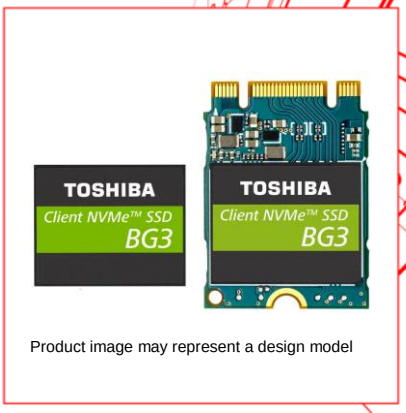
TOSHIBA

BG3 SERIES
CLIENT SSD

SSD



Product image may represent a design model

The BG3 series leverages 64-layer, 3-bit-per-cell (TLC) BiCS FLASH™ and features NVMe™ Revision 1.2.1. With Host Memory Buffer (HMB) technology, this SSD series retains high performance in a DRAM-less architecture, while enabling reduced power and a smaller footprint.

BG3 SSDs, as an innovative, next generation single-package ball grid array (BGA) SSD product line, harness the flexibility in system design that enables mobile computing and IoT embedded devices to be smaller, lighter, faster, and more power efficient. Also, these power-saving BG3 SSDs offer data center applications an alternative solution for server boot storage.

The BG3 series is available in 128GB, 256GB, and 512GB capacities. All three models are available in a surface-mount single package M.2 1620 or a removable module M.2 2230 form factor. BG3 SED models are also available.

KEY FEATURES

- Toshiba 64-Layer BiCS FLASH™
- PCIe® Gen3*2L NVMe™
- Capacities up to 512GB
- M.2 1620 single package and M.2 2230 single-sided form factor
- TCG OPAL 2.01 Optional for SED

APPLICATIONS

- Ultra-mobile PCs
- 2-in-1 notebook PCs
- IoT/embedded devices
- Server and storage array boot drives

SPECIFICATIONS

Standard Models		M.2 1620-S2 Single Package		M.2 1620-S3 Single Package	M.2 2230-S2 Single-sided		M.2 2230-S3 Single-sided
Model Number	(Non-SED)	KBG30ZPZ128G	KBG30ZPZ256G	KBG30ZPZ512G	KBG30ZMS128G	KBG30ZMS256G	KBG30ZMS512G
	(SED)	KBG3AZPZ128G	KBG3AZPZ256G	KBG3AZPZ512G	KBG3AZMS128G	KBG3AZMS256G	KBG3AZMS512G
Memory		TLC (BiCS FLASH™)					
Interface		PCI Express® Base Specification Revision 3.1a (PCIe®)					
Maximum Speed		16 GT/s (PCIe® Gen3x2 Lane)					
Command		NVM Express™ Revision 1.2.1 (NVMe™)					
Connector Type		-			M.2 B-M		
Formatted Capacity[1)]		128 GB	256 GB	512 GB	128 GB	256 GB	512 GB
Perfor-mance[2)] (Up to)	Sequential Read	(Non-SED)					
		1,300 MB/s {1,240 MiB/s}	1,400 MB/s {1,330 MiB/s}	1,500 MB/s {1,430 MiB/s}	1,300 MB/s {1,240 MiB/s}	1,400 MB/s {1,330 MiB/s}	1,500 MB/s {1,430 MiB/s}
		(SED)					
		1,200 MB/s {1,140 MiB/s}	1,250 MB/s {1,190 MiB/s}	1,300 MB/s {1,240 MiB/s}	1,200 MB/s {1,140 MiB/s}	1,250 MB/s {1,190 MiB/s}	1,300 MB/s {1,240 MiB/s}
	Sequential Write	(Non-SED)					
		600 MB/s {570 MiB/s}	800 MB/s {760 MiB/s}	1,000 MB/s {950 MiB/s}	600 MB/s {570 MiB/s}	800 MB/s {760 MiB/s}	1,000 MB/s {950 MiB/s}
		(SED)					
		550 MB/s {520 MiB/s}	750 MB/s {710 MiB/s}	950 MB/s {900 MiB/s}	550 MB/s {520 MiB/s}	750 MB/s {710 MiB/s}	950 MB/s {900 MiB/s}
Supply Voltage		3.3 V ±5 % 1.8 V ±5 % 1.2 V ±5 %			3.3 V ±5 %		
Power Consump-tion	Active	2.7 W typ.	2.8 W typ.		3.2 W typ.	3.3 W typ.	
	L1.2 mode	5 mW typ.			5 mW typ.		

