

Product Summary

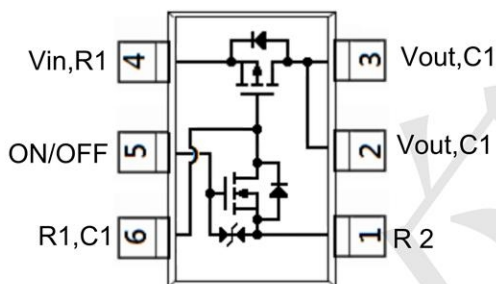
- $V_{drop} = 0.2V @ V_{in}=12V, I_L=2.0A, R_{DS(ON)}=56m\Omega$ Typ
- $V_{drop} = 0.2V @ V_{in}=5.0V, I_L=1.8A, R_{DS(ON)}=90m\Omega$ Typ
- Advanced Trench Process Technology
- Adjustable Turn on/off Slew Rate Control through external R1, R2 and C1
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Application

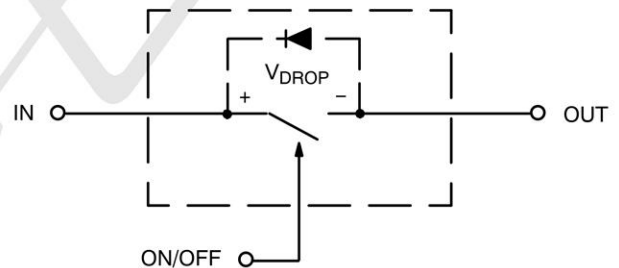
- Battery Packs
- Battery-Powered Portable Equipment
- Cellular and Cordless Telephones

Package and Pin Configuration

SOT23-6



EQUIVALENT CIRCUIT



Marking: 330P

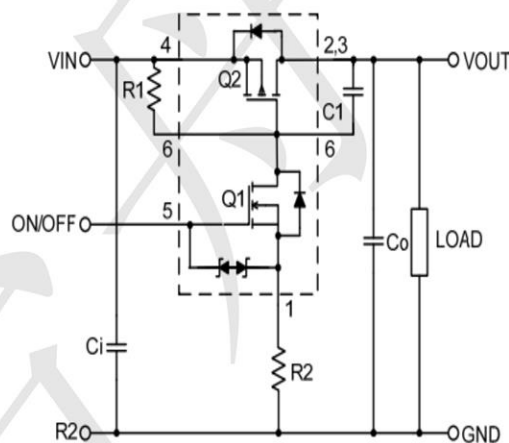
Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

| PARAMETER | SYMBOL | Ratings | UNITS |
|---|------------------|---------|--------------|
| Input Voltage Range ^(Note 1) | V_{IN} | 3-20 | V |
| On/Off Voltage Range | V_{ON}/V_{OFF} | 1.5-8 | V |
| Continuous Load Current ^t (Note 2,3) | I_D | 2.5 | A |
| Pulsed Load Current ^t (Note 4) | I_D | 10 | A |
| Power Dissipation ^(Note 2) | P_D | 0.83 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ C$ |
| ESD, MIL-STD-883D HBM (100pF/1.5kohm) (Von/off pin) | V_{ESD} | 2 | kV |
| Typical Junction to Ambient ^(Note 2) | $R_{\theta JA}$ | 150 | $^\circ C/W$ |

