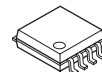


VOLTAGE AND CURRENT CONTROL IC

■GENERAL DESCRIPTION

The **NJM2346** is a battery charger IC featuring a low operating current of 250 μ A (typ.). It includes a high precision voltage reference and two operational amplifiers, which makes it well-suited for control of secondary side circuit in battery chargers and switching regulators. Further the NJM2346 has a low quiescent current of 250 μ A (typ.) which can achieve minimization of power consumption in secondary side and reduction of whole power consumption on stand-by mode. It is available in a small surface mount package of DMP8 and small, thin type of MSOP8 (TVSP8).

■PACKAGE OUTLINE



NJM2346M
(DMP8)



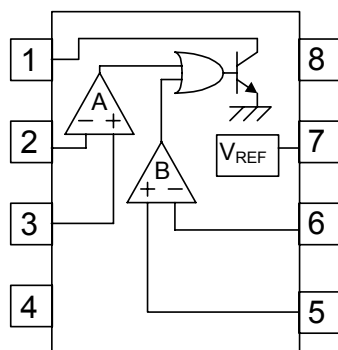
NJM2346RB1
(MSOP8 (TVSP8))

■FEATURES

- Low Quiescent Current 250 μ A typ.
- Precision AMP. $V_{IO}=0.5$ mV typ.
- Operating Voltage 2.2V to 13V
- Precision Voltage Reference 1.24V $\pm$ 1%
- PC pin Sink Current 20mA max.
- Bipolar Technology
- Package Outline DMP8, MSOP8 (TVSP8)*

*MEET JEDEC MO-187-DA / THIN TYPE

■PIN CONFIGURATION



PIN FUNCTION

1. PC
2. A -INPUT
3. A +INPUT
4. GND
5. B +INPUT
6. B -INPUT
7. V_{REF}
8. V^+

■ABSOLUTE MAXIMUM RATINGS

($T_a=25^{\circ}\text{C}$)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Supply Voltage	V^+	14	V
Differential Input Voltage	V_{ID}	(Ach) 14 (Bch) 14	V
Common Mode Input Voltage	V_{IC}	(Ach) -0.3 to 14 (note) (Bch) -0.3 to 14 (note)	V
PC Terminal Current	I_{PC}	20	mA
Power Dissipation	P_D	(DMP 8) 300 (MSOP8 (TVSP8)) 320	mW
Operating Temperature Range	T_{OPR}	-40 to +85	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150	$^{\circ}\text{C}$

(note) When the supply voltage is less than 14V,
the absolute maximum input voltage is equal to the supply voltage.

■RECOMMENDED OPERATING CONDITIONS

(Ta=25°C)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Operating Voltage	Vopr	2.2 to 13	V

■ELECTRICAL CHARACTERISTICS

(V⁺=5V, Ta=25°C)

GENERAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}	I _{PC} =off	—	250	350	μA
Leakage Current	I _{PCLEAK}	V ⁺ =V _{PC} =13V	—	—	1	μA
Saturation Voltage	V _{PC(SAT)}	I _{PC} =20mA	—	0.1	0.3	V
Reference Voltage	V _{REF}	I _{REF} =0mA	1227	1240	1253	mV
Reference Voltage Load Regulation	$\frac{\Delta V_{REF}}{\Delta I_{REF}}$	I _{REF} =0mA ~ 1mA	—	—	10	mV

