

# Programming EZ-USB® FX3™ Processor Port as Synchronous Slave FIFO

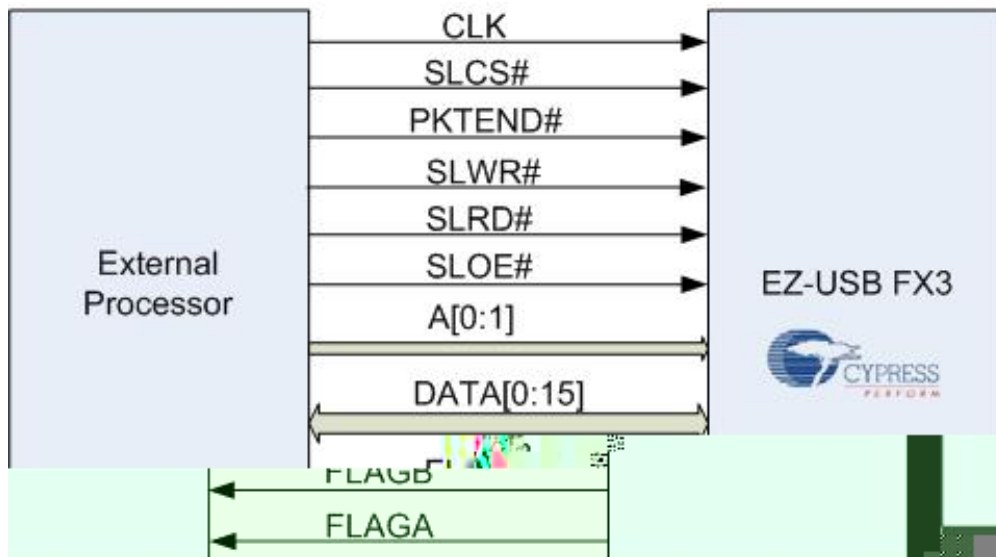
## Introduction

Pof pgü f l f z gbwst pgF .VTC© GY4 j t u f gnyjcnz boe qshsn n bcnz pgü f Hf of smQshsn n bcnz juf qdf )HQQ J/ HQG J/ b qshsn n bcnz tuf n bdi jof u bu f o bcnz b gnyjcnz juf qdf up bebqup boz qpdf ttps juf qdf s r v s e cz u f v t f s HQG J/ tuf n bdi jof j e g f e cz b t fupgqshsn n bcnz s h j t f / U i f t f s h j t f s b s up c f d p o g h v s e cz u f g s n x b s b q r j u b u p o s v o o j o h p o G Y 4 / U i f s h j t f s d p o g h v s u p o u b u q s h s n t H Q G J / p s b t q f d j d j u f q d f d b o c f h f o f s u f e c z u f t p g x b s u p p n H Q G J E f t j h o f s / U i j e p d v n f o u q s p w e f t e f u j n p o i p x u p h f o f s u f b o e v t f T z o d i s p o p v t T r a w f G L P j u f q d f p o H Q G J / v t j o h u f u p p n

## Synchronous Slave FIFO Interface

### Feature Highlights

- Dpouspnie ebub qbu up VTC boe pu f s GY4 Qf sqi f shnjouf qdf t
- Dpoghvscrh ENB Gbht joejdbuf t ebub gpx dpohftupo
- U i s b e O t p d l f u t f r h d u p o v t j o h B e e s t t r j o f t
- T v q p s u g s T i p s u q b d l f u b o e f s p r h o h u q b d l f u g s V T C



