

UTC UNISONIC TECHNOLOGIES CO., LTD

UD05153

Advance

CMOS IC

1.5MHz, 1.5A, V_{FB}=0.6V SYNCHRONOUS STEP-DOWN CONVERTER

DESCRIPTION

UTC UD05153 is a 1.5MHz Constant On-Time Control PWM step-down converter. It is ideal for portable equipment requiring very high current up to 1.5A from single-cell Lithium-ion batteries while still achieving over 90% efficiency during peak load conditions. The 2.5V to 5.5V input voltage range makes UTC UD05153 ideally suited for single Li-Ion applications. 100% duty cycle provides low dropout operation, extending battery life in portable systems. Switching frequency is internally set at 1.5MHz, allowing the use of small surface mount inductors and capacitors. The internal synchronous switch increases efficiency and decreases need of an external Schottky diode. Low output voltages are easily supported with the 0.6V feedback reference voltage.

FEATURES

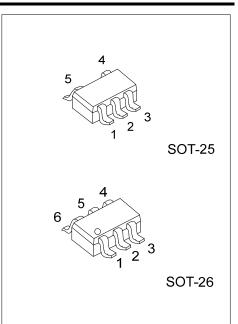
- * Input Voltage Range :2.5V~5.5V
- * Output Voltage: from 0.6V to VIN
- * High Efficiency: Up to 90%
- * Constant Frequency Operation: 1.5MHz
- * Output Current:1.5A
- * Quiescent Current: 300uA (input > 4.5V)
- * No Schottky Diode Required
- * 100% Duty Cycle in Dropout

- * 0.6V Reference Allows Low Output Voltages
- * COT Mode Operation for Excellent Line and Load **Transient Response**
- * Current limit, Enable function
- * Short Circuit Protect (SCP)
- * ≤ 2µA Shutdown Current
- * PG pin function for SOT-26 package

ORDERING INFORMATION			
Ordering Number			

Ordering Number		Deekere	Deeking	
Lead Free	Halogen Free	Package	Packing	
UD05153L-AF5-R	UD05153G-AF5-R	SOT-25	Tape Reel	
UD05153L-AG6-R	UD05153G-AG6-R	SOT-26	Tape Reel	

UD05153 <u>G-AF5</u> -R	
(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AF5: SOT-25, AG6: SOT-26
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

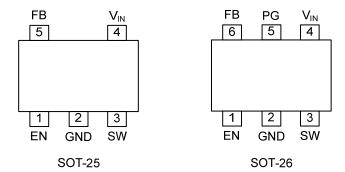


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MARKING

SOT-25	SOT-26
	6 5 4 A A A
DE15	DE15
	日日日 1 2 3

PIN CONFIGURATION



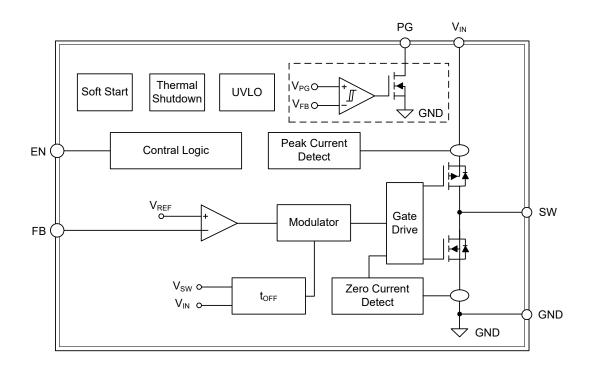
PIN DESCRIPTION

PIN NO.			DECODIDITION		
SOT25	SOT26	PIN NAME	DESCRIPTION		
1	1	EN	Enable pin H: Normal operation L: Shutdown, Can't floating.		
2	2	GND	Ground Pin		
3	3	SW	Switch output pin. Connect external inductor here. Minimize trace area at this pin to reduce EMI.		
4	4	VIN	Power Supply Input Pin		
5	6	FB	Output Feedback pin		
NC	5	PG	Power Good The pull-up resistor should not be connected to any voltage higher than 5.0V. If it's not used, leave the pin floating.		



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BLOCK DIAGRAM





Advance

■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	SYMBOL RATINGS	
V _{IN} Pin Voltage	V _{IN}	5.5	V
Feedback Pin Voltage	V _{FB}	Vcc	V
EN Pin Voltage	V _{EN}	Vcc	V
Switch Pin Voltage	Vsw	Vcc	V
Junction Temperature	TJ	+125	°C
Operation Temperature Range	T _{OPR}	-20 ~ +85	°C
Storage Temperature Range	T _{STG}	-40 ~ +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.

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	280	°C/W

■ ELECTRICAL CHARACTERISTICS (VIN=VEN=5.0V, TA=25°C, unless otherwise specified) (Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Range	VIN		2.5		5.5	V
Feedback Voltage	VFB	V _{FB} =0.6V	0.588	0.600	0.612	V
Feedback Bias Current	I _{FB}	V _{FB} =0.65V		10		nA
Quiescent Current	lcc	V _{FB} =1V		300		μA
Shutdown Supply Current	Isd	V _{EN} =0V		0.1	2	μA
Switching Current Limit	Ilimit	V _{IN} =5V		2.2		Α
Oscillation Frequency	Fosc	SW pin		1.5		MHz
R _{DS(ON)} of P-CH MOSFET	R _{DSON}	I _{OUT} =1.0A		0.17		Ω
RDS(ON) of N-CH MOSFET	Rdson	Iouт=1.0A		0.13		Ω
EN Din Logic Input Threshold Voltage	V _{ENL}				0.6	V
EN Pin Logic Input Threshold Voltage	Venh		1.3			V
EN Pin Input Current	I _{EN}			±0.1	±1	μA

Notes: 1.100% production test at +25°C. Specifications over the temperature range are guaranteed by design and characterization.

2. For EN pin ON/OFF Apply to the following 0.5Hz

3. Output voltage must $\leq V_{IN}$ -1V (Ex.4.3V_{IN} to 3.3V_{OUT})

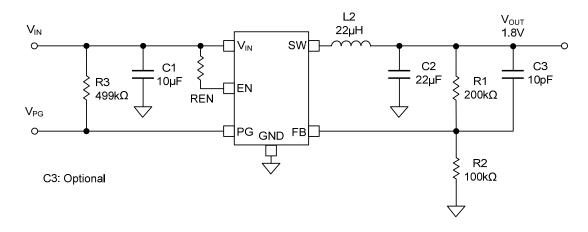


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APPLICATION AND IMPLEMENTATION

Information in the following applications sections is not part of the UTC component specification, and UTC does not warrant its accuracy or completeness. UTC's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

TYPICAL APPLICATION CIRCUIT



Vout=0.6x(1+R1/R2)

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