motor

Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|---------|---------|----------|
| 3439KDW | SOT-363 | | 3000 |

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Rating | | Units |
|------------------------|--|------------|------------|--------------|
| | | N-Channel | P-Channel | |
| VDS | Drain-Source Voltage | 20 | -20 | V |
| VGS | Gate-Source Voltage | ± 12 | ± 12 | V |
| $I_{D@T_A=25^\circ C}$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 0.75 | -0.66 | A |
| IDM | Pulsed Drain Current ² | 1.8 | -1.2 | A |
| TSTG | Storage Temperature Range | -55 to 150 | -55 to 150 | $^\circ C$ |
| T _J | Operating Junction Temperature Range | -55 to 150 | -55 to 150 | $^\circ C$ |
| R _{θJA} | Thermal Resistance Junction-Ambient ¹ | 833 | | $^\circ C/W$ |



N-ch MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|----------------------|--|------|------|-----|------|
| STATIC CHARACTERISTICS | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D =250μA | 20 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =20V, V _{GS} = 0V | | | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} =±10V, V _{DS} = 0V | | | ±20 | uA |
| Gate threshold voltage (note 2) | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.35 | | 1.1 | V |
| Drain-source on-resistance(note 2) | R _{Ds(on)} | V _{GS} =4.5V, I _D =0.65A | | 210 | 380 | mΩ |
| | | V _{GS} =2.5V, I _D =0.55A | | 320 | 450 | mΩ |
| | | V _{GS} =1.8V, I _D =0.45A | | 390 | 800 | mΩ |
| Forward tranconductance(note 2) | g _{FS} | V _{DS} =10V, I _D =0.8A | | 1.6 | | S |
| Diode forward voltage | V _{SD} | I _S =0.15A, V _{GS} = 0V | | | 1.2 | V |
| DYNAMIC CHARACTERISTICS (note 4) | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =16V, V _{GS} =0V, f =1MHz | | 79 | 120 | pF |
| Output Capacitance | C _{oss} | | | 13 | 20 | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 9 | 15 | pF |
| SWITCHING CHARACTERISTICS (note 3,4) | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{GS} =4.5V, V _{DS} =10V, I _D =500mA, R _{GEN} =10Ω | | 6.7 | | ns |
| Turn-on rise time | t _r | | | 4.8 | | ns |
| Turn-off delay time | t _{d(off)} | | | 17.3 | | ns |
| Turn-off fall time | t _f | | | 7.4 | | ns |

P-ch MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--|----------------------|---|-------|------|------|------|
| STATIC CHARACTERISTICS | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D =-250μA | -20 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =-20V, V _{GS} = 0V | | | -1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} =±10V, V _{DS} = 0V | | | ±20 | uA |
| Gate threshold voltage (note 2) | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -0.35 | | -1.1 | V |
| Drain-source on-resistance(note 2) | R _{Ds(on)} | V _{GS} =-4.5V, I _D =-1A | | 430 | 570 | mΩ |
| | | V _{GS} =-2.5V, I _D =-0.8A | | 624 | 700 | mΩ |
| | | V _{GS} =-1.8V, I _D =-0.5A | | 950 | | mΩ |
| Forward tranconductance(note 2) | g _{FS} | V _{DS} =-10V, I _D =-0.54A | | 1.2 | | S |
| Diode forward voltage | V _{SD} | I _S =-0.5A, V _{GS} = 0V | | | -1.2 | V |
| DYNAMIC CHARACTERISTICS (note 4) | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =-16V, V _{GS} =0V, f =1MHz | | 113 | 170 | pF |
| Output Capacitance | C _{oss} | | | 15 | 25 | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 9 | 15 | pF |
| SWITCHING CHARACTERISTICS (note 3, 4) | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{GS} =-4.5V, V _{DS} =-10V, I _D =-200mA, R _{GEN} =10Ω | | 9 | | ns |
| Turn-on rise time | t _r | | | 5.8 | | ns |
| Turn-off delay time | t _{d(off)} | | | 32.7 | | ns |
| Turn-off fall time | t _f | | | 20.3 | | ns |

