

GHM 3I Z gnf K_hki k olnl k olnl f Zr b_k_khf i Z gnf K_hk na nkk gmo K_hk
 K olnl *) 3I kh n rthg
 K olnl * *3 LP r_kgl b gm L I i
 K olnl * +3Ni Zm G hg_bnk NOEH k Zm
 K olnl * , 3Ni Zm b nk *+
 K olnl * - 3Ni Zm = OB HK= K BG HKF: MBIG

LP	/	Lp lna l g h h _ra n d h g o k m k
----	---	------------------------------------

Ho khi kZrtg _k 8Zkmf i kZmk kZg ngell hra l p b ghm

O _{EG}	Bji nmoheZ kZg	- .	-)	O
Mc	Hi kZrtg ang rthg mf i kZmk	&)	*+.	<

O _{L=}	Anf Zg h r F h e A F % k: GL _{BC} = <8CL 8) * & +) *- li bb Zrtg % Zei l g l *	& *	+	dO
	< aZk = ob F h e < = F % k: GL _{BC} = <8CL 8) + & +) *- li bb Zrtg % Zei l g l *	8 .	) .	dO

- (1) C = < h nf gmC l * . l nZml raZm)) O A F Z epl l Z _ f Zgn Z m k g p l a Z l nZg Zk L = hgr h ei kh l l
(2) C = < h nf gmC l * . 0 l nZml raZm .) O < = F Z epl l Z _ f Zgn Z m k g p l a Z l nZg Zk L = hgr h ei kh l l

K _c	Chg rthg rh Zf b gma kf Zek l b nZg *	12	<(P
K _{ox}	Chg rthg rh Zl ra kf Zek l b nZg *	, 2	

* L < Mi khob l K_c Zg K_{ox} gnf k hge Zl k _k g rh l r f Zm ang rthg mf i kZmk l h _ra ob l K_c Zg K_{ox} Zk gh mZ
aZk m k b r b h j Z dZ b h e % n n h _f Zgr hra kl r l m f e o e aZk m k b r l l n a Zl ra l b g Zg eZ h n n h _ra i k g m k n l n
hZk l < h g p a b a r a L < M t -) * b f h n g m % a k f Zei Z l b % Zg q m k g Ze g o l t h g f g r a Z e Z r h k M a l < h Zk b Z a Z r l t g d
r a Z r t b l h e k r h r a e Z l Z g r a k f Zei Z h _ra L < M t -) * < a Z g t g r a l b g h k h g b n k Z r t h g h _ra l < h Zk a Z g l r a
_ b b g r h _ra a Z r l t g d Zg r a k _h k r a Z m Z e K _c Zg K_{ox}

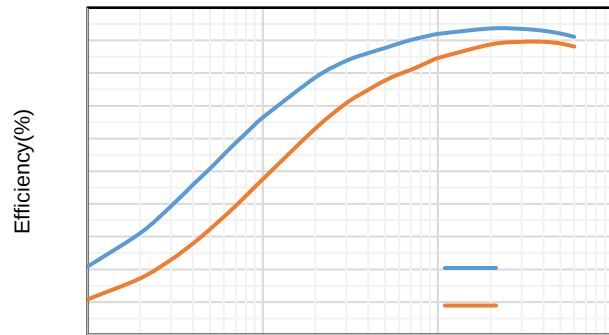
O_{EG} 6 * + O % M b 6 &) < * + . < % n i b Z e o Z e n b m l m ng k + . <

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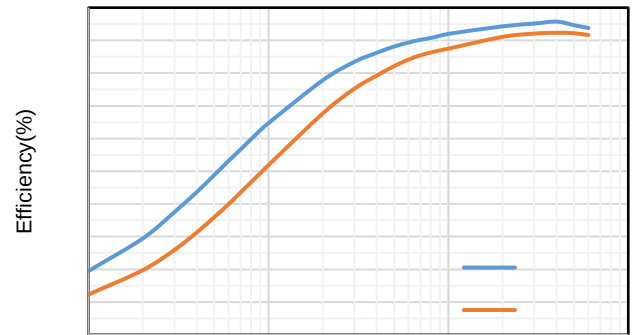
O _{EG}	Hi kZrtg l g i n m o h e Z		- . -)	O
O _{EGXNOEH}	Bji n n N O E H A r l m k l b	O _{EG} k b l g	- , --)	O f O
B=	L a n m h p g n k k g m		* .	n:

