



GW2A series of FPGA Products

Package & Pinout User Guide

UG111-2.2.1E, 12/14/2023

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Revision History

Date	Version	Description
06/18/2018	1.06E	Initial version.
06/04/2019	1.1E	PG484 package outline changed.
07/10/2019	1.2E	The GW2A-55 UG324 package added.
07/29/2019	1.3E	<ul style="list-style-type: none"> ● GW2A-18 PG484 package outline changed. ● GW2A-55 PG484 package outline added.
12/12/2019	1.4E	<ul style="list-style-type: none"> ● GW2A-55 UG324D package information added. ● GW2A-18 PG256E package information added.
03/06/2020	1.5E	<ul style="list-style-type: none"> ● Pin distribution table of GW2A-18 PG256C, UG324, and PG256E updated. ● Pin distribution table of GW2A-55 UG324 and UG324D updated. ● GW2A-18C and GW2A-55C added.
04/16/2020	1.5.1E	I/O Information of GW2A-55 UG324 updated.
09/25/2020	1.6E	The GW2A-55 UG676 package added.
07/16/2021	1.7E	The UG484 and PG256CF packages of GW2A-18 added.
08/25/2021	1.7.1E	PG256 package outline updated.
12/27/2021	1.8E	<ul style="list-style-type: none"> ● The PG256SF package of GW2A-18 added. ● The UG324F package of GW2A-55 added.
09/15/2022	1.9E	<ul style="list-style-type: none"> ● Note about thickness of QN88 package added. ● GW2A-55 UG484S package added. ● EQ144 package outline modified.
10/28/2022	2.0E	<ul style="list-style-type: none"> ● GW2A-18 PG484C package added. ● Pin definitions updated.
03/10/2023	2.1E	<ul style="list-style-type: none"> ● GW2A-18 LQ144 package removed. ● The note of “Table 2-1 Package Information, Max. User I/O, and LVDS Pairs” in Chapter 2 “Overview” updated.
03/30/2023	2.1.1E	The pin quantity of GW2A-18 PG256C, UG324, PG256E, and PG256CF packages as well as GW2A-55 UG324 package in Chapter 2.4 “Pin Quantity” updated.
09/01/2023	2.2E	<ul style="list-style-type: none"> ● Recommended PCB Layouts added. ● The descriptions of “2.5 Introduction to the I/O BANK” optimized. ● The info. of UG324F package for GW2A-55 devices added.
12/14/2023	2.2.1E	<ul style="list-style-type: none"> ● The note of “Table 2-1 Package Information, Max. User I/O, and LVDS Pairs” in “2 Overview” optimized. ● The note of “Table 2-3 Quantity of GW2A-18 Pins” and “Table 2-4 Quantity of GW2A-55 Pins” in “2.4 Pin Quantity” optimized. ● “Figure 4-1 Package Outline QN88” in “4 Package Diagrams” optimized.

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1 About This Guide

1.1 Purpose

This manual mainly contains an introduction to the GW2A series of FPGA products together with a definition of the pins, list of pin numbers, distribution of pin, and package diagrams.

1.2 Related Documents

The latest user guides are available on GOWINSEMI Website. You can find the related documents at www.gowinsemi.com:

- [DS102, GW2A series of FPGA Products Data Sheet](#)
- [UG290, Gowin FPGA Products Programming and Configuration User Guide](#)
- [UG110, GW2A-18 Pinout](#)
- [UG113, GW2A-55 Pinout](#)

1.3 Abbreviations and Terminology

The abbreviations and terminologies used in this manual are set out in Table 1-1 below.

Table 1-1 Abbreviations and Terminology

Abbreviations and Terminology	Name
EQ	ELQFP
FPGA	Field Programmable Gate Array
LQ	LQFP
LVDS	Low-Voltage Differential Signaling
PG	PBGA
QN	QFN
UG	UBGA

1.4 Support and Feedback

Gowin Semiconductor provides customers with comprehensive technical support. If you have any questions, comments, or suggestions, please feel free to contact us directly using the information provided below.

Website: www.gowinsemi.com

E-mail: support@gowinsemi.com

2 Overview

The GW2A series of FPGA products are the first-generation products of Arora family. They are available in various forms that offer high I/O compatibility and flexible usage.

2.1 PB-Free Package

The GW2A series of FPGA Products are PB free, in line with the EU ROHS environmental directives. The substances used in the GW2A series of FPGA products are in full compliance with the IPC-1752 standards.

2.2 Package Information, Max. User I/O, and LVDS Pairs

Table 2-1 Package Information, Max. User I/O, and LVDS Pairs

Package	Pitch(mm)	Size(mm)	GW2A-18	GW2A-55
EQ144	0.5	22 x 22	119 (34)	-
MG196	0.5	8 x 8	114 (39)	-
PG1156	1.0	35 x 35	-	607 (152)
PG256	1.0	17 x 17	207 (73)	-
PG256C	1.0	17 x 17	190 (64)	-
PG256CF	1.0	17 x 17	190 (65)	-
PG256E	1.0	17 x 17	162 (29)	-
PG256S	1.0	17 x 17	192 (72)	-
PG256SF	1.0	17 x 17	192 (71)	-
PG484	1.0	23 x 23	319 (78)	319 (76)
PG484C	1.0	23 x 23	355 (89)	-
QN88	0.4	10 x 10	66 (22)	-
UG324	0.8	15 x 15	239 (90)	239 (86)
UG324D	0.8	15 x 15	-	239 (71)
UG324F	0.8	15 x 15	-	239 (86)
UG484	0.8	19 x 19	379 (94)	-
UG484S	0.8	19 x 19	-	344 (91)
UG676	0.8	21 x 21	-	525 (111)

Note!

- The package types in this manual are written with abbreviations. See [1.3 Abbreviations and Terminology](#) for details.
- The JTAGSEL_N and JTAG pins cannot be used as I/O simultaneously.

2.3 Power Pin

Table 2-2 GW2A Power Pin

VCC	VCCIO0	VCCIO1	VCCIO2
VCCIO3	VCCIO4	VCCIO5	VCCIO6
VCCIO7	VCCX	VSS	NC
VCCPLL0	VCCPLL1	VCCPLLR0	VCCPLLR1
VCCPLL	VCCPLLR	-	-

2.4 Pin Quantity

2.4.1 Quantity of GW2A-18 Pins

Table 2-3 Quantity of GW2A-18 Pins

Pin Type	GW2A-18													
	QN88	EQ144	MG196	PG256	PG256S	PG256C	UG324	PG484	PG484C	PG256E	UG484	PG256CF	PG256SF	
I/O Single end/Differential pair /LVDS ^[1]	BANK0	8/4/2	19/8/4	12/6/4	29/14/10	20/10/8	25/12/8	28/14/12	40/20/10	41/20/11	26/13/5	48/24/12	26/12/8	20/10/8
	BANK1	9/4/4	12/6/6	14/7/6	20/10/10	19/9/9	26/12/11	28/14/11	39/18/10	45/22/11	14/7/3	47/23/12	25/12/11	19/9/9
	BANK2	4/2/1	12/6/3	16/8/5	20/10/7	30/15/11	16/7/5	28/14/10	46/23/11	47/23/12	12/6/2	47/23/11	16/7/5	30/15/11
	BANK3	17/6/3	21/9/5	25/12/7	29/13/10	37/18/10	36/17/9	39/19/11	31/15/8	40/18/9	31/12/4	47/23/11	36/17/9	37/18/9
	BANK4	8/3/3	17/8/6	13/6/4	36/18/12	16/7/7	27/13/11	28/14/12	40/20/10	43/21/10	18/9/3	48/24/12	27/13/11	16/7/7
	BANK5	10/5/5	16/8/5	8/4/3	36/18/11	18/9/8	26/12/9	28/14/12	40/20/10	47/23/12	18/9/4	48/24/12	26/12/9	18/9/8
	BANK6	9/4/4	11/5/3	12/6/5	18/9/8	24/12/8	19/9/7	28/14/11	34/17/8	47/23/12	20/10/4	47/23/12	19/9/7	24/12/8
	BANK7	1/0/0	8/4/2	14/7/5	16/7/5	28/14/11	15/7/5	32/16/11	46/23/11	45/22/12	23/11/4	47/23/12	15/7/5	28/14/11
Max. User I/O ^[2]	66	119	114	207	192	190	239	319	355	162	379	190	192	
Differential Pair	28	54	56	99	94	89	119	157	172	77	187	89	94	
TrueLVDS Output	22	34	39	73	72	65	90	78	89	26	94	65	71	
VCC	4	0	0	6	6	0	0	32	21	0	12	0	6	
VCCX	0	0	8	2	8	0	12	8	4	6	0	0	8	
VCCIO0	1	1	2	2	3	3	3	3	5	2	4	3	3	
VCCIO1	1	1	2	2	2	3	3	3	5	2	5	3	2	
VCCIO2	0	0	3	1	3	2	3	3	4	2	0	2	3	
VCCIO3	1	2	3	2	3	2	3	3	4	3	5	2	3	

Pin Type	GW2A-18												
	QN88	EQ144	MG196	PG256	PG256S	PG256C	UG324	PG484	PG484C	PG256E	UG484	PG256CF	PG256SF
VCCIO4	1	1	2	2	2	3	3	3	5	2	4	3	2
VCCIO5	1	1	2	2	2	3	3	3	5	6	5	3	2
VCCIO6	0	0	3	1	3	2	3	3	4	2	0	2	3
VCCIO7	1	2	3	2	2	0	3	3	4	2	0	0	2
VCCIO6/VCCIO7	0	0	0	0	0	0	0	0	0	0	9	0	0
VCCX/VCCIO2	0	0	0	0	0	0	0	0	0	0	4	0	0
VCCX/VCCIO7	0	0	0	0	0	2	0	0	0	0	0	2	0
VCC/VCCPLL1 ^[3]	0	4	0	0	0	0	0	0	0	0	0	0	0
VCCX/ VCCIO2/ VCCIO6 ^[3]	2	2	0	0	0	0	0	0	0	0	0	0	0
VCCPLL0	0	1	0	0	0	0	0	0	0	0	1	0	0
VCCPLL1	1	0	0	0	0	0	0	0	0	0	1	0	0
VCCPLL0	0	1	0	0	0	0	0	0	0	0	1	0	0
VCCPLL1	1	1	0	0	0	0	0	0	0	0	1	0	0
VCCPLL	0	0	0	1	1	0	0	2	2	0	0	0	1
VCCPLL	0	0	0	1	1	0	0	2	2	0	0	0	1
VCC/VCCPLL/VCCPLL	0	0	0	0	0	10	11	0	0	11	0	10	0
VCC/VCCPLL0/VCCPLL1/ VCCPLL0/VCCPLL1	0	0	15	0	0	0	0	0	0	0	0	0	0
VSS	7	7	39	24	26	33	37	95	63	52	52	33	26
MODE0	1	1	1	1	1	1	1	1	0	0	1	1	1
MODE1	1	1	1	1	1	1	1	1	0	0	1	1	0
MODE2	0	1	0	1	0	1	1	1	0	0	1	1	1
EXTR	1	1	0	1	0	0	0	1	0	0	0	0	1
JTAGSEL_N	0	0	0	0	1	1	1	1	1	0	1	1	1

Pin Type	GW2A-18												
	QN88	EQ144	MG196	PG256	PG256S	PG256C	UG324	PG484	PG484C	PG256E	UG484	PG256CF	PG256SF
NC	0	0	0	0	1	2	0	0	0	4	0	2	1

Note!

- [1] Single end/ Differential/LVDS I/O quantity include CLK pins, and download pins.
- [2] The JTAGSEL_N and JTAG pins cannot be used as I/O simultaneously.
- [3] Pin multiplexing.

2.4.2 Quantity of GW2A-55 Pins

Table 2-4 Quantity of GW2A-55 Pins

Pin Type	GW2A-55							
	UG324	UG324D	PG484	PG1156	UG676	UG484S	UG324F	
I/O Single end/Differential pair/LVDS/LVDS output ^[1]	BANK0	28/14/10	28/14/10	40/20/10	80/40/14/6	68/34/14/0	60/29/14	28/14/10
	BANK1	28/14/13	28/14/13	39/19/10	79/39/16/4	71/35/16/0	51/25/15	28/14/13
	BANK2	28/14/10	28/14/10	46/23/10	80/40/10/10	66/33/10/3	42/21/9	28/14/10
	BANK3	40/20/9	40/20/9	31/15/8	61/30/9/7	58/29/9/4	27/13/7	40/20/9
	BANK4	28/14/13	28/14/13	40/20/10	80/40/16/4	72/36/16/0	60/29/16	28/14/13
	BANK5	28/14/13	28/14/13	40/20/10	80/40/14/6	68/34/14/0	48/24/14	28/14/13
	BANK6	28/14/9/1	28/5/2	34/17/8	64/32/8/8	56/28/8/4	26/13/7	28/14/9/1
	BANK7	32/16/10	32/5/1	46/23/10	80/40/10/10	66/33/10/3	30/15/9	32/16/10
Max. User I/O ^[2]	239	239	319	607	525	344	239	
Differential Pair	119	99	159	303	262	169	119	
True LVDS Output	86	71	76	152	111	91	86	
Only True LVDS Output ^[3]	0	0	0	55	14	0	0	
VCC	0	11	32	32	19	0	11	
VCCX	12	12	8	16	14	14	12	
VCCIO0	3	3	3	12	5	7	3	
VCCIO1	3	3	3	11	4	6	3	
VCCIO2	3	3	3	12	5	4	3	
VCCIO3	3	3	3	11	4	4	3	
VCCIO4	3	3	3	12	5	7	3	
VCCIO5	3	3	3	11	4	6	3	
VCCIO6	3	3	3	12	5	4	3	
VCCIO7	3	3	3	11	4	4	3	
VCCPLL	0	0	2	2	2	0	0	
VCCPLLR	0	0	2	2	2	0	0	
VCC/VCCPLL/VCCPLL R	11	0	0	0	0	20	0	
VSS	37	37	95	172	77	59	37	
MODE0	0	0	1	1	1	0	0	
MODE1	0	0	1	1	1	0	0	
MODE2	1	1	1	1	1	0	1	
MODE0/MODE1	1	1	0	0	0	0	1	
EXTR	0	0	1	1	0	0	0	
NC	0	0	0	231	0	4	0	
JTAGSEL_N	1	1	1	1	1	1	1	

Note!

- [1] I/O Single end/ Differential pair/LVDS/ LVDS output quantity include CLK pins and download pins.
- [2] The JTAGSEL_N and JTAG pins cannot be used as I/O simultaneously.
- [3] Support true LVDS output only, do not support input.

2.5 Introduction to the I/O BANK

There are eight I/O Banks in the GW2A series of FPGA products.

Please refer to [DS102, GW2A series of FPGA Products Data Sheet > 2.3 Input/Output Blocks](#) for detailed Bank distribution schematic.

This manual provides an overview of the distribution view of the pins in the GW2A series of FPGA products. Please refer to [3 View of Pin Distribution](#) for further details. Different IO Banks in the GW1N series FPGA products are marked with different colors.

User I/O, power, and ground are marked with different symbols and colors. The various symbols and colors used for the various pins are defined as follows:

- “

UG111-2.2.1E

3 View of Pin Distribution

3.1 View of GW2A-18 Pins Distribution

3.1.1 View of QN88 Pins Distribution

Figure 3-1 GW2A-18 QN88 View of Pins Distribution (Top View)



Table 3-1 Other Pins in GW2A-18 QN88

VCC	1, 22, 45, 66
VCCX/ VCCIO2/ VCCIO6	12, 64
VCCIO0	78
VCCIO1	67
VCCIO3	58
VCCIO4	44
VCCIO5	23
VCCIO7	3
VCCPLL1	14
VCCPLL1R	50
VSS	2, 21, 24, 43, 46, 65, 68
EXTR	47
MODE	87, 88

3.1.2 View of EQ144 Pins Distribution

Figure 3-2 GW2A-18 EQ144 View of Pins Distribution

Table 3-2 Other Pins in GW2A-18 EQ144

VCC/VCCPLL1	1, 36, 73, 108
VCCX/ VCCIO2/ VCCIO6	31, 103
VCCIO0	127
VCCIO1	109
VCCIO3	77, 91
VCCIO4	55
VCCIO5	37
VCCIO7	5, 19
VCCPLL0	8
VCCPLL0	104
VCCPLL1	81
VSS	2, 17, 35, 53, 74, 89, 107
EXTR	75
MODE	142, 143, 144

3.1.3 View of MG196 Pins Distribution

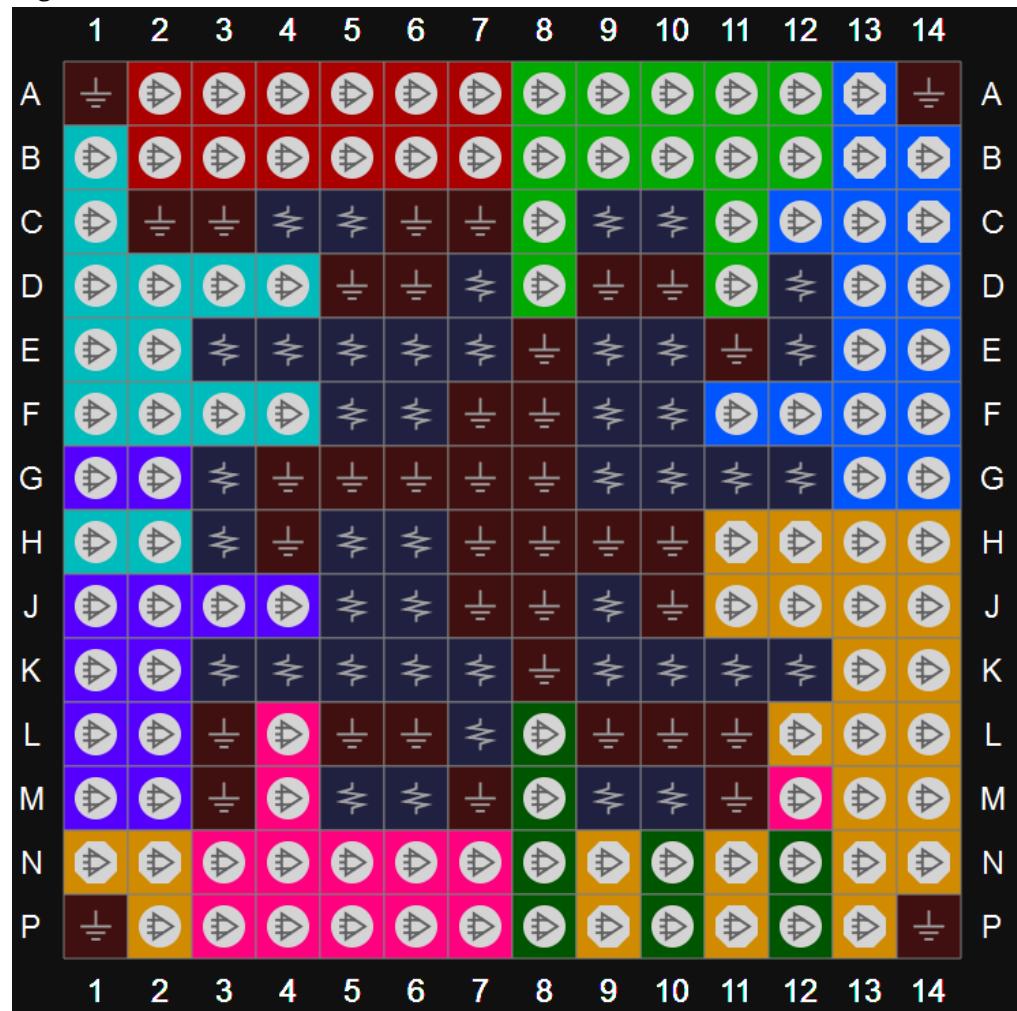
Figure 3-3 GW2A-18 MG196 View of Pins Distribution