Standard Models		M.2 1620-S2 Single Package	M.2 1620-S3 Single Package	M.2 2230-S2 Single-sided	M.2 2230-S3 Single-sided
Size		20.0 mm x 16.0 mm x 1.3 mm	20.0 mm x 16.0 mm x 1.5 mm	30.0 mm x 22.0 mm x 2.18 mm	30.0 mm x 22.0 mm x 2.38 mm
Weight		0.85 g typ.	1.00 g typ.	2.42 g typ.	2.60 g typ.
Tempera-ture	Operating	0 to 80 °C (Package Surface Temperature)		0 to 80 °C (Components Temperature)	
	Non-operating	-40 to 85 °C			
Reliability[3)]		Mean Time to Failure (MTTF): 1,500,000 hours Product Life: Approximately 5 years			
More Features		・Device Self-test is supported. ・Host Controlled Thermal Management (HCTM) is supported. ・The feature of Host Memory Buffer (HMB) is supported. ・Firmware security feature (only digitally signed firmware can be installed) is supported.			
Compliance[4)]		UL, cUL, TÜV, KC, FCC, BSMI, CE, RCM, ISED, VCCI, Moroccan conformity mark			

Note: 1) Definition of capacity: Toshiba Memory Corporation defines a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and a terabyte (TB) as 1,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2^{30} = 1,073,741,824 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

2) Read and write speed, tested on the state of "Host Memory Buffer (HMB) = On", may vary depending on the host device, read and write conditions, and file size.
1 MiB (mebibyte) = 2^{20} bytes = 1,048,576 bytes, and 1 MB (megabyte) = 1,000,000 bytes.

3) MTTF (Mean Time to Failure) is not a guarantee or estimate of product life; it is a statistical value related to mean failure rates for a large number of products which may not accurately reflect actual operation. Actual operating life of the product may be different from the MTTF.

4) The Safety/EMI Standard is supported for KBG3xZMSxxxx only.

* PCIe and PCI Express are registered trademarks of PCI-SIG
* NVMe™ and NVM Express™ are trademarks of NVM Express, Inc.
* All other company names, product names, and service names mentioned herein may be trademarks of their respective companies.
* Availability of the SED model line-up may vary by region.

ORDERING INFORMATION

K	XX	X	X	X	X	X	XXXX
1	2	3	4	5	6	7	8

1.	Product Name	K: SSD product
2.	Prodct Category	BG: BG Series
3.	Development Generation	3: Generation 3
4.	Option Code 1	0: Non-SED
		A: SED
5.	Option Code 2	Z: No-option
6.	Connector Type	M: M.2 (B-M Key)
		P: M.2 BGA
7.	Form Factor	S: M.2 2230 Single Sided
		Z: M.2 1620 Single Package
8.	Capacity	128G / 256G /512G
		128G is 128 GB, 256G is 256 GB and 512G is 512 GB (1 GB = 1,000,000,000 bytes)

PRODUCT LINE UP

Model Number	Formatted Capacity	Form Factor/Connect Type	Function Note
KBG30ZPZ128G	128 GB	M.2 1620-S2[1)]	Non-SED
KBG30ZPZ256G	256 GB		
KBG30ZPZ512G	512 GB	M.2 1620-S3[2)]	
KBG3AZPZ128G	128 GB	M.2 1620-S2[1)]	SED[3)]
KBG3AZPZ256G	256 GB		
KBG3AZPZ512G	512 GB	M.2 1620-S3[2)]	
KBG30ZMS128G	128 GB	M.2 2230-S2[1)] -B-M	Non-SED
KBG30ZMS256G	256 GB		
KBG30ZMS512G	512 GB	M.2 2230-S3[2)] -B-M	
KBG3AZMS128G	128 GB	M.2 2230-S2[1)] -B-M	SED[3)]
KBG3AZMS256G	256 GB		
KBG3AZMS512G	512 GB	M.2 2230-S3[2)] -B-M	

Note: 1) Single Sided/Top side 1.35mm Maximum Thickness
2) Single Sided/Top side 1.5 mm Maximum Thickness
3) Availability of the SED model line-up may vary by region.

