# DW9255

## 35.42MHz SAW FILTER FOR GLOBAL POSITIONING SYSTEM RECEIVERS

The DW9255 is a Surface Acoustic Wave (SAW) bandpass filter for use with the GP2000 Global Positioning System (GPS) receiver chip-set, available from GEC Plessey Semiconductors. It is pre-tuned to the exact 2nd IF filter requirements of the GP2010 & GP2015 RF front-end devices, with a centre-frequency of 35.42MHz. The response is tuned for a flat passband, steep stopband and uniform passband group-delay with 3 external inductors. The device is realised on a Lithium Tantalate substrate and housed in a small leadless ceramic Surface Mount package.

The DW9255 gives significant improvement in correlated GPS Signal-to-Noise Ratio (SNR) performance compared to conventional LC bandpass filter schemes. This aids satellite signal acquisition and tracking capability from the GP2000 GPS chip-set. This device effectively filters out-of-band (unwanted) noise in the GPS signal. The Automatic Gain Control (AGC) within the GP2010 and GP2015 RF Front-end devices will then operate only on in-band noise for optimum gain and superior correlated GPS signal strength.

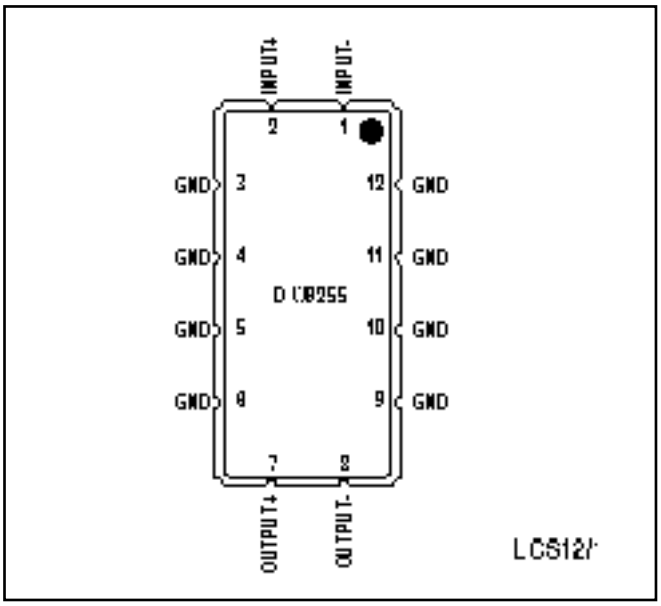



*Fig.1 Pinout*

### FEATURES

- Centre Frequency of 35.42MHz
- Insertion Loss of 17dB ±1dB (typical)
- 1dB Bandwidth 1.9MHz (typical)
- Passband Ripple 0.8dB (typical)
- Low Profile Ceramic Surface Mount Package
- Operating Temperature Range -40° to +85°C

### APPLICATION

- Commercial Global Positioning

### RELATED PRODUCTS AND PUBLICATIONS

| Part | Description | Data Reference |
|---|---|---|
| GP2010 | GPS receiver RF Front-end | DS4056 |
| GP2015 | Miniature GPS receiver RF Front-end | DS4374 |

