



# COMe-8X90 COM Express Module and COMEDB2 Carrier Board

## Quick Guide

### Key Features:

- 1.2+ GHz VIA Nano® X2 E-Series processor
- Supports up to 8GB 1066 DDR3 SDRAM
- DX9 3D/2D graphics with MPEG-2, WMV9, VC1 and H.264 decoding acceleration
- Supports PCIe x4 and PCIe x1 lanes
- Display interface for VGA, 18/24-bit single-channel LVDS panel, one DisplayPort and one HDMI® port
- Supports four USB 3.0 and four USB 2.0 ports

## COMe-8X90 Module Specifications

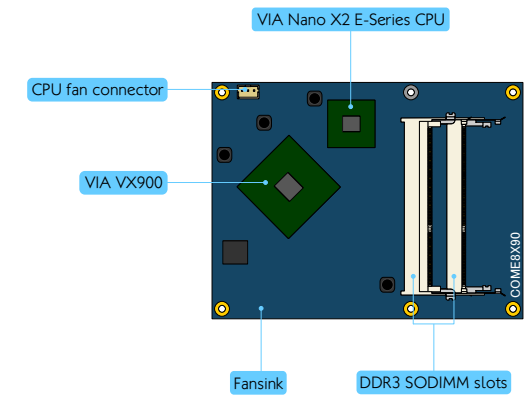
Core	
<b>Processor</b>	<ul style="list-style-type: none"> <li>▪ 1.2+ GHz VIA Nano® X2 E-Series</li> <li>▪ 1.3+ GHz VIA Nano® E-Series (manufacturing option)</li> </ul>
<b>Chipset</b>	▪ VIA VX900 all-in one system processor
<b>System Memory</b>	<ul style="list-style-type: none"> <li>▪ 2 x DDR3 1066 SODIMM slots</li> <li>▪ Supports up to 8GB memory size</li> </ul>
<b>BIOS</b>	<ul style="list-style-type: none"> <li>▪ AMI BIOS</li> <li>▪ 4/8Mbit SPI flash memory</li> </ul>
<b>Operating System</b>	<ul style="list-style-type: none"> <li>▪ Windows 7, XP, XPe and CE6.0</li> <li>▪ Windows Embedded System 7</li> <li>▪ Linux</li> </ul>
<b>Hardware Monitoring</b>	<ul style="list-style-type: none"> <li>▪ CPU temperature reading</li> <li>▪ CPU fan speed reading</li> <li>▪ System voltage monitoring</li> </ul>
<b>Watchdog Timer</b>	▪ Software Programmable
<b>Expansion Bus</b>	<ul style="list-style-type: none"> <li>▪ 1 x PCIe Gen2 x4</li> <li>▪ 1 x PCIe Gen2 x1</li> </ul>
Video	
<b>VGA</b>	▪ Integrated VIA C-9 HD DX9 3D/2D graphics with MPEG-2, WMV9, VC1 and H.264 vide decoding acceleration
<b>CRT Interface</b>	▪ 1 x VGA port supports up to 2560x1600 resolution
<b>LVDS Interface</b>	▪ 1 x LVDS channel supports single-channel 8-bit or 24-bit LVDS panel
<b>HDMI® Interface</b>	▪ 1 x HDMI® port
<b>DisplayPort Interface</b>	▪ 1 x DisplayPort
<b>Expansion Bus</b>	▪ 1 x Digital Video Output port for external HDMI®/LVDS/DVI transmitter or TV encoder

<b>Ethernet</b>	▪ VIA VT6130 Gigabit Ethernet Controller
Input/Output	
<b>Audio</b>	▪ Supports 1 HD audio digital interface
<b>LAN</b>	▪ Supports 1 Gigabit Ethernet port
<b>USB</b>	<ul style="list-style-type: none"> <li>▪ Supports up to 4 USB 3.0 ports by (VLI VL800 controller)</li> <li>▪ Supports up to 4 USB 2.0 ports</li> </ul>
<b>SATA</b>	▪ Supports up to 2 SATA 3.0Gbps connectors
<b>Serial</b>	▪ Supports 2 Serial ports with TX and RX signals
<b>Expansion Buses</b>	<ul style="list-style-type: none"> <li>▪ Supports 1 SMBus interface</li> <li>▪ Supports 1 I²C bus</li> <li>▪ Supports 1 SDIO interface (default)</li> <li>▪ Supports 1 GPIO interface with 4 IN's and 4 OUT's, shared with SDIO (by request)</li> <li>▪ Supports 1 LPC bus interface</li> <li>▪ Supports SPI</li> <li>▪ Supports Express Card, speaker out, reset function, thermal, protection, suspend/wake, signals, power button, power good and fan control signals.</li> </ul>