CAPACITY

Capacity	Total Number of User Addressable Sectors in LBA Mode	
	512 bytes sector	4,096 bytes sector
128 GB[1)]	250,069,680	31,258,710
256 GB[1)]	500,118,192	62,514,774
512 GB[1)]	1,000,215,216	125,026,902

Note: 1) 1 GB (Gigabyte) = 1,000,000,000 bytes

PERFORMANCE

Standard Models		KBG30ZPZ128G KBG30ZMS128G	KBG30ZPZ256G KBG30ZMS256G	KBG30ZPZ512G KBG30ZMS512G
	(Non-SED)			
	(SED)	KBG3AZPZ128G KBG3AZMS128G	KBG3AZPZ256G KBG3AZMS256G	KBG3AZPZ512G KBG3AZMS512G
Interface Speed		16 GT/s (Gen3x2 Lane), 8 GT/s (Gen3x1 Lane) 10 GT/s (Gen2x2 Lane), 5 GT/s (Gen2x1 Lane) 5 GT/s (Gen1x2 Lane), 2.5 GT/s (Gen1x1 Lane)		
Sequential Read[1)] (Up to)	(Non-SED)	1,300 MB/s {1,240 MiB/s}	1,400 MB/s {1,330 MiB/s}	1,500 MB/s {1,430 MiB/s}
	(SED)	1,200 MB/s {1,140 MiB/s}	1,250 MB/s {1,190 MiB/s}	1,300 MB/s {1,240 MiB/s}
Sequential Write[1)] (Up to)	(Non-SED)	600 MB/s {570 MiB/s}	800 MB/s {760 MiB/s}	1,000 MB/s {950 MiB/s}
	(SED)	550 MB/s {520 MiB/s}	750 MB/s {710 MiB/s}	950 MB/s {900 MiB/s}

Note: 1) Under the condition of measurement with 128 KiB unit sequential access and 4KiB align. Queue depth is 32, and access range is 16GiB.
1KiB (Kibibyte) = 2^{10} bytes = 1024 bytes

SUPPLY VOLTAGE

Standard Models	M.2 1620 Single Package	M.2 2280 Module
Allowable voltage	3.3 V ±5 % 1.8 V ±5 % 1.2 V ±5 %	3.3 V ±5 %
Allowable noise/ripple	100 mV p-p, 0-10MHz	
Allowable supply rise time	Comply to the PCI-SIG specification of Power Up/Down Sequence	2 –100 ms

POWER CONSUMPTION

Operation (Ta[1]=25°C)	M.2 1620 Single Package		
	KBG30ZPZ128G KBG3AZPZ128G	KBG30ZPZ256G KBG3AZPZ256G	KBG30ZPZ512G KBG3AZPZ512G
Read[2]	2.7 W typ.	2.8 W typ.	2.8 W typ.
Write[2]	2.1 W typ.	2.4 W typ.	2.8 W typ.
Power State3[3]	50 mW typ.		
Power State4[3]	5 mW typ.		

Operation (Ta[1]=25°C)	M.2 2230 Module		
	KBG30ZMS128G KBG3AZMS128G	KBG30ZMS256G KBG3AZMS256G	KBG30ZMS512G KBG3AZMS512G
Read[2]	3.2 W typ.	3.3 W typ.	3.3 W typ.
Write[2]	2.5 W typ.	2.8 W typ.	3.2 W typ.
Power State 3[3]	50 mW typ.		
Power State 4[3]	5 mW typ.		

Note: 1) Ambient Temperature
2) The values are specified at the condition causing maximum power consumption and Power State 0.
3) PCIe Link state L1.2
Power consumption during the Admin command processing is excluded.

ENVIRONMENTAL CONDITIONS

TEMPERATURE

Condition	Range		Gradient
	M.2 1620 Single Package	M.2 2280 Module	
Operating[1)]	0 °C (Tc) – 80 °C (Tc) (Package Temperature)	0 °C (Tc) – 80 °C (Tc) (Components Temperature)	30 °C (Ta) / h maximum
Non-operating	-40 °C – 85 °C		30 °C / h maximum
Under Shipment [2)]	-40 °C – 85 °C		30 °C / h maximum

Note: 1) Ta: Ambient Temperature, Tc: Package Surface or Components Temperature
2) Packaged in Toshiba Memory Corporation's original shipping package.

HUMIDITY

Condition	Range
Operating	8 % – 90 % R.H. (No condensation)
Non-operating	8 % – 95 % R.H. (No condensation)
Under Shipment[1)]	5 % – 95 % R.H.
Max. wet bulb	32.5 °C (Operating) 40.0 °C (Non-operating / Shipping)

Note: 1) Packaged in Toshiba Memory Corporation's original shipping package.

SHOCK

Condition	Range
Operating[1)]	14.709 km/s^2 {1,500 G}, 0.5 ms half sine wave
Non-operating[1)]	
Under Shipment[2)]	100 cm free drop

Note: 1) Apply shocks in each direction of the drive's three mutually perpendicular axes, one axis at a time.
2) Packaged in Toshiba Memory Corporation's original shipping package.

