

Application Note

G32R430 DDL SDK

Version: V1.2

1 Introduction

The Geehy Semiconductor G32R430 device abstract library software development kit includes a series driver library, a group of example applications that demonstrate key peripheral functionality, and other development files.

The software development kit has a hierarchy as follows:

- Boards
- Documents
- Examples
- Libraries
- Middlewares
- Package
- Utilities

Contents

1	Introduction	1
2	About SDK	3
2.1	DDL SDK files.....	3
2.2	Boards.....	3
2.3	Libraries	4
2.4	Examples.....	4
3	About Boards.....	5
4	About Documents	6
5	About Examples	7
6	About Libraries.....	12
7	About Middlewares	13
8	About Package	14
9	About Utilities	15
10	Development tools and version requirements	16
11	Revision	17

2 About SDK

2.1 DDL SDK files

The complete SDK directory tree is as shown below.

```
G32R430_DDL_SDK/
├── Boards/
│   └── Board_G32R430_TINY/
├── Documents/
│   ├── DDL_Driver_API/
│   ├── AN1166_*.pdf
│   ├── AN1185_*.pdf
│   └── DATASHEET.pdf
├── Examples/
│   └── Board_G32R430_Tiny/
├── Libraries/
│   ├── ATAN2/
│   ├── CMSIS/
│   ├── Device/
│   └── G32R4xx_DDL_Driver/
├── Middlewares/
│   └── Coremark/
├── Package/
│   └── Geehy.G32R4xx_DFP.x.y.z.pack
└── Utilities/
    ├── FLM/
    ├── IAR_AddOn/
    ├── pyOCD/
    └── SVD/
```

DDL SDK are composed of the following set of files:

2.2 Boards

The board support files are as shown in Table 1.

Table 1 List of boards

File	Description
board_g32r430_xxx.c	Board support package file of development board. It includes the basic on-board peripheral drivers. Example: board_g32r430_tiny.c

File	Description
board_g32r430_xxx.h	Header file of the board support package main driver C file. It includes common data, handle and enumeration structures, define statements and macros, as well as the exported generic APIs. Example: board_g32r430_tiny.h

2.3 Libraries

The DDL driver files are as shown in Table 2.

Table 2 DDL driver files

File	Description
g32r4xx_ddl_ppp.c	Peripheral or module driver file. It includes the APIs that are common to all G32R4xx devices. Example: g32r4xx_ddl_adc12.c
g32r4xx_ddl_ppp.h	Header file of the peripheral or module driver C file. It includes common data, handle and enumeration structures, define statements and macros, as well as the exported generic APIs. Example: g32r4xx_ddl_adc12.h

2.4 Examples

The application files are as shown in Table 3.

Table 3 Application files

File	Description
g32r4xx_int.c/h	This file contains the exceptions handler and peripherals interrupt service routine.
main.c/h	This file contains the main program, mainly. - Application code.

3 **About Boards**

The boards folder includes a board support package for G32R4xx board. It can help drive the peripheral circuit or components on the board quickly. The BSP can be found in the ~/Boards directory.

The BSP provided are built for G32R4xx board. For other user development board use, some minor modifications may be required.

Boards have a hierarchy as follows:

- Board_G32R430_TINY folder

4 About Documents

The Documents folder contains SDK manuals, application notes, and the device datasheet. These files can be found in the ~/Documents directory.

The Documents folder includes the following:

- DDL_Driver_API/ — G32R4xx DDL Driver API documentation (HTML and CHM) .
- AN1166_.pdf — G32R430 DDL SDK Quick Start Guide (Chinese and English) .
- AN1185_.pdf — Application note on IAR load restrictions when interrupt handlers call ITCM functions (Chinese and English) .
- DATASHEET.pdf — G32R430 device datasheet.

5 About Examples

The example applications can be found in the ~/Examples directory.

The examples provided are built for G32R4xx xxx board. For other user development board use, some minor modifications may be required.

Example projects have a hierarchy as follows:

- Example folder
 - Include
 - Project
 - IAR
 - MDK
 - Eclipse
 - Source

All example applications tested with **G32R4xx DDL V1.0.0**, include the following examples as shown in Table 4.

Table 4 List of examples supported for evaluation board

IP / Module	Example	G32R403_TINY	NA
ADC12	ADC12_AnalogWindowWatchdog	√	
ADC12	ADC12_ContinuousConversion	√	
ADC12	ADC12_ContinuousMultiChannelScan	√	
ADC12	ADC12_MultiChannelScan	√	
ADC12	ADC12_VDDVREFINT	√	
ADC16	ADC16_AnalogWindowWatchdog	√	
ADC16	ADC16_ContinuousConversion	√	
ADC16	ADC16_ContinuousDualRegulSimul Mode	√	
ADC16	ADC16_ContinuousMultiChannelScan	√	

