

# Multilayer Balun Transformers

For 2.4GHz W-LAN/Bluetooth

## HHM Series

Type:            **HHM1517 (2.0×1.25×0.95mm)**  
                     **HHM1520 (2.0×1.25×0.95mm)**  
                     **HHM1521 (2.0×1.25×0.95mm)**  
                     **HHM1541E1 (2.0×1.25×0.95mm)**

Issue date:     December 2010

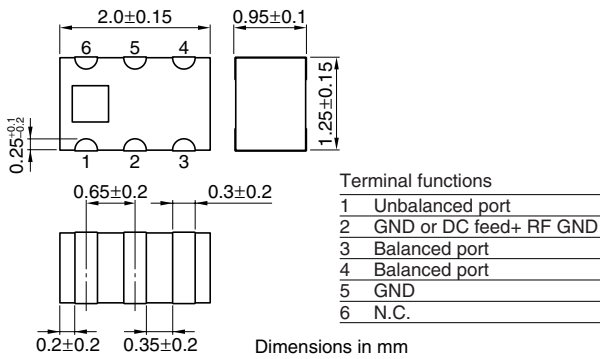
- All specifications are subject to change without notice.
  - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
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# Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

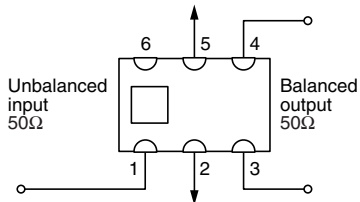
Conformity to RoHS Directive

HHM Series HHM1517

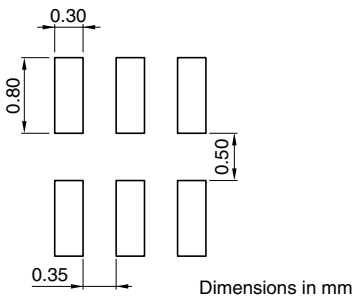
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	50Ω
Frequency range	2400 to 2500MHz
Unbalanced port return loss	10dB min.
Phase imbalance at balanced port	180±10deg.
Amplitude imbalance at balanced port	0±2.0dB
Insertion loss	1.2dB max.
Temperature range	Operating -40 to +85°C
	Storage -40 to +85°C
Packaging style and quantities	2000pieces/reel

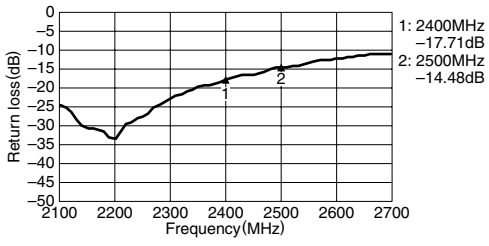
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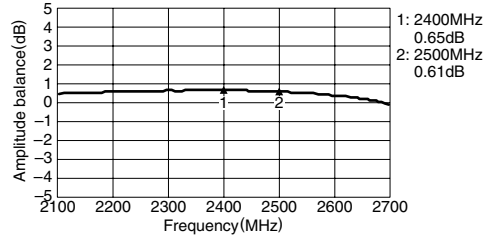
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

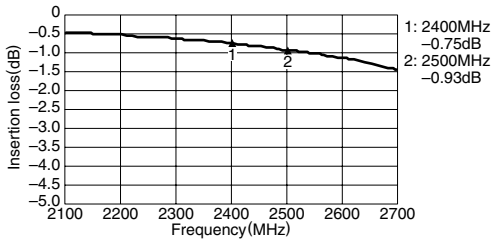
#### RETURN LOSS



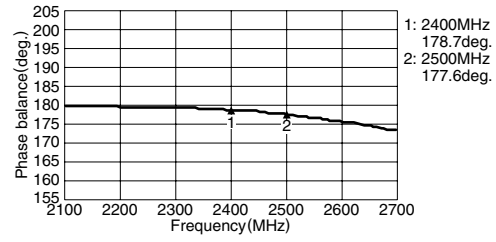
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE

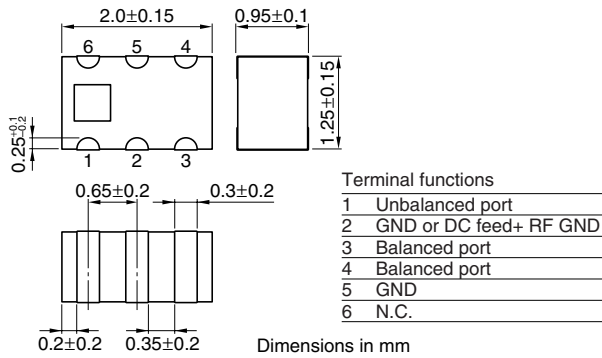


# Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

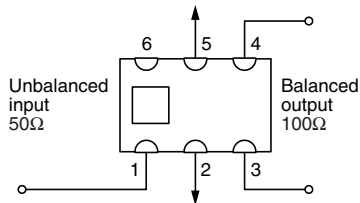
Conformity to RoHS Directive

HHM Series HHM1520

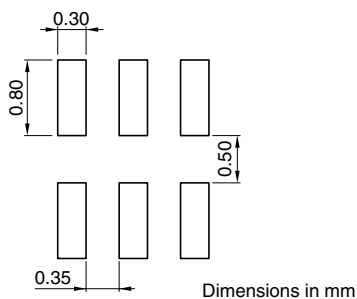
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	100Ω
Frequency range	2400 to 2500MHz
Unbalanced port return loss	10dB min.
Phase imbalance at balanced port	180±10deg.
Amplitude imbalance at balanced port	0±2.0dB
Insertion loss	1.0dB max.
Temperature range	Operating -40 to +85°C
	Storage -40 to +85°C
Packaging style and quantities	2000pieces/reel

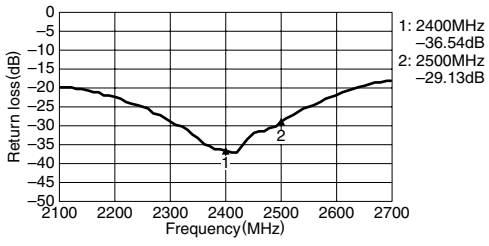
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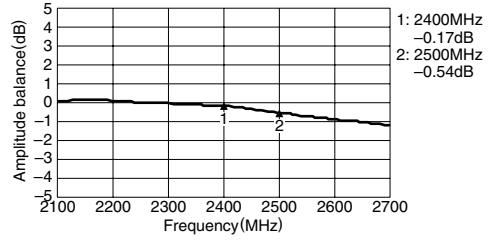
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 100Ω

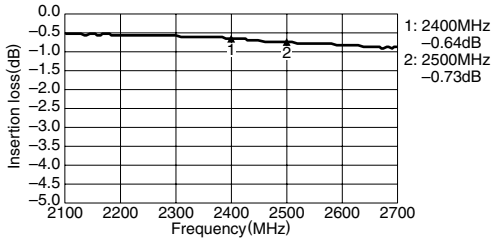
#### RETURN LOSS



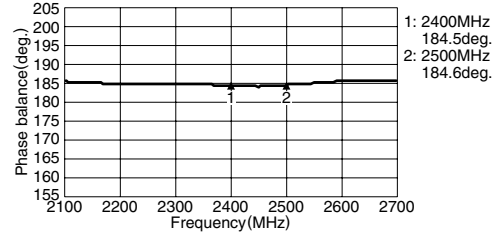
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE

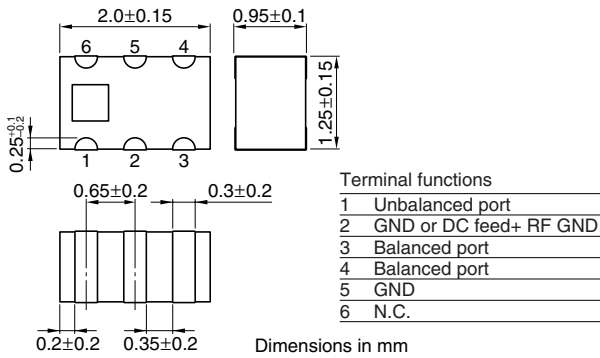


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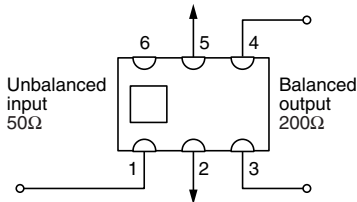
Conformity to RoHS Directive

HHM Series HHM1521

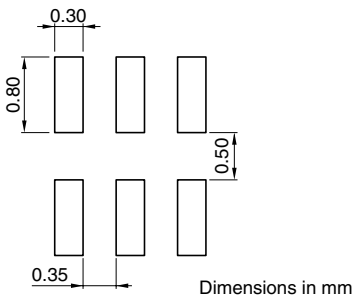
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	200Ω
Frequency range	2400 to 2500MHz
Unbalanced port return loss	10dB min.
Phase imbalance at balanced port	180±10deg.
Amplitude imbalance at balanced port	0±2.0dB
Insertion loss	1.0dB max.
Temperature range	Operating -40 to +85°C
	Storage -40 to +85°C
Packaging style and quantities	2000pieces/reel

