

Intel® GNA Driver

Bring Up Guide

March 2020

Revision 0.8

Intel Confidential



INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm>.

All products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel, Core, Smart Sound Technology and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

Microsoft, Windows, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

Bluetooth is a trademark owned by its proprietor and used by Intel Corporation under license.

*Other names and brands may be claimed as the property of others.

Copyright © 2020 Intel Corporation. All rights reserved.



Contents

1	Introduction	5
1.1	Purpose and Scope of Document.....	5
1.2	Acronyms and Terminology	5
1.3	What is needed for GMM Bring Up	5
2	GNA Bring Up	7
2.1	General Flow	7
2.2	GNA Support Platform	7
2.3	Enable GNA in BIOS	7
2.3.1	Cannon Lake and Ice Lake Platform	7
2.4	Intel GNA Driver Installation	8
2.4.1	Manual Installation	8
2.4.2	Driver Installation Verification	9
2.4.3	Windows Update.....	9
2.5	Verify GNA Driver installation	10



Revision History

Revision Number	Description	Revision Date
0.5	Initial release.	August 2018
0.6	ICL PV Drop	August 2019
0.7	ICL PR Release	August 2019
0.8	Including TGL Support	March 2020



1 Introduction

1.1 Purpose and Scope of Document

This document provides installation instructions and bring up guideline to verify if the GNA device is available and functional on Intel platform with Intel GNA driver installed on Windows* 10 64bit Operating System.

All screenshots presented in the document are from Windows* 10.

1.2 Acronyms and Terminology

Term	Description
BIOS	Basic Input/output System
BKC	Best Known Configuration
CRB	Customer Reference Board
GMM	Gaussian Mixture Module
GNA	GMM and Neural Network Accelerator
IHV	Independent Hardware Vendor
ISV	Independent Software Vendor
MSFT	Microsoft Corporation
OS	Operating System
PCH	Platform Controller Hub
RVP	Reference Validation Platform
ICL	IceLake
CML	CometLake
TGL	TigerLake

1.3 What is needed for GMM Bring Up

- GNA is enabled in platform BIOS
- Intel GNA driver installed in the system



Introduction

- Files: gna.sys, gna.inf, gna.cat

All files are distributed in Intel GNA release package.



2 GNA Bring Up

2.1 General Flow

- Check if GNA is available
 - the platform supports GNA
 - GNA is enabled in BIOS
 - the GNA driver is installed correctly

If you cannot resolve the problem using the guide, contact the Intel CCE Audio Team

2.2 GNA Support Platform

GNA functionality is available on the following Intel platforms:

CPU Family Name	Device ID	Bus/Device/Function
Cannon Lake (CNL)	PCI\VEN_8086&DEV_5A11	0/8/0
Ice Lake (ICL) / CometLake (CML)	PCI\VEN_8086&DEV_8A11	0/8/0
Tiger Lake (TGL)	PCI\VEN_8086&DEV_9A11	0/8/0

2.3 Enable GNA in BIOS

2.3.1 CML/ICL/TGL Platform

1. Enter platform BIOS set-up
2. Check the GNA status at the following path (This path might differ on various platforms and BIOS versions):
 - **Intel Advanced Menu → System Agent (SA) Configuration → GNA Device (B0:D8:F0)** (Figure 1)
3. If there's no GNA entry, then
 - the BIOS version doesn't provide with the GNA enabling capabilities → contact the Intel CCE team to get the correct BIOS version:
4. Set '**GNA device**' to **Enabled**

