Jul. 2018 Ver.2.4
TDK Corporation

# Multilayer Directional Coupler

For 1427-5950MHz

HHM Series 1.0x0.5mm [EIA 0402] TYPE

P/N: **HHM2955A1**

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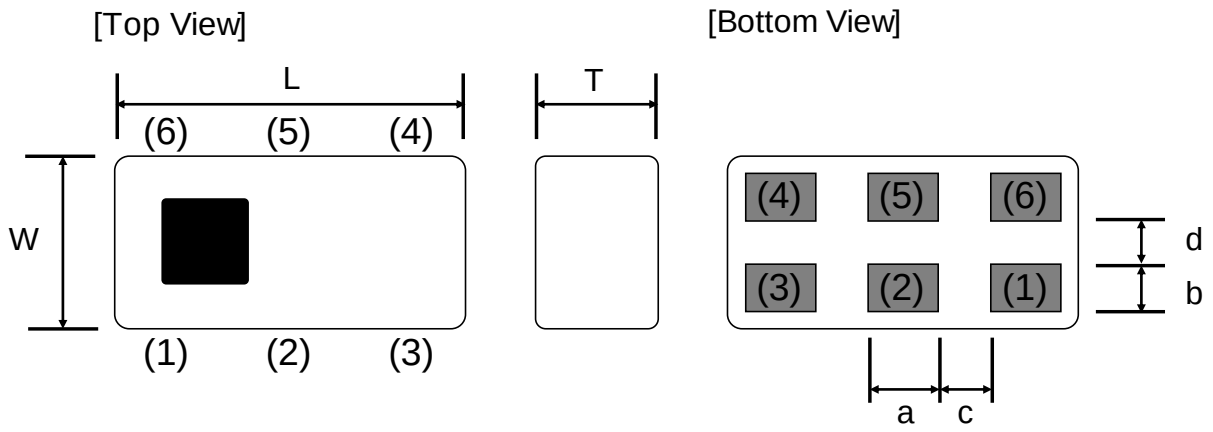
# HHM2955A1

## SHAPES AND DIMENSIONS




Dimensions (mm)

| L | W | T | a | b | c | d |
|---|---|---|---|---|---|---|
| 1.00 +/-0.05 | 0.50 +/-0.05 | 0.50 Max | 0.18 +/-0.05 | 0.125 +/-0.05 | 0.20 +/-0.05 | 0.20 +/-0.05 |

Terminal functions

| | |
|---|---|
| **(1)** | Output |
| **(2)** | GND |
| **(3)** | Input |

| | |
|---|---|
| **(4)** | Coupling Port |
| **(5)** | GND |
| **(6)** | 50ohm Termination |

## TERMINATION FINISH

| Material |
|---|
| Au plate |

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## ELECTRICAL CHARACTERIST ( Measurement )

| Parameter | Frequency (MHz) | TDK Spec | | |
|---|---|---|---|---|
| | | Min. | Typ. | Max. |
| Coupling(dB) | 1427 to 2700 | 23.0 | 25.8 | 28.0 |
| | 3400 to 3800 | 23.0 | 23.6 | 28.0 |
| | 5150 to 5950 | 23.0 | 24.7 | 28.0 |
| Isolation(dB) | 1427 to 2700 | 40 | 45.4 | - |
| | 3400 to 3800 | 40 | 47.8 | - |
| | 5150 to 5950 | 40 | 42.7 | - |
| Directivity(dB) | 1427 to 2700 | 15 | 20.7 | - |
| | 3400 to 3800 | 15 | 24.2 | - |
| | 5150 to 5950 | 15 | 18.0 | - |
| Insertion Loss(dB) | 1427 to 5950 | - | 0.05 | 0.20 |
| Return Loss(dB) | 1427 to 5950 | 10 | 25.0 | - |
| Insertion Loss of Sub Line(dB) | 1427 to 5950 | - | 0.47 | 1.00 |
| Return Loss of Sub Line(dB) | 1427 to 5950 | 10 | 19.4 | - |
| Characteristic Impedance (ohm) | | 50 (Nominal) | | |

