( ) * + / Revised record

B	2018-4				
C	2019-2-20	1			
D	2020-4-1	10	! " # $ %ℓ ' **Normal Charge Cycle** (Note: The BRCL4054ME does not include this trickle charge feature).		
E	2021-12-23				

BRCL4054CME / SOT
BRCL4054CME BRCL4054CME USB
PMOSFET

4.2V
1/10 BRCL4054CME BRCL4054CME

The BRCL4054CME is a complete constant-current/constant voltage linear charger for single cell lithium-ion batteries. Its Thin SOT package and low external component count make the BRCL4054CME ideally suited for portable applications. Furthermore, the BRCL4054CME is specifically designed to work within USB power specifications.No external sense resistor is needed, and no blocking diode is required due to the internal MOSFET architecture. Thermal feedback regulates the charge current to limit the die temperature during high power operation or high ambient temperature. The charge voltage is fixed at 4.2V, and the charge current can be programmed externally with a single resistor. The BRCL4054CME automatically terminates the charge cycle when the charge current drops to 1/10th the programmed value after the final float voltage is reached.Other features include charge current monitor, under voltage lockout, automatic recharge and a status pin to indicate charge termination and the presence of an input voltage.

- 500mA / Programmable charge current up to 500mA
- MOSFET / No MOSFET, sense resistor or blocking diode required
- SOT23-5 / Complete linear charger in 5-Lead SOT-23 package for single cell lithium-Ion batteries
- / / Constant-current/Constant-voltage operation with thermal regulation to maximize charge rate without risk of overheating
- USB / Charges single cell Li-Ion batteries directly from USB port
- 4.2V / Preset 4.2V charge voltage with ±1% accuracy
- / Charge current monitor output for gas gauging
- / Automatic recharge
- / Charge status output pin
- C/10 / Cs z w

Pin Number	Pin Name	Pin Description
		CHRG N MOSFET œ CHRG
1	CHRG	

6 3 h u a N

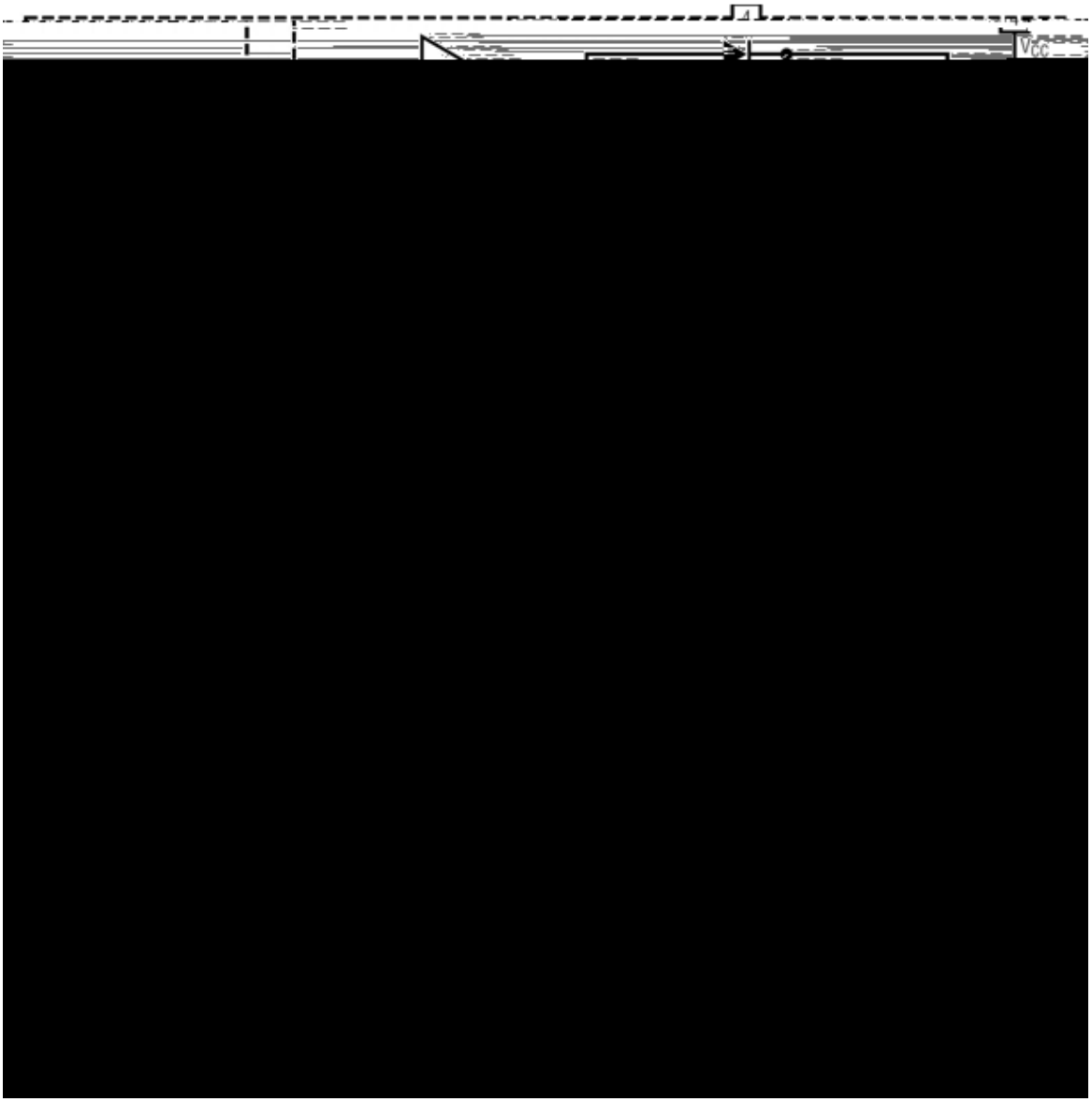
9 : ; < / Marking

见印章说明。See Marking Instructions

参数 数 数 数 数 数 数

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
V_{CC} Undervoltage Lockout Threshold	V_{UV}	From V_{CC} Low to High	3.7	3.8		

D E F G / Functional Block Diagram



BRCL4054CME

Rev.E Dec.-

? @ H I G / Electrical Characteristic Curve

J C , - / Functional Description

V_{cc} ! " # $ UVLO% & ! ' ( ) * + PROG , - . / 0 1 2 3 4 5 6 7 1% 8 9 : ! ; < = 3 4 ! > , ? ! < @ A B C 0 D E 3 4 ? ! F G H I J K L BAT ! ' M N 2.9V E O ? ! < P Q R S ? ! T U J + V T U W E BRCL4054CME X Y Z 1/10 8 9 : ? ! ! S E ([\ ! S ! " X # $ 3 4] ^ 8 ! ' E _ ` a b c ! S ? ! J

A charge cycle begins when the voltage at the V_{CC} pin rises above the UVLO threshold level and a 1% program resistor is connected from the PROG pin to ground or when a battery is connected to the charger output. If the BAT pin is less than 2.9V, the charger enters trickle charge mode. In this mode, the BRCL4054CME supplies approximately 1/10 the programmed charge current to bring the battery voltage up to a safe level for full current charging.

BAT ! " # $ 2.9V ( ) D E ? ! < P Q d : ! S T U E e D f ! > X Y d : 8 ? ! ! S J BAT ! " g h i j k ? ! " l 4.2V m D E BRCL4054CME P Q d : ! " T U E * ? ! ! S H I n o J ? ! ! S p $ 9 : q 8 1/10 E ? ! F G r s J

When the BAT pin voltage rises above 2.9V, the charger enters constant-current mode, where the programmed charge current is supplied to the battery. When the BAT pin approaches the final float voltage (4.2V), the BRCL4054CME enters constant-voltage mode and the charge current begins to decrease. When the charge current drops to 1/10 of the programmed value, the charge cycle ends.