IP / Module	Example	G32R403_TINY	NA
ADC16	ADC16_DifferentialMode	√	
ADC16	ADC16_DualDifferentialMode	√	
ADC16	ADC16_DualRegulSimulMode	√	
ADC16	ADC16_MultiChannelScan	√	
ADC16	ADC16_OversampleMode	√	
ADC16	ADC16_SingleRegulTmrTrigger	√	
ATAN2	ATAN2_Math	√	
COMP	COMP_CompareGpioVsDacInt_OutputGpio	√	
COMP	COMP_PWMSignalControl	√	
COMP	COMP_TMR	√	
Coremark	Coremark	√	
DAC	DAC_ADC16	√	
DAC	DAC_SignalsGeneration2	√	
DMA	DMA_FLASHToRAM	√	
EINT	EINT_Config	√	
FLASH	FLASH_OPT	√	
FLASH	FLASH_Program	√	
FLASH	FLASH_Protection	√	
GPIO	GPIO_Input	√	

IP / Module	Example	G32R403_TINY	NA
GPIO	GPIO_Toggle	√	
GPIO	GPIO_Wakeup	√	
I2C	I2C_EEPROM	√	
I2C	I2C_TwoBoardsinterrupt	√	
I2C	I2C_TwoBoardsDMA	√	
I2C	I2C_TwoBoardspolling	√	
IAP	Application1	√	
IAP	Application2	√	
IAP	BootLoader	√	
IWDT	IWDT_Reset	√	
LPTMR	LPTMR_Timeout	√	
PMU	PMU_EVS	√	
PMU	PMU_Standby	√	
PMU	PMU_Stop	√	
RCM	RCM_Clock_Out	√	
RCM	RCM_Config	√	
RTC	RTC_Alarm	√	
RTC	RTC_TimeStamp	√	
SPI	SPI_Biss-C Slave	√	

IP / Module	Example	G32R403_TINY	NA
SPI	SPI_TwoBoardsInterrupt	√	
SPI	SPI_TwoBoardsDMA	√	
SPI	SPI_TwoBoardspolling	√	
Template	Template	√	
TMR	TMR_CascadeSynchro	√	
TMR	TMR_DMA	√	
TMR	TMR_DMABurst	√	
TMR	TMR_EncoderInterface	√	
TMR	TMR_ExtTriggerSynchro	√	
TMR	TMR_InputCapture	√	
TMR	TMR_OCActive	√	
TMR	TMR_OCInactive	√	
TMR	TMR_OCToggle	√	
TMR	TMR_ParallelSynchro	√	
TMR	TMR_PWMInput	√	
TMR	TMR_PWMOutput	√	
TMR	TMR_SinglePulse	√	
TMR	TMR_TimeBase	√	
TS	TS_ReadTemperature	√	

IP / Module	Example	G32R403_TINY	NA
USART	USART_DMA	√	
USART	USART_Interrupt	√	
USART	USART_Polling	√	
USART	USART_RS485	√	
WWDT	WWDT_OverTime	√	

6 About Libraries

The libraries folder includes a series library. It can provide supports for G32R4xx MCU such as device support and device abstract library etc. The libraries can be found in the ~/Libraries directory.

G32R4xx MCU include following library:

- ATAN2
- G32R4xx_DDL_Driver
- CMSIS
- Device

7 **About Middlewares**

The middlewares folder includes a series third-party middleware. The middlewares can be found in the ~/Middlewares directory.

The middlewares used by G32R4xx include following:

- Coremark

8 About Package

Install and use this pack with MDK-ARM V5.40 or above (see Development tools and version requirements) .

- Geehy.G32R4xx_DFP.x.y.z.pack

9 About Utilities

The Utilities folder provides supporting files for programming, debug, and IDE device support. The Utilities can be found in the ~/Utilities directory.

The Utilities folder includes the following:

- FLM — Flash programming algorithms (.FLM)
- SVD — CMSIS-SVD (G32R430xx.svd)
- pyOCD — target script (target_G32R430xx.py) ; requires pyOCD v0.44. Copy the script to pyocd\target\builtin, add from . import target_G32R430xx and 'g32r430xb':
target_G32R430xx.G32R430xB, in __init__.py; then verify with pyocd list --targets.
- IAR_AddOn — G32R430xx_AddOn_v1.0.2.exe; requires IAR EWARM V9.60.2 or later

10 Development tools and version requirements

The following tool versions are required or recommended for this SDK:

1. Keil MDK-ARM V5.40 or above (required to install/use the DFP pack)
2. IAR EWARM V9.60.2 or later (required for the IAR AddOn)
3. pyOCD v0.44 (required for open-source download/debug with the SDK target script)
4. Eclipse V4.35.0 with LLVM Embedded Toolchain for Arm clang V19.1.1 (as used by example projects)

11 Revision

The document revision is as shown in Table 5.

Table 5 Document revision

Date	Version	Description
2025.11	1.0	First Release version of G32R4xx DDL SDK.
2026.1	1.1	Added Eclipse (Clang) project configuration support.
2026.8	1.2	SDK layout: tools moved to Utilities/; Package keeps DFP pack only; directory shown as text tree; added tool version requirements.

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