TLE4953C E0184

Differential Two-Wire Hall Effect Sensor IC

Datasheet

V 1.1, 2019-04

Sense & Control

Edition 2019-04

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2019 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (**www.infineon.com**).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Revision History: 2019-04, V 1.1

Previous Revision: V 1.0 2010-10

Page	Subjects (major changes since last revision)
Page 5	Ordering code updated

Trademarks of Infineon Technologies AG

A-GOLD™, BlueMoon™, COMNEON™, CONVERGATE™, COSIC™, C166™, CROSSAVE™, CanPAK™, CIPOS™, CoolMOS™, CoolSET™, CONVERPATH™, CORECONTROL™, DAVE™, DUALFALC™, DUSLIC™, EasyPIM™, EconoBRIDGE™, EconoDUAL™, EconoPACK™, EconoPIM™, E-GOLD™, EiceDRIVER™, EUPEC™, ELIC™, EPIC™, FALC™, FCOS™, FLEXISLIC™, GEMINAX™, GOLDMOS™, HITFET™, HybridPACK™, INCA™, ISAC™, ISOFACE™, IsoPACK™, IWORX™, M-GOLD™, MIPAQ™, ModSTACK™, MUSLIC™, my-d™, NovalithIC™, OCTALFALC™, OCTAT™, OmniTune™, OmniVia™, OptiMOS™, OPTIVERSE™, ORIGA™, PROFET™, PRO-SIL™, PrimePACK™, QUADFALC™, RASIC™, ReverSave™, SatRIC™, SCEPTRE™, SCOUT™, S-GOLD™, SensoNor™, SEROCCO™, SICOFI™, SIEGET™, SINDRION™, SLIC™, SMARTi™, SmartLEWIS™, SMINT™, SOCRATES™, TEMPFET™, thinQ!™, TrueNTRY™, TriCore™, TRENCHSTOP™, VINAX™, VINETIC™, VIONTIC™, WildPass™, X-GOLD™, XMM™, X-PMU™, XPOSYS™, XWAY™.

Other Trademarks

AMBA™, ARM™, MULTI-ICE™, PRIMECELL™, REALVIEW™, THUMB™ of ARM Limited, UK. AUTOSAR™ is licensed by AUTOSAR development partnership. Bluetooth™ of Bluetooth SIG Inc. CAT-iq™ of DECT Forum. COLOSSUS™, FirstGPS™ of Trimble Navigation Ltd. EMV™ of EMVCo, LLC (Visa Holdings Inc.). EPCOS™ of Epcos AG. FLEXGO™ of Microsoft Corporation. FlexRay™ is licensed by FlexRay Consortium. HYPERTERMINAL™ of Hilgraeve Incorporated. IEC™ of Commission Electrotechnique Internationale. IrDA™ of Infrared Data Association Corporation. ISO™ of INTERNATIONAL ORGANIZATION FOR STANDARDIZATION. MATLAB™ of MathWorks, Inc. MAXIM™ of Maxim Integrated Products, Inc. MICROTEC™, NUCLEUS™ of Mentor Graphics Corporation. Mifare™ of NXP. MIPI™ of MIPI Alliance, Inc. MIPS™ of MIPS Technologies, Inc., USA. muRata™ of MURATA MANUFACTURING CO. OmniVision™ of OmniVision Technologies, Inc. Openwave™ Openwave Systems Inc. RED HAT™ Red Hat, Inc. RFMD™ RF Micro Devices, Inc. SIRIUS™ of Sirius Sattelite Radio Inc. SOLARIS™ of Sun Microsystems, Inc. SPANSION™ of Spansion LLC Ltd. Symbian™ of Symbian Software Limited. TAIYO YUDEN™ of Taiyo Yuden Co. TEAKLITE™ of CEVA, Inc. TEKTRONIX™ of Tektronix Inc. TOKO™ of TOKO KABUSHIKI KAISHA TA. UNIX™ of X/Open Company Limited. VERILOG™, PALLADIUM™ of Cadence Design Systems, Inc. VLYNQ™ of Texas Instruments Incorporated. VXWORKS™, WIND RIVER™ of WIND RIVER SYSTEMS, INC. ZETEX™ of Diodes Zetex Limited.

