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Understanding Embedded - FPGAs (Field Programmable Gate Array)

Embedded - FPGAs, or Field Programmable Gate Arrays, are advanced integrated circuits that offer unparalleled flexibility and performance for digital systems. Unlike traditional fixed-function logic devices, FPGAs can be programmed and reprogrammed to execute a wide array of logical operations, enabling customized functionality tailored to specific applications. This reprogrammability allows developers to iterate designs quickly and implement complex functions without the need for custom hardware.

Applications of Embedded - FPGAs

The versatility of Embedded - FPGAs makes them indispensable in numerous fields. In telecommunications.

Details	
Product Status	Active
Number of LABs/CLBs	125
Number of Logic Elements/Cells	2000
Total RAM Bits	110592
Number of I/O	160
Number of Gates	-
Voltage - Supply	1.15V ~ 1.25V
Mounting Type	Surface Mount
Operating Temperature	-40°C ~ 125°C (TJ)
Package / Case	324-LFBGA
Supplier Device Package	324-UBGA (15x15)
Purchase URL	https://www.e-xfl.com/product-detail/intel/10m02dcu324a7g

(PEHGGHG 0XOWLSOLHU 6SHFLILFDWLRQV

7DEOH (PEHGGHG 0XOWLSOLHU 6SHFLILFDWLRQV IRU ,QWHO 0$; 'HYLFHV

0RGH	1XPEHU RI 0XOWLSOLHUV	3RZHU 6XSSO\ 0RGH	3HUIRUPDQFH			8QLW
			±,	±$ ±& ±$	±,	±&	
î ELW PXOWLSOLHU		6LQJOH VXSSO\ PRGH				0+]
		'XDO VXSSO\ PRGH				0+]
î ELW PXOWLSOLHU		6LQJOH VXSSO\ PRGH				0+]
		'XDO VXSSO\ PRGH				0+]

7UXH 33'6 DQG (PXODWHG 33'6B(B 5 7UDQVPLWWHU 7LPLQJ 6SHFLILFDWLRQV

7DEOH 7UXH 33'6 DQG (PXODWHG 33'6B(B 5 7UDQVPLWWHU 7LPLQJ 6SHFLILFDWLRQV IRU ,QWHO 0$; 'X

7UXH33'6 WUDQVPLWWHU LV RQO\ VXSSRUWHG DW 1R WRUPDO 2SHUDWLQJ (QYLURQPHQW DW WKH RXWSXW SLQ RI DOO , 2 EDQ

6\PERO	3DUDPHWHU	0RGH	±, ±$ ±& ±,			±$			±&			8QLW
			0LQ	7\S	0D[	0LQ	7\S	0D[	0LQ	7\S	0D[	
I+6&/.	,QSXW FORFN IUHTXHQF\ KLJK VSHHG , 2 SHUIRUPDQFH SLQ			[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
+6,2'5	'DWD UDWH KLJK VSHHG , 2 SHUIRUPDQFH SLQ	î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
I+6&/.	,QSXW FORFN IUHTXHQF\ ORZ VSHHG , 2 SHUIRUPDQFH SLQ			[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
		î		[2]			[2]			[2]		0+]
+6,2'5	'DWD UDWH ORZ VSHHG , 2 SHUIRUPDQFH SLQ	î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV
		î		[2]			[2]			[2]		0ESV

FRQWLQXHG

6\PERO	3DUDPHWHU	0RGH	±, ±$ ±& ±,			±$			±&			8QLW
			0LQ	7\S	0D[	0LQ	7\S	0D[	0LQ	7\S	0D[	
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
W87<	'XW\ F\FOH RQ WUDQVPLWWHU RXWSXW FORFN	2		2			2			2		
7&&6	7UDQVPLWWHU FKDQQHO WR FKDQQHO VNHZ	2	2	2		2	2		2	2		SV
W-LWWHU	2XWSXW MLWWHU KLJK VSHHG , 2 SHUIRUPDQFH SLQ	2	2	2		2	2		2	2		SV
	2XWSXW MLWWHU ORZ VSHHG , 2 SHUIRUPDQFH SLQ	2	2	2		2	2		2	2		SV
W,6(	5LVH WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W)$//	)DOO WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W2&.	7LPH UHTXLUHG IRU WKH 3// WR ORFN DIWHU CONF_DONE VLJQDO JRHV KLJK LQGLFDWLQJ WKH FRPSOHWLRQ RI GHYLFH FRQILJXUDWLRQ	2	2	2		2	2		2	2		PV

