

Quick Start Guide

G32R501

Version: V1.0

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1 PCB Function Introduction

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			G32R501	VAL Board Pin map			<u>л</u>	_	G32R501 EV	AL Board Pin map		• III . IIII • • • • •			G33	R501 EVAL Board	i Pin map		<u>J2</u>	G32	501 EVAL Board	Pin map		
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			(_)	ADCINA14	•	AA14	AC2	•	ADCINC2		1	allin mitt nontho			(_)	PWM3_A	GPIO4	• P4	XRSn	• XR	in			1
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,	(_)	UARTA_RX	PWM7_A	GPIO28	٠	P28	A46	•	ADCINA6			11. 登制书11		(_)	QSPLIO0	PWM4_A	GPIO6	• P6	NC	• N	2			
	(_)	UARTA_TX	PWM7_B	GPIO29	٠	P29	AA2	٠	ADCINA2		_		(_)	OUTPUTXBAR	GSPI_SS_N	PWM4_B	GPIO7	• P7	NC	• N	2			
			(_)	ADCINB4	•	AB4	AC14	•	ADCINC14				(_)	OUTPUTXBAR	QSPL_IO3	PWM2_A	GPIO2	• P2	XRSn	• XR	Sn			
[(_)	ADCINA4	٠	M4	AC1	٠	ADCINC1]	T. 2170 T.	(_)	OUTPUTXBAR	2 QSPI_IO2	PWM2_B	GPIO3	 P3 	P24	• GPI	024 SPIB_SIM	BOOTI	(_)	
[(_)	SPIB_CLK	GPIO22	•	P22	AC3	٠	ADCINC3]	3.441.441.45		(_)	OUTPUTXBAR	QEP2_INDEX	GPIO26	 P26 	P31	• GPI	31 SPIB_SOM	SD1_C4	(_)	
Ī			(_)	ADCINA8	٠	AA8	ACS	٠	ADCINC5		1	THEFT ALLER THE		(_)	OUTPUTXBAR4	QEP2_B	GPIO15	 P15 	P33	• GPI	33 SPIB_STE	CANA_RX	QSPL_SS_N	(()
1		μ	SD1_D4	GPIO54	•	P54	AA3	•	ADCINA3		1			(_)	QEP2_A	PWM8_A	GPIO14	 P14 	P34	• GPK	34 LED2	(_)		
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Figure 1 G32R501 Evaluation Board Development Tool

Some characteristics of G32R501 Evaluation Board are worth noting, and they have been marked in the figure:

- USB isolation interface with power supply (USB1)
- USB isolation power jumper cap (JP7~JP9)
- Onboard Geehy-Link debugger (U12)
- JTAG/UART isolation jumper cap (JP16)
- Onboard LED (LED1, LED2)
- Reset button (B1)
- 40-pin ExpandPack Connector Site 1 (J1~J2)
- VREFHI jumper cap (JP1)
- G32R501 MCU (U1)
- 20MHz passive crystal oscillator (Y1)
- QSPI interface (JP6)
- 40-pin ExpandPack Connector Site 2 (J3~J4)
- Dial switch (S1~S6)
- EQEP1 and EQEP2 interfaces (JP3~JP4)
- CAN interface (JP5)

In this chapter, only the characteristics that need to be used are briefly explained. For more information about the G32R501 Evaluation Board development board, please refer to G32R501 Evaluation Board User Guide.

1.1 **Boot Mode Selection Switch (S1)**

The Boot ROM of G32R501 contains the Bootloader program, which will be executed every time the device is powered on or reset. The two pins, GPIO24 and GPIO32, are connected to the Boot mode selection switch (S1). Please pay attention to the silk screen information on the PCB. The OFF (open) position of the switch corresponds to logic 1 (pin at high level), and the ON (closed) position of



the switch corresponds to logic 0 (pin at low level). By default, these two pins are set to the OFF position, so the device will boot from Flash. In addition to the four Boot modes listed in the table below, G32R501 also supports SPI, I2C, and many other flexible Bootloader configuration options. For more information about the boot mode, please refer to *G32R501 User Manual*.

Table T DOUL MODE SELECTION SWITCH SETTINGS									
Boot mode	Gear 24 of S1	Gear 32 of S1							
Flash (default)	1	1							
UART / Wait Boot	0	1							
CAN	1	0							

Table 1 Boot Mode Selection Switch Settings



Figure 2 Schematic Diagram of Boot Mode Selection Switch

1.2 Virtual COM Port Selection Switch (S4, S6)

G32R501 Evaluation Board allows one of the two groups of UARTA pins (GPIO37/35 and GPIO29/28) to be routed to the Geehy-Link virtual COM port. By default, GPIO28 (configurable as UARTA_RX) and GPIO29 (configurable as UARTA_TX) are routed to the virtual COM port, and are not available on the ExpandPack connector. Alternatively, GPIO35 (configurable as UARTA_RX) and GPIO37 (configurable as UARTA_TX) can be routed to the virtual COM port. When UART function is not required on the virtual COM port, GPIO can be routed to the ExpandPack connector to implement ExpandPack standard functions.

	0	
UART mode	S4 gear	S6 gear
The GPIO29/28 of MCU is mapped to the Geehy-Link virtual COM port.		20/28
The GPO29/28 pins on ExpandPack are unavailable. (Default)	UART	29/20
The GPIO37/35 of MCU is mapped to the Geehy-Link virtual COM port.		27/25
The GPO37/35 pins on ExpandPack are unavailable.	UARI	37/35
The GPIO37/35 and GPIO29/28 of MCU are mapped to the	PD	Arbitrorily
corresponding GPIO on the ExpandPack normally.	DP	Arbitrarily

Table 2 Virtual COM Port Selection Switch Settings

1.3 **Debugging and Interface (JP17)**

The G32R501 Evaluation Board is equipped with a Geehy-Link hardware debugger. Users can use Geehy-Link for burning and debugging in Arm Keil MDK of version V5.40 and above. The Geehy-Link on the board is designed to support the 2pin JTAG mode, which means that it only uses the JTAG



pins of TMS and TCK, and allows reassignment of TDI and TDO according to application requirements.

