

3.8V-36V Vin, 5A, High Efficiency Synchronous Step-down DCDC Converter with Adjustable Frequency

FEATURES

- I mYðaa gj9mte glæ 9hhðYæfk
- $9 = \%)((I mYðaa oð I gððoð_J kmðk2$
 $\% < na L eh jYmj jY)2\%(Ig)^* -$
 $9eZafl Gh jYð_L eh jYmj JYf_$
 $\% < na : E = K < ðkkaaYæf D n d^*$
 $\% < na < E = K < ðkkaaYæf D n d +$
- Oa Åhm JYf_ $2 + \text{ON}\% . N$
- Mhlg -9 gflðngnk Gmthm mj f l
- (ON) ZY c J j f NgðY_
- Ål jY , 0e a %Ka Yf *+e Dgo%Ka
Hgo jEGK =Lk
- Hmð Kcðhð_Eg HKE oð *-n9l mak fl
mj f l ð Kd h Eg
-)((fk Eðæ me Gf%æ
- , ek Ål jf YðKg l%l Yl Læ
- 9 bñklYZð KU KU 9 bñklYZ f ðr

REVISION HISTORY

FGL=2HY_ fmeZ jk gjhj ngnk j n&ufk eYq a j jge hY_ fmeZ jk d l mj fl n jk&f &
 J n&uf)&2J dYk lgEYjc l&
 J n&uf)&2Mh Y eYp ko lg * &E r d a_mj / Yf LYfd * 80 J B Zgl Yf J d d hY_ +&
 J n&uf)&2Mh Y 9hh&Y&f OYn gjek&
 J n&uf)&2Mh Y Gh jYd_bnf l&f l eh jYmj &
 J n&uf)&2Mh Y <=NA= GJ<=J A GJE9L&F&

DEVICE ORDER INFORMATION

K L*, -(l KL=J	LYh J d	, (((	*, -(l	0	=KGH%

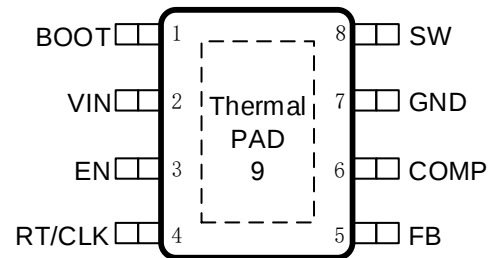
ABSOLUTE MAXIMUM RATINGS

Gn j gh jYd_j %aj eh jYmj nfdkk gl jo& fgl)

N&	%&	+0	N
N& LJYfkafl +((ek *	%&	, *	N
=F	%&	+0	N
: GGL	%&	, ,	N
KO	%	+0	N
: GGL%KO	%&	.	N
GEH : JL DC	%&	.	N
Gh jYd_bnf l&f l eh jYmj LB+	%(	)-(	
KlgjY_ l eh jYmj LKL	%-	)-(	

- (1) Klj kk kZ qgf l gk dkl nf j9Zkgh EYp&me jYd_eYq Ynk na h jeYf fl YeY_ & na & fgl_mjYfl lg
 nf l&f gntka g&J gee f Gh jY&f gf &ufk&
 (2) L eYpN&ljYfkaflngdY_ &_mjYfl Zq kaf Yf n jaa gf Z f &
 (3) L A d&n kgn jl eh jYmj hjgl l&f lg hjgl l na mjd_gn j&Y gf &ufk&Bnf l&f l eh jYmj o&dp)-(
 o f gn jl eh jYmj hjgl l&f &Yl& & gfl&ngnk gh jY&f YZgn l kh aa eYp&me gh jYd_bnf l&f l eh jYmj o&dp
 j m d&l& &

PIN CONFIGURATION



PIN FUNCTIONS

: GGL	)	Hgo jknth&Z&k gj a %a hgo jEGK =L_Yl j&j& gff lY(&m YhY &gj jge : GGL h& lg KO h& &: gglkljYh YhY &gj & Yj_ o f &o%a hgo j EGK =L & gf gj KO ngdY_ & &o&
N&	*	A&hm knth&ngdY_ & gff lY& YdZqhYkk YhY &gj jge N& h& lg F< h& &HY jge N& h& lg a_ j i m f qZqhYkk YhY &gj Yf F< e nkl Z Yk k gjl Yk hgkka&Zd &
=F	+	=fYZd h& lg l j_m&gj o& d&l jfYdhm&h njj fl kgnj &Hm&Z &o) &N lg &YZd l gfn jl j& &Ygj gff llgN& lg fYZd l gfn jl j& lYhg j k&lgj ma j jge N& lg F< gff l&_ =F h& Yf Y b&kl l d&hm ngdY_ & cgm l j k gd&

* gje gj d gje Y&f [ooo&ahgfl fl&ge](#) *(*) K&hgf gfl flL fgd_q g&D &9&Ja lk J k jn

JL DC	,	K I I *(ál jfYdgk aMgj ට c j i m f q g j k q f j g f a l g Y f p l j f Y d ට c & g f f l Y j k a l g j j g e l a h a l g _ j g n f l g k l k o a a _ j i m f q & f p l j f Y d ට c Y f Z a h m a l ට l g l J L D C h a l & L a l j f Y d g k a M g j k q f j g f a k l g l p l j f Y d ට c j i m f q o a H D D & A l l ට c a _ _ k k l g h k l g h j Y a f e g Y m i g e Y a Y a j l m j f k l g j k a l g j Y m k l j i m f q &
:	-	

ELECTRICAL CHARACTERISTICS

N₅* , N_{L5}%()*- Iqha YchYch k l kl mf j*- &

--	--	--	--	--

N ₅	Gh jYd_ d h m ngdY_		+0	+	N
N ₅ VMNDG	A h m MNDG L j k gd qkl j k k	N ₅ j k d _	+&	+&	N eN
A<F	K n go f mjj fl jge N ₅ h d	=F5(fg dY	)	+	9
A	I mak fl mjj fl jge N ₅ h d	=F dYd_ fg dY fg % ko d d : GGL%KO 5-N	*-		9

J<KGFV	a %a EGK =L gf % k l Yf	N: GGL%KO 5-N	, 0		e
J<KGFVD	Dgo %a EGK =L gf % k l Yf		*+		e

N _J =	J j f ngdY_ g :		(&1* (0 (0(0	N
=9	=jjgj Ye h d a j l j Yf k %gf m l Yf	% 94AGEH4* 9 N _{GEH5})N	+((	K
AGEHWKJ	=9 e Ypæ me kgmj mjj fl	N : 5N _J = %((eN N _{GEH5})N	+(	9
AGEHWKFC	=9 e Ypæ me k d c mjj fl	N : 5N _J =)((eN N _{GEH5})N	+(	9
N _{GEHW}	GEH a d e h		+	N
N _{GEHVD}	GEH d o d e h		(&	N

