4.3V-60V Vin, 3.5A, High Efficiency Step-down DCDC Converter with Programmable Frequency

- K XY=bdihFUb Y.(J * J
- I dhc)5 7cbhbici g Cihdih7iffYbh
- , J : YYXVUW_FYZYfYbWY JchU Y
- =bhY fUhYX % a < GXY ACG: 9H
- I hfU ck Ei YgWYbh7iffYbh i5
- G ihXckb 7iffYbh %5
- DYU_WffYbhacXYWcbhfc
- Di gY G_ddb AcXY DGA b hcUX
- % bg A b a i a Cb ha Y
- (a g =bhYfbU GcZfghUfhHa Y
- : fYei YbWhGdfYUX GdYWfi a : GG AcXi Uhcb Zcf 9A=FYXi Wlcb
- 5XighUVY: fYei YbWhUbX9IhYfbU 7cW_ GmbWfcbnUhcb. % _<nr&&A<n
- bYUf bWYUgY b ZfYei YbWhXi fb ghUfhid
- DfYWgcb 9bUVYH fYg c XZcf Dfc fUa a UVY =bdihJchU YI bXYf JchU Y cW_CihDfchYWlcb I J C H fYg c XUbX<mghYfYg g
- Acbchcb WGHUfhi d k h DfY VUgYX Cihdih
- < WWd AcXYZcf CjYf WffYbhDfchYWlcb
- CjYf jchU YUbX CjYf HYa dYfUhfY DfchYWlcb
- 5jU UVY b Ub 9GCD, DUW_U Y

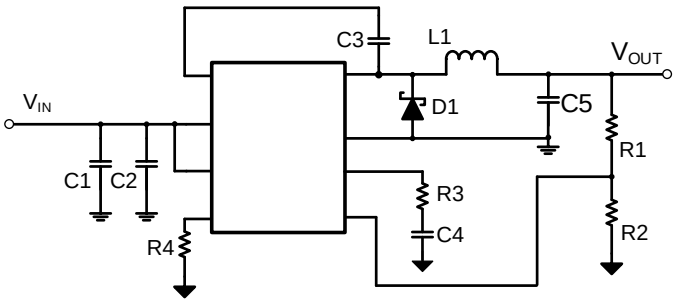
- %& J &(J (, J =bXighfmUbXHYYWcta Dck Yf GmghYa
- =bXighfU 5ihca Uhcb UbX Achcf 7cbhfc
- JY WY5WWYggcfYg

H YG7H&* 6 g)5 ViW_WcbjYfhYfk h k XY bdih jchU Y fUb b Zfca (J hc * J k W bhY fUhYg Ub % a gXY ACG: 9H H YG7H&* 6 UXcdhb h Y dYU_WffYbh acXY WcbhfcgiddcfhghY Di gY G_ddb AcXi Uhcb DGA k W Uggghgh YWcbjYfhYf cb UW Yj b YZZWYbWh Uh h cUX cf ghUbXVm WcbXhcb

H Ygk hW b ZfYei YbWhg dfc fUa a UVYZfca % _<n hc &&A<n k h hk c gYhhb acXYg fYgghcf gYfhb ZfYei YbWha cXY UbX h YWcW_gmbWfcbnUhcb acXY hc cdha nYg Yh Yf h Ydck Yf YZZWYbWhcf h Y YI hYfbU Wcta dcbYbhg gnYg H YG7H&* 6 U ck g dck Yf Wcbj Yfg cb Zfca bdih jchU Y hc ck cihdih jchU Y k h U a b a i a % bg cb ha Y cZ gXY ACG: 9H H YG7H&* 6 g Ub 9YWfca U bYhW =bhYfZYfYbWY 9A= ZfYbXm ViW_WcbjYfhYf k h a d Ya Ybhb cdha nYX XYg b Zcf 9A=fYXi Wlcb H Y G7H&* 6 ZYUhi fYg : fYei YbWhGdfYUX GdYWfi a : GG k h * hhYfb gdUb UbX acXi Uhcb fUhY %) %& cZ gk hW b ZfYei YbWhhc fYXi WYh YWcbXi WYX9A=

H YXYj WY cZZYfg ZI YX(a g gcZfghUfhhc dfYj Ybh bfi g WffYbh Xi fb h Y ghUfhi d cZ cihdih jchU Y fUa d b H YG7H&* 6 gi ddcfhg a cbchcb WghUfh k h dfY VUgYX cihdih H YG7H&* 6 ZYUhi fYg YI hYfbU ccd Wcta dYbgUhcb hc dfcj XYh YZYI V hmhc cdha nYYh Yf ccd ghUV hmcf ccd fYgdcbgY

H YG7H&* 6 dfcj XYg WhWY VmWhWY WffYbh a h WWd acXY Zcf cjYf WffYbh dfchYWlcb h Yfa U g ihXckb dfchYWlcb cihdih cjYf jchU Y dfchYWlcb UbX bdihjchU Yi bXYf jchU Y dfchYWlcb H YXYj WY gUjU UVY b Ub, d b 9GCD, dUW_U Y



4.3V-60V, Asynchronous Buck Converter

BCH9. DU Ybi a VYfg ZcfdfYj ci g fYj g cbg a UmXZZYf Zfca dU Ybi a VYfg b h YWffYbhj Yfg cb
FYj g cb % . FYYUgYhc dfcXi Wlcb
FYj g cb %% I dXUhY 89J=79 CF89F =B: CF A5H=€B
FYj g cb %&. I dXUhY: i fY&)
FYj g cb % . I dXUhY =AS<G b 97 UXX AG

ORDERABLE DEVICE	PACKAGING TYPE	STANDARD PACK QTY	PACKAGE MARKING	PINS	PACKAGE DESCRIPTION	MSL
G7H&* 6GH9F	HUdY FYY	(	* 6	,	9GCD,	

Cj Yf cdYfUhb ZfYY Uf hYa dYfUhi fY i b Ygg ch Yfk gY bchYX %

DESCRIPTION	MIN	MAX	UNIT
J=B 9B		*)	J
6CCH		+%	J
GK	%	*)	J
6CCH GK		*	J

:6 FH7

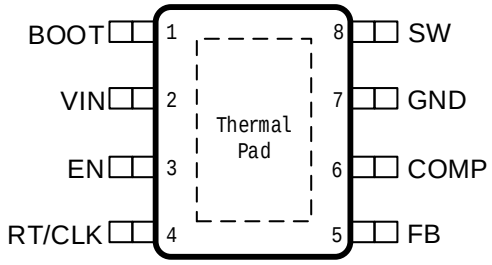


Figure 1. 8-Lead Plastic ESOP

: 6	)	
7 CAD	*	9 ffcf Ua d ZYf ci hdi h 7 cbbYWWhc ZfYei YbWh ccd Wca dYbgUhcb bYfk cf_
B8	+	fci bX
GK	,	F Y i Uhcf gk hW b ci hdi h 7 cbbYWWGK hc Ub Yi hYfbU dck Yf bXi Wcf
H Yfa U DUX	-	< YUh Xgg dUhcb dUh cZXY 9 YWWf WU mWcbbYWWcb hc B8 d b Ai gh VY Wcbb YWWYX hc fci bX d UbY cb D7 6 Zcf dfcd Yf cd YfUhcb UbX cdha nYX h Yfa U dYfZcfa UbWY

Cj Yf cd YfUhb ZfYY U f hYa d YfUhi fY fUb Yi b Ygg ch Yfk gY bchYX

PARAMETER	DEFINITION	MIN	MAX	UNIT
J +B	+bdi hjc hU Y fUb Y	(	*	J
J CI H	Ci hdi hjc hU Y fUb Y	,	) +	J
H	Cd YfUhb i bWcb hYa d YfUhi fY	(	%)	7

PARAMETER	DEFINITION	MIN	MAX	UNIT
J 9G8	< i a Ub 6 cXmA cXY < 6 A dYf 5 BG= 9897 G %& % gd YWZWUhcb U d bg %	%	%	_J
	7 Uf YX 8 Yj WY A cXY 7 8 A dYf 5 BG= 9897 G & & % gd YWZWUhcb U d bg &	%	%	_J

(1) 9897 XcWa Ybh 9D%)) gHUhYg h Uh) J < 6 A U ck g gUZY a Ubi ZUWi f b k h U gHUbXUfX 9G8 Wcbhfc dfcWYgg
(2) 9897 XcWa Ybh 9D%) + gHUhYg h Uh&) J 7 8 A U ck g gUZY a Ubi ZUWi f b k h U gHUbXUfX 9G8 Wcbhfc dfcWYgg

PARAMETER	THERMAL METRIC	ESOP-8L	UNIT
F 5 %&	i bWcb hc Ua V Ybhh Yfa U fYg gHUbWY	) &,	7 K
H &	i bWcb hc hcd WUfUWWYf nUhcb dUfUa YhYf	* (	
6 &	i bWcb hc VcUfX WUfUWWYf nUhcb dUfUa YhYf	%(-	
F 7hcd %&	i bWcb hc WUgY h Yfa U fYg gHUbWY	+%%	
F 6 &	i bWcb hc VcUfX h Yfa U fYg gHUbWY	%(, &	

