

## **Notification about the transfer of the semiconductor business**

The semiconductor business of Panasonic Corporation was transferred on September 1, 2020 to Nuvoton Technology Corporation (hereinafter referred to as "Nuvoton"). Accordingly, Panasonic Semiconductor Solutions Co., Ltd. became under the umbrella of the Nuvoton Group, with the new name of Nuvoton Technology Corporation Japan (hereinafter referred to as "NTCJ").

In accordance with this transfer, semiconductor products will be handled as NTCJ-made products after September 1, 2020. However, such products will be continuously sold through Panasonic Corporation.

Publisher of this Document is NTCJ.

If you would find description "Panasonic" or "Panasonic semiconductor solutions", please replace it with NTCJ.

※ Except below description page

"Request for your special attention and precautions in using the technical information and semiconductors described in this book"

**Nuvoton Technology Corporation Japan**

**FK8V03050L**

**Silicon N-channel MOSFET**

For lithium-ion secondary battery protection circuit  
 For DC-DC Converter

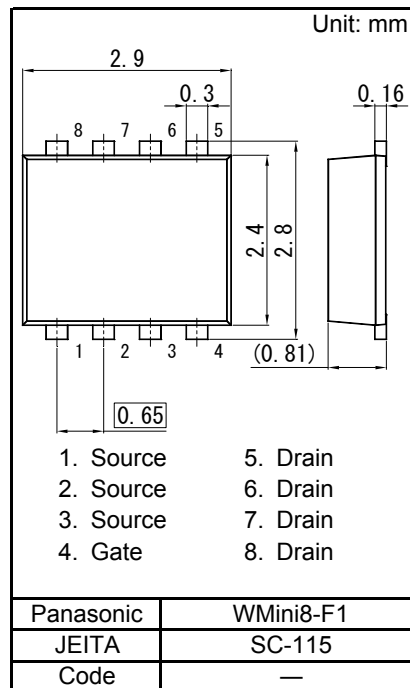
■ Features

- Low drain-source On-state Resistance  
 RDS(on) typ = 16 mΩ (VGS = 4.5 V)
- High-speed switching : Qg = 5.1 nC
- Halogen-free / RoHS compliant  
 (EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 3E

■ Packaging

Embossed type (Thermo-compression sealing) : 3 000 pcs / reel (standard)

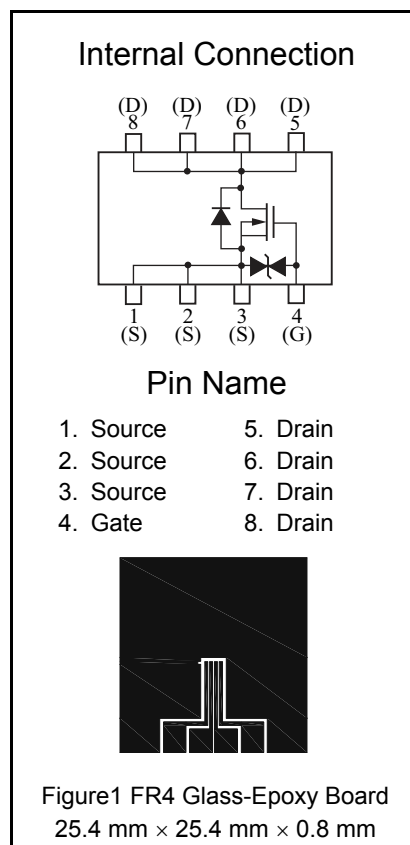


■ Absolute Maximum Ratings Ta = 25 °C

| Parameter  | Symbol      | Rating      | Unit |
|--|-------------|-------------|------|
| Drain-source Voltage                                     | VDS         | 33          | V    |
| Gate-source Voltage                                      | VGS         | ±20         | V    |
| Drain Current (Steady State) <sup>*1</sup>               | ID          | 8           | A    |
| Drain Current (t = 10 s) <sup>*1</sup>                   |             | 10          |      |
| Drain Current (Pulsed) <sup>*1,*2</sup>                  |             | 32          |      |
| Source Current (Pulsed)<br>(Body Diode) <sup>*1,*2</sup> | ISp<br>(BD) | 8           |      |
| Total Power Dissipation (Steady State) <sup>*1</sup>     | PD          | 1           | W    |
| Total Power Dissipation (t = 10 s) <sup>*1</sup>         |             | 1.5         |      |
| Channel Temperature                                      | Tch         | 150         | °C   |
| Operating Ambient Temperature                            | Topr        | -40 to +85  | °C   |
| Storage Temperature Range                                | Tstg        | -55 to +150 | °C   |

