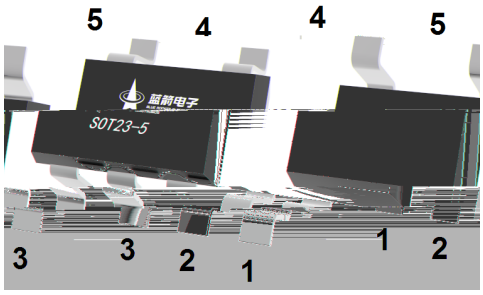
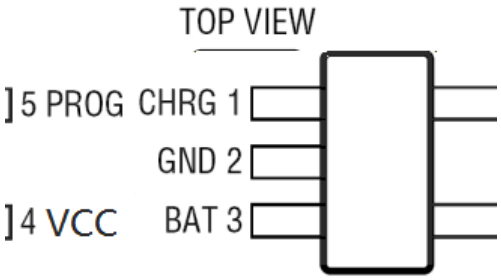
BRCL4058PME-4.2

Rev.C Dec.-2025

/ Pinning





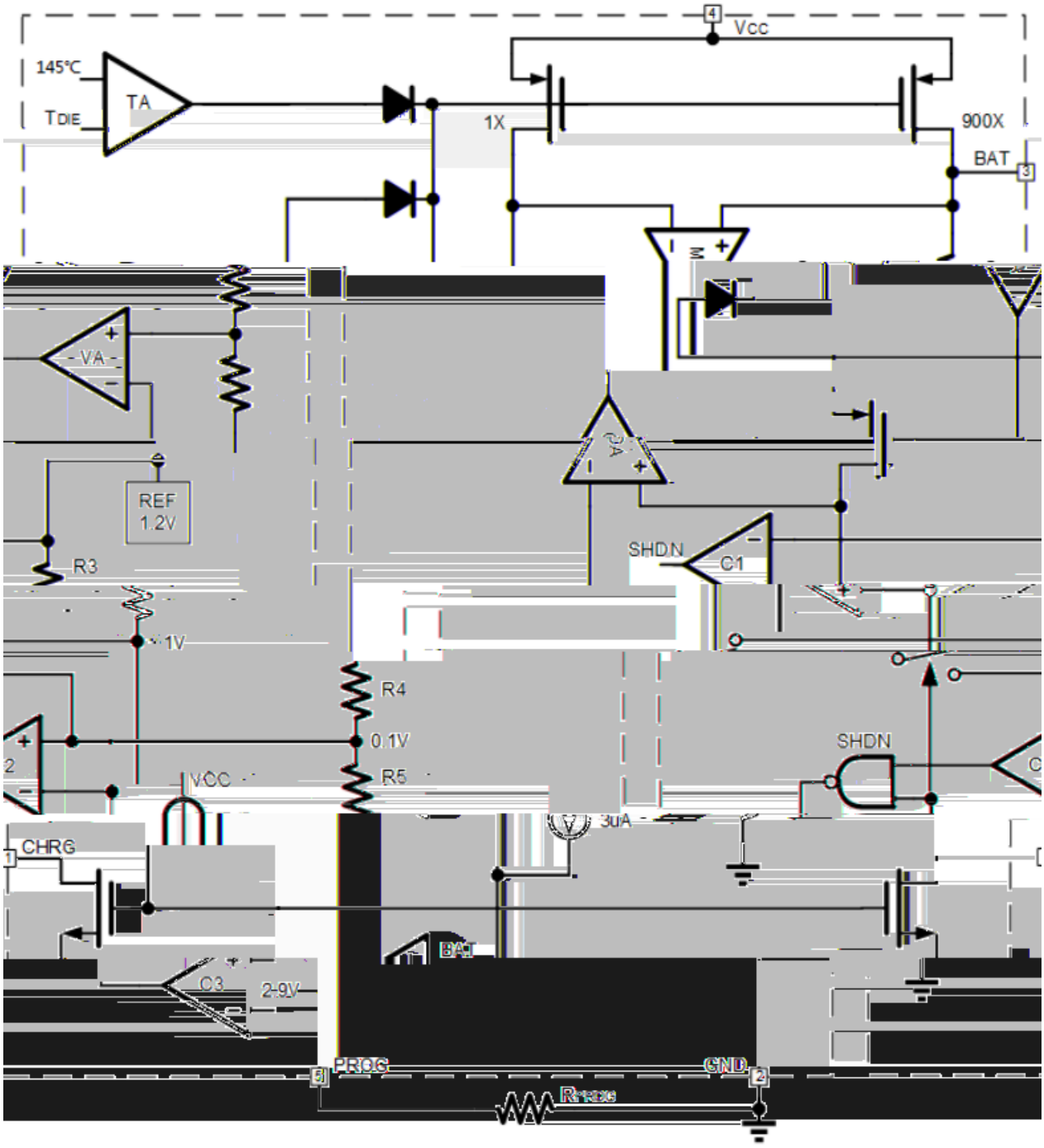
PIN Num.	Symbol	Function
1	CHRG	
2	GND	
3	BAT	
4	VCC	
5	PROG	