Connector JP17 is used to debug external MCU using the onboard Geehy-Link hardware debugger. Through this connector, the Evaluation Board can be used as an independent Geehy-Link hardware debugger. If the Evaluation Board is used in this way, please ensure that all jumper caps of JP16 have been removed so as to isolate the JTAG signal and prevent it from entering the G32R501 MCU. Use an external debugger.

Pin group	S1	S2	S3	S4	S5	S6	Function
				0		0	UART is mapped to virtual COM port
GPIO28/GPIO29	X	X	х		~	0	(default configuration)
	х	х	х	1	х	х	GPIO is mapped to ExpandPack Site2
	х	х	1	х	х	1	GPIO is connected to EQEP port
GPIO35/GPIO37	v	v	0	v	v	v	GPIO is mapped to ExpandPack Site2
	X	X	0	X	х	х	(default configuration)
	х	0	х	х	х	х	QEP1 is mapped to GND
GPIO50/GPIO57/	v	1	v	v	v	v	GPIO is mapped to 3.3V (default
GF1059	X	I	X	X	X	х	configuration)
	х	0	х	х	х	х	QEP2 is mapped to GND
	v	1	v	v	v	v	GPIO is mapped to 3.3V (default
GFIOZO	X	1	X	X	X	X	configuration)
	х	х	х	х	1	х	CAN is mapped to U6
GPIO2/GPIO3	v	v	×	v	0	v	GPIO is mapped to ExpandPack Site2
	X	X	X	X	0	X	(default configuration)

Table 3 Multiplex Function Switch Settings

Note: "x" represents that the status of the switch has no impact on specific functions.



2 Environment Setup

2.1 Introduction

The core of G32R501 is Cortex-M52, based on Arm v8.1-M architecture, which has a series of new features compared to other architectures, and has certain requirements for tool chains. Before developing G32R501, it is necessary to set up an IDE integrated development environment.

(1) Tool preparation

IDE tool: MDK-Arm Version 5.41 with official authorization.

DE address: Arm Keil MDK official website: https://www.keil.arm.com/mdk-community/.

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t电脑 > 本地磁盘 (D:) > IDE工具	在 IDE工具 中搜索	
◎ ◎ 1\ 排序 ~ ≠ 查看 ~ …		1 详细
名称 ^	修改日期 类	型
Geehy 632R5xx_DFP.1.0.0	2024/10/10 13:47 Op	pen-CMSIS-Pa
📲 mdk540	2024/10/10 13:48 成	用程序

(2) IDE installation steps:

Double-click [mdk540] installation package to open MDK-Arm V5.40, as shown in the figure:



× +			
□ > 此电脑 >	本地磁盘 (D:) > IDE工具	在IDE工具。	中搜索
î () ()	1↓ 排序 ◇ _ 三 查看 ◇		
	名称	修改日期	类型
	Geehy.G32R5xx_DFP.1.0.0	2024/10/10 13:47	Open-CMSIS-Pa
	💐 mdk540	2024/10/10 13:48	应用程序
* * * * * *	Setup MDK-ARM V5.40 Welcome to Keil MDK-ARM Release 5/2024 This SETUP program installs: MDK-ARM V5.40 This SETUP program may be used to update a previou However, you should make a backup copy before proc It is recommended that you exit all Windows programs b Follow the instructions to complete the product installati	s product installation. eeding. refore continuing with SETUP. on.	
_	Geehy 2		

(3) Click [Next>>] to enter the interface shown in the figure below:





(4) Check [License Agreement] and click [Next>>] to enter the interface shown in the figure below:

up MDK-ARM V5.40			
icense Agreement		arr	
Please read the following license agreem	ent carefully.	un	KEIL
To continue with SETUP, you must accep agreement, click the check box below.	ot the terms of the Licer	ise Agreement. To acce	pt the
END USER LICENSE AGREEMENT	FOR ARM SOFTWA	RE DEVELOPMENT T	OOLS
This end user license agreement ("I single individual), or the company of represent and have the legal author Tools. Arm is only willing to license the terms of this License. By clicking Arm Tools and/or any Undate theret	License") is a legal r organisation (a sin ity to bind, and Arm i the Arm Tools on co g "I Agree" or by insta o (as permitted by th	agreement between ; gle legal entity) that y elating to use of the ndition that you acce alling or otherwise us is License) you indic	you (a ou Arm pt all of sing the sate that
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up MDK-ARM V5.40 older Selection Select the folder where SETUP will instal Press 'Next' to install MDK-ARM to these f Destination Folders Core: C:\Users\geehy\AppData\Loca Pack: C:\Users\geehy\AppData\Loca	2 – I files. folders. Press 'Browse' al\Keil_v5 al\Arm\Packs folder	o select different folders	for installation. Browse Browse
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up MDK-ARM V5.40 older Selection Select the folder where SETUP will instal Press 'Next' to install MDK-ARM to these f Destination Folders Core: C:\Users\geehy\AppData\Loca Pack: C:\Users\geehy\AppData\Loca Pack: C:\Users\geehy\AppData\Loca Update Installation: Create backup tool I Backup old core files to C:\Users\ge eil MDK-ARM Setup	2 Il files. folders. Press 'Browse' I al\Keil_v5 al\Arm\Packs folder eehy\AppData\Local\I	o select different folders	n KEII for installation. Browse Browse

(5) Set the Keil_v5 tool and PACK package installation path (default installation path is recommended), check the [Update Installation] option and then click [Next>>] to enter the interface shown in the figure below:



Setup MDK-ARM V5.40			×
Folder Selection Select the folder where SETUP will install files.	Gee	arm	KEIL
Press 'Next' to install MDK-ARM to these folders. Press	'Browse' to select diffe	rent folders for in	stallation.
Destination Folders			,
L Core: C:\Users\geehy\AppData\Local\Keil_v5		Bro	wse
2 Pack: C:\Users\geehy\AppData\Local\Arm\Packs	:	Bro	wse
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07			
Company Name:			
Company Name:			
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Company Name: E-mail: — Keil MDK-ARM Setup	<< Back	Next >>	Cancel

