# *Load Switch with Level-Shift*

## *UM3865P SOT363*

### General Description

The UM3865P includes a p- and n-channel MOSFET in a single SOT363 package. The low on-resistance p-channel MOSFET is tailored for use as a load switch. The n-channel, with an external resistor, can be used as a level-shift to drive the p-channel load switch. The n-channel MOSFET has internal ESD protection and can be driven by logic signals as low as 1.5V. The UM3865P operates on supply lines from 1.8V to 8V, and can drive loads up to 1A.

### Applications

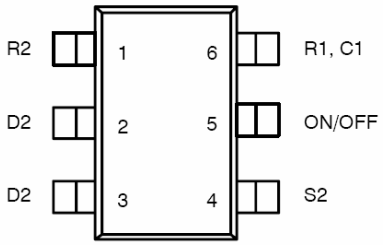
- Battery Packs
- Battery-powered Portable Equipment
- Cellular and Cordless Telephones

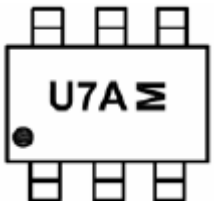
### Features

- 300 mΩ Low On-Resistance
- 1.8V to 8V Input
- 1.5V to 8V Logic Level Control
- Low Profile, Small Footprint SOT363 Package
- 2000V ESD Protection On Input Switch
- Adjustable Slew-Rate

### Pin Configurations

### Top View



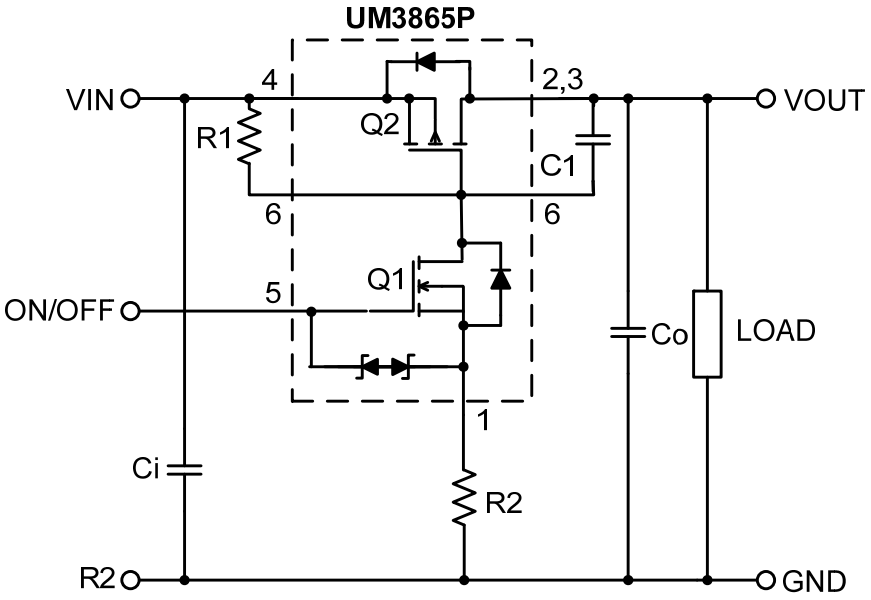




**M: Month Code**
**UM3865P**
**SOT363**

### Ordering Information

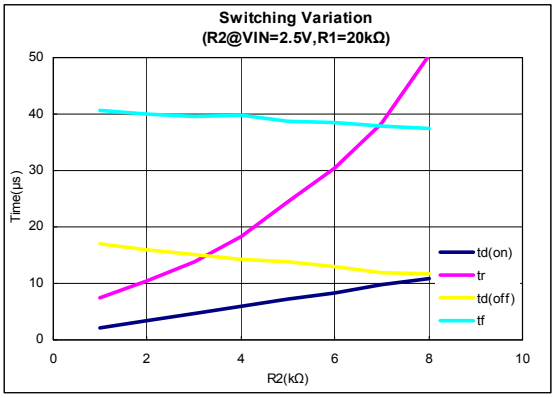
| Part Number | Packaging Type | Marking Code | Shipping Qty |
|---|---|---|---|
| UM3865P | SOT363 | U7A | 3000pcs/7 Inch Tape & Reel |

## Typical Application Circuit




| COMPONENTS | | |
|---|---|---|
| R1 | Pull-Up Resistor | Typical 20kΩ to 1MΩ* |
| R2 | Optional Slew-Rate Control | Typical 0 to 50kΩ |
| C1 | Optional Slew-Rate Control | Typical 1000pF |

*Minimum R1 value should be at least 10×R2 to ensure Q1 turn-on.




