

概述

PLC40561T是一款完整的单节锂离子电池恒定电流/恒定电压线性充电器。小型SOT23-6封装与较少的外部元件数目使得PLC40561T成为便携式应用的理想选择。PLC40561T可以适用于USB电源和适配器电源工作。器件采用了内部PMOSFET架构，加上防倒充电路，所以不需要外部隔离二极管。

PLC40561T充电电流可通过一个电阻进行外部设置。芯片内部集成热反馈模块，可对充电电流进行自动调节，以便在大功率操作或高环境温度条件下对芯片温度加以限制。当充电电流在达到最终浮充电压之后降至设定值Iterm值时，PLC40561T将自动终止充电循环。当输入电压（交流适配器或USB电源）被拿掉时，PLC40561T自动进入一个低电流状态，将电池漏电流降至1uA 以下。

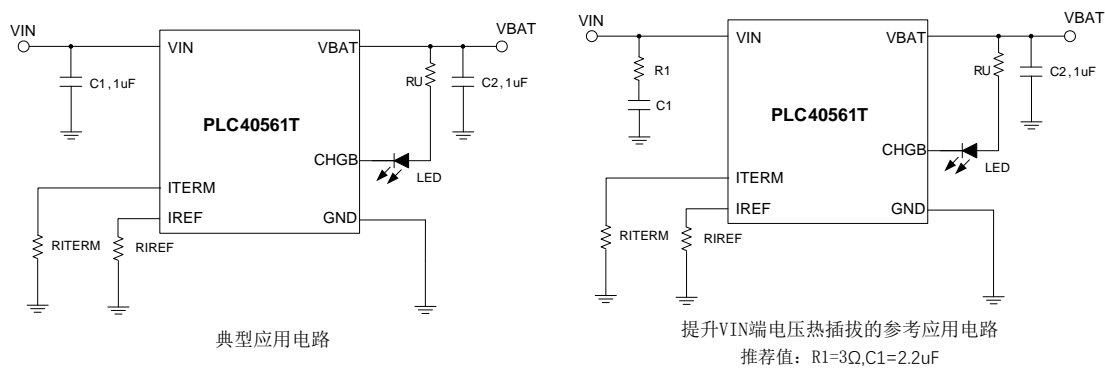


图 1 应用电路

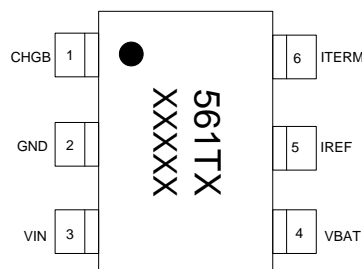


图 2 管脚定义（顶视图）

特性

- 32V最大输入耐压
- 4.5-5.5V输入电压工作范围
- 预充电电压: 精度±1%(0-85°C)
PLC40561T:4.2V
PLC40561TB:4.35V
PLC40561TC:4.4V
PLC40561TD:3.6V
- 最大可编程充电电流达800mA
- 5.9V的输入过压保护功能,精度±3%
- 无需外置MOSFET、检测电阻器或隔离二极管
- 自动再充电
- 充电电源拔出时<1uA的电池漏电
- LED电池充电状态显示
- 过温保护功能
- SOT23-6封装

应用领域

- 穿戴类产品
- 蓝牙耳机
- 数码产品
- GPS
- 便携式设备, 各种充电器

管脚定义

引脚	名称	描述
1	CHGB	连接到充电状态 LED 指示灯，开漏输出。充电时拉低，充满和待机时候悬空。
2	GND	电源地
3	VIN	USB 等充电电源输入脚
4	VBAT	电池输入脚
5	IREF	充电电流设定管脚。
6	ITERM	停充电流 I_{term} 设定管脚。

绝对最大额定值

参数	符号	数值	单位
输入电压 (VIN脚)	VIN	-0.3 ~ 32	V
CHGB输入电压 (CHGB脚)	VCHGB	-0.3 ~ 6.5	V
BAT输出电压 (BAT脚)	VBAT	-0.3 ~ 6.5	V
最大结温	T _J	150	°C
储存温度	T _{STG}	-55~150	°C