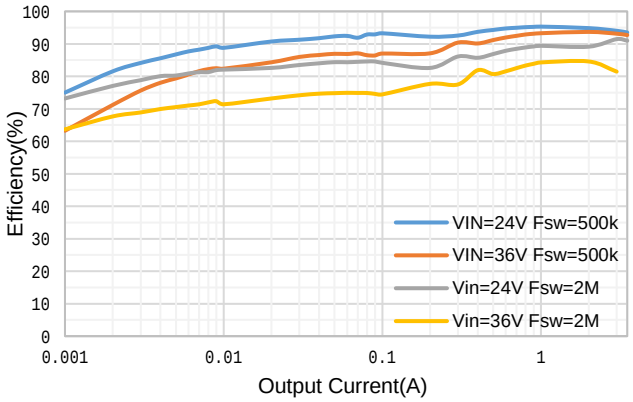
% G7 H dfcj XYg F 5 UbX F 7 bi a VYfg cb mUg fYZYfYbWY hc Ygha UhY i bWcb hYa d YfUhi fYg cZh Y XYj WYg F 5 UbX F 7 UfY bchU WUfUWWYf ghWcZdUWU Y hgYZ Vi hcZa Ubmch Yf gmghYa Yj Y WUfUWWYf ghWg gi W Ugh Y XYg b UbX Uhmci hcZh Y df bhYX WfW h VcUfX D7 6 cb k W h Y G7 H&* 6 g a ci bhYX h Yfa U dUX gnY UbX Yi hYfbU Ybj fcba YbhU ZUWcfg H Y D7 6 VcUfX g U YUhg b_ h Uh g gc XYfYX hc h Y YUXg UbX h Yfa U dUX cZh Y G7 H&* 6 7 Ub b h Y XYg b cf WcbZ i fUhcb cZh Y D7 6 VcUfX WUb Yg h Y YZZWYbWhcZh Y YUhg b_ UbX h YfYZcfYh YUWi U F 5 UbX F 7

J+B1&(J H 1 (7r %&) 7 hmd WJ jUi Y g hYghYXi bXYf &) 7

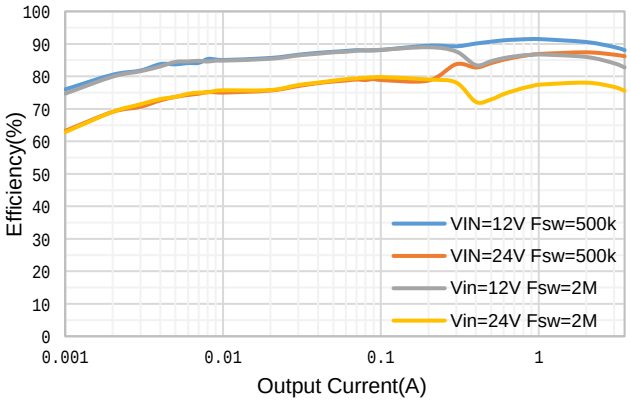
SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Supply						
J+B	CdYfUhb bdi hj c hU Y		(		*	

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
H_{G8}	H YfaU g ihXckbhfYg cX	H fgb		%+)		7
		<mghYfYgg		%)		7

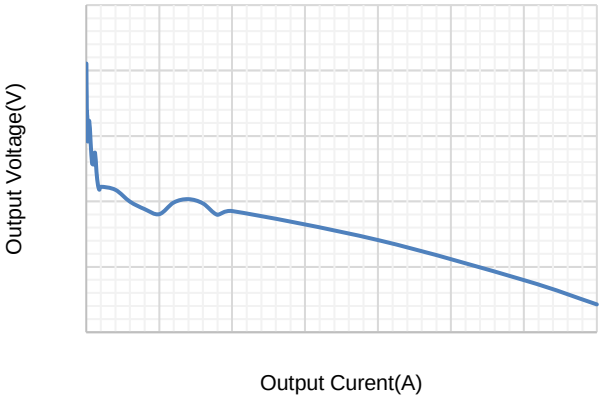
8YfjYXZfcaVYbW WUfUWmYfnUhcb



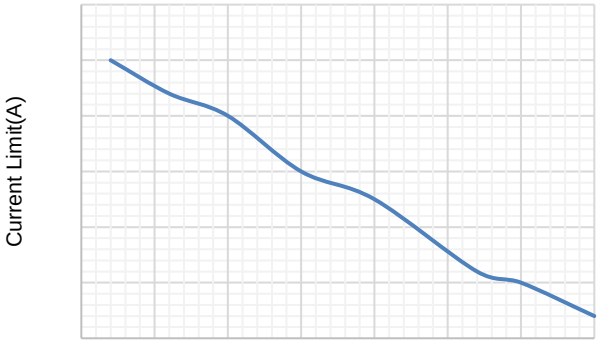
: ifY& 9ZZWYbWhjg cUX7iffYbh Jcih1%&J



: ifY 9ZZWYbWhjg cUX7iffYbh Jcih1)J



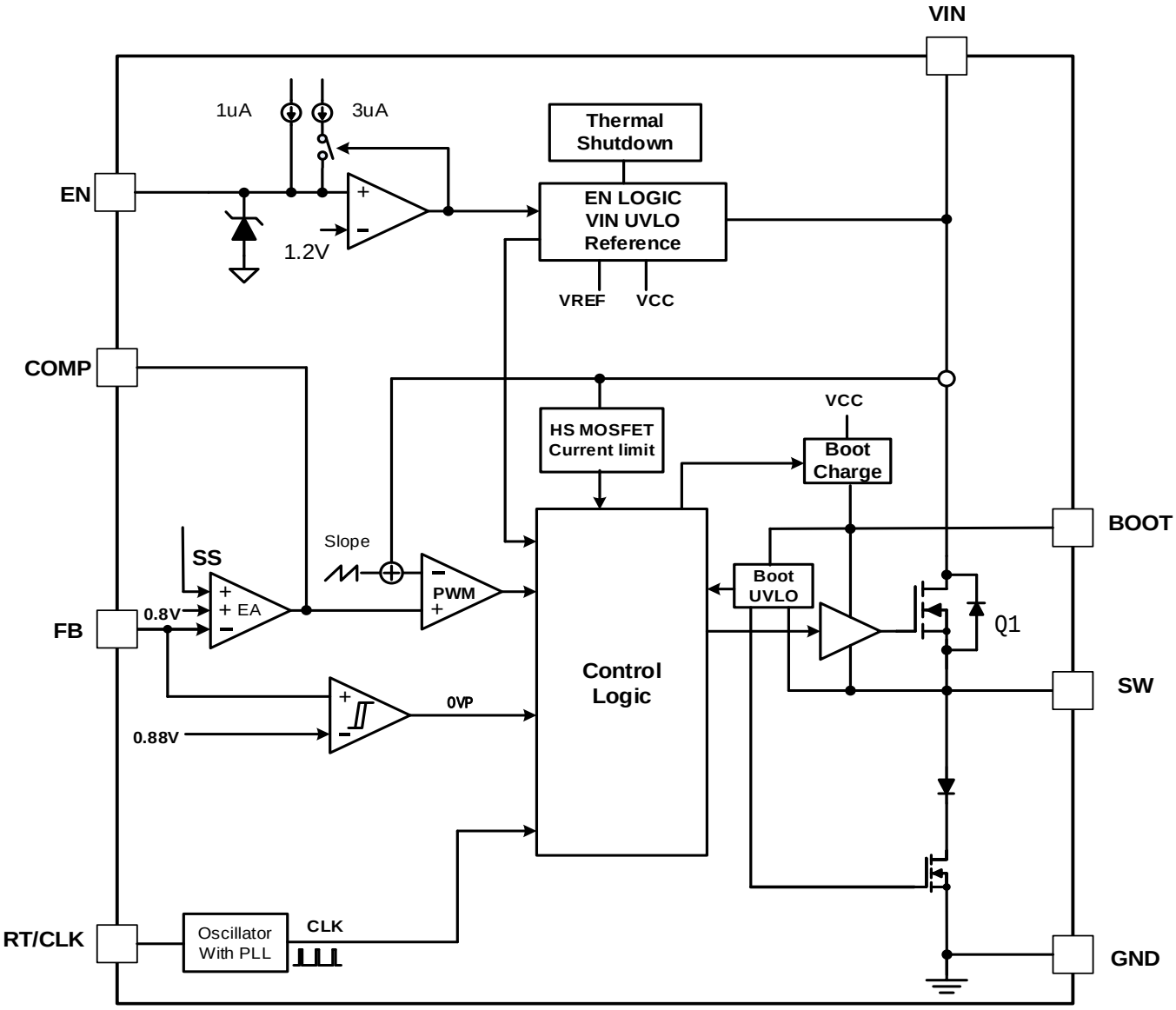
: ifY(cUXFYiUhcb Jb1&(J Jcih1)J :gk1) _



: ifY) 7iffYbh ahJGHYadYfUhifY

: ifY* Gk hWb :fYei YbWhJGHYadYfUhifY

: ifY+ Gk hWb :fYei YbWhjgFHFYgghc



: i fY, : i bWcbU 6 cW_8 U fUa

Overview

H YG7H&* 6gU(J*J bdih)5cihdihViW_WcbjYfhYfkh bhYfUhYX%a FXgcb gXYdckYf ACG:9H=hadYaYbhgWcbghUbhZfYeiYbWhdYU_WffYbhacXYWcbhfchc fYiUhYcihdihjchUY dfcjXb YlWYYbhbYUbXcUXhfUbgYbhfYgdcbgYUbXgadZmbhYYlhYfbU ccdWcadYbgUhcbXYgb