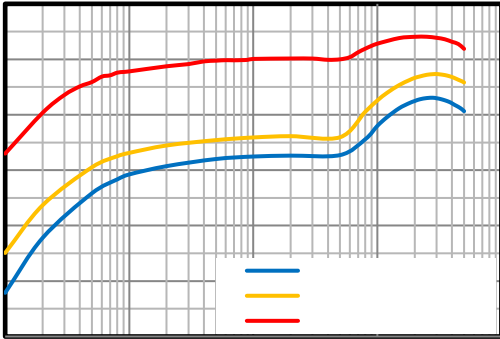
A _{EWK}	a %a hgo j EGK =L h Yc mjj fl d e a l j k gd		. 0 0 1&	9
A _{EWKJ}	Dgo %a hgo j EGK =L kgmj d _ mjj fl d e a l j k gd		1	9
L _{AVD}	Gn j mjj fl h j l l æ f a n h o Y a l æ		-)*	q dk
L _{AW}	Gn j mjj fl h j l l æ f a n h j k l Y l l æ		0)1*	q dk

N=FW	=fYZd a l j k gd		)&0)&-	N
N=FVD	=fYZd d o l j k gd		)&+)&	N
A _{FVD}	=fYZd h d h m d h mjj fl	=F5)N	))& *	9
A _{FW}	=fYZd h d h m d h mjj fl	=F5)&N	-&	n9
L _{kk}	A l j f Ydkg l k l Y l l æ		,	ek

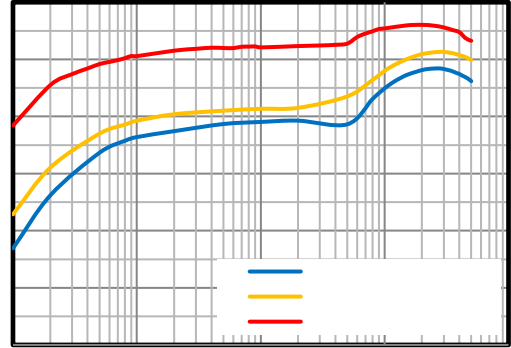
J9F =WL	j i m f q j Yf_ n k d _ J L e g		(((**((	c r
KO	Ko d d _ j i m f q	J _{JL} 5*((c)	, -(-((--(	c r
J9F =WDC	j i m f q j Yf_ n k d _ D C e g		(((**((	c r
BAL=J	j i m f q k h j Y k h l j n e d h j f l Y _ g ko		.	
I _{GFVE}	E d æ me gf %æ	N ₅ * , N	(((	fk

N: GGLMN	: GGL%KO MNDG l j k gd	: GGL%KO Ydñ _ qkl j k&	* &. +((	N eN
L _{K<}	L je Ydk m go f l j k gd	L _B j&ñ _ qkl j k&	)/(*_	

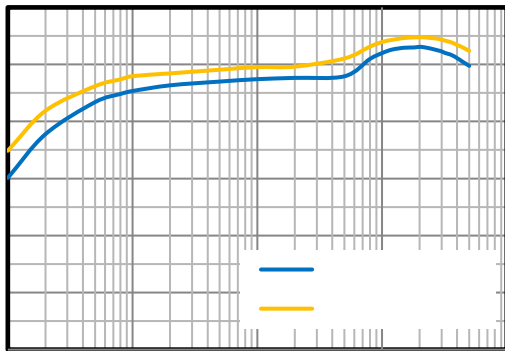
TYPICAL CHARACTERISTICS



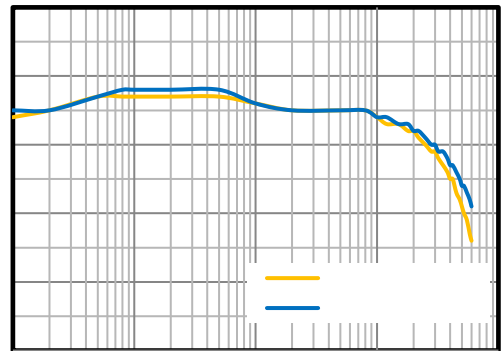
$\underline{a}_{mj} \cdot \&= aaf \ qnk \ DgY \quad mjj \ fl \ N\acute{a}5+.N$



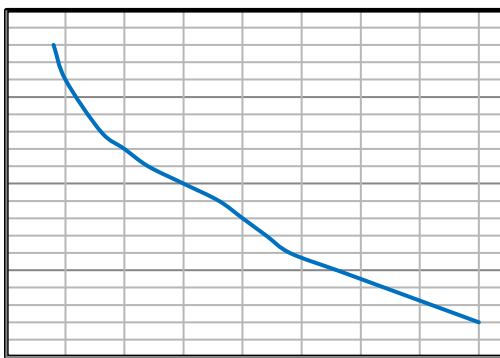
$\underline{a}_{mj} +\&= aaf \ qnk \ DgY \quad mjj \ fl \ N\acute{a}5^*,N$



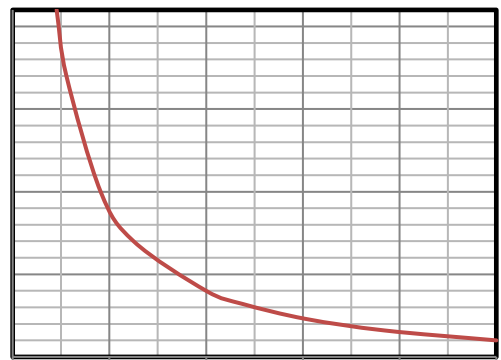
$\underline{a}_{mj} \ , \&= aaf \ qnk \ DgY \quad mjj \ fl \ N\acute{a}5)*N$



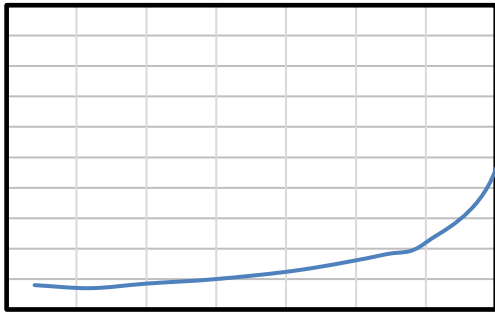
$\underline{a}_{mj} - \&DgY \ J \ _m\acute{d}l\&f \ Ngm5-N$



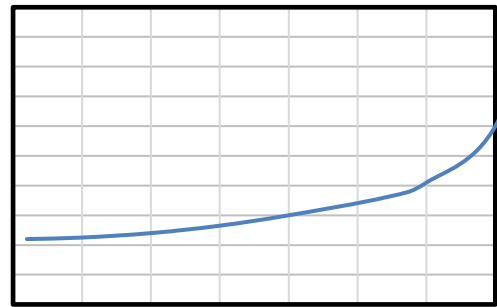
$\underline{a}_{mj} \ . \&D\acute{a} \ J \ _m\acute{d}l\&f \ \&nt5-9$



