

## **ASDBLR99 Functional Block Summary**

– CEA developed two terminal structure with Buried N+ shield

### **Input Protection – 380 $\mu$ m single stripe NPN**

Collector  $\rightarrow$  Input

Base+Emitter  $\rightarrow$  Grounded

### **ODD AND EVEN TEST PULSE –**

Compatible with DTMROC (Xe integral out)

### **Preamp – Pseudo Differential Dual Input**

Cascoded Common Emitter

Gain  $\sim 1.5\text{mV/fC}$   $t_p=1.5\text{n}$

Range 100KeV (1pC)

SE input impedance  $230\Omega$  @<10MHz

$120\Omega$  @<50MHz

Preamp Supply Filter on each channel

### **Shaping and Tail Cancellation –**

**Three Differential Stages**

SE  $\rightarrow$  Differential buffer - **Gain 2**

Selectable ION tail Canc. - **Xe 70% or Ar-CF4**

Programmable shaping adjustment

Operational to 60KeV(600fC)

Limiter Stage - **canc. Preamp Tail**

**Soft Limit at > 10KeV (100fC)**

**Output Gain  $\sim 250\text{mV/KeV}$  (25mV/fC)**

$t_p = 5\text{n}$

## Functional Blocks

### Baseline Restorer –

8pF Coupling caps followed by diode bridge with output sense current steering

Gain ~.80 for at threshold signals

### Track Discriminator –

Threshold range: -200eV to 1.2KeV

Amplifier Stage with shaping final  $t_p = 7.5n$

Fast Comparator with tuned Hysteresis

Minimum output width 5-6ns

4 ns delay stage (aligns ternary outputs)

### TR Discriminator –

Functional Threshold range: 1KeV – 12KeV

Amplifier Stage with shaping final  $t_p = 10ns$

Fast Comparator with tuned Hysteresis

### Ternary Driver –

Diff. Current Sum of Discriminator Outputs

Programmable steps 0 – 2mA

Disc STATE		TERNARY Outputs	
Track	TR	Tern+	Tern-
OFF	OFF	400 $\mu$ A	0 $\mu$ A
ON	OFF	200 $\mu$ A	200 $\mu$ A
ON	ON	0 $\mu$ A	400 $\mu$ A

**ASIC SUBMITTED TO TEMIC 8/13/99**

**DIE SIZE** 3.2X3.6MM 8 CHANNELS ~5500 COMPONENTS

**POWER** 36MW/CH (WITH DRIVERS) +/-3V