

Wide Vin 50V Non-synchronous Boost/Flyback/SEPIC Controller

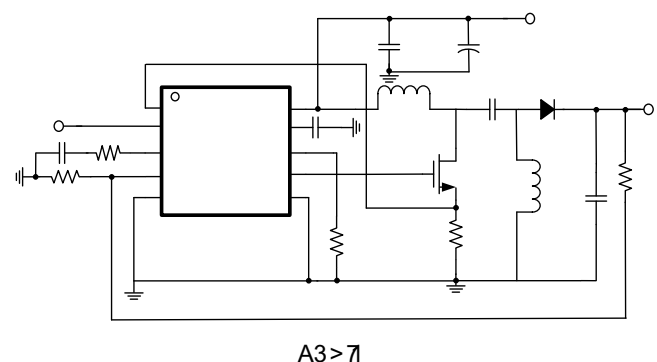
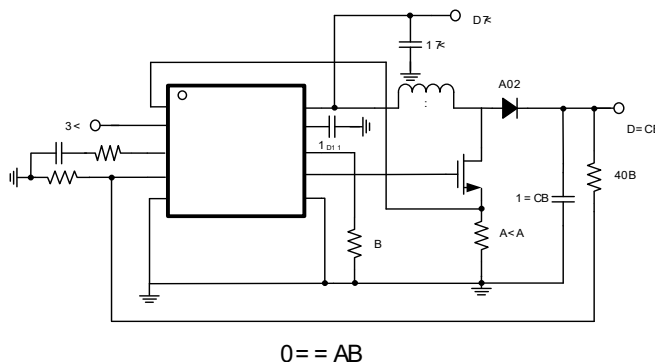
FEATURES

- cOZMSRT / cb bUS / ZOCbW a
- / 31 cOZMSRe W/bVS 4 Ze WU SacZa(
- 2SdVOSBS S Otc S5 ORS (1 b 1
- / PWS b= S O bWUBS S Otc S O US
- 2SdVOS 60 3A2 1 ZaaWOCbW : SdSZ6
- 2SdVOS 12 3A2 1 ZaaWOCbW : SdSZ1 0
- E VRS 7 cbD ZOUS O US(D D
- : e AVctR e 1c S b 'c/
- : e cVACS b= S O bWU1c S b(c/
- 4SSRPOQY STS S QSD ZOUS
- / RxcabCPZ Ae WbWU 4 S_cS Qg(96hb 6h
- 7bSU O bSR 4 S_cS Qg 2 VRS T 3 7 WOCbW
- 3fbS OZ4 S_cS Qg Ag QV W
- 3fbS OZ1 S aObW
- >cZS AYW WU RS
- Ac ba CRRWV OZAZ S1 S aObW
- a 7bS OZA T abObBWS
- 7bSU O bSR> bSOw 4SOtc S
- 1 abO b>SOY1c S b> bSOw BV SaV Z
- =dS 7 cbD ZOUS
- =cb cb=dS d ZOUS> bSOw
- / RxcabCPZ C RS d ZOUS: QY cb
- 6 VOC =dS : OR> bSOw
- BVS OZAVctR e > bSOw (1
- A=> :

APPLICATIONS

- cB/cb cb4Z/POQY
- : 32 0Vb Ac Z
- > bPBA SOYS Ac Z
- 00S g > eS SR 0 ab4Z/POQY A3>71 O Z0bW

TYPICAL APPLICATION



DESCRIPTION

BVS A1 B& RSdV6 W O e RS W cb
ag QV ca P abQ b ZS BVS RSdV6 QD PS caSR
W0 ab A3>71 O R 47 PQYQ dS b a

BVSae WQWUTS_cS Qg ThVSA1B& RSdVQO
PSORcabSRb O g dOZSPSte SS Y6h O R 6h
Pg caWU OaWUZ Sf bS OZ SaWb Pg ag QV WUWU
Wb O Sf bS OZQZ QY 1c S b RS Q b Z dVSA
ac S W PO Re WbV O R b O aW b Sa aS WCRWV
b QgQS Pg QgQS Qc S b ZVWU 1c S b ZVW W
ORcabCPZbv cUVO Sf bS OZ SaWb

BVS A1B& W/O 3ZC QJ S0Q 7bS TS QS
3 7 TW RZ Q b ZS e W W Z S b WU b W WSR
RSa W T 3 7 SRC Q W BVS A1B& TS c Sa
4 S_c S Q A SRC A S Q c 4AA e W X W WU
a O Tb S ae W WU TS_c S Q O R Rc Z W OS
Tae W WU TS_c S Q b SRC S b S Q Rc QR
3 7

BVS A1 B& RsdV S VoaPcW W I SQW TSc Sa
acQ V Oa bVS OZaVctR e aV b QVcW I SQW O R
dS d ZOUS I SQW > e S aQdWU aVctR e RS
SRcSa bVS b tOZac Z Gc S bb ' / 7 tSU O SR
Qc S baZ S Q S aObW aW ZMSa bVS RSaW O R
W SSR SR T a SQW O ZOW a QD PS WQSO SR
caWU OaWUZ SaAb

BVS RSdVS W O dOZS W O A=> :
>OQYUS

REVISION HISTORY

<=B3(>CJS c PS aT SdWca SdWV a QgRWS T CJS c PS a WbVS Qc S bdS aW
 SdWV (SSOaSRb O YSb
 SdWV (1 SQbCD: = SaWb RWS S_cObW
 SdWV (/ RR 0VbD ZOUS aSQW
 SdWV (C RObS 2SdVS = RS 7T ObW
 SdWV (C RObS/ Pa ZbS Of Wc ObWJa ORR A: W2SdVS = RS 7T ObW c RObS 4Wc S' O R

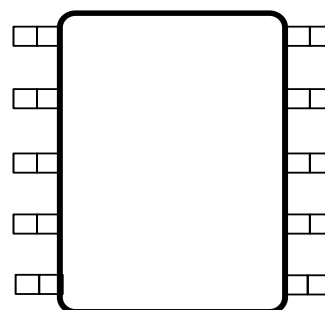
DEVICE ORDER INFORMATION

A1 B&	2	BO S SSZ			: SCR > ZcbQ A= >	

ABSOLUTE MAXIMUM RATINGS

= dS	S ObWUTSS OWbS	S Qc S c Zaa bVS e VS	tSR
D7< CD: =M3<			D
D11 2 21 d ZOUS			D
D11 2 BO aW bT * a		%	D
7A3< 1= > 40 4/ AG<1 A2			D
>SOY2 VS = cb cb1 c S b			/
8c ObW tS S Qc S			1
Ab CUS tS S Qc SBAB5			1

PIN CONFIGURATION



AbSaaSa PSg RbV aS ZbSR c RS / Pa ZbS Of Wc ObWU Qg QCaSRdVS S O S bRO CUS BVSRdVS W bUcOO tSRb
 Tc ObW cbaVS TW SQ S RSR= SObW 1 RWW a
 5 cOO tSSRPg RSaW bSbSR W RcObW a
 BVS 7I WQZSa dS tS S Qc S tSQW b tSQbVSRSdVS Rc WU dS ZORQ RWW a 8c ObW tS S Qc Se VS fCSR % 1
 e VS dS tS S Qc S tSQW WQZSa 1 bWc ca SObW CP dS bVS a SQbSR Of Wc SObW X ObW tS S Qc Se VS
 SRcGS ZbWS

PIN FUNCTIONS

7A3<		1 c S baS aSW cb W 1 SQb bVS aWbSaVS TbVS Qc S baS aS SaWb bV cUVOaV b ObV
CD: =M3<		C RS d ZOUS ZQY cb UO WU W BVS Q dS tS abObc ORaVctR e ZdSd QD PS UO SRPg Q SQWUbW Wb bVS ac Z d ZOUSbV cUVO SaWb RWS BVW W cab bPS ZTZObW 1 SQb D7< WW bcaSR
1= >		= cb cb T bVS tS OZ bO aQ RcQO QS S O ZVS 1 SQb bVS Z Q S aObW Q S baPSaSS bW WORU c R
40		7 dS bWU W cb TbVS S O ZVS 1 SQbOd ZOUSRWS T bVS cb cbb bW Wb aSb cb cb d ZOUS BVSRdVS SUCZSa 40 d ZOUS b bVS WbS OZ STS S QS dOZS T % D tS QOZ
/ 5<2		/ OZUU c R W

PIN FUNCTIONS (continued)

4/ AG<1 A2		Ae WU TS_cS Qg aSWU W BVS ae WU TS_cS Qg W U O SR Pg O aWU S SaW PS e SS bW/ WO R/ 5<2 BVS WS OZQY QD PS ag QV WSR b O Sf bS OZQY / W W Z dSZ bW/ W T a e W bc bVS RSdVS TT O R bVS RSdVS e WVS ROe ' / T bVS ac Z lg WQZ
>5<2	%	> eS U c R W
2	&	< QVO SZ = A43B UGS R WS cb cb 1 SQ RV SQZ b bVS UGS TbVS < QVO SZ = A43B bV cUVOaV b Ze WRcQO QS QV
D11	,	= cb cb TbVS WS OZD11 SUCZb O R ac Z d ZOUS W cb TbVS = A43B R WS 1 SQ OQS O WPg Qaa QO QW T bW/ Wb >5<2
D7		> eS ac Z W cb W.1 SQ OQS O WPg Qaa QO QW T bW/ Wb >5<2

RECOMMENDED OPERATING CONDITIONS

=dS S QWUTSS OWGS S Qc S O US c Zaa bVS e WS bSR

D7	7 cbd ZOUS O US			D
D11	D11 d ZOUS O US			D
B8	= S QWUX QW bS S Qc S			1

ESDRATINGS

D3A2	6c O 0 Rg RSZ60 S / 31			YD
	1 VOUSR2SdVS RSZ12 S / 31			YD

THERMAL INFORMATION

8/	8c QW b O P W bbVS OZ SaW QS			1 E
81 b	8c QW b QaS b bVS OZ SaW QS			
80	8c QW b P OR bVS OZ SaW QS		' %	