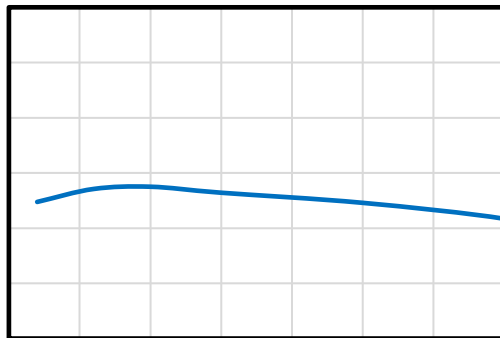
$\underline{a}_{mj} \ / \& \& \ c \ j \ i \ m \ f \ qnk \ JL \ DC \ J \ k\acute{a}lgj$



a_mj 0 K m gof mjj fl nk L eh jYmj

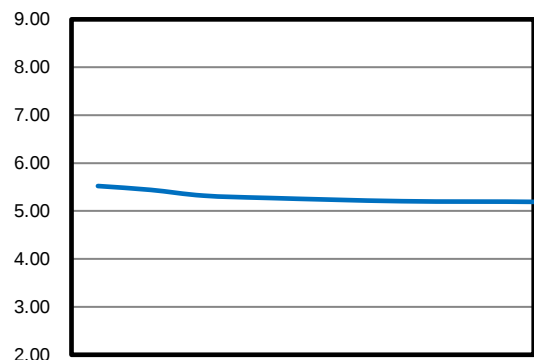


a_mj 1.l mak fl mjj fl nk L eh jYmj

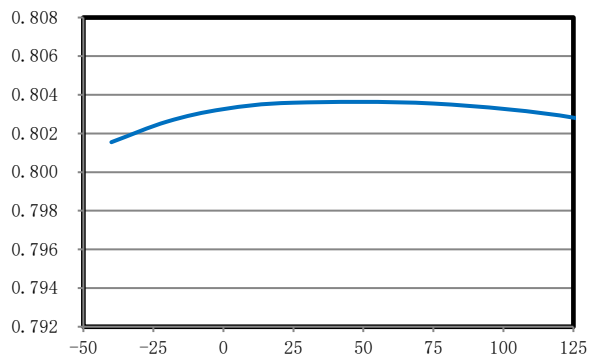


-50 -25 0 25 50 75 100 125

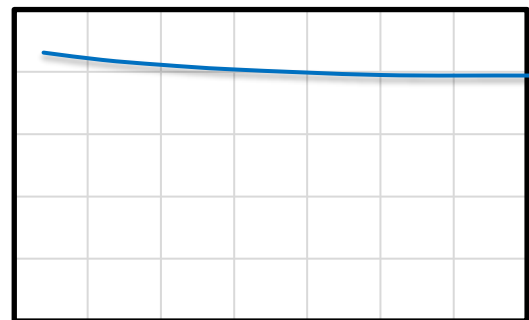
a_mj)(&=F L j k gd nk L eh jYmj



a_mj)) &=F Hm d mjj fl nk L eh jYmj



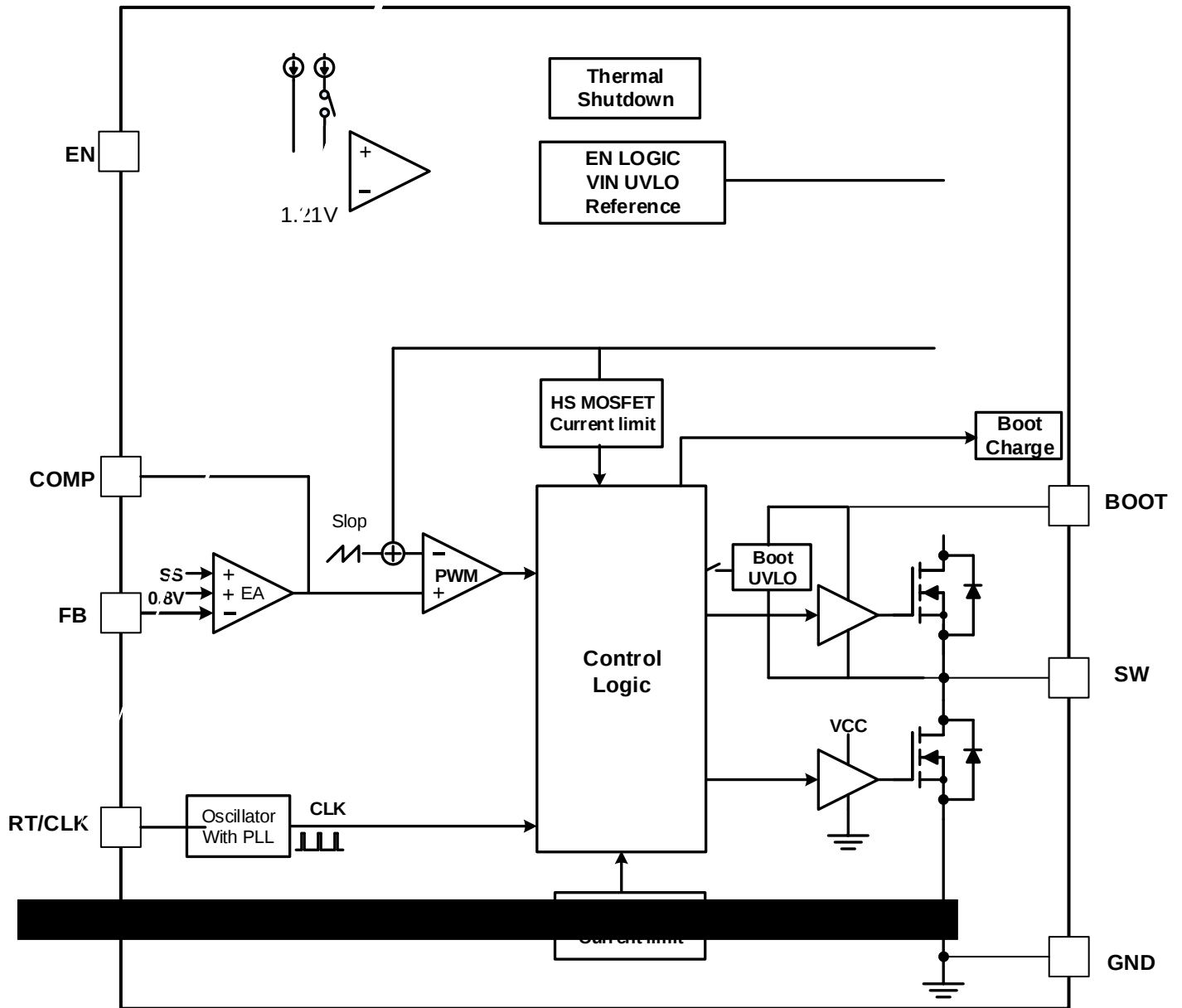
a_mj)*& j f NgdY_ nk L eh jYmj



Temperature (°C)

a_mj)+&H Yc mjj fl Dæ ank L eh jYmj

FUNCTIONAL BLOCK DIAGRAM



amj), & nf ləfYd: ɔ c <ə_jYe

OPERATION

L K L*, -(l & Y+&N%. N áhnt -9 gnhnt =E Aja f ðkqf jgfgnk Zmc gfn jl joa Zmá, Oe J kgf a %a Yf *+e J kgf ðo%a hgo jEGK =Lk&Aæhde flk gfklyfl j imf qh Yc mjj fle g gfljgd lg j_mñl gnhnt ngðY_ hjgnað_ p ðfl ð Yf ðY lYfkafl j khgfk Yf kæhæð_ l pl jfYd j imf q geh fkyæf kæf&

