

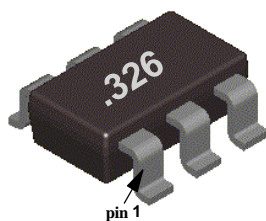
## FDC6326L Integrated Load Switch

### General Description

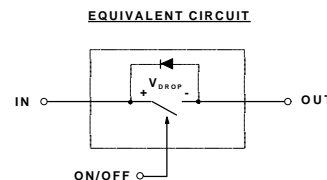
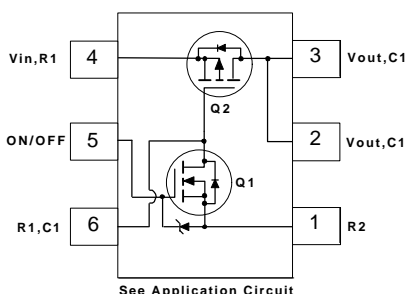
This device is particularly suited for compact power management in portable electronic equipment where 3V to 20V input and 1.8A output current capability are needed. This load switch integrates a small N-Channel power MOSFET (Q1) which drives a large P-Channel power MOSFET (Q2) in one tiny SuperSOT™-6 package.

### Features

- $V_{DROPP}=0.20V$  @  $V_{IN}=12V, I_L=1.5A, R_{DS(ON)} = 0.125 \Omega$   
 $V_{DROPP}=0.20V$  @  $V_{IN}=5V, I_L=1A, R_{DS(ON)} = 0.20 \Omega$ .
- SuperSOT™-6 package design using copper lead frame for superior thermal and electrical capabilities.



SuperSOT™-6



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

| Symbol         | Parameter  | FDC6326L   | Units      |
|----------------|--|------------|------------|
| $V_{IN}$       | Input Voltage Range  | 3 - 20     | V          |
| $V_{ON/OFF}$   | On/Off Voltage Range   | 2.5 - 8    | V          |
| $I_L$          | Load Current - Continuous (Note 1)   | 1.8        | A          |
|                | - Pulsed (Note 1 & 3)  | 5          |            |
| $P_D$          | Maximum Power Dissipation (Note 2)   | 0.7        | W          |
| $T_J, T_{STG}$ | Operating and Storage Temperature Range                                      | -55 to 150 | $^\circ C$ |
| ESD            | Electrostatic Discharge Rating MIL-STD-883D Human Body Model (100pf/1500Ohm) | 6          | kV         |

### THERMAL CHARACTERISTICS

|                 |  |     |              |
|-----------------|--|-----|--------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 180 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case (Note 2)    | 60  | $^\circ C/W$ |

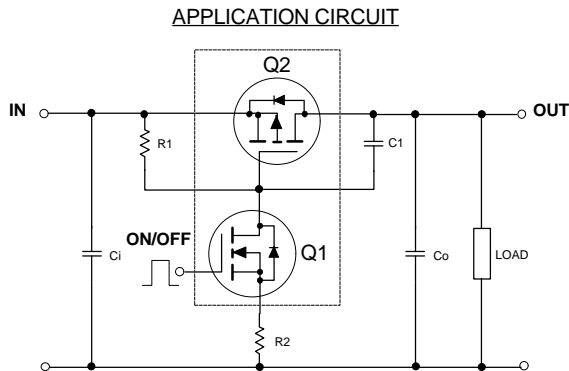
## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol                             | Parameter                    | Conditions   | Min | Typ   | Max   | Units         |
|------------------------------------|------------------------------|--|-----|-------|-------|---------------|
| <b>OFF CHARACTERISTICS</b>         |                              |  |     |       |       |               |
| $I_{FL}$                           | Forward Leakage Current      | $V_{IN} = 20\text{ V}, V_{ON/OFF} = 0\text{ V}$                              |     |       | 1     | $\mu\text{A}$ |
| <b>ON CHARACTERISTICS (Note 3)</b> |                              |  |     |       |       |               |
| $V_{DROP}$                         | Conduction Voltage Drop      | $V_{IN} = 12\text{ V}, V_{ON/OFF} = 3.3\text{ V}, I_L = 1.5\text{ A}$        |     | 0.15  | 0.2   | V             |
|                                    |                              | $V_{IN} = 5\text{ V}, V_{ON/OFF} = 3.3\text{ V}, I_L = 1\text{ A}$           |     | 0.14  | 0.2   |               |
| $R_{DS(ON)}$                       | $Q_2$ - Static On-Resistance | $V_{GS} = -12\text{ V}, I_D = -1.9\text{ A}$                                 |     | 0.095 | 0.125 | $\Omega$      |
|                                    |                              | $V_{GS} = -5\text{ V}, I_D = -1.5\text{ A}$                                  |     | 0.14  | 0.2   |               |
| $I_L$                              | Load Current                 | $V_{DROP} = 0.125\text{ V}, V_{IN} = 12\text{ V}, V_{ON/OFF} = 3.3\text{ V}$ | 1   |       |       | A             |
|                                    |                              | $V_{DROP} = 0.20\text{ V}, V_{IN} = 5\text{ V}, V_{ON/OFF} = 3.3\text{ V}$   | 1   |       |       |               |