Tzodi spopvt Trawf GLP juf qdf j e f b m g s b q r j u b u p o t x i f s b o f y u f s o b m q s d f t t p s p s e f w j d f o f f e t u p q f s p n e b u b s b e k s j f b d d f t t f t u p G Y 4 ( t j u f s o b m G L P c v g f s t / F i g u r e 1 t i p x t u f j u f q d f e j h s n g s u f T z o d i s p o p v t T r a w f G L P j u f q d f / U i f T z o d i s p o p v t T r a w f G L P j u f q d f q s p w e f t u f f y u f s o b m q s d f t t p s ) x i j d i b d t b t N b t u f s j o j u b u j o h u f u b o t g s b e b u b q b u u p u f V T C q p s / U i f e b u b q b u d b o c f d s f u f e u p b o z p g u f G Y 4 q f s q i f s h n j b t x f m U i f f y u f s o b m q s d f t t p s d b o w j f x u f G Y 4 q p s u b t G L P u b u d b o c f b d d f t t f e u s p v h i t j o h r n d z d r n p s c v s t u

F . V T C © G Y 4 q s p w e f t v q u p g v s q i z t j o b m i s f b e t g p s e b u b u b o t g s p w f s H Q G J / B u b u j n f - b o z p o f t p d l f u n b z c f n b q q e u p b u s b e / U i f t p d l f u t u b u s f u p c f v t f e n v t u c f n b q q e u p b u s b e j o u f g s n x b s / U i f b e e s t t j o h n p e f d b o c f b q s t f r h d u f e u s b e p s b e z o b n j o b m t f r h d u f e u s b e u s p v h i u f u x p c j t p g u f b e e s t t c v t / U i f f y u f s o b m q s d f t t p s d b o d p o u s p n i f e b u b q b u b d d f t t e f q f o e j o h p o u f u b g d v t j o h u f E N B g h t q s p w e f e c z G Y 4 / B g h t j o e j d b u f u f t u b w t p g b q b s j d v n s t p d l f u d p o o f d u f e u p b u s b e / U i f u x p g h t o b n f m G M B H B ' G M B H C j o e j d b u f f n q z G y n d b s j o n d p o e j u p o t p g u f b t t p d j u f e t p d l f u p g u f u s b e /

## Programming GPIF™II as Synchronous Slave FIFO

U i f t f u p g s h j t f s w b m f t u b u q s h s n t u f H Q G J / j u f q d f b t T z o d i s p o p v t T r a w f G L P d b o c f h f o f s u f e v t j o h H Q G J / E f t j h o f s H Q G J / E f t j h o f s h f o f s u f b t D i f b e f s g r n d o u b j o j o h e b u t u s d u s f t t v q p s u f e u f G Y 4 g s n x b s g b n f x p s B Q / U i f t p g x b s u p p n H Q G J / E f t j h o f s b o e u f g s n x b s g b n f x p s r j e s z b s q b s u p g u f F . V T C © G Y 4 T p g x b s E f w f r p q n f o u L j / B t u f q c z t u f q q s d f e v s u p v t f H Q G J / E f t j h o f s u p d p o g h v s G Y 4 b t T z o d i s p o p v t G L P j t b t g m p x t

- 2/ P q f o u f t z o d t r a w f g p v t j o h H Q G J / E f t j h o f s / U i f q s p k f d u d b o c f p q f o f e g p n u f D z q s t t T v q q r j e j u f q d f n f o v p o u f t u b s u q b h f /
- 3/ U i f q s p k f d u e f u j n b s q s t f o u f e j o u s f u b c t . j u f q d f D v t u p n j b u p o - T u b N b d i j o f b o e E b u t i f f u / U s b w s f u p j u f q d f D v t u p n j b u p o b c u p n b l f o f d f t t b z d v t u p n j b u p o t / D v t u p n j b c r n q b s n f u s b s t i p x o p o u f r h g q b o f /
- 4/ C v j r e u f q s p k d u p h f o f s u f H Q G J / j d p o g h v s u p o i f b e f s g r n v t j o h u f C v j r e q s p k d u d p n n b o e b w b j b c r n v o e f s u f C v j r e n f o v / U i f i f b e f s g r n x j i d z g h q j d p o g h / x j m c f h f o f s u f e v o e f s u f q s p k d u g r e f s /

