PRODUCT NAME
Universal Source Encoder for Space (USES)

PART NUMBER
HK36

PRODUCT TYPE
Hardware

CCSDS RECOMMENDATION(S) OR CCSDS AGENCY STANDARD(S) TO WHICH PRODUCT CONFORMS
Lossless Data Compression
CCSDS 121.0-B-1

APPLICABLE DOMAIN:
On-Board Data Systems

FUNCTIONAL DESCRIPTION OF PRODUCT IN TERMS OF RELEVANT CCSDS RECOMMENDATION(S)
The CCSDS Lossless Data Compression application specific integrated circuit (ASIC) accepts 4 to 15 bits / sample data as input and outputs packetized compressed data. The compressor supports four prediction modes and compression bypass operation.

PERFORMANCE CHARACTERISTICS
- General
  * Special performance characteristics
    - Entirely lossless compression of data (ASIC)
    - 20 Msamples/sec sustained rate at all quantizations
    - N= 4..15 bits/sample
    - Handles positive and two’s complement data
    - Four prediction modes supported:
      * Nearest neighbor
      * Two dimensional prediction
      * External prediction
      * Multi-spectral prediction
    - Bypass option and entropy coding supported
    - TTL level input compatible

PHYSICAL CHARACTERISTICS (HARDWARE)
Physical Characteristics
* Size
  - 196 Pin Quad Flat Pack
  - Die Size .585 inches on a side
  - Package Size: 1.35 inches on a side, 0.13 inches thick
  - Lead Pitch: 0.025 inches typical
* Weight
  - <0.1 lbs
* Temperature Range
  - Operating: -55° to +125°C
  - Storage: -65° to +150°C
*Power Requirements
- +5.0 Vdc ±10%
- Pd<92mW/MHz with 50pf load on all outputs
- Maximum operating frequency is 20 MHz
*Radiation Hardened
- Single Event Upset (SEU) Linear Energy Transfer (LET) threshold:
  - SEU LET_{th} ≥ 38 MeV-cm/mg
  - SEU LET_{0.1} ≥ 58 MeV-cm/mg
- Single Event Latchup Threshold
  - SEU LET_{th} ≥ 120 MeV-cm/mg
- Total dose up to 10^6 rads(Si)

Available in:
- QML-Q
- QML-V
- Engineering Units

Other Characteristics
- 196 pin CQFP
- 1.2μ CMOS epitaxial technology

9 PROPRIETARY INTERFACES/SYSTEM ENVIRONMENTS
None

10 ILLUSTRATIONS
None

11 HERITAGE
- Previous uses
  - Solar Extreme UV Rocket Telescope & Spectrograph (SERTS)
    - Lewis
    - Cobra Brass-E
    - KOMPSAT
    - Mars Surveyor 2001/ THEMIS
    - Multispectral Thermal Imager (MTI)
    - SBIRS-High
    - Vegetation Canopy Lidar (VCL)
- Context for previous uses
  - Using CCSDS protocols for Lossless Data Compression

12 COMPANY NAME
- Center for Advanced Microelectronics and Biomedical Research

13 POINT OF CONTACT/WEB SITE
- Christy Custer/Price and Delivery (208) 262-2000
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