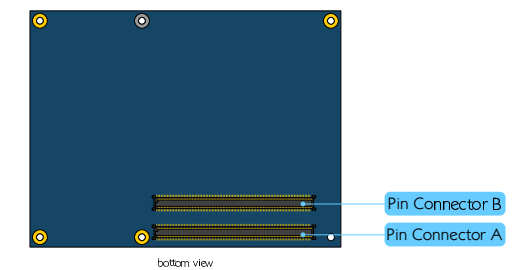
Mechanical and Environment	
<b>COM Express Compliance</b>	▪ COM Express™ Type 6, Basic Module
<b>Dimension</b>	▪ 95mm x 125mm
<b>Operating Temperature</b>	▪ 0°C ~ 60°C
<b>Storage Temperature</b>	▪ -40°C ~ 70°C
<b>Operating Humidity</b>	▪ 0% ~ 95% (relative humidity; non-condensing)

## COMe-8X90 Module Layout Diagram

### Top View



### Bottom View



## COMEDB2 Carrier Board Specifications

<b>COM Express Module Type</b>	▪ Supports COM Express™ Type 6
<b>Audio</b>	▪ VIA VT1828S High Definition Audio Codec
<b>Super I/O</b>	▪ VIA VT1211 LPC Super IO
<b>BIOS</b>	<ul style="list-style-type: none"> <li>▪ AMI BIOS</li> <li>▪ 4/8M bit LPC Flash BIOS, PLCC 32 pin or SPI BIOS</li> </ul>
<b>Front Panel I/O</b>	▪ 1 x SD card slot, shared with DIO1 pin header
<b>Rear Panel I/O</b>	<ul style="list-style-type: none"> <li>▪ 1 x VGA port</li> <li>▪ 1 x COM port</li> <li>▪ 1 x DisplayPort</li> <li>▪ 1 x HDMI® port</li> <li>▪ 4 x USB 3.0 ports</li> <li>▪ 1 x Gigabit Ethernet port</li> <li>▪ 6 x Audio jacks (supports multi-channel audio outputs)</li> </ul>
<b>Onboard Slots, Buttons and Power Connectors</b>	<ul style="list-style-type: none"> <li>▪ 1 x ATX power connector</li> <li>▪ 1 x AUX power connector</li> <li>▪ 1 x miniPCIe slot</li> <li>▪ 1 x Power button</li> <li>▪ 1 x Reset button</li> <li>▪ 2 x SATA connectors</li> <li>▪ 1 x Reserved PCIe x4 slot for DVP</li> <li>▪ 1 x Reserved PCIe x4 slot for VCP</li> <li>▪ 2 x PCIe x1 slots</li> <li>▪ 1 x PCIe x16 (supports 4-Lane) slot for PEG</li> </ul>

## Onboard Pin Headers and Connectors

- 1 x COM2 pin header, add +5V/+12V power select option on RI pin
- 1 x LPT pin header
- 1 x SPI pin header
- 1 x LPC pin header
- 1 x DIO1 pin header, shared with SDIO port
- 1 x DIO2 pin header (from VIA VT1211)
- 1 x SMBus pin header
- 1 x I²C pin header
- 2 x USB 2.0 pin headers for USB 2.0 port 0~3
- 1 x Front LAN LED pin header
- 1 x Front Audio pin header
- 1 x Front Panel pin header (for HDD LED, Power LED, Switch and Speaker)
- 1 x CD-In connector
- 1 x System sensor pin header
- 1 x CPU fan connector
- 1 x System fan connector
- 1 x Serial Port pin header
- 1 x Inverter connector
- 1 x LVDS panel connector
- 1 x S/PDIF connector

## Onboard Jumpers

- 1 x Clear CMOS jumper
- 1 x Inverter power select jumper
- 1 x LCD panel power select jumper
- 2 x BIOS type select jumpers (for select LPC/SPI BIOS)
- 2 x BIOS select jumpers (for select module/carrier board BIOS)
- 2 x COM voltage select jumpers
- 1 x TV/DVP select jumper
- 2 x USB 2.0 port select jumpers
- 1 x USB 2.0 to miniPCIe slot select jumper

