

# MAX14634

## 超低导通电阻、结构紧凑的 双向电池开关

### 概述

MAX14634双向电池开关具有反向保护功能，用于隔离电池与系统的连接。内部开关具有低至7mΩ(典型值)的超低导通电阻，输入电压范围：+2.3V至+5.5V，非常适合在高容量电池系统中用作电池开关。这款器件的摆率控制功能也非常适合较大的容性负载以及大电流负载的开关应用。

器件采用12焊球(1.3mm x 1.7mm, 0.4mm焊球间距) WLP 超小尺寸封装，纤小封装可理想用于空间受限的便携设备。器件工作在-40℃至+85℃扩展级温度范围。

### 应用

平板电脑电池开关  
 智能手机电池开关  
 电池隔离器

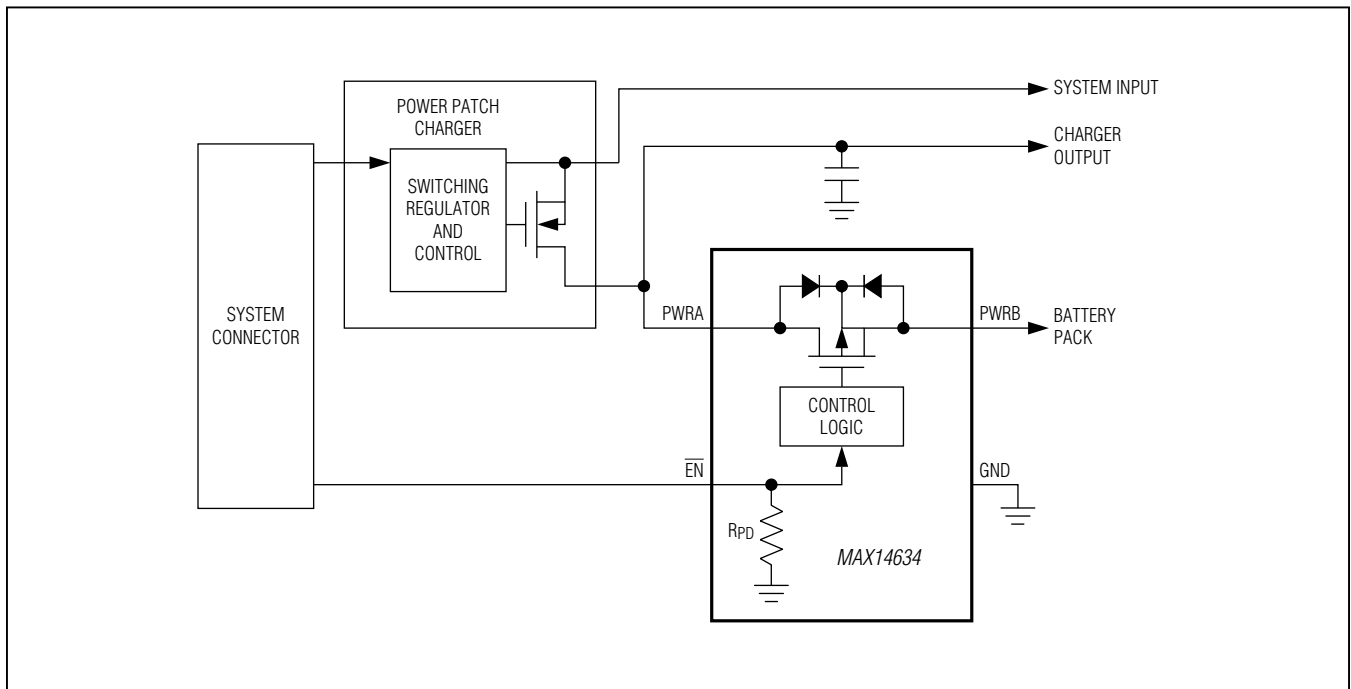
### 优势与特性

- ◆ 高效系统电池开关
  - ◇ 集成FET开关支持双向隔离
  - ◇ 7mΩ超低导通电阻(典型值)
  - ◇ 较宽的输入电压范围：+2.3V至+5.5V
  - ◇ 低静态电流
- ◆ 节省空间
  - ◇ 集成下拉和逻辑缓冲电路
  - ◇ 12焊球1.3mm x 1.7mm、0.4mm焊球间距WLP封装

**订购信息**在数据资料的最后给出。

相关型号以及配合该器件使用的推荐产品，请参见：[china.maximintegrated.com/MAX14634.related](http://china.maximintegrated.com/MAX14634.related)。

### 典型工作电路



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### ABSOLUTE MAXIMUM RATINGS

(All voltages referenced to GND.)

