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FDC6326L Integrated Load Switch

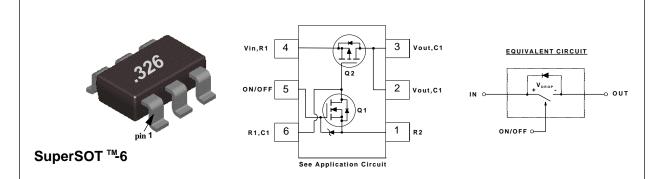
General Description

This device is particularly suited for compact power management in portable electronic equipment where 3V to 20V 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 $^{\text{TM}}$ -6 package.

Features

- V_{DROP} =0.20V @ V_{IN} =12V, I_L =1.5A. $R_{DS(ON)}$ = 0.125 Ω V_{DROP} =0.20V @ V_{IN} =5V, I_L =1A. $R_{DS(ON)}$ = 0.20 Ω .
- SuperSOTTM-6 package design using copper lead frame for superior thermal and electrical capabilities.





Absolute Maximum Ratings T_a = 25°C unless otherwise noted

Symbol	Parameter	FDC6326L	Units
V _{IN}	Input Voltage Range	3 - 20	V
V _{ON/OFF}	On/Off Voltage Range	2.5 - 8	V
IL	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	°C
ESD	Electrostatic Discharge Rating MIL-STD-883D Human Model (100pf/1500Ohm)	Body 6	kV
THERMA	L CHARACTERISTICS	·	<u>.</u>
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	180	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 2)	60	°C/W

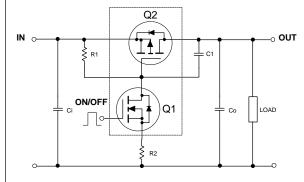
Electric	Electrical Characteristics (T _A = 25°C unless otherwise noted)									
Symbol	Parameter	Conditions	Min	Тур	Max	Units				
OFF CHA	RACTERISTICS									
I _{FL}	Forward Leakage Current	$V_{IN} = 20 \text{ V}, V_{ON/OFF} = 0 \text{ V}$			1	μΑ				
ON CHAR	ACTERISTICS (Note 3)									
V _{DROP}	Conduction Voltage Drop	$V_{IN} = 12 \text{ V}, \ V_{ON/OFF} = 3.3 \text{ V}, \ I_L = 1.5 \text{ A}$		0.15	0.2	V				
		$V_{IN} = 5 \text{ V}, \ V_{ON/OFF} = 3.3 \text{ V}, \ I_{L} = 1 \text{ A}$		0.14	0.2					
R _{DS(ON)}	Q ₂ - Static On-Resistance	$V_{GS} = -12 \text{ V}, \ I_D = -1.9 \text{ A}$		0.095	0.125	Ω				
		$V_{GS} = -5 \text{ V}, I_D = -1.5 \text{ A}$		0.14	0.2					
I _L	Load Current	$V_{DROP} = 0.125 \text{ V}, V_{IN} = 12 \text{ V}, V_{ON/OFF} = 3.3 \text{ V}$	1			Α				
		$V_{DROP} = 0.20 \text{ V}, V_{IN} = 5 \text{ V}, V_{ON/OFF} = 3.3 \text{ V}$	1							

Notes

- 1. V_{IN} =20V, V_{ONOFF} =8V, T_A =25°C
- 2. R_{But} 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_{Ruc} is guaranteed by design while R_{rick} is determined by the user's board design.
- 3. Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 2.0%.

FDC6326L Load Switch Application

APPLICATION CIRCUIT



External Component Recommendation

First select R2, $100 - 1k\Omega$, for Slew Rate control.

 $C1 \le 1000 pF$ can be added in addition to R2 for further In-rush current control.

Then select R1 such that R1/R2 ratio maintains between 10 - 100. R1 is required to turn Q2 off.

For SPICE simulation, users can download a "FDC6326L.MOD" Spice model from Fairchild Web Site at www.fairchildsemi.com

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

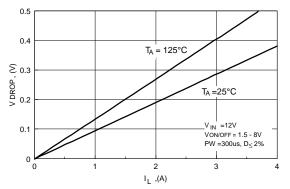


Figure 1. Conduction Voltage Drop Variation with Load Current.

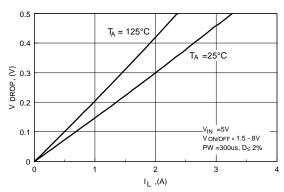


Figure 2. Conduction Voltage Drop Variation with Load Current.

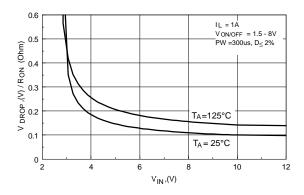


Figure 3. On-Resistance Variation with Input Voltage.

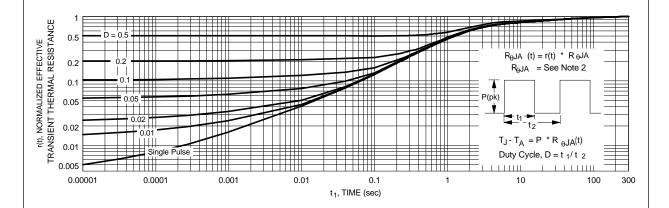


Figure 4. Transient Thermal Response Curve.

Thermal characterization performed on the conditions described in Note 2.

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