June 2003

FDC6332L

Common Source Load Switch

P-Channel 1.8V Specified PowerTrench® MOSFET

General Description

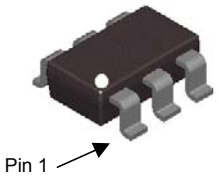
This Load Switch integrates an N-Channel Power MOSFET that drives Common-Source P-Channels and in a small SuperSot™–6 package. It uses Fairchild's advanced low voltage PowerTrench process. The $R_{DS(ON)}$ is 750 mΩ per the switch @ V_{GS} 1.8Vand is optimized for battery power management applications.

Applications

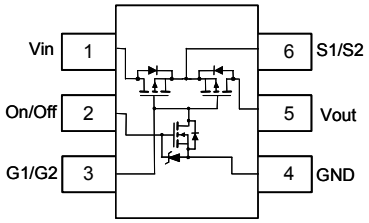
- Battery management/Charger Application
- Accessory load switching

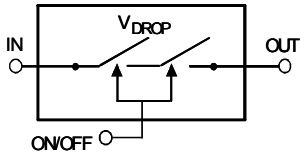
Features

- –1 A, 8 V. $R_{DS(ON)}$ = 350 mΩ @ V_{GS} = –4.5 V
  $R_{DS(ON)}$ = 500 mΩ @ V_{GS} = –2.5 V
  $R_{DS(ON)}$ = 750 mΩ @ V_{GS} = –1.8 V
- N-Channel MOSFET includes Zener protection for ESD ruggedness (>6KV Human body model)
- High performance trench technology for extremely low $R_{DS(ON)}$



SuperSOT™-6





Equivalent Circuit

Absolute Maximum Ratings

T_A=25°C unless otherwise noted

Symbol	Parameter		Ratings	Units
V_{IN}	Input Voltage		±8	V
V_{ON}	Turn-On Voltage		8	V
I_{Load}	Load Current – Continuous	(Note 1)	–1.0	A
	– Pulsed		–2.0	
P_D	Maximum Power Dissipation	(Note 1)	0.7	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range		–55 to +150	°C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	(Note 1)	160	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	(Note 1)	90	

Package Marking and Ordering Information

	Device	Reel Size	Tape width	Quantity
.332	FDC6332L	7''	8mm	3000 units

Electrical Characteristics

T_A = 25°C unless otherwise noted

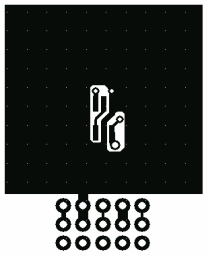
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{IN}	Input – Output Breakdown Voltage	$V_{ON/OFF}$ = 0 V, I_D = –250 μA	–20			V
IR_{IN}	Reverse Input Current	V_{IN} = –8V, $V_{ON/OFF}$ = 0 V			–1	μA
BVG_{OFF}	Driver FET Gate Breakdown Voltage	I_G = 250uA	8			V
I_{GOFF}	Driver FET Gate Leakage Current	V_G = 8 V			100	nA
On Characteristics (Note 2)						
V_{IN}	Input Voltage Range		1.8	2.5	8	V
V_{ON}	Turn-On Voltage Range		1.5		8	V
V_{OFF}	Turn-off Voltage Range		–0.2		0.2	V
I_{LOAD}	Output Load Current	V_{IN} = –5 V V_{ON} = –4.5V	–1			A
$R_{DS(on)}$	Static Drain–Source On–Resistance	V_{GS} = 4.5 V, I_D = –1.0A V_{GS} = 2.5 V, I_D = –0.9 A V_{GS} = 1.8 V, I_D = –0.7 A		230 338 643	350 500 750	mΩ
R_{ON}	Loadswitch On-Resistance	V_{IN} = 8 V, I_D = –1.0 A V_{IN} = 8 V, I_D = –0.9 A V_{IN} = 8 V, I_D = –0.7 A		409 411 420		mΩ

Drain–Source Diode Characteristics and Maximum Ratings

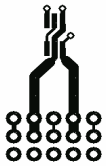
I_S	Maximum Continuous Drain–Source Diode Forward Current				–0.6	A
V_{SD}	Drain–Source Diode Forward Voltage	$V_{ON/OFF}$ = 0 V, I_S = –0.6 A (Note 2		–0.9	–1.2	V

Notes:

1. $R_{\theta JA}$ 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.