A1B dV Sa 8/ O R 81 c PS a Z Qa STS S GS b SabWGS X QW bS S Qc Sa TbVS RSdVS 8/ O R 81 OS bO
QVO QS WQ T QYUS WSZ Pcb T O g bVS agatS Z dSZQVO QS WQ acQV Qa bVS RSaW O R Zg cb TbVS WSR QV W
P OR >10 e W W bVS A1B& W c bSR bVS OZ ORa WS O R Sf bS OZS dW S bZ QO a bVS >10 P OR W O V S b
aWYb QW a ZS SRb bVS ZORa O R bVS OZ OR TbVS A1B& 1 VO UWU bVS RSaW Q TWc QW TbVS >10 P OR QVO Us
bVS STVS Qg TbVS V S b aWY O R bVS ST S bVS Qc OZ 8/ O R 81

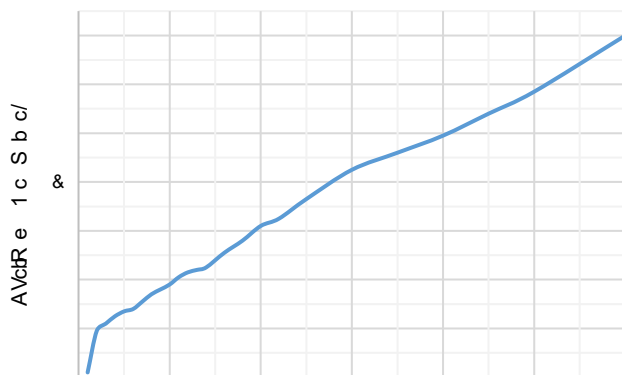
D₇+ D B₈+ 1 1 by VOZdOZSa OSbSaSR c RS 1



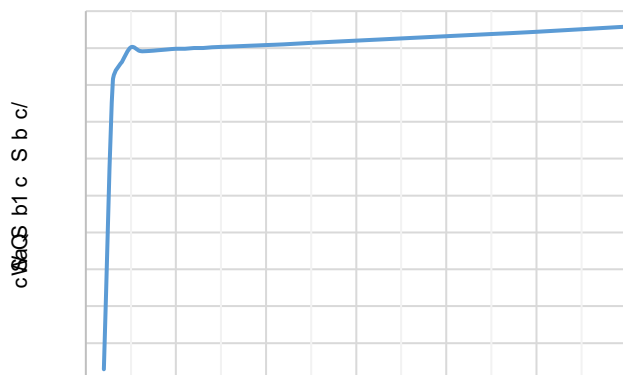
ELECTRICAL CHARACTERISTICS (Continued)

D ₇₊ D _{B8+} 1 1 lg 10Z10ZSa O S bSR c RS 1				
1 671 C>	6 V _{CC} RS TTbWS OTS 0000W	1 Z QY Q _{CS} e W/ ae W _{WUT} Z e SR Pg AA S _{CS}	% &	Q _{CS}
B _{AA}	A T abObBWS			a
4 _{AE}	Ae W _{WUTS} _cS Q _g	4/ AG<1 A2+ % Y		Y6h
4 _{AA}	4 S_cS Q _g A SCR O US			
V _{AG<M67}	BV SaV ZT Ag QV W _{CS} W 4/ AG<1 A2 W	Ag QV W _{CS} W d Z _{CS} W _{WU}	%	D
V _{AG<M =}		Ag QV W _{CS} W d Z _{CS} TOZ _{WU}	& &	D
2 / F	Cf Wc 2 c _{lg} 1 g _{CS}	4/ AG<1 A2+ % Y	& '	
b<M 7	W _{Wc} bWS	4ae+ Y6h		a
D _{A2M67}	AVctR e aW OZb/SaV Z 4/ AG<1 A2 W	AVctR e d Z _{CS} W _{WU}	%	D
D _{A2M =} 7 _{A2M 95}	4/ AG<1 A2 W	AVctR e d Z _{CS} TOZ _{WU}	% &	D

