

## HIGH PRECISION DC/DC CONVERTER CONTROL IC

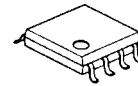
### ■GENERAL DESCRIPTION

**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**

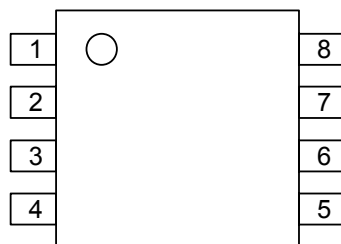


**NJM2340RB1**

### ■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**

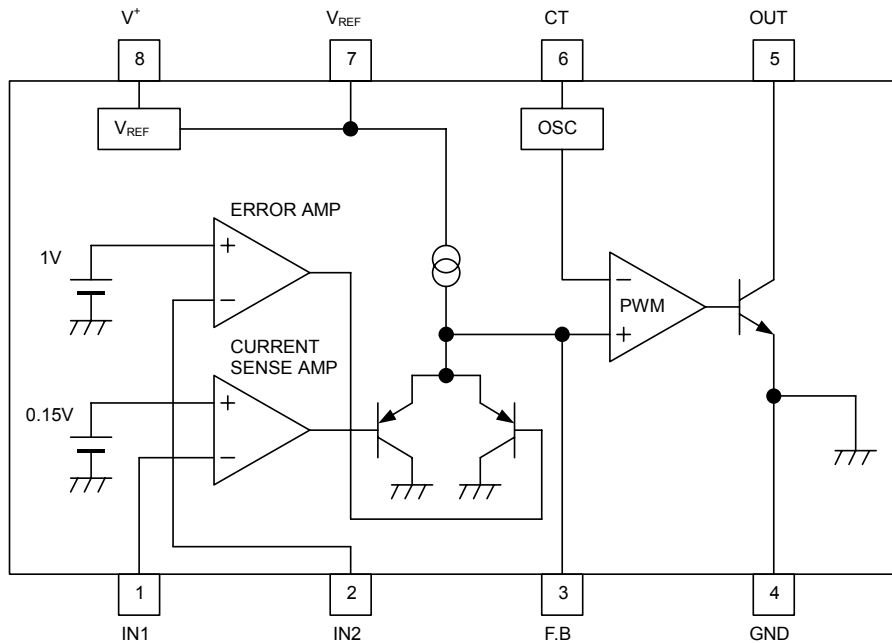
#### Pin Function

- 1.IN1
- 2.IN2
- 3.F.B
- 4.GND
- 5.OUT
- 6.CT
- 7. $V_{REF}$
- 8. $V^+$

# NJM2340

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## ■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	fosc	20	500	kHz
Oscillator Timing Resistance	R <sub>T</sub>	20	100	kΩ

■ ELECTRICAL CHARACTERISTICS ( $V^+=12V, T_a=25^\circ C$ )

REFERENCE VOLTAGE BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{REF}$	$I_{OR}=1mA$	1.98	2.00	2.02	V
Line Regulation	$L_{INE}$	$V^+=3.6 \sim 32V, I_{OR}=1mA$	–	4.0	20	mV
Load Regulation	$L_{OAD}$	$I_{OR}=0.1 \sim 5.0mA$	–	6.0	40	mV

OSCILLATOR BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Oscillation Frequency	$f_{OSC}$	$R_T=27k\Omega, C_T=220pF$	315	350	385	kHz

CURRENT SENSE AMPLIFIER BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage1	$V_{B1}$		144	150	156	mV
Input Bias Voltage1	$I_{B1}$		–	20	100	nA
Maximum Output Voltage1 (F.B Pin)	$V_{OM+1}$	$R_{NF}=100k\Omega$	–	$V_{REF}$ -0.15	–	V
	$V_{OM-1}$	$R_{NF}=100k\Omega$	0.6	0.75	0.9	V
Maximum Source Current1 (F.B Pin)	$I_{OM1}$	$V_{OM1}=0.5V$	40	85	200	$\mu A$