Ta = +25+/-5°C

## MAXIMUM RATINGS

| Parameter | TDK Spec | | Conditions |
|---|---|---|---|
| | Min. | Max. | |
| Operating temperature (°C) | –40 to +90 °C | | |
| Storage temperature (°C) | –40 to +90 °C | | |
| Power Handling (W) | - | 3 | CW |
| Human Body Model : HBM @Each Port (V) | -1000 | 1000 | 100pF / 1500ohm |
| Machine Model : MM @Each Port (V) | -150 | 150 | 200pF / 0ohm |
| Charged Device Model : CDM @Each Port (V) | -500 | 500 | Relative humidity : 51%RH max |

Ambient temperature : +25+/-5°C

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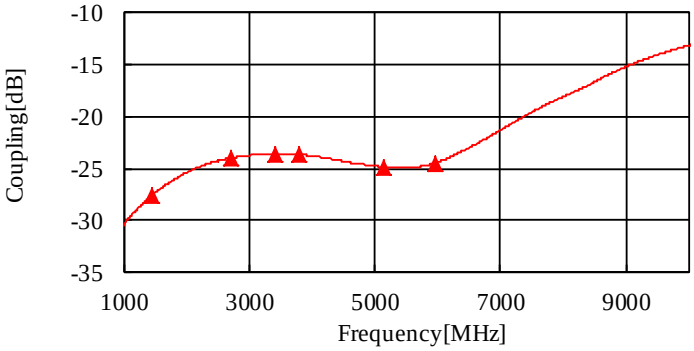
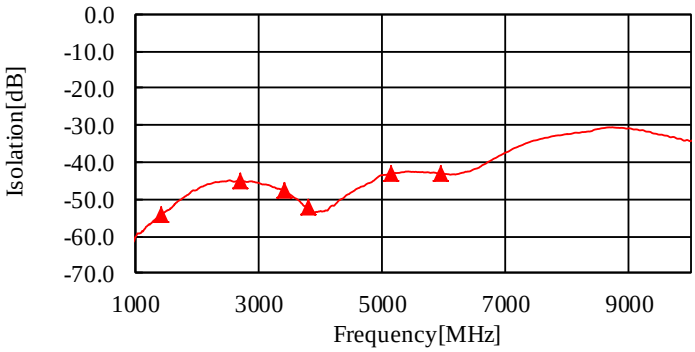
## FREQUENCY CHARACTERISTICS

Coupling



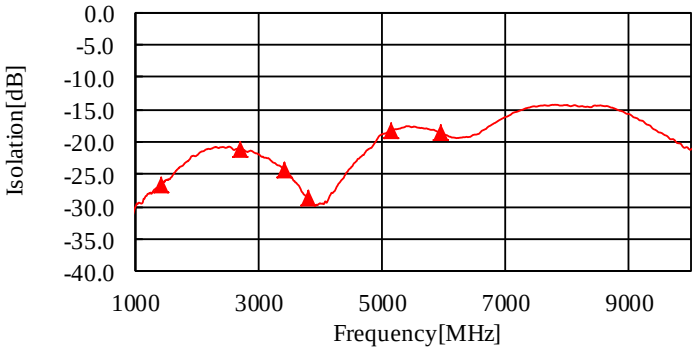

| Frequency | |
|---|---|
| 1427 MHz | -27.6 dB |
| 2700 MHz | -24.0 dB |
| 3400 MHz | -23.6 dB |
| 3800 MHz | -23.6 dB |
| 5150 MHz | -24.9 dB |
| 5950 MHz | -24.5 dB |

Isolation




| Frequency | |
|---|---|
| 1427 MHz | -54.2 dB |
| 2700 MHz | -45.1 dB |
| 3400 MHz | -47.8 dB |
| 3800 MHz | -52.3 dB |
| 5150 MHz | -43.3 dB |
| 5950 MHz | -43.0 dB |

