

REVISION HISTORY

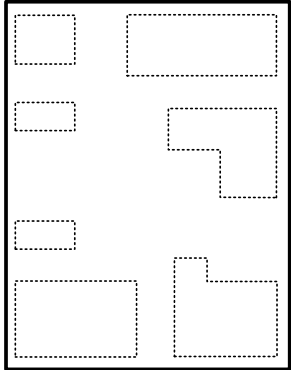
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 EXí #-EXXTfXp Te Xg
 EXí -HcVTgX78l 68 BE78E 49BE 4GBA
 EXí %HcVTgXEXvb XaVW6b cbaXagFXXVgbaf TaWEXvb XaVW95 EXf fpeETaZX
 EXí &-HcVTgXBhgchl bgtZXETaZXTaWG4C8 4A7 E88 49BE 4GBA

DEVICE ORDER INFORMATION

F6G%&& H4E	GTcX EXX_	(###	*	* 86 : 4 %(K *	&

ABSOLUTE MAXIMUM RATING

Bi XebcXefgaZ YXX TegX cXefgheXhaXf bg Xg fXabgXW

			PIN CONFIGURATION
I A	# & p ,	I	
I FJ	p ,	I	
I FJ / #af	%(p %	I	
I 5FG	I FJ # & p I FJ)	I	
I 95	# & p) (	I	
I 8A	# & p) (	I	
G %	# p %	°6	
G FG	)(p (#	°6	F6G%&& Gbc I Xj %(*

FgXffXf UXbaWg bfX_fgWhaVW4UfbhgX T h ETgaZ T VThfXWV VXcXe TaXagVT TZX G XWV VX f abgZhTeTagXXWp
 YhaVgba bhg VXB Yg EXvb XaVWVB cXefgba 6baVgbaf
 % G X 6 aVhVWf bi XegX cXefgheXcogVgba p cogVgg XWV VXVheaZ bi XebTWbaVgbaf =haVgba gX cXefgheXj _X VXXW (# 6
 j Xa bi XegX cXefgheXcogVgba f Tvgi X 6bagahbhf bcXefgba Tlbi Xg XfcXVYXW T h bcXefgaZ haVgba gX cXefgheXj _
 exWVX_Yg X

PIN FUNCTIONS

I BHG		Cbj Xebhgchg c_XTfXhfXTf_TeZXTabhgchgVTcTVgpeTf cbff UXg eXhVXbhgchgi b_gTZX ecc_X
95	%	5hV Vbai XebhgchgVXWTV fXaf aZi b_gTZX 6baaXVgT eXf fpeW VXeYb I BHGg 95 g fXg hc bhgchgi b_gTZX G X VXi VX eZhTgXf 95 g g X agXaT_eXVXeXaVX bY#+I g c VT_
8A	&	8aTUX_bZV achg G XWXi VX Tf ceXVf baXaTUXg eXf b_W % ef aZ % YT_aZ YbecbZeT TU_XHI B g eXf b_WTaW fgXef f
5FG		Cbj Xefhcc_Yeg X Z f VXCbj Xe BF98GZTgVXi Xe hfgVbaaXVgT# 9beZeXTgXe VXeT VVTcTVgpeUXg XXa 5FG c a TaWFJ abVX
FJ	(	Cbj XeFj gV aZ Bhgchg FJ f g Xfj gV aZ abVXg Tgf hcc_Xf cbj Xeg g Xbhgchg AbgX g TgT VTcTVgpe f eXdh eXWb FJ g 5FGg cbj Xeg X Z f VXfj gV
I A	)	Cbj Xefhcc_ achgI A fhcc_Xf g Xcbj Xeg g X 6 Tf j X_Tf g XfgXc Vbj a Vbai XegXe fj gV Xf 7ei XI A j g T % g +(I cbj XefbheX 5 cTffI A g : A7 j g TfhgTU_TeZXVTcTVgpeg X_ aTgXab fXba g X achgg g X 6 FXX achg6TcTVgpe
C: A7	*	Cbj XeZbhaW hfgUXfb_VXeXWVeXVg_ g ZbhaWcTaX

RECOMMENDED OPERATING CONDITIONS

Bi XebcXeTgaZ VXX TegX cXeTgheXeTaZXhaXf bg Xe fXabgXW

I A	achgi b_gTZXeTaZX	%	+ (	I
G=	BcXeTgaZ haVgba gX cXeTgheX	#	%	6

ESD RATINGS

I 8F7	h Ta5bW bVX_5 cXe4 AF<=8786 =F ## %# f cXVYVTgba T_c af	%	%	I
	6 TeZXW7Xi VX bVX_67 cXe4 AF<=8786 =F ##% %# f cXVYVTgba T_c af	# (	# (	I