ERROR AMPLIFIER BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage2	$V_{B2}$		0.985	1.000	1.015	V
Input Bias Voltage2	$I_{B2}$		–	20	100	nA
Maximum Output Voltage2 (F.B Pin)	$V_{OM+2}$	$R_{NF}=100k\Omega$	–	$V_{REF}$ -0.15	–	V
	$V_{OM-2}$	$R_{NF}=100k\Omega$	0.6	0.75	0.9	V
Maximum Source Current2 (F.B Pin)	$I_{OM2}$	$V_{OM2}=0.5V$	40	85	200	$\mu A$

PWM COMPARE BLOCK

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

OUTPUT BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
L Output Voltage (OUT Pin)	$V_{OL}$	$I_{SINK}=10mA$	–	0.5	0.7	V

GENERAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Average Quiescent Current	$I_{CCAV}$	$R_L=\infty, \text{duty}\cdot\text{cycle}=50\%$	–	1.5	2.0	mA

(note) Duty·Cycle is defined as follows:

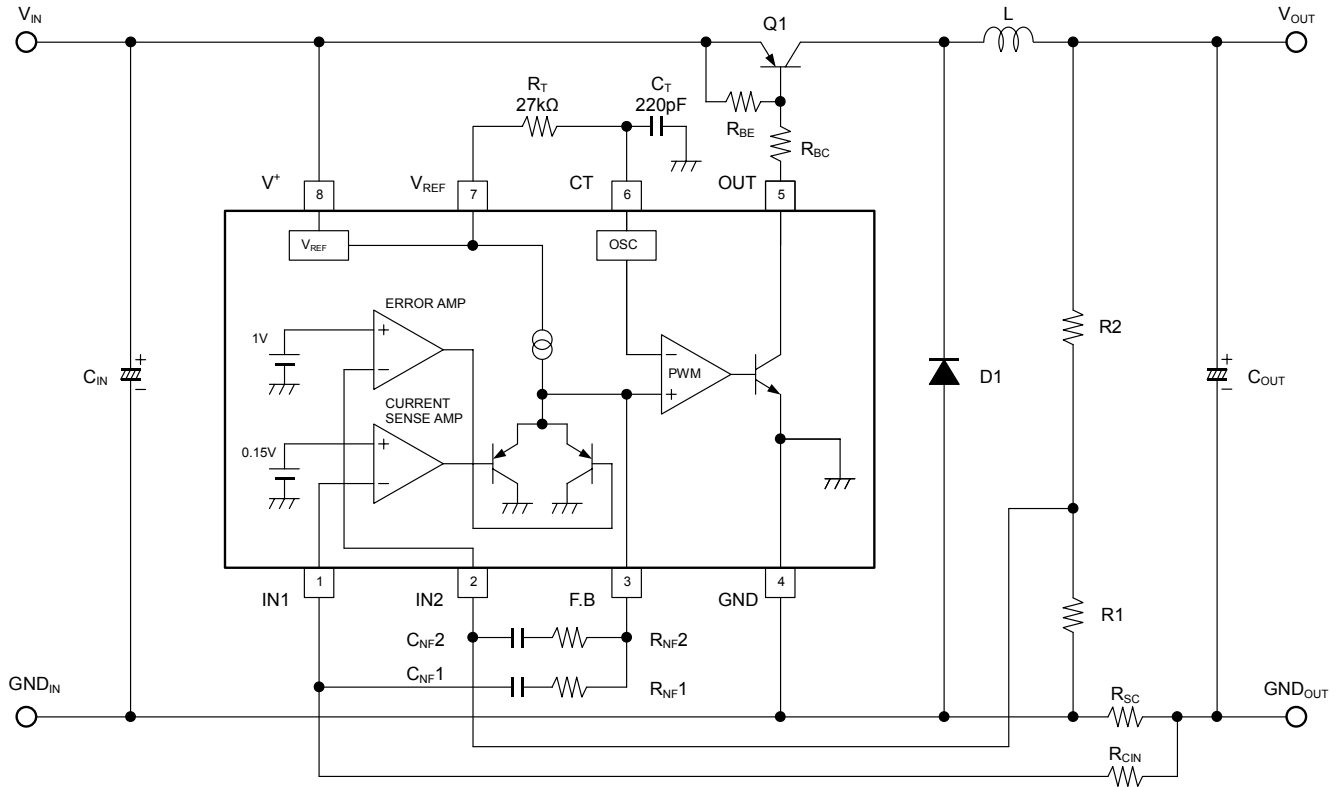
Duty·Cycle=0%: IC output transistor is OFF.

