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°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	°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	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1b)	280	

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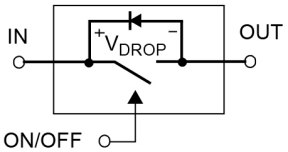
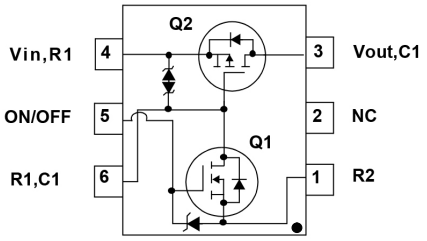
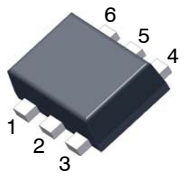
Equivalent Circuit





See Application Circuit



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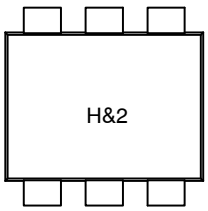
MARKING DIAGRAM



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

ORDERING INFORMATION

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

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
H	FDY6342L	SC89−6	7”	8 mm	3000 units

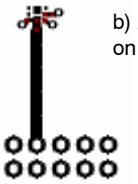
ELECTRICAL CHARACTERISTICS T_J = 25°C, Unless Otherwise Noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{IN}	V_{IN} Breakdown Voltage	I_D = −250 μA, $V_{ON/OFF}$ = 0 V	8			V
I_{Load}	Zero Gate Voltage Drain Current	V_{IN} = −6.4 V, $V_{ON/OFF}$ = 0 V			−1	μA
I_{FL}	Leakage Current, Forward	V_{IN} = 8 V, $V_{ON/OFF}$ = 0 V			10	μA
I_{RL}	Leakage Current, Reverse	V_{IN} = −8 V, $V_{ON/OFF}$ = 0 V			−10	μA
ON CHARACTERISTICS						
$V_{ON/OFF(th)}$	Gate Threshold Voltage	V_{IN} = $V_{ON/OFF}$, I_D = −250 μA	0.65	0.85	1.5	V
$r_{DS(on)}$	Static Drain to Source On Resistance (Q2)	V_{IN} = 4.5 V, I_D = −0.83 A		0.28	0.5	Ω
		V_{IN} = 2.5 V, I_D = −0.70 A		0.35	0.7	
		V_{IN} = 1.8 V, I_D = −0.43 A		0.45	1.2	
		V_{IN} = 1.5 V, I_D = −0.36 A		0.57	1.8	
	Static Drain to Source On Resistance (Q1)	V_{IN} = 4.5 V, I_D = 0.4 A		2.9	4.0	
		V_{IN} = 2.7 V, I_D = 0.2 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 V, I_S = −0.25 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.

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

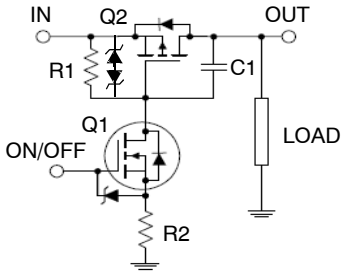
a) 200°C/W when mounted on a 1 in_2 pad of 2 oz copper.



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

2. 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.