$B_{XAL} =$	$AL = i \cdot Z_d \cdot n_{kk} \cdot g_{mf} \cdot t_n$		$) \cdot 0 \quad) \cdot 2 \quad **$	:
$B_{XEL} =$	$EL = oZ_{er} \cdot n_{kk} \cdot g_{mf} \cdot t_n$	$khf \cdot l_{hnk} \cdot rh \cdot kZ_{tg}$	$) \cdot 1$	:
$B_{XEL} = G$	$EL = g \cdot Z_{r0} \cdot n_{kk} \cdot g_{mf} \cdot t_n$	$khf \cdot kZ_{tg} \cdot rh \cdot l_{hnk}$	$) /$	:
LP	$Lp_{lnatg} \cdot k \cdot j \cdot n \cdot g \cdot r$	$O_{66} * + O_{66} \cdot HNM \cdot 6 \cdot O$	$2 /) \quad * +) \quad * - -)$	dA
$m_{GXF} \cdot B$	$F \cdot l_{gdf} \cdot nf \cdot hg_{df}$		$1)$	gl
m_L	$B_{mkg} \cdot Z_{el} \cdot h \cdot n_{r} \cdot n_{r} \cdot k_{mf}$		*	f l
O_{HOI}	$Z \cdot d \cdot h \cdot o \cdot k \cdot h \cdot e \cdot z \cdot p \cdot l \cdot a \cdot k \cdot l \cdot i \cdot m \cdot h$	$O \cdot (O_k \cdot k \cdot l \cdot g$	**)	
	$k \cdot k \cdot g \cdot o \cdot h \cdot e \cdot z$	$O \cdot (O_k \cdot Z_{el}$	*) .	
$M_L =$	$Ma \cdot k \cdot f \cdot Z_{el} \cdot a \cdot n \cdot m \cdot h \cdot p \cdot g \cdot r \cdot a \cdot k \cdot l \cdot a \cdot h \cdot e$ $Ar \cdot l \cdot m \cdot k \cdot l \cdot b$	$M_c \cdot k \cdot l \cdot g$	$* 0)$ +.	<

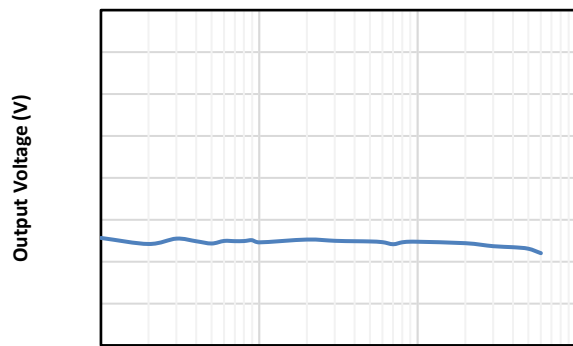
= $k \cdot l \cdot g \cdot khf$ g a aZkZ mk0 Zthg



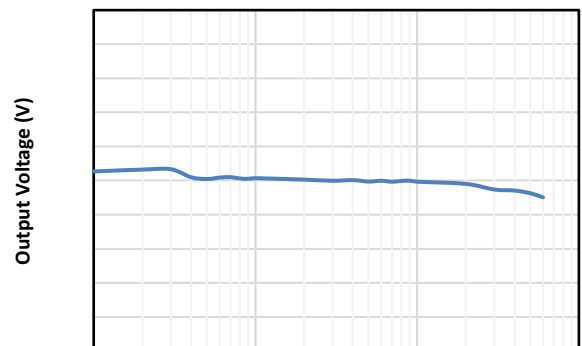
Efficiency (%)
IOUT (A)
b nk * _b b g r ol EhZ <nkk grfO n n6 . O



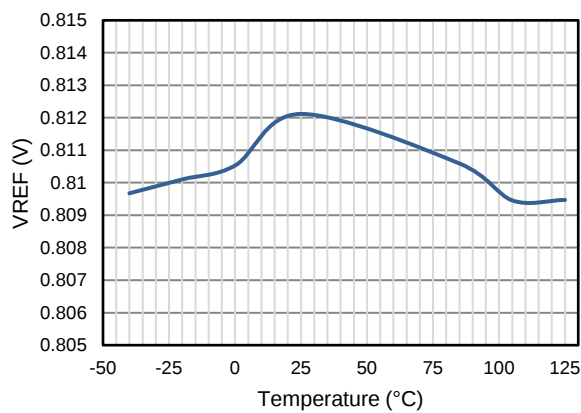
Efficiency (%)
IOUT (A)
b nk + _b b g r ol EhZ <nkk grfO n n6 *+O



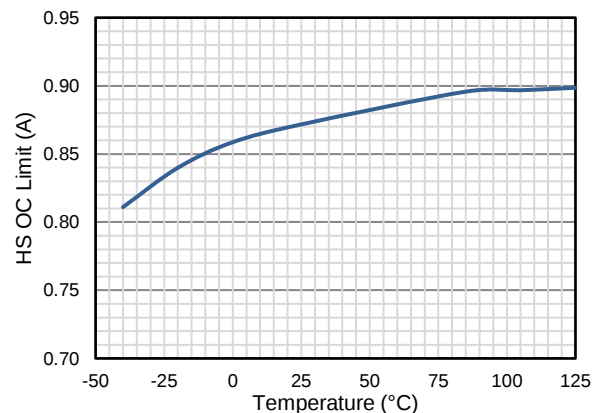
Output Voltage (V)
IOUT (A)
b nk , EhZ K n z h g O n n6 *+O %O g6+-O