### Notes:

- $V_{IN} = 20\text{ V}, V_{ON/OFF} = 8\text{ V}, T_A = 25^\circ\text{C}$
- $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta CA}$  is determined by the user's board design.
- Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

## FDC6326L Load Switch Application



### External Component Recommendation

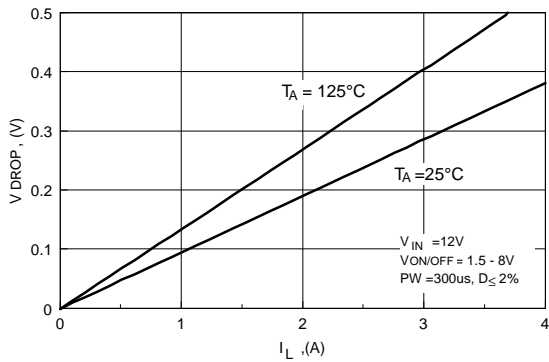
First select  $R_2$ , 100 - 1k $\Omega$ , for Slew Rate control.

$C_1 \leq 1000\text{pF}$  can be added in addition to  $R_2$  for further In-rush current control.

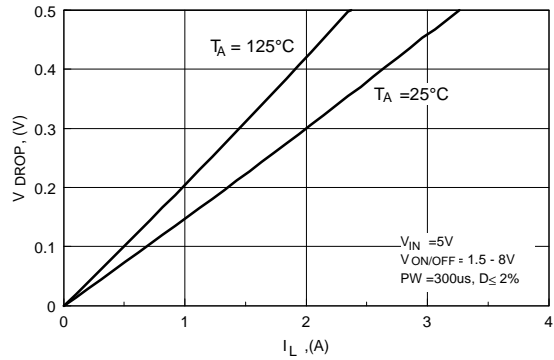
Then select  $R_1$  such that  $R_1/R_2$  ratio maintains between 10 - 100.  $R_1$  is required to turn  $Q_2$  off.

For SPICE simulation, users can download a "FDC6326L.MOD" Spice model from Fairchild Web Site at [www.fairchildsemi.com](http://www.fairchildsemi.com)

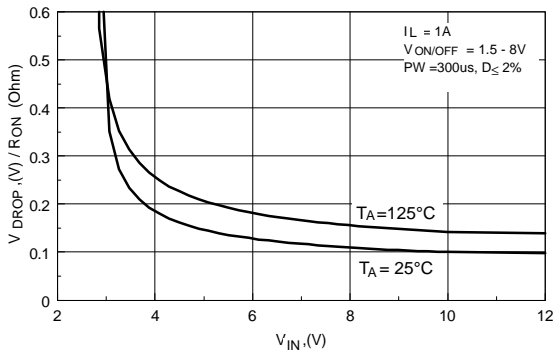
**Typical Electrical Characteristics** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted )



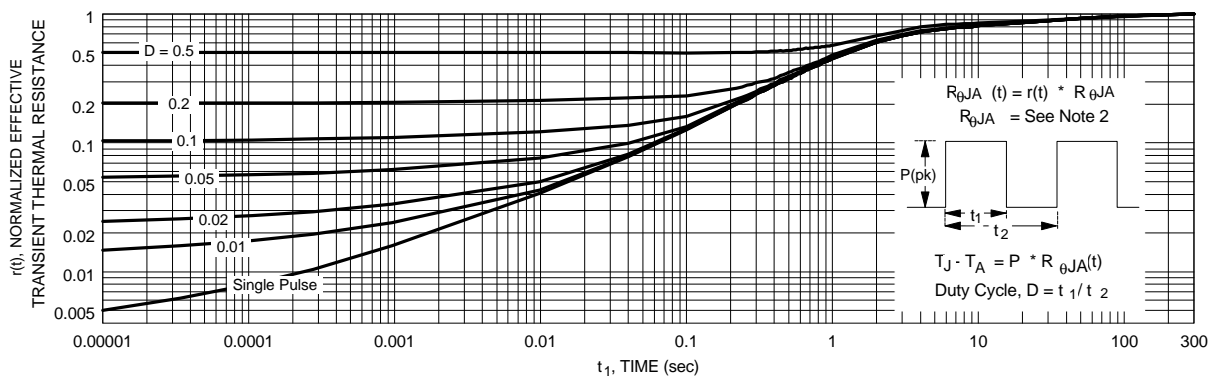
**Figure 1. Conduction Voltage Drop Variation with Load Current.**



**Figure 2. Conduction Voltage Drop Variation with Load Current.**



**Figure 3. On-Resistance Variation with Input Voltage.**



**Figure 4. Transient Thermal Response Curve.**

Thermal characterization performed on the conditions described in Note 2.

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| E <sup>2</sup> CMOS™ | PowerTrench™  |            |
| FACT™                | QFET™         |            |
| FACT Quiet Series™   | QS™           |            |
| FAST®                | Quiet Series™ |            |
| FASTr™               | SuperSOT™-3   |            |
| GTO™                 | SuperSOT™-6   |            |
| HiSeC™               | SuperSOT™-8   |            |

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