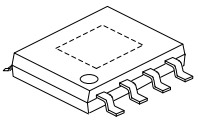
UD40351 **Preliminary** ***LINEAR INTEGRATED CIRCUIT***

40V, 4A, 200KHZ ASYNCHRONOUS STEP-DOWN CONVERTER



HSOP-8

■ DESCRIPTION

The UTC **UD40351** is a monolithic step-down switch mode converter with a built-in high-side power MOSFET. It achieves 4A continuous output current over a wide input supply range with excellent load and line regulation. Current mode operation provides fast transient response and eases loop stabilization. The converter can be configured as single output or dual outputs with independent over current protection (OCP). Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown.

The UTC **UD40351** provides a very compact system solution and good thermal conductance.

■ FEATURES

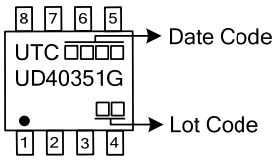
* Wide Input Voltage from 7.5V to 40V
* Up to 4A Output Current
* High Efficiency Up to 93%
* Dual Outputs with Independent Over Current Protection (OCP)
* 7.5% Accurate OCP
* Internal Soft-Start
* Auto Recovery into Full Load after Faults
* Output Cord Voltage Drop Compensation
* Programmable Over Current Setting
* Over-Temperature Protection

■ ORDERING INFORMATION

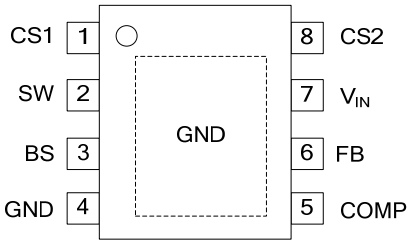
Ordering Number	Package	Packing
UD40351G-SH2-R	HSOP-8	Tape Reel

UD40351G-SH2-R (1)Packing Type (2)Package Type (3)Green Package	 (1) R: Tape Reel (2) SH2: HSOP-8 (3) G: Halogen Free and Lead Free

■ MARKING



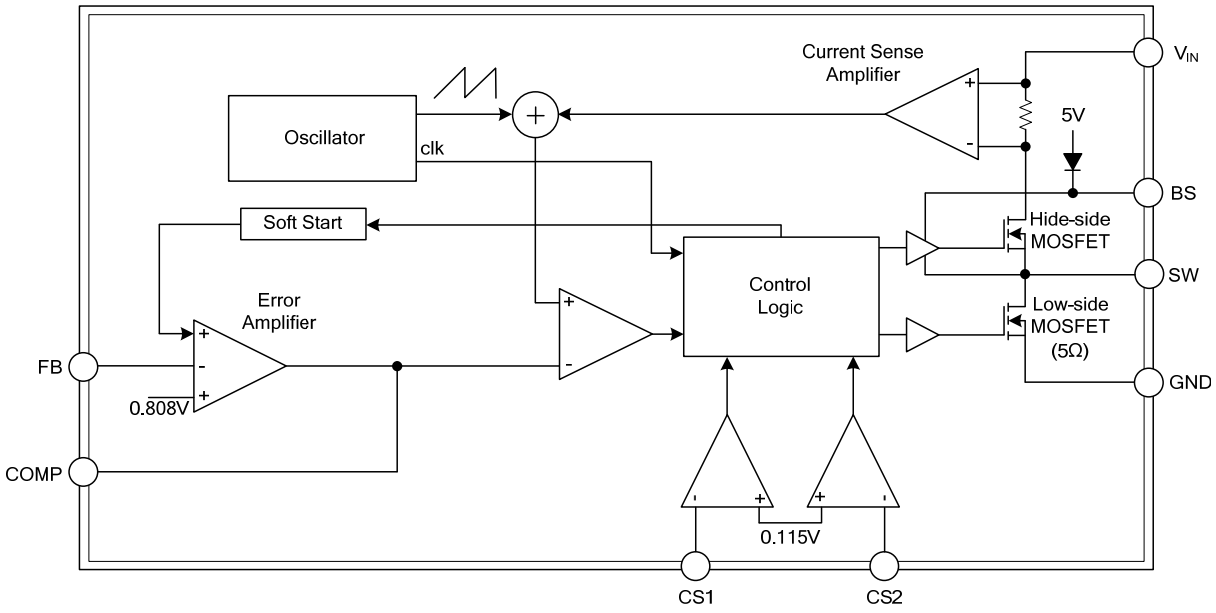
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	CS1	The output current of V_{OUT1} is sensed by this pin. When the voltage on this pin reaches 116mV for 750μs, the IC shuts down for 2.5 seconds before initiating a re-startup.
2	SW	Power Switching Output. It is the output pin that internal high side NMOS switching to supply power.
3	BS	High Side Gate Drive Boost Input. A 22nF or greater capacitor must be connected from this pin to SW. It can boost the gate drive to fully turn on the internal high side NMOS.
4	GND	Ground Pin.
5	COMP	Compensation Pin. This pin is used to compensate the regulation control loop. Connect a series RC network from COMP pin to GND.
6	FB	Voltage Feedback Input Pin. Connecting FB and V_{OUT} with a resistive voltage divider. This IC senses feedback voltage via FB and regulate it at 0.808V.
7	V_{IN}	Power Supply Input Pin. Drive 7.5V to 40V voltage to this pin to power on this chip. Connecting a 10μF ceramic bypass capacitor between V_{IN} and GND to eliminate noise.
8	CS2	The output current of V_{OUT2} is sensed by this pin. When the voltage on this pin reaches 116mV for 750μs, the IC shuts down for 2.5 seconds before initiating a re-startup.
9	GND	Exposed Pad. Connecting to Pin 4.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{IN}	-0.3 ~ 42	V
SW Voltage	V_{SW}	-0.3 ~ 42	V
Boost Voltage	V_{BS}	-0.3 ~ (V_{SW}+6)	V
All Other Pins Voltage		-0.3 ~ 6	V
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°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.