Note) \*1 Device mounted on a glass-epoxy board (See Figure 1)

\*2 Pulse test: Ensure that the channel temperature does not exceed 150°C



■ Electrical Characteristics Ta = 25°C ± 3°C

Static Characteristics

| Parameter                           | Symbol   | Conditions               | Min | Typ | Max | Unit |
|-------------------------------------|----------|--------------------------|-----|-----|-----|------|
| Drain-source Breakdown Voltage      | VDSS     | ID = 1 mA, VGS = 0 V     | 33  |     |     | V    |
| Zero Gate Voltage Drain Current     | IDSS     | VDS = 33 V, VGS = 0 V    |     |     | 10  | μA   |
| Gate-source Leakage Current         | IGSS     | VGS = ±16 V, VDS = 0 V   |     |     | ±10 | μA   |
| Gate-source Threshold Voltage       | Vth      | ID = 0.73 mA, VDS = 10 V | 1   |     | 2.5 | V    |
| Drain-source On-state Resistance *1 | RDS(on)1 | ID = 4A, VGS = 10 V      |     | 11  | 15  | mΩ   |
|                                     | RDS(on)2 | ID = 4A, VGS = 4.5 V     |     | 16  | 25  |      |

Dynamic Characteristics

| Parameter                    | Symbol  | Conditions                                | Min | Typ | Max | Unit |
|------------------------------|---------|---|-----|-----|-----|------|
| Input Capacitance            | Ciss    | VDS = 10 V, VGS = 0 V,<br>f = 1 MHz       |     | 520 |     | pF   |
| Output Capacitance           | Coss    |   |     | 110 |     |      |
| Reverse Transfer Capacitance | Crss    |   |     | 70  |     |      |
| Turn-on Delay Time *2        | td(on)  | VDD = 15 V, VGS = 0 to 10 V               |     | 8   |     | ns   |
| Rise Time *2                 | tr      | ID = 4 A                                  |     | 4   |     |      |
| Turn-off Delay Time *2       | td(off) | VDD = 15 V, VGS = 10 to 0 V               |     | 32  |     |      |
| Fall Time *2                 | tf      | ID = 4 A                                  |     | 10  |     |      |
| Total Gate Charge            | Qg      | VDD = 15 V, VGS = 0 to 4.5 V,<br>ID = 8 A |     | 5.1 |     | nC   |
| Gate-source Charge           | Qgs     |   |     | 1.8 |     |      |
| Gate-drain Charge            | Qgd     |   |     | 2.3 |     |      |

