

/ Revised record

版本	修订日期	有修订的页码	修订涉及的内容	拟制	审核
A	2020-9-30				

/ Descriptions

BRCL3130CZF 产品是单节锂离子/锂聚合物可充电电池组保护的高集成度解决方案。BRCL3130CZF 包括了先进的功率 MOSFET，高精度的电压检测电路和延时电路。

BRCL3130CZF 具有非常小的 DFN252-6L 的封装，这使得该器件非常适合应用于空间限制得非常小的可充电电池组应用。BRCL3130CZF 具有过充，过放，过流，短路等所有的电池所需要保护功能，并且工作时功耗非常低。该芯片不仅仅为手机而设计，也适用于一切需要锂离子或锂聚合物可充电电池长时间供电的各种信息产品的应用场合。

6)e 7R89::;(8<= /e\ e/ p13?@2* >/ A)>B) >C*eB1A*3C /3@*3C .31 D*)>@ 4->3C,p3@E 4 e1 0A**e1E p13*e2*3C.7R89::;(8<= 23C*A/C/ A?>vAC2e? p3 - e1 FGS=H6I)>B)-A22@1A2E v3@*ABe ?e*e2*3C 2>12@* / AC? ?e@AE 2>12@* /.

7R89::;(8<= >/ p@* >C*3 AC @1A-/ 4 A@ J=K ' 5 ' -L9 pA2MABe AC? 3C@E 3Ce eN*e1CA@ 23 4 p3CeC* 4 AMe/ * AC >?eA@ /3@*3C >C D>*e? /pA2e 3. 0A**e1E pA2M. 7R89::;(8<=)A/ A@ *)e p13*e2*3C .@C2*3C/ 1e0@>1e? >C *)e 0A**e1E App>2A*3C >C2@>?>CB 3ve12)A1B>CBI 3ve1?>/2)A1B>CBI 3ve12@11eC* AC? @3A? /)31* 2>12@>?>CB p13*e2*3C e*2. 6)e A22@1A*e 3ve12)A1B>CB ?e*e2*3C v3@*ABe eC/@1e/ /A.e AC? .@@ @*>PA*3C 2)A1B>CB.6)e @3 - / *AC?0E 2@11eC* ?1A>C/ D**@e 2@11eC* .134 *)e 2e@ -)>e >C / *31ABe. 6)e ?ev>2e >/ C3* 3C@E *A1Be*e? .31 ?>B*A@ 2e@@@A1 p)3Ce/I 0@* A/@ .31 ACE 3*)e1 9>-@3C AC? 9>-R3@E 0A**e1E-p3 - e1e? >C.31 4 A*3C App>AC2e/ 1e0@>?>CB @3CB-*e1 4 0A**e1E D>.e.

/ Features

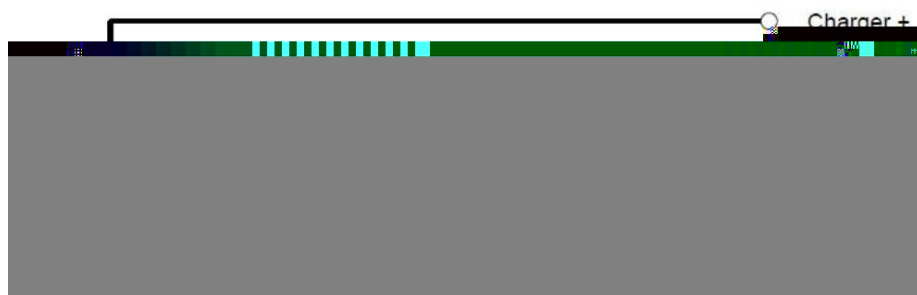
- ◆ 内部集成等效 45mΩ 的先进的功率 MOSFET；
- ◆ 超小封装 DFN252-6L；
- ◆ 过温保护；过充电电流保护；过放电电流；负载短路电流；
- ◆ 充电器检测；0V 电池充电功能，延迟时间内部设定，高精度电压检测；
- ◆ 低静态电流：正常工作电流：3.0uA；待机电流：<0.1uA；
- ◆ 非过放自恢复，需要激活；
- ◆ 无卤产品。
- ◆ QC*eB1A*e A?>vAC2e? p3 - e1 FGS=H6 ->*) HO@>vA@eC* 3. ST 4 U R_{JSIGK}
- ◆ YD*1A-/ 4 A@ J=K ' 5 ' -L9 pA2MABeX
- ◆ Gve1-*e 4 pe1A*@1e R13*e2*3CX Gve12)A1Be 8@11eC* R13*e2*3CX Gve1?>/2)A1Be 8@11eC*X 93A? S)31* 8>12@>?>CB.
- ◆ 8)A1Be1 ?e*e2*3C .@C2*3CX (Z 0A**e1E 2)A1B>CB .@C2*3CX ?e@AE *4 e/ A1e BeCe1A*e? >C/>?eX [>B)-A22@1A2E v3@*ABe ?e*e2*3C.
- ◆ 93 - 8@11eC* 83C/@ 4 p*3CX Gpe1A*3C F3?e+ :.(\A *EpX R3 - e1-?3 - C F3?e+] (.;@A *Ep X
- ◆ 6)e Gve1?>/2)A1Be >/ C3* /e@. 1e23ve1E AC? Cee?/ *3 0e A2*>vA*e?X
- ◆ [A@3BeC-.1ee R13?@2*.

