Jan. 2022 Ver.6.0
TDK Corporation

# Multilayer Diplexer

For 698-2170MHz / 2400-5850MHz

DPX Series 2.0x1.25mm [EIA 0805] TYPE

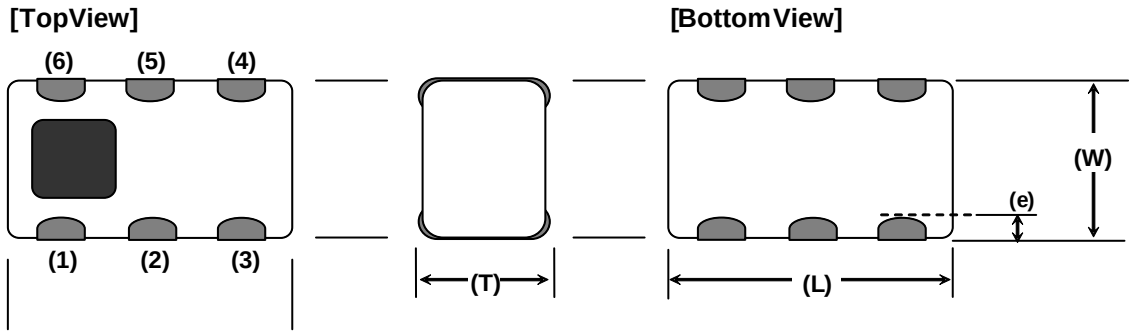
P/N: **DPX205850DT-4054B5**

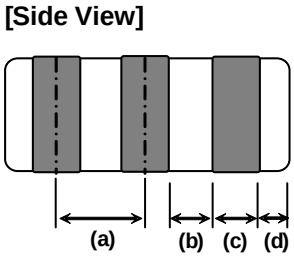
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# DPX205850DT-4054B5

## SHAPES AND DIMENSIONS




Dimensions (mm)

| L | W | T | a | b | c | d | e |
|---|---|---|---|---|---|---|---|
| 2.00 +/-0.15 | 1.25 +/-0.15 | 0.90 +/-0.10 | 0.65 +/-0.10 | 0.35 +/-0.20 | 0.30 +/-0.20 | 0.20 +/-0.20 | 0.20 +/-0.20 |

Terminal functions

| | |
|---|---|
| (1) | GND |
| (2) | Common Port |
| (3) | GND |

| | |
|---|---|
| (4) | High-Band Port |
| (5) | GND |
| (6) | Low-Band Port |

## TERMINATION FINISH

| Material |
|---|
| Sn plate |

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## ■ ELECTRICAL CHARACTERISTICS

( Measurement )

**Low-Band**

| Parameter | Frequency (MHz) | TDK Spec | | |
|---|---|---|---|---|
| | | Min. | Typ. | Max. |
| Insertion Loss (dB) | 698 to 960 | - | 0.23 | 0.40 |
| | 1560 to 1610 | - | 0.35 | 0.50 |
| | 1710 to 1920 | - | 0.48 | 0.65 |
| | 1920 to 1990 | - | 0.53 | 0.80 |
| | 1990 to 2170 | - | 0.98 | 1.30 |
| Insertion Loss (dB) ( –40 to +85 °C ) | 698 to 960 | - | - | 0.50 |
| | 1560 to 1610 | - | - | 0.60 |
| | 1710 to 1920 | - | - | 0.80 |
| | 1920 to 1990 | - | - | 1.00 |
| | 1990 to 2170 | - | - | 1.55 |
| Return Loss@Low-Band (dB) | 698 to 960 | 10 | 16 | - |
| | 1560 to 1610 | 10 | 16 | - |
| | 1710 to 2170 | 10 | 17 | - |
| Attenuation (dB) | 2400 to 2500 | 10 | 15.0 | - |
| | 2500 to 2690 | 10 | 12.0 | - |
| | 5150 to 5850 | 25 | 36.0 | - |
| Characteristic Impedance (ohm) | | 50 (Nominal) | | |

