

# ASSP For Power Management Applications (Secondary battery)

## DC/DC Converter IC for Charging

### MB3832A

#### ■ DESCRIPTION

The MB3832A is a pulse width modulation (PWM) DC/DC converter IC, incorporating a current detector amplifier and error amplifiers (2 circuits) to control the output voltage and current independently. It is suitable for down-conversion.

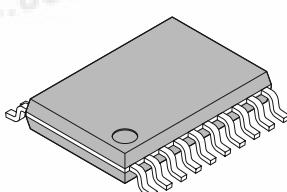
With an on-chip reference voltage generator, the MB3832A is best suited for use in applications such as lithium-ion battery (1-cell to 3-cell) chargers.

#### ■ FEATURES

- High precision reference voltage source:  $2.5\text{ V} \pm 0.5\%$  ( $+25^\circ\text{C}$ )  
 $: 2.5\text{ V} \pm 1.0\%$  ( $-10^\circ\text{C}$  to  $+85^\circ\text{C}$ )
- High frequency operating capability: 500 kHz max.
- Wide operating supply voltage range: 3.6 V to 18 V
- On-chip current detector amplifier with wide in-phase input voltage range: 0 V to  $V_{cc}$
- On-chip standby function
- On-chip triangular waveform oscillator capable of operating in external synchronization
- On-chip, timer-latch short-circuit protection circuit
- Internal totem-pole output stage supporting P-channel MOS FETs and PNP transistors

#### ■ PACKAGE

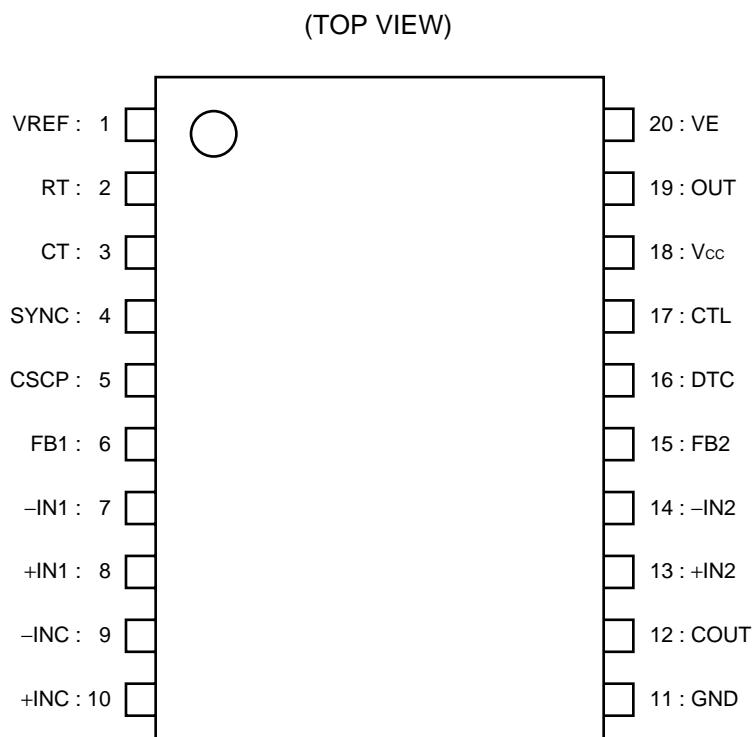
20-pin plastic SSOP



(FPT-20P-M03)

