

E

BCH9. DU Ybi a Vyfg Zf dfYj ci g fYj gcbg a UmXZYf Zca dU Ybi a Vyfg b h YWffYbhj Yfg cb

FYj gcb % . DfcXi Vmcb

FYj gcb %%5XXGK HfUbg Ybh56GgdYW

FYj gcb %&.I dXUHY9B VtbZ i fYI J C fYUHYX

FYj gcb % .I dXUHY: i fY%&

FYj gcb %(.I dXUHY89J 79 CF89F B: CFA5HCB

GK	*	Gk hW b bcXY cZh Y V W Vbj YfhYf
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Cj Yf cdYfUhb ZYY Uf hYa dYfUhi fY fUb Yi b Ygg ch Yfk gY bchYX

L G N L	GHCH	GH	G R	OH
J-8	hdi hjc HU Y fUb Y	()	(	J
H	CdYfUhb i bVMc b hYa dYfUhi fY	(	%&)	7

L G N L	GHCH	GH	G R	OH
J _{9G8}	< i a Ub 6cXmAcXY <6A dYf5BG= 9897 G % & % gdYVZW hcb U d bg %	&	&	J
	7 Uf YX8Yj W AcXY 78A dYf5BG= 9897 G & & % gdYVZW hcb U d bg %	)	)	J

(1) 9897 XcW a Ybh 9D%) ghYgh h Uh) J <6A U ck g gUZ a Ubi ZMM f b k h U ghUbXUfX 9G8 W b hfc d f c Wgg

(2) 9897 XcW a Ybh 9D%+ ghYgh h Uh) J 78A U ck g gUZ a Ubi ZMM f b k h U ghUbXUfX 9G8 W b hfc d f c Wgg

L G N L	NB LG FG NLC	NM N, - 0	OH
F ₅	i bVMc b h Ua VYbh h Yfa U fYg ghUbW %	, -	7 K
F ₇	i bVMc b h WlgY h Yfa U fYg ghUbW %	-	

% G7H d f c j X Y g F₅ UbX F₇ bi a VYg cb mUg fYZfYbW h Ygha UhY i bVMc b hYa dYfUhi fYg cZh Y XYj Wg F₅ UbX F₇ UfY bchU WUfUWYf ghWcZdUWU Y IgYZ V hcZa Ubmch Yf gnhYa Yj Y WUfUWYf ghVj gi W Ug h Y XYg b UbX Uhci hcZh Y d f bhX W W h VcUfX D76 cbk W h Y G7H& % g a ci bhX h Yfa U dUXgnY UbX Y hYfU Ybj fcb a YbU ZMM f g H YD76 VcUfX g U Yuhg b_ h Uh g gc XYfYX h h Y YUXg UbX h Yfa U dUXcZh Y G7H& % 7 Ub b h Y XYg b c f V b z i fU hcb cZh YD76 VcUfX WUb Yg h Y YZWbW h cZh Y Yuhg b_ UbX h YfYfYh YUW U F₅ UbX F₇

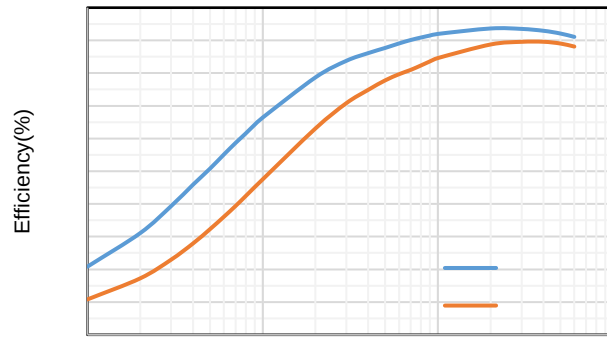
J-81%J H1 (7r %) 7 hmd WU jUi Y ghYghX i bXYf &) 7

MSG I F	L G N L	N M N I H GH	GH NS G R	OH
i q l Mo f s h l on on				
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J-8SI J C	hdi hl J C < n ghYfYg	J-8 f g b	(((	J a J
8	G i hXck b WffYbh	9B1 Bc cUX J-81%J	%)	i 5

MSG I F	L G N L	N M N I H Q C H	G C H N S G R	O H Q
o l l h n F g g n				
=AS<G8	<G8 dYU_ WffYbh a h		+ - %%	5
=AS G8	G8 jU YmWffYbh a h	: fca gci fW h XfU b	,	5
=AS G8B	G8 bY Uhj YWffYbh a h	: fca XfU b h gci fW	*	5
M q n b d a l k o h s				
: Gk	Gk hW b ZYei YbVh	J 1 % J C I H 1) J	- * % & % (	_ < n
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l i n n h				
J C J D	: Y X V U W _ c j Y f j c h U Y k h f Y g d Y W h c	J : 6 J F 9 : f g b	% %	
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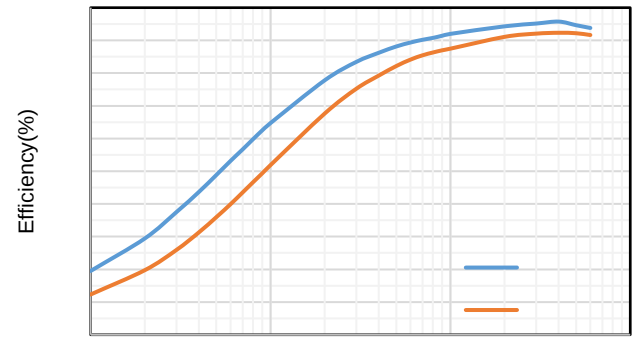
8 Y f j Y X Z c a V y b W W U f U M Y f n U h c b

