

/ Descriptions

BRCL4058PZR-4.2					
BRCL4058PZR-4.2	/				
BRCL4058PZR-4.2					USB
BRCL4058PZR-4.2	PMOSFET				
	4.2V	PROG		1.0A	
	BRCL4058PZR-4.2				2μA
BRCL4058PZR-4.2					
BRCL4058PZR-4.2	DFN		6	PCB	
BRCL4058PZR-4.2	-40°C to +85°C				

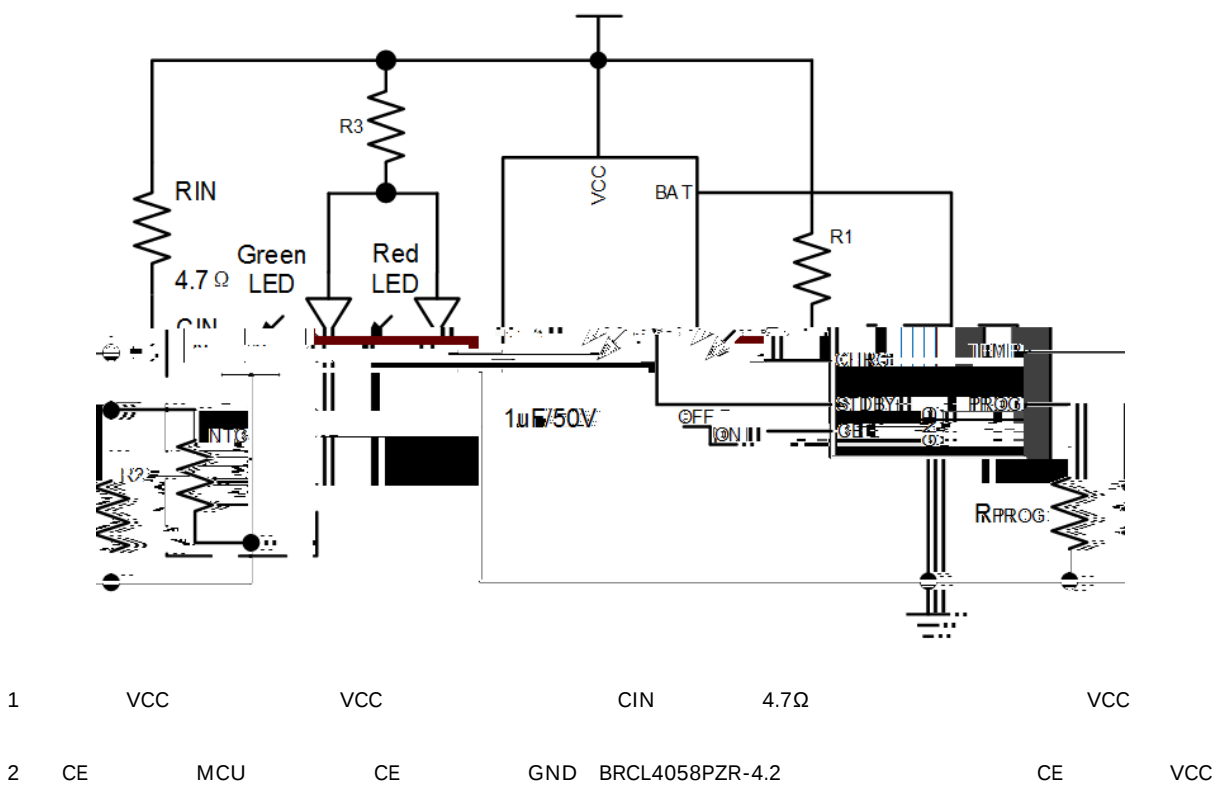
/ Features

- ◆ 36V 6.1V
- ◆ 1% 4.2V
- ◆
- ◆ BAT-VDD
- ◆ <2μA
- ◆ 55μA
- ◆ 0V
- ◆ 1.0A
- ◆ / /
- ◆
- ◆
- ◆
- ◆
- ◆
- ◆
- ◆ RoHS

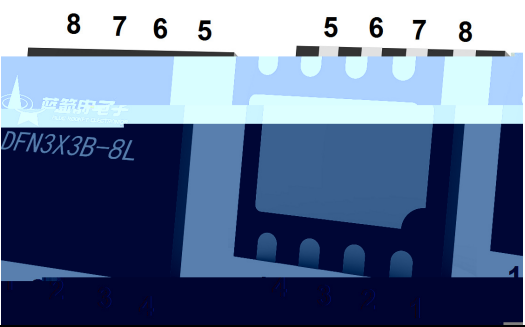
/ Applications

- ◆ PDAs MP3
- ◆ USB
- ◆ TWS
- ◆
- ◆

/ Application Circuit



/ Pinning



PIN Num.	Symbol	Function
