Load Switch with Level-Shift

Product Summary

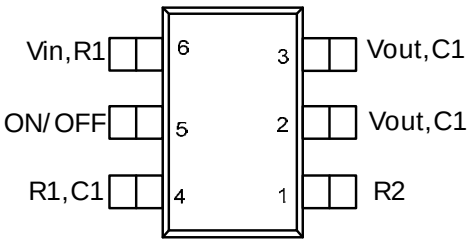
- -2.8A,-8V
- RDS(ON)=45mΩ @ VGS=4.5V(Typ)
- RDS(ON)=50mΩ @ VGS=2.5V(Typ)
- RDS(ON)=80mΩ @ VGS=1.8V(Typ)
- FDC6331L Pin to Pin fully compatible

Application

- Battery Packs
- Battery-Powered Portable Equipment
- Cellular and Cordless Telephones

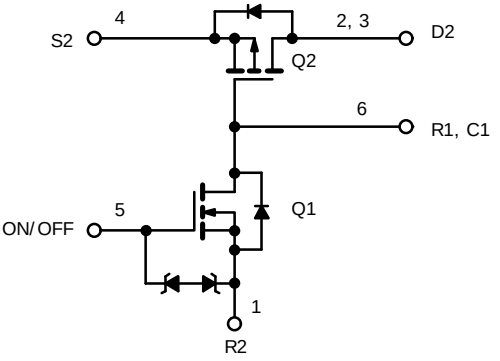
Package and Pin Configuration

SOT23-6



Marking: 331V

Circuit diagram



Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{IN}	Input Voltage	±8	V
$V_{ON/OFF}$	ON/OFF Voltage	-0.5 to 8	
I_L	Continuous Load Current	-2.8	A
	Pulse Load Current	-9	
I_S	Continuous Source Current (Source-Drain Diode)	-1.0	
P_D	Maximum Power Dissipation	0.7	W
T_J, T_{STG}	Junction and Storage Temperature Range	-50 to +150	℃
ESD	ESD Rating, MIL-STD-883D HBM	2000	V
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	250	℃/W

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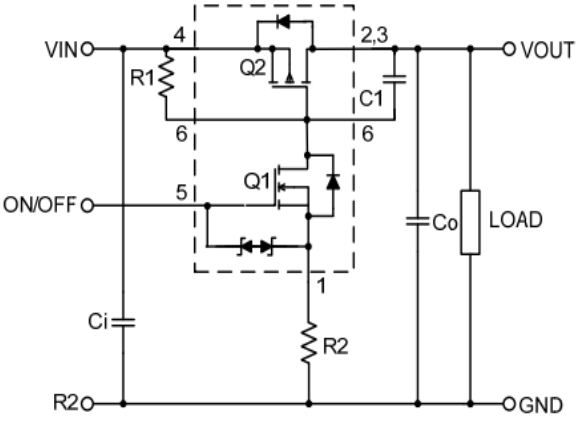
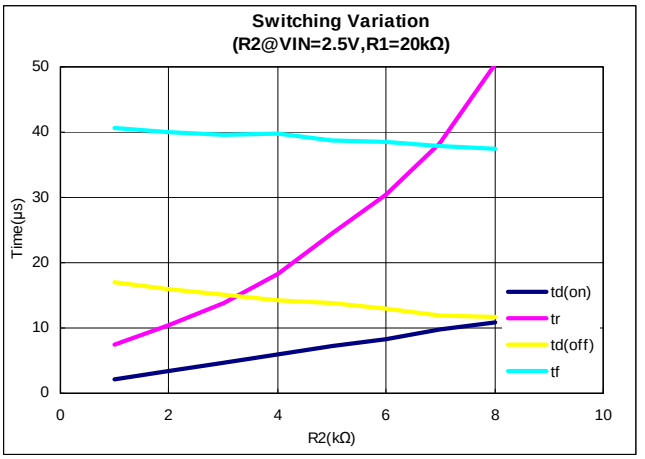
Typical Application Circuit



COMPONENTS		
R1	Pull-Up Resistor	Typical 20kΩ to 1MΩ*
R2	Optional Slew-Rate Control	Typical 0 to 50kΩ
C1	Optional Slew-Rate Control	Typical 1000pF

*Minimum R1 value should be at least 10×R2 to ensure Q1 turn-on.



Note 1: For R2 switching variations with other VIN/R1 combinations, see Typical Characteristics.