VIBRATION

Condition	Range
Operating	196 m/s^2 {20 G} Peak, 10 - 2,000 Hz (20 minutes per axis) x 3 axis
Non-operating	

COMPLIANCE

SAFETY / EMI STANDARDS

Title	Description	Region
UL[1)] (Underwriters Laboratories)	UL 60950-1	USA[2)]
cUL[1)] (Underwriters Laboratories of Canada)	CSA-C22.2 No.60950-1-07	Canada
TÜV[1)] (Technischer Überwachungs Verein)	EN 60950-1	EURO
KC[1)]	KN32, KN35	Korea
FCC[1)]	FCC part 15 Subpart B	USA
BSMI[1)] (Bureau of Standards, Metrology and Inspection)	CNS13438 (CISPR Pub. 22)	Taiwan
CE[1)]	EN 55032, EN 55024	EURO
RCM[1)]	AS/NZS CISPR 32	Australia, New Zealand
ISED[1)]	ICES-003	Canada
Moroccan conformity mark[1)]	NM EN 55032, NM EN 22024	Morocco
VCCI[1)]	VCCI-CISPR32	Japan

Note: 1) The Safety/EMI Standard is supported for KBG3xZMSxxxx only.
2) UL certification is basically on a voluntary basis.

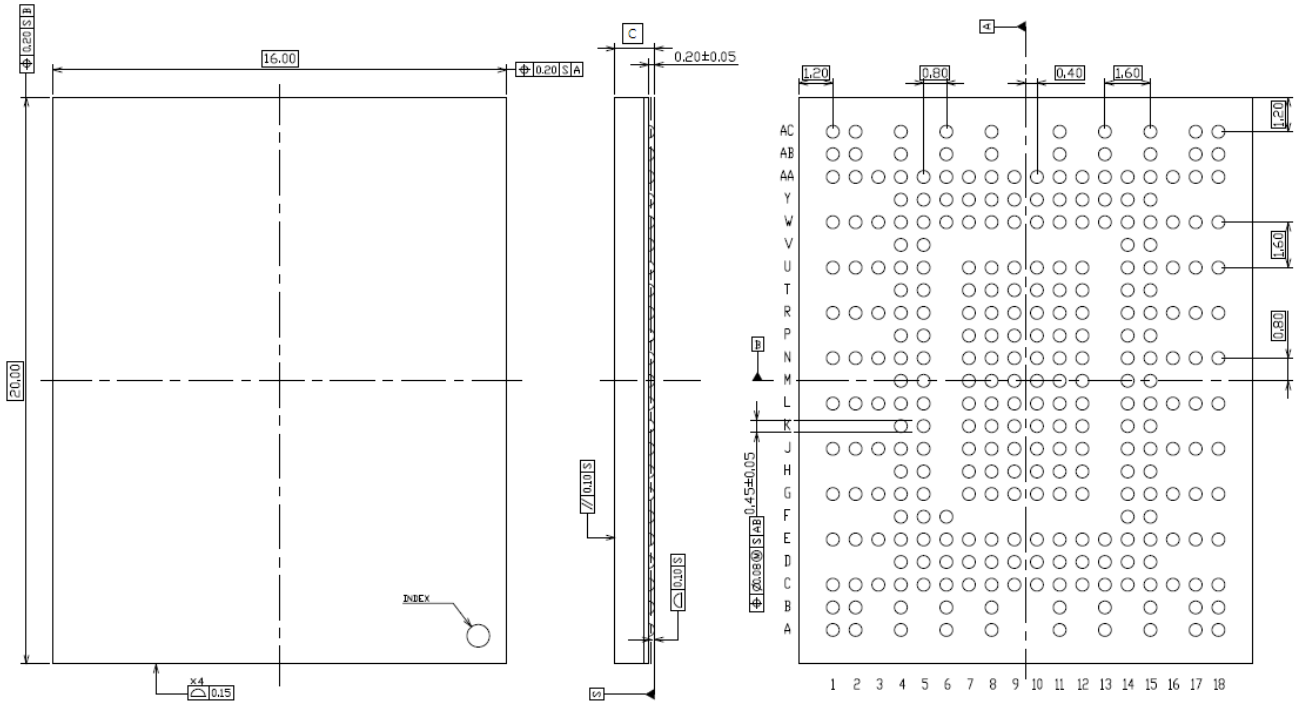
RELIABILITY

Parameter	Value
Mean Time to Failure	1,500,000 hours
Product Life	Approximately 5 years

MECHANICAL SPECIFICATIONS

M.2 1620 SINGLE PACKAGE

Model Number	Weight	Width	Height	Length
KBG30ZPZ128G KBG3AZPZ128G	0.85 g typ.	16.00 mm	1.30 mm	20.00 mm
KBG30ZPZ256G KBG3AZPZ256G				
KBG30ZPZ512G KBG3AZPZ512G	1.00 g typ.		1.50 mm	



