

# System Basis Chip (SBC) with Enhanced High-Speed CAN Transceiver

## Introduction

This thermal addendum is provided as a supplement to the MC33742 technical datasheet. The addendum provides thermal performance information that may be critical in the design and development of system applications. All electrical, application, and packaging information is provided in the data sheet.

## Packaging and Thermal Considerations

The MC33742 is offered in a 28 pin SOICW exposed pad, single die package. There is a single heat source (P), a single junction temperature (T<sub>J</sub>), and thermal resistance (R<sub>θJA</sub>).

$$\{ T_J \} = [ R_{\theta JA} ] \cdot \{ P \}$$

The stated values are solely for a thermal performance comparison of one package to another in a standardized environment. This methodology is not meant to and will not predict the performance of a package in an application-specific environment. Stated values were obtained by measurement and simulation according to the standards listed below.

## Standards

**Table 1. Thermal Performance Comparison**

Thermal Resistance	[°C/W]
R <sub>θJA</sub> <sup>(1) (2)</sup>	41
R <sub>θJB</sub> <sup>(2) (3)</sup>	10
R <sub>θJA</sub> <sup>(1) (4)</sup>	68
R <sub>θJC</sub> <sup>(5)</sup>	220

Notes:

- Per JEDEC JESD51-2 at natural convection, still air condition.
- 2s2p thermal test board per JEDEC JESD51-7.
- Per JEDEC JESD51-8, with the board temperature on the center trace near the center lead.
- Single layer thermal test board per JEDEC JESD51-3.
- Thermal resistance between the die junction and the package top surface; cold plate attached to the package top surface and remaining surfaces insulated.

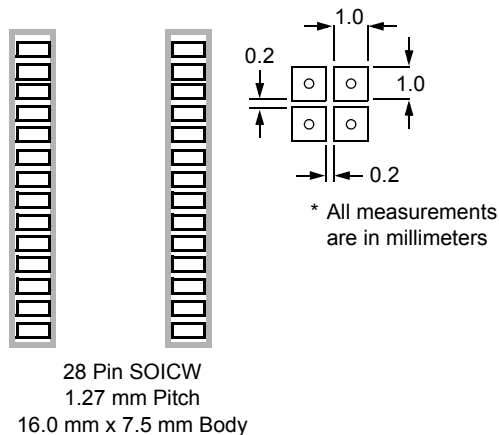
**33742DW  
 33742EG**

**28-PIN  
 SOICW**



**DW SUFFIX  
 EG SUFFIX (PB-FREE)  
 98ASB42345B  
 28-PIN SOICW**

Note For package dimensions, refer to the 33742 data sheet.



