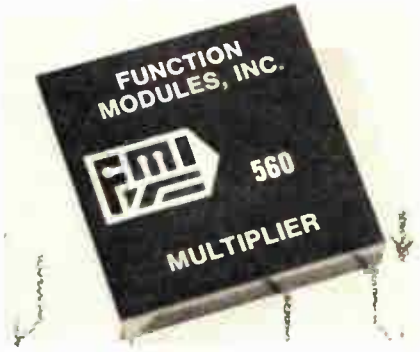
Components

Multiplier holds error to ±0.1%

High-accuracy module uses transconductance technique to bring price down to $139

Like operational amplifiers and data converters, multipliers are rapidly gaining acceptance as building-block components. But the precision units, those having an accuracy to within ±0.1%, are usually relatively high-cost items, with price tags of around $200, because they employ a sophisticated circuit technique called pulse-height/pulse-width analysis. The simpler and less expensive transconductance multiplier, which uses transistor currents to find the product of two inputs, has been limited to an accuracy of within ±0.2% to ±0.5%.

However, Function Modules of



Irvine, Calif., is introducing a four-quadrant transconductance multiplier that boasts a maximum full-scale accuracy of within ±0.1% and that costs only $139 in quantities of 1 to 9. The accuracy figure applies to operation in any quadrant and over the full input voltage range of ±10 volts. Moreover, since all linearity, gain, and offset errors are accounted for in the accuracy specification, the unit's nonlinearity is held to a mere ±0.04%.

The new multiplier, model 560, also minimizes temperature drift. Internal compensation permits the unit to hold drift error to a maximum of ±0.01%/°C. Like the accuracy callout, this figure is a full-scale specification that includes all linearity, gain, and offset errors.

Although it's a precision unit, the model 560 is a small modular package, measuring just 2 by 2 by 0.4 inches. In addition to multiplying, it can be used for dividing, squaring, and finding square roots.

The unit's frequency response is impressive, better than that of several other precision multipliers. Its small-signal 3-decibel bandwidth is 25 kilohertz, and its amplitude response remains flat to within 1% out to 500 hertz. The full-power response extends out to 5 kHz.

Both the X and Y inputs have an impedance of 100 kilohms and can accept signals of up to ±16 V maximum. Slew rate is 300 millivolts per microsecond, while settling time to rated accuracy for a 20-V step input is 80-μs. Output voltage can swing ±10 V at ±5 milliamperes; output impedance is only 1 ohm.

Function Modules Inc., 2441 Campus Dr., Irvine, Calif. 92664 [341]

Low-priced accelerometers require no amplification

A series of accelerometers is available in one-, two-, or three-axis configurations. All feature full-range outputs up to 50 millivolts per volt. The units do not require amplification because they avoid external signal conditioning, and they are designed for a variety of applications, including aerospace engineering, dynamic simulation, and industrial-control systems. Other features are shock endurance of 100 g, and high linearity. Price ranges from $195 to $295, depending on axis.

DSC Inc., 8490 Perimeter Rd. South, Seattle, Wash. 98108 [344]

Reed switch operates without metal contacts

A keyboard-type reed switch called the 2700 series can be panel-mounted or soldered to a circuit. The switch features a low-friction mechanism that has no metal-to-metal contact. An internal magnet is positioned so that reed action is positive, and no magnetic interference is generated between

switches. Contact bounce is limited to 0.4 millisecond, and resistance to 200 milliohms maximum. The unit will handle up to 500 milliamperes in dc-resistive applications.

Maxi-Switch Co., 3121 Washington Ave. North, Minneapolis, Minn. 55411 [345]

Coaxial attenuator can be controlled by a computer

A frequency range of dc to 100 megahertz, usable to 300 MHz, is offered by a programable rf coaxial attenuator. The unit, which can be remotely controlled by a computer or other conventional means, accepts a six-bit parallel binary input that switches the attenuation over a