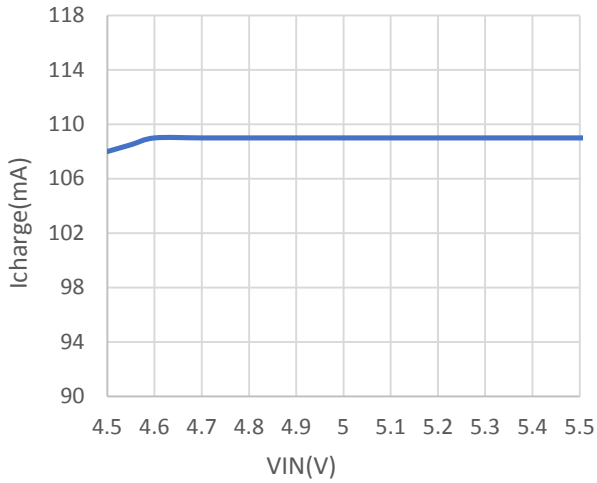
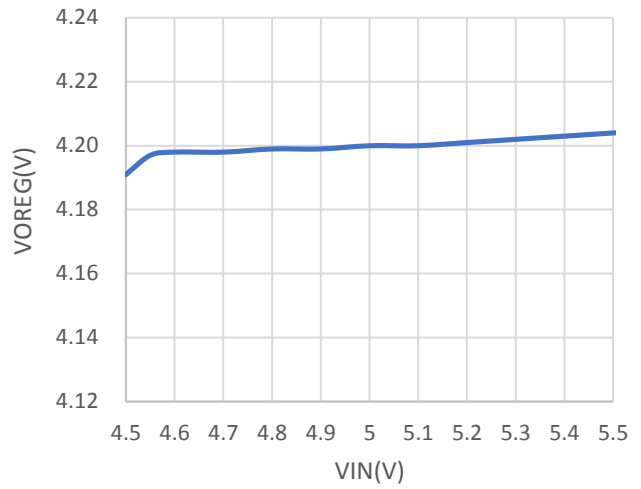
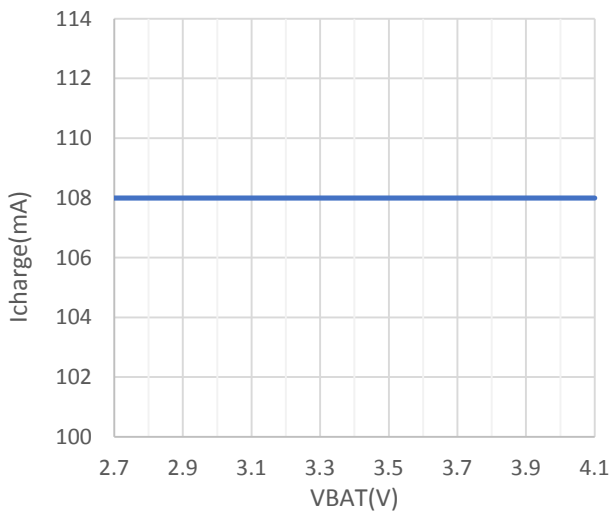
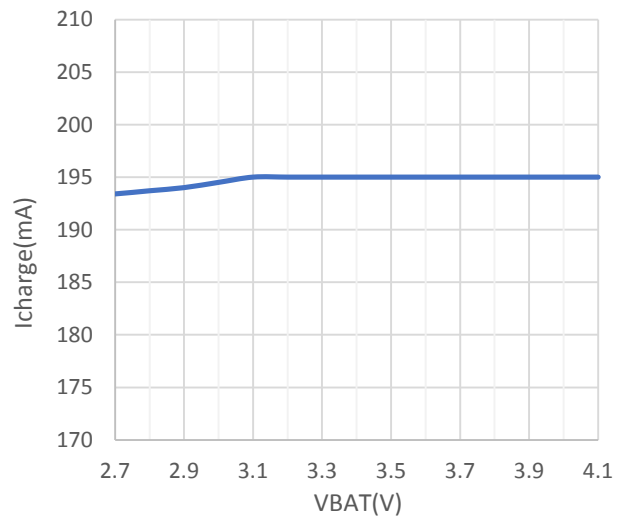
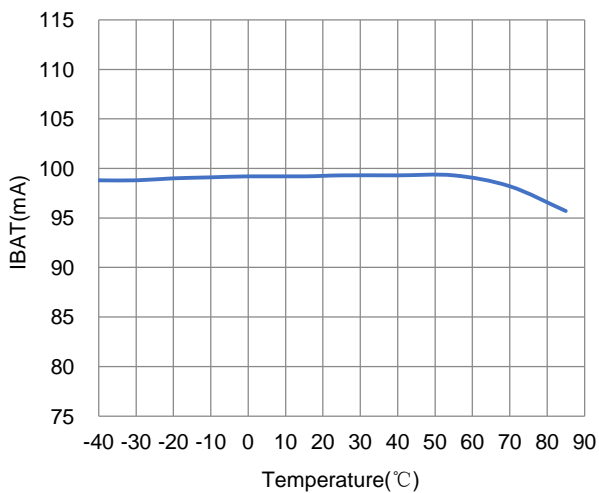
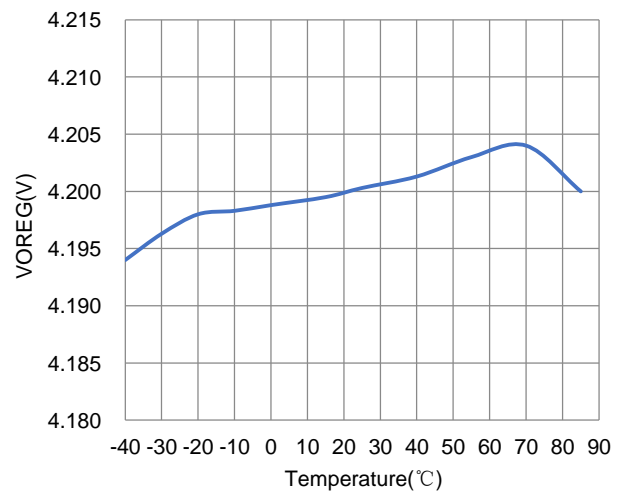
推荐工作条件