E



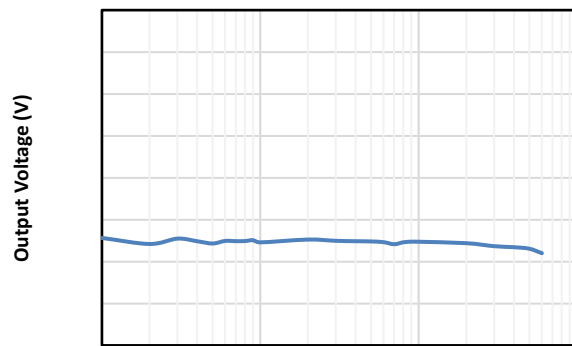
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: i fY % 9ZWbVhjg cUX7i ffYbh Jci hI) J



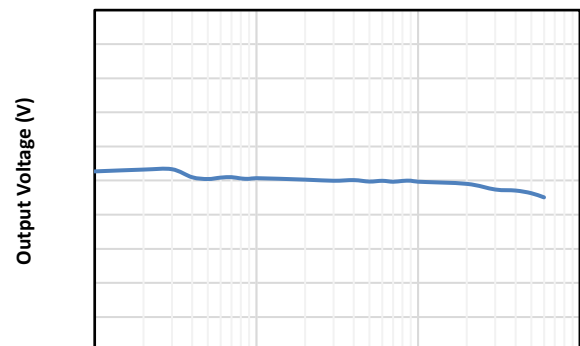
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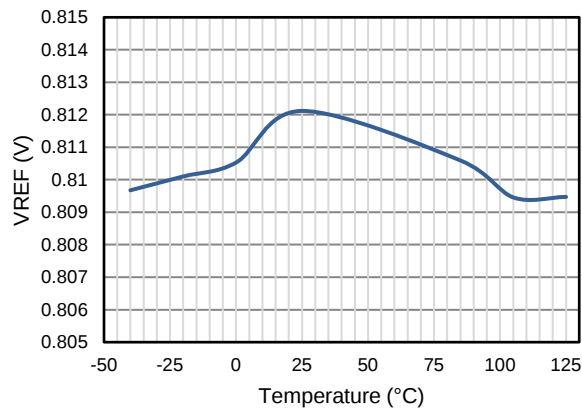
IOUT (A)

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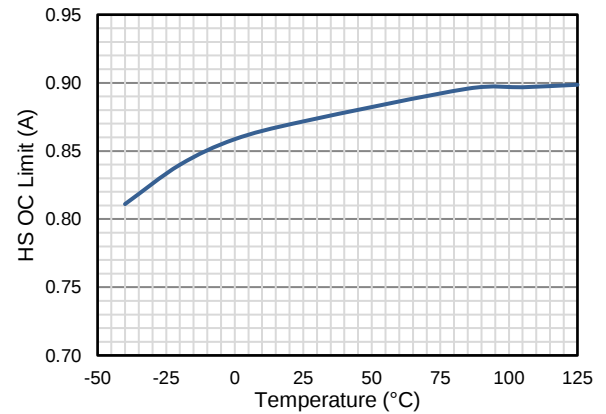


IOUT (A)

