February 1999

# FDC6330L

## SEMICONDUCTOR 11

### FDC6330L Integrated Load Switch

#### **General Description**

This device is particularly suited for compact power management in portable electronic equipment where 3V to 20V input and 2.3A 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<sup>TM</sup>-6 package.

#### Features

- $V_{\text{DROP}} = 0.2V @ V_{\text{IN}} = 12V, I = 2.5 \text{ A. } R_{\text{I}} = 0.08 \Omega$  $V_{\text{DROP}}^{\text{DROP}} = 0.2V @ V_{\text{IN}}^{\text{IN}} = 5V, I = 1.6 \text{ A. } R_{(ON)}^{\text{ON}} = 0.125 \Omega.$
- Control MOSFET (Q1) includes Zener protection for ESD ruggedness (>6kV Human Body Model).
- High performance PowerTrench<sup>™</sup> technology for extremely low on-resistance.
- SuperSOT<sup>TM</sup>-6 package design using copper lead frame for superior thermal and electrical capabilities.

#### Applications

- Power management
- Load actuation





### SuperSOT<sup>™</sup>-6

Symbol	Parameter			Ratings	Units	
V <sub>IN</sub>	Input Voltage	e Range	(Note 1)	3 - 20	V	
/ <sub>on/off</sub>	On/Off Voltag	ge Range		1.5 - 8	V	
D	Load Current	t - Continuous	(Note 2)	2.3	A	
	- Pulsed			10		
D D	Maximum Po	ower Dissipation	(Note 1)	0.7	W	
Γ <sub>J</sub> , T <sub>stg</sub>	Operating an	d Storage Temperature	Range	-55 to +150		
ESD	Electrostatic Discharge Rating MIL-STD-883D Human-Body-Model (100pf/1500 Ohm)			6		
	L Characte		bient (Note 2)	180	∘C/W	
<mark>Therma</mark> <sub>R<sub>өл</sub>а R<sub>өлс</sub></sub>	Thermal Res	eristics istance, Junction-to-Am istance, Junction-to-Ca		<u>180</u> 60		
ع <sub>ویہ</sub> عربیہ Packag	Thermal Res Thermal Res	istance, Junction-to-Am	Se (Note 2)		○C/W ○C/W Quantity	

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
OFF Ch	aracteristics					
<u>001.</u> I <sub>FL</sub>	Leakage Current	$V_{IN} = 20 \text{ V}, V_{ON/OFF} = 250 \ \mu\text{A}$			1	μA
	Conduction Voltage	$V_{\text{IN}} = 12 \text{ V},  V_{\text{ONOFF}} = 3.3 \text{ V},  \text{I}_{\text{L}} = 2.5 \text{ A}$			0.2	V
<mark>DN Cha</mark> / <sub>DROP</sub>		$\frac{V_{IN} = 12 \text{ V}, \text{ V}_{ONOFF} = 3.3 \text{ V}, \text{ I}_{L} = 2.5 \text{ A}}{V_{IN} = 5 \text{ V}, \text{ V}_{ONOFF} = 3.3 \text{ V}, \text{ I}_{L} = 1.6 \text{ A}}$			0.2	V V
				0.054	•	-

Notes:

1. Range of V<sub>in</sub> can be up to 30V, but R<sub>1</sub> and R<sub>2</sub> must be scaled such that V<sub>GS</sub> of Q2 does not exceed 20V.

2.  $R_{\theta JA}$  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  $R_{\theta JA}$  is determined by the user's board design.

3. Pulse Test: Pulse Width  $\leq$  300µs, Duty Cycle  $\leq$  2.0%.

#### FDC6330L Load Switch Application



#### **External Component Recommendation:**

For applications where  $Co \le 1\mu F$ .

For slew rate control, select R2 in the range of 1k -  $4.7k\Omega$  .

For additional in-rush current control,  $C1 \le 1000 pF$  can be added.

Select R1 so that the R1/R2 ratio ranges from 10 - 100. R1 is required to turn Q2 off.

FDC6330L Rev. C



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