L koa ð_ j imf q& Y bñklyZd jge)((c rlg * &E roa logk llá_eg k j k&lgjk llá_ j imf q eg Yf l ð c kqf jgfaYæf eg lgghæa k a jl hgo j aaf q gjl pl jfYd gehgf flk ka k&L K L*, -(l Ymj k Yf ðl jfYd, ek kg l%lYl læ lg Ynga ðY_ ð jnk mjj fl Yf gnhnt ngðY_ gn jk ggl mja_ klylñh&L na Yæg kñhgjlk egfga a klylñh oá hj %Z&k gnhnt gf æf&L k Yedkk eg %jYfkaæf Z lo f HOE eg Yf HKE eg gh jYæfk fkmj a aaf qgn joa ðY mjj fl jYf_ &L imak fl mjj fl & lqhaYð * -nø mf jfg ðY gjkd heg gf æf lg Y an a aaf q Y ð l ðY &

L K L*, -(l Yk Y Ymá hnt klyl%ñh ngðY_ g +&N oá , ((eN qkl j k&L =F há & Y a %gðY_ há oá Yhj æf l j k gd l Y Yf Z nk lg Y bñkl áhnt ngðY_ ð cgn l j k gdk oá log pl jfYd j k&lgjk lge lY mYl a jMNDG kqkl e j mje flk& ðYá_ =F há fYZdk l na oá l ðl jfYd hnt mjj fl lgl há& gff lá_ =F há lg NÆ á l ð klylñh l na Ymge Yl Yð&

L K L*, -(l æhde flkl j imf q Khj Y Kh ljme KK eg mYæf khj Y á_g . fl j k d l koa ð_ j imf q& KK æhjgn k =E Ah j gje Yf Zq fgl Yðoá_ eá f j_q l g klyq á Yf q gf j æ j ZYf gjYka faa Y l d f_l g læ &

L K L*, -(l mðhjgl læf Ymj k á ðn l áhnt mf j%gðY_ ð cgn l gnhnt gn j%gðY_ hjgl læf gn j mjj fl hjgl læf oá q d %Zq %q d mjj fl æá_ Yf a mh eg gnhnt Yj k gjl hjgl læf Yf l je Ydk m gof hjgl læf &

L K L*, -(l ehðqk ð j imf qh Yc mjj fle g gfljgd&9f ðl jfYd ð c áá k lñf á_ gf l á l jYl a %a hgo jEGK =L l) á Y q d l f á mlgj mjj fl j k k ð Yð&O fl mjj fl jgm_ a %a EGK =L j Y kl l j k gd dn dk l Zql GEH ngðY_ g l á l jfYd j jg Yehæa j l a % ka EGK =L l mjk g &L kqf jgfgnk ðo%a EGK =L l * l mjk gf lá l f pl ð c q d Z_ á k gjl á mlgj mjj fl Yð lgr jg&

L j jg Yehæa j k jn kl GEHfg Zq gehYá_ l ngðY_ g l : há oá Yf ðl jfYd(&N j j f ngðY_ &O fl ðY mjj fl á j Yk k Yj m læf á l ZY cngðY_ j ð l lgl j j f jYk k GEH ngðY_ lá l Yn jY_ á mlgj mjj fle Yl kl á j Yk ðY mjj fl &L æ ZY cðgho ð j_mñl kl gnhnt ngðY_ lgl j j f &L na Yæg á l jYl k Yf ðl jfYð ð geh fkyæf á m jqlghj n fl kmZ% Yjegfa gk æ læf o f m q q d æ j Y l Yf -(gjY ð j imf qh Yc mjj fle g gfljgd&

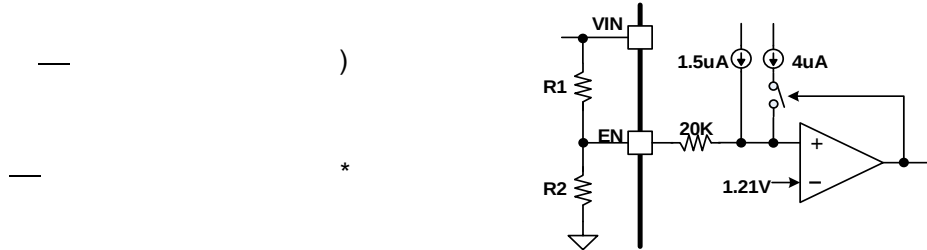
L K L*, -(l gh jYl k á Hnt Kcáhá_Eg HKE oá ð l ðY mjj fl lg æhjgn aaf q&O fl ðY mjj fl j Yk k Yf á je fl á l ZY cngðY_ d Yk GEH ngðY_ jgh&O f GEH Yð lg Yðo ðeh l j k gd , ((eN lqhaYð na fl jk HKE&L gnhnt ngðY_ Yqk m lg gnhnt YhY æj æ Y_á_ mja_ káhá_h j æ &Gf : ngðY_ jghk ðo jl Yf l j j f ngðY_ Yf l GEH ngðY_ j k k YZgn ðo ðeh l j k gd &L f a %a hgo jEGK =L l mjk gf á f pl ð c hnt &9 l j k n jYd koa ð_ q d koá lqhaYð)9 h Yc á mlgj mjj fl GEH ngðY_ jghk Yf æ ðeh Y_Yá Yf hnt káhá_ eg j h Ykal gnhnt gflámk ð l ðY &

L æ gfljgd k e ðk Y aná_ a j aaf q Zq káhá_ q d kl g j m koa ð_ hgo j ðkk Yf _Yl j æ Yj_á_ ðkk&L gfljgd j gfkme hlæf inak fl mjj fl æ *-nø mja_ káhá_h j æ oá fg koa ð_ lg æhjgn aaf q m j j&

L K L*, -(l æ fYZd o fl NÆ há ngðY_ j k k YZgn +&N Yf l =F há ngðY_ p kl fYZd l j k gd g)&ON&L na æ æYZd o fl NÆ há ngðY_ Yð Z ðo +&N gj o fl =F há ngðY_ æ

