

**iG-G45M<sup>®</sup>**

# Stratix<sup>®</sup> 10 SoC FPGA System on Module

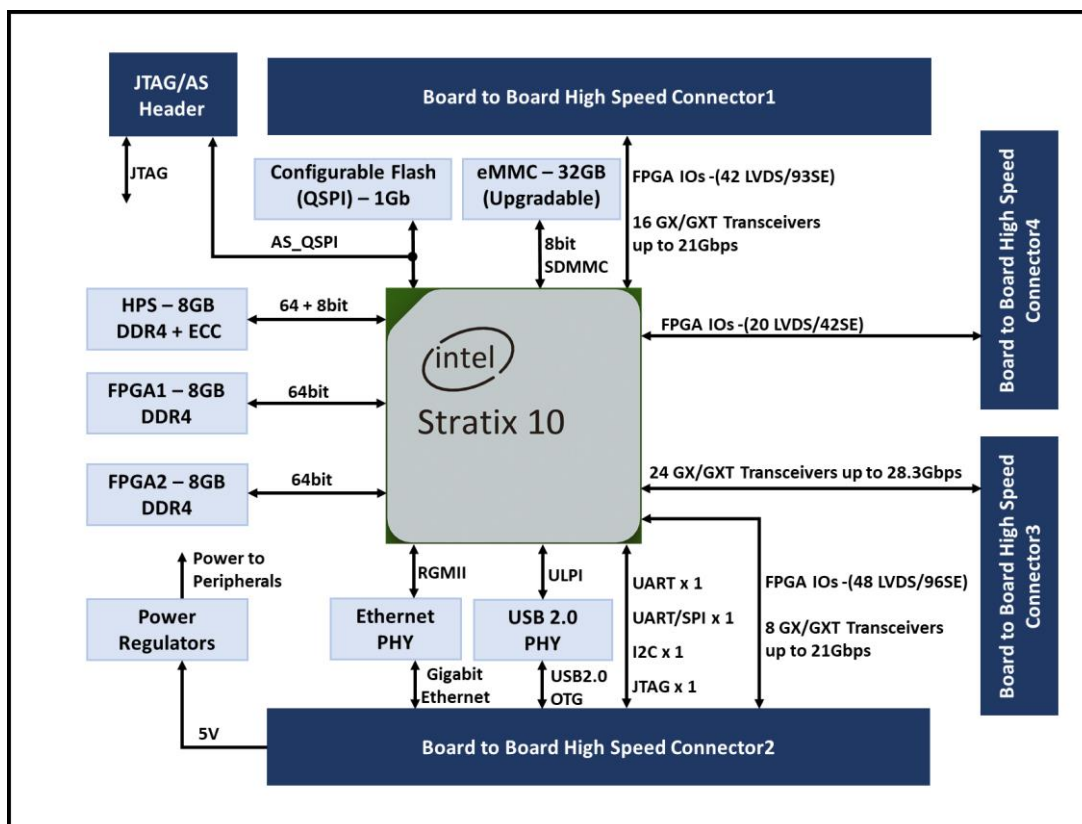
iWave's Stratix<sup>®</sup> 10 SoC FPGA System on Module is a high-performance embedded computing platform built on the Altera<sup>®</sup> Stratix<sup>®</sup> 10 SoC and FPGA family, the module combines a quad-core Arm<sup>®</sup> Cortex<sup>®</sup>-A53 processing system with advanced FPGA fabric, delivering exceptional compute performance, high-speed connectivity & scalable acceleration for complex embedded workloads. The SoM integrates high-bandwidth DDR4 memory, high-speed transceivers up to 28.3 Gbps, and extensive I/O interfaces in a compact 110mm × 75mm form factor. Its modular architecture simplifies system integration, reduces development time, and enables rapid deployment of next-generation embedded solutions while ensuring reliability and long-term scalability.



## Highlights

- ❖ Stratix<sup>®</sup> 10 SX – SX850, SX1100, SX1650, SX2100, SX2500, SX2800
- ❖ Stratix<sup>®</sup> 10 GX – GX850, GX1100, GX1650, GX2100, GX2500, GX2800
- ❖ 8GB DDR4 for HPS with ECC, 2 x 8GB DDR4 for FPGA
- ❖ 32GB eMMC Flash (Expandable) up to 256GB
- ❖ Up to 2753K Logic Elements & 9,33,120 ALMs
- ❖ Up to 16 GXT @28.3Gbps & 32 GX @17.4Gbps Transceivers

