

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[Fairchild Semiconductor](#)
[FDC6325L](#)

For any questions, you can email us directly:

sales@integrated-circuit.com



August 1998

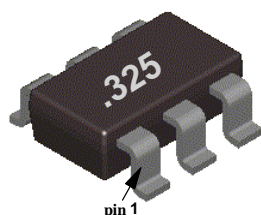
FDC6325L Integrated Load Switch

General Description

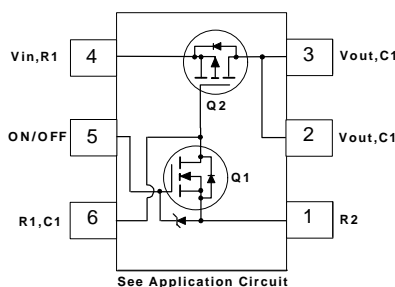
This device is particularly suited for compact power management in portable electronic equipment where 2.5V to 8V input and 1.8A output current capability are needed. This load switch integrates a small N-Channel power MOSFET (Q1) which drives a large P-Channel power MOSFET (Q2) in one tiny SuperSOT™-6 package.

Features

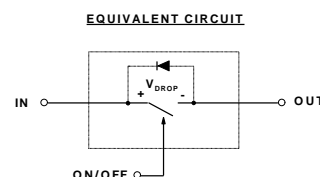
- $V_{\text{DROP}}=0.2\text{V}$ @ $V_{\text{IN}}=5\text{V}$, $I_{\text{L}}=1.5\text{A}$. $R_{\text{(ON)}} = 0.13\Omega$
 $V_{\text{DROP}}=0.2\text{V}$ @ $V_{\text{IN}}=3.3\text{V}$, $I_{\text{L}}=1.2\text{A}$. $R_{\text{(ON)}} = 0.16\Omega$
 $V_{\text{DROP}}=0.2\text{V}$ @ $V_{\text{IN}}=2.5\text{V}$, $I_{\text{L}}=1\text{A}$. $R_{\text{(ON)}} = 0.18\Omega$.
- SuperSOT™-6 package design using copper lead frame for superior thermal and electrical capabilities.



SuperSOT™-6



See Application Circuit



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

Symbol	Parameter	FDC6325L	Units
V_{IN}	Input Voltage Range	2.5 - 8	V
$V_{\text{ON/OFF}}$	On/Off Voltage Range	1.5 - 8	V
I_{L}	Load Current - Continuous (Note 1)	1.8	A
	- Pulsed (Note 1 & 3)	5	
P_{D}	Maximum Power Dissipation (Note 2)	0.7	W
$T_{\text{J}}, T_{\text{STG}}$	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
ESD	Electrostatic Discharge Rating MIL-STD-883D Human Body Model (100pf/1500Ohm)	6	kV

THERMAL CHARACTERISTICS

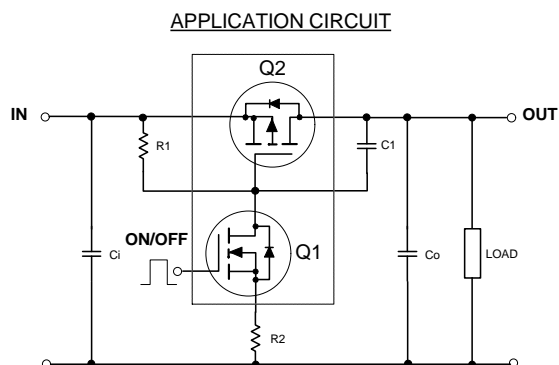
$R_{\theta\text{JA}}$	Thermal Resistance, Junction-to-Ambient (Note 2)	180	$^\circ\text{C/W}$
$R_{\theta\text{JC}}$	Thermal Resistance, Junction-to-Case (Note 2)	60	$^\circ\text{C/W}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
I_{FL}	Forward Leakage Current	$V_{IN} = 8\text{ V}$, $V_{ON/OFF} = 0\text{ V}$			1	μA
ON CHARACTERISTICS (Note 3)						
V_{DROP}	Conduction Voltage Drop	$V_{IN} = 5\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$, $I_L = 1.5\text{ A}$		0.15	0.2	V
		$V_{IN} = 3.3\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$, $I_L = 1.2\text{ A}$		0.145	0.2	
		$V_{IN} = 2.5\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$, $I_L = 1\text{ A}$		0.13	0.2	
$R_{(ON)}$	Q_2 - Static On-Resistance	$V_{GS} = -5\text{ V}$, $I_D = -1.8\text{ A}$		0.115	0.13	Ω
		$V_{GS} = -3.3\text{ V}$, $I_D = -1.6\text{ A}$		0.13	0.16	
		$V_{GS} = -2.5\text{ V}$, $I_D = -1.5\text{ A}$		0.155	0.18	
I_L	Load Current	$V_{DROP} = 0.13\text{ V}$, $V_{IN} = 5\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$	1			A
		$V_{DROP} = 0.16\text{ V}$, $V_{IN} = 3.3\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$	1			
		$V_{DROP} = 0.2\text{ V}$, $V_{IN} = 2.5\text{ V}$, $V_{ON/OFF} = 3.3\text{ V}$	1			

Notes:

- $V_{IN}=8\text{V}$, $V_{ON/OFF}=8\text{V}$, $T_A=25^\circ\text{C}$
- $R_{\theta JA}$ 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 $R_{\theta CA}$ is determined by the user's board design.
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

FDC6325L Load Switch Application



External Component Recommendation

For $C_o \leq 1\mu\text{F}$ applications:

First select R_2 , 100 - 1kW, for Slew Rate control. $C_1 \leq 1000\text{pF}$ can be added in addition to R_2 for further In-rush current control.