PWRA, PWRB,  $\overline{EN}$  ..... -0.3V to +6V  
Current into PWRA, PWRB .....  $\pm 5A$   
Continuous Power Dissipation ( $T_A = +70^\circ C$ )  
WLP (derate 13.7mW/ $^\circ C$  above +70 $^\circ C$ )..... 1096mW

Operating Temperature Range ..... -40 $^\circ C$  to +85 $^\circ C$   
Maximum Junction Temperature..... +150 $^\circ C$   
Storage Temperature Range..... -65 $^\circ C$  to +150 $^\circ C$   
Soldering Temperature (reflow) ..... +260 $^\circ C$

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### PACKAGE THERMAL CHARACTERISTICS (Note 1)

WLP

Junction-to-Ambient Thermal Resistance ( $\theta_{JA}$ ) ..... 73 $^\circ C/W$

**Note 1:** Package thermal resistances were obtained using the method described in JEDEC specification JESD51-7, using a four-layer board. For detailed information on package thermal considerations, refer to [china.maximintegrated.com/thermal-tutorial](http://china.maximintegrated.com/thermal-tutorial).

### ELECTRICAL CHARACTERISTICS

( $V_{PWRA}, V_{PWRB} = 2.3V$  to  $5.5V$ ;  $T_A = -40^\circ C$  to  $+85^\circ C$ , unless otherwise noted. Typical values are at  $V_{PWRA}, V_{PWRB} = 4.2V$ ;  $C_{PWRA}, C_{PWRB} = 0.1\mu F$ ;  $T_A = +25^\circ C$ .) (Note 2)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>SUPPLY OPERATION</b>						
Operating Voltage	$V_{PWRA}$ $V_{PWRB}$		2.3		5.5	V
Quiescent Current	$I_{PWRA}$ $I_{PWRB}$	$V_{\overline{EN}} = 0.4V$ , no load			1	$\mu A$
Transient Supply Current		$\overline{EN}$ from high to low or low to high		30		$\mu A$
Shutdown Current	$I_{SHDN}$	$V_{\overline{EN}} = 5.5V$ , ( $V_{PWRA} = 5.5V$ , $V_{PWRB} =$ open) or ( $V_{PWRB} = 5.5V$ , $V_{PWRA} =$ open)			1	$\mu A$
<b>INTERNAL FET</b>						
On-Resistance Between PWRA and PWRB	$R_{ON}$	$T_A = +25^\circ C$ , $I_{LOAD} = 100mA$	$V_{PWRA}, V_{PWRB} = 2.3V$	8	13	m $\Omega$
			$V_{PWRA}, V_{PWRB} = 3.3V$	7	10	
<b><math>\overline{EN}</math> INPUT</b>						
$\overline{EN}$ Input Logic-High Voltage	$V_{IH}$		1.6			V
$\overline{EN}$ Input Logic-Low Voltage	$V_{IL}$				0.4	V
$\overline{EN}$ Internal Pulldown Resistor	RPD			500	700	k $\Omega$
<b>DYNAMIC</b>						
Turn-On Time	$t_{ON}$	Time from $\overline{EN}$ high-to-low signal to $V_{PWRB/A} = 90\%$ of $V_{PWRA/B}$		3		ms
Turn-Off Time	$t_{OFF}$	Time from $\overline{EN}$ low-to-high signal to $V_{PWRB/A} = 10\%$ of $V_{PWRA/B}$ , $R_{LOAD} = 100\Omega$		3		ms

**Note 2:** All devices are 100% production tested at  $T_A = +25^\circ C$ . Specifications over the operating temperature range are guaranteed by design.

