



**RF COUPLERS, UNSEALED,
SMA CONNECTORS, 4-30 dB, 1 - 22 GHz,
ESCC Detail Specification No. 3404/005**

**ISSUE 1
October 2002**



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SMA CONNECTORS, 4-30 dB, 1 - 22 GHz,
ESA/SCC Detail Specification No. 3404/005**



**space components
coordination group**

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| | | | |
| | | | |

**SCC**ESA/SCC Detail Specification
No. 3404/005

Rev. 'A'

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DOCUMENTATION CHANGE NOTICE

| Rev. Letter | Rev. Date | Reference | CHANGE Item | Approved DCR No. |
|-------------|-----------|--------------------|---|------------------------|
| 'A' | Feb.'94 | P1. P2. P11. | Cover Page DCN Paras. 4.2.4 and 4.2.5 : Deviation about damp heat added | None None 221073 |

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APPENDICES (applicable to specific Manufacturers only).

None.

**1. GENERAL****1.1 SCOPE**

This specification details the ratings, physical and electrical characteristics, test and inspection data for RF Couplers, Unsealed, SMA Connectors, 4-30 dB, 1-22 GHz. It shall be read in conjunction with ESA/SCC Generic Specification No. 3404, Couplers, RF, Coaxial, the requirements of which are supplemented herein.

1.2 TYPE VARIANTS

A list of variants of the basic type couplers specified herein, which are also covered by this specification, is given in "Table 1(a) - Type Variant Summary".

For each type variant, the full electrical and physical characteristics are given in individual Tables 1(a) "Type Variant Detailed Information" at the end of this specification.

The contents of the individual Tables 1(a) shall be as shown in Table 1(c) and the characteristics therein listed shall relate to the design parameters of the individual couplers, optimised for the intended application.

The specific characteristics shall be negotiated between the Manufacturer and the Orderer. The Manufacturer shall then apply to the ESA/SCC Secretariat for a type variant number for each individual coupler concerned, by sending a finalised Table 1(a) which shall also be copied to the Qualifying Space Agency (QSA).

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the couplers specified herein, are scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The derating information for the couplers specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the couplers specified herein are shown in Figure 2.

1.6 FUNCTIONAL DIAGRAM

The functional diagram of the couplers specified herein is shown in Figure 3.

1.7 STORAGE PRECAUTIONS

These components being unsealed require protection against humidity as specified in Para. 4.2 of ESA/SCC Basic Specification No. 20600.

**TABLE 1(a) - TYPE VARIANT SUMMARY (1)**

| VARIANT | FREQUENCY RANGE (GHz) | | COUPLING FACTOR (dB) | |
|---------|-----------------------|-------|----------------------|-------|
| | MIN | MAX | MIN | MAX |
| 01 | 1 | 2 | 5.5 | 6.5 |
| 02 | 1 | 2 | 9.5 | 10.5 |
| 03 | 1 | 2 | 19.5 | 20.5 |
| 04 | 1 | 2 | 29.5 | 30.5 |
| 05 | 2 | 4 | 5.5 | 6.5 |
| 06 | 2 | 4 | 9.5 | 10.5 |
| 07 | 2 | 4 | 19.5 | 20.5 |
| 08 | 2 | 4 | 29 | 31 |
| 09 | 4 | 8 | 5.5 | 6.5 |
| 10 | 4 | 8 | 9.5 | 10.5 |
| 11 | 4 | 8 | 19.5 | 20.5 |
| 12 | 4 | 8 | 29 | 31 |
| 13 | 8 | 12.4 | 5.5 | 6.5 |
| 14 | 8 | 12.4 | 9.25 | 10.75 |
| 15 | 8 | 12.4 | 19.5 | 20.5 |
| 16 | 8 | 12.4 | 29 | 31 |
| 17 | 12.4 | 18 | 5.5 | 6.5 |
| 18 | 12.4 | 18 | 9.5 | 10.5 |
| 19 | 12.4 | 18 | 19.5 | 20.5 |
| 20 | 18 | 22 | 9.5 | 10.5 |
| 21 | 18 | 22 | 15 | 17 |
| 22 | 2.003 | 2.053 | 29 | 31 |
| 23 | 3.7 | 4.2 | See Figure 2 | |

NOTES

1. Full electrical and physical characteristics are given in the individual Tables 1(a) at the end of this specification.

TABLE 1(b) - MAXIMUM RATINGS

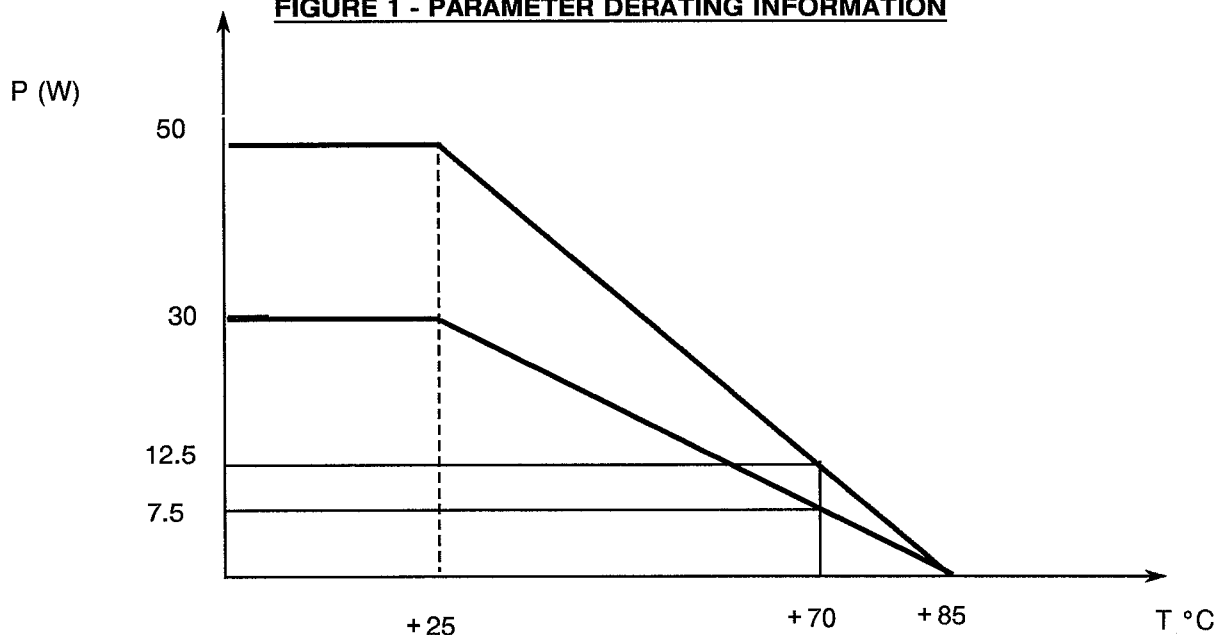
| NO. | CHARACTERISTICS | SYMBOL | MAXIMUM RATINGS | | UNITS |
|-----|-----------------------------|------------------|-----------------|----------|----------------|
| | | | MIN | MAX | |
| 1 | RF Power | P | | 50 30 | W (1) W (2) |
| 2 | Operating Temperature Range | T _{op} | See Figure 2 | | °C |
| 4 | Storage Temperature Range | T _{stg} | -40 | +85 | °C (3) |

NOTES

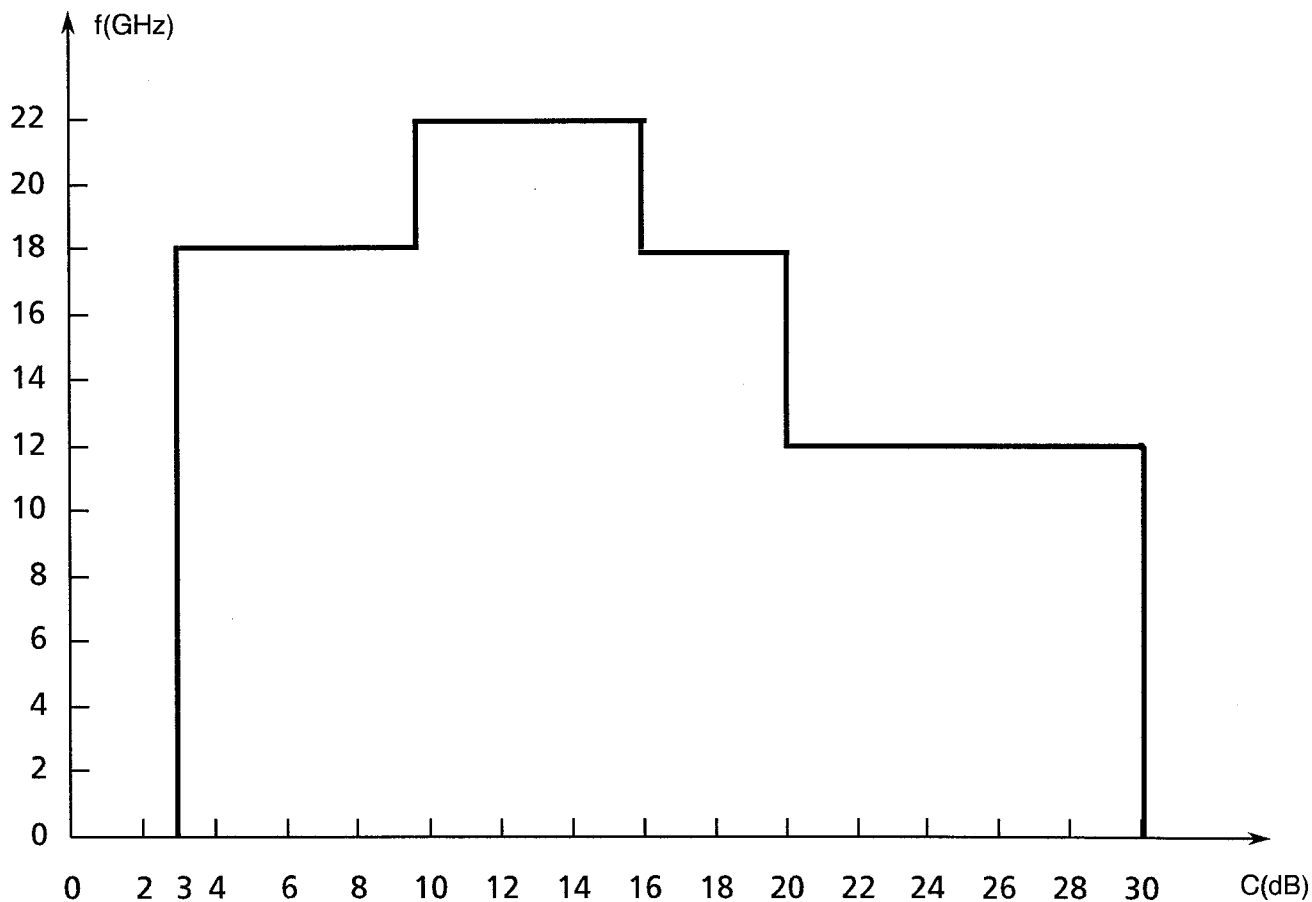
1. See Figure 1.
2. From 18 to 22 GHz. See Figure 1.
3. Temperatures to be used for Thermal Cycling are specified in Para. 9.2 of ESA/SCC Generic Specification No. 3404.



