

OPTIREG™ PMIC TLF35584QVHSx

Functional Safety PMIC



RoHS



ISO 26262
compliant

Features

- High efficient power management integrated circuit (PMIC)
- Serial step up and step down pre regulator for wide input voltage range from 3.0 V to 40 V with full performance and low over all power loss
- Low drop post regulator 5.0 V/200 mA for communication supply (QCO)
- Low drop post regulator 5.0 V/600 mA (TLF35584QVHS1) or 3.3 V/600 mA (TLF35584QVHS2) for μ C supply (QUC)
- Voltage reference 5.0 V $\pm$ 1% for ADC supply, 150 mA current capability (QVR)
- Two trackers for sensor supply following voltage reference 150 mA current capability each (QT1 and QT2)
- Standby regulator 5.0 V/10 mA (TLF35584QVHS1) or 3.3 V/10 mA (TLF35584QVHS2) (QST)
- Provides enable, sync out signal and voltage monitoring for an optional external post regulator for core supply
- Independent voltage monitoring block and error pin monitoring
- Configurable window and functional watchdog
- 16-bit SPI, interrupt and reset function
- Safe State Control with two safe state signals with programmable delay
- Grade 0 supporting junction temperature up to 175°C
- PRO-SIL™ Features:
 - ISO 26262 compliant supporting up to ASIL-D
 - Safety Documentation (Safety Manual & Safety Analysis Summary Report)
- Green Product (RoHS compliant)



Potential applications

- Electric Power Steering
- Battery Management
- Transmission
- Engine Management
- Domain Control

Product validation

Qualified for automotive applications with higher temperature requirements.
Product validation according to AEC-Q100.