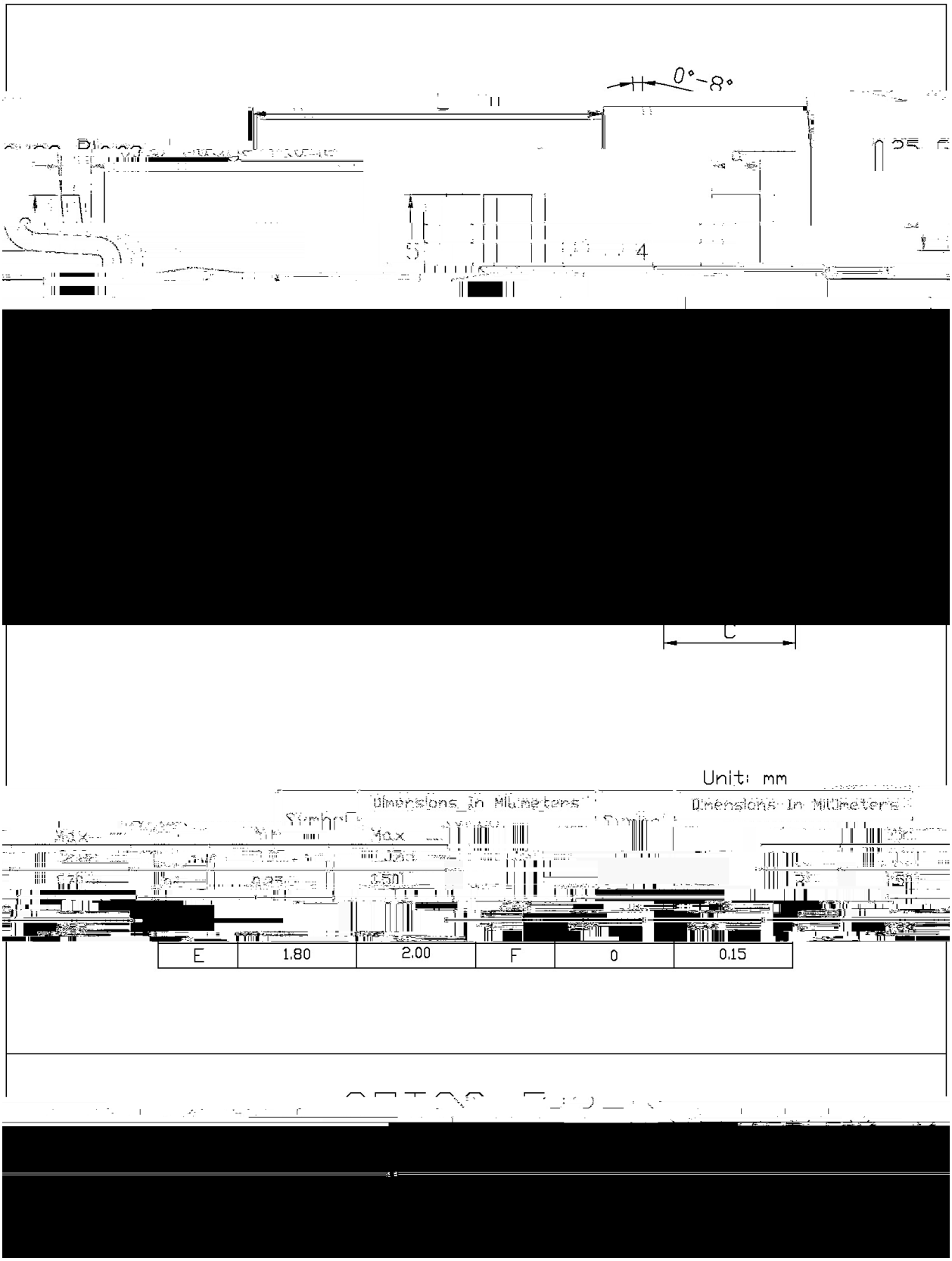
+ t u T U W E BRCL4054CME v BAT ! " P w 0 x y z J K L V ! " p h 4.05V 8 { ? ! ! % & ($V_{ECH\ G}$) (| E O } 3 4 ? ! F G H I ~ { f ! > Y ¡ ! S J + t u T U W P w ? ! F G 8 ¢ £ { ¤ £ D E ¥ ¦ § ¨ © ª { « ¬ @ Q ! " E = - ¥ ¦ ® ¯ ? ! < ~ ° ± PROG P w { ¤ £ J

The BRCL4054CME constantly monitors the BAT pin voltage in standby mode. If this voltage drops below the 4.05V recharge threshold (V_{RECHRG}), another charge cycle begins and current is once again supplied to the battery. To manually restart a charge cycle when in standby mode, the input voltage must be removed and reapplied, or the charger must be shut down and restarted using the PROG pin.