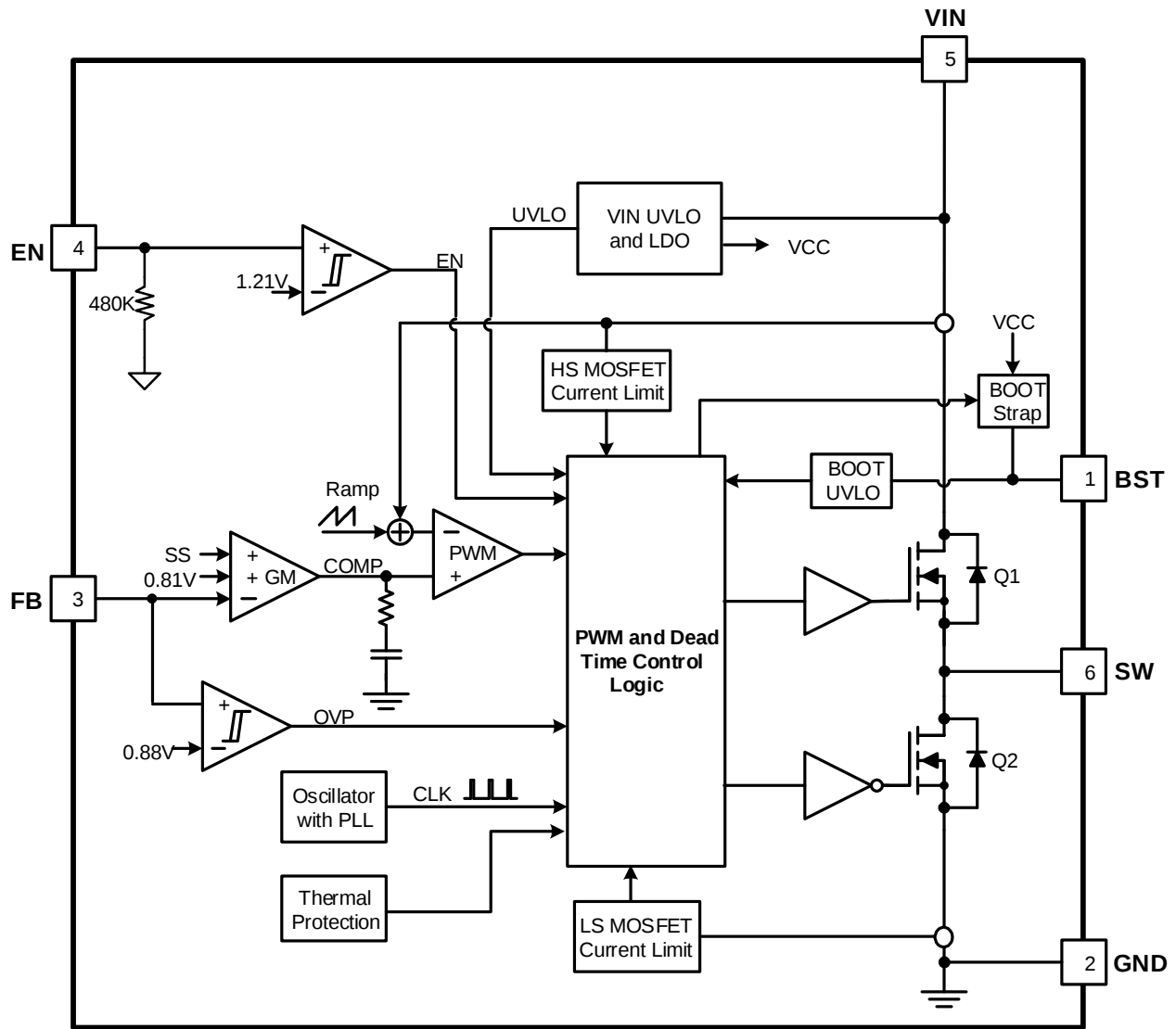
Output Voltage (V)
IOUT (A)
b nk - EhZ K n z h g O n n6 . O %O g6+-O



VREF (V)
Temperature (°C)
b nk . K _k g OL M f i kZmk



HS OC Limit (A)
Temperature (°C)
b nk / AL <nkk grfO n n6 OL M f i kZmk



bnk *, ng rthgZe d=lz kf

Ma L<M+-)* ob b-.O&)O tji nr%))f: hnrnrrfne tgm kZm lrg akghnl n d hgo kmk Ma ob
fi erl tgm kZm abab ihp kFHL MJ* tgm kZm lrg akghnl n d hgo kmk Ma ob
na tgm kZm abab ihp kFHL MJ* tgm kZm lrg akghnl n d hgo kmk Ma ob
aZk l hnrnm Zi Pa gl gl oheZ hg abab FHL Mi Zd nkk gmk tgm kZm lrg akghnl n d hgo kmk Ma ob
<HFI l ng rthgZe d iZ kZf %a ob mkg h_abaab FHL MJ* Zg mkg hg ep&b FHL M
J+ Ma tgm kZm lrg akghnl n d hgo kmk Ma ob
FHL MJ+mkg h_Mab ki Zthhg r e&r&r e Z

