AX58400 BSP User Guide

Revision 3.40
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1. Introduction

The AX58400 2/3-port Dual-Core EtherCAT Slave Controller SoC is a System-in-Package (SiP) product based on the STM32H755 microcontroller from STMicroelectronics. AX58400 is equipped with Dual-Core 32-bit ARM® Cortex®-M7 core with DSP extension runs up to 480 MHz, 32-bit ARM® Cortex®-M4 core with Adaptive Real-Time Accelerator (ST ART Accelerator™) runs up to 240 MHz and EtherCAT Slave Controller (ESC) with two integrated Fast Ethernet PHYs. AX58400 supports AES/TDES/HASH/HMAC hardware cryptographic accelerators, ROP/PCROP/Anti-tamper security techniques, true random number generator, and additional communication interfaces such as 10/100Mbps Ethernet MAC, USB OTG, Camera I/F, TFT-LCD Controller, JPEG Codec, SPI/UART/I2C/I2S/SAI/CAN/SDMMC/ADC/DAC/HDMI-CEC/PWM/DFSDM, etc.

The AX58400 is interoperable with all EtherCAT systems with standard EtherCAT protocols such as CoE, FoE, VoE, etc. and is suitable for motor/motion control, digital I/O control, sensors data acquisition, robotics, EtherCAT IO-Link master, EtherCAT Junction slave module, EtherCAT communication module, etc. industrial automation fieldbus applications.

The AX58400 BSP (Board Support Package) provides ASIX EtherCAT related reference design resource additionally. Users can use this BSP to evaluate/develop their production that target on ASIX AX58400 evaluation board or hardware platform.

2. Directory Information

Directory	Description
Datasheet	AX58400 datasheet
Document	Reference user manual and revision history
Hardware_Design	The related reference schematics, PCB, Layout, Application Design Note and BOM files
SampleCode	Several samples or reference codes
Tools	Utility for SampleCode
AX58400 BSP User Guide	Board Support Package user guide for AX58400

3. Datasheet

File Name	Description
AX58400 Datasheet	AX58400 in chip level description

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4. Document

File Name	Description
AX58400 Product Brief	Product brief of AX58400
AX58400 ESI Design Note	ESI design note for AX58400
AX58400 Production Introduction	Production introduction of AX58400
AX58400 GpioAio User Guide	User guide of AX58400 Analog/Digital I/O reference design
AX58400 MotorControl User Guide	User guide of AX58400 MotorControl reference design
AX58x00 SSC Tool Configuration Import User Guide	How to import the configuration file of AX58x00 GPIO / AIO and MotorControl application to generate related source files
AX58x00 TwinCAT User Guide	How to setup entire environment for BECKHOFF TwinCAT on AX58x00 evaluation platform

5. Hardware_Design

File Name	Description
BOM	The BOM files for AX58400 EVB/EXB boards
Layout	The Layout files for AX58400 EVB/EXB boards
Layout_Guide	AX58400 Application Design Note
Schematics	The reference schematics of AX58400 EVB/EXB boards

6. SampleCode

Folder Name	Description
AX58400_Bldr	Bootloader
AX58400_GpioAio	EtherCAT reference code for Analog/Digital I/O application
AX58400_MotorControl	EtherCAT reference code for MotorControl application

7. Tools

File Name	Description
FileInfoAdder.exe	Utility for SampleCode

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8. Revision History

Revision	Date	Description
V1.00	2021/11/25	Initial release
V200	2022/10/28	1. Updated AX58400 Datasheet 2. Updated AX58400 Application DesignNote v2.00 3. Updated AX58400-TSB-1 SCHEMATIC v200, PCB, Gerber and BOM files 4. Updated AX58400 Brief 20220209 5. Updated AX58400 ESI DesignNote v0.30 6. Updated AX58400 AX58400 Product Introduction v1.10 7. Added AX58400-REF-1 SCHEMATIC v1.00, PCB, Gerber and BOM files
V210	2023/02/22	1. Updated AX58400 Datasheet v1.01 2. Updated AX58400-TSB-1 SCHEMATIC v2.10, PCB, Gerber and BOM files 3. Updated AX58400_SSC Tool Configuration Import User Guide v1.01
V220	2023/10/17	1. Updated AX58400 Datasheet v1.02 2. Updated AX58400 GpioAio UserGuide v1.10 3. Updated AX58400 MotorControl UserGuide v1.20 4. Updated AX58400 Application DesignNote v2.10 5. Updated AX58400-REF-1 SCHEMATIC v1.10 6. Updated AX58400-TSB-1 SCHEMATIC v2.20
V230	2023/12/08	1. Updated AX58400-TSB-1 SCHEMATIC v3.10, PCB, Gerber and BOM files 2. Updated SampleCode, Ax58400_GpioAio v1.4.0 3. Updated SampleCode, Ax58400_MotorControl v1.4.0 4. Removed AX58400-REF-1 SCHEMATIC v1.00, PCB, Gerber and BOM files
V300	2024/04/11	1. Updated AX58400 ESI DesignNote v0.40 2. Updated AX58400 GpioAio UserGuide v2.00 3. Updated AX58400 MotorControl UserGuide v2.00 4. Updated AX58400 Application DesignNote v2.20 5. Updated SampleCode, Ax58400 GpioAio v2.0.0 6. Updated SampleCode, Ax58400 MotorControl v2.0.0 7. Added AX58x00 TwinCAT UserGuide v1.00 8. Added AX58400 Porting SSC Stack UserGuide v1.00
V310	2024/11/28	1. Updated AX58400 Datasheet v1.03 2. Updated AX58x00 TwinCAT UserGuide v1.10 3. Updated AX58400 GpioAio UserGuide v2.10 4. Updated AX58400 MotorControl UserGuide v2.10 5. Updated AX58400 Porting SSC Stack UserGuide v1.10 6. Updated AX58400 Application DesignNote v2.40 7. Updated AX58400-TSB-1 SCHEMATIC v3.20 8. Updated SampleCode, Ax58400 GpioAio v2.1.0 9. Updated SampleCode, Ax58400 MotorControl v2.1.0 10.Added FileInfoAdder.exe utility in the Tools folder for SampeCode
V320	2024/12/25	1. Removed AX58400 Porting SSC Stack User Guide 2. Removed AX58400 SSC Tool Configuration Import UserGuide 3. Updated AX58x00 TwinCAT UserGuide v1.20 4. Updated AX58400 Datasheet v1.04 5. Updated AX58400 GpioAio UserGuide v2.20 6. Updated AX58400 MotorControl UserGuide v2.20

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		7. Added AX58x00 SSC Tool Configuration Import UserGuide v1.00
V330	2026/04/28	1. Updated AX58x00 TwinCAT UserGuide v1.21 2. Updated AX58400-TSB-1 SCHEMATIC v3.40
V340	2026/09/09	1. Updated AX58400-TSB-1 SCHEMATIC v3.50 2. Updated AX58400-EXB-ADIO-1 SCHEMATIC V2.10 and BOM file

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