



HIGH SIDE POWER SWITCHES

DESCRIPTION

The UTC **US94060** are high-side load switches incorporating a low on-resistance P-channel MOSFET which provides customers over 2A continuous current.

The UTC **US94060** is characterized by a fast turn on function. The UTC **US94060** keeps in a floating state when an active pull-down signals is on the enable input until a high level signal applies on the EN pin. Built-in level shift circuitry allows low voltage logic signals to switch to higher supply voltages, on the contrary, high level logic signals can control low level voltages.

The UTC **US94060**'s operating voltage varies from 1.8V ~ 5.5V which makes these devices suitable for 1-cell Lithium ion and 2- to 3-cell NiMH/NiCad/Alkaline powered systems as well as all 5V applications. The 2μA low operating current and low shutdown current(less than 1μA) make the battery life longer.

The UTC **US94060** is generally suitable for applications, such as load switch in portable devices: cellular phones, PDAs, MP3 players, digital Cameras, portable instrumentation, battery switch-over circuits and level translators.

FEATURES

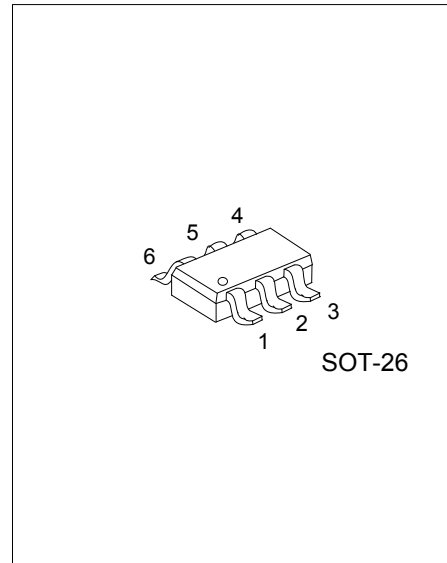
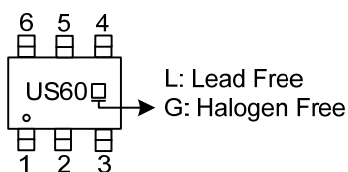
- * Operating voltage range: 1.8V ~ 5.5V
- * Providing 2A continuous operating current
- * P-channel MOSFET's $R_{DS(ON)}$: 90mΩ typical
- * Built-in level shift for control logic
- * Quiescent current is as low as 2μA
- * Micro-power shutdown less than 1μA

ORDERING INFORMATION

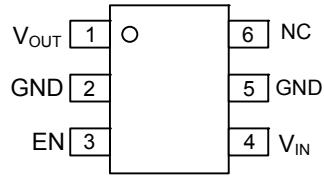
Ordering Number		Package	Packing
Lead Free	Halogen Free		
US94060L-AG6-R	US94060G-AG6-R	SOT-26	Tape Reel

<p>US94060G-AG6-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	---

MARKING



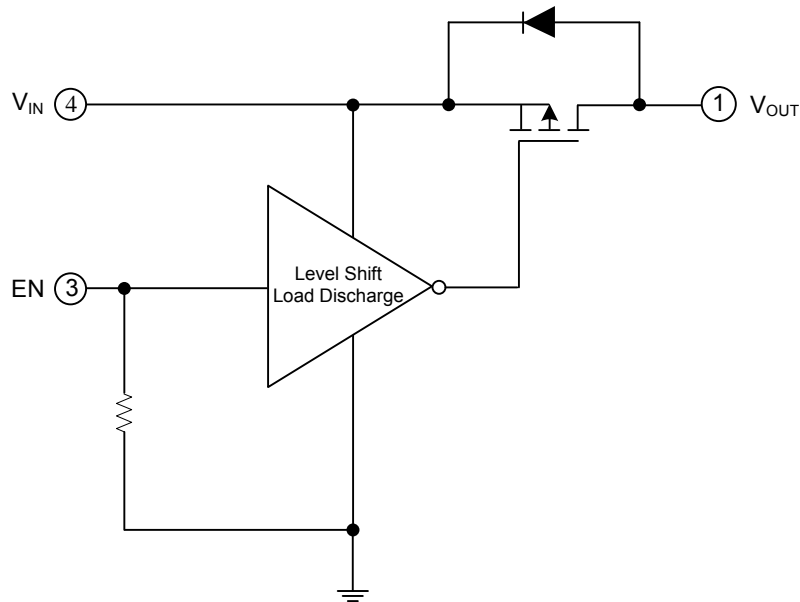
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{OUT}	Drain of P-channel MOSFET.
2, 5	GND	Ground connections. (Should both be connection to electrical ground).
3	EN	Enable (Input): Active-high CMOS compatible control input. Do not leave floating..
4	V _{IN}	Source of P-channel MOSFET.
6	NC	No connect

