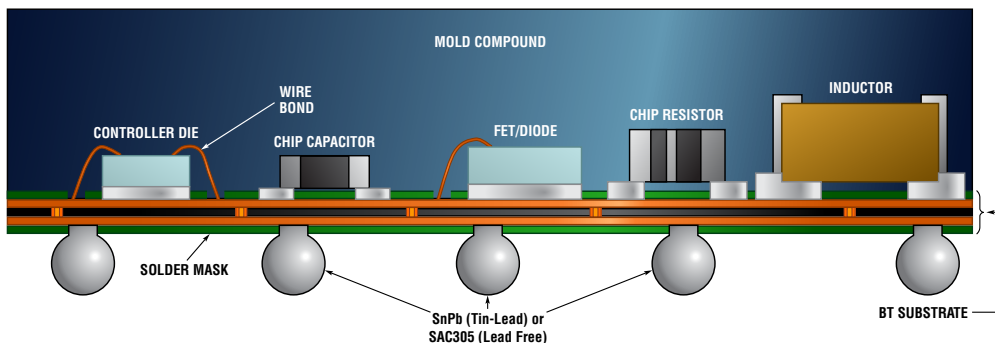


SnPb (Tin-Lead) BGA Packages μModule Power Products

SnPb BGA List:

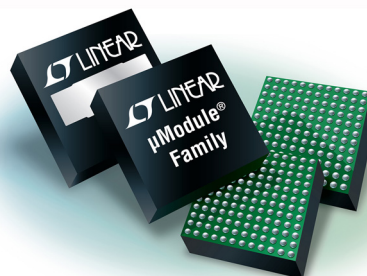
LTM [®] 4601	LTM4649
LTM4601-1	LTM4675
LTM4601A	LTM4676
LTM4601AHV	LTM4676A
LTM4601A-1	LTM4677
LTM4604A	LTM8001
LTM4606	LTM8023
LTM4608A	LTM8025
LTM4609	LTM8026
LTM4613	LTM8027
LTM4616	LTM8028
LTM4620	LTM8029
LTM4620A	LTM8032
LTM4623	LTM8033
LTM4624	LTM8045
LTM4625	LTM8046
LTM4627	LTM8047
LTM4628	LTM8048
LTM4630	LTM8050
LTM4630-1	LTM8052
LTM4633	LTM8052A
LTM4634	LTM8054
LTM4637	LTM8055
LTM4639	LTM8056
LTM4641	LTM8057
LTM4644	LTM8058
LTM4648	

μModule[®] BGA Package Construction (Not to Scale)



Linear Technology introduces eutectic SnPb (tin-lead) ball BGA package options for 53 μModule power products. SnPb BGA μModule products can be distinguished by the package top mark (e0) complying with JEDEC standard J-STD-609. Download the [BGA manufacturing guidelines](#) for PCB assembly.

If you desire a product in a tin-lead BGA that is not listed on the left, [contact](#) your Linear Technology sales representative or call +1-408-432-1900. For technical support or other questions use our [online submission form](#).



Step-Down



Step-Up & Down



Digital Power
System Management



Multiple Output



Isolated



Step-Up & Down

Function	Input Voltage (V)		Output Voltage (V)		Output Current † (A)	Clock Sync Range (MHz)	Extended Temp Range (°C)	Parallelable Outputs (Total I _{OUT})	Inductor	BGA Package Dimensions (mm)	Part Number
	Min	Max	Min	Max							
Step-Up and Down	2.8	18	±2.5	±15	Up to 0.7	0.2 to 2.0	-55 to 125	-	Internal	6.25 × 11.25 × 4.92	LTM8045
	5	36	1.2	36	5.4	0.2 to 0.7	-55 to 125	×2 (10.8A)	Internal	11.25 × 15 × 3.42	LTM8054
	5	58	1.2	48	5.4	0.2 to 0.7	-55 to 125	×2 (10.8A)	Internal	15 × 15 × 4.92	LTM8056
	5	36	1.2	36	8.5	0.2 to 0.7	-55 to 125	×2 (17A)	Internal	15 × 15 × 4.92	LTM8055
	4.5	36	0.8	34	10	0.2 to 0.4	-55 to 125	×4 (16A)††	External	15 × 15 × 3.42	LTM4609

†Output current is different in step-down and step-up operating mode.

