

Multilayer Balun Transformers

For 2.4GHz W-LAN/Bluetooth

HHM Series

Type: **HHM1904C1 (1.0×0.5×0.4mm max.)**
 HHM1902A1 (1.0×0.5×0.5mm max.)
 HHM1902B1 (1.0×0.5×0.5mm max.)
 HHM1903A1 (1.0×0.5×0.5mm max.)
 HHM1904A1 (1.0×0.5×0.5mm max.)
 HHM1907B1 (1.0×0.5×0.5mm max.)
 HHM1908A1 (1.0×0.5×0.5mm max.)

Issue date: December 2010

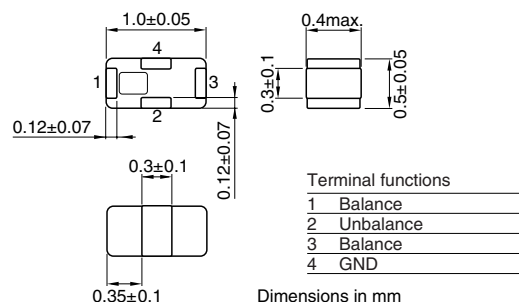
- All specifications are subject to change without notice.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

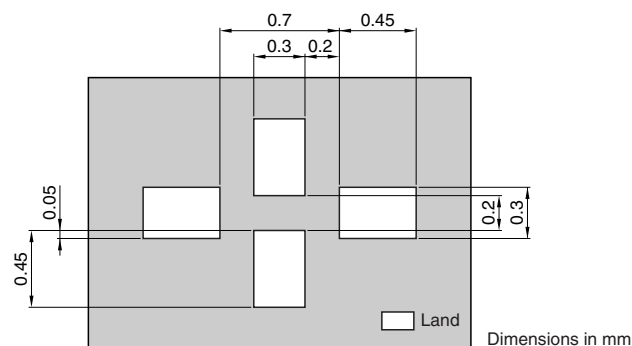
Conformity to RoHS Directive

HHM Series HHM1904C1

SHAPES AND DIMENSIONS



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±2.0dB	
Insertion loss	1.0dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

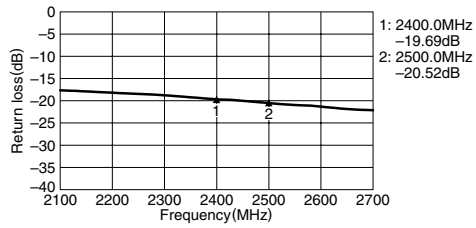
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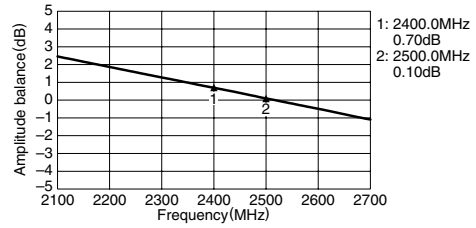
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 75Ω

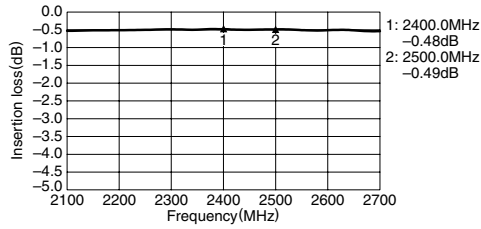
RETURN LOSS



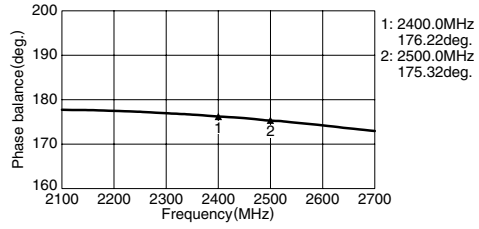
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