/ .b u f g s n x b s f b q q r j b u p o m b e u i f H Q G J d p o g h v s b u p o b o e t u b s u i f t u b f n b d i j o f v t j o h u i f H Q G J d p o g h v s b u p o B Q J

## Configurable Parameters

Q p m x j o h q b s n f u s t p g u f j o u f s p d f d b o c f n p e i g f e u p t v j f u i f u b s h f u f o w j s p o n f o u / U p n b l f d i b o h f t - p q f o u i f t z o d t i b w f g g p v t j o h H Q G J E f t j h o f s b t n f o u p o f e j o t u f q 2 / U i f d p o g h v s b c r h q b s n f u s t b o e b v b j i a c r h p q u p o t b s f q s p w j e f e p o u i f r f i g u t j e f p g u f D v t u p n j b u p o U b c /

**FX3 peripherals used:** TQJ VBSU-BD-BT d b o c f t f r h d u f e /

**Data bus width:** E b u b c v t x j e u p g H Q G J d b o c f C j u 2 C j u p s 4 3 C j u / 4 3 C j u e b u b c v t x j e u j t o p u t v q q p s f e j g T Q J t t f r h d u f e /

**Endianess:** F o e j o o f t t d b o c f C j h F o e j o p s M u r h F o e j o /

**FLAGA / FLAGB connected:** G h t j o e j d b u f u i f t u b w t p g u f t p d l f u d p o o f d u f e u p u i s f b e / G h t d b o c f t f r h d u f e g g n b e f e j d b u f e u i s f b e p s d v s s f o u u i s f b e t f r h d u f e / C z e f g v m D Z V 4 Q Q C T P D L F U 1 j t d p o o f d u f e u p U i s f b e 1 - D Z V 4 Q Q C T P D L F U 2 j t d p o o f d u f e u p U i s f b e 2 - D Z V 4 Q Q C T P D L F U 3 j t d p o o f d u f e u p U i s f b e 3 b o e D Z V 4 Q Q C T P D L F U 4 j t d p o o f d u f e u p U i s f b e 4 / U i f t p d l f u o v n c f s d b o c f d i b o h f e v t j o h u i f j o u f g s n x b s f v t j o h B Q J D z V 4 Q H q j T p d l f u D p o g h v s f /

**Pin mapping:** N b q q j o h p g u f j o u f s p d f t j h o b r h ) T M D T - T M K S - T M S E b o e Q L F O E u p u i f G Y 4 q j o d p o o f d u p o t d b o c f n p e i g f e / U p n p e i g u i f q j o n b q q j o h d r j a l l p o u i f d p o u s p m j o t p o u i f F . V T C G Y 4 c r p d l p o u i f Q j o e j h s n b q q f b s j o h p o u i f d v t u p n j b u p o U b c / U i f e s p q e p x o n f o v t i p x t b v b j i a c r h q j o t u b u d b o c f n b q q f e /

*Note: To swap pins currently allocated pin must be freed. A pin can be freed by allocating to any other available pin temporarily.*

## Interface Description & Timing

U i f T z o d i s p o p v t T i b w f G G P q s p w j e f t u i s f e j g f s o u z q f p g b d d f t t f t /

