ON Semiconductor®

FDG6323L
Integrated Load Switch

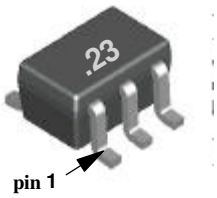
General Description

This device is particularly suited for compact power management in portable electronic equipment where 2.5V to 8V input and 0.6A 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 SC70-6 package.

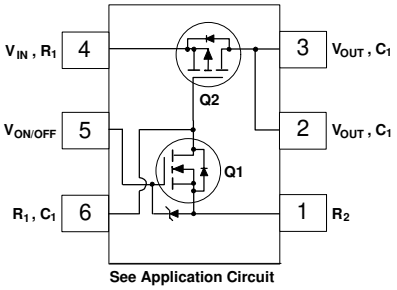
Features

- V_{DROP}=0.2V @ V_{IN}=5V, I_L=0.36A. $R_{(ON)}$ = 0.55Ω
  V_{DROP}=0.2V @ V_{IN}=2.5V, 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.
- Compact industry standard SC70-6 surface mount package.

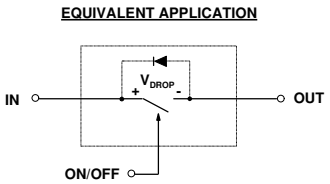
SC70-6	SOT-23	SuperSOT™-6	SuperSOT™-8	SO-8	SOT-223



SC70-6



See Application Circuit



Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter	FDG6323L	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)	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 MIL-STD-883D Human Body Model (100pf/1500Ohm)	6	kV
THERMAL CHARACTERISTICS			
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	415	°C/W

October-2017, Rev. 3

Publication Order Number:
FDG6323L/D

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

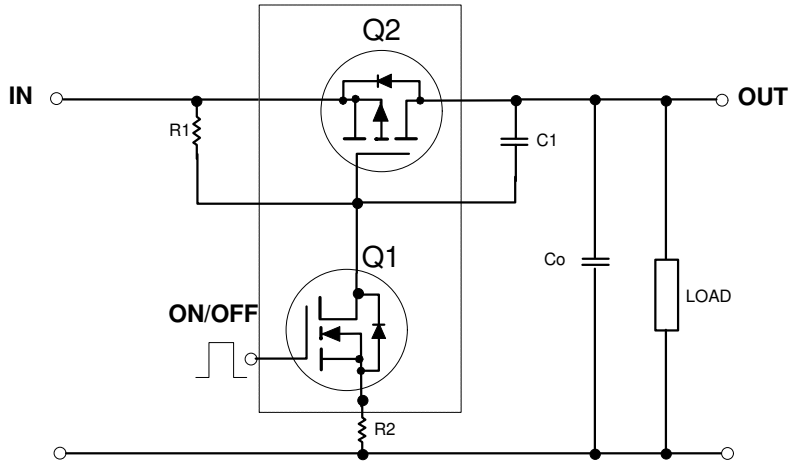
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
I_{FL}	Forward Leakage Current	V_{IN} = 8 V, $V_{ON/OFF}$ = 0 V			1	μA
ON CHARACTERISTICS (Note 3)						
V_{DROP}	Conduction Voltage Drop	V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V, I_L = 0.36 A		0.14	0.2	V
		V_{IN} = 2.5 V, $V_{ON/OFF}$ = 3.3 V, I_L = 0.27 A		0.15	0.2	
$R_{(ON)}$	Q_2 - Static On-Resistance	V_{GS} = -5 V, I_D = -0.6 A		0.41	0.55	Ω
		V_{GS} = -2.5 V, I_D = -0.5 A		0.58	0.75	
I_L	Load Current	V_{DROP} = 0.2 V, V_{IN} = 5 V, $V_{ON/OFF}$ = 3.3 V	0.36			A
		V_{DROP} = 0.2 V, V_{IN} = 2.5 V, $V_{ON/OFF}$ = 3.3 V	0.27			

Notes:

1. Range of V_{in} can be up to 8V, but R_1 and R_2 must be scaled such that V_{GS} of Q2 does not exceed -8V.
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%

FDG6323L Load Switch Application

APPLICATION CIRCUIT



External Component Recommendation

R1 is required to turn Q2 off.
R2 is optional for Slew Rate Control.