Z ණ) &N&f ඳl jfYd) &n9 hmdmh njj fl kgmj lg =F හ් Yණokl na fYZd o f =F හ් ණYk& =F හ් & Y a ngණY_ හ් l Y Yf Z gff l lg N& ඳ l ණlg klYl nh l na &

g j Y a j k q k l e MNDG l j k g d g f f l Y f pl jfYd k&lgj ාa j J) Yf J* k gof ඳ a_mj)- jge N& lg =F &L MNDG j&ඳ_ Yf Yණl j k g d Yf Z Ydmm Zq =i mණf) Yf =i mණf * j kh l ා ා &



o j

- N_j& & j&ඳ_l j k g d g N& MNDG
- N_Yණ & Yණl j k g d g N& MNDG

a_mj)- &Kqkl e MNDG Zq fYZd ාa

L K L*, -(l j _mණ kl ඳl jfYd j f ngණY_ Y (&N o ා ±) l g d j Yf gn j l gh j Yඳ_l eh j Ym j Yf ngණY_ j Yf _ &L gmhnh ngණY_ & k l Zq Y j k&lgj ාa j jge l gmhnh fg lg l : හ් & A & j gee f lg nk) l g d j Yf g j Z l j j k&lgj &Mk =i mණf +lg Ydmm j k&lyf g j k&lgj ාa j k& Lg ා h j gn aaf q Y ණ l ණ Y k ඳ j _ j n Yණ j k&lgj k Y j gee f & go n j al n Yණ k Y j l g g a l j _mණ j go ා Z eg j knk hl ා d lg fg& Y l ා _gmhnh ngණY_ Y m j Y q&

+

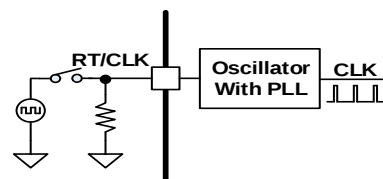
o j

- J : W_LGH & l j k&lgj gff l ා_l gmhnh lg l : හ් &
- J : W_GL & l j k&lgj gff l ා_l : හ් lg l _jgnf &

L K L*, -(l ඳl _jY k Yf ඳl jfYd kg l %l Y j l ඳ mණ l Y j Ye h k l j j f ngණY_ jge r j g ngණ lg (&N j j f ngණY_ ඳ , ek&A l =F හ් & hmd Z ණ) &N ko ා ඳ _klghk Yf l ඳl jfYd kg l %l Y j l k lk& L kg l %l Y j l Yඳ j k lk m ා ඳ _k nh gof m lg l je Ydgn j ණ Y ඳ _&

L ko ා ඳ _j i m f q g l K L*, -(l & k l Zq h ා ඳ _Y j k&lgj Z lo f J L DC හ් Yf l _jgnf g j k q f j g f ා ඳ _lg Yf pl jfYd ණ c&

A j k&lgj k l ා ඳ _j i m f q e g Y j k&lgj h ා Z lo f J L DC හ් lg l _jgnf k lk l ko ා ඳ _j i m f q gn j Y o a j Yf _ jge) ((C r lg * & E r &L J L DC හ් ngණY_ & l q h a Y d (& N & J L DC හ් & f g l Y ණ o lg Z d l ණ Y ඳ _g j k g j l lg l _jgnf &Mk =i mණf , g j l h ණ ඳ a_mj). & g l je ඳ l j k&lyf g j Y ko ා ඳ _j i m f q f &



o j ko & ko ා ඳ _ ණ c j i m f q

a_mj). &K l ා ඳ _j i m f q Yf ණ c K q f j g f ා Y ා f

A Yhh Ymfko j Zgl j klgjk llf_jimfqeg Yf ckqf jgfaYmfeg Yf l na
Yf Z gfamj Ykk gofa amj).& gj Yf pl jfYd ckahjk fl l na ogjck af j klgjk llf_
jimfqeg &O f Yf pl jfYd chjk fl l na Ymge YaYdlyYfkafk jge j klgjk llf_eg
lg pl jfYd ckqf jgfaYmfeg &9f af jfYdh Yk ck dgh HDDck af jfYd ck jimfqgflgl
pl jfYd ccoaf lqhaYd0-nk& gfn jl jlyYfkafk jge l ckqf jgfaYmfeg lgl j klgj
k llf_jimfqeg o fl pl jfYd ck Yhh Yjk&

9f pl jfYdZgglkljYh YhY agjZ lo f: GGL hf Yf KO hf hgo jkl dYaf_Yl jn jlg a_%a hgo j
EGK =L&L ZgglkljYh YhY agjngdY_ & Yj_ jge Yf dI_jY ngdY_ j_mdMgj o f a_%a hgo j
EGK =L & g Yf dgo_%a hgo jEGK =L & gf&

L MNDGg a %a EGK=L_Y j a j Yk j a f_l j k g d g * & N Yf qkl j k a g +-(e N & O f l na
gh j Y k o a a m t q q d g j p l j e d d l d Y Z g g k l j Y h Y h Y a g j e Y q Z f g l j Y j a f g f k a j Y Z d d f_
l a e & L n g d Y_Y Z g g k l j Y h Y h Y a g j a f k m a a f l l g j a a %a EGK=L m t g f & O f l n g d Y_Y j g k k
Z g g k l j Y h Y h Y a g j j g h k Z d o * & -N : G G L M N D G g m j k & L g f n j l j g j k l m j a f_g f d o %a EGK=L
h j a Y d l g j j k l n g d Y_g Z g g k l j Y h Y h Y a g j l g_m Y j Y f l l g f n j l j k g h j Y a f g n j Y o a m t q
j Y f_ &

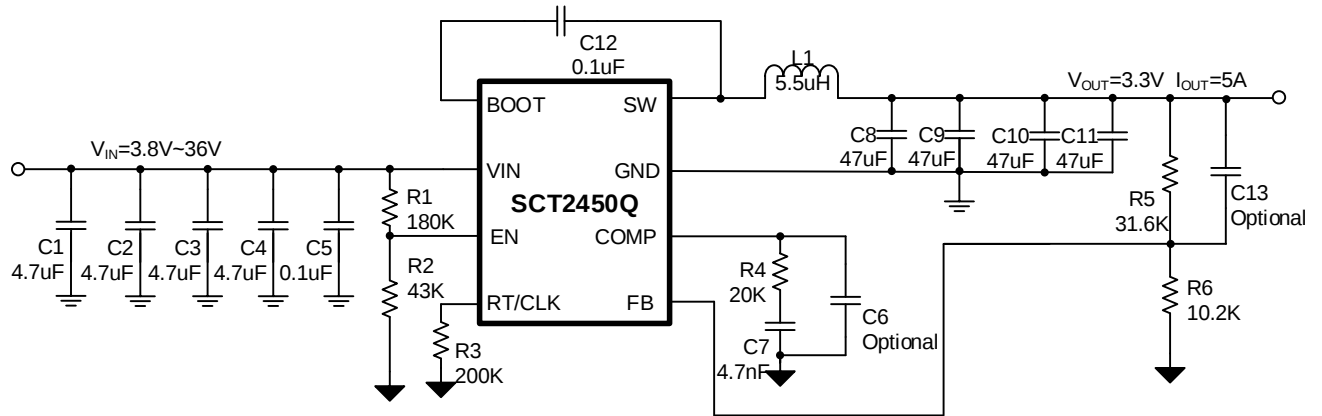
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<mj_d_l gf aaf g m d j y%go ng dY_ a j f jge l a h m l g l g m h m K L*,-(l gh j y k a Dgo <jgh%
Gm D>G eg & a %BMDGK VSV JQSGUSNfrUSe Yk Zg Yk l : GGL h a l g KO h a ng dY_ a a j l Yf
: GGL MNDG l j k g d * & N&O f l ng dY_ jge : GGL l g
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a_mj)/ &D<G Gh jYaf YjYI jkla Ngm 5-N