: i fY(cUXFY i Uchb Jci hI) J J b1&(J

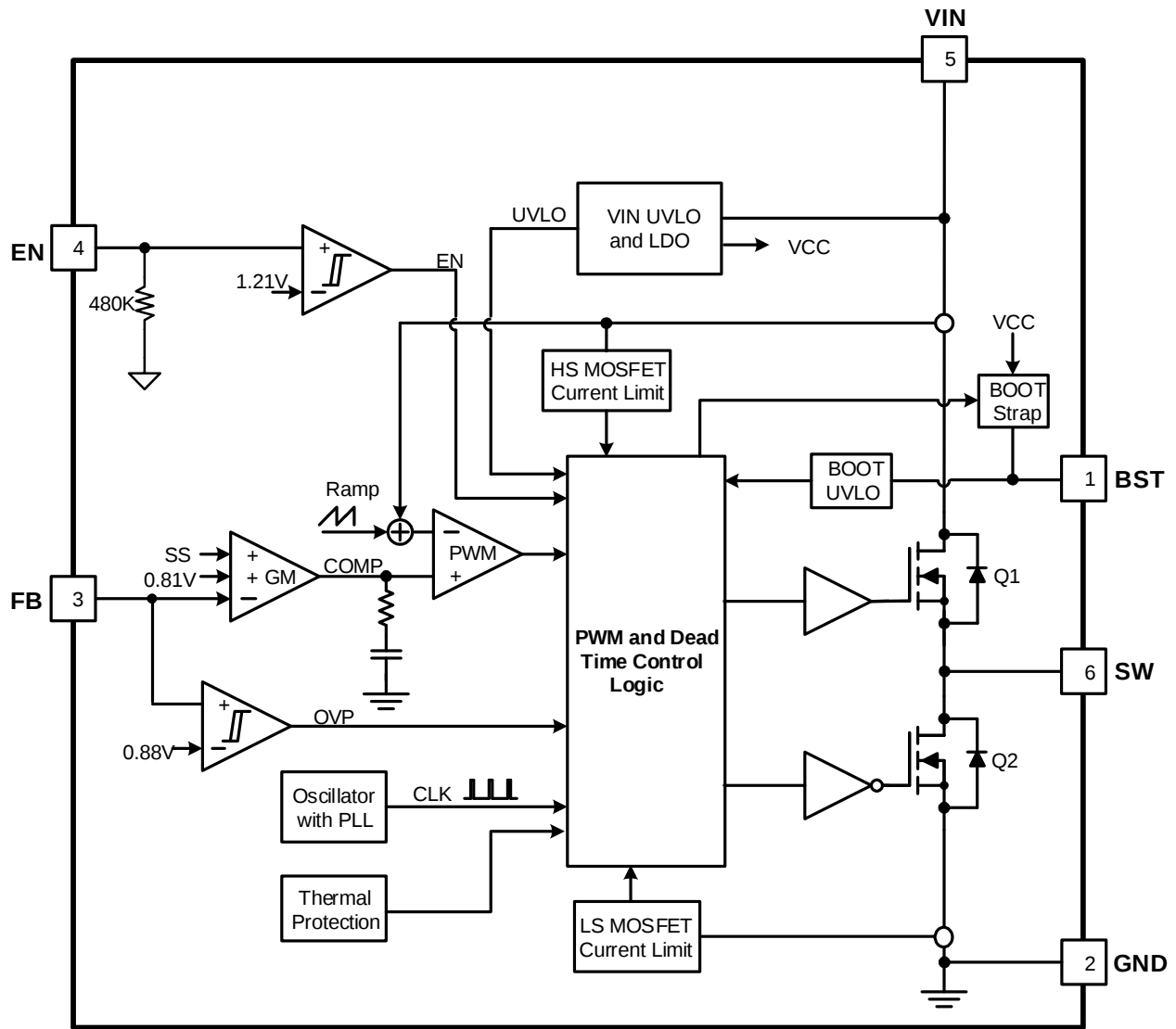


: i fY) FYZfYbW J GHYa dYfUi fY



: i fY* <G7i ffYbh a hJ GHYa dYfUi fY

M N, .



: i fY % : i bVWcbU 6 cW_8 U fUa

I p lpc q

H Y G7H&(% XYj W g () J (J bdi h * a5 ci hdi h Z m bhY fUHYX gmbWfc bci g V W V&bj YfhYfg H YXYj WY Ya dcmg Z YX ZYei YbVhdYU_ WffYbha cXY V&bhfc 5b bhYfbU W&W k h %&A<n ZYei YbVh b hUhg h fb b cb h Y bhY fUHYX gXY dck Yf ACG: 9HE % b YUW VhWY h Yb bXi V&cf WffYbhfgYg bYUfmUbXh Y V&bj YfhYf WUf Yg ci hdi hWd K Yb gYbgYXjc tU Ycb gXY ACG: 9H dYU_ WffYbhfgb Uvcj Yh Yjc tU YcZ bhYfbU 7CAD gYYZ bVhcbU VcW XU fUa h YXYj WY h fbg cZZ gXY ACG: 9HE %UbXh fbg cb ck gXY ACG: 9H E & H Y bXi V&cf WffYbhXYWYUgYg k Yb ACG: 9HE & g CB ð h YbY hfgb YX YcZV&W VhWY h Y ck gXY ACG: 9HE & h fbg cZZ H g fYdYUg cb VhWY VmVhWY VUgYX

H Y dYU_ WffYbha cXY V&bhfc k h h Y bhYfbU ccd V&a dYbgUhcb bYk cf_ UbXh Y V h b %a g gcZhghUfhg a d Zh h Y G7H&(% Z&chdf bfg UbXa b a nYh YcZZW d V&a dcbYbhV&i bfg AYUbk Y h fYXi WYg h Y Y hYfbU dUgg j Y V&a dcbYbfg gnYUg k Y

K Yb XgUV b h YXYj W h Ygi ddmg i hXck b WffYbh g cbm%5 H Y G7H&(% k cf_g Uh: cfW Di gYK Xh AcXi Uhcb : DK A a cXYtc UW Yj Yga U ci hdi hf dd YUh h cUXa cXY

e oll hnGi i hrli f

H Y G7H&(% Ya dcmg Z YX ZYei YbVhdYU_ WffYbha cXY V&bhfc 5b bhYfbU W&W b hUhg h fb b cb h Y bhY fUHYX gXY dck Yf ACG: 9HE % b YUW VhWY h Yb bXi V&cf WffYbhfgYg bYUfmK Yb h YWffYbh fci gXY ACG: 9H fYUWYg h Y h fYg c X Yj Y gYh Vmh Y7CAD jc tU YcZh Y bhYfbU Yffcf Ua d ZYf h Y gXY ACG: 9H h fbg cZZH Y gmbWfc bci g ck gXY ACG: 9HE & h fbg cb h h YbY h W&W VhWY VY bg

