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# BTL-0012SMG-1

## Miniature Surface-Mount Bias-Tee

## DEVICE OVERVIEW

### General Description

The BTL-0012SMG is a packaged bias tee featuring excellent insertion loss and superior isolations over a broad 500 kHz to 12 GHz bandwidth. Tight fabrication tolerances allow for low unit to unit variation enabling accurate simulations using the provided s3p file taken from measured production units. The bias tee is available in a compact package and is suitable for applications such as amplifier biasing, diode biasing and DC level shifting.


Download s-parameters here

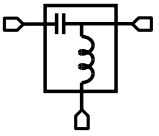
### Features

- Frequency Range: 500 kHz to 12 GHz
- Frequency Range with External Coil: 5 kHz to 12 GHz
- 1 Watt RF Power Handling
- DC Current 500 mA
- Miniature Surface Mount Package
- Lead Free Assembly
- Reflow Solderable

### Applications

- Test and Measurement Equipment

### Functional Block Diagram



### Part Ordering Options

| Part Number | Description | Package | Green Status | Product Lifecycle | Export Classification |
|---|---|---|---|---|---|
| BTL-0012SMG-1 | Miniature Surface-Mount Bias-Tee | SMG | RoHS REACH | Released | EAR99 |
| BTL-0012SMG-2 | Miniature Surface-Mount Bias-Tee | SMG | RoHS REACH | Released | EAR99 |
| EVAL-BTL-0012 | Evaluation Board, Miniature 0.0005 - 12 GHz Bias-Tee | EVAL | REACH RoHS | Released | EAR99 |

## Table Of Contents

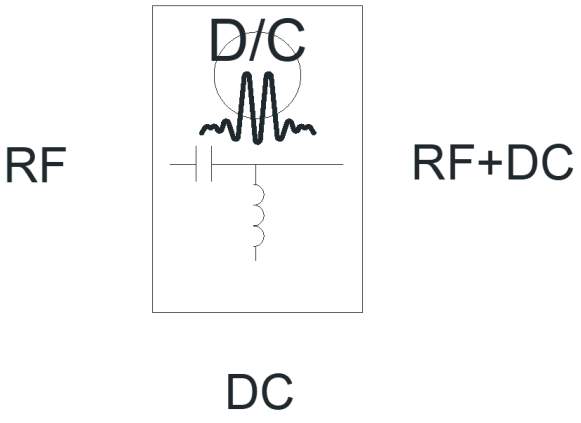

- **Device Overview**
  - General Description
  - Features
  - Applications
  - Functional Block Diagram
- **Port Configuration and Functions**
  - Port Diagram
  - Port Functions
- **Revision History**
- **Specifications**
  - Absolute Maximum Ratings
  - Package Information
  - Electrical Specifications
  - Typical Performance Plots
  - Typical Performance vs Bias Current at Low Frequencies Plots
- **Mechanical Data**
  - Outline Drawing
- **Footprint Image**
- **Evaluation Board**


## Revision History

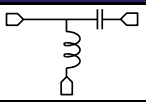
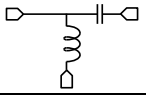
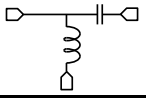
| Revision Code | Revision Date | Comment |
|---|---|---|
| - | 2021-01-01 | Datasheet Initial Release |
| A | 2025-06-26 | ESD rating |

## Port Configuration and Functions

### Port Diagram




## Port Functions

| Port | Function | Description | DC Equivalent Circuit |
|---|---|---|---|
| Common | RF+DC | This port is DC blocked to the RF port and DC connected to the DC port through an internal RF choke. |  |
| DC | DC | This port is internally connected to an RF choke which is DC connected to the RF+DC port and DC blocked to the RF port. |  |
| RF | RF | This port is internally DC blocked to the RF+DC and DC ports. |  |

## Specifications

### Absolute Maximum Ratings

| Parameter | Maximum Rating | Unit |
|---|---|---|
| DC Current | 0.5 | A |
| DC Voltage | 30 | V |
| Maximum Storage Temperature | 125 | °C |
| Minimum Storage Temperature | -65 | °C |
| RF Power Handling | 1 | W |
| Minimum Operating Temperature | -55 | °C |
| Maximum Operating Temperature | 100 | °C |