## Form Factor and Dimension

- Micro-ATX
- 10" x 9.6"

## Operating Temperature

- 0°C ~ 60°C

## Storage Temperature

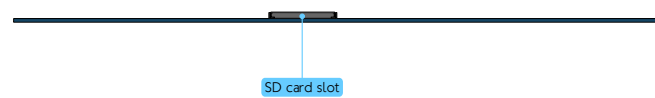
- -40°C ~ 70°C

## Operating Humidity

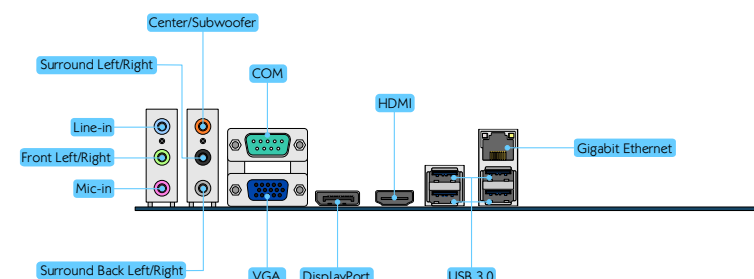
- 0% ~ 95% relative humidity

## COMEDB2 Carrier Board Layout Diagram

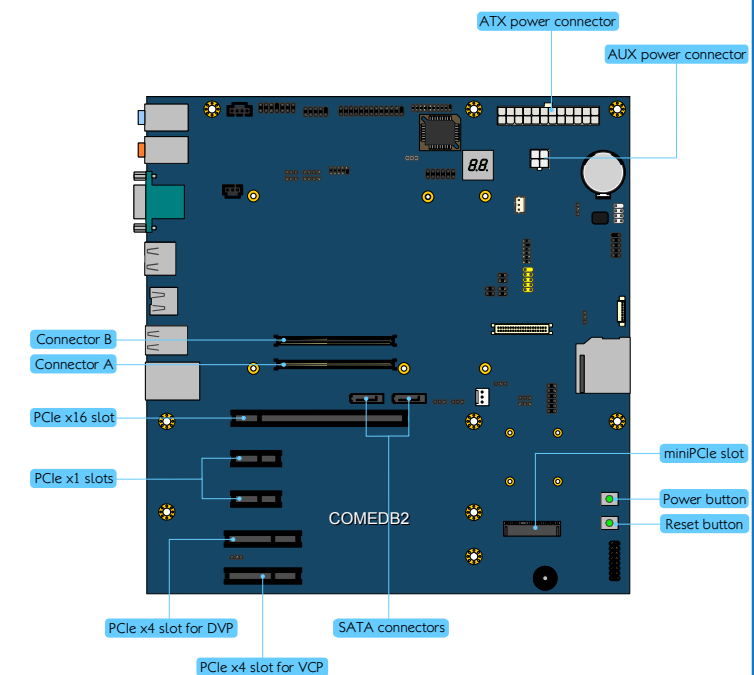
### Front Panel I/O



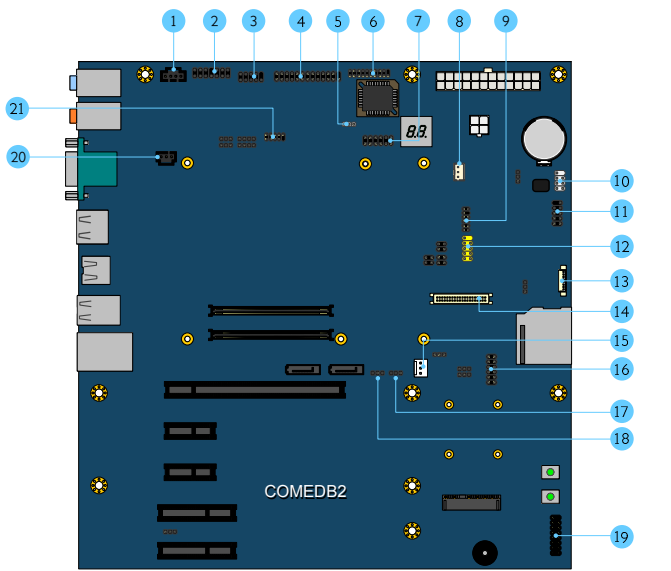
### Rear Panel I/O



## Onboard Slots, Buttons and Power Connectors



## Onboard Pin headers and Connectors



### 6 LPC

LPC_AD1	1	2	LPC_33M_CLK
-LPC_RESET	3	4	GND
LPC_AD0	5	6	NC
LPC_AD2	7	8	-LPC_FRAME
LPC_SERIRQ	9	10	LPC_AD3
-LPC_DRQ1	11	12	NC
+5V	13	14	+3.3V
+5V	15	16	+3.3V
GND	17	18	GND
GND	19	20	KEY