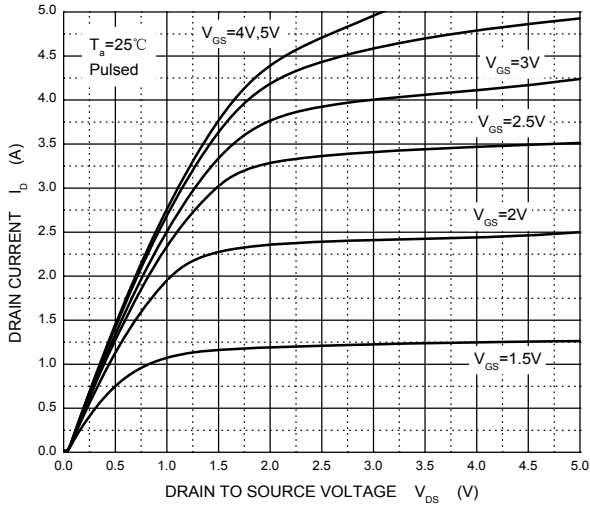
Notes :

- 1.Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300μs, duty cycle≤2%.
3. Switching characteristics are independent of operating junction temperature.
4. Granted by design, not subject to producing.

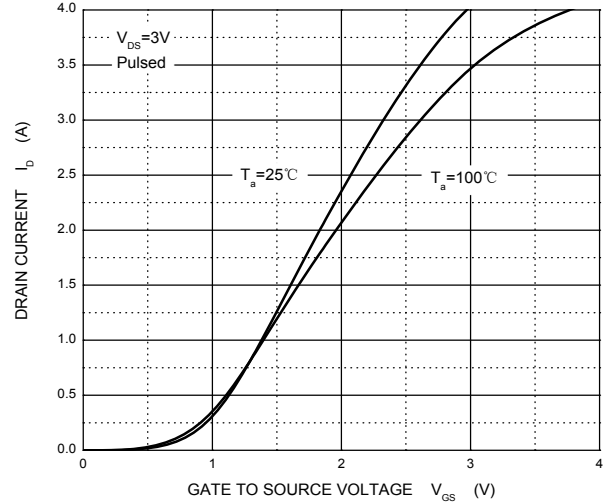


N-Channel Typical Characteristics

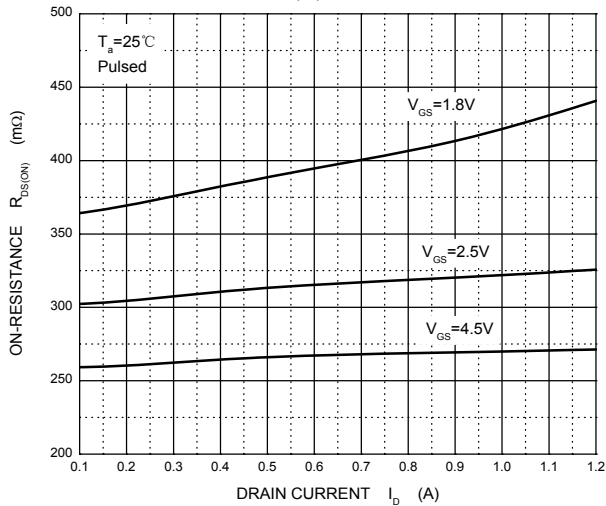
Output Characteristics



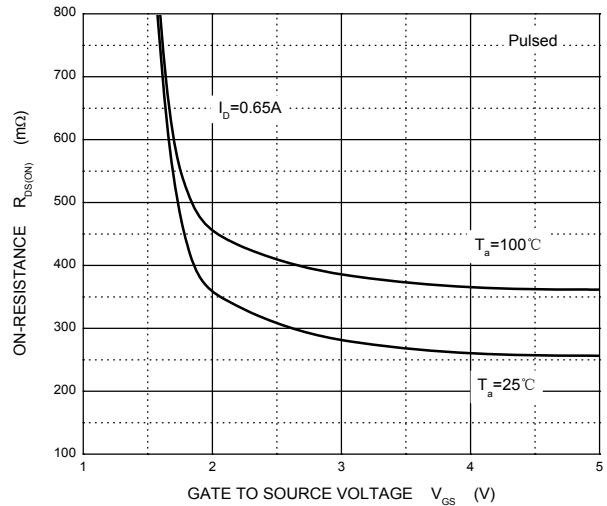
Transfer Characteristics



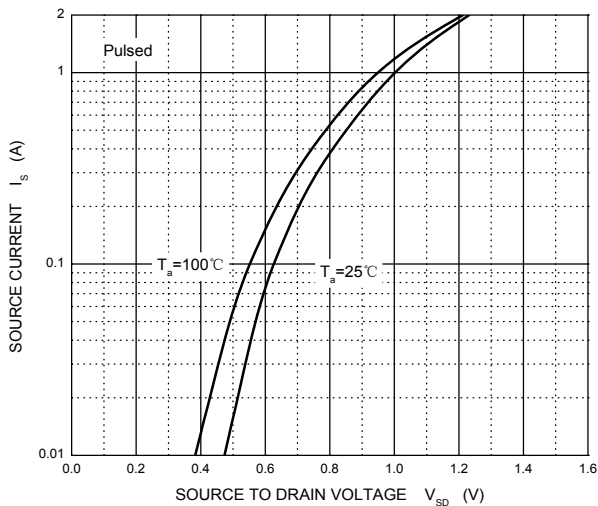
$R_{DS(ON)}$ — I_D



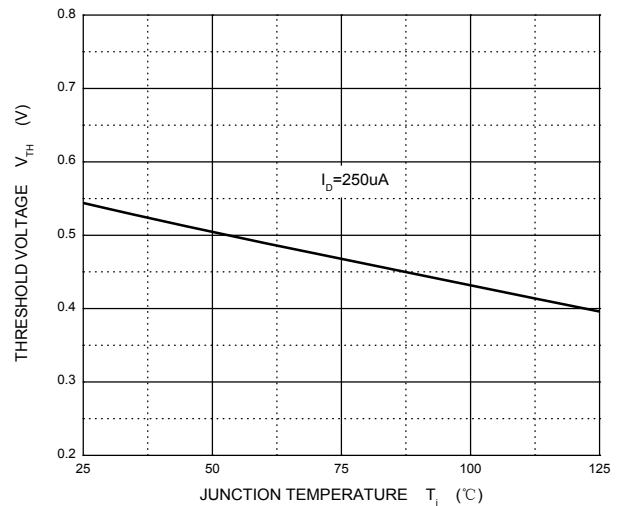
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

