Anode Front-End electronics status.

N.Bondar, T.Ferguson, A.Golyash, N.Terentiev

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Anode Front-End electronics status

- AFEB production status
  - CMP16-G ASIC
  - AFEB production
  - AFEB certification
  - AFEB shipment
- Documentation
- AFEB-ALCT cable production
- Delay chip DEL16 test status
- ME 234/2 HV noise investigation
AFEB production status

CMP16_G ASIC

- Produced quantity 28,000
- Tested 25,000
- Assembled at USA 12,200
- Sent to Dubna 1,472
- Stored on shelf 11,228
- Yield rate 90%

We have to test more 3,000 more chips.

Prepared CMP16_G Datasheet
# AFEB production status

## Production completed
Need to produce 12,000  
Total ordered 12,200  
Total delivered to FNAL 12,200

## Testing completed
Certification statistic:  
- Total measured 12,200  
- Total certified 12,160  
- Yield rate after cuts 99.6%  
- Final yield rate (including chip selection) ~90%

## Shipping completed
- UCLA 2027  
- UF 2031  
- PNPI 2160  
- IHEP/p 1584  
- IHEP/s 1427

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Detail information on the following WEB page:  
Anode electronics assembly instructions.

The following instructions and manuals were prepared and located at the following WEB site http://www-hep.phys.cmu.edu/cms/:

- AFEB AD16_F user manual
- Instruction for AFEB installation
- Instruction for AFEB-ALCT cables installation for ME234/2 chamber
- Instruction for AFEB-ALCT cables installation for ME1/2 chamber
- Instruction for AFEB-ALCT cables installation for ME2/1 chamber
- Instruction for AFEB-ALCT cables installation for ME3/1 chamber
- Instruction for repair broken M4 thread.
- Instruction for AFEB-ALCT cables installation for ME4/1 chamber
- Instruction for AFEB-ALCT cables installation for ME1/3 chamber
- CMP15_G Datasheet
- DEL16 Datasheet
- Protection board PB Datasheet
**AFEB-ALCT cables status**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cables to produce</td>
<td>10760</td>
</tr>
<tr>
<td>Total produced cables</td>
<td>9336</td>
</tr>
<tr>
<td>Production balance (ME4/1 included)</td>
<td>1424</td>
</tr>
<tr>
<td>Production balance (spare cables only)</td>
<td>92</td>
</tr>
<tr>
<td><strong>ME234/2</strong> - 148 sets made, shipped to US FAST sites</td>
<td></td>
</tr>
<tr>
<td><strong>ME2/1</strong> - 38 sets made, shipped to PNPI</td>
<td></td>
</tr>
<tr>
<td><strong>ME3/1</strong> - 38 sets made, ready for shipment to PNPI</td>
<td></td>
</tr>
<tr>
<td><strong>ME1/2</strong> - 74 sets made, shipped to IHEP</td>
<td></td>
</tr>
<tr>
<td><strong>ME1/3</strong> - 74 sets made, ready for shipment to IHEP</td>
<td></td>
</tr>
<tr>
<td>Spare - 120 cables made</td>
<td></td>
</tr>
</tbody>
</table>
Delay chip D16 status.

16 Channel Programmable Delay

**D16G**

**General Description**

The D16G is a custom designed 16-channel programmable delay circuit. Each channel consists of an input LVDS-to-CMOS level converter, four stages of delay with 1, 2, 4, and 8 steps; and output width pulse shaper. Also, the chip has the possibility to generate a test level at each output. This option is used for testing chip-to-chip connections. The chip has a serial interface to control the delay and set the output test level.

The D16G is designed and fabricated using a CMOS 0.5 micron technology. The chip is encapsulated into a QFP-64L 10X10 plastic package.

This ASIC is designed as a part of the anode front-end electronics for Cathode Strip Chambers of the Endcap of the Muon System of CMS experiment.

**Features**

- **Input signal level**: LVDS standard
- **Input resistance**: 110 Ohm
- **Output signal**: 3.3 V CMOS
- **Number of delay steps**: 15
- **Delay step (slope)**: 1-4 ns (adjustable with an external current)
- **Output pulse width**: 40 ns (adjustable with an external current)
- **Power supply voltage**: 3.3 V
- **Power consumption**: 0.2 W
- **Temperature drift**: 0.6 mV/°C

**Top View**

Size: 10 mm x 10 mm x 1 mm.
Pin pitch: 0.5 mm.

**Prepared D16 delay chip Datasheet**

Detail information on the following WEB page: