

BRCL4079SE-4.2

Rev.A Dec.-2025



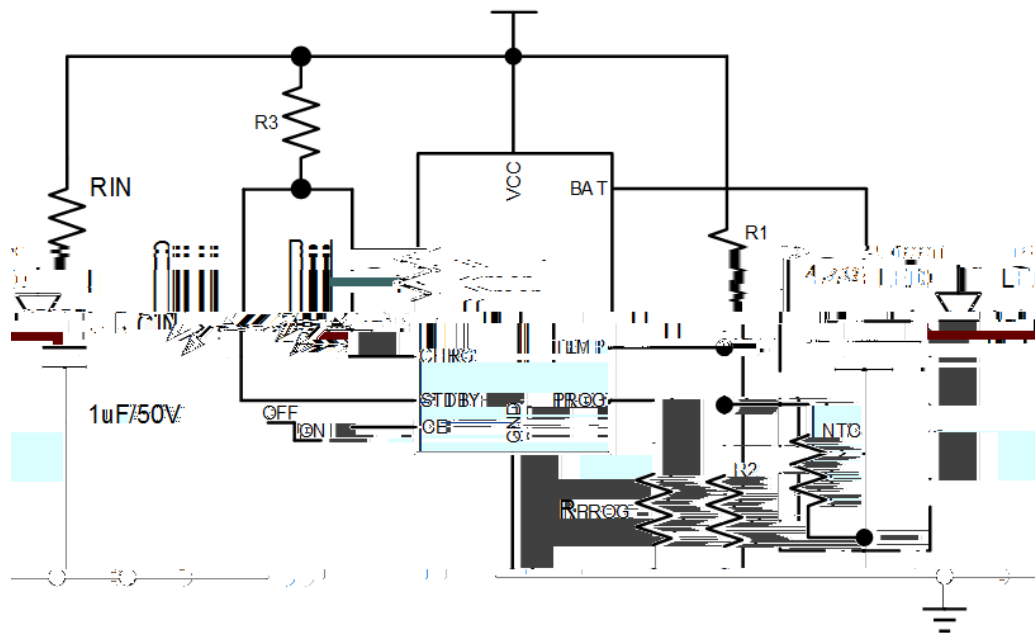
蓝箭电子
BLUE ROCKET ELECTRONICS

DATA SHEET

BRCL4079SE-4.2 ©%². ... k 9' ä 9o• ä □ è to• ä Å _ A % -eO Yÿ P - ~ož
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BRCL4079SE-4.2 J 4 Å B PMOSFET ë ã k ... -- è k ñ Y ¬ } Ù B y Š y œ Y

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PARAMETER	SYMBOL	RATINGS	UNITS
VCC Pin Voltage	V_{VCC}	-0.3~36.0	V
BAT Pin Voltage	V_{BAT}	-4.2~18.0	
CHRG/STDBY Pin Voltage	$V_{CHRG/STDBY}$	-0.3~13.0	
PROG Pin Voltage	V_{PROG}	-0.3~5.5	
Other Pin Voltage	$V_{TEMP/CE}$	-0.3~5.5	
Operating Ambient Temperature Range	T_{OP}	-40~+85	°C
Storage Temperature	T_{stg}	-65~+150	°C
Lead Temperature (Soldering, 10s)	T_{solder}	260	°C
ESD	HBM	2000	V
	CDM	1000	V