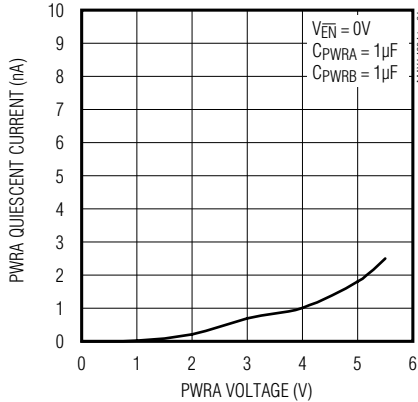
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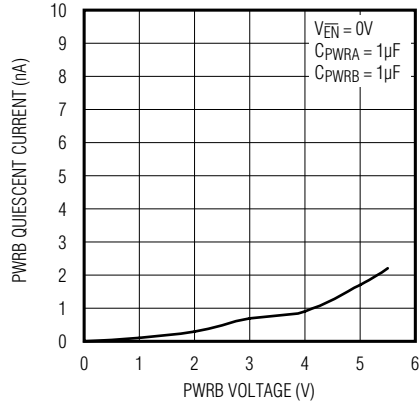
### 典型工作特性

( $T_A = +25^\circ\text{C}$ , unless otherwise noted.)

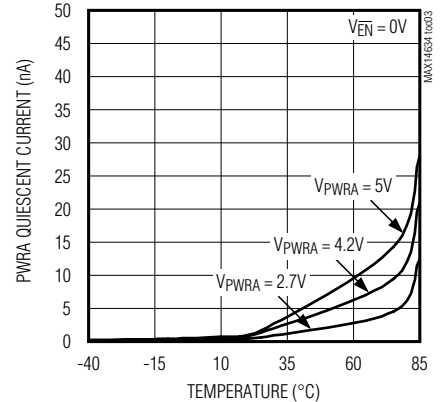
**PWRA QUIESCENT SUPPLY CURRENT vs. SUPPLY VOLTAGE**



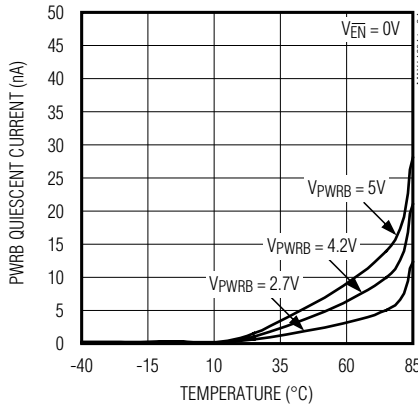
**PWRB QUIESCENT SUPPLY CURRENT vs. SUPPLY VOLTAGE**



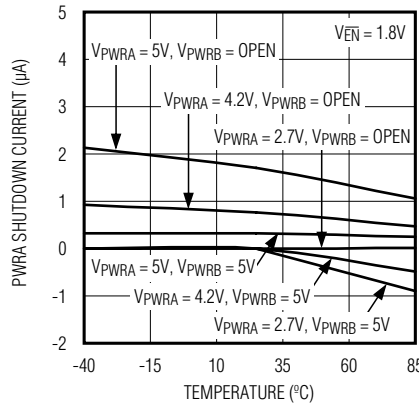
**PWRA QUIESCENT SUPPLY CURRENT vs. TEMPERATURE**



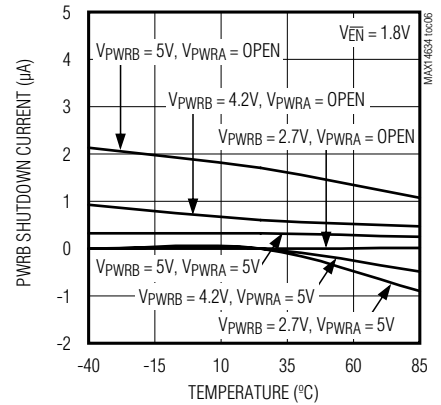
**PWRB QUIESCENT SUPPLY CURRENT vs. TEMPERATURE**



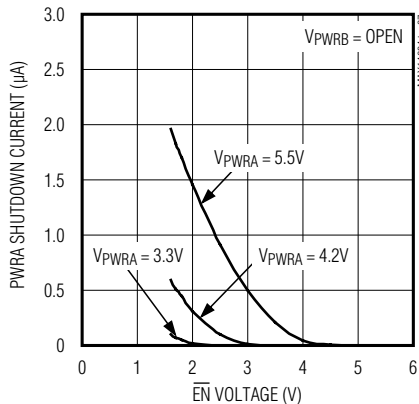
**PWRA SHUTDOWN SUPPLY CURRENT vs. TEMPERATURE**