Load Switch with Level-Shift

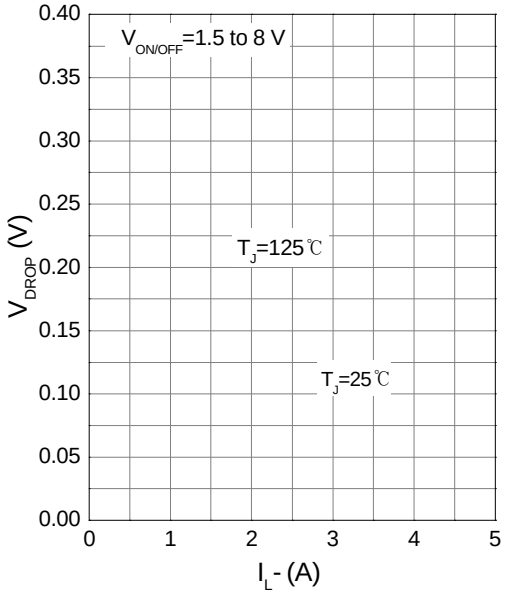
Electrical Characteristics (T_A = 25℃ unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
OFF Characteristics						
I_{FL}	Reverse Leakage Current	V_{IN}=8.0V, $V_{ON/OFF}$=0V			1	μA
V_{SD}	Diode Forward Voltage	I_S =-1A	-0.4	-0.65	-1.5	V
ON Characteristics						
V_{IN}	Input Voltage Range		8.0			V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	$V_{ON/OFF}$=1.8V, V_{IN}=4.5V, I_D=1.0A		0.045	0.055	Ω
		$V_{ON/OFF}$=1.8V,V_{IN}=2.5V, I =1.0A		0.050	0.065	
		$V_{ON/OFF}$=1.8V,V_{IN}=1.8V, I =1.0A		0.080	0.150	
$I_{D(on)}$	On-State (P-Channel) Drain Current	V_{IN-OUT}≤0.2V, V_{IN}=5V, $V_{ON/OFF}$=1.5V	1			A
		V_{IN-OUT}≤0.3V, V_{IN}=3V, $V_{ON/OFF}$=1.8V	1			