1	TEMP	
2	PROG	GND
3	GND	
4	VCC	
5	BAT	
6	STDBY	
7	CHRG	
8	CE	

/ Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

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	$V_{TEMP/GND/CE}$	-0.3~5.5	
Operating Ambient Temperature Range	T_{OP}	-40~+85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65~+150	$^\circ\text{C}$
Lead Temperature (Soldering, 10s)	T_{solder}	260	$^\circ\text{C}$
ESD	HBM	4000	V
	CDM	1000	V

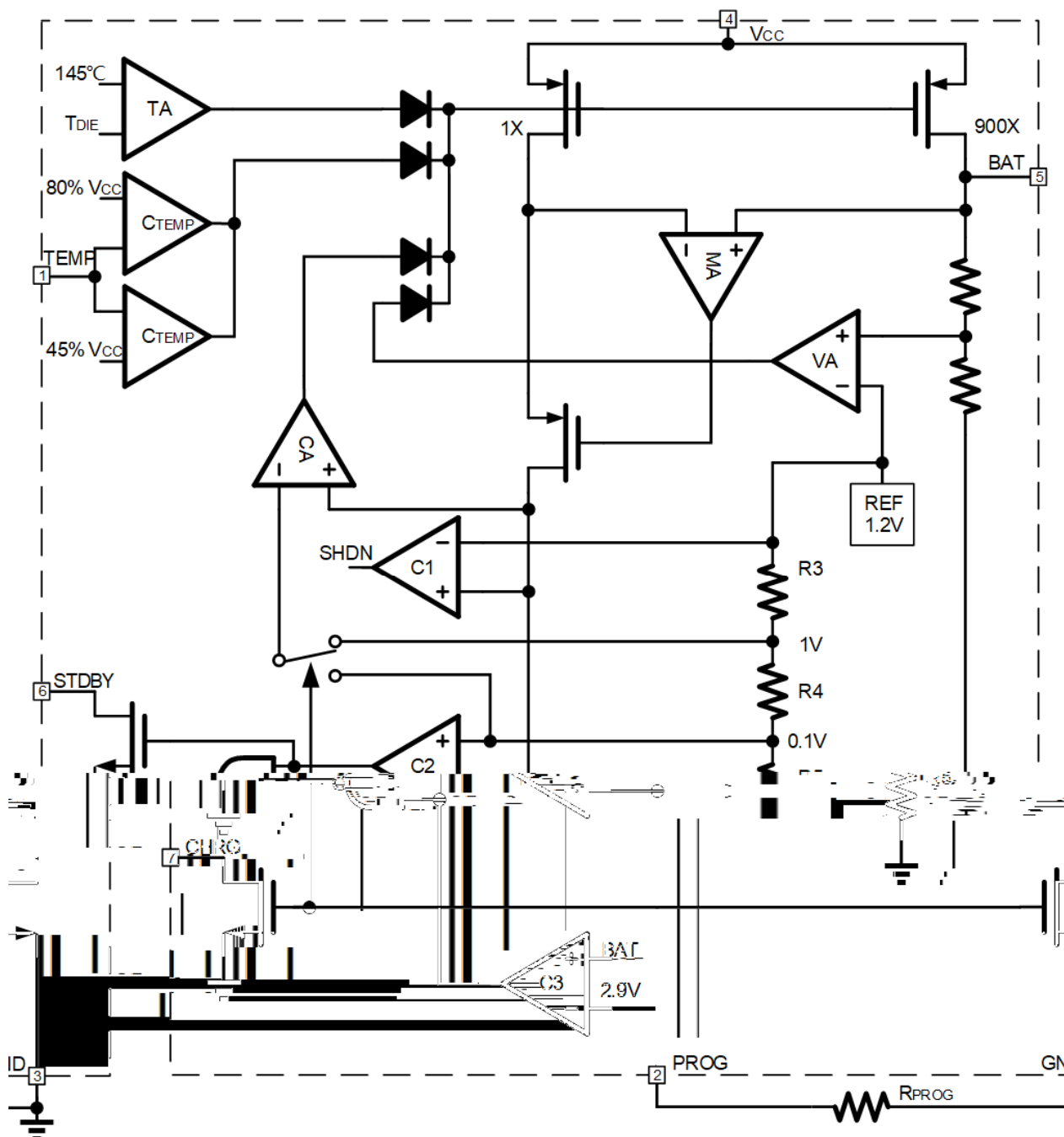
/ Electrical Characteristics($V_{CC}=5V, V_{BAT}=3.6V, T_a=25^\circ\text{C}$)