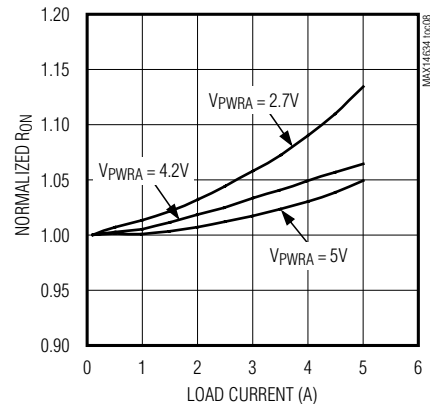
**PWRB SHUTDOWN SUPPLY CURRENT vs. TEMPERATURE**



**PWRA SHUTDOWN CURRENT vs. EN VOLTAGE**



**NORMALIZED ON-RESISTANCE vs. LOAD CURRENT**

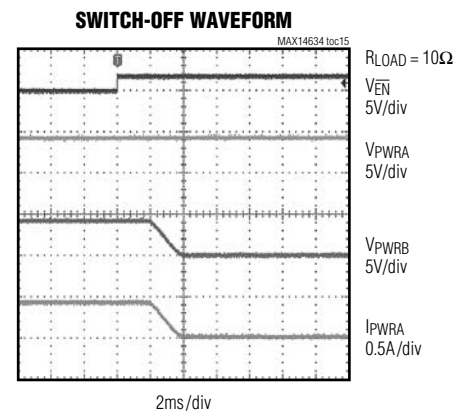
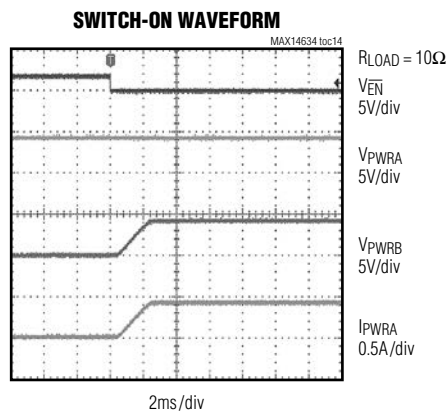
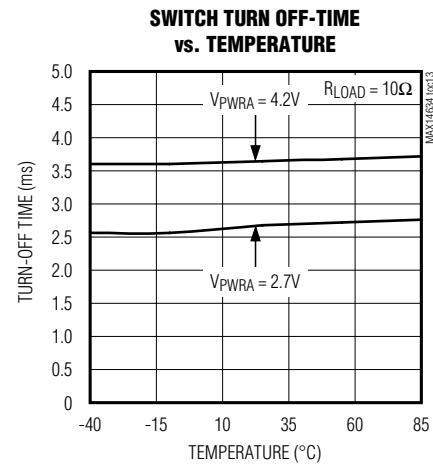
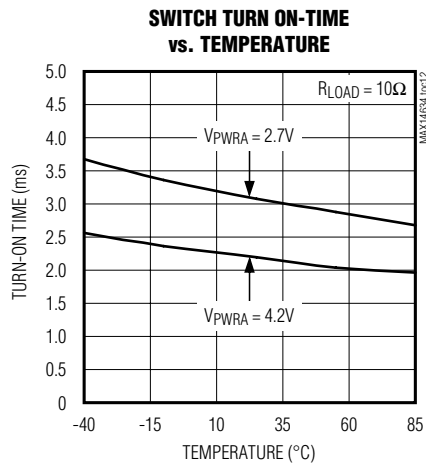
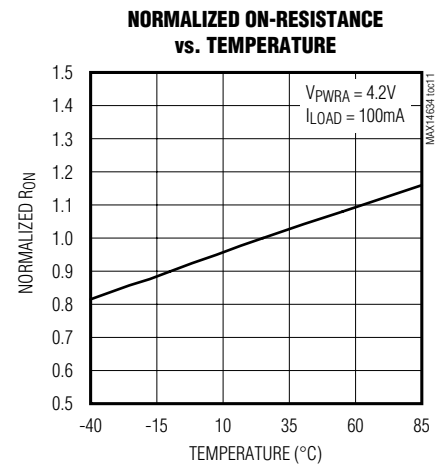
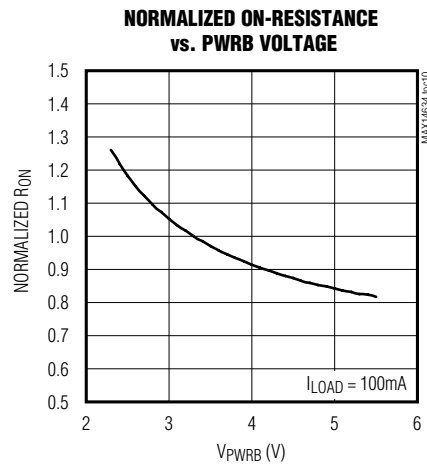
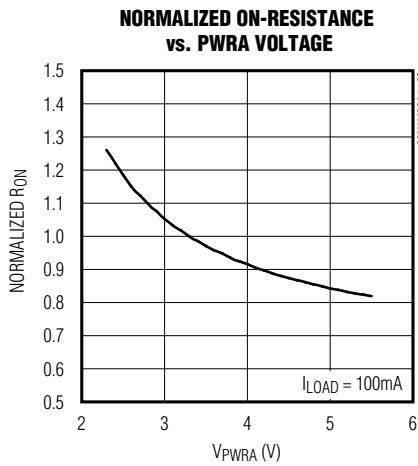