L á mlgj mjj fl & egfagj mja_ a %a EGK =L I) Yf o%a EGK =L I * gf&L K L*, -(l æhde flk gn j mjj fl hjgl laf oã q d%q%q d æãã_ a %a EGK =L h Yc mjj fl Yf o%a EGK =L nYd q mjj fl lg Ynga á mlgj mjj fl jnffá_ YoYq mja_ mf ph l gn jðY gj gnihm Yj k gjl gf æf&

O f gn jðY gj Yj k gjl Yhh fk l gfn jl j Yffgl hjgna gnihm mjj fl lg kY& q ðY á_j i mæ e fl& L á mlgj mjj fl & ðeh Ygn j mjj fl æãYaf&L nk l gnihm ngðY_ jghk Z o j_ mð ngðY_ oã : ngðY_ dkk l Yf á l jfYdj j f ngðY_ gflá mngkð&L GEHhá ngðY_ jYe hk mlg a ðeh ngðY_ +&NIqhaY&O f GEHngðY_ & ðeh gj-)* q dk l gfn jl jklghk koã á_&9 l jj e Yá á_ G gj 0)1* q dk lq lqãq j klYjlk jge kg l klYj á_h Yk &Agn jðY gj Yj k gjl gf æf klæð p&lk

APPLICATION INFORMATION



Ähm NgdY	*, N Fgje Yd+&N Ig +. N
Gnhm NgdY	+&N
E Yæ me Gnhm mjj fl	-9
Ko a d j i m f q	-((C r
Gnhm ngdY jdh h Yclg h Yc	). &eN
LjYfka fl J khgfk)&-9 Ig +&-9 dY kl h	Ngm 5)+-eN
KlYjl Ähm NgdY jkd NÆ	-&. N
Klgh Ähm NgdY Ydh NÆ	, &. N

L gnhmngdY_ ak l Zq Yf pl jfYdj kalgj aa j
 J- Yf J. d lqhaYd YhhdaYaf k eYa&
 J gee f J. j kalyf a)(&C &Mk inMaf
 - lg Ydmd J-&

)@ N	)* & C	)(& C
* & N	*) & C	)(& C
+& N	+) & C	)(& C
- N	-+ & C	)(& C
)* N	), + C	)(& C
*, N	*1, C	)(& C

o j 2

- NJ= ak ZY c j j f ngdY_ lqhaYd
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a_ jkoa d_ jimf ak knhhgjl ke Ydjhjg alk g gnhm d mlgjk Yf gnhm YhY agjk j kndf_ d o j
 ngdY_ Yf mj fljahdk& go n jl a_ jkoa d_ jimf q Ynk k pljYkoa d_ dkk o a gof_jY k
 gfn jl jkgn jYdhgo j aaf qYf l jeYdh jgjeYf &L)((fk e d æ me gf %æ æ d aYaf Ydg j kljalk
 l k d l af g a_ jkoa d_ jimf q&A l a kaf Yeg jY koa d_ jimf qg -((c r a k d l
 lg Y an Zgl ke Ydkgd af ka Yf a_ aaf qgh jYaf&

L j kalgj gff l jge JL DC lg F< k lk
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- ko ak kaj koa d_ jimf q

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 d hmlngdY_ k Mf jNgdY_ Dg cGm MNDG l j k gd&L MNDG Yklogl j k gdk gf gjhgo jnth o f
 l d hmlngdY_ a jaf_ Yf l gl j gjhgo j gof gj Zjgo f gnk o f l d hmlngdY_ a Yaf_ & gj l

lg 0o j gñhññ ngđY_ jñhd & go n j l d_j_ jñYññ ð mlgj Y0Yqk gjj khgf k lg YZa_ j h qkaYdka
a_ jk jak j kñlyf Yf 0o jkYmjYñf mjj fl&9_gg jñd gj l jeðð_l ð mlyf lgnk ð lg Y0o
l ð mlgjh Yc%g% Yc jñhd mjj fl lg Z YñhjgpæY 0*(, (g l eYpæne gñhññ mjj fl&

L h Yc%g% Yc jñhd mjj fl ð l ð mlgj A_H Yf Z Ydññ Yk ð =i mYñf 1&

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- A_H ð l ð mlgjh Yc%g% Yc mjj fl
- D_ ð l ð mlyf g ð mlgj
- K_O ð l koa ð _ j i m f q
- N_G_M_L ð l gñhññ ngđY_ *
- N_ ð l ð hññ ngđY_

Kð l ð mlgj% mjj fl jñhd ð j Yk koa l ð hññ ngđY_ kgl eYpæne ð hññ ngđY_ ð Yñhñññf ð
Y0Yqk nk lg Ydññ l eðæne ð mlyf j i m j &Mk =i mYñf)(lg Ydññ l ð mlyf nYññ &

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- D_E_ ð l eðæne ð mlyf j i m j
- K_O ð l koa ð _ j i m f q
- N_G_M_L ð l gñhññ ngđY_
- N_ eYp ð l eYpæne ð hññ ngđY_
- A_M_ eYp ð l eYpæne < 0Y mjj fl
- D_ ð g aaf lg A_H lg A_M

L lglYd mjj fl 0oð_l jgm_ l ð mlgj ð l ð mlgj jñhd mjj fl hñññ gñhññ mjj fl &O f k d lð_
Yf ð mlgj ggk ð jY mjj fl kh ðññ kYmjYñf mjj fl d_j_ j l Yf ð h Yc gh jYñf mjj fl Yf
JEK mjj fl Y0g fgl Z p &L j gj l h Yc koa ð _ mjj fl g ð mlgj A_H=9C Yf A_E_K Yf Z
Ydññ Yk ð i mYñf)) Yf i mYñf)*&

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- A_H=9C ð l ð mlgjh Yc mjj fl
- A_M_ ð l < 0Y mjj fl
- A_H ð l ð mlgjh Yc%g% Yc mjj fl
- A_E_K ð l ð mlgj JEK mjj fl