Ta = +25+/-5°C

**High-Band**

| Parameter | Frequency (MHz) | TDK Spec | | |
|---|---|---|---|---|
| | | Min. | Typ. | Max. |
| Insertion Loss (dB) | 2400 to 2500 | - | 1.27 | 1.70 |
| | 2500 to 2690 | - | 0.76 | 1.00 |
| | 5150 to 5850 | - | 0.27 | 0.50 |
| Insertion Loss (dB) ( –40 to +85 °C ) | 2400 to 2500 | - | - | 2.00 |
| | 2500 to 2690 | - | - | 1.20 |
| | 5150 to 5850 | - | - | 0.60 |
| Return Loss@High-Band (dB) | 2400 to 2500 | 10 | 23 | - |
| | 2500 to 2690 | 10 | 17 | - |
| | 5150 to 5850 | 10 | 14 | - |
| Attenuation (dB) | 698 to 960 | 18 | 23.0 | - |
| | 1560 to 1610 | 15 | 19.0 | - |
| | 1710 to 2170 | 12 | 15.0 | - |
| Characteristic Impedance (ohm) | | 50 (Nominal) | | |

Ta = +25+/-5°C

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# DPX205850DT-4054B5

## ■ MAXIMUM RATINGS

| Parameter | | | TDK Spec | Conditions |
|---|---|---|---|---|
| Operating temperature (°C) | | | –40 to +85 °C | |
| Storage temperature (°C) | | | –40 to +85 °C | |
| Power Handling (W) *1 | | Frequency (MHz) | | |
| | Low-Band | 698 to 2170 | 1 | CW |
| | High-Band | 2400 to 5850 | 1 | CW |
| Human Body Model : HBM | | @Each Port (V) | +/-1000 | 100pF / 1500ohm |
| Machine Model : MM | | @Each Port (V) | +/-150 | 200pF / 0ohm |
| Charged Device Model : CDM | | @Each Port (V) | +/-500 | Humidity : 60%RH max |

*1 : Refer to 3GPP TS 38.101-1 V15.2.0

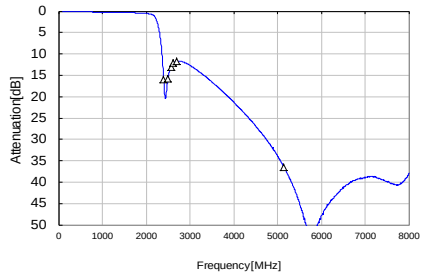
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# DPX205850DT-4054B5

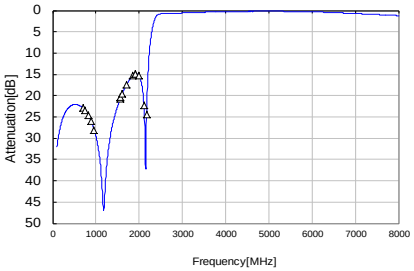
## FREQUENCY CHARACTERISTICS

**Low-Band Port Attenuation S21**



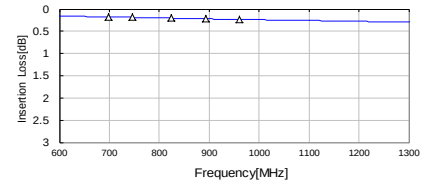

| | | |
|---|---|---|
| 2400 MHz | 16.1 | dB |
| 2500 MHz | 15.7 | dB |
| 2570 MHz | 13.0 | dB |
| 2620 MHz | 12.2 | dB |
| 2690 MHz | 11.7 | dB |
| 5150 MHz | 36.5 | dB |
| 5850 MHz | 51.4 | dB |

**High-Band Port Attenuation S31**



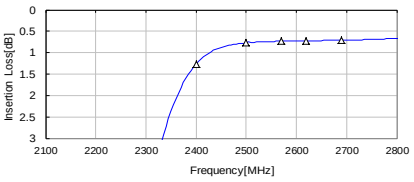

| | | |
|---|---|---|
| 698 MHz | 22.9 | dB |
| 746 MHz | 23.4 | dB |
| 824 MHz | 24.6 | dB |
| 894 MHz | 26.0 | dB |
| 960 MHz | 28.0 | dB |
| 1560 MHz | 20.8 | dB |
| 1575 MHz | 20.4 | dB |
| 1610 MHz | 19.5 | dB |
| 1710 MHz | 17.4 | dB |
| 1850 MHz | 15.4 | dB |
| 1910 MHz | 15.0 | dB |
| 1920 MHz | 14.9 | dB |
| 1990 MHz | 15.2 | dB |
| 2110 MHz | 22.2 | dB |
| 2170 MHz | 24.4 | dB |