Note: For R2 switching variations with other VIN/R1 combinations See Typical Characteristics

## Absolute Maximum Ratings

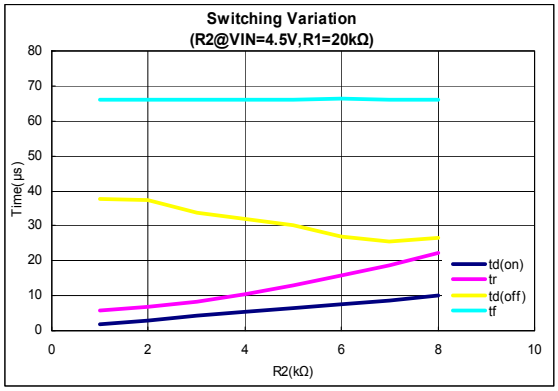
| Symbol | Parameter | Limit | Unit |
|---|---|---|---|
| $V_{IN}$ | Input Voltage | 8 | V |
| $V_{ON/OFF}$ | ON/OFF Voltage | 8 | |
| $I_L$ | Continuous Load Current(1)(2) | ±1 | A |
| | Pulse Load Current(2)(3) | ±5 | |
| $I_S$ | Continuous Source Current (Source-Drain Diode) | -1.0 | |
| $P_D$ | Maximum Power Dissipation | 0.5 | W |
| $T_J$ ,$T_{STG}$ | Junction and Storage Temperature Range | - 50 to +150 | ℃ |
| ESD | ESD Rating, MIL-STD-883D HBM | 2000 | V |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 250 | ℃/W |

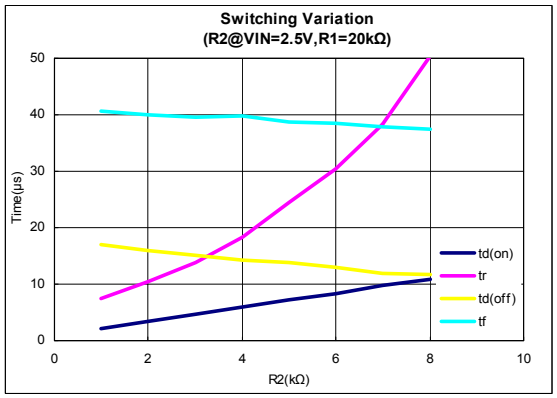
## Electrical Characteristics ($T_J$=25℃, Unless Otherwise Noted)

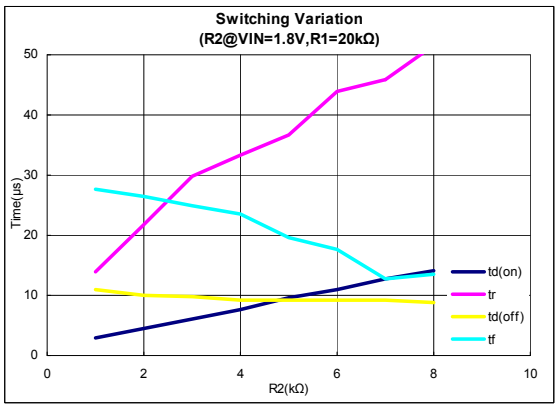
| Symbol | Parameter | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| $I_{FL}$ | Reverse Leakage Current | $V_{IN}$=8V, $V_{ON/OFF}$=0V | | | 1 | μA |
| $V_{SD}$ | Diode Forward Voltage | $I_S$ =-1 A | | -0.73 | -1 | V |
| **ON Characteristics** | | | | | | |
| $V_{IN}$ | Input Voltage Range | | 1.8 | | 8 | V |
| $R_{DS(ON)}$ | Static Drain-to-Source On-Resistance | $V_{ON/OFF}$=1.5V, $V_{IN}$=4.5V, $I_D$=1.0A | | 0.300 | 0.350 | Ω |
| | | $V_{ON/OFF}$=1.5V,$V_{IN}$=2.5V, $I_D$=1.0A | | 0.400 | 0.450 | |
| $I_{D(on)}$ | On-State (p-channel) Drain Current | $V_{IN-OUT}$≤0.2V,$V_{IN}$=5V, $V_{ON/OFF}$=1.5V | 0.7 | | | A |
| | | $V_{IN-OUT}$≤0.3V,$V_{IN}$=3V, $V_{ON/OFF}$=1.5V | 0.8 | | | |