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+6	V
Enable Voltage	V_{EN}	+6	V
Continuous Drain Current (Note 3)	I_D	$T_A = 25^\circ\text{C}$	± 2
		$T_A = 85^\circ\text{C}$	± 1.4
Pulsed Drain Current (Note 5)	I_{DP}	± 6	A
Continuous Diode Current (Note 7)	I_S	-50	mA
Power Dissipation (Note 3)($T_A = 85^\circ\text{C}$)	P_D	270	mW
Operating Ratings (Note 2)			
Input Voltage Range	V_{IN}	+1.8 ~ +5.5	V
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature (Note 4)	T_{STG}	-55~+150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

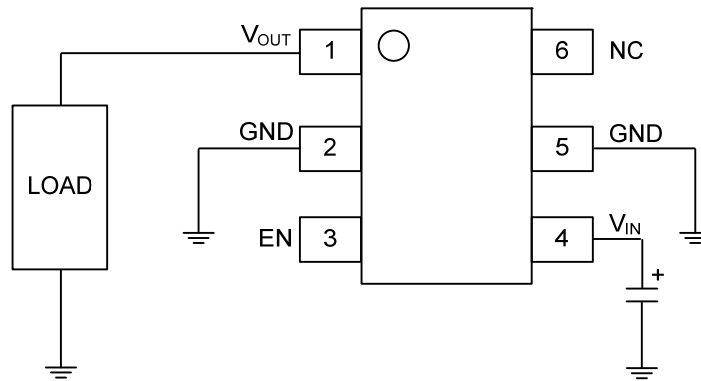
■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	θ_{JA}	240	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