**Low-Band Port Insertion Loss S21**

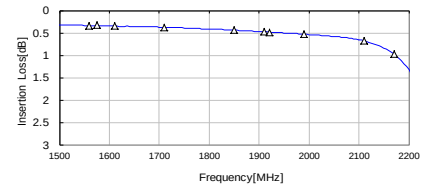



| | | |
|---|---|---|
| 698 MHz | 0.18 | dB |
| 746 MHz | 0.19 | dB |
| 824 MHz | 0.20 | dB |
| 894 MHz | 0.22 | dB |
| 960 MHz | 0.23 | dB |

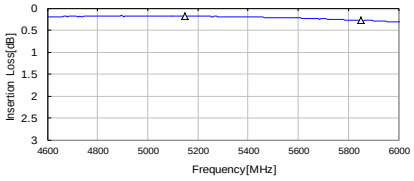
**High-Band Port Insertion Loss S31**




| | | |
|---|---|---|
| 2400 MHz | 1.27 | dB |
| 2500 MHz | 0.76 | dB |
| 2570 MHz | 0.73 | dB |
| 2620 MHz | 0.73 | dB |
| 2690 MHz | 0.71 | dB |

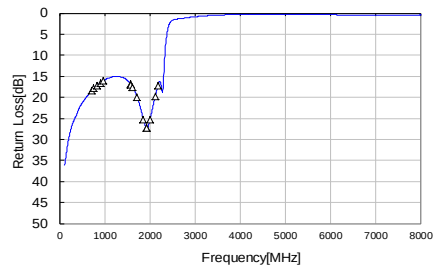



| | | |
|---|---|---|
| 1560 MHz | 0.34 | dB |
| 1575 MHz | 0.33 | dB |
| 1610 MHz | 0.35 | dB |
| 1710 MHz | 0.38 | dB |
| 1850 MHz | 0.44 | dB |
| 1910 MHz | 0.48 | dB |
| 1920 MHz | 0.48 | dB |
| 1990 MHz | 0.53 | dB |
| 2110 MHz | 0.68 | dB |
| 2170 MHz | 0.98 | dB |



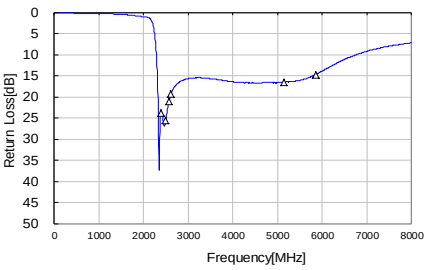

| | | |
|---|---|---|
| 5150 MHz | 0.18 | dB |
| 5850 MHz | 0.27 | dB |

**Low-Band Port Return Loss S22**



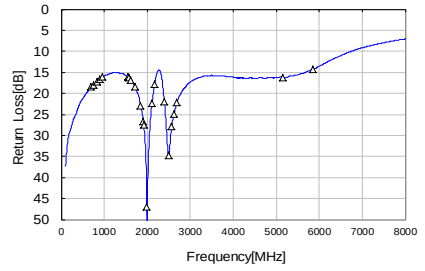

| | | |
|---|---|---|
| 698 MHz | 18.5 | dB |
| 746 MHz | 17.9 | dB |
| 824 MHz | 17.2 | dB |
| 894 MHz | 16.6 | dB |
| 960 MHz | 16.0 | dB |
| 1560 MHz | 16.7 | dB |
| 1575 MHz | 17.0 | dB |
| 1610 MHz | 17.6 | dB |
| 1710 MHz | 19.9 | dB |
| 1850 MHz | 25.3 | dB |
| 1910 MHz | 27.2 | dB |
| 1920 MHz | 27.4 | dB |
| 1990 MHz | 25.4 | dB |
| 2110 MHz | 19.8 | dB |
| 2170 MHz | 17.1 | dB |

**High-Band Port Return Loss S33**



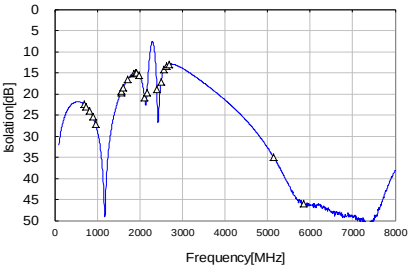

| | | |
|---|---|---|
| 2400 MHz | 23.8 | dB |
| 2500 MHz | 25.7 | dB |
| 2570 MHz | 21.1 | dB |
| 2620 MHz | 19.3 | dB |
| 5150 MHz | 16.5 | dB |
| 5850 MHz | 14.7 | dB |