Ma i Zd nkk gmf h hgrthe: g tgm kZm lrg akghnl n d hgo kmk Ma ob
na L<M+-)* hnrnrrfne tgm kZm lrg akghnl n d hgo kmk Ma ob
hfi hg ghl b Z p e

Pa g bZ tgm kZm lrg akghnl n d hgo kmk Ma ob
Fh nZhg IPF fh rh Z abo lf Zehnrnrrfne tgm kZm lrg akghnl n d hgo kmk Ma ob

Ma L<M+-)* fi erl tgm kZm abab ihp kFHL MJ* tgm kZm lrg akghnl n d hgo kmk Ma ob
tgm kZm abab ihp kFHL MJ* tgm kZm lrg akghnl n d hgo kmk Ma ob
abaab FHL Mk Z al na raklahe eo el m r na <HFI oheZ h_ na tgm kZm lrg akghnl n d hgo kmk Ma ob
lb FHL Mmkg h_Ma lrg akghnl ep&b FHL MJ+mkg hgrthe: g tgm kZm lrg akghnl n d hgo kmk Ma ob

Ma kkhZfi ebkl ko l na <HFI gh r hfi Z tgm kZm lrg akghnl n d hgo kmk Ma ob
oheZ Pa g na dZ nkk gmk k Z l %Z k n rthg tgm kZm lrg akghnl n d hgo kmk Ma ob
oheZ r na Zo kZ tgm kZm lrg akghnl n d hgo kmk Ma ob
hnrnm oheZ r na k_k g Ma ob Zeh tgm kZm lrg akghnl n d hgo kmk Ma ob
aZk hgb hl tgm kZm lrg akghnl n d hgo kmk Ma ob
(hZ tgm kZm lrg akghnl n d hgo kmk Ma ob)

Ma L<M+-)* hi kZm tgm kZm lrg akghnl n d hgo kmk Ma ob
fh rh khob na ep khnrnrrfne tgm kZm lrg akghnl n d hgo kmk Ma ob

Ma L<M+-)* b lbg rh hi kZm khf Zg tgm kZm lrg akghnl n d hgo kmk Ma ob
hni tgm kZm lrg akghnl n d hgo kmk Ma ob
tgm kZm lrg akghnl n d hgo kmk Ma ob
k jnk tgm kZm lrg akghnl n d hgo kmk Ma ob

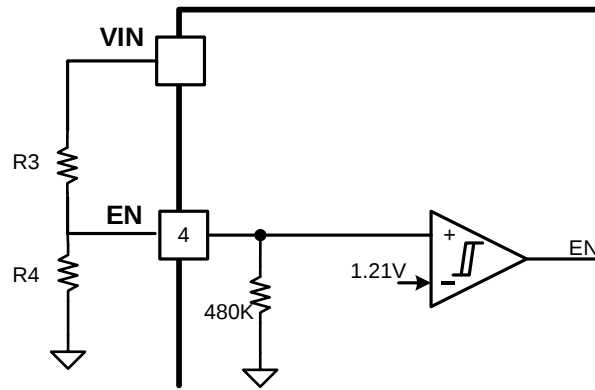
Ma L<M+-)* Ng k oheZ Eh d Hnm NOEH Znerl rZmi raklahe b mi bZe- ,O p na OEG k tgm kZm lrg akghnl n d hgo kmk Ma ob
lanmhp g raklahe b , 10 p na OEG Z tgm kZm lrg akghnl n d hgo kmk Ma ob
ik tgm kZm lrg akghnl n d hgo kmk Ma ob

Pa g Zi e tgm kZm lrg akghnl n d hgo kmk Ma ob
ng rthg tgm kZm lrg akghnl n d hgo kmk Ma ob
hnrnmho k ahmZg tgm kZm lrg akghnl n d hgo kmk Ma ob
n dhi kZthg b bZ e pa g GoheZ Z tgm kZm lrg akghnl n d hgo kmk Ma ob

: g tgm kZm lrg akghnl n d hgo kmk Ma ob
aba k OEG NOEH oheZ naZg na Znerl mi %hgg mZg qmkgZe k l b r h k l o b k K, Zg K- lahpg tgm kZm lrg akghnl n d hgo kmk Ma ob

*- hf OG rh G Ma NOEH k b g Zg Zg nak lahe Zg Zene m r jnZrhg * Zg jnZrhg +
kli r e B ra k b gh k j n k f g m h k r a OG NOEH i k k f % h g g m a G rh OG rh l f i e r a q m k g Z e
k n b k