††Step-up mode



LT, LT, LTC, LTM, Linear Technology, μModule and the Linear logo are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.



Isolated

Function	Isolation Rating	Output Channels	Input Voltage (V)		Output Voltage (V)		Output Ripple	Output Power (W)	Temp Range (°C)	UL Recognized	BGA Package Dimensions (mm)	Part Number
			Min	Max	Min	Max						
Isolated	725VDC	1	3.1	32	2.5	12	35mV _{P,P}	1.5	-55 to 125	-	9 x 11.25 x 4.92	LTM8047
		2	3.1	32	1.2	12	1mV _{P,P}	1.5 Combined	-55 to 125	-	9 x 11.25 x 4.92	LTM8048
	2kVAC (3kVDC)	1	3.1	31	2.5	12	10mV _{P,P}	1.5	-55 to 125	UL60950	9 x 11.25 x 4.92	LTM8057
		2	3.1	31	1.2	12	1mV _{P,P}	1.5 Combined	-55 to 125	UL60950	9 x 11.25 x 4.92	LTM8058
		1	3.1	31	1.8	12	50mV _{P,P}	2.5	-55 to 125	UL60950	9 x 15 x 4.92	LTM8046



Step-Down

Function	Input Voltage (V)		Output Voltage (V)		Output Capability per Channel	Temp Range (°C)	Parallelable Outputs (Total I _{OUT})	BGA Package Dimensions (mm)	Part Number
	Min	Max	Min	Max					
Single Output Step-Down	4.5	36	1.2	18	0.6A	-55 to 125	x1 (0.6A)	6.25 x 11.25 x 3.42	LTM8029
	3.6	36	0.8	10	2A	-55 to 125	x2 (4A)	9 x 11.25 x 3.42	LTM8023
	3.6	36	0.8	10	2A	-55 to 125	x2 (4A)	9 x 15 x 3.42	LTM8032
	3.6	58	0.8	24	2A	-55 to 125	x2 (4A)	9 x 15 x 4.92	LTM8050
	3.6	36	0.8	24	3A	-55 to 125	x2 (6A)	9 x 15 x 4.92	LTM8025
	3.6	36	0.8	24	3A	-55 to 125	x2 (6A)	11.25 x 15 x 4.92	LTM8033
	4*	20	0.6	5.5	3A	-40 to 125	x12 (36A)	6.23 x 6.25 x 2.42	LTM4623
	2.375	5.5	0.8	5	4A	-40 to 125	x2 (8A)	9 x 15 x 3.42	LTM4604A
	4*	14	0.6	5.5	4A	-40 to 125	x1 (4A)	6.25 x 6.25 x 5.01	LTM4624
	4.5	60	2.5	24	4A	-55 to 125	x2 (8A)	15 x 15 x 4.92	LTM8027
	6	36	0.8	1.8	5A	-55 to 125	x2 (10A)	15 x 15 x 4.92	LTM8028
	4	20	0.6	5.5	5A	-40 to 125	x12 (60A)	6.25 x 6.25 x 5.01	LTM4625
	6	36	1.2	24	5A	-55 to 125	x2 (10A)	11.25 x 15 x 2.82	LTM8026
	6	36	1.2	24	5A	-55 to 125	x1 (5A)	11.25 x 15 x 3.42	LTM8052
	6	36	1.2	24	5A	-55 to 125	x1 (5A)	11.25 x 15 x 3.42	LTM8052A
	4.5	28	0.6	5	6A	-55 to 125	x2 (12A)	15 x 15 x 3.42	LTM4606
	2.7	5.5	0.6	5	8A	-55 to 125	x4 (32A)	15 x 15 x 3.42	LTM4608A
	5	36	3.3	15	8A	-40 to 125	x2 (16A)	15 x 15 x 4.92	LTM4613
	2.375	5.5	0.6	5	10A	-40 to 125	x3 (30A)	9 x 15 x 4.92	LTM4648