**Common Port Return Loss S11**




| | | |
|---|---|---|
| 698 MHz | 18.4 | dB |
| 746 MHz | 18.0 | dB |
| 824 MHz | 17.2 | dB |
| 894 MHz | 16.7 | dB |
| 960 MHz | 16.1 | dB |
| 1560 MHz | 16.1 | dB |
| 1575 MHz | 16.3 | dB |
| 1610 MHz | 16.8 | dB |
| 1710 MHz | 18.4 | dB |
| 1850 MHz | 22.9 | dB |
| 1910 MHz | 26.6 | dB |
| 1920 MHz | 27.5 | dB |
| 1990 MHz | 47.0 | dB |
| 2110 MHz | 22.4 | dB |
| 2170 MHz | 17.9 | dB |
| 2400 MHz | 22.0 | dB |
| 2500 MHz | 34.7 | dB |
| 2570 MHz | 27.8 | dB |
| 2620 MHz | 24.9 | dB |
| 2690 MHz | 22.1 | dB |
| 5150 MHz | 16.1 | dB |
| 5850 MHz | 14.3 | dB |

**Isolation (Low - High) S23**



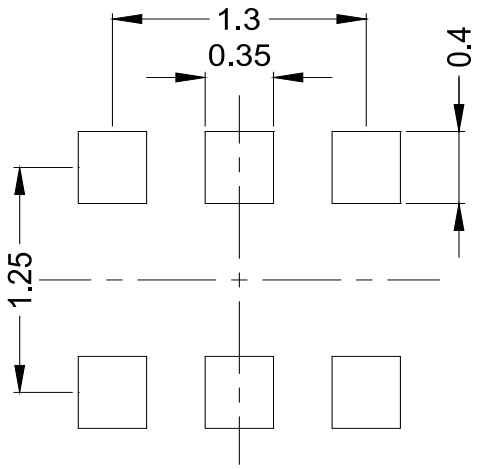

| | | |
|---|---|---|
| 698 MHz | 22.5 | dB |
| 746 MHz | 23.0 | dB |
| 824 MHz | 24.0 | dB |
| 894 MHz | 25.3 | dB |
| 960 MHz | 27.2 | dB |
| 1560 MHz | 19.6 | dB |
| 1575 MHz | 19.3 | dB |
| 1610 MHz | 18.5 | dB |
| 1710 MHz | 16.6 | dB |
| 1850 MHz | 15.2 | dB |
| 1910 MHz | 15.0 | dB |
| 1920 MHz | 15.0 | dB |
| 1990 MHz | 15.6 | dB |
| 2110 MHz | 20.9 | dB |
| 2170 MHz | 19.8 | dB |
| 2400 MHz | 19.0 | dB |
| 2500 MHz | 17.1 | dB |
| 2570 MHz | 14.2 | dB |
| 2620 MHz | 13.4 | dB |
| 2690 MHz | 13.0 | dB |
| 5150 MHz | 35.1 | dB |
| 5850 MHz | 45.9 | dB |

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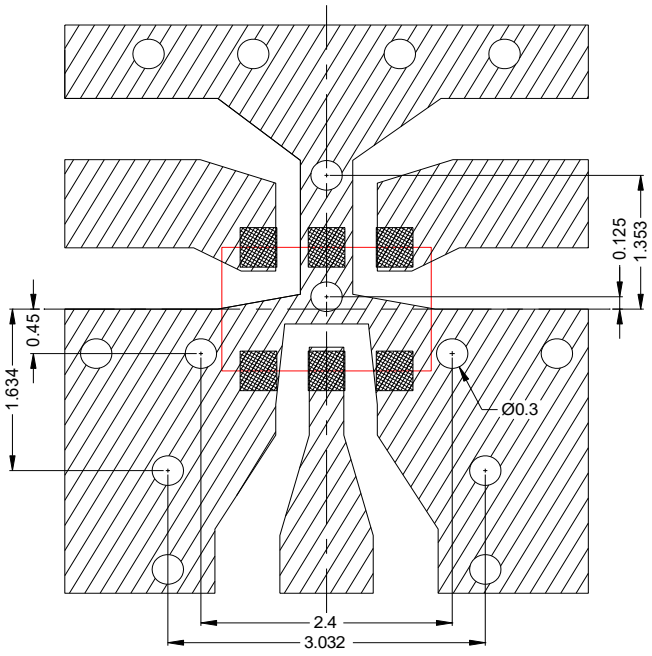
# DPX205850DT-4054B5

## RECOMMENDED LAND PATTERN




Unit[mm]

## EVALUATION BOARD




Thru Hole
Surface Pattern
Land Pattern
DUT

| Material & Layer | Thickness |
|---|---|
| Copper Surface Pattern | 0.05 mm |
| Teflon | 0.35 mm |
| Copper Bottom GND | 0.05 mm |

unit : mm

* Line width should be designed to match 50 ohm characteristic impedance depending on PCB material and thickness.
** The position of the throuh hole which have possibility of influence to the prerformance are indicated by dimension line.