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典型工作特性(续)

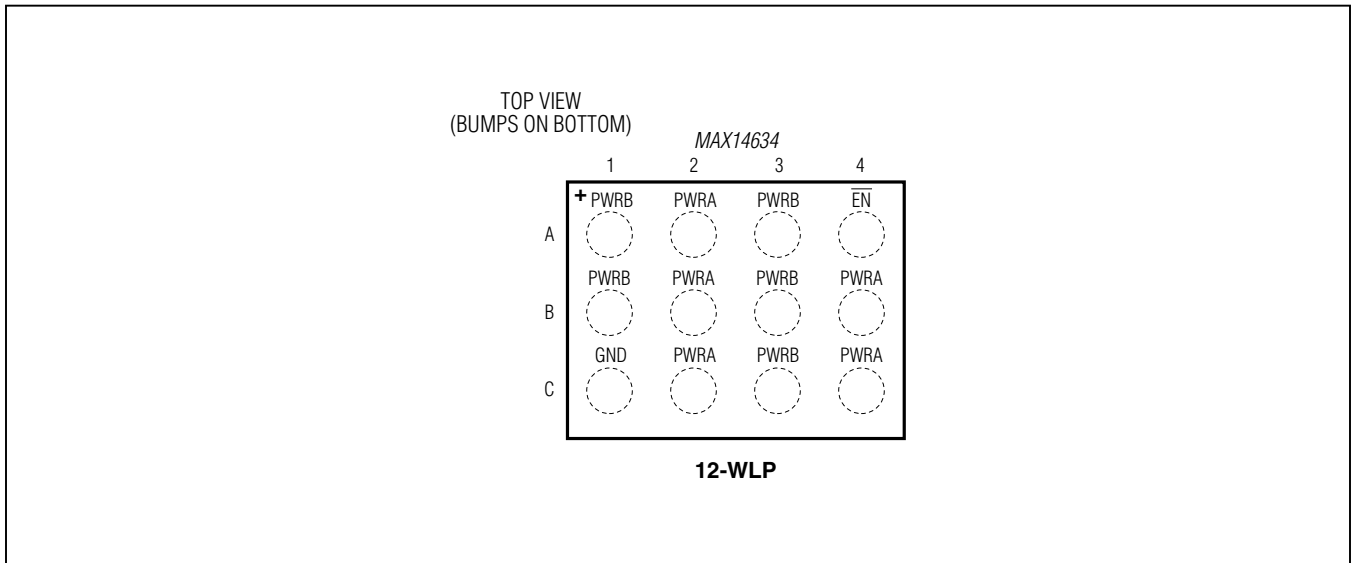
( $T_A = +25^\circ\text{C}$ , unless otherwise noted.)