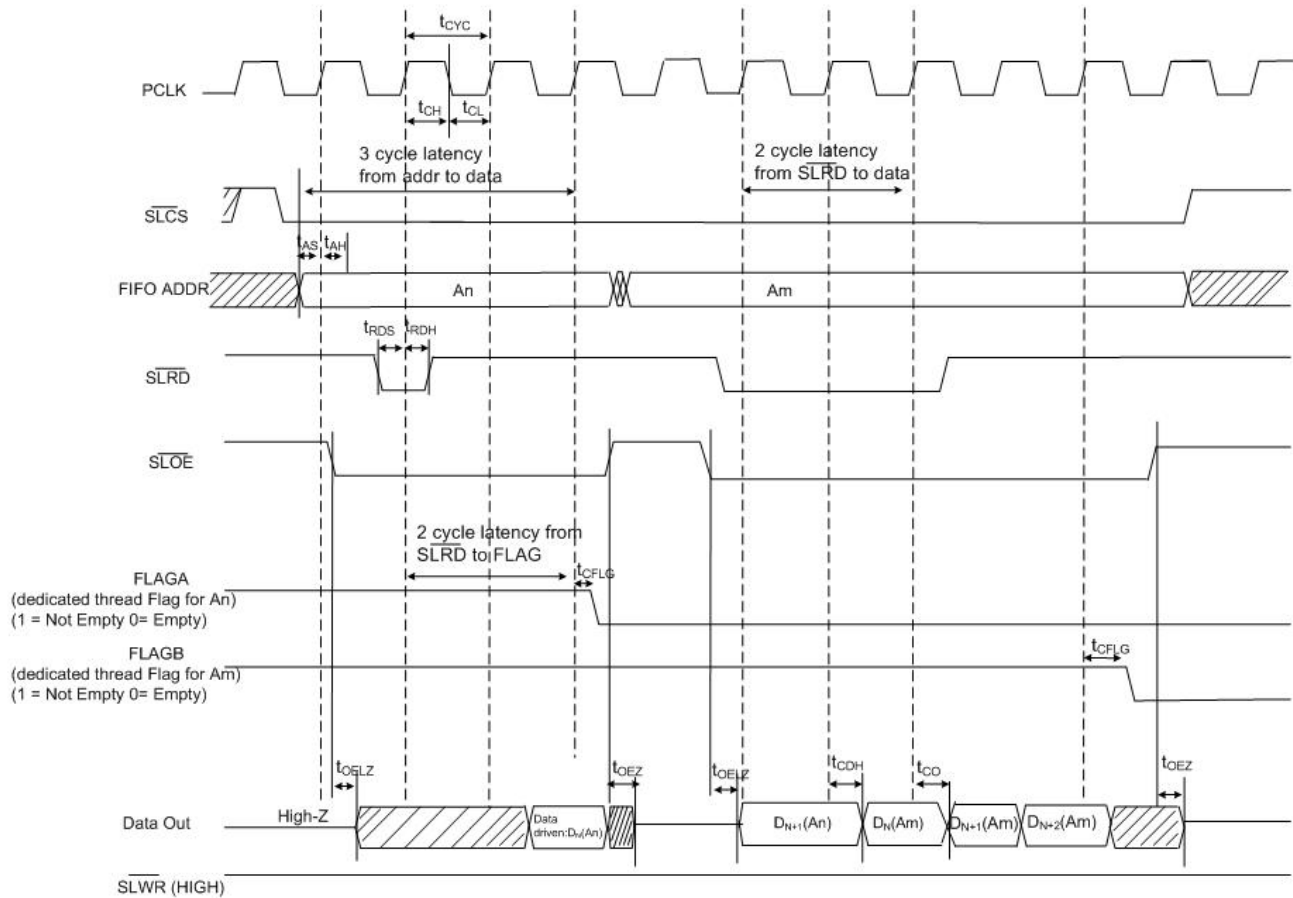
- S f b e . S f b e j o h g g n u i f t q f d i g f e b e e s f t t
- X s j f . X s j o h u p u i f b t t p d j b u f e c v g f s
- f s p r h o u i q b d l f u . D p n n j u j o h b f s p r h o u i q b d l f u /

### Read

U i f S f b e b d d f t t f t d b o c f t j o h r h d z d r h b d d f t t p s c v s t u b d d f t t / G h v s f 3 t i p x t u i f u j n j o h b o e t f r v f o d f g s B t z o d i s p o p v t T i b w f G G P s f b e b d d f t t f t / O p u f u b u s h j t u f s b d d f t t f t d b o o p u c f q f s p s n f e p w f s u i f T i b w f G G P j o u f s p d f /