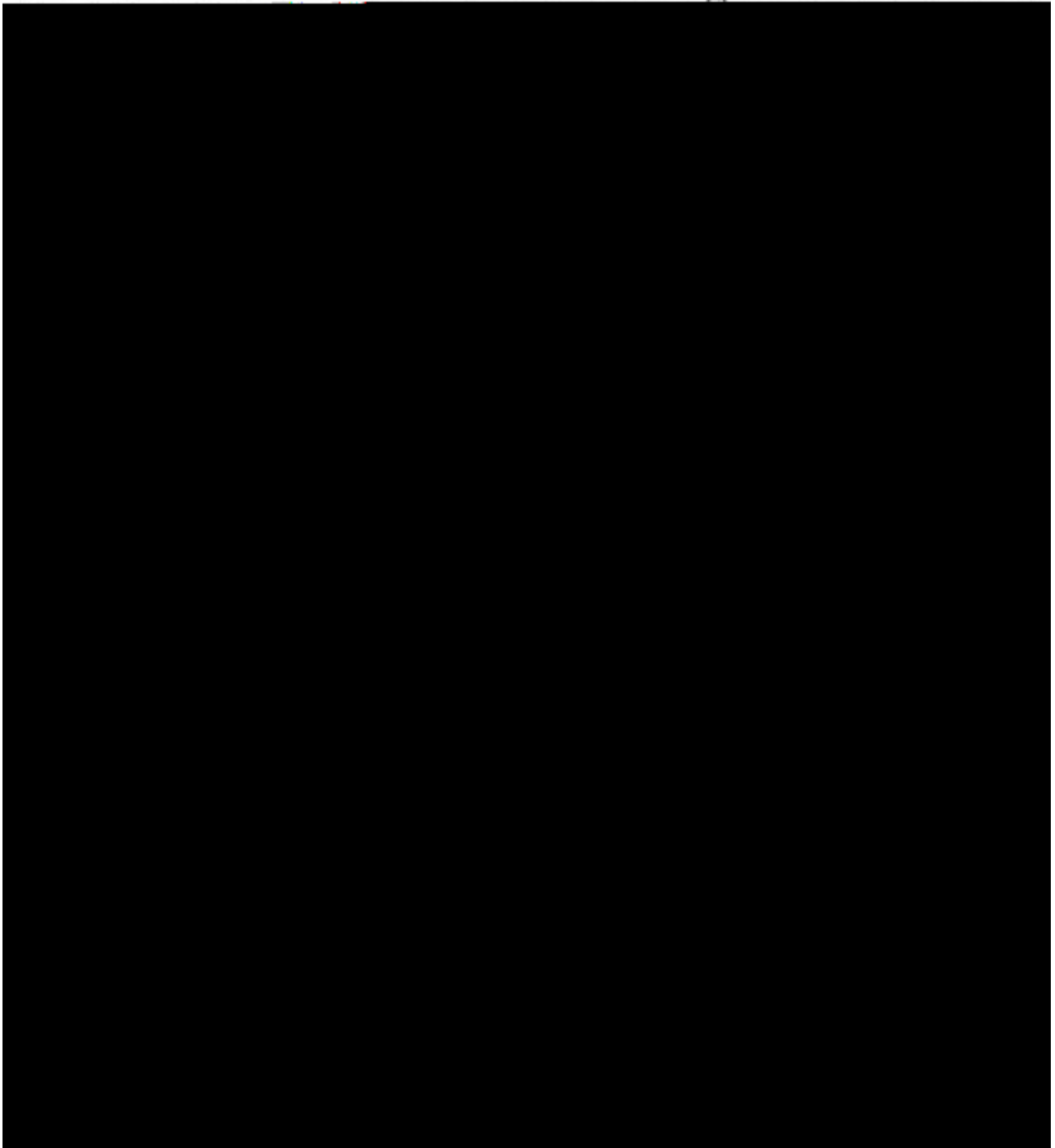
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Supply Voltage	V_{CC}		4.5	5.0	36.0	V
Input Power Supply Current	I_{CC}	Charging mode ($R_{PROG}=1.0K$)		260	360	A
		Standby mode, charging terminated		180	300	A
		Shutdown mode (R_{PROG} not connected, $V_{CC}<V_{BAT}$, or $V_{CC} \emptyset V_{UV}$)		180	300	A
		OVP mode ($V_{CC}=30V$)		180	300	A
Regulated Output (Float) Voltage	V_{FLOAT}	0 0 T_A 085 , $R_{PROG}=1.0k$	4.158	4.2	4.242	V
BAT Pin Current	I_{BAT}	$R_{PROG}=1.0k$ Ë Current mode	855	950	1045	mA
		Standby mode, $V_{BAT}=4.2V$	0	-2.5	-6	A
		Shutdown mode (R_{PROG} not connected)		f 1	f 2	A
		Sleep mode, $V_{CC}=0V$		-1	-2	A
Trickle Charge Current	I_{TRIKL}	$V_{BAT} \{ V_{TRIKL} \}$ Ë $R_{PROG}=1.0k$	62	95	128	mA
Trickle Charge Threshold	V_{TRIKL}	$R_{PROG}=1.0k$ V_{BAT} from Low to High	2.3	2.5	2.7	V
Trickle Charge Hysteresis V_{CC}	V_{TR_HYS}	$R_{PROG}=1.0k$	120	160	200	mV


