

BALANCED TO UNBALNCED

RF Transformer

TC1.33-282+

Mini-Circuits

100 to 75Ω 5 to 2800 MHz

THE BIG DEAL

- Suitable for Tin/Lead and RoHS Solder Systems
- Wideband, 5 to 2800 MHz
- Balanced Transmission Line
- Good Return Loss, 20 dB Typ. at 1 dB Band
- Excellent Amplitude Unbalance, 0.3 dB Typ.
- Aqueous Washable

*Generic photo used for illustration purposes only*

CASE STYLE: AT224-1A

+RoHS Compliant

The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Balanced to Unbalanced Transformation
- Push-Pull Amplifiers
- PCS/DCS
- Cable TV
- Cellular

PRODUCT OVERVIEW

The TC1.33-282+ is a mini wideband tri-filar transformer, measuring approximately 4 mm on all sides. The plastic substrate, 5-pad design is aqueous washable and RoHS compliant, featuring a square core and all welded wire construction for repeatability and reliability in balanced-to-unbalanced 100/75Ω implementations.

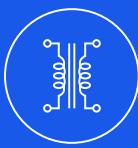
KEY FEATURES

| Feature | Advantages |
|---|--|
| Very Wide Bandwidth | 5-2800 MHz bandwidth useful for CATV (forward & return), medical wireless and D2A/A2D, and communications applications |
| Excellent Amplitude and Phase Unbalance | 0.3 dB amplitude and 6° phase unbalance aid rejection of even harmonics (in push-pull amplifiers) and common mode signals (when used as a balun) |
| Good Return Loss | Efficient signal path across 100/75Ω transitions |
| Low and Flat Insertion Loss | Flatness ± 0.1 dB across 50-1000 MHz CATV bands preserves gain flatness after impedance transformation. |

REV. B
ECO-025303
TC1.33-282+
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ELECTRICAL SPECIFICATIONS AT +25°C, 75Ω

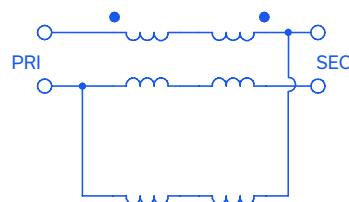
| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-------------------------------------|-----------------|------|------|------|------|
| Impedance Ratio (Secondary/Primary) | | | 1.33 | | |
| Frequency Range | | 5 | | 2800 | MHz |
| Insertion Loss ¹ | 5 - 2800 | | | 3 | |
| | 30 - 2000 | | | 2 | |
| | 50 - 1500 | | | 1 | |
| Phase Unbalance | 50 - 1500 | | | 6 | Deg. |
| | 30 - 2000 | | | 6 | |
| Amplitude Unbalance | 50 - 1500 | | | 0.3 | |
| | 30 - 2000 | | | 1.0 | |

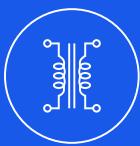
1. Insertion Loss is referenced to mid-band loss, 1.0 dB typ. Measured in 75Ω system.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Ratings |
|-----------------------|-----------------|
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +100°C |
| RF Power | 0.25 mW |
| DC Current | 30 mA |

Permanent damage may occur if any of these limits are exceeded.

CONFIG. K



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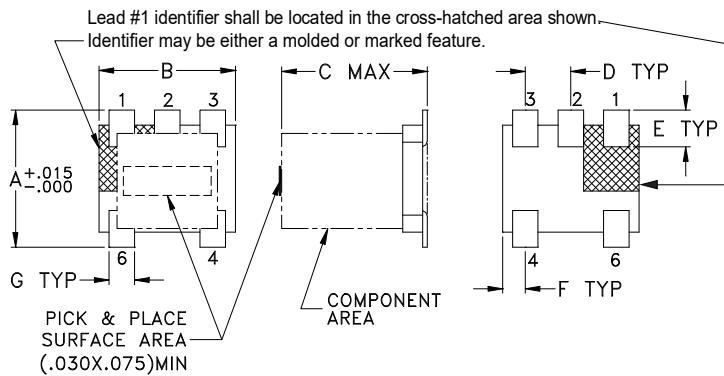
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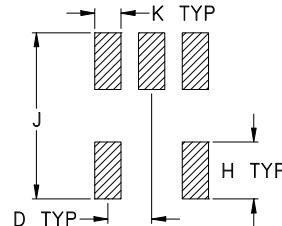
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PIN CONNECTIONS

| Function | Pin Number |
|---------------|------------|
| PRIMARY DOT | 6 |
| PRIMARY | 4 |
| SECONDARY DOT | 1 |
| SECONDARY | 3 |
| NOT USED | 2 |

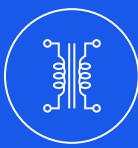
PRODUCT MARKING: N/A**OUTLINE DRAWING**

PCB Land Pattern

Suggested Layout,
Tolerance to be within $\pm .002$ **OUTLINE DIMENSIONS (Inch mm)**

| A | B | C | D | E | F |
|--------------|--------------|--------------|--------------|--------------|---------------|
| .150 3.81 | .150 3.81 | .160 4.06 | .050 1.27 | .040 1.02 | .025 0.64 |
| G | H | J | K | | wt |
| .028 0.71 | .065 1.65 | .190 4.83 | .030 0.76 | | grams 0.15 |

TAPE & REEL INFORMATION: F17



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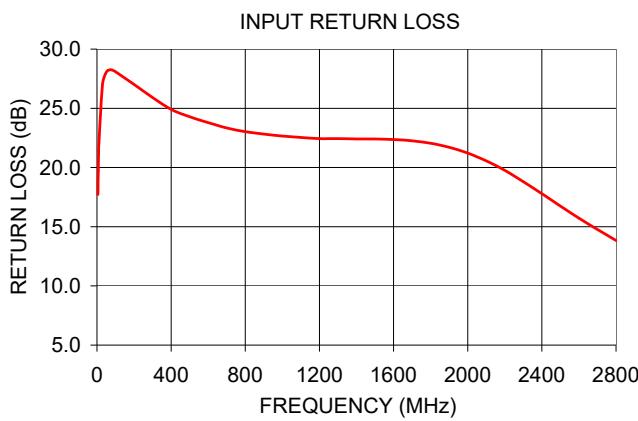
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TYPICAL PERFORMANCE DATA

| FREQUENCY (MHz) | INSERTION LOSS (dB) | INPUT R. LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (Deg.) |
|-----------------|---------------------|--------------------|--------------------------|------------------------|
| 5.00 | 1.48 | 17.72 | 0.38 | 3.28 |
| 10.00 | 1.20 | 21.95 | 0.21 | 2.17 |
| 30.00 | 1.08 | 27.05 | 0.11 | 0.55 |
| 50.00 | 1.08 | 28.04 | 0.09 | 0.06 |
| 100.00 | 1.09 | 28.09 | 0.08 | 1.09 |
| 500.00 | 0.99 | 24.29 | 0.21 | 5.00 |
| 1000.00 | 0.97 | 22.66 | 0.07 | 6.34 |
| 1500.00 | 1.20 | 22.41 | 0.71 | 5.18 |
| 2000.00 | 1.64 | 21.22 | 1.49 | 1.64 |
| 2400.00 | 2.13 | 17.79 | 2.00 | 3.40 |
| 2800.00 | 2.76 | 13.83 | 2.31 | 10.70 |



NOTES

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html