

FDY6342L

Integrated Load Switch

General Description

This device is particularly suited for compact power management in portable electronic equipment where 2.5 V to 8 V input and 0.83 A 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 SC89-6 package.

Features

- Max $r_{DS(on)}$ = 0.5 Ω at V_{GS} = 4.5 V, I_D = -0.83 A
- Max $r_{DS(on)}$ = 0.7 Ω at V_{GS} = 2.5 V, I_D = -0.70 A
- Max $r_{DS(on)}$ = 1.2 Ω at V_{GS} = 1.8 V, I_D = -0.43 A
- Max $r_{DS(on)}$ = 1.8 Ω at V_{GS} = 1.5 V, I_D = -0.36 A
- Control MOSFET (Q1) Includes Zener Protection for ESD Ruggedness (>4 kV Human Body Model)
- High Performance Trench Technology for Extremely Low $r_{DS(on)}$
- Compact Industry Standard SC89-6 Surface Mount Package
- This Device is Pb-Free and is RoHS Compliant

Applications

- Power Management
- Load Switch

MOSFET MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ Unless Otherwise Noted

| Symbol | Parameter | Rating | 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) | 0.83 | A |
| | -Pulsed (Note 2) | 1.0 | |
| P_D | Power Dissipation (Note 1a) | 0.625 | W |
| | Power Dissipation (Note 1b) | 0.446 | |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

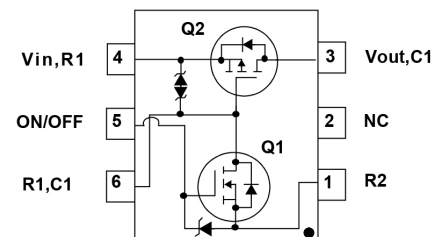
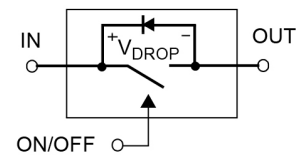
| Symbol | Parameter | Rating | Units |
|-----------------|---|--------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 1a) | 200 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 1b) | 280 | |



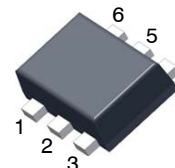
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Equivalent Circuit

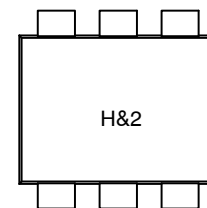


See Application Circuit



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MARKING DIAGRAM



H = Device Code (FDY6342L)
&2 = Date Code (Year & Week)

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

FDY6342L

PACKAGE MARKING AND ORDERING INFORMATION

| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|----------------|----------|---------|-----------|------------|------------|
| H | FDY6342L | SC89-6 | 7" | 8 mm | 3000 units |

ELECTRICAL CHARACTERISTICS $T_J = 25^\circ\text{C}$, Unless Otherwise Noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|--------|-----------|-----------------|-----|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | | | |
|------------|---------------------------------|--|---|--|-----|---------------|
| BV_{IN} | V_{IN} Breakdown Voltage | $I_D = -250 \mu\text{A}$, $V_{ON/OFF} = 0 \text{ V}$ | 8 | | | V |
| I_{Load} | Zero Gate Voltage Drain Current | $V_{IN} = -6.4 \text{ V}$, $V_{ON/OFF} = 0 \text{ V}$ | | | -1 | μA |
| I_{FL} | Leakage Current, Forward | $V_{IN} = 8 \text{ V}$, $V_{ON/OFF} = 0 \text{ V}$ | | | 10 | μA |
| I_{RL} | Leakage Current, Reverse | $V_{IN} = -8 \text{ V}$, $V_{ON/OFF} = 0 \text{ V}$ | | | -10 | μA |

ON CHARACTERISTICS

| | | | | | | |
|------------------|---|--|------|------|-----|----------|
| $V_{ON/OFF(th)}$ | Gate Threshold Voltage | $V_{IN} = V_{ON/OFF}$, $I_D = -250 \mu\text{A}$ | 0.65 | 0.85 | 1.5 | V |
| $r_{DS(on)}$ | Static Drain to Source On Resistance (Q2) | $V_{IN} = 4.5 \text{ V}$, $I_D = -0.83 \text{ A}$ | | 0.28 | 0.5 | Ω |
| | | $V_{IN} = 2.5 \text{ V}$, $I_D = -0.70 \text{ A}$ | | 0.35 | 0.7 | |
| | | $V_{IN} = 1.8 \text{ V}$, $I_D = -0.43 \text{ A}$ | | 0.45 | 1.2 | |
| | | $V_{IN} = 1.5 \text{ V}$, $I_D = -0.36 \text{ A}$ | | 0.57 | 1.8 | |
| | Static Drain to Source On Resistance (Q1) | $V_{IN} = 4.5 \text{ V}$, $I_D = 0.4 \text{ A}$ | | 2.9 | 4.0 | |
| | | $V_{IN} = 2.7 \text{ V}$, $I_D = 0.2 \text{ A}$ | | 3.5 | 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 | $V_{ON/OFF} = 0 \text{ V}$, $I_S = -0.25 \text{ A}$ (Note 2) | | -0.8 | -1.2 | V |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- $R_{\theta JA}$ is determined with the device mounted on a 1 in² 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.