Electrical Characteristics ($V_{CC}=5V, V_{BAT}=3.6V, T_a=25^\circ C$)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
V_{CC} Under voltage Lockout Hysteresis	$V_{CC_UV_HYS}$	V_{CC} from High to Low	100	200	300	mV
$V_{CC}-V_{BAT}$ Lockout Threshold	V_{ASD}	V_{CC} from Low to High	100	125	150	mV
		V_{CC} from High to Low	30	65	100	mV
C/10 Charging Termination Current	I_{TERM}	$R_{PROG}=1.0k$	62	95	128	mA
R_{PROG} voltage at Constant Current Mode	V_{PROG}	$R_{PROG}=1.0k$, Current mode	0.9	1.0	1.1	V
CHRG outputs low voltage	V_{CHRG}	$I_{CHRG}=5mA$		0.3	0.6	V
STDBY outputs low voltage	V_{STDBY}	$I_{STDBYG}=5mA$		0.3	0.6	V
Rechargeable Battery Voltage	V_{RECHRG}	$V_{FLOAT}-V_{RECHRGH}$	100	150	200	mV
Junction temperature in limited temperature mode	T_{LIM}			145		
Static Drain-Source On-Resistance	$R_{DS(on)}$			500		m
Soft start time	t_{ss}	$I_{BAT} = 0$ to $I_{BAT} = 950V/R_{PROG}$		20		s
Recharge Comparator Filtering Time	$t_{RECHARG}$	V_{BAT} from High to Low	0.8	1.8	4.0	ms
Terminate comparator filtering Time	t_{TERM}	I_{BAT} drop to $I_{CHG}/10$	0.8	1.8	4.0	ms
PROG pin pull-up current	I_{PROG}			1.0		A
TEMP high-side protection voltage	V_{TEMP-H}			80	82	% V_{CC}
TEMP low-side protection voltage	V_{TEMP-L}		43	45		% V_{CC}



< Æ ¢ / Principle block diagram





× 5 é / Function description

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 BRCL4079SE-4.2 □ è 4%² Ä B P ? ú 3 ä MOSFET C ½ ² - è k — ¬ æ Y 8 â ' ê Û B v y
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¢ VCC — 9 UVLO y' u Y " PROG — ¢ \$ • N 4%² □ † 1% —
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 ~ µ @ Â v - % " ož " ¥ % " k BRCL4079SE-4.2 U ^ ³ 1/10 — - v k Y Ž 1 P 9
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¢ BAT — 9 V TRIKL Y ž k - ~ µ É v % " k 4 ž g P U ^ É - vož ¢ BAT
 — 9 ñ Â Ä • - 9 g V FOLOAT h ž k BRCL4079SE-4.2 µ É 9 - % " k - v • ÷ ×
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- v © J %² N " PROG — ¢ \$ • Š Ů — ož P - v © PROG — ÿ ß
 v 950 • ož — Š y - v J ç , " Ů < ' y