Gi b b Z a b a o h e z i b g Zg Zg k n e h g g m r h OG rh Z n r h f Z n b Z e l n k m i n a o b p l a OG k b g
r h b h g m k g Z e NOEH n a k l a h e



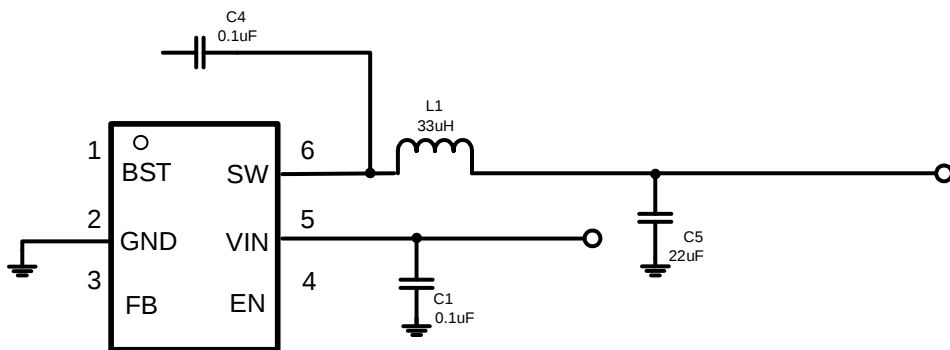
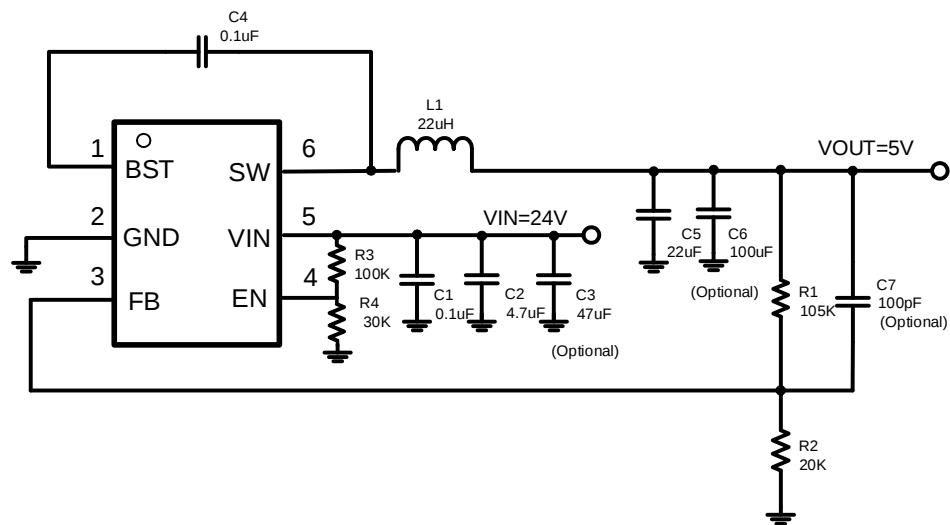
b n k *- : m l n z e OG NOEH

_____ (1)

_____ (2)

P a k 3
O b

Hg na ng ng mfi kZmk lg na L<M+)* q l *0) °<% na na kf Zel gl lg k nlnl rhil hgo kmk
 l p naly Zg klnZhp na na ng ng mfi kZmk Zlg ep *- . °< Ma kf Zel anmhp gi k o grh na Zf Z
 hg ob nkg q ll a ZnZg i hp k bl bZng hg blng



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

Ma hnrnmohēz b l m r Zg qmkgZek l b r h k l o b k
K* Zg K+ tū mibZe Ziē Zrthg l a f Zr
K h f f g K+ k l b r z g b +) D Nl j n Zrthg -
rh Zēz m K*

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

* 1 O	+ - 2 D	+) D
+ . O	- + + D	+) D
, , O	/ + D	+) D
. O	*) . D	+) D
* + O	+ 1) D	+) D

p a k 3

Ok b ra _ Z d k _ k g o h e z % m i b Z e
) 1 * O

: g qmkgZeohēz l o b k g r p h k d h _ K , k h f r a tū j n m r h G i tū Zg K - k h f G i tū r h r a k h n g Z g l m a
tū j n m o h e z l N g k O h e z E h d H m N O E H r a k l a h e M a N O E H a Z l r p h r a k l a h e l % g h k i h p k n i p a g
r a tū j n m o h e z b k b tū Zg r a h r a k h k i h p k h p g h k k h p g h n r h p a g r a tū j n m o h e z b Z e g h k r a
q Z f i e l b g % r a l n i i e l a h n e m k g h g Z g l n z k l p l o n a tū h g r a tū j n m o h e z tū k Z l l Z h o . . O l n z k m
h k g Z e : m k r a k n e z h k l n z k l p l o n a tū m l a h n e h g r tū n r h h l h n g r t a tū j n m o h e z Z e e p . O l r h i
h k b Z e N l j n Z r t h g . Z g j n Z r t h g / r h Z e z m r a o z e l *)) d Z g ,) d h _ K , Z g K - k l b r h k