Table 3-3 Other Pins in GW2A-18 MG196

VCC/VCCPLL0/VCCPLL1/ VCCPLL0/VCCPLL1	E10, E5, E6, E9, F10, F5, F6, F9, J5, J6, J9, K10, K5, K6, K9
VCCIO0	C10, C4
VCCIO1	C5, C9
VCCIO2	D12, E12, G11
VCCIO3	G12, K11, K12
VCCIO4	M10, M5
VCCIO5	M6, M9
VCCIO6	E3, E4, G3
VCCIO7	H3, K3, K4
VCCX	D7, E7, G10, G9, H5, H6, K7, L7
VSS	A1, A14, C2, C3, C6, C7, D10, D5, D6, D9, E11, E8, F7, F8, G4, G5, G6, G7, G8, H10, H4, H7, H8, H9, J10, J7, J8, K8, L10, L11, L3, L5, L6, L9, M11, M3, M7, P1, P14
MODE	N9, P13

3.1.4 View of PG256 Pins Distribution

Figure 3-4 GW2A-18 PG256View of Pins Distribution

Table 3-4 Other Pins in GW2A-18 PG256 (Power, MODE, and Ground, compatible with GW1N)

VCC	A1, A16, G7, K10, T1, T16
VCCIO0	E13, H10
VCCIO1	J10, M13
VCCIO2	N12
VCCIO3	K8, N5
VCCIO4	M4, J7
VCCIO5	E4, H7
VCCIO6	D5
VCCIO7	D12, G9
VCCX	G8, K9
VCCPLL	G10
VCCPLLR	K7
VSS	B2, B15, C3, C14, D4, D13, E5, E12, F6, F11, H8, H9, J8, J9, L6, L11, M5, M12, N4, N13, P3, P14, R2, R15
EXTR	L7
MODE	B16, C15, M16

3.1.5 View of PG256S Pins Distribution

Figure 3-5 GW2A-18 PG256S View of Pins Distribution



Table 3-5 Other Pins in GW2A-18 PG256S

VCC	G7, G9, H8, J9, K10, K8
VCCIO0	B4, B9, D7
VCCIO1	B13, D10
VCCIO2	D15, G13, J15
VCCIO3	K13, N15, R13
VCCIO4	N10, R8
VCCIO5	R4, N7
VCCIO6	J2, K4, N2
VCCIO7	D2, G4
VCCX	E5, F11, F8, G10, H6, J10, L6, L9
VCCPLL	J7
VCCPLL	H10
VSS	A1, A16, B11, B7, D13, D4, E9, G15, G2, G8, H12, H7, H9, J5, J8, K7, K9, L15, L2, M8, N13, P3, R10, R6, T1, T16
NC	P14
MODE	T11, N11
JTAGSEL_N	D12

3.1.6 View of PG256C Pins Distribution

Figure 3-6 GW2A-18 PG256C View of Pins Distribution



Table 3-6 Other Pins in GW2A-18 PG256C

VCC/VCCPLL/VCCPLLR	D13, G10, G6, G7, G8, G9, H11, H6, K7, N4
VCCIO0	A1, C4, C7
VCCIO1	A16, C10, C13
VCCIO2	E14, G14
VCCIO3	K14, M14
VCCIO4	P10, P13, T16
VCCIO5	P4, P7, T1
VCCIO6	K3, M3
VCCX /VCCIO7	E3, G3
VCCPLL	L5
VCCPLLR	F12
VSS	B15, B2, C12, C5, D10, D7, E12, E13, E2, E4, G13, G4, H10, H15, H16, H7, H8, H9, J10, J7, J8, J9, K13, K4, M13, M4, M5, N10, N7, P12, P5, R15, R2
NC	L5, F12
MODE	H13, H12, G12
JTAGSEL_N	C11

3.1.7 View of UG324 Pins Distribution

Figure 3-7 GW2A-18 UG324 View of Pins Distribution (Top View)

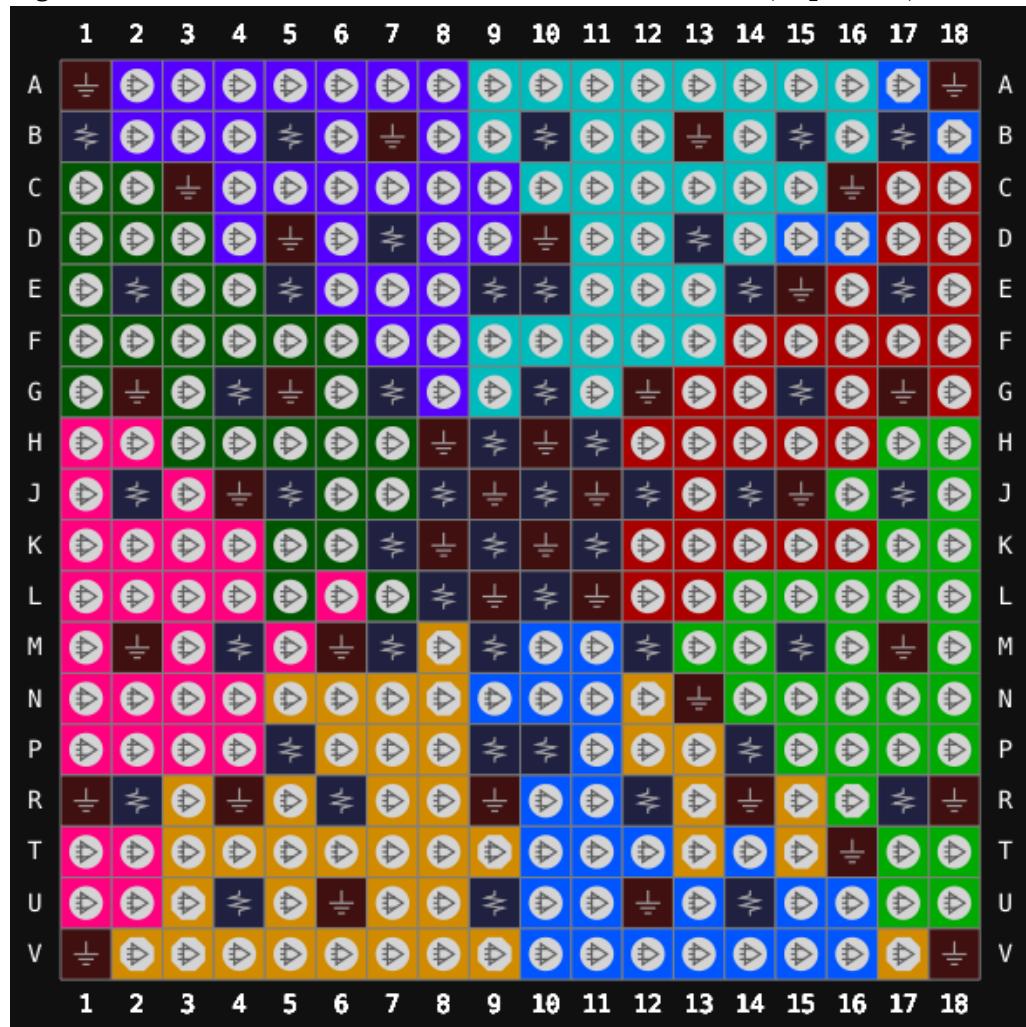


Table 3-7 Other Pins in GW2A-18 UG324

VCC/VCCPLL L/VCCPLL R	G7,H11,H9 J10,J8,K11,K9,L10,L8,M12,M7
VCCIO0	E17,G15,J14
VCCIO1	J17,M15,R17
VCCIO2	P9,R12,U14
VCCIO3	R6,U4,U9
VCCIO4	J5,M4,R2
VCCIO5	E2,G4,J2
VCCIO6	B10,B5,D7
VCCIO7	B15,D13,E10
VSS	A1,A18,B13,B7,C16,C3,D10,D5,E15,G12,G17,G2,G5,H10,H8,J11, J1,J4,J9,K10,K8,L11,L9,M17,M2,M6,N13,R1,R14,R18,R4,R9,T16, U12,U6,V1
MODE	T15,N12
JTAGSEL_N	R16

3.1.8 View of PG484 Pins Distribution

Figure 3-8 GW2A-18 PG484 View of Pins Distribution (Top View)

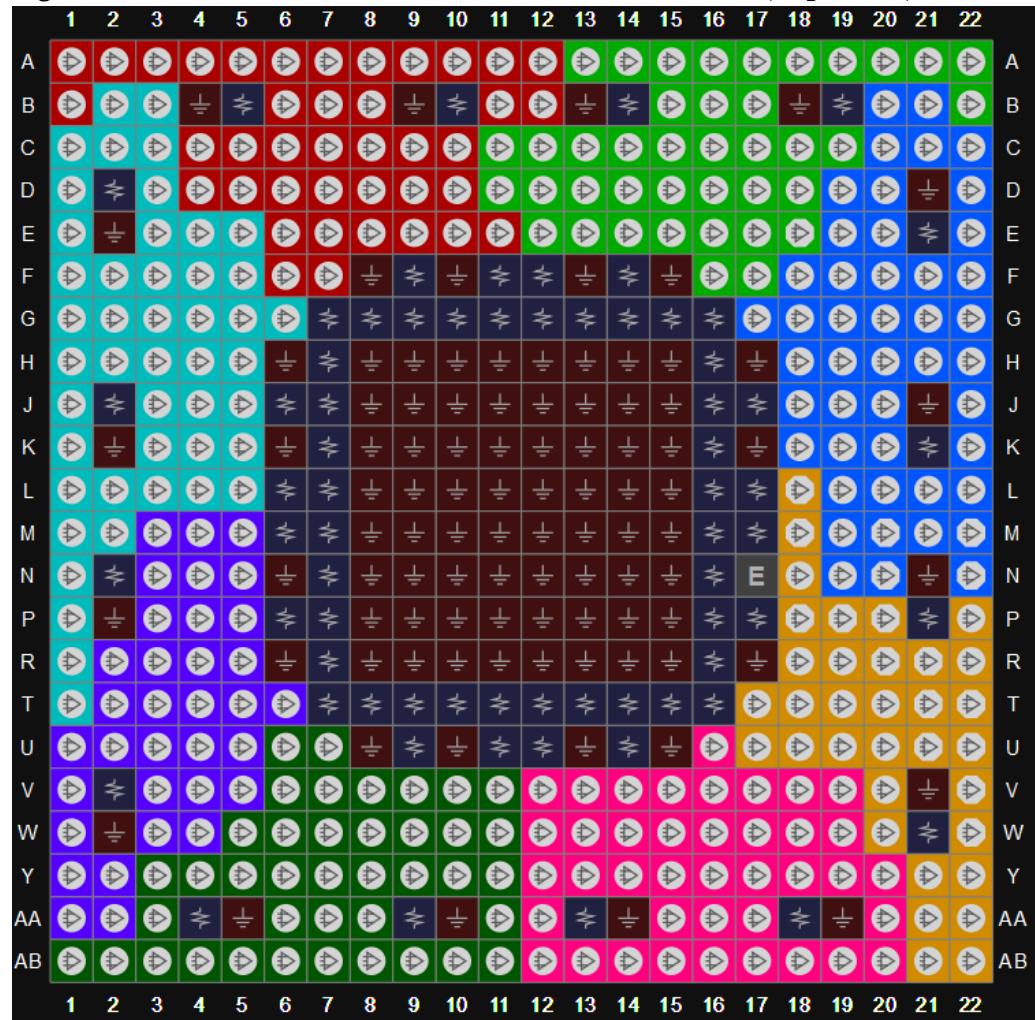


Table 3-8 Other Pins in GW2A-18 PG484

VCC	G10, G11, G12, G13, G14, G15, G16, G7, G8, G9, H16, H7, J16, J7, L16, L7, M16, M7, P16, P7, R16, R7, T10, T11, T12, T13, T14, T15, T16, T7, T8, T9
VCCIO0	B5, B10, F11
VCCIO1	B14, B19, F12
VCCIO2	E21, K21, L17
VCCIO3	M17, P21, W21
VCCIO4	AA13, AA18, U12
VCCIO5	U11, AA4, AA9
VCCIO6	M6, N2, V2
VCCIO7	D2, J2, L6
VCCX	F14, F9, J6, J17, P6, P17, U9, U14
VCCPLL	N7, K7
VCCPLLR	N16, K16
VSS	AA10, AA14, AA19, AA5, B13, B18, B4, B9, D21, E2, F10, F13, F15, F8, H10, H11, H12, H13, H14, H15, H17, H6, H8, H9, J10, J11, J12,

	J13, J14, J15, J21, J8, J9, K10, K11, K12, K13, K14, K15, K17, K2, K6, K8, K9, L10, L11, L12, L13, L14, L15, L8, L9, M10, M11, M12, M13, M14, M15, M8, M9, N10, N11, N12, N13, N14, N15, N21, N6, N8, N9, P10, P11, P12, P13, P14, P15, P2, P8, P9, R10, R11, R12, R13, R14, R15, R17, R6, R8, R9, U10, U13, U15, U8, V21, W2
EXTR	N17
MODE	U22, U21, T22
JTAGSEL_N	E18

3.1.9 View of PG484C Pins Distribution

Figure 3-9 GW2A-18 PG484C View of Pins Distribution

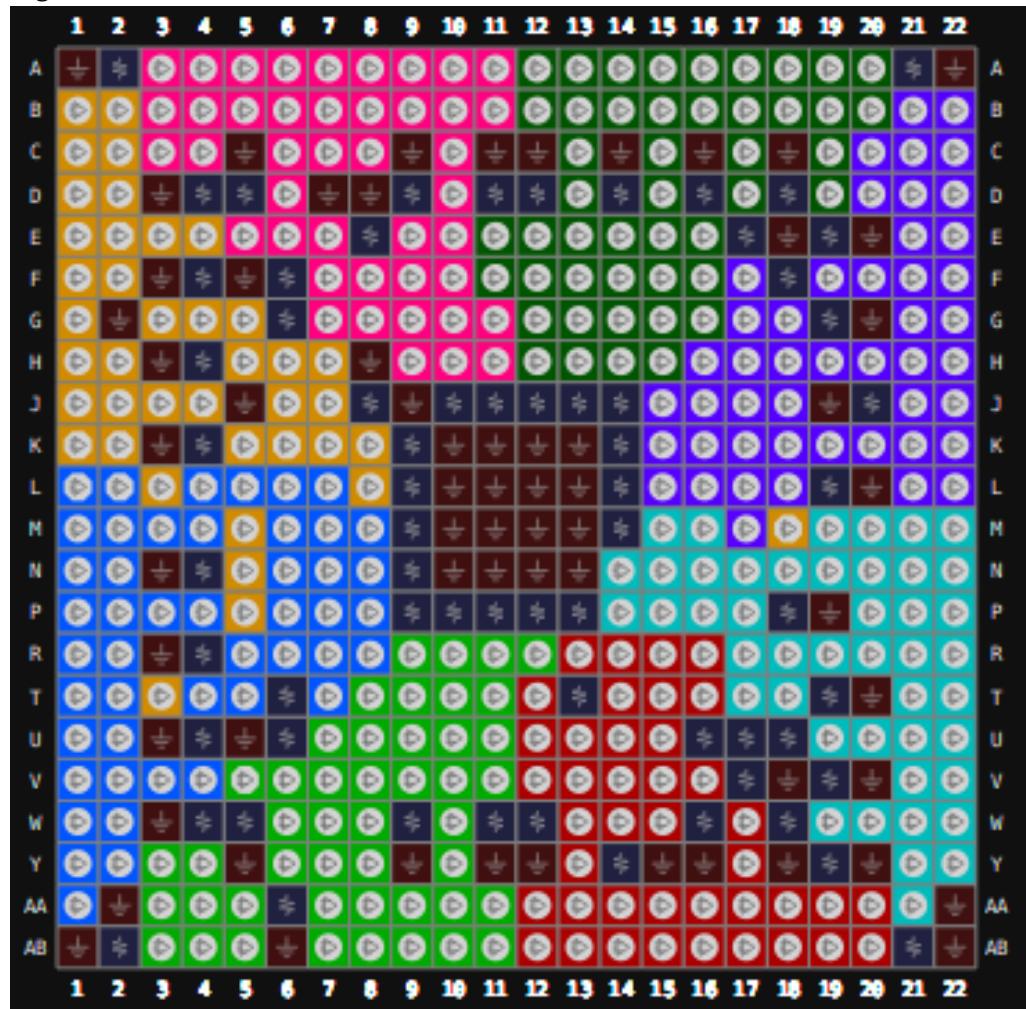


Table 3-9 Other Pins in GW2A-18 PG484C

VCC	P10, N9, U17, J8, T13, P13, J10, J13, K14, P9, J12, U16, L14, P11, K9, J14, L9, P12, J11, M14, M9
VCCIO0	W16, W18, W12, Y14, AB21
VCCIO1	W9, W5, W11, AB2, AA6
VCCIO2	F4, D4, H4, K4
VCCIO3	N4, W4, U4, R4
VCCIO4	D11, D5, D9, A2, E8
VCCIO5	D16, D18, A21, D14, D12
VCCIO6	G19, L19, E19, J20
VCCIO7	P18, T19, V19, Y19
VCCX	U18, F18, G6, T6
VCCPLL	U6, E17
VCCPLLR	F6, V17
VSS	L10, L11, M10, M11, L12, L13, M12, M13, N11, K11, N12, K12, K13, N13, N10, K10, J9, D7, J5, H8, A1, C5, C9, C11, C12, C14, C16, A22, E20, G20, L20, P19, V20, Y20, AB22, Y18, Y16, Y12, Y11, Y9, Y5, AB1, N3, U3, W3, D3, F3, K3, G2, AA2, AA22, H3, R3, AB6, Y15, T20, J19, C18, D8, U5, E18, F5, V18
JTAGSEL_N	V5

3.1.10 View of PG256E Pins Distribution

Figure 3-10 GW2A-18 PG256E View of Pins Distribution



Table 3-10 Other Pins in GW2A-18 PG256E

VCC/VCCPLL L/VCCPLL R	F5,G10,G8,H7,J10,K7,K9,L8,L9,M10,M7
VCCIO0	E7,F7
VCCIO1	E10,F9
VCCIO2	G12,H11
VCCIO3	F12,N7,N8
VCCIO4	J11,M13
VCCIO5	N10,N11,N12,N5,N6,N9
VCCIO6	J6,M4
VCCIO7	G5,H6
VCCX	F8,H12,H5,K12,K5,L10
VSS	A1,A16,B12,B4,B8,D15,E2,F10,F11,F6,G7,G9,H10,H15,H8,H9,J12,J2,J5,J7,J8,J9,K10,K8,L12,L6,L7,M11,M12,M15,M5,M6,N13,N2,N4,P13,P4,R10,R11,R12,R13,R4,R5,R6,R7,R8,R9,T1,T13,T16,T4,L11
NC	G6,G11,K11,K6

