

# HIGH FREQUENCY MAGNETICS

## T1/E1 Dual Hybrid Transformer Module

TM01125

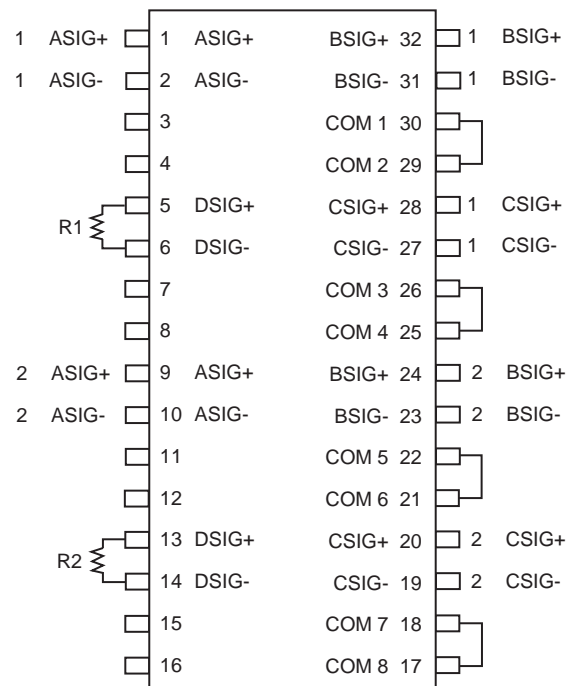
- Optimized for T1/E1 signal splitting with either balanced pair 100Ω or 120Ω lines, or unbalanced 75Ω cable
- Two balanced, equal-ratio 3dB hybrid transformers in one surface mount package
- Excellent signal isolation at split ports B and C
- Meets ITU-T G.703 return loss from -40° to +85° C
- UL 1950 approved: file number E150991
- Operating temperature range -40° to +85°C
- Meets IEC 695, 2-2 flammability requirements
- PWB Process Capability: standard printed wiring board assembly techniques, total-immersion cleaning
- Reliability testing: Shock, vibration, temperature cycling, temperature - humidity - bias
- Interwinding breakdown voltage: 1500 Vrms min

### ELECTRICAL SPECIFICATIONS at 25° C

Part Number	Impedance Ratio Ω	Insertion Loss dB typ	Transhybrid Loss dB typ	Return Loss dB typ
	Port A : Port B + Port C	500 kHz to 5 MHz	500 kHz to 5 MHz	100 kHz to 5 MHz
	ASIG : BSIG + CSIG	ASIG to BSIG ASIG to CSIG	BSIG to CSIG	ASIG
S553-6500-F4	100 : 100 + 100 or 120 : 120 + 120 or 75 : 75 + 75	3.2	55	30

### PIN DIAGRAM AND EXTERNAL CONNECTIONS

S553-6500-F4



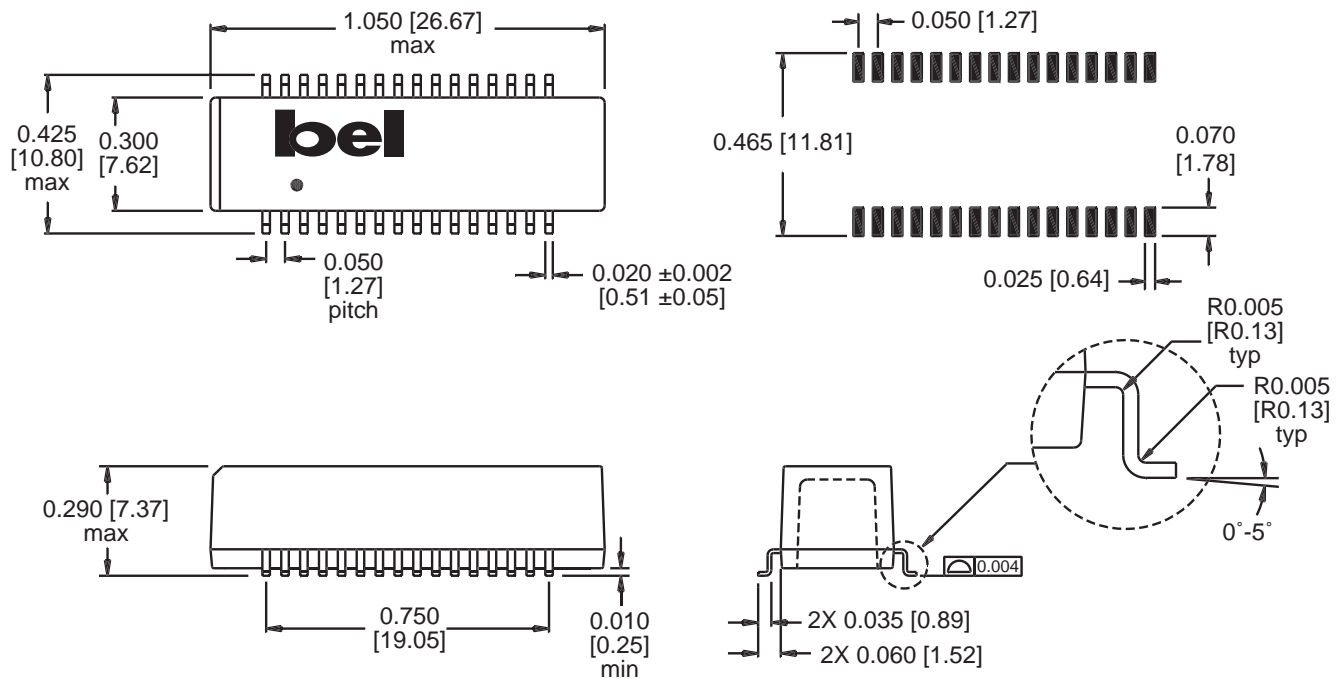
#### Notes

- 1) External resistors R1 and R2 terminate the unused fourth port (DSIG) for each hybrid.
- 2) External connections at COM 1 through COM 8 terminals complete required internal interconnections.
- 3) Resistors R1 and R2 should be set equal to the line impedance.