FIGURE 1 - PARAMETER DERATING INFORMATION



(a) RF POWER VERSUS TEMPERATURE

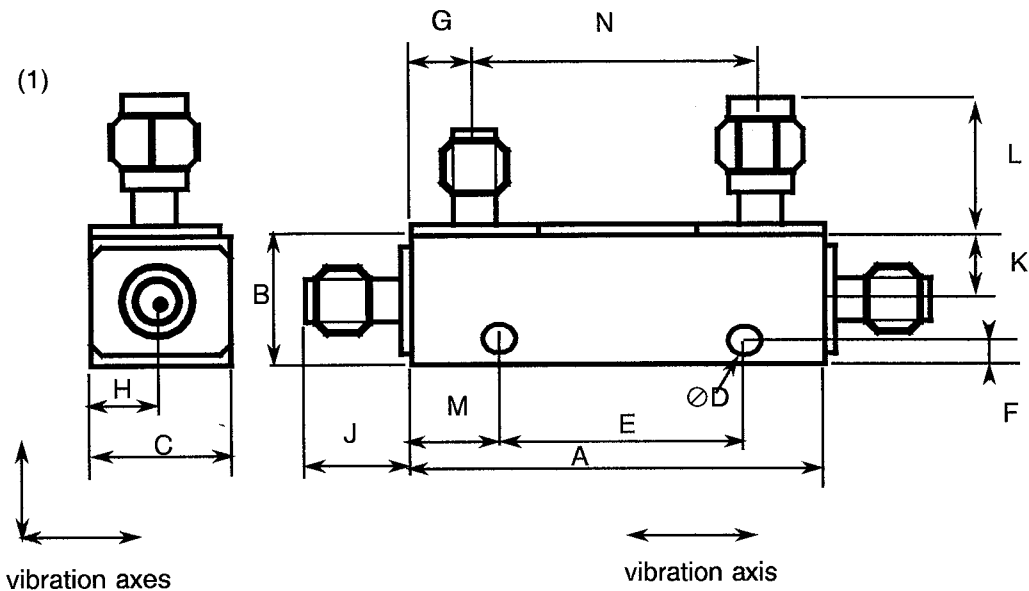


(b) COUPLING (NOMINAL VALUES) VERSUS FREQUENCY



TABLE 1(c) - FORMAT FOR INDIVIDUAL TABLES 1(a)
TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. _____



| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|------------------------|-----|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | | | dB |
| 2 | Coupling Variation | CV | | | dB |
| 3 | VSWR Primary Line | RLp | - | | - |
| | Secondary Line | RLs | - | | - |
| 4 | Insertion Loss (3) | IL | - | | dB |
| 5 | Directivity | DIR | | - | dB |
| 6 | Frequency Range | f | | | GHz |
| 7 | RF Power | P | - | | W |
| 8 | RF Leakage | E | | - | dB |
| 9 | Weight | W | - | | g |
| 10 | Interfaces Input | - | 340200XXXB Char XXX(2) | | - |
| | Output | - | 340200XXXB Char XXX(2) | | - |
| | Coupled Output | - | 340200XXXB Char XXX(2) | | - |
| 11 | Operating Temperature Range | Top | | | °C |
| 12 | Physical Dimensions * on area without paint | A* | | | mm |
| | | B* | | | |
| | | C | | | |
| | | ∅D | | | |
| | | E | | | |
| | | F | | | |
| | | G* | | | |
| | | H | | | |
| | | J | | | |
| | | K* | | | |
| | | L | | | |
| | | N | | | |

NOTES: See Page 9.

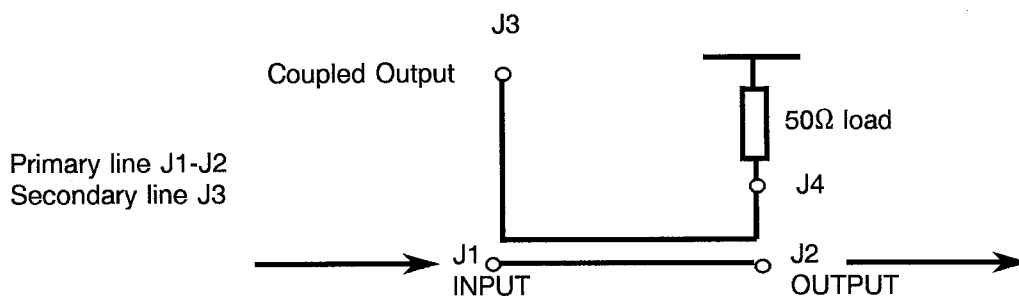
NOTES TO TABLES 1(a) AND 1(c)


1. Drawing shown as an example only.
2. The missing information shall be derived as follows:
 - The first X denotes the last figure of the Detail Specification Number.
 - The next XX denotes the Variant Number selected.
 - The final XXX denotes the Characteristics selected.
3. Insertion Loss: Excluding coupling power loss.

FIGURE 2 - PHYSICAL DIMENSIONS

See Tables 1(a)

FIGURE 3 - FUNCTIONAL DIAGRAM



| | | |
|---|--|----------------------------|
|  | <p style="text-align: center;">ESA/SCC Detail Specification No. 3404/005</p> | <p>PAGE 10 ISSUE 1</p> |
|---|--|----------------------------|

2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:-

- (a) ESA/SCC Generic Specification No. 3404, Power Dividers, Couplers, RF, Coaxial.
- (b) ESA/SCC Detail Specification No. 3402/001, RF Coaxial Connectors, Type SMA (Male Contacts).
- (c) ESA/SCC Detail Specification No. 3402/002, RF Coaxial Connectors, Type SMA (Female Contacts).
- (d) IEC Publication 410, Sampling Procedures and Tables for Inspection by Attributes.
- (e) ESA PSS-01-702, A Thermal Vacuum Test for the Screening of Space Materials.

3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 shall apply.

In addition, the following symbols shall be used :

- CF : Coupling Factor
- CV : Coupling Variation
- RL : VSWR
- RLp : VSWR on primary line
- RLs : VSWR on secondary line
- IL : Insertion Loss
- DIR : Directivity
- E : RF Leakage
- W : Weight

4. REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the couplers specified herein are stated in this specification and ESA/SCC Generic Specification No. 3404, Power Dividers, Couplers, RF, Coaxial. Deviations from the Generic Specification, applicable to this specification only, are detailed in Para 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls



None.

4.2.2 Deviations from Final Production Tests (Chart II)

None.

4.2.3 Deviations from Burn-in Tests (Chart III)

None.

| | | | |
|---|--|---|----------------------------|
|   | <p style="text-align: center;">ESA/SCC Detail Specification No. 3404/005</p> | <p style="text-align: center;">Rev. 'A'</p> | <p>PAGE 11 ISSUE 1</p> |
|---|--|---|----------------------------|

4.2.4 Deviations from Qualification Tests (Chart IV)

- (a) Paras. 9.10.3 and 9.10.6, Damp Heat, Accelerated: Not applicable.
- (b) Para. 9.11, Corrosion : Not applicable.
- (c) Para. 9.13, RF Leakage: Shall be performed.
- (d) Para. 9.16, Peak Power : Not applicable.
- (e) Subgroup III : Add Para. 9.5.3, Electrical Measurements at High and Low Temperatures after the Power Level Test.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

- (a) Paras. 9.10.3 and 9.10.6, Damp Heat, Accelerated: Not applicable.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the couplers specified herein shall be verified in accordance with the requirements set out in Para 9.18 of ESA/SCC Generic Specification No. 3404 and shall conform to those shown in the Tables 1(a) of this specification.

4.3.2 Weight

The maximum weight of the couplers specified herein shall be as specified in the Tables 1(a) of this specification.

4.3.3 Female Contact Retention

The requirements for this test are specified in Para 9.6 of ESA/SCC Generic Specification No. 3404. Female contacts shall be capable of meeting the requirements of Para 4.3.8. (c) of ESA/SCC Detail Specification No. 3402/002.

4.4 Materials and Finishes

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the couplers specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 Connector Receptacles

As per ESA/SCC Detail Specifications 3402/001 or 3402/002 and as specified in the Tables 1(a) of this specification.

4.4.2 Body

The body shall be made of aluminium. The finish shall be a matt black paint meeting the outgassing requirements of ESA-PSS-01-702. A 7mm diameter area without paint shall be left at each mounting hole on both sides of the body or flange.

4.4.3 Load Termination

3403004XB as per ESA/SCC Detail Specification 3403/004. See Tables 1(a) at the end of this specification for applicability.



4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700 and the following subparagraphs. Each component shall be marked in respect of:-

- (a) The SCC Component Number.
- (b) Traceability Information.

4.5.2 The SCC Component Number

Each component shall bear the SCC Component Number which shall be constituted and marked as follows:-

340400501B

Detail Specification Number _____
Type Variant, (see Table 1(a)) _____
Testing Level _____

4.5.3 Traceability Information

Traceability information shall be marked in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

4.6 ELECTRICAL MEASUREMENTS

4.6.1 Electrical Measurements at Room Temperature

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3 \text{ }^\circ\text{C}$.

4.6.2 Electrical Measurements at High and Low Temperatures (Table 3)

The parameters to be measured at high and low temperatures are scheduled in Table 3. Unless otherwise specified, the measurements shall be performed at the operating temperature extremes specified in the individual Tables 1(a) at the end of this specification.

4.6.3 Circuit for Electrical Measurements

Circuits for electrical measurements are given in ESA/SCC Generic Specification No. 3404.

**TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE**

| No. | CHARACTERISTICS | SYMBOL | SPEC. AND/OR TEST METHOD | TEST CONDITION | LIMITS | | UNIT |
|-----|-----------------------|--------|------------------------------------|--------------------------------------|--------------|-----|------|
| | | | | | MIN | MAX | |
| 1 | Coupling Factor J1-J3 | CF | ESA/SCC No 3404, Para 9.5.1.1.1 | Para. 9.5.1.1.1 Input \leq 10mW | See Figure 2 | | - |
| 2 | Coupling Variation | CV | ESA/SCC No 3404, Para 9.5.1.1.2 | Para. 9.5.1.1.2 Input \leq 10mW | See Figure 2 | | - |
| 3 | VSWR | RL | ESA/SCC No 3404, Para 9.5.1.1.3 | Para. 9.5.1.1.3 Input \leq 10mW | See Figure 2 | | - |
| 4 | Insertion Loss | IL | ESA/SCC No 3404, Para 9.5.1.1.4 | Para. 9.5.1.1.4 Input \leq 10mW | See Figure 2 | | - |
| 5 | Directivity | DIR | ESA/SCC No 3404, Para 9.5.1.1.5 | Para. 9.5.1.1.5 Input \leq 10mW | See Figure 2 | | - |

TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES (1)

| No. | CHARACTERISTICS | SYMBOL | SPEC. AND/OR TEST METHOD | TEST CONDITION | LIMITS | | UNIT |
|-----|-----------------------|--------|------------------------------------|--------------------------------------|--------------|-----|------|
| | | | | | MIN | MAX | |
| 1 | Coupling Factor J1-J3 | CF | ESA/SCC No 3404, Para 9.5.1.1.1 | Para. 9.5.1.1.1 Input \leq 10mW | See Figure 2 | | - |
| 4 | Insertion Loss | IL | ESA/SCC No 3404, Para 9.5.1.1.4 | Para. 9.5.1.1.4 Input \leq 10mW | See Figure 2 | | - |
| 5 | Directivity | DIR | ESA/SCC No 3404, Para 9.5.1.1.5 | Para. 9.5.1.1.5 Input \leq 10mW | See Figure 2 | | - |

NOTES

1. Sampling IEC Publication 410 General Inspection Level II AQL 1.5%.
2. The high and low temperatures shall be as specified in Figure 2.