Then select R_1 such that R_1/R_2 ratio maintains between 10 - 100. R_1 is required to turn Q_2 off.

For SPICE simulation, users can download a "FDC6325L.MOD" Spice model from Fairchild Web Site at www.fairchildsemi.com

Typical Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

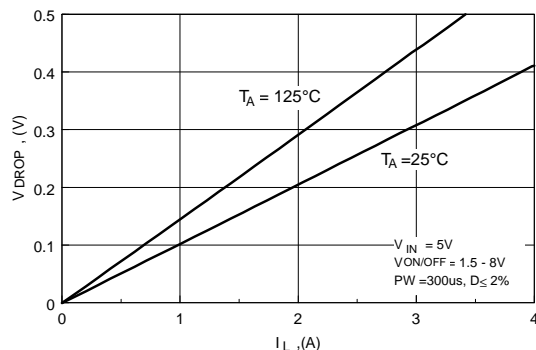


Figure 1. Conduction Voltage Drop Variation with Load Current.

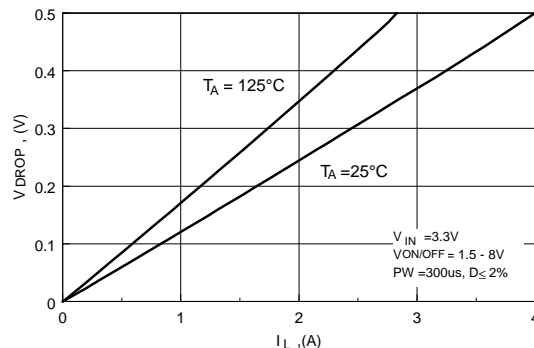


Figure 2. Conduction Voltage Drop Variation with Load Current.

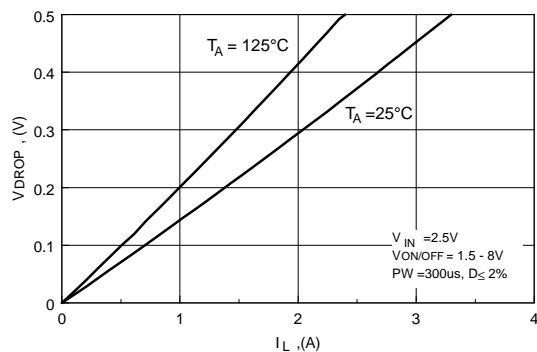


Figure 3. Conduction Voltage Drop Variation with Load Current.

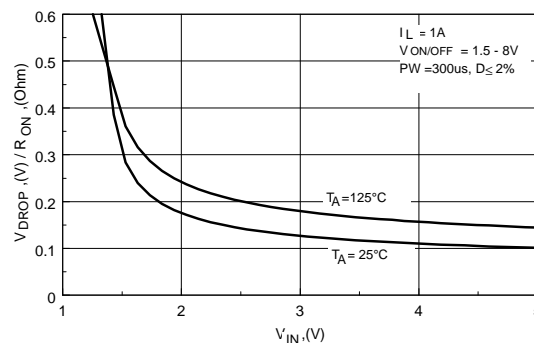


Figure 4. On-Resistance Variation with Input Voltage.

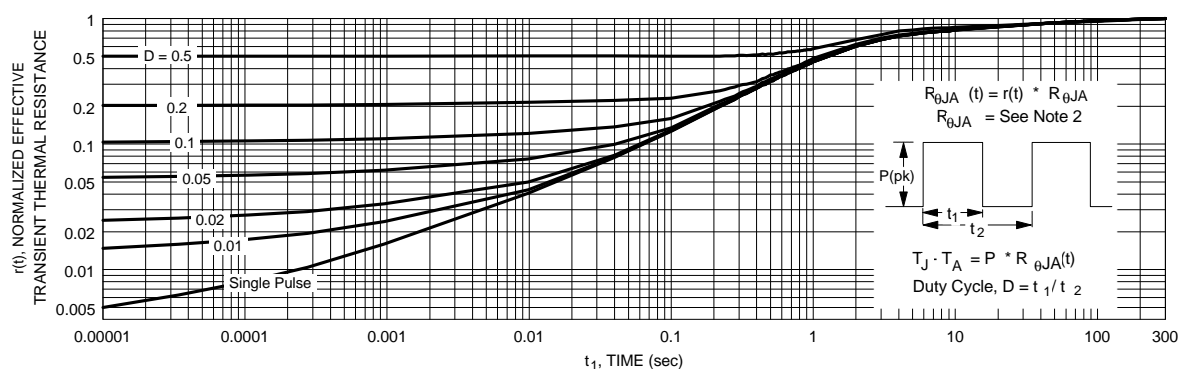


Figure 5. Transient Thermal Response Curve.

Thermal characterization performed on the conditions described in Note 2.
Transient thermal response will change depends on the circuit board design.

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACE ^x ™	ISOPLANAR™	TinyLogic™
CoolFET™	MICROWIRE™	UHC™
CROSSVOLT™	POP™	VCX™
E ² CMOS™	PowerTrench™	
FACT™	QFET™	
FACT Quiet Series™	QS™	
FAST®	Quiet Series™	
FASTr™	SuperSOT™-3	
GTO™	SuperSOT™-6	
HiSeC™	SuperSOT™-8	

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.