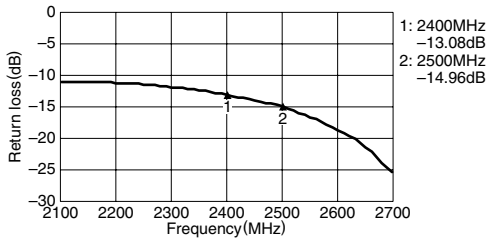
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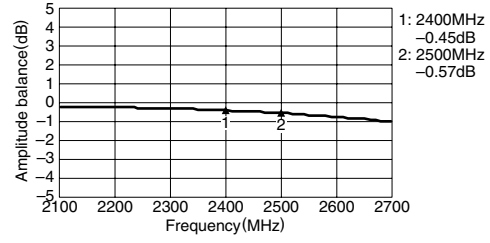
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 200Ω

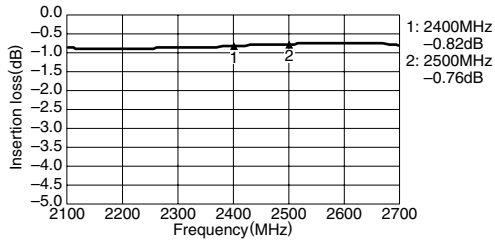
#### RETURN LOSS



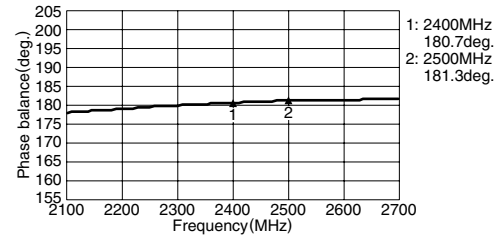
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE



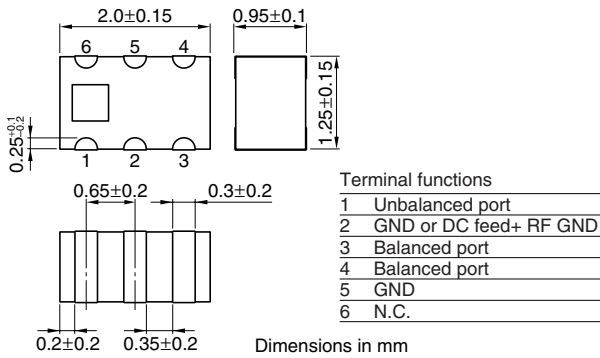
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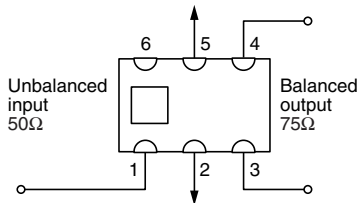
Conformity to RoHS Directive

HHM Series HHM1541E1

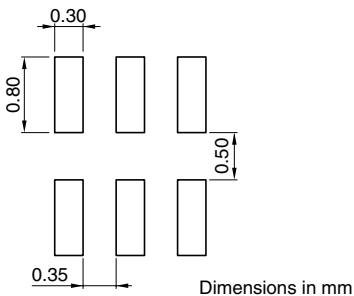
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	75Ω
Frequency range	2400 to 2500MHz
Unbalanced port return loss	10dB min.
Phase imbalance at balanced port	180±10deg.
Amplitude imbalance at balanced port	0±1.5dB
Insertion loss	1.0dB max.
Temperature range	Operating -40 to +85°C
	Storage -40 to +85°C
Packaging style and quantities	2000pieces/reel

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

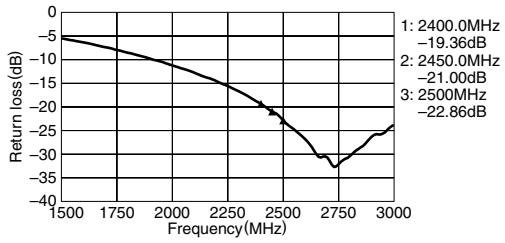
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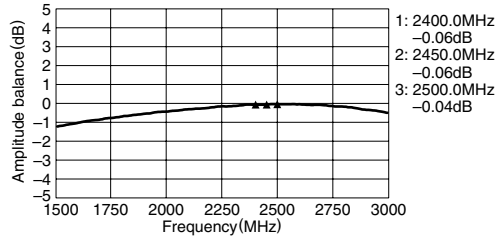
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 75Ω

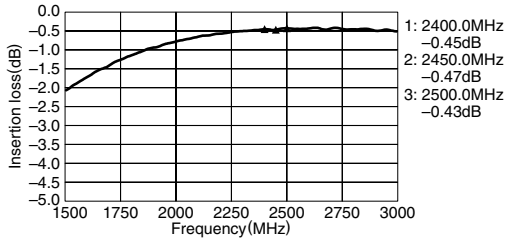
#### RETURN LOSS



#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE

