



## UD05302

Advance

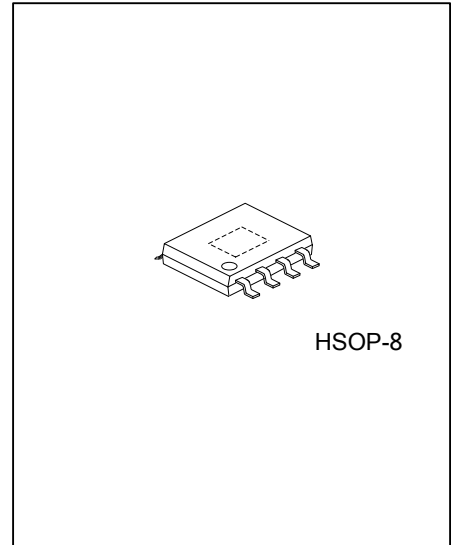
LINEAR INTEGRATED CIRCUIT

### HIGH EFFICIENCY 1MHZ, DUAL 3A SYNCHRONOUS STEP DOWN REGULATOR

#### DESCRIPTION

The UTC **UD05302** is a high-efficiency 1MHz synchronous step-down DC-DC regulator IC capable of delivering up to 3A output current. The UTC **UD05302** operates over a wide input voltage ranging from 3V to 5.5V and integrate main switch and synchronous switch with very low  $R_{DS(ON)}$  to minimize the conduction loss.

Low output voltage ripple and small external inductor and capacitor sizes are achieved with 1MHz switching frequency.



HSOP-8

#### FEATURES

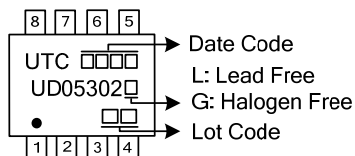
- \* Low  $R_{DS(ON)}$  for internal switches (top/bottom) 110m $\Omega$ /80m $\Omega$
- \* 3~5.5V input voltage range
- \* 1MHz switching frequency minimizes the external components
- \* Internal softstart limits the inrush current
- \* 100% dropout operation

#### ORDERING INFORMATION

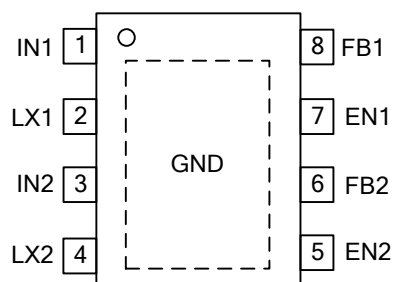
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UD05302L-SH2-R	UD05302G-SH2-R	HSOP-8	Tape Reel

<p>UD05302G-SH2-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) SH2: HSOP-8</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, 3	IN1,2	Input pin. Decouple this pin to GND paddle with at least 10uF ceramic cap
2, 4	LX1,2	Inductor pin. Connect this pin to the switching node of inductor
7, 5	EN1,2	Enable control. Pull high to turn on. Do not float.
8, 6	FB1,2	Output Feedback Pin. Connect this pin to the center point of the output resistor divider (as shown in Figure 1) to program the output voltage: $V_{OUT}=0.6*(1+R1/R2)$

## ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Input Voltage			6	V
Enable, FB Voltage			$V_{IN}+0.6$	V
Power Dissipation	$T_A=25^{\circ}\text{C}$	$P_D$	1	W
Junction Temperature Range		$T_J$	150	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-65~150	$^{\circ}\text{C}$
ESD Susceptibility (Note 1)	HBM (Human Body Mode)		2	kV
	MM (Machine Mode)		200	V

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
Supply Input Voltage			3 ~ 5.5	V
Junction Temperature Range		$T_J$	-40 ~ 125	$^{\circ}\text{C}$
Ambient Temperature Range		$T_A$	-40 ~ 85	$^{\circ}\text{C}$

Note:  $\theta_{JA}$  is measured in the natural convection at  $T_A=25^{\circ}\text{C}$  on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

## ■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		$\theta_{JA}$	50	$^{\circ}\text{C/W}$
Junction to Case		$\theta_{JC}$	10	$^{\circ}\text{C/W}$

## ■ ELECTRICAL CHARACTERISTICS

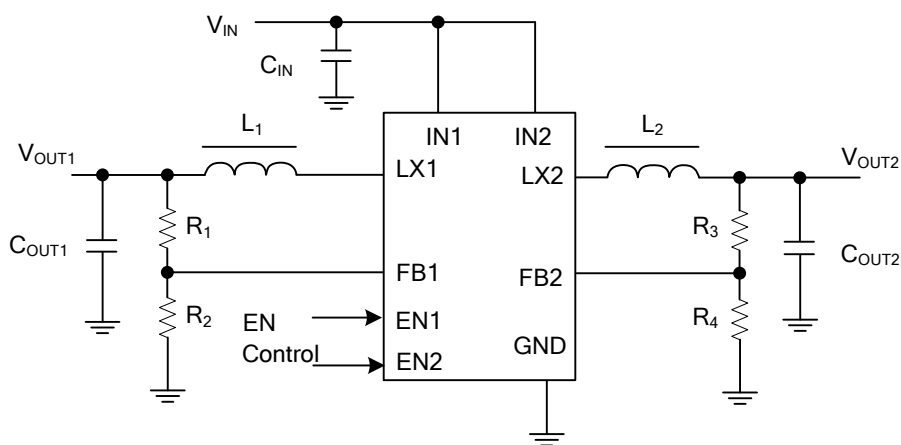
( $V_{IN}=5\text{V}$ ,  $V_{OUT}=2.5\text{V}$ ,  $L=2.2\mu\text{H}$ ,  $C_{OUT}=10\mu\text{F}$ ,  $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Range	$V_{IN}$		3		5.5	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $V_{FB}=V_{REF}\times 105\%$		80		$\mu\text{A}$
Shutdown Current	$I_{SHDN}$	EN=0			10	$\mu\text{A}$
Feedback Reference Voltage	$V_{REF}$		0.588	0.6	0.612	V
FB Input Current	$I_{FB}$	$V_{FB}=V_{IN}$	-50		50	nA
PFET RON	$R_{DS(ON)_P}$			0.11		$\Omega$
NFET RON	$R_{DS(ON)_N}$			0.08		$\Omega$
PFET Current Limit	$I_{LIM}$		3.5			A
EN Rising Threshold	$V_{ENH}$		1.5			V
EN Falling Threshold	$V_{ENL}$				0.4	V
Input UVLO Threshold	$V_{UVLO}$				2.9	V
UVLO Hysteresis	$V_{HYS}$			0.15		V
Oscillator Frequency	$F_{OSC}$	$I_{OUT}=100\text{mA}$		1		MHz
Min ON Time				50		ns
Max Duty Cycle			100			%
Thermal Shutdown Temperature	$T_{SD}$			150		$^{\circ}\text{C}$

Notes: 1.  $\theta_{JA}$  is measured in the natural convection at  $T_A=25^{\circ}\text{C}$  on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

2. The device is not guaranteed to function outside its operating conditions.

■ TYPICAL APPLICATION CIRCUIT



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