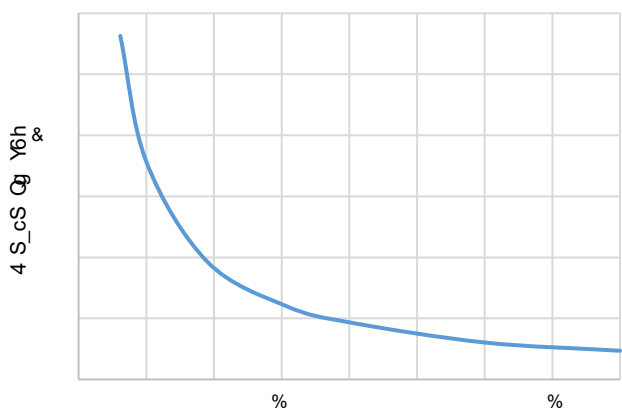
TYPICAL CHARACTERISTICS



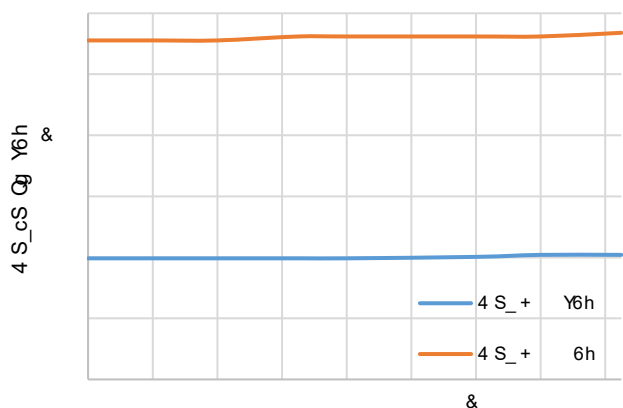
7 cbD 10US D
4Wc S 7a2 da 7 cbD 10US



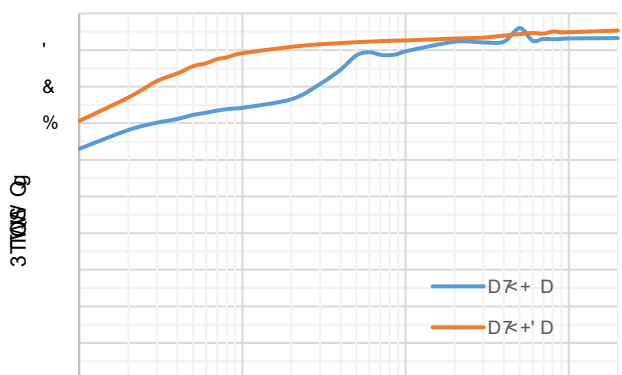
7 cbD 10US D
4Wc S 7 da 7 cbD 10US



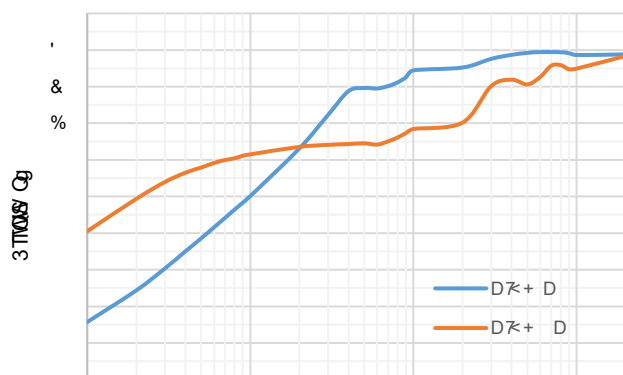
4Wc S Ae 4WU 4 S_cS Qg da B



4Wc S Ae 4WU 4 S_cS Qg da BS S Qc S

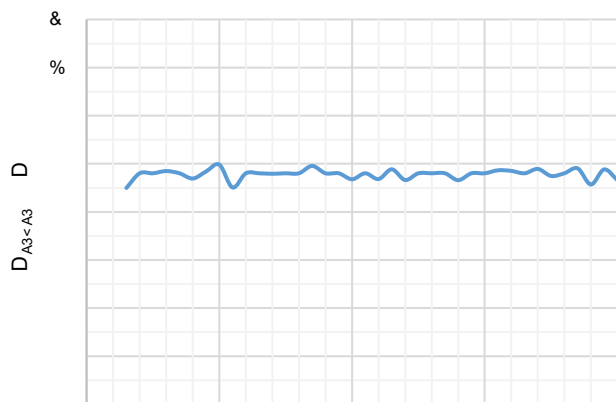


4Wc S 3 TMS Qg da : CR1 c S b 0 ab D=ca+ D

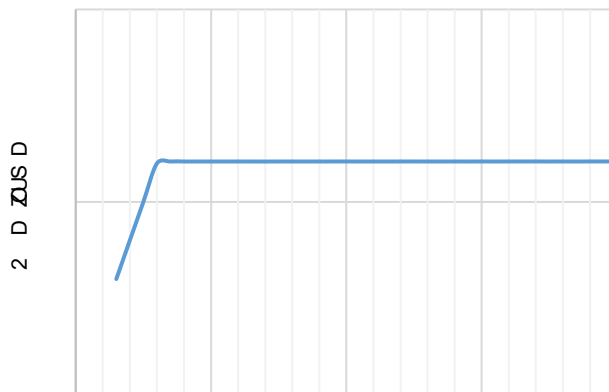


4Wc S 3 TMS Qg da : CR1 c S b A3>7 D=ca+ D

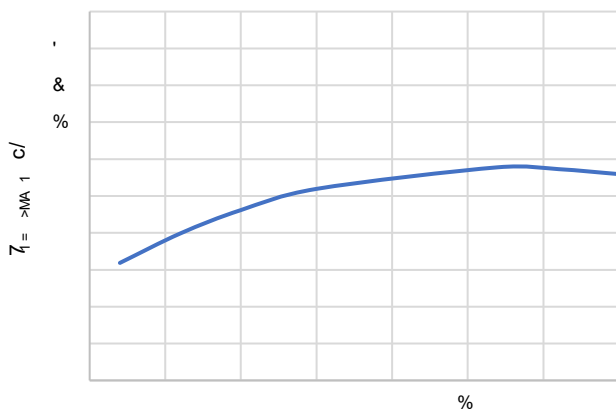
TYPICAL CHARACTERISTICS



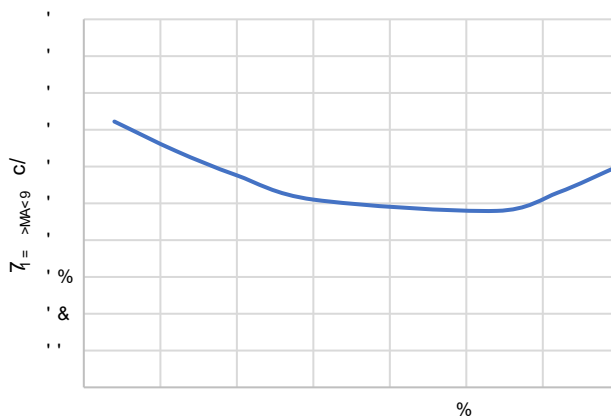
7 cbD ZOUS D
4Wc S%1 c S bAS aSBV SaV Zda 7 cbD ZOUS



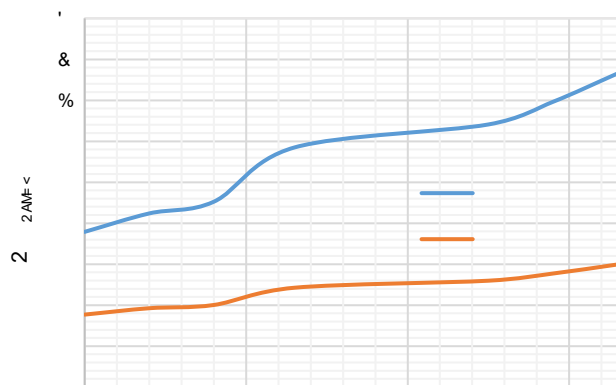
7 cbD ZOUS D
4Wc S & 2 D ZUS da 7 cbD ZOUS



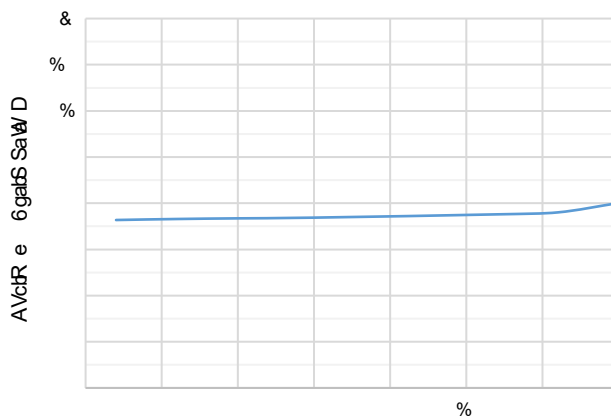
BS S Qc S °1
4Wc S' 1 = > A c Q S 1 c S bda BS S Qc S



BS S Qc S °1
4Wc S 1 = > AWY1 c S bda BS S Qc S

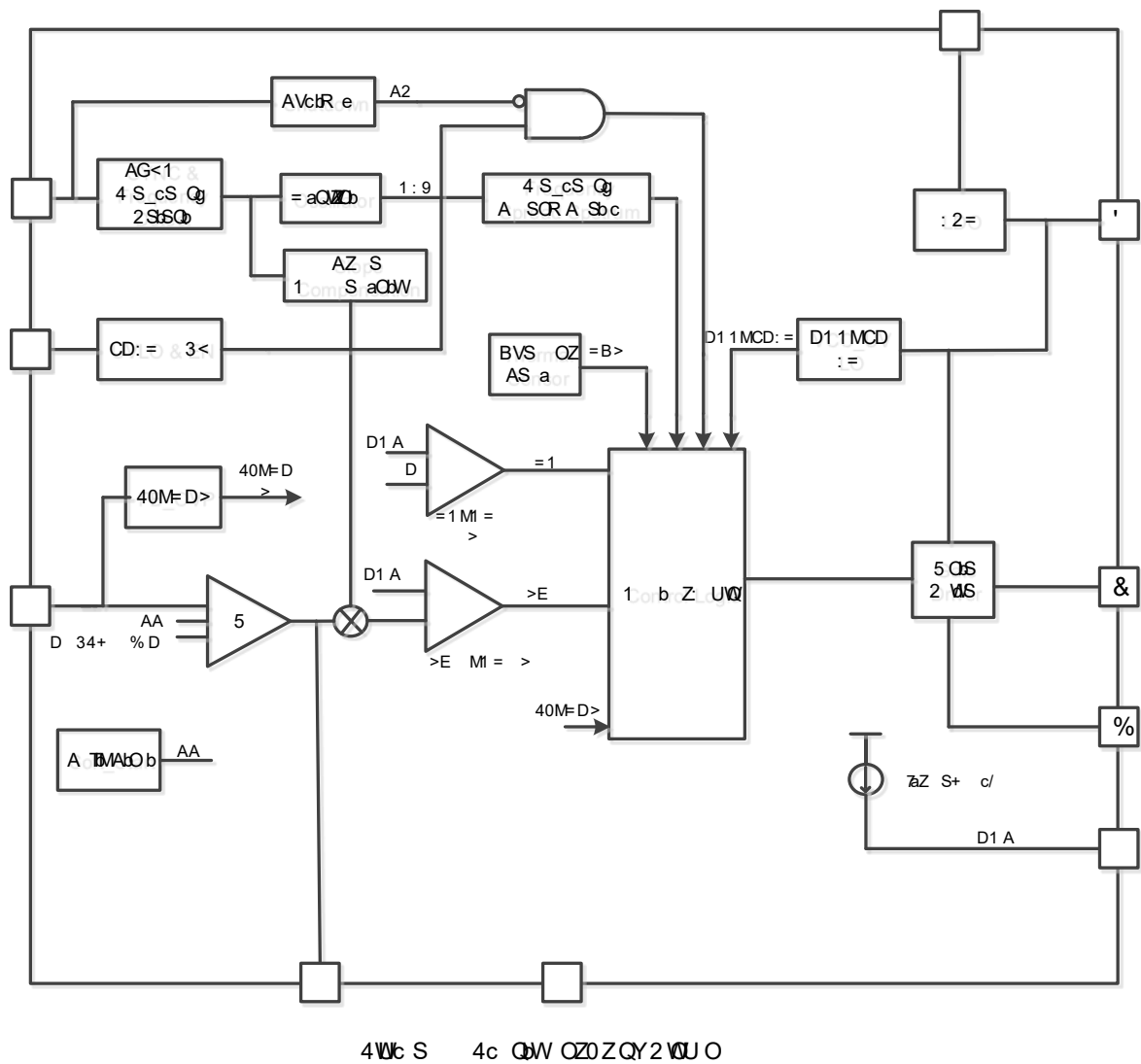


BS S Qc S °1
4Wc S 2 SaV O Q da BS S Qc S



BS S Qc S °1
4Wc S AVcR e BV SaV Z 6 gatS SaW da BS S Qc S

FUNCTIONAL BLOCK DIAGRAM



OPERATION

BVS A1B& RsdVb W/Oe Wb W cb O US ag QV ca P ab Q b Zb bVcb caSa SOYQc S b RS
Q b ZBVSRsdVb QD PS caSRWP ab A3>7I O RTgPQOYb ZUVSa

7 Oltg VQZO ZObW QVcWbVb SOYQc S bbV cUVbVSf bS OZ = A43B W/aS aSRbV cUVO Sf bS OZaS aS
SaVb BVS d ZOUS OQ aa bW/ SaVb W/TSR Wb bVS 7A<A W BWA/d ZOUS W/TSR Wb bVS aVbS W cb TbVS
>E Q OOb BVS cb cbd ZOUS W/OZ aS aSRbV cUVO Sf bS OZISSRPOQY SaVb R/VbS Ste YO RTSR
Wb bVS S O ZVb SUCbVS W cb BVS cb cb TbVS S O ZVb 1= > W W/CRSR b bVS aZ S
Q S aObW O O RTSR Wb bVS SUCbVS W cb TbVS>E Q OOb / bbVsatOb TO gae VQWU QcS bVS
aQZOb aSa bVS A ZQV caWU bVS ae VQV ZUVQZ QY BVA/T QSa OVWVaW OZ bVS 2 W UObS TbVS Sf bS OZ
= A43B O R bVS Sf bS OZ = A43B bc a E VS bVS d ZOUS bVS aVbS W cb TbVS>E Q OOb
Sf QSRa bVS SUCbVS W cb bVS A ZQV W/ SaSb O R bVS Sf bS OZ = A43B bc a TT BVS d ZOUS aS aSR OQ aa
bVS aS aS SaVb US S OZg Q bVb a c Vca VbS a VbS a BVSaSa VbS a QD T QbVS>E Q OOb b SaSb
bVS A ZQV/ S Cc Sg B SdS bbVbSaSa VbSaT SaSbWU bVS ZQV OPZ Y cb QVcWbVbS bVS 7I SdS ka
bVS>E Q OOb T SaSbWU bVS ZQV/T OaV bRc ObW O bS bVS ZQV W/aSb BVA/Rc ObW W/QZSR bVS
PZ YWU VbS dOZO R W/a SQVSR Qa VWc bVS WbVS 3ZOb VQZ1 VO QbS VbVb aSQW C RS Sf bS Sg
ZVbZOR ZOR Q RWW a bVS S S Ug RSZbS SR b bVS cb cb QD QW e VS bVS Sf bS OZ = A43B W
Rc WU bVS PZ YWU VbS dOZ W/ S bVb e Vb W/RSZbS SR b bVS ZOR / dS d ZOUS Q OOb WbVbS
A1B& SdS ka bVS cb cbd ZOUT WU c RS bVSaSQ RWW a BVS dS d ZOUS Q OOb aS aSa
bVS TSSRPOQY 40 W d ZOUS O R SaSa bVS A ZQV BVS ZQV S OVa W SaSbatObS c bVbS cb cb RSQga b
bVS WQZdOZS