$$R_{\text{PROG}} = 950 / I_{\text{CHG}} \text{ k } \hat{e} \text{ } I_{\text{CHG}} = 950 / R_{\text{PROG}}$$

$$R_{\text{BAT}} = \ddot{y} \beta - v U^* !, \quad \text{PROG} - 9 \check{z} \check{z} G k , " \grave{o} y$$

$$I_{\text{BAT}} = (V_{\text{PROG}} \sim 950) / R_{\text{PROG}}$$

+ 9 Ý 9 0.5A - v • k / ì ½ O , + û Ý k ' " † O ò k ' z - v k c ê Ě y
 i v , " < ' ò - > - J ± ¶ %² ož ĭ • k U ÿ G ¬ L # H ` Ý 4 R_{\text{PROG}} \text{Ož}

< **R1 x R2** é š

R1 yR2 > } ÿ G P “†!y8 y½} Š Š>Û G kĕ †^açò y

• — — P “ † 8 TL~TH k g ħ TL { TH) z P ... © ħ “ † © f ½ } Š

gNTC h k RTL ħ " " † TL ž Š > k RTH ħ " " † TH ž Š > k é RTL } RTH k ; " k " " †
TL ž k † %² ' TEMP € 9 y

$$V_{TEMP1} = \frac{R2 || R_{TL}}{R1 + R2 || R_{TL}} V_{IN}$$

“† TH ž k †%²’ TEMP € 9 y

$$V_{TEMP1} = \frac{R2 || R_{TH}}{R1 + R2 || R_{TH}} V_{IN}$$

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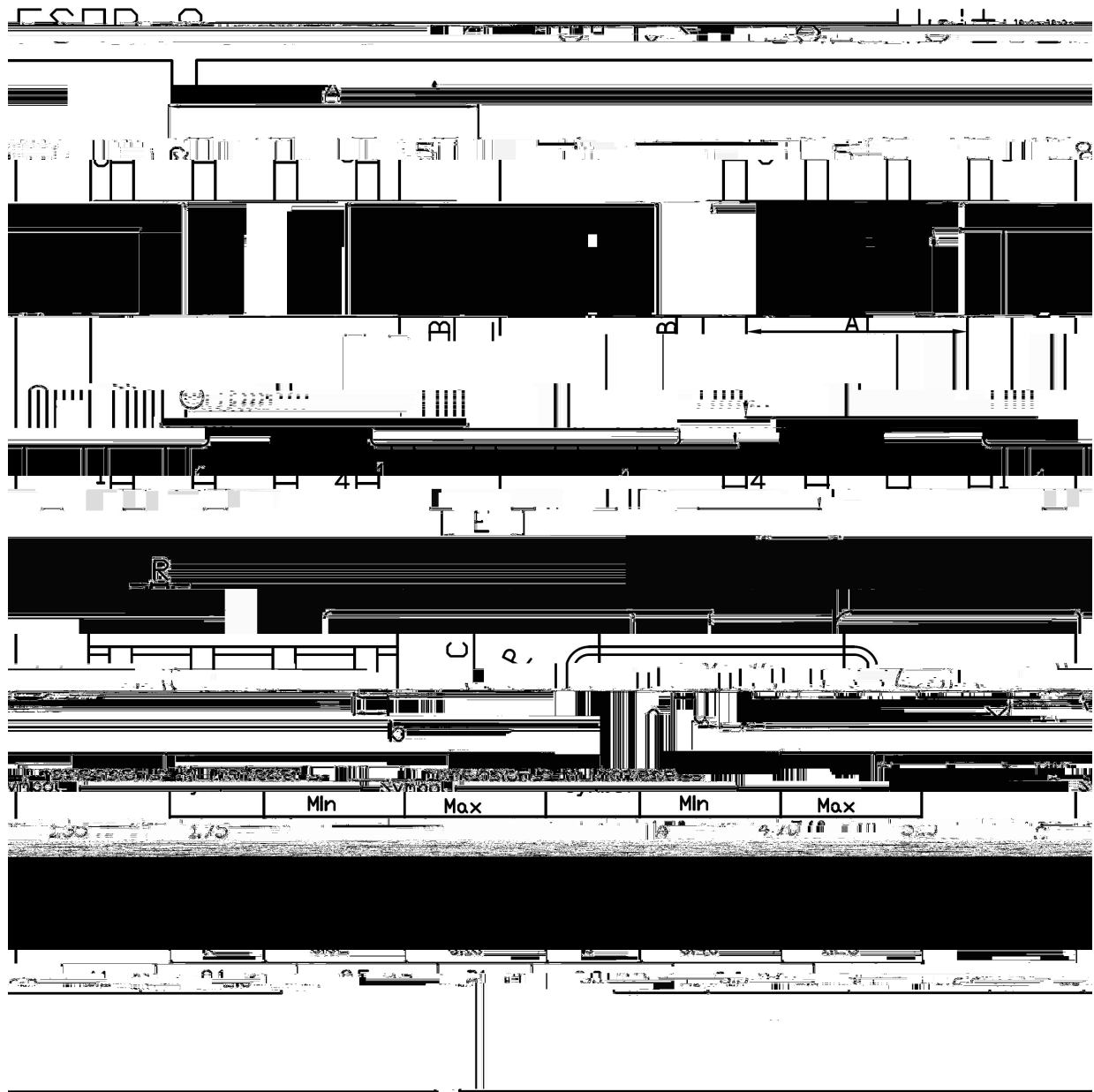
$$V_{TEMP1} = V_{HIGH} - k2 \times V_{GG}(k2 = 0.8)$$

