5 é / Descriptions

(8) 2 * @ 8 ©%² . Ä å 3 5 9 , + : % -eO P ‘ / Ìož ¥ / Ì À Ä ³ o z ô y ³ o z Š Ä å 3 5 9 , + :ož ¥ / Ì Ä - 9o• - vo• y 9o• y vo• ½o• ? è ˆ _ ¾ ‘ ˆ k G ‘ / ¶ k ä | ª W •ož

(8) 2 * @ 8 J * , 4 ˜ (2 / x kÙ Q ¬ }%² Š y%² k• â ¿ • l kW • ¶ U ´ož

¤ ª / Features

‹ Ä å S S 3 5 9 , + : z
‹ * , 4 ˜ (2 / x z
‹ Ä å “ ‘ z
‹ M y y ‘ z
‹ Ý 4 ² Á v v ' z
‹ Ý 4 g 2 v v '
‹ —)í D }ož

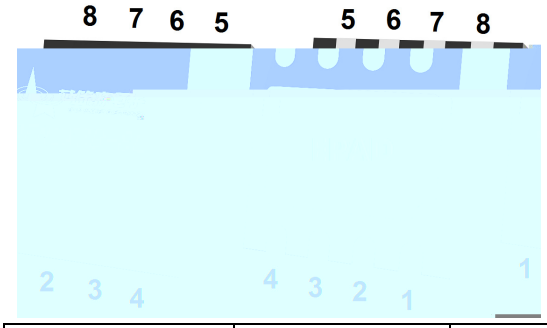
Ð ÷ / Applications

% -eO Y ÿ U - P Á k % -eO ü ` Ò U - P Áož
9 O T M R K R O Z N O [S O U T X K I N G X M K G H R K HRG_ZSZKKXX_X KVIGNIGQX MYKOGTHMRRKK HRGOZZZ

À ¹ € Ð Ô · ¢

h Þ y Š 8 P < Š › Q 4 Q 4) P < › [, k N / e / Ì Ü ¬ t k / Ì 3 o W •ož ò ç P } µD k Š 8 À 1ož

• Û - æ / Pinning



– Ú Z 6 O T 4 [S H	K X 6 O T 4 G S K	– ª ¢ 6 O T * K Y I X O V Z O U T
	VDD	› €
	- 4 *	/ Ì ª k N P / ¿ â
	< 3	- ˜ ¿ 9 N µ €
+ 6 ' *	- 4 *	/ Ì ª k N P / ¿ â

, M V / Marking

• - ~ ª ¢ož

See Marking Instructions.

Ã a ? d / Absolute Maximum Ratings(Ta=25 ;)

@ ƒ/Parameter	… Z/Symbol	ƒ › /Value	% y/Unit
V_{DD} input pin voltage	V_{IN}	-0.3 to +8	V
V_{VM} input pin voltage	V_{VM}	-8 to +10	V
Maximum Junction Temperature	T_J	-40 to +145	
Storage Temperature	T_{stg}	-55 to +145	
ESD g HBM Mode h	ESD	f 4000	V