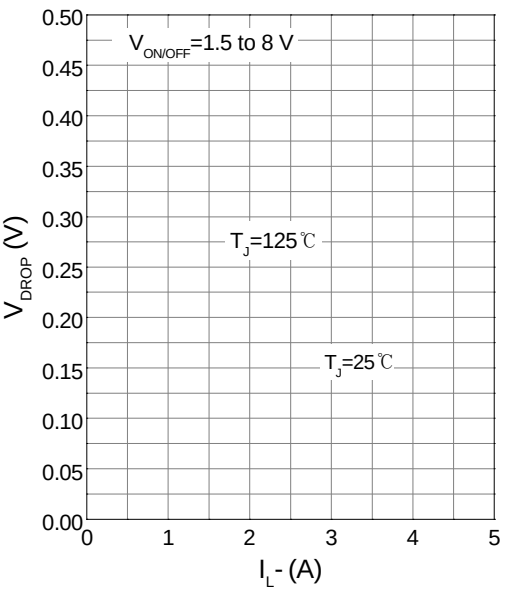
Load Switch with Level-Shift

Typical Operating Characteristics

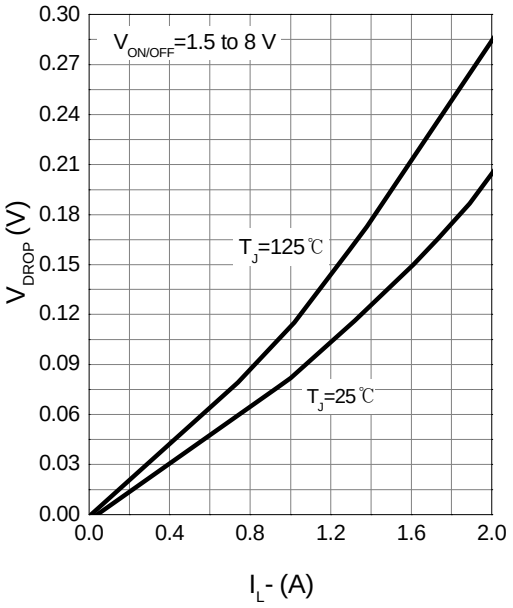
V_{DROP} vs. I_L @ V_{IN} =4.5 V



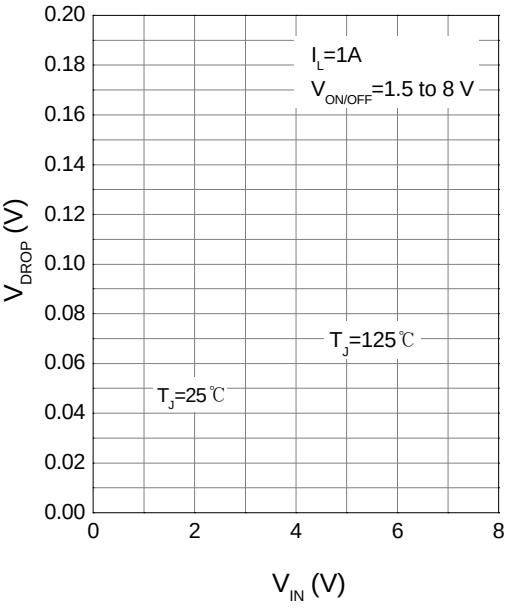
V_{DROP} vs. I_L @ V_{IN} =2.5 V



V_{DROP} vs. I_L @ V_{IN} =1.8 V



V_{DROP} vs. V_{IN} @ I_L =1 A



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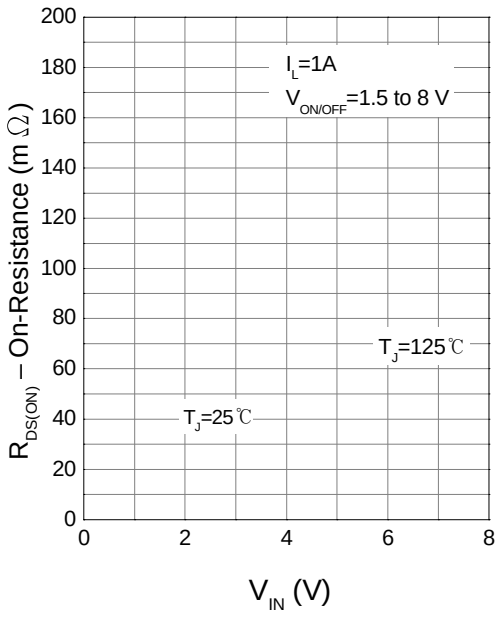
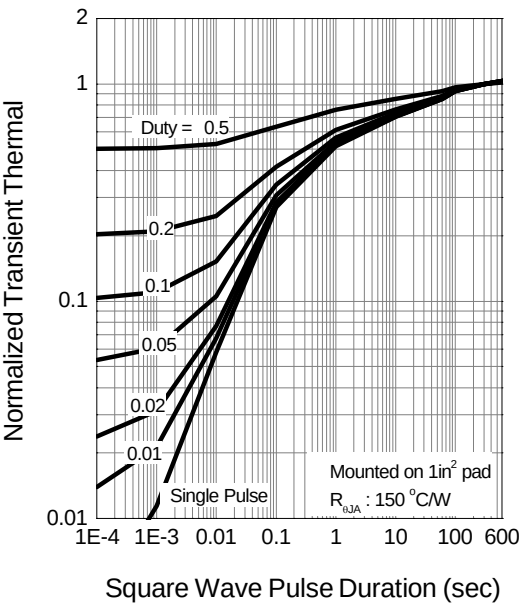
On-Resistance vs. Input Voltage