# MB3832A

## ■ PIN ASSIGNMENT



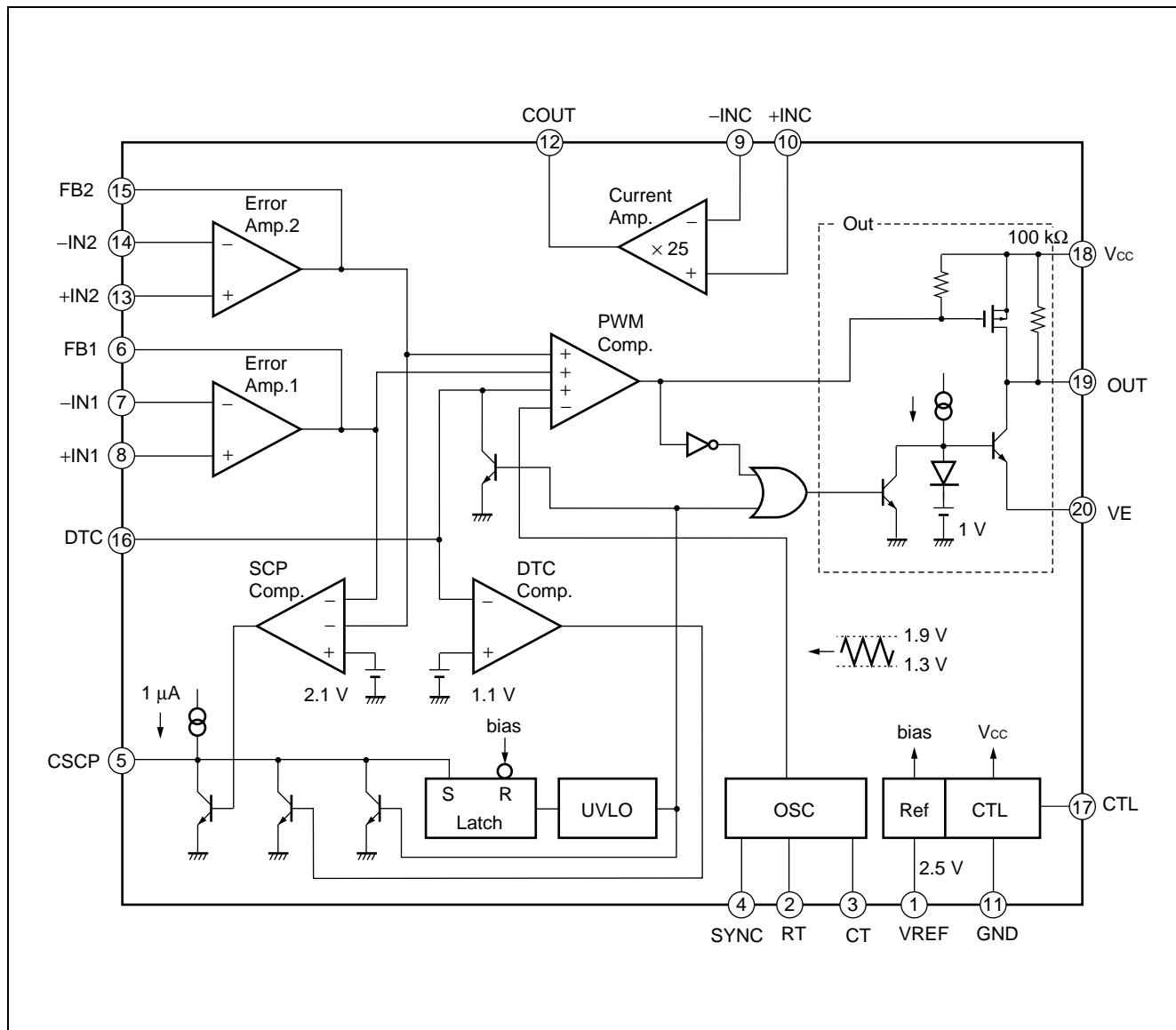
## ■ PIN DESCRIPTION

Pin no.	Pin name	I/O	Descriptions
1	VREF	O	Reference voltage output pin
2	RT	—	Connection pin for triangular wave frequency setting resistor
3	CT	—	Connection pin for triangular wave frequency setting capacitor
4	SYNC	I	External synchronous signal input pin
5	CSCP	—	Connection pin for time constant setting capacitor for timer-latch short-circuit protection circuit
6	FBI	O	Error amplifier 1 output pin
7	-IN1	I	Error amplifier 1 inverted input pin
8	+IN1	I	Error amplifier 1 non-inverted input pin
9	-INC	I	Current detector amplifier inverted input pin
10	+INC	I	Current detector amplifier non-inverted input pin
11	GND	—	Ground pin
12	COUT	O	Current detector amplifier output pin
13	+IN2	I	Error amplifier 2 non-inverted input pin
14	-IN2	I	Error amplifier 2 inverted input pin
15	FB2	O	Error amplifier 2 output pin
16	DTC	I	Connection pin for dead time/soft start time setting resistor/capacitor
17	CTL	I	Power supply control input pin “H” level: Active state “L” level: Standby state
18	V <sub>cc</sub>	—	Power supply pin
19	OUT	O	Totem-pole output pin
20	VE	—	Connector pin for output sink current setting resistor