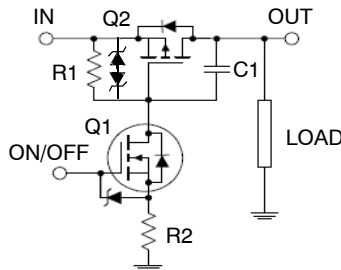
a) 200°C/W when mounted on a 1 in² pad of 2 oz copper.



b) 280°C/W when mounted on a minimum pad of 2 oz copper.

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

FDY6342L Load 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.

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TYPICAL CHARACTERISTICS $T_J = 25^\circ\text{C}$, Unless Otherwise Noted

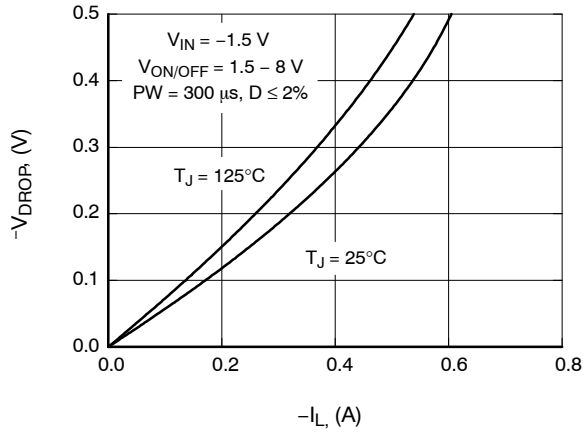


Figure 1. Conduction Voltage Drop Variation with Load Current

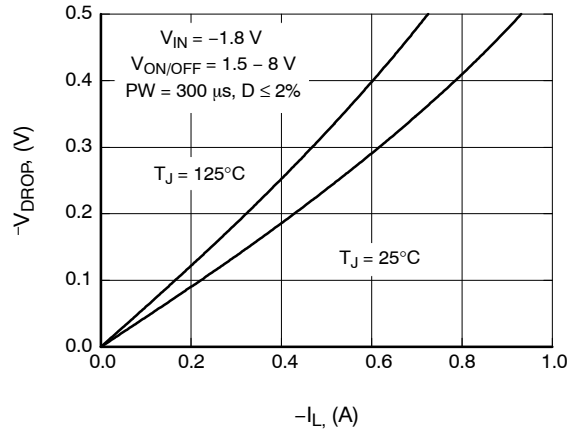


Figure 2. Conduction Voltage Drop Variation with Load Current

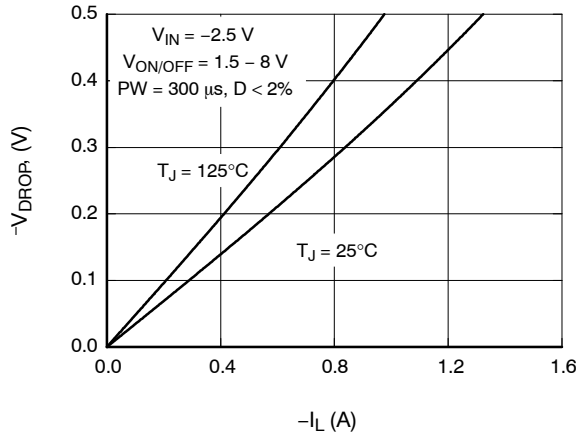


Figure 3. Conduction Voltage Drop Variation with Load Current

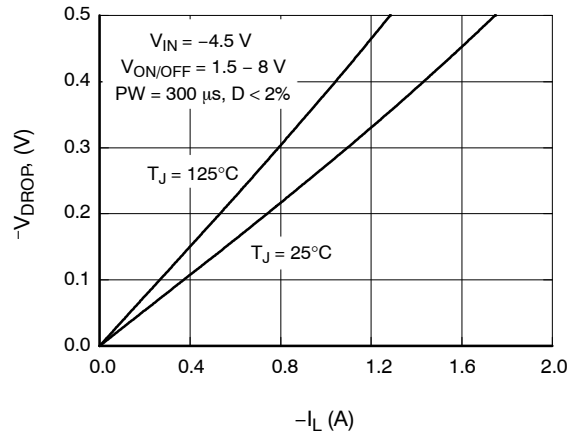


Figure 4. Conduction Voltage Drop Variation with Load Current