ELECTRICAL CHARACTERISTICS

I_A0+ (I_G0 # 6 % 6 g c VT_i ThXf TeXgXWhaWKe% 6

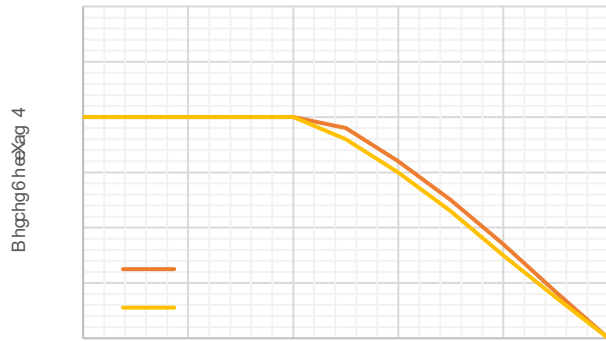
I_A	B cXeTgaZ achgi b_gTZ		% + (	I
I_ARHI B	achgHI B f_gXe f	I_A ef aZ	# & #	I
F7	F hgWj a VhæXag	8A0# Ab_bTWI_A0+ (I	#,	4
5	Dh Xf VXagVhæXag	8A0% Ab_bTW Ab fj g/ aZ I_A0+ (I 5FGFJ 0(I	%#(	4
I_8AR	8aTUX_Z g æf b_W		%	I
I_8AR	8aTUX_bj g æf b_W		%	I
E7FBAR	Z f WX98Gba æf fgTaVX		(#	
E7FBAR	bj f WX98Gba æf fgTaVX		%	
I_95	9XXWTV I b_gTZ	G=0% 6 66	#*++ #+ #+ %	I
<_R F7	F7 i T_X VhæXag_ g		% & %	4
9FJ	Fj g/ aZ XdhXaV	I_A0+ (I I BHG0(I	%##	
9AR_A	a h ba g X		* #	af
99R_A	a h bYg X		%8#	af
gF	ægXæT_fbYfgTæg X		&	f
G_F7	G Xe T_f hgWj a g æf b_W f_gXe f	G= ef aZ	((%	6

