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ON Semiconductor®

# FDG6342L

## Integrated Load Switch

### Features

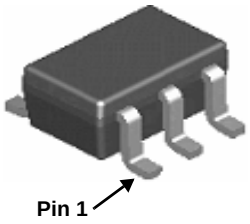
- Max $r_{DS(on)}$ = 150mΩ at $V_{GS}$ = 4.5V, $I_D$ = –1.5A
- Max $r_{DS(on)}$ = 195mΩ at $V_{GS}$ = 2.5V, $I_D$ = –1.3A
- Max $r_{DS(on)}$ = 280mΩ at $V_{GS}$ = 1.8V, $I_D$ = –1.1A
- Max $r_{DS(on)}$ = 480mΩ at $V_{GS}$ = 1.5V, $I_D$ = –0.9A
- Control MOSFET (Q1) includes Zener protection for ESD ruggedness ( >4KV Human body model)
- High performance trench technology for extremely low $r_{DS(on)}$
- Compact industry standard SC70-6 surface mount package
- RoHS Compliant

### General Description

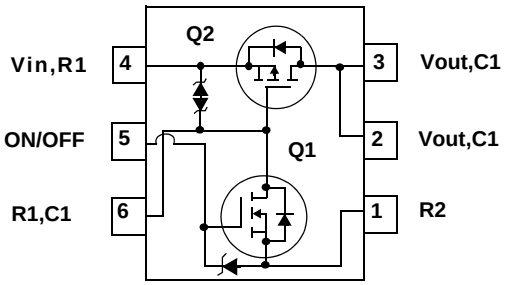
This device is particularly suited for compact power management in portable electronic equipment where 2.5V to 8V input and 1.5A output current capability are needed. This load switch integrates a small N-Channel power MOSFET (Q1) that drives a large P-Channel power MOSFET (Q2) in one tiny SC70-6 package.

### Applications

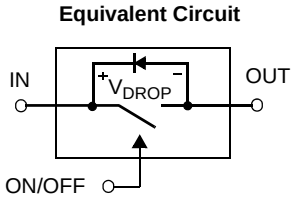
- Power management
- Load switch




SC70-6




See Application Circuit




## MOSFET Maximum Ratings $T_A$ = 25°C unless otherwise noted

| Symbol | Parameter | | Ratings | Units |
|---|---|---|---|---|
| $V_{IN}$ | Gate to Source Voltage (Q2) | | ±8 | V |
| $V_{ON/OFF}$ | Gate to Source Voltage (Q1) | | –0.5 to 8 | V |
| $I_{Load}$ | Load Current -Continuous | (Note 2) | 1.5 | A |
| | -Pulsed | (Note 2) | 6 | |
| $P_D$ | Power Dissipation for Single Operation | (Note 1a) | 0.36 | W |
| | | (Note 1b) | 0.3 | |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | | –55 to +150 | °C |

### Thermal Characteristics

| | | | | |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient Single operation | (Note 1a) | 350 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient Single operation | (Note 1b) | 415 | |

### Package Marking and Ordering Information

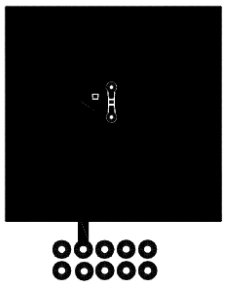
| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|---|---|---|---|---|---|
| .2L | FDG6342L | SC70-6 | 7” | 8mm | 3000units |

## Electrical Characteristics $T_J$ = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{IN}$ | $V_{IN}$ Breakdown Voltage | $I_D$ = -250μA, $V_{ON/OFF}$ = 0V | 8 | | | V |
| $I_{Load}$ | Zero Gate Voltage Drain Current | $V_{IN}$ = -6.4V, $V_{ON/OFF}$ = 0V | | | –1 | μA |
| $I_{FL}$ | Leakage Current, Forward | $V_{IN}$ = 8V, $V_{ON/OFF}$ = 0V | | | 10 | μA |
| $I_{RL}$ | Leakage Current, Reverse | $V_{IN}$ = –8V, $V_{ON/OFF}$ = 0V | | | –10 | μA |
| **On Characteristics (note 2)** | | | | | | |
| $V_{ON/OFF(th)}$ | Gate Threshold Voltage | $V_{IN}$ = $V_{ON/OFF}$, $I_D$ = -250μA | 0.65 | 0.8 | 1.5 | V |
| $r_{DS(on)}$ | Static Drain to Source On Resistance (Q2) | $V_{IN}$ = 4.5V, $I_D$ = –1.5A | | 125 | 150 | mΩ |
| | | $V_{IN}$ = 2.5V, $I_D$ = –1.3A | | 150 | 195 | |
| | | $V_{IN}$ = 1.8V, $I_D$ = –1.1A | | 200 | 280 | |
| | | $V_{IN}$ = 1.5V, $I_D$ = –0.9A | | 250 | 480 | |
| | Static Drain to Source On Resistance (Q1) | $V_{IN}$ = 4.5V, $I_D$ = 0.4A | | 2.6 | 4.0 | Ω |
| | | $V_{IN}$ = 2.7V, $I_D$ = 0.2A | | 3.3 | 5.0 | |
| **Drain-Source Diode Characteristics** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | | | –0.25 | A |
| $V_{SD}$ | Source to Drain Diode Forward Voltage | $V_{ON/OFF}$ = 0V, $I_S$ = –0.25A (Note 2) | | –0.6 | –1.2 | V |

NOTES:

1. $R_{\theta JA}$ is determined with the device mounted on a 1in$^2$ pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.

