

### Dual N-channel Power MOSFET 12V, 36mohm, 2.5A

#### Product Summary

| VSSS | VGSS | RSS(ON) TYP/MAX                                                               | IS MAX |
|------|------|-------------------------------------------------------------------------------|--------|
| 12V  | ± 8V | 36/48mΩ@VGS=4.5V<br>38/53mΩ@VGS=3.8V<br>43/74mΩ@VGS=3.1V<br>56/112mΩ@VGS=2.5V | 2.5A   |

#### Features

- ❖ Source-source ON resistance: Rss(on) typ. = 36 mΩ (VGS = 4.5 V)
- ❖ CSP (Chip Size Package)
- ❖ Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 /MSL: Level 1)

#### Ordering Information

| Part Number | Package Type  | Package Qty        |
|-------------|---------------|--------------------|
| GTD1210A    | WLCSP_0.8*0.8 | 20,000/Tape & Reel |

#### Absolute Maximum Rating (Ta=25°C)

| Parameter                 | Symbol    | Rating      | Unit |
|---------------------------|-----------|-------------|------|
| Source-source Voltage     | VSS       | 12          | V    |
| Gate-source Voltage       | VGS       | ±8          | V    |
| Source Current            | DC        | IS1 *1      | A    |
|                           |           | IS2 *2      |      |
|                           | Pulsed *3 | ISp         | 25   |
| Total Power Dissipation   | DC        | PD1 *1      | W    |
|                           |           | PD2 *2      |      |
| Channel Temperature       | Tch       | 150         | °C   |
| Storage Temperature Range | Tstg      | -55 to +150 | °C   |

#### Thermal Characteristic (Ta=25°C)

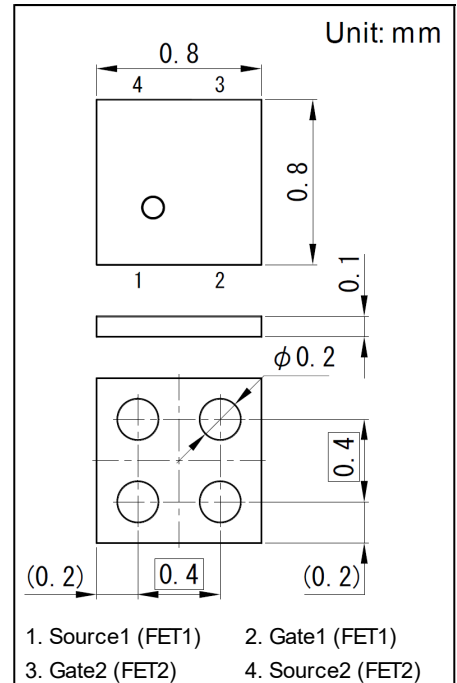
| Parameter                 | Symbol  | Rating | Unit |
|---------------------------|---------|--------|------|
| Thermal Resistance (ch-a) | Rth1 *1 | 360    | °C/W |
|                           | Rth2 *2 | 135    |      |

Note \*1 Mounted on FR4 board (25.4 mm x 25.4 mm x t1.0 mm),  
FR4 board partially covered with copper pad (18 mm<sup>2</sup> area, 36 μm thickness).

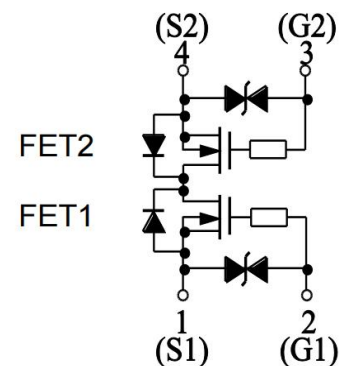
\*2 Mounted on Ceramic board (70 mm x 70 mm x t1.0 mm).

