A Control Circuit for Diode based RF Circuits

Indian Space Research Organisation (ISRO) has developed a driver circuit for stepwise temperature invariant performance of diode-based RF circuits such as *p-i-n* and *Schottky* diode-based attenuator, phase shifter, linearizer etc which will find wide commercial and special applications.

It is frequently required that some electrical parameters (such as attenuation, phase shift, gain, etc) of a diode based RF circuit be controlled in a stepwise manner according to a digital signal command. RF resistance of the RF diodes is very sensitive to the temperature of the circuits and also RF performance. This driver circuit provides temperature-controlled bias to the RF diodes in such a way that the stepwise RF performance of the diode based RF circuits will remain temperature invariant.

SALIENT FEATURES

- The driver circuit will provide bias to the RF diodes to provide temperature compensated RF performance without using any temperature sensors.
- No temperature sensor is required, since properties of the diodes themselves are used to achieve the temperature compensation performance.
- The temperature controlled bias voltage/current generated according to the junction temperature of the RF diodes themselves, thus any temperature gradient will not affect the temperature compensation.
- Temperature changes induced by RF energy dissipated within the diodes are also compensated.
- No trial and error method is involved to optimize the circuit performance.

APPLICATION(S)

- Electronically controlled RF attenuators for various RF/Microwave instruments.
- Electronically controlled RF phase shifters for RF/Microwave instrument and digital beam forming networks.
- Gain control of RF/Microwave amplifiers for on-board and ground based instrument.
- RF Linearisers for TWTAs, SSPAs.

TECHNOLOGY TRANSFER FROM ISRO

ISRO is willing to offer the know-how of this technology to entrepreneurs / industries in India. Capable manufacturing industries in acquiring this know-how may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below. Alternatively, you can also fill in the response form provided in this website.

For further details, please contact:

Head
Technology Transfer & Industry Interface Division (TTID)
Planning & Projects Group (PPG)
Space Applications Centre (SAC), ISRO
Ambawadi Vistar (PO)
Ahmedabad – 380 015
Ph:079-2691 3355, Fax:079-2691 5817
e-mail: ttid@sac.isro.gov.in

Director
Technology Transfer & Industry Cooperation (TT&IC)
ISRO Headquarters
"Antariksh Bhavan"
New BEL Road
Bangalore – 560 094

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