HOLT INTEGRATED CIRCUITS INC.

# Capabilities & Services

Serving the Aerospace Industry for over 45 years

# Our Company

**Holt Integrated Circuits** is a U.S.-based micro-electronic design and manufacturing company headquartered in Orange County, California, with an additional location in Hauppauge, New York. Founded in 1976, Holt is a major supplier of Integrated Circuits to the aerospace industry and has more than 500 unique customers worldwide.

All Holt's design, final test, quality assurance, applications support and customer service are centralized at the headquarters in Orange County, and all product is shipped from this location via a worldwide distribution network.

Holt's has manufactured data bus and display driver ICs for both commercial and military users worldwide and its products are used in all types of avionics applications and environments. From F-16 to A-350, you will find Holt ICs on almost every aircraft, at the heart of Flight Control, Navigation, Munitions, Engine Management, Communications, Safety equipment, and In-Flight Entertainment systems.

## Mission Statement

Holt's mission is to provide the highest quality integrated circuit products and superior customer service to the aerospace industry.

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# Capabilities Toolbox


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# Proven Quality Systems

- **AS9100D:2016 & ISO 9001:2015**
  - Registered with British Standards Institute since 1999
  - ANSI–ASQ National Accreditation Board
  - Certificate No: FM 661927
- **DLA Land and Maritime (Defense Logistic Agency) Supplier since 1995**
  - SMD part numbers for select devices
  - MIL-STD 883 / MIL-PRF-38535 compliant products
  - QML-Q / QML-V screening
  - Military temperature range commercial processed product
- **IEC/TS 625464-1:2009**
  - Aerospace Qualified Electronic Component (AQEC) compliant since 2008

- **For more information, see Holt Quality Systems Website at: http://www.holtic.com/content/2-quality.aspx**

# Design Building Blocks

## Holt uses it's proven design building blocks to provide high quality solutions to optimize Size, Weight, Power and Cost: SWaP-C

- Protocols (MIL-STD-1553, ARINC 429, Canbus, RS-485/422)
- Encoder/decoders
- Data buffer management
- Programmable transmission schedulers
- Selective opcode processing engine
- Protocol Error Correction/Detection
- Channel noise/crosstalk mitigation
- Host Interfaces
  - 8, 16 or 32-bit parallel data bus interface
  - Programmable Serial Peripheral Interface (SPI, Quad-SPI) - Speeds up to 160 MHz SDR and 80 MHz DDR
- Selective Data Recorder / Filtering
- Discrete-to-digital threshold sensing with voltage monitoring
- RAM parity and error detection/ correction
- EEPROM Boot capability
- Power-on Reset
- Analog Switches
- 1.2V, 1.8V, 2.5V and 3.3V digital I/O
- DC/DC conversion
- On-chip fully integrated voltage regulation
- Precision current and voltage references
- Fully integrated PLLs for frequency synthesis
- IP Core Security Encryption
  - SHA-256 authentication
- Lightning protection to DO-160G
- Galvanic isolation to 800V
- High-Z outputs with power on or off
- IRIG-106 Chapter 10
- IRIG-B Receiver

## Mixed Signal ASIC Design

- Robust SOI and CMOS process technologies
- Proven proprietary IC product portfolio for independent IP Core product design
  - Cell Libraries
    - MIL-STD-1553
    - ARINC 429
    - ARINC 717
    - CAN (ARINC 825)
- Digital Protocol Logic
- Line Driver/Receiver/Transceiver Design
- Combine Digital Logic, RAM, Host Interfaces and Analog Transceivers

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# Fault Tolerance

## On-chip Galvanic Isolation up to 800V (World's first!)

- Isolate bus faults from mission critical electronics
  - Protect FPGAs and microcontrollers from analog bus faults
- Ideal for safety critical applications
  - ARINC 429 line drivers and receivers
  - Patented capacitive isolation design

## Lightning Protection

- Complies with RTCA/DO-160G, Section 22 Level 3 Pin Injection Test
  - Waveform Set A (3 & 4), Set B (3 & 5A) and Set Z (3 & 5B)
  - No external components required
- Select Components Level 4 capable with minimal external components

## High voltage tolerant discrete inputs

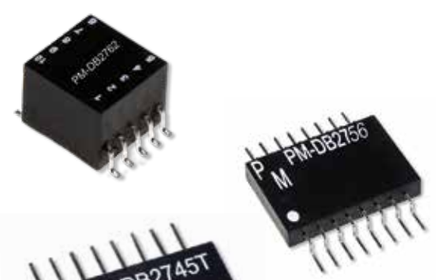
- 115 Vrms, 400 Hz
- MIL-STD-704

## High temperature, extreme environment operation

- Up to 200ºC in ceramic packages
- Up to 175ºC in plastic packages

## Radiation tolerant design

- RHA to total absorbed dose of 300 krads (3 Gy)
- Single-Event Latchup (SEL) Immune
- Linear Energy Transfer (LET) Threshold of 100 MeV-cm2/mg



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# DO-254 Design Assurance Level A (DAL A)

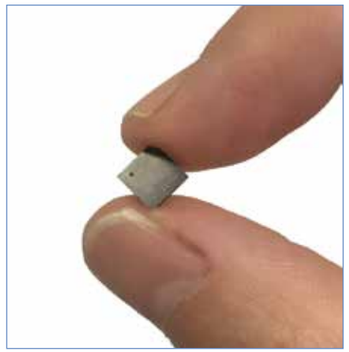
The RTCA DO-254/EUROCAE ED-80 (DO-254) standard provides guidance and recommendations for the activities that must be performed in order to meet the design assurance objectives of complex electronic hardware (CEH) used in avionics systems. Design Assurance Level A (DAL A) is the highest and most stringent level of certification, in which a failure is classified as resulting in a catastrophic failure for the aircraft. Holt Integrated Circuits designed the World's first MIL-STD-1553 DO-254 certifiable IP Core for military and commercial avionics applications and provides customers with a complete DO-254 certification data package.