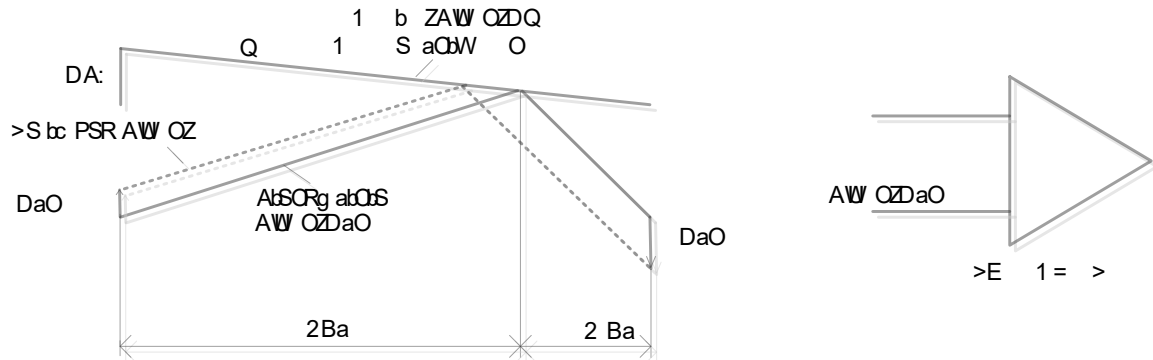
BVS A1B& e Ya Ob>cZSaYW RS b Tc bVS WQSOaS bVS STVbS Qg WZVbZOR Q RWW

BVS_cVbS bQc S b TA1B& W c/ lg VQZc RS ZOR Q RWW O R ae VQWU 2 WOPZU bVS
RsdVb bVS lg VQZac g aVctR e Qc S b D7< Wb/ ' /

BVS A1B& VOb dS d ZOUS bSQW =D> T bVS cb cbd ZOUS =D> W/aS aSR ObVbS TSSRPOQY W 40
7ObO g bVS bVS d ZOUS ObVbS TSSRPOQY W VbSa b D lg =D> W/b VUS SR =D> e VQOcaS bVS 2 Wb
U Ze T QWU bVS eS = A43B TTE WbVS = A43B TT bVS cb cbd ZOUS e VZR BVS A1B& PSUWa
ae VQWU QUOWe VS bVS TSSRPOQY d ZOUS SQVbSa &D lg

BVS WbS OZPVOb TbVS A1B& Q Sa T SWS bVS WbS OZPVOb d ZOUS US S Ob RVbQZ T bVS
d ZOUS ObVbS D7< W / bW cbd ZOUSa ZeS bVO D bVS WbS OZ7I PVOb W/bVS W cbd ZOUS O R Ob d ZOUSa
CP dS D bVS WbS OZPVOb d ZOUS US S Ob TbVS A1B& dVbSa bVS PVOb BVS UObS R VbS ac g d ZOUS
D11 S_cVbS O Sf bS OZPg Qaa QD QW SQ S R D11 QD QW QbS W/ 4 R b ZQS QD QW QbS
Sf QSRWU 4 2 bPVOb bVS D11 WPg O Sf bS OZd ZOUSa c Qb

BVS A1B& caSa OQc S b RSQ b ZaQVS S BVS OWORdO bUSa TQc S b RSQ b ZOS WbS S b
QcS Pg QcS Qc S b ZVWT bVS ae VQV O RaW Zb Q b ZZ QVO QbS VbVb 6 e SdS Qc S b RSQ b Z
VOb OAcP VO Vb= aQZbW e VS Rctg QcS WU SOb bVO B SdS bbVbS AcP VO Vb aQZbW a O
Q S aObW O W/CRSR b bVS Q b ZaW OZ



$$4Wc S \quad AcP 6O \quad W=aQZbW \quad T 2, \quad OR1 \quad S aOW \quad O \quad b / d \quad WAcP 6O \quad W=aQZbW$$

$$BVS Qc S b \quad RSQ b \quad ZaQVS \quad SaO \quad Za bVS WRcQ \quad Qc S b 7. \quad ORQ \quad OSa bVSaO \quad ZRaW OZDaO \quad b O \\ WS OZUS S QSRQ b \quad ZaW OZDQBVS Qc S baS aS SaWb \quad A3< \quad OaaV e \quad W4Wc S \quad Q dSba bVSaO \quad ZR \\ WRcQ \quad Qc S b 7. \quad b bVS d \quad ZOUSaW OZDaO \quad bVObW \quad bW OZb 7. \quad acQ/bVOb$$

$$G_{dR a} = C_D$$

$$4Wc S \quad WabOS bVS bVS \quad g e Vg \quad AcP 6O \quad W=aQZbW \quad VO \quad S \quad BVS \quad WUO R TOZU aZ \quad Sa \quad OR \\ Sa SOUSg \quad TDaO \quad OS OZ \quad bW OZb \quad bVS WRcQ \quad Qc S b \quad WUO R TOZU aZ \quad Sa \quad OR \quad TT \\ Sa SOUSg \quad E VS S \quad WbVS WRcQ \quad aZ \quad SRc \quad WU bVS ae W \quad bWSOR \quad TTW bVS WRcQ \quad aZ \quad SRc \quad WU bVS \\ ae W \quad TTbWSOROS \quad SZSRb \quad OR \quad Pg$$

$$= C_D$$

$$- = - W C_D$$

$$4 \quad bVP \quad abb \quad ZUg($$

$$= C_D = G C_D$$

$$= W C_D = G J - G C_D$$

$$7 \quad 4Wc S \quad Oa \quad OZWQSOaS \quad WbVS ZORQc \quad S bQcSa bVSaO \quad ZRaW OZb \quad WQSOaS \quad Pg \quad DaO \quad BVS STSQ \quad T \\ bWAZORQO \quad US \quad DaO \quad QbbVS S R \quad TbVS Tbae \quad WUWUgQS W$$

$$\Delta G_{dR a} = - \frac{-}{+} \frac{T}{T} \quad \Delta G_{dR a}$$

$$A \quad E VS < Q \quad S aOW \quad O \quad aW OZWORRSR e W \quad QW hS \quad bVS ($$

$$\Delta G_{dR a} = - \frac{-}{-} \quad \Delta G_{dR a} = - \frac{-}{-} \quad \Delta G_{dR a}$$

%

E

BVS Q S aCbW O VOa PSS CRRSR WbS OZg WbVS A1 B& BVS aZ S TbW/Q S aCbW O VOa
PSS aSZQSR b aCbWg abO ZOW a O R W dOZSR S Ra bVS ae WWMU TS_cS Qg BVAZ S QD PS
QZcZSR caWU bVS T cZ(

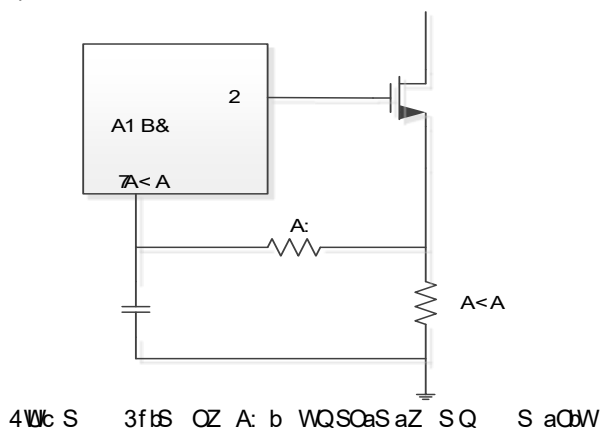
$$T = G_D \quad d$$

DA: W bVS O ZWRS T bVS WbS OZ Q S aCbW O O R 4A W bVS Q b ZS a ae WWMU
TS_cS Qg

4 S f W W aZ S Q S aCbW QD PS WQSOaSR Pg CRRWU S Sf bS OZ SaVb A: WbVS 7A3< a CbV
4Wc S aV ea bVS aSrc BVS Sf bS OZg US S CbSR aZ S Q S aCbW WbVS CRRSR b bVS WbS OZaZ S
Q S aCbW TbVS A1 B& E VS caWU Sf bS OZaZ S Q S aCbW bVS T cZT QPSQ Sa(

$$T = G_D + C_D \quad d$$

/ lg WQZdOZST TQ 9 W /



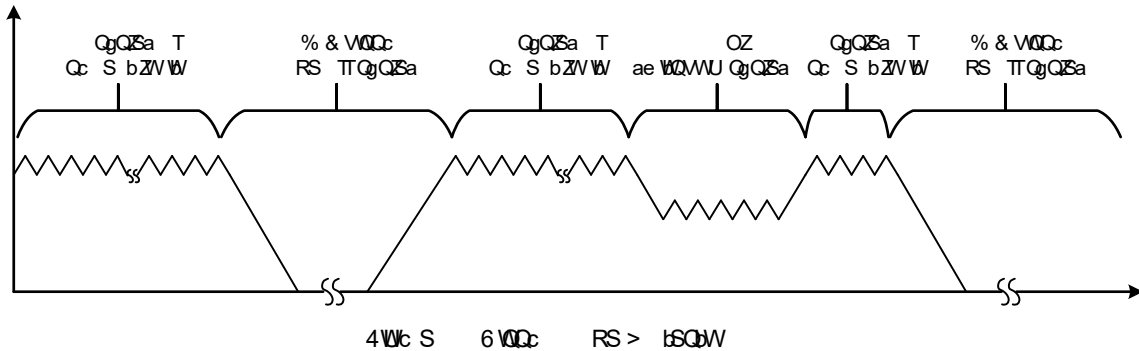
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WRcQ Qc S bO RbVS UO CPZaZ S Q S aCbW O SQV Sa bVS Qc S bZVW bV SaV Z > SOYWRcQ
Qc S bZVW 73/91: WabSRg abVS WQZcZSR OaV e W(

$$A = \frac{G_D \quad D - \int \times C_D \times}{C_D \quad D}$$

E VS S

DA3<A3 W7A3< WZVWUd ZOUS Bg + D
73/91: WbVS WRcQ SOYQc S bZVW
A: WAZ S Q S aCbW SaVb
2 W2chg QgQS
A<A WbVS 7RcQO QS SOYQc S bRSQW SaVbO QS