**4.7 BURN-IN AND ELECTRICAL MEASUREMENTS****4.7.1 Parameter Drift Values**

The parameter drift values applicable to burn-in are specified in Table 4 of this specification. Unless otherwise specified, these measurements shall be performed at $T_{amb} = +22 \pm 3 \text{ }^\circ\text{C}$.

The parameter drift value (Δ) applicable to the parameter scheduled shall not be exceeded. In addition to these drift value requirements, the appropriate limit value specified in Table 2 shall not be exceeded.

4.7.2 Conditions for Burn-in

The requirements for burn-in are specified in Section 7 of ESA/SCC Generic Specification No. 3404. The conditions for burn-in shall be as specified in Table 5(a) of this specification.

Upon completion of burn-in, a recovery period of 24 ± 2 hours is necessary before performance of the end measurements.

4.7.3 Electrical Circuit for Burn-in

Not applicable.

TABLE 4 - PARAMETER DRIFT VALUES

| No | CHARACTERISTICS | SYMBOL | TEST METHOD AND CONDITIONS | LIMITS | UNIT |
|----|----------------------|-------------|--|-----------|------|
| 1 | Coupling J1-J3 Drift | ΔCF | ESA/SCC No. 3404 Para 9.5.1.1.1 Input $\leq 10\text{mW}$ | ± 0.1 | dB |
| 5 | Insertion Loss Drift | ΔIL | ESA/SCC No. 3404 Para 9.5.1.1.4 Input $\leq 10\text{mW}$ | ± 0.1 | dB |

TABLE 5(a) - CONDITIONS FOR BURN-IN

| No | CHARACTERISTICS | SYMBOL | LIMITS | UNIT |
|----|------------------|--------|------------|------------------|
| 1 | Input Power | P | 0 | W |
| 2 | High Temperature | T | +85 (-0+5) | $^\circ\text{C}$ |

TABLE 5(b) - CONDITIONS FOR OPERATING LIFE TEST

| No | CHARACTERISTICS | SYMBOL | LIMITS | UNIT |
|----|---------------------|--------|---------------------------------|------------------|
| 1 | RF Power | P | See Figure 1 and Tables 1(a) | W(1, 2) |
| 2 | Ambient Temperature | T | +70 | $^\circ\text{C}$ |

NOTES

1. The coupler shall have the same DC power rating as the RF power rating of the ordered component.
2. Applicable only if RF power rating is $>5\text{W}$. If P is smaller than 5W, then use $P=0$ or $T_{stg} = 85^\circ\text{C}$.



4.8 ENVIRONMENTAL AND ENDURANCE TESTS (Charts IV and V of ESA/SCC Generic Specification No. 3404)

4.8.1 Measurements and Inspections on Completion of Environmental Tests

The parameters to be measured and inspections to be performed on completion of environmental tests are scheduled in Table 6. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3 \text{ }^{\circ}\text{C}$.

4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests

The parameters to be measured and inspections to be performed at intermediate points during endurance tests are scheduled in Table 6. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3 \text{ }^{\circ}\text{C}$.

4.8.3 Measurements and Inspections on Completion of Endurance Tests

The parameters to be measured and inspections to be performed on completion of endurance tests shall be those specified in Table 6. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3 \text{ }^{\circ}\text{C}$.

4.8.4 Conditions for Operating Life Test (Part of Endurance Testing)

The requirements for operating life test are specified in Section 9 of ESA/SCC Generic Specification No. 3404. The conditions for operating life test shall be as specified in Table 5(b) of this specification.

4.8.5 Electrical Circuits for Operating Life Test

Not applicable.

4.8.6 Conditions for High Temperature Storage Test (Part of Endurance Testing)

The requirements for high temperature storage test are specified in Section 9 of ESA/SCC Generic Specification No. 3404.

The conditions for high temperature storage testing shall be as specified in Table 5(a) of this specification.



TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING

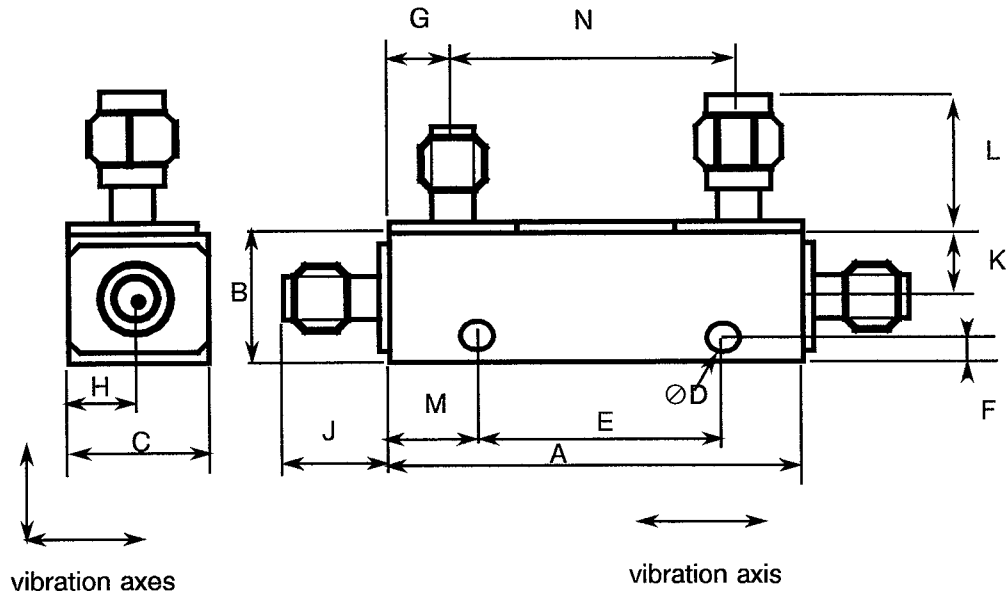
| NO. | ESA/SCC GENERIC SPEC. No. 3404 | | MEASUREMENTS AND INSPECTIONS | | SYMBOL | LIMITS | | UNIT |
|-----|---------------------------------------|---|--|---|--------------------------|--------------------|--------------------|--------|
| | ENVIRONMENTAL AND ENDURANCE TESTS (1) | TEST METHOD AND COND. | IDENTIFICATION | CONDITIONS | | MIN | MAX | |
| | | | | | | | | |
| 01 | Vibration | Para 9.7 | Visual Examination | - | | - | - | - |
| 02 | Shock or Bump | Para 9.8 | Electrical Measur. Visual Examination | Table 2 Damage | | Tables 1(a) - | - | - |
| 03 | Rapid Change of Temperature | Para 9.9 | After 24 ± 2 hours Electrical Measur. Visual Examination | Table 2 Damage | | Tables 1(a) | | - |
| 04 | Climatic Sequence Dry Heat | Para 9.10 | Electrical Measur. | Table 3 | | Tables 1(a) | | - |
| | Damp Heat, Accelerated | Para 9.10.2 Para 9.10.3 | Not applicable | | | | | - |
| | Cold Test | Para 9.10.4 | At low Temperat. Electrical Measur. | Table 3 | | Tables 1(a) | | - |
| | Low Air Pressure | Para 9.10.5 Temp + 35°C Power see Figure 1 | | | - | | - | - |
| 06 | Operating Life | Para 9.12 Table 5(b) | Electrical Measur. | At 168, 500 & 1000 Hours Table 4 | | Table 4 | | - |
| | | | Electrical Measur. Visual Examination | At 1000 Hours Table 2 Damage | | Tables 1(a) - - | | - - |
| 07 | RF Leakage | Para 9.13 | RF Leakage | Para 9.13 | | Tables 1(a) | | - |
| 08 | Power Level | Para 9.14 | Electrical Measur. | Table 2 | | Tables 1(a) | | - |
| 09 | High Temperature Storage | Para 9.15 Table 5(a) | Contact Resist. | At 1000 Hours Gen. 3404 Para 9.15 | $\frac{\Delta R_c}{R_c}$ | Table 4 | | - |
| | | | Electrical Measur. Visual Examination | Table 2 - | | | Tables 1(a) - - | |
| 10 | Peak Power | Para 9.16 | Not applicable | | | | | |
| 11 | Perman. of Marking | Para 9.17 | - | - | | - | - | - |
| 12 | Dimension Check | Para 9.18 | Dimensions | - | | Tables 1(a) | | - |
| 13 | Weight | Para 9.19 | Weight | - | | Tables 1(a) | | - |

NOTES 1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 01



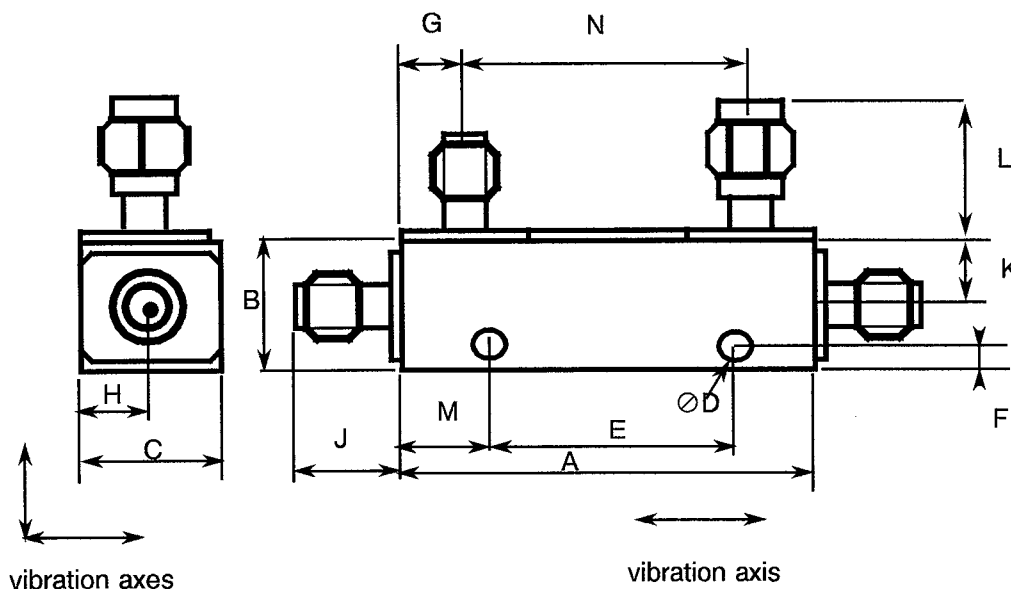
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 5.5 | 6.5 | dB |
| 2 | Coupling Variation | CV | -0.6 | +0.6 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.15 | - |
| | | RLs | - | 1.15 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 22 | - | dB |
| 6 | Frequency Range | f | 1 | 2 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 50 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 50.3 | 51.3 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 33.5 | 34.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.7 | 7.7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | N | 35.9 | 36.9 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 02



