Patent Abstracts

These Patent Abstracts of recently issued patents are intended to provide the minimum information necessary for readers to determine if they are interested in examing the patent in more detail. Complete copies of patents are available for a small fee by writing: U.S. Patent and Trademark Office, Box 9, Washington, D.C. 20231.

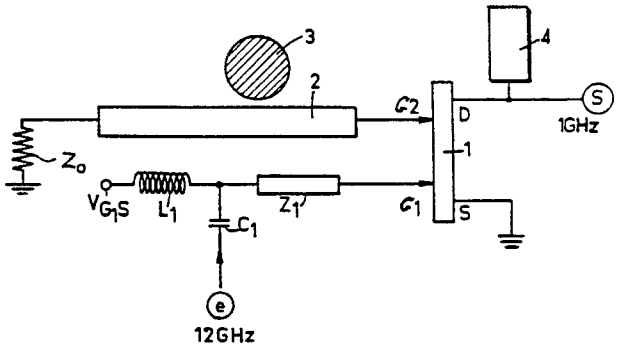
4,605,909 Aug. 12, 1986

Dual-Gate FET Oscillator Mixer

Inventor: Christos Tsironis.
Assignee: U.S. Philips Corporation.
Filed: Jan. 28, 1982.

Abstract—An oscillator-mixer arrangement including a dual-gate field effect transistor of the Schottky type for supplying an intermediate frequency output signal. The output signal is obtained by subtractively mixing a high frequency input signal and a signal produced in the arrangement. The input signal is applied to the first gate electrode (G_1), the produced signal is controlled by the second gate electrode (G_2), and the output signal is recovered at the drain electrode (D), while the source electrode (S) is directly connected to ground. A microstrip line having a characteristic impedance Z_0 which is electromagnetically coupled to a dielectric resonator and loaded by an impedance (Z_0) is connected to the second gate electrode (G_2). The arrangement is intended to be included in a receiver front end assembly for very high frequency waves, typically of a frequency of 12 GHz, used for broadcasting radio-télevision programs by artificial satellites.

6 Claims, 6 Drawing Figures



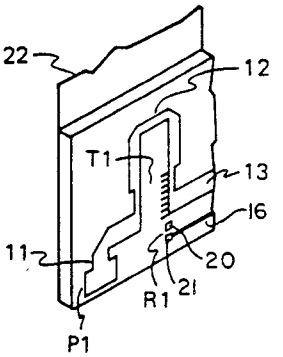
4,605,912 Aug. 12, 1986

Continuously Variable Phase Shifting Element Comprised of Interdigitated Electrode MESFET

Inventors: Ronald J. Naster, John A. Windyka, and Allen R. Wolfe.
Assignee: General Electric Company.
Filed: Apr. 26, 1984.

Abstract—A bidirectional continuously variable phase shifting element is described for incorporation in a monolithic microwave integrated circuit (a circuit which combines both passive and active circuit elements). The preferred active device for use in the phase shifting element is a variable resistance field effect transistor (MESFET), while the preferred passive circuit element is a short transmission line interconnecting the principal electrodes. A variable phase shift for an RF signal passing through the phase shifting element is obtained by adjusting the gate potential of the MESFET between full conduction and nonconduction. The change in conductivity of the MESFET causes the serial impedance of the phase shifting element to vary from a substantially resistive impedance to a substantially capacitively reactive impedance arrangement, which requires only a single active device, is applicable to frequencies generally above 1 GHz, and provides phase shifts up to 45° with reasonable insertion loss and return loss.

24 Claims, 11 Drawing Figures



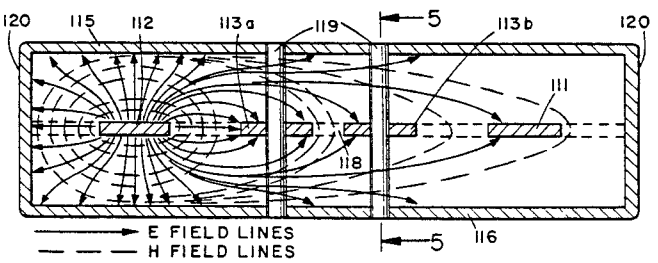
4,605,915 Aug. 12, 1986

Stripline Circuits Isolated by Adjacent Decoupling Strip Portions

Inventors: Henry D. Marshall, Jeffrey K. Iida, Douglas J. Crow, and Lawrence O. Friend.
Assignee: Cubic Corporation.
Filed: July 9, 1984.