H Ygk hWb ZfYeiYbWhgdfcfUaaUVYZfca %_<nhc&&A<nkhhkcgYfhb acXYg fYgghcfgYfhb ZfYeiYbWh acXYUbXhYWcW_gmbWfcbnUhcb acXY hc ccdhanYgYhYfhYdckYf YZZWYbWhcfhYYlhYfbU WcadcbYbhg gnYg H YG7H&* 6ZYUhifYgUb bhYfbU (aggcZhghUfhhaYhc UjcX Uf Y bfig WffYbhUbXcihdihjchUY cjYfg cchXifb ghUfhid H YXYj WY Ugc gi ddcfhg acbch WghUfhidkh dfYVUgYX cihdihWcbXhcb H YgYUa Ygg acXYhfUbghcb VYhk YYb DK A acXYUbX DGA acXYcdYfUhcbg Ybgi fY YZZWYbWhcjYfk XY cUX WffYbhfUb Y H YeiYgWYbhWffYbhghmdWUm i5ibXYf bc cUXcfgYYd acXYWcbXhcb hc UW YjY YZZWYbWhUh hcUX H YG7H&* 6k YldYfYbWYU bYUf bWYUgY bZfYeiYbWhXifb ghUfhid

H YG7H&* 6UgUXYZUihbdihghUfhidjchU YcZ(Jkh& aJ mghYfYgg H Y9Bdb gU jchU Ydb kh UdfYWgcbhfYg cXhUhWUb VYigYXhcUXighh Y bdihjchU YcW_cihhfYg cXgkh hkcYlhYfbU fYgghcfg hc aYYhUWWfUhY Yf l J C gmghYa fYeiYfYabhg :cUhb 9Bdb YbUVYgh YXYj WYkh h Y bhYfbU di id WffYbhhch Ydb 7cbbYWb 9Bdb hcJ=B XfYWmghUfhgidh YXYj WYUihcaUhWUm

H YG7H&* 6adYaYbhgh Y:fYeiYbWhGdfYUXGdYWfia :GGacXiUhcbgdfYUXb cZ* WYbhYfYXgYYWYX gkhWb ZfYeiYbWh:GGadfcjYg 9A=dYfZcfaUbWY VmbchUckb YahhYXYbYfmhc ghUmbUbmcbYfYWYjYf VUbXZcfUg bZWUbhYbh cZhaY

H YG7H&* 6Zdfch YWfcbZYUhifYg bWlXYhY bdihibXYfjchU YcW_cihhYcihdihcjYfjchU Ydfch YWfcb cjYfWffYbhdfch YWfcbkh WfWY VmWfWY WffYbh ahb UbX WWVdacXY cihdih UfXg cfhdfch YWfcbUbX hYfaUg ihXckb dfch YWfcb

Peak Current Mode Control

H YG7H&* 6Yadcmg ZlYX ZfYeiYbWhdYU_WffYbhacXY WcbhfcWcW_bhUhYg hifbb cbhY bhYfbU WcW_bhUhYg hifbb cbhY bhYfUhYX gXYdckYf ACG:9HE%bYUW WfWY hYbbXiWcfWffYbhfgYg bYUfmK Ybh YWffYbhh fci gXY ACG:9HfYUWYgh Yh fYg cXYjYgYhVmh Y7CADjchU YcZh Y bhYfbU Yffcf Uad ZYfh Y bhYfUhYX gXY ACG:9H ghifbYXcZZ

H YYffcf Uad ZYfgYfjYgh Y7CADbcXY VmWcadUfb h YjchU YcZh Y:6dbk h Ub bhYfbU ,JfYZYfYbWY jchU YK Ybh YcUXWffYbhbWfYUgYg UfYXiWfcb bh YZYYXVUW_jchU YfYUhjYhch YfYZYfYbWYfUgYg 7CAD jchU Yh h YUjYfU Y bXiWcfWffYbhaUhWYgh Y bWfYUgYX cUXWffYbh H gZYYXVUW_ccdkY fYiUhYgh Y cihdihjchU Yhch YfYZYfYbWY H YXYj WYUgc bhY fUhYg Ub bhYfbU gcdYWcadYbgUhcb WfWWhfmhc dfYjYbhgi V Ufacb WcgWUhcbk Yb XihmWfWY g fYUhYfh Ub) ZcfUZlYXZfYeiYbWhdYU_WffYbhacXYWcbhfc

H YG7H&* 6cdYfUhYg bDigYG_ddb AcXY DGA kh hcUXWffYbhhc adfcjYYZZWYbWhK Ybh YcUX WffYbhXYWfYUgYg Ub bWfYaYbh bh YZYYXVUW_jchU Y YUXg 7CADjchU YXfcd K Yb 7CAD ZUghc Uck WUadhfYg cX(aJ hmdWUm XYj WY YbhYfg DGA H Y cihdihjchU Y XYWUmg XiYhc cihdih WUdUWhcf XgWUf b Xifb g_ddb dYfcX CbWY:6jchU YXfcdg ckYfh Ubh YfYZYfYbWYjchU Y UbXh Y7CADjchU Y fgYg UVcjY ck WUadhfYg cX H Yb gXY dckYf ACG:9H hifbg cb b bYlh WcW_di gY 5ZfYf gYjYfU gkhWb WfWYgkh hmdWU* a5dYU_bXiWcfWffYbh 7CADjchU YXfcdg UbX g WUadYX U Ub UbX di gY g_ddb acXYfYdYUhg Zh Ycihdih WcbhbiYg hcUXYX

H gWcbhfc gWYaY YdgUW Yjb Yf YZZWYbWhVmg_ddb WfWYghc fYXiWYgkhWb dckYf cgg UbX UhY XfjYWUf b cgg H YWcbhfc YfWcbgiadhcb ei YgWYbhWffYbhg i5Xifb g_ddb dYfcXkh bc gkhWb hc adfcjYYZZWYbWhZfh Yf

Enable and Under Voltage Lockout Threshold

H YG7H&* 6gYbUVYXk Ybh YJ=B db jchU YfgYg UVcjY(J UbXh Y9Bdb jchU YYlWYYXgh YYbUVY hfYg cXcZ%&J H YXYj WY gXgUVYXk Ybh YJ=B db jchU YZUgVYck ,JcfkYbh Y9Bdb jchU Yg VYck %)J 5bbhYfbU %5di id WffYbhgcifWYhc 9Bdb Uckgh YXYj WY YbUVYk Yb 9Bdb ZcUhg

ZU b YX YcZh YYlhYfbU WcW_UhFH7 dbk h hmdWU**bghaYXYUm5 geiUfYkUjYWcW_g bUhcFH7 dbaigh UjY YjYbc ckYfhUb)J ckYjYbc Yfh Ub (J UbXdigYk Xh Uf Yfh Ub, bg

=bUddWUhcbgk YfYVch fYgghcfgYmhb ZfYei YbWmhacXYUbXWcW_gmbWfcbnUhcbacXYUfYbYYXYX hYXYj WY WUb VYWcbZ ifYXUgg ckbb: ifY% 6YZcfYUb YlhYfbU WcW_g dfYgYbh h YXYj WYk cf_g bfYgghcfgYmhb ZfYei YbWmhacXY K YbUb YlhYfbU WcW_dfYgYbhg h YXYj WYUihcaUhWUmhfUbghcbgZfca fYgghcfgYmhb acXY hc YlhYfbU WcW_gmbWfcbnUhcbacXY 5bbhYfbU d UgY cW_YX ccd D cW_g bhYfbU WcW_ZfYei YbWmhcbhc hY YlhYfbU WcW_k h bhmdWU,)igH YWcbjYfhYfhfUbghcbgZfca h YWcW_gmbWfcbnUhcbacXYhc h YfYgghcf gYmhb ZfYei YbWmhacXYk Ybh YYlhYfbU WcW_XgUddYUfg

Frequency Spread Spectrum

Hc fYXi WY 9A=h Y G7H&* 6 adYaYbhg :fYei YbWmhGdfYUX GdYWmfia :GG H Y :GG WfWhfmg Zfg h Y gk hW b ZfYei YbWmhcZh YfY i Uhcf dYfcXWUmk h bUWYfhUb ZfYei YbWmhfUb YUfcibXh YUXighYXgk hW b ZfYei YbWmhH Y hhYfb gdUb g * cZh Ygk hW b ZfYei YbWmhk h %)%&gk b ZfYei YbWmh

Linear Frequency Reduction

=bcfXYfhccdhanYh YdYfZcfaUbWYcZh Yci hdihjchU YXi fb ghUfhi dUbXcdhanYh Y bXiWmUbWY WffYbhfddY h YG7H&* 6UXcdhgU bYUfZfYei YbWmhfYXiWmcbZbWmcb XYg bXifb ghUfhi dckYfid 8ifb h YdfcWYggcZ bWfYUgb h Y:6dbjchU YZfca J hc ,JXifb ghUfhi d h YZfYei YbWmhcZG7H&* 6k bYUfmbWfYUgYhc h YgYhZfYei YbWmhbUWYffUbdfcdcfhcb

Bootstrap Voltage Regulator and Low Drop-out Operation

5bYlhYfbU VcchghfUd WUdUWhcf VYmk YYb 6CCHdbUbXGK dbdckYfgh YZcUhb UhYXfjYfhc gXYdckYf ACG:9H H YVcchghfUd WUdUWhcfjchU Y gWUf YXZfca Ub bhY fUhYXjchU YfY i Uhcfk Yb gXYdckYf ACG:9H gcZZUbXh YYlhYfbU ck gXYXcXYWcbXi Wg H YfYWca aYbXYXjUi YcZh Y6CCHWUdUWhcf g %:

H YI J CcZ gXYACG:9H UhYXfjYf Ugfgb hfYg cXcZ&)JUbX mghYfYggcZ aJK Ybh YXYj WY cdYfUhYgk h XihmWmWY cfYlhfYa Ym hcUX VcchghfUd WUdUWhcfaUmVYbchfYWUf YX bWcbgXYfUVY cb haYH YjchU YUhVcchghfUd WUdUWhcf g bgiZZWYbhhc Xfj Y gXYACG:9HZi mcb K Ybh YjchU YUWfcgg VcchghfUd WUdUWhcfXfcdgVYck &&J 6CCHI J CcWWfg H YWcbjYfhYfZcfWYghifbb cbUb bhY fUhYX ck gXY ACG:9H dYfcXWUmhc fYZfYg h YjchU YcZVcchghfUd WUdUWhcf hc iUfUbhYY h YWcbjYfhYfg cdYfUhcb cjYfU k XYXihmfUb Y