TYPICAL CHARACTERISTICS T_J = 25°C, Unless Otherwise Noted

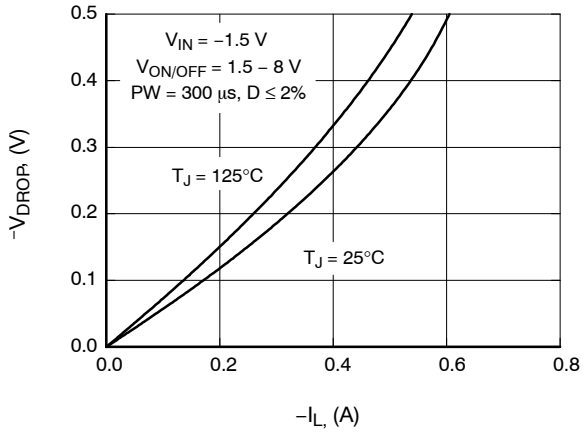


Figure 1. Conduction Voltage Drop Variation with Load Current

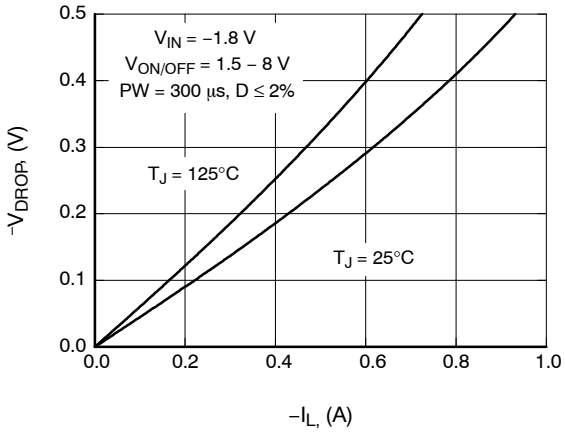


Figure 2. Conduction Voltage Drop Variation with Load Current

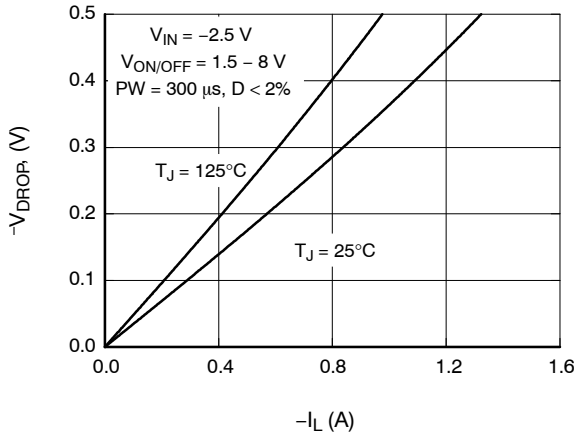


Figure 3. Conduction Voltage Drop Variation with Load Current

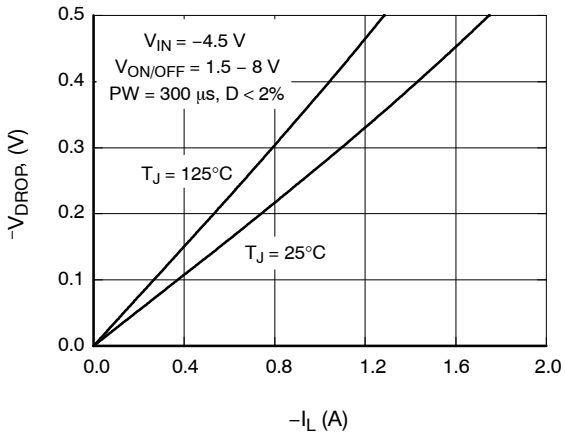


Figure 4. Conduction Voltage Drop Variation with Load Current

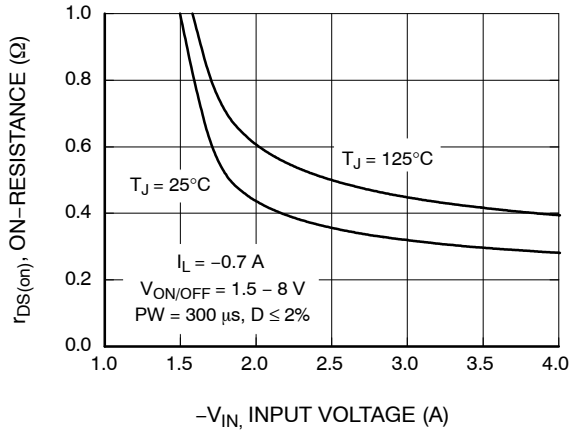


