

Multilayer Balun Transformers

For 2.4GHz W-LAN/Bluetooth

HHM Series

Type: **HHM1710D1 (1.6×0.8×0.6mm)**
 HHM1711D1 (1.6×0.8×0.6mm)
 HHM1712D1 (1.6×0.8×0.6mm)
 HHM1713E2 (1.6×0.8×0.6mm)

Issue date: December 2010

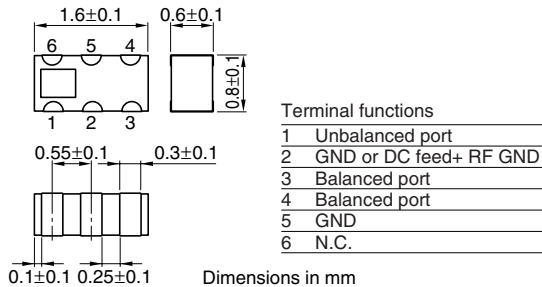
- All specifications are subject to change without notice.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

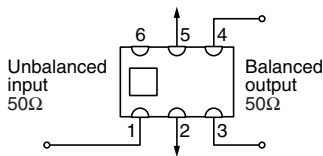
Conformity to RoHS Directive

HHM Series HHM1710D1

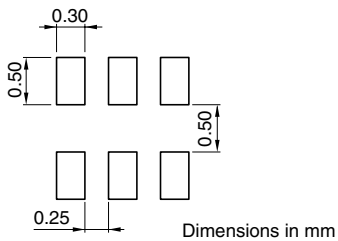
SHAPES AND DIMENSIONS



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	4000pieces/reel

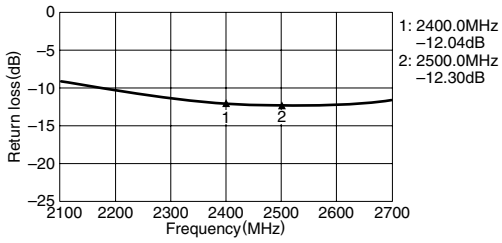
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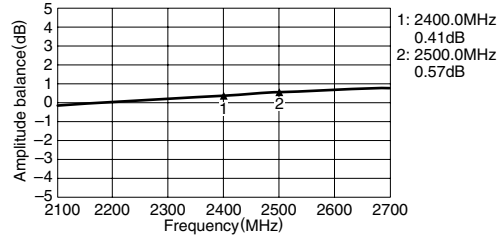
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

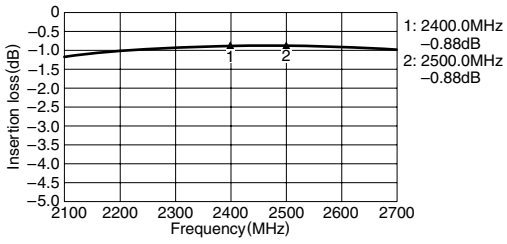
RETURN LOSS



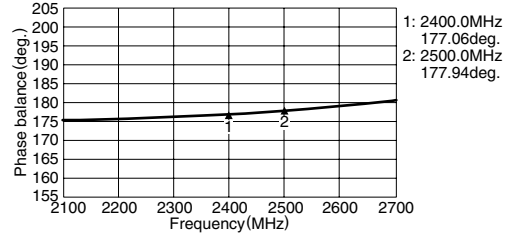
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



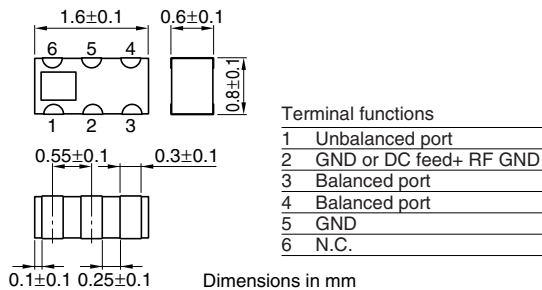
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Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