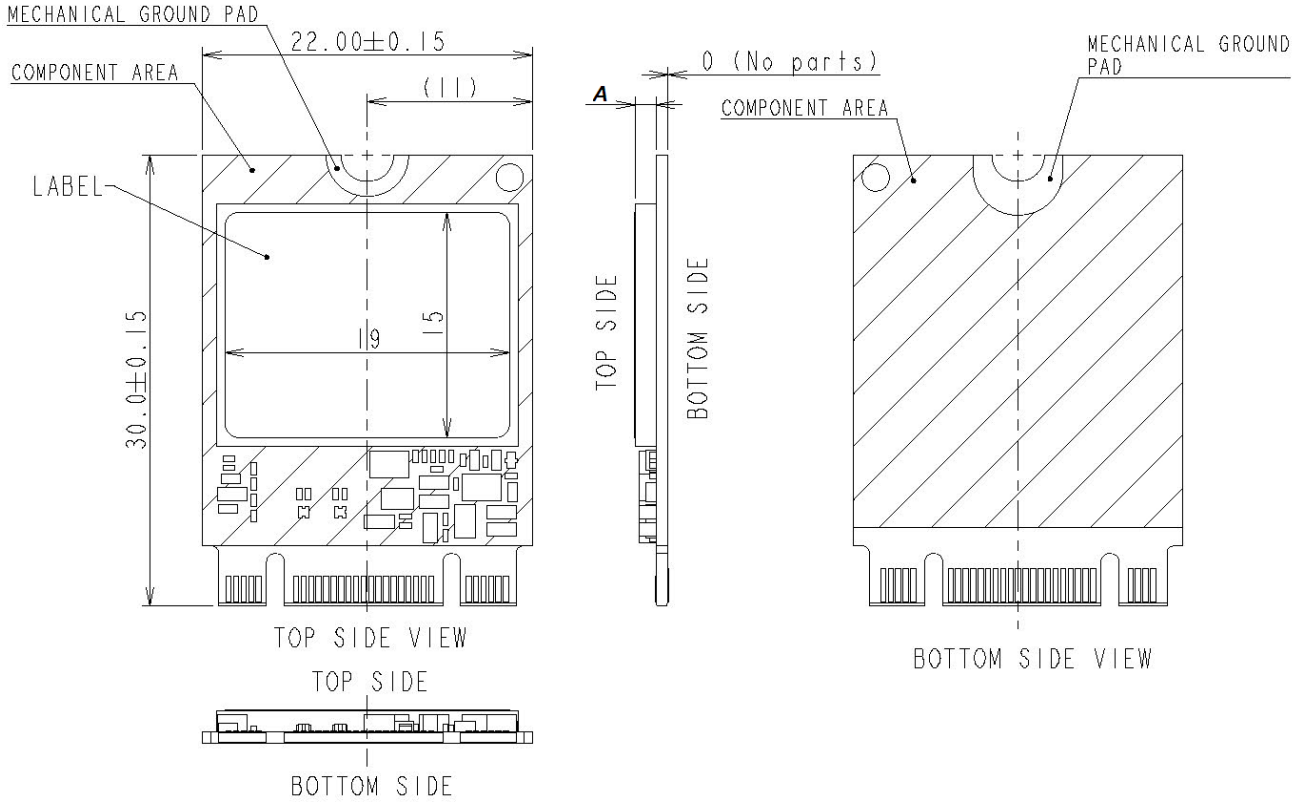
Unit:mm

Dimension	Description	KBG30ZPZ128G KBG3AZPZ128G KBG30ZPZ256G KBG3AZPZ256G	KBG30ZPZ512G KBG3AZPZ512G
c	Thickness of BGA Package	1.30 mm Max.	1.50 mm Max.

Figure 1: Dimensions of KBG3xZPZxxxx (Single Package)

M.2 2230 MODULE

Model Number	Weight	Width	Height	Length
KBG30ZMS128G KBG3AZMS128G	2.42 g typ.	22.00 mm	2.18 mm	30.00 mm
KBG30ZMS256G KBG3AZMS256G				
KBG30ZMS512G KBG3AZMS512G	2.60 g typ.		2.38 mm	



Unit:mm

Dimension	Description	KBG30ZMS128G KBG3AZMS128G KBG30ZMS256G KBG3AZMS256G	KBG30ZMS512G KBG3AZMS512G
A	Thickness of BGA Package (without label)	1.30 mm Max.	1.50 mm Max.

