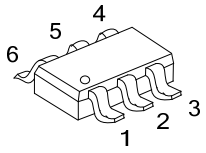
18V/2A HIGH EFFICIENCY SYNCHRONOUS RECTIFIED STEP-DOWN DC/DC CONVERTER



SOT-26

■ DESCRIPTION

The UTC **UD18204** is a high efficiency synchronous step-down DC/DC converter output up current to 2A continuous output current supplied.

UTC **UD18204** built-in over-current protection, thermal protection and Under Voltage Lockout (UVLO) circuit is provided to prevent start-up until the input voltage to 4.5V.

UTC **UD18204** is designed as the power saving mode to reduce the switching frequency to improve the light load efficiency.

■ FEATURES

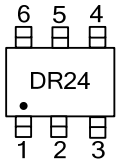
* Input Voltage Supply Range from 4.5V to 18V
* High Efficiency up to 90%
* Adjustable Output Voltage from 0.6V to 12V
* Power Saving Mode (PSM) during the light Load Operation
* Typical 500kHz Frequency Operation
* Current Mode Operation
* Over-temperature Protection
* Over-current Protection

■ ORDERING INFORMATION

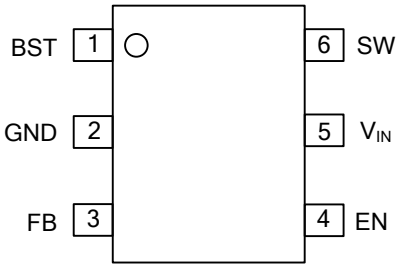
Ordering Number	Package	Packing
UD18204G-AG6-R	SOT-26	Tape Reel

UD18204G-AG6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free

■ MARKING



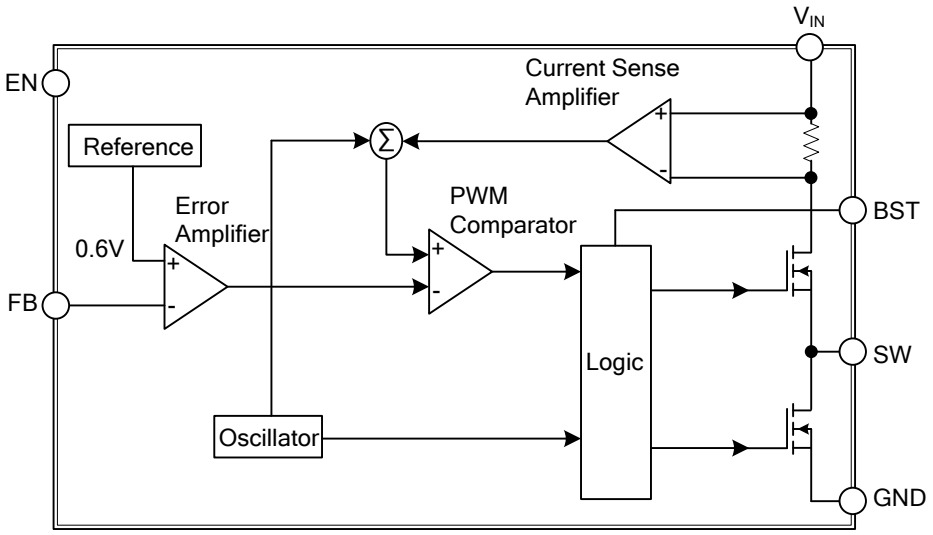
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	BST	High Side Gate Drive Boost Input. It is required to connect SW and BST by a capacitor.
2	GND	Ground.
3	FB	Voltage Feedback. It is necessary to connect this pin to set the DC output voltage.
4	EN	Enable (floating of this pin not recommended).
5	V_{IN}	Power Supply.
6	SW	Power Switch Output.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{IN}	+21	V
SW Voltage	V_{SW}	+21	V
EN Voltage	V_{EN}	-0.3 ~ V_{IN}+0.3	V
Other Pins		-0.3 ~ 6	V
Boost Voltage		V_{SW}+6	V
Power Dissipation	P_D	0.8	W
Junction Temperature Range	T_J	-40 ~ +150	°C
Storage Temperature Range	T_{STG}	-65 ~ +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.