(6) Fill in [First Name], [Last Name], [Company Name] and [E-mail], and click [Next>>] to enter the interface shown in the figure below:



	5.40		
Customer Informa Please enter you	ation r information.	Gerarmke	IL
Please enter your	name, the name of the compa	any for whom you work and your E-mail address.	
First Name:	huwei		
Last Name: 1	geehy		
Company Name:	Geehy		
E-mail:	xxxxx@xxx.com		1
		<< Back Next >> Car	ncel
Setup MDK-ARM V	/5.40		
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MDK-ARM Setup Install Files Installing libcpp-e	o is performing the requested o experimental_8en.I.	operations.	EIL
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(7) After successful installation, click [finish]



Setup MDK-ARM V5.40		×
Keil MDK-ARM Setup completed MDK-ARM V5.40	Geearm	KEIL
MDK-ARM Core Setup has performed all requested of Show Release Notes.	operations successfully.	
— Keil MDK-ARM Setup ————————————————————————————————————	<< Back Finish	Cancel



3 PACK Package Installation

Geehy.G32R5xx_DFP.1.0.0.pack is a software package provided by Geehy and used in Keil. It includes libraries, drivers, header files, sample codes, and corresponding documents used for G32R501.

Please find the software package file in package folder of SDK folder, and it is located at:

- ... / ... / Geehy.G32R5xx_DFP.1.0.0.pack (the specific location is provided by FAE)
 - (1) Click Keil IDE to enter the interface shown in the figure below:



(2) Click to open [Pack Installer] and enter the interface shown in the figure below:





Device:		221			X	
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arch: 👻 🗸			Show deprecated packs al	so		
ice	/ Summary		Pack	Action	Description	
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🖲 🔗 Ambiq Micro	16 Devices		AlifSemiconductor::LV	🚸 Install+	Alif Semiconductor D/AVE2D driver CMSIS package	
E 🔮 Amiccom	5 Devices		-AnalogDevices::ADSP	🐵 Install+	OS Abstraction Layer binding for FreeRTOS.	
🗄 💡 Analog Devices	14 Devices	Pack Installer		×	OASIS PKCS #11 Cryptographic Token Interface	
APEXMIC	23 Devices				Unit Testing for C (especially Embedded Software)	
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🐑 🔗 BrainChip	1 Device	Pack Installer is a utility for managing	g Software Packs on the local comput	er and late	CMSIS (Common Microcontroller Software Interface Standard)	
🗄 🔗 Cmsemicon	95 Devices	provides the following windows:		late	CMSIS Compiler extensions for Arm Compiler, GCC, Clang, and IAR Comp	
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🗉 🍳 Dialog Semiconductor	20 Devices	Devices : List supported devices, select a	a device to show related Packs and es	kamples.	CMSIS Drivers for STMicroelectronics STM32 Series devices	
🗄 🔗 ELAN	1 Device	Boards : List supported boards. Select a	board to show related Packs and exa	amples.	CMSIS-Driver Validation	
🖲 🎐 FMD	50 Devices	Packer I Liet and manage Software Rade	n Tostall a Dack for access within whi	-	CMSIS Embedded Compute Library	
🗄 🔶 FMSH	11 Devices	Packs . List and manage software Pac	s. Install a Pack for access within pric		Bundle of FreeRTOS for Cortex-M and Cortex-A	
🗉 🔗 Geehy	107 Devices	Examples : List example projects. Copy pro	pjects and launch µVision for testing e	xamples.	CMSIS NN software library of efficient neural network kernels	
🗄 🔗 GigaDevice	388 Devices	Part Tartella and the same half and for	the shares the sublehed of the second	late	RTX RTOS implementation of CMSIS-RTOS2 API	
H IDSC	120 Devices	Pack Installer connects to <u>www.keil.com/pa</u> To install a local Software Pack use File - Im	to obtain the published Software Pa port from the menu	dos.	Debugger visualization of software events and statistics	
🖲 🔗 Himax	2 Devices		portar non ore menor		Pack for the DMA350 drivers.	
🗄 🔗 Holtek	422 Devices	Show this dialog at startup	OK	Help	Device Driver for the Arm(R) Ethos(TM)-U NPU.	
🗉 🔗 Infineon	1192 Devices				Pack for the MALIC55 ISP drivers.	
🗄 🔗 Maxim	19 Devices		⊞ ARM::mbedTLS	📀 Install+	ARM mbed Cryptographic and SSL/TLS library	
🗄 🔗 Megawin	14 Devices		ARM::ml-embedded-e	. 🧇 Install+	ML sample use case APIs derived from mI-embedded-eval-kit	
Microchip	331 Devices		ARM::PSA	🚸 Install	PSA (Platform Security Architecture)	
🗉 🔗 Microsemi	6 Devices		ARM::SDS	🚸 Install	Synchronous Data Streaming	
MindMotion	157 Devices		H ARM::TFM	♦ Install+	Trusted Firmware-M (TF-M) reference implementation of Arm's Platform S	
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Pack descriptions						

(3) Click [OK], as shown in the figure below:

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- 🌯 All Devices	9677 Devices	•	Device Specific	0 Packs	No device selected	
T PEAK	12 Devices		Generic	415 Packs		_
+ ABOV Semiconductor	34 Devices		AlifSemiconductor::Az.	🚸 Install	AzureRTOS support for Alif Semiconductor M55 HP and M55 HE device	
Active-Semi	17 Devices		+ AlifSemiconductor::Da.	🔅 Install+	Alif Semiconductor D/AVE2D driver CMSIS package	
Alif Semiconductor	13 Devices		+ AlifSemiconductor::Fr	Install+	FreeRTOS Components support for Alif Semiconductor M55 HP and M5	5 HE
+ 🔮 Ambia Micro	16 Devices		+ AlifSemiconductor::LV	Install+	Alif Semiconductor D/AVE2D driver CMSIS package	
Amiccom	5 Devices		AnalogDevices::ADSP	🔅 Install+	OS Abstraction Layer binding for FreeRTOS.	
Analog Devices	14 Devices	Pack Installer	10	×	OASIS PKCS #11 Cryptographic Token Interface	~8
APEXMIC	23 Devices	- dec motalier			Unit Testing for C (especially Embedded Software)	-
💌 🔗 ARM	52 Devices	Welcome to the Keil Pack Ins	taller		A 2D graphic library optimized for Cortex-M processors.	
🗉 🤗 BrainChip	1 Device	Pack Installer is a utility for managin	g Software Packs on the local compute	erand late	CMSIS (Common Microcontroller Software Interface Standard)	
Cmsemicon	95 Devices	provides the following windows:		late	CMSIS Compiler extensions for Arm Compiler, GCC, Clang, and IAR Cor	mpile
Cypress	691 Devices	660			CMSIS Drivers for external devices	
Dialog Semiconductor	20 Devices	Devices : List supported devices. Select a	a device to show related Packs and ex	amples.	CMSIS Drivers for STMicroelectronics STM32 Series devices	
🗉 🤗 ELAN	1 Device	Boards : List supported boards. Select a	board to show related Packs and exp	mples.	CMSIS-Driver Validation	
🐑 🔗 FMD	50 Devices	Profes	a taskell a David for any second with law of		CMSIS Embedded Compute Library	
🗉 🤗 FMSH	11 Devices	Packs : List and manage software Pac	is, tristall a Pack for access with pre	aori.	Bundle of FreeRTOS for Cortex-M and Cortex-A	
🗉 🤗 Geehy	107 Devices	Examples : List example projects. Copy pro	pjects and launch µVision for resting e	xamples.	CMSIS NN software library of efficient neural network kernels	
🐑 🎐 GigaDevice	388 Devices	Park Tardalla anna da barra da 11 ans fas	and the state of t	late	RTX RTOS implementation of CMSIS-RTOS2 API	
🗄 🔗 HDSC	120 Devices	To instal a local Software Pack use File - Im	to obtain the published Software Pa	oos. late	Debugger visualization of software events and statistics	
🐵 🔗 Himax	2 Devices				Pack for the DMA350 drivers.	
😥 🎐 Holtek	422 Devices	Show this dialog at startup	ОК	Help	Device Driver for the Arm(R) Ethos(TM)-U NPU.	
🗉 🔗 Infineon	1192 Devices				Pack for the MALIC55 ISP drivers.	
🖢 🔗 Maxim	19 Devices		ARM::mbedTLS	🚸 Install+	ARM mbed Cryptographic and SSL/TLS library	
🐑 🕈 Megawin	14 Devices		ARM::ml-embedded-e	🔅 Install+	ML sample use case APIs derived from mI-embedded-eval-kit	
Microchip	331 Devices		ARM::PSA	🚸 Install	PSA (Platform Security Architecture)	
🖲 🔗 Microsemi	6 Devices		ARM::SDS	🚸 Install	Synchronous Data Streaming	
🐑 🔗 MindMotion	157 Devices		ARM::TFM	🔅 Install+	Trusted Firmware-M (TF-M) reference implementation of Arm's Platform	n Seci
🐵 🌳 Nordic Semiconductor	19 Devices		I ARM::TFM-Test	🚸 Install+	Trusted Firmware-M (TF-M) Tests	
🖲 🔗 NSING	121 Devices	-	ARM-W2M MPS3 SSF	🔅 Install+	ARM V2M-MPS3 TE-M Platform Support pack	
🗄 🏟 Musakan	001 D	<u>ت</u>				
Output						, a)
erresh Pack descriptions	ostalled: 2.8.0 available: 2.9.0					
poure available for ARMILEMSIS-Driver (i	istancal 2010, available, 215.0)					

(4) Click [File] to display the drop-down menu, as shown in the interface below:



