Ultra Low Noise
AC/DC Switching Power Supply
by Daitron

http://www.daitronpower.com

Daitron Inc.
DEC, 2018
Background

Current Situation using SMPS

- SMPS Products
  - Advantage
    - Small size, Low cost
  - Disadvantage
    - Large Ripple Noise
      - Requires Filter Circuit
      - Large capacitance
        - Leakage Current -> Isolation Transformer will be needed
    - Low Efficiency (because of High Switching loss)
Background

Current Situation using Linear type Power Supply

• Linear Power Supply
  • Advantage
    • Low noise
  • Disadvantage
    • Expensive
    • Heavy
    • Large Foot print
    • Low Efficiency (Hot)
## Comparison Chart by types of Power Supplies

<table>
<thead>
<tr>
<th></th>
<th>Linear PS</th>
<th>Switching PS</th>
<th>Ideal PS</th>
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</thead>
<tbody>
<tr>
<td><strong>Noise</strong></td>
<td>Very Low</td>
<td>High</td>
<td>Very Low</td>
</tr>
<tr>
<td><strong>Leakage Current</strong></td>
<td>Very Low</td>
<td>High</td>
<td>Very Low</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Big</td>
<td>Small</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Heavy</td>
<td>Light</td>
<td>Light</td>
</tr>
<tr>
<td><strong>Component Count</strong></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>High</td>
<td>Low</td>
<td>Competitive</td>
</tr>
</tbody>
</table>
Background

Daitron Power Supply History / Resources

• Developed in-house SMPS for visual market.
• Fully staffed, dedicated Tokyo based power supply design center
  • Fabless production
  • UL certified factory in Japan

R&D and Marketing HQ,
Power Supply Division
Hamura, Tokyo Japan
Ideal Solution for Noise Sensitive Applications

- Ultra Low Ripple Noise
  - 10~13 mV range – Ultra Low Noise series
- Low Component Count
  - Low Ripple Noise = Less Filter Circuits
  - Small Capacitance = Low Leakage Current
- High Efficiency
  - High Efficiency because of low Switching loss
    Requires only;
    - Small switching FET on Primary side
    - Low Peak Voltage diode on Secondary side
- Green Technology
  - RoHS Compliant, Vinyl Chloride Free, Halogen Free PCB
  - High Efficiency
- Certified to industry standards
  - UL File No. E237238
  - EN61000-4-2,3,4,5,6,8,11, 60950-1, CSA-C22.2, EN55022-B, FCC-B, VCCI-B
Reason Why Daitron use Soft Switching

• Hard vs Soft Switching

Hard Switching

Raising and lowering edge of the current wave form generates noise at the zero cross point (ringing noise) & negatively affects efficiency.

Soft Switching (Daitron)

Current has sine wave form, thereby reducing noise. Minimum current & voltage overlap further reduces noise while increasing efficiency.
Comparison Data – Ripple Noise -

AC input Ripple Noise

Hard Switching Type 50W-12V

Daitron LFS Ultra low noise 50W-12V
Product Series

• **LFS50A series**
  - Ultra Low Noise < 10mV >
  - Medical Standard
    - Certified: UL60601-1 File No.: E320635
    - “Power Supplies, Medical and Dental Certified – Component“ (In US & Canada)
  - Wide Input Range < 85-264Vac>
  - 50W
  - Single output

• **LFS150A series**
  - Ultra Low Noise < 10~13mV >
  - Medical Standard
    - Certified: UL60601-1 File No.: E320635
    - “Power Supplies, Medical and Dental Certified – Component“ (In US & Canada)
  - Wide Input Range (85-264Vac)
  - 150W
  - Single output
Product Series

- PFS300A series
  - Ultra Low Noise < 10mV >
  - Wide Input Range < 85-264Vac >
  - 300W
  - Single output

See [product selection guide](#) for more info
Daitron Incorporated

US Operation of Daitron Group

http://www.daitron.com
http://www.daitron.co.jp/en/

HQ Location : Wilsonville, OR USA

- Semiconductor Equipment Sales and Support
- Vision System Products Sales
- Electronic Components
- Founded: Sep 23rd, 1986
- Number of Employee: 48
- Location:
  - Lincoln, Nebraska
  - Reliable & Heavy duty cable assembly manufacturer specific for Rail road application