FEATURES

* Guaranteed 300 MHz Operation
* Deadtimeless Updating Outputs
* Fast Veto and Bin Gate Inhibiting
* High Fan-Out Capability

DESCRIPTION

Utilizing the most advanced technology, the Model 704 Quad Discriminator boasts a 300 MHz continuous repetition rate capability. The updating feature ensures deadtimeless operation for coincidence applications, while the double-pulse resolution is a remarkable 3.3nSec for counting applications. A fifteen-turn potentiometer provides continuous output width adjustment from 2nSec to over 50nSec for each channel.

The threshold is variable from -10mV to -1 volt with a fifteen-turn potentiometer on each channel. The threshold setting is easily determined from a front panel test point that provides a DC voltage equal to ten times the actual threshold.

Inhibiting of the discriminator can be accomplished in two ways. A front panel LEMO input accepts a NIM level pulse for fast vetoing of all channels. The fast veto is capable of inhibiting a single pulse from a 300 MHz input pulse train. Secondly, a slow bin gate via the rear panel connector inhibits all four channels and is enabled or disabled from a rear panel slide switch.

The outputs are the current source type with two pairs of negative bridged outputs and two complements for each channel. When only one output of a bridged pair is used, a double-amplitude NIM pulse (-32mA) is generated, useful for driving long cables with narrow pulse widths. The outputs have transition times of 1nSec, and their shapes are virtually unaffected by loading the outputs in any combination.
**INPUT CHARACTERISTICS**

**General:**
One LEMO connector input per channel; 50ohms, ±1%, direct coupled; less than ±2% input reflection for a 1.0nSec input risetime. Input protection clamps at +.7Volts and -5Volts, and can withstand ±2Amps (±100Volt) for 1μSec with no damage to the input.

**Threshold:**
From -10mV to -1Volt; 15-turn screwdriver adjustment; better than ±0.2%/°C stability; front panel test point provides a DC voltage ten (10) times the actual threshold setting.

**Fast Veto:**
One LEMO connector input common to all four (4) channels; accepts normal NIM level pulse (-500mV), 50 ohms, direct coupled; must precede the negative edge of input pulse by 3nSec; Capable of gating a single pulse from a 300 MHz continuous pulse train.

**Bin Gate:**
Rear panel slide switch enables or disables slow bin gate in accordance with TID-20893.

**OUTPUT CHARACTERISTICS**

**General:**
Six (6) LEMO connector outputs per channel; Two pairs of negative bridged outputs and two complements. The bridged outputs deliver -32mA into a single 50 ohm load (-1.6Volts) and -16mA (-800mV) with both terminated. The complementary outputs are quiescently -16mA and go to 0mA during output. The output rise and fall times are less than 1nSec from 10% to 90% levels. The output shapes are optimized when the bridged outputs are 50 ohm terminated.

**Width Control:**
One control per channel; 15-turn screwdriver adjustment; outputs continuously variable from 2nSec to 50nSec. Width stability is better than ±0.1%/°C of setting.

**Updating Output:**
The output pulse will be extended if a new input pulse occurs while the output is active. A 100% duty cycle can be achieved.

**GENERAL PERFORMANCE**

**Continuous Repetition Rate:**
Greater than 300 MHz, 3 db bandwidth; and a throughput counting rate of 300 MHz with output width set at minimum.

**Pulse-Pair Resolution:**
Better than 3.3 nSec, with output width set at minimum.

**Input to Output Delay:**
Less than 8.0 nSec.

**Multiple Pulsing:**
None; One and only one output pulse regardless of input pulse amplitude or duration.

**Power Supply Requirements:**
- 6 Volts @ 320 mA  
-12 Volts @ 160 mA  
-24 Volts @ 75 mA  
+6 Volts @ 220 mA  
+12 Volts @ 0 mA  
+24 Volts @ 45 mA

**Note:** All currents are within NIM specification limits permitting a full powered bin to be operated without overloading.

**Operating Temperature:**
0 °C to 70 °C ambient.

**Packaging:**
Standard single width NIM module in accordance with TID-20893 and Section ND-524.

**Quality Control:**
Standard 36-hour, cycled burn-in with switched power cycles.

**Options:**
Call Phillips Scientific to find out about available options.