/ Applications

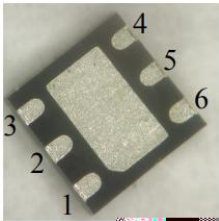
单芯锂离子电池组；锂聚合物电池组。

GCE-8e@ D*)>@ 4->3C 0A**e1E pA2MX 9*)>@ 4 -R3@E 4 e1 0A**e1E pA2M.

/ Typical Application



/ Pinning



Pin Number	Pin Name	Pin Description
1	Z J J	R3 - e1 S@ppE
2 7	^ K J	^13@C?I 23CCe2* *)e CeBA*>ve *e14>CA 3. *)e 0A**e1E *3 *)>/ p>C.
3	Z6	Q C*e1CA e/* p>C.
4	K8	K3 e e2*1>2A 23CCe2*>3C.
5 6	Z F	6)e CeBA*>ve *e14>CA 3. *)e 2)A1Be1. 6)e >C*e1CA =H6 / ->*2) 23CCe2*/ *)>/ *e14>CA *3 ^ K J.

/ Marking

See FA1M>CB Q C/*1@2*>3C/.

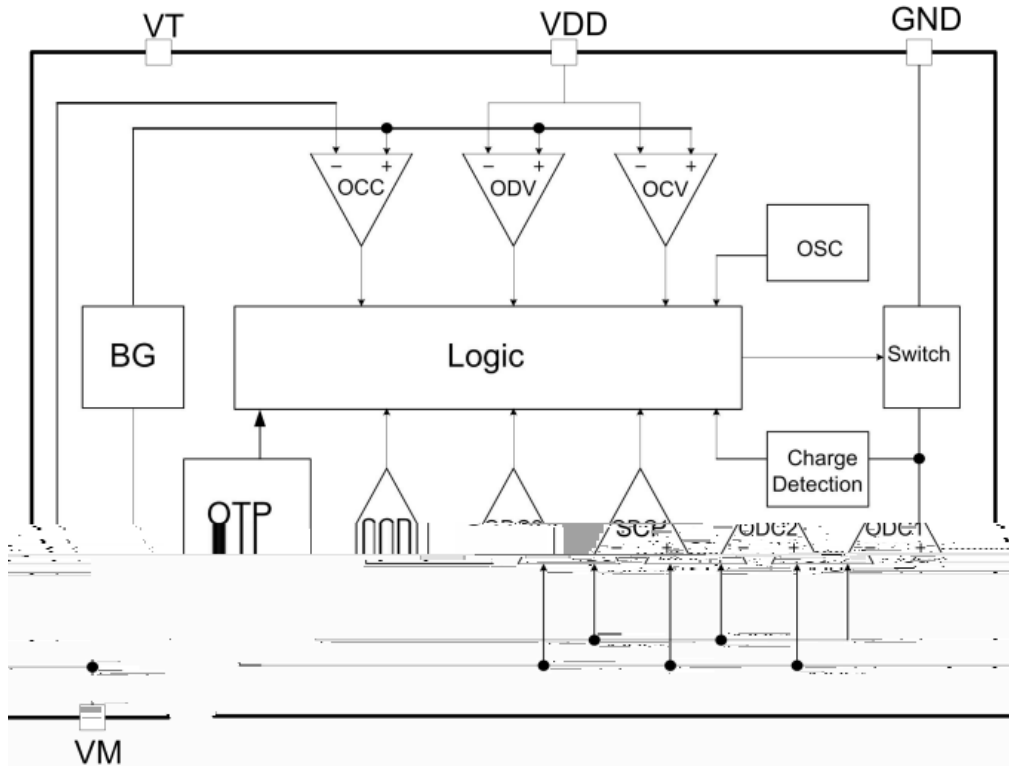
/ Absolute Maximum Ratings(Ta=25)