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

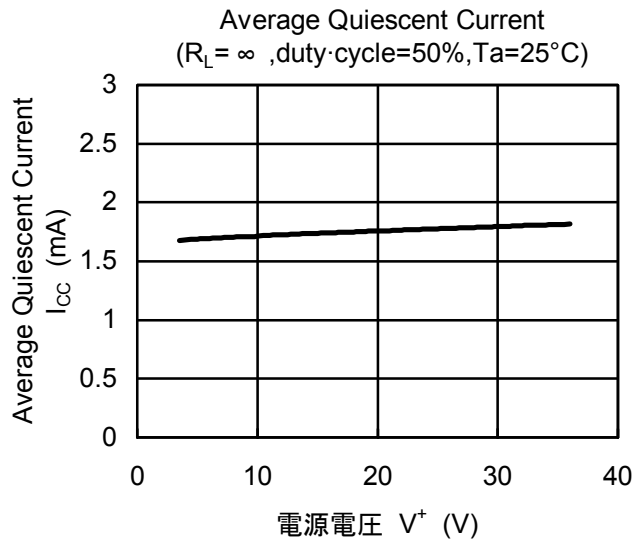
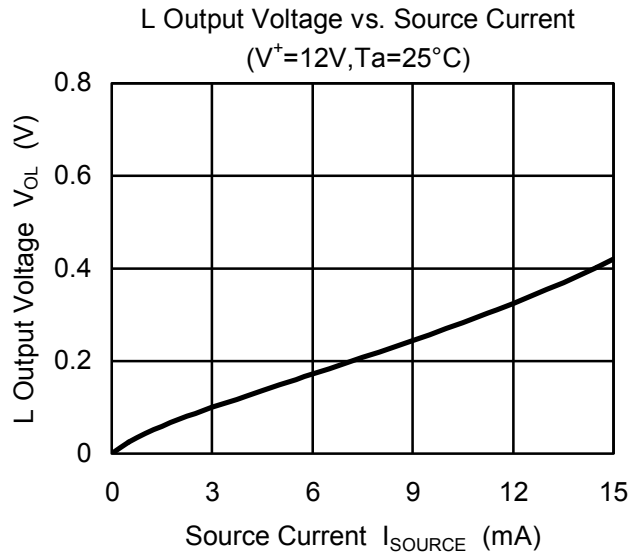
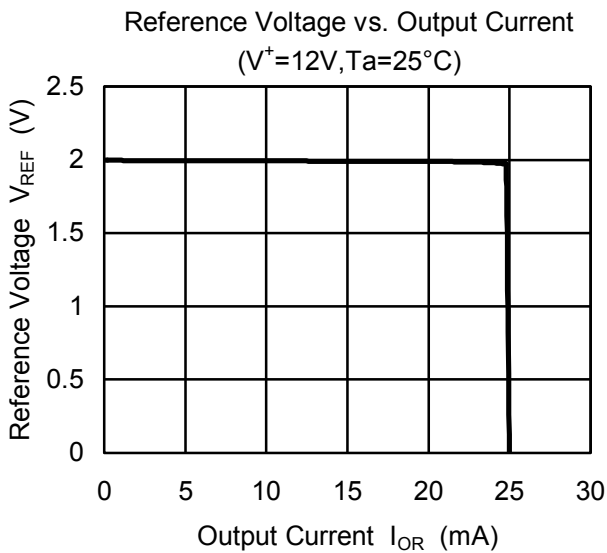
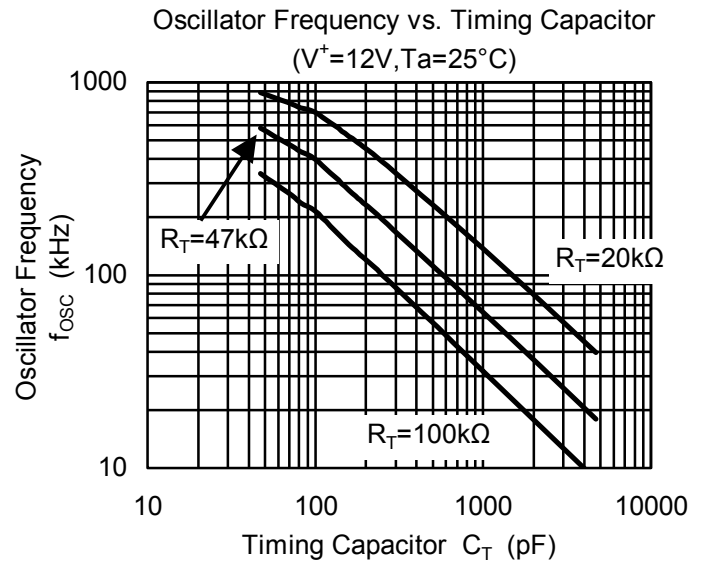