HAC H T

Typical Application

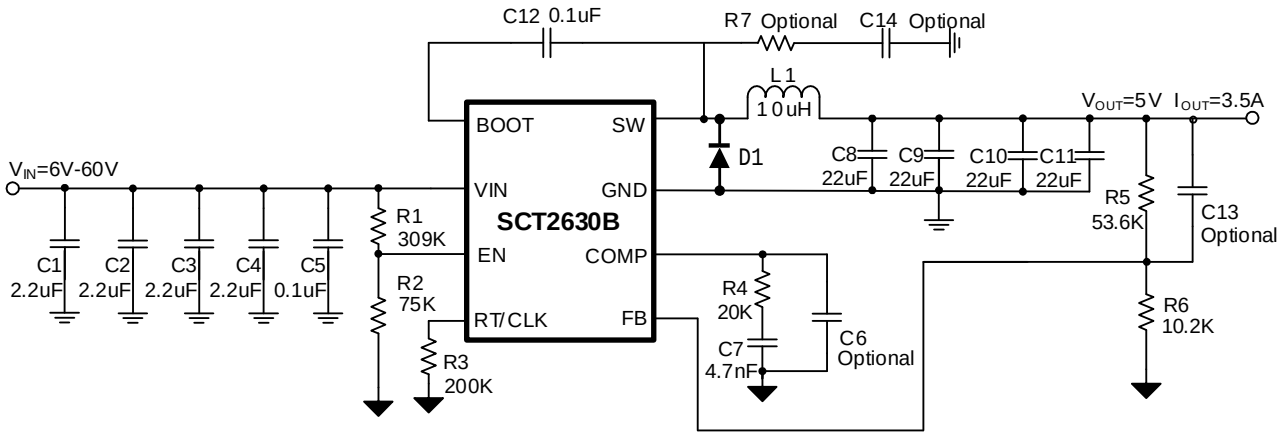


Figure 11. SCT2630B Design Example, 5V Output with Programmable UVLO

Design Parameters

Design Parameters	Example Value
=bdihJchU Y	&(J BcfaU *J hc * J
Cihdih Jch U Y	)J
AUl aia Cihdih7iffYbh	)5
Gk hW b :fYeiYbWh	) <n
Cihdihjch U Yfdd Y dYU_hc dYU_	, &aJ
HfUbgYbhFYgdcbgY , +)5 hc &*&)5 cUXghYd	Jcih1(& aJ
GHUfh=bdihJchU Y fgb J=B	) , J
Ghcd=bdihJchU Y ZU b J=B	(%J

Inductor Selection

H YfY UfY gYj YfU ZUWcfg g ci X VY Wcbg XYfYX b gY YWb bXi Wcf gi W Ug bXi WUbWY gUhi fUhcb WffYbh h Y F AG WffYbhUbX 87 fYg gHUbWY 87 F Uf Yf bXi WUbWY fYgi hg b Ygg bXi Wcf WffYbhfdd YUbXh YfYZcfY YUXg hc ck Yf ci hdi hjc hU Y fdd Y <ck Yj Yf h Y Uf Yf jUi Y bXi Wcf Uk Umg WcffYgdcbXg hc U V Yf d mg WU gn Y Yf gYf Yg fYg gHUbWY UbX ck Yf gUhi fUhcb WffYbh 5 ccX fi YZcf XYhYfa b b h Y bXi WUbWY hc i gY g hc U ck h Y bXi Wcf dYU_hc dYU_f dd YWffYbhhc VY Uddfcl a UhYm& r(cZh Ya Ul a i a ci hdi h WffYbh

H YdYU_hc dYU_f dd YWffYbh b h Y bXi Wcf =DD WUb VY WU WU UhYX Ug b 9ei Uhcb %

_____ %

K YfY

- =DD g h Y bXi Wcf dYU_hc dYU_WffYbh
- g h Y bXi WUbWY cZ bXi Wcf
- ZGK g h Y gk hW b ZfYei YbWh
- JCIH g h Y ci hdi hjc hU Y
- J=B g h Y bdi hjc hU Y

GbWY h Y bXi Wcf WffYbh f dd Y bWYUgYg k h h Y bdi hjc hU Y gc h Ya Ul a i a bdi hjc hU Y b Udd WUhcb g Uk Umg i gYX hc WU WU UhYh Ya b a i a bXi WUbWY fYei fYX I gY 9ei Uhcb %%hc WU WU UhYh Y bXi WUbWY jUi Y

_____ _____ %%

K YfY

- A=B g h Ya b a i a bXi WUbWY fYei fYX
- ZGK g h Y gk hW b ZfYei YbWh
- JCIH g h Y ci hdi hjc hU Y
- J=Bau g h Ya Ul a i a bdi hjc hU Y
- =CIHau g h Ya Ul a i a 87 cUX WffYbh
- =F g WcYZZWYbhcZ=DD hc =CIH

H YhchU WffYbhZck b h fci h Y bXi Wcf g h Y bXi Wcf f dd YWffYbhd i g h Y ci hdi h WffYbh K Yb gY YWb Ub bXi Wcf WccgY hg fUhYX WffYbh YgdYWU mh Y gUhi fUhcb WffYbh Uf Yf h Ub hg dYU_cdYfUhcb WffYbhUbX F AG WffYbh Ugc bch VY Yi WYYXYX H YfYZcfY h Y dYU_gk hW b WffYbh cZ bXi Wcf =D95 UbX =FAG WUb VY WU WU UhYX Ug b 9ei Uhcb %& UbX 9ei Uhcb %

___ %&

_____

___ %

K YfY

- =D95 g h Y bXi Wcf dYU_WffYbh
- =CIH g h Y 87 cUX WffYbh
- =DD g h Y bXi Wcf dYU_hc dYU_WffYbh
- =FAG g h Y bXi Wcf F AG WffYbh

=b cj YfcUXb cf cUX hfUbg YbhWcbXhcbg h Y bXi Wcf dYU_WffYbh WUb bWYUgY i d hc h Y gk hW WffYbh a hcZ h YXYj WYk W ghmd WU m))5 H Ya cgh WcbgYfjUhj YUddfcUW g hc WccgYUb bXi Wcf k h UgUhi fUhcb WffYbh fUhb fYUhYf h Ub))5 6YWUi gY cZh Ya Ul a i a =D95 a hYX VmXYj WY h Y a Ul a i a ci hdi h WffYbhh Uhh Y G7H&* 6 WUb XY j YfUgc XYdYbXg cb h Y bXi Wcf WffYbhfdd Y H i g h Ya Ul a i a XYg fYX ci hdi h WffYbhUgc

UZZYWg h YgY YWmcb cZ bXi WmUbWY H YgaU Yf bXi WmcffYgi hg b Uf Yf bXi WmcfWffYbhfddY YUXb hc U ck Yf aUaia cihdihWffYbh

Diode Selection

H YG7H&* 6 fYei fYgUb YlhYfbU WUhW XcXY VYhk YYb h YGK dbUbX B8 H YgYYWmYXXcXYaighUjYU fYjYfgYjchU YfUhb YeiUhccf fYUhYfhUbJ=BaUl H YdYU_WffYbhfUhb cZh YXcXYaighVY fYUhYfhUb h YaUlaia bXiWmcfWffYbh GWchh_mXcXYgUfYhmdWUmU ccXWcWYZcfh YWUhW XcXY Xi Yhc h Yf ck ZcfkUfXjchU Y H Y ck Yfh YZcfkUfXjchU YcZh YXcXY h Y Yfh YYZZWYbWhcZh YfY i Uhcf

HmdWUmXcXYgk h Yfjch U YUbXWffYbhfUhb g UjY YfZcfkUfXjchU Yg 5XcXYk h Ua baia cZ * J fYjYfgYjchU Y gdfYZYffYXhcUck bdihjchU YhfUbgYbhgidhch YfUhYXjchU YcZh YG7H&* 6

:cfh YYlUadYXYg b h YD8G+* % GWchh_mXcXY ggYYWmYXZcfhg ck YfZcfkUfXjchU YUbX ccXh YfaU WUfUWmYfghWgWcadUfYXhc gaU Yf XYj WYg H YhmdWUZcfkUfXjchU YcZh YD8G+* % g (, jchgUh)5

H YXcXYaighUgc VYgYYWmYXk h UbUddfcdfUhY dck Yf fUhb H YXcXYWcbXiWmgh YcihdihWffYbhXifb h YcZZha YcZh Y bhYfbU dck Yf gk hW H YcZZha YcZh Y bhYfbU gk hW g UZbWmcb cZh YaUlaia bdih jchU Y h YcihdihjchU Y UbXh Ygk hW b ZfYei YbWmH YcihdihWffYbhXifb h YcZZha Y gaihd YXVmh Y ZcfkUfXjchU YcZh YXcXYhc WUWUhY h Y bghUbhUbYcig WcbXiWmcb cggYg cZh YXcXY 5h Yf gk hW b ZfYei YbWYg h YUWcggYg cZh YXcXYbYYXhc VYhU_Yb bhc UWWcibh H YUWcggYg cZh YXcXYUfYXi Yhc h Y WUf b UbXXgWUf b cZh Yi bWmcb WUdUWhUbWYUbXfYjYfgYfYWcjYfmWUf Y 9eiUhcb %(gYfgYXhc WUWUhY h YhchU dck Yf Xgg dUhcb bWlXb WcbXiWmcb cggYg UbXUWcggYg cZh YXcXY