Body Diode Characteristic

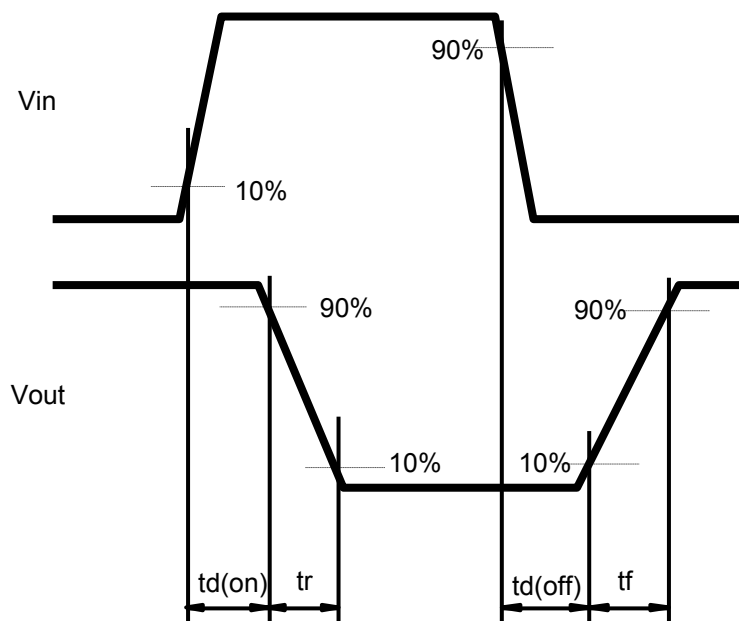
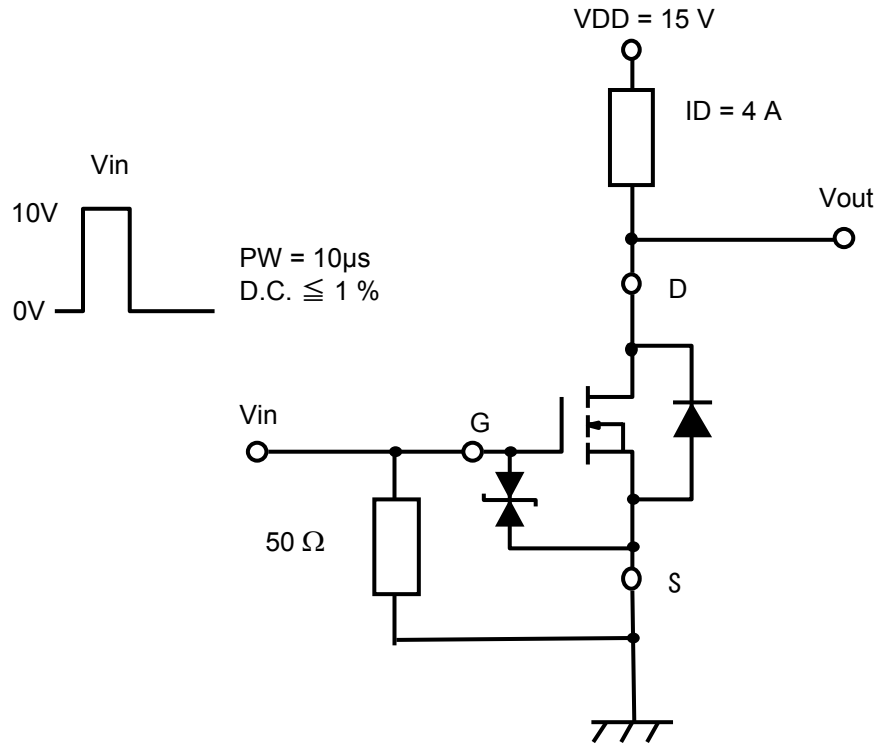
| Diode Forward Voltage *1 | VSD | IS = 4 A, VGS = 0 V | Min | Typ | Max | Unit |
|--------------------------|-----|---------------------|-----|-----|-----|------|
|                          |     |                     |     | 0.8 | 1.2 | V    |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