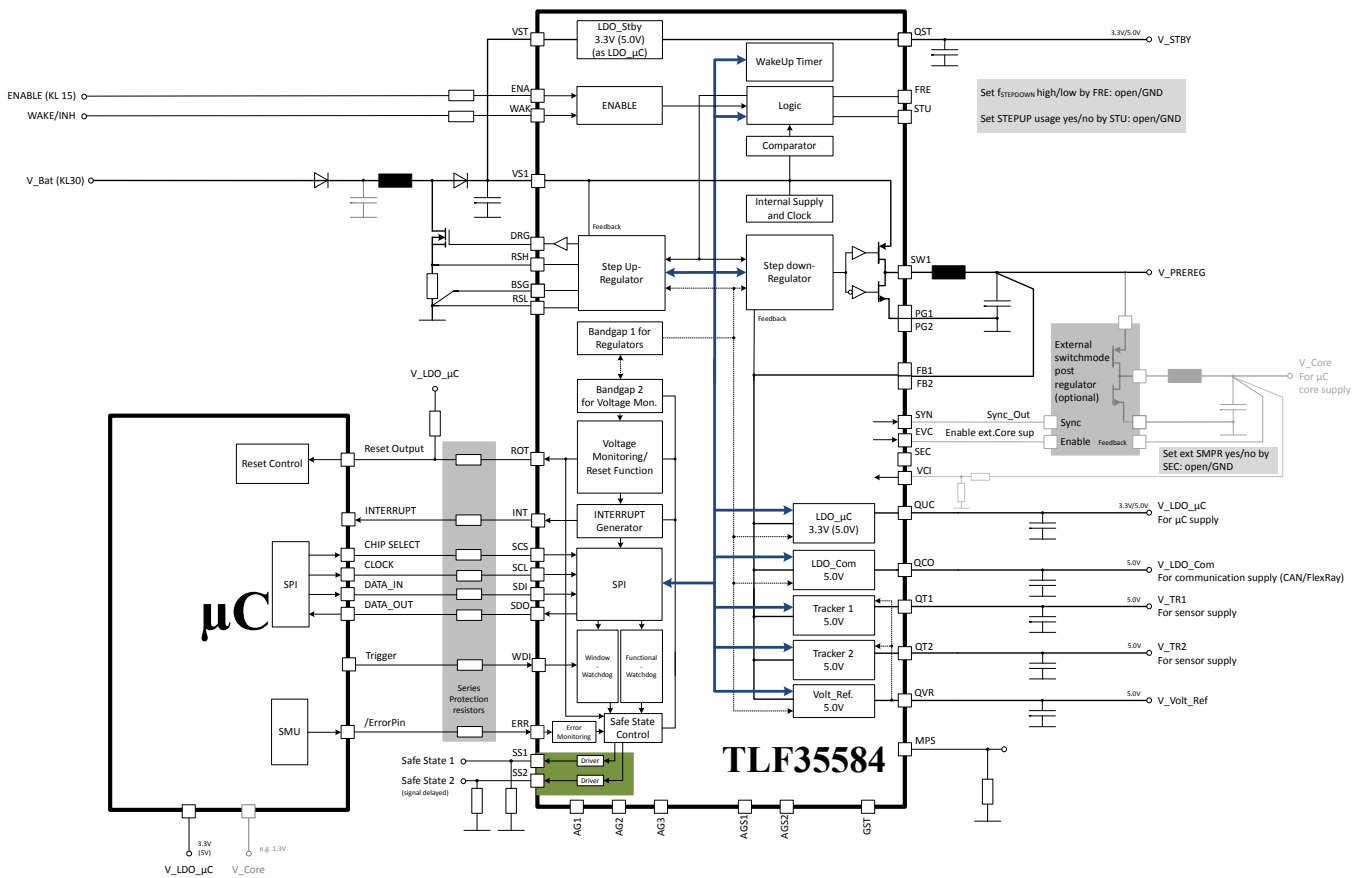
Description

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The OPTIREG™ PMIC TLF35584QVHSx is a high efficient Functional Safety PMIC (Power Management Integrated Circuit).

Type	Package
TLF35584QVHS1 (5.0 V Variant)	PG-VQFN-48
TLF35584QVHS2 (3.3 V Variant)	PG-VQFN-48

Application Example



Note: The following information is given as an example for the implementation of the device only and shall not be regarded as a description or warranty of a certain functionality, condition or quality of the device.

- Please contact us for additional supportive documentation.
- For further information you may contact <http://www.infineon.com/OPTIREG-PMIC>

Note: This figure is a very simplified example on an application circuit. The function must be verified in the real application.

1 Absolute maximum ratings

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Table 1 Absolute maximum ratings¹⁾

$T_j = -40^{\circ}\text{C}$ to 175°C , all voltages with respect to ground, positive current flowing into pin (unless otherwise specified)

Parameter	Symbol	Values			Unit	Note or condition
		Min.	Typ.	Max.		
Voltages						
Boost driver ground	V _{BSG}	-0.3	–	0.3	V	–
Input standby LDO	V _{VST}	-0.3	–	40	V	2)3)
Input voltage pin 1 (pre regulator)	V _{VS1}	-0.3	–	40	V	–
External step up power stage, gate	V _{DRG}	-0.3	–	40	V	–
External power stage, sense resistor high	V _{RSH}	-0.3	–	40	V	–
External power stage, sense resistor low	V _{RSL}	-0.3	–	6.0	V	–
Enable input	V _{ENA}	-0.3	–	40	V	–
Enable input	I _{ENA}	-5	–	–	mA	4)
Wake input	V _{WAK}	-0.3	–	40	V	–
Wake input	I _{WAK}	-5	–	–	mA	–
Reset output	V _{ROT}	-0.3	–	6.0	V	–
SPI chip select input	V _{SCS}	-0.3	–	6.0	V	–
SPI clock input	V _{SCL}	-0.3	–	6.0	V	–
SPI data in (MOSI) input	V _{SDI}	-0.3	–	6.0	V	–
SPI data out (MISO output)	V _{SDO}	-0.3	–	6.0	V	–
Interrupt output	V _{INT}	-0.3	–	6.0	V	–
Window watchdog trigger input	V _{WDI}	-0.3	–	6.0	V	–
Error pin input	V _{ERR}	-0.3	–	6.0	V	–
Safe state 1 output	V _{SS1}	-0.3	–	6.0	V	–
Safe state 2 output	V _{SS2}	-0.3	–	6.0	V	–
Output voltage reference LDO	V _{QVR}	-0.3	–	6.0	V	–
Output tracker 2	V _{QT2}	-1.0	–	40	V	–
Output tracker 1	V _{QT1}	-1.0	–	40	V	–