3.1.11 View of UG484 Pins Distribution

Figure 3-11 GW2A-18 UG484 View of Pins Distribution

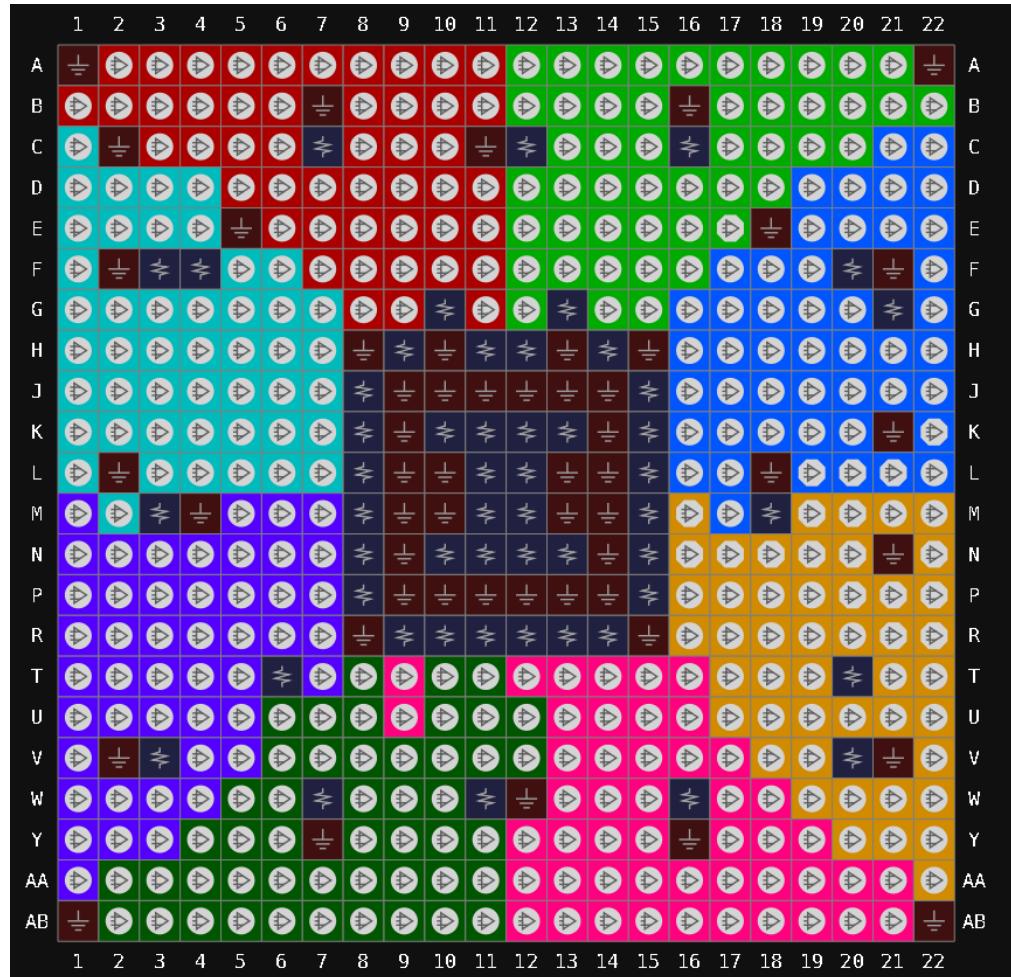


Table 3-11 Other Pins in GW2A-18 UG484

VCC	K10,K11,K12,K13,L11,L12,M11,M12,N10,N11,N12,N13
VCCIO0	C7,G10,H11,H9
VCCIO1	C12,C16,G13,H12,H14
VCCIO3	M15,M18,N15,P15,V20
VCCIO4	R12,R13,R14,W16
VCCIO5	R10,R11,R9,W11,W7
VCCIO6/VCCIO7	F3,J8,K8,L8,M3,M8,N8,P8,V3
VCCX/VCCIO2	F20,J15,K15,L15
VCCPLL0	F4
VCCPLL1	T6
VCCPLL0	G21
VCCPLL1	T20
VSS	A1,A22,AB1,AB22,B16,B7,C11,C2,E18,E5,F2,F21,H10,H13,H15,H8,J10,J11,J12,J13,J14,J9,K14,K21,K9,L10,L13,L14,L18,L2,L9,M10,M13,M14,M4,M9,N14,N21,N9,P10,P11,P12,P13,P14,P9,R15,R8,V2,V21,W12,Y16,Y7

3.1.12 View of PG256CF Pins Distribution

Figure 3-12 GW2A-18 PG256CF View of Pins Distribution



Table 3-12 Other Pins in GW2A-18 PG256CF

VCC/VCCPLL/ VCCPLLR	D13, G10, G6, G7, G8, G9, H11, H6, K7, N4
VCCIO0	A1, C4, C7
VCCIO1	A16, C10, C13
VCCIO2	E14, G14
VCCIO3	K14, M14
VCCIO4	P10, P13, T16
VCCIO5	P4, P7, T1
VCCIO6	K3, M3
VCCX /VCCIO7	E3, G3
VSS	B15, B2, C12, C5, D10, D7, E12, E13, E2, E4, G13, G4, H10, H15, H16, H7, H8, H9, J10, J7, J8, J9, K13, K4, M13, M4, M5, N10, N7, P12, P5, R15, R2
NC	L5, F12
MODE	H13, H12, G12
JTAGSEL_N	C11

3.1.13 View of PG256SF Pins Distribution

Figure 3-13 GW2A-18 PG256SF View of Pins Distribution



Table 3-13 Other Pins in GW2A-18 PG256SF

VCC	G7,G9,H8,J9,K10,K8
VCCIO0	D7,B4,B9
VCCIO1	D10,B13
VCCIO2	D15,G13,J15
VCCIO3	K13,N15,R13
VCCIO4	N10,R8
VCCIO5	N7,R4
VCCIO6	K4,N2,J2
VCCIO7	G4,D2
VCCPLL	J7
VCCPLL	H10
VCCX	E5,F11,F8,G10,H6,J10,L6,L9
VSS	A1,A16,B11,B7,D13,D4,E9,G15,G2,G8,H12,H7,H9,J5,J8,K7,K9,L15,L2,M8,N13,P3,R10,R6,T1,T16
NC	P14
MODE	T11,N11
JTAGSEL_N	D12

3.2 View of GW2A-55 Pin Distribution

3.2.1 View of UG324 Pin Distribution

Figure 3-14 View of GW2A-55 UG324 Pin Distribution



Table 3-14 Other Pins of GW2A-55 UG324

VCC/VCCPLL L/VCCPLL R	G7,H11,H9,J10,J8,K11,K9,L10,L8,M12,M7
VCCIO0	E17,J14,G15
VCCIO1	J17,M15,R17
VCCIO2	P9,R12,U14
VCCIO3	R6,U4,U9
VCCIO4	J5,M4,R2
VCCIO5	E2,G4,J2
VCCIO6	B10,B5,D7
VCCIO7	B15,D13,E10
VCCX	B1,B17,E14,E5,E9,G10,J12,K7,M9,P10,P14,P5
VSS	A1,A18,B13,B7,C16,C3,D10,D5,E15,G12,G17,G2,G5,H10,H8,J11,J15,J4,J9,K10,K8,L11,L9,M17,M2,M6,N13,R1,R14,R18,R4,R9,T16,U12,U6,V1,V18
MODE	T15,N12

3.2.2 View of UG324D Pin Distribution

Figure 3-15 View of GW2A-55 UG324D Pin Distribution



Table 3-15 Other Pins of GW2A-55 UG324D

VCC/VCCPLL L/VCCPLLR	M7,M12,L8,L10,K9,K11,J8,J10,H9,H11,G7
VCCIO0	J14,G15,E17
VCCIO1	J17,M15,R17
VCCIO2	P9,R12,U14
VCCIO3	R6,U4,U9
VCCIO4	J5,M4,R2
VCCIO5	E2,G4,J2
VCCIO6	B10,B5,D7
VCCIO7	B15,D13,E10
VCCX	B1,B17,E14,E5,E9,G10,J12,K7,M9,P10,P14,P5
VSS	A1,A18,B13,B7,C16,C3,D10,D5,E15,G12,G17,G2,G5,H10,H8,J11, J15,J4,J9,K10,K8,L11,L9,M17,M2,M6,N13,R1,R14,R18,R4,R9,T16 ,U12,U6,V1,V18
MODE	T15,N12

3.2.3 View of PG484 Pin Distribution

Figure 3-16 View of GW2A-55 PG484 Pin Distribution

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	A
B	◎	◎	◎	+	+	◎	◎	◎	+	+	◎	+	+	+	+	+	+	+	+	+	+	+	B
C	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	C
D	+	+	+	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	+	+	+	D
E	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	E
F	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	+	+	+	+	+	+	+	+	+	+	+	+	F
G	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	+	+	+	+	+	+	+	+	+	+	+	+	G
H	◎	◎	◎	◎	◎	◎	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	H
J	◎	+	+	◎	◎	◎	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	J
K	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	K
L	◎	◎	◎	◎	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	L
M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M
N	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N
P	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	P
R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	R
T	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	T
U	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	U
V	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	V
W	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	W
Y	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Y
AA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	AA
AB	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	AB

Table 3-16 Other Pins of GW2A-55 PG484

VCC	J7, M16, T7, L7, L16, H7, G9, T13, T14, G10, M7, G11, G12, G14, G13, G15, P16, P7, H16, G7, G16, G8, R16, J16, T12, T11, R7, T15, T9, T8, T10, T16
VCCIO0	B5, B10, F11
VCCIO1	B14, B19, F12
VCCIO2	E21, K21, L17
VCCIO3	M17, P21, W21
VCCIO4	AA13, AA18, U12
VCCIO5	U11, AA4, AA9
VCCIO6	M6, N2, V2
VCCIO7	D2, J2, L6
VCCX	F14, F9, J6, J17, P6, P17, U9, U14
VCCPLL	N7, K7
VCCPLLR	N16, K16
VSS	AA10, AA14, AA19, AA5, B13, B18, B4, B9, D21, E2, F10, F13, F15, F8, H10, H11, H12, H13, H14, H15, H17, H6, H8, H9, J10, J11, J12, J13, J14, J15, J21, J8, J9, K10, K11, K12, K13, K14, K15, K17, K2, K6, K8, K9, L10, L11, L12, L13, L14, L15, L8, L9, M10, M11, M12, M13, M14, M15, M8, M9, N10, N11, N12, N13, N14, N15, N21, N6, N8, N9, P10, P11, P12, P13, P14, P15, P2, P8, P9, R10, R11, R12, R13, R14, R15, R17, R6, R8, R9, U10, U13, U15, U8, V21, W2
EXTR	N17
MODE	U22,U21,T22
JTAGSEL_N	E18

3.2.4 View of PG1156 Pin Distribution

Figure 3-17 View of GW2A-55 PG1156 Pin Distribution (Top View)

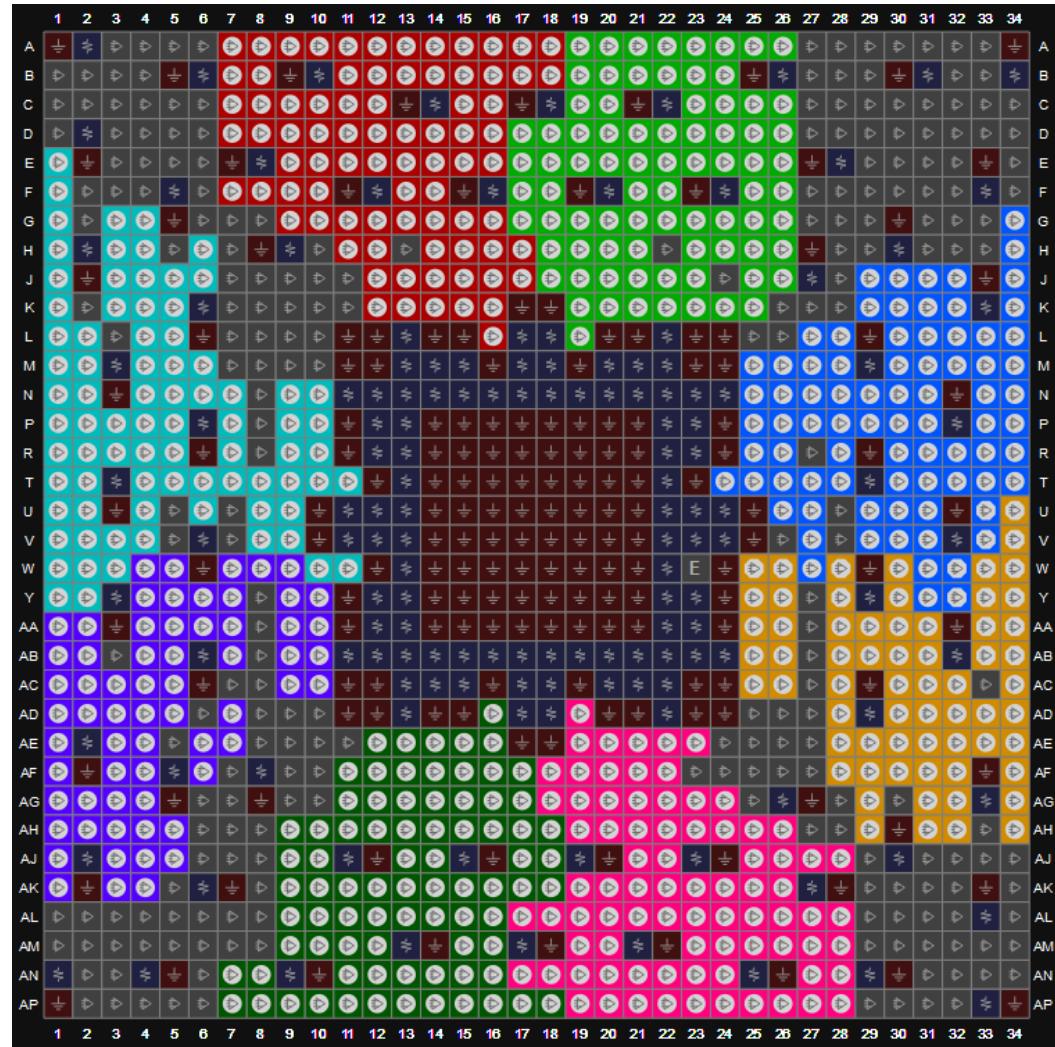


Table 3-17 Other Pins in GW2A-55 PG1156

VCC	AA13, AA22, AB13, AB14, AB15, AB16, AB17, AB18, AB19, AB20, AB21, AB22, N13, N14, N15, N16, N17, N18, N19, N20, N21, N22, P13, P22, R13, R22, U13, U22, V13, V22, Y13, Y22
VCCIO0	A2, B10, B6, C14, E8, F12, F16, H9, L13, L17, M13, M17
VCCIO1	B26, B31, C18, C22, E28, F20, F24, L18, L22, M18, M22
VCCIO2	B34, F33, H30, J27, K33, M29, N23, N24, P32, T29, U23, U24
VCCIO3	AB23, AB24, AB32, AD29, AG33, AJ30, AL33, V23, V24, V32, Y29
VCCIO4	AC18, AC22, AD18, AD22, AG26, AJ19, AJ23, AK27, AM21, AN25, AN29, AP33
VCCIO5	AC13, AC17, AD13, AD17, AJ11, AJ15, AK6, AM13, AM17, AN4, AN9
VCCIO6	AB11, AB12, AB6, AE2, AF5, AF8, AJ2, AN1, V11, V12, V6, Y3
VCCIO7	D2, F5, H2, K6, M3, N11, N12, P6, T3, U11, U12
VCCX	AA12, AA23, AC14, AC15, AC20, AC21, M14, M15, M20, M21, P12, P23, R12, R23, Y12, Y23
VCCPLL	T13, W13

VCCPLL	T22,W22
VSS	A1, A34, AA11, AA14, AA15, AA16, AA17, AA18, AA19, AA20, AA21, AA24, AA3, AA32, AC11, AC12, AC16, AC19, AC23, AC24, AC29, AC6, AD11, AD12, AD14, AD15, AD20, AD21, AD23, AD24, AE17, AE18, AF2, AF33, AG27, AG5, AG8, AH30, AJ12, AJ16, AJ20, AJ24, AK2, AK28, AK33, AK7, AM14, AM18, AM22, AN10, AN26, AN30, AN5, AP1, AP34, B25, B30, B5, B9, C13, C17, C21, E2, E27, E33, E7, F11, F15, F19, F23, G30, G5, H27, H8, J2, J33, K17, K18, L11, L12, L14, L15, L20, L21, L23, L24, L29, L6, M11, M12, M16, M19, M23, M24, N3, N32, P11, P14, P15, P16, P17, P18, P19, P20, P21, P24, R11, R14, R15, R16, R17, R18, R19, R20, R21, R24, R29, R6, T12, T14, T15, T16, T17, T18, T19, T20, T21, T23, U10, U14, U15, U16, U17, U18, U19, U20, U21, U25, U3, U32, V10, V14, V15, V16, V17, V18, V19, V20, V21, V25, W12, W14, W15, W16, W17, W18, W19, W20, W21, W24, W29, W6, Y11, Y14, Y15, Y16, Y17, Y18, Y19, Y20, Y21, Y24
EXTR	W23
MODE	W28,V34,U34
JTAGSEL_N	G26
NC	A27, A28, A29, A3, A30, A31, A32, A33, A4, A5, A6, AA27, AA8, AB27, AB3, AB8, AC27, AC33, AC7, AC8, AD10, AD25, AD26, AD27, AD6, AD8, AD9, AE10, AE11, AE24, AE25, AE26, AE27, AE5, AE8, AE9, AF10, AF23, AF24, AF25, AF26, AF27, AF7, AF9, AG10, AG25, AG28, AG30, AG6, AG7, AG9, AH27, AH28, AH33, AH6, AH7, AH8, AJ29, AJ31, AJ32, AJ33, AJ34, AJ6, AJ7, AJ8, AK29, AK30, AK31, AK32, AK34, AK5, AK8, AL1, AL2, AL29, AL3, AL30, AL31, AL32, AL34, AL4, AL5, AL6, AL7, AL8, AM1, AM2, AM29, AM3, AM30, AM31, AM32, AM33, AM34, AM4, AM5, AM6, AM7, AM8, AN2, AN3, AN31, AN32, AN33, AN34, AN6, AP2, AP29, AP3, AP30, AP31, AP32, AP4, AP5, AP6, B1, B2, B27, B28, B29, B3, B32, B33, B4, C1, C2, C27, C28, C29, C3, C30, C31, C32, C33, C34, C4, C5, C6, D1, D27, D28, D29, D3, D30, D31, D32, D33, D34, D4, D5, D6, E29, E3, E30, E31, E32, E34, E4, E5, E6, F2, F27, F28, F29, F3, F30, F31, F32, F34, F4, F6, G2, G27, G28, G29, G31, G32, G33, G6, G7, G8, H10, H13, H22, H28, H29, H31, H32, H33, H5, H7, J10, J11, J24, J28, J7, J8, J9, K10, K11, K2, K26, K27, K28, K7, K8, K9, L10, L25, L26, L3, L7, L8, L9, M10, M7, M8, M9, N8, P8, R27, R8, U28, U5, U7, V26, V28, V5, V7, Y27, Y8

3.2.5 View of UG676 Pin Distribution

Figure 3-18 View of GW2A-55 UG676 Pin Distribution (Top View)