$$e \cup t \pm y$$

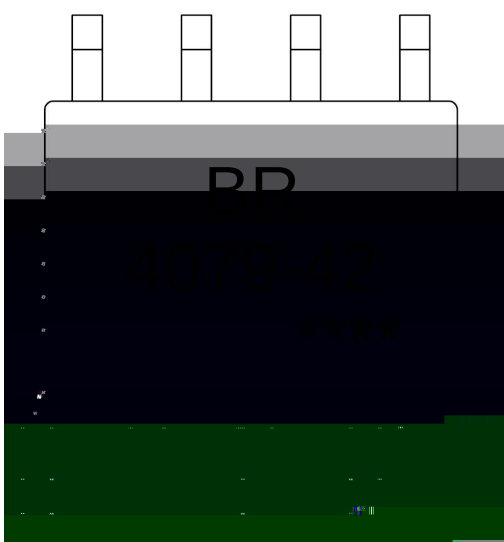
$$R1 = \frac{RTL \times RTH(k2 - k1)}{(RTL + RTH)k2 - k1}$$

còkòç PÄB©3“†©fg

Ø □ =) ⌀ / Package Dimensions



, M y f / Marking Instructions



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- 1o• Ä ½ “† 150 ½180 - k ž • 60 ½90sec;
- 2o• Q > “† 245 r5 - k ž • 4 Ò 5 r0.5sec;
- 3o•D N ò i Ò 0 ,† 2 ½10 - /sec.

- Note:
- 1.Preheating:150~180 - , Time:60~90sec.
 - 2.Peak Temp.:245 r5 - , Duration:5 r0.5sec.
 - 3. Cooling Speed: 2~10 - /sec.

ÂD /Cã p ¯ »] / Resistance to Soldering Heat Test Conditions

“† y 260 r5 - ž • y 10 r1 sec. Temp.:260±5 Time:10±1 sec

G P á / Packaging SPEC.

2 & x / REEL

Package Type 7>û ~ E	Units ;>û !H	Dimension ;>û p .	(unit Åmm³)
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