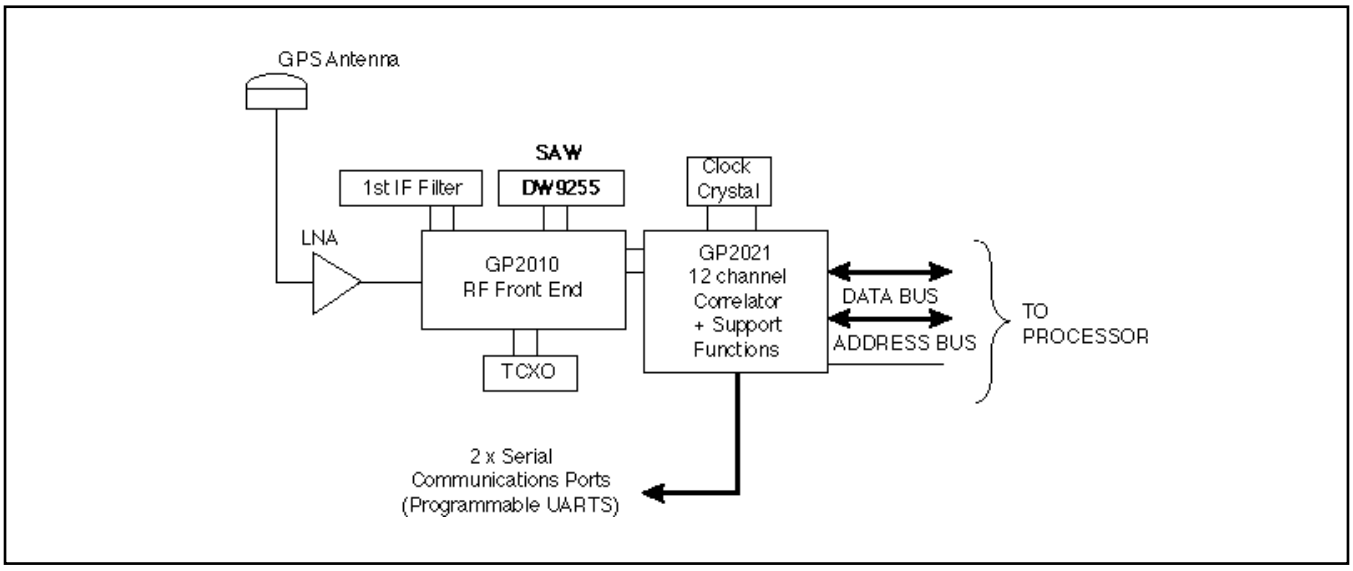



*Fig.2 DW9255 used with GPS chipset*

## ELECTRICAL CHARACTERISTICS (Typ. @ 25°C)

| Parameter | | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Centre Frequency | | - | 35.42 | - | MHz |
| 1dB Bandwidth | | 1.6 | 1.9 | - | MHz |
| Insertion Loss | | 16 | 17 | 18 | dB |
| Amplitude Ripple (34.62 to 36.22MHz) | | - | 0.8 | 1.6 | dB (pk to pk) |
| Relative Attenuation (relative to insertion loss) | <28MHz | 35 | 40 | - | dB |
| | <31MHz | 30 | 35 | - | dB |
| | <33.5MHz | 21 | 25 | - | dB |
| | >37.5MHz | 21 | 25 | - | dB |
| | >40MHz | 25 | 30 | - | dB |
| | >50MHz | 30 | 40 | - | dB |
| | >63MHz | 28 | 35 | - | dB |
| | >73 - 110MHz | 40 | 45 | - | dB |
| Group Delay Ripple (34.62 to 36.22MHz) | | - | 190 | 300 | ns |
| Maximum Group Delay (34.62 to 36.22MHz) | | - | 1.6 | 1.7 | µs |
| Operating Temperature Range | | -40 | - | +85 | °C |

**DW9255 used as 2nd IF filter for GP2010**

| | |
|---|---|
| Centre Frequency | 35.42MHz |
| Pass Band | ±1.0MHz (within ±1.0dB) |
| Insertion loss | 14-18dB |
| 3rd IF Image frequency at 2nd IF | 26.8MHz |
| Source Impedance | 500Ω typical |
| Load Impedance | 1000Ω typical |

The second external IF filter is connected between the output of Stage 2 and input of Stage 3. It is required to define the bandwidth of the RF section of the GPS receiver, hence it is critical to the receiver performance. The filter should be flat across the 2MHz bandwidth of the GPS Coarse-Acquisition (C/A) code signal. It should also have high rejection (greater than 20dB) beyond this bandwidth, and so should have a brick-wall type response at these extremes. The DW9255 SAW filter provides a 1dB Bandwidth of typically 1.9MHz centred on 35.42MHz, with a typical pass band ripple of 0.8dB, when the SAW input and output capacitance is resonantly matched with inductors of optimum value. The out-of-band signal rejection is better than 21dB at ±2.0MHz, and better than 35dB at ±7.5MHz.

The frequency response of the DW9255 SAW filter with matching components is shown in Fig. 3. The matching components used with the GP2010 device are shown in Fig. 4.