Ma k Z k l o k Z e Z r h k l a h n e h g l b k tū l e r tū tū n r h k l n a Z l tū n r z g % Z m k Z r t h g n k k g r f r a
K F L n k k g m Z g = < k l b r z g = < K E Z k k tū n r z g k l n e h tū e l l tū n r h k n k k g m k i e Z g r a k h k e Z l
r h e p k h n r n m o h e z k i e A h p o l r a e z k k o z e tū n r h k Z e Z l h k k l i n g l r h Z b k i a r l b Z e l b %
a b a k l k o l k l b r z g % Z g e p k l Z m k Z r t h g n k k g m : h h k n e h k m k f tū tū r a tū n r z g r h n l b r h Z e p
r a tū n r h k i Z d h & Z d k i e n k k g m r h Z i i k h q f Z m e +) ,) h _ r a f Z q f n f h n r n m n k k g m

Ma i Z d h & Z d k i e n k k g m tū r a tū n r h k b i Z g Z e z m Z l tū j n Z r t h g 0

0

P a k

B i b r a tū n r h k i Z d h & Z d n k k g m
E b r a tū n r z g h _ tū n r h k
_ L P b r a l p l o n a tū k j n g r
O H N M b r a h n r n m o h e z
O e b r a tū j n m o h e z

L tū r a tū n r h k & n k k g m k i e tū k Z l l p l o n a r a tū j n m o h e z % h r a f Z q f n f tū j n m o h e z tū Z i e Z r t h g b
Z e Z r l n l r h Z e z m r a f tū f n f tū n r z g k j n k N l j n Z r t h g 1 r h Z e z m r a tū n r z g o z e

P a k

E_{FG} b ra f t_gf nf t_g n r_{Zg} k j n k
 J_P b ra l p l m a t_g k j n g r
 O_{HNM} b ra h n r i n m o h e_Z
 O_{BGfZq} b ra f Z q f nf t_g i n m o h e_Z
 B_{NMfZq} b ra f Z q f nf =< e_Z n k k g m
 E_{BK} b h _ b b g r h _ B_i r h B_{NM}

Ma r h r_Ze n k k g m e_p t_g r a k h n a r a t_g n r h k b r a t_g n r h k k b i e n k k g m i e l r a h n r i n m n k k g m P a g l e r t_g
 Z g t_g n r h k % a h h i b h k Z m n k k g m l i b_Ze r a l Z m k Z r i n g n k k g m e_Zk k r a Z g b h i Z d h i k Z r i n g n k k g m Z g
 K F L n k k g m Z e h g h m q Ma k _ h k % r a i Z d l p l m a t_g n k k g m h _ t_g n r h k % B_i : D Z g B_{KFL} Z g
 Z e n e_Zm Z l t_g j n Z r i n g 2 Z g j n Z r i n g *)

2

*)

P a k

Ma phkmZi hg bthgh nk ZnO₆+ O_{HNM}%p a k 3

*+

hkl f i eb Z_{thg}% ahl Zg lgi nm Zi Z hkp ba Zg KFL nkk gmkZ_{thg} k ZmkraZg aZe_h_ra f Zqf nf ez nkk gm

P a g l e rtg kZf b Zi Z hkl %ong l rh hgl b kra _ no oZ_{th} h_Z Zi Z hkl k Zi lg Zi na =< zi ohe_z Z khll Z Zi Z hktg k Zi l

Ma lgi nm Zi Z bzg oZ_{th} mkf lg l na lginmk_{ie} ohe_z h_ra k n_{zh}nk Ma lginmohe_z k_{ie} Zg Z_{en}zm nl lg jnZ_{thg}*, Zg ra f Zqf nf lginmohe_z k_{ie} h nk Zn) nm r e

*,

hkrab qZf i e %Z- 0 %QOK kZf b Zi Z hkl kZm h_) Olgi ZkZ_eezk nl : g Z) * hkaba&k jn g r hktg Zi Z hkb i e_z Zi el Zi i h l b e r h a ob i lg

:) * kZf b Zi Z hkf nlm hgg m rp g HHMi lg Zg LP i lg hki khi k_{hi} kZ_{thg}: kZf b Zi Z hkp ba Q K h k m k kZ b e r to b k h f f g Ma Zi Z hkl ahne aZo Z*) Ohkaba kohe_z kZ_{thg}

Ma l e thg h_hnrm Zi Z hkp ba ez rhnrnmoh_{ez} k_{ie} lg l mZ r l n_{zh} Zg ez r kZg l b g n i k_{hf} Zg