\*3 t = 10 μs, Duty Cycle ≤ 1 %

#### Package & Internal Circuit



#### Equivalent circuit



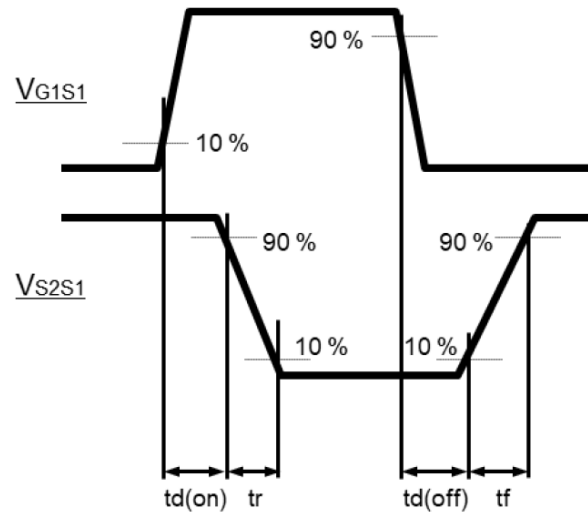
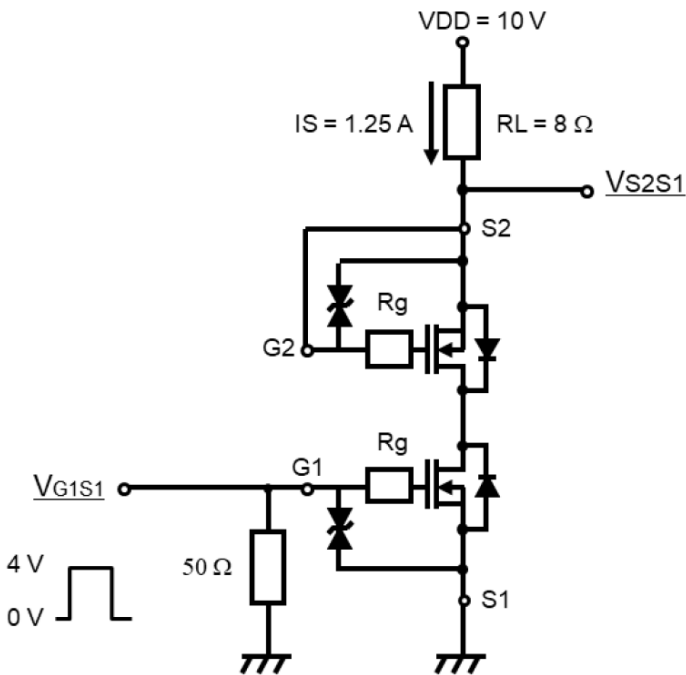
**Electrical characteristics (Ta=25°C ± 3°C)**

