Stratix IV Military Temperature Range Support

Introduction

As part of the Altera® initiative to provide enhanced commercial off-the-shelf (COTS) devices for military applications, the temperature range for the Stratix® IV device family has been extended to enable operation across the military temperature range (-55°C to 125°C). This extension allows military programs to benefit from the new technology and economies of scale by using commercially available Stratix IV FPGAs. Stratix IV FPGAs are extremely robust and capable of operating across a wide temperature range with excellent reliability.

Military Temperature Support

Military temperature operation requires additional timing margin over industrial temperature operation to compensate for the potentially increased variation of delay across temperature.

Altera recommends that customers use military temperature grade devices for production. However, customers may substitute industrial temperature grade for military temperature grade devices during the prototyping phase because of the shorter lead times of the industrial temperature grade devices.

Use the following guidelines to compile your design using industrial or military devices:

■ When using military models through industrial devices, select an applicable I4 part code and update the **Operating Settings and Conditions** dialog box to reflect -55° C (Minimum) and 125° C (Maximum) junction temperatures before compiling or recompiling your design.
■ When using military models through military devices, select an applicable M3 part code and compile or recompile your design.

Table 1 lists the Stratix IV device part numbers that support the industrial and military temperatures.

Table 1. Stratix IV Industrial and Military Temperature Device Part Numbers

Item	Device Part Number		Package
	Industrial Temperature	**Military Temperature**	
1	EP4SGX70DF29I4	EP4SGX70DF29M3	F780
2	EP4SGX70HF35I4	EP4SGX70HF35M3	F1152
3	EP4SGX110DF29I4	EP4SGX110DF29M3	F780
4	EP4SGX110HF35I4	EP4SGX110HF35M3	F1152
5	EP4SGX180DF29I4	EP4SGX180DF29M3	F780
6	EP4SGX180HF35I4	EP4SGX180HF35M3	F1152
7	EP4SGX180KF40I4	EP4SGX180KF40M3	F1517
8	EP4SGX230DF29I4	EP4SGX230DF29M3	F780
9	EP4SGX230HF35I4	EP4SGX230HF35M3	F1152
10	EP4SGX230KF40I4	EP4SGX230KF40M3	F1517
11	EP4SE230F29I4	EP4SE230F29M3	F780

Software Support

The Stratix IV military temperature grade device models are supported in the following versions of these tools:

■ The PowerPlay Early Power Estimator or PowerPlay Power Analyzer software, version 11.0 or later.
   Download from www.altera.com/support/devices/estimator/pow-powerplay.html.
■ The Quartus II software, version 11.0 or later.
   Download from www.altera.com/products/software/quartus-ii/subscription-edition/qts-se-index.html.

Characterization Report

Characterization reports are available upon request from your local Altera sales representative. For contact information, refer to www.altera.com/corporate/contact/con-index.html.