### 7 DIO2

5V_DIO2	1	2	12V_DIO2
SIO_GPO30	3	4	SIO_GPI34
SIO_GPO31	5	6	SIO_GPI35
SIO_GPO32	7	8	SIO_GPI36
SIO_GPO33	9	10	SIO_GPI37
GND	11	12	GND

### 8 CPUFAN

1	FANIO
2	FANPWM
3	GND

### 9 USB2\_0/1

VUSB	1	2	VUSB
USBD_T4-	3	4	USBD_T5-
USBD_T4+	5	6	USBD_T5+
GND	7	8	GND
KEY	9	10	W_LESS_LED
GND	11	12	-RF_ON

### 10 SPI

SPI_VCC	1	2	GND
-SPI_SS0	3	4	SPI_CLK
SPI_DI	5	6	SPI_DO
KEY	7	8	RESET

### 11 SER\_PORT

SER0_TX_CON	1	2	SER0_RX_CON
NC	3	4	NC
GND	5	6	NC
SER1_TX_CON	7	8	SER1_RX_CON
NC	9	10	KEY

### 12 USB2\_2/3

VUSB	1	2	VUSB
USBD_T6-	3	4	USBD_T7-
USBD_T6+	5	6	USBD_T7+
GND	7	8	GND
KEY	9	10	GND

### 13 INVERTER

1	IVDD_IN
2	IVDD_IN
3	BAKLITE_EN
4	BLT_CLK
5	BAKLITE_EN
6	BLT_CTRL
7	GND
8	GND

### 14 LVDS

NC	1	2	PVDD
NC	3	4	PVDD
GND	5	6	GND
NC	7	8	GND
NC	9	10	-A0_L
GND	11	12	A0_L
NC	13	14	GND
NC	15	16	-A1_L
GND	17	18	A1_L
NC	19	20	GND
NC	21	22	-A2_L
GND	23	24	A2_L
NC	25	26	GND
NC	27	28	-CLK1_L
NC	29	30	CLK1_L
NC	31	32	GND
NC	33	34	-A3_L
NC	35	36	A3_L
NC	37	38	SPLCK
NC	39	40	SPD

### 15 SYSFAN

1	FANIO
2	FANPWM
3	GND

### 16 DIO1

5V_DIO1	1	2	12V_DIO1
COM_GPO0	3	4	COM_GPI0
COM_GPO1	5	6	COM_GPI1
COM_GPO2	7	8	COM_GPI2
COM_GPO3	9	10	COM_GPI3
GND	11	12	GND

### 17 I2C\_BUS

1	I2C_CLK
2	I2C_DATA
3	GND

### 18 SMBUS

1	SMB_CLK
2	SMB_DATA
3	GND

### 19 F\_PANEL

FP_5V	1	2	FP_3V
FP_5V	3	4	-SATA_LED
-PLED	5	6	-PW_BTN
FP_5V	7	8	GND
NC	9	10	RST_SW
NC	11	12	GND
SPEAK	13	14	FP_5V
KEY	15	16	NC