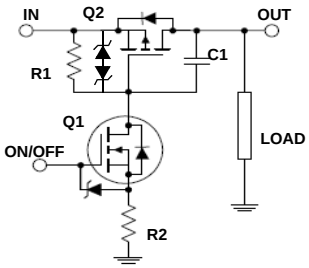


a. 350°C/W when mounted on a 1 in$^2$ pad of 2 oz copper .

b. 415°C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width < 300μs, Duty cycle < 2.0%.

### FDG6342LLoad Switch Application circuit




**External Component Recommendation:**

For additional in-rush current control, R2 and C1 can be added. For more information, see application note AN1030

## Typical Characteristics $T_J$ = 25°C unless otherwise noted

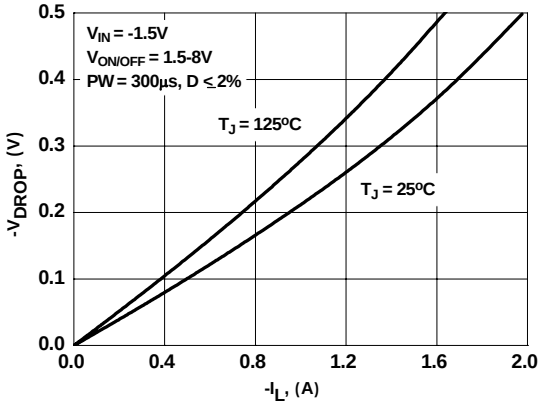



**Figure 1. Conduction Voltage Drop Variation with Load Current.**

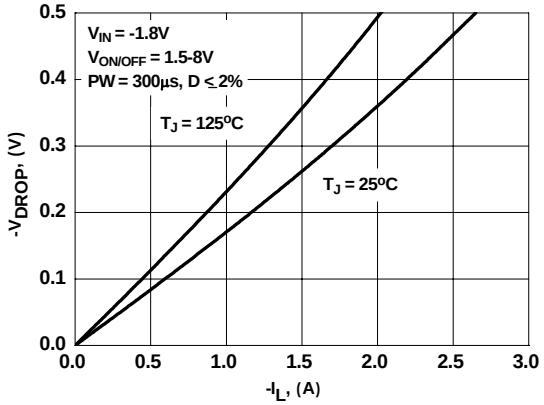