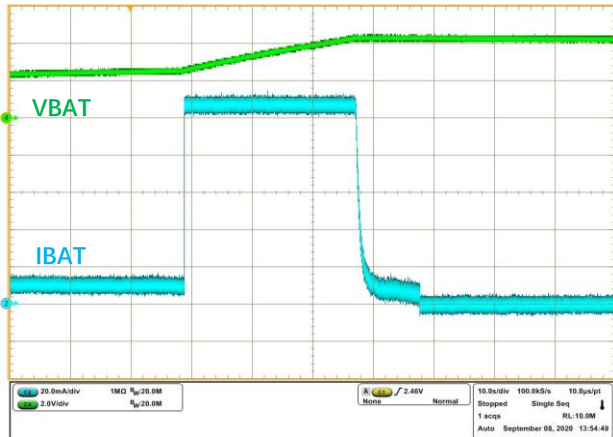
参数	符号	数值	单位
输入工作电压	V _{IN}	4.55~5.5	V
典型充电电流	I _{OUT}	500	mA
工作环境温度	T _{OPR}	-40~85	°C

电特性

(没有特殊说明, 以下数值均为VIN=5.0V, 室温TA=25°C下测试结果)

参数	符号	条件	最小值	典型值	最大值	单位
VIN (BUS) 静态电流	I _{IN}	VIN=5.0V, VBAT=4.4V		267	350	uA
		VIN=5.0V, VBAT floating		12	20	uA
Sleep 模式静态电流	I _{sleep}	VIN-VBAT < 0.1V			5	uA
OVP 静态电流	I _{DDQ1}	VIN=6.5V		83	200	uA
高压静态电流	I _{DDQ2}	VIN=32V		277	350	uA
BAT 静态电流	I _{QBAT}	VBAT=4.3V, 终止充电;			1	uA
		VBAT=4.3V, VIN floating			1	uA
VIN 工作电压范围	V _{BUS_VALID}		4.55		5.5	V
VBUS OVP	V _{OVP}		5.72	5.9	6.08	V
过压迟滞	V _{OVP_HYS}			0.2		V
目标电压	V _{OREG}	0-85 度, VOREG=4.2V 版本	4.16	4.2	4.24	V
回充迟滞	V _{RECHYS}			100		mV
预充电电流	I _{PRE-CC}			ICC/10		mA
恒流充电电流精度	I _{REF}	I _{REF} 设置为 100mA	90	100	110	mA
停充电流精度	I _{TERM}	I _{REF} 设置为 4mA	1	4	7	mA
涓流充电电压阈值	V _{WAKE}			2.55		V
涓流充电电压迟滞	V _{WAKEHYS}			40		mV
LED 指示管脚低电平导通电阻值	R _{LED}	Pin voltage=1V		1.2		kΩ
热反馈调节温度阈值	T _{FOLD}			100		°C
过温保护温度	OTP	VIN=5V, VBAT=3.8V, R _{ISNS} =10K		150		°C
过温保护温度迟滞	OTP_HYS	VIN=5V, VBAT=3.8V, R _{ISNS} =10K		20		°C

典型性能特征

 电流随 V_{IN} 变化 (R_{IREF}=18K)

 浮充电压随 V_{IN} 变化

 充电电流随 V_{BAT} 变化 (V_{IN}=5V, R_{IREF}=18K)

 充电电流随 V_{BAT} 变化 (V_{IN}=5V, R_{IREF}=10K)