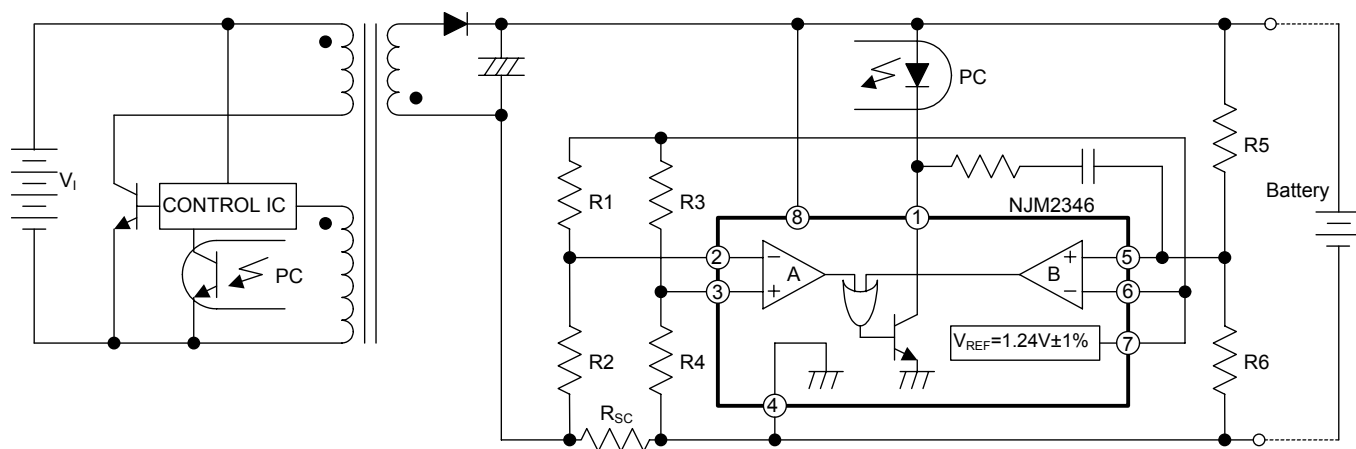
[Ach]

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}		—	0.5	2	mV
Input Offset Current	I _{IO}		—	10	50	nA
Input Bias Current	I _B		—	40	160	nA
Large Signal Voltage Gain	A _V		—	80	—	dB
Input Common Mode Voltage Range	V _{ICM}		-0.2 to 3.0	—	—	V
Common Mode Rejection Ratio	CMR		—	80	—	dB
Supply Voltage Rejection Ratio	SVR		—	80	—	dB
Slew Rate	SR		—	0.5	—	V/μA
Gain Bandwidth Product	GB	f=10kHz	—	1	—	MHz

[Bch]

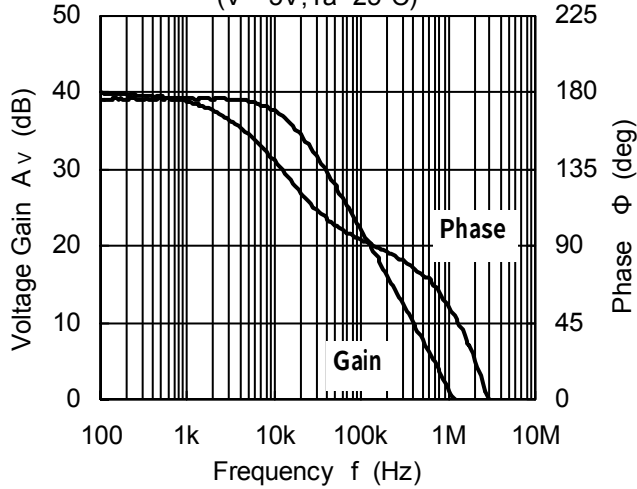
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}		—	0.5	2	mV
Input Offset Current	I _{IO}		—	10	50	nA
Input Bias Current	I _B		—	20	80	nA
Large Signal Voltage Gain	A _V		—	80	—	dB
Input Common Mode Voltage Range	V _{ICM}		0.5 to 4.0	—	—	V
Common Mode Rejection Ratio	CMR		—	80	—	dB
Supply Voltage Rejection Ratio	SVR		—	80	—	dB
Slew Rate	SR		—	0.5	—	V/μA
Gain Bandwidth Product	GB	f=10kHz	—	1	—	MHz

