

ADVANCED TECHNOLOGIES FROM ISRO/DOS

Interest Exploration Note

TT / 11 / 01 / SCL

Ultra Wide Band Filter

The Indian Space Research Organisation (ISRO) at its Semi Conductor Laboratory (SCL) has developed an Ultra Wide Band Filter which will find wide commercial and special application.

Ultra-Wide Band (UWB) technology has progressed a lot in recent years for high-speed wireless communication. UWB communication systems require key building blocks such as band pass filters and band stop filters, consisting of wider bandwidth, low insertion loss and flat group delay properties. Reported filters are bulkier, lossy and incompatible to integrate with the existing systems. Also traditional designs have uncontrolled non-linear frequency dispersion over the wide bandwidth of interest. Proposed designs are compact, planar, simpler, repeatable and reproducible with minimum turnaround time. Added feature is the insensitiveness to fabrication tolerances and metal proximity effects.

The architecture of Filters are based on the coupled line approach modified to provide desired specifications. Further, step-impedance resonators (SIR) approach is adopted for enhancing the selectivity of the filters. Both the filters are implemented on alumina and can be replicated on other substrates also. Band pass filter is around 8.5mm × 7.64mm whereas band stop size is around 5.5mm × 4.0mm.

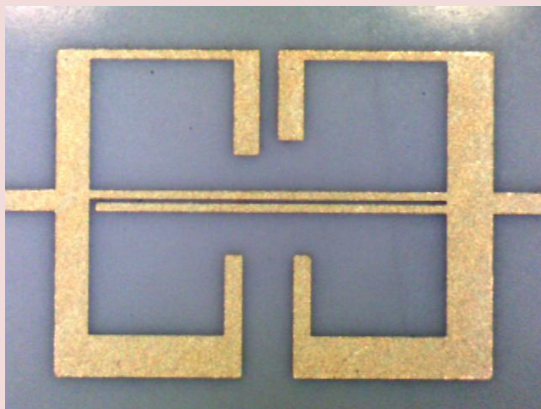


Fig : Band Pass Filter



TECHNICAL SPECIFICATION(S)

| | |
|-------------------|-----------------------|
| Implementation | : Planar (Microstrip) |
| Substrate | : 10 mils Alumina |
| Operational Freq. | : L-Ku band |
| Bandwidth | : >80% |
| Insertion Loss | : <1 dB |
| Return Loss | : 20 dB (min.) |
| Group Delay | : <1 ns |

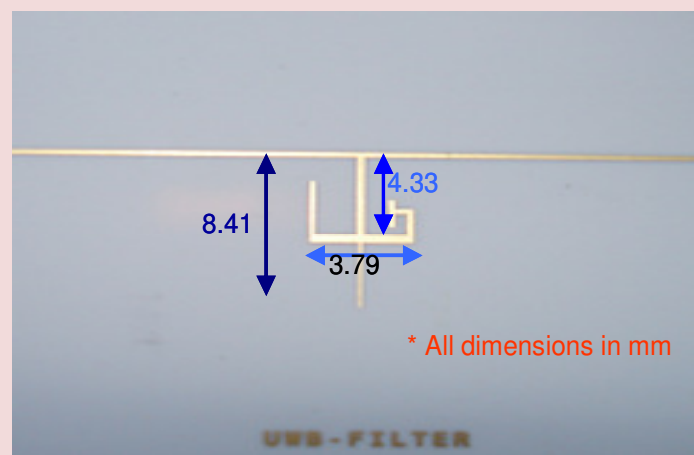


Fig : Band Stop Filter

SALIENT FEATURES / APPLICATIONS

Filters can be easily incorporated in the UWB wireless communication system. They also find applications in RFID, through wall and medical imaging, vehicular radar, indoor and handheld devices.

These Filters provide more than 80% band width and can be scaled to desired frequencies. Also the circuit can be realized on variety of substrates.

ADVANTAGE(S)

The simple geometry, low cost, good RF performance, ease of integration and compatibility with MMICs are the inherent advantages of the proposed filters. Further, easy affordability, small footprint for on chip integration and compatible to various fabrication processes are the added advantages.

TECHNOLOGY TRANSFER FROM ISRO /DOS

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

For further details, please contact:

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