,RA1A4 e*e1	,SE403	,ZA e	,YC>*
Z J J >Cp@* p>C v3 ABe	Z K	-(. : *3 _L	Z
Z F >Cp@* p>C v3 ABe	Z ZF	-` *3 _; (	Z
FAN>4 @4 a@C2*>3C 6e4 pe1A*@1e	6a	; 'T	°C
9eA? 6e4 pe1A*@1e	6g	: ((	°C
Gpe1A>CB a@C2*>3C 6e4 pe1A*@1e	63p1	-S(*3 _bT	°C
S*31ABe 6e4 pe1A*@1e	6/*B	-TT *3 _; T(	°C
RA2MABe 6)e14A Re /> /*AC2e	RcaA	'T(	°C, d
	Rca2	; : (	°C, d
HSJ [7F	HSJ	'(((	Z



,RA1A4 e*e1	,SE4 03	,6e/* 83C?>3C	,F>C	,6Ep	,FAN	,YC*
Gve12)A1Be Je*e2*3C Z3)*ABe	Z _{8Y}		S.'T	S.: (	S.:T	Z
Gve12)A1Be ReDeA/e Z3)*ABe	Z ₈₉		S.(T	S.; (	S.;T	Z
Gve1?>/2)A1Be Je*e2*3C Z3)*ABe	Z _{J9}		'.e'	'.b(	'.bb	Z
Gve1?>/2)A1Be ReDeA/e Z3)*ABe	Z _{JR}		'.`'	:.((	:.(b	Z
8)A1Be1 Je*e2*3C Z3)*ABe	Z _{8[A}		-(.:	-(.S	-(.T	Z
Gve12)A1Be 8@11eC* Je*e2*3C	Q ₈₈	Z??f :.LZ	(.:	(.e	;	A
Gve1?>/2)A1Be 8@11eC*; Je*e2*3C	Q _{GZ;}	Z??f :.LZ	(.:	(.e	;	A
Gve1?>/2)A1Be 8@11eC*' Je*e2*3C	Q _{GZ'}	Z??f :.LZ	:	S.T	и	A я

/ Functional Block Diagram



/ Functional Description

BRCL3130CZF

MOSFET

45mΩ

6)e 7R89: ; (8<= 43C>*31/ *)e v30*ABe AC? 2@11eC* 3. A 0A**e1E AC? p13*e2*/ >* .134 0e>CB ?A4ABe? ?@e *3 3ve12)A1Be v30*ABe1 3ve1?>/2)A1Be v30*ABe1 3ve1?>/2)A1Be 2@11eC*I AC? /)31* 2>12@>* 23C?>*3C/ 0E ?>/23CCe2*>CB *)e 0A**e1E .134 *)e 03A? 31 2)A1Be1. 6)e pe1p)e1A0 2>12@>* >/ ve1E />4ple. 6)e FGS=H6 >/ >C*eB1A*e? AC? >*/ R_{JS\GK} >/ A/ 03- A/ ST 4 h *Ep>2A0.

/ Normal Operating mode

Q. C3 eN2ep>*3C 23C?>*3C >/ ?e*e2*e?! 2)A1B>CB AC? ?>/2)A1B>CB 2AC 0e 2A11>e? 3@* .1ee0E. 6)>/ 23C?>*3C >/ 2A00e? *)e C314A0 3pe1A*>CB 43?e.