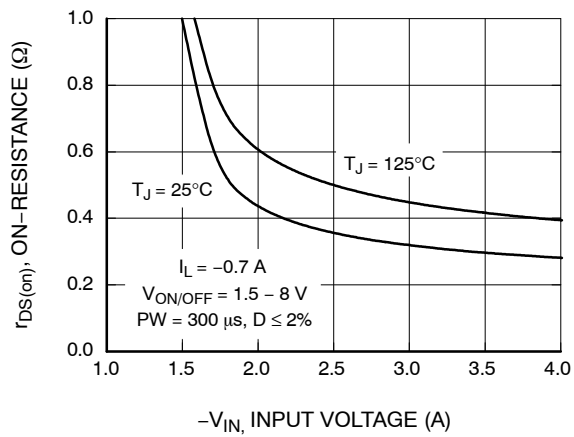


Figure 5. On-Resistance Variation with Input Current

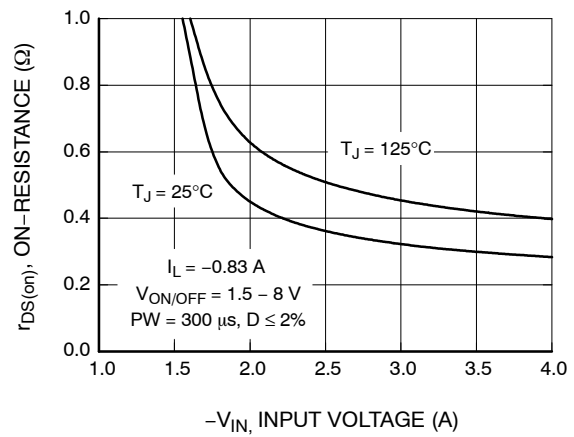
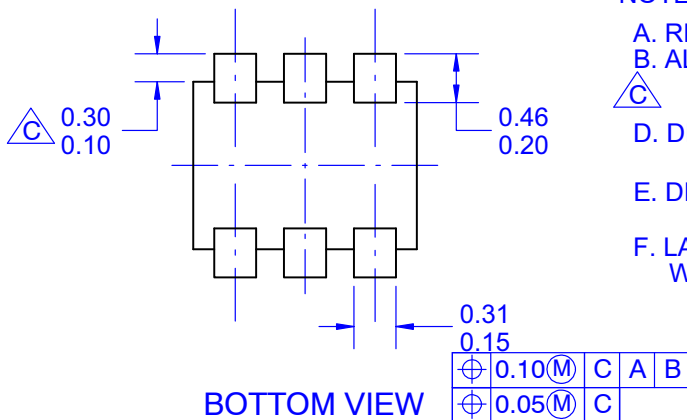
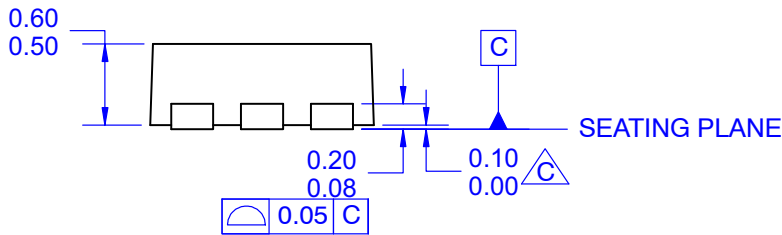
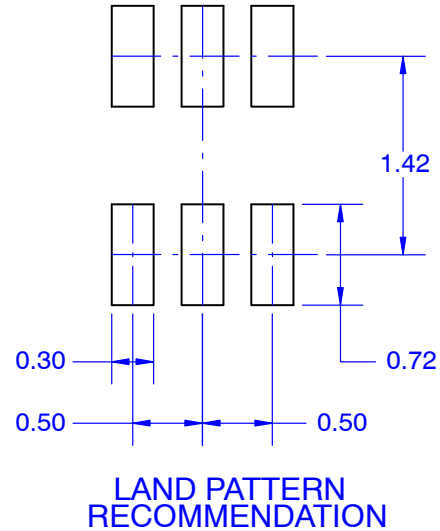
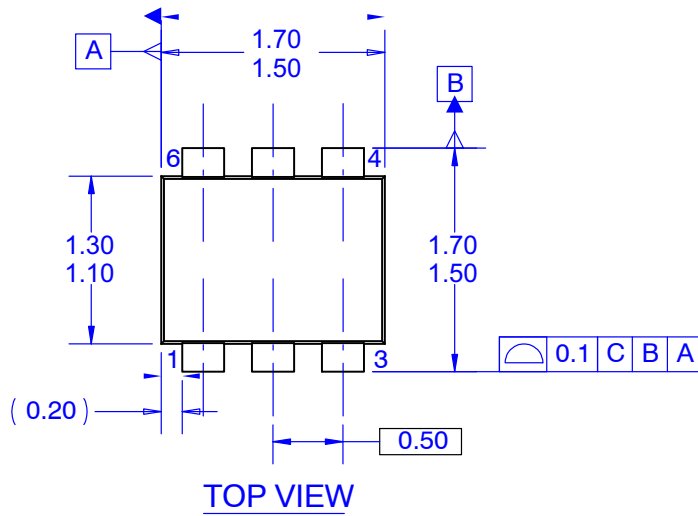


Figure 6. On-Resistance Variation with Input Current



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DATE 31 AUG 2016



NOTES: UNLESS OTHERWISE SPECIFIED.

- A. REFERENCE TO JEDEC MO293.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- △ C DOES NOT COMPLY JEDEC STANDARD VALUE.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSION.
- E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-2009.
- F. LANDPATTERN RECOMMENDATION GENERATED WITH IPC LANDPATTERN GENERATOR

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