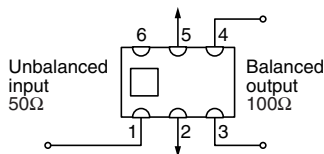
Conformity to RoHS Directive

HHM Series HHM1711D1

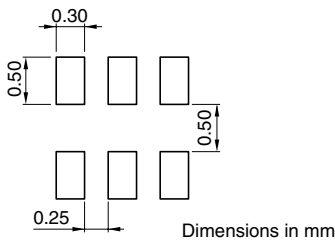
SHAPES AND DIMENSIONS



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	1.2dB max.
Temperature range	Operating: -40 to +85°C Storage: -40 to +85°C
Packaging style and quantities	4000pieces/reel

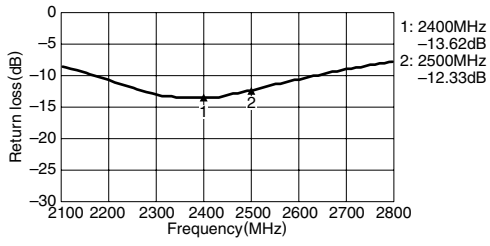
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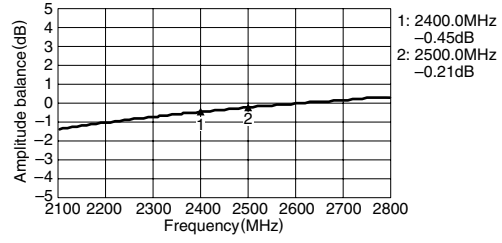
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 100Ω

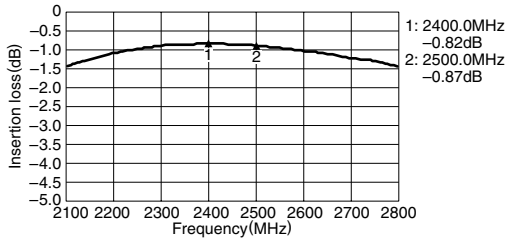
RETURN LOSS



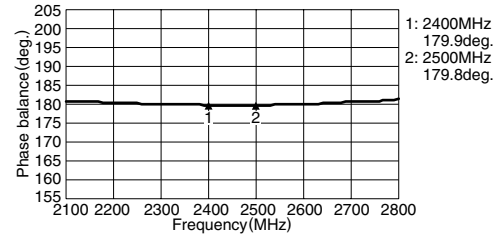
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



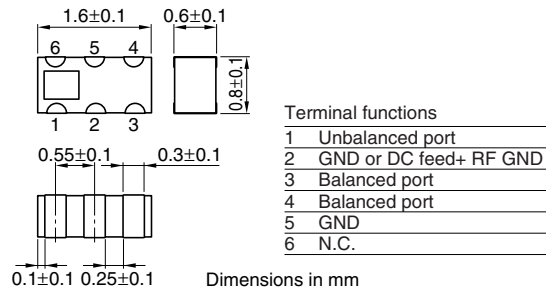
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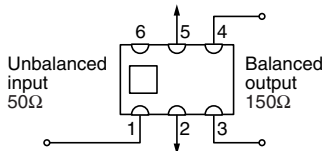
Conformity to RoHS Directive

HHM Series HHM1712D1

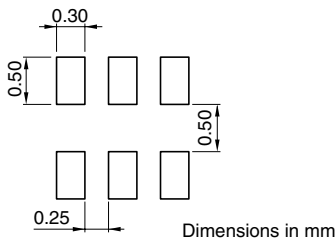
SHAPES AND DIMENSIONS



CIRCUIT DIAGRAM



RECOMMENDED PC BOARD PATTERNS



ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω
Balanced impedance	150Ω
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	4000pieces/reel

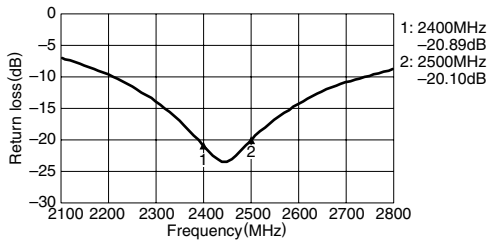
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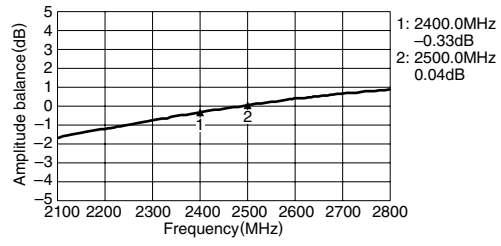
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 150Ω