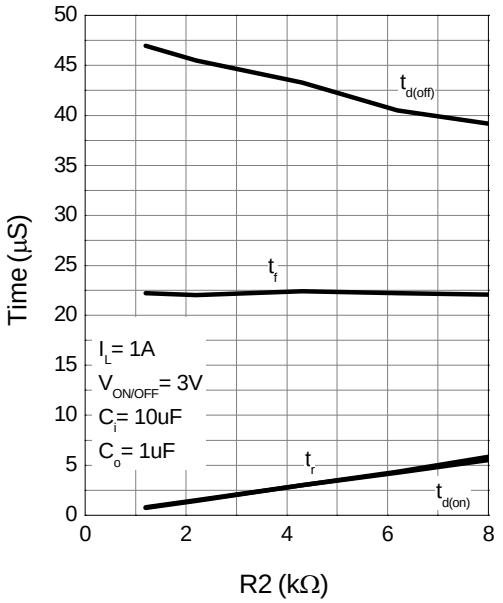


Thermal Transient Impedance



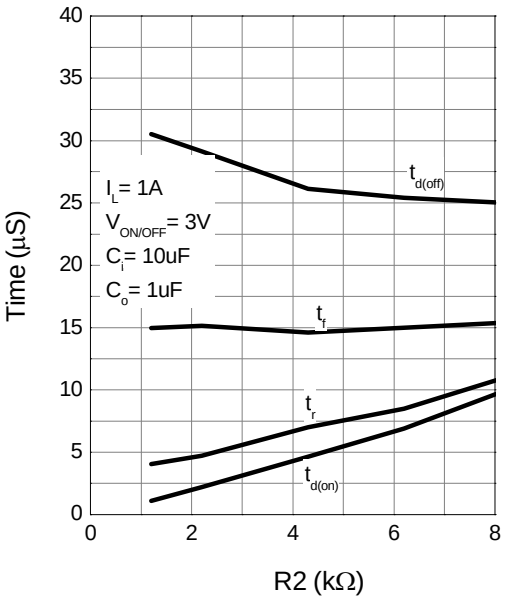
Switching Variation

R2 @ V_{IN}=4.5 V, R1 = 20 kΩ



Switching Variation

R2 @ V_{IN}=2.5 V, R1 = 20 kΩ



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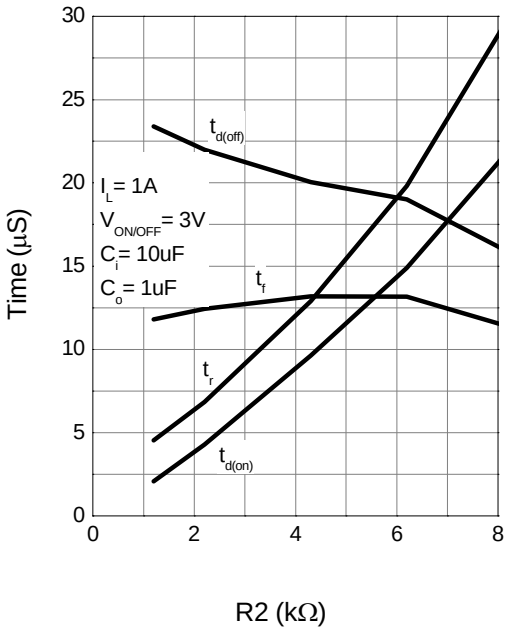
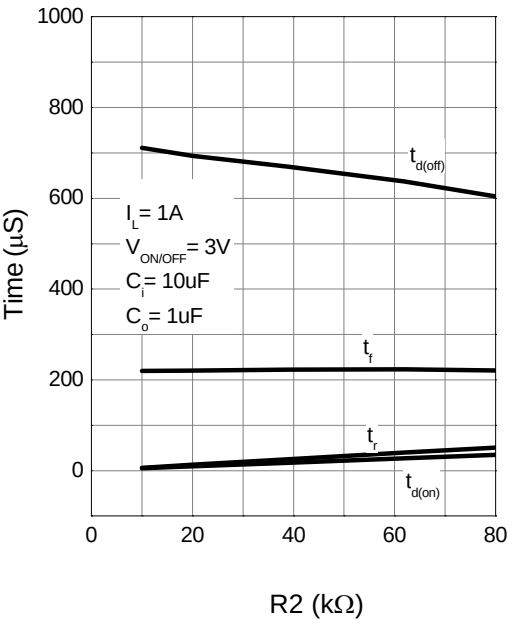
Switching Variation

