

# Multilayer Balun Transformers

For WiMAX

## HHM Series

Type:            **HHM1710J1 (1.6×0.8×0.6mm)**  
                     **HHM1711E1 (1.6×0.8×0.6mm)**  
                     **HHM1727D1 (1.6×0.8×0.6mm)**  
                     **HHM1715E1 (1.6×0.8×0.6mm)**

Issue date:     December 2010

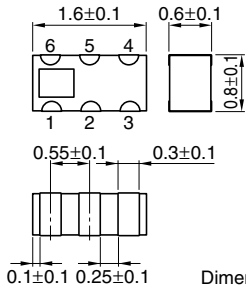
- All specifications are subject to change without notice.
  - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.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

Conformity to RoHS Directive

## HHM Series HHM1710J1

### SHAPES AND DIMENSIONS

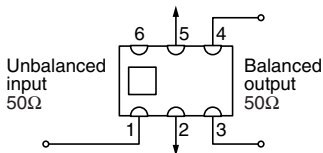


#### Terminal functions

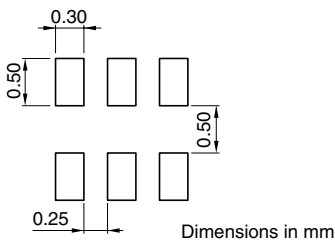
1	Unbalanced port
2	GND or DC feed+ RF GND
3	Balanced port
4	Balanced port
5	GND
6	N.C.

Dimensions in mm

### CIRCUIT DIAGRAM



### RECOMMENDED PC BOARD PATTERNS



Dimensions in mm

### ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω	
Balanced impedance	50Ω	
Frequency range	2300 to 2700MHz	
Unbalanced port return loss	10dB min.	
Phase imbalance at balanced port	180±10deg.	
Amplitude imbalance at balanced port	0±1.5dB	
Insertion loss	1.2dB max.	
Attenuation	[800 to 960MHz]	6dB min.
	[1700 to 1900MHz]	1dB min.
	[1900 to 1980MHz]	1dB min.
Power capacity	0.5W max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C
Packaging style and quantities	4000pieces/reel	

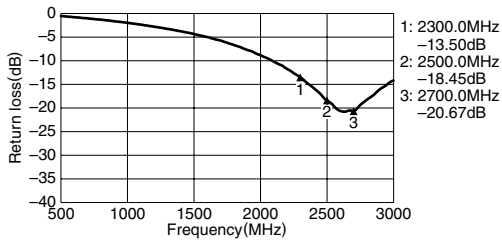
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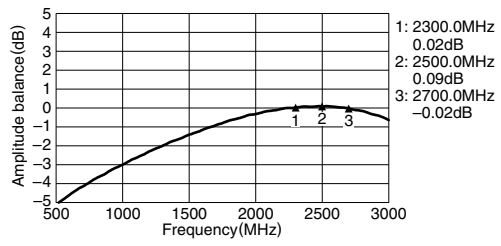
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

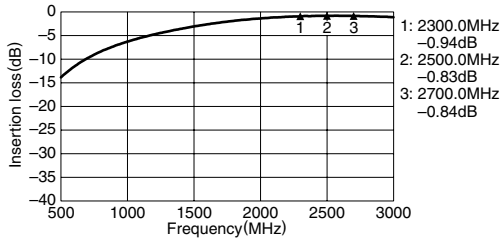
#### RETURN LOSS



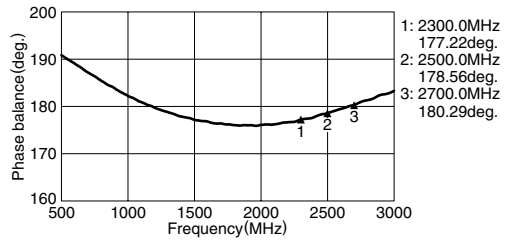
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE

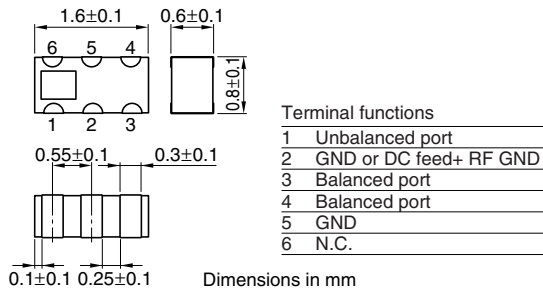


# Multilayer Chip Baluns For WiMAX

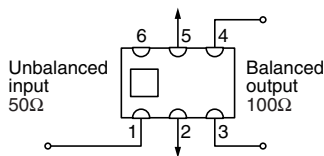
Conformity to RoHS Directive

HHM Series HHM1711E1

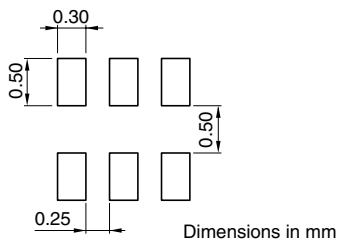
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω	
Balanced impedance	100Ω	
Frequency range	2300 to 2700MHz	
Unbalanced port return loss	10dB min.	
Phase imbalance at balanced port	180±12deg.	
Amplitude imbalance at balanced port	0±1.5dB	
Insertion loss	1.2dB max.	
Power capacity	0.5W max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C
Packaging style and quantities	4000pieces/reel	

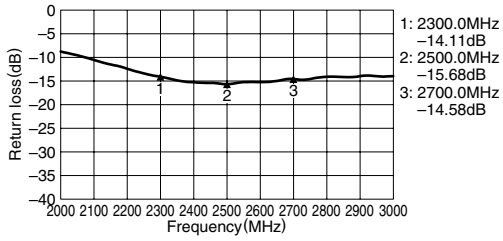
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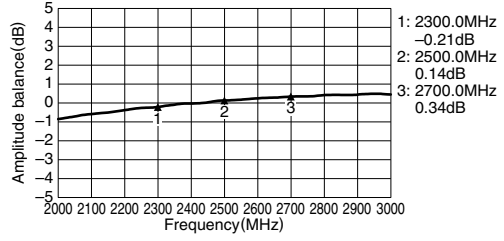
### FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 100Ω

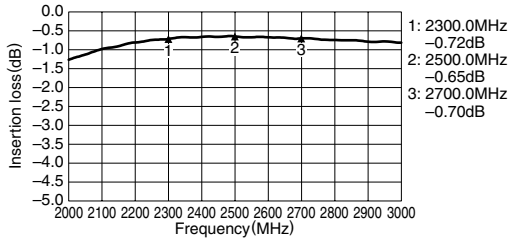
#### RETURN LOSS



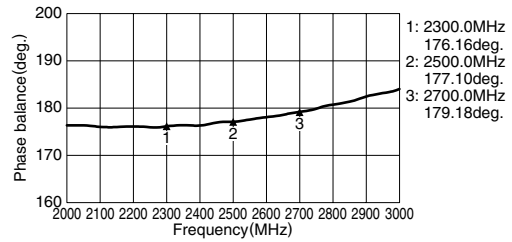
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE



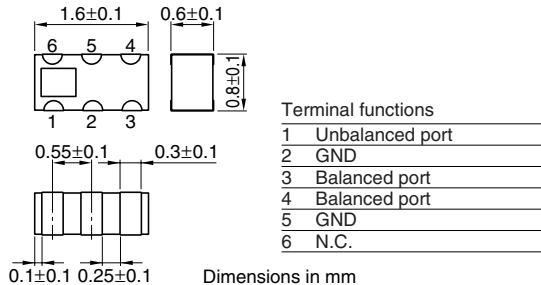
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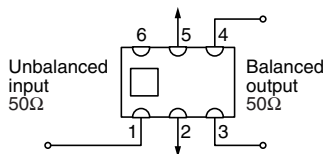
Conformity to RoHS Directive

HHM Series HHM1727D1

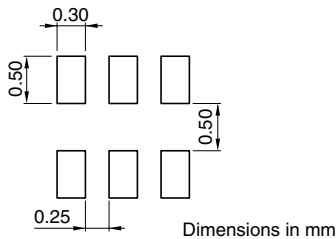
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance		50Ω
Balanced impedance		50Ω
Frequency range		3300 to 3900MHz
Unbalanced port return loss		10dB min.
Phase imbalance at balanced port		180±15deg.
Amplitude imbalance at balanced port		0±1.5dB
Insertion loss		1.2dB
Attenuation	[800 to 960MHz]	11dB min.
	[1700 to 1900MHz]	4dB min.
	[1900 to 1980MHz]	3.5dB min.(4dB typ.)
Power capacity		0.5W max.
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C
Packaging style and quantities		4000pieces/reel

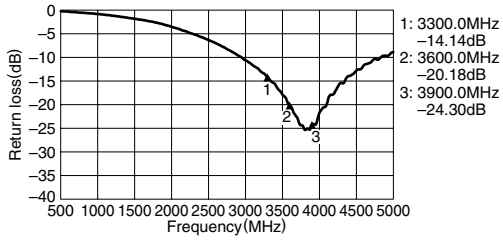
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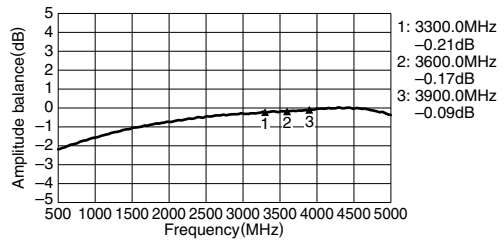
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Unbalance 50Ω/Balance 50Ω