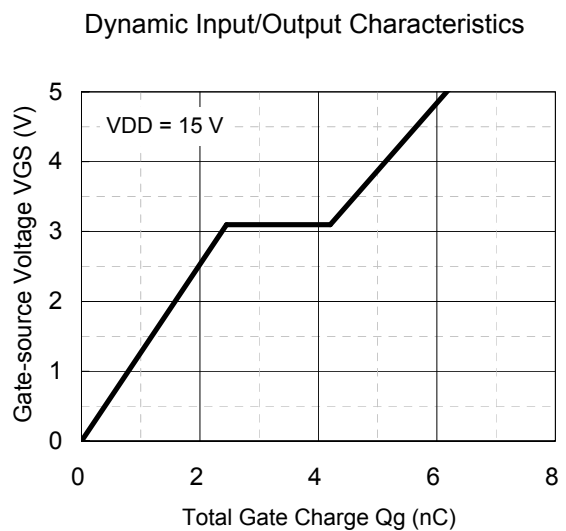
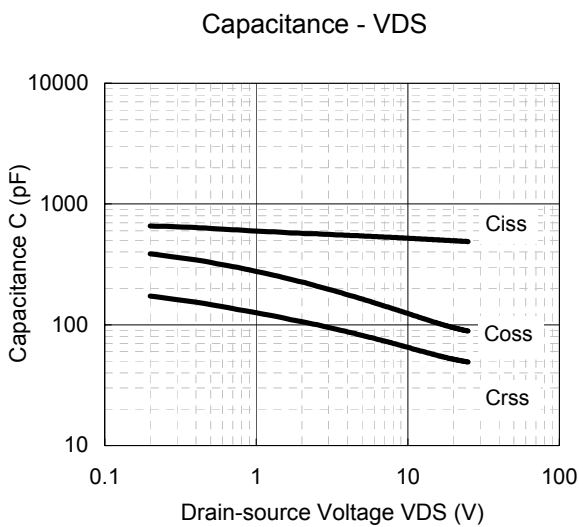
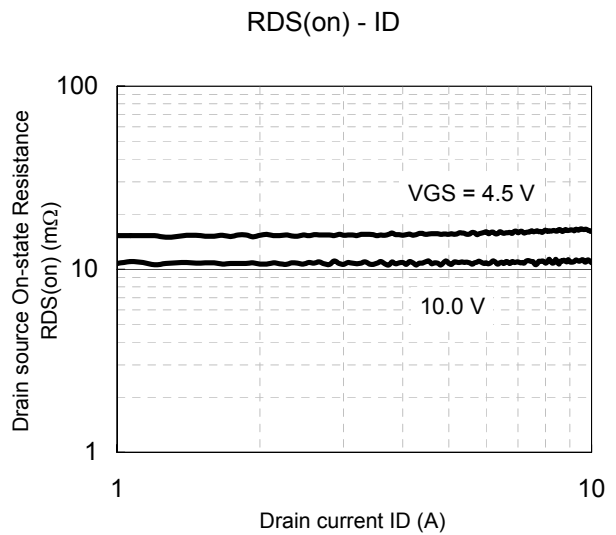
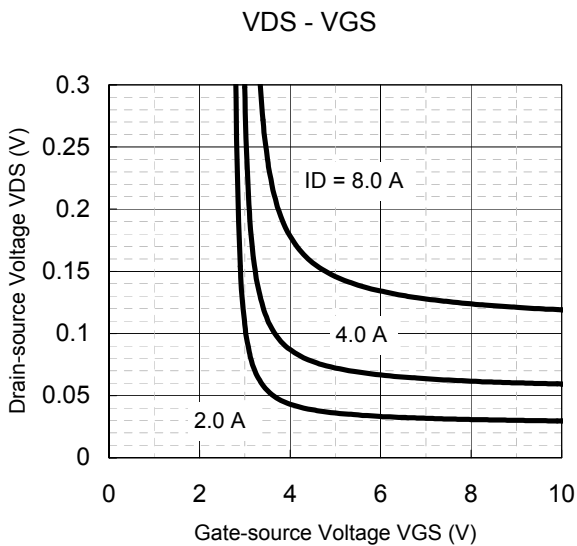
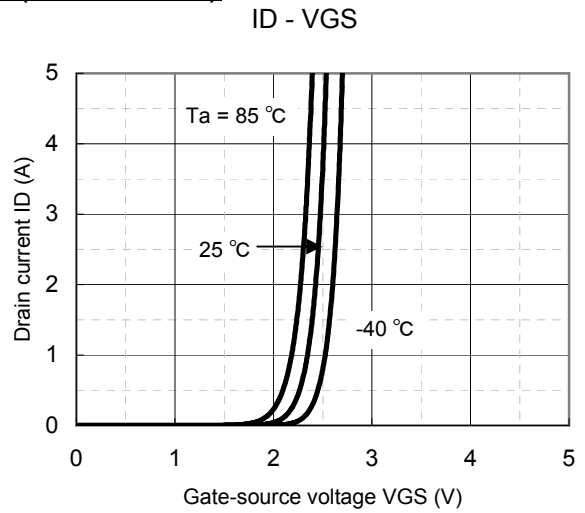
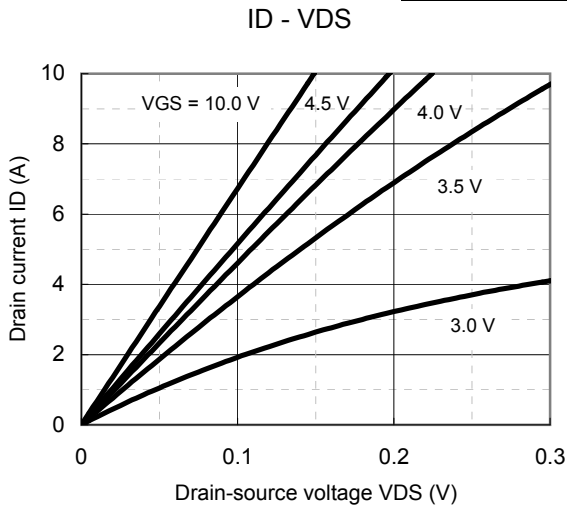
2. \*1 Pulse test: Ensure that the channel temperature does not exceed 150°C