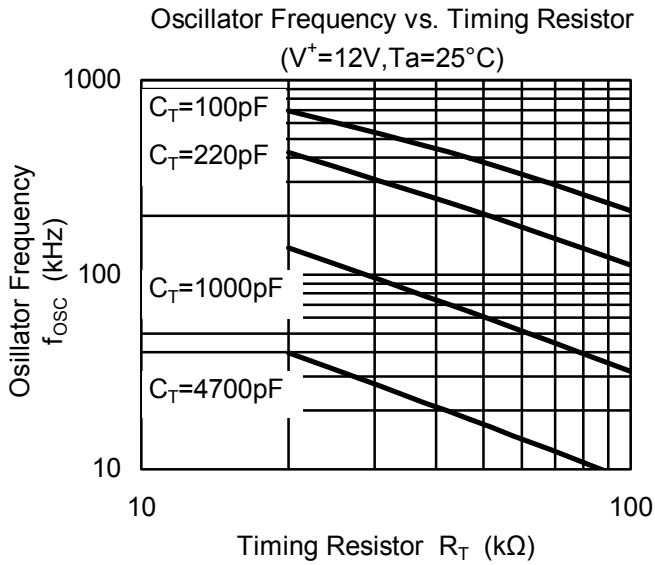
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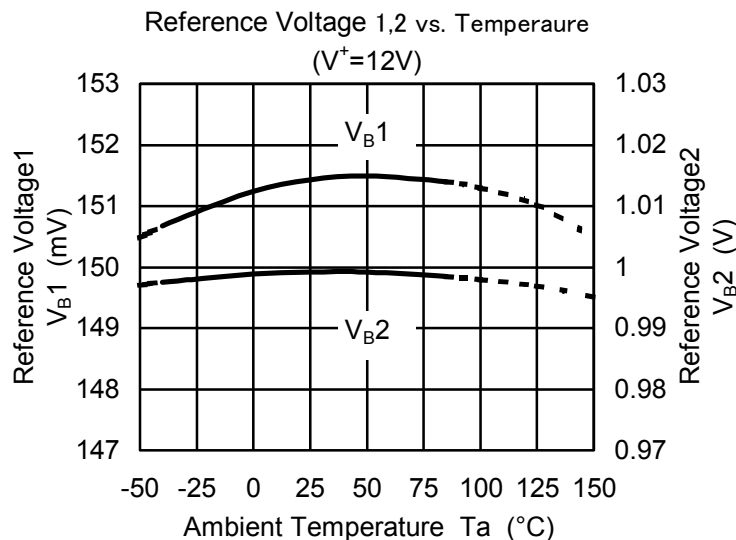
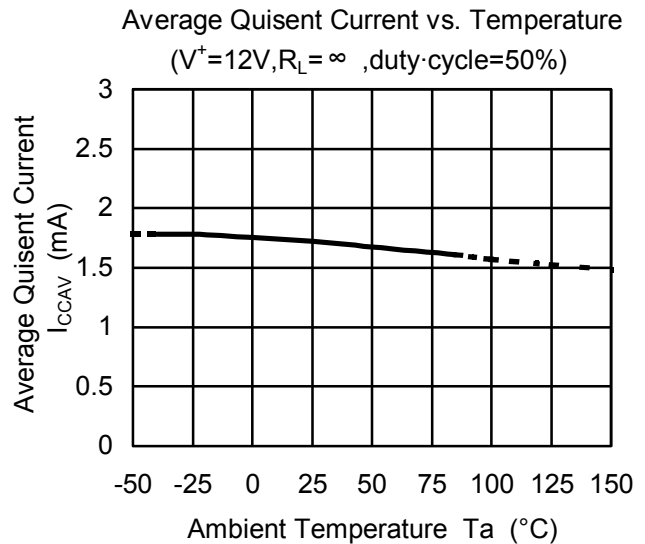
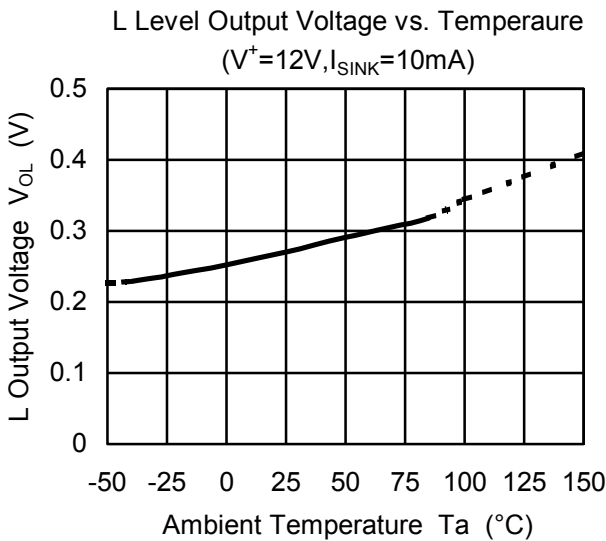