H YD8G+* % XcXY UgUibWmcb WUdUWhUbWYcZ(d: lgb 9eiUhcb %(h YhchU cgg b h YXcXYUhh Y aUeaia bdihjc(hU Y g %-K

=Zh Y dck Yf gi ddmgdYbXg Ug b ZWUbhUaci bhcZha YUh h cUX WffYbhg cf b gYYd acXY WcbgXYf igb U XcXYk W UgU ck YU_U YWffYbhUbXg hm YfZcfkUfXjchU YXfcd

%(

Input Capacitor Selection

H Y bdihWffYbhhc h YghYd Xck b 8787 WcbjYfhYf g XgWcbhbici g h YfYZcfY hfYei fYgUWUdUWhcfhc gi ddmh Y 57 WffYbhhc h YghYd Xck b 8787 WcbjYfhYfk YaUbhUb b h Y87 bdihjchU Y IgYWUdUWhcfgk h ck 9GF ZcfVYhhYfdYfZcfaUbWY 7YfUa WWUdUWhcfgk h L)FcfL+F XYYWmfWgUfYigiUmgi YghYXVYWUigYcZh Yf ck 9GF UbXgaU hYadYfUhifYWcYZZWYbhg UbXhgghfcb mfYWcaaYbXYXhcigYUbch Yf ck YfjUiYWUdUWhcf Y %:k h gaU dUWUYgnY * hc ZhYf ZfYei YbWmgk hW b bcgY DUWYh YgaU gnYWUdUWhcfUg WcgYhc

K Yb gY YWWb WYfUa VWVUdUWhcfg hbYYXghc WcbgXYf h Y YZZYWWjY jUi Y cZU WUdUWhcf XYWYYUgb Ugh Y 87 VUgjchU YUWfcggUVWUdUWhcf bWYUgb

H Y bdihWUdUWhUbWY jUi Y XYhYfa bYgh Y bdihfddYjchU YcZh YfY i Uhcf H Y bdihjchU Yfdd YWUb VY WUW UhYXigb 9eiUhcb %+ UbXh YaUl aia bdihjchU Yfdd YcWWfgUh) XimVWhWY

%+

:cfh gYlUad Y Zcif && : L+F WYfUa VWVUdUWhcfg fUhYXZcf % J b dUfU Y UfYigYX 5bXU % : Zcf ZfYei YbWmZhYfb WUdUWhcf gdUWYXUgWcgYUgdcggVYhch YXYj WYdbg

Bootstrap Capacitor Selection

5 %: WYfUa VWVUdUWhcf aighVY WcbbYWmYX VYmk YYb 6CCH db UbX GK db Zcf dfcdYf cdYfUhcb 5 WYfUa W WUdUWhcfk h L)F cf VYhhYf fUXY XYYWmfWgfYWca aYbXYX H YWUdUWhcfg ci X UjYU%J cf Yfjch U Y fUhb

Output Capacitor Selection

H YgYYWWcb cZcihdihWUdUWhcfk UZZYWWcihdihjchU Yfdd Y bghYUXmghUhYUbX cUXhfUbg YbhdYfZcfaUbWY

H Yci hdihfddY gYggYbhUmWca dcgYXcZhk c dUfhg CbY gWUigYX Vmh Y bXi Wcf WffYbhfddY cb h fci h Y9ei jUYbhGYfYgFYgghUbWY9GF cZh Yci hdihWUdUWhcfgUbXh Ych Yf gWUigYX Vmh Y bXi Wcf WffYbhfddY WUf b UbXXgWUf b h Yci hdihWUdUWhcfg Hc UW YjYgaU ci hdihjchU Yfdd Y WccgYU ck 9GF ci hdih WUdUWhcf _Y WYfUa WVWUdUWhcf :cf WYfUa WVWUdUWhcfg h Y WUdUWhUbWY Xca bUhYg h Y ci hdih fddY :cf g a d ZWUhcb h Yci hdihjchU Yfdd YWUb VY Ygha UhYX Vm9ei Uhcb % XYgfYX

%

K YfY

- gh Yci hdihjchU Yfdd Y
- ZGK gh Ygk hW b ZfYei YbWmh
- gh Y bXi WUbWY cZbXi Wcf
- 7CI H gh Yci hdihWUdUWhUbWY
- JCI H gh Yci hdihjchU Y
- J-B gh Y bdihjchU Y

8iYhc WUdUWhcfg XY fUXb ibXYf 87 VUg h Y VUgjchU Y WUb g bZWUbhmfYXi WY WUdUWhUbWY 7YfUa W WUdUWhcfg WUb cgYacghcZh Yf WUdUWhUbWY Uh fUhYXjchU Y H YfYZcfY YUjYaUf b cb h Yjch U YfUhb hc Ybgi fYUXYei UhY YZZYWWjY WUdUWhUbWY Hmd WU mZcif && : WYfUa WcihdihWUdUWhcfgk cf_Zcfa cghUdd WUhcbg

Compensation Components

H YG7H&* 6 Yad cmg dYU_WffYbha cXYWcbhfc ZcfYUgmWca dYbgUhcb UbXZUghhfUbg YbhfYgdcbgY 5bYlhYfbU bYfk cf_Wca dfgb fYgghYf F(WYfUa WVWUdUWhcfg 7+UbXcdhcbU 7* WcbbYWmYXhch Y7CAD db gigYXZcfh Y ccd Wca dYbgUhcb H Y9eiUhcb % g ck gh YWcgY ccd gaU g bU hfUbgZYfZbWmcb

%

k YfY

- 595 gYffcfUad ZYfjchU Y Ub
- =GBG g7CADhc GK WffYbhhfUbg WcbXi WUbWY %%5 J hmdWUm

H Y 8 7 jc hU Y Ub cZh Y ccd g jYb Vm9ei Uhcb &

&

H Y gmghYa Ug hk c bchYk cfh mdc Yg. cbY g Xi Yhc h Y Wca dYbgUhcb WUdUWhcf 7 + UbXh Y Yffcf Ua d ZYf ci hdi h fYg ghcf H Y ch Yf g WUi gYX Vmh Y ci hdi h WUdUWhcf UbXh Y cUX fYg ghcf H YgY dc Yg Ug cWUhYX Uh

&%

&&

k YfY

- F C95 g Yffcf Ua d ZYf ci hdi h fYg ghcf
- 95 g 9ffcf Ua d ZYf hfUbg Wcb Xi WUbWY & i G hmd WU m
- F C58 g Yei jU Ybh cUX fYg ghcf

H Y gmghYa Ug cbY nYfc cZ a dcfhUbWY Zfca F(UbX 7 + Zh % g i gYX hc Wci bhYfUWh Y Zd& UbXZh % cWUhYX Uh

&

H Y gmghYa a Um Uj Y Ubch Yf a dcfhUbhnYfc Zh Y ci hdi h WUdUWhcf Ug U Uf Y WUdUWhUbWY cf U 9GF jUi Y H Y nYfc Xi Yhc h Y 9GF UbXh Y WUdUWhUbWY cZh Y ci hdi h WUdUWhcf g WU W UhYX Vm9ei Uhcb &(

&(

=b h g WUgY Uh fX dc Y gYh Vmh Y cdhcbU Wca dYbgUhcb WUdUWhcf 7 * UbXh Y Wca dYbgUhcb fYg ghcf F(g i gYX hc Wca dYbgUhYg h Y YZZYWcZh Y 9GF nYfc H g dc Y g WU W UhYX Vm9ei Uhcb &)

&)

H Y Wfcggcj Yf ZfYei YbWhcZWcbj YfhYf g g ck b b 9ei Uhcb &*

&*

H Y gmghYa Wfcggcj Yf ZfYei YbWhk YfYh YZYYXVUW_ ccd Ug i b hm Ub g a dcfhUbh 5 ck Yf Wfcggcj Yf ZfYei YbWh fYgi hg b g ck Yf bY UbX cUX hfUbg Ybh fYgdcbgY 5 Yf Wfcggcj Yf ZfYei YbWh Wci XWUi gYh Y gmghYa i bgh UVY 5 fYWca a YbXYX fi Y cZh i a V g hc gYhh Y Wfcggcj Yf ZfYei YbWhhc VY Uddfcl a UhYm %% cZgk hW b ZfYei YbWh

H Y Zc ck b ghYdg WUb VY Zc ck YX hc WU W UhY h Y Yl hYfbU Wca dYbgUhcb Wca dcbYbhg 7 UW UhY h Y Wca dYbgUhcb fYg ghcf F(k h 9ei Uhcb &+ cbWY Wfcggcj Yf ZfYei YbWh g gY YWmYX

&+

H Yb WU W UhY 7 + Vmd UWb U Wca dYbgUhcb nYfc Uhcf VYZcfYh Y ci hdi h ghU Y dc Y

&,

8 YhYfa bY Zh Y cdhcbU Wca dYbgUhcb WUdUWhcf 7 * g fYei fYX YbYfU m h g fYei fYX Zh Y 9GF nYfc Z&& g cWUhYX Ygg h Ub U ZcZh Y gk hW b ZfYei YbWh H Yb Zd WUb VY i gYX hc WUbWY Zh & 7 * WUb VY WU W UhYX k h 9ei Uhcb &-