- G G P b e e s f t t j t t u b c r h b o e u i f T M D T t j h o b n j t b t t f s f e /
- T M P F j t b t t f s f e / T M P F j t b o p v u v u f o b c r h p o r z - x i p t f t p r h g v o d u p o j t u p e s j m f u i f e b u b c v t
- T M S E j t b t t f s f e /
- U i f G G P q p j o u f s j t v q e b u f e p o u i f s j t j o h f e h f p g u f Q D M L - x i j r h u i f T M S E j t b t t f s f e / U i j t t u b s t u i f q s p q b h b u p o p g e b u b g g n u i f o f x m b e e s f t t f e m d b u p o u p u i f e b u b c v t / B g f s b q s p q b h b u p o e f r a z p g u d p n f b t v s f e g g n u i f s j t j o h f e h f p g Q D M L u i f o f x e b u b v b n m f j t q s f t f o u /

## Synchronous Read Cycle Timing



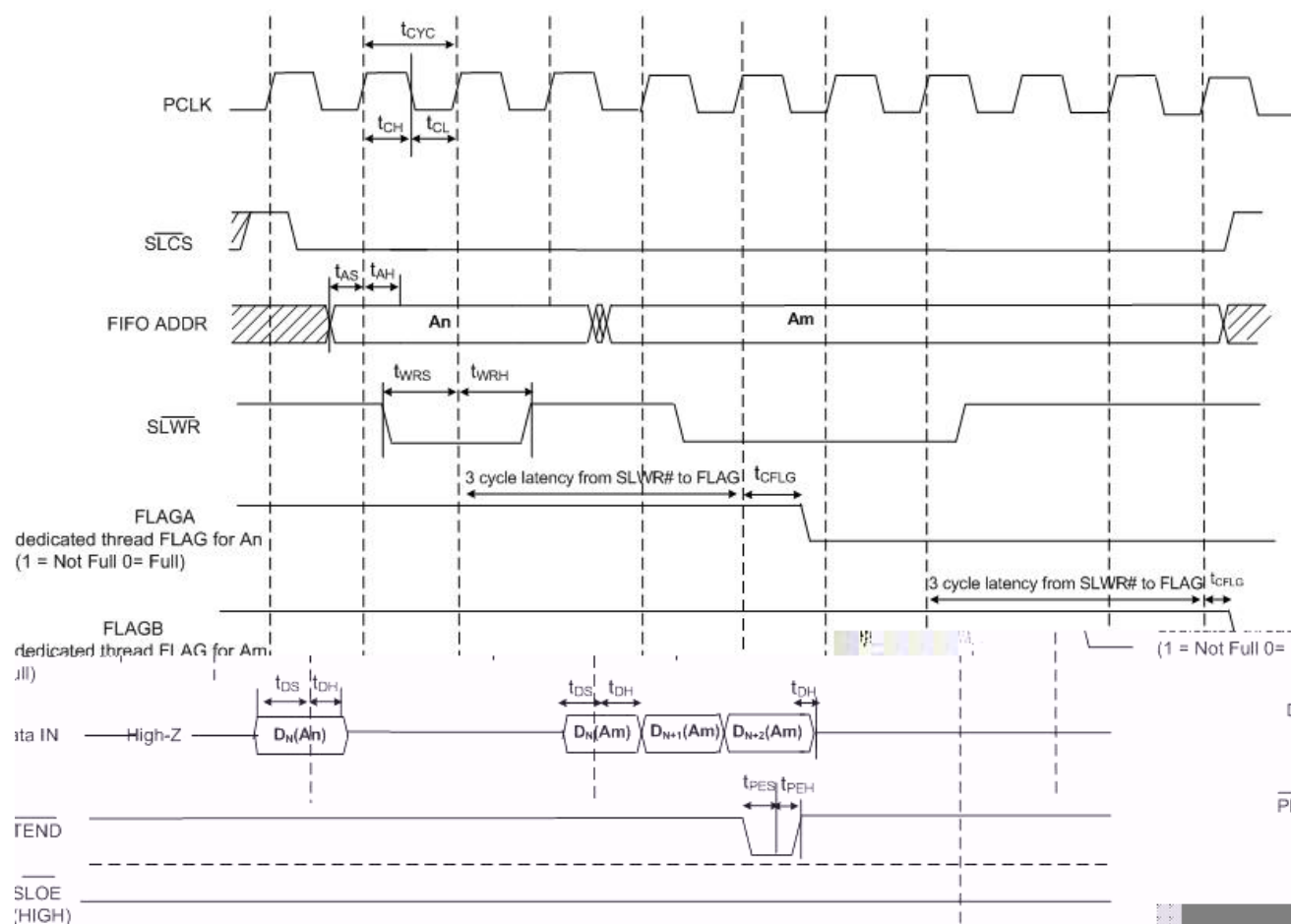
Uif bcpwf ephson -ebub O jt u f gstuwbje ebub sf be gpn u f GGP /Up i bwf ebub pou f GGP ebub cvt-TMPF n vtubrtf cf bttf sfe / Qpscvstun pef -u f TMSE boe TMPF bs rfgubttf sfe evsjoh u f foujsf evsbupogui f sf be/Xifo TMPF jt bttf sfe-u f ebub cvt jt esjwfo)x ju ebub gpn u f qsf wjvtrn bees ttf e GGP / Qpsf bdi tvctfrvfousjt joh feh f pgQDML-xi jrf u f TMSE jt bttf sfe-u f GGP qpjousjt jodsf n f ouf e boe u f of yueubub vbrnf jt qrbdf e pou f ebub cvt /