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 ($R_{PROG}=1.02k$)		260	360	A
		Standby mode, charging terminated		180	300	A
		Shutdown mode (R_{PROG} not connected, $V_{CC}<V_{BAT}$, or V_{CC} V_{UV})		180	300	A
		OVP mode($V_{CC}=30V$)		180	300	A
Regulated Output (Float) Voltage	V_{FLOAT}	$0 \leq T_a \leq 85^\circ\text{C}$, $R_{PROG}=1.02k$	4.158	4.2	4.242	V
BAT Pin Current	I_{BAT}	$R_{PROG}=1.02k$ Current mode	900	1000	1100	mA
		Standby mode, $V_{BAT}=4.2V$	0	-2.5	-6	A
		Shutdown mode (R_{PROG} not connected)		± 1	± 2	A
		Sleep mode, $V_{CC}=0V$		-1	-2	A
Trickle Charge Current	I_{TRIKL}	$V_{BAT} \geq V_{TRIKL}$, $R_{PROG}=1.02k$	65	100	135	mA
Trickle Charge Threshold	V_{TRIKL}	$R_{PROG}=1.02k$, V_{BAT} from Low to High	2.3	2.5	2.7	V
Trickle Charge Hysteresis	V_{TR_HYS}	$R_{PROG}=1.02k$	120	160	200	mV
VCC Under Voltage Lockout Threshold	V_{CC_UV}	V_{CC} from Low to High	3.5	3.7	3.9	V

/ 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	$V_{CC_UV_HYS}$		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}	$R_{PROG}=1.02k$	90	100	110	mA
R_{PROG} voltage at Constant Current Mode	V_{PROG}	$R_{PROG}=1.02k$, 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}	$V_{FLOAT}-V_{RECHARGH}$	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 $I_{BAT} = 900V/R_{PROG}$		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}