 电流精度随环境温度变化 (V_{IN}=5V, R_{ISNS}=19K)

 浮充电压随环境温度变化 (V_{IN}=5V)



充电波形

功能描述

充电电流设定

充电电流采用一个连接在IREF引脚与地之间的电阻来设定的。设定电阻和充电电流采用下列公式来计算：根据需要的充电电流来确定电阻阻值，

$$I_{BAT} = \frac{1920}{R_{IREF}}$$

电阻单位：kΩ 电流单位：mA

客户应用中，可根据需求选取合适大小的R_{IREF}，R_{IREF}与充电电流的关系确定可参考下表：

R _{IREF} (kΩ)	I _{BAT} (mA)
200	9.6
43	45
18	107
10	192
3.9	492

截止电流设定

充电电流采用一个连接在ITERM引脚与地之间的电阻来设定的。设定电阻和充电电流采用下列公式来计算：根据需要的充电电流来确定电阻阻值，

$$I_{BAT} = \frac{2400}{R_{ITERM}}$$

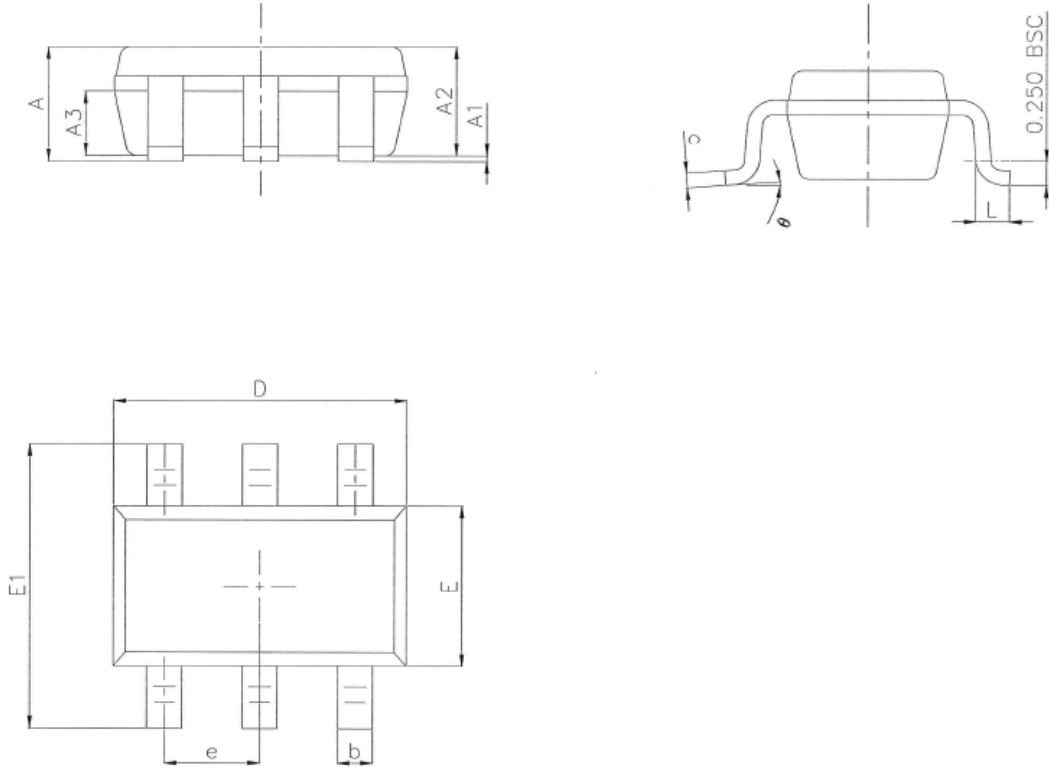
电阻单位：kΩ 电流单位：mA

客户应用中，可根据需求选取合适大小的R_{ITERM}，R_{ITERM}与充电电流的关系确定可参考下表：

R _{ITERM} (kΩ)	I _{TERM} (mA)
560	4.3
100	24
51	47
24	100


LED 状态显示

指示说明	条件	显示规则
CHG 指示	电池充电中	ON
	电池充满	OFF

封装尺寸 (SOT23-6)


Dim	Millimeters		
	MIN	NOM	MAX
A	1.050	1.150	1.250
A1	0.000	0.060	0.100
A2	1.000	1.100	1.200
A3	0.550	0.650	0.750
D	2.820	2.920	3.020
E	1.510	1.610	1.700
E1	2.650	2.800	2.950
b	0.300	0.400	0.500
e	0.950BSC		
θ	0°	4°	8°
L	0.300	0.420	0.570
c	0.100	0.152	0.200


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