/ Overcharge Condition

[illegible]

6)e 3ve12)A1Be 23C?>*3C >/ 1e1eA/e? >C *)e .3003 ->CB * - 3 2A/e/+
; d)eC *)e 0A**e1E v3l*ABe ?13p/ 0e13 - *)e 3ve12)A1Be 1e1eA/e v3l*ABe VZ8YwI *)e 7R89:;:(8<=
*@1C/ *)e 2)A1B>CB 23C*13l =H6 3C AC? 1e*@1C/ *3 *)e C314A0 23C?>*3C.
' d)eC A l3A? >/ 23CCe2*e? AC? ?>/2)A1B>CB /*A1*/I *)e 7R89:;:(8<=*@1C/ *)e 2)A1B>CB 23C*13l
=H6 3C AC? 1e*@1C/ *3 *)e C314A0 23C?>*3C. 6)e 1e1eA/e 4e2)AC>/4 >/ A/ .3003 -/+ *)e ?>/2)A1B>CB
2@11eC* .l3 - / *)l3@B) AC >C*e1CA0 pA1A/>*2 ?>3?e 3. *)e 2)A1B>CB =H6 >4 4e?>A*e1E A.*e1 A l3A? >/
23CCe2*e? AC? ?>/2)A1B>CB /*A1*/I AC? *)e Z F pC v3l*ABe >C21eA/e/ A03@* (.e Z V.31 - A1? v3l*ABe 3. *)e
?>3?eW .l34 *)e ^KJ p>C v3l*ABe 434eC*A1>E. 6)e 7R89:;:(8<=?e*e2*/ *)>/ v3l*ABe AC? 1e1eA/e/
*)e 3ve12)A1Be 23C?>*3C. 83C/e0@eC*1E1 >C *)e 2A/e *)A** *)e 0A**e1E v3l*ABe >/ e0@A0 *3 31 l3 - e1 *)AC
*)e 3ve12)A1Be ?e*e2>*3C v3l*ABe VZ8YwI *)e 7R89:;:(8<= 1e*@1C/ *3 *)e C314A0 23C?>*3C
>4 4e?>A*e1E 0@* >C *)e 2A/e *)e 0A**e1E v3l*ABe >/)>B)e1 *)AC *)e 3ve12)A1Be ?e*e2>*3C v3l*ABe
VZ8YwI*)e 2)>p ?3e/ C3* 1e*@1C *3 *)e C314A0 23C?>*3C @C>l *)e 0A**e1E v3l*ABe ?13p/ 0e13 - *)e
3ve12)A1Be ?e*e2>*3C v3l*ABe VZ8YwI eveC >. *)e l3A? >/ 23C



/ Overdischarge Condition

TDL BRCL3130CZF VDL ,
 FET VM VDD RVMD
 IPDN VM VDD
 RVMD VM VDD
 VDR
 d)eC *)e 0A**e1E v3D*ABe ?13p/ 0eD3 - *)e 3ve1?>/2)A1Be ?e*e2*3C v3D*ABe VZJ9W ?@1>CB ?>/2)A1B>CB
 @C?e1 C314A 23C?>*3C AC? * 23C?>C@e/ .31 *)e 3ve1?>/2)A1Be ?e*e2*3C ?eD AE *4e V*J9W 31 D3CBe1I *)e
 7R89: ; ; (8<= *@1C/ *)e ?>/2)A1B>CB 23C*13D =H6 3.. AC? /*3p/ ?>/2)A1B>CB. 6)>/ 23C?>*3C >/ 2A 0e?
 3ve1?>/2)A1Be 23C?>*3C. A.*e1 *)e ?>/2)A1B>CB 23C*13D =H6 >/ *@1Ce? 3..I *)e ZF p>C >/ p@00e? @p 0E *)e
 RZFJ 1e/>/*31 0e* -eeC ZF AC? ZJJ J >C 7R89: ; ; (8<= *)e 2@11eC* 3. *)e 2)p >/ 1e?@2e? *3 *)e
 p3 - e1-?3 - C 2@11eC* VQRJKW. 6)>/ 23C?>*3C >/ 2A 0e? p3 - e1-?3 - C 23C?>*3C. 6)e ZF AC? ZJJ J p>C/ A1e
 /)31*e? 0E *)e RZFJ 1e/>/*31.
 K3*e+ Q. *)e ZF p>C v3D*ABe >/ C3 De// *)AC *)e 2)A1Be1 ?e*e2*3C v3D*ABe VZ8 [AWI -)eC *)e 0A**e1E
 @C?e1 3ve1?>/2)A1Be 23C?>*3C >/ 23CCe2*e? *3 A 2)A1Be1I *)e 3ve1?>/2)A1Be 23C?>*3C >/ 1e1eA/e? V*)e
 ?>/2)A1B>CB 23C*13D =H6 >/ *@1Ce? 3C W A/ @/@AD p13v?e? *)A* *)e 0A**e1E v3D*ABe 1eA2)e/ *)e
 3ve1?>/2)A1Be 1e1eA/e v3D*ABe VZJR W 31)>B)e1.