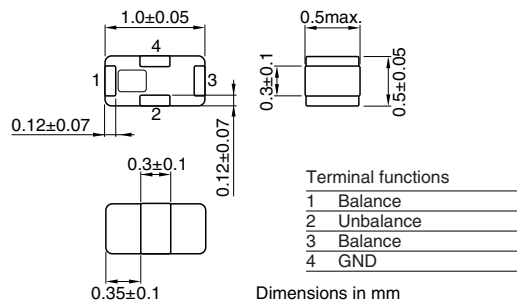
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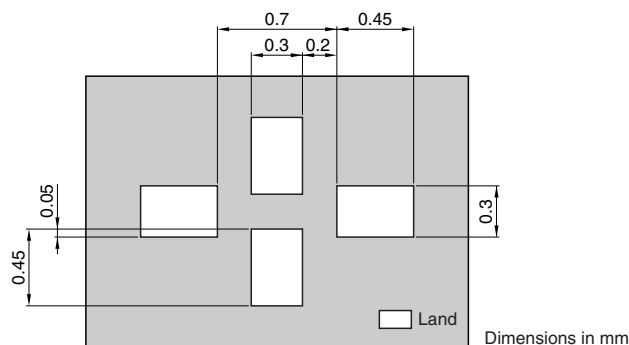
Conformity to RoHS Directive

HHM Series HHM1902A1

SHAPES AND DIMENSIONS



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	1.0dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

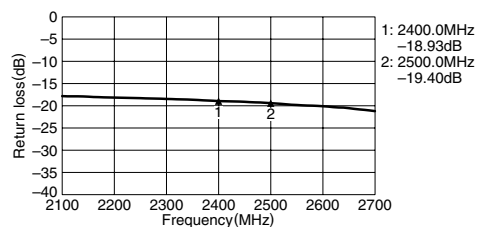
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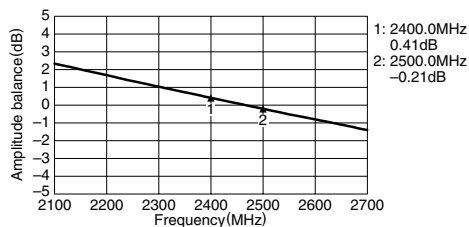
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

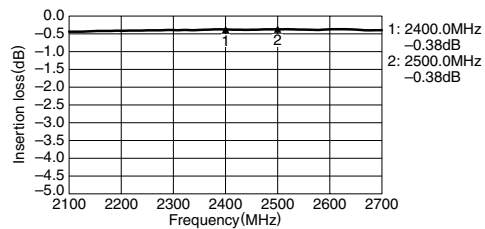
RETURN LOSS



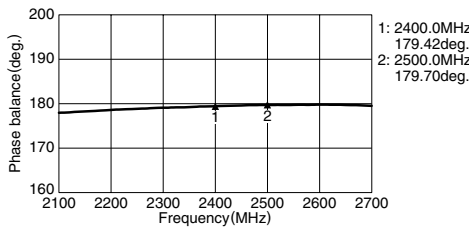
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



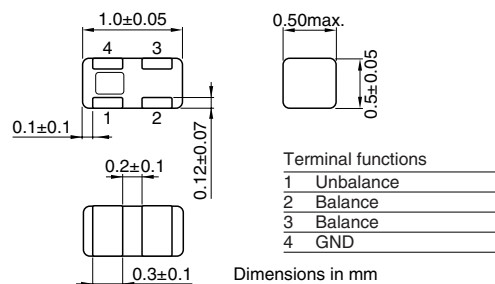
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Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

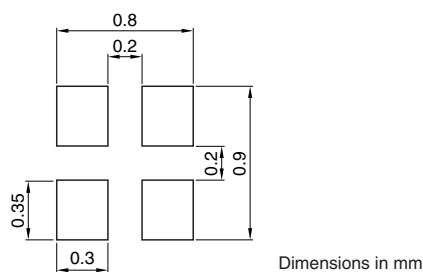
Conformity to RoHS Directive

HHM Series HHM1902B1

SHAPES AND DIMENSIONS



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	0.8dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

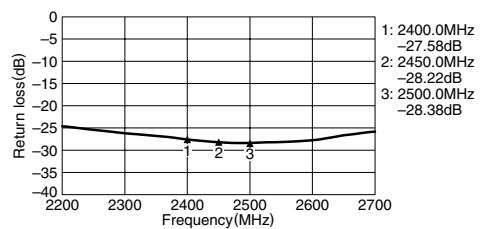
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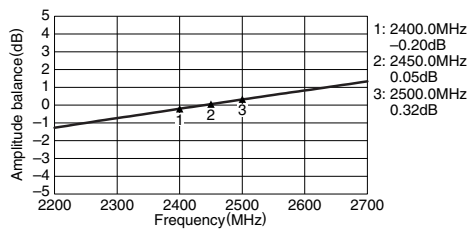
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