■ TYPICAL APPLICATIONS

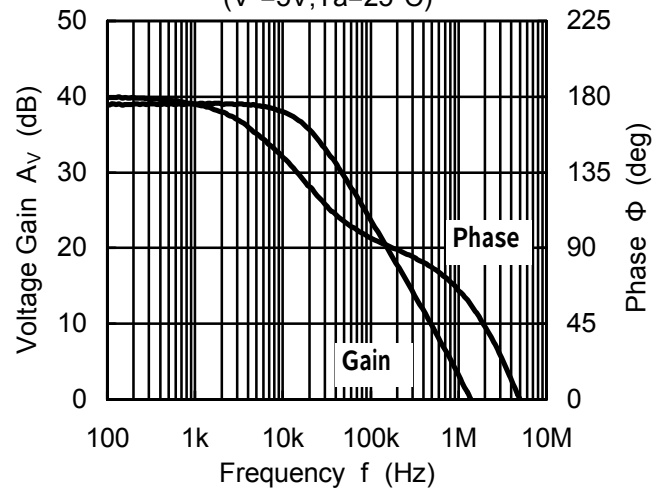


■ TYPICAL CHARACTERISTICS

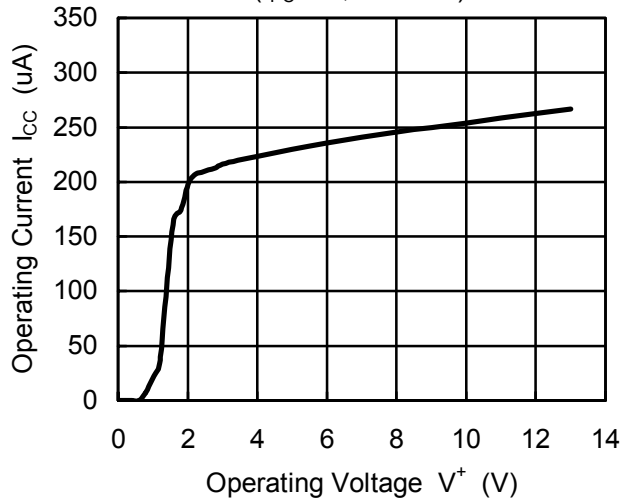
Ach Voltage Gain · Phase vs. Frequency
($V^+ = 5V, T_a = 25^\circ C$)



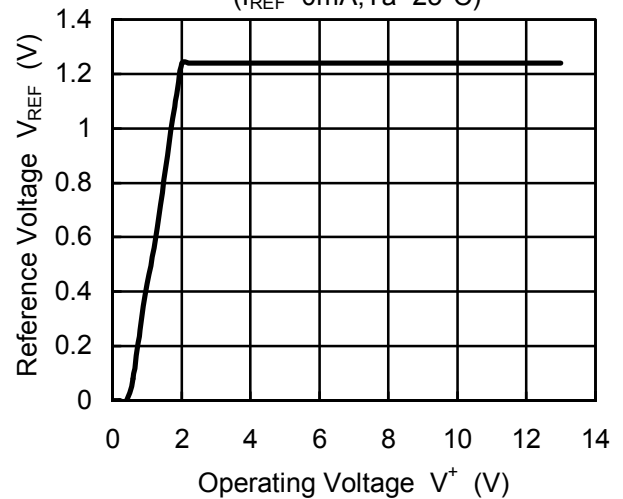
Bch Voltage Gain · Phase vs. Frequency
($V^+ = 5V, T_a = 25^\circ C$)



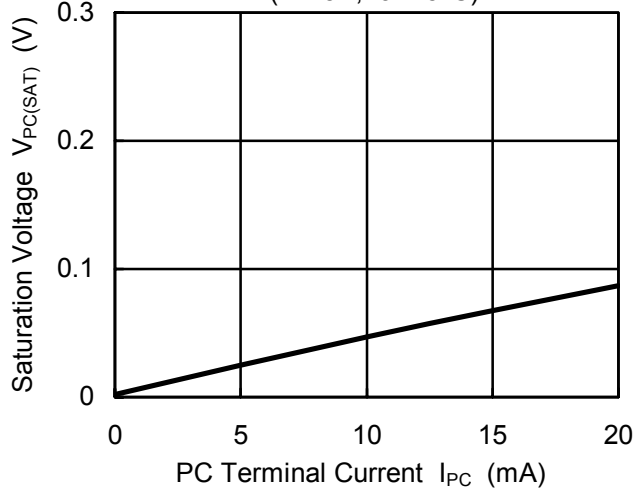
Operating Current vs. Operating Voltage
($I_{PC} = \text{off}, T_a = 25^\circ C$)



