FAIRCHILD
SEMICONDUCTOR TM

August 1998

FDC6326L
Integrated Load Switch

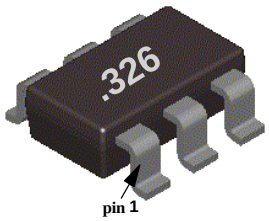
General Description

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™-6 package.

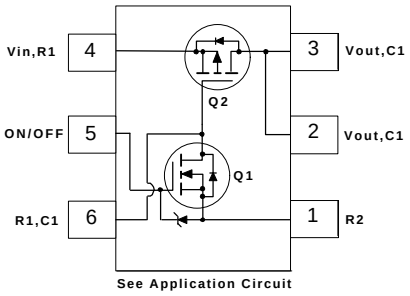
Features

- 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.
- SuperSOT™-6 package design using copper lead frame for superior thermal and electrical capabilities.

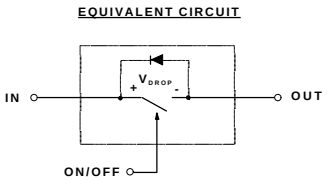
SOT-23	SuperSOT™-6	SuperSOT™-8	SO-8	SOT-223	SOIC-16



SuperSOT ™-6



See Application Circuit



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
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	°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	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		(Note 2)	60	°C/W

Electrical Characteristics (T_A = 25°C unless otherwise noted)

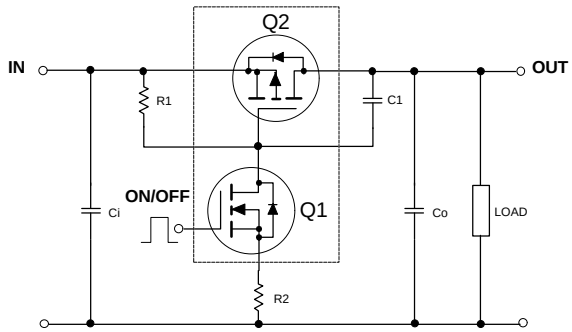
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
I_{FL}	Forward Leakage Current	V_{IN} = 20 V, $V_{ON/OFF}$ = 0 V			1	µA
ON CHARACTERISTICS (Note 3)						
V_{DROP}	Conduction Voltage Drop	V_{IN} = 12 V, $V_{ON/OFF}$ = 3.3 V, I_L = 1.5 A		0.15	0.2	V
		V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V, I_L = 1 A		0.14	0.2	
$R_{DS(ON)}$	Q_2 - Static On-Resistance	V_{GS} = -12 V, I_D = -1.9 A		0.095	0.125	Ω
		V_{GS} = -5 V, I_D = -1.5 A		0.14	0.2	
I_L	Load Current	V_{DROP} = 0.125 V, V_{IN} = 12 V, $V_{ON/OFF}$ = 3.3 V	1			A
		V_{DROP} = 0.20 V, V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V	1			

Notes:

1. V_{IN}=20V, $V_{ON/OFF}$=8V, T_A=25°C
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 $R_{\theta CA}$ is determined by the user's board design.
3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2.0%.

FDC6326L Load Switch Application

APPLICATION CIRCUIT



External Component Recommendation

First select R2, 100 - 1kΩ, for Slew Rate control.
C1 ≤ 1000pF 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 °C unless otherwise noted)

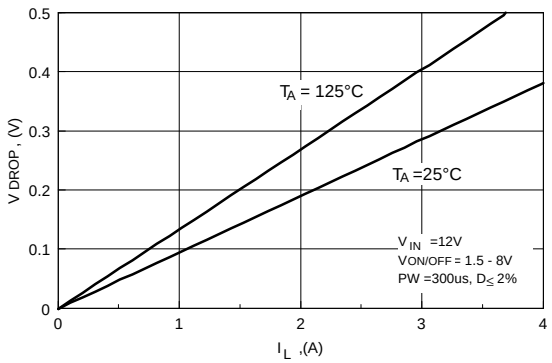


Figure 1. Conduction Voltage Drop Variation with Load Current.

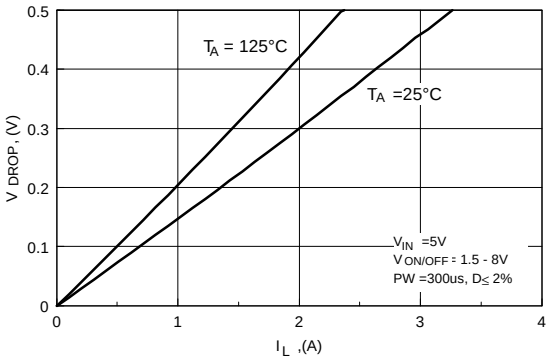


Figure 2. Conduction Voltage Drop Variation with Load Current.