Figure 5. On−Resistance Variaton with Input Current

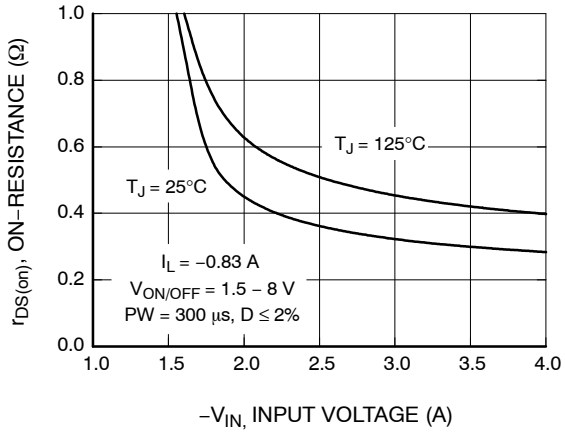


Figure 6. On−Resistance Variaton with Input Current

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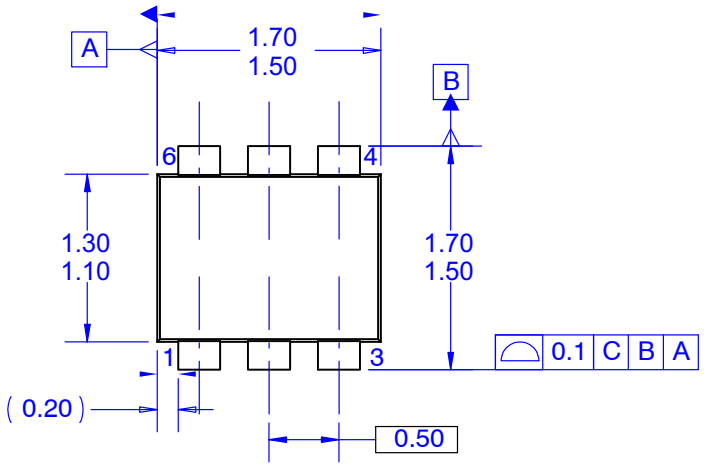
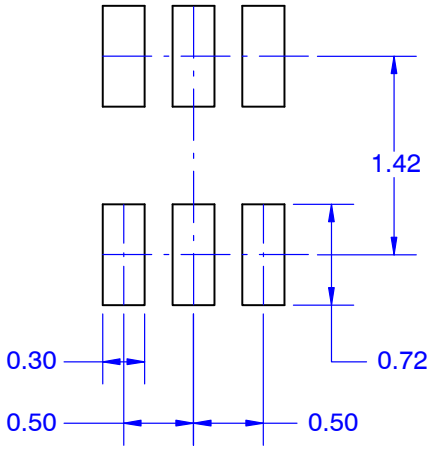
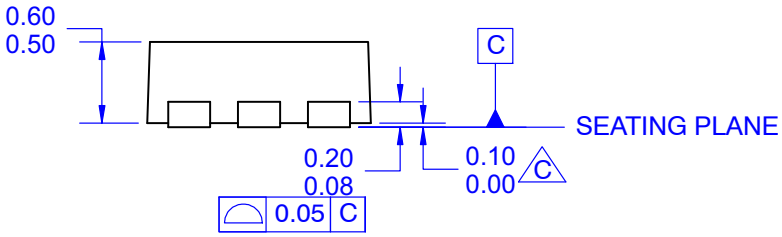
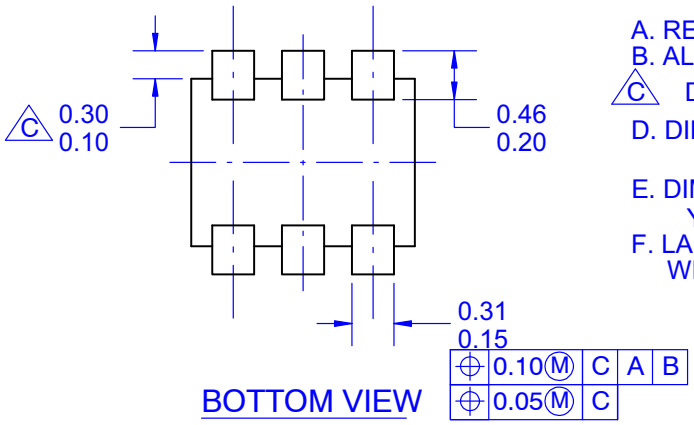


TOP VIEW



LAND PATTERN
RECOMMENDATION





BOTTOM VIEW

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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