



New Halogen-Free Package Laminate for

ADSP-BF538/ADSP-BF539

DESCRIPTION

This document provides information about a future change from current product packaging to High Density Halogen-free laminate for the ADSP-BF538 and ADSP-BF539 Blackfin Embedded Processors. For more information, see PCN number 10-0034.

THERMAL CHARACTERISTICS

To determine the junction temperature on the application printed circuit board use

$$T_J = T_{CASE} + (\Psi_{JT} \times P_D)$$

where:

T_J = junction temperature (°C)

T_{CASE} = case temperature (°C) measured by customer at top center of package.

Ψ_{JT} = from Table 1 or Table 2

P_D = power dissipation

Values of θ_{JA} are provided for package comparison and printed circuit board design considerations. θ_{JA} can be used for a first order approximation of T_J by the equation:

$$T_J = T_A + (\theta_{JA} \times P_D)$$

where:

T_A = ambient temperature (°C)

Values of θ_{JC} are provided for package comparison and printed circuit board design considerations when an external heatsink is required.

Values of θ_{JB} are provided for package comparison and printed circuit board design considerations.

In Table 1 and Table 2, airflow measurements comply with JEDEC standards JESD51-2 and JESD51-6, and the junction-to-board measurement complies with JESD51-8. The junction-to-case measurement complies with MIL-STD-883 (Method 1012.1). All measurements use a 2S2P JEDEC test board.

Table 1. Thermal Characteristics BC-316 Without Flash

Parameter	Condition	Typical	Unit
θ_{JA}	0 linear m/s air flow	25.4	°C/W
θ_{JMA}	1 linear m/s air flow	22.8	°C/W
θ_{JMA}	2 linear m/s air flow	22.0	°C/W
θ_{JC}		6.7	°C/W
Ψ_{JT}	0 linear m/s air flow	0.18	°C/W
Ψ_{JT}	1 linear m/s air flow	0.38	°C/W
Ψ_{JT}	2 linear m/s air flow	0.40	°C/W

Table 2. Thermal Characteristics BC-316 With Flash

Parameter	Condition	Typical	Unit
θ_{JA}	0 linear m/s air flow	24.3	°C/W
θ_{JMA}	1 linear m/s air flow	21.8	°C/W
θ_{JMA}	2 linear m/s air flow	21.0	°C/W
θ_{JC}		6.3	°C/W
Ψ_{JT}	0 linear m/s air flow	0.17	°C/W
Ψ_{JT}	1 linear m/s air flow	0.36	°C/W
Ψ_{JT}	2 linear m/s air flow	0.38	°C/W

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OUTLINE DIMENSIONS

Dimensions in the outline dimensions figures are shown in millimeters.

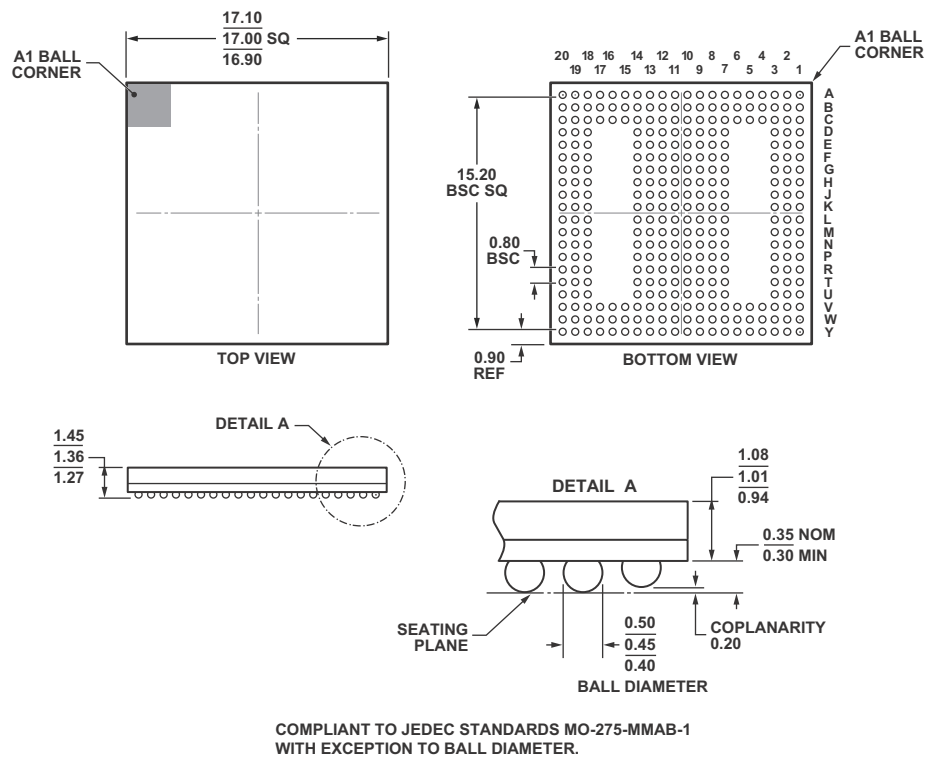


Figure 1. 316-Ball Chip Scale Package Ball Grid Array [CSP_BGA] (BC-316)
Dimensions shown in millimeters

SURFACE-MOUNT DESIGN

Table 3 is provided as an aid to PCB design. For industry-standard design recommendations, refer to IPC-7351, *Generic Requirements for Surface Mount Design and Land Pattern Standard*.

Table 3. BGA Data for Use with Surface-Mount Design

Package	Package Ball Attach Type	Package Solder Mask Opening	Package Ball Pad Size
316-Ball CSP_BGA (BC-316)	Solder Mask Defined	0.40 mm diameter	0.50 mm diameter