### Package Information

| Parameter | Details | Rating |
|---|---|---|
| ESD | 250 to < 500 Volts | HBM Class 1A |
| Dimensions | - | 3.81 x 5.59 mm |
| Moisture Sensitivity Level | - | MSL 1 |

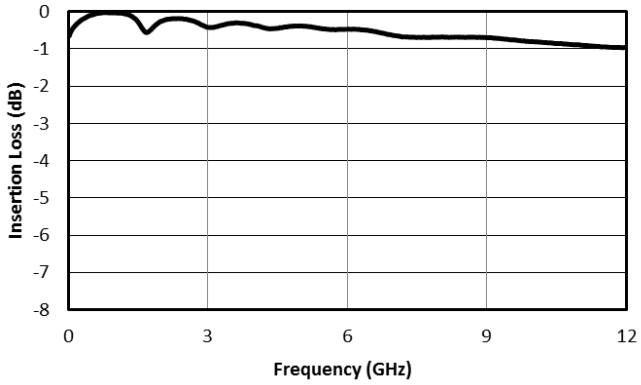
## Electrical Specifications

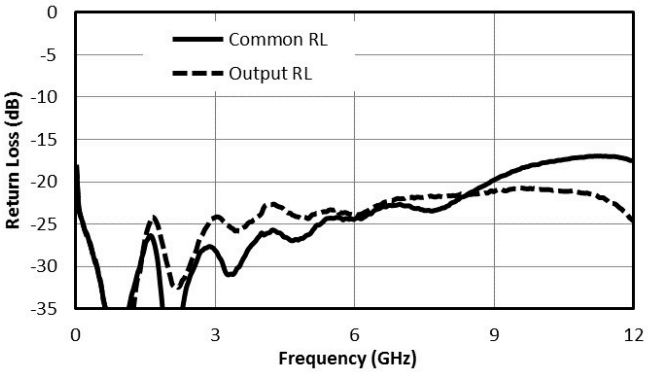
Specifications guaranteed at +25C, measured in a 50-Ohm system

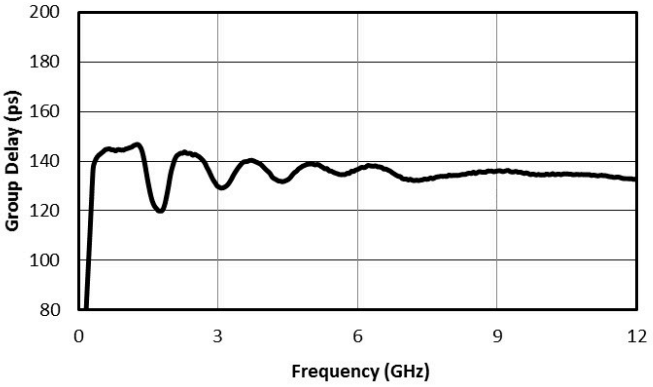
| Parameter | Test Conditions | Minimum Frequency (GHz) | Maximum Frequency (GHz) | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Capacitance | - | 0.0005 | 12 | - | 1 | - | µF |
| DC Port Isolation | - | 0.0005 | 12 | - | 35 | - | dB |
| DC Resistance | - | 0.0005 | 12 | - | 1.5 | - | Ω |
| Inductance | - | 0.0005 | 12 | - | 17 | - | µH |
| Insertion Loss | - | 0.005 | 12 | - | 0.5 | 1.5 | dB |
| Insertion Loss | - | 0.0005 | 0.005 | - | 1 | 6 | dB |

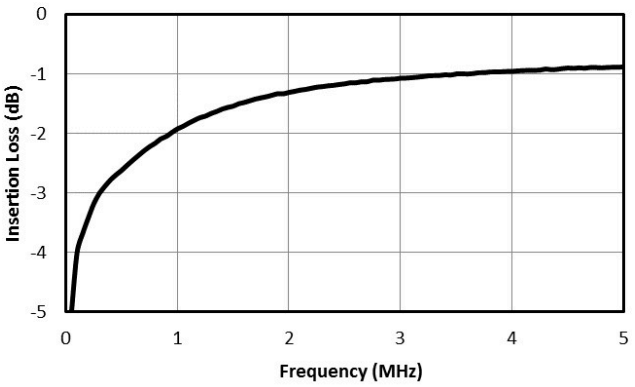
## Typical Performance Plots

Insertion Loss data was taken with de-embedding of connectors and traces. Return loss and group delay data include fixture effects.