## Write

Uif X sjf bddfttft dbo cf tjohrf dzdrf bddftt pscvstubddftt / Ghvaf 4 ti pxt u f ujn joh boe tfr v f odf gpsTzodi spopvt Trhvf GGP x sjf bddfttft /Opuf u busf hjtuf sbddfttft dboopucf qf spsn fe pfw su f Trhvf GGP jousf sgd f /

- GGP bees ttf jt esjwfo boe TMDT jt bttf sfe
- Fyuf sobrm btuf sgd f sji f sbnpvqvut u f ebub pou u f ebub cvt
- TMK S jt bttf sfe
- Xi jrf u f TMK S jt bttf sfe-ebub jt x sjwfo pou f GGP boe pou f sjt joh feh f pgu f QDML-u f GGP qpjousjt jodsf n f ouf e
- Ui f GGP jt vqebuf e bgf sb ef rtoz pguX GMH gpn u f sjt joh feh f pgu f drpdll

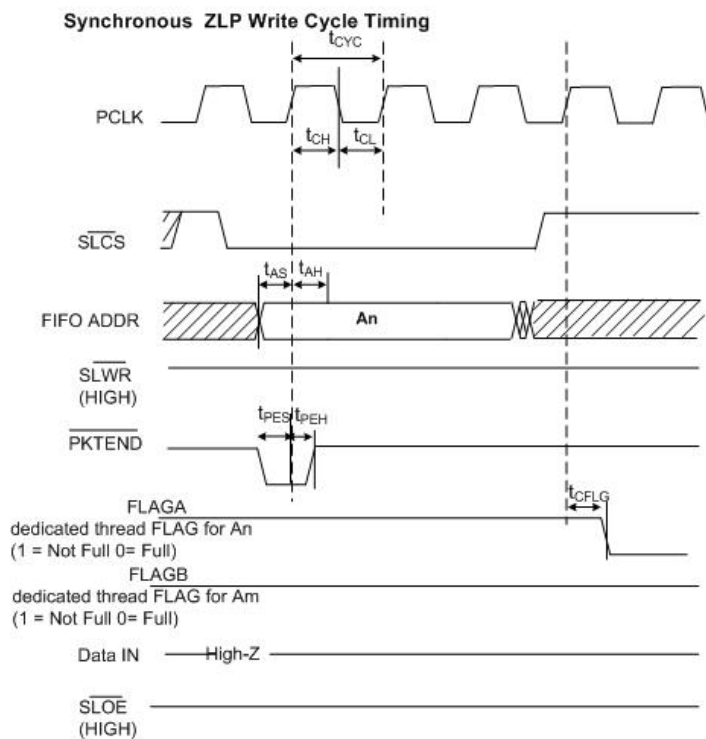
# Synchronous Write Cycle Timing



U i f t b n f t f r v f o d f p g f w f o u b t t i p x o j o b c v s t u s f b e j t t i p x o g p s b c v s t u x s j f / b c v s t u x s j f n p e f - T M X S e f . b t t f s u p o - u i f e b u b j t x s j f o u p u i f G G P b o e u i f o u f G G P q p j o u f s j t j o d s n f o u f e / B t i p s u q b d l f u d b o c f d p n n j u f e u p u i f V T C i p t u c z v t j o h Q L U F O E / B q q r j u b u p o q s p d f t t p s d p o o f d u f e t i p v r e b t t f s u Q L U F O E b i p o h x j i n t u x p s e p g e b u b b o e T M X S q v r t f d p s f t q p o e j o h u p u i f n t u x p s e / U i f G G P B E E S r j o f t t i p v r e c f d p o t u b o u e v s j o h u i f Q L U F O E b t t f s u p o /

## Zero Length Packet

B f s p r h o u i q b d l f u d b o c f d p n n j u f e u p u i f V T C i p t u c z v t j o h Q L U F O E / B q q r j u b u p o q s p d f t t p s d p o o f d u f e t i p v r e b t t f s u Q L U F O E