TM01125

### MECHANICAL

#### S553-6500-F4



Dimensions are in inches [millimeters].  
Standard dimension tolerance is ±0.005 [0.13] unless otherwise noted.

#### Tape and Reel Packaging

44 mm wide by 16 mm pitch; 13 inch OD, 4 inch ID  
400 modules per reel, maximum  
Meets ANSI/EIA 481-2 Carrier Tape Standards - JEDEC SO Package

# HIGH FREQUENCY MAGNETICS

## T1/E1 Dual Hybrid Transformer Module

TM01125

### APPLICATION NOTES

The S553-6500-F4 hybrid transformer module contains two identical balanced hybrid transformers. Each balanced hybrid is arranged in a symmetrical 4-port configuration, which provides low loss for preferred paths and high loss in non-preferred (transhybrid) paths:

Bi-directional Preferred Paths	Bi-directional Non-preferred Paths
Port A to Port B Port A to Port C	Port A to Port D Port B to Port C
Port D to Port B Port D to Port C	

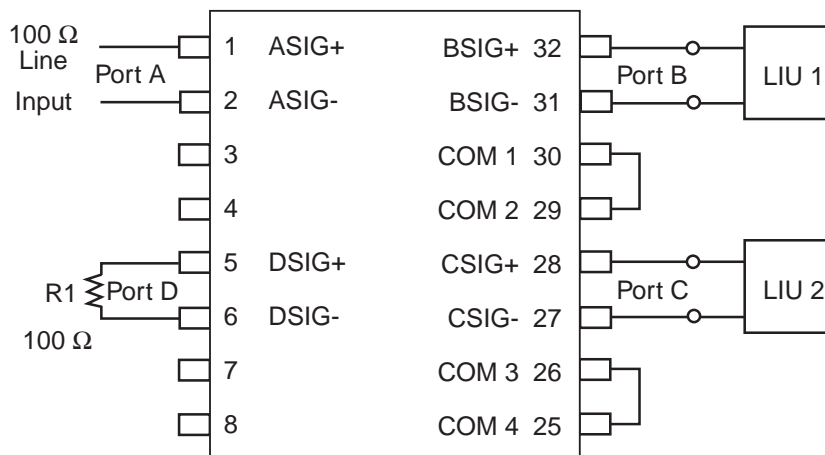
Normally, each hybrid is used as a 3-port device and the fourth port is terminated in a resistor whose value is equal to the line impedance (100 Ω for T1, 75 Ω or 120 Ω for E1). While each hybrid is designed to handle balanced lines, it will also handle a 75 Ω unbalanced line as well. In this case, R1 should be set to 75 Ω and should be left floating as it is for the balanced lines also.

In operation, a signal at Port A is divided equally at Ports B and C with half of its original power appearing at Port B and half at Port C. Signal isolation between splitting Ports B and C is very high at the fundamental T1 and E1 pulse repetition frequencies. In fact, the signal isolation is typically greater than 55 dB from 500 kHz to 5 MHz. This allows equipment connected at one of the splitting ports to be shorted or opened with virtually no effect on the signal at the other port. In the preferred paths, the insertion loss is very low – typically less than 0.2 dB. This value is added to the theoretical half-power or 3 dB value that results from the equal signal split to obtain a total insertion loss of 3.2 dB from input to either output.

A typical signal-splitting application is shown below. A single input signal is applied at the ASIG inputs of Port A and is split equally at the BSIG and CSIG outputs of Ports B and C.

### TYPICAL APPLICATION

Half of S553-6500-F4





TM01125

## HIGH FREQUENCY MAGNETICS

### T1/E1 Dual Hybrid Transformer Module

THIS PAGE INTENTIONALLY LEFT BLANK

©2001 Bel Fuse Inc. Specifications subject to change without notice. 12.01

#### CORPORATE

**Bel Fuse Inc.**  
206 Van Vorst Street  
Jersey City, NJ 07302  
Tel 201-432-0463  
Fax 201-432-9542  
[www.belfuse.com](http://www.belfuse.com)

#### FAR EAST

**Bel Fuse Ltd.**  
8F / 8 Luk Hop Street  
San Po Kong  
Kowloon, Hong Kong  
Tel 852-2328-5515  
Fax 852-2352-3706  
[www.belfuse.com](http://www.belfuse.com)

#### EUROPE

**Bel Fuse Europe Ltd.**  
Preston Technology Management Centre  
Marsh Lane, Suite G7, Preston  
Lancashire, PR1 8UD, U.K.  
Tel 44-1772-556601  
Fax 44-1772-888366  
[www.belfuse.com](http://www.belfuse.com)