TYPICAL CHARACTERISTICS

9 ZheX 8YVXaV i f bTW6heXag I A0* %

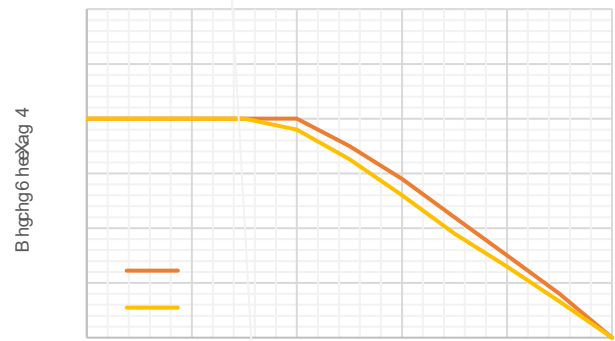
9 ZheX% bTWEXZh_Igba I A0(I

9 ZheX



4 UXagGX cXœTgheX

9 ZheX* G Xe T_7XœTgaZ I BHG0 +I =40) # 6 J

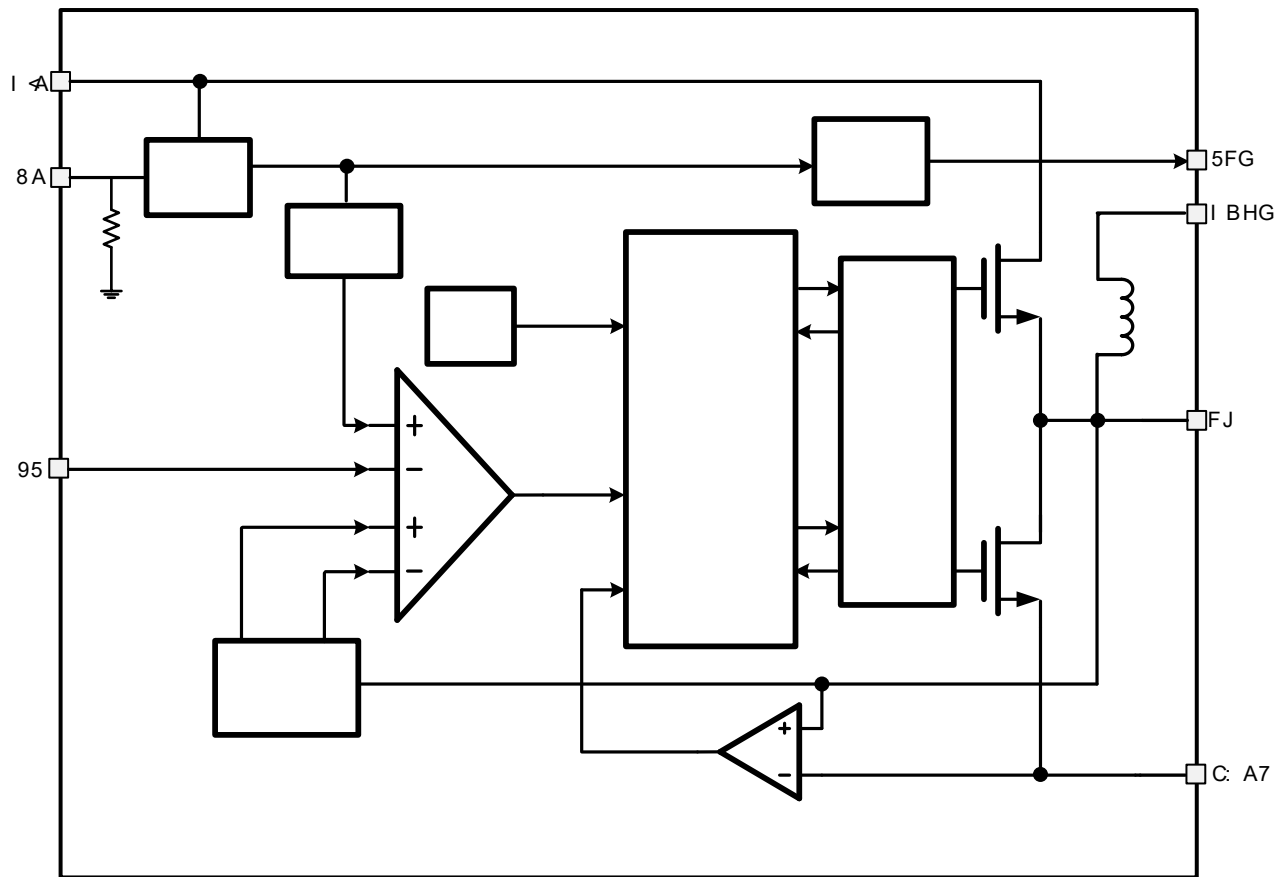


4 UXagGX cXœTgheX

9 ZheX+ G Xe T_7XœTgaZ I BHG0&I =40) # 6 J

9 ZheX, G Xe T_7XœTgaZ I BHG0(I =40) # 6 J

FUNCTIONAL BLOCK DIAGRAM



9 ZhēX # 9haVgbaT_5_bV 7 TZēT

OPERATION

G XF6G%&& Wk VX f %+(I achg %4 bhgchg f aV d abhf fgXc Wbj a Vbai XegXe bVhXj g agXeaT_cbj Xe
BF98Gf 4VTcgi XVbafgTagba g X 46BG Vbagb_f X c_b XWb cbi VKYfggTaf XageXfcbafXTaWXTf_bbc
fgTU_Tgba 4gg XUXZaa aZbYXTV V VX g X Z f VK BF98G f ghaXWba YbET Y XWbaXf bgg XBA g X
cXebWG XbaXf bgg X f VT_hTgXWU g XVbai XegXef achgi b_gTZX I A TaWg Xbhgchgi b_gTZX I BHG V VX
U V VXUTfXWb TagT a TcfXhVb Y XWbXdhXaV bi Xeg X achgi b_gTZX eTaZX XaVX g f VT_XWTWTcgi Xba
g XVbagb_F6G%&& ghaef bY Z f VK BF98G TgXeg XY XWba g XTaWghaef ba g X bj f VK BF98G
F6G%&& ghaef bYg X bj f VK BF98GbaVXg Xbhgchgi b_gTZX WbcccXWUXbj g XbhgchgeXZhTgba g XbaX
f bgg Xeg Xa eXfXgTaWg X Z f VK BF98G f ghaXWba TZTa G Xba g X f ai XefX_cdbcbgbaT_d g X
achgi b_gTZX TaWcdcbgbaT_d g Xbhgchgi b_gTZX gVTa UXVT_hTgXWhf aZg Xb_bj aZ XdhTgba -

$$GBA \frac{I_{BHG}}{I_A f_s}$$

J XeX-

I BHG f g Xbhgchgi b_gTZX
I A f g X achgi b_gTZX
Y f g Xfj gV aZ XdhXaV

4YXeTaBA g XcXebWg XeXZhTgpeZbXf agd g XB99 g XcXebWG XB99 g XcXebW_XaZg VkcXaW bal 95
a bfgVTfXf g_j_XaWj Xag X95 i b_gTZXVXVeTfXf UXbj #+I Tgj V cbagg XBA g XcXebWf gZZXeXW
Yg XB99 g XcXebWf_Xff g Tag X a h B99 g X g X a h B99 g Xj _UXTcc_XWj V f TdhaW
%/#af g c VT_