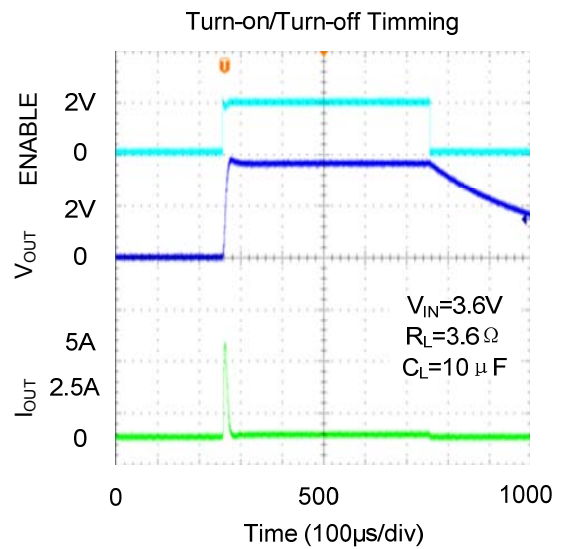
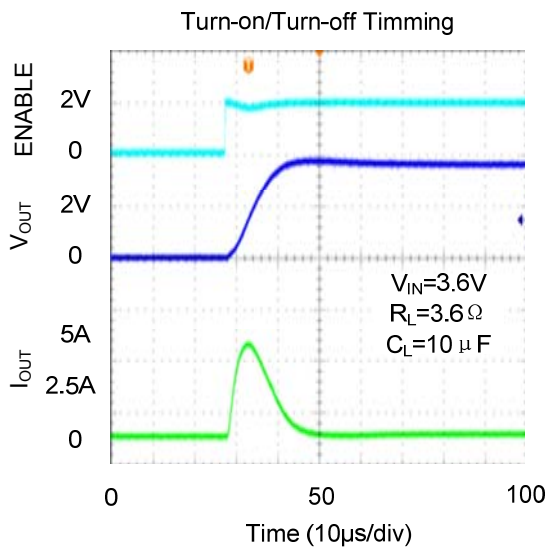
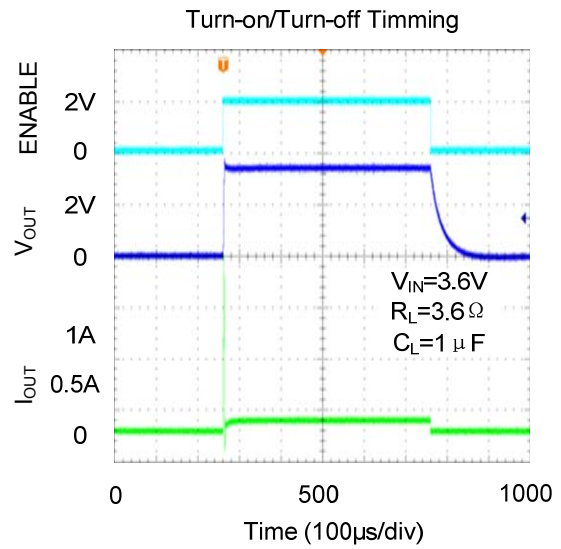
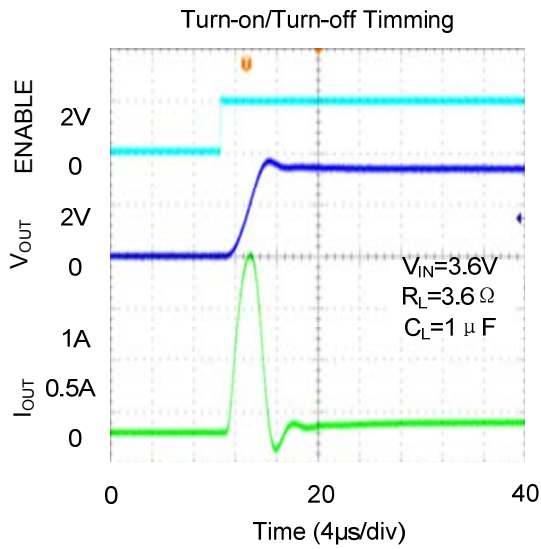
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC						
EN Threshold Voltage	$V_{THD(EN)}$	$V_{IN} = 1.8\text{V} \sim 4.5\text{V}, I_D = -250\mu\text{A}$	0.5		1.2	V
EN Input Current (Quiescent Current)	$I_{Q(EN)}$	$V_{IN} = V_{EN} = 5.5\text{V}$		2	4	μA
OFF State Leakage Current	I_{LEAK}	$V_{EN} = \text{OPEN or } 0\text{V}, V_{IN} = +5.5\text{V}$			1	μA
P-Channel Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{IN} = 4.5\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		90	125	m Ω
		$V_{IN} = 3.6\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		95	135	
		$V_{IN} = 2.5\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		115	150	
		$V_{IN} = 1.8\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		165	200	
DYNAMIC (NOTE 6)						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{IN} = 3.6\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		850	1500	ns
Turn-ON Rise Time	t_R	$V_{IN} = 3.6\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$	0.5	1	5	μs
Turn-OFF Delay Time	$t_{D(OFF)}$	$V_{IN} = 3.6\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		100	150	ns
Turn-OFF Fall Time	t_F	$V_{IN} = 3.6\text{V}, I_D = -100\text{mA}, V_{EN} = 1.5\text{V}$		60	100	ns

■ TYPICAL APPLICATION CIRCUIT



Load Switch Application with Capacitive Load Discharge

■ TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.