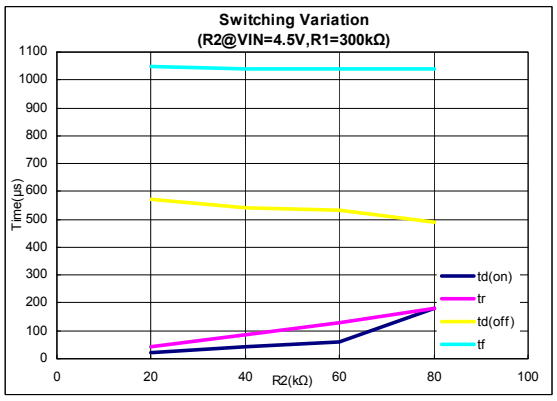
Notes:
(1): Surface Mounted on FR4 Board
(2): $V_{IN}$=8V,$V_{ON/OFF}$=8V, $T_A$=25℃
(3): Pulse test: Pulse Width ≤ 300μs, duty cycle ≤ 2%

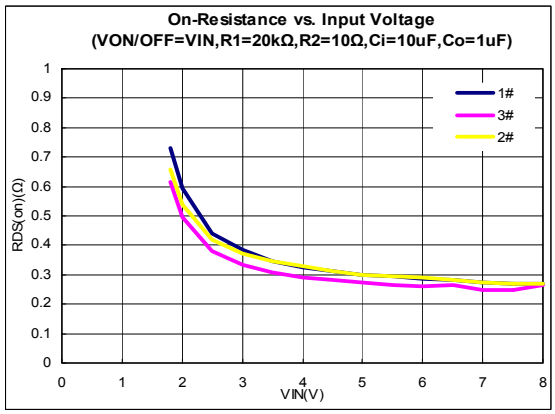
## Typical Characteristics ($T_J$=25℃, Unless Otherwise Noted)

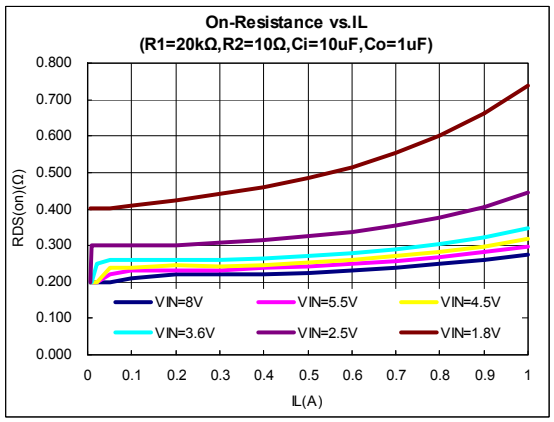


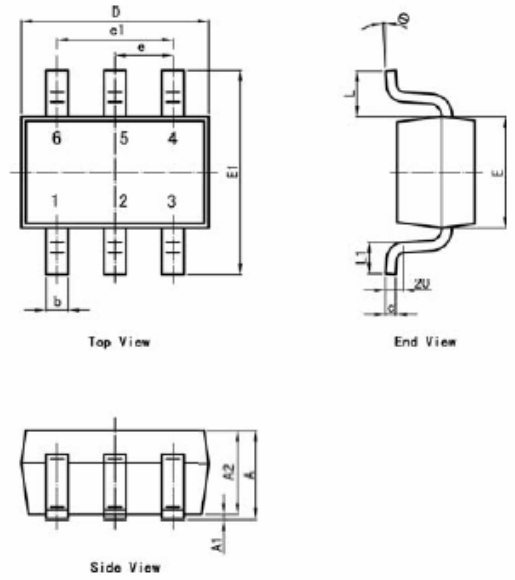



## Package Information

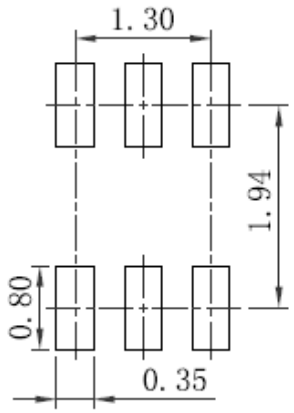
**UM3865P SOT363**

### Outline Drawing



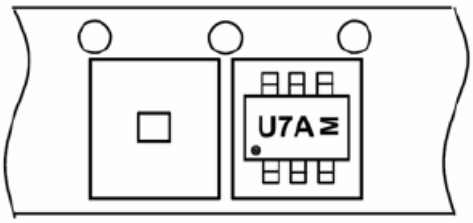

| Symbol | DIMENSIONS | | | |
|---|---|---|---|---|
| | MILLIMETERS | | INCHES | |
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.036 | 0.039 |
| b | 0.100 | 0.350 | 0.004 | 0.014 |
| c | 0.080 | 0.220 | 0.003 | 0.009 |
| D | 1.800 | 2.200 | 0.071 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.000 | 2.450 | 0.079 | 0.096 |
| e | 0.650REF | | 0.026REF | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525REF | | 0.021REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

### Land Pattern




NOTES:
1. Compound dimension: 2.10×1.25;
2. Unit: mm;
3.General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

### Tape and Reel Orientation



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