



### 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 than1µA) 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.

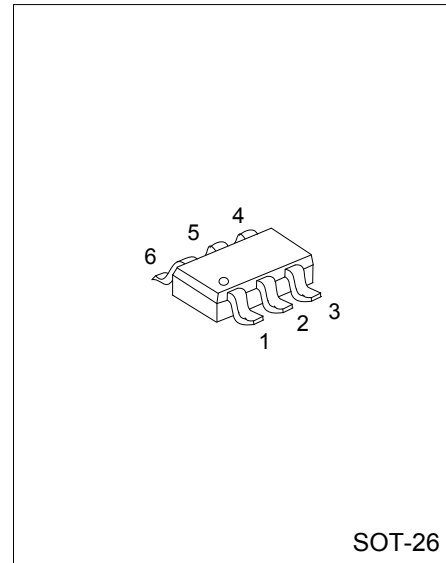
#### FEATURES

- \* Operating voltage range:1.8V ~ 5.5V
- \* Providing 2A continuous operating current
- \* P-channel MOSFET's R<sub>ON</sub> : 175mΩ typical
- \* Built-in level shift for control logic
- \* Quiescent current is as low as 2µA
- \* Micro-power shutdown less than 1µA

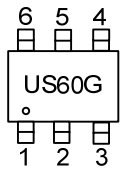
#### ORDERING INFORMATION

Ordering Number	Package	Packing
US94060G-AG6-R	SOT-26	Tape Reel

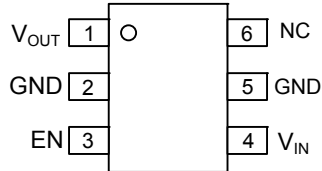
	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AG6: SOT-26
	(3)Halogen Free	(3) G: Halogen Free



■ MARKING



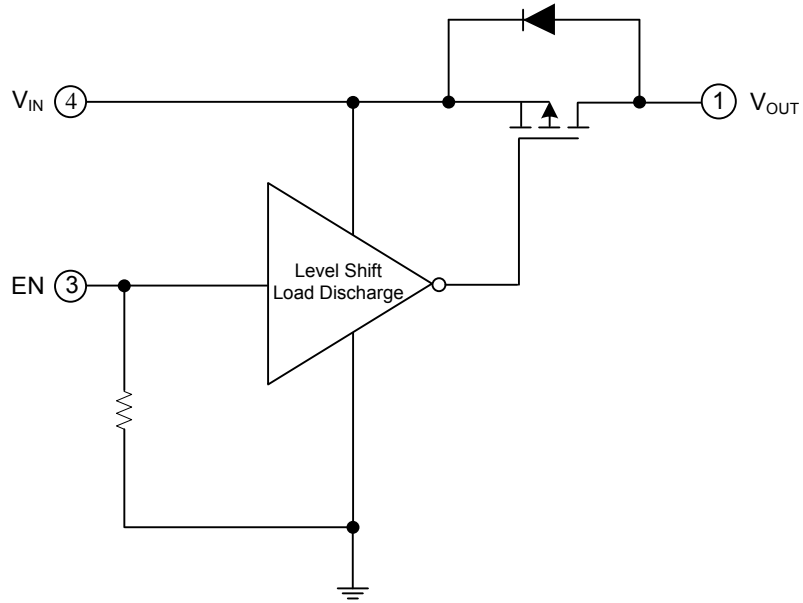
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V <sub>OUT</sub>	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 <sub>IN</sub>	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)	$I_D$	$T_A = 25^\circ\text{C}$	$\pm 2$
		$T_A = 85^\circ\text{C}$	$\pm 1.4$
Pulsed Drain Current (Note 5)	$I_{DP}$	$\pm 6$	A
Continuous Diode Current (Note 7)	$I_S$	-50	mA
Power Dissipation (Note 3)( $T_A = 85^\circ\text{C}$ )	$P_D$	270	mW
<b>Operating Ratings (Note 2)</b>			
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.