**Figure 2. Conduction Voltage Drop Variation with Load Current.**

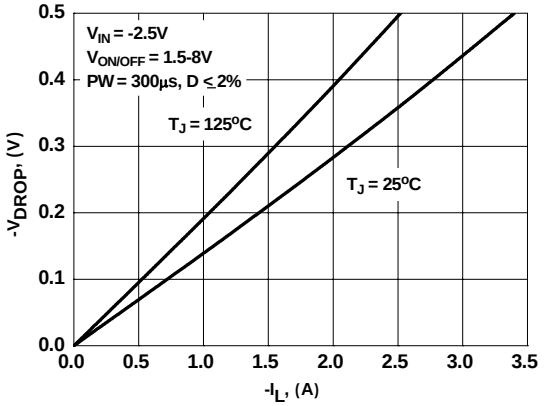



**Figure 3. Conduction Voltage Drop Variation with Load Current.**

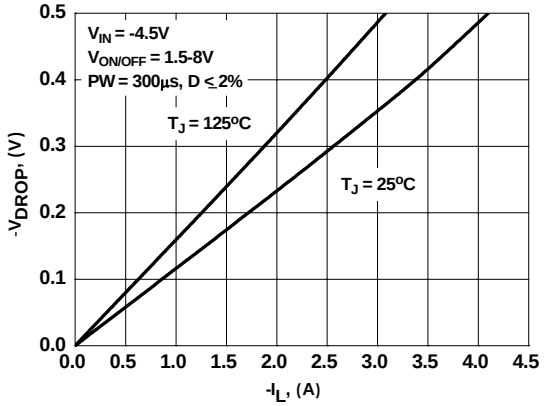



**Figure 4. Conduction Voltage Drop Variation with Load Current.**

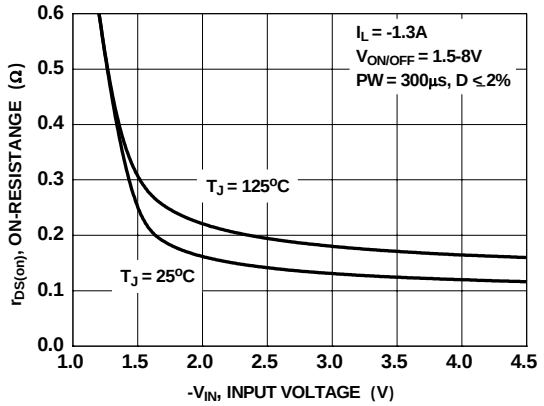



**Figure 5. On-Resistance Variation With Input Voltage**

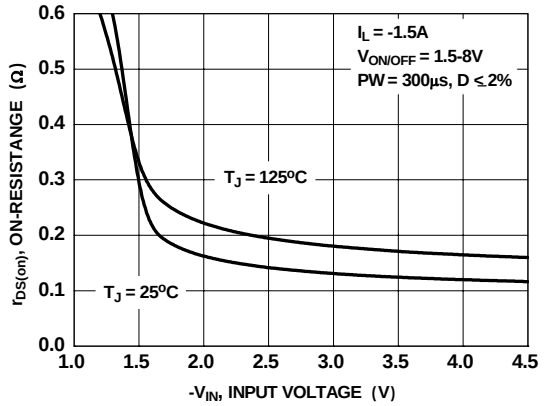
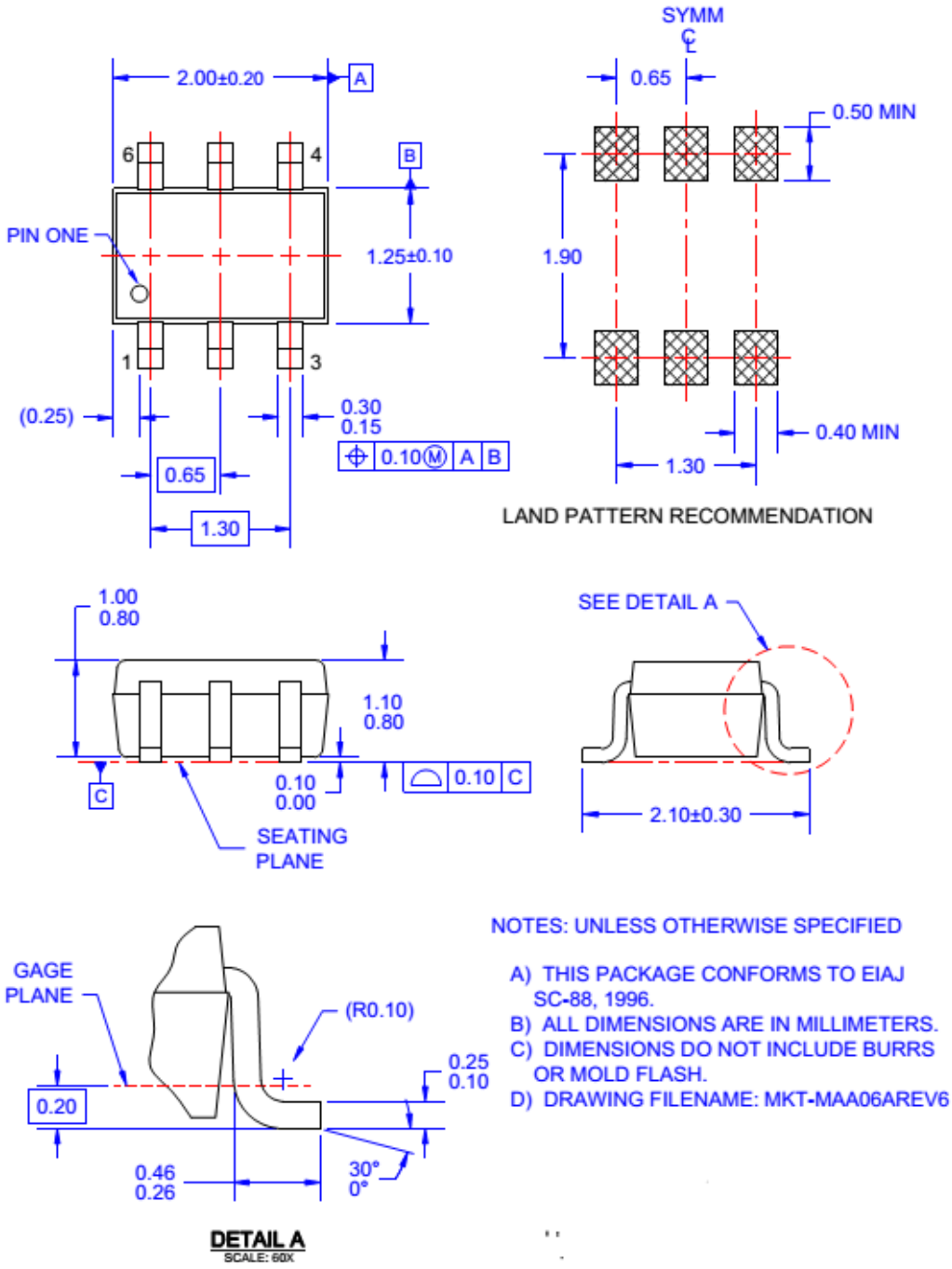



**Figure 6. On-Resistance Variation With Input Voltage**

## Dimensional Outline and Pad Layout

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