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# FDY6342L

## Integrated Load Switch



FDY6342L Integrated Load Switch

### Features

- Max  $r_{DS(on)}$  = 0.5  $\Omega$  at  $V_{GS} = 4.5$  V,  $I_D = -0.83$  A
- Max  $r_{DS(on)}$  = 0.7  $\Omega$  at  $V_{GS} = 2.5$  V,  $I_D = -0.70$  A
- Max  $r_{DS(on)}$  = 1.2  $\Omega$  at  $V_{GS} = 1.8$  V,  $I_D = -0.43$  A
- Max  $r_{DS(on)}$  = 1.8  $\Omega$  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
- RoHS Compliant

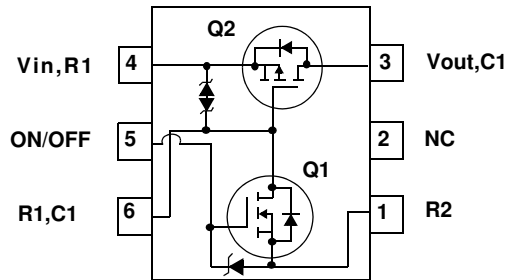
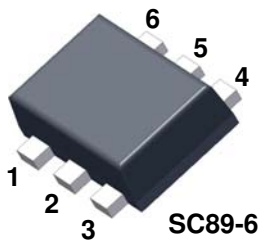


### General Description

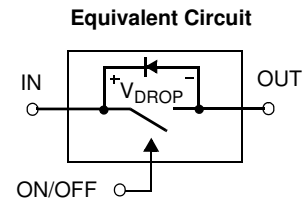
This device is particularly suited for compact power management in portable electronic equipment where 2.5 V to 8 V input and 0.83 A output current capability are needed. This load switch integrates a small N-Channel power MOSFET (Q1) that drives a large P-Channel power MOSFET (Q2) in one tiny SC89-6 package.

### Applications

- Power management
- Load switch



See Application Circuit



### MOSFET Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
$V_{IN}$	Gate to Source Voltage (Q2)	$\pm 8$	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	$^\circ\text{C}$

### Thermal Characteristics

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

### 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 $T_J = 25\text{ }^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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### Off Characteristics

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

### On Characteristics (note 2)

$V_{ON/OFF(th)}$	Gate Threshold Voltage	$V_{IN} = V_{ON/OFF}$ , $I_D = -250\text{ }\mu\text{A}$	0.65	0.85	1.5	V
$r_{DS(on)}$	Static Drain to Source On Resistance ( $Q_2$ )	$V_{IN} = 4.5\text{ V}$ , $I_D = -0.83\text{ A}$		0.28	0.5	$\Omega$
		$V_{IN} = 2.5\text{ V}$ , $I_D = -0.70\text{ A}$		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	
		$V_{IN} = 4.5\text{ V}$ , $I_D = 0.4\text{ A}$		2.9	4.0	
	Static Drain to Source On Resistance ( $Q_1$ )	$V_{IN} = 2.7\text{ V}$ , $I_D = 0.2\text{ A}$		3.5	5.0	$\Omega$

### Drain-Source Diode Characteristics

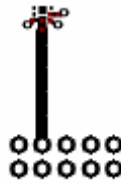
$I_S$	Maximum Continuous Drain to Source Diode Forward Current				-0.25	A
$V_{SD}$	Source to Drain Diode Forward Voltage	$V_{ON/OFF} = 0\text{ V}$ , $I_S = -0.25\text{ A}$ (Note 2)		-0.8	-1.2	V

#### NOTES:

- $R_{\theta JA}$  is determined with the device mounted on a 1 in<sup>2</sup> 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.



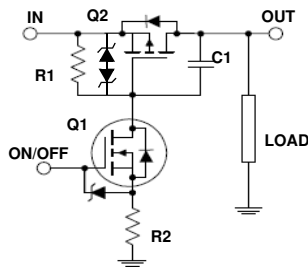
a) 200 °C/W when mounted on a 1 in<sup>2</sup> pad of 2 oz copper.



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

- Pulse Test: Pulse Width < 300  $\mu\text{s}$ , Duty cycle < 2.0%.

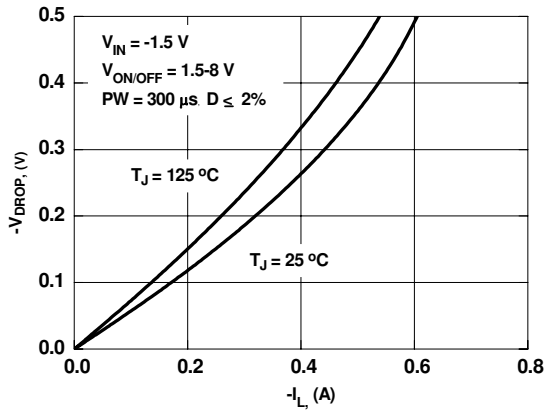
### FDY6342L Load Switch Application circuit