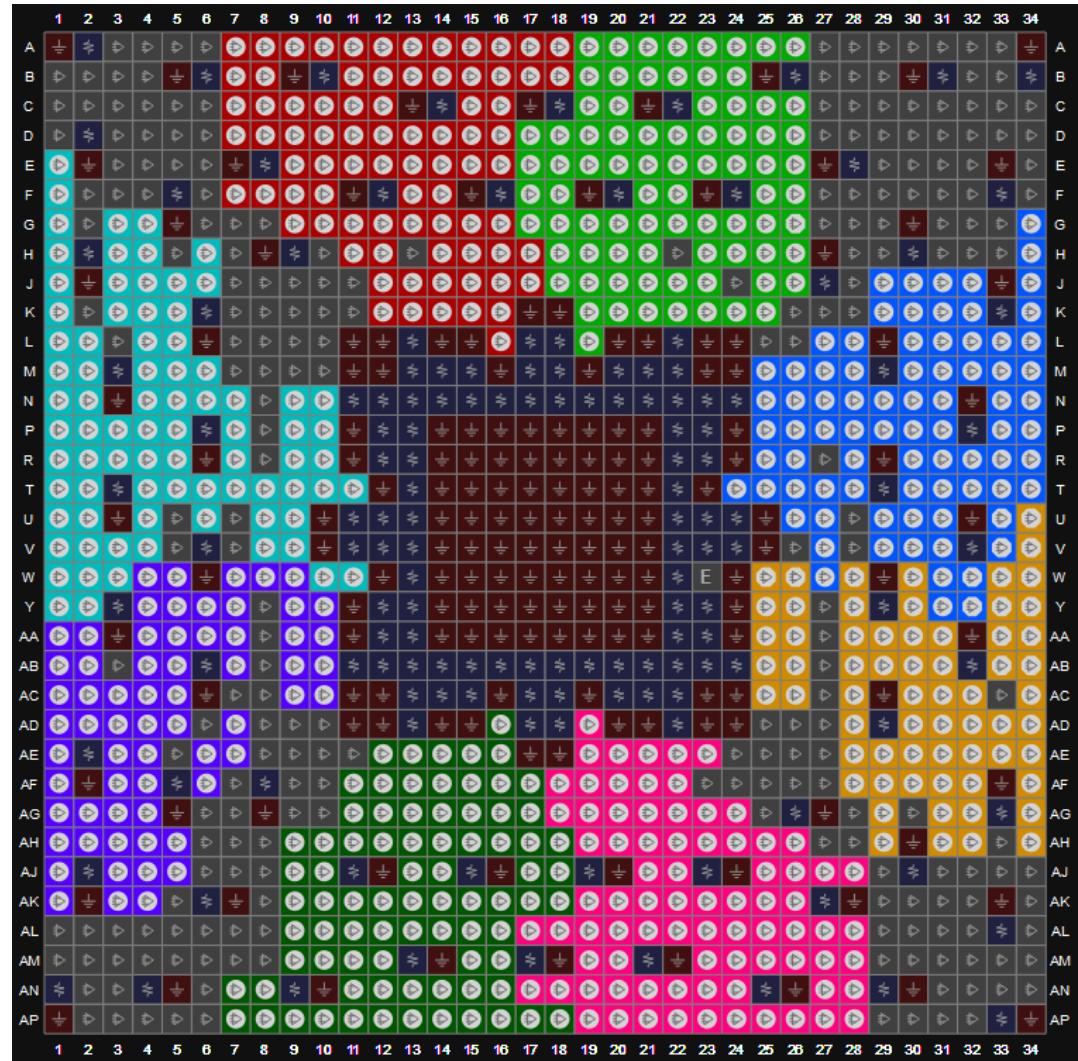


Table 3-18 Other Pins in GW2A-55 UG676

VCC	K15,L12,L14,L16,M13,M17,N12,N13,N14,N16,P11,P13,P14,P15,R12,R14,R16,T13,U12
VCCIO0	B11,B5,E13,E8,H11
VCCIO1	B16,B22,E19,H16
VCCIO2	E25,H22,L19,L25,N22
VCCIO3	AB25,T19,T25,W22
VCCIO4	AB14,AB19,AE16,AE22,W16
VCCIO5	AB8,AE11,AE5,W11
VCCIO6	AB2,P5,T2,T8,W5
VCCIO7	E2,H5,L2,L8
VCCX	AB11,AB22,AB5,E16,E22,E5,J18,K13,L5,N10,P17,T22,U14,V9
VCCPLL	M11,M15
VCCPLLR	T11,T15
VSS	A1,A11,,A16,A21,A26,A6,AA1,AA11,AA16,,AA21,AA26,AA6,AD13,AD

	18,AD24,AD3,AD8,AF1,AF11,AF16,AF21,AF26,AF6,C14,C19,C24,C3,C9,F1,F11,F16,F21,F26,F6,H14,H19,H3,H8,J24,K10,K17,L1,L11,L13,L15,L21,L26,L6,M12,M14,M16,N11,N15,N3,N8,P12,P16,P19,P24,R11,R13,R15,T1,T12,T14,T16,T21,T26,T6,U10,U13,U17,V3,W14,W19,W24,W8
MODE	P26,R26,R23
JTAGSEL_N	D24

3.2.6 View of UG484S Pin Distribution

Figure 3-19 View of GW2A-55 UG484S Pin Distribution (Top View)

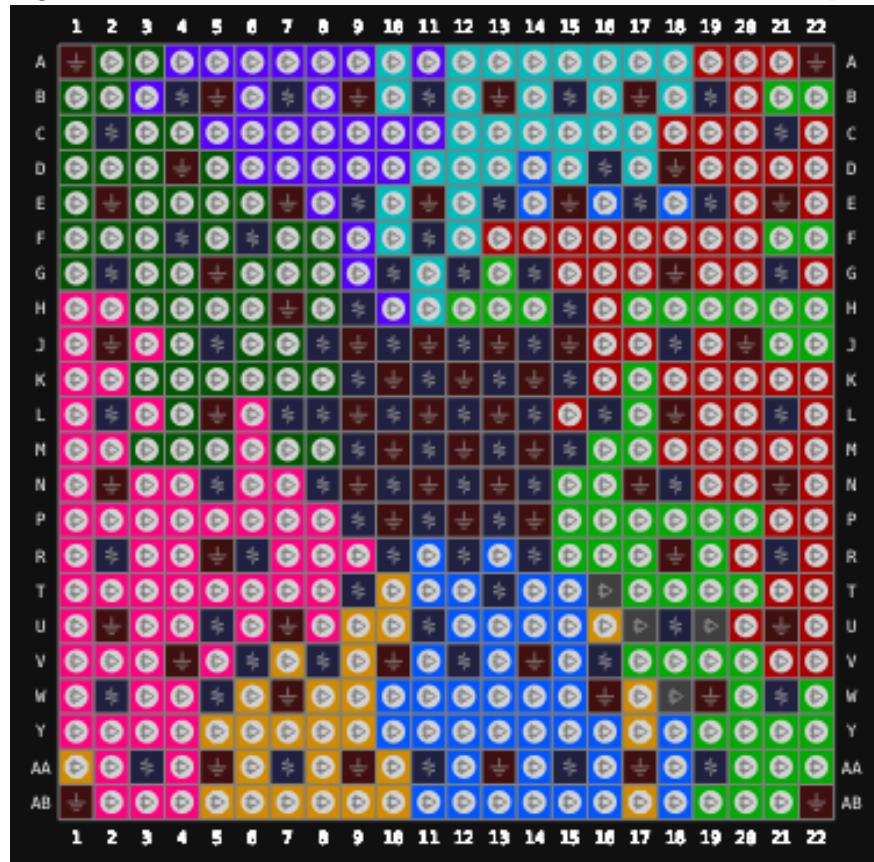


Table 3-19 Other Pins in GW2A-55 UG484S

VCC/VCCPLL/ VCCPLLR	K9,K11,J12,J8,P9,P11,L10,N10,L14,P13,R14,N14,L12,J10,N12,M9, J14,K13,M13,M11
VCCIO0	L16,J18,G14,C21,B19,E19,G21
VCCIO1	L21,R21,N18,U18,W21,AA19
VCCIO2	V16,AA11,T13,AA15
VCCIO3	V8,T9,AA7,V12
VCCIO4	L7,W2,W5,U5,AA3,N5,R2
VCCIO5	F6,L2,G2,J5,F4,C2
VCCIO6	B7,G10,B4,E9
VCCIO7	B15,B11,E13,E17
VCCX	L8,D16,K15,N8,H15,G12,R12,H9,U11,F11,V6,R6,R10,M15
VSS	A1,A22,B5,B9,B13,B17,D4,D18,E2,E7,E11,E15,E21,G5,G18,H7,J2 ,J9,J11,J13,J15,J20,K10,K12,K14,L5,L9,L11,L13,L18,M10,M12,M1

	4,N2,N9,N11,N13,N17,N21,P10,P12,P14,R5,R18,U2,U7,U21,V4,V10,V14,W7,W16,W19,AA5,AA9,AA13,AA17,AB1,AB22
JTAGSEL_N	T20
NC	T16,U17,W18,U19

3.2.7 View of UG324F Pin Distribution

Figure 3-20 View of GW2A-55 UG324F Pin Distribution (Top View)



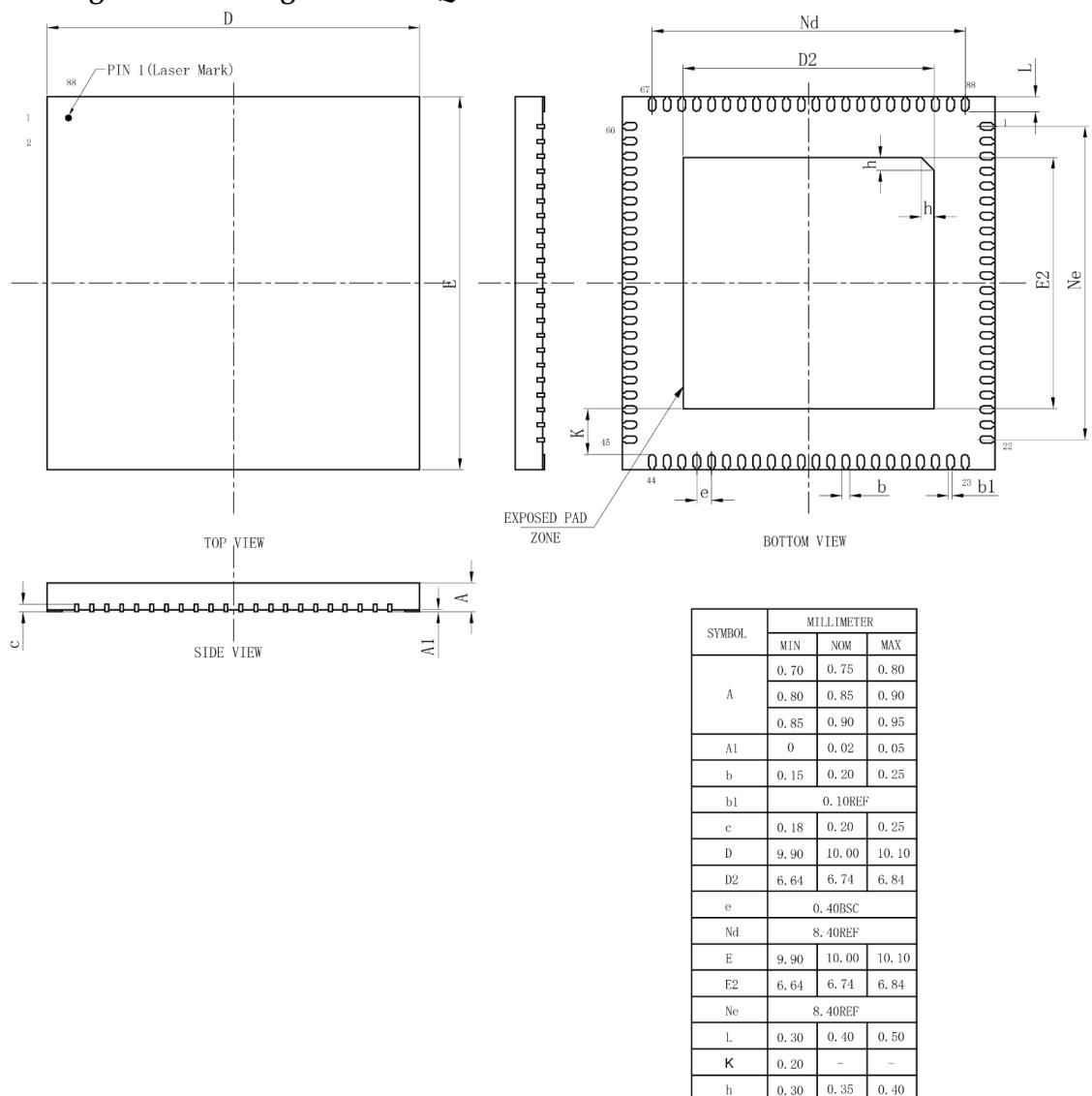
Table 3-20 Other Pins in GW2A-55 UG324F

VCC/VCCPLL/ VCCPLLR	G7,H11,H9,J10,J8,K11,K9,L10,L8,M12,M7
VCCIO0	E17,J14,G15
VCCIO1	J17,M15,R17
VCCIO2	P9,R12,U14
VCCIO3	R6,U4,U9
VCCIO4	J5,M4,R2
VCCIO5	E2,G4,J2
VCCIO6	B10,B5,D7
VCCIO7	B15,D13,E10
VCCX	B1,B17,E14,E5,E9,G10,J12,K7,M9,P10,P14,P5
VSS	A1,A18,B13,B7,C16,C3,D10,D5,E15,G12,G17,G2,G5,H10,H8,J11,J15,J4,J9,K10,K8,L11,L9,M17,M2,M6,N13,R1,R14,R18,R4,R9,T16,U12,U6,V1,V18
MODE	T15,N12

4 Package Diagrams

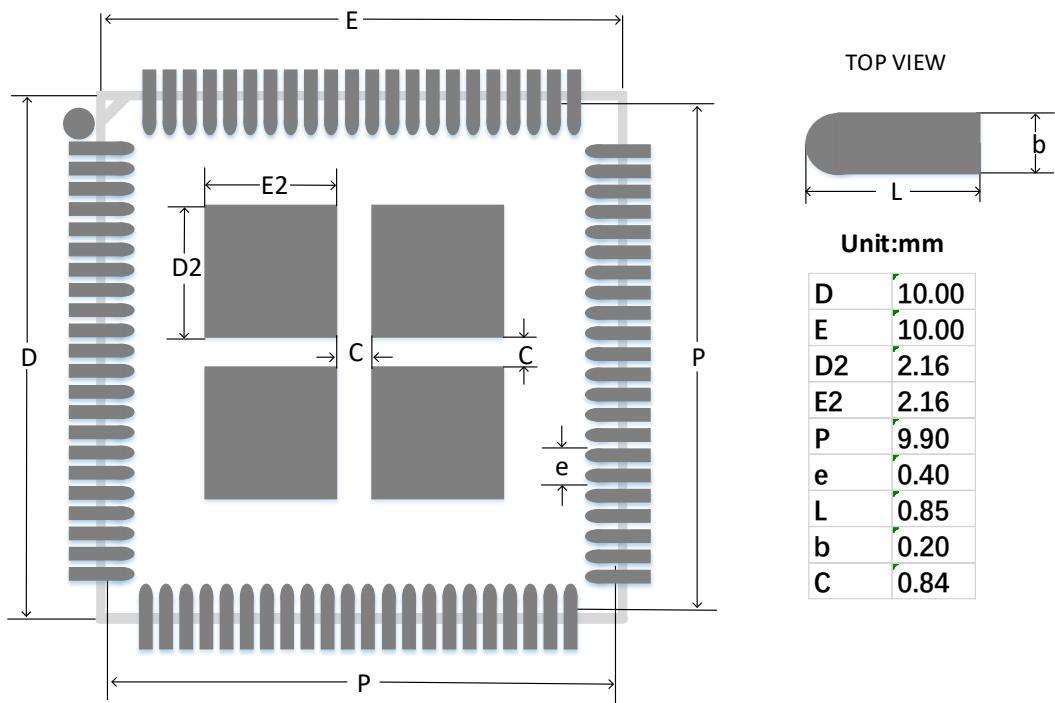
4.1 QN88 Package Outline (10mm x 10mm)

Figure 4-1 Package Outline QN88



Note!

For GW2A-LV18QN88, the value of A(NOM) is 0.9mm.

