



UC3666

CMOS IC

DUAL CHANNEL 1A HIGH EFFICIENCY STEP-DOWN DC/DC CONVERTER

DESCRIPTION

The UTC **UC3666** is a dual channel high efficiency step-down DC/DC converter with constant frequency and current mode. A main switch and a synchronous rectifier for high efficiency are contained in each converter, and thus an external Schottky diode is saved. The output voltage can be adjusted to as low as 0.6V. With input voltage range from 2.5V ~ 5.5V , each converter can deliver 1A current to the load. Due to the internally fixed 1.6MHz switching frequency, small surface mount inductors and capacitors can be used.

The UTC **UC3666** is generally used in digital still cameras, portable instruments, slim-type DVD, microprocessors and DSP core supplies, wireless and DSL card, PDAs, smart phones, cellular telephones and so on.

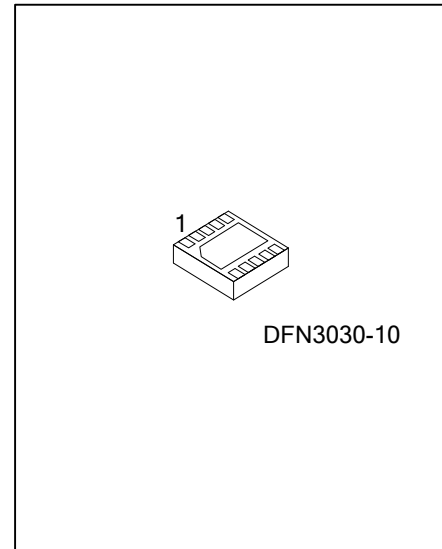
FEATURES

- * high efficiency
- * Current mode operation
- * Input voltage varying from 2.5V to 5.5V
- * Output current on each channel: 1A
- * Fixed frequency operation
- * 0.6V reference allows low output voltages
- * Over-temperature protection circuit
- * RoHS Compliant (100% green available)

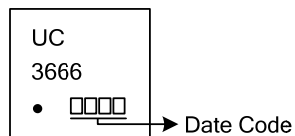
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UC3666L-K10-3030-R	UC3666G-K10-3030-R	DFN3030-10	Tape Reel

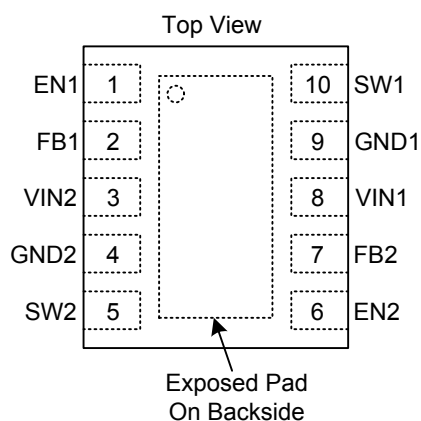
<p>UC3666G-K10-3030-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) K10-3030: DFN3030-10</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