G XF6G%&& f Wk ZaXWj g Cbj XeFTi X bVK CF Tg_Z g_bTWbaWgbaf Ybe Z cbj XeXYVXaV G X
eXZhTgpeThd TgVT_ eXWVXf g Xfj gV aZ XdhXaV TaWX gXaW GbYj_Xab Gba V TaZ aZ VhaZg X_Z g
_bTWbaWgbag ZXg_Z XYVXaV TaWbj bhgchgecc_X 4f g XbhgchghaXagVXVeTfXf Yb XTi _bTWbaWgba
g X aVWbpeVhaXagVXVeTfXf Tf j X_Xi XagT_aXTeaZ Xb VhaXag g f f g XUbhaVTe UXj XXa 66 TaW
76 G Xbj f VK BF98G f ghaXWbYj Xag X aVWbpeVhaXagXTV Xf Xb Xi X_G X_bTWf cbi VkWba_
U bhgchg VTcTVdpe j Xa 95 i b_gTZX f_bj Xeg Ta #+I g XaX gBA V VX UXZ af J Xa g Xbhgchg VhaXag
aVeTfXf Yb_Z gdp XTi _bTWg Xfj gV aZ XdhXaV aVeTfXf d XXc bhgchgi b_gTZX G XgeTaf gba cb agd
_Z g_bTWbcXeTgba VTa UXVT_hTgXWhf aZg Xb_bj aZ XdhTgba %-

%

J XeX-

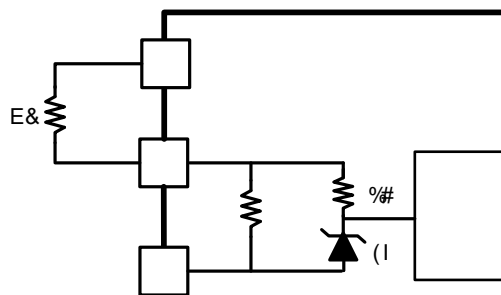
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VWbhc_aZVXeT VVTc f eXVb XaVXWb U cTff g Xfhcc_abfX Yg X achgf hcc_bVTgXf beXg Ta T Yj
aV Xf Yb g XVbai XegXe Ta TWVgBaT_XXVg_gVbegTaf h Uh_VTcTVdpebej g eXVb XaVXW #h9 T UX
eXdh eXWa TWVgBa d g X_bVT_VXeT VU cTff VTcTVdpe

G XF6G%&& HaWkel b_gTZx bV Bhg HI B WYThgfTgchcg eXf b_Wf g c VT_ l j g l A ef aZTaWf hgVbj a
g eXf b_Wf &)*l j g l A Yt_aZ G X beXTWheTgXHI B g eXf b_WTa UXcZet XWg dhZ g XceXVf ba
XaTU_Xg eXf b_WbY8A ca

J XaTcc_aZTib_gTZx Z Xeg Tag X8A Z g eXf b_Wg c VT_ % efX g XF6G%&& XaTU_Xf T_YhVgbaf
TaWg XWV VXfgTeg fbYfgTegc TfX G XF6G%&& Tf g XUh_g a & f fbYfgTegg X d ceX Xagg Xbhgchg
bi Xef bbgTaWaeHf VheXag J Xa 8A ca f ch_XWbj g X agXaT_FF aXgj UXWfV TeZXWd ZohaW 5hV
bcXetgba f Wf TU_XWj Xa 8Ai b_gTZxYf UXbj g bj Xeg eXf b_Wg c VT_ % Yt_

4a agXaT_ eXf f d eYb 8A d: A7 T_bj 8A YbTg d f hgVbj ag XV c 8A f VT cXWagXaT_ hf aZT(l
fXeXf WbWV 9beTcc_VTgbaf j XeXTfcXVYXW A HI Bib_gTZxaXXW d UXfXg 8A VbaaXVf T eXf f d eE& d
l A d Ybe Tib_gTZxW VKej g T eXf f d eaf Wkg XV c Yeg XVbaYZheTgbabY A HI Bib_gTZx Tf f bj a
a 9 ZheX G X eXf f d eWfgeUh d eE& f VT_Yh_TgXWU 8dhTgba &



9 ZheX 4WhfgTU_Xl A HI B

&

J XeX-

l fgTeg- l a efXg eXf b_Wd XaTU_Xg XWV VX
l f d c-l a Yt_g eXf b_Wd Wf TU_Xg XWV VX
l 8AE0 %
l 8 90 %
E0

a XTV fj g/ aZ V VX g X aWV d eVheXag f fXaf XMU ba d eazg X_bj f Wk BF98G WheaZg XB99 cXebW
J Xa g Xi b_gTZxUXg XXa: A7 ca TaWFJ ca f bj Xeg Tag Xbi XeVheXagg eXf b_W b_gTZx g XB6C j _UX

gZZXeXWTaWg X\bagb_Xe XXcf g XB99 fgTgX 4 aXj fj gV aZ V VXj _UXZ aba_j Xag X XTfhexW bgTZX
f Z Xeg Ta_ gi b.gTZX <ybhgchg_bTWaZ VbagahXf d aVexTfX bhgchgj _Vbc UXbj g XHI C TaWFF ca f
WfV TeZXWfhV g Tgbhgchg f # G Xa g XWV VXj _VbhagYe* V VXf bYfbYfgTeg XYe Whc j TgaZ g X
TaWexfTegabe T_ TYXe* V VXf fbYfgTegcXebW