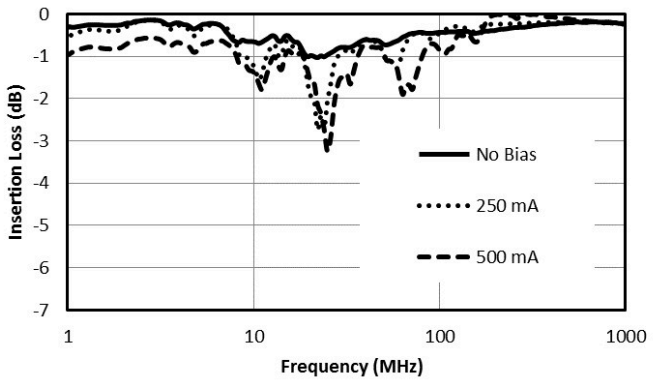


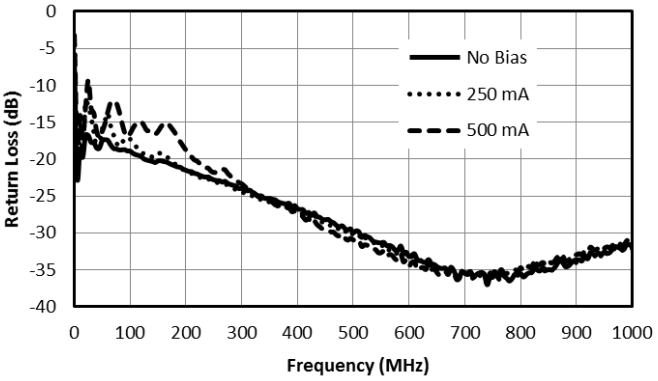



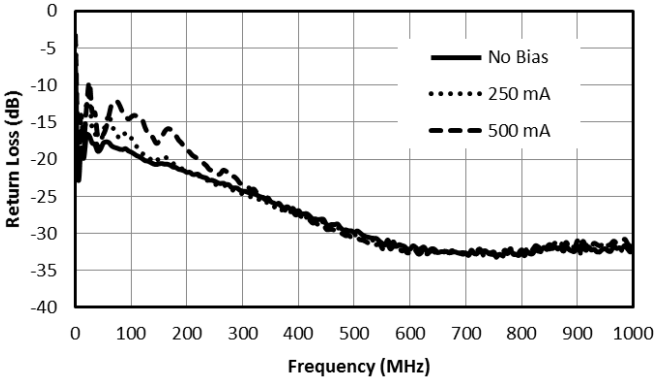



## Typical Performance vs Bias Current at Low Frequencies Plots



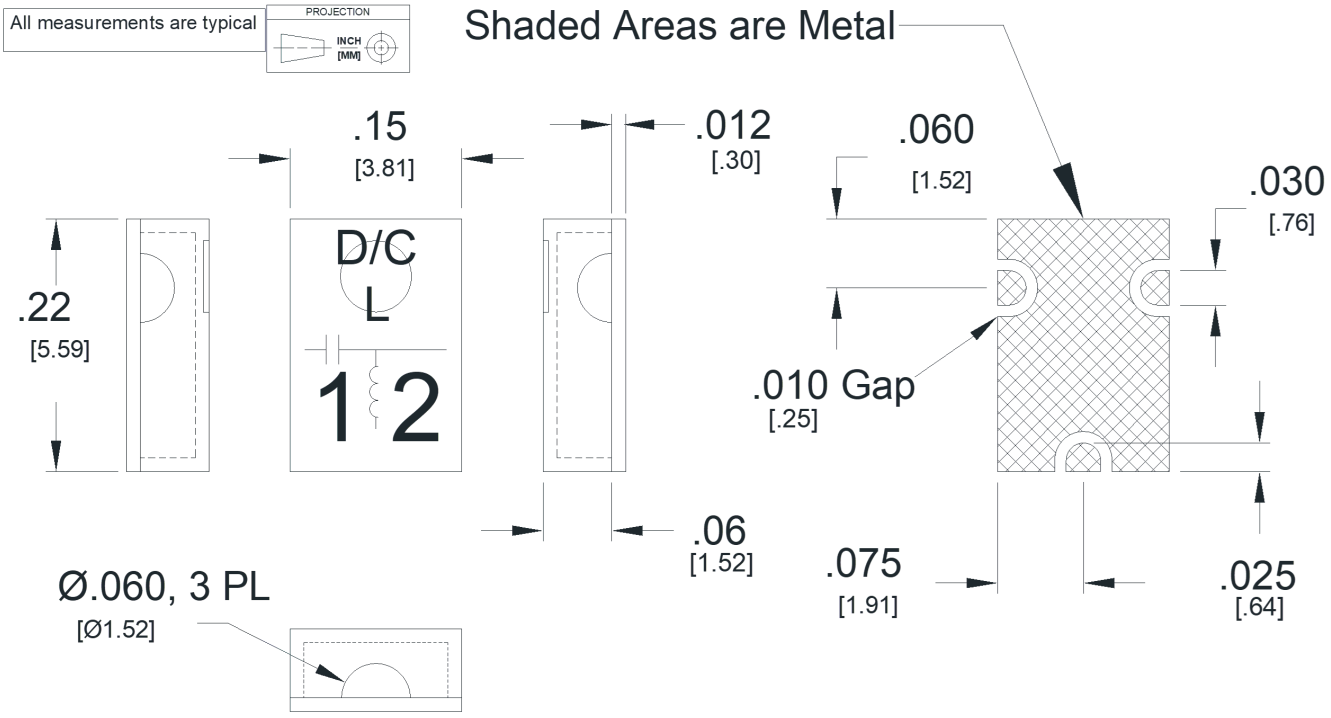