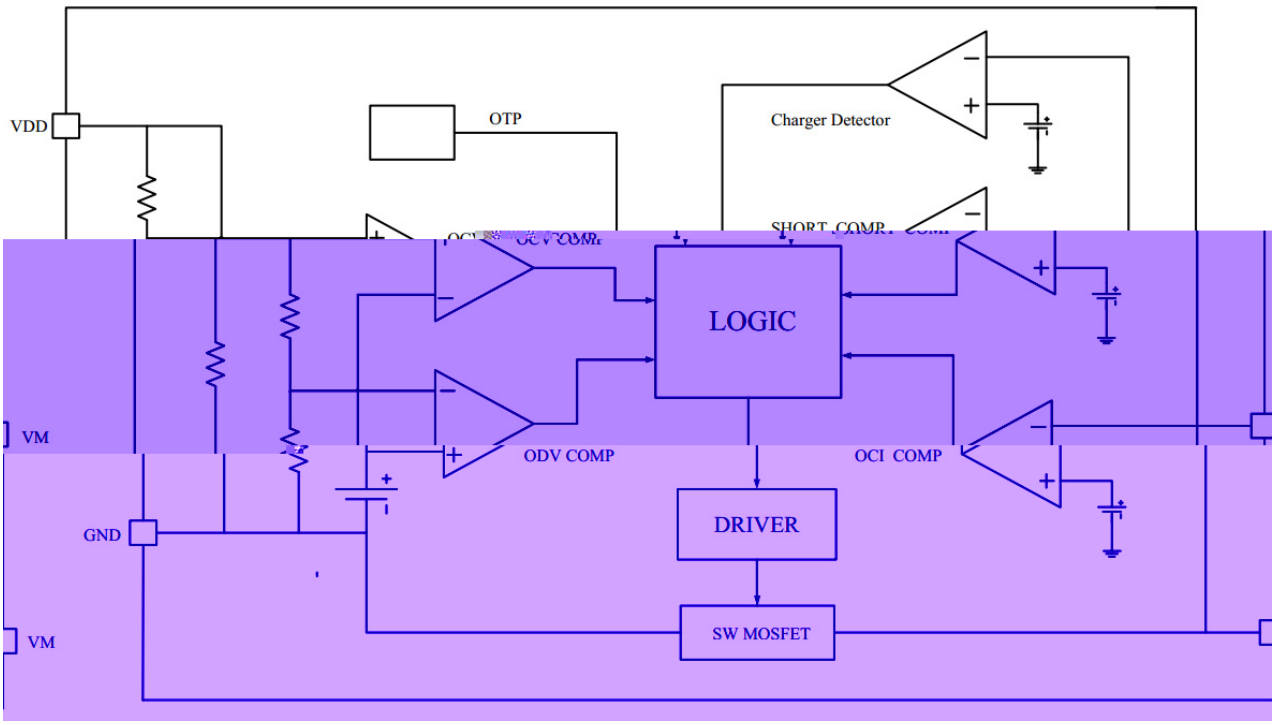
Ô4ì × ? d / Electrical Characteristics(Unless otherwise specified,Ta=25 ;)

@ ƒ Parameter	… Z Symbol	y ¡ Ú ^ Test Condition	Â 4 › Min	Á º › Typ	Â Ý › Max	% y Unit
Power supply						
Supply Voltage	V_{DD}		0		6	V
Charger input voltage	V_M		-6		6	V
Detection voltage						
Overcharge Detection Voltage	V_{OCV}		4.25	4.3	4.35	V
Overcharge Release Voltage	V_{OCR}		4.04	4.10	4.16	V
Overdischarge Detection Voltage	V_{ODV}		2.30	2.40	2.50	V
Overdischarge Release Voltage	V_{ODR}		2.90	3.00	3.10	V
Detection current						
Overdischarge Current Detection	I_{OCI}		9	11.5	14	A
Load Short-Circuiting Detection	I_{SHORT}		15	25	35	A
Overcharge Current Detection	I_{CHA}		7	10	13	A
Static current						
Current Consumption in Normal Operation	I_{OPE}	V_M=0V		3.5	7	A
Current Consumption in Dormancy	I_{PDN}	V_{DD}=1.8V		0.6	1.5	A
Pull-up and Pull-down Current from VM						
Internal pull-up current	I_{PU}			14		A
Internal pull-down current	I_{PD}	V_M=1V		14		A
Equivalent FET on Resistance						
Equivalent FET on Resistance	R_{DS}	I_{VM}=1A	12.5	16	18	m

Ô4ì × ? d / Electrical Characteristics(c , ¤ ï g Ta=25 ;)

@ ƒ Parameter	… Z Symbol	y ¡ Ú ^ Test Condition	Â 4 › Min	Á º › Typ	Â Ý › Max	% y Unit
Over temperature protection						
Over-temperature protection	OTP			145		
Over-temperature protection release temperature	OTPR			120		
Detection delay						
Overcharge Voltage Detection Delay Time	T_{OCV}			100		ms
Overdischarge Voltage Detection Delay Time	T_{ODV}			100		ms
Overdischarge Current1 Detection Delay Time	T_{IOV1}			8		ms
Overdischarge Current2 Detection Delay Time	T_{IOV2}			2		ms
Load Short-Circuiting Detection Delay Time	T_{SHORT}			150		ms