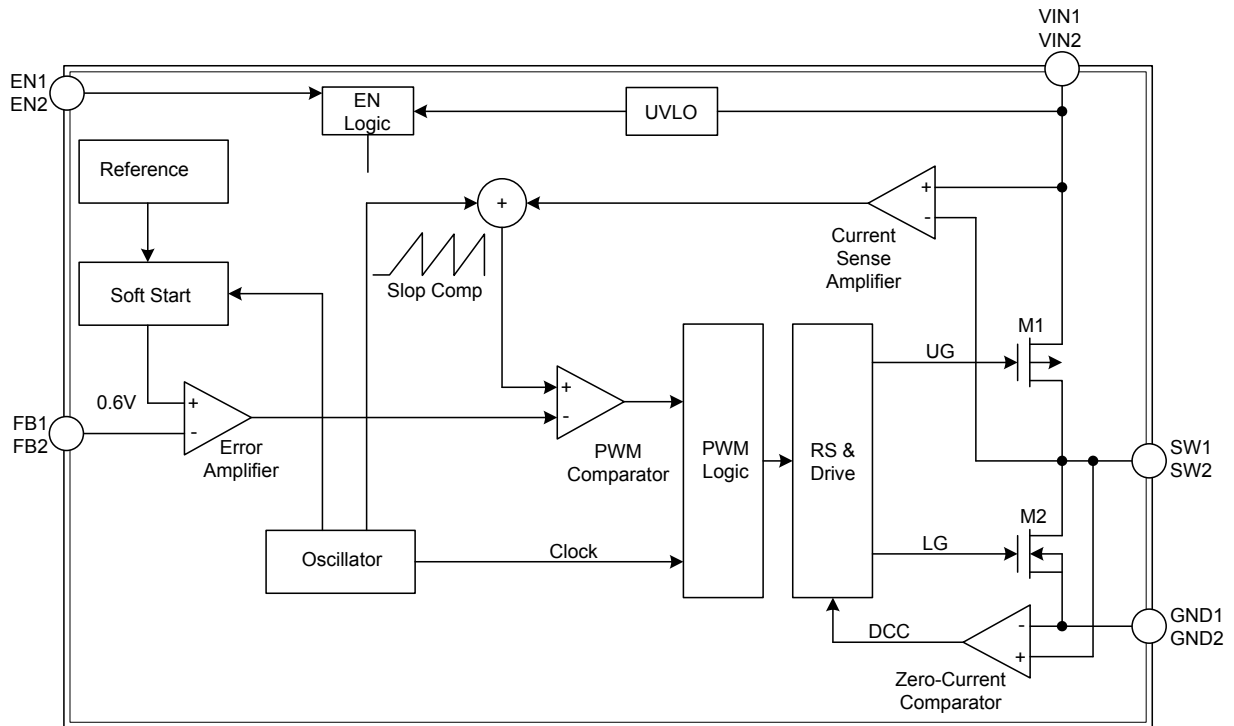
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	EN1	Channel 1 Regulator Enable Control Input Pin. Drive EN1 above 1.5V to turn on channel1. Drive EN1 below 0.3V to turn it off (shutdown current < 0.1uA).
2	FB1	Channel 1 Voltage Feedback Pin
3	VIN2	Channel 2 Supply Pin
4	GND2	Channel 2 Ground Pin
5	SW2	Channel 2 Power Switch Output
6	EN2	Channel 2 Regulator Enable Control Input Pin. Drive EN2 above 1.5V to turn on channel2. Drive EN2 below 0.3V to turn it off (shutdown current < 0.1uA).
7	FB2	Channel 2 Voltage Feedback Pin
8	VIN1	Channel 1 Supply Pin
9	GND1	Channel 1 Ground Pin
10	SW1	Channel 1 Power Switch Output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{IN}	GND-0.3 ~ +6.5	V
SW Voltage		-0.3 ~ $V_{IN} + 0.3$	V
ENB, V_{FB} Voltage		-0.3 ~ V_{IN}	V
SW Peak Current		1.5	A
Junction Temperature	T_J	125	°C
Operating Temperature	T_{OPR}	-20 ~ +85	°C
Storage Temperature Range	T_{STG}	-65 ~ +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.

The IC has a protection circuit against static electricity. Do not apply high static electricity or high voltage that exceeds the performance of the protection circuit to the IC.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction ambient	θ_{JA}	72	°C/W

Note: The PCB area is 4 times larger than that of IC's

■ ELECTRICAL CHARACTERISTICS

(Recommended Operating Conditions, unless otherwise specified; $V_{IN}=3.6V$, $T_A=0 \sim 70^\circ C$ (typical= $25^\circ C$))