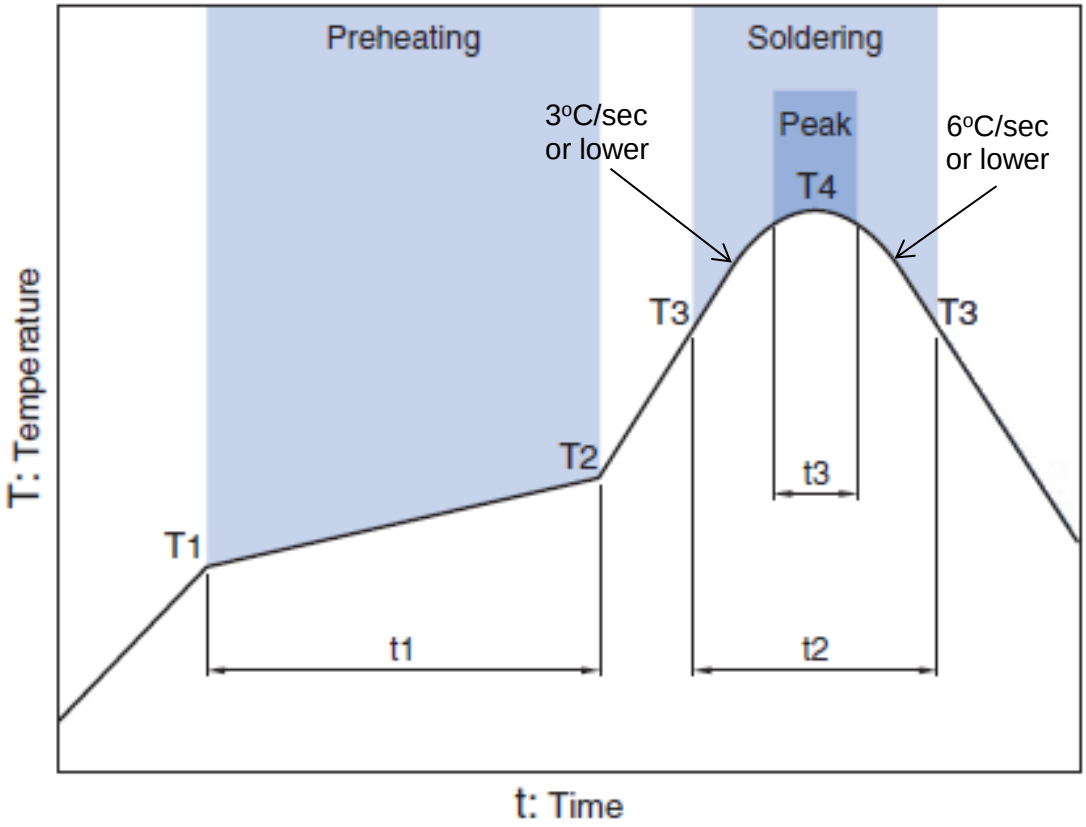
## ENVIRONMENT INFORMATION

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)