× ä ¢ Functionl Block Diagram



× 5 é Functional Description

(8)2 *@8!O P 9y vkw* ••- ˜êñ¿úkÛ‘ %-U- eO P k œ - 9o• y 9o• y vYC?è^ÕÑòC°ož ? C…U- PW•¨6 8 Äož¥/ÌN¬%²h,ÙN y%² ÙN Šk359,+:]Äåk^| Š Á º› S Sož (8)2 *@8u4š_ g%”y3oW•%”o•- W•%”o•y W•%”yg2W•%”ož

n V € “ Normal Operating mode

òçZÄ yñ`~‘oÕÑk- yy iC1 ôEk _ÕÑf 3oW•%”ož

Ú¬Ô85Š Đ Overcharge Voltage Condition

¨3oÚ^ - ik¢ P 9ä9 - y 9 < 5)< kw4Òž• ñ - 9 y• ž• : 5)< ê¾xk(8)2 *@81Oò359,+:Y 2-ož _ÕÑf - 9ÕÑožòç‘ oÕÑ¨ - 9 y• ž• : 5)< Äƒâk©Ï1 •ož Y _ÕÑ k - 9ÕÑ1tKyy o• - ˜ NÕÑ k <3€ 9z9- ˜ y 9 <).' k P 9J -Ky 9 < 5)8 ož o• - ˜Ì NÕÑ k P 9J - y 9 <UI\ ož¢- ˜Ìt Nžk 9QÀ ä9 - y 9k P1* ÄB8â’y ož

Ú¬ÔW5Š Đ 5\KXINGXMK)[XXKTZ)UTJOZOUT

¨- W•%” kòç v ›Ý /).' w4Ò%²<ž• : 5)/ ê¾xk/Ì1Oò359,+:Y 2-k _ÕÑtf - vÕÑož(8)2 *@814Ò!O vÙÁk N¿úêñ- ˜• •k/Ì1Ky - vÕÑož

Ú ZÔ 85Š Đ Overdischarge Voltage Condition

¨3oÚ^ y ik¢ P 9J y y 9 < 5*< kw4Òž• ñ y 9 y • ž• : 5*< ê¾xk(8)2 *@81ä• Py¿ú NkY 2y ož _ÕÑtf y 9ÕÑož4žy Oò359,+:••kÄB v’ø•ož¢<** 949^9 < Á º› k v ƒô1‘z g2ÙÁ vƒô / 6*4 _ÕÑtf g2ÕÑož¢<** 9^9 < Á º› ê¾äžkg2Ú^1tKyož P 9Ý9^9 y yKy 9 < 5*8 žk(8)2 *@81›ñ3 oW•Ú^ož

Ú ZÔ W5Š Đ Overdischarge Current Condition

òçy vÝ Ì ›k 4Òž•Ý9^9 y v y• ž•k Py¿ú1t••ož ò ç¨ y v y• ž•Äk vA‘ Ì ›8 $Äk ©Ï1 •ož /ÌÄB v <3k ¢<3 949ê^9 y v @ð 9k y vÙÁ1tÖyož

ŽÉ ·5Š Đ Load Short-circuiting Condition

3<3’ 949^9?è‘ 9 < 9.58: k©Ï1 2y Py¿ú N1••ož :9.58:©ä• v ÂÝ• ž•ož¢<3 949ê^9 y v @ð 9k¿ú?èÙÁ1tÖ yož