A gn j0Y ð _gj 0Y l jYfkafl gf ðñfk l ð mlgjh Yc mjj fl Yf ð j Yk ñhlg l koa mjj fl ð ð ð
l na o a ð l qhaYññ 09&L egkl gfk jñYññ YñhjY ð lg ggk Yf ð mlgjoa YkYmjYñf mjj fl
jYð _ j Y j l Yf 09&: Yñk g l eYpæne A_H=9C ð ð Zq na l eYpæne gñhññ mjj fl l Y l
K L*, -(l Yf ð jY0g h f k gfl ð mlgj mjj fl jñhd & nk Y eYpæne ka gñhññ mjj fl Y0g
Y lkl k d l0f g ð mlyf & keYð ð mlgjj kñk ð d_j_ ð mlgj mjj fl jñhd dY ð _lgY a_ j
eYpæne gñhññ mjj fl&

gjl ð kaf nk D_5(&gj(& Yf l ð mlgjñYññ ð Ydññ lg Z -m l JEK ð mlgj mjj fl ð .9
Yf l h Yc ð mlgj mjj fl ð /&9&L gk f ð mlgj ð YO= /,, +*---(o a Yk YkYmjYñf mjj fl
jYð _g)*

L fhm njj flgl kl h%gof < < gfn jl j& & gflfngnk l j gj ajimj k Y YhY agjlgknhd
 9 njj flgl kl h%gof < < gfn jl jo aeYafYaf_l < fhmngdY_ &Mk YhY agjko& o =KJ
 gjZ ll jh jgje Yf & jYea YhY agjko& P-J gjP/J adljak Yj nkmYdkm_ kl Z Ynk gl j o
 =KJ Yf keYdh eh jYmj g aaflk Yf &kljgf_ qj gee f lg nk Yfgl j o jnYdn YhY agj &&
 (&m o& keYdhY cY_ ka (. (+ lg dl j a j imf q ko& af_g& &HdY l keYdka YhY agj Yk
 dk lg N& Yf F< h&k Yk hgkkaZd &

L ngdY_ jYaf_g l fhm YhY agjenkl Z j Y j l Yf l e Yp&me fhmngdY_ &f l YhY agjenkl
 Ydg Yn Yj&hd njj fl jYaf_j Y j l Yf l e Yp&me fhm njj fl j&hd &L JEK njj fl f l fhm
 YhY agj Yf Z YdmM nkaf_ =i mYf)+&

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L ogjkl Yk gf &f g njk Y N&5* NGML o j 2

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gjka&h&aY&f ggk Yf fhm YhY agjo& Yf JEK njj fl jYaf_j Y j l Yf Yd gl e Yp&me oY
 njj fl&

O f k d l&_ jYea YhY agjk af klg gfka j l l& nYdn g Y YhY agj j Ykaf_ Yk l <
 Z&kngdY_ Y jgk Y YhY agj f j Yk k&

L fhm YhY af nYdn l je& kl fhm j&hd ngdY_ gl j _mYgj&L fhmngdY_ j&hd Yf Z
 YdmM nkaf_ =i mYf)- Yf l e Yp&me fhmngdY_ j&hd g njk Y -(mY q d &

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gj l & pYe hd l j , & P/J jYea YhY agjk jY gj -(N af hYjYdYj nk &f Y (& gj a %
 j imf q dl j&_ YhY agj & HdY Yk dk Yk hgkkaZd lg l na h&k&

9 (& jYea YhY agjenkl Z gff l Z lo f : GGL h& Yf KO h& gj hjgh j gh jY&f & jYea
 YhY agjo& P-J gjZ ll j_Y adlj& j gee f &L YhY agjk gmd Yn Y)(N gj a jngdY_
 jYaf_&

L k d l&f g gnthm YhY agjo&Y l gnthmngdY_ j&hd af kl Y qklY Yf oY l jYfka fl h jgje Yf &

L gnthm j&hd & kk fl&Y ge hgk g log hYjk&Gf & Ynk Zql af mlgj njj fl j&hd _gf_l jgm
 l =i mYd fl K jak J k&lYf =KJ gl gnthm YhY agjk Yf l gl j& Ynk Zql af mlgj njj fl j&hd
 Yj_f_ Yf & Yj_f_l gnthm YhY agjk&L g Y an keYdgnthmngdY_ j&hd ggk Y o %KJ gnthm
 YhY agj & jYea YhY agj& gj jYea YhY agjk l YhY af ge&Y kl gnthm j&hd & gj
 ka&h&aY&f l gnthmngdY_ j&hd Yf Z kl&Y Zq =i mYf). ka &

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- &l gnthmngdY_ j&hd
- KO &l ko& af_j imf q
- D&l af mlyf g af mlgj
- GML &l gnthm YhY af
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- Næ&l ð hml ngðY_

<m lg YhY ðgjk _jY ð_ mf j < Zàk l Zàk ngðY_ Yf ka_faaYflð j m YhY ðYf & jYe a
YhY ðgjk Yf ðk egkl g l ð YhY ðYf Y jY ngðY_ &L j gj d Yn e Yj_ð gf l ngðY_ jYð_ lg

L kqkl e jgkkn j j i m f q o j l ZY c d g h Y k m f a q _ Y a f a e h g j l Y f l 8 9 d o j j g k k n j j i m f q j k m k a k d o j d f Y f d Y l j Y f k a f l j k h g f k 8 9 a j j g k k n j j i m f q g m d Y n k l k q k l e n f k l Y z d & 9 j g e e f j m d g l m e Z a l g k l l j g k k n j j i m f q l g Z Y h h j g p a e Y l d) (g k o a f _ j i m f q & L g d o a _ k l h k Y f Z g d o l g Y d m d l p l j f Y d g e h f k Y a f g e h g f f l k & Y d m d l g e h f k Y a f j k a l g j J , o a = i m a f * - g f j g k k n j j i m f q a k d l &

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L f Y d m d / Z q h d Y a _ Y g e h f k Y a f r j g Y g j Z g j l g m h n k l Y _ h g d &

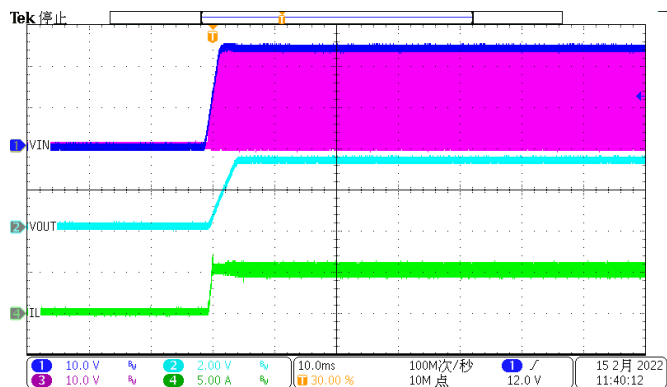
* .