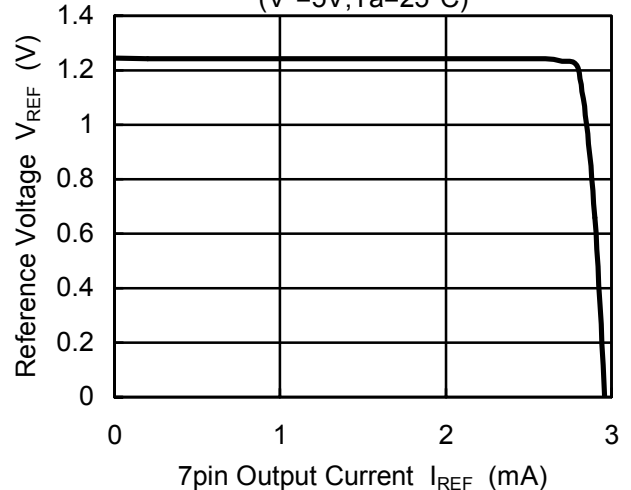
Reference Voltage vs. Operating Voltage
($I_{REF} = 0mA, T_a = 25^\circ C$)



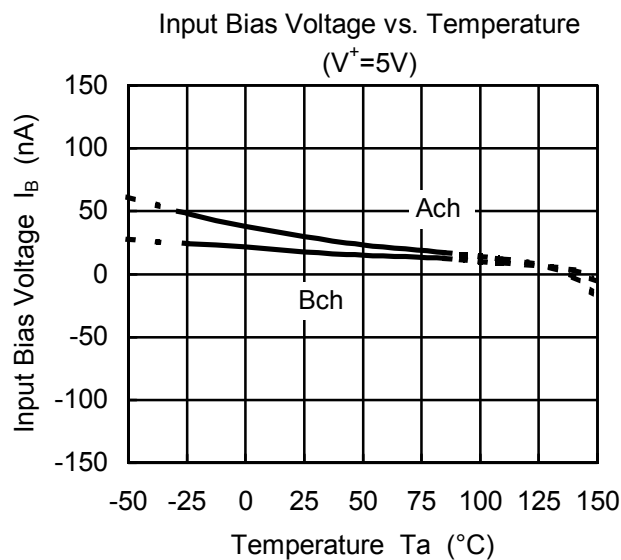
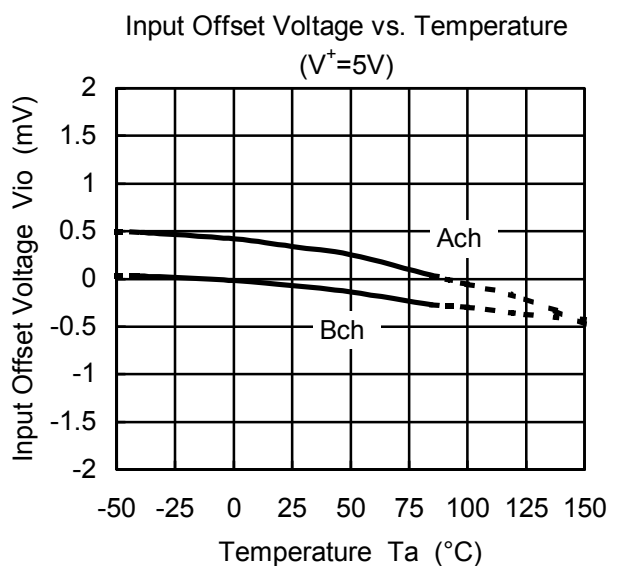
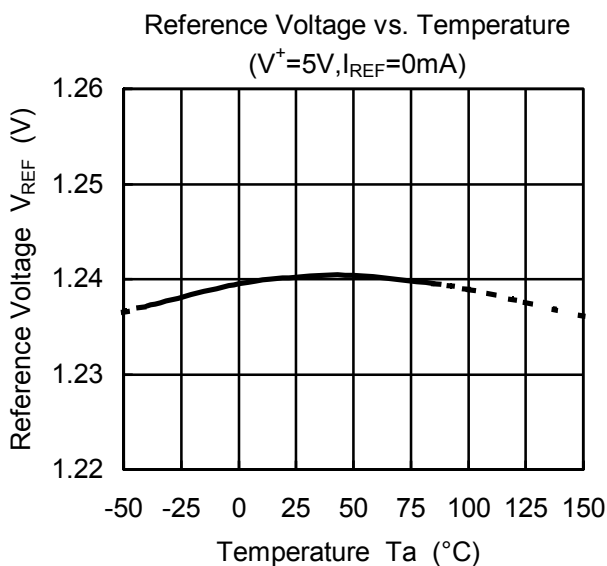
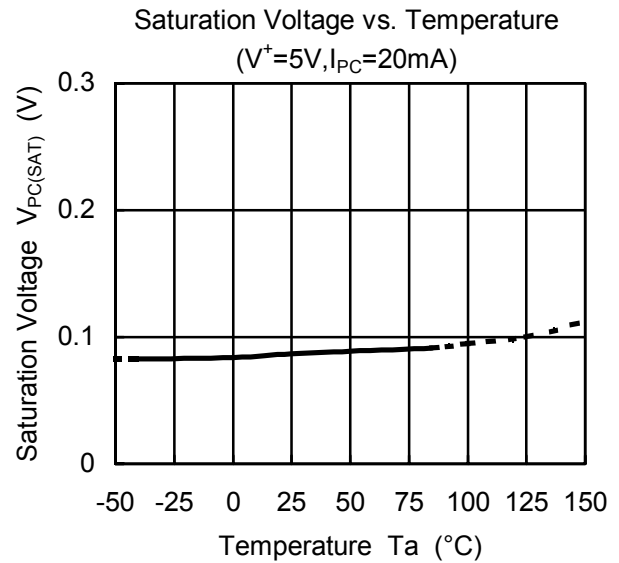