E VS dSZOR VO S a bVS Q dS bS QD b dVSc cb cbQc S bb aCbWg ZORWU S_cVS S b BVS WRcQ
Qc S bWQD SRQb dS Qc S bZVW bV BVca bVS cb cbd ZOUSR aPSZe SucZSRd ZOUS e W/40 d ZOUS
Zaa bVO WbS OZ STS S QS d ZOUS Q bVc caZ BVS WbS OZ1= > d ZOUS O a c b WVV E VS 1= >
d ZOUS WQD SRT QgQSa bVS Q b ZS ab ae YWU / TS S OWMU=44 T % & QgQSa bVS RSdVS
SaOba T a TabObWU VOaS 7 dSZOR VORaV bQ RWV abZSf WbRc WUa TabObO R OYS1= >
d ZOUS QD SRQb WVV OTS a TabObbWS O R1= > abZYSS WVV T QgQSa bVS RSdVS S bS a Wb
bc WU TT RSQUOW E VS dSZOR VORaV bQ RWV W S dSR bVS RSdVS Ocb QWZg SQ dS a b
S bS a OZ SucZWU S CbW



0SQcaS 2 QD PSdOVPZ c RS RMS S bDW 7-3/9 1: W/ babCPZ c RS RMS S bDW e VS caWU Sf bS OZaZ S
Q S aCwW SaVb A T O CQc bS SOY Qc S b ZVW S CwW dS bVS W cb ac Z d ZOUS A1B
SQ S Ra caWU Z bVS TMSRaZ SQ S aCwW

BVS cb cbd ZOUS WaSbPg O Sf bS OZSaVb RMS 40B O R 400 Wtg WcZ ZOW aVS CwW / WWc
Qc S b Ttg WcZ c/ TZeWU bV cUVTSRPOQY SaVb RMS UMSaU RQc Cg O R VSQ dS WU BVSdOZS
T 40B QD PS CQc ZSRPg 3_cW

$$C_E = \frac{G_{FE} - G_c}{G_c} \times C$$

e VS S(

D 34 WbVS TSPQOY STS S Csd ZOUS tg WcZ %D

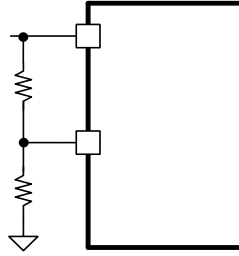
BVSae WUWUTS_cS Qg TbVS A1B& QD PS CRcabSRPSe SS Y6h O R 6h caWU OaWU Z Sf bS OZ
SaVb BVa SaVb cabPS Q SQSRPSe SS bVS 4/ AG<1 A2 WORU c R 3_cW QD PS caSRb
SabWCsbVS TS_cS Qg CRcab SaVb

$$\Omega = \frac{1}{n\lambda} -$$

BVS A1B& QD OZ PS ag QV WSRb O Sf bS OZQZQY BVS Sf bS OZQZQY cabPS Q SQSRPSe SS
bVS 4/ AG<1 A2 WORU c R Qa aV e W4Wc S %BVS TS_cS Qg CRcab SaVb Qg S OWQ SQSR
e VZag QV WUOaW OZbVS ST S WVS S W OZaa TaW OZbVSae WUWUTS_cS Qge VPSaSbPg bVS TS_cS Qg
CRcab SaVb

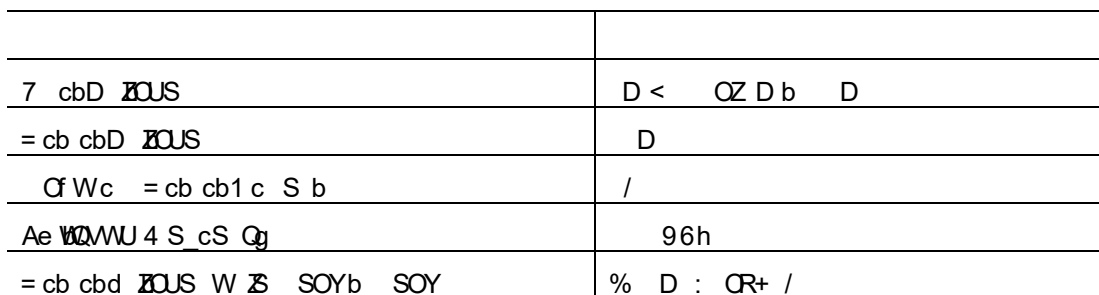
BVS 4/ AG<1 A2 WOZ Tc QW a Oa OaVctR e W TOVWVaW OZ, %D O SOa bVS 4/ AG<1 A2 W
dS A bVS A1B& ab aae WUWU O RU Sa Vb OZe Qc S b RS BVS bOZac Z Qc S b TbVS 7
SRcQab ' / tg WcZ c RS bVSaSQ RWW a

4Wc S ' O R 4Wc S aV e O W Z S bCwW TOaVctR e Tc QW e VS S CwW WUTS_cS Qg CRcab RS
O R ag QV WcW RS Sa SQMSZ 7 TS_cS Qg CRcab RS Q SQWU bVS 4/ AG<1 A2 Wb U c R
T Qa bVS OZQYb c Qb O CbOW TS_cS Qg >cZU bW W WVaVba R e bVS 7 7 TS_cS Qg CRcab
ag QV WcW RS O WVaW OZT SbVO a aVba R e bVS 7.



4Wc S AgabS CD: = Saab 2WRS

B SRcS 3 7 bVS RSdVS W Z S ba 4 S_cS Qg A SCR A SOc 4AA BVS 4AA Q/c Wg aVla bVS ae WcWU
 TS_cS Qg TbVS SUCZb S WRVOZ e WWOQS bOWTS_cS Qg O US O c RbVS CRcabSR ae WcWU TS_cS Qg
 BVS XcS WUa O W TbVS ae WcWU TS_cS Qg e W ae WUTS_cS Qg BW/TS_cS Qg RWS WUc QW
 W/STSQbST P bVTS_cS Qg CRcabSRPg Saab ZCSRcb4/ AG<1 A2 WO RO Sfb OZZQYag QV WcW
 O ZcW



BVS ST O QS TWRcQ OTSca bVS eS ac Zga abSRg abQS S CbW bO aW bPSVdW Z abCPW
 O RP abQ dSbS STWVS Qg BVS WRcQ dOZS 21 SaWbO QS O RaCQ CbW Qc S bWZS QSa P bVSTWVS Qg
 O R bVS CU WRS TbVS cb cb d ZOUS W Z : OUS WRcQO QS dOZS SRcQSa WRcQ Qc S b W Z O R
 bVS ST S ZCPa b ZeS cb cb d ZOUS W Z 4 O TWR 21 SaWbO QS O ZOUS dOZS WRcQ gSRa WVS
 STWVS Qg dV SRcQSR A O R Q S ZaaSa 6 eSdS O ZOUS WRcQ e WWOUMS WRcQ TO Wje ZUS SOZ
 VdS OU SdS aS Sa SaWbO QS bVS SPg Q c bS OOWU bW STWVS Qg CRdO bOUS

7 RcQ dOZSa QD VdS SdS b Z O QSe W Qc S bPVA E VS bVS WRcQ Qc S bO CQSa
 aCQ CbW ZdSZ W WRcQO QS QD RSQSOaS b T bVS dOZS Cb / Qc S bRS S RWU V e bVS
 WRcQ dS R RSTWsa aCQ CbW E VS aSZOWU O WRcQ QV aS W CbSR Qc S bSa SQOZ bVS aCQ CbW
 Qc S bZUS bVO W SOYQc S bRc WU bVS S CbW

B CQZS bVS Qc S bWbVS e abQaS caS bVS WWc W cb d ZOUS Of Wc cb cb d ZOUS Of W ZOR
 Qc S bO R WWc ae WWMUTS_cS Qg TbVS O ZOW e VZ Q aPS WU bVS WRcQO QSe W b Z O QS
 ORZe eS Q dSaW STWVS Qg

4 OP bQ dSbS CQZS bVS WRcQ 21 Qc S bOa W3_cCbW

E VS S

D=CB WbVS cb cb d ZOUS TbVSP abQ dSbS
 ZCB WbVS cb cb Qc S b TbVSP abQ dSbS
 DZ WbVS W cb d ZOUS TbVSP abQ dSbS
 WbVS eS Q dSaW STWVS Qg

1 CQZS bVS WRcQ Qc S b SOYb SOY W Z 7>> Qa W3_cCbW %

%

E VS S

7>> WbVS WRcQ SOYb SOYQc S b
 : WbVS WRcQO QS TWRcQ
 TAE WbVS ae WWMUTS_cS Qg
 D=CB WbVS cb cb d ZOUS
 DZ WbVS W cb d ZOUS

BVS ST S bVS SOYae WWMU Qc S b TWRcQ 7>3/9 WCOZSR Ca W3_cCbW &

&

ASbbVSQc S bZVW TbVSA1B& WVS bVO bVS SOYQc S b7>3/9 O RaSZQbVS WRcQ e WbVsaCQ CbW
 Qc S bWVS bVO bVSQc S bZVW