# Block Diagram



# Technical Specifications

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SoC                                          | <ul style="list-style-type: none"> <li>Quad-Core 64bit ARM Cortex - A53 with MPU up to 1500MHz</li> <li>Up to 2753K Logic Elements &amp; 9,33,120 ALMs</li> <li>High Speed Transceivers x48 up to 28.3Gbps</li> </ul>                                                                                                                                                                                                                                                                                                                                                                |
| Memory & Storage                             | <ul style="list-style-type: none"> <li>32GB eMMC Flash (Upgradable)</li> <li>1Gb QSPI Flash (Upgradable)</li> <li>8GB DDR4 for HPS with ECC (64bit + 8bit) (Upgradable)</li> <li>2 x 8GB DDR4 for FPGA (64bit + 64bit) (Upgradable)</li> </ul>                                                                                                                                                                                                                                                                                                                                       |
| Other                                        | <ul style="list-style-type: none"> <li>Gigabit Ethernet PHY for HPS</li> <li>USB2.0 OTG Transceiver for HPS</li> <li>JTAG/ Active Serial Header</li> <li>Fan Header</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |
| Board to Board Connector1 Interfaces(240pin) | <b>From FPGA Block</b> <ul style="list-style-type: none"> <li>16 GX/GXT Transceiver Channels up to 21Gbps1</li> </ul> <b>FPGA IOs</b> <ul style="list-style-type: none"> <li>43 LVDS IOs/93 Single ended</li> <li>3 General Purpose Clock Input LVDS Pair/Single Ended</li> <li>4 General Purpose Clock Output LVDS Pair/Single Ended</li> </ul>                                                                                                                                                                                                                                     |
| Board to Board Connector2 Interfaces(240pin) | <b>From HPS &amp; SDM Blocks</b> <ul style="list-style-type: none"> <li>Gigabit Ethernet , USB2.0 OTG, UART, I2C, Debug UART, JTAG x 1 Port from SDM</li> <li>SPI x 1 Port from SDM* , SPI Slave x 1 * , SDMMC x 1 *</li> </ul> <b>From FPGA Block</b> <ul style="list-style-type: none"> <li>8 GX/GXT Transceiver Channels up to 21Gbps1</li> </ul> <b>FPGA IOs</b> <ul style="list-style-type: none"> <li>48 LVDS IOs/96 Single ended (SE)</li> <li>4 General Purpose Clock Input LVDS Pair/Single Ended</li> <li>4 General Purpose Clock Output LVDS Pair/Single Ended</li> </ul> |
| Board to Board Connector3 Interfaces(240pin) | <b>From FPGA Block</b> <ul style="list-style-type: none"> <li>24 GX/GXT Transceiver Channels up to 28.3Gbps</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Board to Board Connector4 Interfaces(80pin)  | <b>From FPGA Block</b> <ul style="list-style-type: none"> <li>FPGA IOs</li> <li>20 LVDS IOs/42 Single ended (SE)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Power Input                                  | 5V through B2B Connector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| BSP Support                                  | Linux / Quartus 22.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operating Temp.                              | -40°C to +85°C (Industrial Grade)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Form Factor                                  | 110mm x 75mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# Ordering Information

iW-G45M-S085-4E008G-E032G-BEA

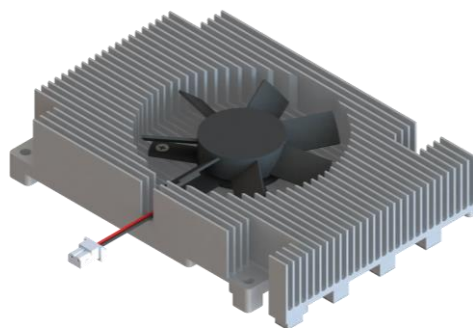
SX850 (Speed - 2) Stratix 10 SOC, 8GB HPS DDR4 with ECC, Dual 8GB  
FPGA DDR4, 32GB EMMC, Extended, Industrial Temperature

## Product accessories



### Development Kit

The Stratix® 10 SoC FPGA Development Kit integrates high-speed networking, 4K video, FMC/FMC+ expansion, M.2 SATA, Gigabit Ethernet, and USB connectivity in a compact form factor. It provides a versatile platform for rapid development of advanced FPGA-based networking, vision, and embedded computing applications.



### Thermal Solutions

For any highly integrated System On Modules, thermal design is very important factor. iWave Supports Fan Sink solution for Stratix 10 GX/SX SoC FPGA based SOM.

## Applications

### ■ Data Centers

Powering cache-coherent accelerators, custom cloud servers, and high-performance SmartNICs.

### ■ Communications

Managing 5G infrastructure, network functions virtualization (NFV), and optical transport networks.

### ■ High-Performance Computing

Handling compute-heavy workloads like digital signal processing (DSP) and embedded hardware virtualization.

# A Global Leader in Embedded Systems Engineering and Solutions

Since 1999, we have pioneered leadership in embedded systems technology, establishing ourselves as a strategic embedded technology partner for advanced solutions. Our comprehensive portfolio encompasses ARM and FPGA System on Modules, COTS FPGA solutions, and ODM solutions which include Telematics, Gateways & HMI Solutions.

Beyond our robust product ecosystem, we provide comprehensive ODM support with specialized custom design and manufacturing capabilities, enabling customers to accelerate and optimize their product development roadmaps. With a strategic focus on industrial, automotive, medical, and avionics markets, we deliver innovative technology solutions to global clients.

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