Ma hnrmnk_{ie} b l l g_{th} ez hfi h l h_p h i Z_{th} Hg b Zn l r na lg n rhk nkk gmk_{ie} h_{lg} rakhn a ra jn_{th}Ze g n l k l K l b_{thg} LK h_ra hnrm Zi Z hkl Zg ra h_{ra} k_b Zn l r na lg n rhk nkk gmk_{ie} aZk lg Zg b aZk lg na hnrm Zi Z hkl M_h Z abo l f Z_{th}nrnmoh_{ez} k_{ie} % ahl Z ep & LK hnrm Zi Z hkl el kZf b Zi Z hkl h k kZf b Zi Z hkl %ra Zi Z bzg h f lg Zml na hnrmnk_{ie} h k l f i eb Z_{thg}%ra hnrmoh_{ez} k_{ie} Zg l r f Zm r jnZ_{thg}*- l k

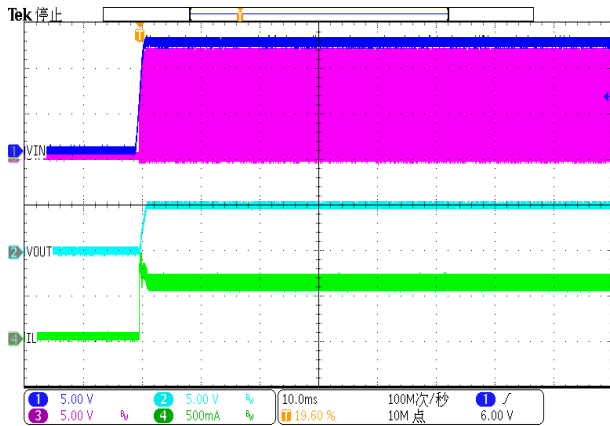
*_

P a k

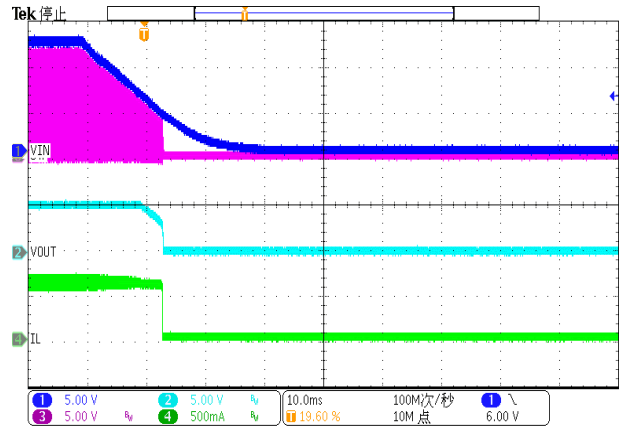
b ra hnrmoh_{ez} k_{ie}
LP b ra l p that_{lg} k jn g r
 E b ra lg n n_{zh}g h_ lg n rhk
 <HNM b ra hnrm Zi Z bzg
 O_{HNM} b ra hnrmoh_{ez}
 O_{ez} b ra lgi nmoh_{ez}

=n rh Zi Z hkl kZ lg ng k=< zi %ra zi ohe_z Zg l b g b b Zg n k n Zi Z bzg < kZf b Zi Z hkl Zg el f h l m h_{ra} l k Zi Z bzg ZmkZm ohe_z Ma k hk %e Zo f Zk lg h g ra ohe_z kZ_{thg} rh gl nk Z jnZm _ no Zi Z bzg M i b Z_e%ng ++ kZf b hnrm Zi Z hkl phkd hkf h l m_{zi} i eb Z_{thg} l

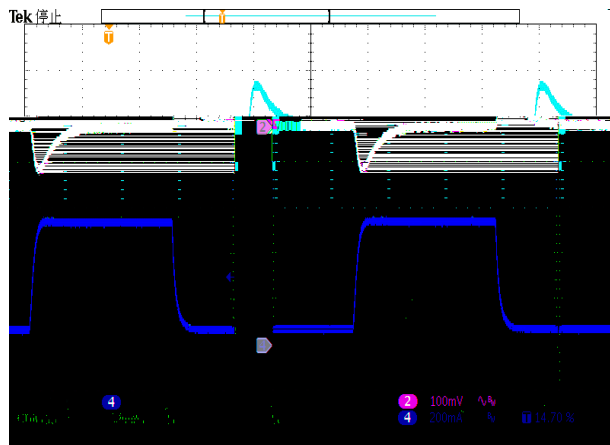
Ngell hra kpb ghm ra hēp lū hg bngl Zi e 30lg6+-0%OHNM6.0% LP 6*+)) dA