Import-	N	d Parke Framplas		
Import from Folder		Packs Examples		
Manage Local Repositories		Show deprecated packs at	50	
Settions	imary	Pack	Action	Description
Settings	Devices	Device Specific	1 Pack	ELAN selected
Exit	evices	ELAN::eKTF7020_DFP	📀 Install	ELAN ARM Cortex-M0+ Device Family Pack
ABUY Semiconductor	34 Devices	🗄 Generic	415 Packs	
Active-Semi	17 Devices	AlifSemiconductor::Az	😔 Install	AzureRTOS support for Alif Semiconductor M55_HP and M55_HE device
Alif Semiconductor	13 Devices	AlifSemiconductor::Da	😔 Install+	Alif Semiconductor D/AVE2D driver CMSIS package
Ambiq Micro	16 Devices	AlifSemiconductor::Fr	🔅 Install+	FreeRIOS Components support for Alif Semiconductor M55_HP and M55_HE
Amiccom	5 Devices	AlifSemiconductor::LV	🔅 Install+	Alif Semiconductor D/AVE2D driver CMSIS package
Analog Devices	14 Devices	AnalogDevices::ADSP	🔅 Install+	OS Abstraction Layer binding for FreeRTOS.
ADuCM4x50 Series	1 Device	Arm-Packs::PKCS11	🐵 Install	OASIS PKCS #11 Cryptographic Token Interface
ADuCM32x Series	4 Devices	Arm-Packs::Unity	🐵 Install	Unit Testing for C (especially Embedded Software)
ADuCM36x Series	4 Devices	ARM::Arm-2D	🐵 Install	A 2D graphic library optimized for Cortex+M processors.
ADuCM41x Series	1 Device	ARM::CMSIS	🔶 Up to date	CMSIS (Common Microcontroller Software Interface Standard)
ADuCM302x Series	2 Devices	ARM::CMSIS-Compiler	🔶 Up to date	CMSIS Compiler extensions for Arm Compiler, GCC, Clang, and IAR Compile
ADuCM355 Series	2 Devices	ARM::CMSIS-Driver	🚸 Update	CMSIS Drivers for external devices
APEXMIC	23 Devices	ARM::CMSIS-Driver_ST.	. 🥸 Install	CMSIS Drivers for STMicroelectronics STM32 Series devices
😥 🔗 ARM	52 Devices	ARM::CMSIS-Driver_Va.	. 🧇 Install+	CMSIS-Driver Validation
😥 🔗 BrainChip	1 Device	ARM::CMSIS-DSP	🚸 Update	CMSIS Embedded Compute Library
😥 🔗 Cmsemicon	95 Devices	ARM::CMSIS-FreeRTOS	🗇 Install	Bundle of FreeRTOS for Cortex-M and Cortex-A
🕀 🔗 Cypress	691 Devices 🔥 🖄	-ARM::CMSIS-NN	💠 Update	CMSIS NN software library of efficient neural network kernels
Dialog Semiconductor	20 Devices	-ARM::CMSIS-RTX	💠 Up to date	RTX RTOS implementation of CMSIS-RTOS2 API
⊕ ^A S DA1453x Series	1 Device	-ARM::CMSIS-View	💠 Up to date	Debugger visualization of software events and statistics
DA1458x Series	6 Devices	ARM::DMA350	🚸 Install	Pack for the DMA350 drivers.
🕀 🔧 DA1468x Series	4 Devices	Arm::ethos-u-core-dri	🗇 Install	Device Driver for the Arm(R) Ethos(TM)-U NPU.
🕀 🏄 da1469x Series	4 Devices	ARM::MALIC55	Install	Pack for the MALIC55 ISP drivers.
🕀 🏤 DA1470x Series	5 Devices	ARM::mbedTLS	Install+	ARM mbed Cryptographic and SSL/TLS library
🖶 🔮 ELAN	1 Device	ARM:ml-embedded-e.	🔅 Install+	ML sample use case APIs derived from mI-embedded-eval-kit
🕀 🏤 eKTF Series	1 Device	ARM::PSA	🔅 Install	PSA (Platform Security Architecture)
🗄 🔶 FMD	50 Devices	H-ARM::SDS	🚸 Install	Synchronous Data Streaming
FT32F0 Series	26 Devices	B ARM::TFM	🚸 Install+	Trusted Firmware-M (TF-M) reference implementation of Arm's Platform Sec
# 12 FT32F1 Series	24 Devices	IN ARM-TEM-Test	🕸 Install+	Trusted Firmware-M (TF-M) Tests
- 4 PART	11 Decision			•
Dutput				a
efresh Pack descriptions				

(5) Click [import] to enter the import Pcak interface and select Geehy.G32R5xx_DFP.1.0.0 file, as shown in the following figure:

		≣	- 🗆 🔮
名称	修改日期	类型	大小
Geehy.G32R5xx_DFP.1.0.0	2024/10/10 13:47	Open-CMSIS-Pa	666 KB
403			

(6) 7. When the progress bar reaches 100%, the pack installation is completed.

Device: Analog Devices				
Devices Boards	land the second s	Packs Examples		C NO M
arch: -	× E	Show deprecated pack	also	
ice	/ Summary	Pack	Action	Description
🖇 All Devices	9677 Devices	Device Specific	8 Packs	Analog Devices selected
🗄 🔗 🖉 3PEAK	12 Devices	AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM4x50 Device Support. (Subject to the Software Licens
ABOV Semiconductor	34 Devices	-AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM36x Device Support and Examples
🗉 🍳 Active-Semi	17 Devices	-AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM302x Device Support. (Subject to the Software Licens
Alif Semiconductor	13 Devices	+ AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM320 Device Support and Examples
E Ambig Micro	16 Devices	H AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM355 Device Support and Examples
Amiccom	5 Devices	AnalogDevices::ADu	C 🚸 Install	Analog Devices ADuCM410 Device Support and Examples
Analog Devices	14 Devices	+ AnalogDevices::EV-C	0 🚸 Install+	Analog Devices EV-COG-AD3029 Off-Chip Drivers and Examples. (Subject to
🗄 🍕 ADuCM4x50 Series	1 Device	AnalogDevices::EV-C	0 🚸 Install+	Analog Devices EV-COG-AD4050 Off-Chip Drivers and Examples. (Subject to
+ 🍕 ADuCM32x Series	4 Devices	Generic	415 Packs	
🗉 🍕 ADuCM36x Series	4 Devices	AlifSemiconductor:	z 🚸 Install	AzureRTOS support for Alif Semiconductor M55_HP and M55_HE device
H ADuCM41x Series	1 Device	AlifSemiconductor:	a 🐼 Install+	Alif Semiconductor D/AVE2D driver CMSIS package
ADuCM302x Series	2 Devices	AlifSemiconductor:	r 🐼 Install+	FreeRTOS Components support for Alif Semiconductor M55_HP and M55_H
🗉 🎕 ADuCM355 Series	2 Devices	AlifSemiconductor:	V 🛞 Install+	Alif Semiconductor D/AVE2D driver CMSIS package
- 🔗 APEXMIC	23 Devices	AnalogDevices::ADSI	🐼 Install+	OS Abstraction Layer binding for FreeRTOS.
ARM	52 Devices	-Arm-Packs::PKCS11	Install	OASIS PKCS #11 Cryptographic Token Interface
🗄 🎐 BrainChip	1 Device	Arm-Packs::Unity	Install	Unit Testing for C (especially Embedded Software)
E ·· 🔗 Cmsemicon	95 Devices	-ARM::Arm-2D	Install	A 2D graphic library optimized for Cortex-M processors.
··· · Cypress	691 Devices	-ARM::CMSIS	Up to date	CMSIS (Common Microcontroller Software Interface Standard)
Dialog Semiconductor	20 Devices	ARM::CMSIS-Compi	er 🔶 Up to date	CMSIS Compiler extensions for Arm Compiler, GCC, Clang, and IAR Compil
DA1453x Series	1 Device	ARM::CMSIS-Driver	🚸 Update	CMSIS Drivers for external devices
E 1 DA1458x Series	6 Devices	ARM::CMSIS-Driver	T 🕸 Install	CMSIS Drivers for STMicroelectronics STM32 Series devices
E A DA1468x Series	4 Devices	-ARM::CMSIS-Driver	/a 🔄 Install+	CMSIS-Driver Validation
H da1469x Series	4 Devices	-ARM::CMSIS-DSP	Update	CMSIS Embedded Compute Library
E A DA1470x Series	5 Devices	ARM::CMSIS-FreeRIC	S install	Bundle of FreeRTOS for Cortex-M and Cortex-A
- 🔶 ELAN	1 Device	-ARM::CMSIS-NN	🕹 Update	CMSIS NN software library of efficient neural network kernels
+ A eKTF Series	1 Device	H-ARM::CMSIS-RTX	Up to date	RTX RTOS implementation of CMSIS-RTOS2 API
FMD	50 Devices	H-ARM::CMSIS-View	Up to date	Debugger visualization of software events and statistics
E-132F0 Series	26 Devices	E-ARM::DMA350	Install	Pack for the DMA350 drivers.
E .4 FT32F1 Series	24 Devices	Arm-ethos-u-core-d	ri 🐼 Install	Device Driver for the Arm(R) Ethos(TMI-11 NPI)
A FMCU	11 D	•		
a de la companya de la				~
available for ARM::CMSIS-DSP (in available for ARM::CMSIS-NN (in: available for ARM::CMSIS-Driver available for ARM::CMSIS-DSP (in	stalled: 1.15.0, available: 1.16.2) talled: 5.0.0, available: 6.0.0) installed: 2.8.0, available: 2.9.0) stalled: 1.15.0, available: 1.16.2)			