Figure 4-2 Recommended PCB Layout QN88

4.2 EQ144 Package Outline (20mm x 20mm)

Figure 4-3 Package Outline EQ144

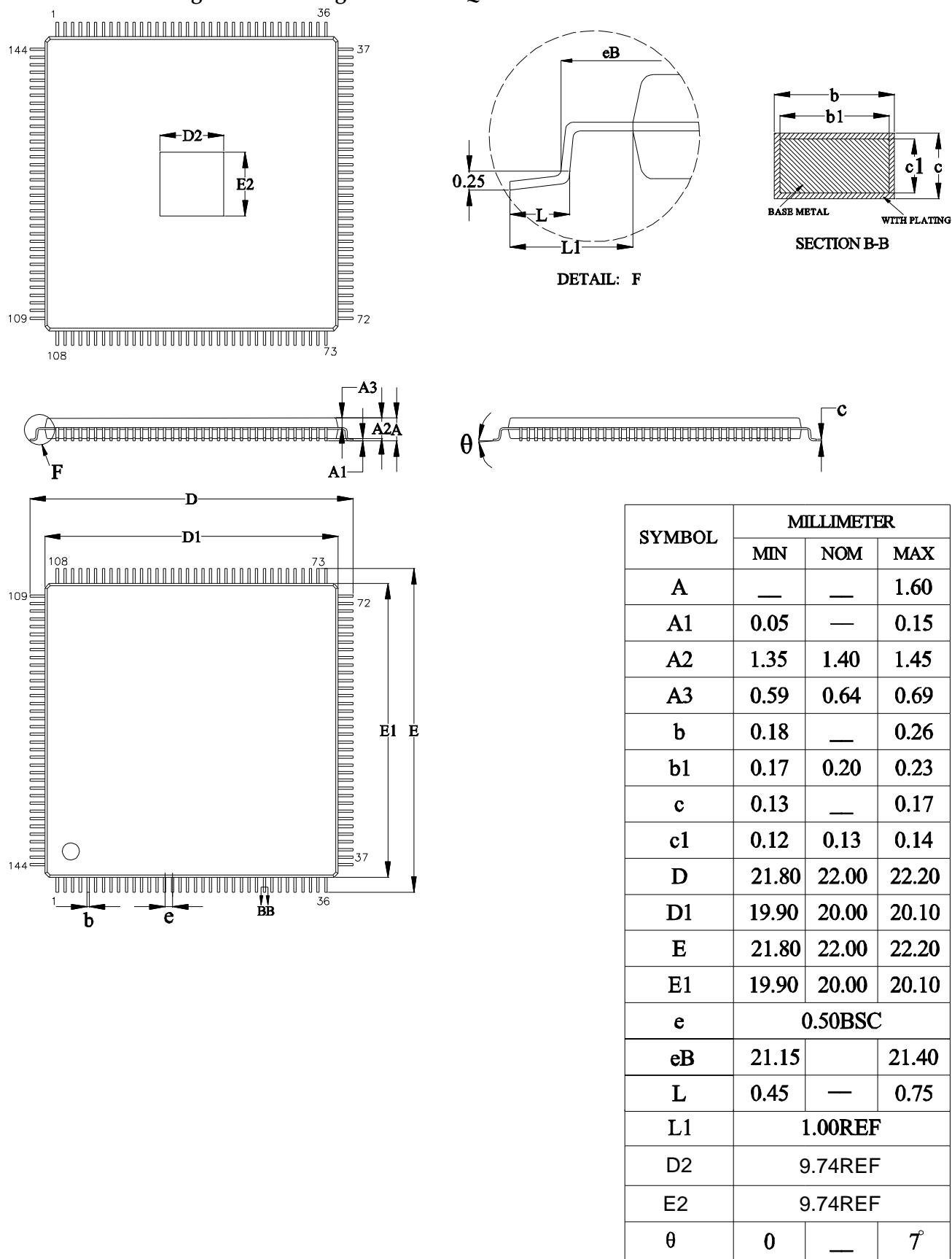
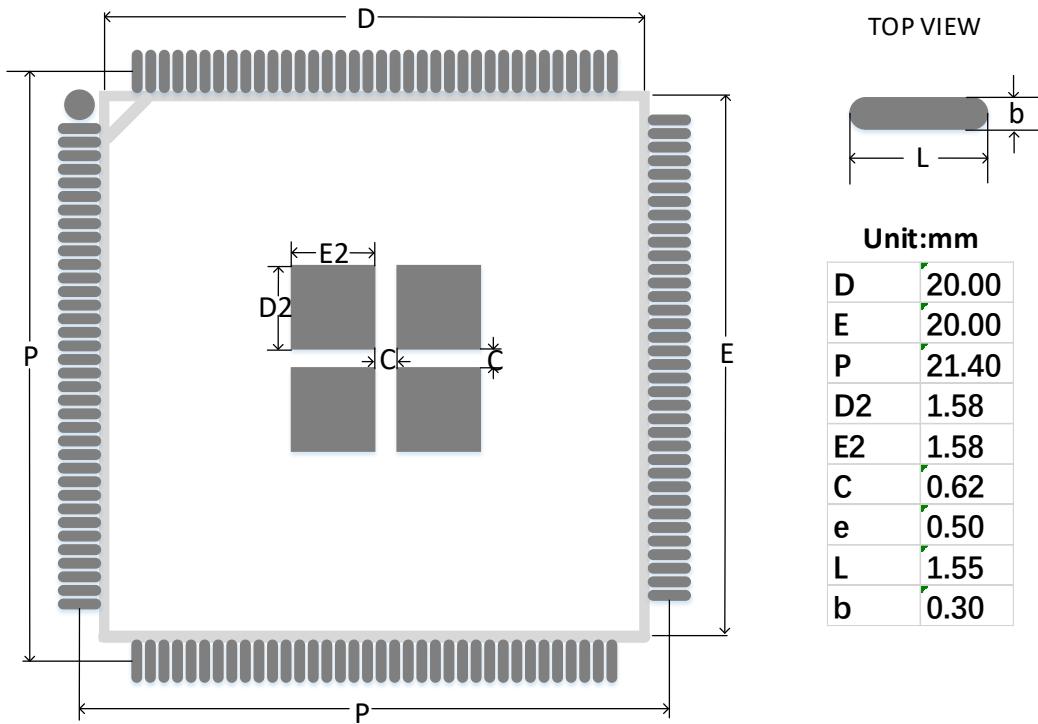


Figure 4-4 Recommended PCB Layout EQ144

4.3 MG196 Package Outline (8mm x 8mm)

Figure 4-5 Package Outline MG196

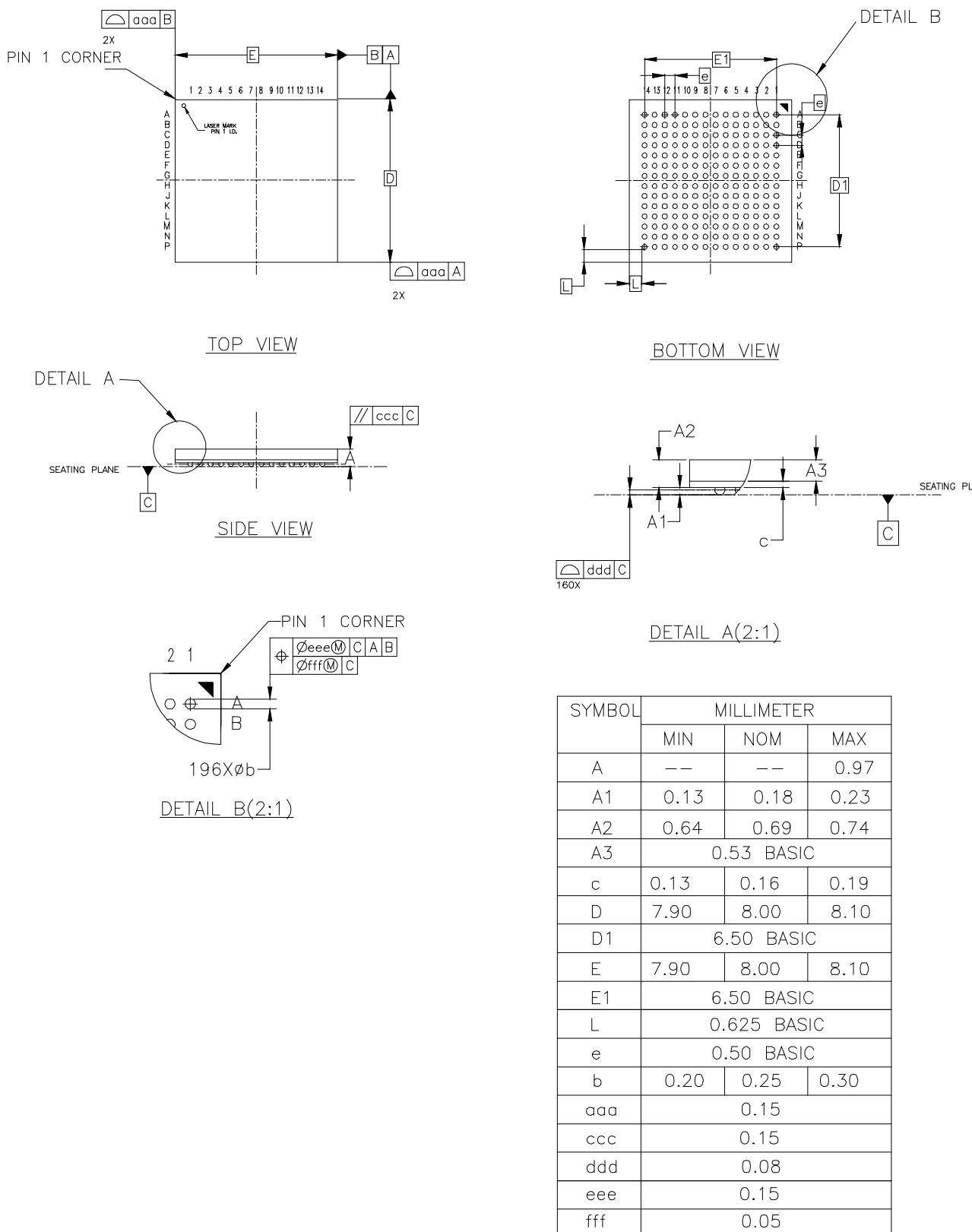
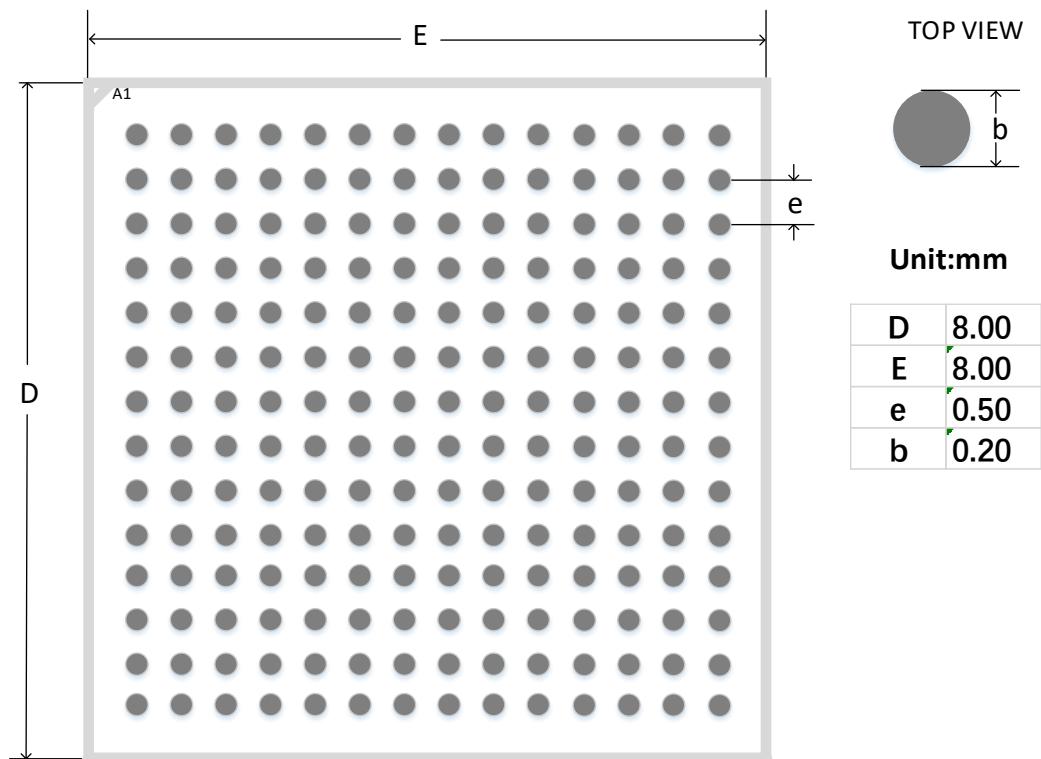


Figure 4-6 Recommended PCB Layout MG196

4.4 PG256 Package Outline (17mm x 17mm)

Figure 4-7 Package Outline PG256

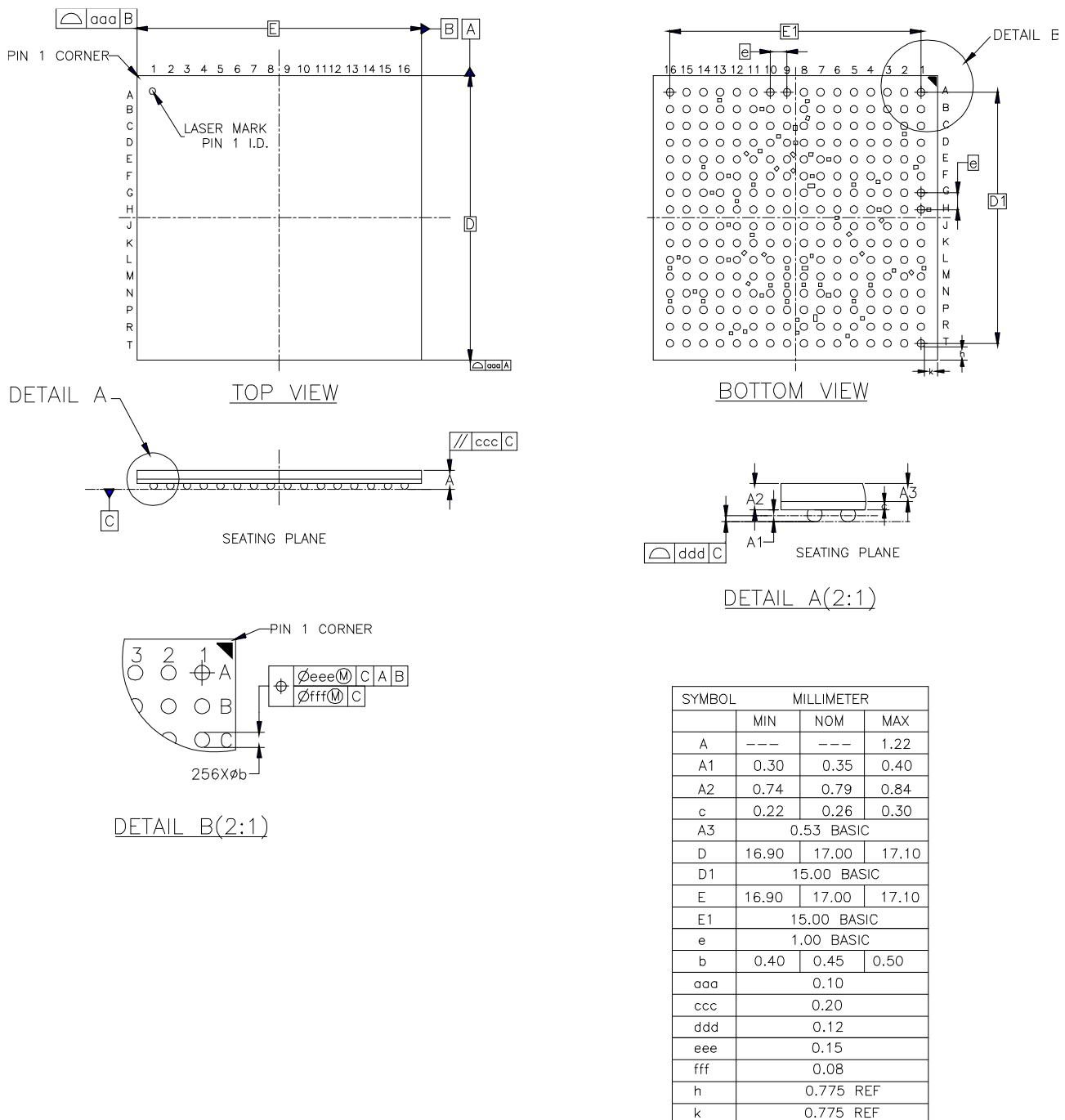
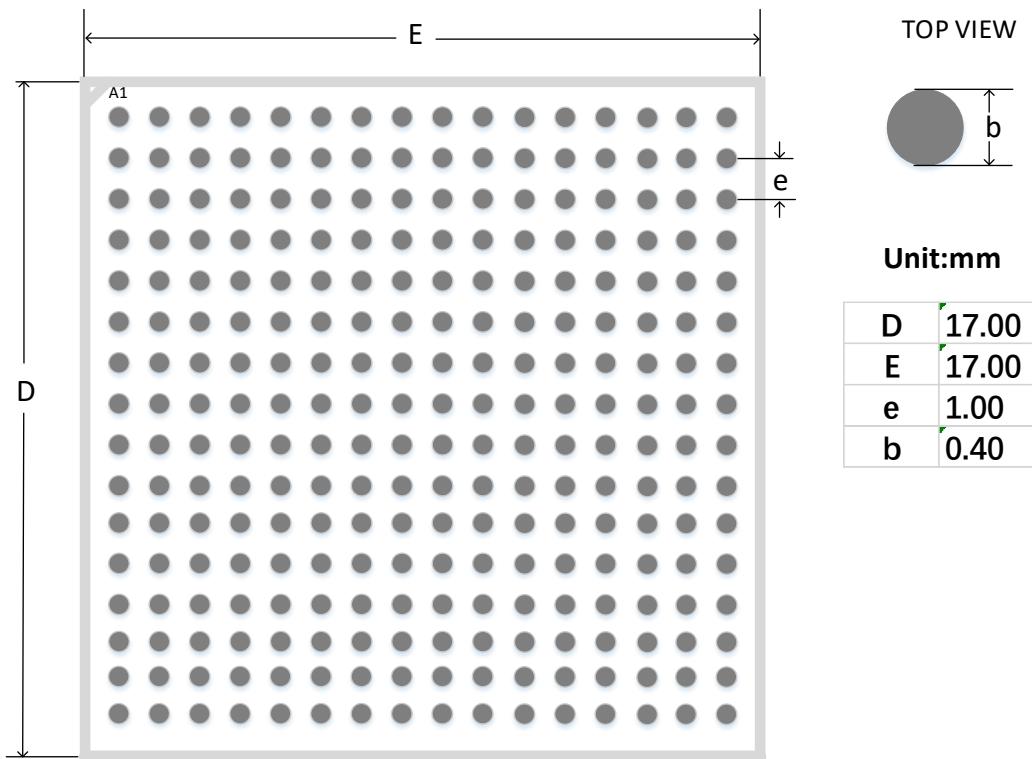