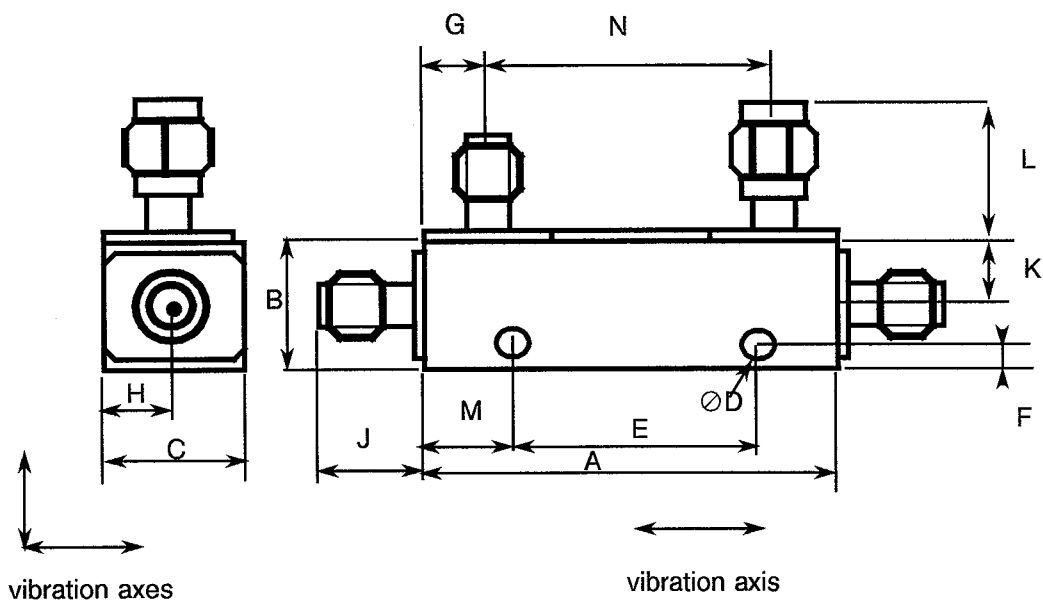
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.5 | 10.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.15 | - |
| | | RLs | - | 1.15 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 22 | - | dB |
| 6 | Frequency Range | f | 1 | 2 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 50 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 50.3 | 51.3 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 33.5 | 34.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.7 | 7.7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | M | 7.9 | 8.9 | mm |
| N | 35.9 | 36.9 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 03



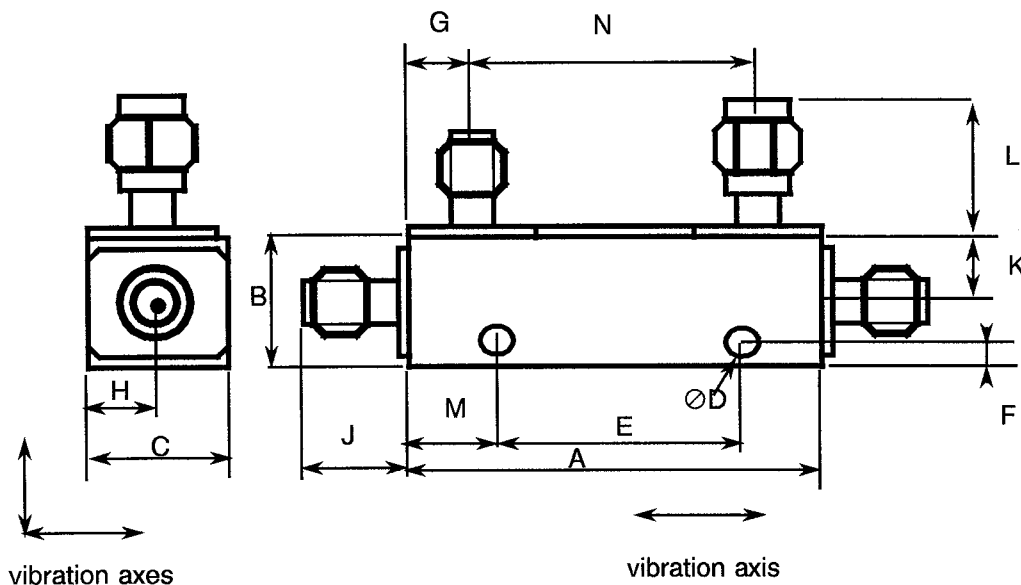
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 19.5 | 20.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.15 | - |
| | | RLs | - | 1.15 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 22 | - | dB |
| 6 | Frequency Range | f | 1 | 2 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 50 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 50.3 | 51.3 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 33.5 | 34.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.7 | 7.7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | N | 35.9 | 36.9 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 04

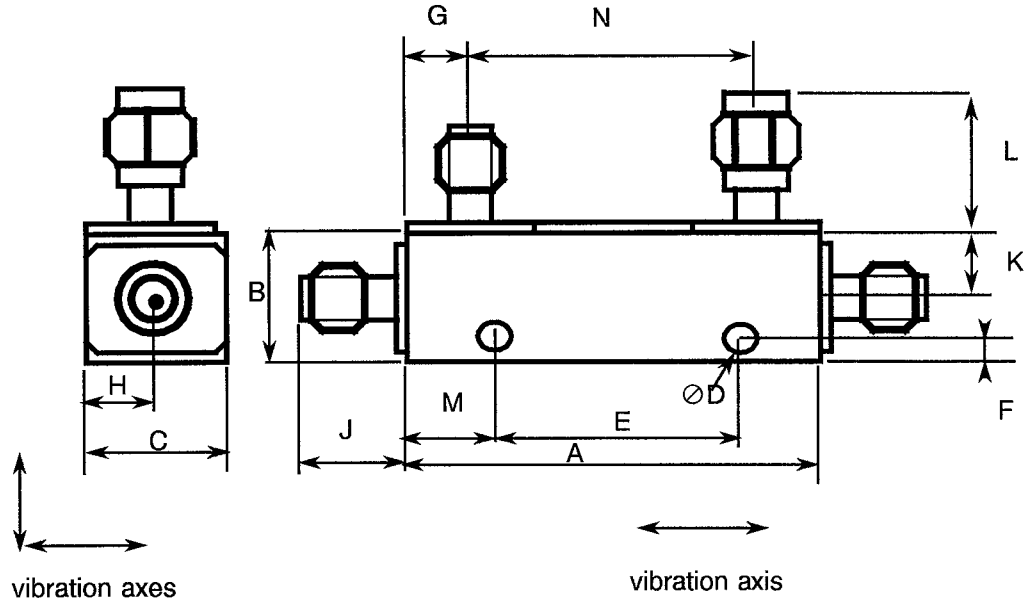


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|--------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 29.5 | 30.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | + 0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.15 | - |
| | | RLs | - | 1.15 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 22 | - | dB |
| 6 | Frequency Range | f | 1 | 2 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 50 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | + 85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 50.3 | 51.3 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 33.5 | 34.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.7 | 7.7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | N | 7.9 | 8.9 | mm |
| | | | 35.9 | 36.9 | mm |

NOTES: See Page 9.

**TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION**

TYPE VARIANT No. 05



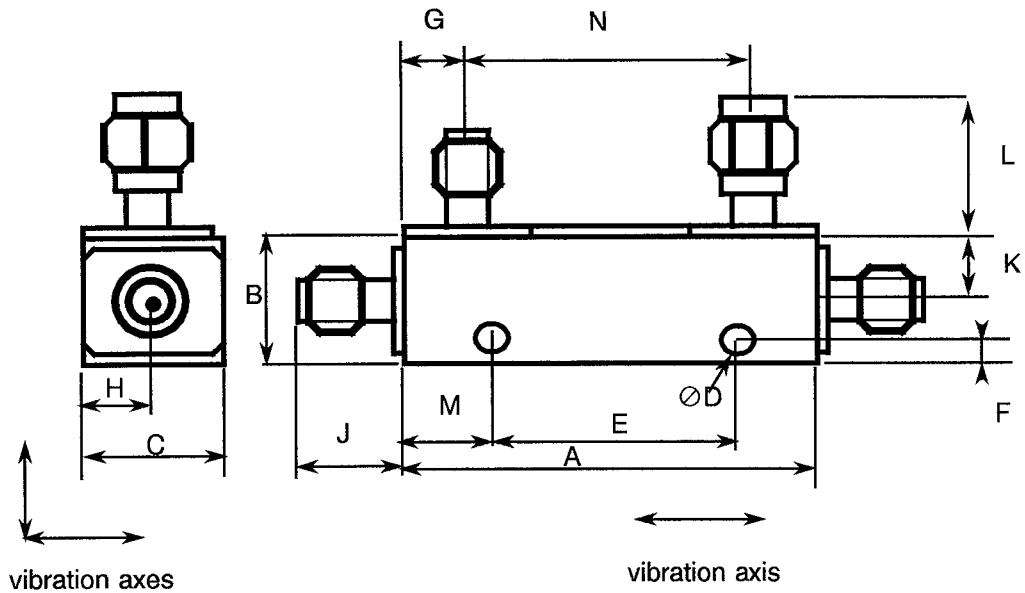
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 5.5 | 6.5 | dB |
| 2 | Coupling Variation | CV | -0.6 | +0.6 | dB |
| 3 | VSWR Primary Line | RLp | - | 1.20 | - |
| | Secondary Line | RLs | - | 1.20 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 20 | - | dB |
| 6 | Frequency Range | f | 2 | 4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 40 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 30 | 31 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 8 | 9.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.5 | 8 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| L | - | 20 | mm | | |
| M | 10 | 12 | mm | | |
| N | 16 | 17 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 06



