



ON Semiconductor®

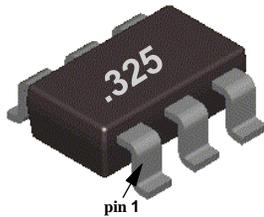
FDC6325L Integrated Load Switch

General Description

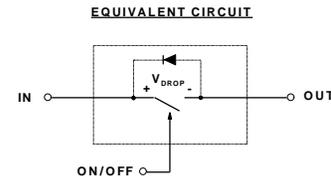
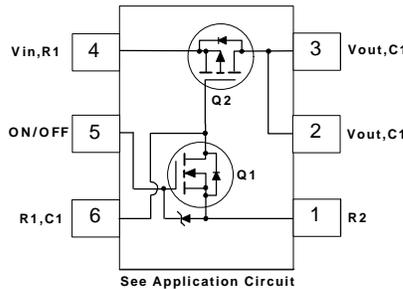
This device is particularly suited for compact power management in portable electronic equipment where 2.5V to 8V input and 1.8A output current capability are needed. This load switch integrates a small N-Channel power MOSFET (Q1) which drives a large P-Channel power MOSFET (Q2) in one tiny SuperSOT™-6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

Features

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



SuperSOT™-6



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
$V_{ON/OFF}$	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_J, T_{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

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

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

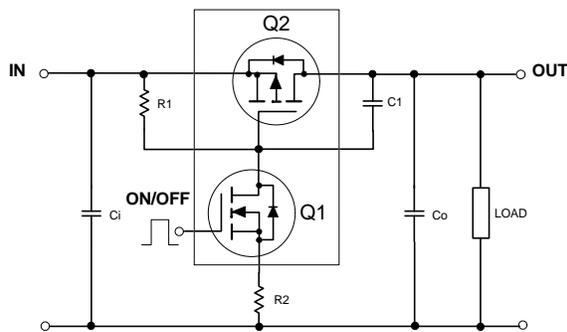
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
I_{FL}	Forward Leakage Current	$V_{IN} = 8\text{ V}, V_{ON/OFF} = 0\text{ V}$			1	μA
ON CHARACTERISTICS (Note 3)						
V_{DROP}	Conduction Voltage Drop	$V_{IN} = 5\text{ V}, V_{ON/OFF} = 3.3\text{ V}, I_L = 1.5\text{ A}$		0.15	0.2	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

APPLICATION CIRCUIT



External Component Recommendation

For $C_0 \leq 1\mu\text{F}$ applications:

First select R_2 , 100 - 1k Ω , 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 ON Semiconductor Web Site at www.onsemi.com

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

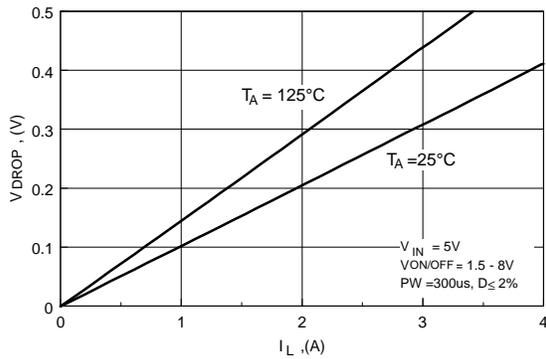


Figure 1. Conduction Voltage Drop Variation with Load Current.

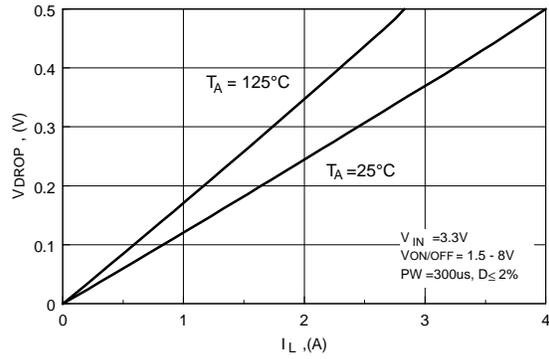


Figure 2. Conduction Voltage Drop Variation with Load Current.

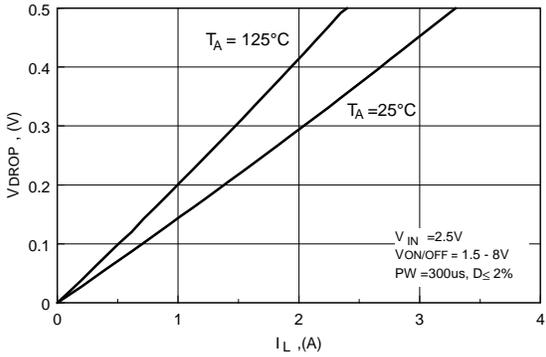


Figure 3. Conduction Voltage Drop Variation with Load Current.

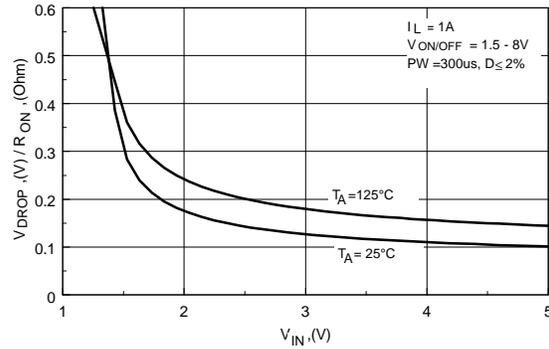


Figure 4. On-Resistance Variation with Input Voltage.

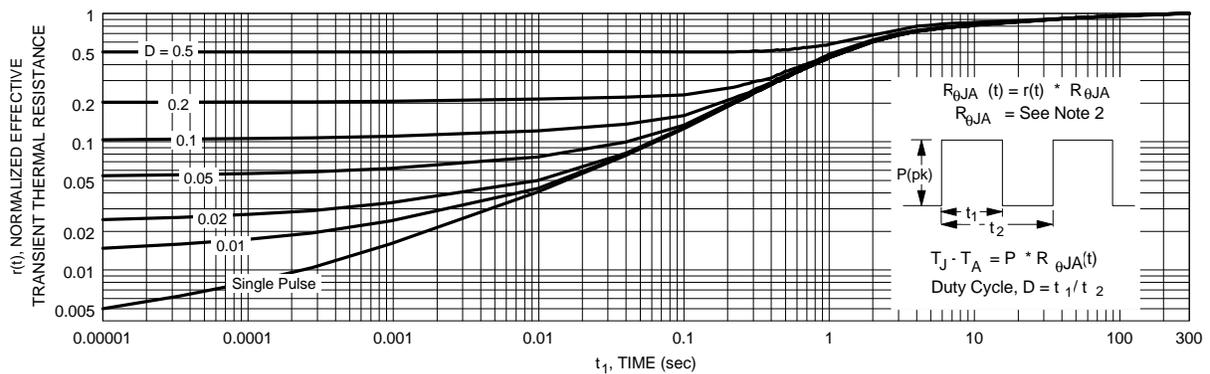


Figure 5. Transient Thermal Response Curve.

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

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