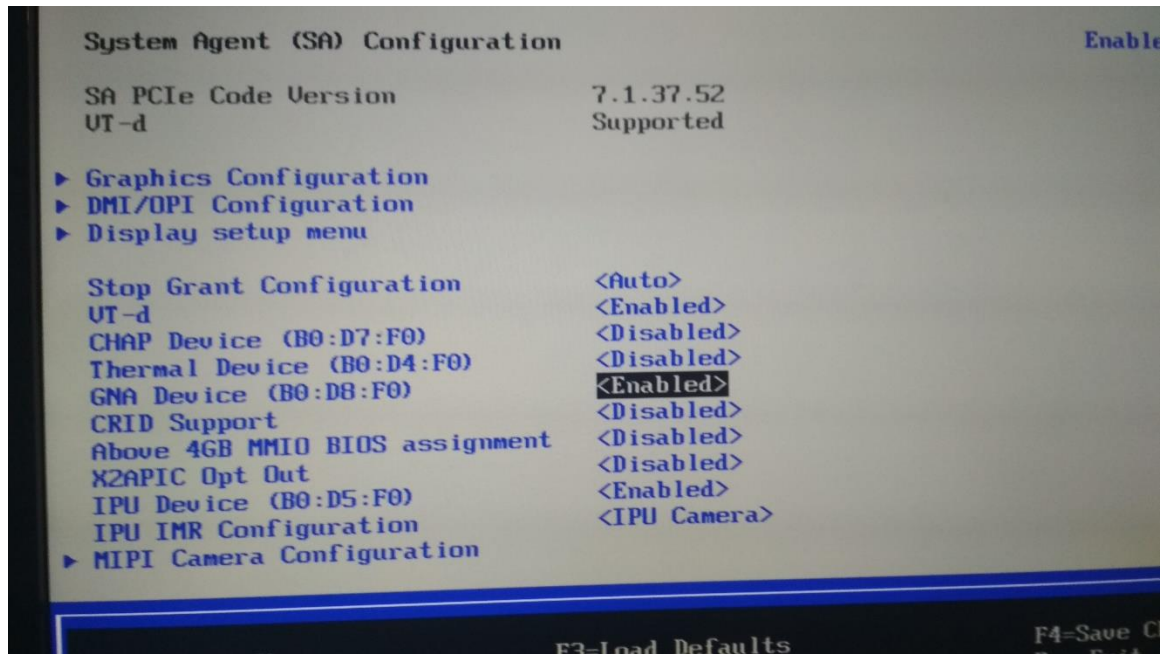


Figure 1 CML/ICL/TGL Intel BIOS (example on an RVP board)

2.4 Intel GNA Driver Installation

2.4.1 Manual Installation

The GNA driver can be installed manually using the INF file (see Figure 2):

- click the right mouse button on "*gna.inf*"
- select "*Install*"
- expect message "*The operation completed successfully*" in the case of the successful installation

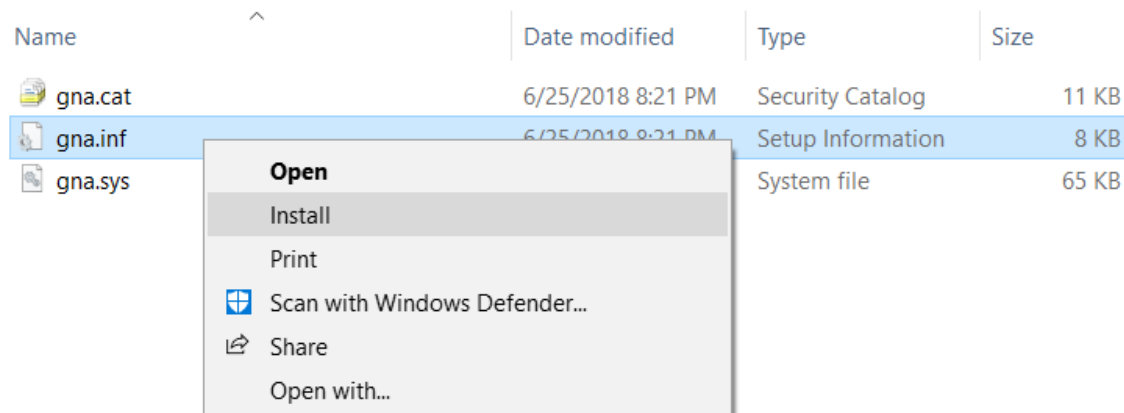
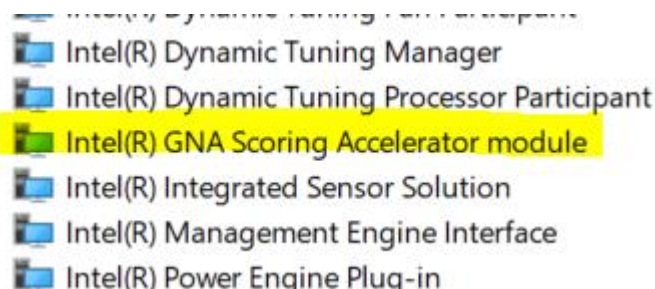


