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2735DC AND 2735PC 16-CHANNEL WIRE CHAMBER CARD

- Compact, Low Power
- Two Versions: For Drift and Proportional Chambers
- Appropriate for Chamber Mounting
- -2 μ A Minimum Threshold, Remotely Settable
- Simple and Reliable: Uses Surface Mount Technology
- Negative or Positive Versions
- Protected Against HV Discharge

FOR USE WITH WIRE CHAMBERS IN PARTICLE, HEAVY ION, OR MEDICAL PHYSICS APPLICATIONS

The Model 2735DC is an amplifier/discriminator optimized with short time constants for low slewing applications. It is intended for drift chambers with high resolution timing requirements and also useful for multiwire proportional chambers with short signal fall times. The low threshold of -2 μ A can be achieved with chamber-mounted operation without oscillations or multiple pulsing on threshold-level signals provided that signal fall times are less than approximately 30 nsec. The 2735DC is also appropriate for leading-edge triggered, drift chamber readout without the above shape restrictions on the chamber signals. The slower version, the 2735PC, is optimized for the slower timing of multiwire proportional chambers but is otherwise identical to the 2735DC.

Both cards accept 16 negative inputs via a printed circuit edge connector. A positive version is also available (MOD 100). The inputs are protected against discharges of up to 3 kV from 250 pF. The threshold of the 16 channels can be commonly adjusted via a control voltage at the power connector or at the output connector. The latter allows the cards to be programmed from the Model 2731A or Model 2730 PCOS III Receiver modules.

The use of multichannel custom integrated circuits and surface-mount packaging has resulted in simplicity and hence reliability and economy. The main components of the cards are the custom monolithics TRA402S Amplifier and model MVL407S Comparator. The use of these circuit elements results in high sensitivity and a power dissipation of less than 375 mW per channel. The positive version is achieved by a jumper option. The TRA402S front-end amplifier was designed for wire chamber inputs. Its low impedance, current-sensitive inputs are uniquely suited to chamber applications, providing no extensive pulse integration as characteristic of FET designs. This offers high rate capability and optimum sensitivity to charge pulses from wire chambers.

The card offers a high impedance test input on the power connector. Application of a triangular waveshape or pulse at this point injects a signal into all channels simultaneously. This allows the card to be tested in place.

The outputs are differential ECL, suitable for driving twisted-pair cable. They are presented at a

standard 34-pin header. The output duration is equal to the time over threshold with a 7 nsec minimum.

SPECIFICATIONS

Model 2735DC

Conditions: $V_+ = 5.0\text{ V}$, $V_- = 5.2\text{ V}$, $T = 25^\circ\text{ C}$, Threshold = 1 V corresponding to $-2\text{ }\mu\text{A}$.

Input Pulse (Neg): 5 nsec rise time, 30 nsec decay time constant.

Channels: 16.

Input Impedance: 150 ohm.

Input Offset Voltage: -0.7 V .

Input Coupling: Must be externally AC coupled, unless driven from a high impedance source.

Input Protection: Protected against discharge of up to 3 kV from 250 pF.

Threshold Control Voltage Input: 0.5 to 10 V, $+500\text{ mV}/\mu\text{A}$ ($\pm 20\%$ $+100\text{ mV}/\mu\text{A}$). Applied via power connector or output connector. Current drawn is 12 mA at 10 V.

Minimum Threshold: $-2\text{ }\mu\text{A}$ (typically $-1\text{ }\mu\text{A}$ bench test).

Interchannel Isolation: $> 45\text{ dB}$ for 10 nsec rise time. Better for slower signals.

Opposite Polarity Pulse Rejection: $> 30\text{ }\mu\text{A}$.

Propagation Delay: 15 nsec at 2 x threshold; 11.5 nsec at 20 x threshold.

Slewing (2x to 20x Threshold): 2.5 nsec.

Double Pulse Resolution: 20 nsec at 5 x threshold for 5 nsec; wide input pulses.

Outputs: Complementary ECL outputs with on-board pull-down resistors, capable of driving twisted-pair cables of 100 to 120 ohm impedance.

Output Pulse Width: Equal to time over threshold, except for effects of hysteresis and shaping time constant.

Minimum Output Pulse Width: 5 nsec at 2 x threshold.

Test Input: Via power connector. Minimum dV/dt for $2\text{ }\mu\text{A}$ input, approximately $20\text{ mV}/\text{nsec}$; recommended width, 100 nsec.

Input Connector: 36-contact PC card-edge connector (0.254 cm centers), mates with Viking

3VGH18/1JND5, LeCroy 455660036 (wire wrap); or Viking 3VH18/1JV5 (solder tail).

Power Connector: 20-contact PC card-edge connector (0.254 cm centers). Mates with LeCroy CK20P.

Output Connector: 34-pin header. Mates with LeCroy CK34.

Dimensions: 12.0 cm x 9.1 cm overall.

Power Requirements: 0.52 A at +5 V (+4.75 to +5.25 V); 0.68 A at -5.2 V (-4.75 to -5.5 V).

Weight: 55 grams.

Model 2735PC

Conditions: $V_+ = 5.0$ V, $V_- = 5.2$ V, $T = 25^\circ$ C, Threshold = 1 V corresponding to -2 μ A.

Input Pulse (Neg): 5 nsec rise time, 100 nsec decay time constant.

Channels: 16.

Input Impedance: 150 ohm.

Input Offset Voltage: -0.7 V.

Input Coupling: Must be externally AC coupled, unless driven from a high impedance source.

Input Protection: Protected against discharge of up to 3 kV from 250 pF.

Threshold Control Voltage Input: 0.5 to 10 V, +500 mV/ μ A ($\pm 20\%$ +100 mV/ μ A). Applied via power connector or output connector. Current drawn is 12 mA at 10 V.

Minimum Threshold: -2 μ A (typically -1 μ A bench test).

Interchannel Isolation: > 45 dB for 10 nsec rise time. Better for slower signals.

Opposite Polarity Pulse Rejection: > 30 μ A.

Propagation Delay: 20 nsec at 2 x threshold; 12 nsec at 20 x threshold.

Slewing (2x to 20x Threshold): 8 nsec.

Double Pulse Resolution: 35 nsec at 5 x threshold for 8 nsec; wide input pulses.

Outputs: Complementary ECL outputs with on-board pull-down resistors, capable of driving twisted-pair cables of 100 to 120 ohm impedance.

Output Pulse Width: Equal to time over threshold, except for effects of hysteresis and shaping time constant.

Minimum Output Pulse Width: 8 nsec at 2 x threshold.

Test Input: Via power connector. Minimum dV/dt for 2 μA input, approximately 20 mV/nsec; recommended width, 100 nsec.

Input Connector: 36-contact PC card-edge connector (0.254 cm centers), mates with Viking 3VGH18/1JND5, LeCroy 455660036 (wire wrap) or Viking 3VH18/1JV5 (solder tail).

Power Connector: 20-contact PC card-edge connector (0.254 cm centers). Mates with LeCroy CK20P.

Output Connector: 34-pin header. Mates with LeCroy CK34.

Dimensions: 12.0 cm x 9.1 cm overall.

Power Requirements: 0.52 A at +5 V (+4.75 to +5.25 V); 0.68 A at -5.2 V (-4.75 to -5.5 V).

Weight: 55 grams.

Ordering Information

Negative Input: 2735DC or 2735PC.

Positive Input: 2735DC/MOD100 or 2735PC/MOD100. (Positive version available for quantities of > 250).

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