4a X gXaT_UbbfgTc VTcTVdpeUXj XXa 5FG TaWFJ c a cbj Xf YbTgaZ Z f VKcbj Xe BF98G ZTgX Wei Xe
G XUbbfgTc VTcTVdpei b.gTZX f V TeZXWVb Ta agZeTgXW b.gTZX exZh_Tdpej Xa Z f VKcbj Xe BF98G f
bYTawbj f VKcbj Xe BF98G f ba

BaVX g X haVgba gX cXeTgheX a g X F6G%&& X VXXW ((6 g X g Xe T_fXaf aZ VeMgf dcf Vbai XagXe
fj gV aZ TaWexfTeg j g g X haVgba gX cXeTgheX Y_aZ UXbj &# 6 G Xe T_f hgVbj a ceX Xag g XVT TZX
ba VV VXVheaZ X Vxf i X XTgTaWcbj XeWf cTgba VbaWgba

APPLICATION INFORMATION

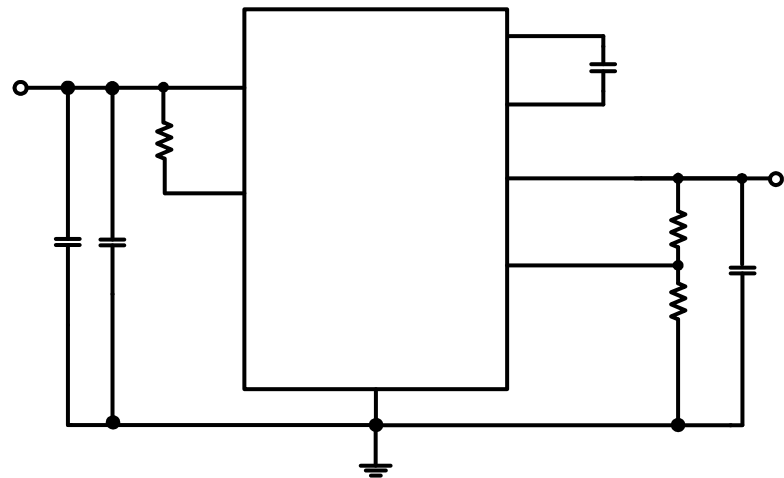
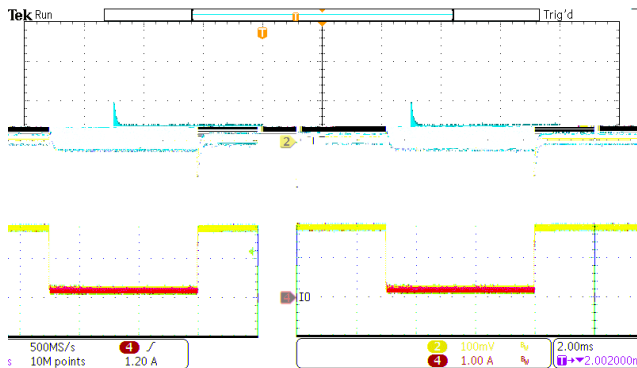


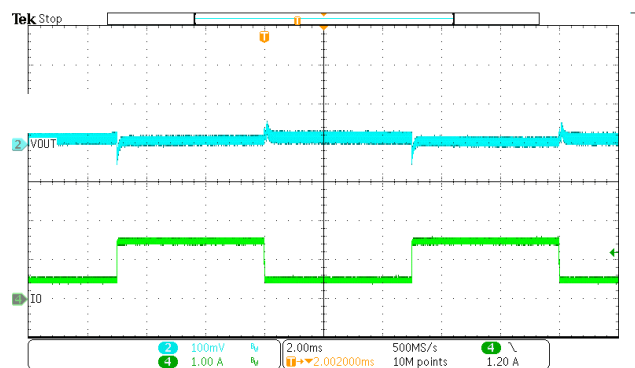
Figure 1. Typical Application Circuit

Crystal	+ (1
Resistor	& &
Capacitor	%4
Crystal	%
Resistor	% I
Capacitor	I bhg0 %# I