- Meets DO-254 DAL A design assurance objectives
- Compliant with guidance from CAST 33 and AC20-152A
- Independently audited and passed by certified FAA DER
- Full DO-254 design certification package supplied to customer
  - Encrypted source code
  - Test bench and data
  - Design artifacts
- Product: HI-6300, World's Only Certifiable MIL-STD-1553 IP Core

# Advanced Packaging Technologies

- Integrate magnetics in same package as mixed signal ICs
- Reliable high TCE substrates
- Large I/O capability with advanced BGA process
- Integrated Circuit Standard Packages

| | |
|---|---|
| - Ceramic | - PGA |
| - CERDIP | - Plastic |
| - J-lead CerQuad | - PQFP |
| - Side-Brazed DIP | - QFN |
| - CerLCC | - TSSOP |
| - Hermetic Gull-Wing | - DIP |
| - BGA | - SOIC |



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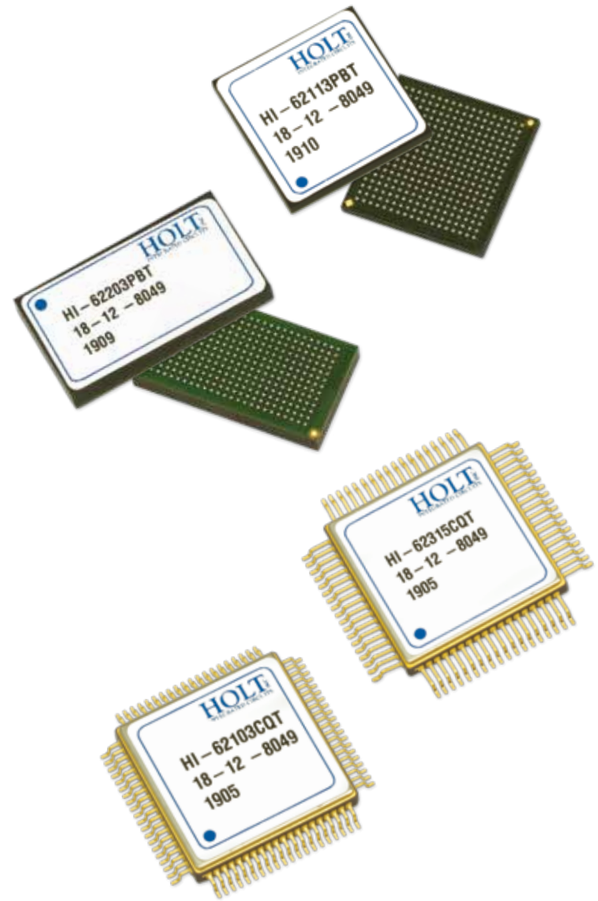
# Design For Obsolescence

Holt provides compact single-chip monolithic designs which offer drop-in capability for legacy designs, providing a significant cost saving over the older traditional hybrid or multi-chip module approaches.

- Proven track record
- Drop-in form, fit, function replacements for industry standard products
  - Drop-in replacement for legacy MIL-STD-1553, ARINC 429, CAN 2.0B, RS-485
- Compatibility with legacy software
- Dual Channel MIL-STD-1553 Mini PCIe Reference Design






# Reference Designs and Kits

- Dual Channel MIL-STD-1553 FPGA Mezzanine Card (FMC)
- Dual Channel MIL-STD-1553 PCIe Development Card
- ARM Cortex M3 motherboards interface with Holt product daughter cards
- BeagleBone Black Developers Kit for MIL-STD-1553
- 16 Rx / 8 Tx ARINC 429 Data Management Development Kit
- ANSI ‘C’ software drivers and API libraries
  - Windows, Linux, VxWorks

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# Awards and Certifications

## Holt is well known in the aerospace industry for superior quality, on-time-delivery and customer service, securing multiple awards from industry leading customers.

- 2018, 2020, 2022 Lockheed Martin Rotary & Mission Systems Elite Supplier Award C6ISR
- 2015–18 AMETEK Aerospace & Defense 100% Quality and OTD Supplier Award
- 2012 STACK International Gold Supplier the Year Award
- 2011 Lockheed Martin EBSA STAR Supplier of the Year Award
- 2009 STACK International Certified Supplier
- 2009 PURE Certified Supplier
- 2008 Rockwell Collins Preferred Supplier of the Year Award
- 2006 Lockheed Martin EBSA STAR Supplier of the Year Award

*For further information on these and other Holt products contact:*

HOLT INC.
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**Corporate Headquarters**
101 Columbia
Aliso Viejo, CA 92656. USA
Phone: (949) 859-8800 Fax: (949) 859-9643
Email: sales@holtic.com Web: www.holtic.com

**East Coast Office**
740 Veterans Memorial Hwy, Suite 205
Hauppauge, NY 11788. USA
Phone: (631) 343-7118