## Mechanical Data

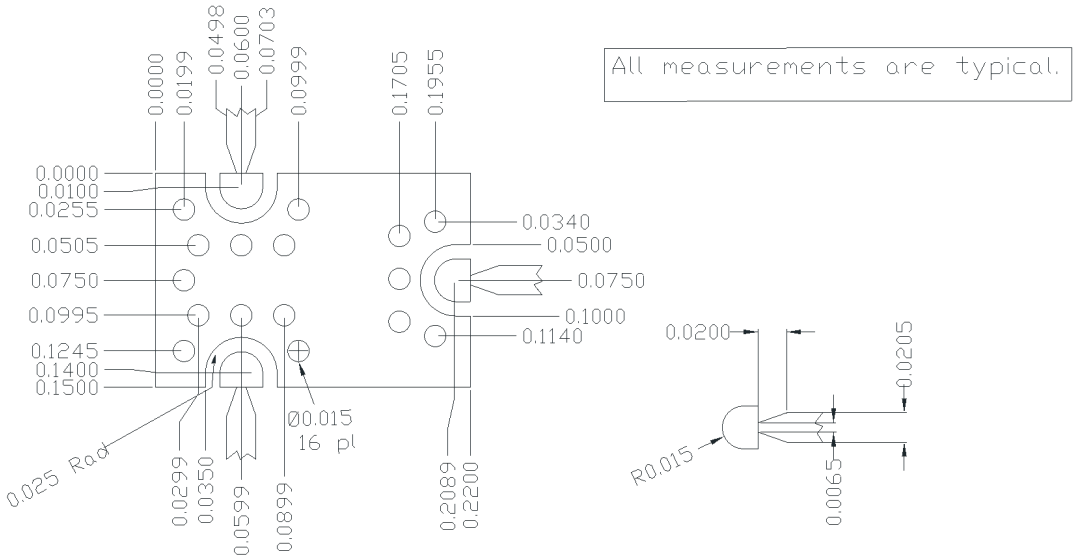
### Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



## Footprint Image

Download : Footprint Drawing



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