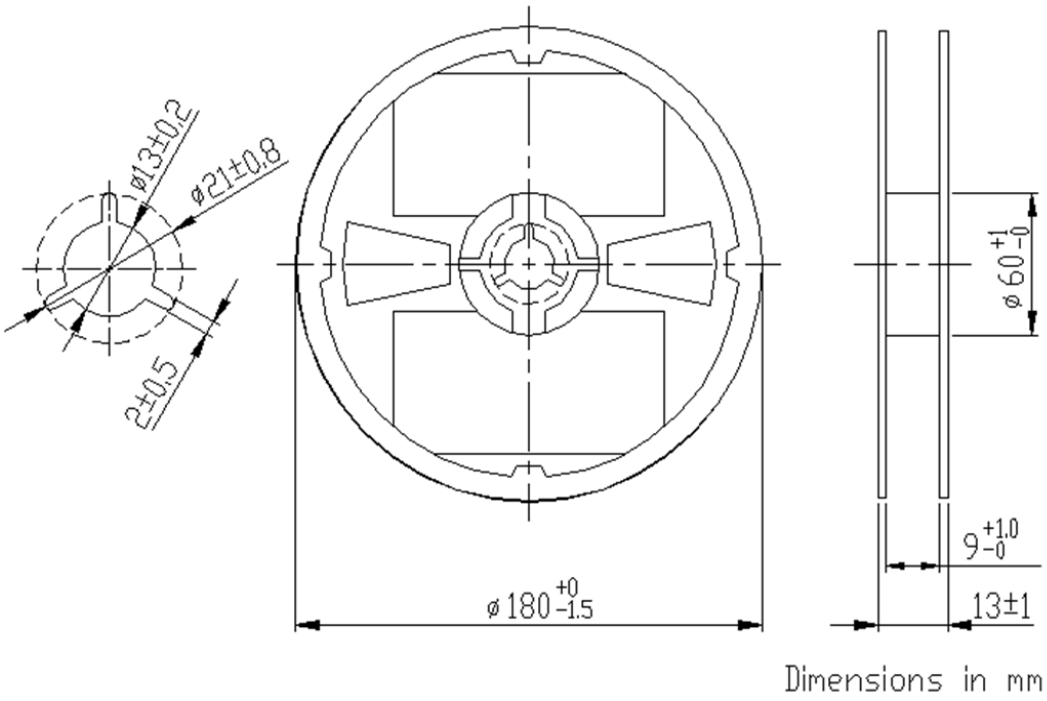
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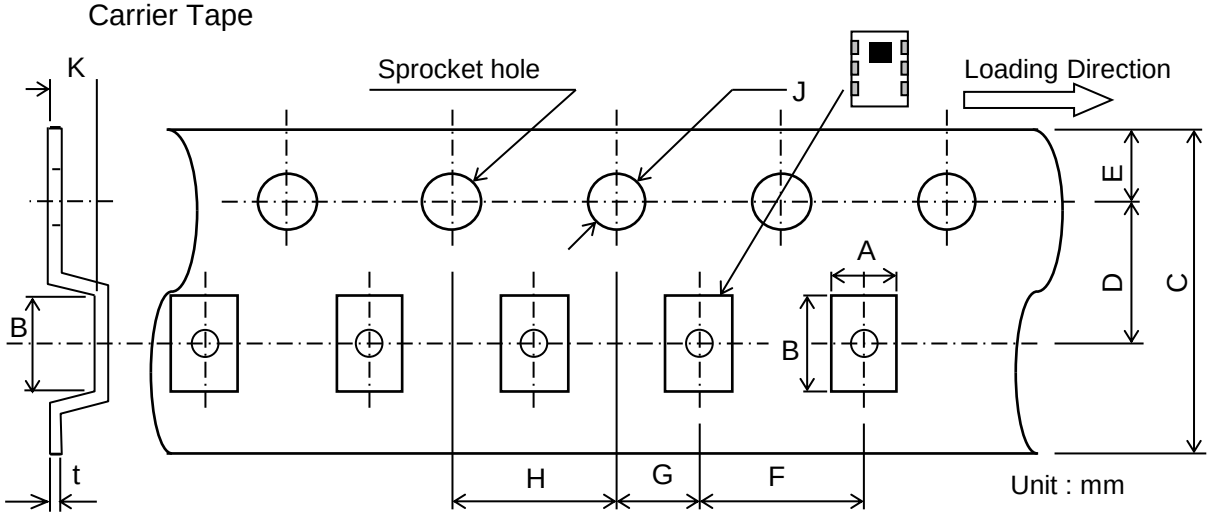
# DPX205850DT-4054B5

## ■ PACKAGING STYLE

Reel Dimensions




Carrier Tape




Dimensions (mm)

| A | B | C | D | E | F | G | H | J | K | t |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.45 +/-0.1 | 2.25 +/-0.1 | 8.0 +/-0.20 | 3.5 +/-0.05 | 1.75 +/-0.1 | 4.0 +/-0.1 | 2.0 +/-0.05 | 4.0 +/-0.1 | 1.5 +0.1/-0 | 1.2 MAX | 0.25 +/-0.05 |

| STANDARD PACKAGE QUANTITY ( pieces/reel ) |
|---|
| 2,000 |

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# 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.