Abstract—An electromagnetically-decoupled stripline circuit on a conventional circuitboard includes a center ground-plane and two coplanar striplines that are sandwiched within a dielectric material between two outer groundplanes. A plurality of connectors conductively interconnect the groundplanes. The center groundplane has a decoupling strip portion lying between the striplines that is split in two by a gap. The gap traverses the direction an electromagnetic field would propagate from one of the striplines toward the other, and a pair of the connectors are positioned to straddle the gap. Z-wires, plated-through holes, and additional gaps may be employed.

8 Claims, 6 Drawing Figures



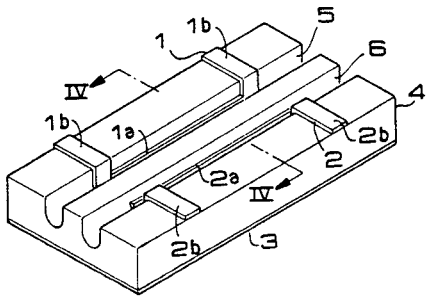
4,607,240 Aug. 19, 1986

Directional Coupler

Inventors: Yoji Isota, Osami Ishida, and Fumio Takeda.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Dec. 20, 1984.

Abstract—A directional coupler having a main line and an auxiliary line each formed within a groove formed dielectric plate, having good directivity and capable of tight coupling.

5 Claims, 18 Drawing Figures



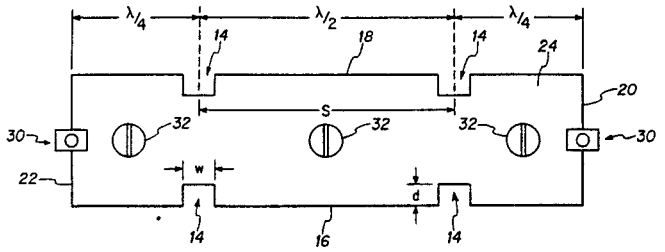
4,607, 242 Aug. 19, 1986

Microwave Filter

Inventor: James C. Cozzie.
Assignee: Rockwell International Corporation.
Filed: May 2, 1983.

Abstract—A low-loss bandpass microwave filter is disclosed which enables filter size reduction in the frequency range of 1–5 GHz. The filter includes a main ceramic body member which is notched or drilled and coated over all exposed surfaces except for opposite end portions. Coupling terminals are attached to the opposite end portions to provide microwave input and output coupling to the filter.

5 Claims, 6 Drawing Figures



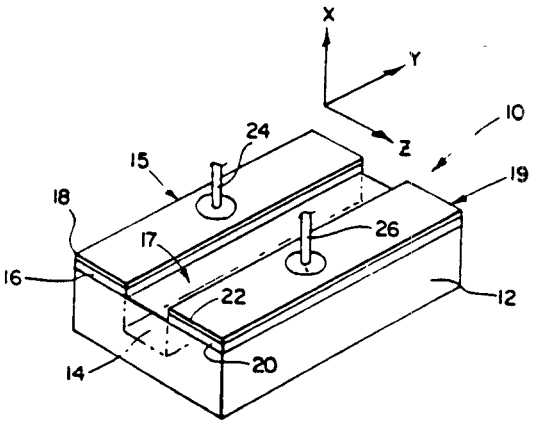
4,607,909 Aug. 26, 1986

Method for Modulating a Carrier Wave

Inventor: Norman A. Sanford.
Assignee: Polaroid Corporation.
Filed: June 14, 1984.

Abstract—A method for externally modulating an optical carrier wave by propagating the wave through a single channel waveguide structured to have an output whose optical power in the near field is distributed in a predetermined spatial pattern, selectively changing the optical power distribution pattern in correspondence with an information signal, and spatially filtering the power distribution pattern so that only the power available within selected region of the pattern is transmitted beyond the point of spatial filtering where it is available as an optical carrier wave whose intensity is modulated in correspondence with the information signal.

6 Claims, 7 Drawing Figures



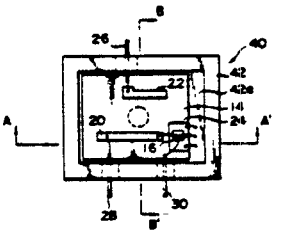
4,609,883 Sept. 2, 1986

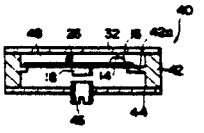
Microwave Oscillator Hermetically Sealed and Coupled to Dielectric Resonator

Inventors: Motoo Mizumura and Kenzo Wada.
Assignee: NEC Corporation.
Filed: Aug. 27, 1984.