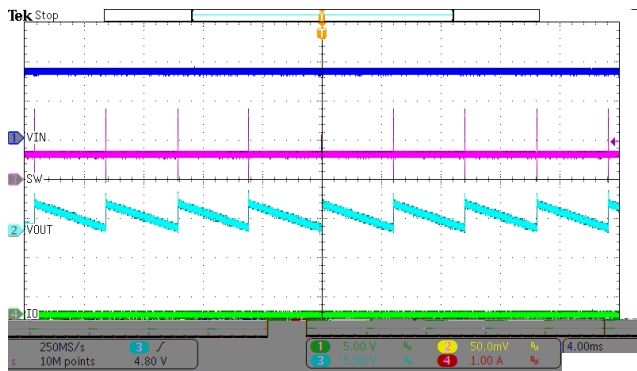
I a0+ (



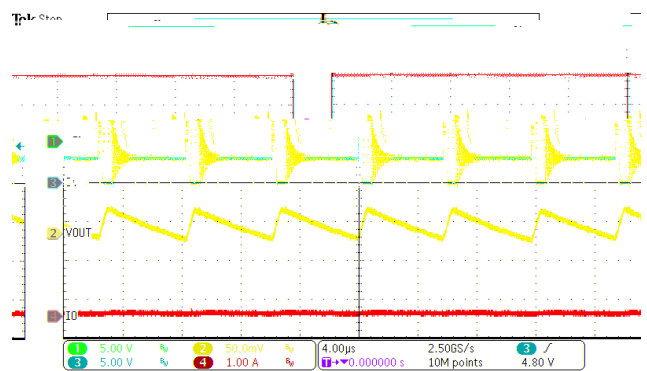
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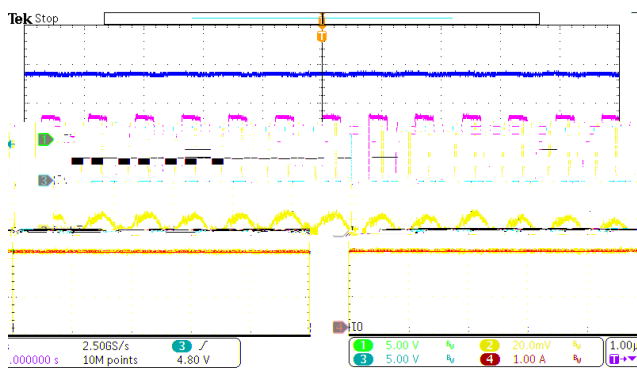
9 ZheX % # bTWGaf Xag # (4 (4 # 4 hf



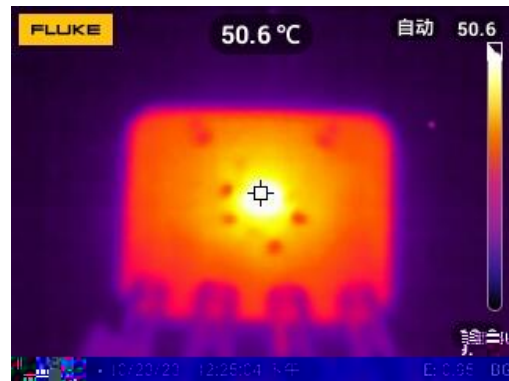
9 ZheX % BhghgE cc_X 4TV0 #4



9 ZheX % BhghgE cc_X 4TV0 # 4



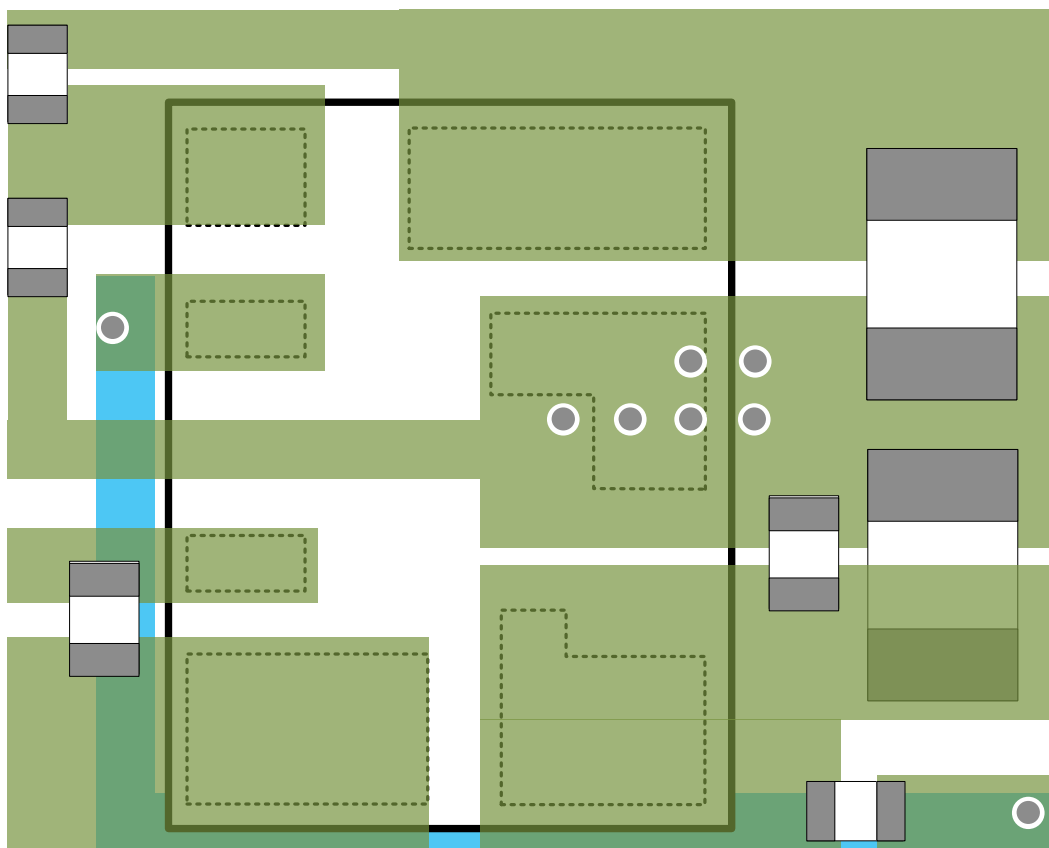
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9 ZheX % G Xe T_ & bhg %4