a) 90°C/W when mounted on a 1in^2 pad of 2 oz copper

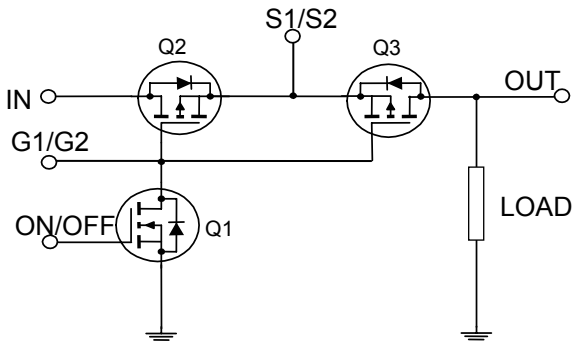


b) 160°C/W when mounted on a minimum pad of 2 oz copper

Scale 1 : 1 on letter size paper

2. Pulse Test: Pulse Width < 300μs, Duty Cycle < 2.0%

FDC6332L Load Switch Application Circuit



Typical Characteristics

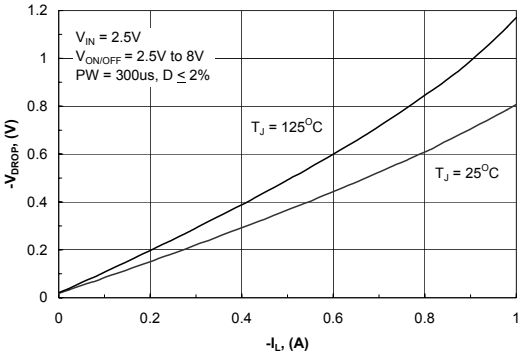


Figure 1. Conduction Voltage Drop Variation with Load Current.

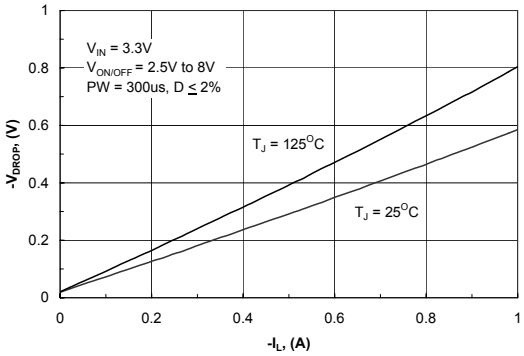


Figure 2. Conduction Voltage Drop Variation with Load Current.

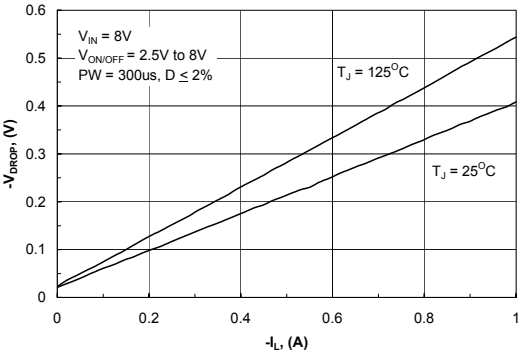


Figure 3. Conduction Voltage Drop Variation with Load Current.

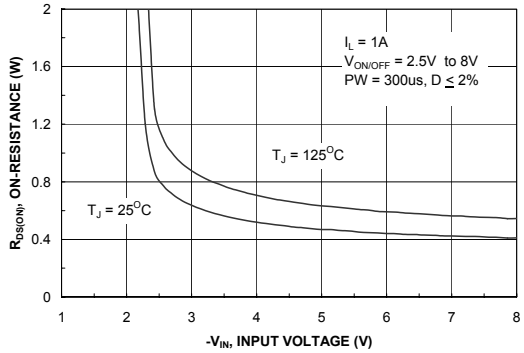


Figure 4. On-Resistance Variation With Input Voltage

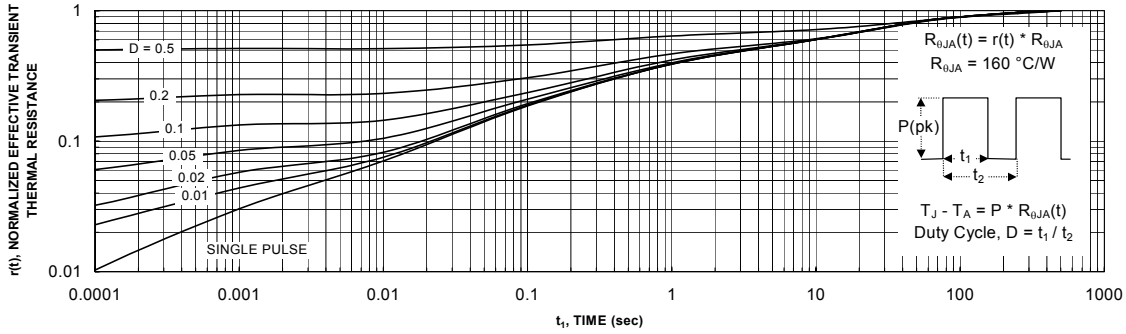


Figure 5. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in Note 1
Transient thermal response will change depending on the circuit board design.

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