4 Engineering Configuration, Import, and Compilation

4.1 Import Project

Example routine: gpio_ex2_toggle

Example relative path:

G32R501_SDK_v0.6\driverlib\g32r501\examples\launchboard\gpio\gpio_ex2_toggle

Import steps:

(1) Enter the folder gpio_ex2_toggle->project->MDK, find the file named project, as shown in the figure below:



(2) Double-click the project file to open it, the Object, Listings, and Debug will be automatically generated, and the project will be displayed in Keil IDE, as shown in the figure below:

标 project r501_cpu0_flash_link Objects	修改日期 2024/10/14 20:17 2024/10/14 20:17	类型 礦ision5 Project	大小	
project r501_cpu0_flash_link Objects	2024/10/14 20:17 2024/10/14 20:17	磼ision5 Project		
r501_cpu0_flash_link Objects	2024/10/14 20:17		24 KB	
Objects		Windows Script	10 KB	
	2024/10/14 20:18	文件夹		
Listings	2024/10/14 20:18	文件夹		
DebugConfig	2024/10/14 20:18	文件夹		



□◎日間 とらぬ つ 0 ← → ○ 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	- 🔜 🖉 🔍 • 💿 O 🔗 🏨 • 🔝 • 🔍	
🕸 🖾 📽 • 🚳 🛱 g32r501 💿 🖧 着 🛸 🕈 🧒 🏟		
nijerz nije Project project nije Jožstov nije dosec nije dosec		
🗄 🞑 user		
201		
Geelin		

(3) Click the function bar Build to compile, and then view the errors in the Build Output information bar, as shown in the figure below:

(Choose either Step 3 or Step 4)

DASVN_SDKUUT32501(E501)/Firmware/werification/G32R501_SDK_0423/G32R501_SDK_v0	Bidriverlib\g32r501\examplesVaunchboard\gpio\gpio_ex2_toggle\project\MDR\projec		- • ×
□●● ● ▲ 国際 ウビー + ● 自自我 家家店店	💆 🔍 🕅 🖉 🖉 • 💿 • 🔗 🍓 • 🔲 • 🐁		
🙆 🐨 🗢 🐺 🙀 👔 g32r501 🖂 🔊 🚭 🐨 🌚			
neet 9 0 ¹⁰ Forest protecting ¹⁰ ⊕ 20501 ¹⁰ ⊕ 40cia ¹⁰ ⊕ 40cia ¹⁰ ⊕ 40cia ¹⁰ ⊕ 40cia ¹⁰ ⊕ 40cia	Contract Contraction	Contract Parameter State	and the second
Geetiti 2024 (D.1.4			
Project 🔞 Books () Tunc U., Temp			
We Compute Sequence of the second se	Geeny 2024-16	Geen 2024	
<pre>inting inting inting inting inter Code=7268 BO-data=1080 EW-data=0 II-data=1176 inter Buil = User command fr inter Buil = User command fr inter Buil = User command fr inter III file generated into User inter inte</pre>	es/kell_dbq_tool/kell_dbq_tool ~a Dr/578_SDK/UT32501(E501)/Firmware/	verification/0338501_55K_0423/0338501_55K_v0.4/driverib/g33r501/examp:	les\launchboard\gpio\gpio_ex2_toggle\

(4) Click Rebuild to compile, and then view the errors in the Build Output information bar, as shown in the figure below: (Choose either Step 3 or Step 4)





(5) Click Options for Target "Magic Wand" and the following interface will appear:

ug Peripherals Tools SVCS Window Help		
- ← → 作為為後 準準///////////////////////////////////	🖂 🕸 🍳 • 🕘 O 🔗 🍓 • 🔲 • 🔍	
🖂 🎊 📥 🕾 🔶 🐡 🎰		
1 		
	Options for Target 'g32:501' X Device _ Twrest Options 1(string 1(string 0(0++ (408))] am _ 1(string 1(ti))] (string 1(ti))]	
and the second s	Geelty G32R501VE Code Generation Xali (MHz): aundefined5 Xali (MHz): aundefined5	
5.94 1	Operating system: None View MicroLJB Big Endian	
	System Viewer File: Floating Point Hardware: Double Precision 💌	
	G32R501.svd Vector Extensions: Integer + Roating Point 🔽	
	I Use Custom He Branch Protection: Not Used	
	- Part Ohi Manar Anar	
	default off-chip Start Size Startup default off-chip Start Size Nohnt	
	ROM1: C RAM1: 0x20100000 0x2000 C	
	□ ROM2: C □ RAM2: 0x20200000 0x2000 □	
	C RAM3: 0x2030000 0x8000 C	
	on-chip on chip	
	□ IROM2: C IF IRAM2: 0x20000000 [0x4000 □	
2020	OK Cancel Dafualts Malp	

sta=2080 RW-data=0 ZI-data=11776

(6) Configure in the Option for Target interface, select the Device column, expand Geehy->G32R5xx Series