Directivity




| Frequency | |
|---|---|
| 1427 MHz | -26.6 dB |
| 2700 MHz | -21.1 dB |
| 3400 MHz | -24.2 dB |
| 3800 MHz | -28.8 dB |
| 5150 MHz | -18.3 dB |
| 5950 MHz | -18.5 dB |

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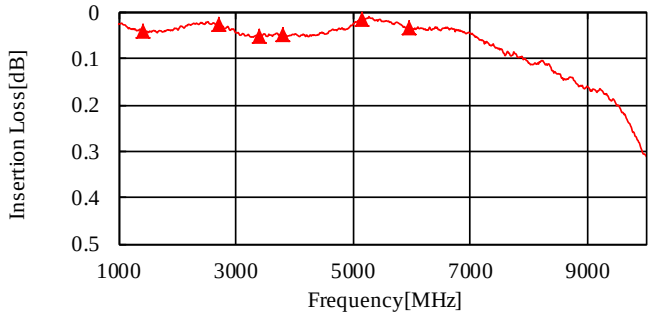
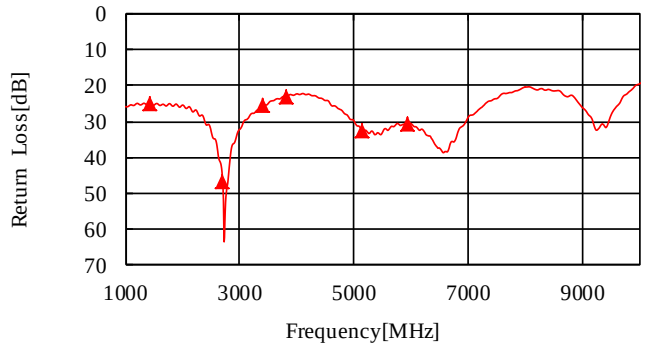
## FREQUENCY CHARACTERISTICS

S21(Main Line Insertion Loss)



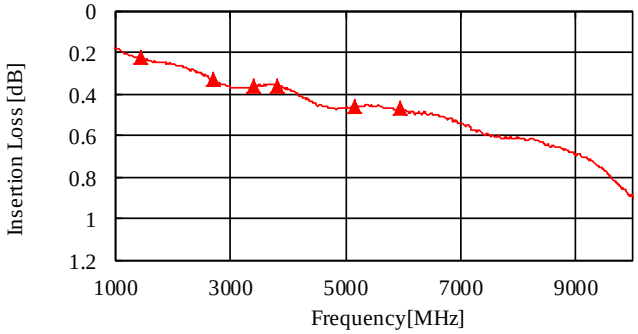

| Frequency | |
|---|---|
| 1427 MHz | 0.04 dB |
| 2700 MHz | 0.02 dB |
| 3400 MHz | 0.05 dB |
| 3800 MHz | 0.05 dB |
| 5150 MHz | 0.02 dB |
| 5950 MHz | 0.03 dB |

S11(Main Line)



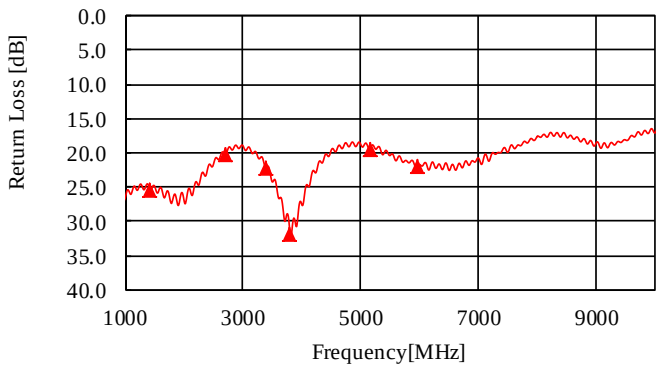

| Frequency | |
|---|---|
| 1427 MHz | 25.0 dB |
| 2700 MHz | 46.5 dB |
| 3400 MHz | 25.4 dB |
| 3800 MHz | 23.1 dB |
| 5150 MHz | 32.5 dB |
| 5950 MHz | 30.8 dB |