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 YdhXaV ab fX aVhVf 8 <fb cOcXe_T bhgbYg X Z YdhXaV fj g/ aZcTg f XffXagT_ a Xg X_XaZg
 TaWT_eT bYT_gTVf VbaaXgXWg g XFJ c a TaWT_i T f hfXT ZohaWc_TaX haWkeg Xfj g/ aZ eZh_Tp_e
 a XVbhc_aZ G X achgVTcTVp_eaXW p UXi Xe VbfXp g XI A c a TaW. A7 c a p eVhVXg X achgf hcc_
 ecc_X CTXg XVtcTVp_eTf VbfXp I A c a Tf cbff UXp eVhVX Z YdhXaV eaZaZi b_gZXba FJ c a Tf
 j X_9 ZheX% f g XeXb XaVWC65 _T bhgbYF6G%&&

G X _T bhgaXW UX VbaXj g j X_Vbaf W_eTgba bYg Xg Xe T_4 TeZXp_c _T XeZohaWc_Tg hf aZ hgc X
 g Xe T_i Tf f hfXWp cbi Xg Xg Xe T_Wff cTgba G XUbp _T Xef T TeZXZohaWc_TaX VbaaXgXWp g X
 p_c _T XeZohaWU i Tf



9 ZheX% C65 T bhg8 T c_X

G X T h 6 haVgba gX cXeTgheXf bh_WUXeXf gVgWp % 6 haVXeabe T_bcXeTgaZ VbaWgbaf 6T_Vh_TgX
g X T h T_bj TU_XWff cTgba C7 T TaW XXc g XT_VhT_cbj XeWff cTgba_Xff g TabexdhT_d C7 T G X
T h cbj XeWff cTgba_ gf WgXe aXWhf aZ 8dhTgba ,

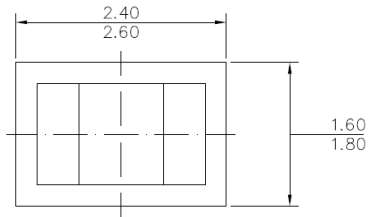
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j XeX

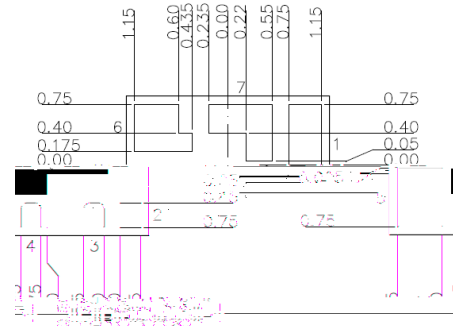
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E =4 f g X haVgba d T UXagg Xe T_eXf fgTaVX

G X eXT_haVgba d T UXagg Xe T_eXf fgTaVX E =4 bYg X cTV TZX ZeXTg_ WcXaW ba g X C6 5 g cX T bhg
g Xe T_cTWbaaXVgba TaWXai da XagT_YTVhe Hf aZg V C6 5 VbccXeTaWfb_VXeaZg X: A7 d T TeZXZdhaW
c_TgX Xa TaVXg Xg Xe T_cXebe TaVX Hf aZ beXi Tf VbaaXVf g X ZdhaWc_TgXba g X d c T XeTaWUb
T XeTdhaWg X 6 j g bhgfb_VXe Tf Tfb Xa TaVXg Xg Xe T_VTcTU_g

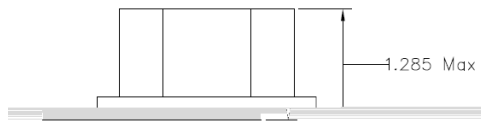
PACKAGE INFORMATION (7L ECLGA)