I: Input pin, O: Output pin

# MB3832A

## ■ BLOCK DIAGRAM



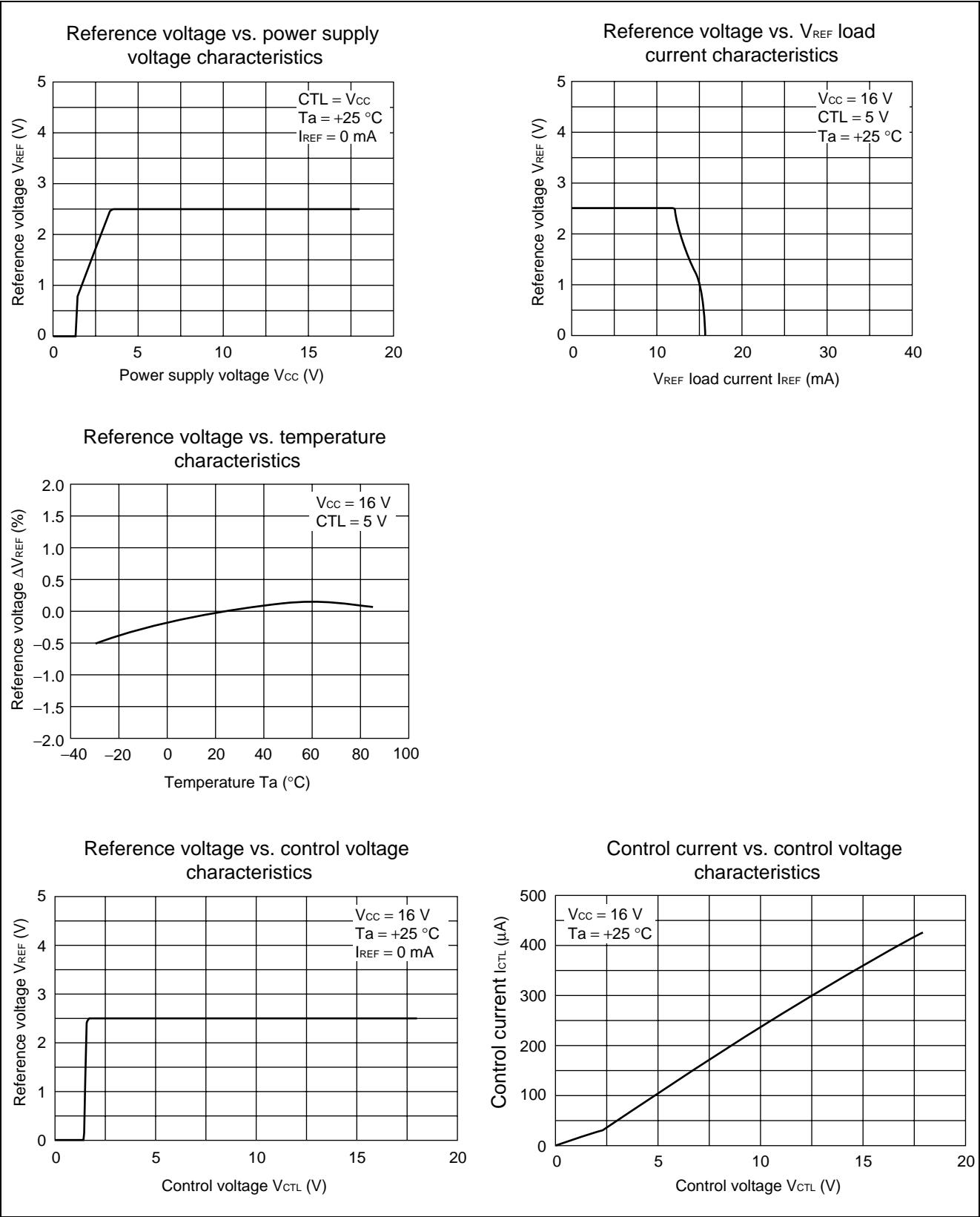








## ■ TYPICAL CHARACTERISTICS



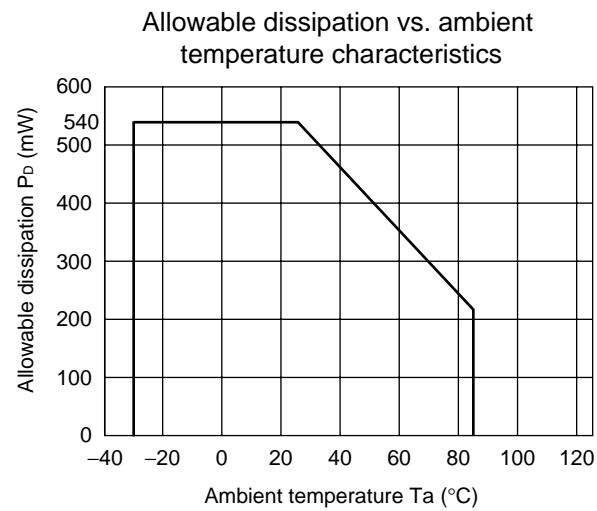
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# MB3832A

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# MB3832A

and turn off the external output transistor to make dead time 100%. The circuit restores voltage supply when the supply voltage reaches its threshold voltage.

## (2) Timer-latch short-circuit protection circuit (SCP Comp., SR Latch)

The latch circuit detects the output voltage levels of the error amplifiers. When the output voltage levels of the two error amplifiers reach about 2.1 V at the same time, the timer circuit is actuated to start charging the external capacitor connected to the CSCP pin (pin 5). If the error amplifier outputs are not restored to the normal voltage range before the capacitor voltage reaches about 0.7 V, the latch circuit is actuated to fix the output pins (OUT) at the "H" level. To reset the actuated protection circuit, turn the power supply on back.

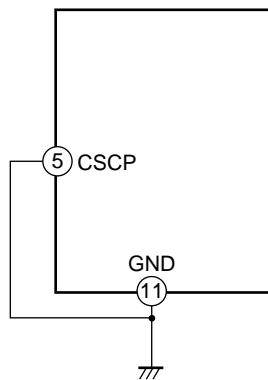


# MB3832A

## ■ TREATMENT OF UNUSED CSCP PIN

When the timer-latch short-circuit protection circuit is not used, connect the CSCP pin (pin 5) to the GND at the shortest distance.