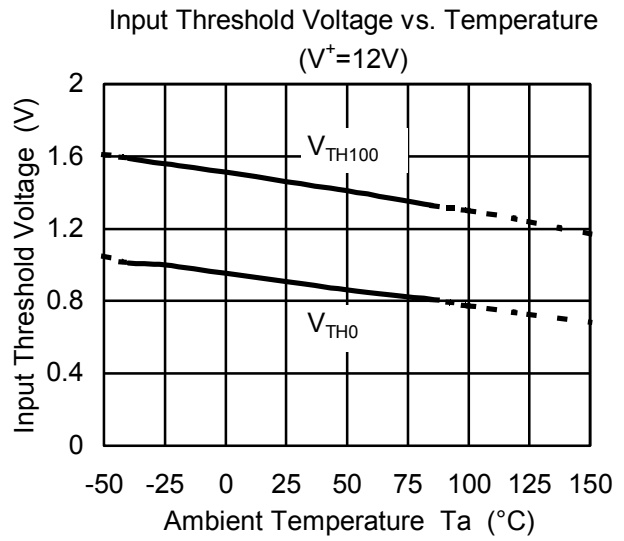
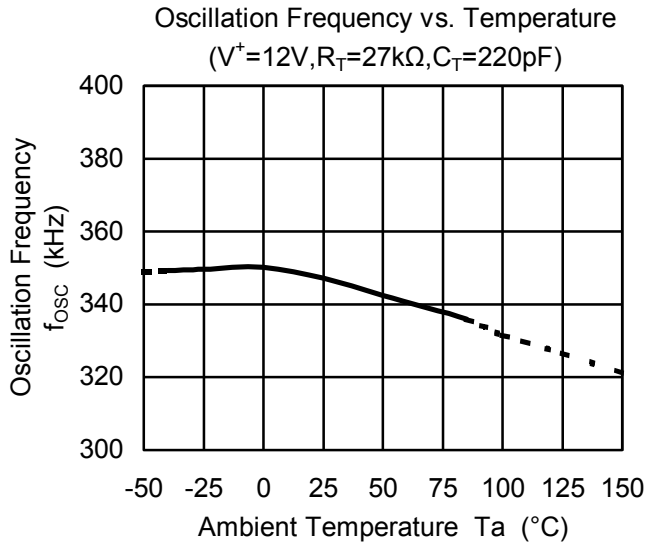
## ■ TYPICAL APPLICATION



## ■ TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



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