H Y Yffcf Ua d ZYf gYf Yg h Y7CAD bcXY VmV&a dUf b h Yjc tU YcZh Y: 6 db k h Ub bhYfbU , % fYZfYbWY jc tU Y K Yb h Y cUXWffYbh bWYUgYg UfYXi V&cb b h ZYXUW_jc tU YfYUj Ytc h YfYZfYbWY fUgYg 7CAD jc tU Yh h YUj YfU Y bXi V&cf WffYbha UH Yg h Y bWYUgYX cUX WffYbh H g ZYXUW_ ccd k Y fY i UYg h Y ci hdi h jc tU Ytc h YfYZfYbWY H YXYj WUgc bhY fUHYg Ub bhYfbU gcdY V&a dYbgUhcb WfW hfmhc dfYj Ybghi V Ufa cb W&gWUhcb k Yb Xi hmVhWY g fYUHYf h Ub) Z&f U Z YX ZYei YbVhdYU_ WffYbha cXY V&bhfc

H Y G7H&(% cdYfUHYg b : cfW Di gYK Xh AcXi Uhcb : DK A a cXYtc UW Yj Yga U ci hdi hf dd YUh h cUX a cXYtc dfcj XYh Y ck Yf ci hdi hf dd Y b h cUX V&bXhcb

PGI i q l

H Y G7H&(% g XYg bYXtc cdYfUHY Zca Ub bdi h jc tU Ygi ddmfUb Y VYk Yyb () J tc (J Uh YUgh %: XYV&i d b WYfUa WUd g fYV&a a YbXYXtc VhdUgg h Ygi ddm b c gY Zh Y bdi hgi ddm cWYhg a cfYh Ub UZk bWYg Zca h Y V&bj YfhYf Ub UXXhcbU Y YVfrc nhW&cf tU b tU i a V _ WdUW&cf cf k h fYV&a a YbXYX %i: a UmVY fYei fYX b UXXhcb tc h Y cWU WYfUa WVhdUgg WdUW&cf g

h f h Oh I Pi fn a Fi ei onOPFI

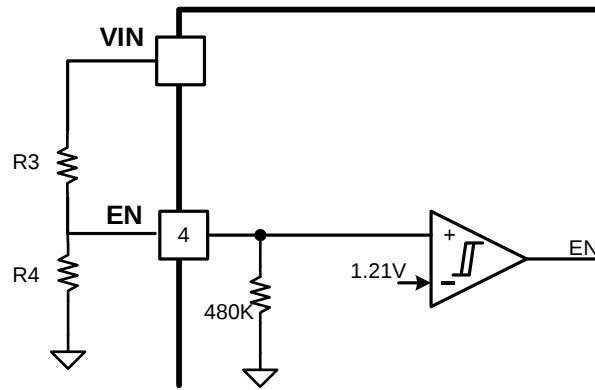
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K Yb Uddmb Ujc tU Y Yf h Ub h Y 9B h fYg c X hmd W %&% fgb h Y G7H&(% YbUVYg U Z bVhcbg UbXh YXYj WY ghUfhg gcZhghUfhg d UgY H Y G7H&(% Ug h Y V h b %a g gcZhghUfhg a Ytc dfYj Ybh h Y ci hdi hcj Yfg cchUbX bfg WffYbh K Yb 9B db g di YX ck h Y bhYfbU GG bYhk VY XgWUf YXtc fci bX 6i W_cdfUhcb g XgUVYXk Yb 9B jc tU YZU g VYck hg ck Yf h fYg c X hmd W m%& ZU b

5b bhYfbU (, _di Xck b fYg gtf a U_Y 9B db ZcUhb g i hXck b h Y G7H&(% : cf h Y Udd WUhcb fYei fb Yf J ð I J C jc tU Yh Ub h YXYZji hgYti d V&bbYVhUb Y hYfbU fYg gtf Xj XYf F UbXF(g ck b b: i fY

% žca J-B ĩc 9B H Y I J C fgb UbX ŽJ b h fYg c X Wb VY WUW UhYX Vm 9ei Uhcb %UbX 9ei Uhcb & fYgdYm j Ym žh YfY g bc fYei fYa Ybh žf h Y J-B I J C dfc fUa VžbbYm h Y 9B ĩc J-B ĩc g a d žh Y Y hYfbU WfW hfm

9B db gU j c ĩU Ydb UbX Wb VY XfYm VžbbYm X ĩc J-B ĩc U ĩca UhW m ĩU ĩh d h YXYj Wk h J-B fgb ĩc ĩg bhYfbU I J C h fYg c X



: ĩ fY% 5Xi g ĩU VY J-B I J C

(1)

(2)