2cSb bVS SaS QS TO WRcQ CbVS W cb TOP abQ dSbS bVS W cbQc S beQdST W/Q bWc ca BVS
 WRcQ S ac Sa bVbVS W cbQD CQW aSSa TOW Ze W ZQc S ba 6 eSdS Ca bVS W cbQD CQW USaa OZS
 bVS W cb W ZU Sa c BVS A Qc S bWbVS W cbQD CQW WUMS caWU3_cCbW '

$$C_D = \frac{G_{FE} - G}{\sqrt{\times G_{FE} \times \times Wd}} \times G$$

BVS W cbQD CQW aV cZPS QD OPZ TVO RZU bVS A Qc S b / ZV cUV bVS W cbQD CQW W bCa QWQZW
 OP abO ZOW Ze dOZSa QD CQCaS W SRO QS WbS CQW a BVS ST S OU R_cOZy QD CQW aV cZPS

QV aS WbVS O US T 4 b 4 7TOdQZS ZeS bVO 4 W/caSR bVS PZ a e W/ W SRO QS
WbSQW a ae WMMU WbSQ OTSQbVS A1B& B W dS ST O QS Sa SQW e W/DWPSZe &
d Za W/W SQ S RSR b caS O =V SaWb ObVS W cbb dVS O 1 TWS BVS SaWb W/ZQSR W
aS Sa e W/bVS D7- We W/ Z O Pg Oaa QD QW ObQSR b bVS D7- WRVbQ / 4 4 QS O W
QD QW W/SQaaOg WbW/Q TWc ObW BVS PcZ/W cbQD QW O R WRcOb e WZQ SQ bVS bVS aVS T
bVS SaWb ObVS W cb eS ac Z

4 a OZ cb cbd ZOUS W Z QV aSOZe 3A cb cbQD QW ZMSQS O WQD QW Bg WQZ f 4
QS O W cb cbQD QW a e YT abO ZObW a / 4 QS O W Pg Oaa QD QW W/SQ S RSR b PS
ZQSR Oa QZaS Oa aaWZ b bVS ae W/ RS.6 WVS QD QW dQZSa QD PS caSR b W dSbVS ZORbO aW b
Sa aS 2cS b O QD QW a RS ObWU c RS 21 POb bVS POb QD aW WOb Zg SRcQS QD QW QS 1S O W
QD QW a QD ZaS ab TbVSWQD QW QS Ob ObSR d ZOUS BVS ST S ZQdS OUW bVS d ZOUS ObWU b
S ac S ORS cObS STSQbVS QD QW QS 4 bVS S_cVSR cb cbd ZOUS W Z caS bVS S_cObW O R b
QDcZbVS WWc S_cVSR STSQbVS QD QW QS 1 =CB

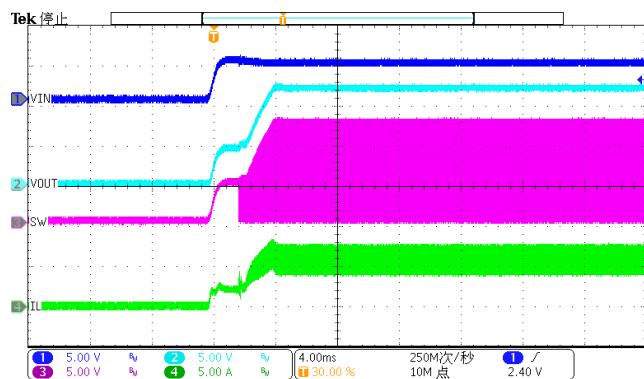
BVSb bOZ eS RWAQW T = A43B WQZSa Q RcQW Zaa Qa aV e WbVS TAbtS O R ae WQWU Zaa Qa
aV e WbVSaSQ RbS BVSb bOZ eS RWAQW aV cZPSe WW QYOUSbVS OZ QWUa

= PaS dQW TbVS P abQ dS bS QWQW aV e a bVObVS QdS QUS Qc S bbV cUVbVS RWRS WbVS QdS QUS ZOR
Qc S b O R bVS SOYQc S bbV cUVbVS RWRS WbVS SOYQc S bbV cUVbVS WRcQ BVS RWRS aV cZPS QbSR
b VO RZ SbVO W SOYQc S b BVS SOYRWRS Qc S b QD PS QZc ZbSR caWU 3_cQW

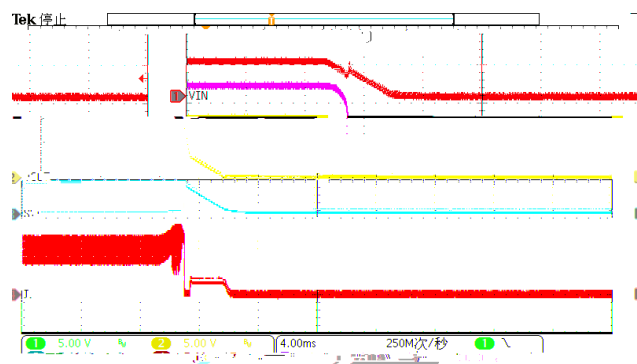
$$A = \frac{FE}{-} + \Delta$$

BVS QZbVS RWRS cabPS QZb VO RZbVS Qf Wc QdS QUS Qc S bRSZbSRb bVS cb cb BVS SOY SdS aS
d ZQUST P abQ dS bS a W_S_cQZb bVS SUCZbSR cb cbd ZQUS BVS RWRS cabPS QD QZb TVO RZU bW
d ZQUS B W dSSTWQg OZe T e ORR aQV bYg RWRS W SQ S RSR

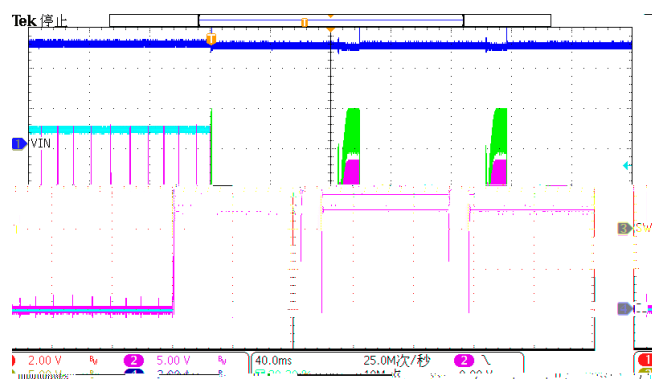
DW+ D D cb+ D c 3aa bVS e WS bSR



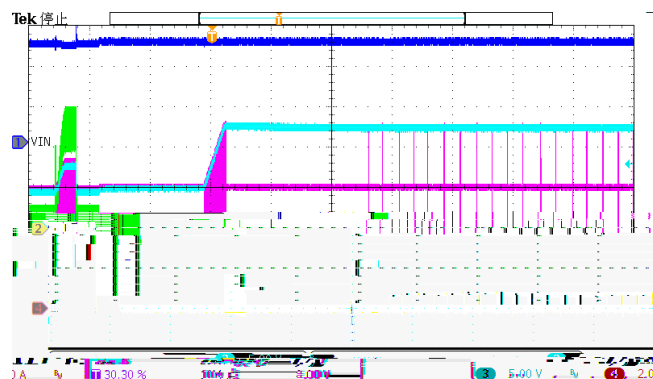
4Vc S > eS c ZCR+ /



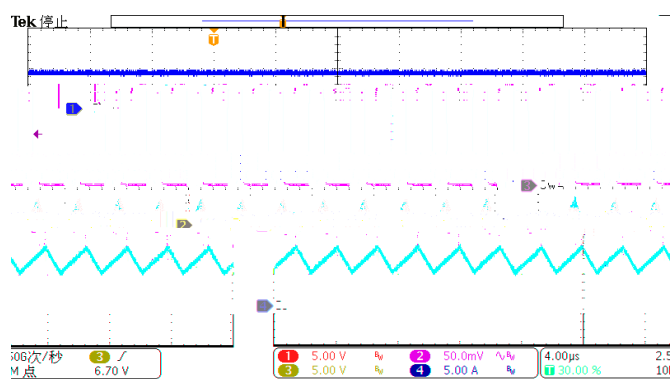
4Vc S > eS R e ZCR+ /



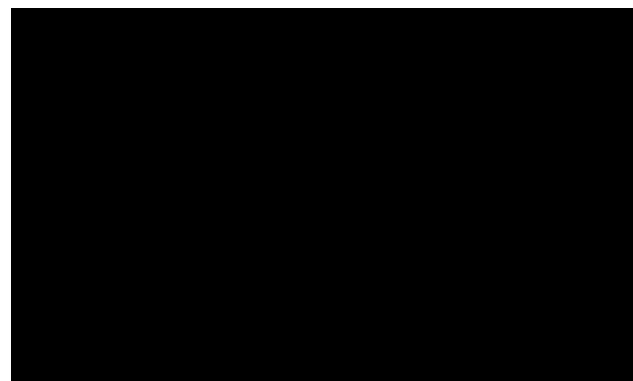
4Vc S =dS Qc S b bSQW ZCR+ /



4Vc S =dS Qc S b SQ dSg ZCR+ /

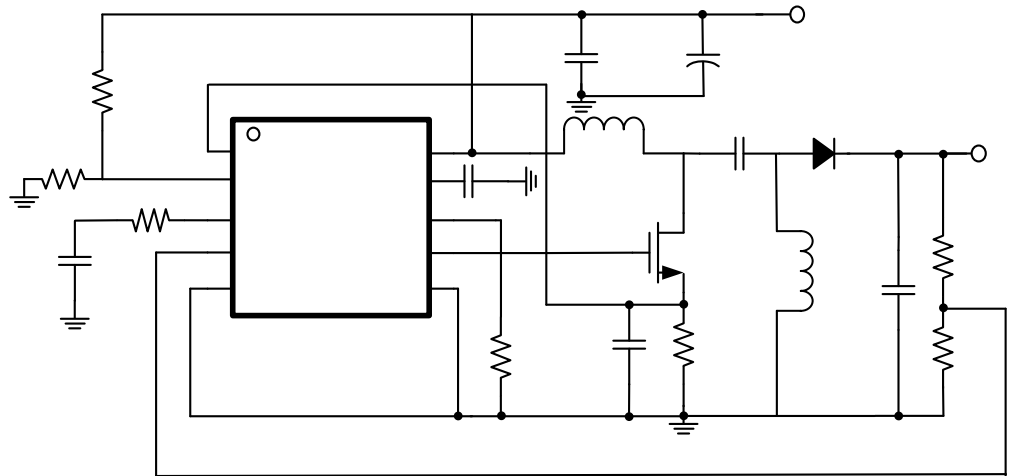


4Vc S % AbSRg abCS ZCR+ /



4Vc S & Ag Q4 S_cS Qg

APPLICATION INFORMATION



4V S' / 20W AQS Ob D b D / AS V Sucb Ob Y6h

7 cbD 10US	D < 0Z D b D
= cb cbD 10US	D
Cf Wc = cb cb1 c S b	/
Ae 10WU 4 S_cS Qg	96h

