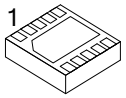
6.0V, 3.5A, 1.2MHZ, HIGH EFFICIENCY PWM STEP-DOWN DC/DC CONVERTER



DFN-10(3x3)

■ DESCRIPTION

UTC **UD05301** is a high efficiency step-down DC/DC converter operated with the current mode and the constant frequency. The internal switch and synchronous rectifier are integrated for high efficiency. UTC **UD05301** can supply 3.5A of load current from 2.7V ~ 5.5V supply voltage.

The switching frequency is set at 1.2MHz, allowing the use of small surface mount inductors and capacitors. It can run 100% duty cycle for low dropout application. UTC **UD05301** is available in a DFN3X3-10 package.

■ FEATURES

* 2.7V~5.5V Input Voltage Range
* High Efficiency: Up to 95%
* 1.2MHz Constant Switching Frequency
* 3.5A Available Load Current
* 100% Duty Cycle in Dropout
* Current Mode Control
* Short Circuit Protection
* Thermal Fault Protection
* Compact package: DFN3X3-10

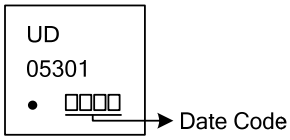
■ ORDERING INFORMATION

Ordering Number	Package	Packing
UD05301G-K10-3030-R	DFN-10(3×3)	Tape Reel

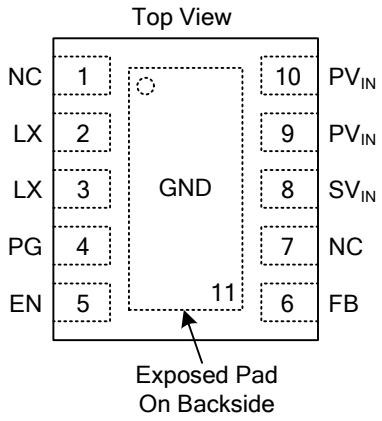
UD05301G-K10-3030-R

(1) Packing Type	(1) R: Tape Reel
(2) Package Type	(2) K10-3030: DFN-10(3×3)
(3) Green Package	(3) G: Halogen Free and Lead Free

■ MARKING



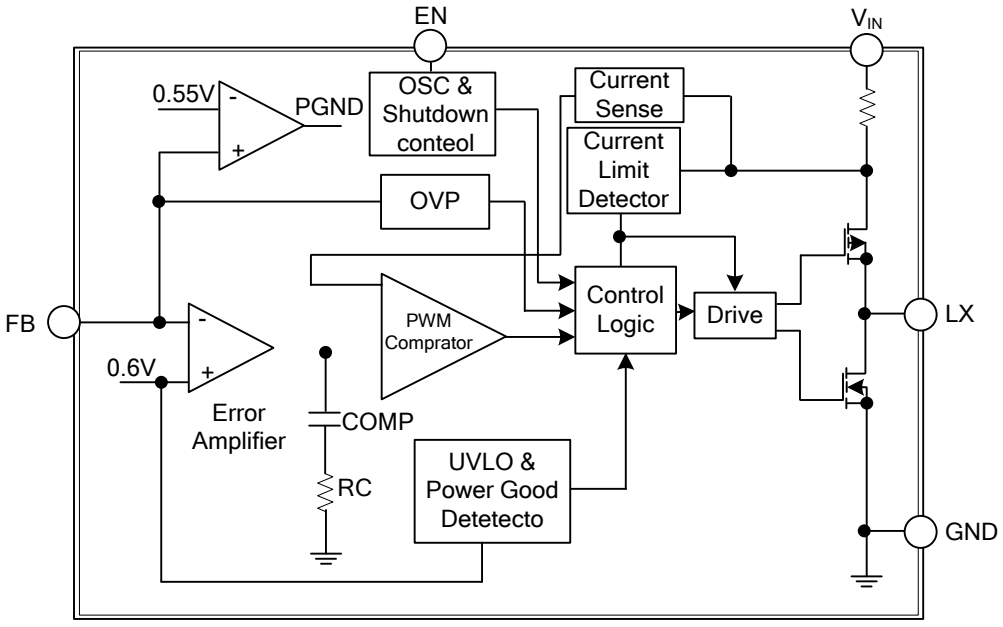
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 7	NC	No connection.
2, 3	LX	Switch Output. Connect this pin to the switching end of the inductor.
4	PG	Power Good Indicator. Pull-High Resistor is Needed.
5	EN	On/Off Control Input. Pull EN above 1.5V to turn the device on.
6	FB	Feedback Input. Connect FB to the center point of the external resistor divider. The feedback threshold voltage is 0.6V.
8	SV_{IN}	Signal Input. Drive 2.7V~5.5V voltage to this pin to power on this chip. Connecting a 1uF(min)ceramic bypass capacitor between SVIN and GND to eliminate noise
9, 10	PV_{IN}	Power Supply Input. Drive 2.7V~5.5V voltage to this pin to power on this chip. Connecting a 10uF(min)ceramic bypass capacitor between PVIN and GND to eliminate noise
11	GND	Ground. This pin is the voltage reference for the regulated output voltage. For this reason care must be taken in its layout.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	6	V
	V_{LX}	-0.3~V_{IN}~+0.3	V
All Other Pins		-0.3~+6	V
Power Dissipation (T_A= 25°C)	P_D	1.43	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-65~+150	°C