(table continues...)

¹ Not subject to production test, specified by design.

² Maximum rating is 60 V, if rise time from 0 to 60 V is longer than 10 ms

³ Maximum rating is 49 V, for an overall time of 10 s (in the range of 40 V to 49 V) during the lifetime of the product independent from the rise time.

⁴ Consider external series resistor for negative voltages < -0.3 V to ensure maximum rating of current

1 Absolute maximum ratings

Table 1 (continued) **Absolute maximum ratings¹⁾**

$T_j = -40^{\circ}\text{C}$ to 175°C , all voltages with respect to ground, positive current flowing into pin (unless otherwise specified)

Parameter	Symbol	Values			Unit	Note or condition
		Min.	Typ.	Max.		
Output communication LDO	V_{QCO}	-0.3	–	6.0	V	–
Output microcontroller LDO	V_{QUC}	-0.3	–	6.0	V	–
External core voltage monitor input	V_{VCI}	-0.3	–	6.0	V	–
HW config: ext. core voltage monitor	V_{SEC}	-0.3	–	6.0	V	–
Synchronization output	V_{SYN}	-0.3	–	6.0	V	–
Enable output for ext. core supply	V_{EVC}	-0.3	–	6.0	V	–
Step down feedback input 2	V_{FB2}	-0.3	–	7.0	V	–
Step down feedback input 1	V_{FB1}	-0.3	–	7.0	V	–
Step down power ground 2	V_{PG2}	-0.3	–	0.3	V	–
Step down power ground 1	V_{PG1}	-0.3	–	0.3	V	–
Step down switching node 1	V_{SW1}	-0.3	–	40	V	–
HW config: step up pre regulator	V_{STU}	-0.3	–	6.0	V	–
HW config: step down frequency	V_{FRE}	-0.3	–	6.0	V	–
Output standby LDO	V_{QST}	-0.3	–	6.0	V	–
Input MPS	V_{MPS}	-0.3	–	6.0	V	–

Temperatures

Junction temperature	T_j	-40	–	175	$^{\circ}\text{C}$	–
Storage temperature	T_{stg}	-55	–	175	$^{\circ}\text{C}$	–

ESD susceptibility

ESD susceptibility to GND	V_{ESD}	-2	–	2	kV	HBM ⁵⁾
ESD susceptibility to GND	V_{ESD}	-500	–	500	V	CDM ⁶⁾
ESD susceptibility (corner pins) to GND	$V_{ESD,Corner}$	-750	–	750	V	CDM

¹⁾ Not subject to production test, specified by design.

⁵⁾ ESD susceptibility, HBM according to JEDEC HBM Human Body Model ANSI/ESDA/JEDEC JS001 (1.5 k Ω , 100 pF)

⁶⁾ ESD susceptibility, Charged Device Model “CDM” ESDA STM5.3.1 or ANSI/ESD S.5.3.1