/ Overcurrent Condition

VM
 ,BRCL3130CZF FET ,
 1 2 ,VM GND RVMS
 VM VDD
 VM GND RVMS VM
 1
 d)eC *)e ?>/2)A1B>CB 2@11eC* 0e234e/ eO@A 3 31)>B)e1 *)AC A /pe2>.e? vA 0@e V*)e ZF p>C v3D*ABe >/
 eO@A 3 31)>B)e1 *)AC *)e 3ve12@11eC* ?e*e2*3C v3D*ABe W ?@1>CB ?>/2)A1B>CB @C?e1 C314A 23C?>*3C
 AC? *)e /*A*e 23C?>C@e/ .31 *)e 3ve12@11eC* ?e*e2*3C ?eD AE *4e 31 D3CBe1I *)e 7R89: ; ; (8<= *@1C/ 3..
 *)e ?>/2)A1B>CB 23C*13D =H6 *3 /*3p ?>/2)A1B>CB. 6)>/ 23C?>*3C >/ 2A 0e? 3ve12@11eC* 23C?>*3C. V6)e
 3ve12@11eC* >C2D@?e/ 3ve12@11eC*I 31 D3A? /)31*2>12@*CB.W 6)e ZF AC? ^KJ p>C/ A1e /)31*e? >C*e1CA 0E
 0E *)e RZFS 1e/>/*31 @C?e1 *)e 3ve12@11eC* 23C?>*3C. d)eC A D3A? >/ 23CCe2*e?I *)e ZF p>C v3D*ABe
 eO@A /) *)e ZJJ J v3D*ABe ?@e *3 *)e D3A?
 7e2A@/e 3. *)e 23CCe2*3C 0e* -eeC *)e ZF AC? *)e ^KJ 0E *)e RZFS 1e/>/*31 -)eC *)e D3A? >/
 1e43ve?I *)e ZF p>C B3e/ 0A2M *3 *)e ^KJ p3*eC*AD />C2e *)e ZF p>C >/ /)31*e? *)e ^KJ p>C ->*) *)e
 RZFS 1e/>/*31. Je*e2*CB *)A* *)e ZF p>C p3*eC*AD >/ D3 - e1 *)AC *)e 3ve12@11eC* ?e*e2*3C v3D*ABe
 VZQGZ ; W *)e Q8 1e*@1C/ *3 *)e C314A 23C?>*3C.



/ Abnormal Charge Current Detection

VM		I _{IOCC}	
BRCL3130CZF	FET		
VM GND		(VCHA)	0V
		0V	

Q. *)e Z F p>C v3)*ABe ?13p/ 0e13 - *)e Gve12)A1Be 8@11eC* Je*e2*3C ?@1>CB 2)A1B>CB @C?e1 *)e C314 A 23C?>3C AC? >* 23C*CB@e/ .31 *)e 3ve12)A1Be ?e*e2*3C ?e1AE *4 e 31 13CBe1l *)e 7R89: ; : (8<= *@1C/ *)e 2)A1B>CB 23C*13) =H6 3.. AC? /*3p/ 2)A1B>CB. 6)>/ A2*3C >/ 2A1e? A0C314 A 2)A1Be 2@11eC* ?e*e2*3C.

A0C314 A 2)A1Be 2@11eC* ?e*e2*3C >/ 1e1eA/e? -)eC *)e v3)*ABe ?..e1eC2e 0e* - eeC Z F p>C AC? ^K J p>C 0e234 e/)>B)e1 *)AC *)e 2)A1Be1 ?e*e2*3C v3)*ABe VZ8 [A 0E /epA1A*CB *)e 2)A1Be1. S>C2e *)e (Z 0A**e1E 2)A1B>CB .@C2*3C)A/)>B)e1 p1>31>E *)AC *)e A0C314 A 2)A1Be 2@11eC* ?e*e2*3C .@C2*3C A0C314 A 2)A1Be 2@11eC* 4 AE C3* 0e ?e*e2*e? 0E *)e p13?@2* ->*) *)e (Z 0A**e1E 2)A1B>CB .@C2*3C -)>e *)e 0A**e1E v3)*ABe >/ 13 - .