Last Trademarks Update 2009-10-19

Table of Contents

Table of Contents 4

1 Features 5

2 Specifications 6

2.1 Absolute Maximum Ratings 6

2.2 Magnetic Characteristics 6

2.3 Vibration suppression algorithm 7

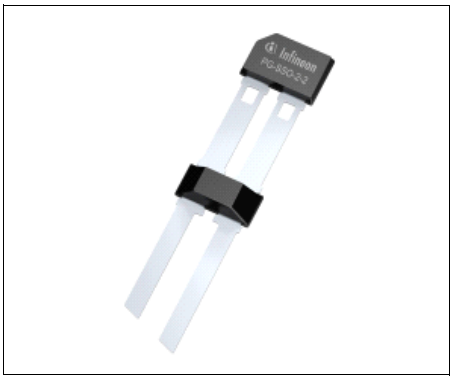
TLE4953C-E0184

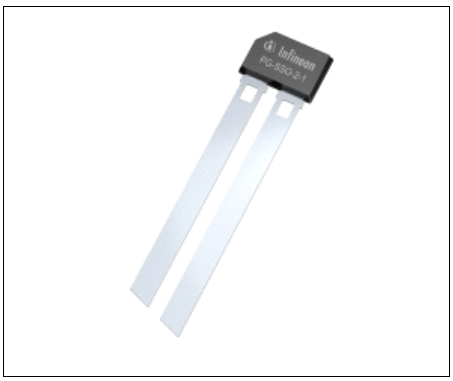
Differential Two Wire Hall Effect sensor IC

TLE4953-E0184

For All parameters not specified in this document TLE4953/C datasheet is valid

1 Features





- Two-wire PWM current interface
- Improved airgap performance
- Detection of rotation direction
- Dynamic self calibration principle
- Adaptive hysteresis
- Single chip solution
- South and north pole pre-induction possible
- High resistance to piezo effects
- Wide operating temperatures
- From 0 speed to 4.5kHz
- 1.8nF overmolded capacitor
- For coarse transmission target wheel

Product Type	Marking	Ordering Code	Package
TLE4953C-E0184	53C84	SP001963074	PG-SSO-2-4
TLE4953-E0184	53X84	SP000844996	PG-SSO-2-1

2 Specifications

2.1 Absolute Maximum Ratings

Table 1 Absolute maximum ratings

Parameter	Symbol	Limit Value			Unit	Remarks
		min.	typ.	max.		
Supply Voltage	V_{CC}			9	V	
Frequency	f			4.5	kHz	1)
Temperature profile2)	Tj				h	
-40°C≤ Tj ≤ 20°C				700		7.7% of the lifetime3)
20°C≤ Tj ≤115°C				970		9.7% of the lifetime3)
115°C≤ Tj ≤125°C				7000		70% of the lifetime3)
125°C≤ Tj ≤140°C				1000		10% of the lifetime3)
140°C≤ Tj ≤150°C				260		2.6% of the lifetime3)

1) High frequency behavior not subject to production test - verified by design/characterization

2) The component is able to withstand following temperature mission profile, subject to the following provisions: Assembly concept “Einschubtasche” (Delta T = 15K), Basis for the evaluation for the mission profile is the average of the ambient temperature interval.

3) Life time shall be considered as anticipation and will not extend the agreed warranty period

Attention: Stress in excess of those listed here may cause permanent damage to the divice. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

2.2 Magnetic Characteristics

Table 2 Magnetics characteristics

Parameter	Symbol	Limit Value			Unit	Remarks
		min.	typ.	max.		
Limit threshold speed 0Hz ≤ f≤ 4500Hz	ΔB_{Limit}	0.35	0.8	1.84	mT	Max. is 5σ value at Tj≤145°C1)
Limit differential direction signal 0Hz ≤ f≤ 1100Hz	ΔB_{Dir}		0.08	0.54	mT	Calculated at two consecutive threshold crossing2)

1) Magnetic amplitude values, sine magnetic field, limits refer to the 0% criteria just 1pulse is missing out of 100. Only valid at lowest PGA stage/highest amplification because of adaptive hysteresis.

2) Magnetic peak to peak value, not subject to production test - verified by design/characterization. No part of the FAR procedure. Max is 5σ value of characterization of distribution at Tj≤145°C, with 0% criteria, just one pulse is missing out of 100.

2.3 Vibration suppression algorithm

The performance of the vibration suppression algorithm depends strongly on the typical value of the differential direction signal limit. TLE4953/C E0184 has a very reduced value to guarantee extended airgap performance, but this fact will also reduce the vibration suppression capabilities of this version.

w w w . i n f i n e o n . c o m

Published by Infineon Technologies AG