Figure 4-8 Recommended PCB Layout PG256

4.5 PG256C/PG256CF Package Outline (17mm x 17mm)

Figure 4-9 Package Outline PG256C

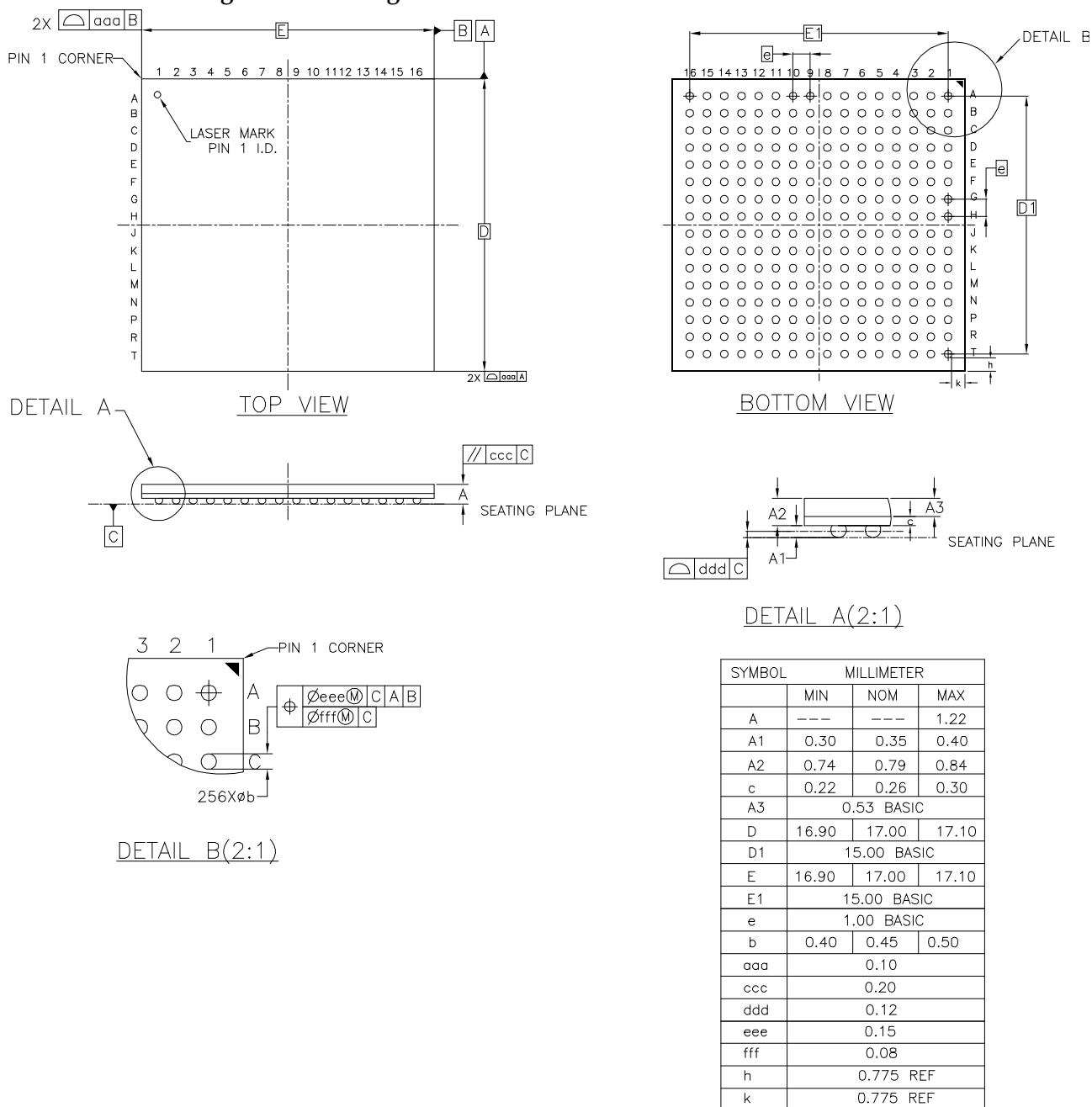
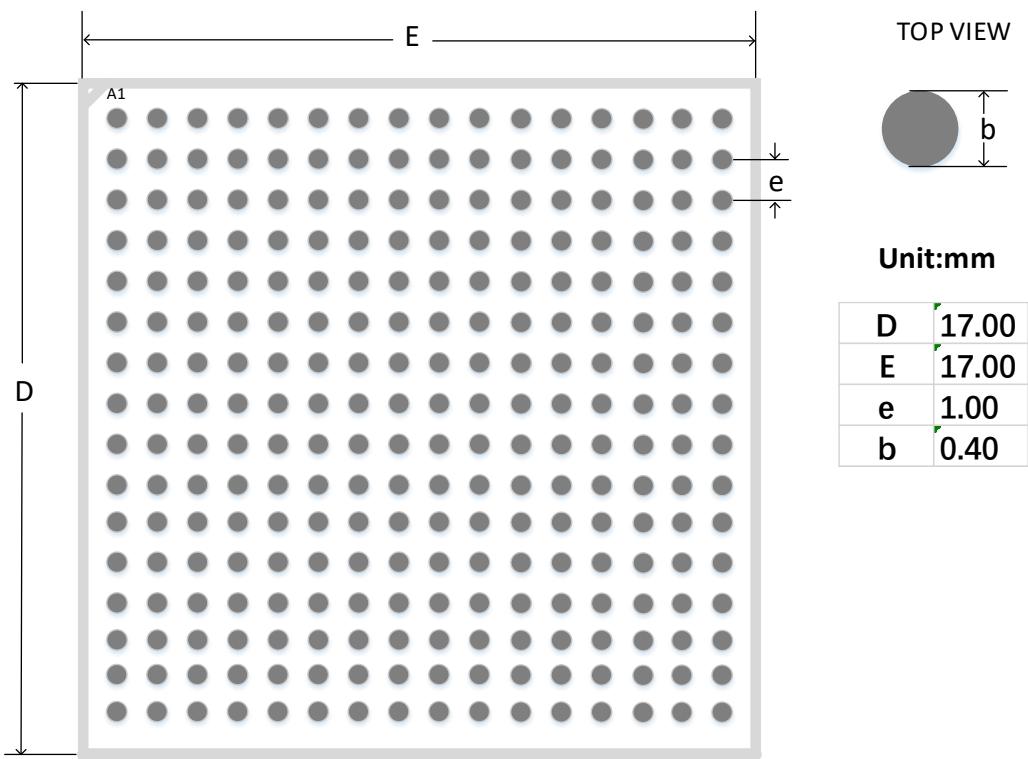


Figure 4-10 Recommended PCB Layout PG256C/PG256CF

4.6 PG256S /PG256SF Package Outline (17mm x 17mm)

Figure 4-11 Package Outline PG256S / PG256SF

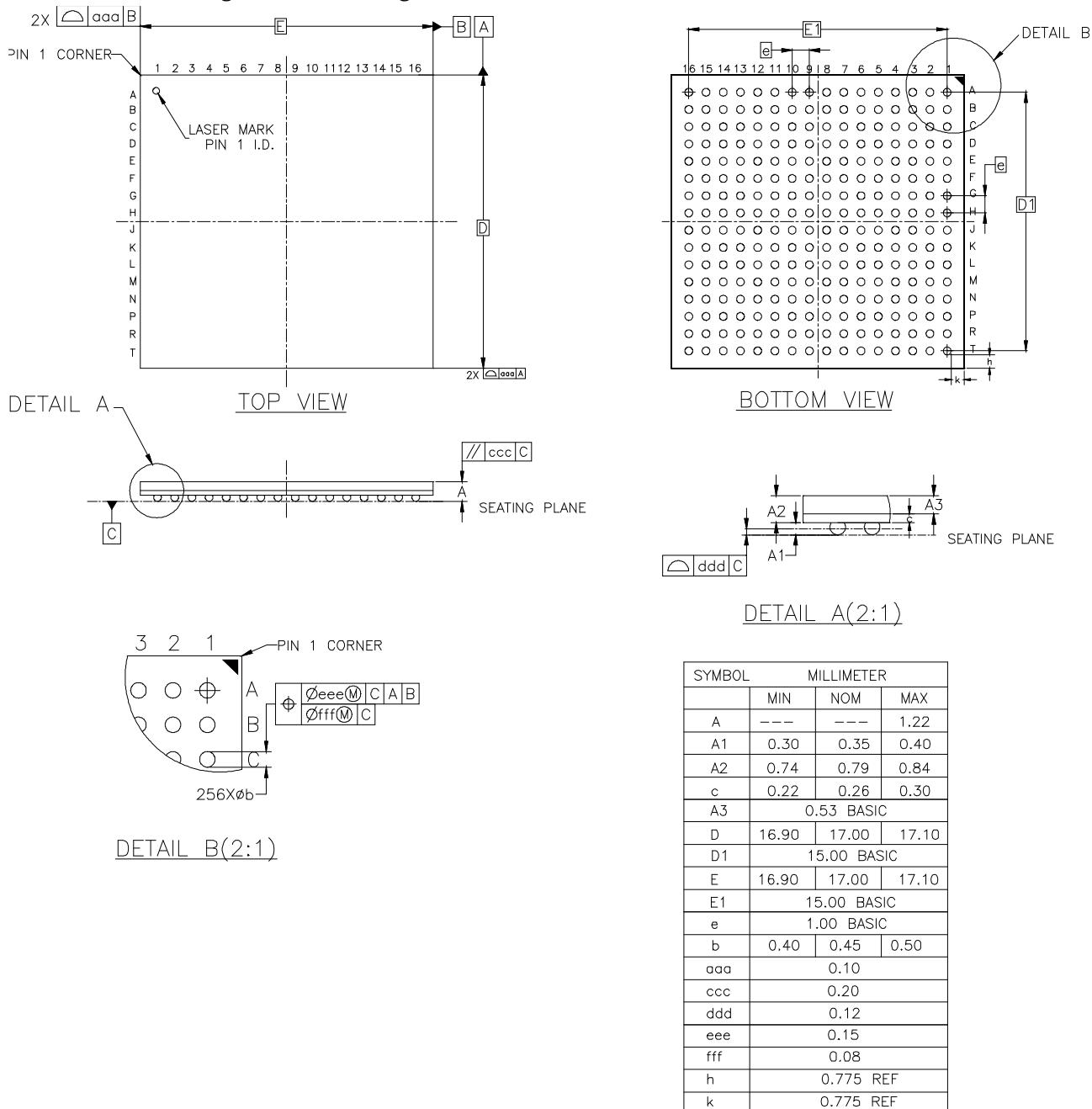
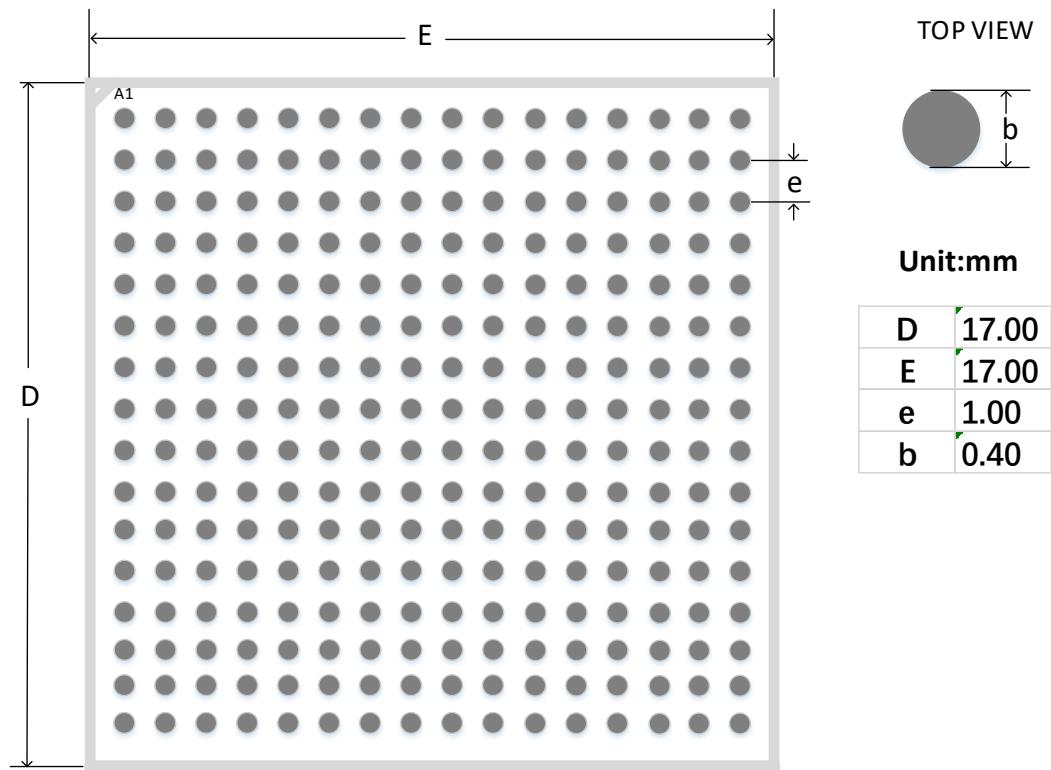


Figure 4-12 Recommended PCB Layout PG256S/PG256SF

4.7 PG256E Package Outline (17mm x 17mm)

Figure 4-13 Package Outline PG256E

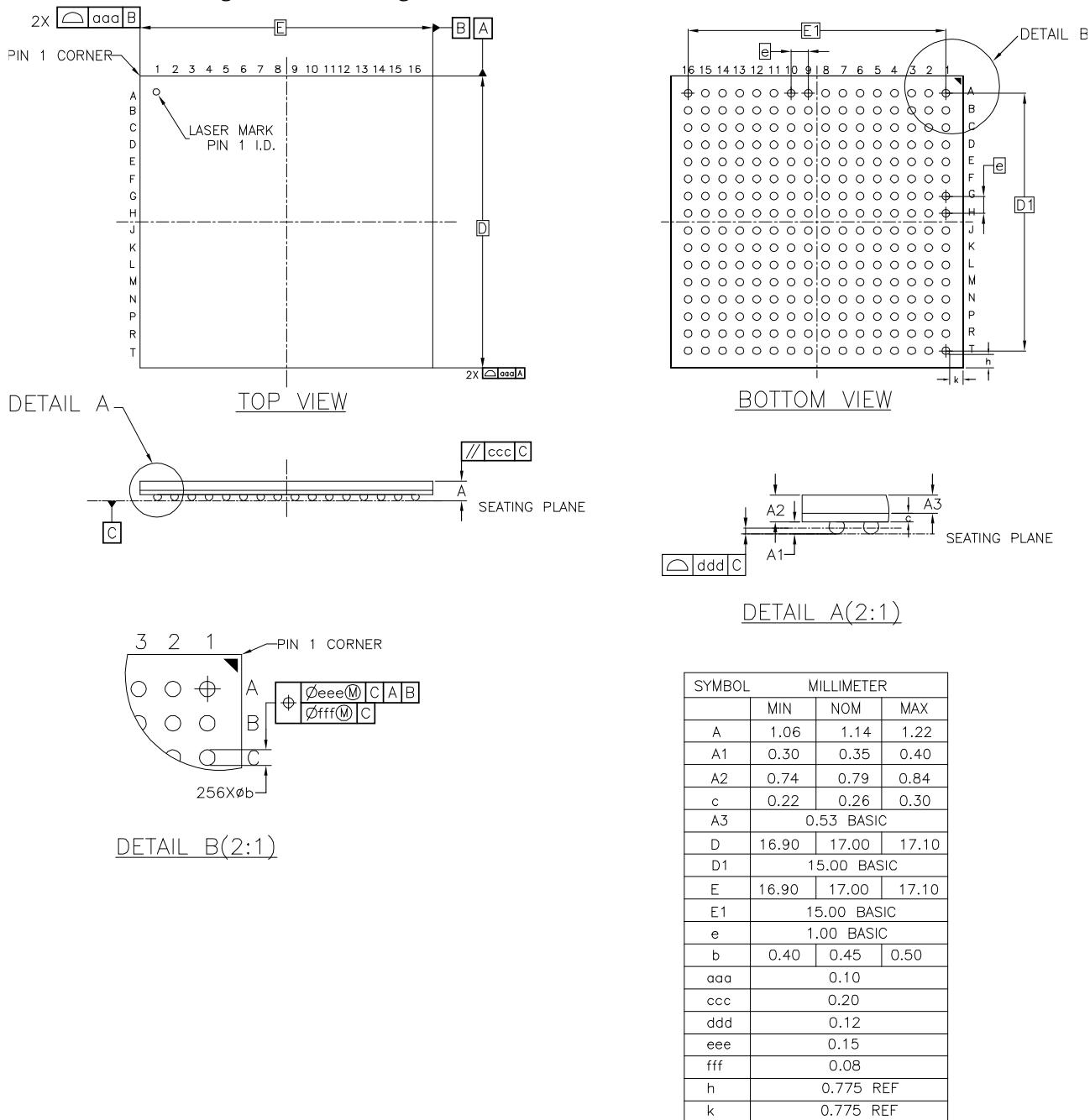
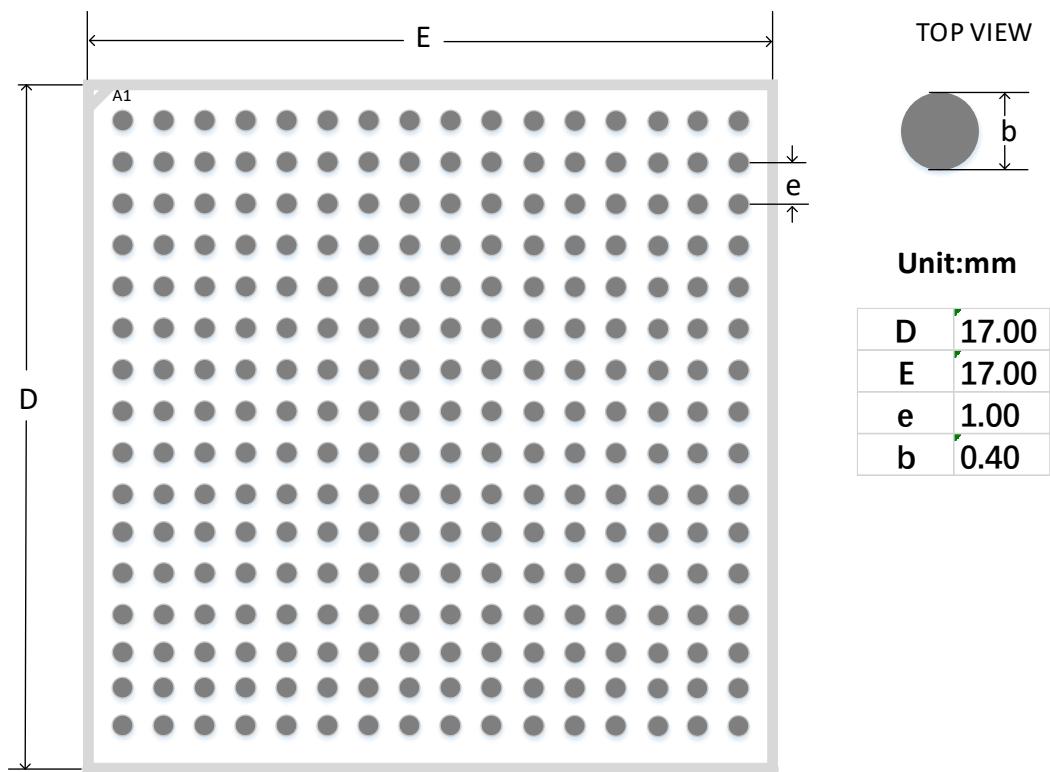
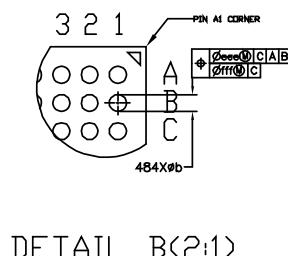
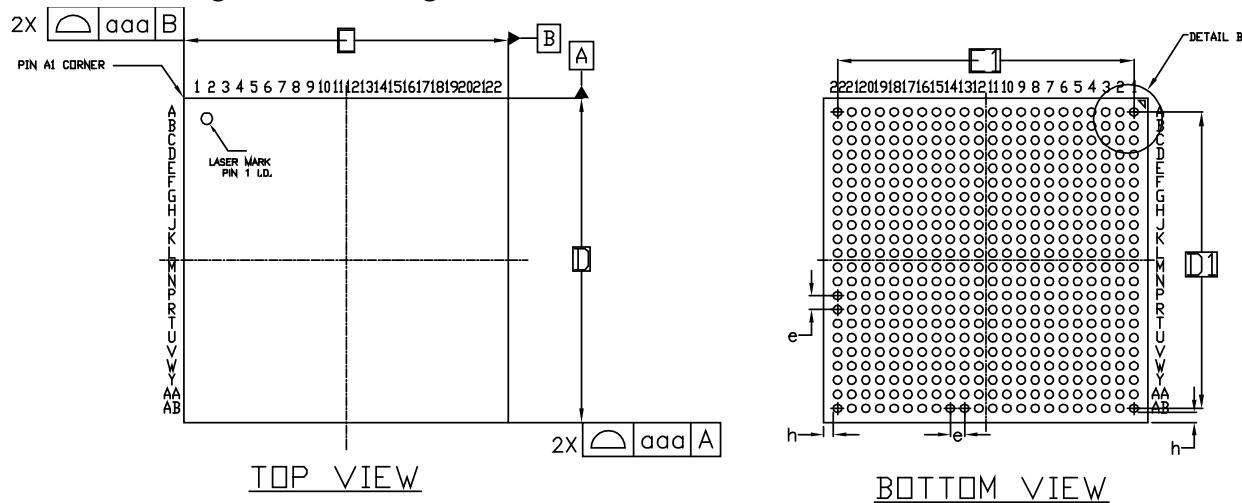