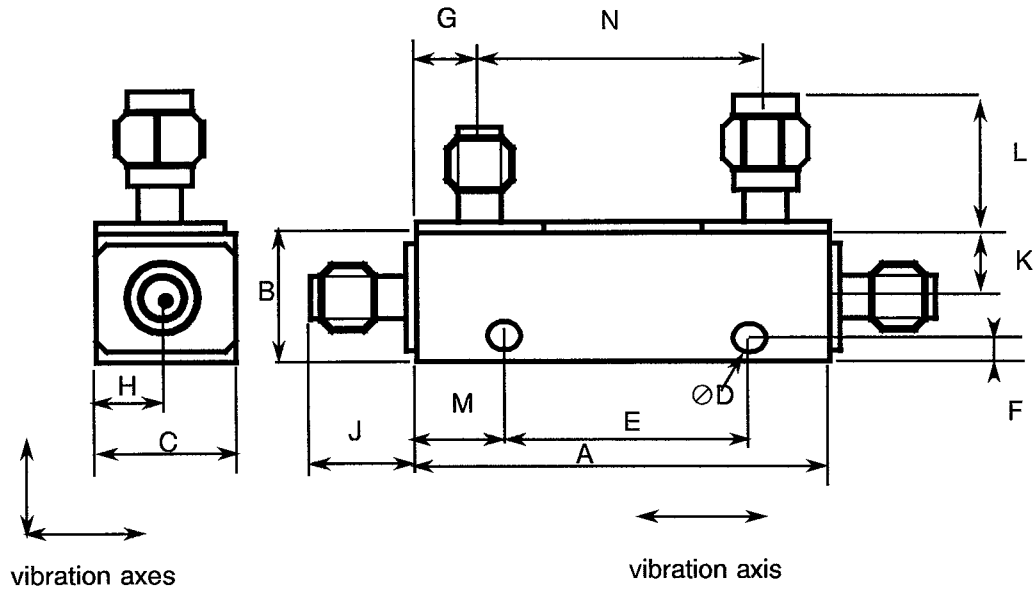
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.5 | 10.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.20 | - |
| | | RLs | - | 1.20 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 20 | - | dB |
| 6 | Frequency Range | f | 2 | 4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 40 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 30 | 31 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 8 | 9.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.5 | 8 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | N | 16 | 17 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 07

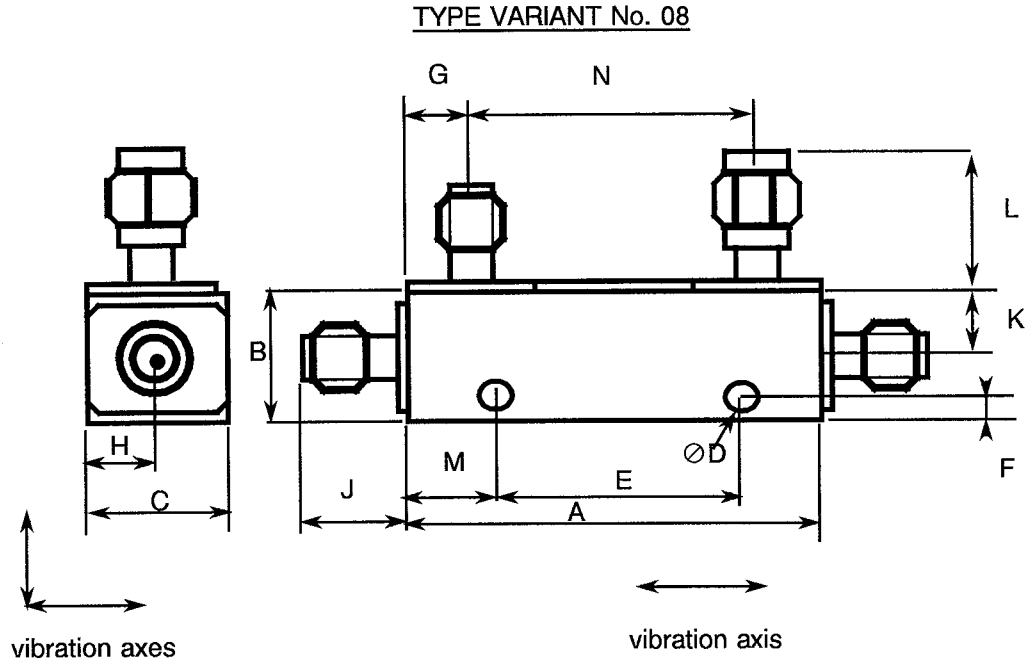


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 19.5 | 20.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line | RLp | - | 1.20 | - |
| | Secondary Line | RLs | - | 1.20 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 20 | - | dB |
| 6 | Frequency Range | f | 2 | 4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 40 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 30 | 31 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ØD | 2.5 | 2.7 | mm |
| | | E | 8 | 9.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.5 | 8 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| M | 10 | 12 | mm | | |
| N | 16 | 17 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION



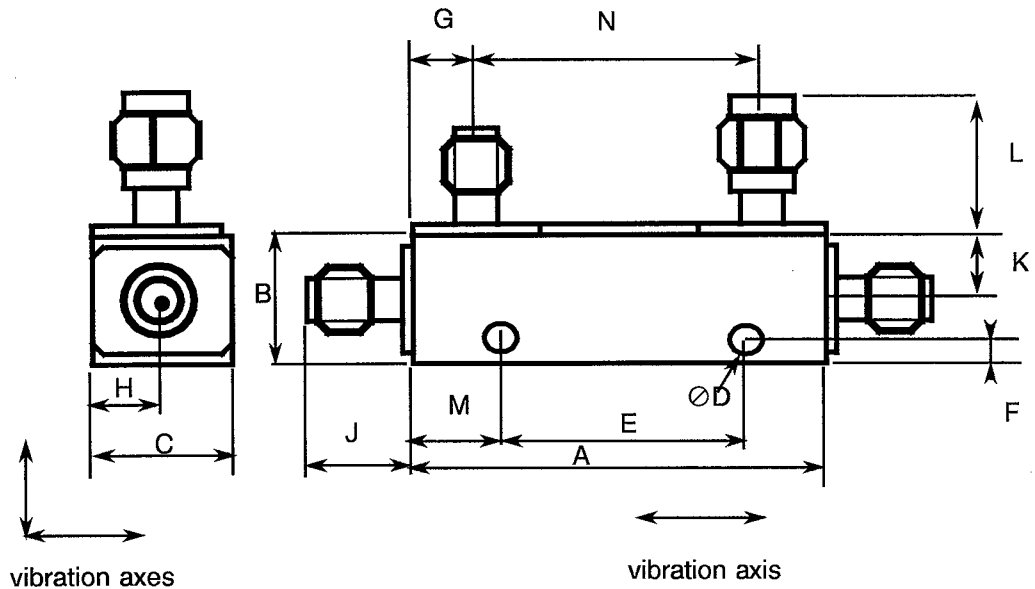
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 29 | 31 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.20 | - |
| | | RLs | - | 1.20 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 20 | - | dB |
| 6 | Frequency Range | f | 2 | 4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 40 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 30 | 31 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 8 | 9.5 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6.5 | 8 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 20 | mm |
| | | N | 16 | 17 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 09

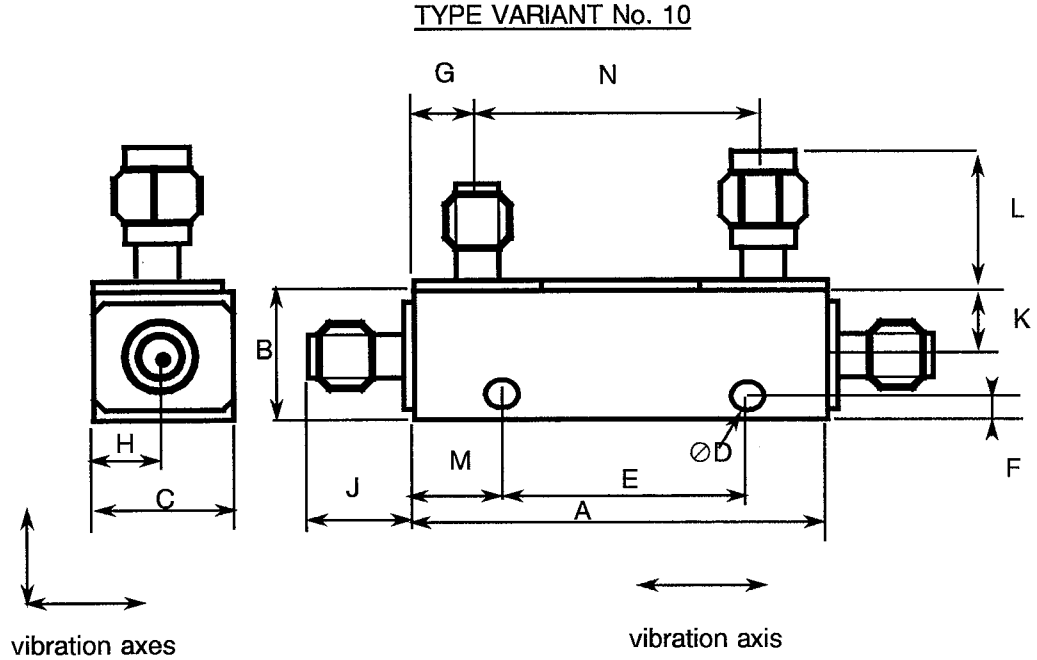


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|-----------------------------|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 5.5 | 6.5 | dB |
| 2 | Coupling Variation | CV | -0.6 | +0.6 | dB |
| 3 | VSWR Primary Line | RLp | - | 1.25 | - |
| | Secondary Line | RLs | - | 1.25 | - |
| 4 | Insertion Loss | IL | - | 0.25 | dB |
| 5 | Directivity | DIR | 18 | - | dB |
| 6 | Frequency Range | f | 4 | 8 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | * on area without paint | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| | | M | 12.3 | 13.3 | mm |
| | | N | 12.2 | 13.2 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION



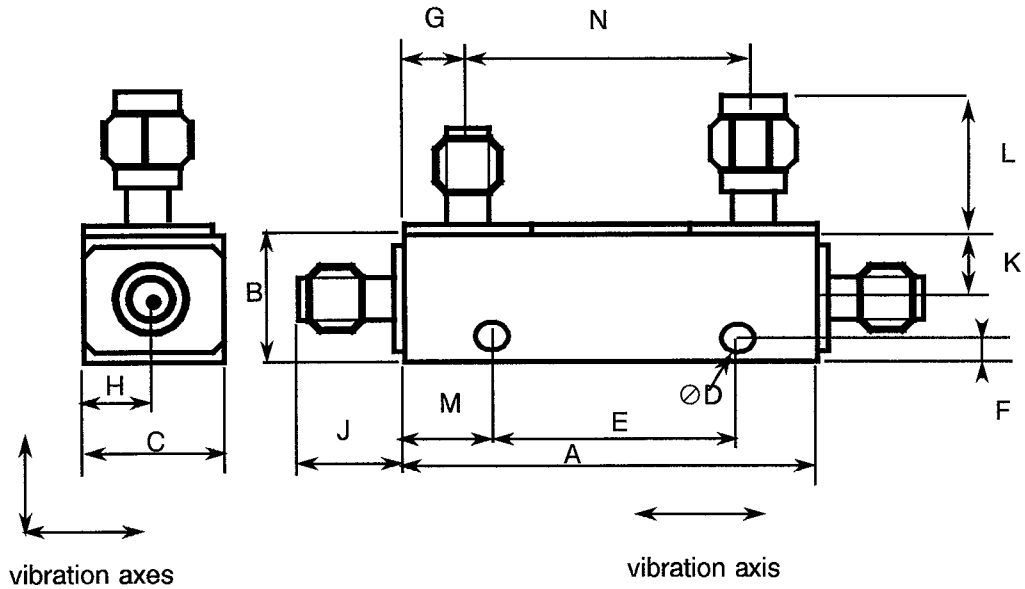
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.5 | 10.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.25 | - |
| | | RLs | - | 1.25 | - |
| 4 | Insertion Loss | IL | - | 0.25 | dB |
| 5 | Directivity | DIR | 18 | - | dB |
| 6 | Frequency Range | f | 4 | 8 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 11