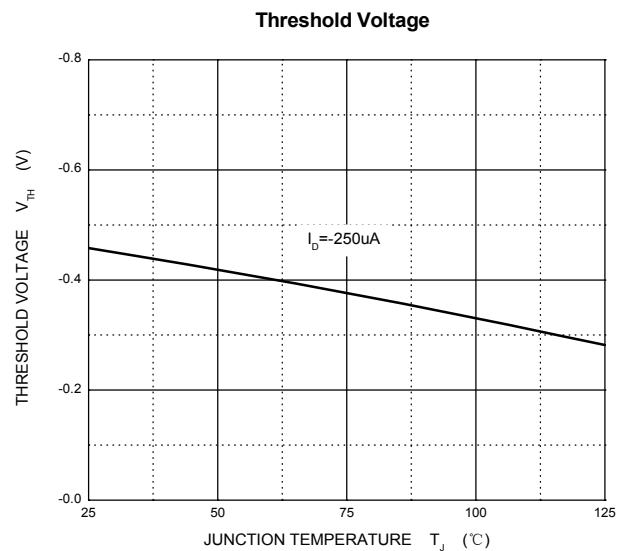
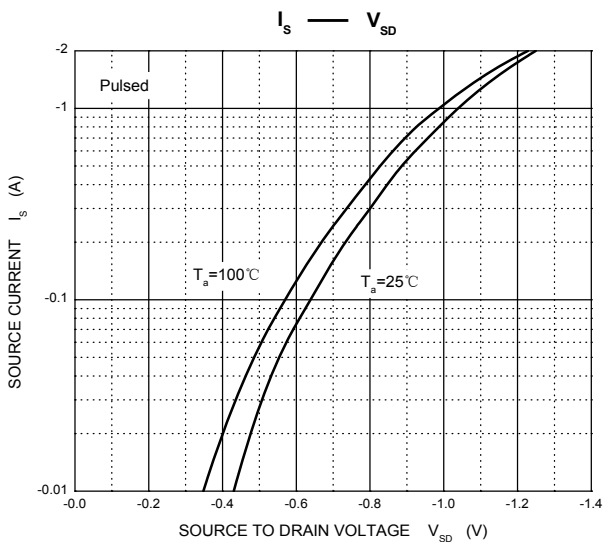
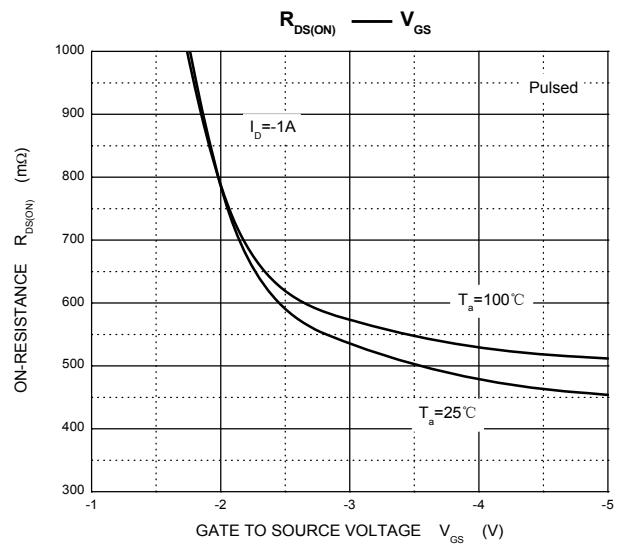