R2 @ V_{IN} =1.8 V, R1 = 20 kΩ



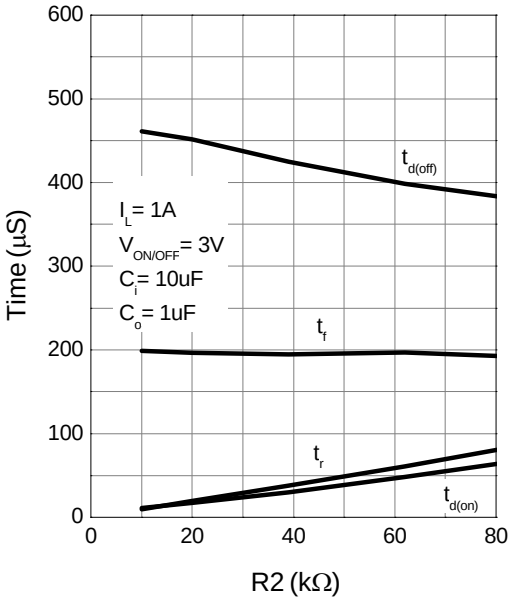
Switching Variation

R2 @ V_{IN} =4.5 V, R1 = 300 kΩ



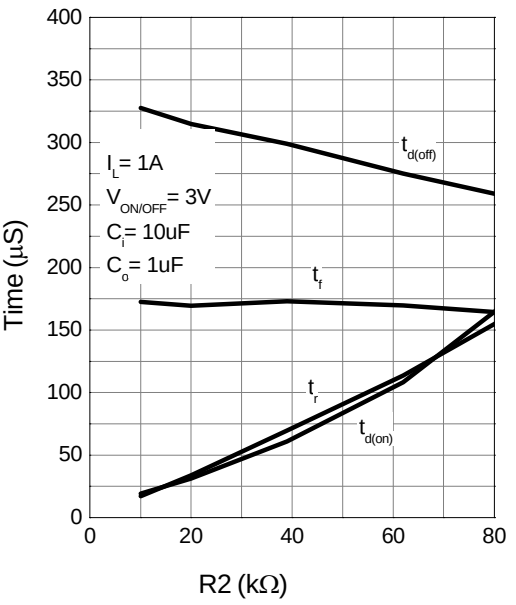
Switching Variation

R2 @ V_{IN} =2.5 V, R1 = 300 kΩ



Switching Variation

R2 @ V_{IN} =1.8 V, R1 = 300 kΩ



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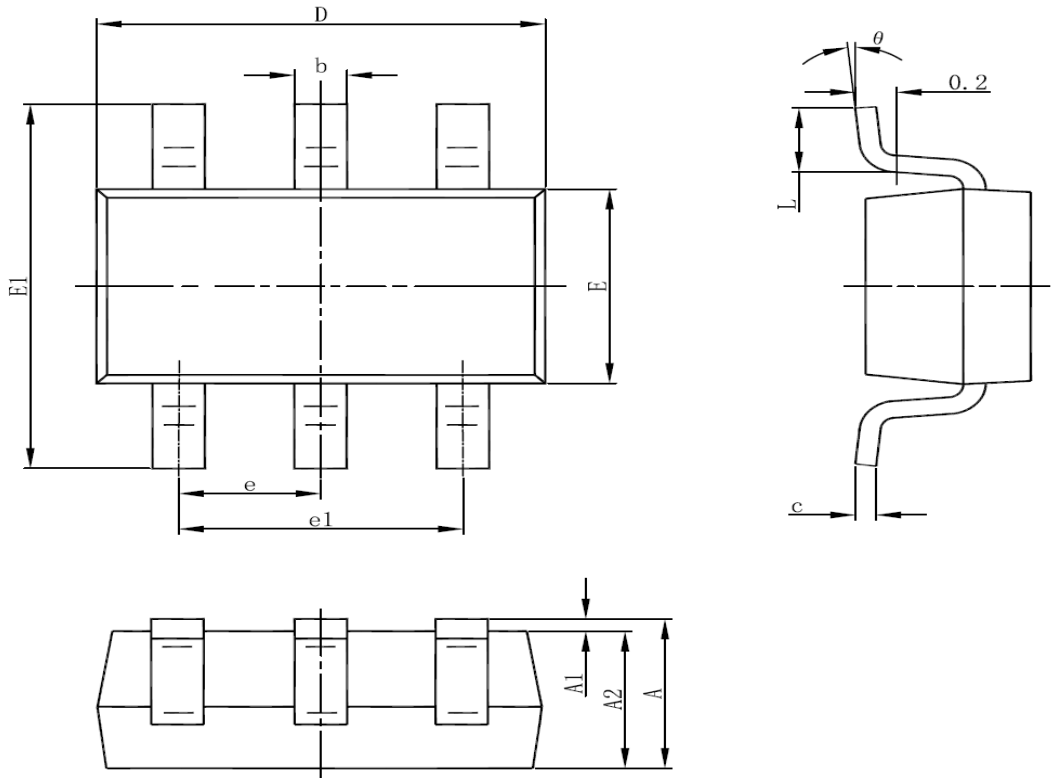
SOT23-6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°