Fig.2. Manual GNA driver installation

2.4.2 Driver Installation Verification

It is recommended to check in Windows* Device Manager if the newly installed GNA driver is seen:

- go to "System devices" category and look for "Intel® GNA Scoring Accelerator module"
- make sure there's no new yellow bang



2.4.3 Windows Update

Windows Update can automatically install the GNA driver after the device detection if there's no other GNA driver installed, including Null Driver.

The update of the GNA driver can be also enforced in Windows* Device Manager:

- Find:
 - "Base System Device" in the root directory
- click the right mouse button on it
- select "Update Driver"
 - note: by default, a newer driver version overrides a previous one, however it is recommended to uninstall the previous GNA driver manually before installing the new one



- choose option “*Search automatically for updated driver software*” (see Figure 3)

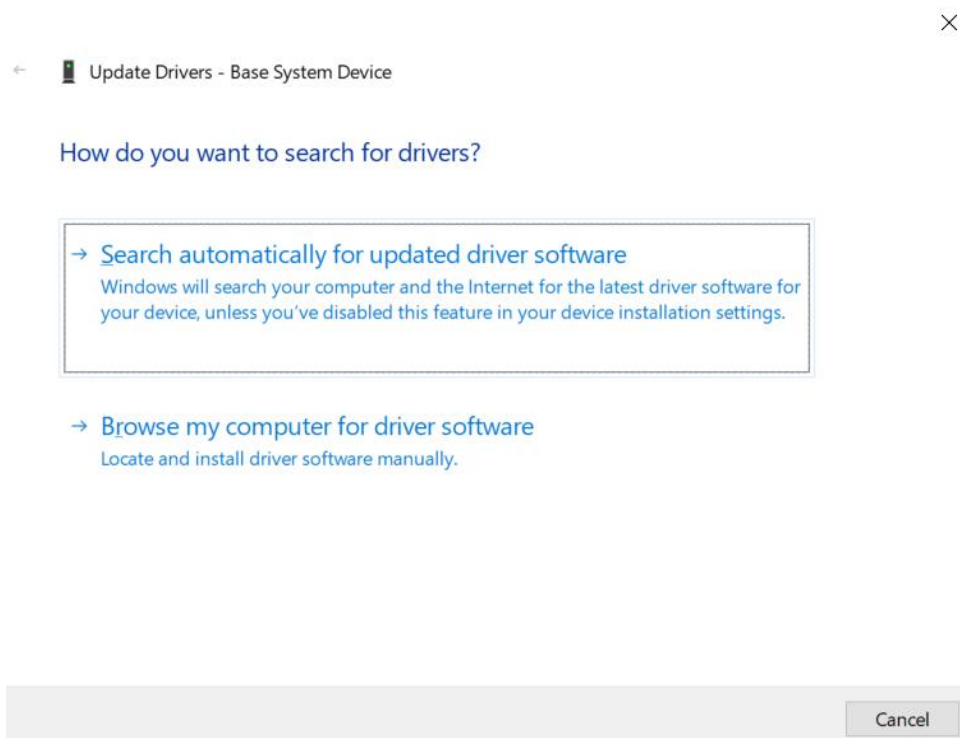


Figure 3 Windows Update: *search automatically for updated driver software*

2.5 Verify GNA Driver installation

Open Windows* Device Manager

Go to “*System devices*” category and look for “**Intel® GNA Scoring Accelerator module**”

- If the GNA device is present without Yellow bang (see Figure 4)
 - **Meaning: GNA is available** (supported by the platform, enabled in BIOS and the GNA driver installed correctly)
 - Bus, Device, Function and Device ID are listed in *Properties* (click the right mouse button and select “*Properties*”)