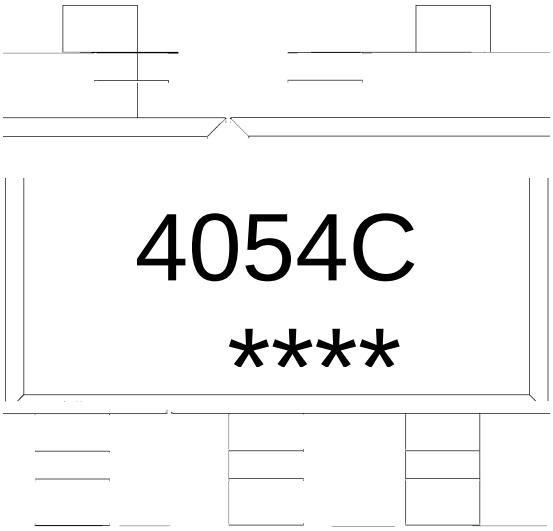
? ! ! S ² ³ ± 3 4 0 1 + PROG , - . / 8 ! ; < ´ 9 : 8 J ! S ? ! ! S ² PROG @ A ! S 8 1000 µ J 9 : ! ; < ¶ ? ! ! S ³ ± | · ¸ U ´ ¹ º »

The charging current is set by a resistor connected between prog pin and ground. The charging current is 1000 times the output current of prog pin. The setting resistor and charging current are calculated using the following formula »

K L M N G / Package Dimensions



9 : O P / Marking Instructions



¼½ »

4054C » 7 ¾ ¿ À Á

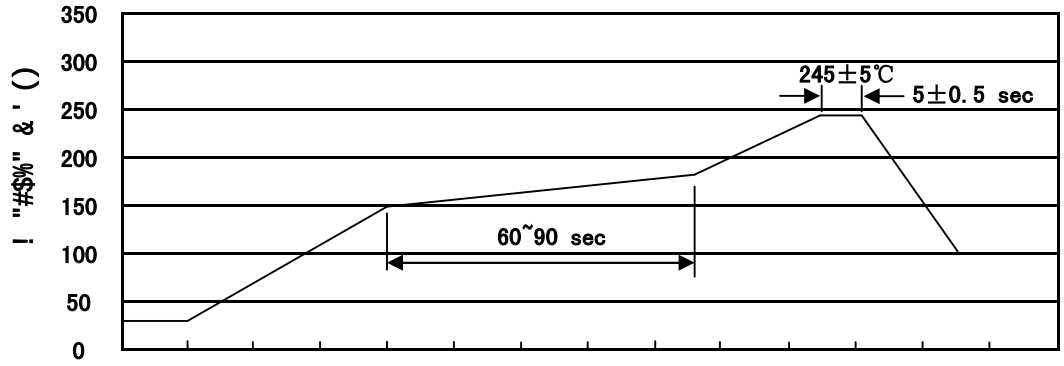
**** » 7 Â Ã Ä ¿ À Á E Å Â Ã Ä ¿ ÆÇ

Note:

4054C: Product Type

****: Lot No. Code, code change with Lot No

Q R S T U H I G(V W) / Temperature Profile for IR Reflow Soldering(Pb-Free)



						Note:
1		150	180	60	90sec;	1.Preheating:150~180℃, Time:60~90sec.
2		245±5			5±0.5sec;	2.Peak Temp.:245±5℃, Duration:5±0.5sec.
3			2	10℃/sec.		3. Cooling Speed: 2~10℃/sec.

X S Y Z [\ ] ^ / Resistance to Soldering Heat Test Conditions

260±5℃	10±1 sec.	Temp.:260±5℃	Time:10±1 sec

_ ` a b / Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm^3)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	nner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOT23-5/6	3,000	10	30,000	4	120,000	7″ ×8	210×205×205	445×230×435

c 0 O P / Notices