\*2 Measurement circuit for Turn-on Delay Time/Rise Time/Turn-off Delay Time/Fall Time

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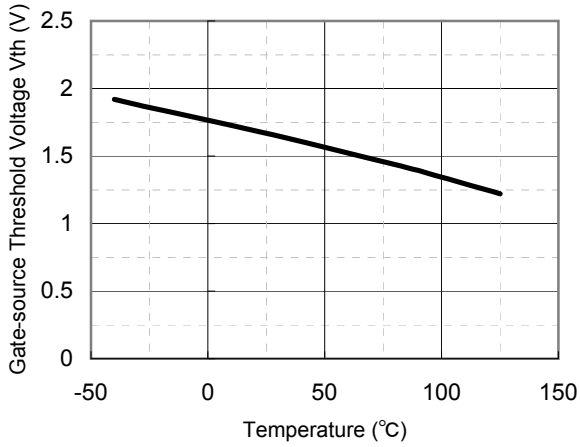


Technical Data ( reference )

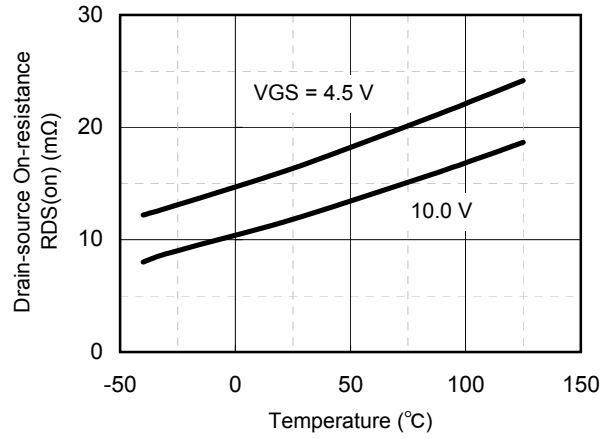


Technical Data ( reference )