Figure 2: Dimensions of KBG3xZMSxxxx (M.2 2230 Module)

INTERFACE CONNECTOR

M.2 1620 SINGLE PACKAGE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	DNU	DNU		DNU		DNU		DNU			DNU		DNU		DNU		DNU	DNU
B	DNU	DNU		DNU		NC		DNU			DNU		DNU		DNU		DNU	DNU
C	GND	GND	GND	GND	GND	DNU	NC	NC	DNU	NC	DNU	DNU	RFU	RFU	GND	DNU	DNU	DNU
D				REF CLKP	REF CLKN	GND	PER ST#	CLK REQ#	PWR_1	PWR_1	GND	DNU	DIAG1	NC	RFU			
E	GND	GND	GND	GND	GND	GND	GND	NC	PWR_1	PWR_1	GND	NC	DIAG0	GND	GND	DNU	DNU	DNU
F				PERp0	PERn0	GND								PE DET	RFU			
G	GND	GND	GND	GND	GND		PWR_3	PWR_3	GND	GND	PWR_3	PWR_3		GND	GND	DNU	DNU	DNU
H				PETp0	PETn0		PWR_3	PWR_3	GND	GND	PWR_3	PWR_3		RFU	RFU			
J	GND	GND	GND	GND	GND		PWR_3	PWR_3	GND	GND	PWR_3	PWR_3		GND	GND	DNU	DNU	DNU
K				PERp1	PERn1		GND	GND	GND	GND	GND	GND		RFU	RFU			
L	GND	GND	GND	GND	GND		RFU	RFU	RFU	RFU	RFU	RFU		GND	GND	DNU	DNU	NC
M				PETp1	PETn1		RFU	RFU	GND	GND	RFU	RFU		RFU	RFU			
N	GND	GND	GND	GND	GND		RFU	RFU	RFU	RFU	RFU	RFU		GND	GND	DNU	NC	NC
P				NC	NC		GND	GND	GND	GND	GND	GND		RFU	RFU			
R	GND	GND	GND	GND	GND		PWR_2	PWR_2	GND	GND	PWR_2	PWR_2		GND	GND	DNU	NC	NC
T				NC	NC		PWR_2	PWR_2	GND	GND	PWR_2	PWR_2		RFU	RFU			
U	GND	GND	GND	GND	GND		PWR_2	PWR_2	GND	GND	PWR_2	PWR_2		GND	GND	DNU	NC	NC
V				NC	NC									RFU	RFU			
W	GND	GND	GND	GND	GND	GND	LED 1#	RFU	PWR_1	PWR_1	GND	RFU	RFU	GND	GND	DNU	DNU	NC
Y				NC	NC	GND	DNU	DNU	PWR_1	PWR_1	GND	DNU	GND	DNU	DNU			
AA	GND	GND	GND	GND	GND	DNU	DNU	DNU	DNU	NC	DNU	DNU	DNU	GND	GND	DNU	DNU	DNU
AB	DNU	DNU		DNU		DNU		DNU			DNU		DNU		DNU		DNU	DNU
AC	DNU	DNU		DNU		DNU		DNU			DNU		DNU		DNU		DNU	DNU

Note: 1) The total ball number is 291.
2) The voltage powers must be supplied to each ball on all power rails.
3) NC is not used in KBG3xZPZxxxx. But NC ball function is assigned in PCI-SiG specification.
4) NC, DNU and RFU must be connected to independent OPEN land, and can't be connected between each other on host board.
5) DIAG0 and DIAG1 are engineering diagnosis balls. Toshiba Memory Corporation requests to enable access to DIAG0 and DIAG1 on host board.

