

## HIGH PRECISION DC/DC CONVERTER CONTROL IC

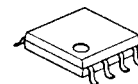
### ■GENERAL DESCRIPTION

**NJM2340** is a high precision DC/DC converter control IC with current sense amplifier.

It uses a low side current sensing which reduces external components and improves accuracy.

It is applicable for a wide range of application since it features high operating voltage and small outline packages.

### ■PACKAGE OUTLINE



**NJM2340M**

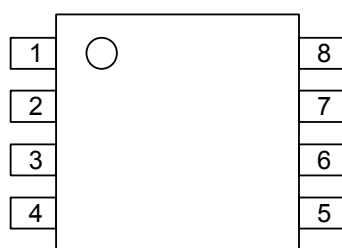


**NJM2340RB1**

### ■FEATURES

- PWM switching control
- Operating Voltage (3.6 to 32V)
- Wide Oscillator Range (20kHz to 500 kHz)
- Duty Cycle (0% to 100%)
- Current Sensing Amplifier
- High Precision Reference Voltage Voltage Detect:  $1V \pm 1.5\%$   
Current Detect:  $150mV \pm 4\%$
- Bipolar Technology
- Package Outline DMP8, TVSP8

### ■PIN CONFIGURATION



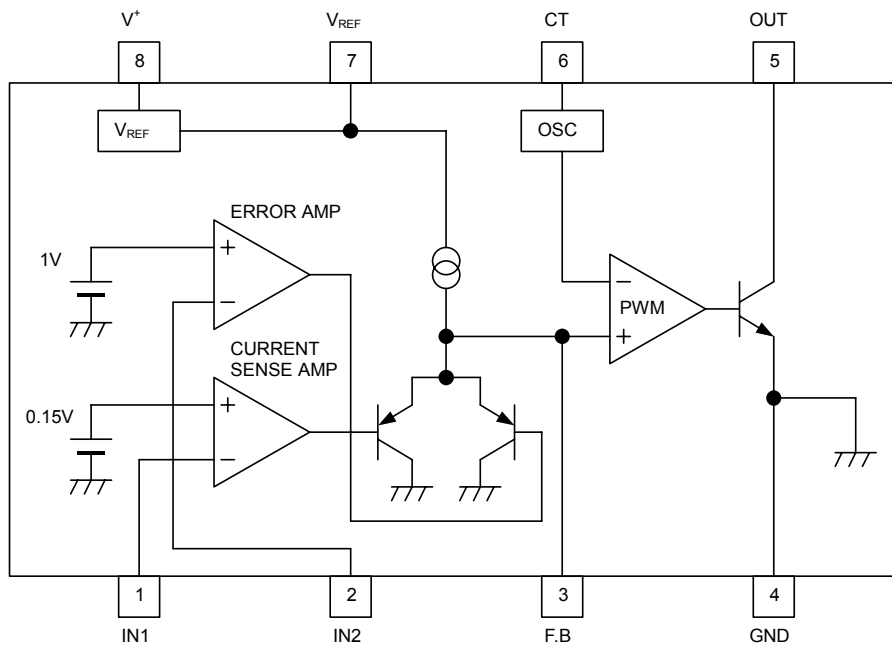
**NJM2340M**  
**NJM2340RB1**

#### Pin Function

- 1.IN1
- 2.IN2
- 3.F.B
- 4.GND
- 5.OUT
- 6.CT
- 7.V<sub>REF</sub>
- 8.V<sup>+</sup>

# NJM2340

## ■BLOCK DIAGRAM



## ■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Maximum Supply Voltage	V <sup>+</sup>	36	V
Output Sink Current	I <sub>SINK</sub>	15	mA
Power Dissipation	P <sub>D</sub>	(DMP8) 300 (TVSP8) 320	mW
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-50 ~ +150	°C

## ■RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V <sup>+</sup>	3.6	32	V
Oscillation Frequency	f <sub>osc</sub>	20	500	kHz
Oscillator Timing Resistance	R <sub>T</sub>	20	100	kΩ

## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=12V, Ta=25°C)

### REFERENCE VOLTAGE BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>REF</sub>	I <sub>OR</sub> =1mA	1.98	2.00	2.02	V
Line Regulation	L <sub>INE</sub>	V <sup>+</sup> =3.6 ~ 32V, I <sub>OR</sub> =1mA	–	4.0	20	mV
Load Regulation	L <sub>OAD</sub>	I <sub>OR</sub> =0.1 ~ 5.0mA	–	6.0	40	mV