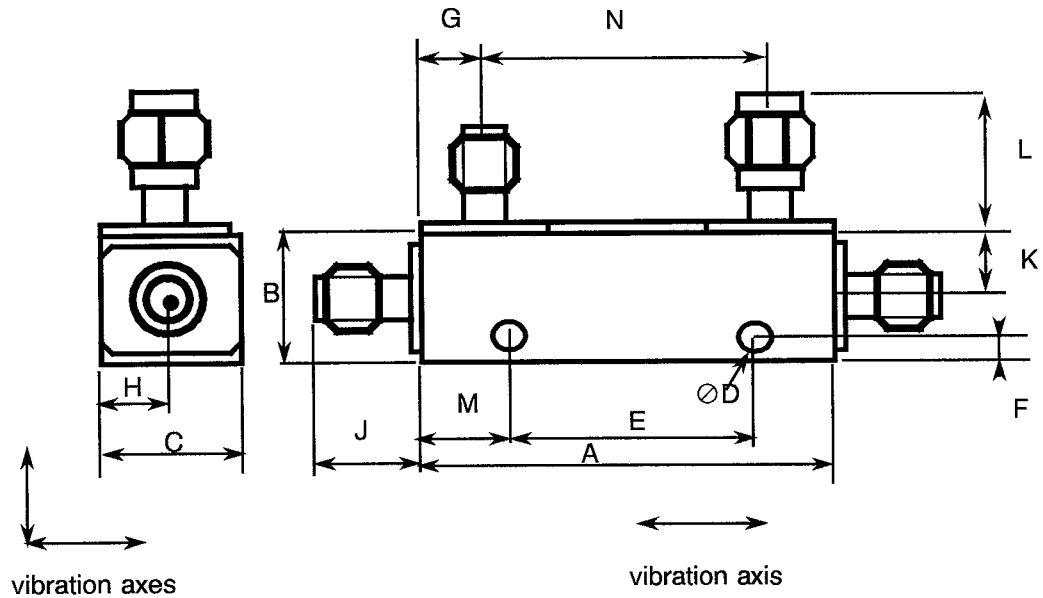
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 19.5 | 20.5 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.25 | - |
| | | RLs | - | 1.25 | - |
| 4 | Insertion Loss | IL | - | 0.25 | dB |
| 5 | Directivity | DIR | 18 | - | dB |
| 6 | Frequency Range | f | 4 | 8 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| L | - | 20 | mm | | |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 12



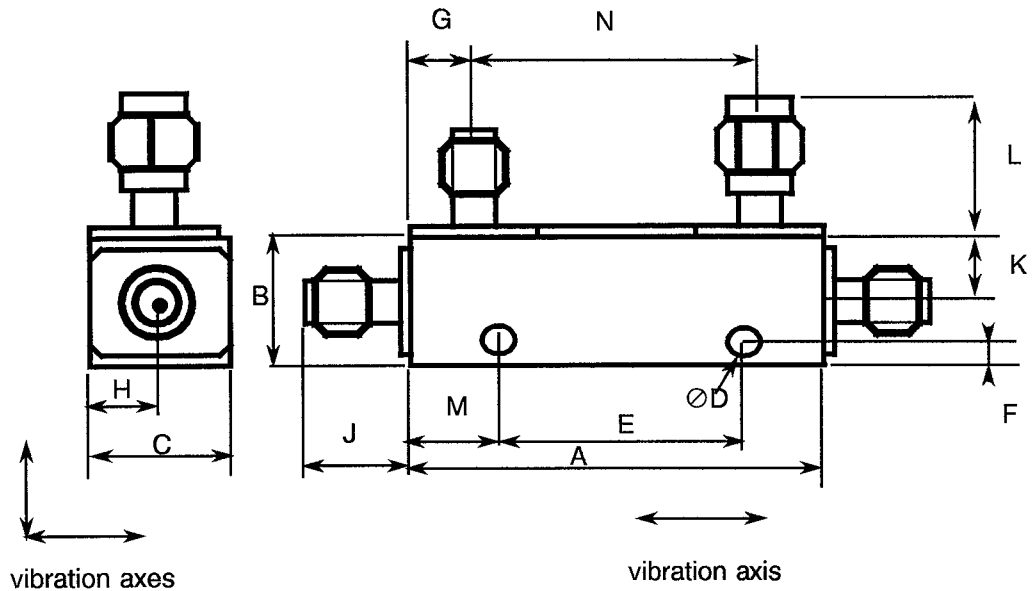
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 29 | 31 | dB |
| 2 | Coupling Variation | CV | -0.75 | +0.75 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.25 | - |
| | | RLs | - | 1.25 | - |
| 4 | Insertion Loss | IL | - | 0.25 | dB |
| 5 | Directivity | DIR | 18 | - | dB |
| 6 | Frequency Range | f | 4 | 8 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 13

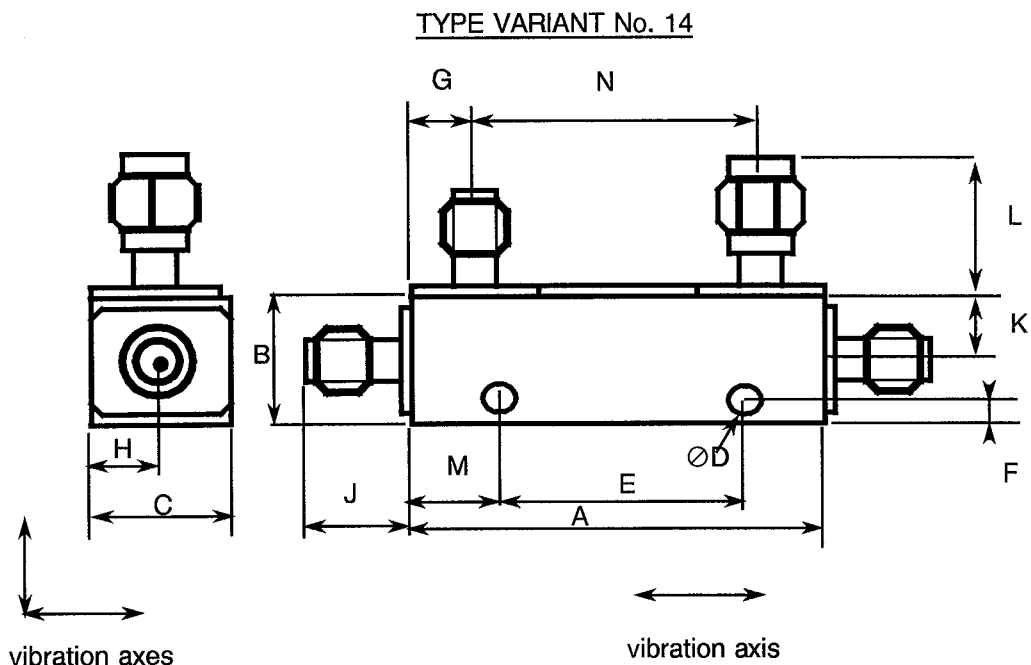


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 5.5 | 6.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.30 | - |
| | | RLs | - | 1.30 | - |
| 4 | Insertion Loss | IL | - | 0.4 | dB |
| 5 | Directivity | DIR | 17 | - | dB |
| 6 | Frequency Range | f | 8 | 12.4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION



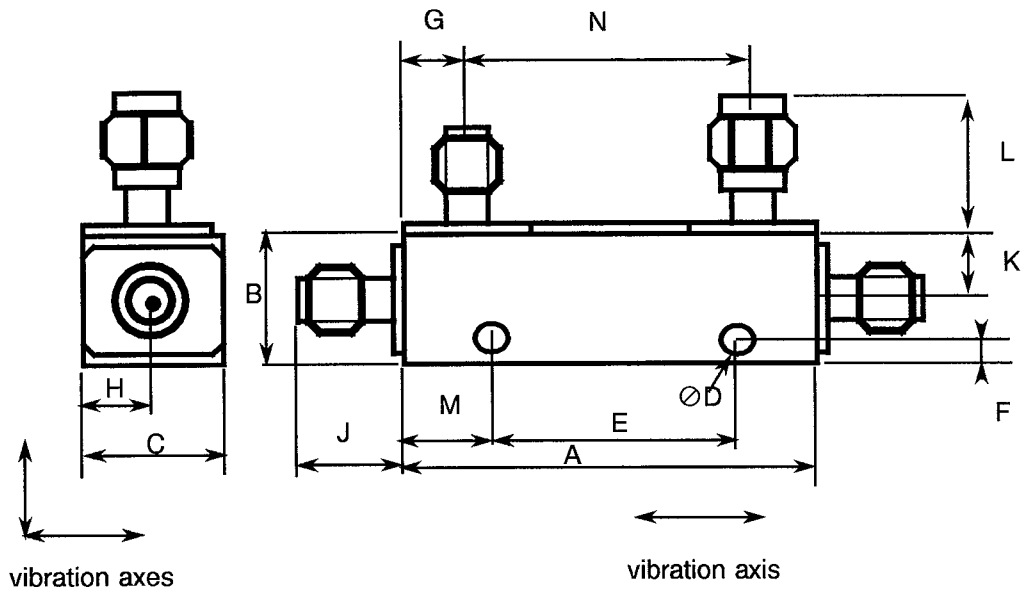
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.25 | 10.75 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.30 | - |
| | | RLs | - | 1.30 | - |
| 4 | Insertion Loss | IL | - | 0.4 | dB |
| 5 | Directivity | DIR | 17 | - | dB |
| 6 | Frequency Range | f | 8 | 12.4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| | | M | 12.3 | 13.3 | mm |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 15