7&&6 VSHFLILFDWLRQV DSSO\ WR , 2 EDQNV IURP WKH VDPH VLGH RQO\

7; MLWWHU LV WKH MLWWHU LQGXFHG IURP FRUH QRLVH DQG , 2 VZLWFKLQJ QRLVH

6\PERO	3DUDPHWHU	0RGH	±, ±$ ±& ±,			±$			±&			8QLW
			0LQ	7\S	0D[	0LQ	7\S	0D[	0LQ	7\S	0D[	
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
W87<	'XW\ F\FOH RQ WUDQVPLWWHU RXWSXW FORFN	2		2			2			2		
7&&6	7UDQVPLWWHU FKDQQHO WR FKDQQHO VNHZ	4	2	2		2	2		2	2		SV
W[-LWWHU	2XWSXW MLWWHU KLJK VSHHG , 2 SHUIRUPDQFH SLQ	4	2	2		2	2		2	2		SV
	2XWSXW MLWWHU ORZ VSHHG , 2 SHUIRUPDQFH SLQ	2	2	2		2	2		2	2		SV
W5,6(	5LVH WLPH	± &42$' S)	2		2	2		2	2		2	SV
W)$//	)DOO WLPH	± &42$' S)	2		2	2		2	2		2	SV
W/2&.	7LPH UHTXLUHG IRU WKH 3// WR ORFN DIWHU CONF_DONE VLJQDO JRHV KLJK LQGLFDWLQJ WKH FRPSOHWLRQ RI GHYLFH FRQILJXUDWLRQ	4	2	2		2	2		2	2		PV

7&&6 VSHFLILFDWLRQV DSSO\ WR , 2 EDQNV IURP WKH VDPH VLGH RQO\

7; MLWWHU LV WKH MLWWHU LQGXFHG IURP FRUH QRLVH DQG , 2 VZLWFKLQJ QRLVH

6\PERO	3DUDPHWHU	0RGH	±& ±,			±$			±&			8QLW
			0LQ	7\S	0D[	0LQ	7\S	0D[	0LQ	7\S	0D[	
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
W67<	'XW\ F\FOH RQ WUDQVPLWWHU RXWSXW FORFN	2		2			2			2		
7&&6	7UDQVPLWWHU FKDQQHO WR FKDQQHO VNHZ	2	2	2		2	2		2	2		SV
W-LWWHU	2XWSXW MLWWHU	2	2	2		2	2		2	2		SV
W3,6(	5LVH WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W)3//	)DOO WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W2&.	7LPH UHTXLUHG IRU WKH 3// WR ORFN DIWHU CONF_DONE VLJQDO JRHV KLJK LQGLFDWLQJ WKH FRPSOHWLRQ RI GHYLFH FRQILJXUDWLRQ	2	2		2	2		2	2		PV	

7&&6 VSHFLILFDWLRQV DSSO\ WR , 2 EDQNV IURP WKH VDPH VLGH RQO\

7; MLWWHU LV WKH MLWWHU LQGXFHG IURP FRUH QRLVH DQG , 2 VZLWFKLQJ QRLVH

6\PERO	3DUDPHWHU	0RGH	±, ±$ ±& ±,			±$			±&			8QLW
			0LQ	7\S	0D[	0LQ	7\S	0D[	0LQ	7\S	0D[	
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
		î		2			2			2		0ESV
W87<	'XW\ F\FOH RQ WUDQVPLWWHU RXWSXW FORFN	2		2			2			2		
7&&6	7UDQVPLWWHU FKDQQHO WR FKDQQHO VNHZ	4	2	2		2	2		2	2		SV
W[-LWWHU	2XWSXW MLWWHU KLJK VSHHG , 2 SHUIRUPDQFH SLQ	1	2	2		2	2		2	2		SV
	2XWSXW MLWWHU ORZ VSHHG , 2 SHUIRUPDQFH SLQ	2	2	2		2	2		2	2		SV
W9,6(	5LVH WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W)$//	)DOO WLPH	± &/2$' S)	2		2	2		2	2		2	SV
W/2&.	7LPH UHTXLUHG IRU WKH 3// WR ORFN DIWHU CONF_DONE VLJQDO JRHV KLJK LQGLFDWLQJ WKH FRPSOHWLRQ RI GHYLFH FRQILJXUDWLRQ	1	2	2		2	2		2	2		PV