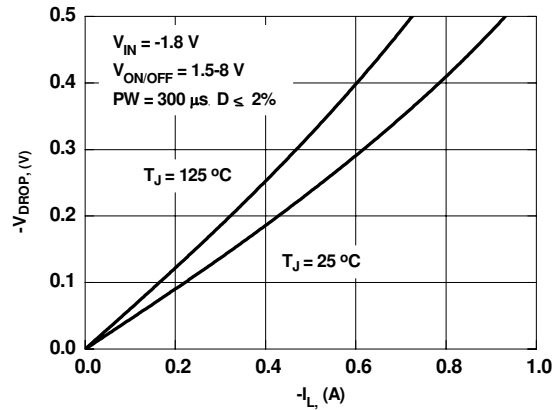
#### External Component Recommendation:

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

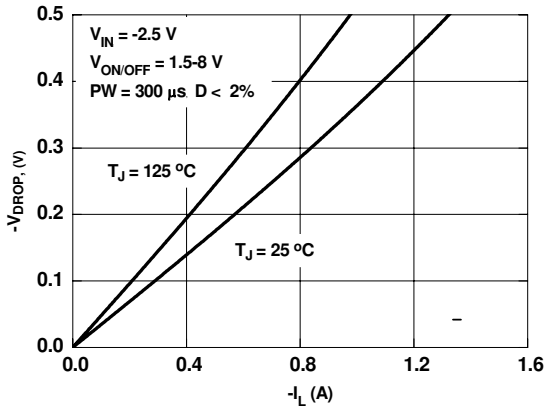
**Typical Characteristics**  $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted



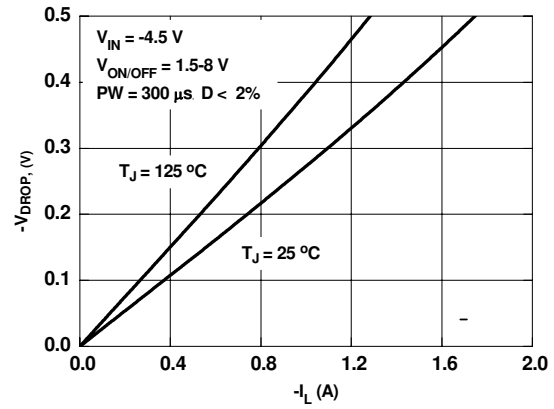
**Figure 1. Conduction Voltage Drop Variation with Load Current**



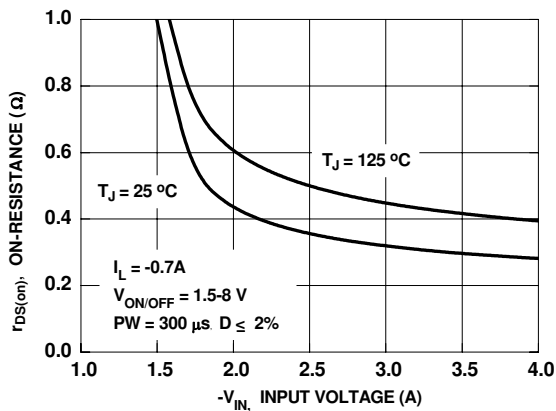
**Figure 2. Conduction Voltage Drop Variation with Load Current**



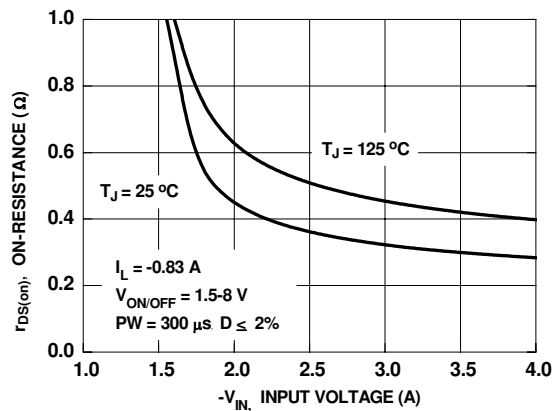
**Figure 3. Conduction Voltage Drop Variation with Load Current**