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---------------------------------------|--------------|---|------|-------|------|---------------|
| Off Characteristics | | | | | | |
| Leakage Current | I_{FL} | $V_{IN}=20\text{V}, V_{ON}/V_{OFF}=0\text{V}$ | - | - | 1 | μA |
| Diode Forward Voltage | V_{SD} | $I_S=-1.0\text{A}$ | - | -0.76 | -1.2 | V |
| On Characteristics | | | | | | |
| Conduction Voltage | V_{drop} | $V_{in}=12\text{V}, V_{on/oFF}=3.3\text{V}, I_L=2.0\text{A},$ | | - | 0.2 | V |
| | | $V_{in}=5\text{V}, V_{on/oFF}=5.0\text{V}, I_L=1.8\text{A},$ | | - | 0.2 | V |
| Drain-Source On-State Resistance (Q2) | $R_{DS(on)}$ | $V_{GS}=-12\text{V}, I_D=-2.0\text{A}$ | - | 56 | 90 | m Ω |
| | | $V_{GS}=-5.0\text{V}, I_D=-1.8\text{A}$ | - | 95 | 120 | |
| Load Current | I_L | $V_{drop}=0.2\text{V}, V_{in}=12\text{V}, V_{on/oFF}=3.3\text{V}$ | 2.0 | - | | A |
| | | $V_{drop}=0.2\text{V}, V_{in}=5\text{V}, V_{on/oFF}=3.3\text{V}$ | 1.8 | - | | |

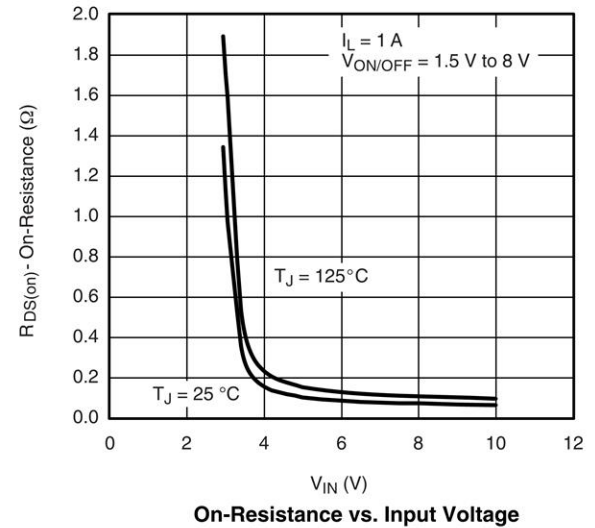
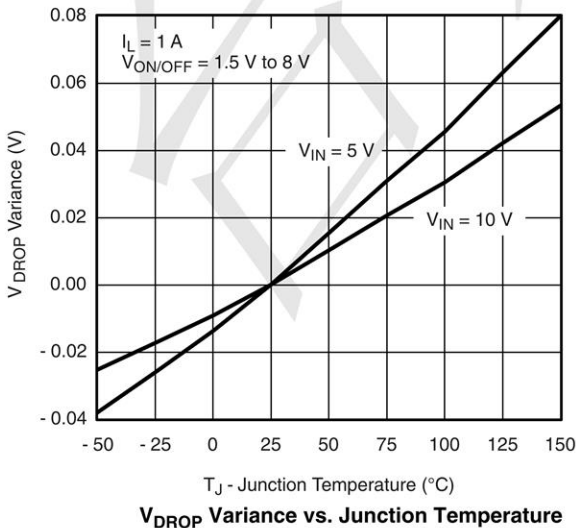
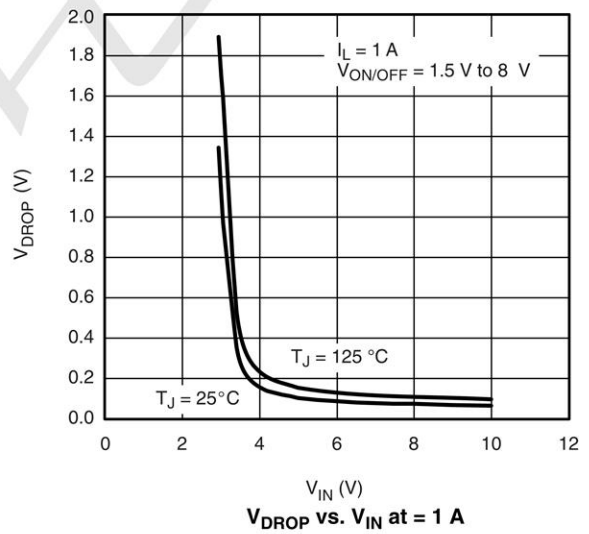
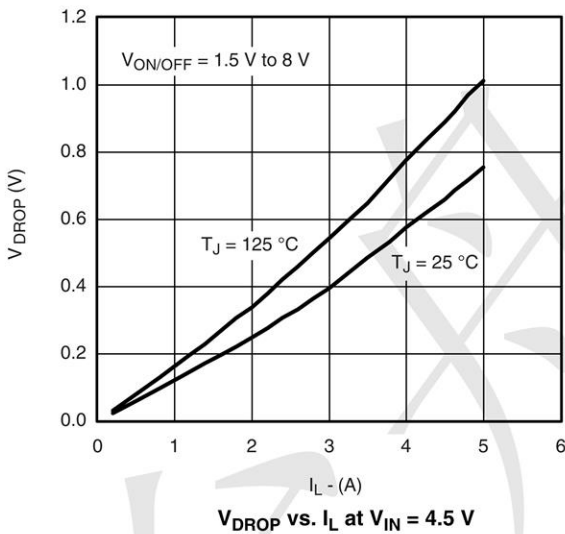
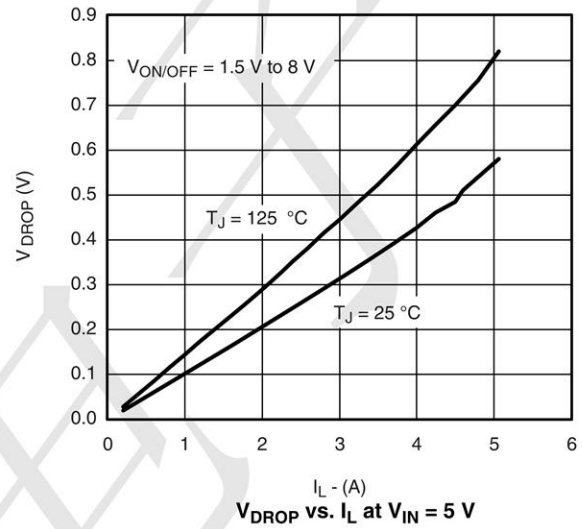
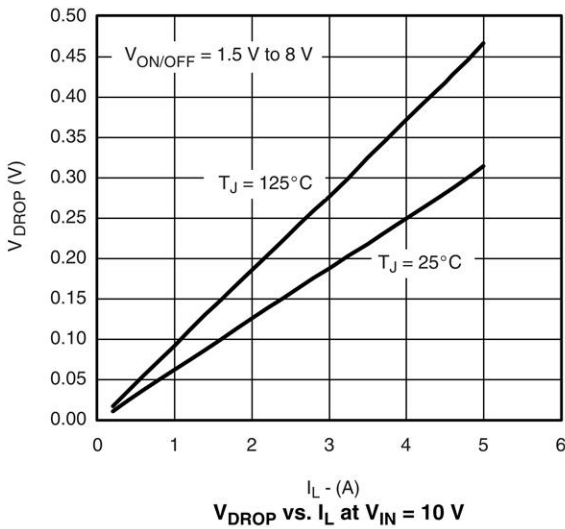
Typical Application Circuit