Figure 4-14 Recommended PCB Layout PG256E

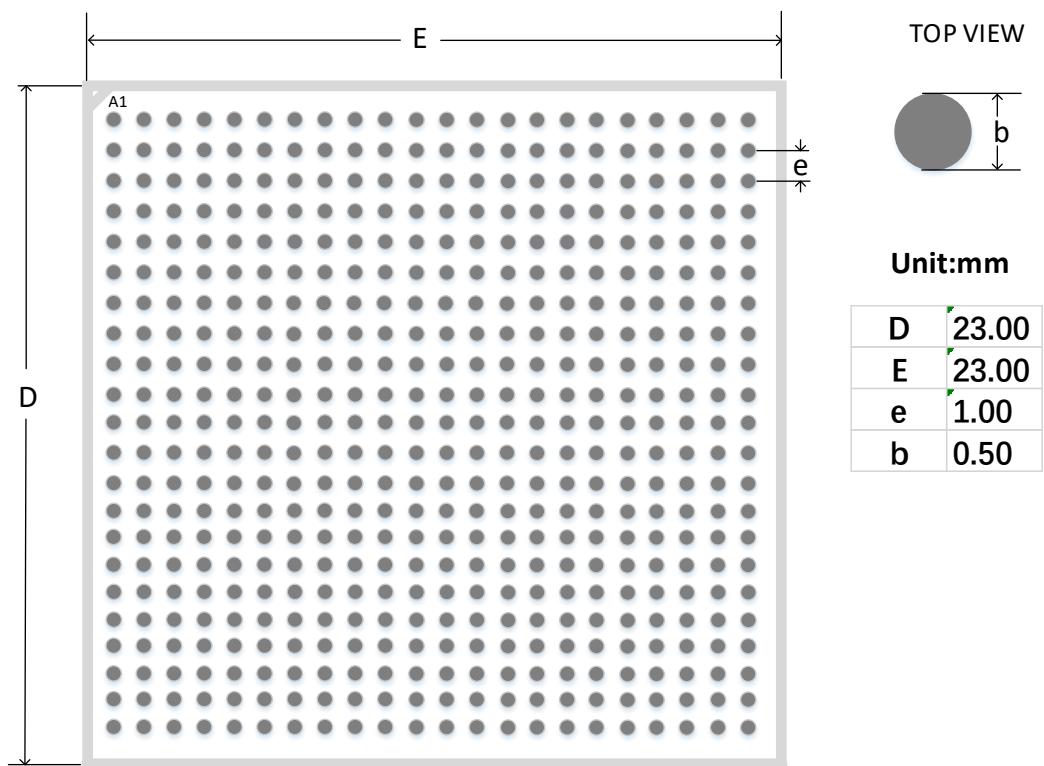
4.8 PG484 Package Outline (23mm x 23mm, GW2A-18)

Figure 4-15 Package Outline PG484



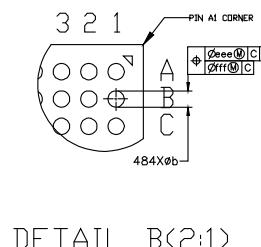
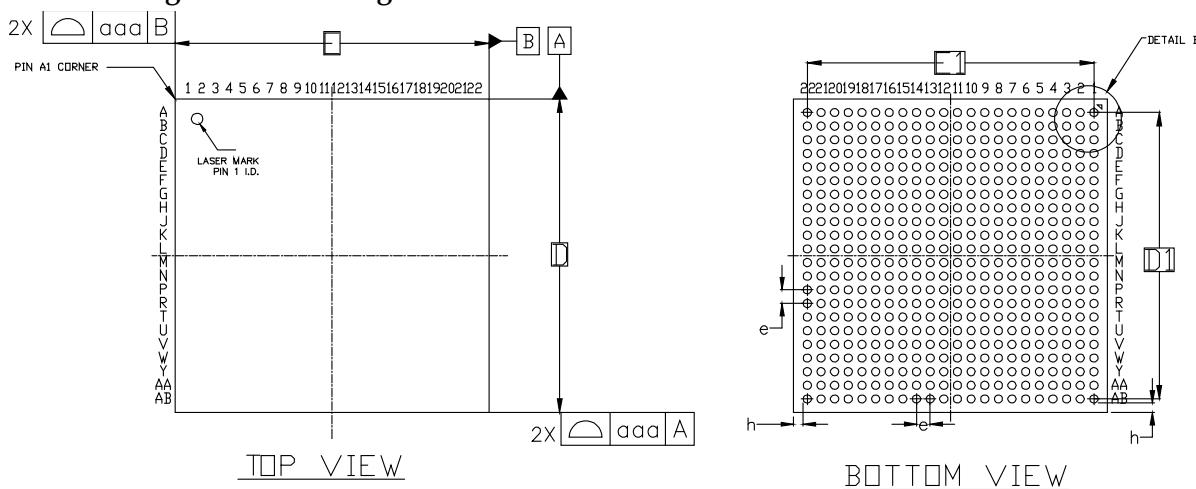
DETAIL B(2:1)

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	---	2.06	2.15
A1	0.45	0.50	0.55
A2	1.51	1.56	1.61
A3	1.00 BASIC		
c	0.52	0.56	0.60
D	22.90	23.00	23.10
D1	21.00 BASIC		
E	22.90	23.00	23.10
E1	21.00 BASIC		
e	1.00 BASIC		
b	0.55	0.60	0.65
h	0.70 REF		
aaa	0.20		
ccc	0.35		
ddd	0.15		
eee	0.25		
fff	0.10		

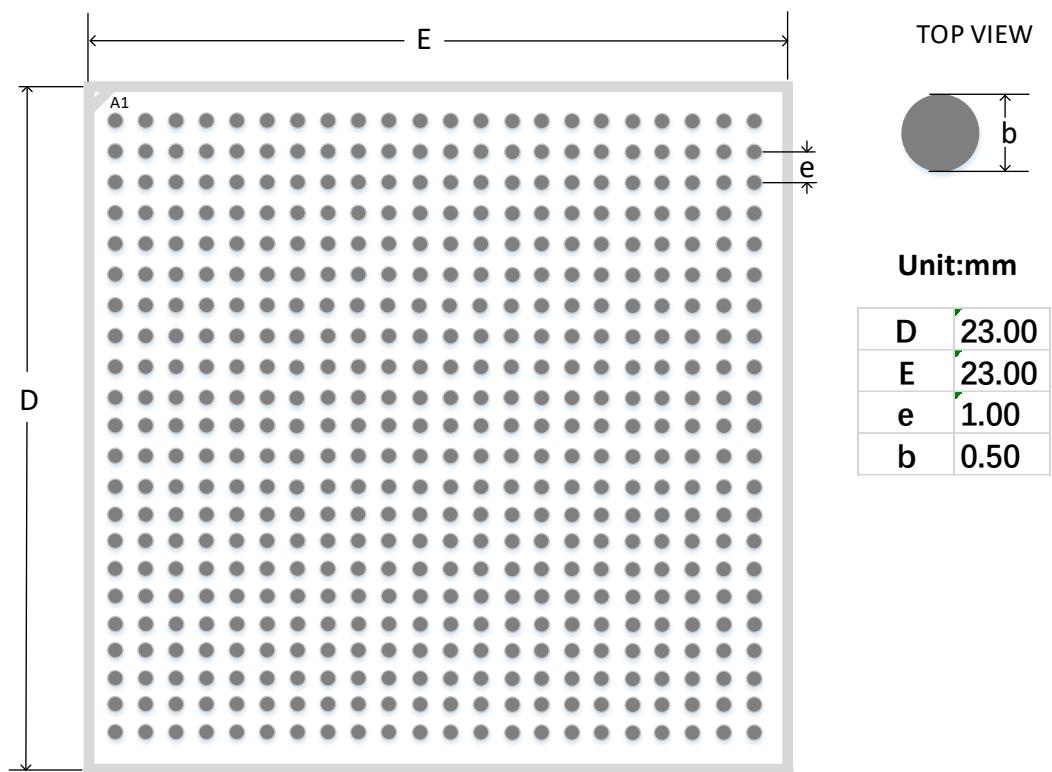
Figure 4-16 Recommended PCB Layout PG484 (GW2A-18)

4.9 PG484C Package Outline (23mm x 23mm)

Figure 4-17 Package Outline PG484C



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.38	1.46	1.54
A1	0.45	0.50	0.55
A2	0.91	0.96	1.01
A3	0.70	BASIC	
c	0.23	0.26	0.29
D	22.90	23.00	23.10
D1	21.00	BASIC	
E	22.90	23.00	23.10
E1	21.00	BASIC	
e	1.00	BASIC	
b	0.55	0.60	0.65
h	0.70	REF	
aaa	0.20		
ccc	0.15		
ddd	0.20		
eee	0.18		
fff	0.10		

Figure 4-18 Recommended PCB Layout PG484C

4.10 PG484 Package Outline (23mm x 23mm, GW2A-55)

Figure 4-19 Package Outline PG484

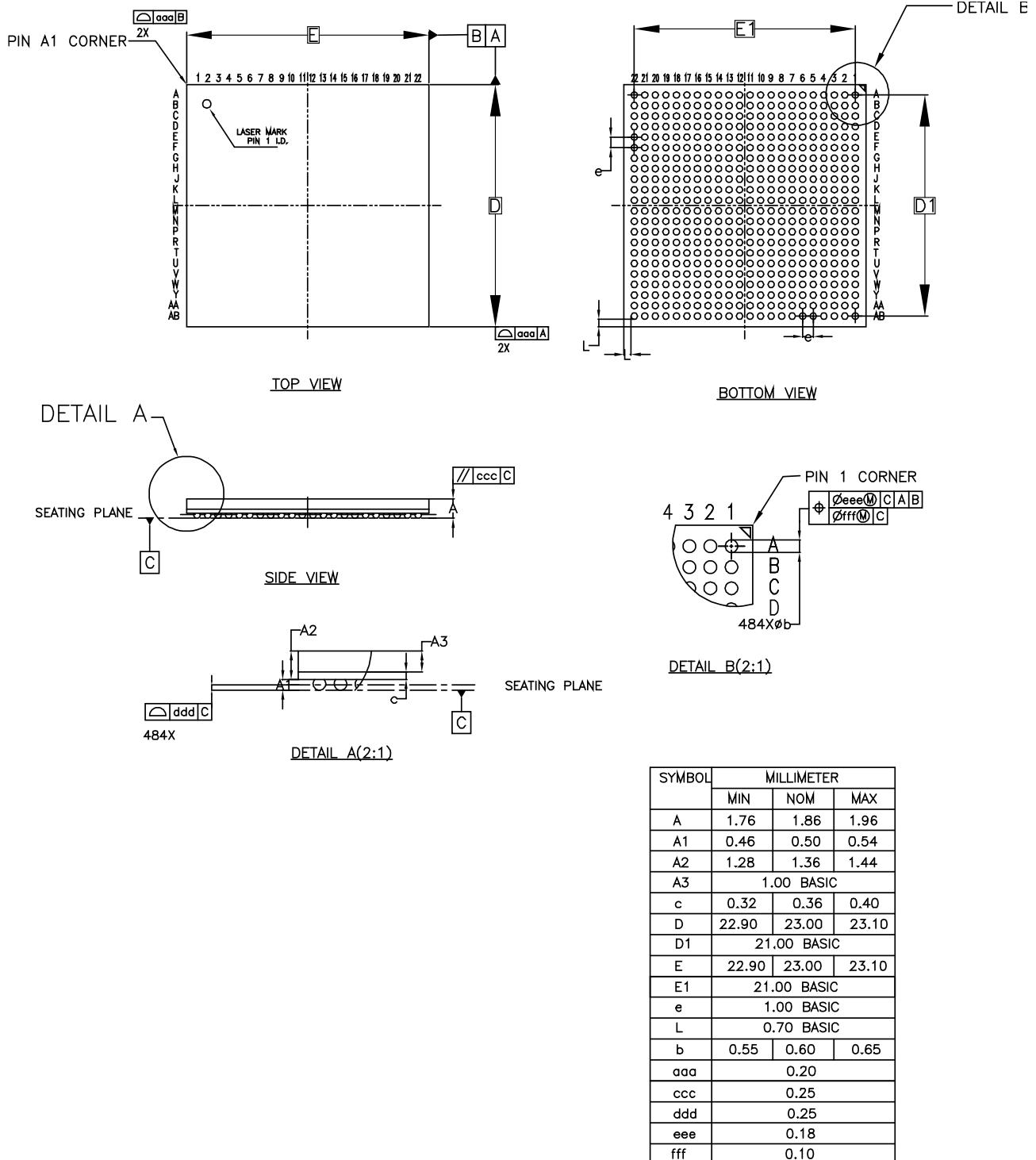
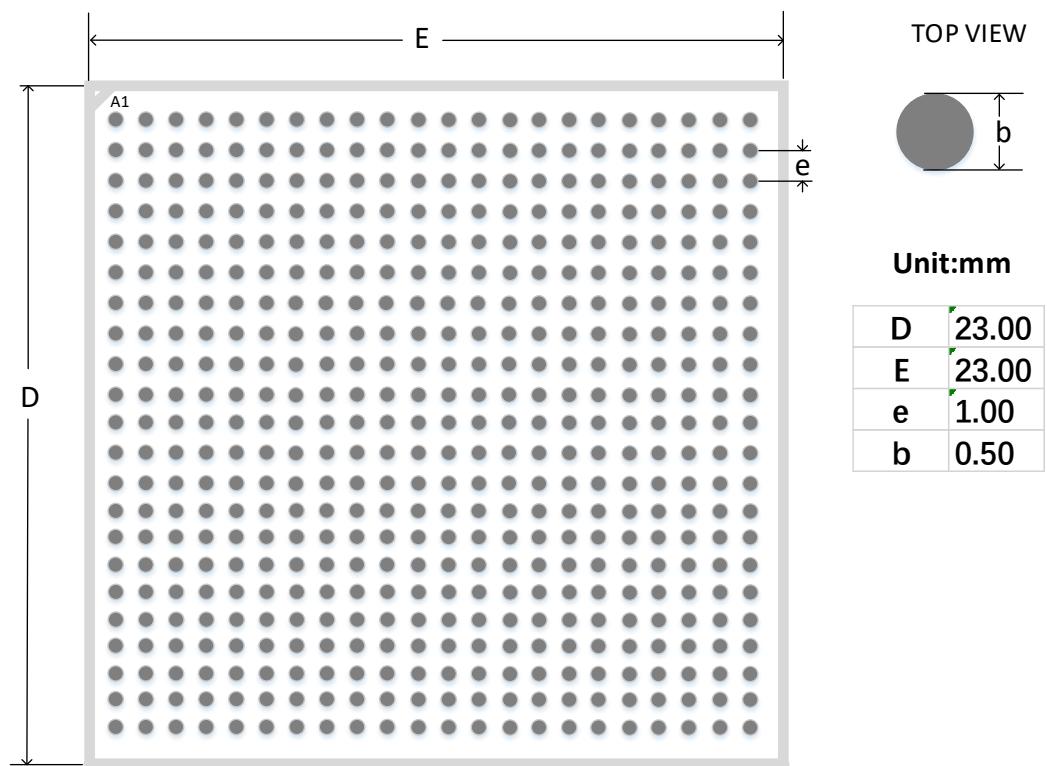


Figure 4-20 Recommended PCB Layout PG484 (GW2A-55)



4.11 PG1156 Package Outline (35mm x 35mm)

Figure 4-21 Package Outline PG1156

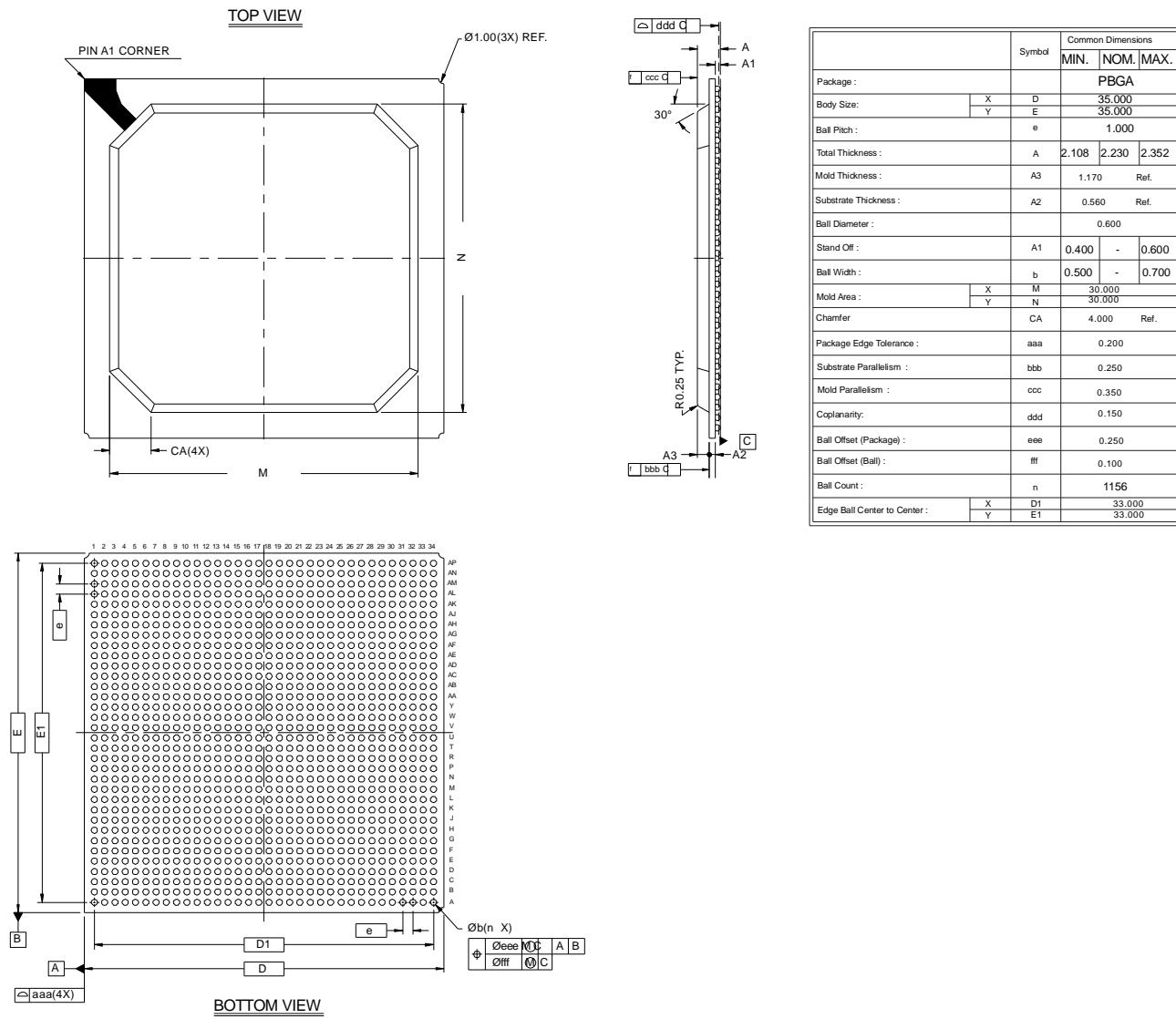
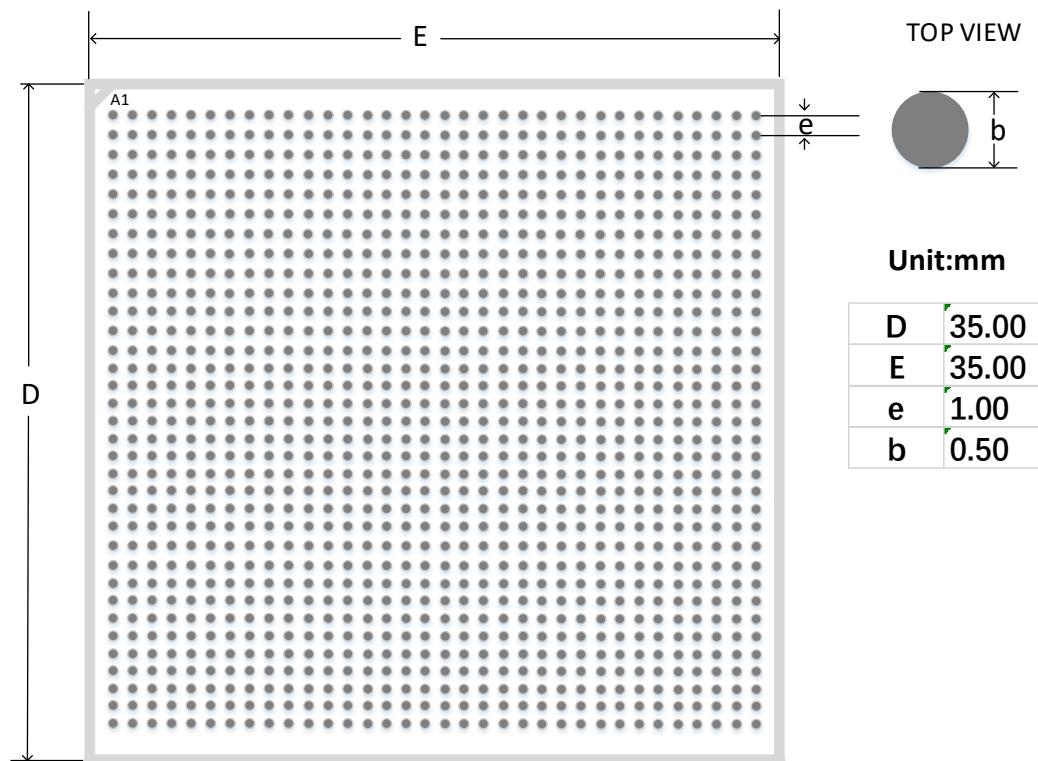