### OSCILLATOR BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Oscillation Frequency	f <sub>OSC</sub>	R <sub>T</sub> =27kΩ, C <sub>T</sub> =220pF	315	350	385	kHz

### CURRENT SENSE AMPLIFIER BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage1	V <sub>B1</sub>		144	150	156	mV
Input Bias Voltage1	I <sub>B1</sub>		–	20	100	nA
Maximum Output Voltage1 (F.B Pin)	V <sub>OM+1</sub>	R <sub>NF</sub> =100kΩ	–	V <sub>REF</sub> -0.15	–	V
	V <sub>OM-1</sub>	R <sub>NF</sub> =100kΩ	0.6	0.75	0.9	V
Maximum Source Current1 (F.B Pin)	I <sub>OM1</sub>	V <sub>OM1</sub> =0.5V	40	85	200	μA

### ERROR AMPLIFIER BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage2	V <sub>B2</sub>		0.985	1.000	1.015	V
Input Bias Voltage2	I <sub>B2</sub>		–	20	100	nA
Maximum Output Voltage2 (F.B Pin)	V <sub>OM+2</sub>	R <sub>NF</sub> =100kΩ	–	V <sub>REF</sub> -0.15	–	V
	V <sub>OM-2</sub>	R <sub>NF</sub> =100kΩ	0.6	0.75	0.9	V
Maximum Source Current2 (F.B Pin)	I <sub>OM2</sub>	V <sub>OM2</sub> =0.5V	40	85	200	μA

### PWM COMPARETE BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Threshold Voltage (F.B Pin)	V <sub>TH0</sub>	duty·cycle=0% (note)	V <sub>OM-</sub>	1.0	1.1	V
Input Threshold Voltage (F.B Pin)	V <sub>TH100</sub>	duty·cycle=100% (note)	–	1.4	–	V

### OUTPUT BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
L Output Voltage (OUT Pin)	V <sub>OL</sub>	I <sub>SINK</sub> =10mA	–	0.5	0.7	V

### GENERAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Average Quiescent Current	I <sub>CCAV</sub>	R <sub>L</sub> =∞, duty·cycle=50%	–	1.5	2.0	mA

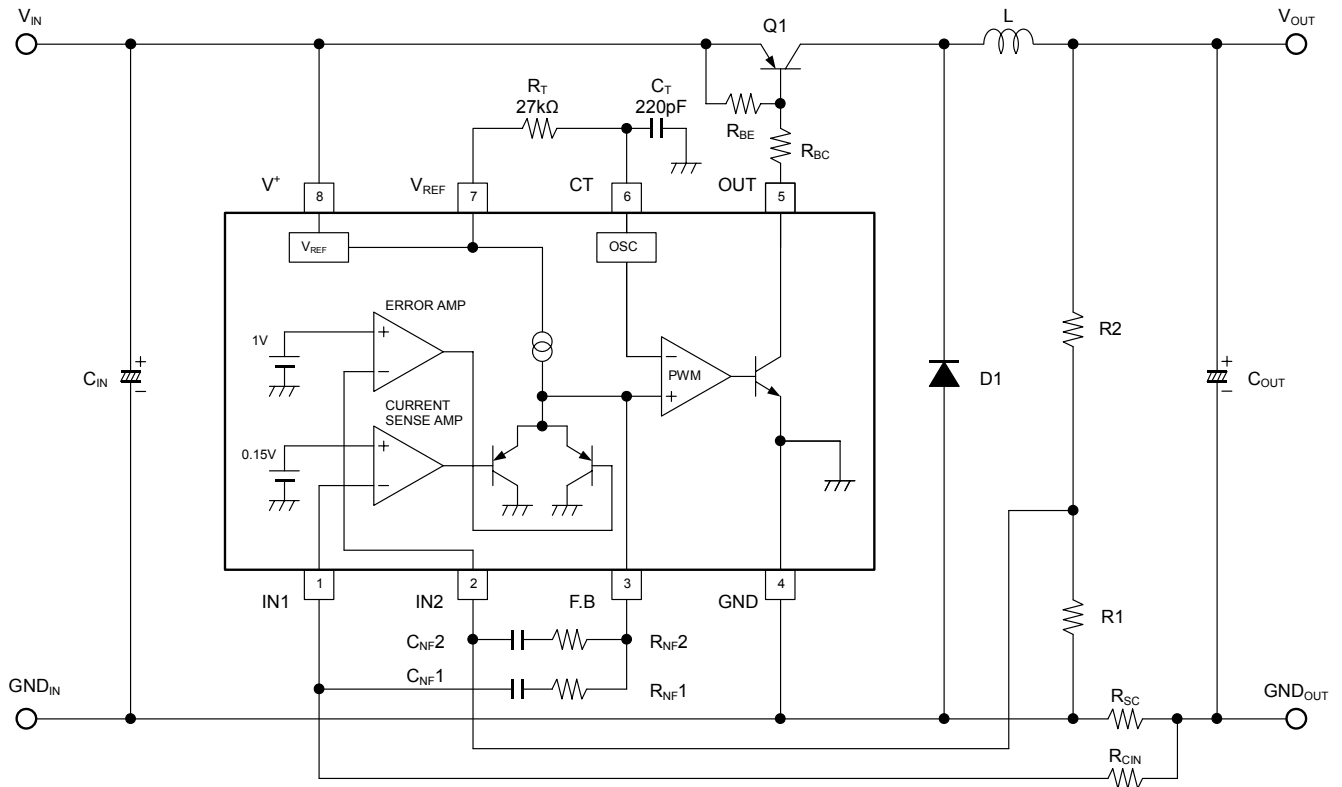
(note) Duty·Cycle is defined as follows:

Duty·Cycle=0%: IC output transistor is OFF.

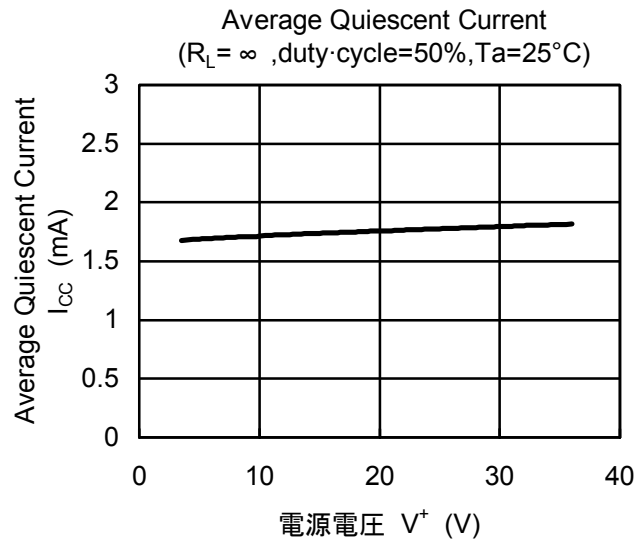
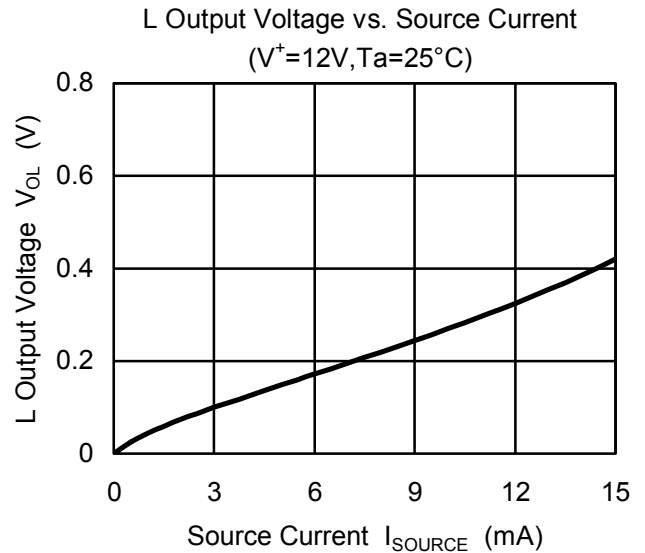
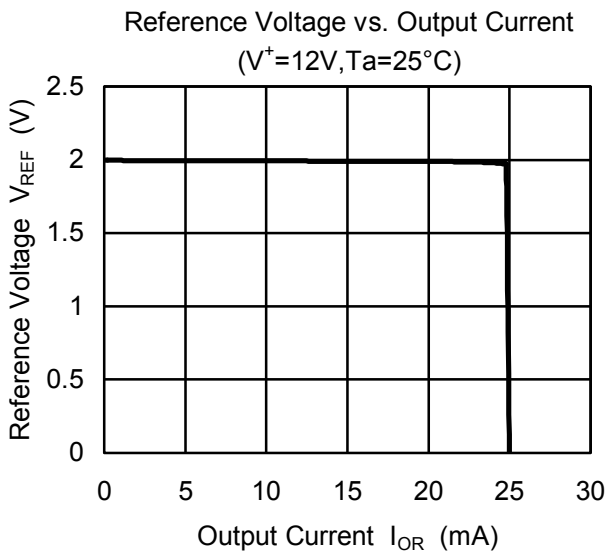