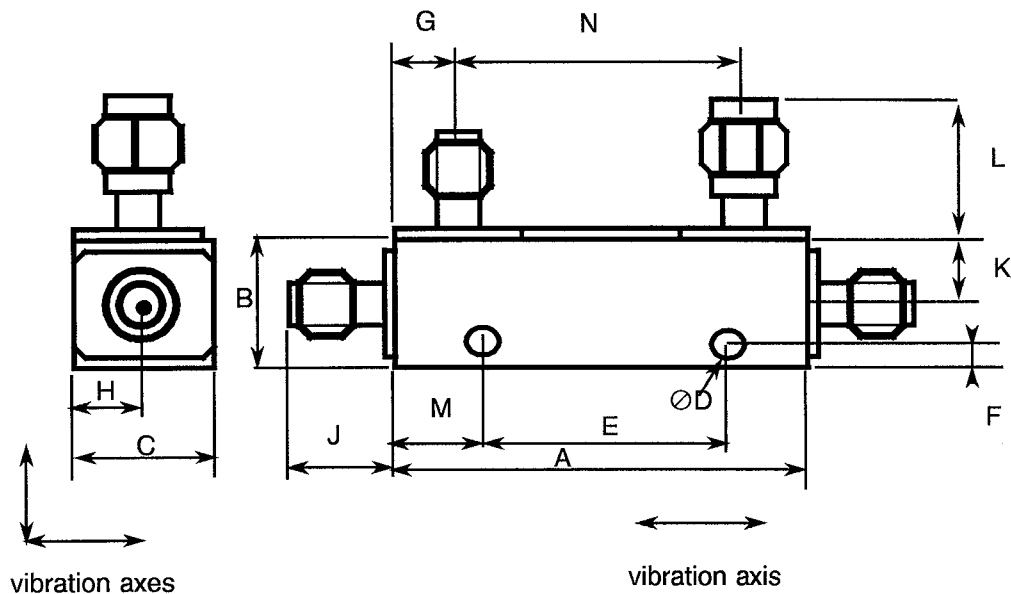
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 19.5 | 20.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.30 | - |
| | | RLs | - | 1.30 | - |
| 4 | Insertion Loss | IL | - | 0.4 | dB |
| 5 | Directivity | DIR | 17 | - | dB |
| 6 | Frequency Range | f | 8 | 12.4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 16



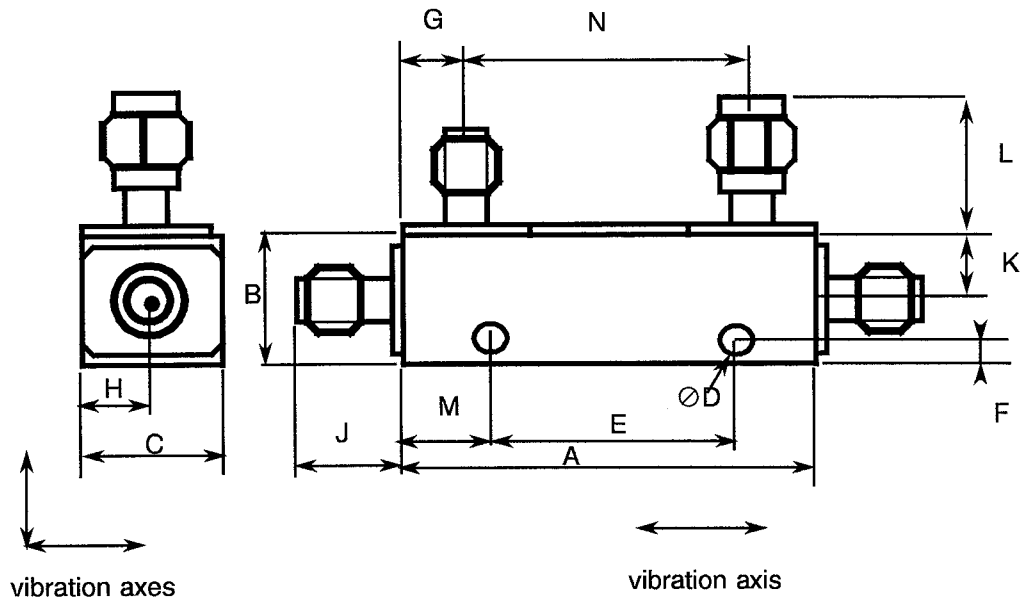
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 29 | 31 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.30 | - |
| | | RLs | - | 1.30 | - |
| 4 | Insertion Loss | IL | - | 0.4 | dB |
| 5 | Directivity | DIR | 17 | - | dB |
| 6 | Frequency Range | f | 8 | 12.4 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 17 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 10.5 | mm |
| L | - | 20 | mm | | |
| M | 12.3 | 13.3 | mm | | |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 17



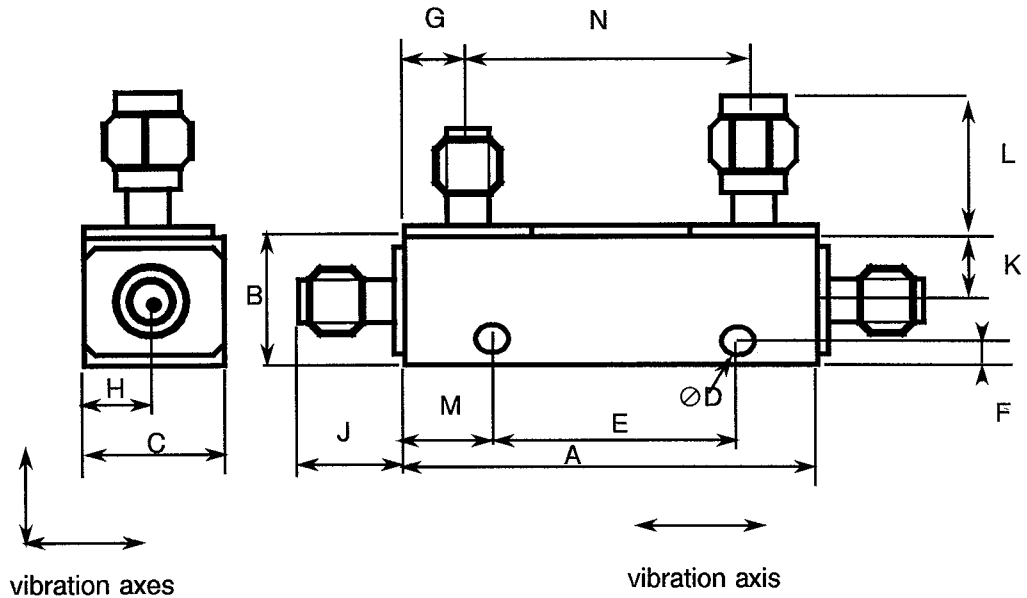
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 5.5 | 6.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.35 | - |
| | | RLs | - | 1.40 | - |
| 4 | Insertion Loss | IL | - | 0.55 | dB |
| 5 | Directivity | DIR | 15 | - | dB |
| 6 | Frequency Range | f | 12.4 | 18 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | F | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| | | N | 12.3 | 13.3 | mm |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 18

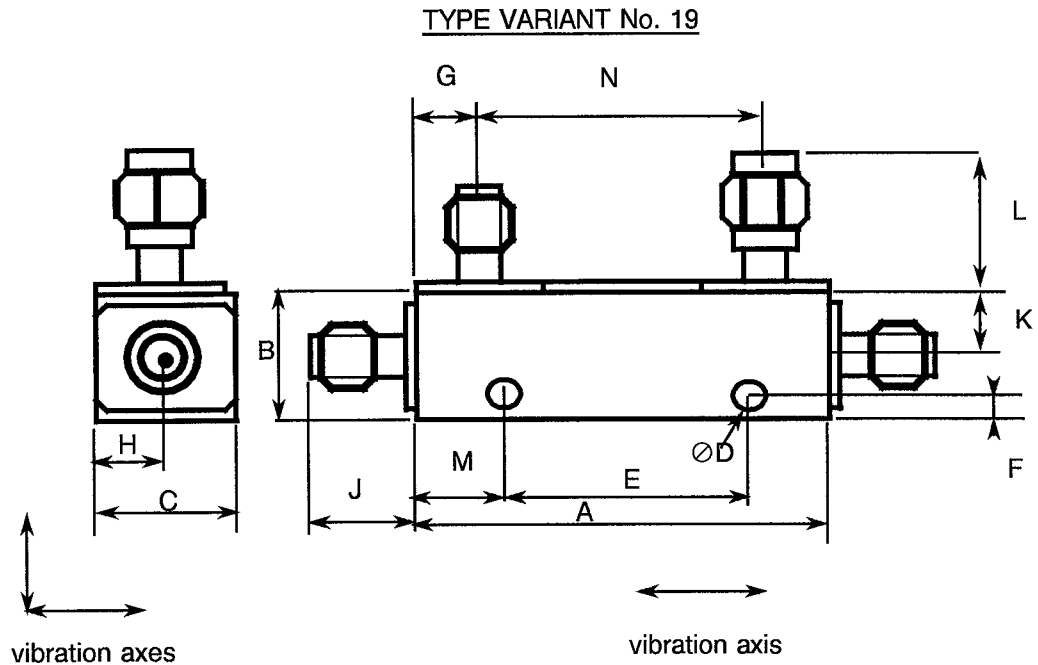


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.5 | 10.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.35 | - |
| | | RLs | - | 1.40 | - |
| 4 | Insertion Loss | IL | - | 0.55 | dB |
| 5 | Directivity | DIR | 15 | - | dB |
| 6 | Frequency Range | f | 12.4 | 18 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| | | M | 12.3 | 13.3 | mm |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION



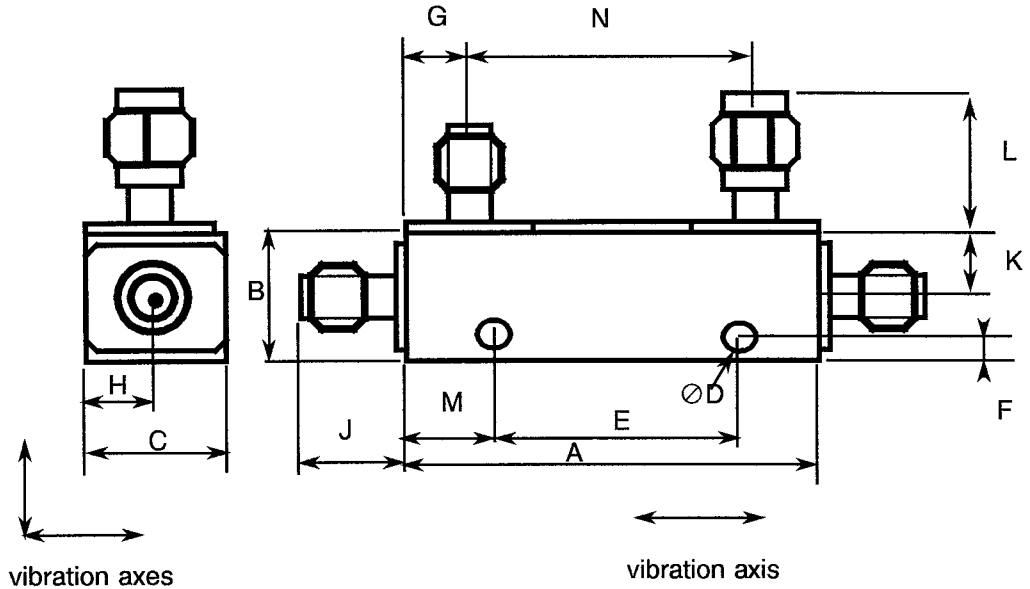
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 19.5 | 20.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.35 | - |
| | | RLs | - | 1.40 | - |
| 4 | Insertion Loss | IL | - | 0.55 | dB |
| 5 | Directivity | DIR | 15 | - | dB |
| 6 | Frequency Range | f | 12.4 | 18 | GHz |
| 7 | RF Power | P | - | 50 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 30 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 25.1 | 26.1 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ØD | 2.5 | 2.7 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 2.7 | mm |
| | | G* | 6 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.8 | 8.8 | mm |
| | | L | - | 20 | mm |
| | | M | 12.3 | 13.3 | mm |
| N | 12.2 | 13.2 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 20