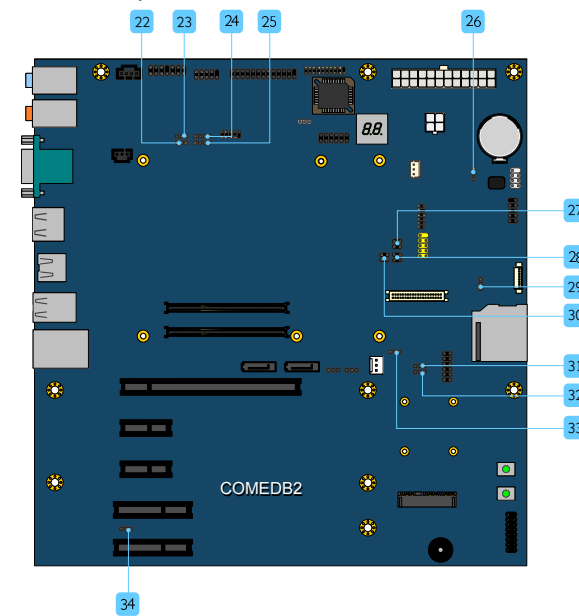
### 20 SPDIF

1	+5V
2	SPDIFO
3	GND

### 21 FLAN\_LED

3VSUS	1	2	-LAN_ACT
3VSUS	3	4	NC
GND	5	6	W_LAN_LED
3VSUS	7	8	GND
KEY	9	10	GND

## Onboard Jumpers



### 29 IVDD

Pins	Description
1-2	Use +5V for the Inverter power
2-3	Use +12V for the Inverter power (default)

### 30 JP\_USBME\_SEL

Pins	Description
1-2	Enabled USB 2.0 Port 2 to Min PCIe slot.
3-4	Enabled USB 2.0 Port 2 to Mini PCIe slot.

**Note:** For 30 JP\_USBME\_SEL to be activated, 28 JP\_USB2\_SEL has to be disabled.

### 31 BIOS\_DIS1

BIOS_DIS1		BIOS_DIS0	
Pins	Description	Pins	Description
1-2	1-2	1-2	Select module SPI BIOS (default)
1-2	2-3	2-3	Select carrier board LPC BIOS
2-3	1-2	2-3	Select module LPC BIOS
2-3	2-3	2-3	Select carrier board SPI BIOS

### 32 BIOS\_DIS0

### 33 PVDD

Pins	Description
1-2	Use +5V for the LCD panel power.
2-3	Use +3.3V for the LCD panel power (default)

### 34 TV\_DVP\_SEL

Pins	Description
1-2	Enabled the TTL/TV support from DVP slot
2-3	Plug detect from DVP slot (default)

### 22 BIOS\_SELO

BIOS_SELO		BIOS_SEL1	
Pins	Description	Pins	Description
1-2	2-3	1-2	Select SPI BIOS (default)
2-3	1-2	2-3	Select LPC BIOS

### 23 BIOS\_SEL1

### 26 CLEAR\_CMOS

Pins	Description
1-2	Keep CMOS settings (default)
2-3	Clear CMOS settings

### 27 JP\_USB3\_SE

Pins	Description
1-2	Enabled USB 2.0 Port 3 (USB2_3). (default)
3-4	Enabled USB 2.0 Port 3 (USB2_3). (default)

### 28 JP\_USB2\_SEL

Pins	Description
1-2	Enabled USB 2.0 Port 2 (USB2_2). (default)
2-3	Normal (default)
3-4	Enabled USB 2.0 Port 2 (USB2_2). (default)

**Note:** For 28 JP\_USB2\_SEL to be activated, 30 JP\_USBME\_SEL has to be disabled.

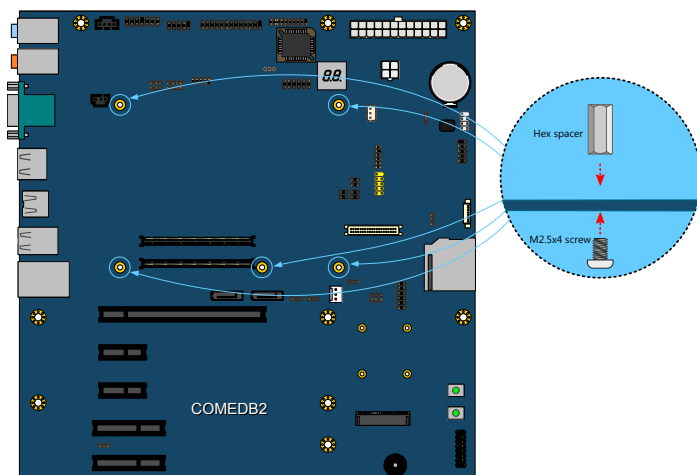
## 1 Installing COME-8X90 module to COMEDB2 carrier board

### Step 1

Locate the carrier board mount points (x5) and the connectors (x2).

### Step 2

Install the hex spacer onto the carrier board. The hex spacer must be placed on top of the board. From the bottom of the board, tighten the hex spacers by using the M2.5x4mm screws (x5).