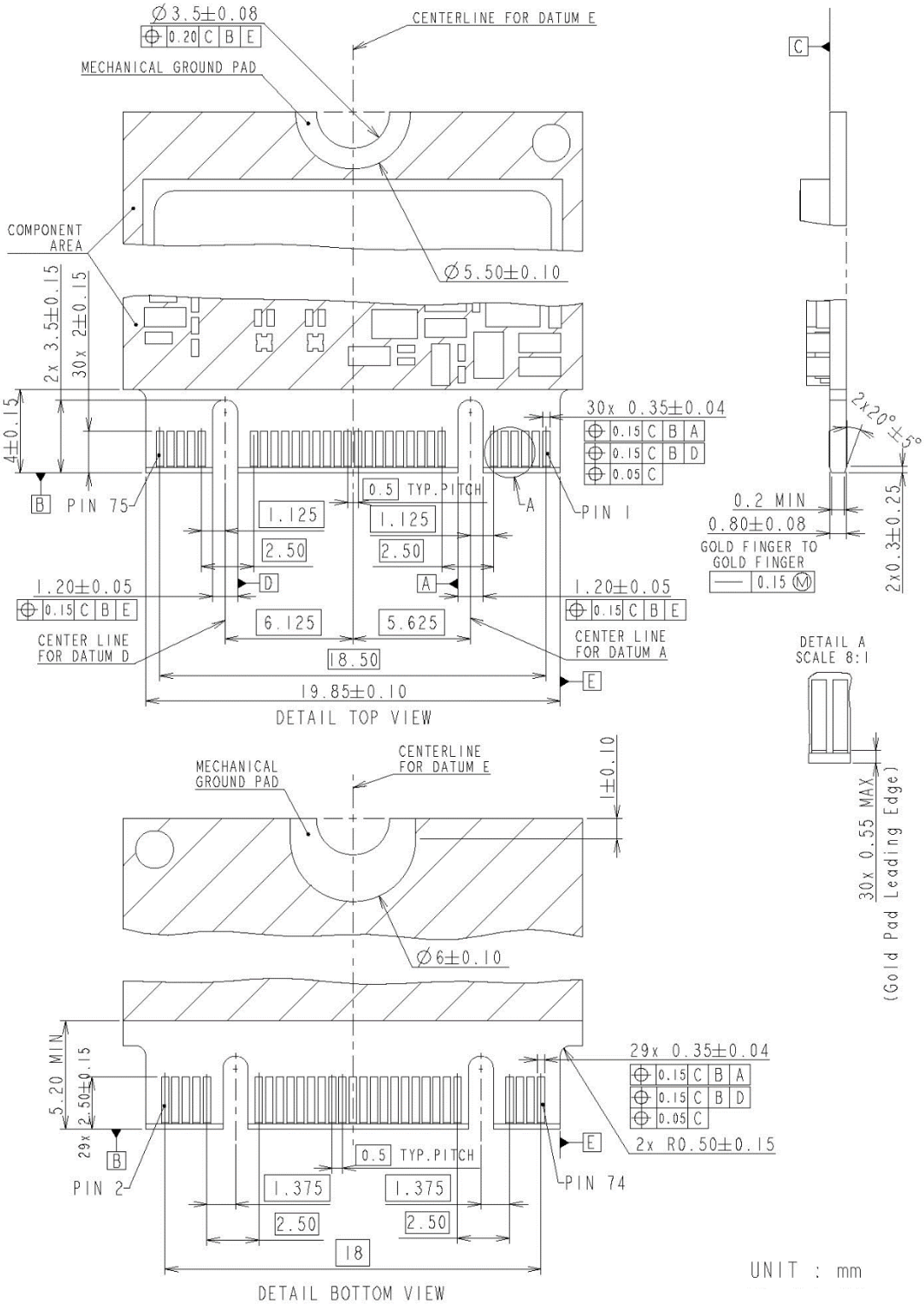
Figure 3: Ball Map of KBG3xZPZxxxx (Single Package)

SINGLE PACKAGE INTERFACE SIGNALS

Interface	Signal Name	Description	Location
Power and Grounds	PWR_1	3.3 V Source	D9, D10, E9, E10, W9, W10, Y9, Y10
	PWR_2	1.8 V Source	R7, R8, R11, R12, T7, T8, T11, T12, U7, U8, U11, U12
	PWR_3	1.2 V Source	G7, G8, G11, G12, H7, H8, H11, H12, J7, J8, J11, J12
Power and Grounds	GND	GND	C1-C5, C15, D6, D11, E1-E7, E11, E14, E15, F6, G1-G5, G9, G10, G14, G15, H9, H10, J1-J5, J9, J10, J14, J15, K7-K12, L1-L5, L14, L15, M9, M10, N1-N5, N14, N15, P7-P12, R1-R5, R9, R10, R14, R15, T9, T10, U1-U5, U9, U10, U14, U15, W1-W6, W11, W14, W15, Y6, Y11, Y13, AA1-AA5, AA14, AA15
PCIe	PERp0, PERn0	PCIe 0 Device Receiver	F4, F5
	PETp0, PETn0	PCIe 0 Device Transfer	H4, H5
	PERp1, PERn1	PCIe 1 Device Receiver	K4, K5
	PETp1, PETn1	PCIe 1 Device Transfer	M4, M5
	REFCLKp, REFCLKn	PCIe Reference Clock	D4, D5
	PERST#	PE-Reset	D7
	CLKREQ#	Clock Request	D8
SSD Specific Signals	LED1#	Device Activity	W7
	PEDET	Host I/F Indication (PCIe:OPEN / SATA:GND)	F14
Optional Signals	DIAG0, DIAG1	Diagnosis, option for engineering	D13, E13