/ Load Short-circuiting Condition

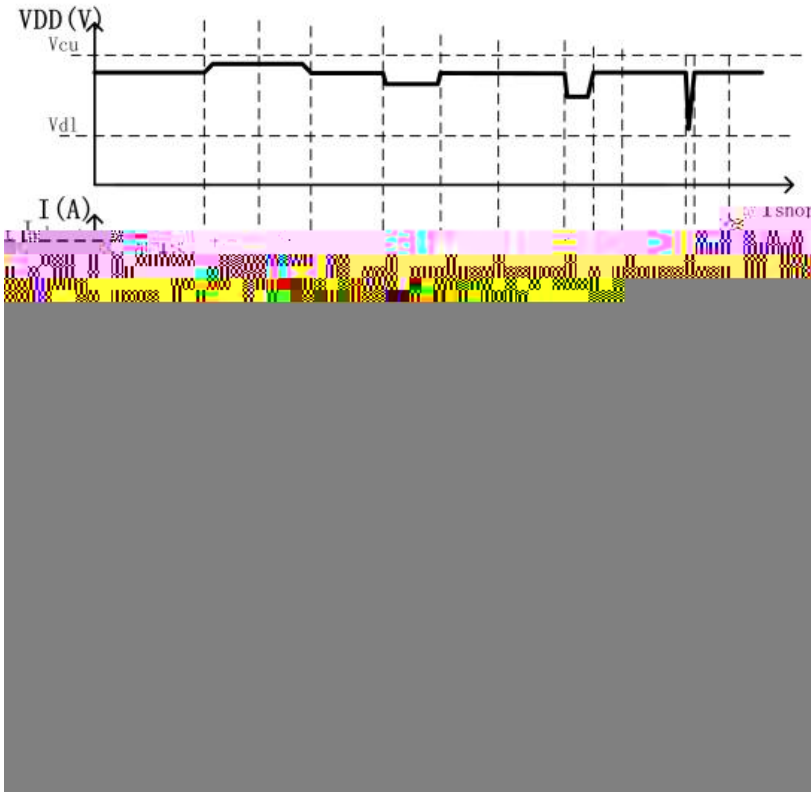
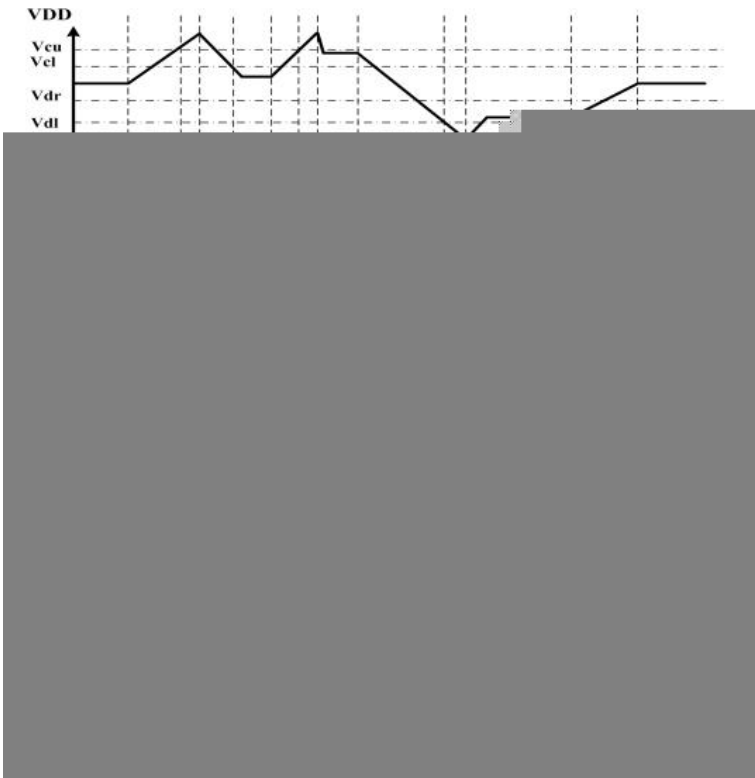
VM	VSHORT		tSHORT
BRCL3130CZF	VM	VSHORT	