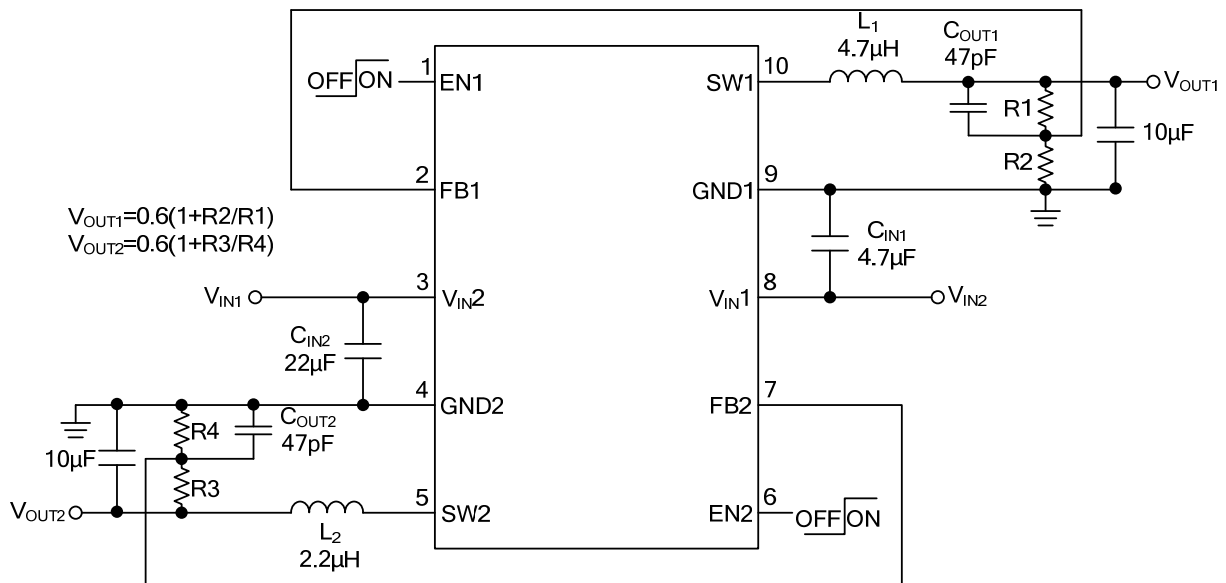
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{IN}		2.5		5.5	V
Feedback Current	I_{VFB}		-30	0.5	30	nA
Regulated Feedback Voltage	V_{FB}	$T_A=25^\circ C$	0.588	0.6	0.612	V
		$-40^\circ C \leq T_A \leq 85^\circ C$	0.582	0.6	0.618	V
Reference Voltage Line Regulation	ΔV_{FB}	$V_{IN}=2.5V \sim 5.5V$		0.04	0.4	%V
Output Voltage Line Regulation	ΔV_{OUT}	$V_{IN}=2.5V \sim 5.5V$		0.04	0.4	%V
Output Voltage Load Regulation	$V_{LOADRGE}$			0.5		%
Shutdown Current	I_S	$V_{EN}=0V$, $V_{IN}=5.5V$		0.01	1	μA
SW Leakage Current	I_{LEAK}	$V_{EN}=0V$, $V_{IN}=5.5V$, $V_{SW}=0V$ or $5.5V$	-1		1	μA
PMOSFET On Resistance	R_{DSONP}	$I_{SW}=100mA$		0.35		Ω
NMOSFET On Resistance	R_{DSONN}	$I_{SW}=100mA$		0.24		Ω
PMOSFET Current Limit	I_{PCL}	Duty Cycle=100% Current Pulse Width<1ms	0.9	1.2	1.4	A
Oscillator Frequency	f_{OSC}		1.2	1.6	2.0	MHz
Thermal Shutdown Threshold	T_S			145		°C
EN High Level Input Voltage	V_{EN}	$-40^\circ C \leq T_A \leq +85^\circ C$	0.9			V
EN Low Level Input Voltage	V_{EN}	$-40^\circ C \leq T_A \leq +85^\circ C$			0.3	V
EN Input Current	I_{EN}	$V_{EN}=0V \sim V_{IN}$	-1		1	μA

■ TYPICAL APPLICATION CIRCUIT

Adjustable Output Voltage

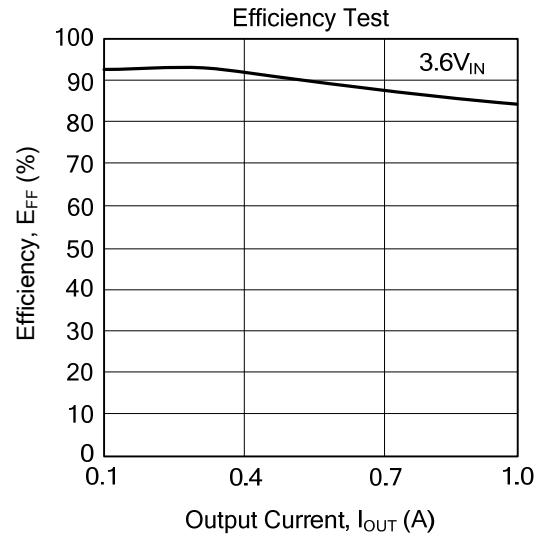
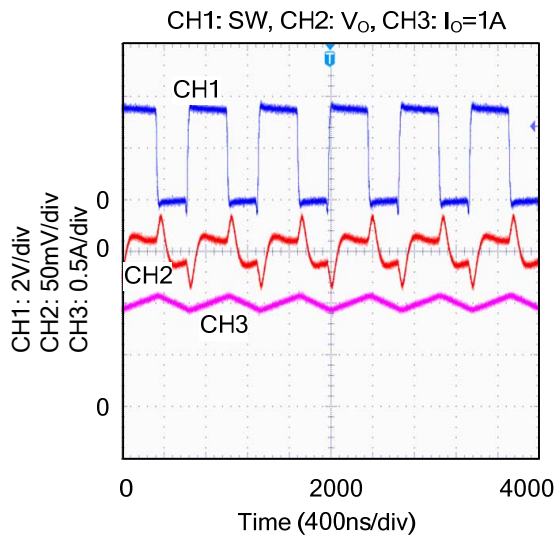
A resistive divider adjusts the output voltage of the UTC **UC3656**, which divides a 0.6V reference voltage at FB pin. The output voltage can be obtained by the equation as follows:

$$V_{OUT} = 0.6V \times \left(1 + \frac{R_2}{R_1}\right)$$



$R1 \sim R4 \leq 150k\Omega$

■ TYPICAL CHARACTERISTICS



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