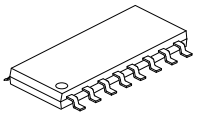
UC3535 **Preliminary** ***CMOS IC***

DC-DC CONTROLLER



SOP-16

■ DESCRIPTION

Featured Device, UTC **UC3535** is a DC-DC controller with innovative technology. The controller can work in high voltage with high voltage MOS in PCB.

UTC **UC3535** provides several protection features. It includes a cycle-by-cycle current limit to the power switch; short-circuit protection; V_{DD} UVLO protection.

■ FEATURES

* Under-voltage lockout (UVLO) with hysteresis
* Provides complete protection functions
  -Cycle-by-cycle current limit
  - Short-Circuit Protection

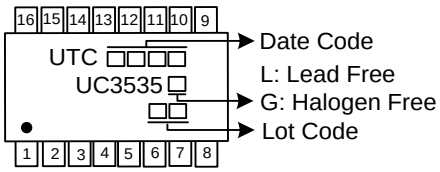
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UC3535L-S16-R	UC3535G-S16-R	SOP-16	Tape Reel

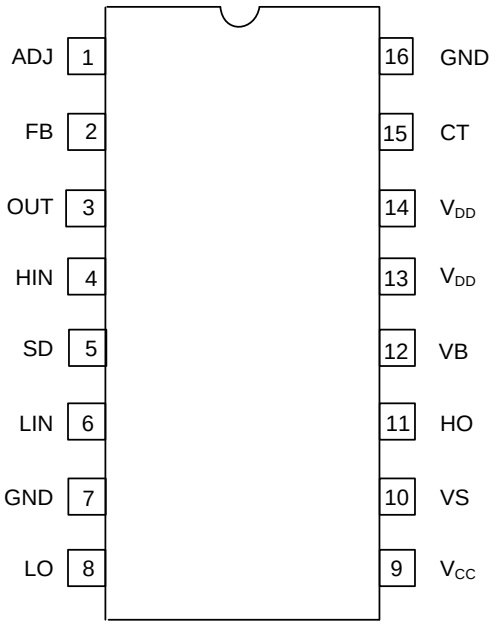
UC3535G-S16-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S16: SOP-16
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