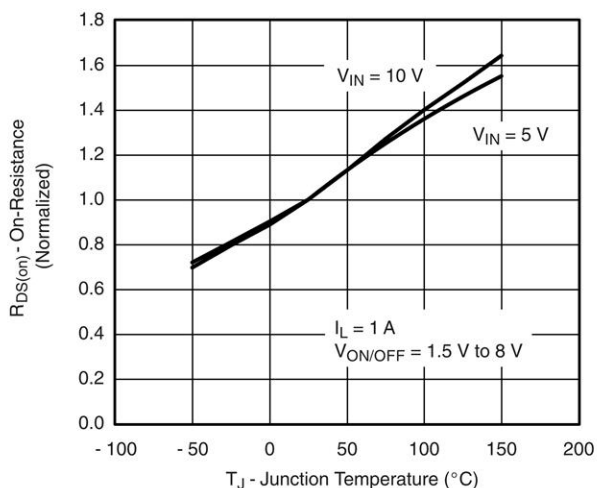


Component Table

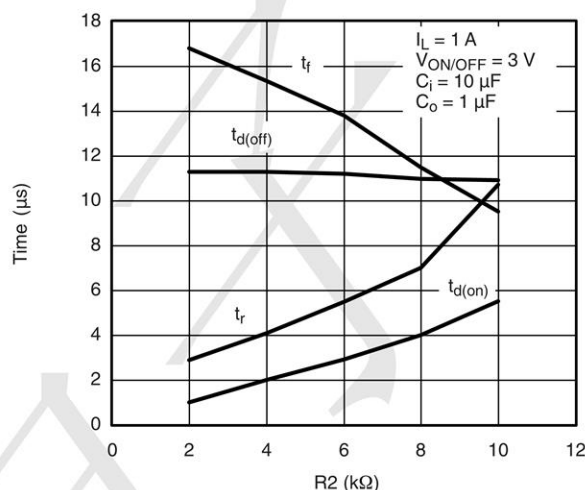
| | | |
|---|----------------------------|--------------------------------------|
| R1 | Pull-Up Resistor | Typical 10k Ω to 1M Ω |
| R2 | Optional Slew-Rate Control | Typical 0k Ω to 100k Ω |
| C1 | Optional Slew-Rate Control | Typical 1 μF |
| Note: R1 should be at least 10 * R2 to ensure Q1 turn-on | | |

Typical Operating Characteristics

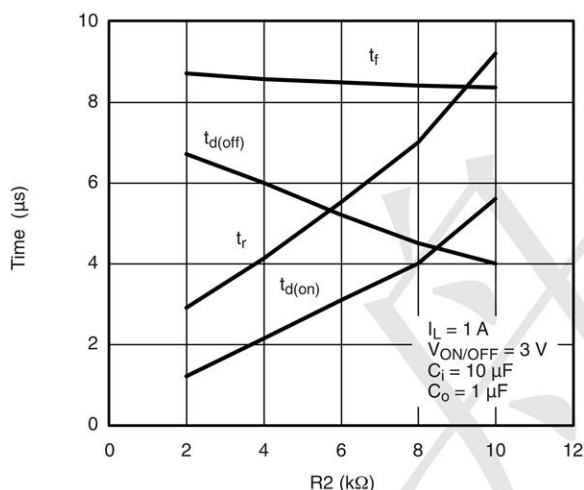




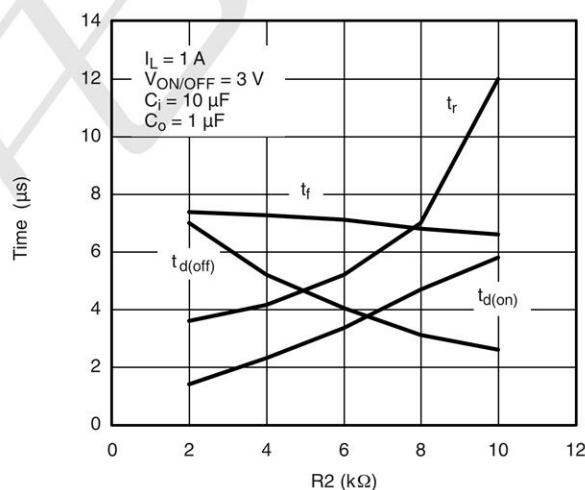
Normalized On-Resistance vs. Junction Temperature



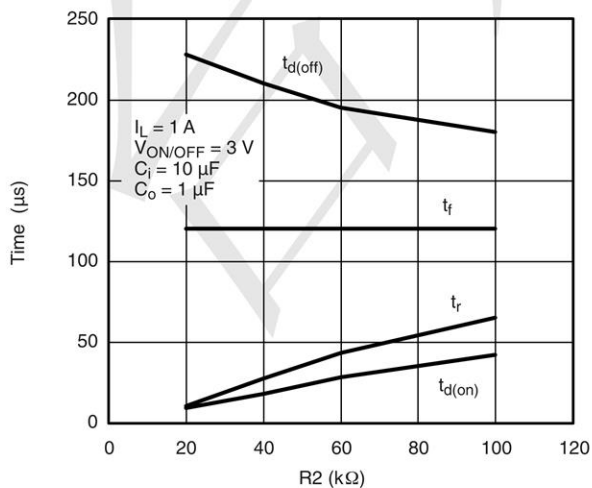
**Switching Variation
R2 at $V_{IN} = 10\text{ V}$, $R_1 = 20\text{ k}\Omega$**