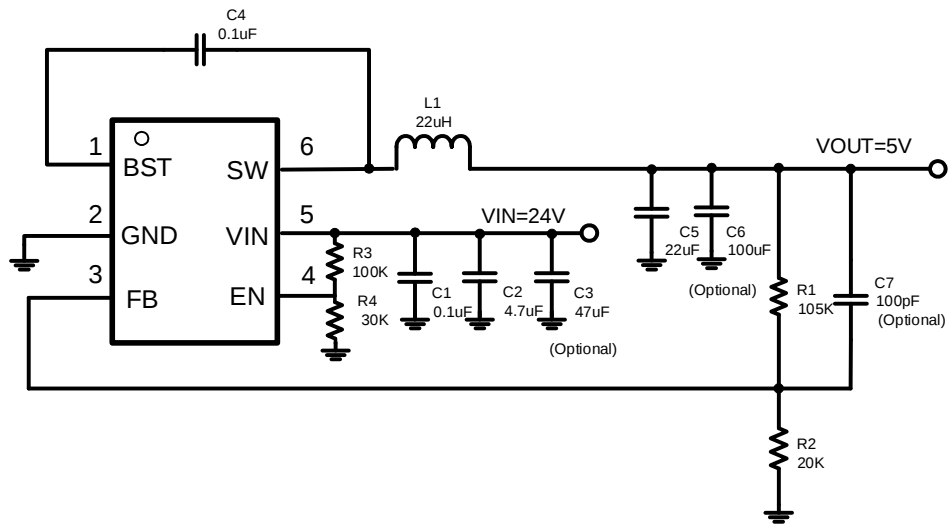
K YfY.
J fgY

M N, .

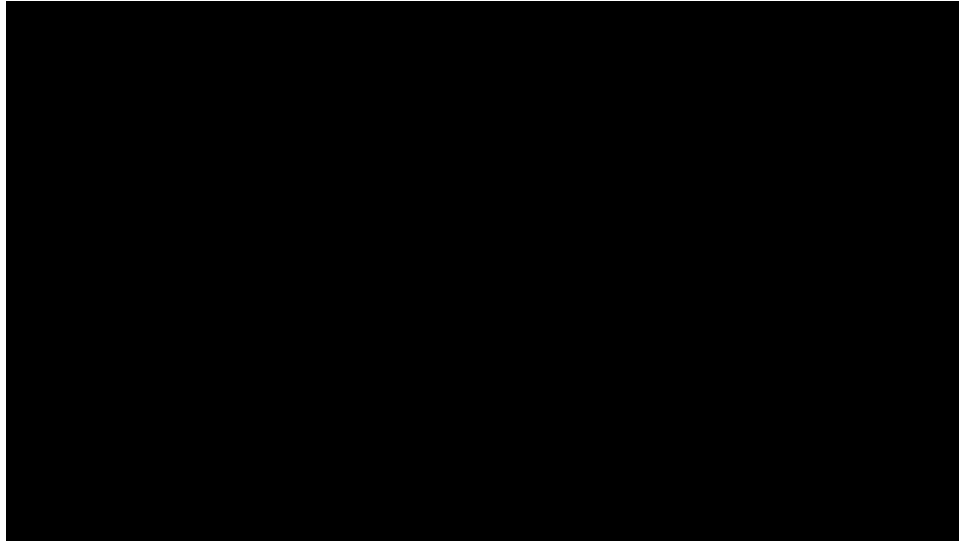
Nb lg fMbon i q h

CbW h Y i bVlcb hYa dYfUhi fY b h Y G7H&(% Yl WYXg % 7 h Y h Yfa U gYbg b WfW h g hcdg V b j YfhYf
gk hW b UbXfYgtUfkg k h h Y i bVlcb hYa dYfUhi fY ZU b VYck %) 7 H Yfa U g i hXck b dfYj Yb h g h Y XJa U Y
cb XYj WY Xi f b Yl WYgg j Y YUhUbX dck Yf Xgg dU hcb V b Xhcb

Ns c f fc ni h



aol 0 , . P On / P 0 I on on



aol 1 , . P On , P 0 I on on

mah I g n lm

Design Parameters	Example Value
Input Voltage	24V
Output Current	0.6A
Switching Frequency	1.2MHz
Start Input Voltage (rising VIN)	5.5V
Stop Input Voltage (falling VIN)	5V

I on onPi fn a

H Y ci hdi hjc tU Y g gYh VmUb Yl hYfbU fYg ghrf Xj XYf
 F % UbX F& b hmd WJ Udd WWhcb gWYa UhW
 F YW&a a YbXYX F& fYg gUUbWY g & I gY Yei Uhcb (
 hc WJW UhY F %

Table 1. R₁, R₂ Value for Common Output Voltage (Room Temperature)

P _I on	L	L _r
% J	& -	&
&) J	(& &	&
J	* &	&
) J	%)	&
% & J	&	&

k YfY.

J_{F9}: g h YZYXUW_ fYZfYbWY j c tU Y hmd WJ
 , %J

Oh I Pi fn a Fi e l on

5b Yl hYfbU j c tU Y Xj XYf bYfk cf_cZF Zca h Y bdi hrc 9B db UbXF(Zca 9B db hc h Y fci bXWUb gYhh Y
 bdi hjc tU Ygl bXYf Jc tU Y cW_ Ci h I J C h fYg c X H Yl J C Ug tk c h fYg c Xg cbY Zf dck Yf i d k Yb
 h Y bdi hjc tU Y g fgb UbX h Y ch Yf Zf dck Yf Xck b cf Vfck b ci hg k Yb h Y bdi hjc tU Y g ZJ b : cf h Y
 Yl Ua d Y XYg b h Ygi ddmg ci Xh fb cb UbX gUfhgk hW b cbWY h Y bdi hjc tU Y bWYUgYg Uvcj Y) J gUfh
 cf YbUVY 5ZYfh YfY i Urcf gUfhgk hW b hg ci XW&bhi Yhc Xc gc i bh h Y bdi hjc tU Y ZJ g VYck) J ghrd
 cf XgUVY I gY9ei Uhcb) UbX9ei Uhcb * hc WJW UhYh YjUi Yg % _ UbX _ cZF UbXF(fYg ghrf