/ U R c Z T R S S W W U b S W R c Q Q S b c a S W b O Z e b S W R c Q SOY b SOY W Z Q S b b P S
O f W O S Z b T b S O f W c W c b Q S b O b S W W c W c b d Z O U S B V S Q S b W Z T e W U
W W R c Q a: O R: W U M S P g(

$$\Delta = \times \square \times \frac{G}{G} \times \square \quad \%$$

$$\Delta = \times \square \times \square \quad \&$$

< O Z e S Q a S Z O S _ c Z O Z S T b S W R c Q a: O R: R S W S R Q a(

$$= = \frac{G}{\Delta \times W_{DH}} \times I \quad ,$$

E V S S

AE W b S a e W W U T S _ c S Q

< b S b O b S a Q c O W Q S b T W R c Q a a V c Z P S U S O S b V O SOY Q S b T Z e W U W W R c Q a U M S P g(

$$_A = + \frac{\Delta}{G} = \times \frac{G}{G} \times + \square$$

$$_A = + \frac{\Delta}{G} = \times + \square$$

T: O R: O S e c R W a O S Q S Q a O Q c Z R W R c Q b S W R c Q Q S S _ c V S e W P S V O Z R c S b b S c b c O Z
W R c Q W O Z c Z S R P g(

$$= = - \frac{G}{\times \Delta \times W_{DH}} \times I$$

B V S T Z e W U O O S S a a V c Z P S b O S W b Q a V S O W T = A 4 3 B (b S S a V O Q S 2 A M F < b S W W c
U O S b V S a V Z d Z O U S D B 6 M 7 b S b b Z O U S Q M O U S U b S S d S a S b O a T S Q O O W Q S 1 A A O R b S O f W c
R O W b a c Q S d Z O U S D M / F B V S SOY a e W W U d Z O U S P S e S S R O W b a c Q S W O A 3 > 7 W U M S P g(

$$G_{DH \ A} = G + G + G$$

B V S b S D M / F T e S = A 4 3 B a V c Z P S U S O S b V O b S SOY a e W W U d Z O U S

B V S SOY a e W W U Q S S b T Z e W U b V c U V b S = A 4 3 B W U M S P g(

$$_B \ A = \ A + \ A$$

B V S A Q S b b V c U V b S = A 4 3 B 7 a O Z c Z S R P g(

$$_B \ C \ D = \times \sqrt{\frac{(G + G + G) \times (G + G)}{G}}$$

B V S e S R a W O W W = A 4 3 B Q Q P S S a b W O S R P g(

$$_A \ D = \ _B \ C \ D \times \ C \ D \times \ _I + (G + G) \times \ _B \ A \times \frac{B_X \times W_{DH}}{G}$$

E V S S

5 W b S U O S R W S Q S b

BVS b bOZ e S R W W T = A43B W Q R S a Q R c W Z a a O a V e W b V S T a b b S O R a e W W U Z a a O a
a V e W b V S a S Q R b S BVS b bOZ e S R W W a V c R P S e W W Q Q U S b V S O Z Q W J a

BVS R W R S O b b V S c b c b a V S c a b e W a b O R b V S S d S a S d Z O U S e V S b V S = A43B W b c S R BVS S O Y S d S a S
d Z O U S W U M S P g (

$$G_A = G_I + G_I \quad \%$$

BVS R W R S a V c R O Z P S Q O P Z b T Z e a e W W S O Y Q c S b 7 M 3 / 9

BVS e S R W W T b V S R W R S W S c O Z b b V S T e O R d Z O U S R c Z W S a c b c b Q c S b A Q V b y R W R S a
O S S Q S R S R V S S b W W W S b V S e S Z a a

4 Q S O W Q O Q W a e W Z e 3 A b V S S O Y b S O Y d Z O U S W Z Q c Z W U Q O Q W W S a b W O S R P g (

$$\Delta G_D = \frac{\times I}{D \times W_{DH}} \quad \&$$

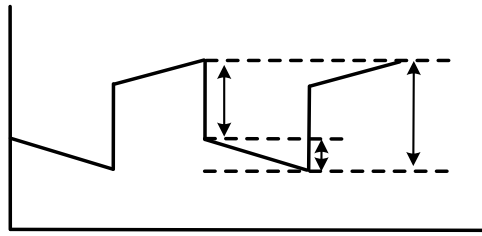
BVS O f W c d Z O U S Q a a b V S Q c Z W U Q O Q W W O f W c W c b d Z O U S B V S d Z O U S Q W U T b V S Q c Z W
Q O Q W c a b P S U S O S b V O W

BVS A Q c S b T Q c Z W U Q O Q W W U M S P g (

$$D C D = \times \sqrt{\frac{G + G}{G}} \quad ,$$

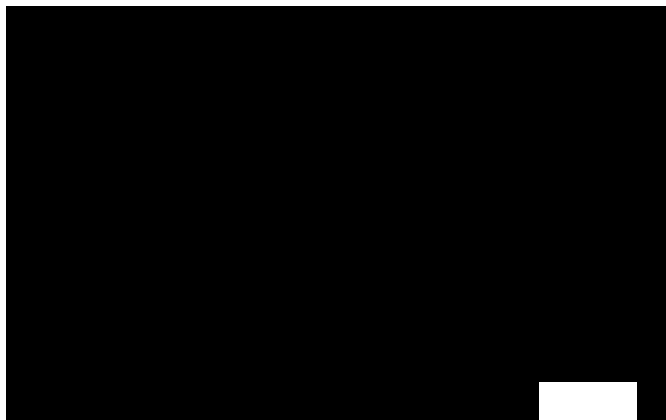
BVS S W O Z O U S A Q c S b b V c U V Q c Z W U Q O Q W S Z W S b c b c b e S 3 a c S b V S Q c Z W U Q O Q W
Q O e W a b O R b e W U R V S c b U S S c W b V O d S S b V S O Z S T O Q S