Abstract—The interior of a metal housing is divided by a dielectric substrate into two compartments. At least one of the compartments is kept air-tight. The substrate carries thereon a semiconductor active element chip for oscillation within the air-tight compartment and a dielectric resonator within the other compartment. The chip and the resonator, electromagnetically coupled with the chip, constitute a microwave oscillator whose oscillation frequency can be stabilized. A metal screw is threaded into that wall of the housing which defines the other compartment in a predetermined positional relationship to the resonator. The metal screw is rotatable to vary the distance between the screw and the resonator and, thereby, the oscillation frequency.

8 Claims, 8 Drawing Figures





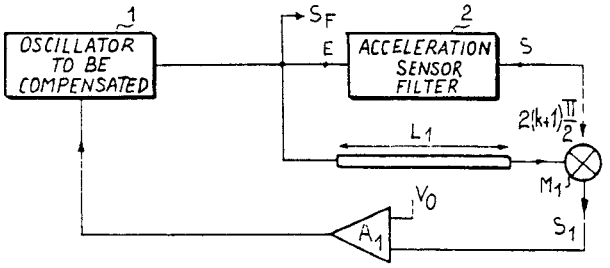
4,609,885 Sept. 2, 1986

Device Providing Compensation for Acceleration Sensitivity of an Oscillator

Inventor: Patrick Renoult.
Assignee: Compagnie d'Electronique et de Piezo-Electricité C.E.P.E.
Filed: Nov. 13, 1984.

Abstract—A device having the function of compensating for the acceleration sensitivity of an oscillator of given nominal frequency comprises an acceleration-sensing element such as a filter which is capable of producing a signal having a nominal frequency equal to that of the oscillator to be compensated but, in respect of its nominal frequency, has higher sensitivity to acceleration than the oscillator to be compensated. The phase difference between the frequency of the oscillator and the frequency produced by the filter is compared in a mixer in order to extract the phase modulation induced by the acceleration. A follow-up control amplifier receives the output signal of the phase comparator and produces at its output a signal for correcting the oscillator.

10 Claims, 6 Drawing Figures



4,609,892 Sept. 2, 1986

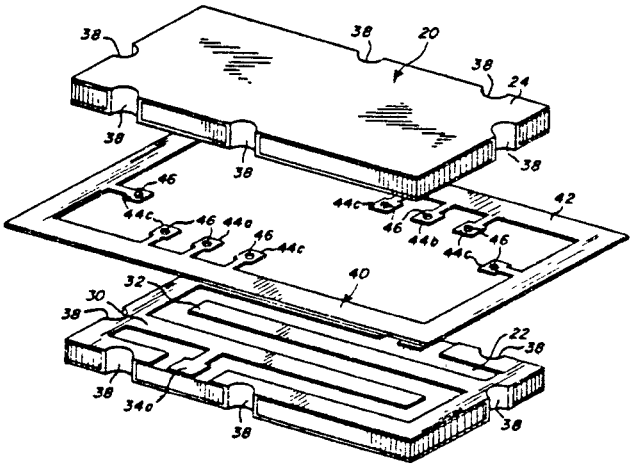
Stripline Filter Apparatus and Method of Making the Same

Inventor: Robert J. Higgins, Jr.
Assignee: Motorola, Inc.
Filed: Sept. 30, 1985.

Abstract—An improved ceramic stripline filter assembly is disclosed which provides optimized performance characteristics by careful control of the gap thickness between the filter halves during the assembly process. The filter arrangement utilizes paddle leads which include central cavities or pocket holes to accept any excess solder during filter assemblage. Close tolerances are thereby obtained regarding the referenced gap thicknesses from filter to filter.

The method of fabricating the stripline filter assembly contemplates the use of a leadframe with the leads extending laterally from a unitary support structure. The leads are then cut or otherwise separated from this integral support after attachment of the leads to the filter body connection points. They may be pre-formed to any predetermined pattern after such separation.

15 Claims, 4 Drawing Figures



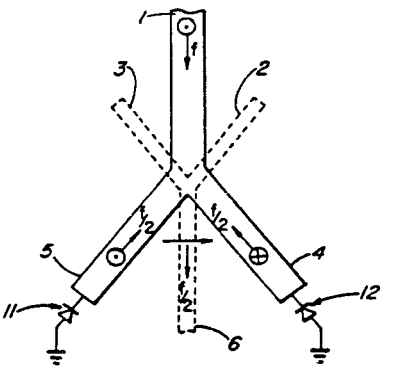
4,609,893 Sept. 2, 1986

Nonresonant Microwave Frequency Halver

Inventor: William D. Cornish.
Assignee: Canadian Department of National Defence.
Filed: Oct. 31, 1984.