Interface	Signal Name	Description	Location
Other Signals	RFU	Reserved; OPEN	C13, C14, D15, F15, H14, H15, K14, K15, L7, L8, L9, L10, L11, L12, M7, M8, M11, M12, M14, M15, N7, N8, N9, N10, N11, N12, P14, P15, T14, T15, V14, V15, W8, W12, W13
	DNU	Manufacturing purpose only;OPEN	A1, A2, A4, A6, A8, A11, A13, A15, A17, A18, B1, B2, B4, B8, B11, B13, B15, B17, B18, C6, C9, C11, C12, C16-C18, D12, E16-E18, G16-G18, J16-J18, L16, L17, N16, R16, U16, W16, W17, Y7, Y8, Y12, Y14, Y15, AA6-AA9, AA11-AA13, AA16-AA18, AB1, AB2, AB4, AB6, AB8, AB11, AB13, AB15, AB17, AB18, AC1, AC2, AC4, AC6, AC8, AC11, AC13, AC15, AC17, AC18
	NC	Not used; OPEN	B6, C7, C8, C10, D14, E8, E12, L18, N17, N18, P4, P5, R17, R18, T4, T5, U17, U18, V4, V5, W18, Y4, Y5, AA10

M.2 2230 MODULE



Unit:mm

Figure 4: Interface Dimensions of KBG3xZMSxxxx (M.2 2230 Module)

M.2 2230 MODULE CONNECTOR PIN ASSIGNMENT

Pin #	Signal Name	Description
1	CONFIG_3	GND
3	GND	GND
5	Reserved	NC
7	Reserved	NC
9	Reserved	NC
11	Reserved	NC
Notch		
21	CONFIG_0	GND
23	Reserved	NC
25	Reserved	NC
27	GND	GND
29	PETn1	PCIe 1 Device Transfer
31	PETp1	
33	GND	GND
35	PERn1	PCIe 1 Device Receiver
37	PERp1	
39	GND	GND
41	PETn0	PCIe 0 Device Transfer
43	PETp0	
45	GND	GND
47	PERn0	PCIe 0 Device Receiver
49	PERp0	
51	GND	GND
53	REFCLKn	PCIe Reference Clock
55	REFCLKp	PCIe Reference Clock
57	GND	GND
Notch		
67	Reserved	NC
69	PEDET	Host I/F Indication (PCIe:OPEN / SATA:GND)
71	GND	GND
73	GND	GND
75	GND	GND

Pin #	Name	Description
2	+3.3V	3.3 V Source
4	+3.3V	3.3 V Source
6	Reserved	NC
8	Reserved	NC
10	LED1#	Device Activity
Notch		
20	Reserved	NC
22	Reserved	NC
24	Reserved	NC
26	Reserved	NC
28	Reserved	NC
30	Reserved	NC
32	Reserved	NC
34	Reserved	NC
36	Reserved	NC
38	Reserved	NC
40	Reserved	NC
42	Reserved	NC
44	Reserved	NC
46	Reserved	NC
48	Reserved	NC
50	PERST#	PE-Reset
52	CLKREQ#	Clock Request
54	PEWAKE#	NC
56	MFG DATA	Manufacturing pin. Must **NOT** be connected on host board.
58	MFG CLOCK	
Notch		
68	SUSCLK	NC
70	+3.3V	3.3 V Source
72	+3.3V	3.3 V Source
74	+3.3V	3.3 V Source

COMMAND TABLE

ADMIN Command set

Op-Code	Command Name
00h	Delete I/O Submission Queue
01h	Create I/O Submission Queue
02h	Get Log Page
04h	Delete I/O Completion Queue
05h	Create I/O Completion Queue
06h	Identify
08h	Abort
09h	Set Features
0Ah	Get Features
0Ch	Asynchronous Event Request
10h	Firmware Commit
11h	Firmware Image Download
14h	Device Self-Test (DST)
80h	Format NVM
81h	Security Send
82h	Security Receive

Set Features / Get Features Set

Op-Code	Feature Name
01h	Arbitration
02h	Power Management
04h	Temperature Threshold
05h	Error Recovery
06h	Volatile Write Cache
07h	Number of Queues
08h	Interrupt Coalescing
09h	Interrupt Vector Configuration
0Ah	Write Atomicity
0Bh	Asynchronous Event Configuration
0Ch	Autonomous Power State Transition
0Dh	Host Memory Buffer (HMB)
10h	Host Controlled Thermal Management (HCTM)

NVMe Command Set

Op-Code	Command Name
00h	Flush
01h	Write
02h	Read
04h	Write Uncorrectable
05h	Compare
09h	Dataset Management

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