->G32R501->G32R501DVE, and select G32R501DVE:



Options for Target 'g32r501'	×
Device Parget Output Listing User	C/C++ (AC6) Asm Linker Debug Utilities
Software Packs	
Vendor: Geehv	Software Pack
Device: G32R501VE	Pack: Geehy::G32R5xx_DFP@1.0.0
Toolset: ARM	URL: https://www.geehy.com/uploads/tool/
Search:	
200	
ARM	G32R501 is a dual core M52 based SoC. This SoC employs the
Geehy	need large bandwidth are connected to AMBA AHB buses, while
G32R5xx Series	lower speed components are connected to AMBA APB buses.
	~ D:
OK	Cancel Defaults Help
Options for Target 'g32r501'	Se x
Device Trunch Output I intigal II	
Target output Listing 0	ser C/C·· (ACO/ ASIII Linker Bebug Offifities
Software Packs	-
Vendor: Geehy	Software Pack
Device: G32R501VE	Pack: Geehy::G32R5xx_DFP@1.0.0
Toolset: ARM	URL: <u>https://www.geehy.com/uploads/tool/</u>
Search:	
20-	
⊕ G32R501DVE	▲ G32R501 is a dual core M52 based SoC. This SoC employs the popular AMBA2.0 bus to integrate peripheral IPs: components which
G32R501MC	need large bandwidth are connected to AMBA AHB buses, while
G32R501NC	lower apeed components die connected to AMBA Ar B bases.
G32R501NE	
G32R501RC	
G32R501RE	
G32R501VC	
G32R501VE	
30	Cancel Defaults Halm
- NO	Canver Deradits neth



(7) Configure in the Option for Target interface, select the Target column, and check the configuration of IROM1, IRAM1, IRAM2, RAM1, and RAM2 addresses and sizes, as shown in the following figure:

evice larget Output Listing User C/C++	(AC6) Asm Linker Debug Vtilities
Geehy G32R501VE Xtal (MHz): <a>defined	ARM Compiler: Use default compiler version 6
Operating system: None	Use MicroLIB 🔲 Big Endian
System Viewer File:	Floating Point Hardware: Single Precision
G32R501.svd	Vector Extensions: Integer + Floating Point 💌
Use Custom File	Branch Protection: Not Used
	CDE CoProcessors [07]: 🔽 🔲 🗌 🔲 🗌
Read/Only Memory Areas	Read/Write Memory Areas
default off-chip Start Size Startup	default off-chip Start Size NoInit
□ ROM1: 0	□ RAM1: 0x20100000 0x2000 □
□ ROM2: ○	□ RAM2: 0x20200000 0x2000 □
ROM3: On-chip	RAM3: 0x20300000 0x8000
▼ IROM1: 0x8000000 0x80000 (•	▼ IRAM1: 0x0 0x10000 □
IROM2: C	IRAM2: 0x20000000 0x40000 □

(8) Configure in the Option for Target interface, select the Debug column, choose CMSIS-DAP
 ARMv8-M Debugger as the Debug tool, and select the [Initialization File] file:

CFGSMS_BANK_MAP_SRAM1, CFGSMS_BANK_MAP_SRAM1,		🔛 Select Target Debugger I	Initialization File				
CFGSMS_BANK_MAP_SRAM1,	<u>1</u> 9.	$\langle + + + + + \rangle$	« launchboard > gpic	> gpio_ex2_toggle > project	MDK	 C 在 MDK 中搜索 	م م
Options for Target 'g32r501' Device Target Output Listing User C/C++ (ACG) Ann Linker Debug Utilities	组织 ▼ 新建文件夹				=	- 🖬 🗿
C Use Simulator <u>with restrictions</u> <u>Settings</u> ☐ Limit Speed to Real-Time	CMSIS-DAP ARMv8-M Debugg Settings	> 🦲 OneDrive - Per	名称	个 修改日期 2024/10/15	类型 11:33 文件夹	大小	
I Load Application at Startup I Fun to main() Initialization File:	Load Application at Startup Run to main Initialization File:	三 桌面 📌 📔	Listings	2024/10/15	11:33 文件夹		
Edt	.vr501_dbg.ini Edit	↓ 丁载 ★	Sol dbg	2024/10/15	11.20 配票设票	2 1/ 2	
Ward: Windows & Performance Analyzer Ward: Parameter: Dalog DLL: Parameter: Ward & cudded Executable is loaded Manage Component \ 000	Versekaports V Toobox Versey Versey Versey Versey Versey	→ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆	T301-Jey	2024/10/15 GBBN 2024	11:39 配置设置	1 KB	
void CFGSMS_Config(Void) (if USE_AUTO_DYNAMICASSIGNMENT if(TCFGSMS_getBankConfigMode()) (CFGSMS_clearParityIncRawStati	a (0x77) ;	> 📮 此电脑 > 🐲 网络				10-15 5+,	开启搜狗智
	04	文件	B(N): r501_dbg	6	20117	V Ini Files (*.ini)	~
						11#(O)	现公询