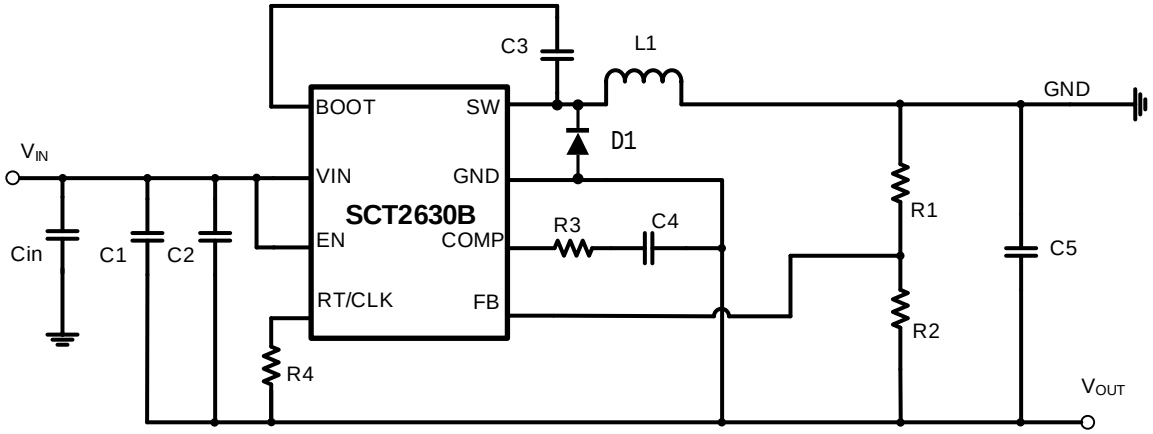
&-

HUVY ghg hmd WU jUi Yg cZWca dYbgUhcb Wca dcbYbhg Zcf gca Y ghUbXUfX ci hdi h j c hU Yg k h jUfc i g ci hdi h WYfUa WVWdUWhcfg UbX bXi Wcfg H Y jUi Yg cZh Y Wca dYbgUhcb Wca dcbYbhg UjY VYYb cdha nYX Zcf ZUgh hfUbg Ybh fYgdcbgYg UbX ccX ghUV hm : cf h Y WcbXhcbg bch gh b HUVY WYghca Yfg WUb i gY 9ei Uhcb &+ 9ei Uhcb &- hc cdha nYh Y Wca dYbgUhcb Wca dcbYbhg

Table 3: Compensation Values for Typical Output Voltage/Capacitor Combinations

Inverting Power application

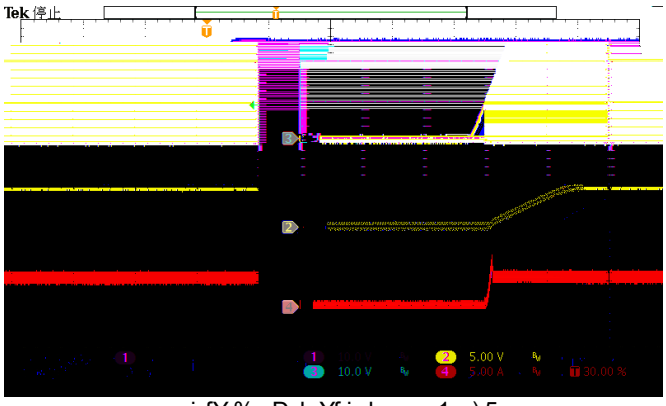
H YG7H&* 6 WUb VYigYXhc WcbjYfhUdcghjY bdihjchU YhcUbY UhjYcihdihjchU Y HmdWU Udd WUhcbg UfYUad ZYfgfYei fb UbY UhjYdckYfgiddm



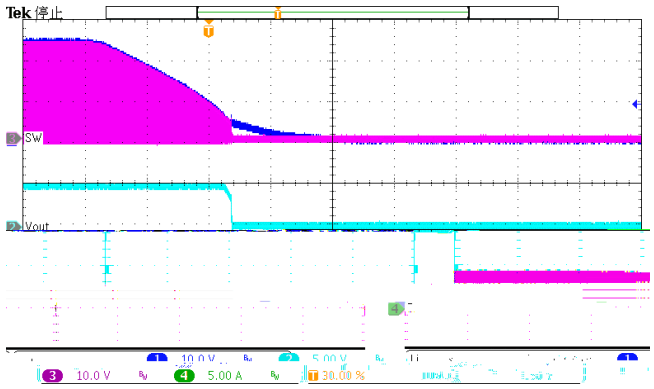
: ifY%& G7H&* 6 =bjYfhb Dck YfGiddm

Application Waveforms

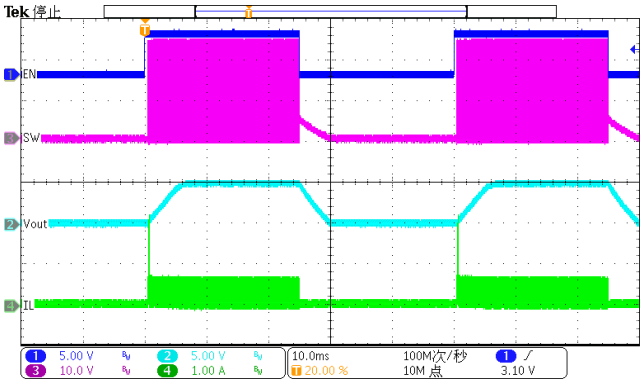
J+B1&(J JCI H1) J :GK1) _ i b Ygg ch Yfk gY bchYX



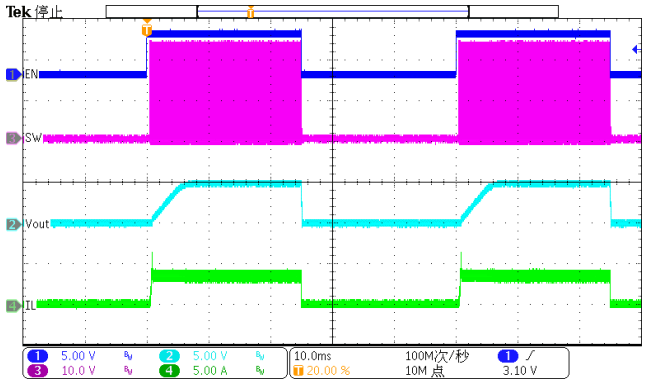
: i fY% Dck Yf i d =C581)5



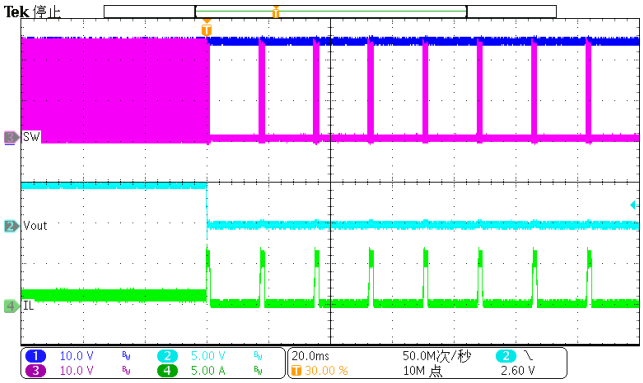
: i fY% Dck Yf Xck b =C581)5



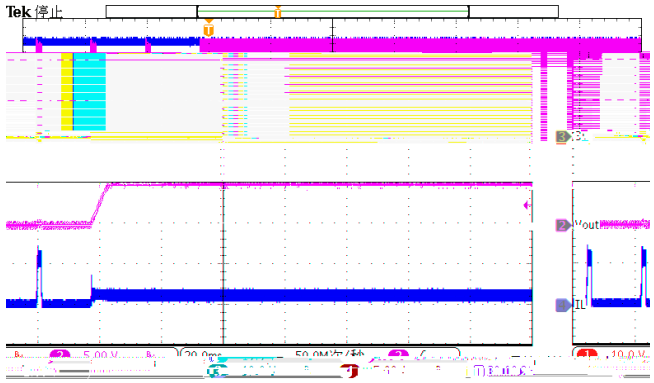
: i fY% 9B hc Y =C581 %5



: i fY% 9B hc Y =C581)5



: i fY%+ Cj Yf 7i ffYbhDfchYWcb %5 hc UfXg cfh



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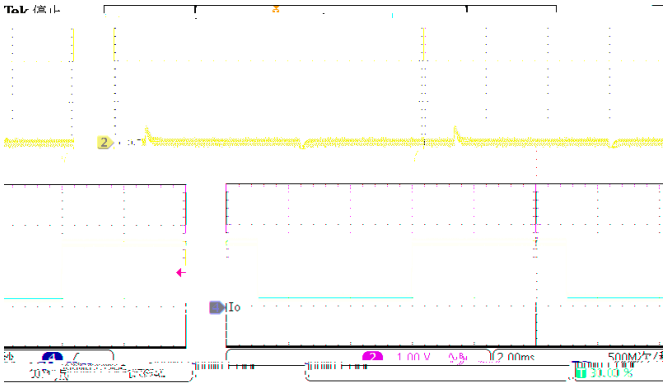
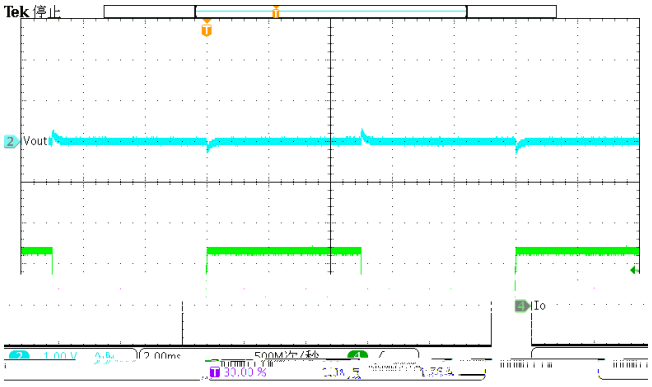
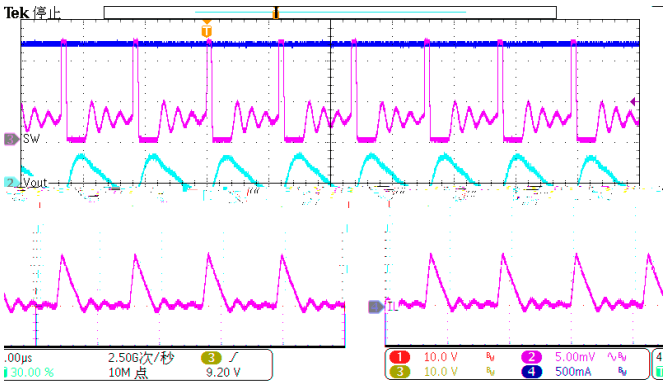
Application Waveforms