## Summary

U i f e b u b q s f t f o u f e i f s j t j o e j d b u j m f p o r n b o e n v t u o p u c f t f f o b t b t v c t u j u v f g s u f g y m t q f d j g d b u j o g p n x i j d i j u j t e s b x o / Q r i b t f w j t j .  
Dzqsf tt F . V T C © G Y 4 x f c t j f g s e f u b j r h e b o e r a u f t u E b u t i f f u /

## Notice of Disclaimer

™ Dzqsf tt T f n j d p o e v d u p s D p s a p s b u j o - 3 1 2 3 / U i f j o g s n b u j o d p o u b j o f e i f s j o j t t v c k f d u p d i b o h f x j u p v u o p u j d f / D z q s f t t  
T f n j d p o e v d u p s D p s a p s b u j o b t t v n f t o p s f t q p o t j c j r j z g s u f v t f p g b o z d j s d v j s z p u f s u b o d j s d v j s z f n c p e j f e j o b D z q s f t t  
T f n j d p o e v d u p s q s p e v d u / O p s e p f t j u d p o w f z p s j n q r n b o z r j a f o t f v o e f s q b u f o u p s p u f s s h i u / D z q s f t t T f n j d p o e v d u p s e p f t o p u b v u p s j f  
j t q s p e v d u t g s v t f b t d s j u d b m d p n q p o f o u t j o r j g . t v q q p s u t z t u f n t x i f s b n b r o d u j o p s d j n a s n b z s f b t p o b c m c f f y q f d u f e u p s f t v m j o  
t h o j g d b o u j o k v s z u p u f v t f s / U i f j o d n t j o p g D z q s f t t T f n j d p o e v d u p s q s p e v d u t j o r j g . t v q q p s u t z t u f n t b q q r a b u j o j n q r i t u b u i f  
n b o v g d u v s f s b t t v n f t b m s j l p g t v d i v t f b o e j o e p j o h t p j o e f n o j g f t D z q s f t t T f n j d p o e v d u p s b h b j o t u b m m l i b s h f t /