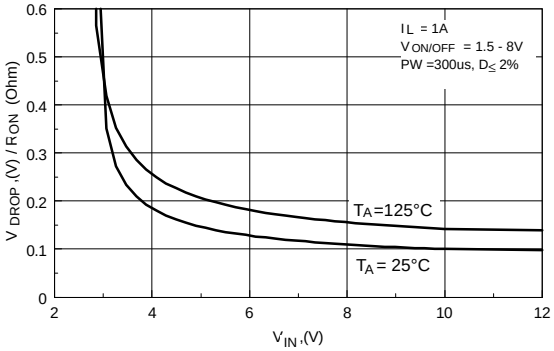


Figure 3. On-Resistance Variation with Input Voltage.

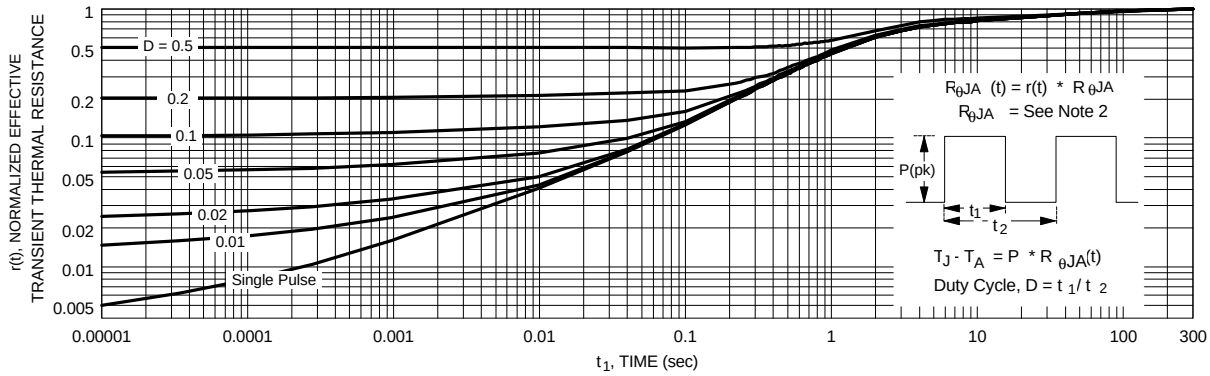


Figure 4. Transient Thermal Response Curve.

Thermal characterization performed on the conditions described in Note 2.

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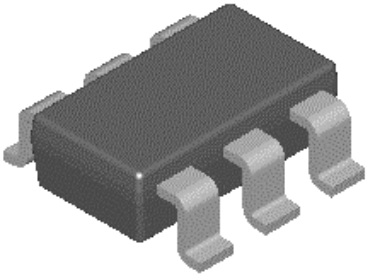
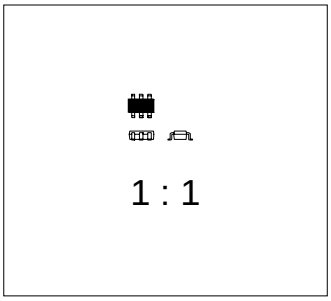
SuperSOT™-6 (FS PKG Code 31, 33)

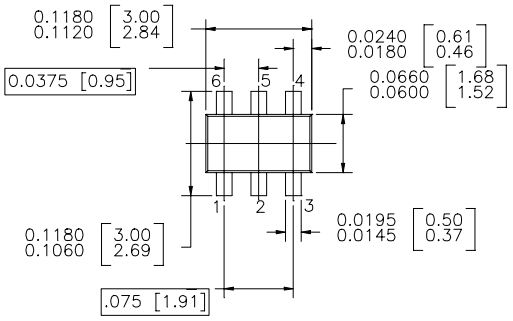


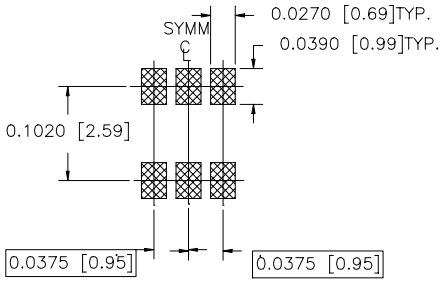


Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.0158





LAND PATTERN RECOMMENDATION

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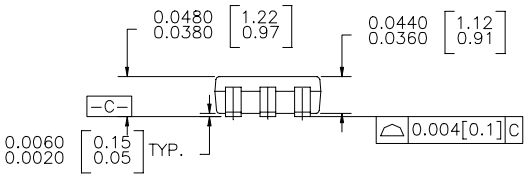

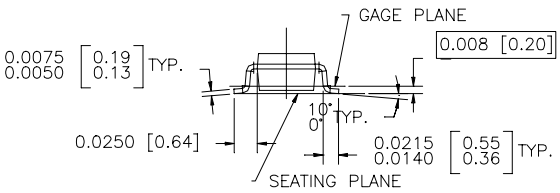

NOTES : UNLESS OTHERWISE SPECIFIED

1.0 STANDARD LEAD FINISH : 150 MICROINCHES 93.81 MICROMETERS)
MINIMUM TIN / LEAD (SOLDER) ON COPPER.

2.0 NO JEDEC REGISTRATION AS OF JULY 1996

SUPER SOT 6 LEADS

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Datasheet Identification	Product Status	Definition
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