TOSHIBA e-MMC Module

4GB THGBMNG5D1LBAIL

INTRODUCTION

THGBMNG5D1LBAIL is 4GB density of e-MMC Module product housed in 153 ball BGA package. This unit is utilized advanced TOSHIBA NAND flash device(s) and controller chip assembled as Multi Chip Module. THGBMNG5D1LBAIL has an industry standard MMC protocol for easy use.

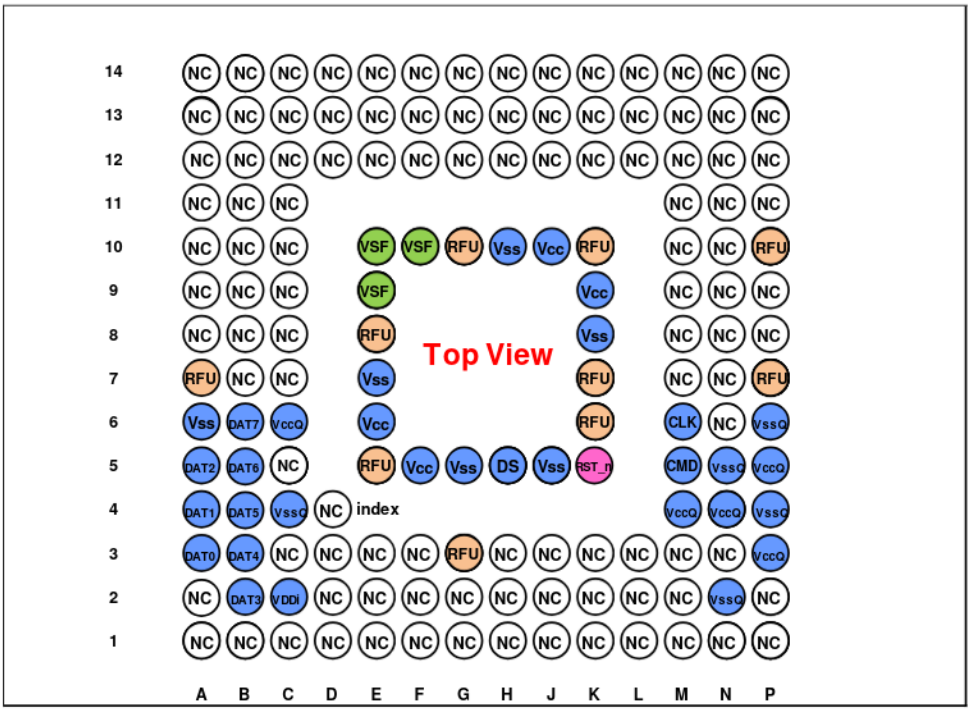
FEATURES

THGBMNG5D1LBAIL Interface

THGBMNG5D1LBAIL has the JEDEC/MMCA Version 5.0 interface with 1-I/O, 4-I/O and 8-I/O mode.

Pin Connection

P-WFBGA153-1113-0.50 (11.5mm x 13mm, H0.8mm max. package)



Pin Number	Name	Pin Number	Name	Pin Number	Name	Pin Number	Name
A3	DAT0	C2	VDDi	J5	Vss	N4	VccQ
A4	DAT1	C4	VssQ	J10	Vcc	N5	VssQ
A5	DAT2	C6	VccQ	K5	RST_n	P3	VccQ
A6	Vss	E6	Vcc	K8	Vss	P4	VssQ
B2	DAT3	E7	Vss	K9	Vcc	P5	VccQ
B3	DAT4	F5	Vcc	M4	VccQ	P6	VssQ
B4	DAT5	G5	Vss	M5	CMD		
B5	DAT6	H5	DS	M6	CLK		
B6	DAT7	H10	Vss	N2	VssQ		

NC: No Connect, shall be connected to ground or left floating.
RFU: Reserved for Future Use, shall be left floating for future use.
VSF: Vendor Specific Function, shall be left floating.

Part Numbers

Available e-MMC Module Products – Part Numbers

TOSHIBA Part Number	Density	Package Size	NAND Flash Type	Weight
THGBMNG5D1LBAIL	4GB	11.5mm x 13mm x 0.8mm(max)	1 x 32Gbit 15nm	0.18g typ

Operating Temperature

-25°C to +85°C

Storage Temperature

-40°C to +85°C

Performance

X8 mode/ Sequential access

TOSHIBA Part Number	Density	NAND Flash Type	Interleave Operation	Frequency /Mode	VccQ	Typ. Performance [MB/sec]	
						Read	Write
THGBMNG5D1LBAIL	4GB	1 x 32Gbit 15nm	Non Interleave	52MHz/SDR	1.8V	46	14
					3.3V	46	14
				52MHz/DDR	1.8V	88	14
					3.3V	88	14
				HS200	1.8V	152	14
				HS400	1.8V	152	14

Power Supply

Vcc = 2.7V to 3.6V
VccQ = 1.7V to 1.95V / 2.7V to 3.6V

Operating Current (RMS)

The measurement for max RMS current is done as average RMS current consumption over a period of 100ms

TOSHIBA Part Number	Density	NAND Flash Type	Interleave Operation	Frequency /Mode	VccQ	Max Operating Current [mA]	
						Iccq	Icc
THGBMNG5D1LBAIL	4GB	1 x 32Gbit 15nm	Non Interleave	52MHz/SDR	1.8V	60	25
					3.3V	70	25
				52MHz/DDR	1.8V	70	30
					3.3V	85	30
				HS200	1.8V	90	30
				HS400	1.8V	100	30

Sleep Mode Current

TOSHIBA Part Number	Density	NAND Flash Type	Interleave Operation	Iccqs [µA]		Iccqs+Iccs [µA]	
				Typ. *1	Max. *2	Typ. *1	Max. *2
THGBMNG5D1LBAIL	4GB	1 x 32Gbit 15nm	Non Interleave	100	510	120	560

*1 : The conditions of typical values are 25°C and VccQ = 3.3V or 1.8V.
*2 : The conditions of maximum values are 85°C and VccQ = 3.6V or 1.95V.