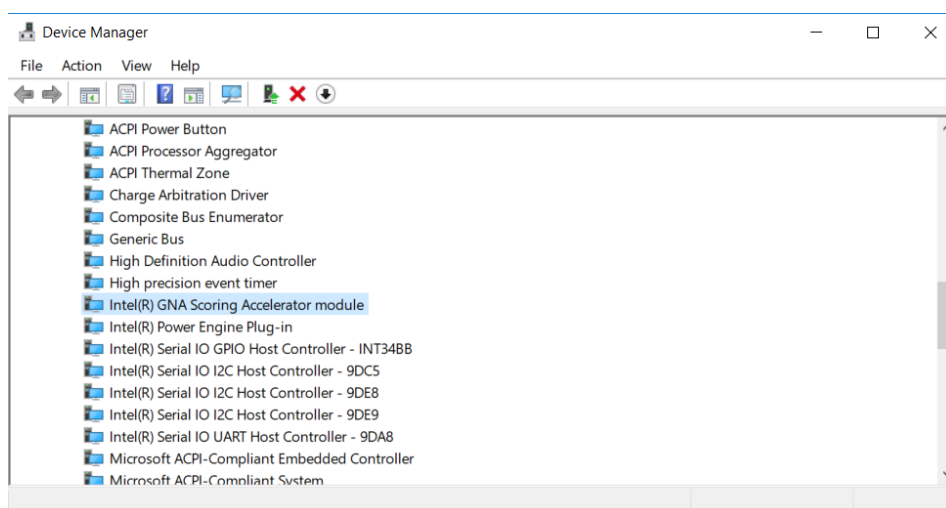


Figure 4 Correctly installed GNA driver (example)

Go to “Other devices” category and look for “**Base System Device**”

- If the device is detected with the yellow bang (see Figure 5)
 - **Meaning:** GNA is enabled in BIOS, and the GNA driver is missing
 - **Action:** install the GNA driver (Chapter 2.4)

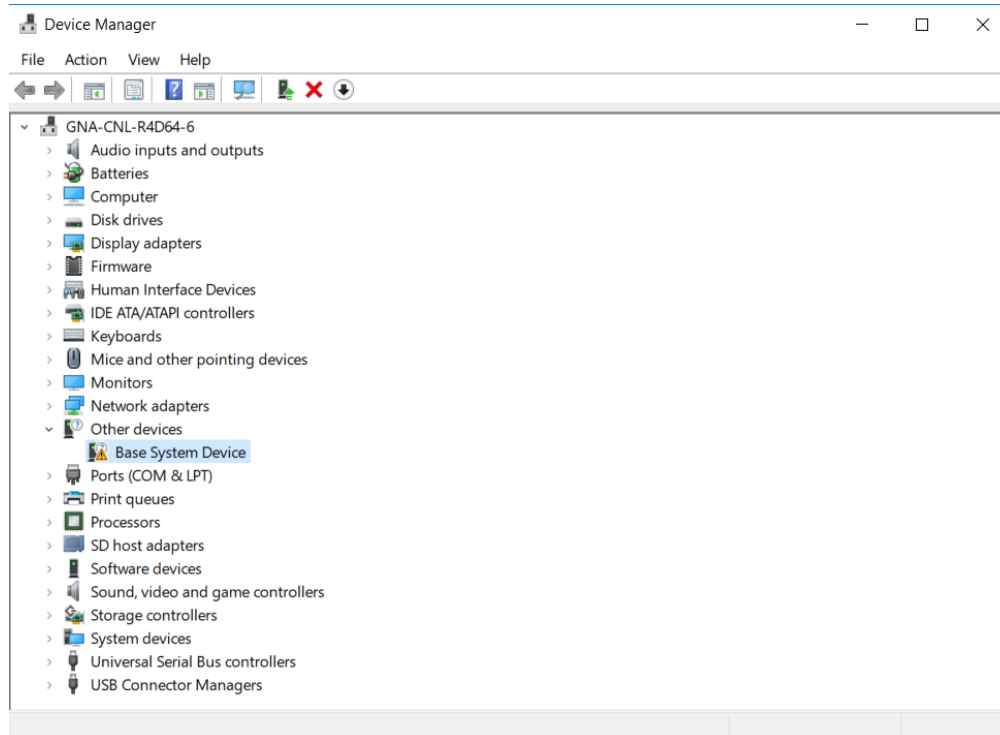


Figure 5 Windows* Device Manager without GNA driver (example)