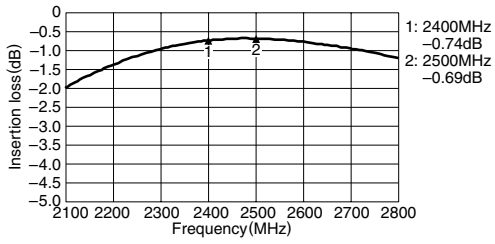
RETURN LOSS



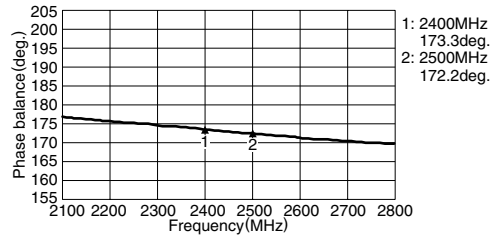
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



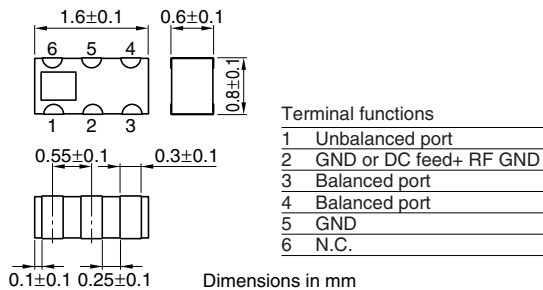
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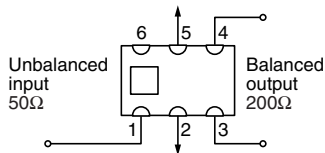
Conformity to RoHS Directive

HHM Series HHM1713E2

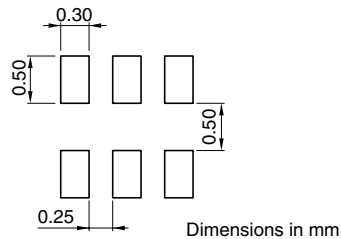
SHAPES AND DIMENSIONS



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±1.7dB	
Insertion loss	1.2dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C
Packaging style and quantities	4000pieces/reel	

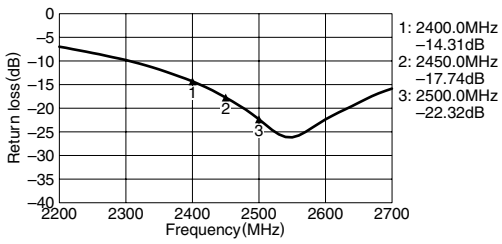
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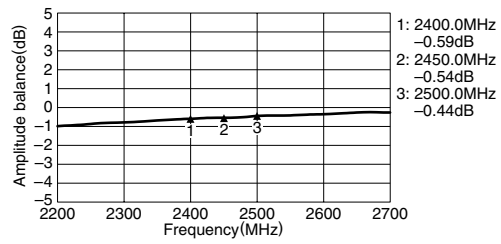
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 200Ω

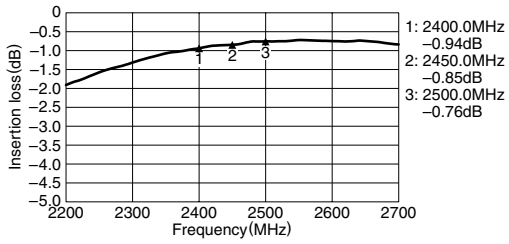
RETURN LOSS



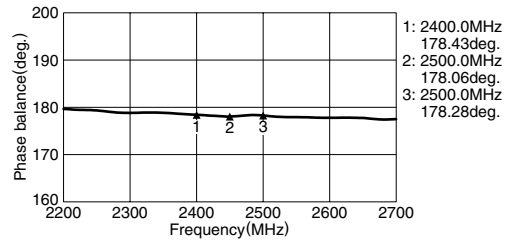
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