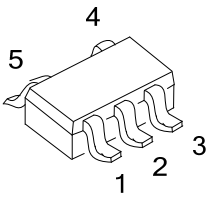
HIGH EFFICIENCY SYNCHRONOUS STEP-UP DC-DC CONVERTER WITH LOW STARTUP VOLTAGE



SOT-25

■ DESCRIPTION

The UTC **UU05052** is a high-efficiency synchronous step-up DC-DC converter. The startup voltage of this device is just 1V, making it ideal for applications operating from 1 or 2 alkaline cells. The device consumes just 17μA of quiescent supply current, and provides up to 400mA output current using a minimum number of readily available standard external components.

The device includes 0.19Ω N-channel power switch and 0.21Ω P-channel synchronous rectifier. Synchronous rectification and unique control scheme contribute to a high efficiency over a wide range of loads.

The UTC **UU05052** features fixed 3.3V/5V or from 2V to 5V adjustable output voltage.

■ FEATURES

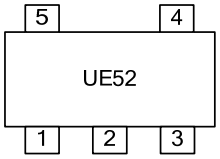
* Low Startup Voltage of 1V
* 17μA Of Quiescent Supply Current
* Less Than 1μA Of Shutdown Current
* Fully Integrated N-channel Power Switch and P-channel Synchronous Rectifier
* Fixed 3.3V/5V or Adjustable Output Voltage

■ ORDERING INFORMATION

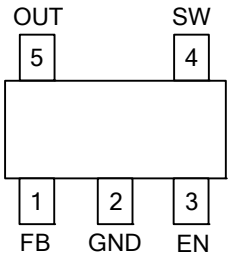
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UU05052L-AF5-R	UU05052G-AF5-R	SOT-25	Tape Reel

UU05052G-AF5-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AF5: SOT-25 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



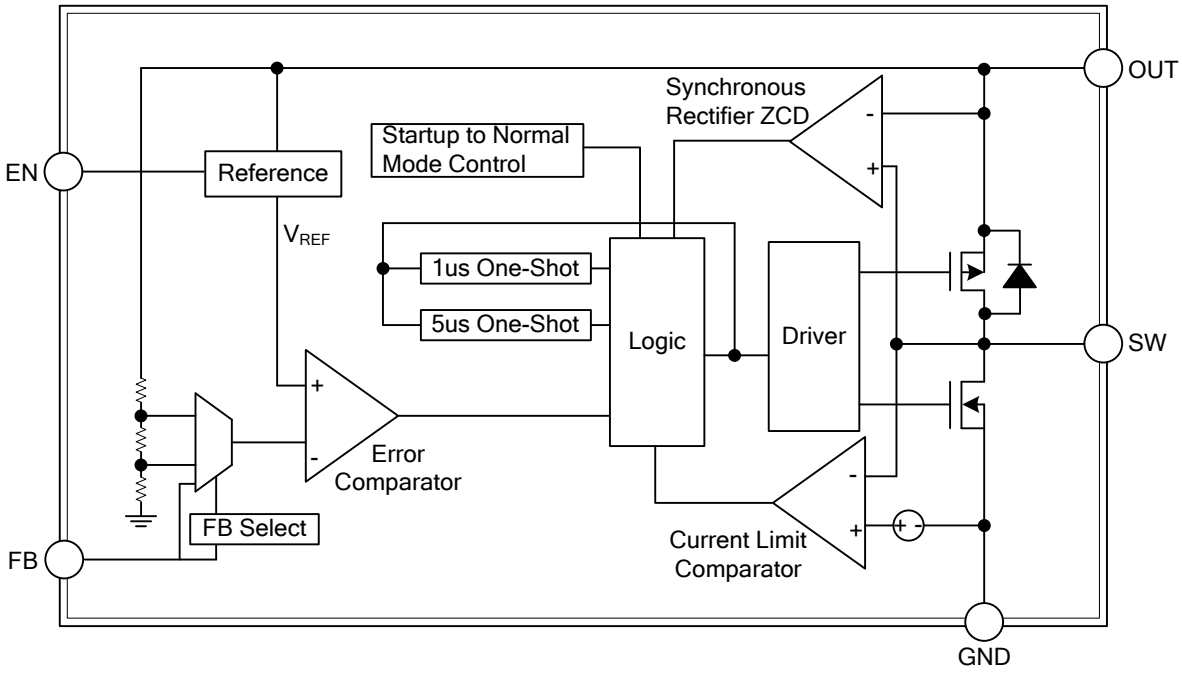
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	FB	Output Voltage Selected and Feedback Input. Connect to GND, V_{OUT}=5V; Connect to OUT, V_{OUT}=3.3V. Connect to a resistor divider to set 2V to 5V adjustable output voltage.
2	GND	Ground.
3	EN	Enable Input. EN high to turn on the regulator; low to turn it off.
4	SW	Inductor Connection
5	OUT	Output. OUT also provides power to the IC.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
OUT To GND	V_{OUT}	6	V
EN To GND	V_{EN}	6	V
FB To GND	V_{FB}	V_{OUT}+0.3	V
SW To GND	V_{SW}	V_{OUT}+0.3	V
Continuous SW Current	I_{SW}	Internally Limited	A
Maximum Power Dissipation (Derate 5mW/°C above T_A=50°C)	P_D	0.53	W
Operating Junction Temperature	T_J	-40 ~ +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.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	190	°C/W

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=1.5V, V_{OUT}=3.3V, T_A=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Minimum Operating Input Voltage	V_{IN}	After Turn-On & Vin=EN		0.6		V
Maximum Operating Input Voltage	V_{IN}				5	
Startup Voltage	V_{IN}	I_{LOAD}=1mA		1	1.18	V
Output Voltage	V_{OUT}	FB=OUT	3.2	3.3	3.4	V
		FB=GND	4.85	5	5.15	
Output Voltage Range		External Feedback Divider	2		5	V
Quiescent Current at OUT	I_Q	V_{FB}=1.3V		17	34	μA
Shutdown Supply Current	I_{SD}	EN=GND		0.1	1	μA
Startup To Normal Transition Threshold				1.85		V
FB Feedback Voltage	V_{FB}	V_{OUT}=2V~5V	1.15	1.180	1.21	V
FB Input Current		FB=1.3V		50		nA
Power Switch Current Limit	I_{LIM}		0.7	1	1.25	A
Power Switch On Resistance	R_{ONN}	I_{SW}=100mA		0.19	0.4	Ω
Synchronous Rectifier On Resistance	R_{ONP}	I_{SW}=-100mA		0.21	0.4	Ω
SW Leakage Current		EN=GND, V_{SW}=0V or 3.3V		0.1	1	μA
Maximum Switch On-Time	t_{ONMAX}		3.75	5	6.25	μs
Minimum Switch Off-Time	t_{OFFMIN}		0.75	1	1.25	μs
EN Logic Low Threshold	V_{IL}				0.5	V
EN Logic High Threshold	V_{IH}		0.8			V
EN Input Current					1	μA

■ TYPICAL APPLICATION CIRCUIT