/ Principle block diagram



/ Function description



BRCL4058PZR-4.2 /
1.0A PCB ±1%
BRCL4058PZR-4.2 P MOSFET
BRCL4058PZR-4.2 USB



VCC UVLO PROG 1%
BAT V_{TRIKL}
BRCL4058PZR-4.2 1/10
BAT V_{TRIKL} BAT
V_{FOLOAT} BRCL4058PZR-4.2
1/10

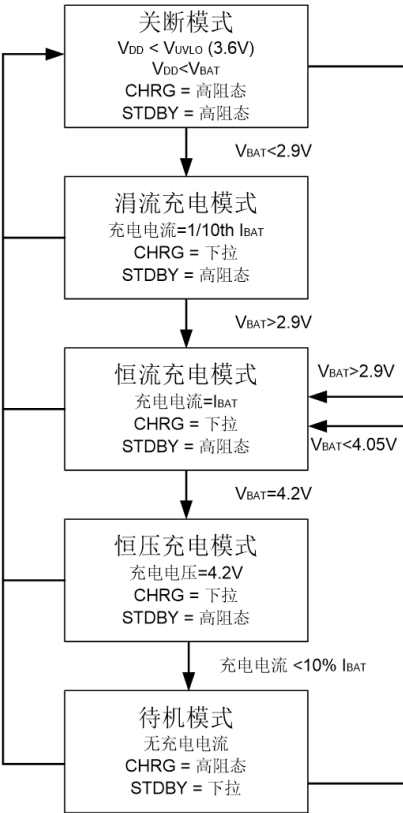
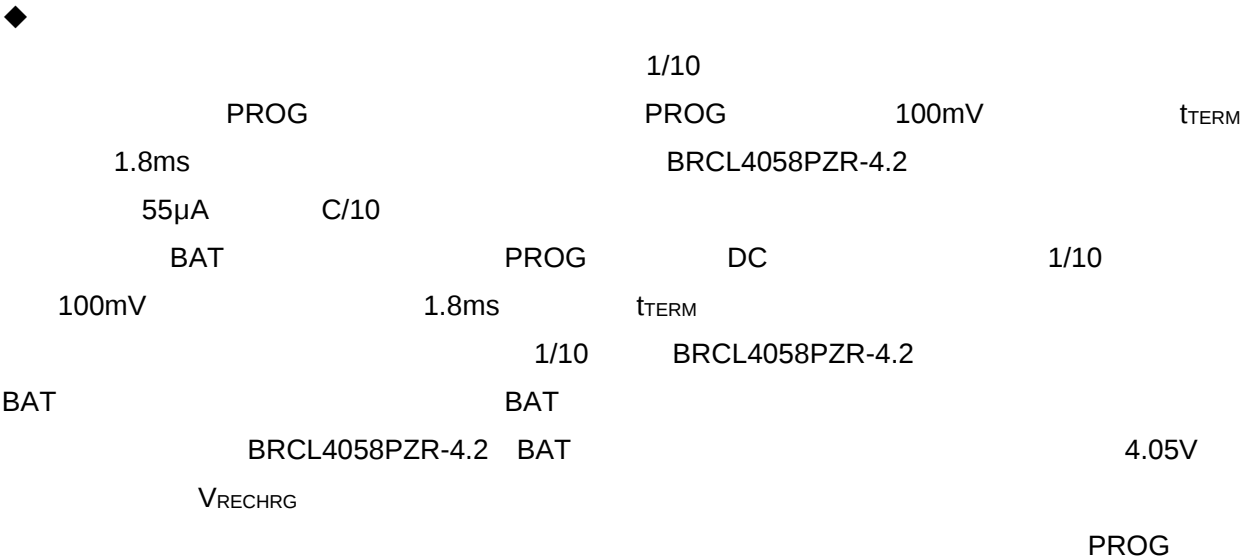


PROG PROG
900
R_{PROG}=900/I_{CHG} I_{CHG}=900/R_{PROG}
BAT PROG
I_{BAT}=(V_{PROG}×900)/R_{PROG}
0.5A
R_{PROG}

R_{PROG}

R _{PROG} (K)	I _{CHG} (mA)
3.00	305
2.32	400
2.05	450
1.91	485
1.80	520
1.58	590
1.47	640
1.37	690
1.27	755
1.21	800
1.10	910
1.02	1000

/ Function description



/ Function description



BRCL4058PZR-4.2
CHRG STDBY BRCL4058PZR-4.2
CHRG CHRG STDBY
CHRG STDBY
TEMP BAT 10μF
LED LED 1-4s

	LED CHRG	LED STDBY
BAT 10uF (TEMP=GND)	LED LED 1-4s	



145
BRCL4058PZR-4.2
BRCL4058PZR-4.2



BRCL4058PZR-4.2
TEMP TEMP NTC
BRCL4058PZR-4.2 TEMP VLOW VHIG
BRCL4058PZR-4.2 VLOW 45%×Vcc VHIG
80%×Vcc
TEMP VTEMP<VLOW VTEMP>VHIGH
TEMP VTEMP VLOW VHIG TEMP