■ RECOMMEND OPERATING CONDITIONS (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	4.5 ~ 18	V
Junction Temperature Range	T_J	<+135	°C
Operating Temperature Range	T_{OPR}	-40 ~ +85	°C

Note: The device is not guaranteed to function outside of the recommended operating conditions.

■ THERMAL CHARACTERISTICS

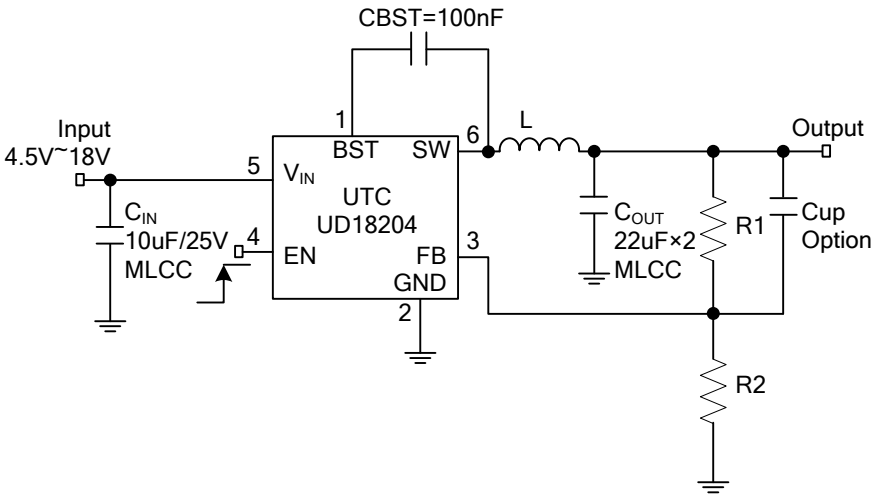
PARAMETER	SYMBOL	RATINGS	UNIT
Junction To Ambient	θ_{JA}	270	°C/W
Junction to Case	θ_{JC}	85	°C/W

■ ELECTRICAL CHARACTERISTICS

(Recommended Operating Conditions, Unless Otherwise Noted; V_{IN}=12V; T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5		18	V
Shutdown Supply Current		V_{EN}=0V		10		μA
Regulated Feedback Voltage		4.5V≦V_{IN}≦18V	0.584	0.6	0.616	V
Current Limit	I_{LIMIT}	V_O=1V		3	5	A
High Side On Resistance				0.12		Ω
Low Side On Resistance				0.08		Ω
Oscillation Frequency			400	500	600	kHz
Short Circuit Oscillation Frequency		V_{FB}=0V		167		kHz
Minimum On Time				50		ns
Under Voltage Lockout Threshold		V_{IN} Rising		4.1		V
Thermal Shutdown Threshold				155		°C
EN High Level			2.8			V
EN Low Level					0.6	V

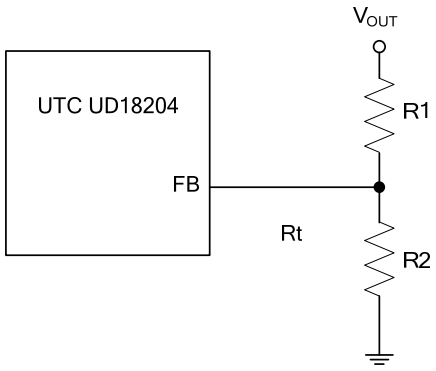
■ TYPICAL APPLICATION CIRCUIT



■ APPLICATION INFORMATION

Output Voltage

The output voltage is set using the FB pin and a T-type resistor connected to the output as the circuit shown below.



The output voltage (V_{OUT}) can be calculated according to the voltage of the FB pin (V_{FB}) and ratio of the feedback resistors by the following equation, where (V_{FB}) is 0.6V:

$$V_{OUT} = 0.6 \times \frac{(R_1 + R_2)}{R_2}$$

Recommended component values

Application 1 (Typical) without Rt			
V_{OUT} (V)	L (uH)	R1 (KΩ)	R2 (KΩ)
1	4.7	86.6 (1%)	130 (1%)
1.2	4.7	86.6 (1%)	86.6 (1%)
1.5	4.7	86.6 (1%)	57.6 (1%)
1.8	4.7	86.6 (1%)	43.2 (1%)
2.5	6.8	86.6 (1%)	27.4 (1%)
3.3	6.8	86.6 (1%)	19.1 (1%)
5	6.8	86.6 (1%)	11.8 (1%)