For Co ≤ 1uF applications:
First select R2,100 - 1KΩ, for Slew Rate control.
Then select R1 such that R1/R2 ratio maintains between 10 - 100.

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

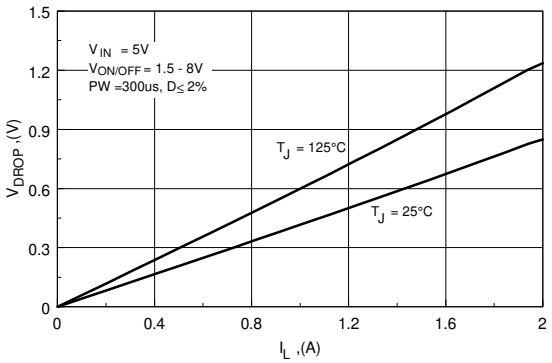


Figure 1. Conduction Voltage Drop Variation with Load Current.

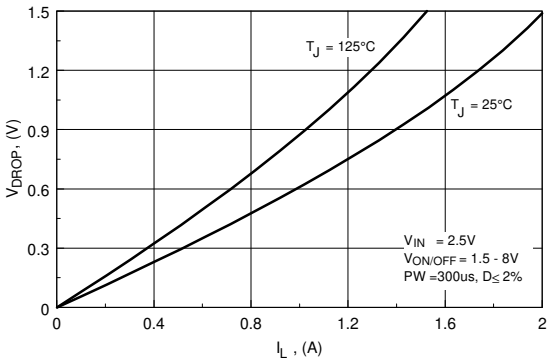


Figure 2. Conduction Voltage Drop Variation with Load Current.

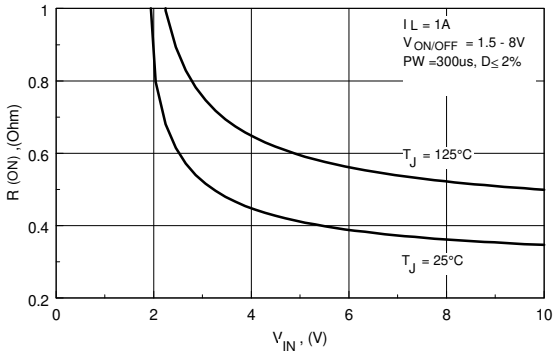


Figure 3. On-Resistance Variation with Input Voltage.

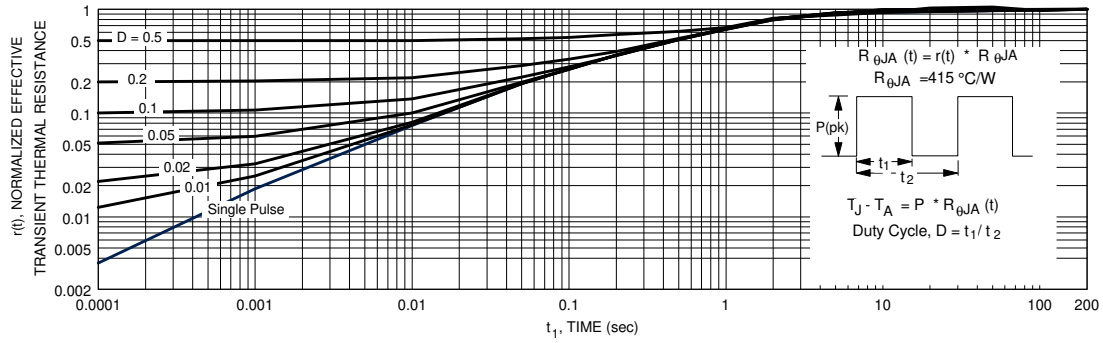


Figure 4. Transient Thermal Response Curve.

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

PUBLICATION ORDERING INFORMATION

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