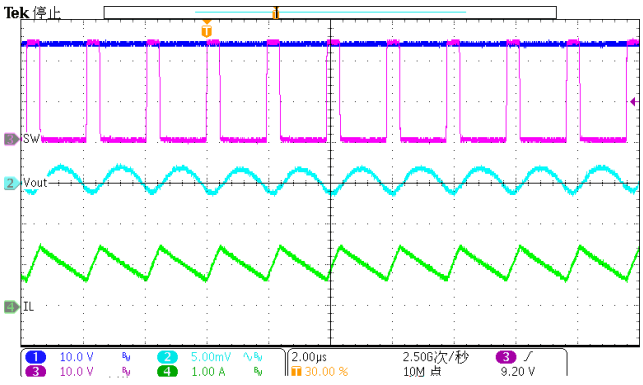
: ifY% cUXHfUbg Ybh)5 %)5 %*5 ig



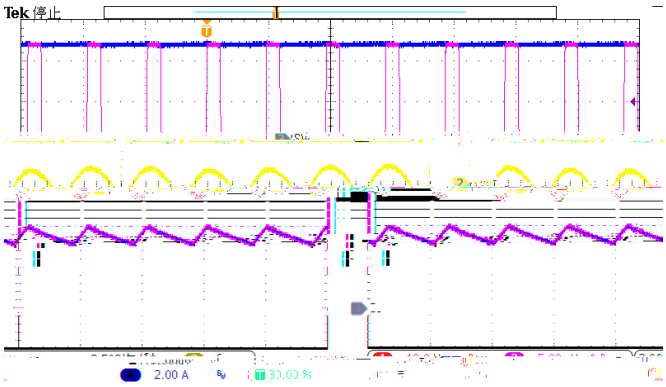
: ifY& cUXHfUbg Ybh ,+)5 &*&)5 %*5 ig



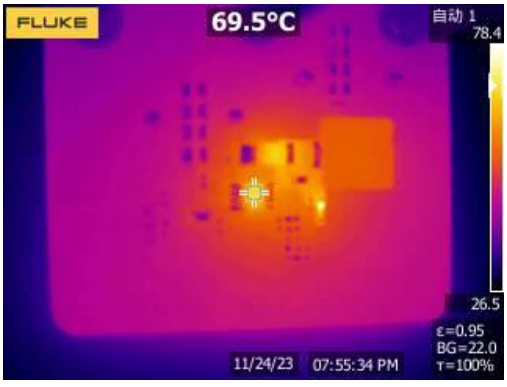
: ifY&% Cihdi hF ddY =C581% a5



: ifY&& Cihdi hF ddY =C581%5



: ifY& Cihdi hF ddY =C581)5

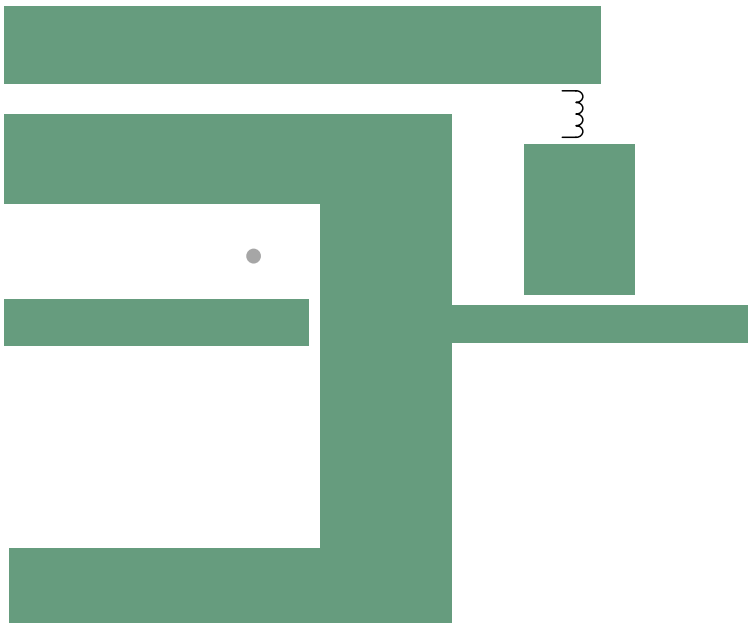


: ifY&(H YfaU &(J+B)JCIH)5

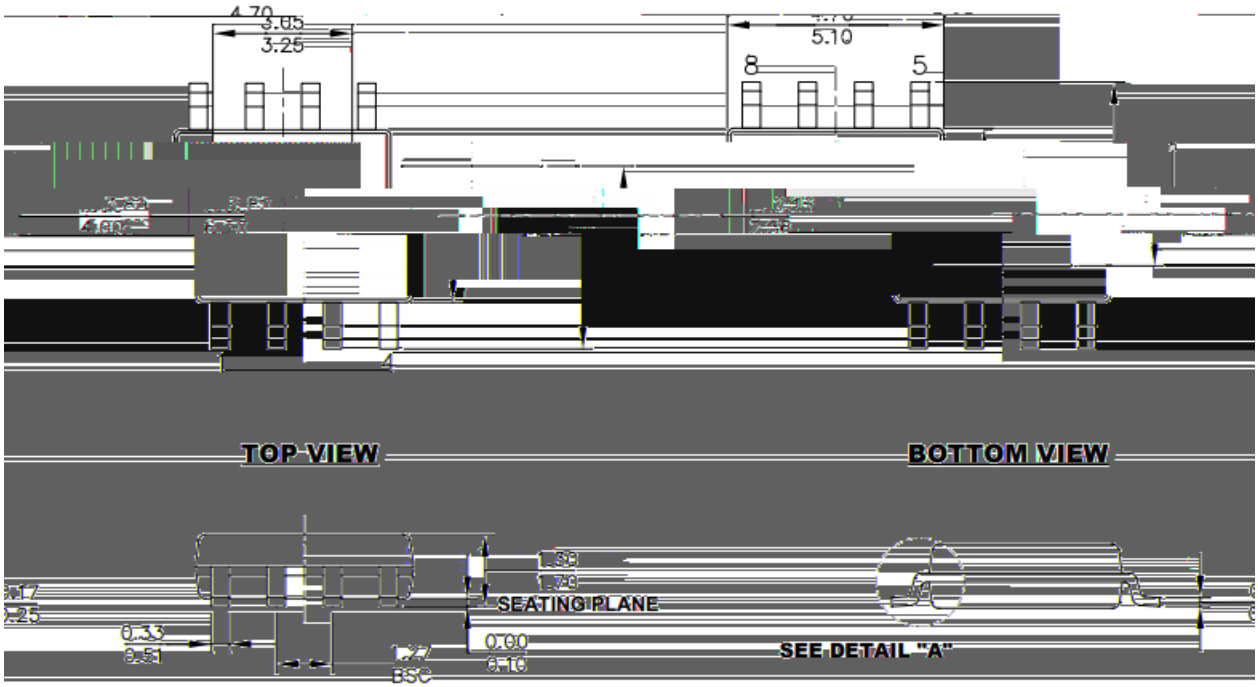
Layout Guideline

DfcdYf D7 6 Umcih g U WfhWU ZcfG7H&* 6 g ghUVYUbX YZZWYbhcdYfUhcb H YhfUWYg WcbXi Wmb ZUghgk hW b WffYbhg cf jchU Yg UfY YUgmhc bhYfUWmk h ghfUm bXi WmUbWY UbX dUfUghWWUdUWfUbWY hc YbYfUhY bc gY UbX XY fUXY dYfZcfa UbWY : cf VYhhYf fYgi hg Zc ck h YgY i XY bYg Ug VYck .