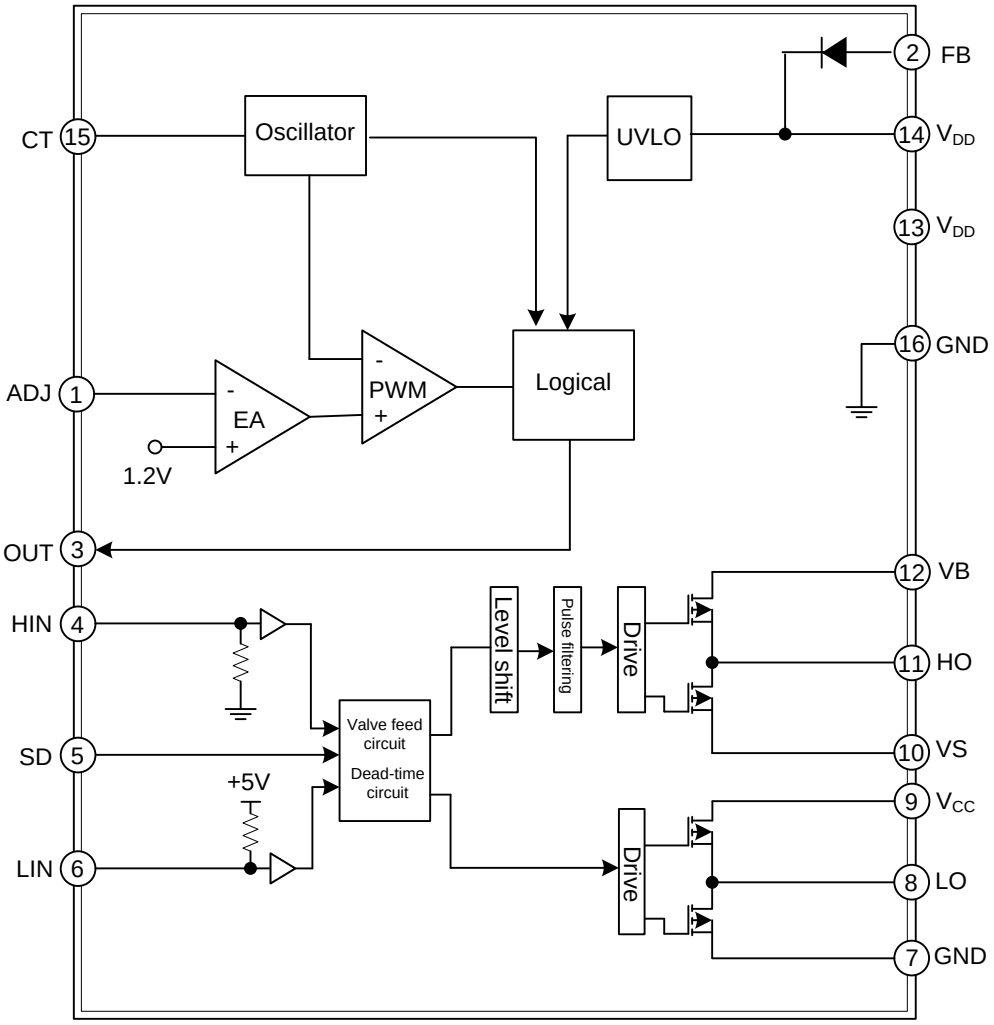


■ PIN DESCRIPTION

PIN NO.	I/O (Note 1)	PIN NAME	DESCRIPTION
1	I	ADJ	Output feedback.
2	I	FB	IC Power supply
3	O	OUT	PWM logic output
4	I	HIN	Input logic for controlling high side power mos
5	I	SD	Over current protection by shut down HO, LO output
6	I	LIN	Input logic for controlling low side power mos
7	Ground	GND	Power ground
8	O	LO	Output for controlling low side power mos
9	Power	V_{CC}	Power supply
10	O	VS	Floating ground in high side
11	O	HO	Output for controlling high side power mos
12	O	VB	Floating power supply in high side
13	Power	V_{DD}	Power supply
14	Power	V_{DD}	Power supply
15	I	CT	Setting frequency of oscillator
16	Ground	GND	Power ground

Note: I=Input, O=Output.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Floating supply voltage VB	V_B	-0.3 ~ 600	V
Floating ground voltage VS	V_S	VB-20.0 ~ VB+0.3	V
High side output HO Pin	V_{HO}	VS-0.3 ~ VB+0.3	V
Low side and low voltage pins, ADJ, FB, OUT	V_L	-0.3 ~ 20.0	V
Low side and low voltage pins, HIN, LIN, SD	V_L	-0.3 ~ 20.0	V
Maximum Operating Junction Temperature	T_J	+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.

■ RECOMMENDED OPERATING RANGE (Note)

PARAMETER	SYMBOL	RATINGS	UNIT
VDD Supply Voltage	V_{DD}	8 ~ 20	V
Operation Ambient Temperature	T_A	-40 ~ +85	°C
Operating Junction Temperature	T_J	+125	°C

■ THERMAL DATA (Note)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	50	°C/W
Junction to Case	θ_{JC}	8	°C/W

Note: Not to exceed the maximum junction temperature of the IC, which relates to the operating power of the IC and the thermal resistance of the IC/package as above. The operation power of the IC can be calculated by Pd $=V_{DD\_IN}$ x I_{IN}, where V_{DD_IN} represents the input voltage at the V_{DD} pin of the IC and I_{IN} represents the current flow into the V_{DD} pin of the IC.

■ ELECTRICAL CHARACTERISTICS (V_{DD}=12V, T_A=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage						
Floating power supply	V_B		3		600	V
Power supply VDD, VCC	V_{DD}		3.5		20	V
UVLO ON voltage	U_{VLO_ON}		7	7.5	8	V
UVLO off voltage	U_{VLO_OFF}		3	3.5	4	V
Hysteresis of UVLO voltage	U_{VLO_H}			4		V
Reference for Non-Inverting Input	V_{ADJ}	T_A=25°C	1.1	1.2	1.3	V
Oscillator frequency	F_{OSC}	C_T=470P	60	75	90	KHz
Maximum output duty	D_{MAX}			70		%
GATE Drive Output						
LO,HO pull current	I_S		0.8	1		A
LO, HO drain current	I_D		1.2	1.5		A

■ FUNCTIONAL DESCRIPTION

Refer to both the Block Diagram in Figure 1 and a reference design circuit in Figure 4 for the following discussions. All parameters mentioned below are typical values.

Start-up Circuit

Applying power to the input port in Figure 4, initiates the operation. V_{DD} voltage is lower than UVLO_ON pwm logic is off and output voltage is 0.

After V_{DD} voltage is over UVLO_ON normal operation starts. PWM logic is running and output voltage goes to pre-setting value gradually.

Output voltage Setting

Output voltage can be set by two divided-resistors. Reference voltage in the chip is 1.2V. The output voltage can be calculated by

$$V_{OUT}=(1+R1/R2)\times 1.2$$

For example, setting V_{OUT} 12.12V it just select R1=9.1K and R2=1K

■ TYPICAL APPLICATION CIRCUIT

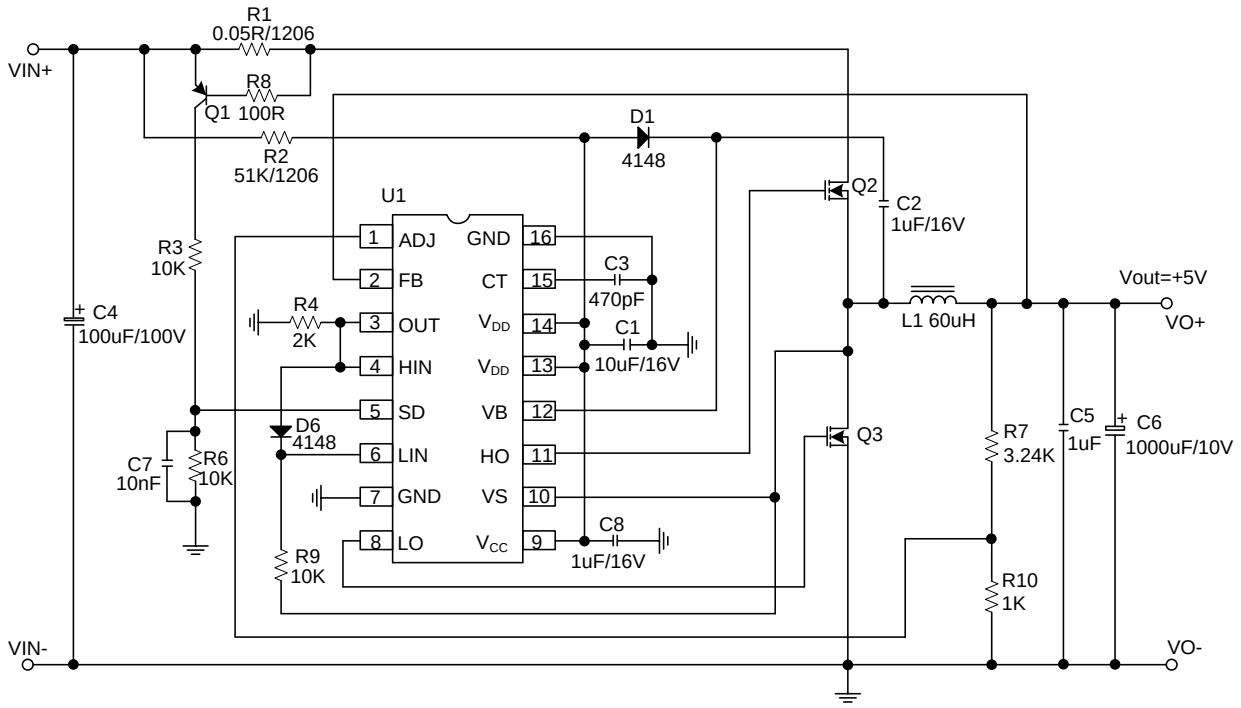


Figure 4