¬ Ô — ó Z Charger Detection

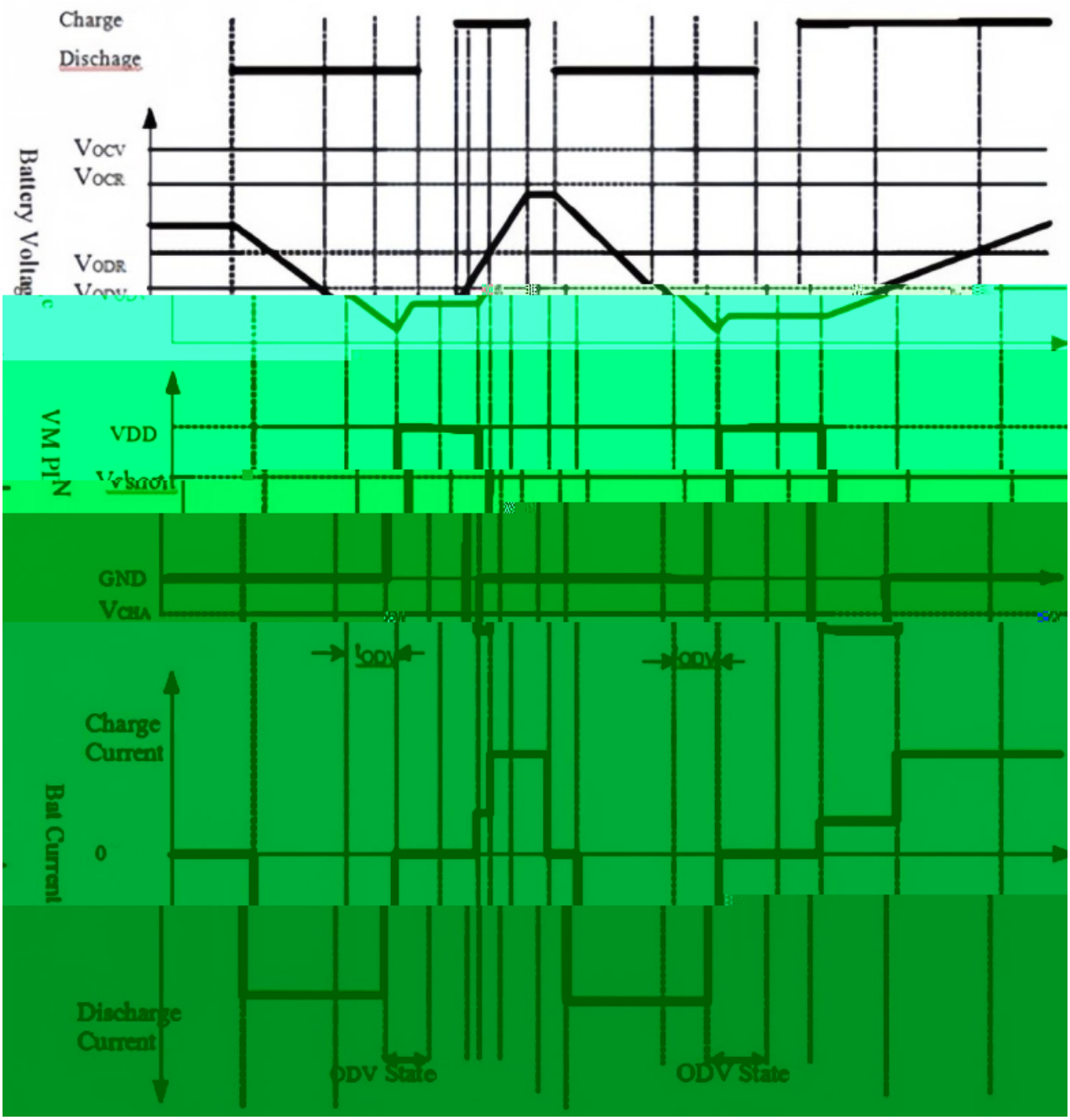
¢ Ô 9 y Ù Á P y - ˜ , k 3 < 3 ' 9 4 9 ˆ 9 - ˜ y 9 <) . ' k ¢ P 9 Ý 9 ˆ 9 y y 9 < 5 * < k (8) 2 * @ 8 1 K y y Ù Áož

< Ô 1 ¬ Ô × 0V Battery Charging Function

U Y < - k P 9 z 9 < k - / Ì µ g 2 Ù Á k 4 ž 3 5 9 • • k / Ì * } 8 â ' - ož P 9 z 9 < k - v Ý 9 S ' k Y ² P y / Ì C °ož