1. Dck Yf fci bXb gW Ya Y g jYfm WfhWU VYWUi gY cZ WUffmb dck Yf h Yfa U UbX hW Vci bWb bc gY UggcWUhYX k h WcW_ZfYei YbWmH Y h i a V cZfi Y g hc a U_Y fci bX hfUWY ck Ygh a dYbXYbWY UbX dck Yf UfY XghfVihYX Yj Yb mcb D7 6 GiZZWYbhmdUWb fci bXUfYUk cdha nY h Yfa U UbX bchWUi g b cj Yf YUhUfYU
2. DUWY U ck 9GF WYfUa WWUdUWhcf Ug WcgY hc J=B d b UbXh Y fci bXUg dcgg V Y hc fYXi WY dUfUg hWYZZYWm
3. : fYYk YY b XcXY g ci X VY dUWY Ug WcgY hc GK d b UbXh Y fci bXUg dcgg V Y hc fYXi WY dUfUg hWYZZYWm
4. : cf cdYfUhcb UhZ fUhYX cUX h Y hcd g XY fci bXUfYU a i gh dfcj XY UXYei UhY YUh Xgg dUhb UfYU AU_Y gi fY hcd gk hW b ccd k h dck Yf Uj Y ck Yf a dYbXYbWY cZ fci bXb
5. H Y Vchhca UmYf g U Uf Y fci bX dUbY WcbbYWmYX hc h Y fci bX dUbY cb hcd UmYf Vmj Ug H Y dck Yf dUX g ci X VY WcbbYWmYX hc Vchhca D7 6 fci bX dUbYg i g b a i hd Y j Ug XfYWmi bXYf h Y =7 H Y WYbhYf h Yfa U dUX g ci X Uk Umg VY gc XYfYX hc h Y VcUfX Zcf a YW Ub WU ghfYb h UbX fY UV hm i g b a i hd Y h Yfa U j Ug i bXYfbYUh h Y h Yfa U dUX =a dfcdYf gc XYf b h Yfa U dUXhc fci bX dUhY cb D7 6 k WUi gY GK Yf f b b UbX cj Yfg cch VYg XYg Xck b fUXb h Yfa U dYfZcfa UbWY h g fYWca a YbXYX, a XUa YhYf Xf c Yg cZh Yfa U j Ug VihUga U Yf j U cZZYfg Ygg f g_cZgc XYf j c i a Y cgg Cb Udd WUhcbg k YfY gc XYf j c i a Y cgg h fi h Y j Ug g cZWcbWYfb di b cf hYbhb WUb VY i gYX hc UW Yj Y U fYd YUhUV Y dfcWYgg
6. Cihdi h bXi WmcfUbXZfYYk YY b XcXY g ci X VY dUWYX WcgY hc h Y GK d b H Y gk hW b UfYU cZh Y D7 6 WcbXi Wmcf a b a nYX hc dfYj Ybh YI WYgg j Y WUdUWhj Y Wci d b
7. H Y FH 7 hYfa bU g gYbghj Y hc bc gY gc h Y FH fYg ghcf g ci X VY cWUhYX Ug WcgY Ug dcgg V Y hc h Y =7 UbX fci hYXk h a b a U Yb h g cZhfUWY
8. I J C UXi gh UbX FH fYg ghcfg ccd Wca dYbgUhcb UbXZfYYXVUW_Wca dcbYbhg g ci X WcbbYWmhc ga U g bU fci bXk W a i gh fYhi fb hc h Y B8 d b k h ci hUbm bhYf YUj b k h dck Yf fci bX
9. Fci hY 6 CCH WUdUWhcf hfUWY cb h Y ch Yf UmYf h Ub hcd UmYf hc dfcj XYk XY dUh Zcf hcdg XY fci bX
10. : cf UW Yj b VYhhYf h Yfa U dYfZcfa UbWY U Zci f UmYf Umci h g ghfcb mfYWca a YbXYX

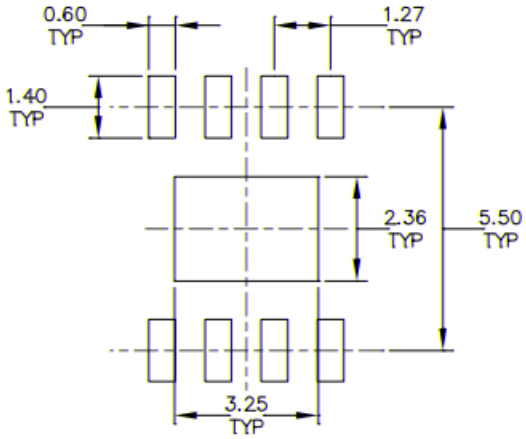


: i fY &) D7 6 Umcih9l Ua d Y

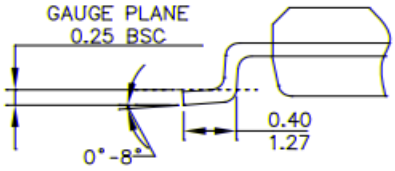


FRONT VIEW

SIDE VIEW



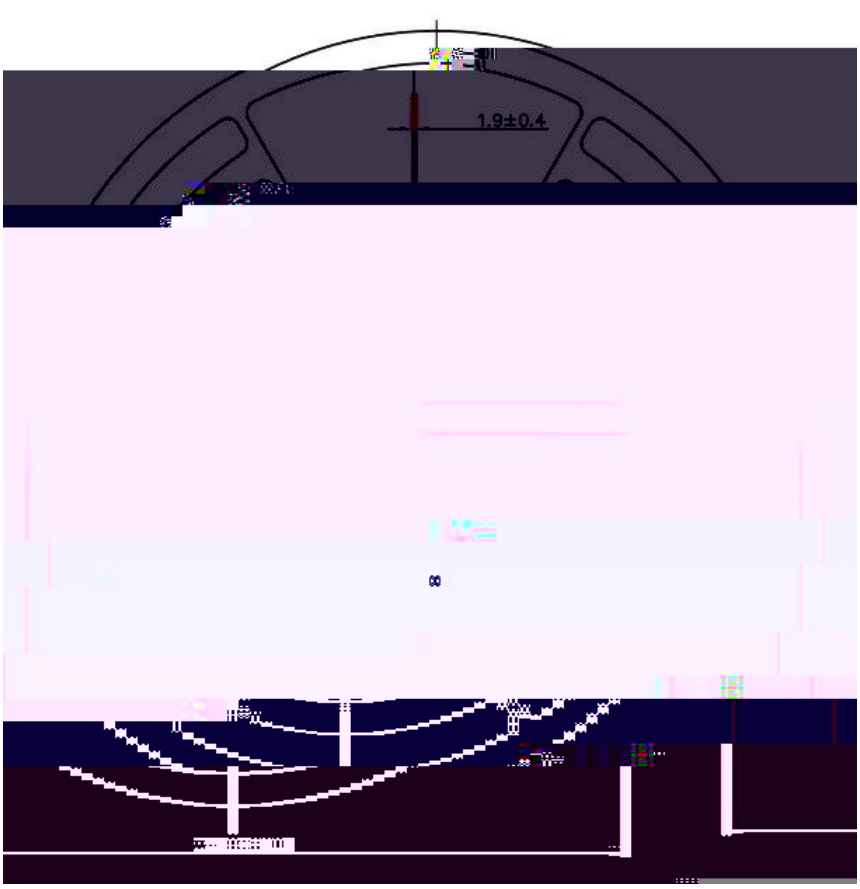
RECOMMENDED LAND PATTERN

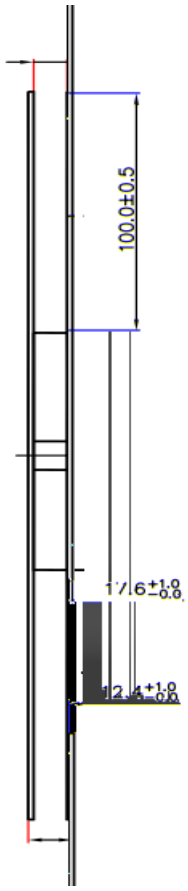


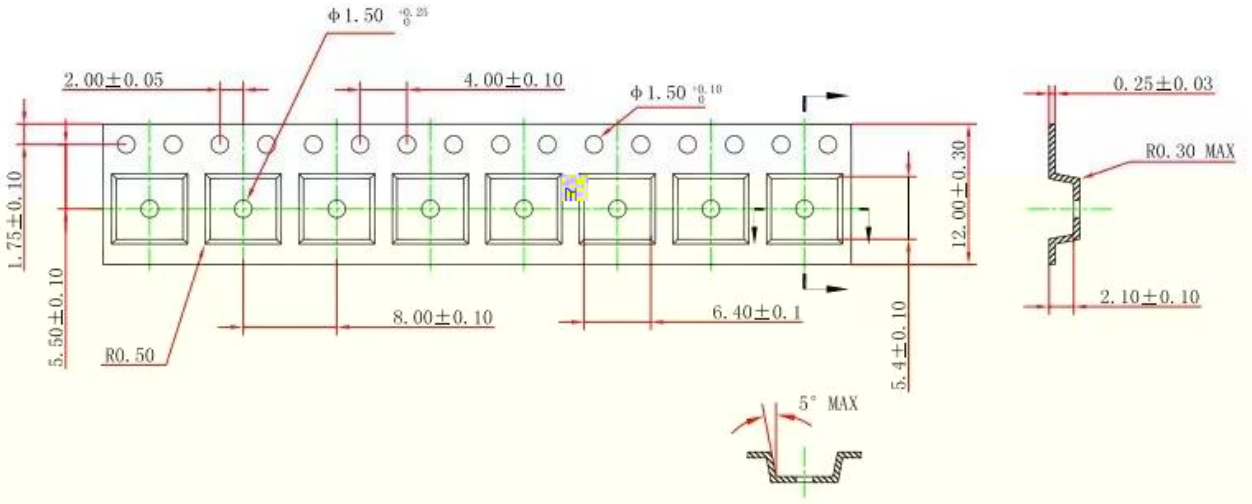
DETAIL "A"

NOTE:

1) CONTROL DIMENSION IS IN INCHES. DIMENSION IN BRACKET IS IN MILLIMETERS.
2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.
4) LEAD COPLANARITY (BOTTOM OF LEADS AFTER FORMING) SHALL BE 0.004" INCHES MAX.
5) DRAWING REFERENCE TO JEDEC MS-012, VARIATION AA.
6) DRAWING IS NOT TO SCALE







NOTICE: H Y bZcfa Uhcb b h g XcWa Ybh g gi VYWkhc WUb Yk h ci hbchWY I gYfg g ci Xk UffUbhUbX i UfUbhYYh Yh fX dUfhm+bhY YWkU DfcdYfhmf hg UfYbch bZfb YXi dcb k Yb bhY fUhb G Wcb 7cbhYbhHYWbc c m G7H dfcXi Wg bhc Ubm Udd WUhcb G7Hk bchUggi a YUbm Y U fYgdcbg V hmZcf UbmgUXUdd WUhcbg