BVS A3 > 7 V O a O W R c Q Q W c b a V S Z W U Q O Q : O U S % % & & S E b & % Q Q A O * * 1 2 ' : O U S

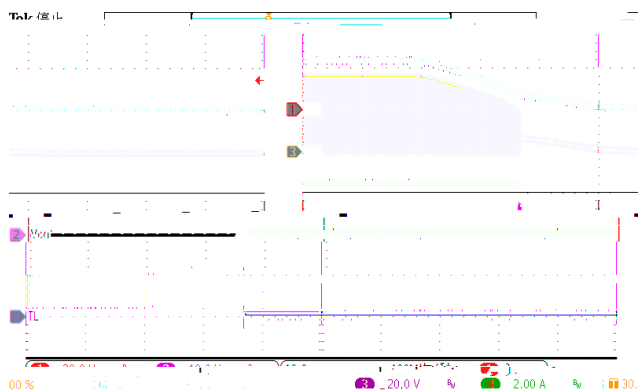


4Wc S = cb cbD 20US W 3

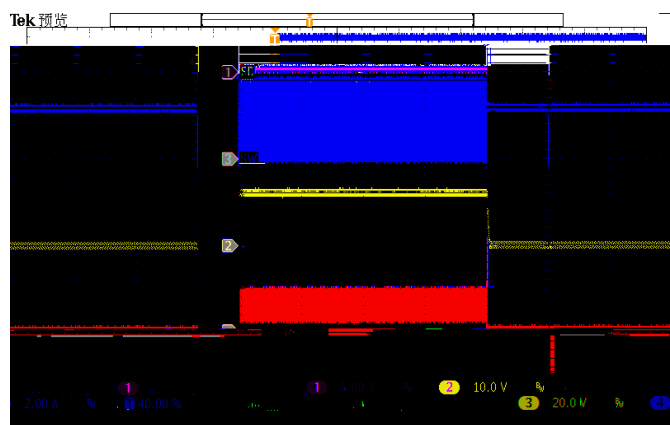
DW+ D D cb+ D c 3aa bVS e WS tSR



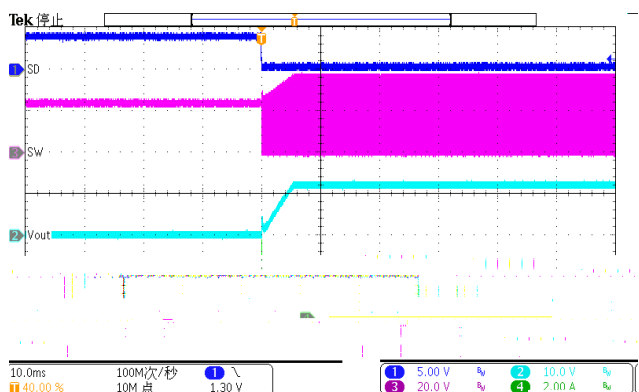
4V6 S > eS c ZCR+ /



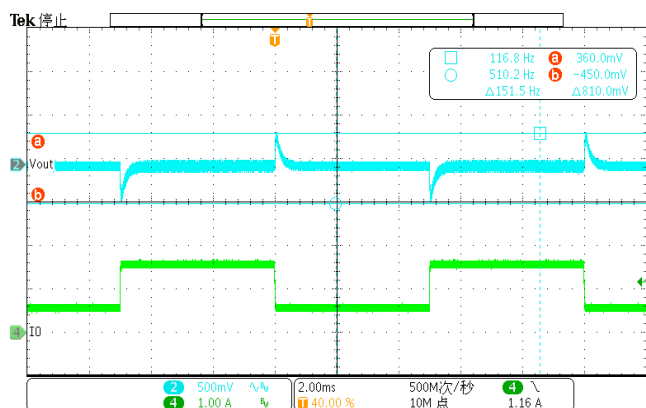
4V6 S > eS R e ZCR+ /



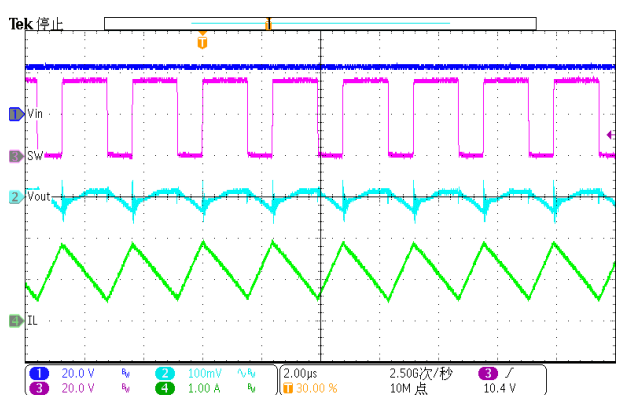
4V6 S AVctR e S bg



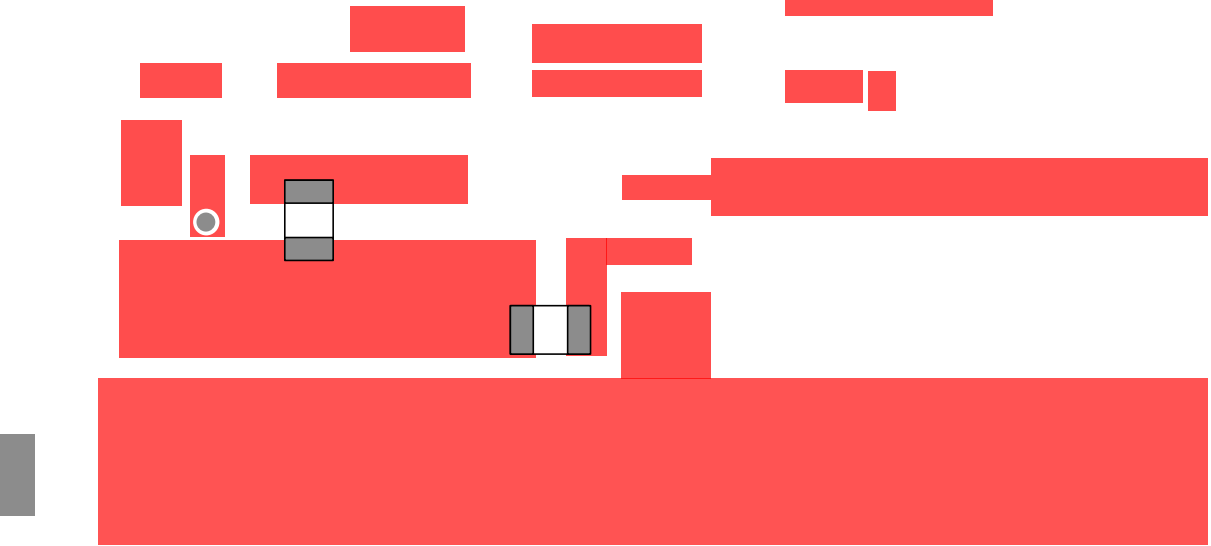
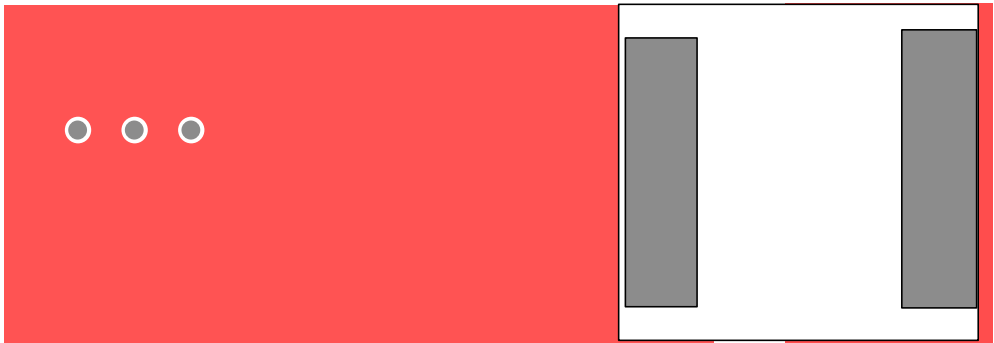
4V6 S AVctR e S dS



4V6 S : CRB O a ZCR+ / /

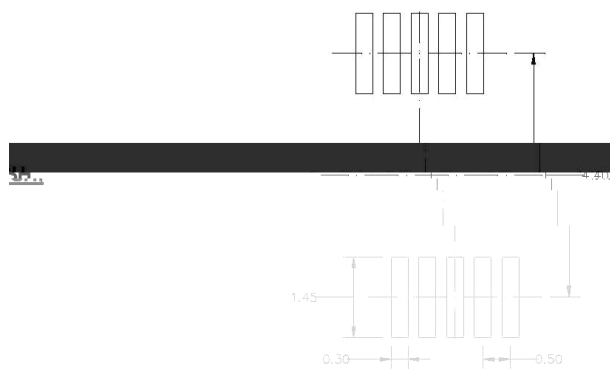
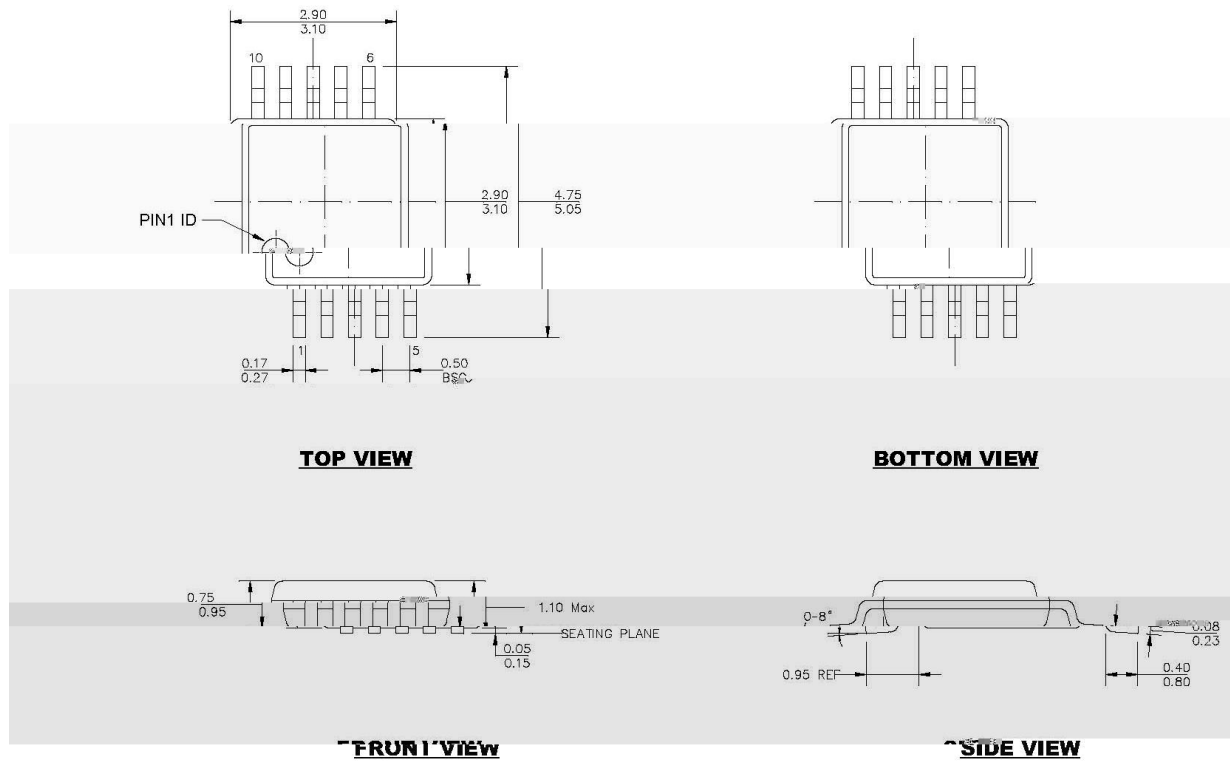


4V6 S atSRg atSR ZCR+ /



4Wc S % 0== AB >1 0 : Qg cb

PACKAGE INFORMATION



RECOMMENDED LAND PATTERN

NOTE:

- 1) ALL DIMENSIONS ARE IN MILLIMETERS.
- 2) PACKAGE LENGTH DOES NOT INCLUDE MOUNTING PROTRUSION OR GATE BURR.
- 3) DRAWING MEETS JEDEC MO-187, VARIATION PA.
- 4) DRAWING IS NOT TO SCALE.

TAPE AND REEL INFORMATION