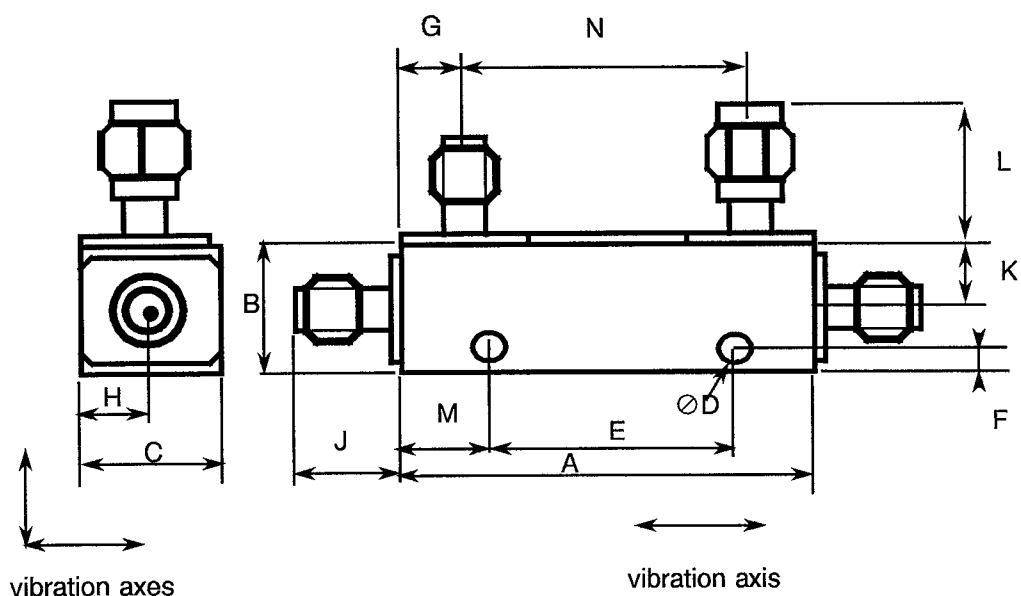
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 9.5 | 10.5 | dB |
| 2 | Coupling Variation | CV | -0.5 | +0.5 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.40 | - |
| | | RLs | - | 1.50 | - |
| 4 | Insertion Loss | IL | - | 0.7 | dB |
| 5 | Directivity | DIR | 15 | - | dB |
| 6 | Frequency Range | f | 18 | 22 | GHz |
| 7 | RF Power | P | - | 30 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 35 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 26.4 | 27.4 | mm |
| | | B* | 15.5 | 16.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 3 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 3 | mm |
| | | G* | 5 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 9 | 10 | mm |
| | | L | - | 25 | mm |
| M | 13 | 14 | mm | | |
| N | 13.7 | 14.7 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 21

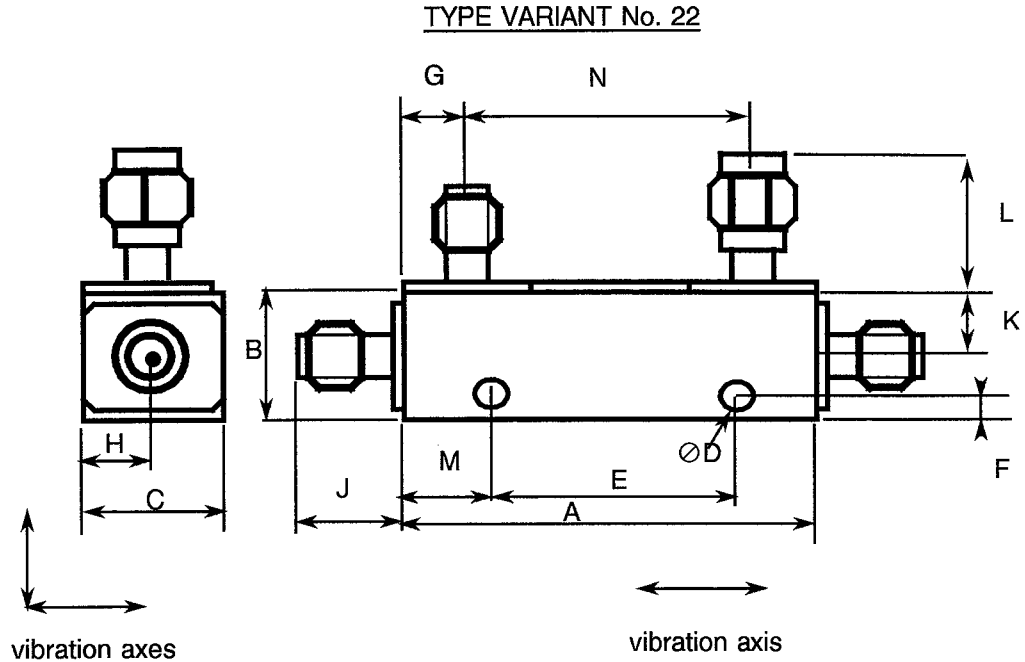


| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 15 | 17 | dB |
| 2 | Coupling Variation | CV | -0.8 | +0.8 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.40 | - |
| | | RLs | - | 1.50 | - |
| 4 | Insertion Loss | IL | - | 0.7 | dB |
| 5 | Directivity | DIR | 13 | - | dB |
| 6 | Frequency Range | f | 18 | 22 | GHz |
| 7 | RF Power | P | - | 30 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 35 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 26.4 | 27.4 | mm |
| | | B* | 15.5 | 16.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.5 | 3 | mm |
| | | E | 0 | 0 | mm |
| | | F | 1.7 | 3 | mm |
| | | G* | 5 | 7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 9 | 10 | mm |
| | | L | - | 25 | mm |
| | | M | 13 | 14 | mm |
| N | 13.7 | 14.7 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION



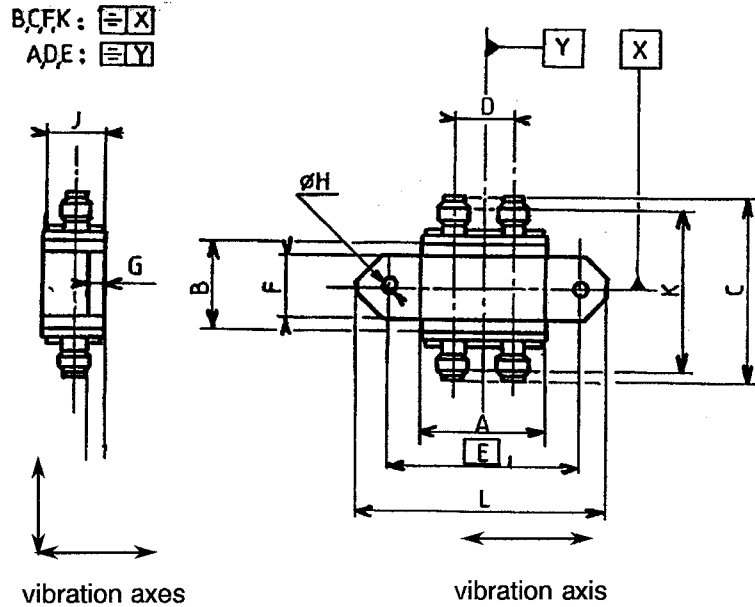
| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|-------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 29 | 31 | dB |
| 2 | Coupling Variation | CV | -0.1 | +0.1 | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.15 | - |
| | | RLs | - | 1.15 | - |
| 4 | Insertion Loss | IL | - | 0.2 | dB |
| 5 | Directivity | DIR | 13 | - | dB |
| 6 | Frequency Range | f | 2.003 | 2.053 | GHz |
| 7 | RF Power | P | - | 4 | W |
| 8 | RF Leakage | E | 65 | - | dB |
| 9 | Weight | W | - | 45 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -40 | +85 | °C |
| 12 | Physical Dimensions * on area without paint | A* | 39.5 | 40.5 | mm |
| | | B* | 14.5 | 15.5 | mm |
| | | C | 12.5 | 13.5 | mm |
| | | ∅D | 2.79 | 2.95 | mm |
| | | E | 13.9 | 14.1 | mm |
| | | F | 1.9 | 2.1 | mm |
| | | G* | 6.7 | 7.7 | mm |
| | | H | 6 | 7 | mm |
| | | J | 9 | 10 | mm |
| | | K* | 7.7 | 8.7 | mm |
| | | L | - | 17 | mm |
| M | 12 | 14 | mm | | |
| N | 25 | 27 | mm | | |

NOTES: See Page 9.



TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT No. 23



| No | CHARACTERISTICS | SYMBOL | VALUES | | UNIT |
|----|--|--------|---------------|------|------|
| | | | MIN | MAX | |
| 1 | Coupling Factor | CF | 3.9 | 4.5 | dB |
| 2 | Coupling Variation | CV | - | - | dB |
| 3 | VSWR Primary Line Secondary Line | RLp | - | 1.22 | - |
| | | RLs | - | 1.22 | - |
| 4 | Insertion Loss | IL | - | 0.5 | dB |
| 5 | Directivity | DIR | 25 | - | dB |
| 6 | Frequency Range | f | 3.7 | 4.2 | GHz |
| 7 | RF Power | P | - | 12 | W |
| 8 | RF Leakage | E | 85 | - | dB |
| 9 | Weight | W | - | 45 | g |
| 10 | Interfaces Input | - | 340200231B301 | | - |
| | Output | - | 340200231B301 | | - |
| | Coupled Output | - | 340200231B301 | | - |
| 11 | Operating Temperature Range | Top | -10 | +60 | °C |
| 12 | Physical Dimensions * on area without paint | A* | - | 22 | mm |
| | | B* | 17.7 | 18.2 | mm |
| | | C | - | 37.5 | mm |
| | | D | 14.7 | 15.2 | mm |
| | | E | 39.5 | 40.5 | mm |
| | | F | 14.5 | 14.9 | mm |
| | | G* | 2.8 | 3.2 | mm |
| | | ∅H | 4.5 | 4.6 | mm |
| | | J | 12.5 | 12.9 | mm |
| | | K* | 32.9 | 33.4 | mm |
| | | L | - | 53.1 | mm |
| | | M | - | - | mm |
| N | - | - | mm | | |

NOTES: See Page 9. (Note 3 does not apply)