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

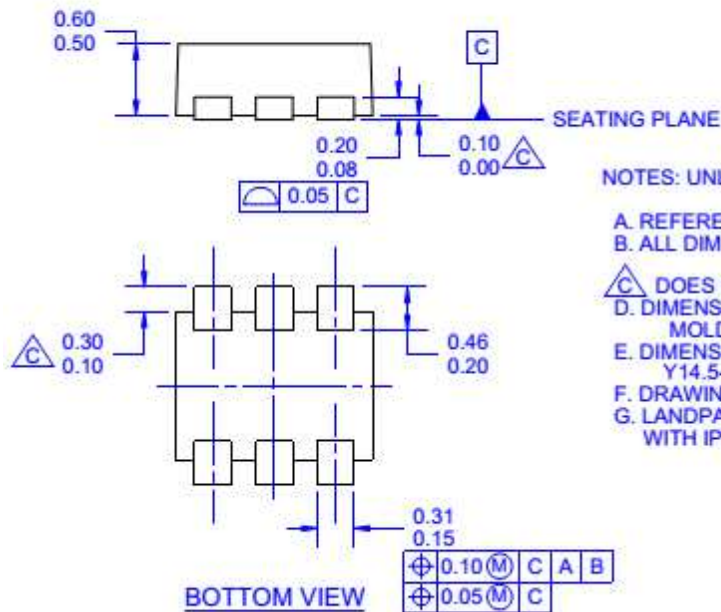
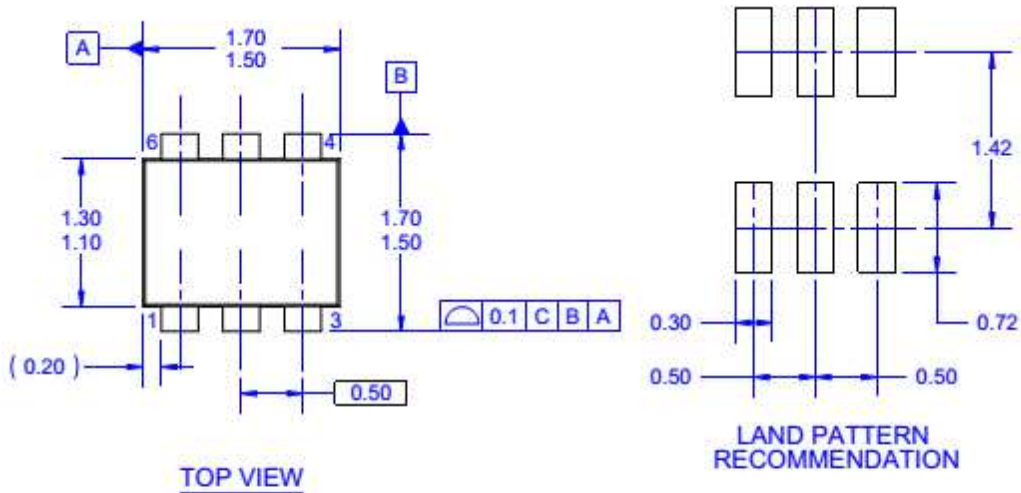


**Figure 5. On-Resistance Variaton with Input Current**



**Figure 6. On-Resistance Variaton with Input Current**

## Dimensional Outline and Pad Layout



NOTES: UNLESS OTHERWISE SPECIFIED.

A. REFERENCE TO JEDEC MO293.

B. ALL DIMENSIONS ARE IN MILLIMETERS.

$\triangle$  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. DRAWING FILE NAME: MAD06A REV3

G. LANDPATTERN RECOMMENDATION GENERATED WITH IPC LANDPATTERN GENERATOR



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| AX-CAP®*                 | Global Power Resource™                          | PowerTrench®                          | TinyBuck®        |
| BitSiC™                  | GreenBridge™                                    | PowerXS™                              | TinyCalc™        |
| Build it Now™            | Green FPS™                                      | Programmable Active Droop™            | TinyLogic®       |
| CorePLUS™                | Green FPS™ e-Series™                            | QFET®                                 | TINYOPTO™        |
| CorePOWER™               | Gmax™   | QS™                                   | TinyPower™       |
| CROSSVOLT™               | GTO™  | Quiet Series™                         | TinyPWM™         |
| CTL™                     | IntelliMAX™                                     | RapidConfigure™                       | TinyWire™        |
| Current Transfer Logic™  | ISOPANAR™                                       |                                       | TranSiC™         |
| DEUXPEED®                | Marking Small Speakers Sound Louder and Better™ | Saving our world, 1mW/W/kW at a time™ | TriFault Detect™ |
| Dual Cool™               | MegaBuck™                                       | SignalWise™                           | TRUECURRENT®*    |
| EcoSPARK®                | MICROCOUPLER™                                   | SmartMax™                             | μSerDes™         |
| EfficientMax™            | MicroFET™                                       | SMART START™                          |                  |
| ESBC™                    | MicroPak™                                       | Solutions for Your Success™           | UHC®             |
|                          | MicroPak2™                                      | SPM®                                  | Ultra FRFET™     |
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| FACT Quiet Series™       | MotionGrid®                                     | SuperSOT™-3                           | VisualMax™       |
| FACT®                    | MTi®  | SuperSOT™-6                           | VoltagePlus™     |
| FAST®                    | MTx®  | SuperSOT™-8                           | XSTM             |
| FastvCore™               | MVN®  | SupreMOS®                             | Xsens™           |
| FETBench™                | mWSaver®  | SyncFET™                              | 仙童™              |
| FPS™                     | OptoHiT™  | Sync-Lock™                            |                  |
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