Q o r i l M f n h

H YfY UfY gYj YfU ZUMc f g ci X VY V&bg XYfYX b gYVWb bXi V&cf gi W Ug bXi V&UbWY gUli fUhcb WffYbh h Y
 F AG WffYbhUbX87 fYg gUUbWY 87F Uf Yf bXi V&UbWY fYgi hg b Ygg bXi V&cf WffYbh fdd YUbXh YfYZfY YUXg
 hc ck Yf ci hdi hjc tU Y fdd Y <ck Yj Yf h Y Uf Yf jUi Y bXi V&cf Uk Uhg V&ffYgdc bXg hc U V Yf d mg WJ gnY
 Yf gYf Yg fYg gUUbWY UbX ck Yf gUli fUhcb WffYbh 5 ccXfi YZf XYhfa b b h Y bXi V&UbWY hc i gY g hc U ck
 h Y bXi V&cf dYU_ hc dYU_ f dd Y WffYbh hc VYUddfcl a UYm& r cZh YaU a i a ci hdi hWffYbh

H Y dYU_ hc dYU_ f dd Y WffYbh b h Y bXi V&cf =_{DD} WJb VY WJW UhYX Ug b 9ei Uhcb +

K YfY

=_{DD} g h Y bXi V&cf dYU_ hc dYU_ WffYbh
 g h Y bXi V&UbWY cZ bXi V&cf
 Z& g h Ygk hW b ZYei YbVh
 J_{CIH} g h Yci hdi hjc tU Y
 J_B g h Y bdi hjc tU Y

GbWY h Y bXi V&cf WffYbh fdd Y bWYUgYgk h h Y bdi hjc tU Y gc h YaU a i a bdi hjc tU Y b Udd WWhcb g
 Uk Uhg i gYXhc WJW UhYh Ya b a i a bXi V&UbWY fYei fYX I gY9ei Uhcb , hc WJW UhYh Y bXi V&UbWY jUi Y

H Yk cfghWUgY VēbXhcb cWVfg UhJ 1& J Cl H k YfY.

%&

: cf g a d ZWUhc b WccgY Ub bdi hWdUWfc k h Ub FAG WffYbh fUhb fYUhf h Ub UZcZh Y a U a i a cUX WffYbh

K Yb gYVWmb WYfUa WWdUWfcg hbYYXg hc Vēbg XYf h Y YZZVmj Y jUi Y cZU WdUWfc XYWYUg b Ug h Y 87 VUg j c HU YUWfcg U WdUWfc bWYUgYg

H Y bdi hWdUWU bWY jUi Y XYhf a bYg h Y bdi hf dd Y j c HU Y cZh Y fY i Uhf H Y bdi h j c HU Y f dd Y WU b VY WUW UhYXi g b 9ei Uhcb % UbXh Ya U a i a bdi h j c HU Y f dd Y cWVfg Uh) Xi hmWVWY

%

: cf h g Yl Ua d Y U(+ : L + F WYfUa WWdUWfcg fUhfYcZ) J b dUfU Y UfYi gYX 5 bXU % : Zēf ZYei YbVh ZhYf b WdUWfc g d UYX Ug WēgY Ug dēg VYhc h Y XYj W d bg

i i m l c i l M f nē h

5 %: WYfUa WWdUWfc a i gh VY VēbbYVhY Vfk YYb 6CCH d b UbX GK d b Zēf dfcdYf cdYfUhcb 5 WYfUa W WdUWfc k h L) F cf VhfYf fUXY XYVWf Wg fVēa a YbXYX H Y WdUWfc g ci X Uj YU % J cf Yf j c HU Y fUhb

I on on c i l M f nē h

H YgYVWmb cZci hdi hWdUWfc k UZZVmi hdi h j c HU Y f dd Y b ghYUXmgfUhfY UbX cUX hfUbg YbhdYfZēfa UbWY

H Yci hdi hf dd Y g YggYbhU mVēa dēgYXcZk c dUf g CbY g Wli gYX Vmh Y bXi Vēf WffYbhf dd Y c b h fci h Y9ei j UYbhGYf Yg FYg gU bVY 9GF cZh Yci hdi hWdUWfcg UbXh Ych Yf g Wli gYX Vmh Y bXi Vēf WffYbhf dd Y WUf b UbX XgWUf b h Yci hdi hWdUWfcg Hc UW Yj Yga U ci hdi h j c HU Y f dd Y WccgY U ck 9GF ci hdi h WdUWfc _Y WYfUa W WdUWfc : cf WYfUa WWdUWfcg h Y WdUWU bWY Xca bUhf g h Y ci hdi hf dd Y : cf g a d ZWUhc b h Yci hdi h j c HU Y f dd Y WU b VY Ygha UhYX Vm9ei Uhcb % XYg fYX