2 Package information

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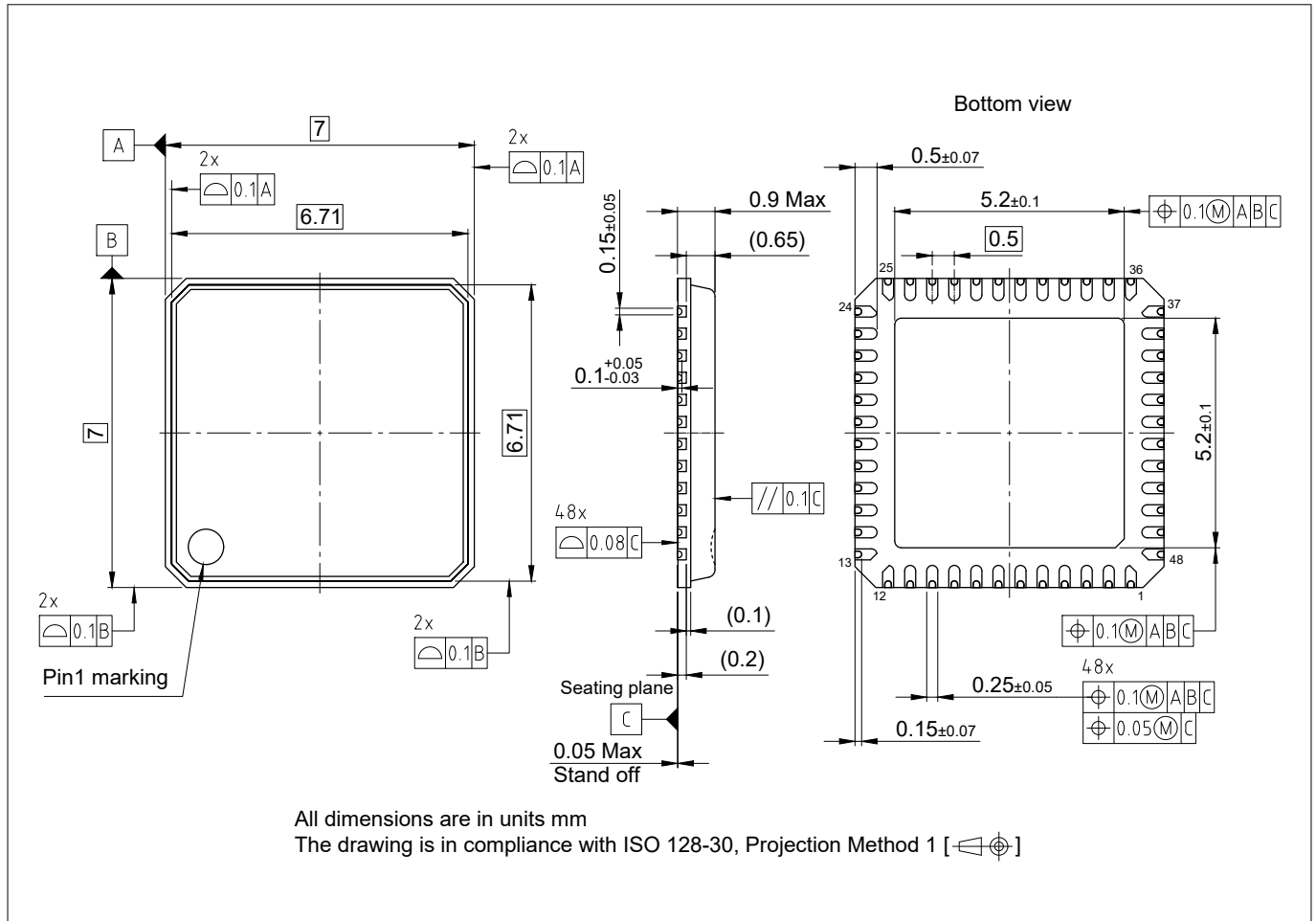


Figure 1 PG-VQFN-48 package outline⁷⁾

Add this text below the package outline drawing: Green Product (RoHS compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations the device is available as a Green Product. Green Products are RoHS compliant (Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).

Add this text at the bottom of the package information content: Information on alternative packages

Please visit www.infineon.com/packages.

⁷⁾ Dimensions in mm

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