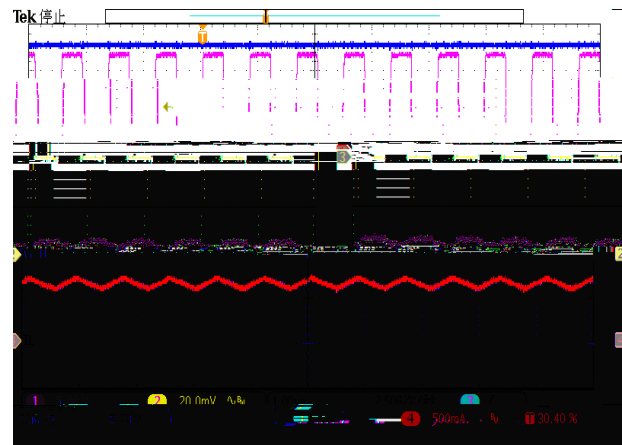
b nk *1 l hp kni



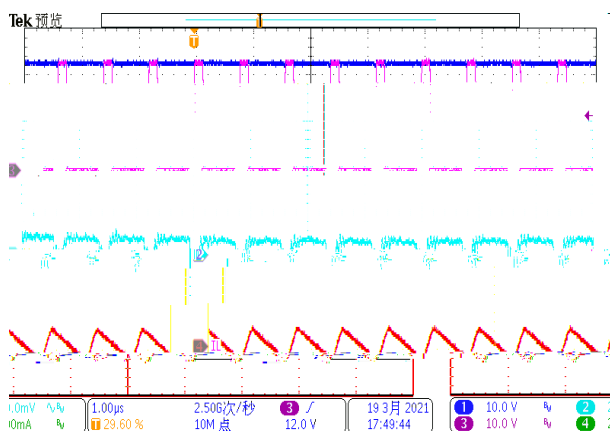
b nk *2 l hp k hp g



b nk +) EhZ MZgl bgm) / : & . - : %&) f : (nl



b nk +* LP Zg OhnrKbi e Bnr6) / :



b nk ++ LP Zg OhnrKbi e Bnr6) :



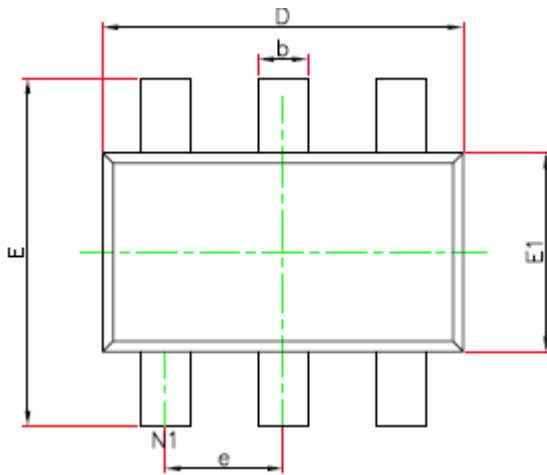
b nk +, Ma kf Ze/- OBG% Ohnr6) / :

:

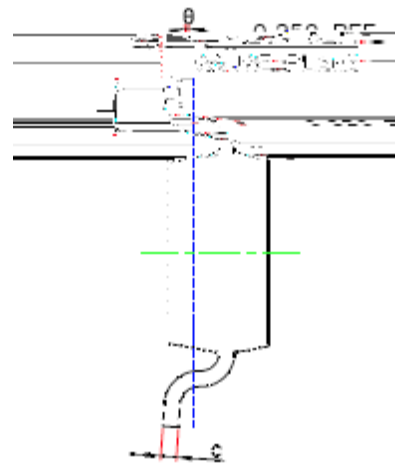
Ma k nēzhk hne l n_k khf tō nē l nē Zg ghb i kh ef l p mahn m Zk nē ēzhnmh_l < KZ bēzhng h_aba&
_k j n g r ghb tō n l F b h i k h i k ēzhnmh_n a b a&k j n g r l p m a tō i Z n a b l l g r t z e

1. tō f b n a e g n a Zg Zk Zh_Z e k l h g g m r h n a L P i tō Zg Z e Z r l n l Z k h n g i ē Z g n g k n a
l p m a tō k nēzhk r h f tō f b h n i tō

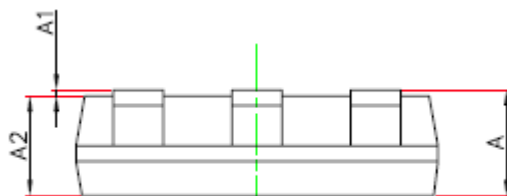
2. Ma tō j n m Z i Z tō k g l r h g tō Z tō k g l i e tō n 6 F % r



MHI OB P



HMMHF OB P



LB OB P

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1. =kZp lg i khl rh f Z ZC = < i Z dZ hnrng FH& ++) oZkZrning
2. =kZp lg ghmrhl Ze
3. : edg Zk lf gl hgl Zk lg f hf mk
4. Ma kf Zei Z laZe l he k hgra hZk
5. =lf gl hgl h_qihl i Z hg hmhf h_j Z dZ hghm lg en f he _a
6. <hgrZ ml < hZk _Z kZrning_hkf lg nf l he kf Z dp rhekZg l rp gra i lg