%

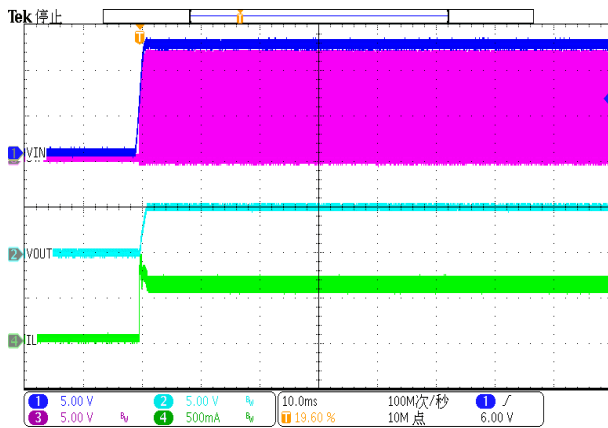
K YfY

gh Yci hdi h j c HU Y f dd Y
Zē gh Ygk hW b ZYei YbVh
gh Y bXi VU bWY cZ bXi Vēf
7 Cl H gh Yci hdi hWdUWU bWY
J Cl H gh Yci hdi h j c HU Y
Jē gh Y bdi h j c HU Y

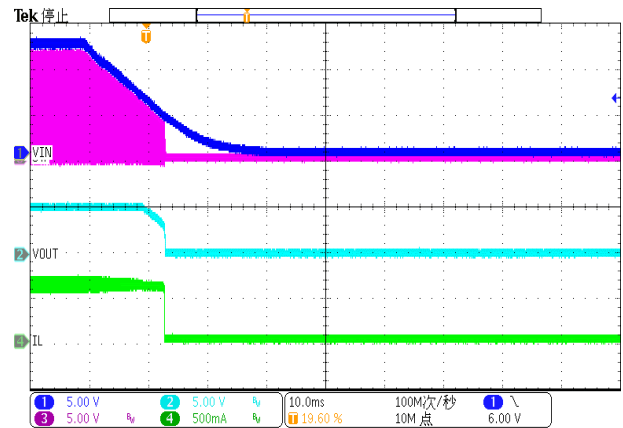
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fc nř h Q p i l g m

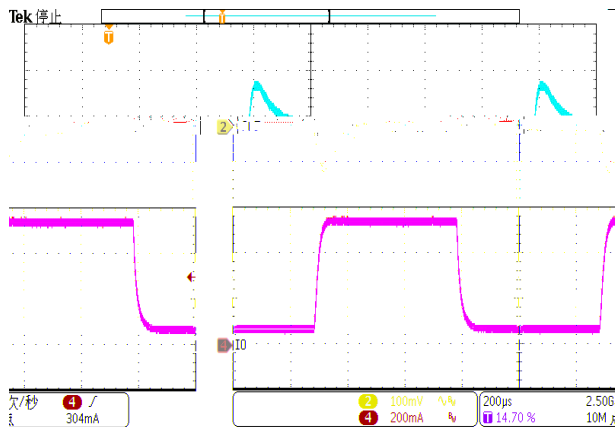
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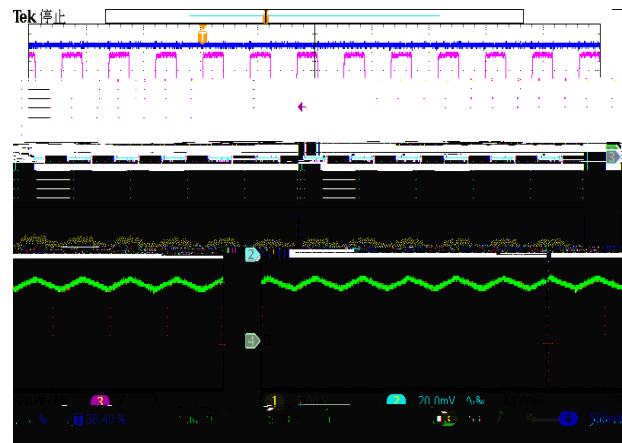
: i fY % Dck Yř i d