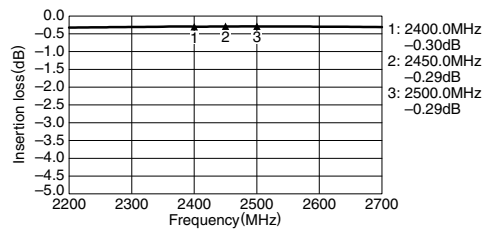
RETURN LOSS



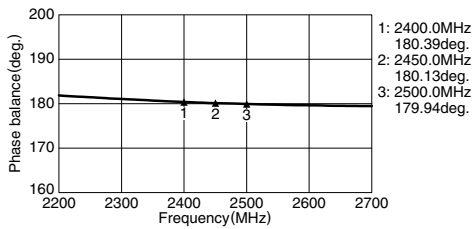
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



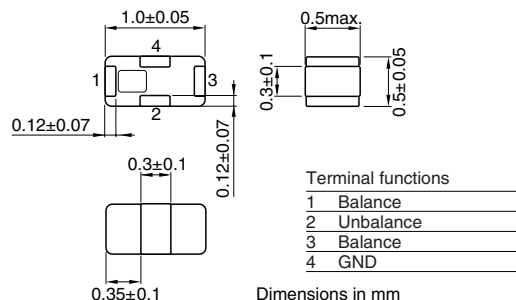
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Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

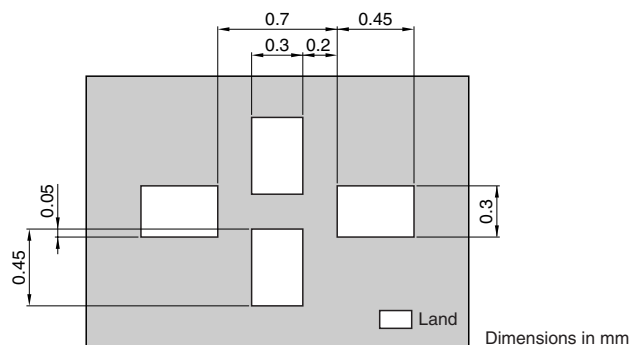
Conformity to RoHS Directive

HHM Series HHM1903A1

SHAPES AND DIMENSIONS



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

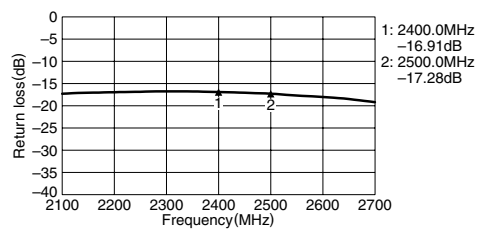
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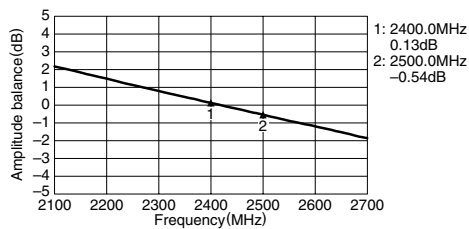
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 100Ω

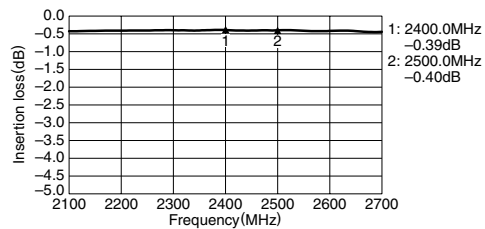
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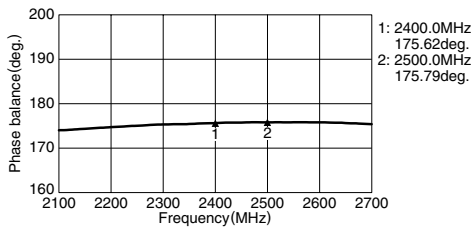
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



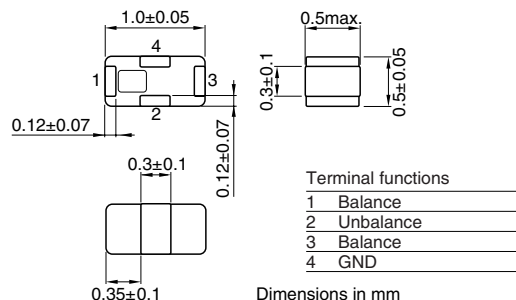
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Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