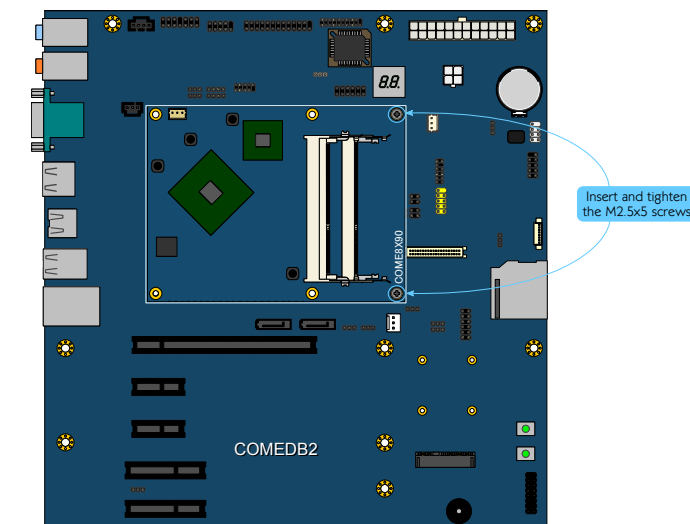


### Step 3

Align the pin connectors and mount points of the COME-8X90 into the connectors and hex spacers on the carrier board respectively. Then press down the COME-8X90 module until the pin connectors have been fully inserted into the connectors.

### Step 4

Secure the COME-8X90 module by tightening the two M2.5x5mm screws.



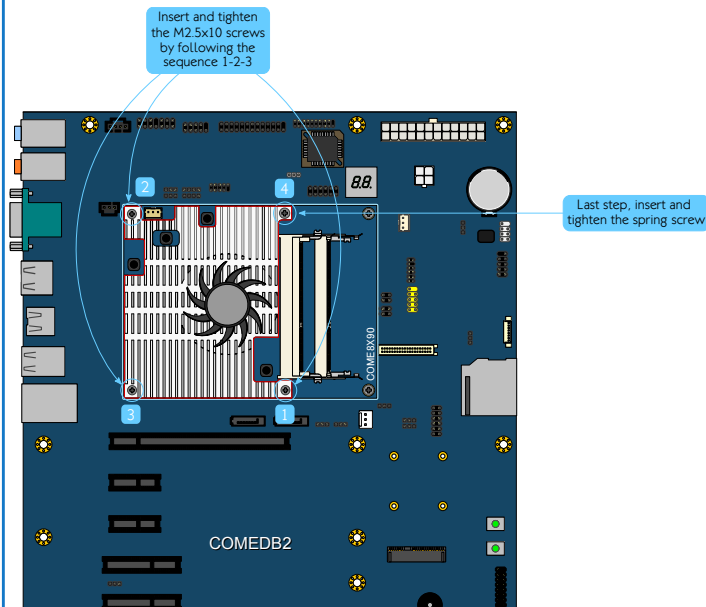
**Note:** Make sure the thermal grease has been applied on top of the processor (≈0.06 cc) and any two places of the chipset (≈0.03 cc each place) before installing the fansink.

### Step 5

Take off the protective cover of the fansink, and then install the fansink on top of the COME-8X90 mount points.

### Step 6

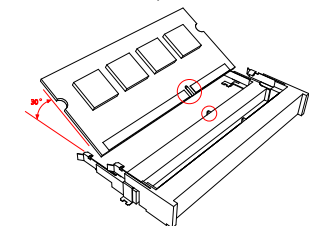
Insert the tighten three M2.5x10mm screws to secure the fansink by following the specific sequence as shown in the figure below. Lastly, insert and tighten the spring screw on the fansink into the COME-8X90 (torque: 3 kgfcm)



## 2 Installing SODIMM memory on COME-8X90 module

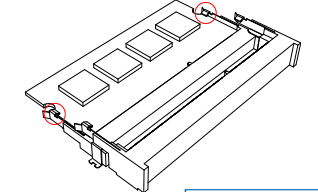
### Step 1

Align the notch on the SODIMM memory module with the protruding wedge on the memory slot. Insert the SODIMM memory module at a 30 degrees angle relative to the memory slot.



### Step 2

Insert the SODIMM memory module. Push down until the locking clips lock the module into place. There will be a slight tension as the module is being locked.



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