Figure 4-22 Recommended PCB Layout PG1156

4.12 UG324/UG324D/UG324F Package Outline (15mm x 15mm)

Figure 4-23 Package Outline UG324/UG324D/UG324F

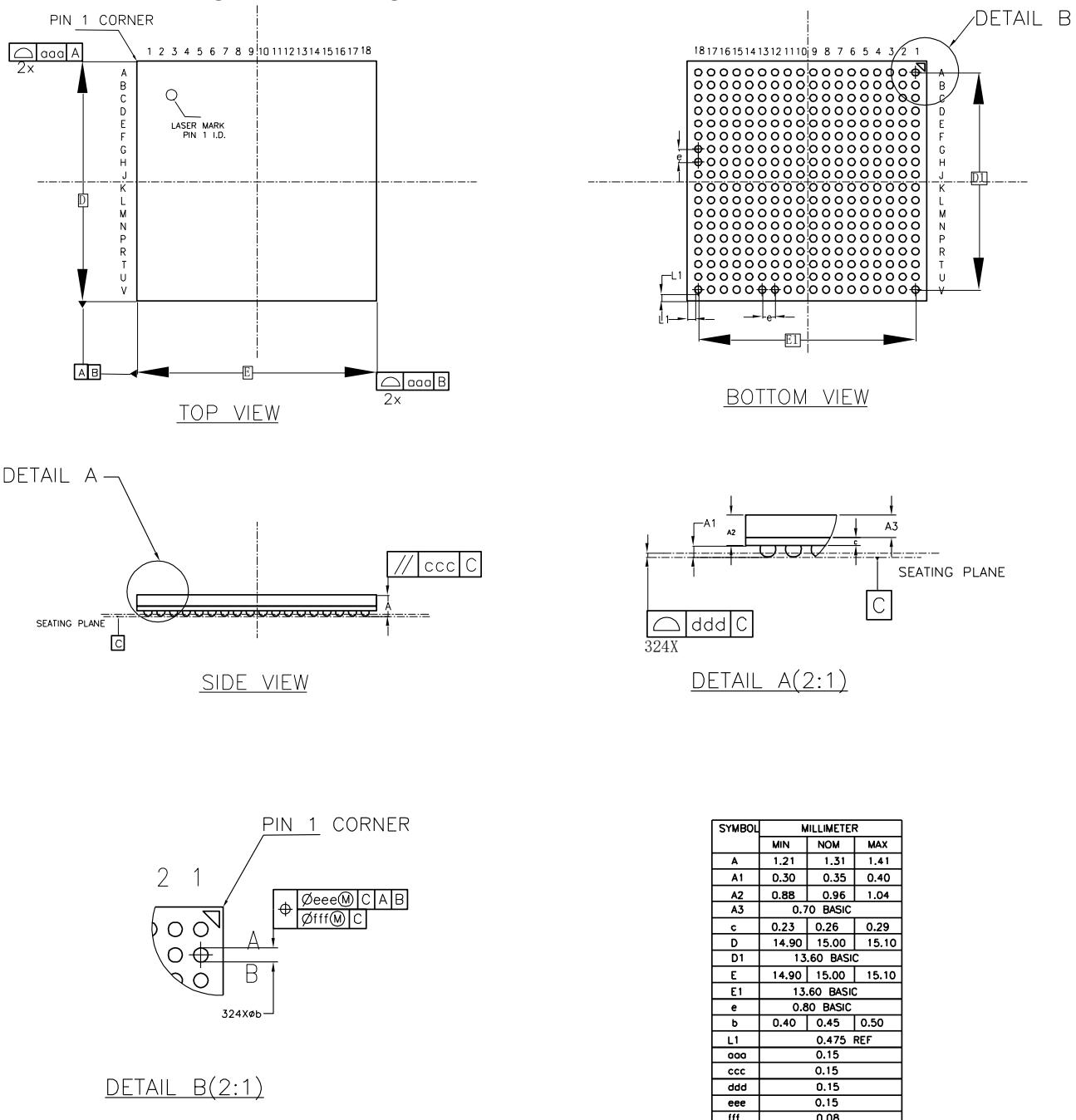
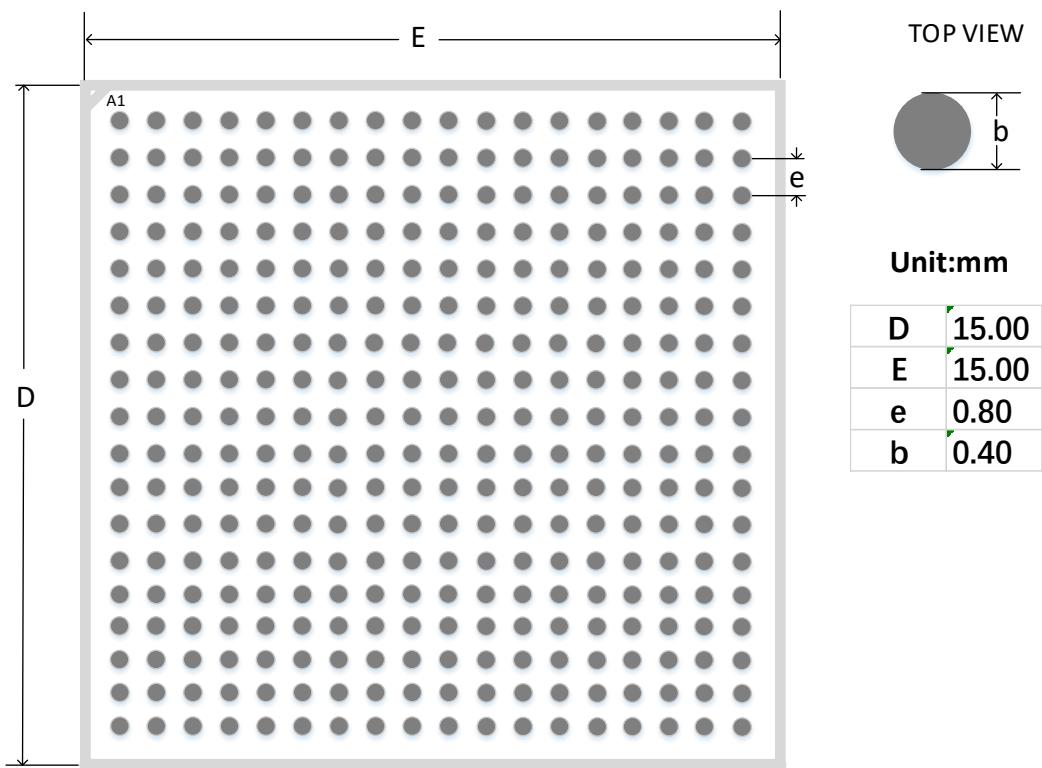


Figure 4-24 Recommended PCB Layout UG324/UG324D/UG324F



4.13 UG484/UG484S Package Outline (19mm x 19mm)

Figure 4-25 Package Outline UG484/UG484S

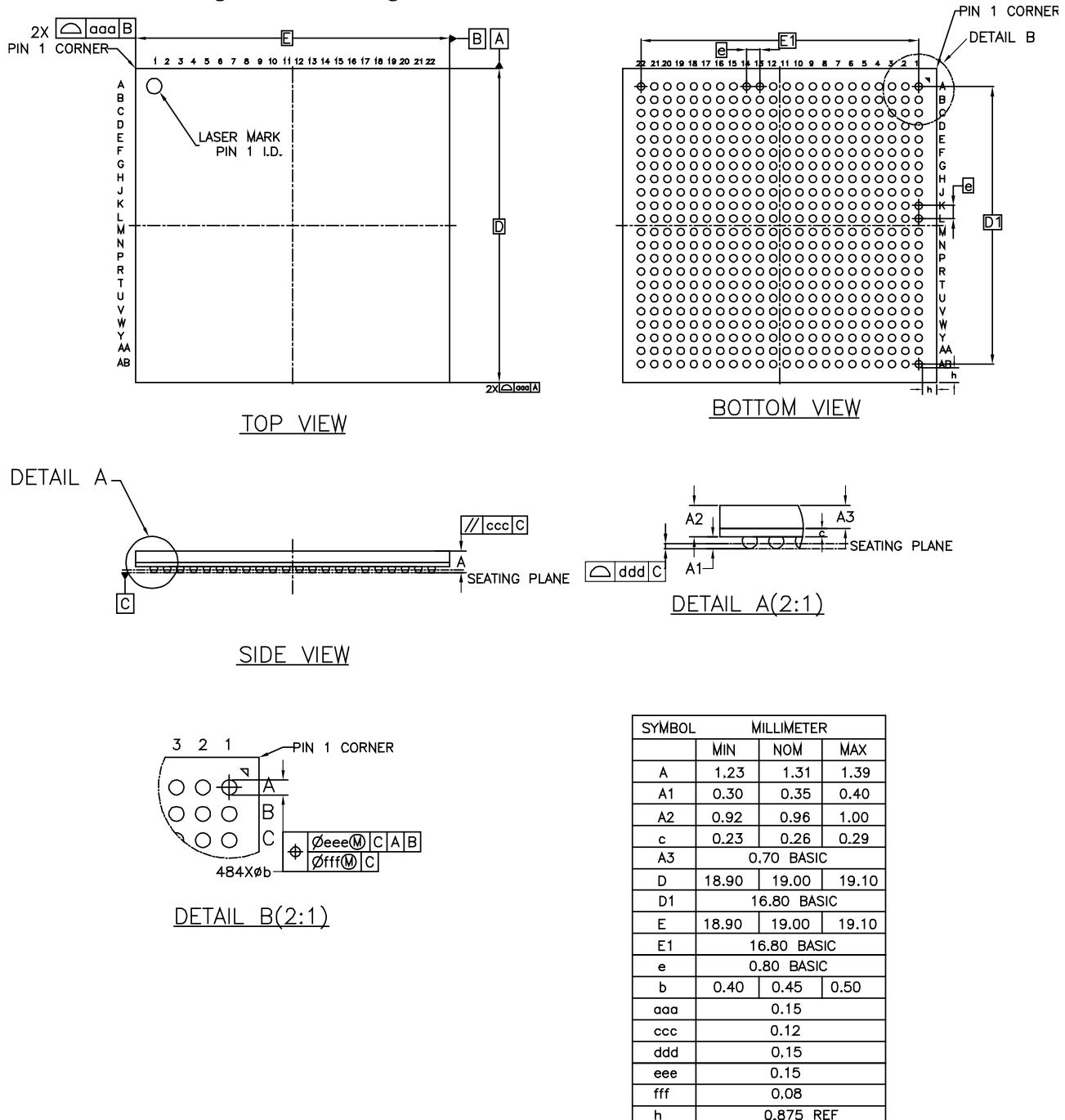
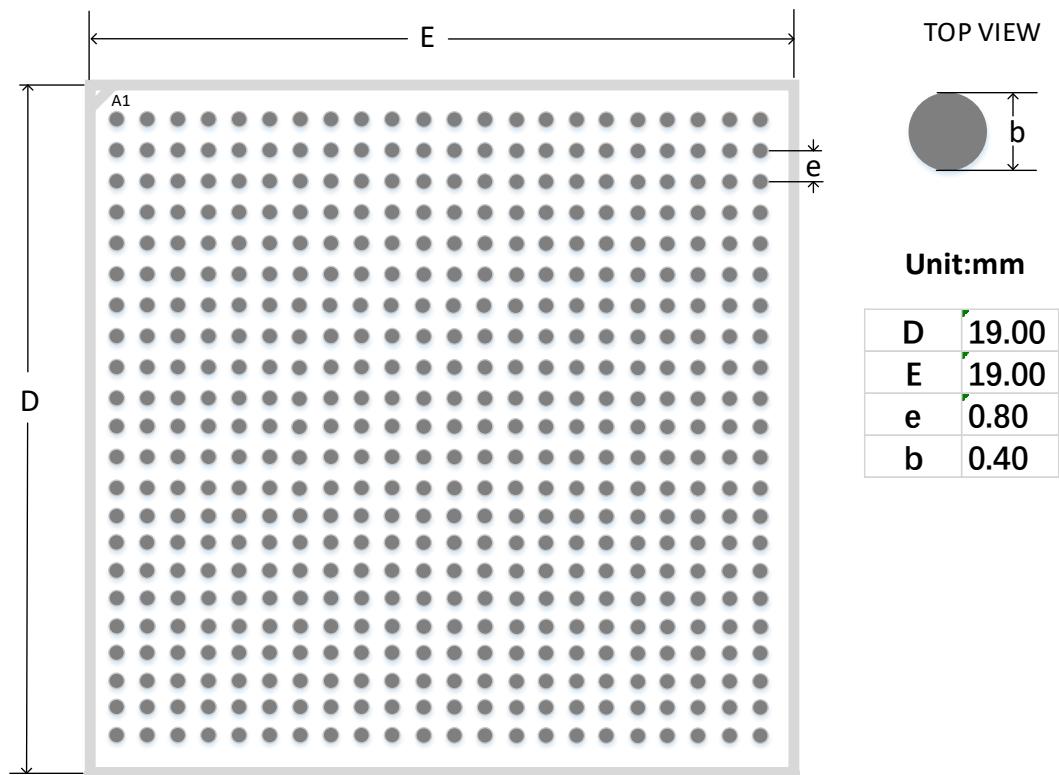


Figure 4-26 Recommended PCB Layout UG484/UG484S



4.14 UG676 Package Outline (21mm x 21mm)

Figure 4-27 Package Outline UG676

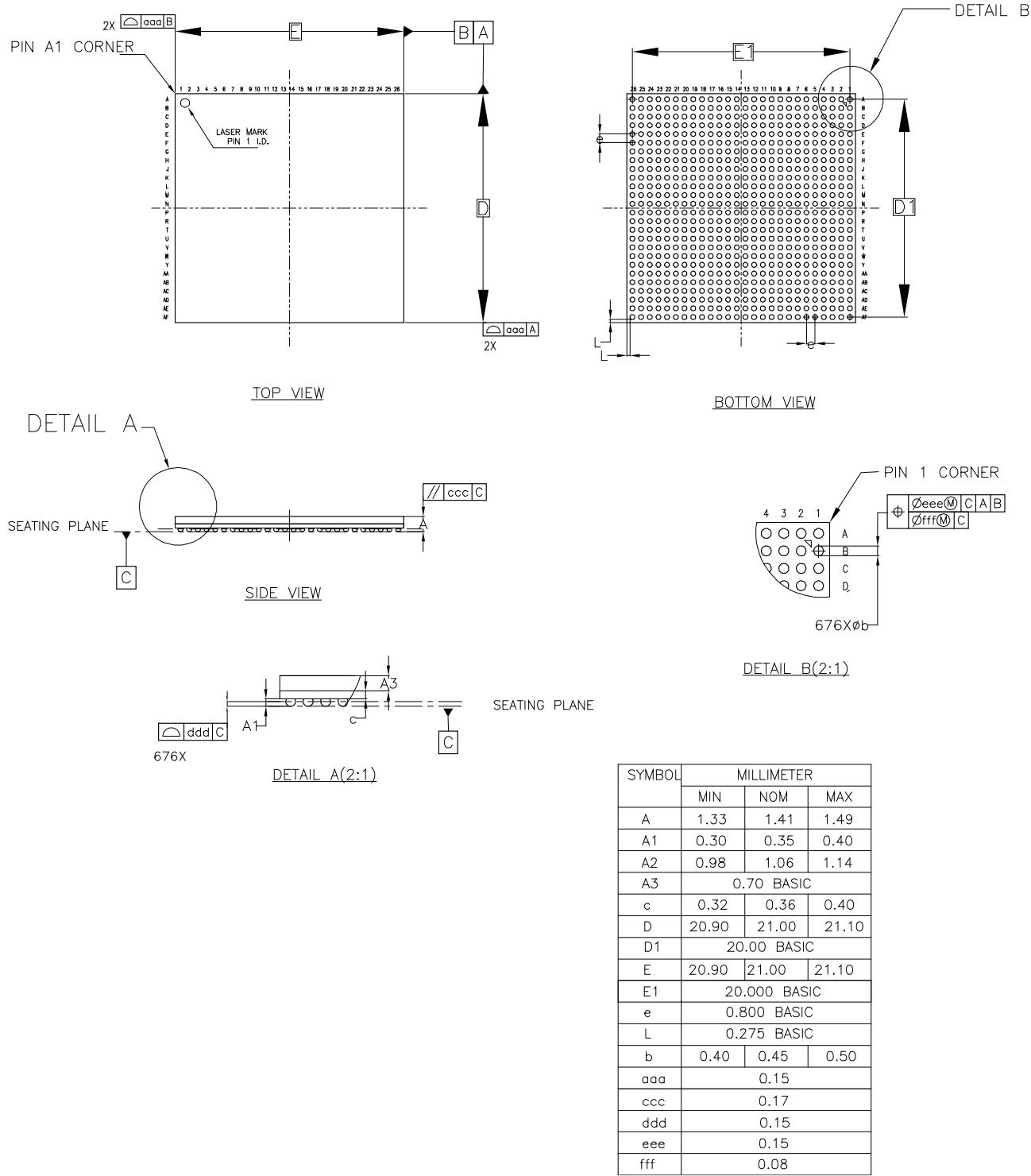


Figure 4-28 Recommended PCB Layout UG676