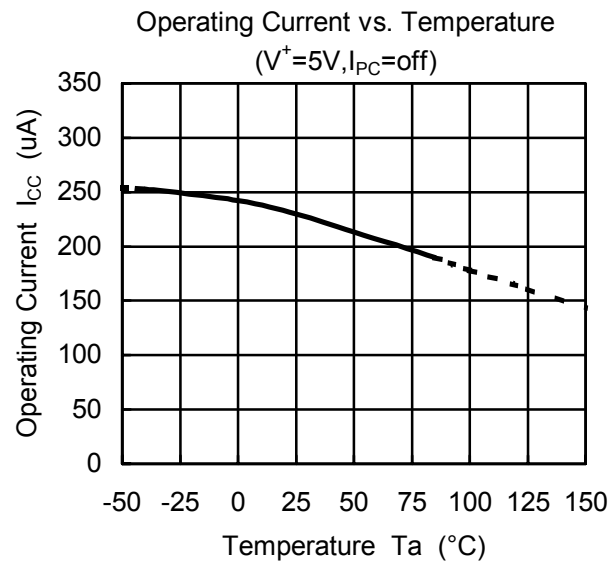
Saturation Voltage vs. PC Terminal Current
($V^+ = 5V, T_a = 25^\circ C$)



Reference Voltage vs. 7pin Output Current
($V^+ = 5V, T_a = 25^\circ C$)



■ TYPICAL CHARACTERISTICS



[CAUTION]
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