/ Absolute Maximum Ratings(Ta=25)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Pin Voltage	V_{VCC}	-0.3~36	V
BAT Pin Voltage	V_{BAT}	-4.2~18	
Other Pin Voltage	V_{PROG}	-0.3~5.5	
CHRG Pin Voltage	V_{CHRG}	-0.3~13	
Storage Temperature	T_{stg}	-65~+150	
Junction Temperature	T_J	150	
Operating Ambient Temperature Range	T_{OP}	-40~+85	
Lead Temperature (Soldering, 10s)	T_{solder}	260	
Power onsumption	P_D	0.3	W
Junction-to-Ambient	$R_{\theta JA}$	250	/W
ESD	HBM	2000	V
	CDM	1000	V

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage Range	V_{CC}		4.5	5	36	V
Quiescent Supply Current	I_Q	Charge Mode R_{PROG}=2.05k		240	360	μA
		Standby Mode (Charge Terminated)		220	300	μA
		Shutdown Mode (R_{PROG} Not Connected, V_{CC} < V_{BAT}, or V_{CC} < V_{UV})		220	300	μA
		OVP state		120	250	μA
Regulated Output (Float)Voltage	V_{FLOAT}	0 ≤T_A≤85 , R_{PROG} = 2.05k	4.158	4.200	4.242	V
BAT Pin Current	I_{BAT}	R_{PROG} =2.05k, Current Mode	400	450	500	mA
		Standby Mode, V_{BAT} = 4.2V	0	-2.5	-6	μA
		Shutdown Mode (R_{PROG} Not Connected)		±1	±2	μA
		Sleep Mode, V_{CC} = 0V		-1	-2	μA
Trickle Charge Current	I_{TRIKL}	V_{BAT} < V_{TRIKL}, R_{PROG} = 2.05K	30	45	60	mA
Trickle Charge Threshold Voltage	V_{TRIKL}	R_{PROG} = 2.05k, VBAT Rising	2.3	2.5	2.7	V
Trickle Charge Hysteresis Voltage	V_{TRHYS}	R_{PROG} =2.05k	120	160	200	mV
VCC Undervoltage Lockout Threshold	V_{UV}	From V_{CC} Low to High	3.5	3.7	3.9	V
VCC Undervoltage Lockout Hysteresis	V_{UVHYS}	From V_{CC} High to Low	100	200	300	mV
VCC-VBAT Lockout Threshold Voltage	V_{ASD}	V_{CC} from Low to High	100	125	150	mV
		V_{CC} from High to Low	30	65	100	mV
C/10 Termination Current Threshold	I_{TERM}	R_{PROG} = 2.05k	40	45	50	mA
PROG Pin Voltage	V_{PROG}	R_{PROG} = 2.05k, Current Mode	0.9	1.0	1.1	V
CHRG Pin Output Low Voltage	V_{CHRG}	I_{CHRG} = 5mA		0.3	0.6	V
Recharge Battery Threshold Voltage						

/ Principle block diagram



/ Function description

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BRCL4058PME-4.2 / PCB
600mA ±1% BRCL4058PME-4.2 P
MOSFET
BRCL4058PME-4.2 USB

