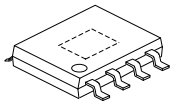
HIGH EFFICIENCY 1MHZ, DUAL 3A SYNCHRONOUS STEP DOWN REGULATOR



HSOP-8

■ 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.

■ FEATURES

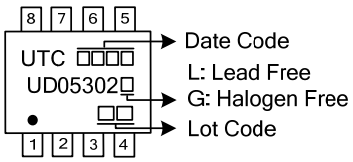
* Low $R_{DS(ON)}$ for internal switches (top/bottom) 110mΩ/80mΩ
* 3~5.5V input voltage range
* 1MHz switching frequency minimizes the external components
* Internal softstart limits the inrush current
* 100% dropout operation

■ ORDERING INFORMATION

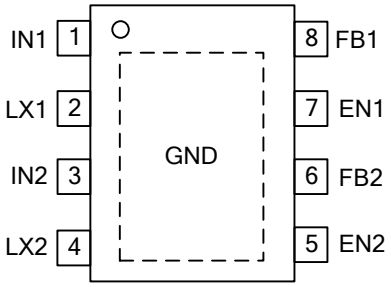
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UD05302L-SH2-R	UD05302G-SH2-R	HSOP-8	Tape Reel

UD05302G-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, L: Lead Free

■ 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°C	P_D	1	W
Junction Temperature Range		T_J	150	°C
Storage Temperature Range		T_{STG}	-65~150	°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	°C
Ambient Temperature Range	T_A	-40 ~ 85	°C

Note: θ_{JA} is measured in the natural convection at T_A=25°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	θ_{JA}	50	°C/W
Junction to Case	θ_{JC}	10	°C/W

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=5V, V_{OUT}=2.5V, L=2.2μH, C_{OUT}=10μF, T_A=25°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}×105%		80		μA
Shutdown Current	I_{SHDN}	EN=0			10	μA
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		Ω
NFET RON	$R_{DS(ON)\_N}$			0.08		Ω
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}=100mA		1		MHz
Min ON Time				50		ns
Max Duty Cycle			100			%
Thermal Shutdown Temperature	T_{SD}			150		°C

Notes: 1. θ_{JA} is measured in the natural convection at T_A=25°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