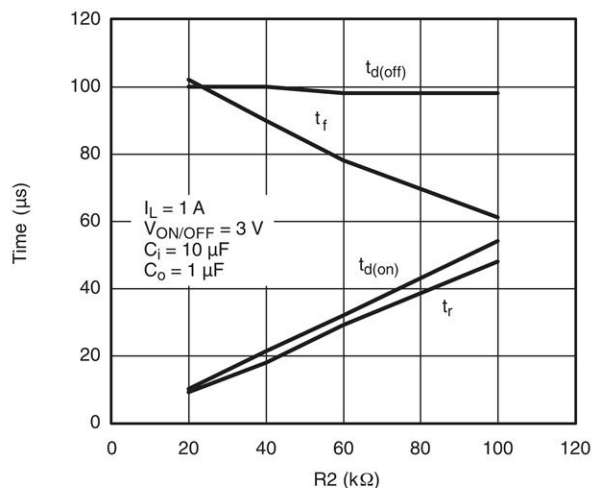
**Switching Variation
R2 at $V_{IN} = 5\text{ V}$, $R_1 = 20\text{ k}\Omega$**



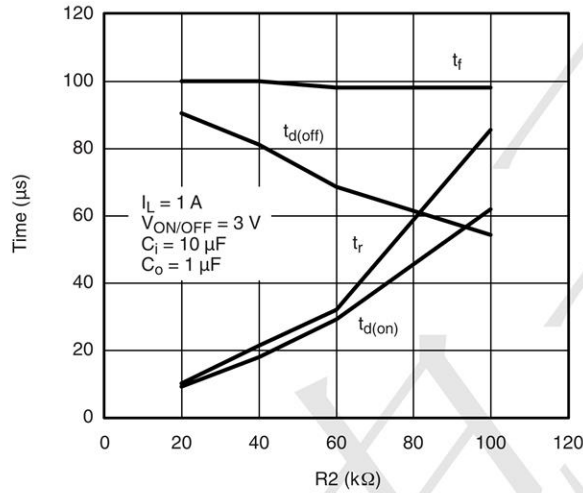
**Switching Variation
R2 at $V_{IN} = 4.5\text{ V}$, $R_1 = 20\text{ k}\Omega$**



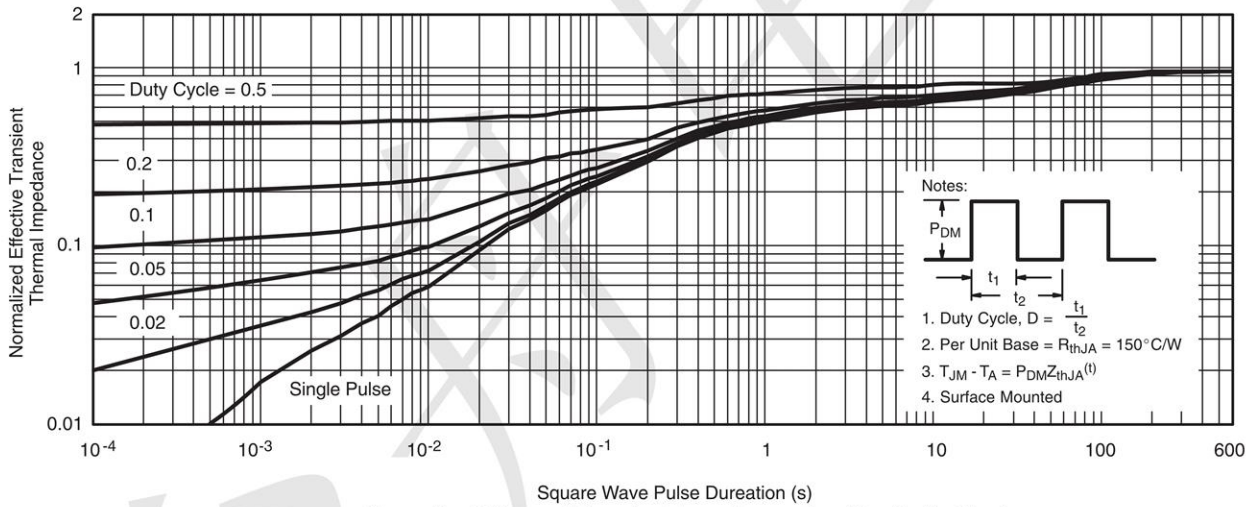
**Switching Variation
R2 at $V_{IN} = 10\text{ V}$, $R_1 = 300\text{ k}\Omega$**