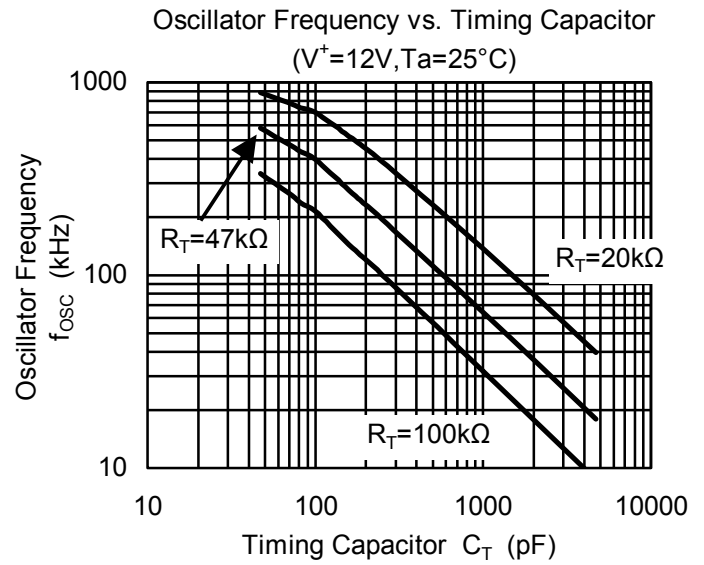
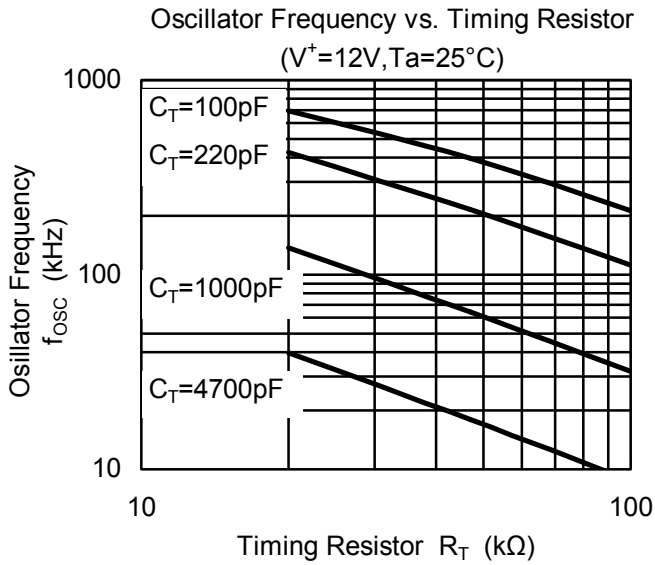
Duty·Cycle=100%: IC output transistor is ON.