### Treatment of the CSCP pin when not used

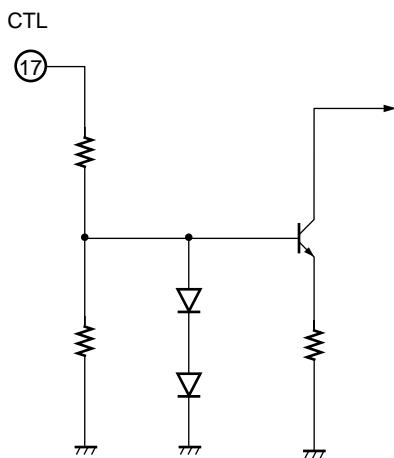




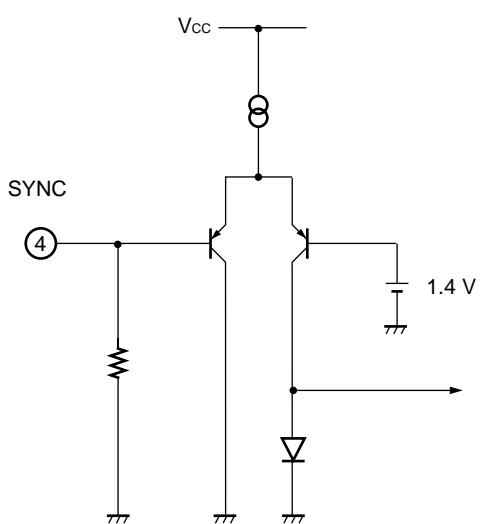
# MB3832A

## ■ EQUIVALENT CIRCUIT (CTL, SYNC pin)

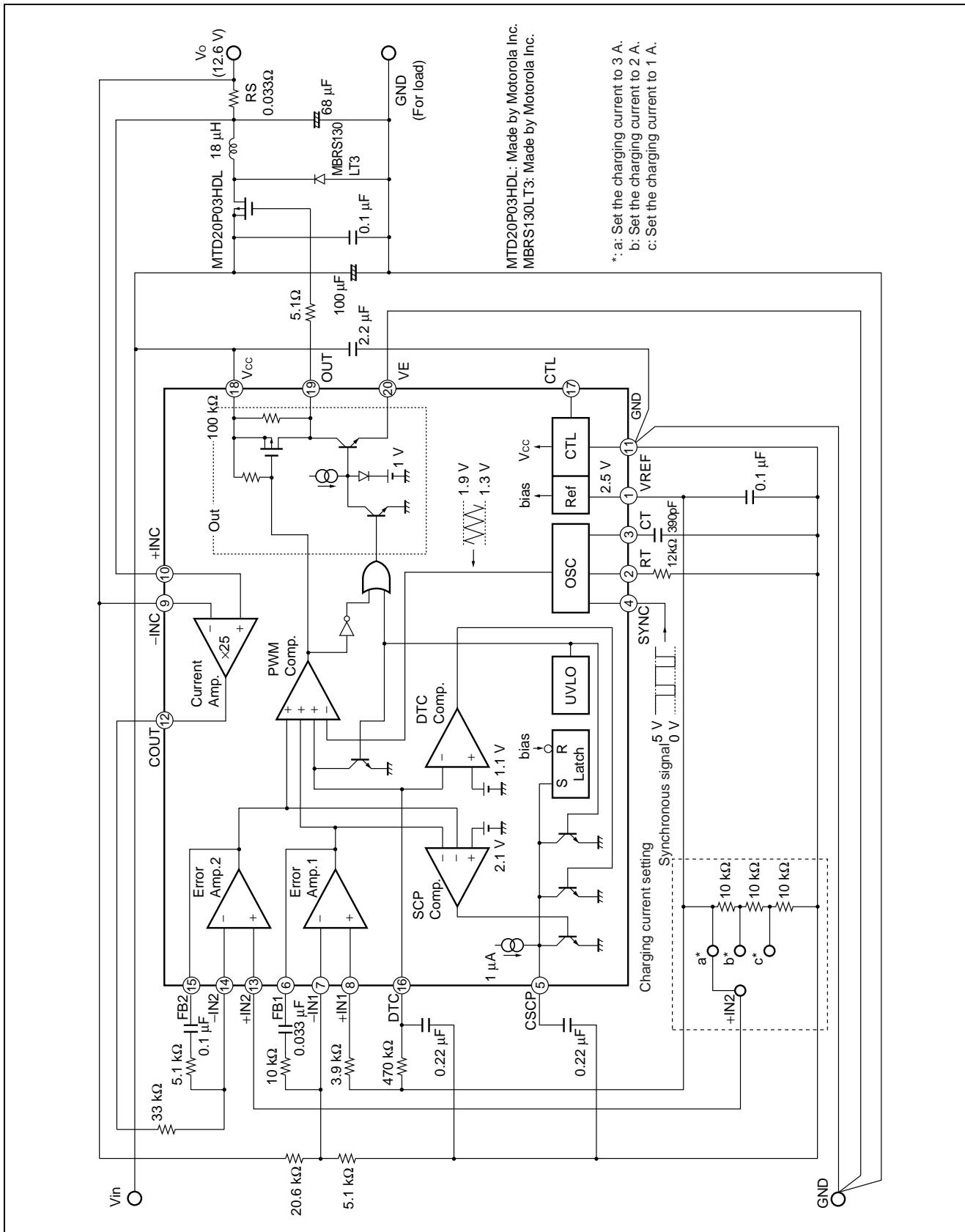
- CTL pin



- SYNC pin

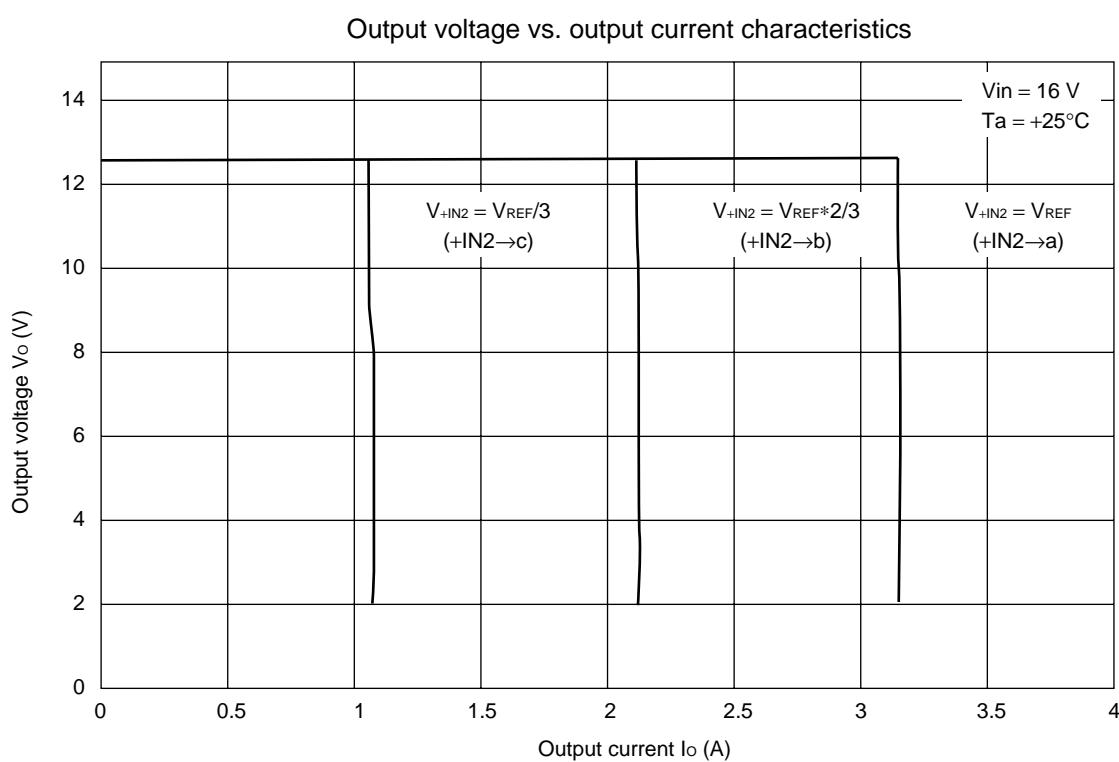


## ■ APPLICATION EXAMPLE (Step-down scheme)

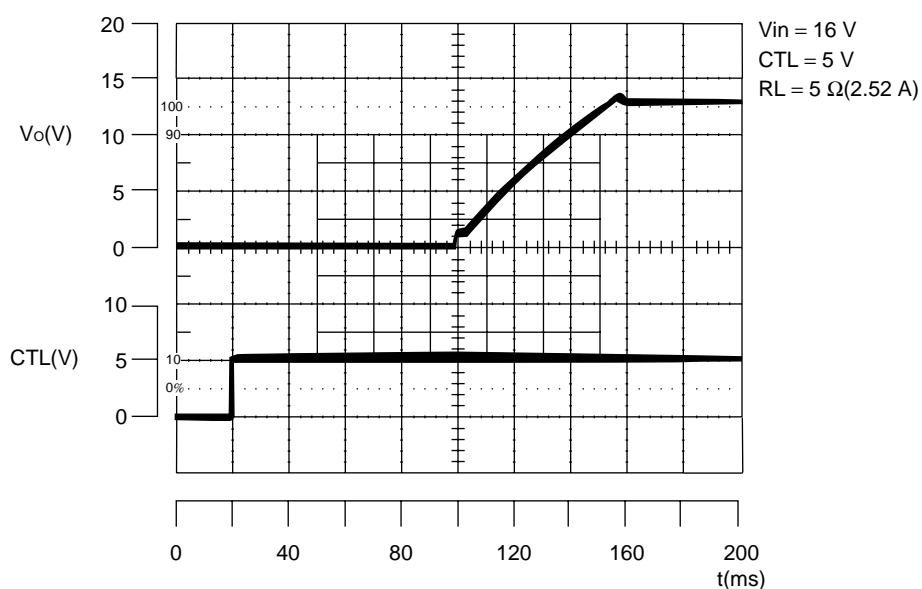


# MB3832A

## ■ REFERENCE DATA



## Soft start operation waveforms



## ■ USAGE PRECAUTIONS

1. Printed circuit board ground lines should be set up with consideration for common impedance.
2. Take appropriate static electricity measures.
  - Containers for semiconductor materials should have anti-static protection or be made of conductive material.
  - After mounting, printed circuit boards should be stored and shipped in conductive bags or containers.
  - Work platforms, tools, and instruments should be properly grounded.
  - Working personnel should be grounded with resistance of 250 kΩ to 1 mΩ between body and ground.

## ■ ORDERING INFORMATION

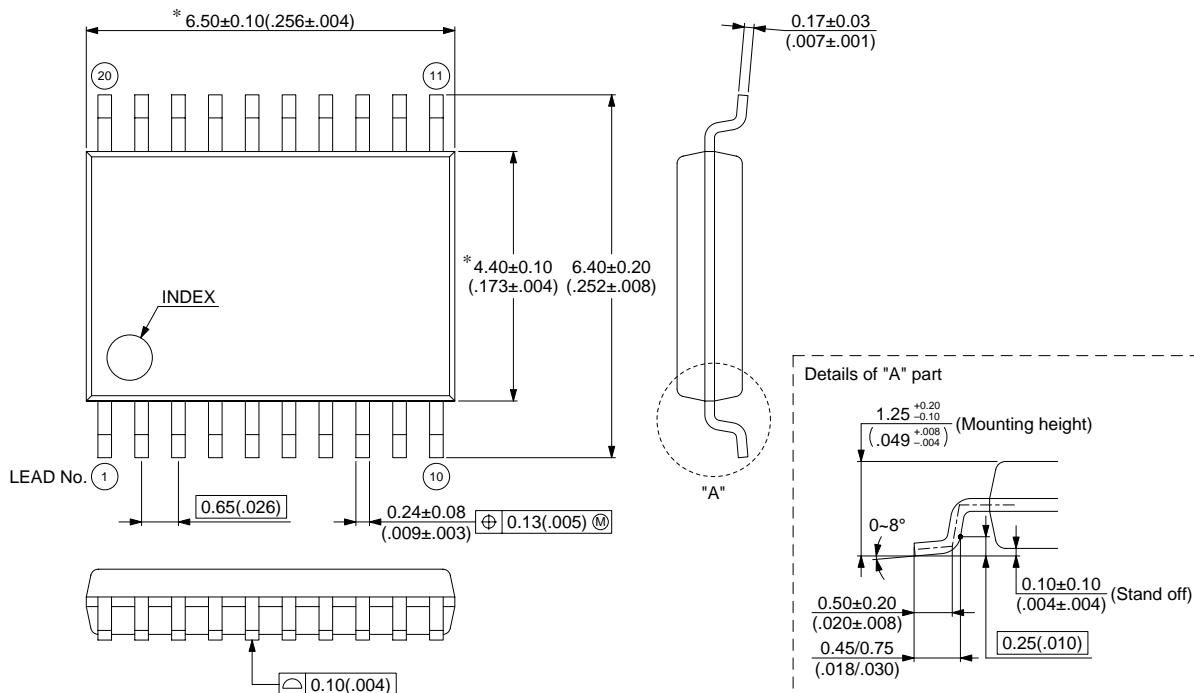
Part number	Package	Remarks
MB3832APFV	20-pin Plastic SSOP (FPT-20P-M03)	

# MB3832A

## ■ PACKAGE DIMENSION

20-pin Plastic SSOP  
(FPT-20P-M03)

\*: These dimensions do not include resin protrusion.



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Dimensions in mm (inches)