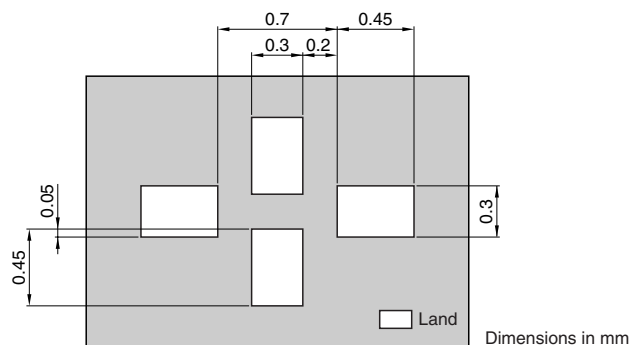
Conformity to RoHS Directive

HHM Series HHM1904A1

SHAPES AND DIMENSIONS



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±2.0dB	
Insertion loss	0.8dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

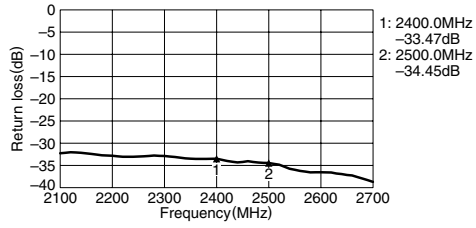
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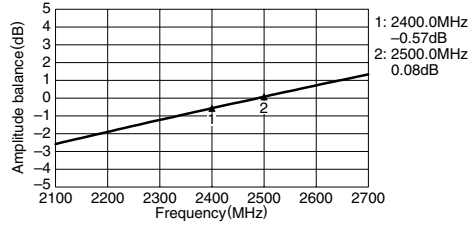
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 75Ω

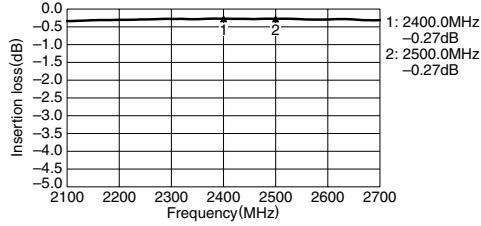
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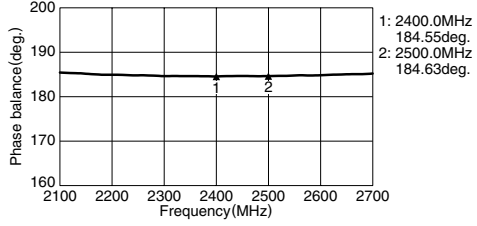
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



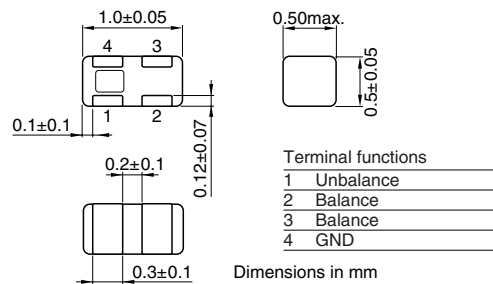
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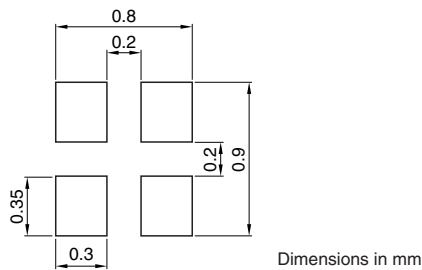
Conformity to RoHS Directive

HHM Series HHM1907B1

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERNS



ELECTRICAL CHARACTERISTICS

Unbalanced impedance		50Ω
Balanced impedance		50Ω
Frequency range		4900 to 5950MHz
Unbalanced port return loss		10dB min.
Phase imbalance at balanced port		180±10deg.
Amplitude imbalance at balanced port		0±2.5dB
Insertion loss		0.8dB max.
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

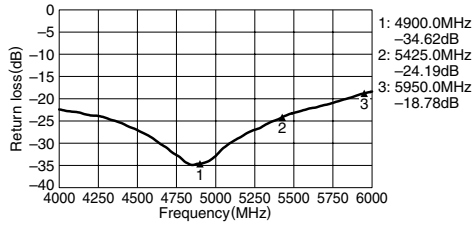
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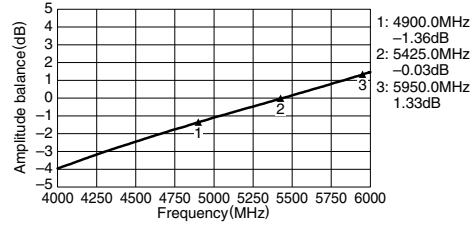
FREQUENCY CHARACTERISTICS