Notes: 1. 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.
2. Stresses exceed those ratings may damage the device.

■ RECOMMENDED OPERATING CONDITIONS

Input Supply Voltage	V_{IN}	2.7~5.5	V
Output Voltage	V_{OUT}	0.6~5.5	V
Ambient Temperature	T_A	-40~+85	°C
Junction Temperature	T_J	-40~125	°C

Note: If out of its operation conditions, the device is not guaranteed to function.

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction ambient (Note)	θ_{JA}	72	°C/W
Junction to Case	θ_{JC}	10	°C/W

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

■ ELECTRICAL CHARACTERISTICS (V_{IN}=5V, T_A= 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Range	V_{IN}		2.7		5.5	V
Quiescent Current	I_Q	V_{EN}=V_{IN}, V_{FB}=0.65V		550		μA
Shutdown Current	I_S	V_{EN}=0V, V_{IN}=5.5V		0.1	1	μA
IN Under Voltage Lockout Threshold	UVLO	Rising Edge		2.2		V
IN Under Voltage Lockout Hysteresis				0.2		V
Regulated FB Voltage			0.582	0.6	0.618	V
FB Input Current	I_{FB}	V_{FB}=0.65V	-50		50	nA
PFET On Resistance (Note)	$R_{(ON)\ P}$	I_{SW}=200mA		0.085		Ω
NFET On Resistance (Note)	$R_{(ON)\ N}$	I_{SW}=-200mA		0.065		Ω
SW Leakage Current			-1		1	μA
PFET Current Limit		Duty Cycle=100%, Current Pulse Width <1ms	3.2	3.5		A
Oscillator Frequency	F_{SW}	V_{IN}=3.6V, I_{OUT}=300mA	1	1.2	1.4	MHZ
Maximum Duty Cycle				100		%
Minimum On-Time (Note)		T_{ON}		80		nS
Thermal Shutdown Trip Threshold (Note)				150		°C
EN High-Level Input Voltage		–40°C ≤ T_A ≤ +85°C	1.5			V
EN Low-Level Input Voltage					0.4	V
EN Input Current		V_{EN}=0V~5.5V	-1		1	μA

Note: Guaranteed by design.

■ TYPICAL APPLICATION CIRCUIT

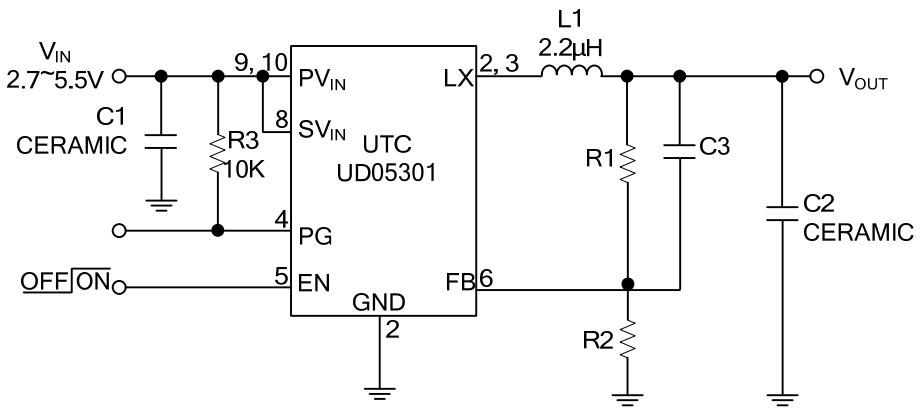


Table 1. Recommended Component Selection

V_{OUT}	C1	R1	R2	C3	L1	C2
3.3V	22µF×2	30.5K	6.8K	Option	2.2µH	22µF
2.5V	22µF	15K	4.7K	Option	2.2µH	22µF
1.8V	22µF	20K	10K	Option	2.2µH	22µF
1.2V	10µF	20K	20K	Option	1.2µH	22µF×2
1.0V	10µF	20K	30K	Option	1.2µH	22µF×2