◆

VCC UVLO 1% PROG
BAT 2.5V
BRCL4058PME-4.2 1/10
BAT 2.5V BAT
4.2V BRCL4058PME-4.2
1/10

◆

PROG PROG 900

$R_{PROG}=900/I_{CHG}$ $I_{CHG}=900/R_{PROG}$

PROG BAT
$I_{BAT}= (V_{PROG}\times900)/R_{PROG}$

R_{PROG}

R_{PROG}(KΩ)	I_{CHG}(mA)
3.00	305
2.32	400
2.05	450
1.91	485
1.80	520
1.58	590

/ Function description

◆

1/10

PROG PROG 100mV tTERM

BRCL4058PME-4.2 55μA

C/10

BAT PROG 1/10

100mV 1.8ms t_{TERM}

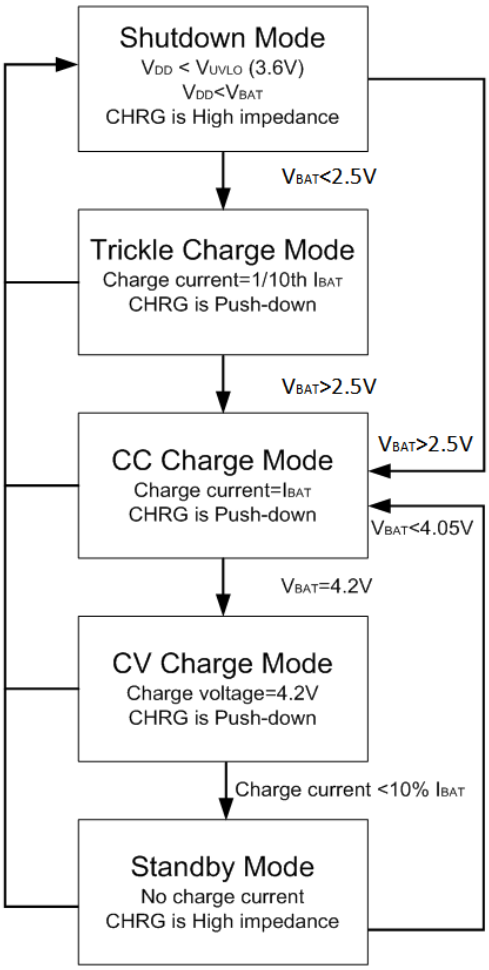
1/10 BRCL4058PME-4.2

BAT BAT

BRCL4058PME-4.2 BAT 4.05V

V_{RECHRG}

PROG



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BRCL4058PME-4.2 CHRG BRCL4058PME-4.2
CHRG CHRG CHRG

BAT 10μF LED LED 1-4

	LED
UVLO	

BAT 10μ

/ Function description

◆

PROG PROG

20k

PROG 100kHz

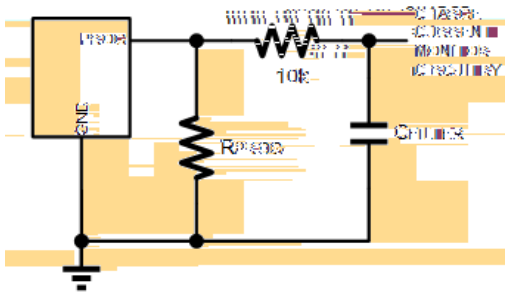
PROG CPROG RPROG

$$R_{PROG} \leq \frac{1}{2\pi \cdot 10^5 \cdot C_{PROG}}$$

BAT

PROG RC PROG

10k



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PCB P_D

$T_J=P_D \times \theta_{JA} + T_A$

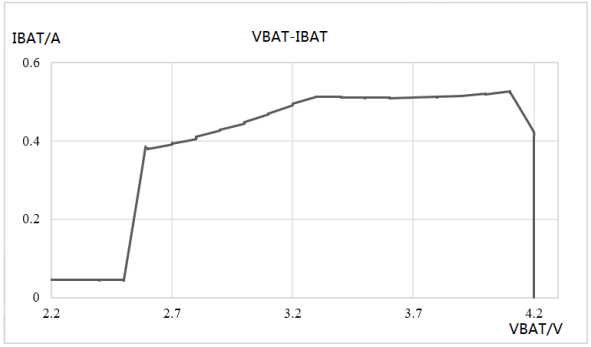
◆

IC PD V_{IN}-V_{BAT} I_{CHG} :

