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Product Service

CERTIFICATE

No. Z10 16 09 84071 015

Holder of Certificate: **Texas Instruments Incorporated**
13905 University Blvd.
Sugar Land TX 77479
USA

Factory(ies): 89040

Certification Mark:

Product: **Safety components**
Safety MCU

Model(s): **RM57x**
For nomenclature see attachment

Parameters: Up to SIL 3

The report referenced below and the user documentation in the currently valid revision are mandatory part of this certificate. The product complies with the following listed safety requirements only if the specifications documented in the currently vaild revisions of this report are met.

Tested according to: IEC 61508-1(ed.2)
IEC 61508-2(ed.2)

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: TH89793C

Valid until: 2021-09-22

Date, 2016-09-23 (Peter Weiss)

TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany

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Product Service

ATTACHMENT TO CERTIFICATE
No. Z10 16 09 84071 015

Nomenclature of product type RM57x

Orderable Part Number	Part Number
RM57L843BZWTT	RM57L843
RM57L843BZWTTR	RM57L843

Report

on the

Certificate

Z10 16 09 84071 015

Manufacturer:

Texas Instruments Incorporated
13905 University Blvd.
Sugar Land TX 77479
USA

Report no. TH89793C
Revision 1.0 of 2016-09-23

Test Body
TÜV SÜD Rail GmbH
Generic Safety Systems
D-80339 Munich

Certification Body
TÜV SÜD Product Service GmbH

D-80339 Munich

TABLE OF CONTENTS

Revision

Version	Status	Date	Author	Changed chapters	Reason of change
1.0	final	2016-09-23	Axel Köhnen	Initial	

Table 1: Revision

1 Purpose and Scope

In February 2016 the company Texas Instruments Incorporated assigned TÜV SÜD for testing and certification the Safety MCU RM57x according to SIL 3 of IEC 61508:2010. The project number related to these activities was: 717512332. The report on the certificate gives an overview related to the results of the certification process and the general safety relevant conditions and restrictions related to the use of the Safety MCU RM57x.

2 Target of evaluation

2.1 Description

The target of evaluation is a generic safety microcontroller device based on the Hercules TMS570LSx and RM4x platform architecture. The assessment is based on a tailored safety lifecycle for compliant items according to IEC 61508:2010.

2.2 Identification

This report is valid for the silicon revision B. The models covered by the certificate are listed in the following table:

Orderable Part Number	Part Number
RM57L843BZWTT	RM57L843
RM57L843BZWTTR	RM57L843

Table 1: Identification

3 Certification Requirements

3.1 Basis of Certification

The certification of the Safety MCU was performed according to the standards listed in clause 3.3 of this document. The basis of the certification was the successful completion of the following test segments:

I. Functional Safety
   - Functional Safety management (FSM) and safety life-cycle
   - Avoidance of systematic faults
   - Hardware safety requirements (assumptions of use)
   - Analysis of the device structure (IP FMEAs, DFA)
   - Quantitative analysis of the hardware (FMEDA)
   - Fault injection and simulation
   - Hardware functional test and design verification
   - Hardware qualification
   - Development tool qualification

II. Safety information in the product documentation (Safety manual, operating instructions)

III. Product-related Quality Management in manufacturing

Certification is dependent on successful completion of all above listed test segments. The testing follows the basic certification scheme for Safety Components of TÜV SÜD Rail GmbH.

3.2 Certification Documentation

The detailed technical evaluation is documented in the technical reports № TF89791T.

3.3 Functional Safety

The testing for Functional Safety is to be performed using the following standards:

No.	Standard	Title
[N1]	IEC 61508-1: 2010 (SIL 3)	Functional safety of electrical/electronic/programmable electronic safety-related systems Part 1: General requirements
[N2]	IEC 61508-2: 2010 (SIL 3)	Functional safety of electrical/electronic/programmable electronic safety-related systems Part 2: Requirements for electrical/electronic/ programmable electronic safety-related systems

Table 2: Functional Safety

4 Results

4.1 Functional Safety

The tests performed and quality assurance measures implemented by the manufacturer have shown that the Safety MCU complies with the tailored testing criteria specified in clause 3.3. The Safety MCU provides different safety features implemented on-chip and requires additional safety mechanism to be implemented by the system integrator as software measures and external measures on system level. By using the different safety mechanisms the MCU can be used to support safety functions up to SIL 3 according to IEC 61508:2010.

4.2 General Conditions and Restrictions

The use of the Safety MCU shall comply with the current version of the safety relevant parts of the user documentation. The following list describes the main conditions and restrictions of use:

- The guidelines and requirements specified in the user documentation shall be followed. Especially the requirements of the system integration section of the Safety manual have to be regarded.
- The impact on the overall safety concept and the safety function has to be well understood and analysed if a safety mechanism described in the Safety Manual is not used.
- All safety mechanism implemented by the system integrator have to be developed and verified according to the targeted safety standards
- All specific required characteristics and behaviour of the Safety MCU required by the final safety function have to be developed and verified according to the targeted safety standards. This includes also timing aspects like reaction times, test intervals or test execution times.
- The system integrator has to make sure that the conditions and restrictions defined in the documentation of the Safety MCU are understood and followed.

5 Certificate Number

This report defines conditions and restrictions required for the application of the Safety MCU to the certificate:

Z10 16 09 84071 015

Munich, 2016-09-23

TÜV SÜD Rail GmbH
Embedded Systems

Peter Weiß
(Technical Certifier)

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265