ON Semiconductor®

FDG6324L
Integrated Load Switch

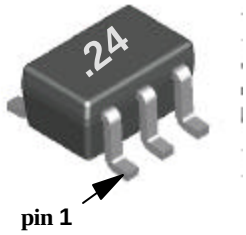
General Description

This device is intended to be configured as a load switch and is particularly suited for compact computer peripheral switching applications where 3V to 20V input and 0.6A output current capability are needed. This device features a small N-Channel MOSFET (Q1) together with a large P-Channel Power MOSFET (Q2) in a single SC70-6 package.

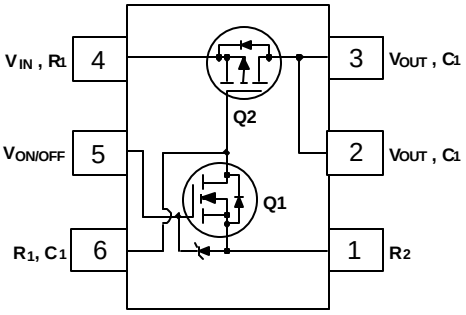
Features

- V_{DROP}=0.2V @ V_{IN}=12V, I_L=0.36A. $R_{(ON)}$ = 0.55Ω. V_{DROP}=0.2V @ V_{IN}=5V, I_L=0.27A. $R_{(ON)}$ = 0.75Ω.
- Very small package outline (SC70-6).
- Control MOSFET (Q1) includes Zener protection for ESD ruggedness (> 6KV Human Body Model).
- High density cell design for extremely low on-resistance.

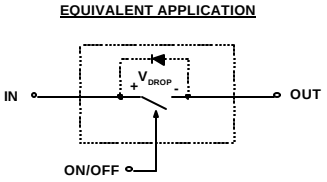
SC70-6	SOT-23	SuperSOT™-6	SuperSOT™-8	SO-8	SOT-223



SC70-6



See Application Circuit



Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter		FDG6324L	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)	0.6	A
		- Pulsed (Note 1 & 3)	1.8	
P_D	Maximum Power Dissipation	(Note 2)	0.3	W
T_J,T_{STG}	Operating and Storage Temperature Range		-55 to 150	°C
ESD	Electrostatic Discharge Rating Human Body Model (100pf/1500Ohm)		6	kV
THERMAL CHARACTERISTICS				
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	(Note 2)	415	°C/W

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Publication Order Number:
FDG6324L/D

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 = 0.36 A		0.14	0.2	V
		V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V, I_L = 0.27 A		0.16	0.2	
$R_{(ON)}$	Q_2 - Static On-Resistance	V_{GS} = -12 V, I_D = -0.6 A		0.37	0.55	Ω
		V_{GS} = -5 V, I_D = -0.5 A		0.58	0.75	
I_L	Load Current	V_{DROP} = 0.2 V, V_{IN} = 12 V, $V_{ON/OFF}$ = 3.3 V	0.36			A
		V_{DROP} = 0.2 V, V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V	0.27			

Notes:

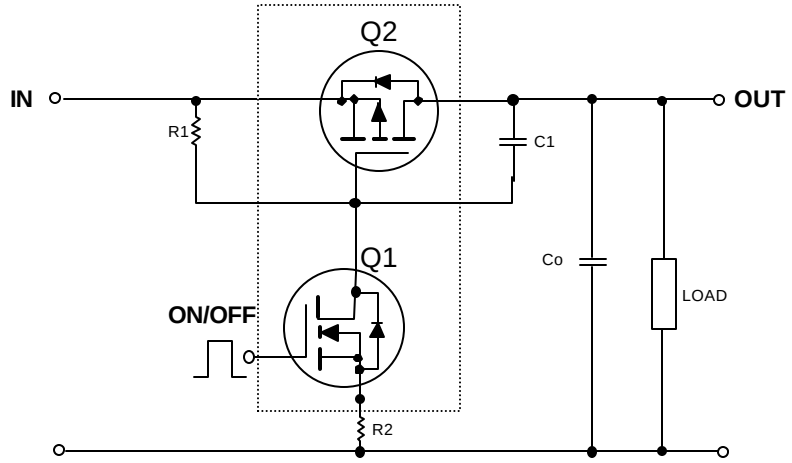
1. Range of V_{in} can be up to 25V, but R_1 and R_2 must be scaled such that V_{GS} of Q2 does not exceed -20V.