S43(Sub line Insertion Loss)




| Frequency | |
|---|---|
| 1427 MHz | 0.22 dB |
| 2700 MHz | 0.33 dB |
| 3400 MHz | 0.36 dB |
| 3800 MHz | 0.36 dB |
| 5150 MHz | 0.46 dB |
| 5950 MHz | 0.47 dB |

S33(Sub Line Return Loss)




| Frequency | |
|---|---|
| 1427 MHz | 25.5 dB |
| 2700 MHz | 20.3 dB |
| 3400 MHz | 22.1 dB |
| 3800 MHz | 31.9 dB |
| 5150 MHz | 19.4 dB |
| 5950 MHz | 22.1 dB |

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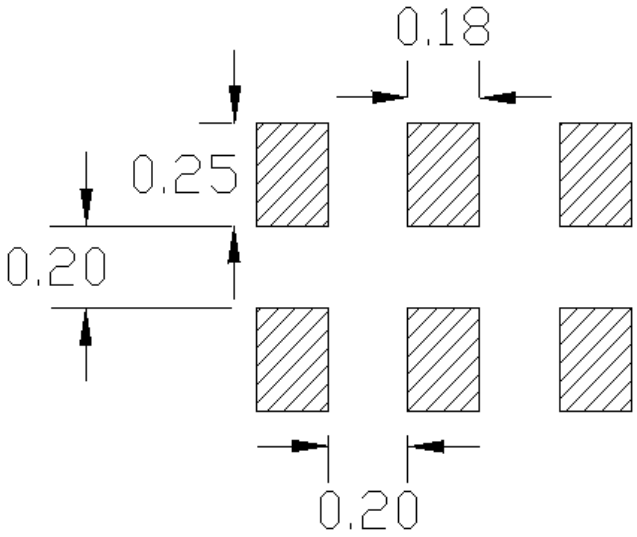
## RECOMMENDED LAND PATTERN




unit : mm

## ENVIRONMENT INFORMATION

RoHS Statement
RoHS Compliance

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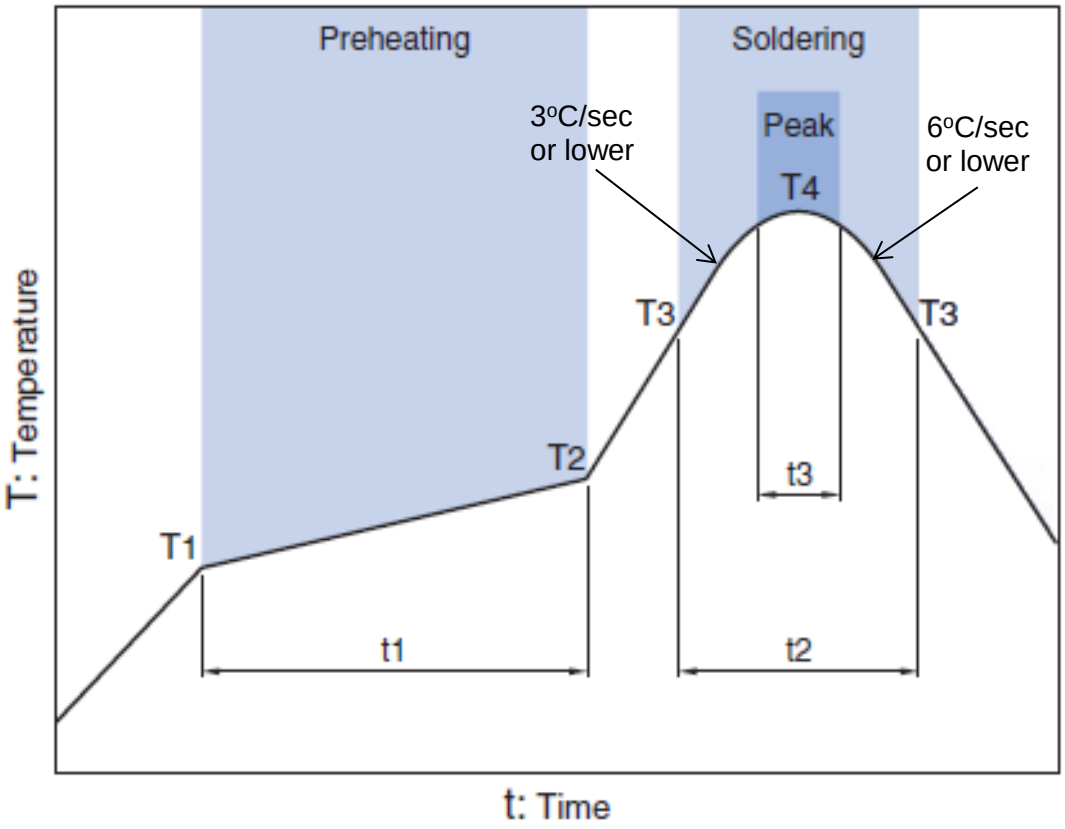
## ■ RECOMMENDED REFLOW PROFILE