evice Targe	t Output Listing User C/C++ (A	C6) Asm Linker Debug Vtilitie	s
○ Use Simula □ Limit Speed ▼ Load Applid Initialization File	tor <u>with restrictions</u> <u>Settings</u> d to Real-Time cation at Startup v Run to main() e: Edit	 ✓ Use: CMSIS-DAP ARMv8-M Debugg _ ULINKplus Debugger J-LINK / J-TRACE Cortex ST-Link Debugger NULink Debugger Initializatic Pemicro Debugger \vr501_k ULINK Pro ARMv8-M Debugger 	> Settings
Restore Deb Breakp Watch Memory	ug Session Settings oints I Toolbox Windows & Performance Analyzer v Display I System Viewer	Restore Models ARMv8-M Debugger Watch Windows Tracepoints Memory Display System View	/er
CPU DLL:	Parameter:	Driver DLL: Parameter: SARMV8M.DLL -MPU -MVE -PACBTI	
Dialog DLL:	Parameter:	Dialog DLL: Parameter: TCM.DLL pCM52	
Warn if out	dated Executable is loaded Manage Component Vie	Wam if outdated Executable is loaded	
	07 6	real Before t	¥.1-

(9) 8. Configure in the Option for Target interface, select the Debug column, click Settings, check Erase Sectors, Program, Verify, and set the start address and size of RAM for Algorithm:

Options for Target '932r501' Device Target Output Listing User C/C++ (A Use Smulator <u>with restrictions</u> Umit Speed to Real-Time	C8) Asm Linker Debug Utilities	CMSIS-DAP ARMv8-M Target Driver Setup Debug Trace = Flash Dovaload Pack Download Finction
Load Application at Startup Iv Run to main() Initialization File: Iv Edit	Image: Cool of the second state Image: Cool of	Construction C
Restore Debug Session Settings IF Breakpoints IF Toolbox IF Watch Windows & Performance Analyzer IF Memory Display IF System Viewer	Restore Debug Session Settings	*/ Description Device Size Device Type Address Range G32R5xx Program Algorithm 527353x On-chip Rash 00000000H - 20307FFFH
Dialog DLL: Parameter:	Diver DLL: Parameter: [SARMV8M.DLL] -MPU -MVE -PACBTI Dialog DLL: Parameter: [TCM.DLL] -pCM52	Stat: Size: Size: Add Remove
Wam if outdated Executable is loaded Manage Component W	Wam if outdated Executable is loaded	OK Cancel Help

(10) Configure in the Option for Target interface, select the Debug column, click Settings, and select the address and memory size of Program Algorithm:



200					
CMSIS-DAP ARMv8-M Target Driver Setup		Add Elash Programming Algo	rithm		. 200
Debug Trace Flash Download Pack				10	3
Download Function	RAM for Algorithm	- Description	Flash Size	Device Type	Origin
Erase Full Chip 🔽 Program		G32R5xx Flash OTP	8k	On-chip Flash	Device Family Package
Erase Sectors Verify	Start: 0x20000000 Size	G32R5xx Program Algorithm	527392k	On-chip Flash	Device Family Package
O Do not Erase Reset and Run		AM29x128 Flash	16M	Ext. Flash 16-bit	MDK Core
		K8P5615UQA Dual Flash	64M	Ext. Flash 32-bit	MDK Core
Programming Algorithm	/	LPC18xx/43xx MX25V8035F	8M	Ext. Flash SPI	MDK Core
		— LPC18xx/43xx S25FL032 SP	4M	Ext. Flash SPI	MDK Core
Description Device Size Dev	vice Type Address Ra	LPC18xx/43xx S25FL064 SP	8M	Ext. Flash SPI	MDK Core
G32R5xx Program Algorithm 527392k On-	chip Flash 000000000000000000000000000000000000	30 LPC407x/8x S25FL032 SPIFI	4M	Ext. Flash SPI	MDK Core
		LPC5460x MT25QL128 SPIFI	16M	Ext. Flash SPI	MDK Core
		M29W640FB Flash	N8 /	Ext. Flash 16-bit	MDK Core
		MIMXRT105x EcoXiP Flash	4M	Ext. Flash SPI	MDK Core
		RC28F640J3x Dual Flash	6M	Ext. Flash 32-bit	MDK Core
		S25FL128S_V2C	1 <mark>6</mark> M	Ext. Flash SPI	MDK Core
		S29GL064N Dual Flash	16 <mark>M</mark>	Ext. Flash 32-bit	MDK Core
	Start: Size	e: S29JL032H_BOT Flash	4M	Ext. Flash 16-bit	MDK Core
		S29JL032H_TOP Flash	4M	Ext. Flash 16-bit	MDK Core
Add	Bemove		Am\Packs Ge	eby/G32R5vy_DEP	100\Flash\G32B5vy_P
		C. tosers igeeny o pp bata toear	o uni di densi de	city to be t	(1.0.0 (Hoar) (Gozhow_H
0К	Cancel	-	Add	Cancel	I Ge

(11) Complete the configuration of Option for Target interface, and before clicking Settings, connect the Evaluation Board to the computer, and the Debug interface should display the IDCODE of debugger correctly:

	-		IDCODE	Device Na	me		Move
Serial No: 0018	800424700000	SWDIO	⊙ 0x6BA024	77 ARM Core	Sight SW-DP		Up
, imware Version	: 2.1.0						Down
SW/I Port	- SW -	C Aut	r tomatic Detectic	on ID (:ODE:		
May Clash		C Ma	nual Configurati	ion Device I	Name:		
Max Clock	∵ 10MHz <u>▼</u>	Add	Delete	Update		AP: 0	×00
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5 Hardware Development Board Wiring

The hardware development board wiring and boot switch selects OFF for S24 and S32.





6 Burning Debugging Program

View the status of the debugger drive device



Perform program burning, as shown in the following figure





7 Compilation and Download Debugging

After selecting Build or Rebuild to compile the project, download or start/stop Debug Session debugging as needed.



Running result: The onboard red LED1 flashes, indicating successful running. (LED1 is led out from the GPO23 pin). The phenomenon is shown in the following figure:









8 Common Errors

Note: This section will be updated later.



9 **Revision history**

Table 4 Document Revision History

Date	Version	Revision History
January, 2025	1.0	New



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