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 $R_{\theta CA}$ is determined by the user's board design. Thermal ratings based on minimum mounting pad.

3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle≤ 2.0%

FDG6324L Load Switch Application

APPLICATION CIRCUIT



External Component Recommendation

For Co ≤ 1uF applications:
R1 is required to turn Q2 off.
R2 and C1 are optional for slew rate control.
First select R2, 100 -1KΩ, for slew rate control.
Then select R1 such that the ratio R1/R2 is maintained between 10-100.
SPICE model (FDG6324L.MOD) available at www.onsemi.com.

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

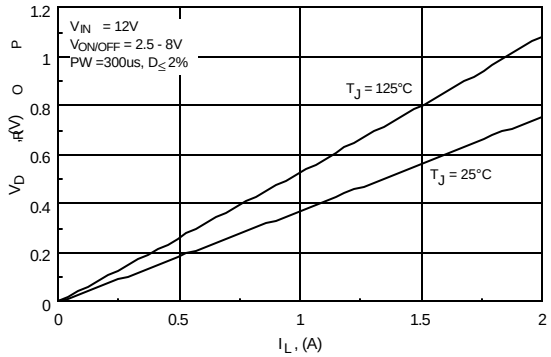


Figure 1. Conduction Voltage Drop Variation with Load Current.

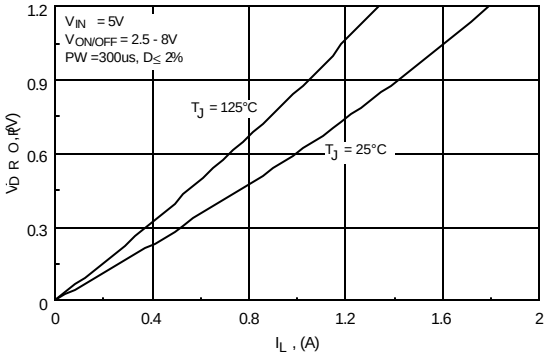


Figure 2. Conduction Voltage Drop Variation with Load Current.

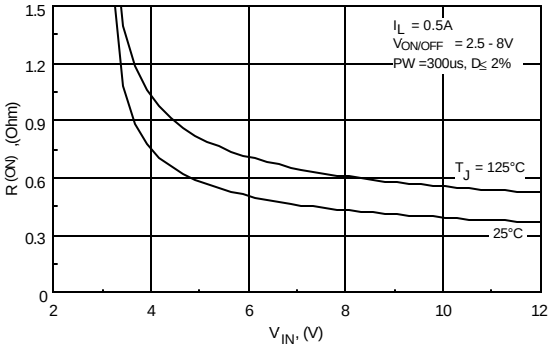


Figure 3. On-Resistance Variation with Input Voltage.

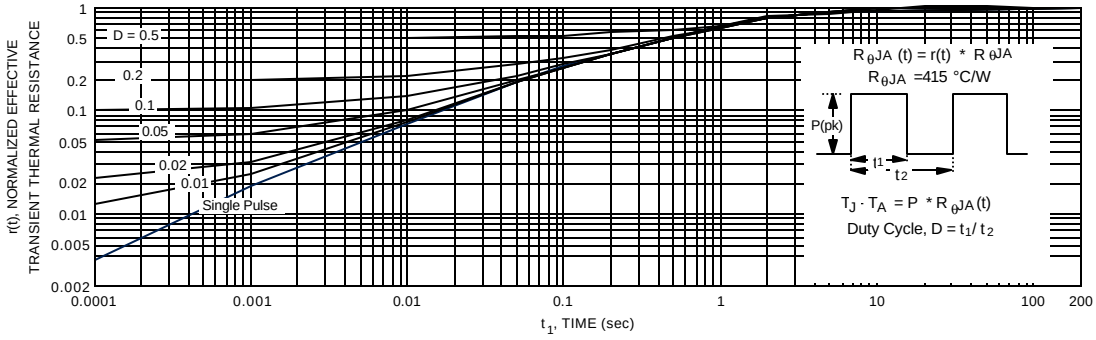


Figure 4. Transient Thermal Response Curve.

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

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