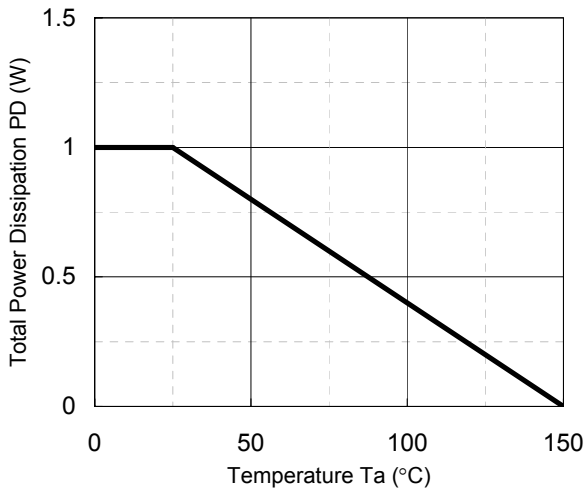
V<sub>th</sub> - T<sub>a</sub>



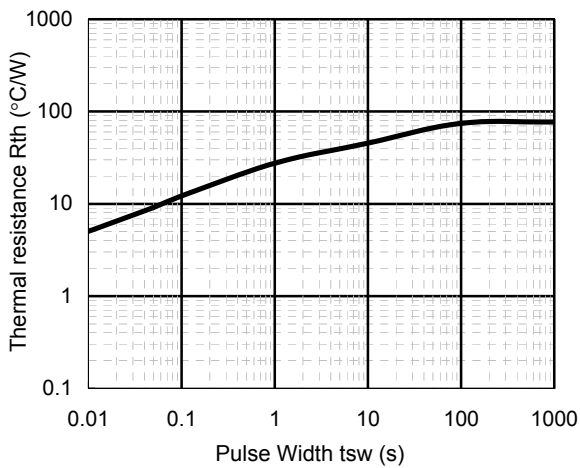
R<sub>DS(on)</sub> - T<sub>a</sub>



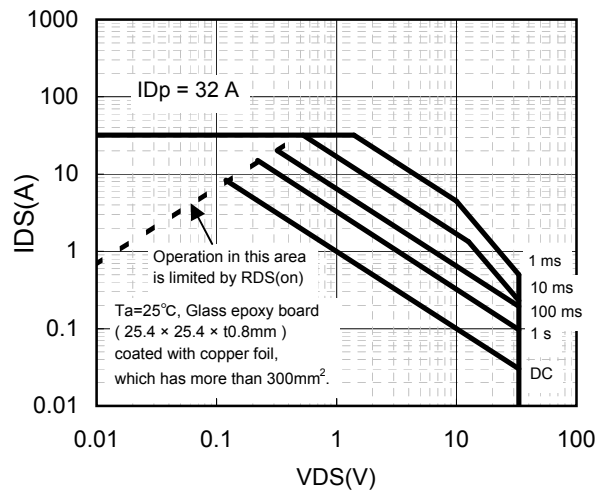
PD - T<sub>a</sub>



R<sub>th</sub> - t<sub>sw</sub>

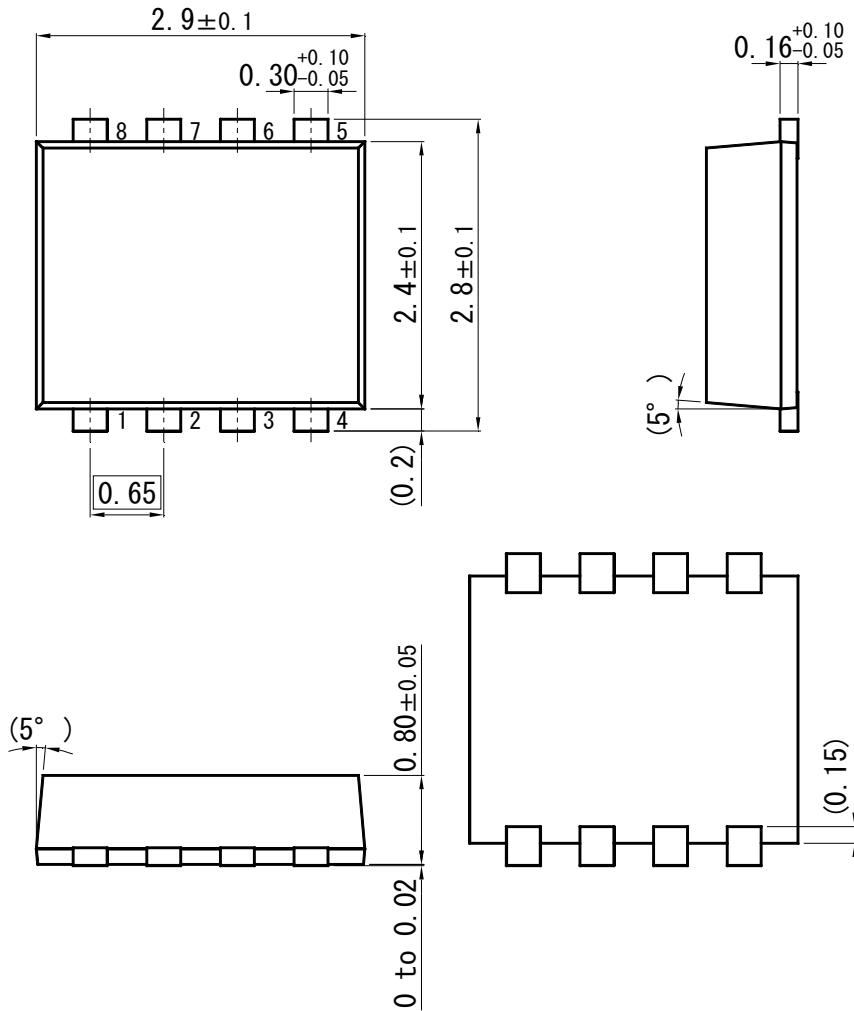


Safe Operating Area

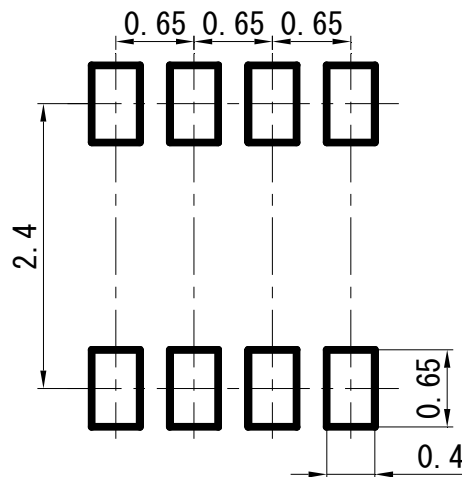


WMini8-F1

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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