/ Function description

◆ R1 R2

R1 R2

NTC RTL TL TH) TH RTL RTH

TL TEMP

$$V_{TEMPL} = \frac{R2 || RTL}{R1 + R2 || RTL} V_{IN}$$

TH TEMP

$$V_{TEMPH} = \frac{R2 || RTH}{R1 + R2 || RTH} V_{IN}$$

$$V_{TEMPH} = V_{HIGH} = k2 \times V_{CC} (k2 = 0.8)$$

$$V_{TEMPL} = k1 \times V_{CC} (k1 = 0.45) \quad V_{TEMPH} = V_{L}$$

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

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

PTC

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

$$R2 = \frac{RTL \times RTH (k2 - k1)}{RTH (k1 - k2 \times k1) - RTL (k2 - k2 \times k1)}$$

Vcc

R1 R2 RTH RTL

RTH RTL

R2

R1

R1

◆ UVLO

VCC

UVLO

UVLO

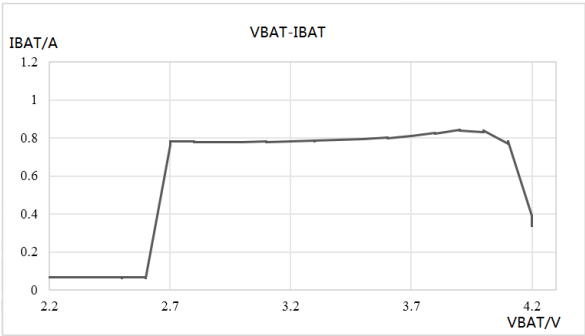
VCC

100mV

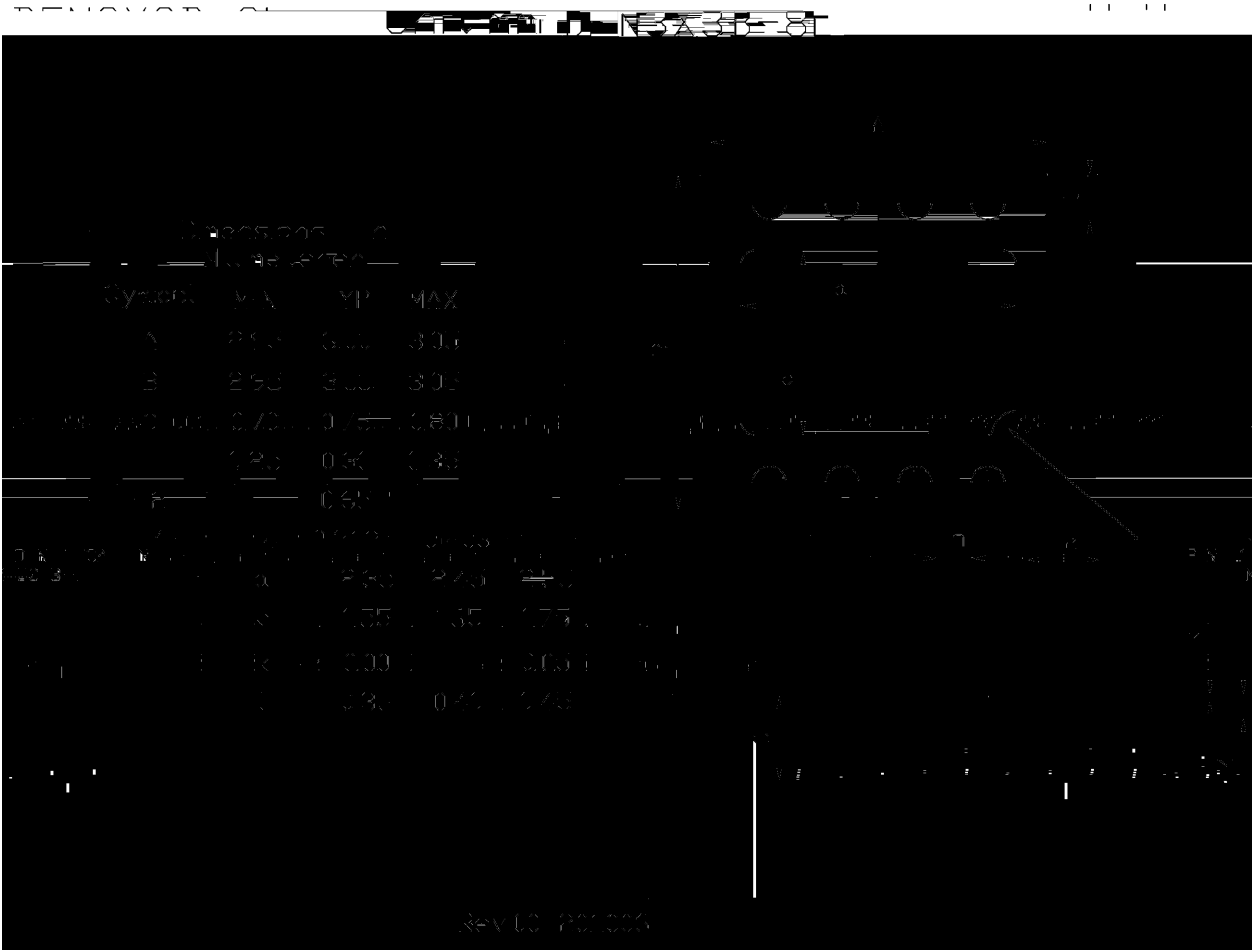
/ Function description



IC	PD	$V_{IN}-V_{BAT}$	I_{CHG}	:
		$P_D=V_{IN}-V_{BAT} \times I_{CHG}$		
	3.6V			
	4.0V		5%~10%	PD

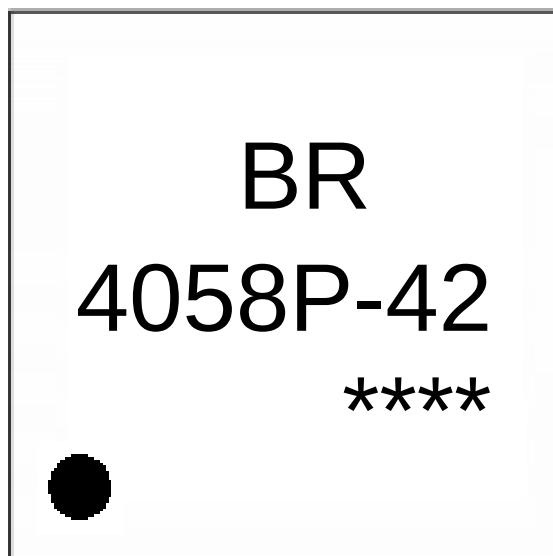


/ Package Dimensions





/ Marking Instructions



BR

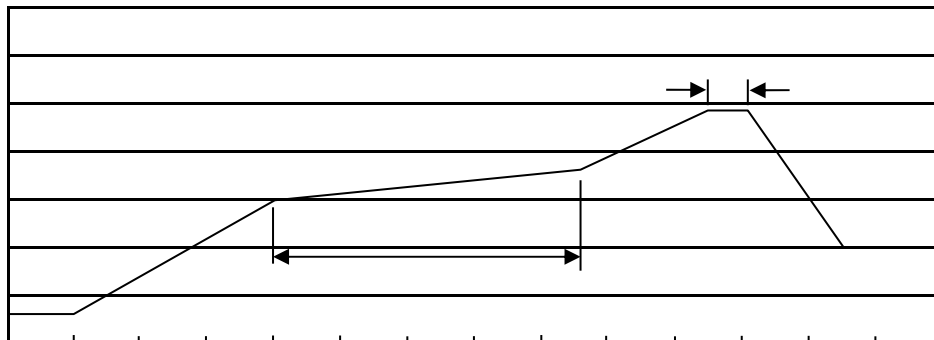
4058P

42

4.2V



() / 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

Package Type	Units					Dimension (unit mm ³)		
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
DFN3×3B-8L	5,000	2	10,000	6	60,000	13 ×12	360×360×50	380×335×366

/ Notices

All information provided in this document is subject to legal disclaimers.