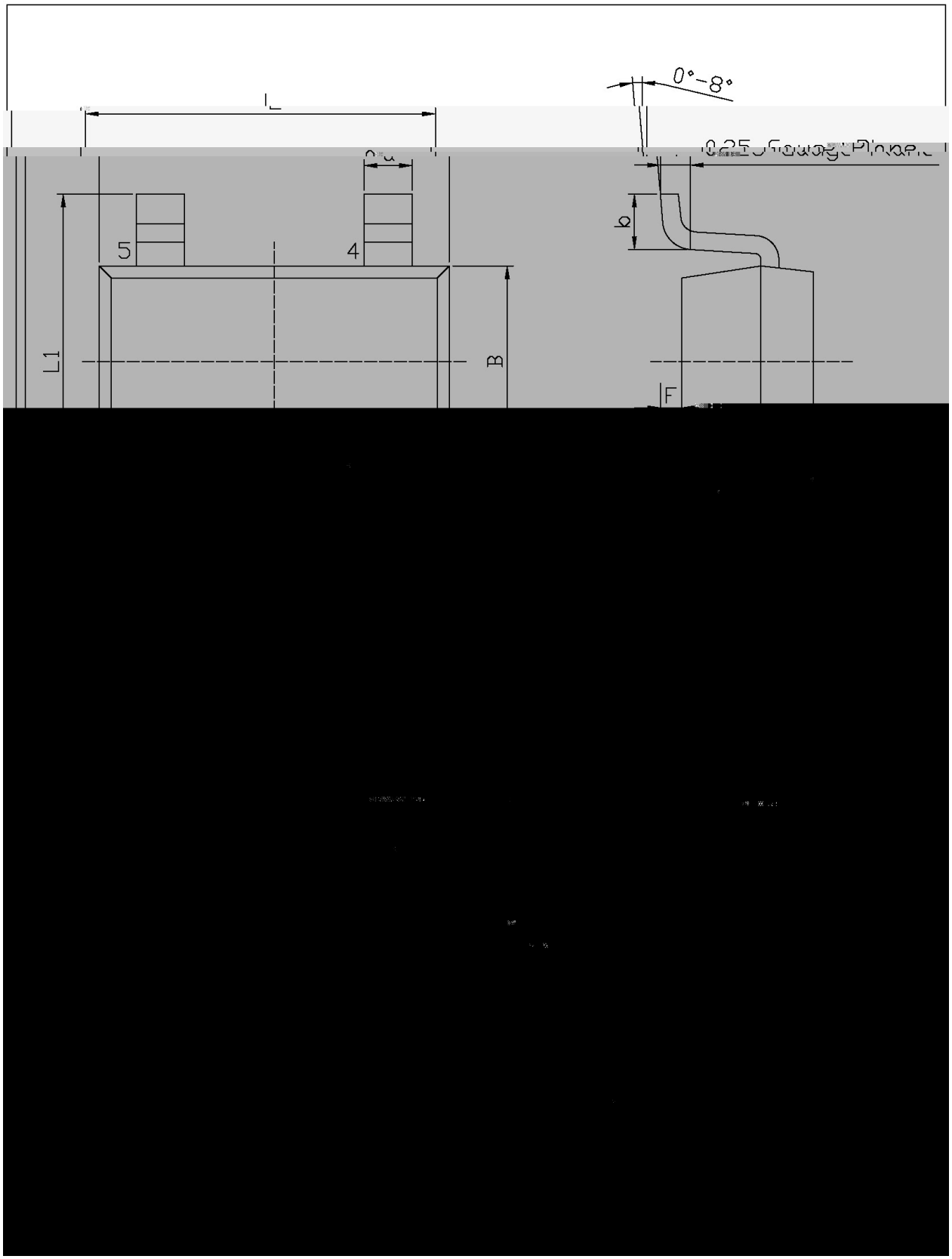
$P_D = V_{IN}-V_{BAT} * I_{CHG}$

3.6V

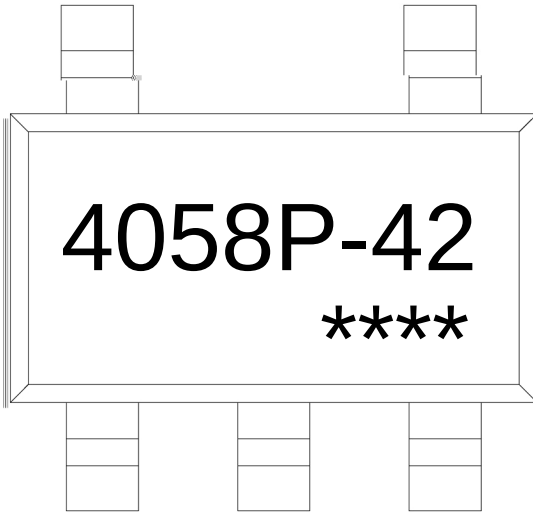
4.0V 5%~10% PD



/ Package Dimensions



/ Marking Instructions



4058P-42

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( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

Note:

1	150	180	60	90sec;
2	245±5			5±0.5sec;
3		2	10	/sec.

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

/ Resistance to Soldering Heat Test Conditions

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

/ Packaging SPEC.

/ REEL

t C6(t J/TT10 1 Tf1.0004165.4114 Tc6.0004 Tc0 Tw<053[<10 T1<005<3efb1 0 10 T/TT4 1 Tf4.2588Tc2D0 Tc( )TjET[46278 re5 -66.0004 T1[0.)-Uni