Abstract—A broad-band nonresonant microwave frequency halver which simultaneously decouples the input frequency from the output port through phase cancellation and couples the subharmonic frequency to the output port through phase addition providing good isolation between input and output over a very broad frequency range. The implementation of this circuit specifically excludes resonant, or frequency dependent elements and therefore has a much broader band of operation than previous circuits which relied on resonant phenomena.

7 Claims, 12 Drawing Figures



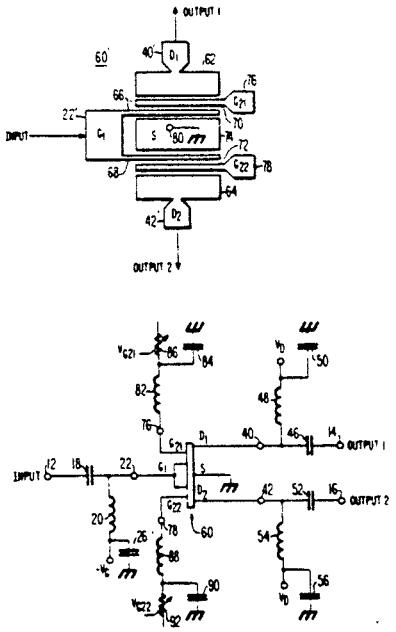
4,611,184 Sept. 9, 1986

Microwave Frequency Power Divider

Inventor: Mahesh Kumar.
Assignee: RCA Corporation.
Filed: July 13, 1984.

Abstract—An in-phase power divider is constructed of a double field-effect transistor having a common source, first and second gates and first and second drains. The gates are coupled together and adapted to receive a radio frequency signal of power P to be power divided. The power divided output signals each at substantially $P \div 2$ or more appear at the drains. An alternative power divider for producing unequal power division is constructed of a double dual gate FET having, in addition to the above-mentioned elements, third and fourth gates. By appropriate unequal application of gate bias to the additional gates unequal power division is effected.

1 Claim, 4 Drawing Figures



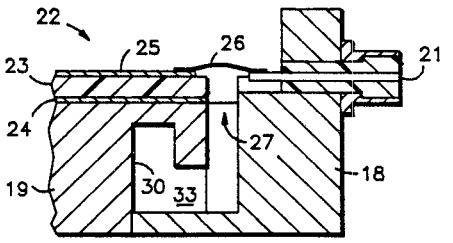
4,611,186 Sept. 9, 1986

Noncontacting MIC Ground Plane Coupling Using a Broad-Band Virtual Short Circuit Gap

Inventor: Bernhard A. Ziegner.
Assignee: Motorola, Inc.
Filed: July 29, 1985.

Abstract—Electrical coupling to the ground plane of an MIC is accomplished by forming a gap adjacent an edge of the ground plane and causing a virtual short to appear across the gap. A two part, one-half wavelength transmission line transformer is used to provide the virtual short. The transformer is defined by the conductive members surrounding the MIC and is open at the end corresponding to the gap and shorted at the other end. The impedances of the two parts of the transformer are chosen to maximize the bandwidth of the virtual short.

4 Claims, 8 Drawing Figures



4,611,884 Sept. 16, 1986

Bidirectional Optical Fiber Coupler

Inventor: Harold Roberts.
Assignee: Magnetic Controls Company.
Filed: Nov. 24, 1982

Abstract—A bidirectional, fiber optic coupler operative to receive from an optical fiber, modulated light for detection thereof, and for applying to the same fiber, modulated light for transmission to a remote location The coupler comprises a body which can be conveniently and economically molded as a unitary plastic element and in which a V-channel is formed to receive and securely hold the optical fiber. The channel terminates in a slanted reflecting face which is readily coated with a dielectric layer to provide a beam splitting function, or in the case of dual frequency transmissions, a frequency dependent layer to provide multiplexing or demultiplexing The slanted reflecting face is located at the bottom of an emitter cavity in which an emitter assembly is readily press-fit to provide predetermined alignment between light emanating from the emitter assembly and the reflecting face from which the light is reflected into the adjacent termination of the optical fiber. A detector cavity is formed within the body and positioned to receive light passing through the reflecting face. The transiting light is refracted downward toward the detector cavity which is positioned off axis. An index of refraction matching material may be applied between the optical fiber and reflecting face in which case the reflecting face passes the incoming light directly along the axis. A portion of the transmitted light is totally internally reflected by the bottom surface of the emitter cavity which is formed to provide a mirror surface that redirects that light toward the detector cavity. A lens may be molded directly into the coupler body to gather light passing through and refracted by the reflecting face. For the portion of light generated by the emitter and passing through the reflective face, a reflective wedge is provided in the bottom of the coupler body to direct that radiation away from the detector to reduce cross talk.

18 Claims, 8 Drawing Figures