

# Duet™ & Duet+™ Isolation Modules

SMD Dual Port T1/E1 Transformers



US Patent Numbers:  
5,656,985 6,297,721 B1  
6,297,720 B1 6,320,489 B1  
6,344,785 B1 6,662,431 B1

## Product Features:

- DUET and DUET+ Telecom Transformers
- UL/EN60950 & DEMKO Recognized
- 100% Electrical Testing
- 1500Vrms Hi-Pot
- Patented Open Frame Construction

| DUET™         |         |                 |            |              |               |              |                    |           |
|---------------|---------|-----------------|------------|--------------|---------------|--------------|--------------------|-----------|
| Part Number   | Circuit | Turns Ratio ±2% |            | Primary Pins |               | Cw/w<br>(pF) | PRI LL<br>(μH max) | RoHS¹     |
|               |         | TX              | RX         | TX           | RX            |              |                    |           |
| TG08-1505NZLF | A       | 1CT:2CT         | 1CT:2CT    | 1-3 & 7-9    | 4-6 & 10-12   | 35           | 0.5                | Pb-Free   |
| TG08-1505NZRL | A       | 1CT:2CT         | 1CT:2CT    | 1-3 & 7-9    | 4-6 & 10-12   | 35           | 0.5                | RoHS (7a) |
| TG25-1505NZLF | A       | 1CT:1.26CT      | 1CT:1.26CT | 1-3 & 7-9    | 4-6 & 10-12   | 35           | 0.5                | Pb-Free   |
| TG25-1505NZRL | A       | 1CT:1.26CT      | 1CT:1.26CT | 1-3 & 7-9    | 4-6 & 10-12   | 35           | 0.5                | RoHS (7a) |
| TG26-1505NZLF | A       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG26-1505NZRL | A       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG27-S004NZLF | A       | 1CT:1.36CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG27-S004NZRL | A       | 1CT:1.36CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG28-1505NZLF | A       | 1CT:1.36CT      | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG28-1505NZRL | A       | 1CT:1.36CT      | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG37-S002NZLF | A       | 1CT:1.14CT      | 1CT:1.14CT | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG37-S002NZRL | A       | 1CT:1.14CT      | 1CT:1.14CT | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG38-1505NZLF | A       | 1CT:1.15CT      | 1CT:1.15CT | 1-3 & 10-12  | 4-6 & 7-9     | 35           | 0.5                | Pb-Free   |
| TG38-1505NZRL | A       | 1CT:1.15CT      | 1CT:1.15CT | 1-3 & 10-12  | 4-6 & 7-9     | 35           | 0.5                | RoHS (7a) |
| TG42-1505NZLF | A       | 1CT:1.41CT      | 1CT:1.41CT | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG42-1505NZRL | A       | 1CT:1.41CT      | 1CT:1.41CT | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG63-1505NZLF | A       | 1CT:1.15CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG63-1505NZRL | A       | 1CT:1.15CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG63-S002NZLF | A       | 1CT:1.15CT      | 1CT:2CT    | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | Pb-Free   |
| TG63-S002NZRL | A       | 1CT:2CT         | 1CT:1.15CT | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | RoHS (7a) |
| TG74-1505NZLF | A       | 1CT:2CT         | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb- Free  |
| TG74-1505NZRL | A       | 1CT:2CT         | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a) |
| TG91-1505NZLF | A       | 1CT:2.4CT       | 1CT:1CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free   |
| TG91-1505NZRL | A       | 1CT:2.4CT       | 1CT:1CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a) |

For additional information contact your [local representative](#), or HALO's support staff at (650) 903-3800 or [info@haloelectronics.com](mailto:info@haloelectronics.com)