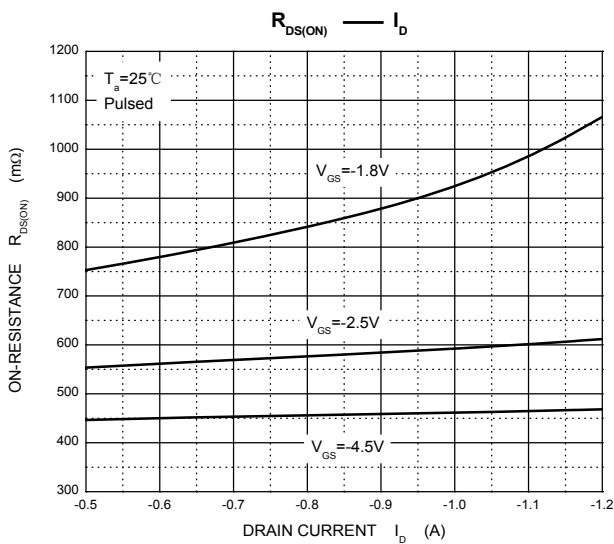
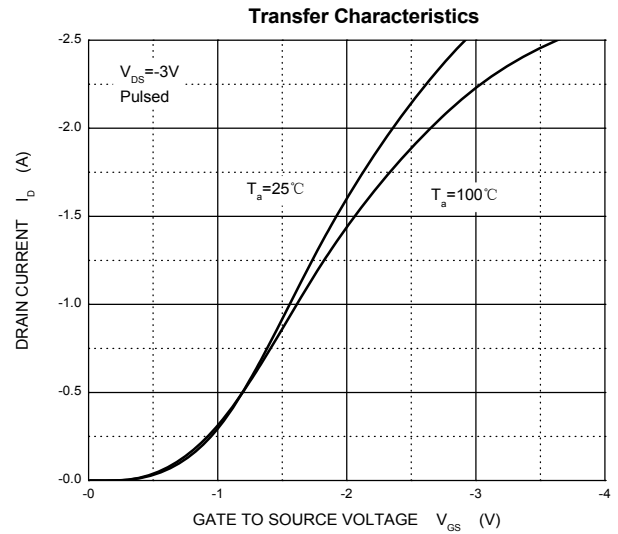
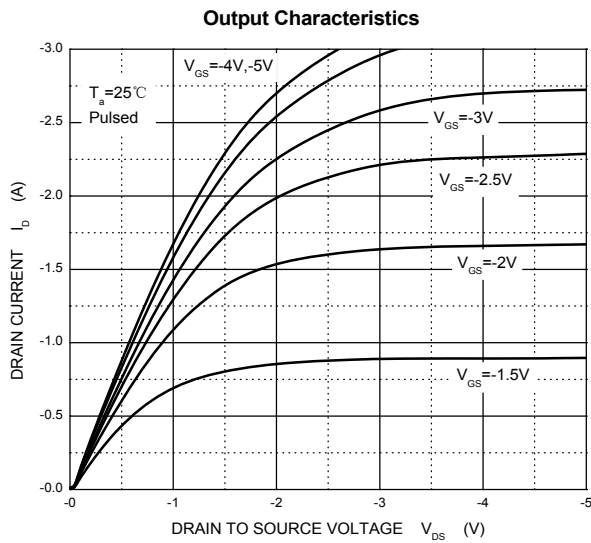