**Figure 1. Surface Mount for SOIC Wide Body  
 non-Exposed Pad**

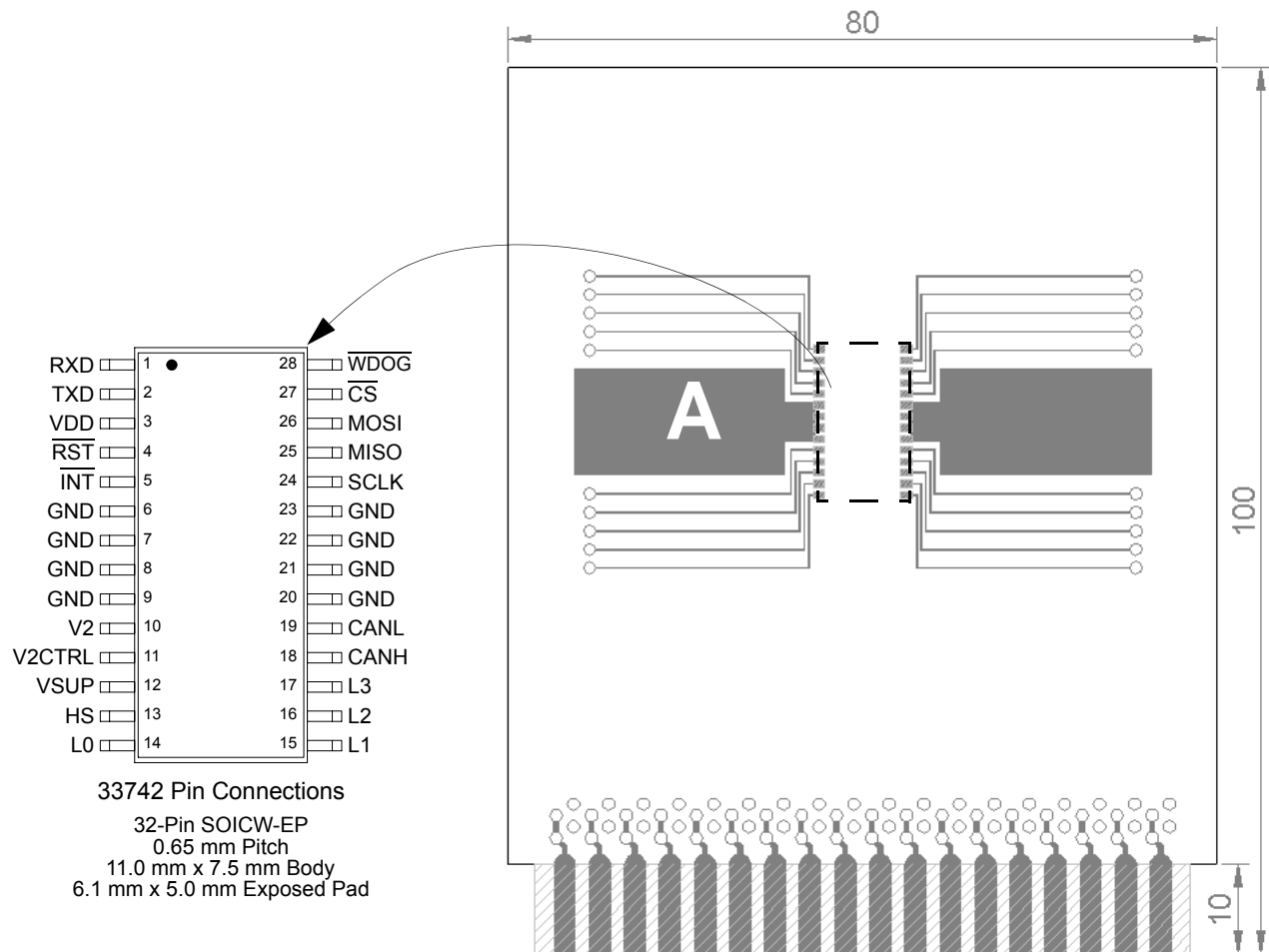


Figure 1. Thermal Test Board

**Device on Thermal Test Board**

- Material: Single layer printed circuit board  
FR4, 1.6 mm thickness  
Cu traces, 0.07 mm thickness
- Outline: 80 mm x 100 mm board area,  
including edge connector for thermal  
testing
- Area A: Cu heat-spreading areas on board  
surface
- Ambient Conditions: Natural convection, still air

**Table 1. Thermal Resistance Performance**

A [mm <sup>2</sup> ]	R <sub>θJA</sub> [°C/W]
0	68
300	52
600	47

R<sub>θJA</sub> is the thermal resistance between die junction and ambient air.

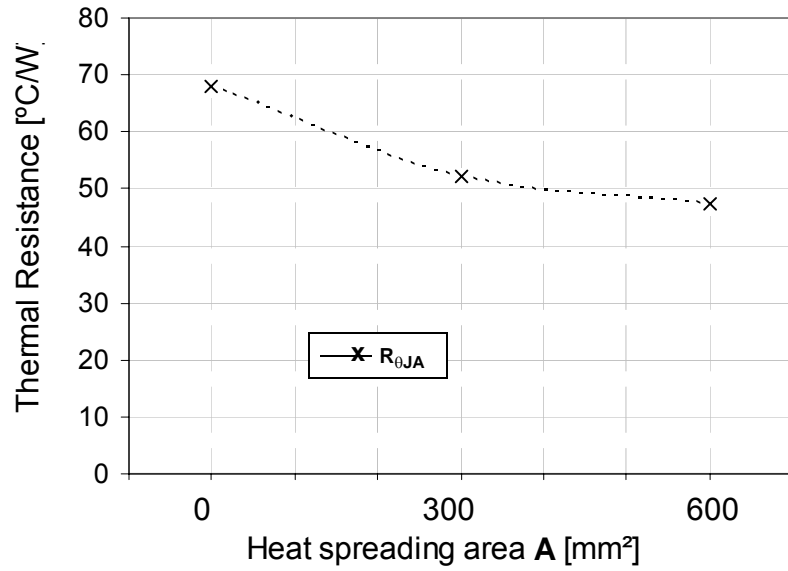


Figure 2. Device on Thermal Test Board  $R_{\theta JA}$

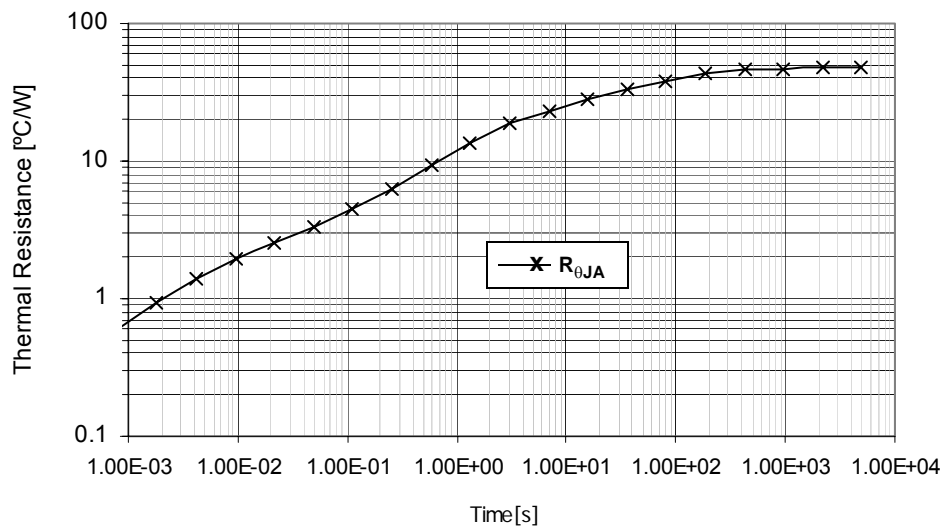


Figure 3. Transient Thermal Resistance  $R_{\theta JA}$ ,  
1 W Step response, Device on Thermal Test Board Area A = 600 (mm<sup>2</sup>)

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