	4.5	16	0.6	3.3	10A	-40 to 125	x3 (30A)	9 x 15 x 4.92	LTM4649
	4.5	38	0.6	6	10A	-55 to 125	x4 (40A)	15 x 15 x 5.02	LTM4641
	4.5	20	0.6	5	12A	-40 to 125	x4 (48A)	15 x 15 x 3.42	LTM4601†
	4.5	20	0.6	5	12A	-40 to 125	x4 (48A)	15 x 15 x 3.42	LTM4601-1†
	4.5	20	0.6	5	12A	-40 to 125	x4 (48A)	15 x 15 x 3.42	LTM4601A†‡
	4.5	20	0.6	5	12A	-40 to 125	x4 (48A)	15 x 15 x 3.42	LTM4601A-1†‡
	4.5	28	0.6	5	12A	-55 to 125	x4 (48A)	15 x 15 x 3.42	LTM4601AHV†‡
4.5	20	0.6	5	15A	-55 to 125	x4 (60A)	15 x 15 x 4.92	LTM4627	
4.5	20	0.6	5.5	20A	-40 to 125	x4 (80A)	15 x 15 x 4.92	LTM4637	
2.375	7	0.6	5.5	20A	-40 to 125	x4 (80A)	15 x 15 x 4.92	LTM4639	
Multiple Output Step-Down	6	36	0	24	Five: 1A	-55 to 125	x10 (10A)	15 x 15 x 3.42	LTM8001
	4*	14	0.6	5.5	Quad: 4A	-40 to 125	x4 (60A)	9 x 15 x 5.01	LTM4644
	4.75	28	0.8	5.5,13.5	Triple: 5A,5A,4A	-40 to 125	x2 (10A)	15 x 15 x 5.01	LTM4634
	2.7	5.5	0.6	5	Dual: 8A	-55 to 125	x4 (32A)	15 x 15 x 3.42	LTM4616
	4.5	26.5	0.6	5.5	Dual: 8A	-40 to 125	x4 (32A)	15 x 15 x 4.92	LTM4628
	4.7*	16	0.8	1.8,5.5	Dual: 10A	-55 to 125	x2 (20A)	15 x 15 x 5.01	LTM4633
	4.5	16	0.6	2.5	Dual: 13A	-40 to 125	x8 (100A)	15 x 15 x 5.01	LTM4620
	4.5	16	0.6	5.3	Dual: 13A	-40 to 125	x8 (100A)	15 x 15 x 5.01	LTM4620A
	4.5	15	0.6	1.8	Dual: 18A	-40 to 125	x4 (144A)	16 x 16 x 5.01	LTM4630
	4.5	15	0.6	1.8	Dual: 18A	-40 to 125	x8 (144A)	16 x 16 x 5.01	LTM4630-1

† LTM4601, LTM4601A, LTM4601HV and LTM4601AHV offer precision remote sense (see page 8). Devices ending with “-1” do not.

‡ LTM4601A, LTM4601A-1 and LTM4601AHV have redundant pads for enhanced solder joint strength to the PCB.

*Minimum Input Voltage can be reduced to 2.375V with external bias voltage



Digital Power System Management

Function	# of Outputs	Input Voltage (V)		Output Voltage (V)		Output Current per Channel (A)	Read Back Accuracy		Turn-On Time (ms)	BGA Package Dimensions (mm)	Part Number
		Min	Max	Min	Max		Voltage	Current			
Digital Power System Management	2	4.5	17	0.5	5.5	Dual: 9	0.5%	2.5%	70	16 x 11.9 x 3.51	LTM4675
		4.5	26.5	0.5	5.4	Dual: 13	1.0%	2.5%	170	16 x 16 x 5.01	LTM4676
		4.5	17	0.5	5.5	Dual: 13	0.5%	2.5%	70	16 x 16 x 5.01	LTM4676A
		4.5	16	0.5	1.8	Dual: 18	0.5%	2.5%	70	16 x 16 x 5.01	LTM4677