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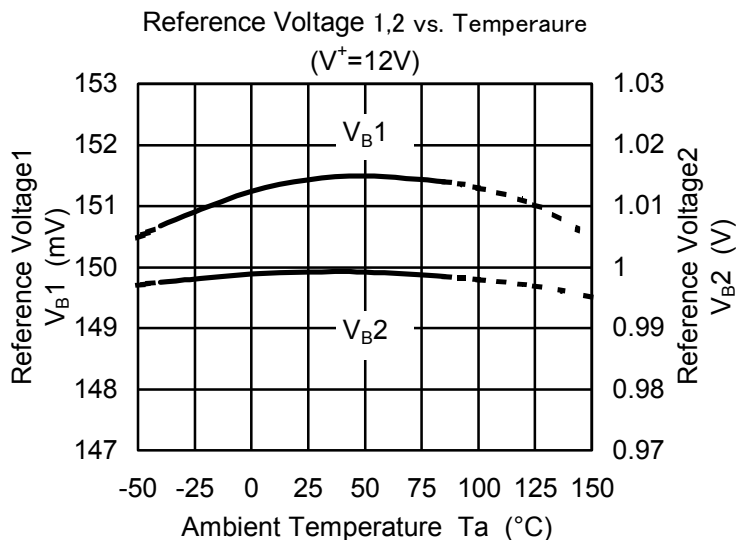
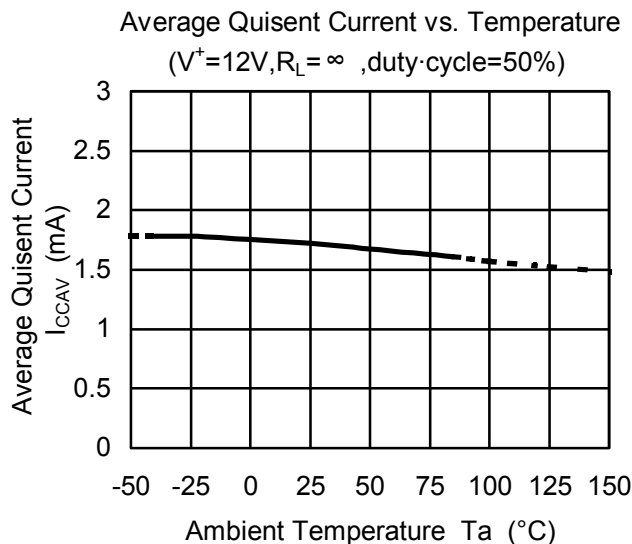
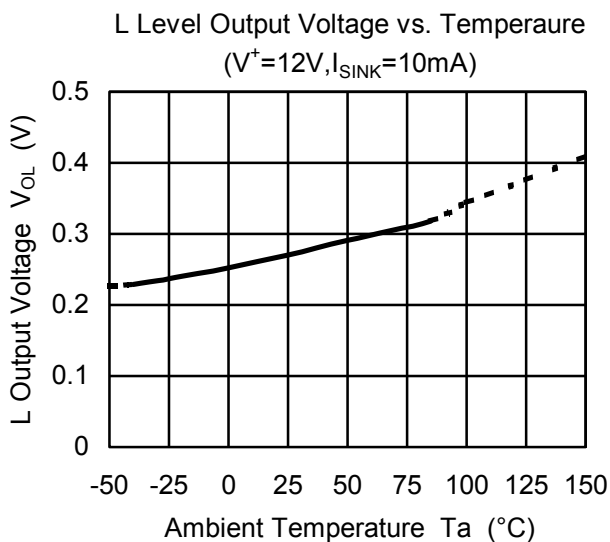
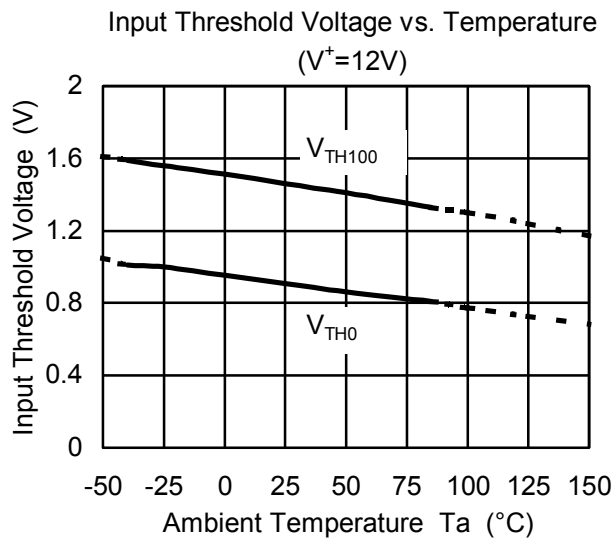
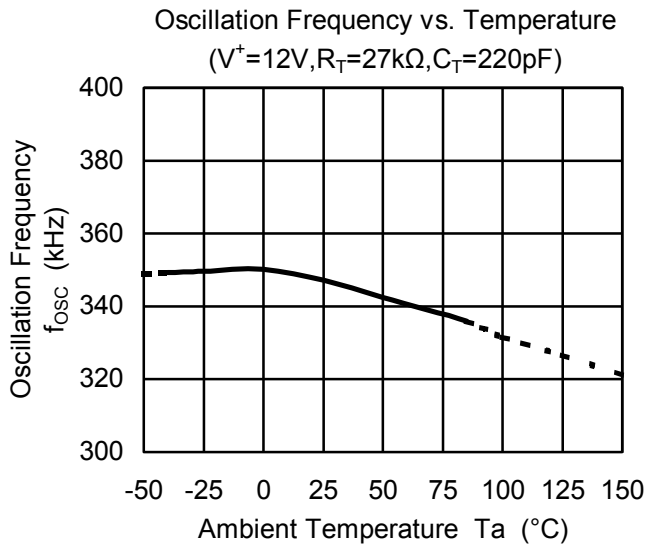
## ■ TYPICAL APPLICATION



## ■ TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



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