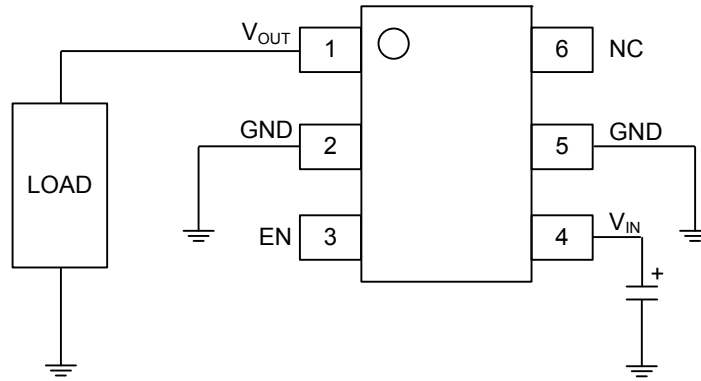
### ■ THERMAL DATA

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

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

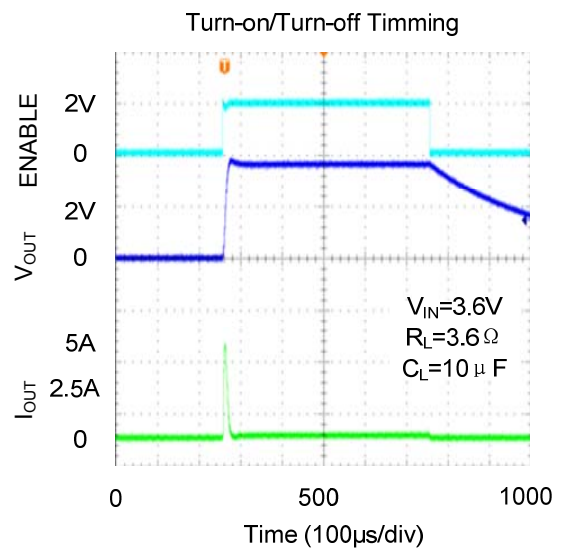
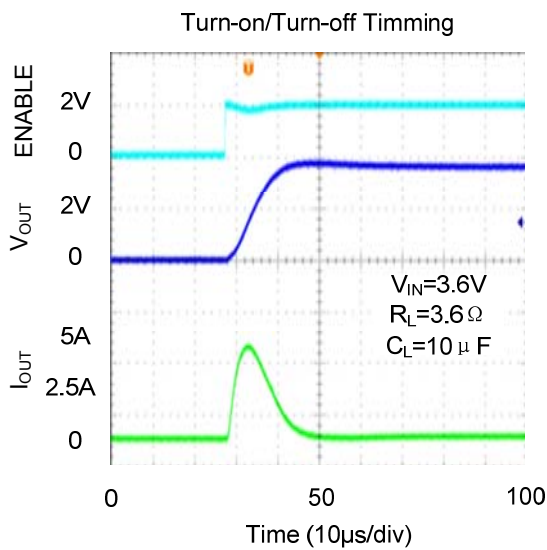
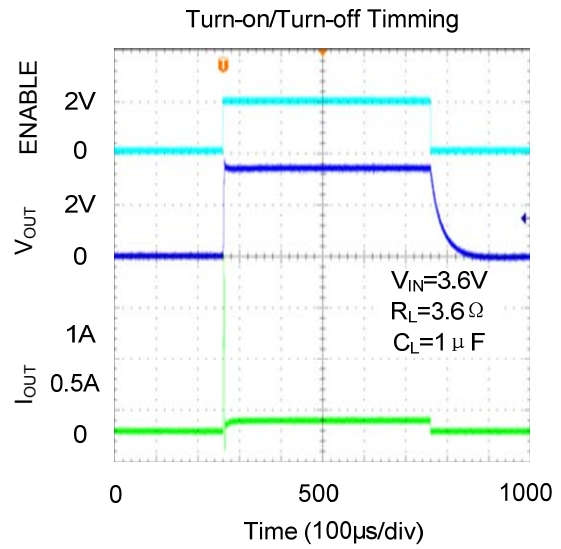
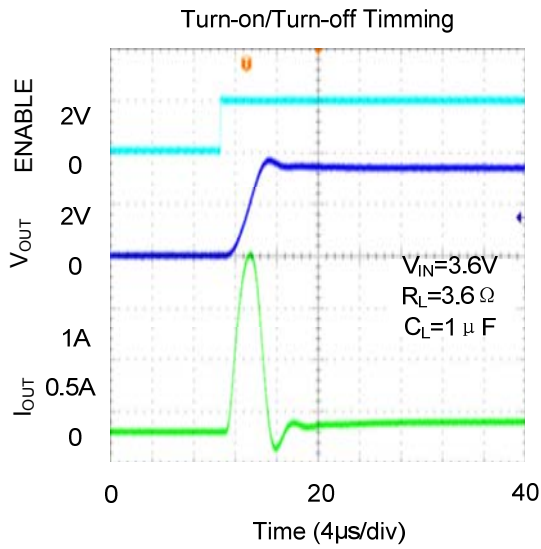
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>Static</b>						
EN Threshold Voltage	$V_{THD(EN)}$	$V_{IN} = 1.8\text{V} \sim 4.5\text{V}$ , $I_D = -250\mu\text{A}$	0.5		1.2	V
EN Input Current (Quiescent Current)	$I_{Q(EN)}$	$V_{IN} = V_{EN} = 5.5\text{V}$		2	4	$\mu\text{A}$
OFF State Leakage Current	$I_{LEAK}$	$V_{EN} = \text{OPEN or } 0\text{V}$ , $V_{IN} = +5.5\text{V}$			1	$\mu\text{A}$
P-Channel Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{IN} = 4.5\text{V}$ , $I_D = -100\text{mA}$ , $V_{EN} = 1.5\text{V}$		175	200	m $\Omega$
		$V_{IN} = 3.6\text{V}$ , $I_D = -100\text{mA}$ , $V_{EN} = 1.5\text{V}$		185	215	
		$V_{IN} = 2.5\text{V}$ , $I_D = -100\text{mA}$ , $V_{EN} = 1.5\text{V}$		205	245	
		$V_{IN} = 1.8\text{V}$ , $I_D = -100\text{mA}$ , $V_{EN} = 1.5\text{V}$		270	325	
<b>Dynamic (Note 6)</b>						
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	$\mu\text{s}$
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



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