DSU-33C/B Proximity Sensor
Design to Production Transition

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51st Annual
NDIA Fuze Conference
Nashville, TN
“I know the price of success: dedication, hard work, and an unremitting devotion to the things you want to see happen.”

Frank Lloyd Wright
An advanced weapon and space systems company

Agenda

DSU-33/B Product Description

DSU-33/B History

DSU-33C/B Manufacturability Workshop

- Team Members
- Goals/Result
- Lean Activity

Questions?
• Provide air burst proximity fuzing for general-purpose bombs and warheads, including M117 and MK80 series (also JDAM)

• Provide fire pulse signal to the FMU-139, FMU-152 electronic fuzes

• Weighs under 2.3 Kg (5 lb)

• Self powered by internal thermal battery after receipt of initiation signal

• Initiation signal provided by
  • FZU-48/FZU-55 (U.S. Air Force Aircraft)
  • Fuze Functional Control Set (FFCS) for U.S. Navy Aircraft

• 95% Reliability over 10 year storage life
  • HOB of 5 ft to 35 ft at 80%, 0 ft to 50 ft at 100%
  • All surfaces condition including water
DSU-33 History

1980’s Motorola developed DSU-33A/B
1998 DSU-33B/B JDAM design upgrade is completed.
2003 ATK starts development of DSU-33C/B
2005 ATK completed qualification DSU-33C/B
2005- Present ATK in production DSU-33C/B
DSU-33C/B Production Team Members

Design For Manufacturability Workshop – Focused on Production

US Government Participation

ATK Design Engineering

RF
Electrical
Mechanical

Production Engineer
Quality Engineer
Production Supervisor
Surface Mount CCA Engineer
Test Engineer
Production Lead Operator

Distribution Statement A approved for public release; distribution is unlimited.
Eliminated epoxy staking of components on Circuit Card Assemblies

Through Hole to Surface Mount Technology (SMT)

Brought SMT CCA Process in House

More Control / Lower Cost

B/B  X-Y Table Application of Epoxy Required

C/B No Epoxy Required
Eliminated embedded re-processing in build cycle

DSU-33B/B build process required:

Assemble, test, disassemble prior to installing thermal battery

DSU-33C/B process flow has no disassembly required.
DSU-33C/B Goals/Results

Eliminate hand soldered joints

- Eliminated two (2) flex cables and associated solder joints
- Reduced hand soldering by 21%
Reduction of Process Steps by 24%

- Eliminated laser welding operations
- Eliminated mixed technology RF Assembly
- Reduced hand soldering operations by 21%
- # Test operations reduced by 25%
DSU-33C/B Designed for Testability

DSU-33C/B Test Interface is More Reliable and User Friendly.

Distribution Statement A approved for public release; distribution is unlimited.
Every DSU-33 Sensor is functionally tested at an ambient, cold and hot condition.

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<tr>
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<th>First Pass Yields</th>
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<tr>
<td></td>
<td>DSU-33 B/B</td>
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<tr>
<td>Sensor Ambient</td>
<td>96.90%</td>
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<tr>
<td>Sensor Cold</td>
<td>69.30%</td>
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<tr>
<td>Sensor Hot</td>
<td>82.40%</td>
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<tr>
<td>Rolled Yield</td>
<td>55.33%</td>
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Increase Rolled Yield by 29%
DSU-33C/B Producibility

Decreased Touch Hours by 30%

Improved rolled test yields by 29%

Reduced process steps by 24%

Reduced hand solder joints by 21%

Increased capacity of factory by 34%

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DSU-33C/B Lean Activities

Team Members

- Production Supervisor
- Production Engineer
- Quality Engineer
- Production Control
- Production Lead Operator

Goals

- Increases Quality – Real time issues surface faster
- Reduced Risk – Manufacturing problems are found earlier
- Reduced Cost – Eliminate unnecessary steps and labor
QUESTIONS