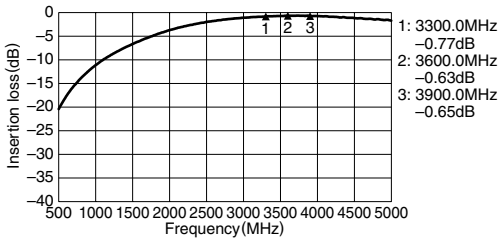
#### RETURN LOSS



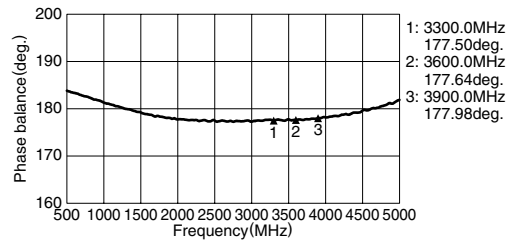
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE



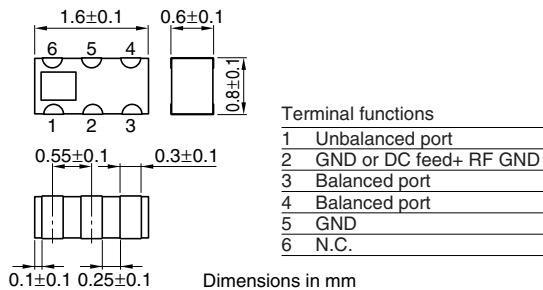
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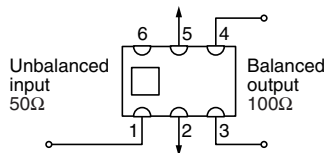
Conformity to RoHS Directive

HHM Series HHM1715E1

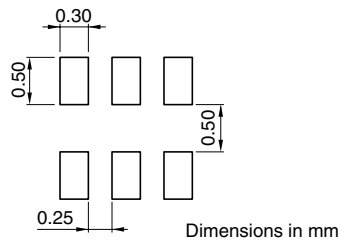
## SHAPES AND DIMENSIONS



## CIRCUIT DIAGRAM



## RECOMMENDED PC BOARD PATTERNS



## ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	100Ω
Frequency range	3300 to 3900MHz
Unbalanced port return loss	10dB min.
Phase imbalance at balanced port	180±15deg.
Amplitude imbalance at balanced port	0±1.2dB
Insertion loss	1.0dB max.
Power capacity	0.5W max.
Temperature range	Operating -40 to +85°C
	Storage -40 to +85°C
Packaging style and quantities	4000pieces/reel

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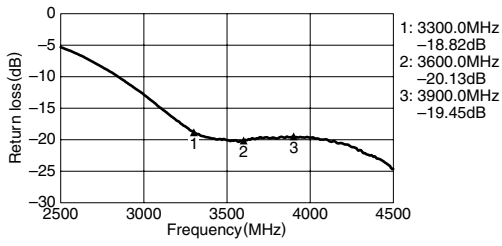
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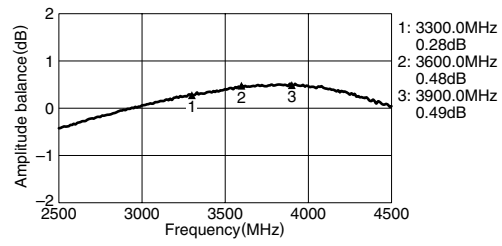
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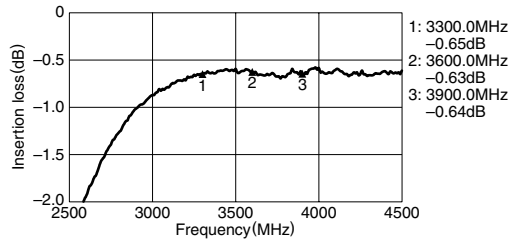
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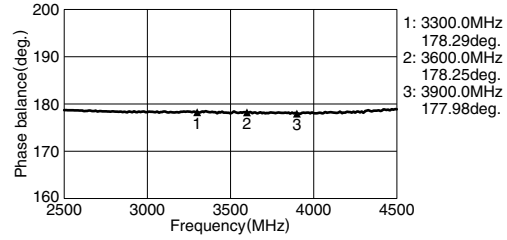
#### AMPLITUDE BALANCE



#### INSERTION LOSS



#### PHASE BALANCE



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