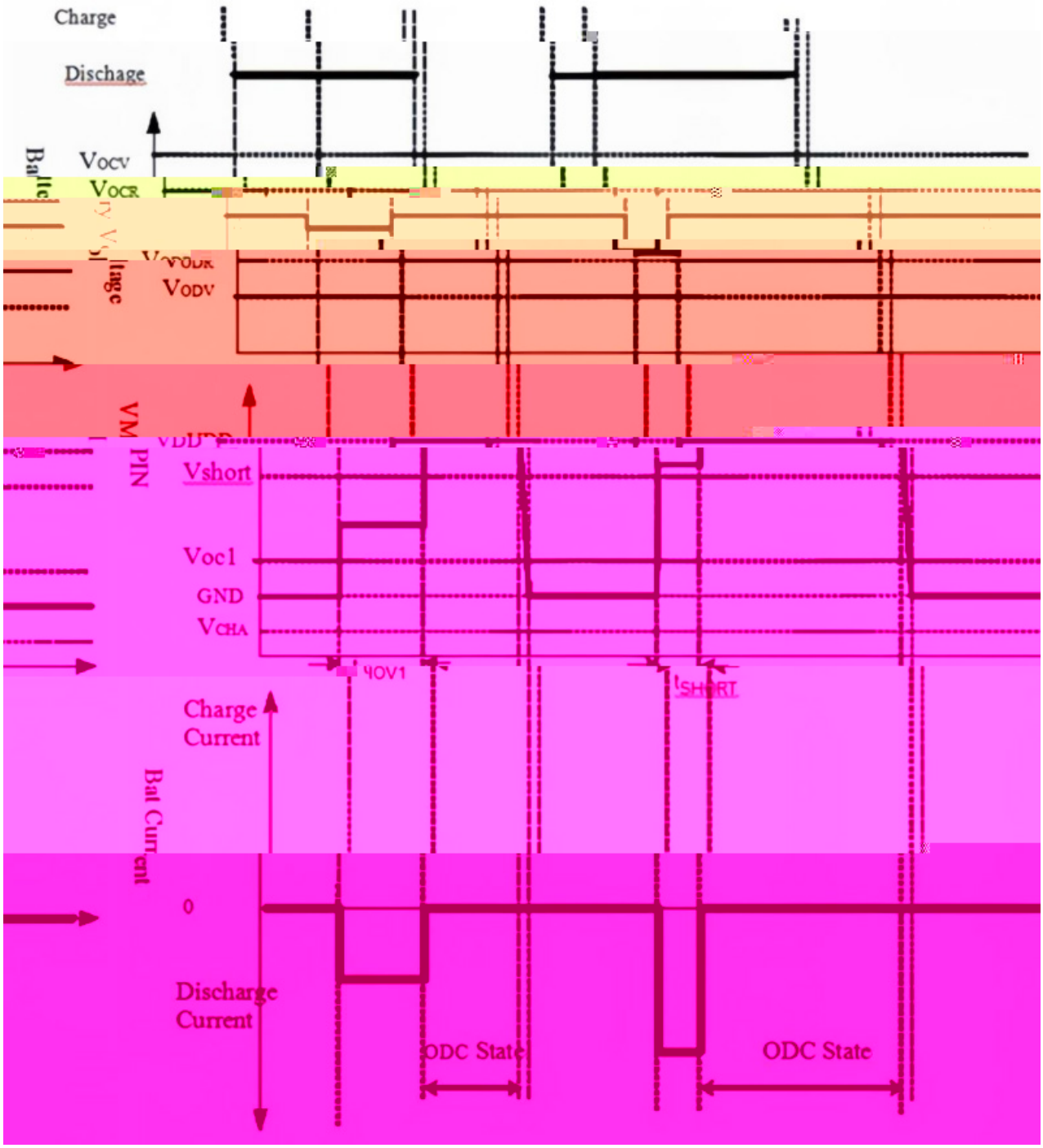
• } ¢ Timing Chart

Ú Z ` ¬ Ô ` n V € Overdischarge ` Charging ` Normal Operation.