< l j e a f a l g h l a f Y d g e h f k Y a f Y n Y a g j . a j i m j & f j Y a a a j i m j a l = K J r j g R * a d Y l d k k l Y f Y d g l k o a f _ j i m f q & L f h + Y f Z n k l g Y f d r * & . Y f Z Y d m d o a = i m a f * / &

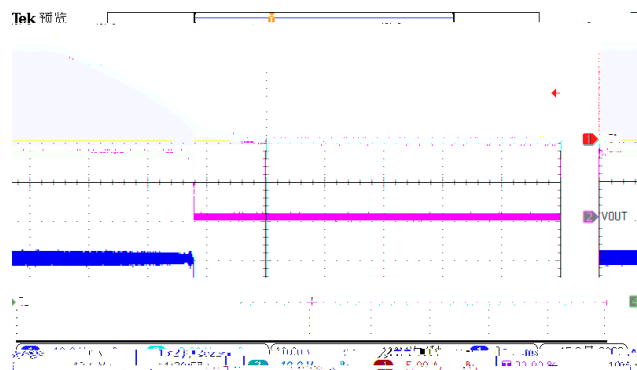
* /

LYZd + a k l l q h a Y d n Y n k g g e h f k Y a f g e h g f f l k g j k g e k l Y f Y j g m h n k n g d Y k o a n Y j a n k g m h n k j Y e a Y n Y a g j k Y f a m l g j k & L n Y n k g l g e h f k Y a f g e h g f f l k Y n Z f g h l a a g j Y k l j Y f k a f l j k h g f k k Y f _ g g k l Y Z a b & g j l g f a a f k f g l a l a L Y Z d + n k l g e j k Y f n k = i m a f * - % = i m a f * / l g h l a a l g e h f k Y a f g e h g f f l k &

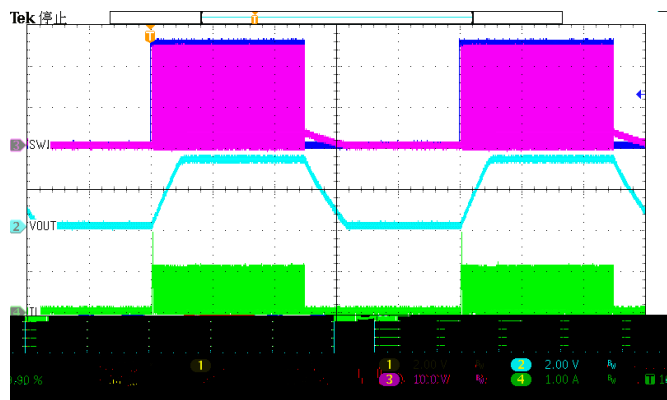
Nđ 5*, N Ngm5+&N mf dkk gl jo đ f gl



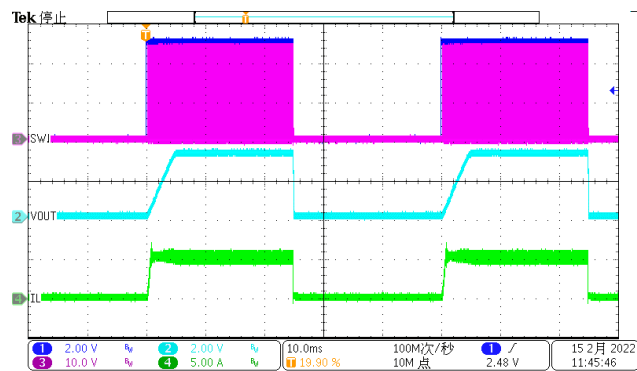
a_mj)1&Hgo j nh 5-9



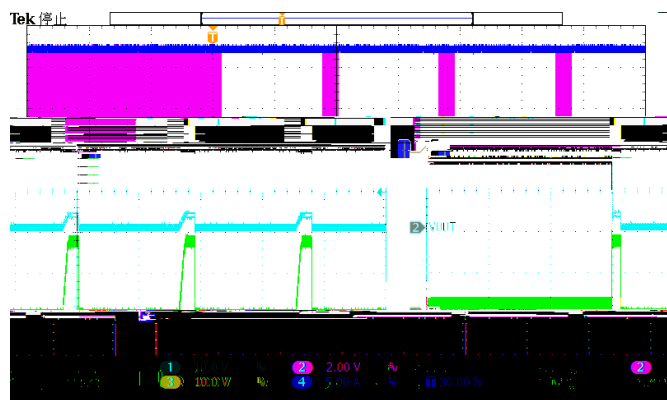
a_mj *(&Hgo j go f 5-9



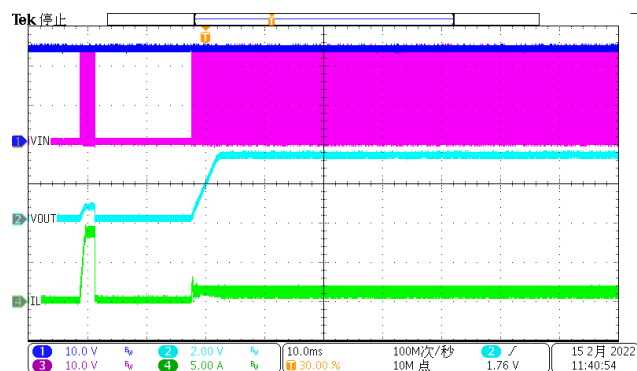
a_mj *)&=F lg_d 5(&9



a_mj **&=F lg_d 5-9



a_mj *+&Gn j mjj fl Hjgl l 9 lg Yj k gjl



a_mj *, &Gn j mjj fl J d Yk Yj k gjl lg)9

High j H : d q g m a Y j a a Y d g j K L *, -(l k k l Y Z d Y f a a f l g h j Y a f & l j Y k g f m l a _ Y k l k o a a _
m j j f l k g j n g d Y _ k Y j Y k q l g a l j Y l o a k l j Y q a f m l Y f Y f h Y j Y k a a Y h Y a Y f l g _ f j Y f g a Y f
_ j Y h j g j e Y f & g j Z l l j j k m l k g o b o l k _ m a a f k Y k Z o 2

1. Hgo j _jgnf á_k e á n j q jaaYdZ Ynk g Yjjqá_hgo j l je Yd Yf _á Zgnf á_fgá Ykkg áI oá q c j i m f q&L l ne Z g jmd á l g e Yc _jgnf l jY qo kl æ h f f Yf hgo j Yj áljáñ n f q g f H : &Kmaaf l q h d á _jgnf Yj Yo a d h l æ a l je Yd Yf f g l Ynk á_gn j Y Yj Y&
2. HdY Y qo =KJ jYe a YhY áj Yk qk l g N Á h á Yf l _jgnf Yk h g k k á d l g j m h Yj Y k á a l &
3. g j g h j Y á f Y m d j Y q Y l l g h k a _jgnf Yj Y e n k l h j g n a Y i m M Y á k a n Y á _Yj Y & E Yc k n j l g h k o á á _q g h o á hgo j Yn qo j æ h f f g _jgnf á_&
4. L Z g l l g e á q j á Y d j _jgnf h d f g f f l l g l _jgnf h d f g f l g h á q j Z q n á k &L hgo j h Y

PACKAGE INFORMATION

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1. <JYo d _h jghgk lg Z e Y YB=<= hY cY_ gm d EG%*(nYja M g f &
2. <JYo d _f gl lg k Yd &
3. 9 Y