# Duet™ & Duet+™ Transformers

SMD Dual Port T1/E1 Modules



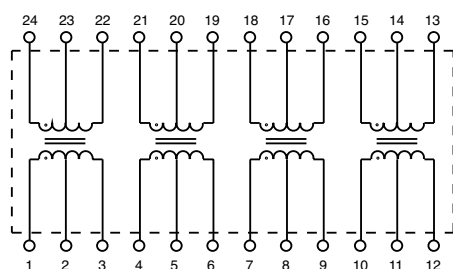
| DUET+™        |         |                 |            |              |               |              |                    |                   |
|---------------|---------|-----------------|------------|--------------|---------------|--------------|--------------------|-------------------|
| Part Number   | Circuit | Turns Ratio ±2% |            | Primary Pins |               | Cw/w<br>(pF) | PRI LL<br>(μH max) | RoHS <sup>1</sup> |
|               |         | TX              | RX         | TX           | RX            |              |                    |                   |
| TG36-1505NZLF | B       | 1CT:1.15CT      | 1CT:1.15CT | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | Pb-Free           |
| TG36-1505NZRL | B       | 1CT:1.15CT      | 1CT:1.15CT | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | RoHS (7a)         |
| TG43-1505NZLF | C       | 1CT:1.41CT      | 1CT:1.41CT | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free           |
| TG43-1505NZRL | C       | 1CT:1.41CT      | 1CT:1.41CT | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TG48-1505NZLF | B       | 1CT:2CT         | 1CT:2CT    | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | Pb-Free           |
| TG48-1505NZRL | B       | 1CT:2CT         | 1CT:2CT    | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | RoHS (7a)         |
| TG75-1505NZLF | B       | 1CT:2CT         | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free           |
| TG75-1505NZRL | B       | 1CT:2CT         | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TG85-1505NZLF | C       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 4-6 & 7-9     | 35           | 0.5                | Pb-Free           |
| TG85-1505NZRL | C       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 4-6 & 7-9     | 35           | 0.5                | RoHS (7a)         |
| TG85-S002NZLF | C       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free           |
| TG85-S002NZRL | C       | 1CT:2CT         | 1CT:2CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TG93-1505NZLF | B       | 1CT:2.42CT      | 1CT:2.42CT | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | Pb-Free           |
| TG93-1505NZRL | B       | 1CT:2.42CT      | 1CT:2.42CT | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | RoHS (7a)         |
| TG97-1505NZLF | B       | 1CT:1.36CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free           |
| TG97-1505NZRL | B       | 1CT:1.36CT      | 1CT:2CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TG98-1505NZLF | B       | 1CT:1.36CT      | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | Pb-Free           |
| TG98-1505NZRL | B       | 1CT:1.36CT      | 1CT:1CT    | 4-6 & 10-12  | 24-22 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TGSP-S225NZLF | C       | 1CT:2.4CT       | 1CT:1CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | Pb-Free           |
| TGSP-S225NZRL | C       | 1CT:2.4CT       | 1CT:1CT    | 1-3 & 10-12  | 21-19 & 18-16 | 35           | 0.5                | RoHS (7a)         |
| TGSP-S281NZLF | B       | 1CT:1.15CT      | 1CT:2CT    | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | Pb-Free           |
| TGSP-S281NZRL | B       | 1CT:1.15CT      | 1CT:2CT    | 4-6 & 10-12  | 1-3 & 7-9     | 35           | 0.5                | RoHS (7a)         |

Notes:

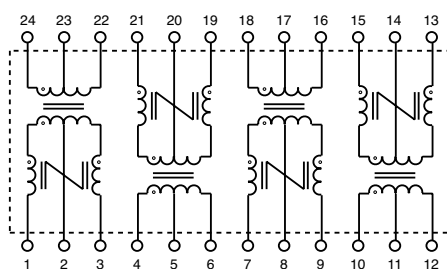
1. Pb-Free parts are RoHS 6/6 compliant. RoHS (7a) parts contain lead per exemption 7a which is set to expire in July 2016.
2. Parts with RL suffix are not recommended for new designs.
3. Contact the factory or your local representative for individual datasheet or additional information.

# HALO DUET™ and DUET™ Telecom Transformers

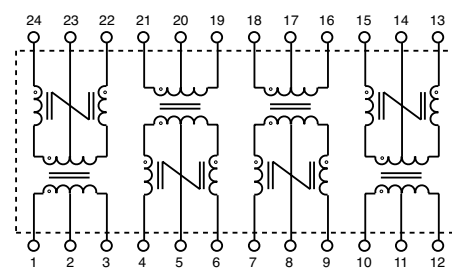
Circuit A



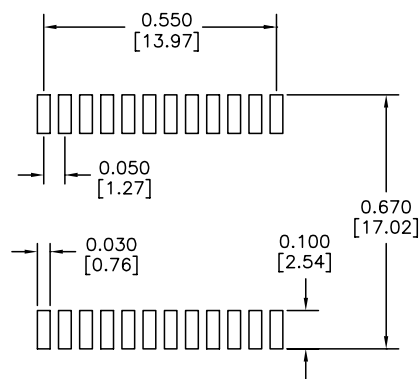
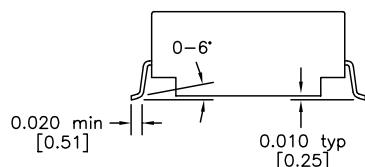
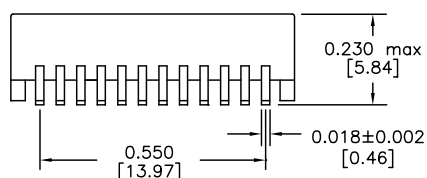
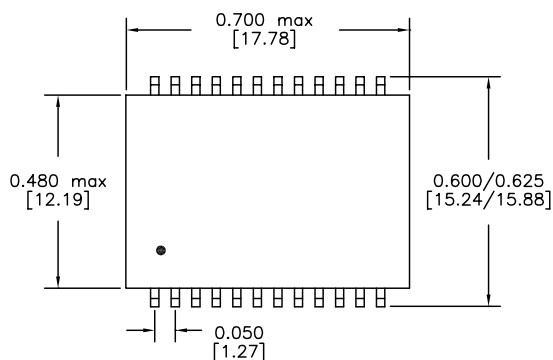
Circuit B



Circuit C



## NZ Package



Recommended Solder Pad Dimensions

Co-Planarity: 0.004 [0.10]

Dimensions: inch [mm]

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[TG28-1505NZLF](#) [TG28-1505NZLFTR](#) [TG36-1505NZLF](#) [TG36-1505NZLFTR](#) [TG38-1505NZLF](#) [TG38-1505NZLFTR](#)  
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