Threshold Voltage



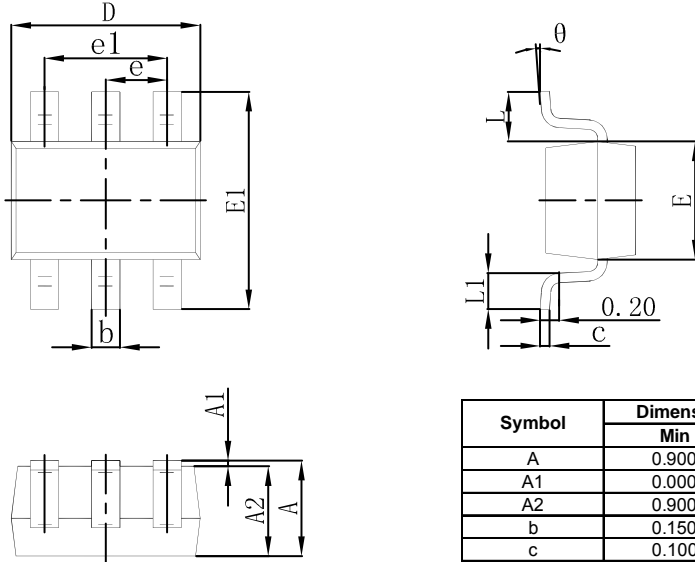


P-Channel Typical Characteristics



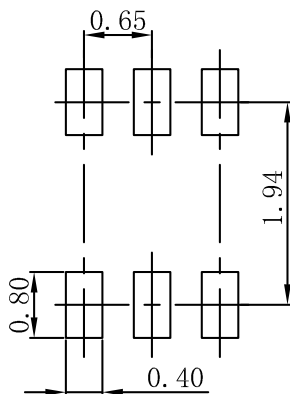


SOT-363 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.100 | 0.150 | 0.004 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.400 | 0.085 | 0.094 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

SOT-363 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.



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