| Preheating | | | Soldering | | | |
|---|---|---|---|---|---|---|
| | | | Critical zone (T3 to T4) | | Peak | |
| Temp. | | Time | Temp. | Time | Temp. | Time |
| T1 | T2 | t1 | T3 | t2 | T4 | t3 * |
| 150°C | 200°C | 60 to 120sec | 217°C | 60 to 120sec | 240 to 260°C | 30 sec Max |

* t3 : Time within 5°C of actual peak temperature

The maximum number of reflow is 3.

Note: Lead free solder is recommended.
Recommended solder is Sn-3.0Ag-0.5Cu. (M705 by Senju Metal Industry)

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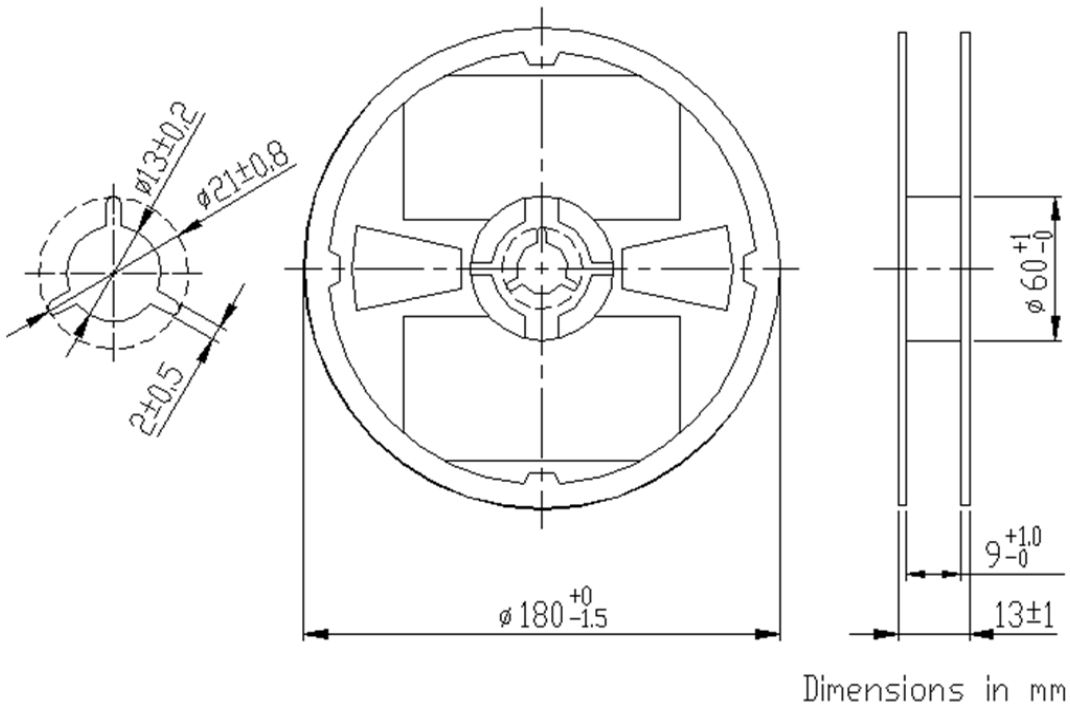
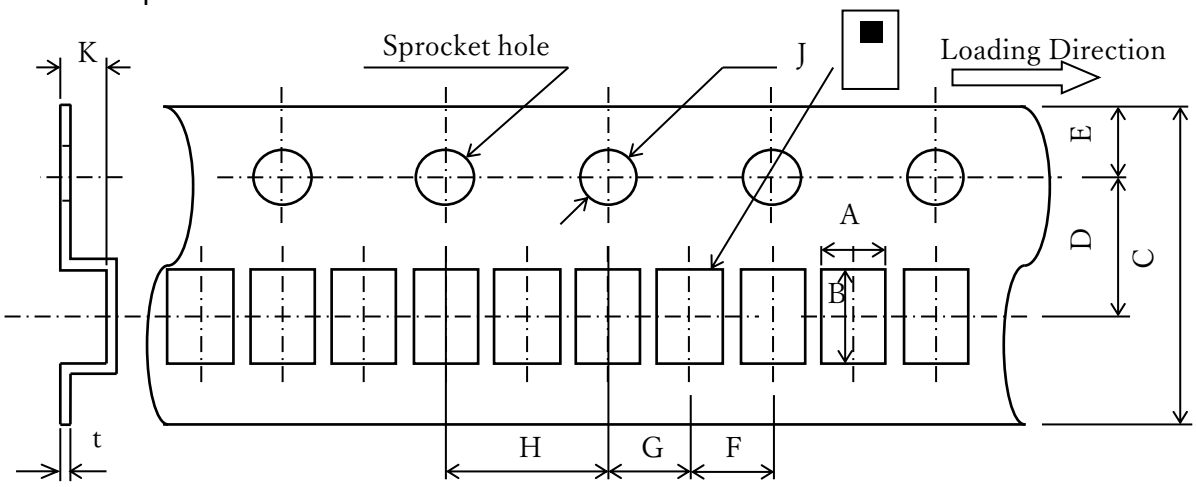
## ■ PACKAGING STYLE

Reel Dimensions




Carrier Tape




Dimensions (mm)

| A | B | C | D | E | F | G | H | J | K | t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.62 +/-0.05 | 1.12 +/-0.05 | 8.0 +/-0.2 | 3.5 +/-0.05 | 1.75 +/-0.1 | 2.0 +/-0.05 | 2.0 +/-0.05 | 4.0 +/-0.05 | 1.5 +0.1/-0 | 0.53 MAX | 0.25 +/-0.05 |

| STANDARD PACKAGE QUANTITY ( pieces/reel ) |
|---|
| 10,000 |

# REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

# SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

## ⚠ REMINDERS

The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.
Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this catalog.

(1) Aerospace/Aviation equipment
(2) Transportation equipment (cars, electric trains, ships, etc.)
(3) Medical equipment
(4) Power-generation control equipment
(5) Atomic energy-related equipment
(6) Seabed equipment
(7) Transportation control equipment
(8) Public information-processing equipment
(9) Military equipment
(10) Electric heating apparatus, burning equipment
(11) Disaster prevention/crime prevention equipment
(12) Safety equipment
(13) Other applications that are not considered general-purpose applications

When using this product in general-purpose applications, you are kindly requested to take into consideration securing protection circuit/equipment or providing backup circuits, etc., to ensure higher safety.