■ RECOMMENDED OPERATING CONDITIONS (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{IN}	7.5 ~ 40	V
Ambient Temperature	T_A	-40 ~ +85	°C

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction To Ambient	θ_{JA}	105	°C/W
Junction to Case	θ_{JC}	50	°C/W

■ ELECTRICAL CHARACTERISTICS (V_{IN}=12V, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN} Input Supply Voltage			7.5		40	V
Quiescent Current (Non-Switching)	I_Q	V_{FB}=1V		1	1.5	mA
Standby Supply Current (No Loading)				4		mA
Feedback Voltage	V_{FB}	7.5V≤V_{IN}≤40V	798	808	818	mV
High-Side MOSFET-On Resistance (Note 3)	$R_{DS(ON)1}$	At 25°C		38		mΩ
Low-Side MOSFET-On Resistance (Note 3)	$R_{DS(ON)2}$			5		Ω
High-Side MOSFET Leakage Current		V_{EN}=0V, V_{SW}=0V			10	μA
High-Side MOSFET Current Limit (Note 3)		Duty=65%		6.5		A
COMP to Current Sense Transconductance	G_{CS}			4.6		A/V
Error Amplifier Transconductance	G_{EA}	ΔI_{COMP}=±10μA		650		μA/V
Error Amplifier Voltage Gain	A_{EA}			4000		V/V
Maximum Duty Cycle	DMAX	V_{FB}=0.7V		80		%
Minimum On Time	T_{ON}			250		ns
Oscillation Frequency	F_{OSC}		140	200	260	KHz
Input UVLO Threshold		V_{IN} Rising		7	7.25	V
Under Voltage Lockout Threshold Hysteresis				650		mV
Over Voltage Protection Threshold	V_{OVP}			41		V
Soft-Start Period				3		ms
CS1 Reference Voltage	V_{CS1}		113	116	119	mV
CS2 Reference Voltage	V_{CS2}		113	116	119	mV
Cord Compensation		V_{IN}=12V, R_1=200K, I_{OUT}=3.5A		0.245		V
Thermal Shutdown Threshold (Note 3)				150		°C

Notes: 1. Stresses exceed those ratings may damage the device.
2. If out of its operation conditions, the device is not guaranteed to function.
3. Guaranteed by design.

■ TYPICAL APPLICATION CIRCUIT