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## 超低导通电阻、结构紧凑的 双向电池开关

焊球配置



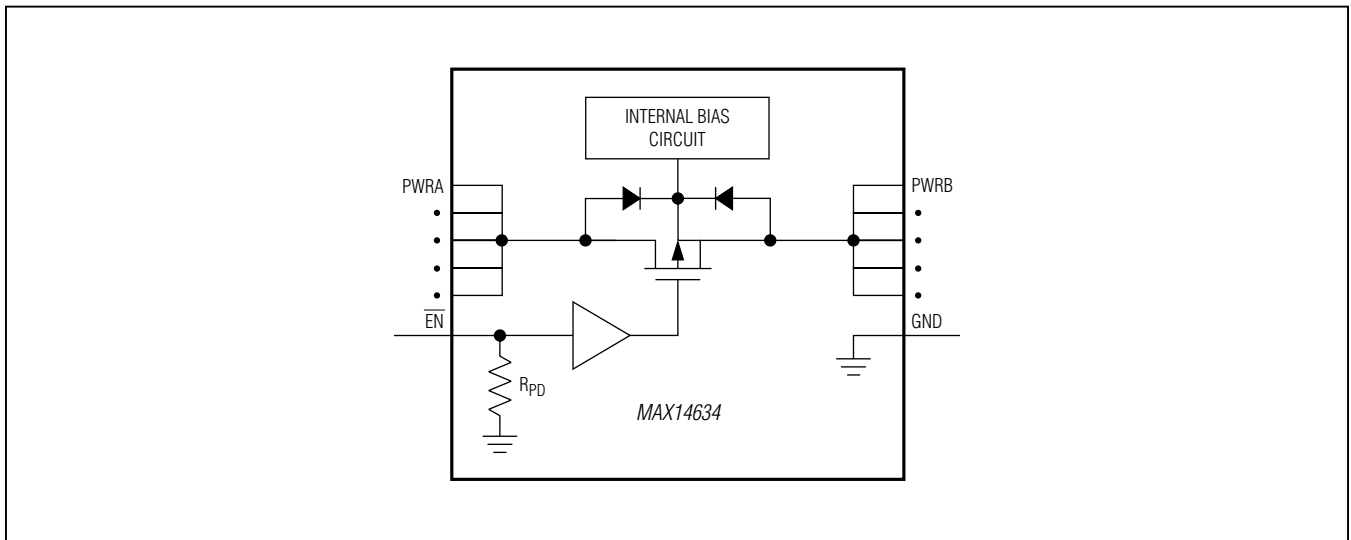
焊球说明

焊球	名称	功能
A1, A3, B1, B3, C3	PWRB	电源I/O。
A2, B2, B4, C2, C4	PWRA	电源I/O。
A4	$\overline{\text{EN}}$	低电平有效使能输入，拉低 $\overline{\text{EN}}$ 使开关导通。
C1	GND	地。

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## 超低导通电阻、结构紧凑的 双向电池开关

### 功能框图



### 详细说明

MAX14634是一款具有反向电流保护的双向开关，导通电阻仅为7mΩ (典型值)。器件具有低静态电流特性，工作在+2.3V至+5.5V输入电压范围，非常适合在高容量电池应用中用作电池开关。这款器件的摆率控制功能也非常适合较大的容性负载以及大电流负载的开关应用。

#### 反向电流保护

当开关禁用时，双向FET开关可防止电流从一个电源输入引脚流向另一电源输入引脚。

#### EN输入

开关状态由EN低电平有效逻辑输入控制。当EN为低电平时，开关导通；EN为高电平时，开关断开。R<sub>PD</sub>在内部将EN下拉接地。

### 订购信息

PART	TEMP RANGE	TOP MARK	PIN-PACKAGE
MAX14634EWC+T	-40°C to +85°C	ACO	12 WLP

+表示无铅(Pb)符合RoHS标准的封装。  
T = 卷带包装。

### 芯片信息

PROCESS: BiCMOS

### 封装信息

如需最近的封装外形信息和焊盘布局(占位面积)，请查询[china.maximintegrated.com/packages](http://china.maximintegrated.com/packages)。请注意，封装编码中的“+”、“#”或“-”仅表示RoHS状态。封装图中可能包含不同的尾缀字符，但封装图只与封装有关，与RoHS状态无关。

封装类型	封装编码	文档编号	焊盘布局编号
12 WLP	W121F1+1	<a href="#">21-0449</a>	参见 <a href="#">应用笔记1891</a>

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### 修订历史

修订号	修订日期	说明	修改页
0	5/12	最初版本。	—

### Maxim北京办事处

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**Maxim Integrated 160 Rio Robles, San Jose, CA 95134 USA 1-408-601-10 00**

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