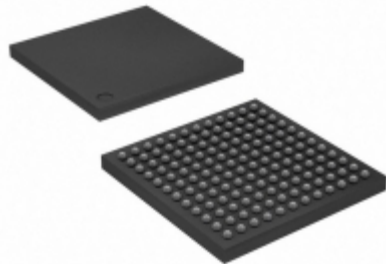


EP20K60EFC144-3





**Part Number:** [EP20K60EFC144-3](#)

**Manufacturer:** [Altera \(Intel® Programmable Solutions Group\)](#)

**Description:** IC FPGA 93 I/O 144FBGA

**Data sheet:**  [APEX 20K Family Datasheet](#)  
 [144-FBGA Pkg Info](#)  
 [Virtual JTAG Megafuntion User Guide](#)

**RoHs Status:** Contains lead / RoHS non-compliant

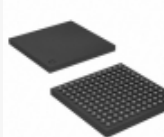
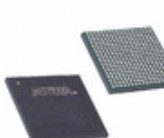
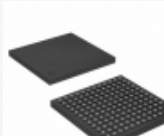
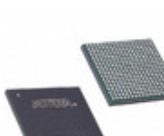
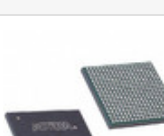
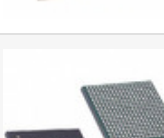
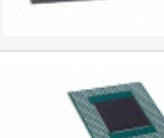
**Ship From:** Hong Kong

**Shipment Way:** DHL/Fedex/TNT/UPS/EMS

Images are for reference only.  
See Product Specifications for product details.  
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| PRODUCT PARAMETER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |                                |                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Part Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EP20K60EFC144-3                           | Manufacturer                   | <a href="#">Altera (Intel® Programmable Solutions Group)</a>                                                                          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | IC FPGA 93 I/O 144FBGA                    | Lead Free Status / RoHS Status | Contains lead / RoHS non-compliant                                                                                                    |
| Quantity Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4937 pcs                                  | Data sheet                     | <a href="#">APEX 20K Family Datasheet</a><br><a href="#">144-FBGA Pkg Info</a><br><a href="#">Virtual JTAG Megafuntion User Guide</a> |
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <a href="#">Integrated Circuits (ICs)</a> | Voltage - Supply               | 1.71 V ~ 1.89 V                                                                                                                       |
| Total RAM Bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 32768                                     | Supplier Device Package        | 144-FBGA (13x13)                                                                                                                      |
| Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | APEX-20KE®                                | Package / Case                 | 144-BGA                                                                                                                               |
| Operating Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0°C ~ 85°C (TJ)                           | Number of Logic Elements/Cells | 2560                                                                                                                                  |
| Number of LABs/CLBs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2560                                      | Number of I/O                  | 93                                                                                                                                    |
| Number of Gates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 162000                                    | Mounting Type                  | Surface Mount                                                                                                                         |
| Moisture Sensitivity Level (MSL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3 (168 Hours)                             | Lead Free Status / RoHS Status | Contains lead / RoHS non-compliant                                                                                                    |
| Base Part Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | EP20K60                                   |                                |                                                                                                                                       |
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|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------|
|  | Part#: <a href="#">EP20K60EQC208-1</a><br>Description: IC FPGA APEX 600K 208PQFP | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC144-2</a><br>Description: IC FPGA 93 I/O 144FBGA    | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-2X</a><br>Description: IC FPGA 196 I/O 324FBGA  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC144-2XN</a><br>Description: IC FPGA 93 I/O 144FBGA  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-1X</a><br>Description: IC FPGA 196 I/O 324FBGA  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-1</a><br>Description: IC FPGA 196 I/O 324FBGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-1N</a><br>Description: IC FPGA 196 I/O 324FBGA  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EBC356-2</a><br>Description: IC FPGA 196 I/O 356BGA    | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-3N</a><br>Description: IC FPGA 196 I/O 324FBGA  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC144-1X</a><br>Description: IC FPGA 93 I/O 144FBGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EBC356-2X</a><br>Description: IC FPGA 196 I/O 356BGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-2</a><br>Description: IC FPGA 196 I/O 324FBGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EBC356-1</a><br>Description: IC FPGA 196 I/O 356BGA    | Manufacturers: <a href="#">Intel® FPGAs</a>                                 | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-2N</a><br>Description: IC FPGA                  | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EBC356-3</a><br>Description: IC FPGA 196 I/O 356BGA    | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EQC208-1N</a><br>Description: IC FPGA 148 I/O 208QFP   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC144-2X</a><br>Description: IC FPGA 93 I/O 144FBGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC324-3</a><br>Description: IC FPGA 196 I/O 324FBGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EFC144-1</a><br>Description: IC FPGA 93 I/O 144FBGA    | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |
|  | Part#: <a href="#">EP20K60EBC356-1X</a><br>Description: IC FPGA 196 I/O 356BGA   | Manufacturers: <a href="#">Altera (Intel® Programmable Solutions Group)</a> | <a href="#">RFQ</a> |

|                                                                 |                                              |                           |                                              |
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