7&&6 VSHFLILFDWLRQV DSSO\ WR , 2 EDQNV IURP WKH VDPH VLGH RQO\

7; MLWWHU LV WKH MLWWHU LQGXFHG IURP FRUH QRLVH DQG , 2 VZLWFKLQJ QRLVH

/9'6 70'6 +L6SL 6/96 DQG 6XE /9'6 5HFHLYHU 7LPLQJ 6SHFLILFDWLRQV

6LQJOH 6XSSO\ 'HYLFHV /9'6 5HFHLYHU 7LPLQJ 6SHFLILFDWLRQV

7DEOH /9'6 5HFHLYHU 7LPLQJ 6SHFLILFDWLRQV IRU ,QWHO 0$; 6LQJOH 6XSSO\ 'HYLFHV

/9'6 UHFHLYHUV DUH VXSSRUWHG DW DOO EDQGV

6\PERO	3DUDPHWHU	0RGH	±& ±,		±$		±&		8QLW
			0LQ	0D[	0LQ	0D[	0LQ	0D[	
I+6&/.	,QSXW FORFN IUHTXHQF\ KLJK VSHHG , 2 SHUIRUPDQFH SLQ	Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
+6,2'5	'DWD UDWH KLJK VSHHG , 2 SHUIRUPDQFH SLQ	Î							0ESV
		Î							0ESV
		Î							0ESV
		Î							0ESV
		Î							0ESV
		Î							0ESV
I+6&/.	,QSXW FORFN IUHTXHQF\ ORZ VSHHG , 2 SHUIRUPDQFH SLQ	Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
		Î							0+]
+6,2'5	'DWD UDWH ORZ VSHHG , 2 SHUIRUPDQFH SLQ	Î							0ESV

FRQWLQXHG

6\PERO	3DUDPHWHU	0RGH	±& ±,		±$		±&		8QLW
			0LQ	0D[	0LQ	0D[	0LQ	0D[	
		î							0ESV
		î							0ESV
		î							0ESV
		î							0ESV
		î							0ESV
6:	6DPSOLQJ ZLQGRZ KLJK VSHHG , 2 SHUIRUPDQFH SLQ	²	²		²		²		SV
	6DPSOLQJ ZLQGRZ ORZ VSHHG , 2 SHUIRUPDQFH SLQ	²	²		²		²		SV
W[-LWWHU	,QSXW MLWWHU	²	²		²		²		SV
W/2&.	7LPH UHTXLUHG IRU WKH 3//² WR ORFN DOWN_DONE VLJQDO JRHV KLJK LQGLFDWLQJ WKH FRPSOHWLRQ RI GHYLFH FRQILJXUDWLRQ	²	²		²		²		PV

'DWH	9HUVLRQ	&KDQJHV
		‡ 8SGDWHG 667/ &ODVV , DQG ,, , 2 VWDQGDUG VSHFLILFDWLRQV IRU -('(& FRPSOLDQFH DV IROOR ² 9,/ $& 0D[8SGDWHG IURP 9 WR 9± ² 9,+ $& 0LQ 8SGDWHG IURP 9 WR 9 ‡ $GGHG D QRWH WR %/9'6 LQ 'LIIHUHQWLDO , 2 6WDQGDUGV 6SHFLILFDWLRQV IRU ,QWHO 0$; 'HY VXSSRUWHG LQ VLQJOH VXSSO\ GHYLFHV ‡ $GGHG D OLQN WR 0$; +LJK 6SHHG /9'6 , 2 8VHU *XLGH IRU WKH OLVW RI , 2 VWDQGDUGV VXSSR VXSSO\ GHYLFHV