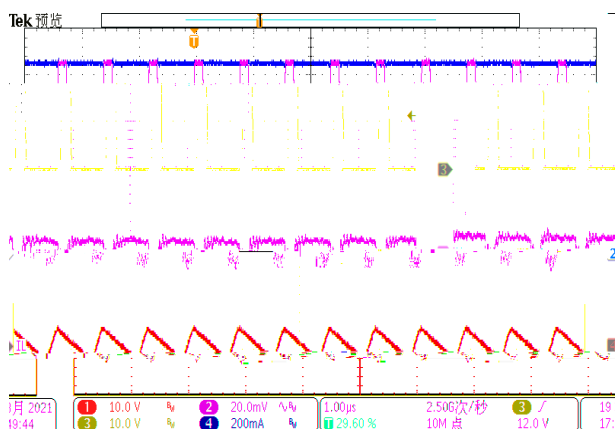
: i fY % Dck Yř Xck b



: i fY & cUXHřUbg Ybh *5)(5 &) a5 i g



: i fY & % GK UbXJci hF dd Y ř i h l *5



: i fY & & GK UbXJci hF dd Y ř i h l 5

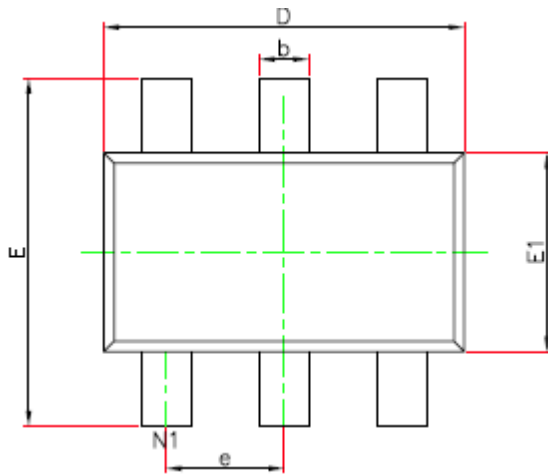


: i fY & H Yřa U & (J ř) Jci h *5

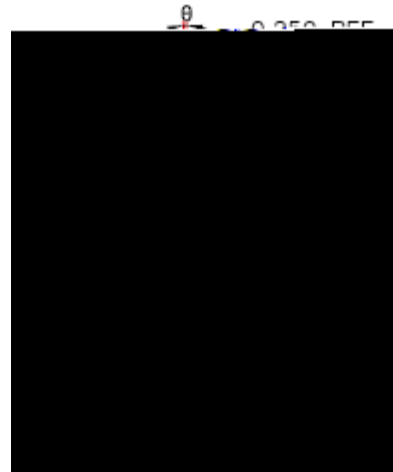
F si onAoc fth

H Y fY i Urcf Vti X gi ZYf Zca bghUV lmUbXbc gY dfcVYa g k h ci hWfYZ m Urci hcZD7 6 FUXUcb cZ
ZYei YbVhbc gY bXi WYg 9A=gc dfcdYf Urci hcZh Y ZYei YbVhngk hW b dUh g YggYbhU

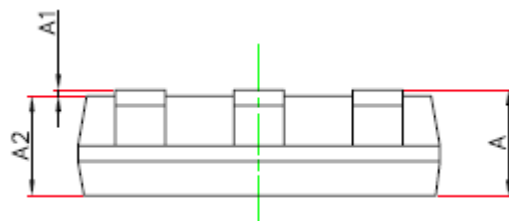
1. A b a nYh Y Yb h UbXUfYU cZU hfUWg VbbYMYXhc h YGK d b UbXUk Uhg i gYU fci bXdUbYi bXYf h Y
gk hW b fY i Urcf hc a b a nYVti d b
2. H Y bdi hWdUWrcf bYYXg hc



HCD J-ØK



6CHCA J-ØK

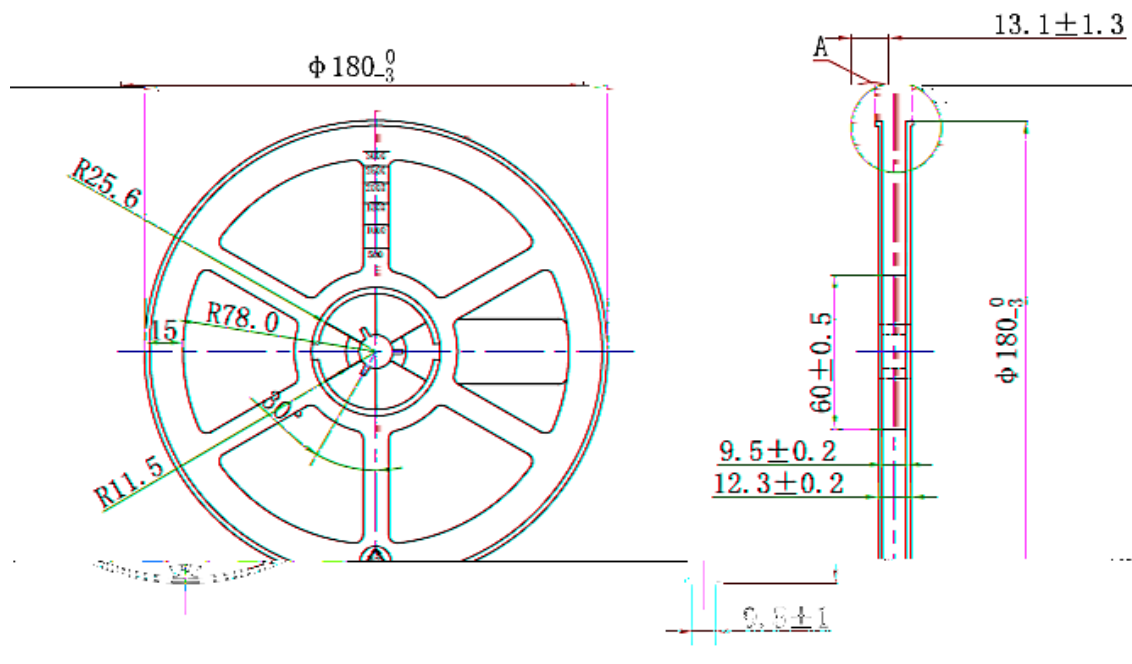


G-89 J-ØK

HI N 4

1. 8 fUk b dfcdcgYXhc VY a UX Y U 9897 dUW U Y ci h b Y AC && j Uf Uhcb
2. 8 fUk b bchhc gW Y
3. 5 b Y Uf X a Y bg cbg Uf Y b a a Y h Y fg
4. H Y fa U dUX g U V Y gc XYf Y Xcb h Y Vc Uf X
5. 8 a Y bg cbg cZY dcg Y X dUX cb Vchhc a cZdUW U Y Xc bch bW XY a c XZ U g
6. 7 cbhUW D7 6 VcUf X ZVf W hcb Z f a b a i a gc XYf a Ug_k YV hc YfUbVWg VYfk Y Yb h Y d bg

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