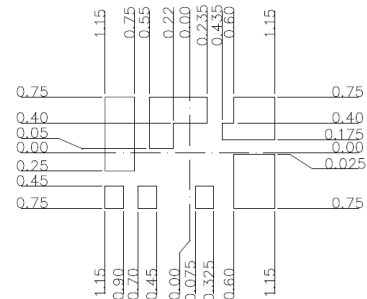
* 86 : 4 GB CI 8J



* 86 : 4 5B GGB | 8J



* 86 : 4 F781 8J



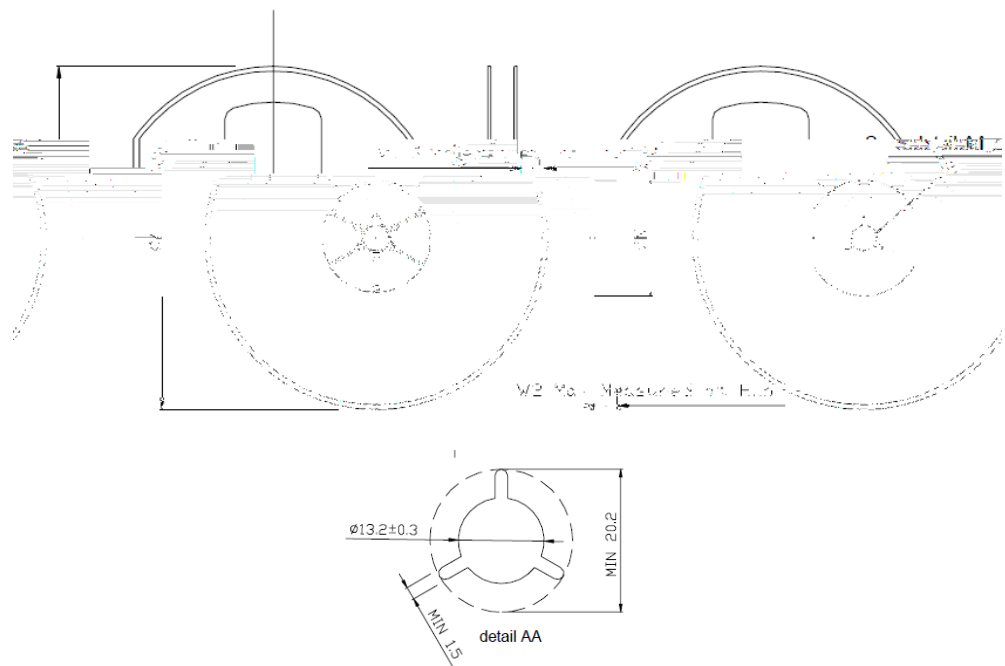
* 86 : 4 E86B 8A787 4A7 C4GG8EA

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% 7ēŧj aZ abgđ fVT_X
& 4__aXTeW Xaf baf TeX a __ XgXf
G Xe T_cTWf T_UXfb VXeXWba g XUbTeV
(7 Xaf baf bYX cbfXWcTWba Ubđ bYcTV TZXVb abg aVhVVK b_WYŦf
) 6bagŦVgC65 UbTeWYŦUeVTgba Ye a h fbVXe Tf j XUđ XeŦaVXf UXg XXa g Xc af

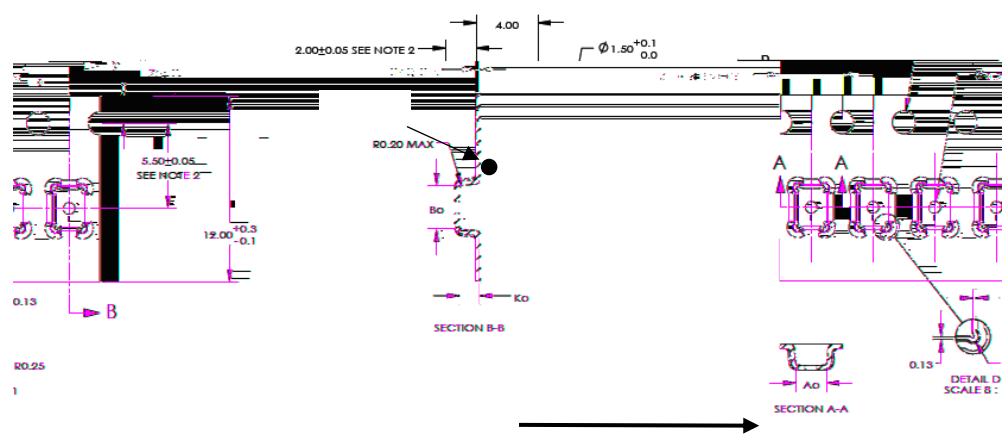
*

9_bbe%5h_WaZ (LTdW&7 aEbTW TWTa7 fgeVg 5X aZ ###,(
+) #) **,+#) 94K- +) #) **,+#) j j j f _baaYagVb F _Vba6baaYag%#)

TAPE AND REEL INFORMATION



	*)	* +	&&#
	(+	) #	) %
	%		
Q C8 J 7 G		%##	



	, #	%##	% #
	%* #	%+ #	%, #
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