Q. v3)*ABe 3. Z F p>C >/)>B)e1 /)31* 2>12@>*CB p13*e2*3C v3)*ABe VZS [GR6 0E AC? >* 23C*CB@e/ .31 *)e *S [GR6 31 13CBe1l *)e 7R89: ; : (8<= ->1 / *3p ?>/2)A1B>CB AC? 0A**e1E >/ ?>/23CCe2*e? .134 13A?. 6)>/ /*A*@/ >/ 1e1eA/e? -)eC v3)*ABe 3. Z F p>C >/)>B)e1 *)AC /)31* p13*e2*3C v3)*ABe VZS [GR6 0E /@2) A/ -)eC ?>/23CCe2*CB *)e 13A?.

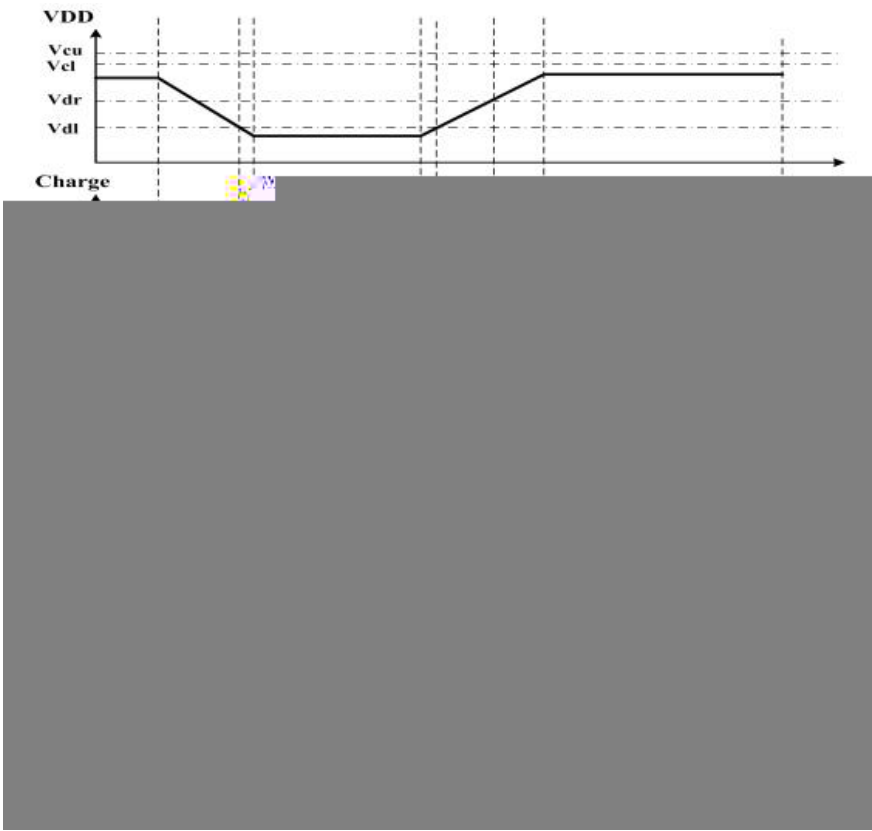
0V

/

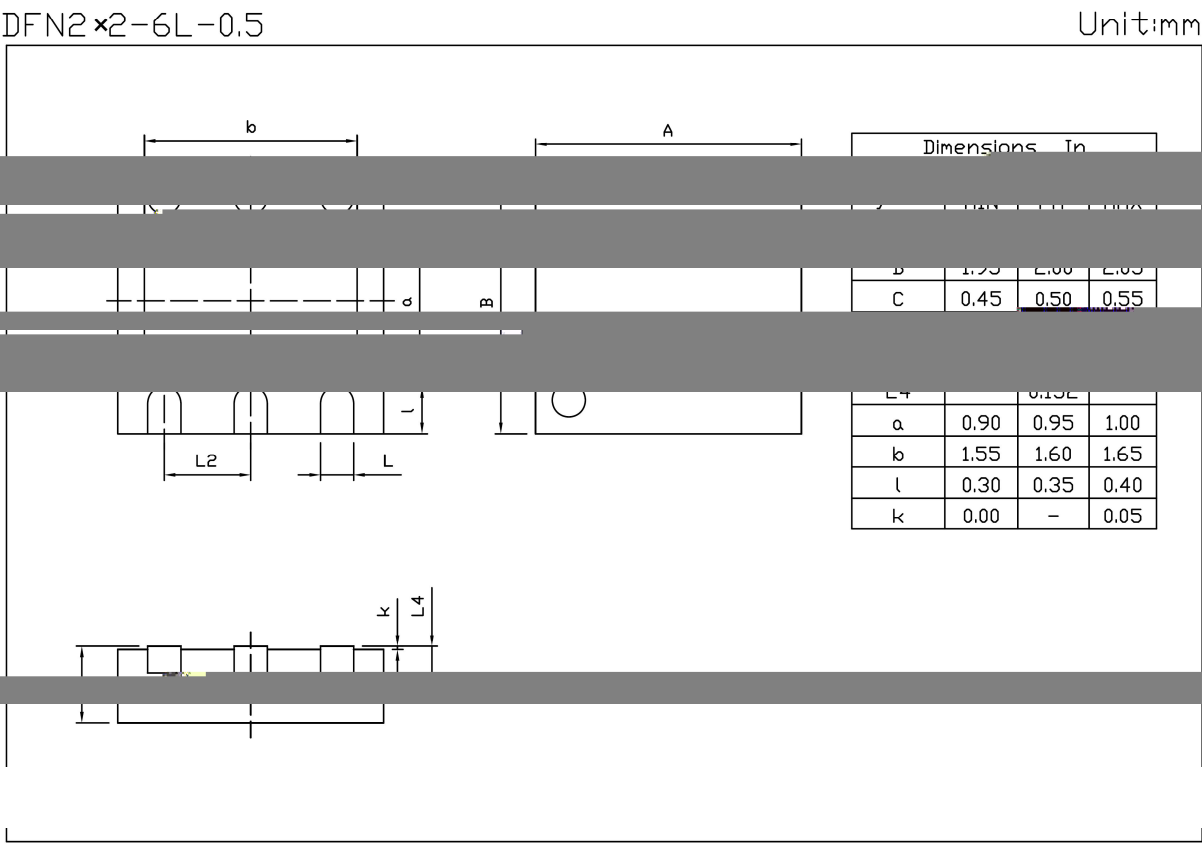
/ Timing Chart



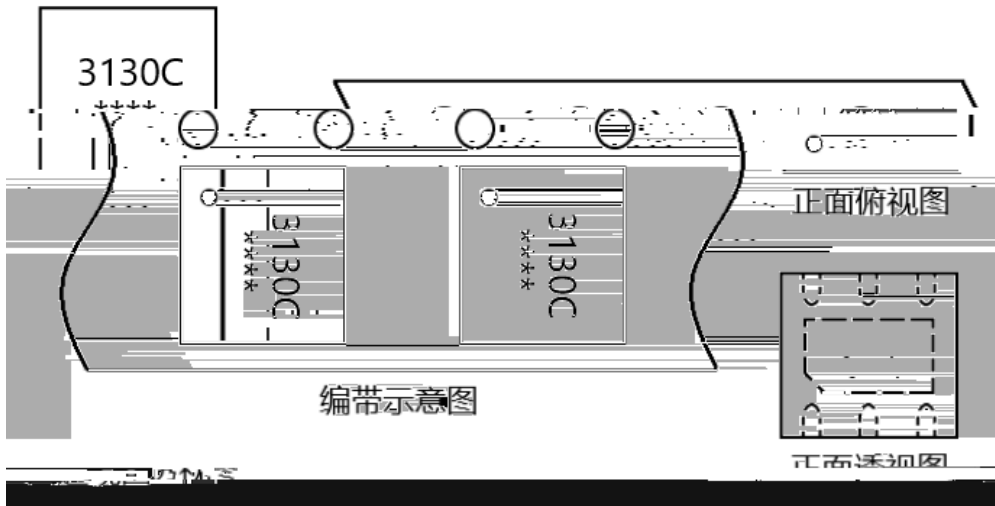
/ Timing Chart



/ Package Dimensions



/ Marking Instructions



3130C

K3*e+
:: (8+ R13?@2* 6Epe.
iiii+ 93* K3. 83?el 23?e 2)ACBe ->) 93* K3.