**Switching Variation
R2 at $V_{IN} = 5\text{ V}$, $R_1 = 300\text{ k}\Omega$**

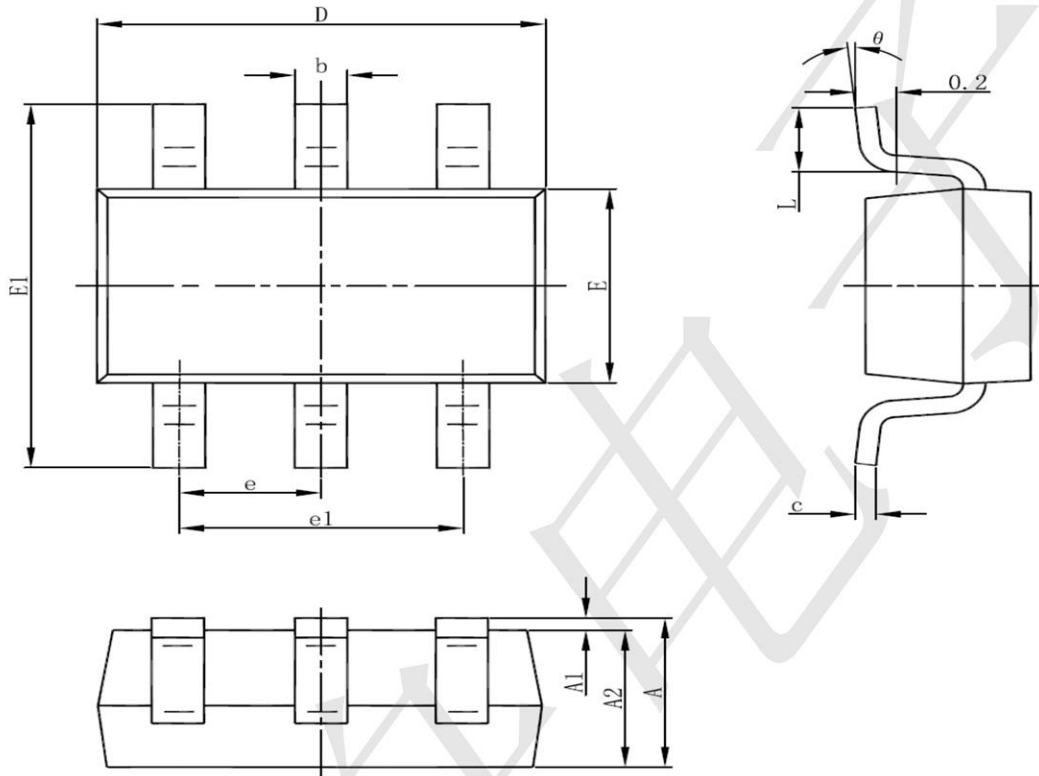


Switching Variation
R2 at $V_{\text{IN}} = 4.5 \text{ V}$, $R_1 = 300 \text{ k}\Omega$





SOT23-6 Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |