

3A 180KHz 36V Buck DC to DC Converter With CV/CC Loop**JTMX4986****Features**

- Wide 8V to 36V Input Voltage Range
- Output Adjustable from 1.25V to 32V
- Maximum Duty Cycle 100%
- Minimum Drop Out 0.3V
- Fixed 180KHz Switching Frequency
- Maximum 3A Switching Current
- Internal Optimize Power MOSFET
- High efficiency
- Excellent line and load regulation
- With output constant current loop
- Built in thermal shutdown function
- Built in current limit function
- Built in output short protection function
- Available in SOP8L package

Applications

- Car Charger
- Battery Charger
- LCD Monitor and LCD TV
- Portable instrument power supply
- Telecom / Networking Equipment

General Description

The JTMX4986 is a 180 KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 2.5A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 100%. An over current protection function is built inside. When short protection function happens, the operation frequency will be reduced from 180KHz to 48KHz. An internal compensation block is built in to minimize external component count.



Figure1. Package Type of JTMX4986

Pin Configurations

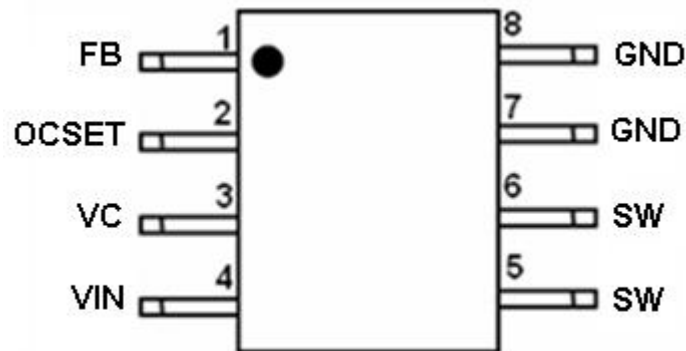


Figure2. Pin Configuration of JTMX4986 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	FB	Feedback Pin (FB). Through an external resistor divider network, FB senses the output voltage and regulates it. The feedback threshold voltage is 1.25V.
2	OCSET	Output Constant Current Set Pin.
3	VC	Internal Voltage Regulator Bypass Capacity. In typical system application, The VC pin connect a 1uf capacity to VIN.
4	VIN	Supply Voltage Input Pin. JTMX4986 operates from a 8V to 36V DC voltage. Bypass Vin to GND with a suitably large
5,6	SW	Power Switch Output Pin (SW). SW is the switch node that supplies power to the output.
7,8	GND	Ground Pin. Care must be taken in layout. This pin should be placed outside of the Schottky Diode to output capacitor ground path to prevent switching current spikes from inducing voltage noise into JTMX4986.

Function Block

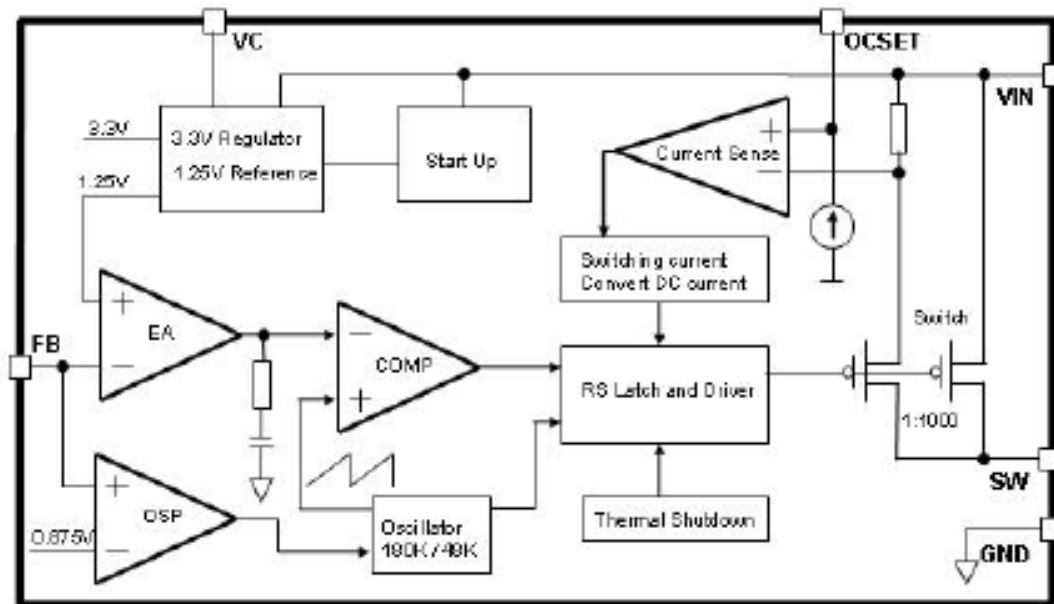


Figure3. Function Block Diagram of JTMX4986

Typical Application Circuit

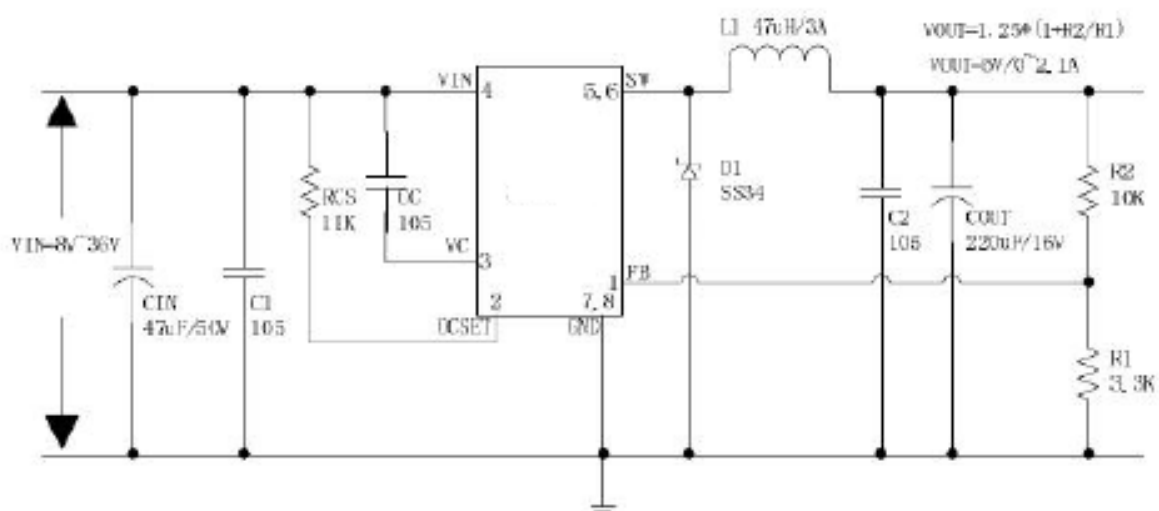


Figure4. JTMX4986 Typical Application Circuit (VIN=8V~36V, VOUT=5V/2.1A)

3A 180KHz 36V Buck DC to DC Converter With CV/CC Loop**JTMX4986****Ordering Information**

Order Information	Marking ID	Package Type	Packing Type Supplied As
JTMX4986E1	JTMX4986E1	SOP8L	2500 Units on Tape & Reel

JIATAIMU Pb-free products, as designated with “E1” suffix in the par number, are RoHS compliant.

Absolute Maximum Ratings (Note1)

Parameter	Symbol	Value	Unit
Input Voltage	V _{IN}	-0.3 to 40	V
Feedback Pin Voltage	V _{FB}	-0.3 to V _{IN}	V
Output Switch Pin Voltage	V _{Output}	-0.3 to V _{IN}	V
Power Dissipation	P _D	Internally limited	mW
Thermal Resistance (SOP8L) (Junction to Ambient, No Heatsink, Free Air)	R _{JA}	100	℃/W
Operating Junction Temperature	T _J	-40 to 125	℃
Storage Temperature	T _{STG}	-65 to 150	℃
Lead Temperature (Soldering, 10 sec)	T _{LEAD}	260	℃
ESD (HBM)		>2000	V

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

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JTMX4986

JTMX4986 Electrical Characteristics

T_a = 25 °C; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<i>System parameters test circuit figure4</i>						
VFB	Feedback Voltage	V _{in} = 8V to 36V, V _{out} =5V I _{load} =0.5A to 2.5A	1.225	1.25	1.275	V
Efficiency	η	V _{in} =12V , V _{out} =5V I _{out} =2.1A	-	89	-	%

Electrical Characteristics (DC Parameters)

V_{in} = 12V, GND=0V, V_{in} & GND parallel connect a 100uf/50V capacitor; I_{out}=500mA, T_a = 25 °C; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	V _{in}		8		36	V
Quiescent Supply Current	I _q	V _{FB} =V _{in}		2.1	5	mA
Oscillator Frequency	F _{osc}		153	180	207	KHz
Output Short Frequency	F _{osp}			48		KHz
Switch Current Limit	I _L	V _{FB} =0		4		A
Max. Duty Cycle	D _{MAX}	V _{FB} =0V		100		%
Output Power PMOS	R _{dson}	V _{FB} =0V, V _{in} =12V, I _{sw} =3A		60	80	mohm

Typical System Application (VOUT=5V/2.1A)

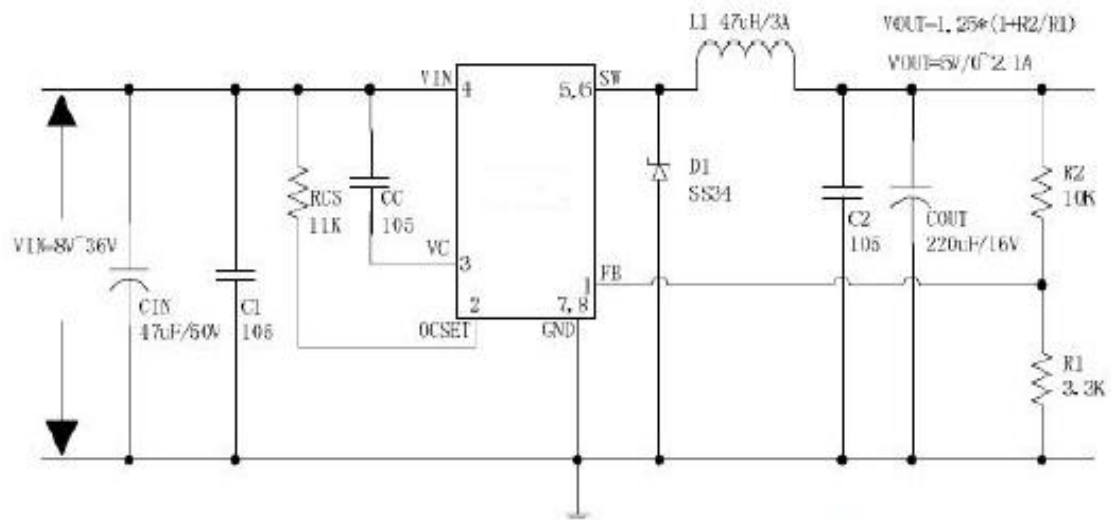


Figure5. JTMX4986 System Parameters Test Circuit (VIN=8V~36V, VOUT=5V/2.1A)

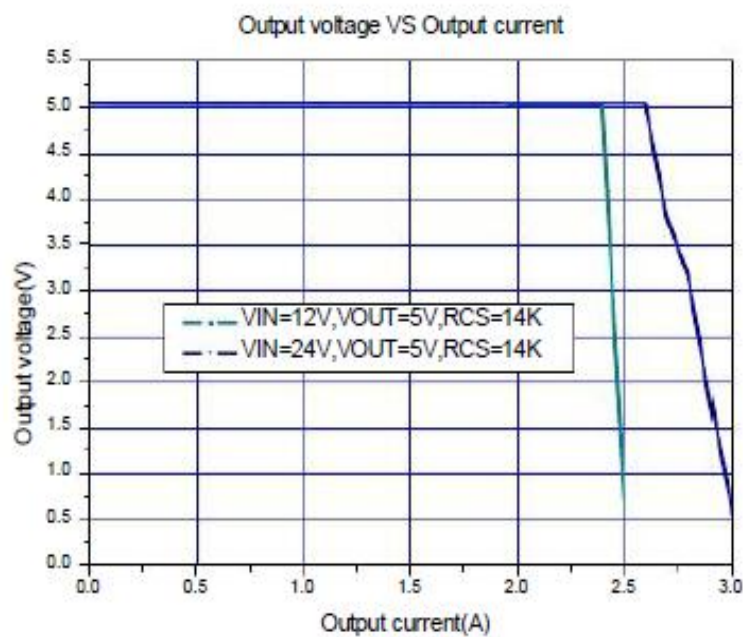


Figure6. JTMX4986 System Output Constant Current Curve

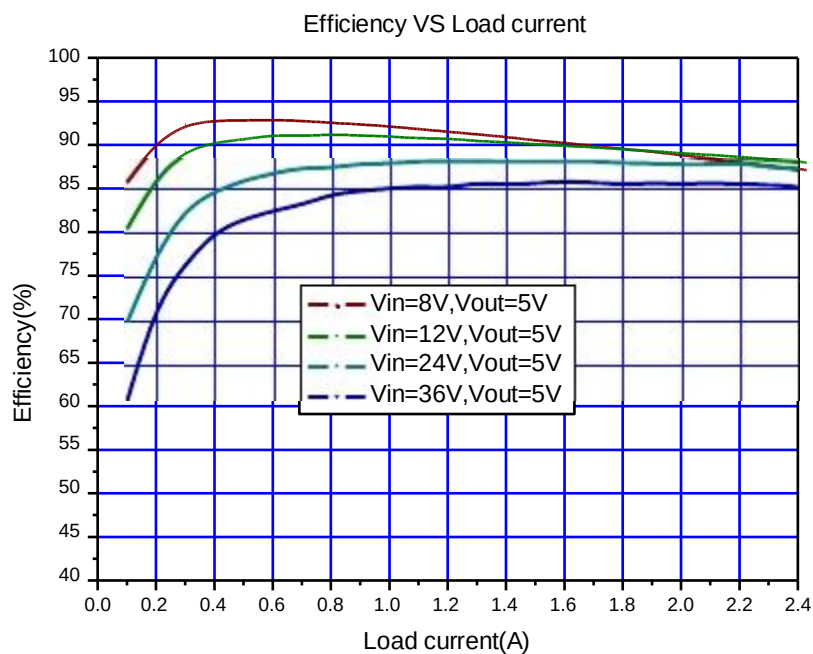


Figure7. JTMX4986 System Efficiency Curve

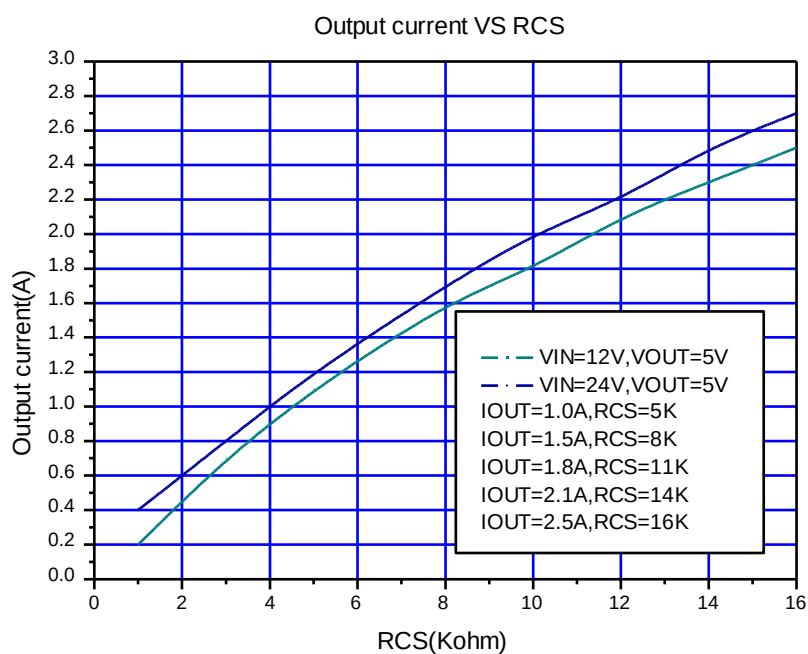


Figure8. RCS VS Output Current Select Curve

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Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A		√	1N5817	1N5818	1N5819		
3A		√	1N5820	1N5821	1N5822		
		√	MBR320	MBR330	MBR340	MBR350	MBR360
	√		SK32	SK33	SK34	SK35	SK36
	√			30WQ03	30WQ04	30WQ05	
		√		31DQ03	31DQ04	31DQ05	
		√	SR302	SR303	SR304	SR305	SR306

Package Information

SOP8 Package Mechanical Dimensions