Unbalance 50Ω/Balance 50Ω

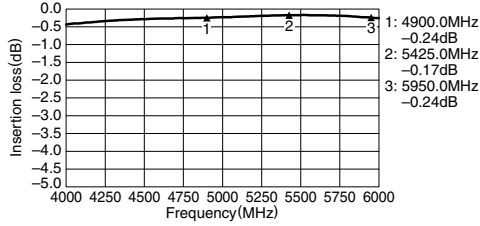
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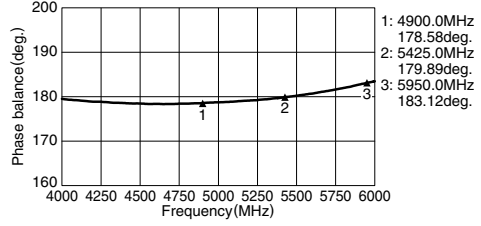
AMPLITUDE BALANCE



INSERTION LOSS



PHASE BALANCE



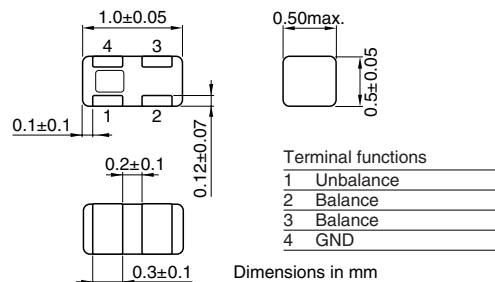
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Multilayer Chip Baluns For Bluetooth & 2.4GHz W-LAN

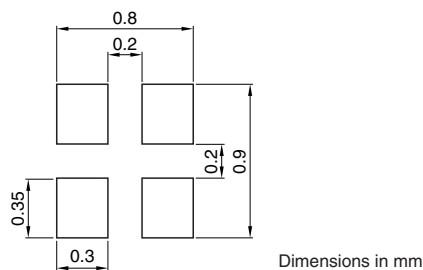
Conformity to RoHS Directive

HHM Series HHM1908A1

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERNS



ELECTRICAL CHARACTERISTICS

Unbalanced impedance	50Ω	
Balanced impedance	100Ω	
Frequency range	4900 to 5950MHz	
Unbalanced port return loss	10dB min.	
Phase imbalance at balanced port	180±10deg.	
Amplitude imbalance at balanced port	0±2.5dB	
Insertion loss	0.8dB max.	
Temperature range	Operating	-40 to +85°C
	Storage	-40 to +85°C

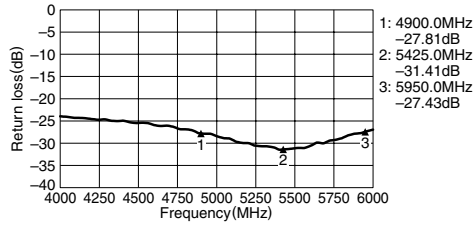
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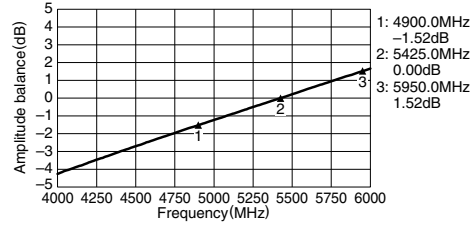
FREQUENCY CHARACTERISTICS

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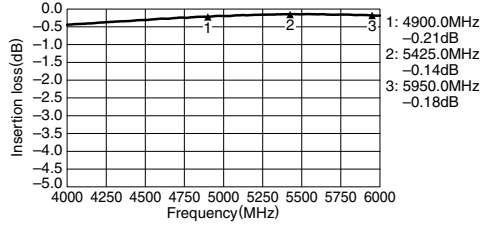
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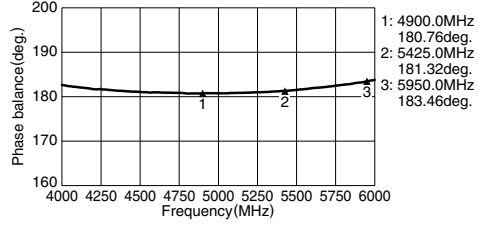
AMPLITUDE BALANCE



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