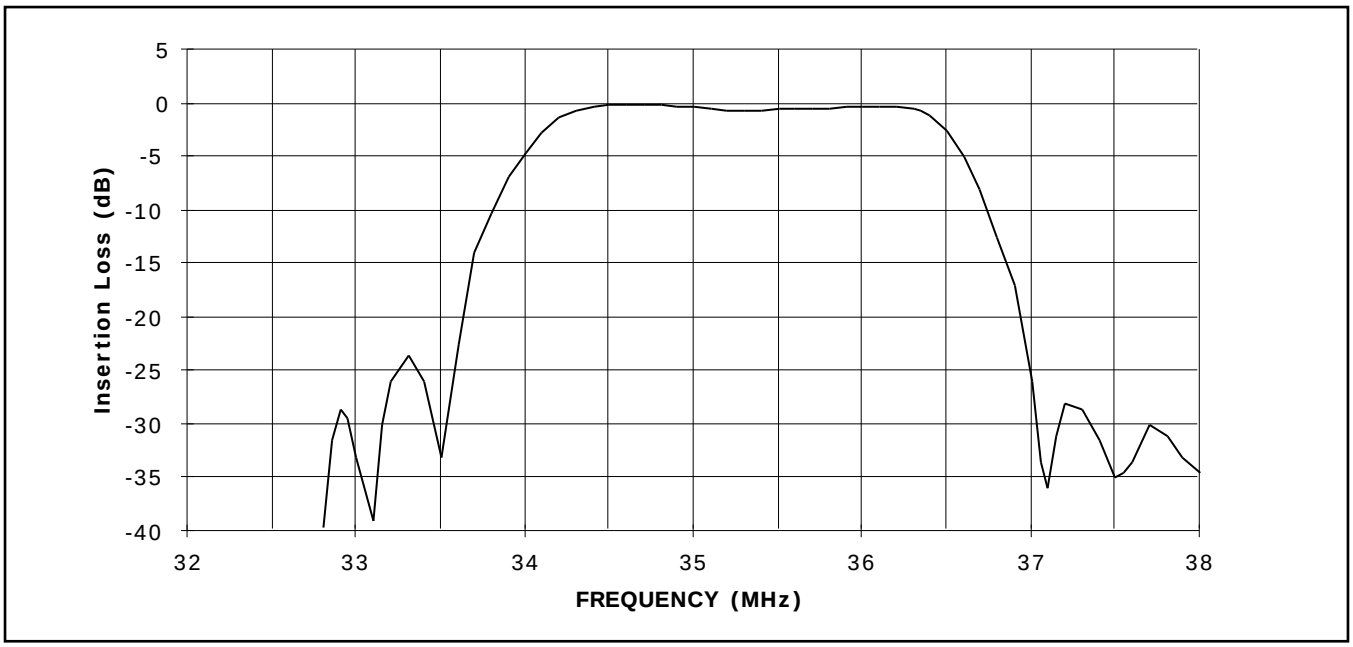



*Fig.3 Typical frequency response of DW9255 SAW filter used as 2nd IF filter*

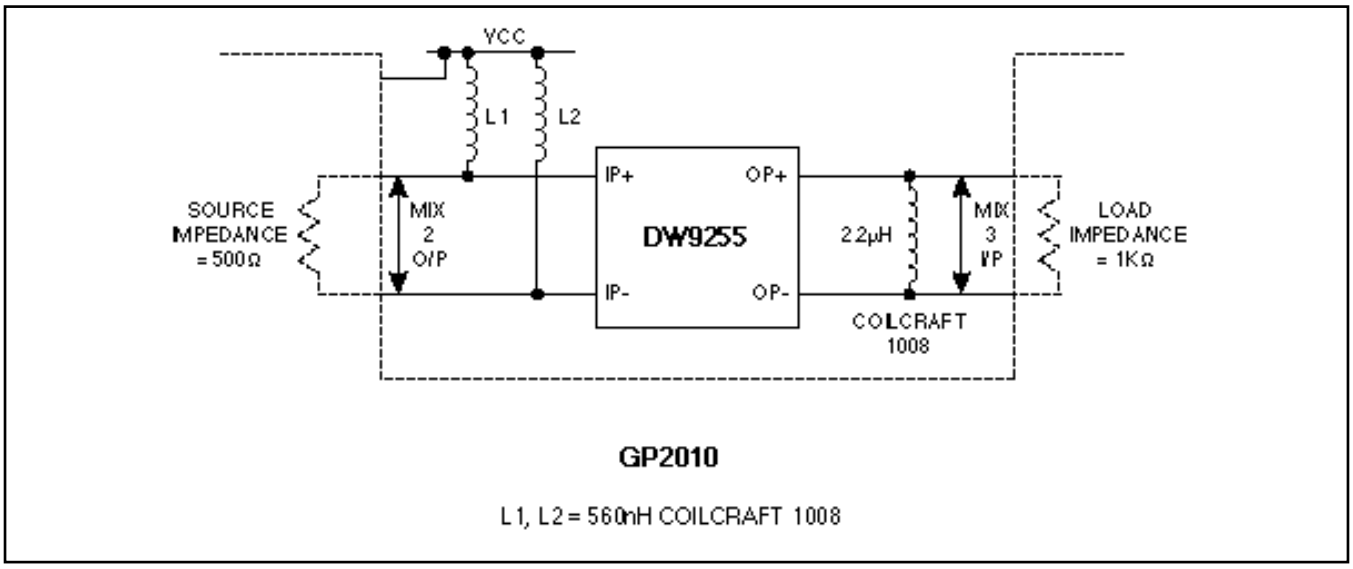



*Fig.4 Typical matching components when used with GP2010 GPS Front-end IC*

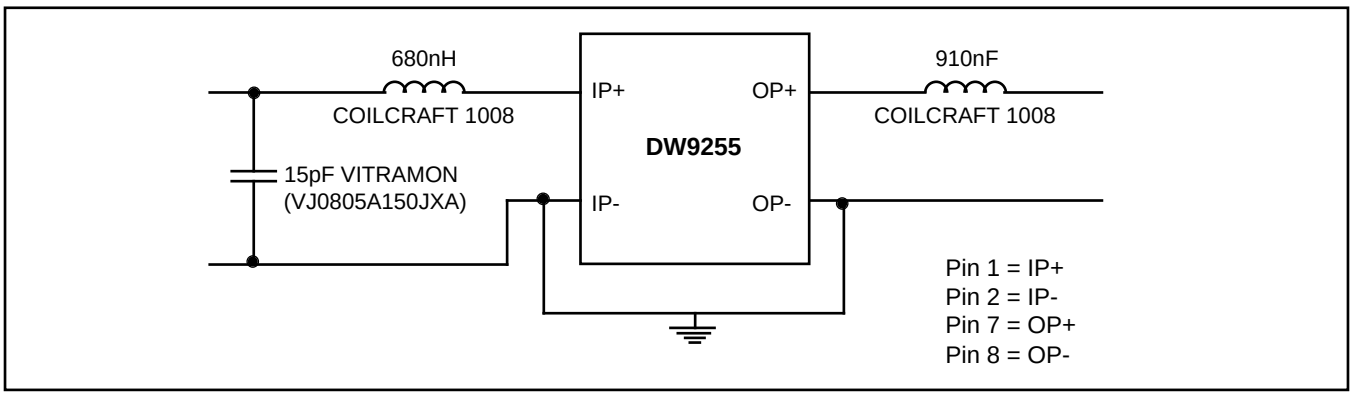
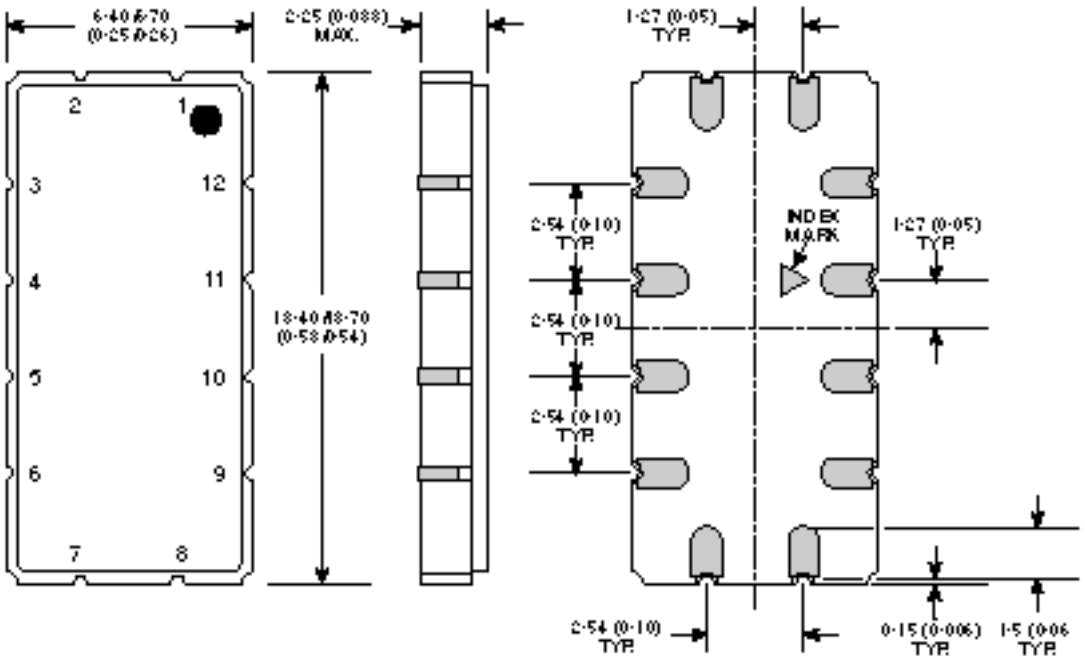



*Fig.5 50Ω Matching network*

## DW9255

## PACKAGE OUTLINE




NOTES
1. Controlling dimensions are millimetres.
2. This package outline diagram is for guidance only. Please contact your GPS Customer Service Centre for further information.

12-PAD LEADLESS CHIP CARRIER (SEAM SEAL) - LCS12/1

GEC PLESSEY
SEMICONDUCTORS


HEADQUARTERS OPERATIONS
**GEC PLESSEY SEMICONDUCTORS**
Cheney Manor, Swindon,
Wiltshire SN2 2QW, United Kingdom.
Tel: (01793) 518000
Fax: (01793) 518411

**GEC PLESSEY SEMICONDUCTORS**
P.O. Box 660017
1500 Green Hills Road,
Scotts Valley, California 95067-0017,
United States of America.
Tel: (408) 438 2900
Fax: (408) 438 5576

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