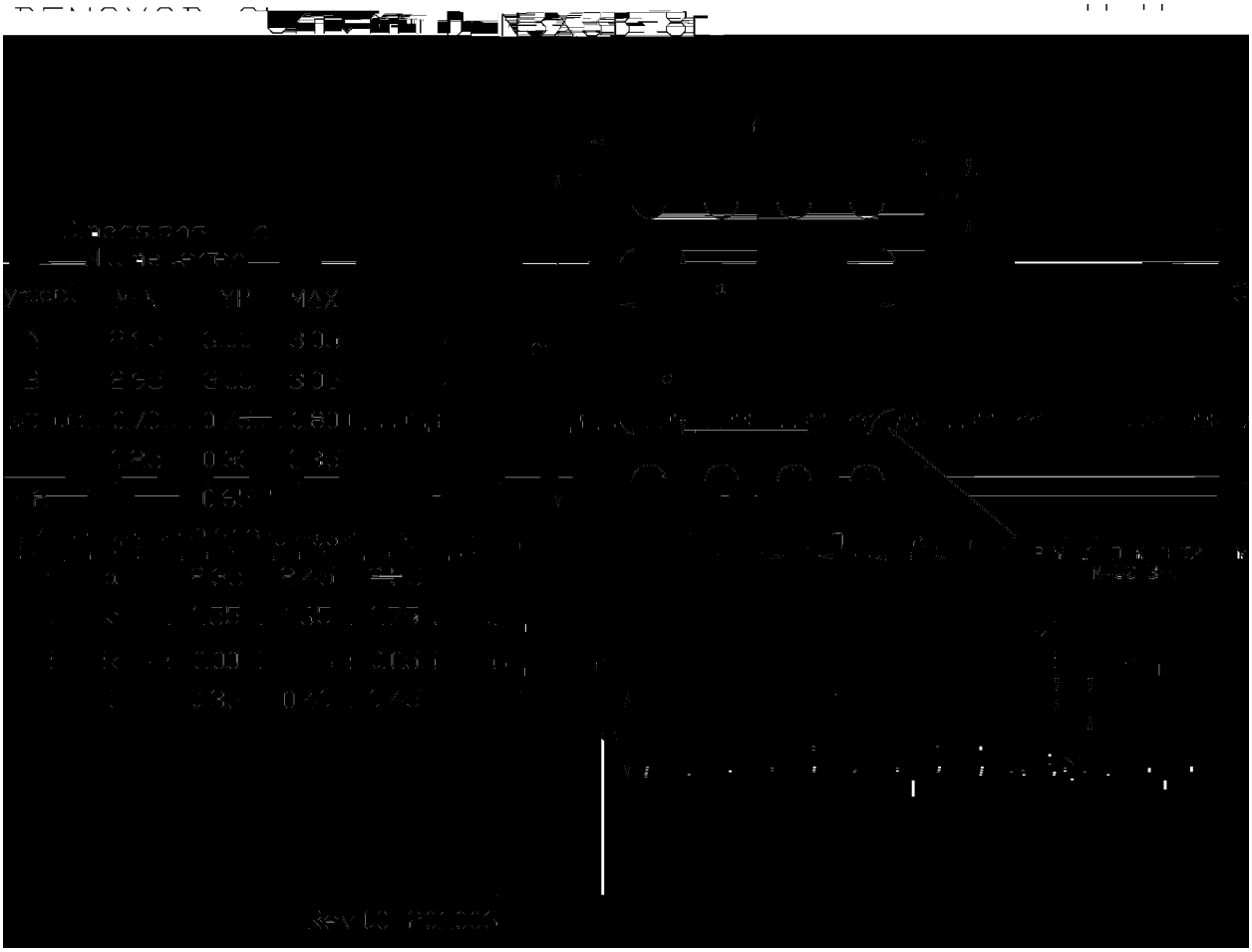


• } ¢ Timing Chart

Z Ô Ú W ` n V € Discharge Overcurrent ` Normal Operation.



Ø ¤ =) ¢ / Package Dimensions



, M y ƒ / Marking Instructions

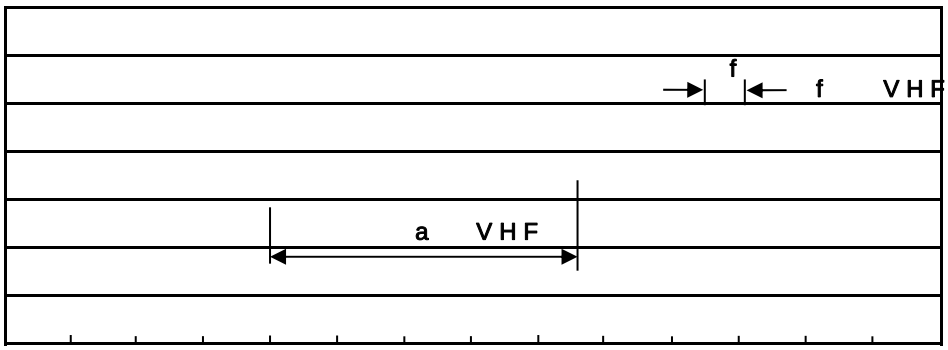
ª ¢ y

(8 y , [W A

* y º Z W A

y ÿ D Z W A k š ÿ D Z J

š WD t … • Ž ¢ (x /) / : K S V K X G Z [X K 6 X U L O R K L U X / 8 8 K L R U] 9 U R J K X O T M 6



7 L P H V H F

ª ¢ y

Note:

1o• Ä ½ “ † 150 ½180 - k ž • 60 ½90sec;

1.Preheating:150~180 - , Time:60~90sec.

2o• Q › “ † 245 r5 - k ž • 4 Ò 5 r0.5sec;

2.Peak Temp.:245 r5 - , Duration:5 r0.5sec.

3o•D N ò i Ò 0 , † 2 ½10 - /sec.

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 ÆEmm³)		
	Units/Reel / --	Reels/Inner Box -- /-	Units/Inner Box /-	Inner Boxes/Outer Box - /1ç	Units/Outer Box /1ç	Reel	Inner Box×	Outer Box1ç
DFN3×3B-8L	5,000	2	10,000	6	60,000	13 s ×12	360×360×50	380×335×366

„ Ð y ƒ / Notices

Î † U ^ ñ Ä ’ Î ® I c ¯ ² Á Ò ¢ ³ Øož

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