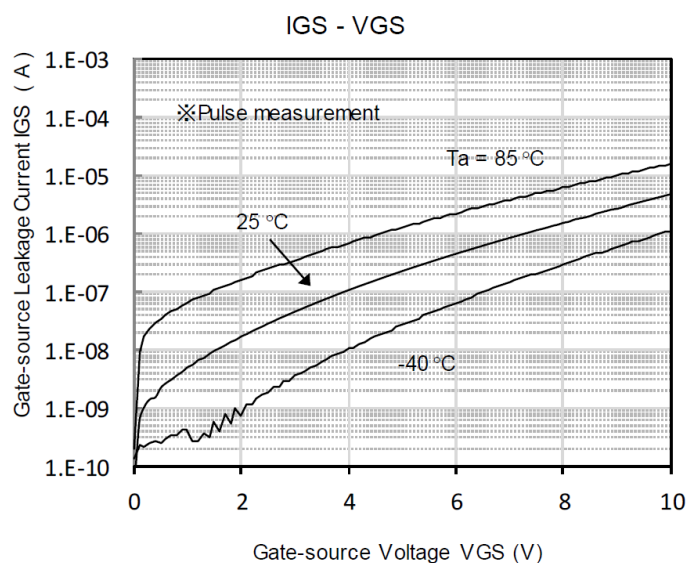
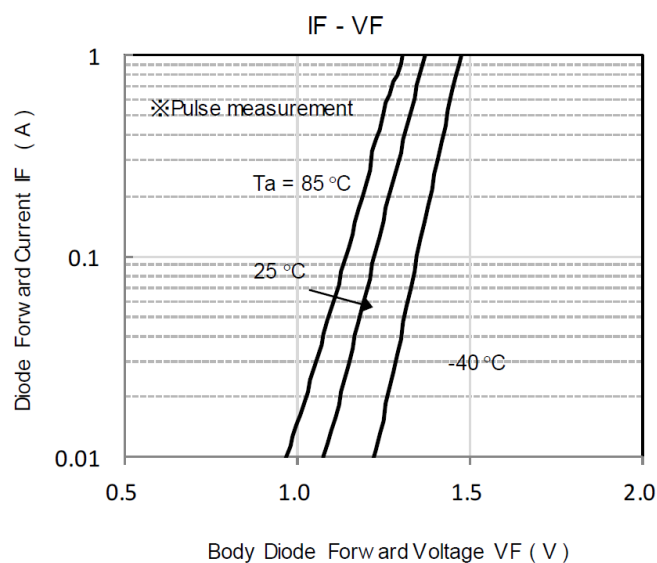
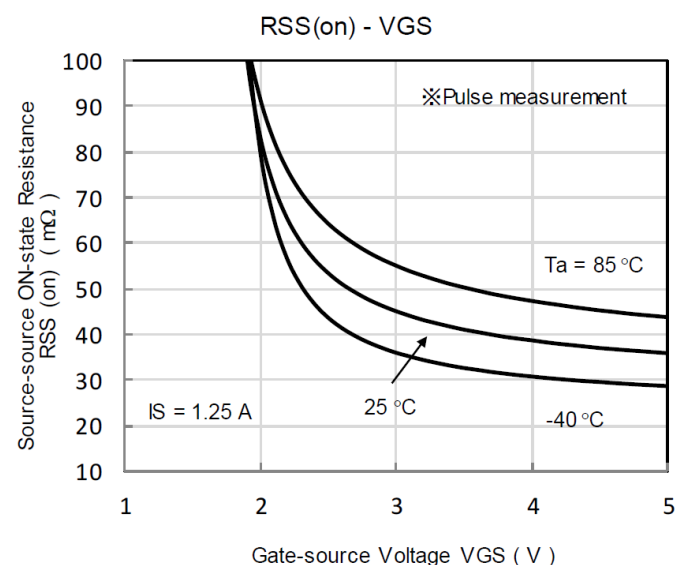
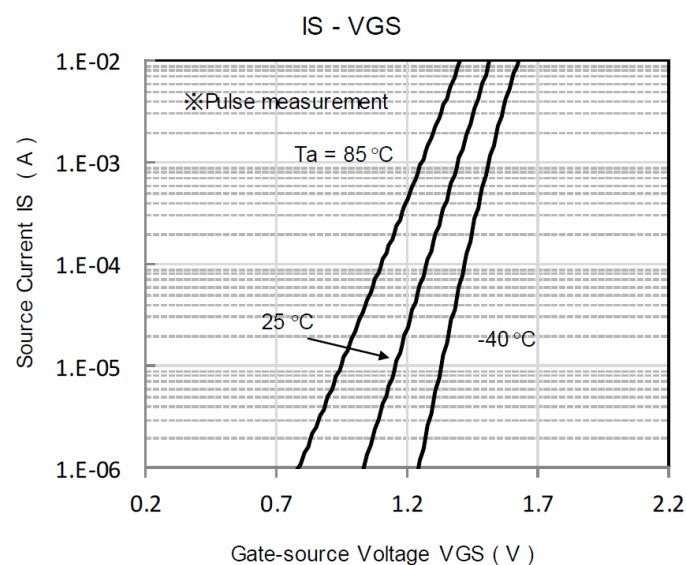
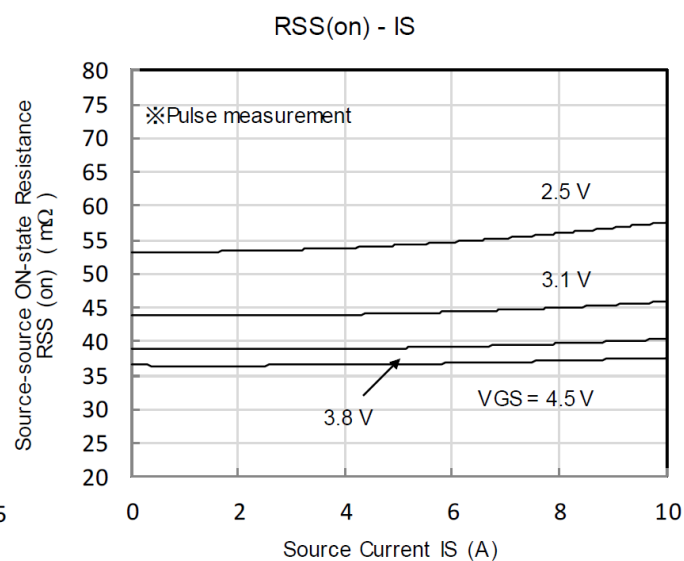
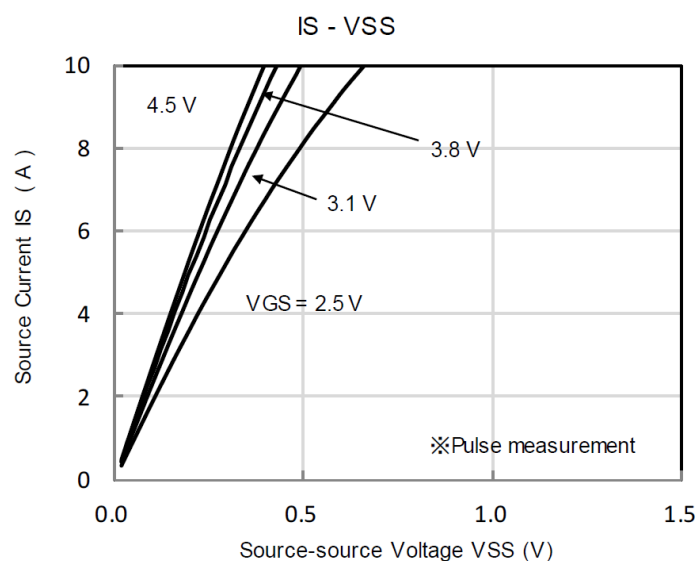
| Parameter                         | Symbol   | Conditions                       | Min  | Typ  | Max  | Unit |
|-----------------------------------|----------|----------------------------------|------|------|------|------|
| Source-Source Breakdown Voltage   | VSSS     | IS=1mA, VGS=0V                   | 12.0 |      |      | V    |
| Zero Gate Voltage Source Current  | ISSS     | VSS=12V, VGS=0V                  |      |      | 1.0  | μA   |
| Gate-Source Leakage Current       | IGSS1    | VGS=±8V, VSS=0V                  |      |      | ±10  | μA   |
|                                   | IGSS2    | VGS=±5V, VSS=0V                  |      |      | ±1.0 |      |
| Gate-Source Threshold Voltage     | Vth      | VSS=10V, IS=1.0mA                | 0.4  | 0.9  | 1.4  | V    |
| Source-Source On-State Resistance | RSS(on)1 | IS=1.25A, VGS=4.5V               | 27   | 36   | 48   | mΩ   |
|                                   | RSS(on)2 | IS=1.25A, VGS=3.8V               | 28   | 38   | 53   |      |
|                                   | RSS(on)3 | IS=1.25A, VGS=3.1V               | 31   | 43   | 64   |      |
|                                   | RSS(on)4 | IS=1.25A, VGS=2.5V               | 33   | 56   | 112  |      |
| Body Diode Forward Voltage        | VF(S-S)  | IF=1.25A, VGS=0V                 |      | 0.6  | 1.2  | V    |
| Input Capacitance *1              | Ciss     | VSS=10V, VGS=0V, f=1kHz          |      | 210  |      | pF   |
| Output Capacitance *1             | Coss     |                                  |      | 54   |      |      |
| Reverse Transfer Capacitance *1   | Crss     |                                  |      | 40   |      |      |
| Turn-On Delay Time *1 *2          | td(on)   | VDD=10V, VGS=0 to 4.0V, IS=1.25A |      | 0.1  |      | μs   |
| Rise Time *1 *2                   | tr       |                                  |      | 0.16 |      |      |
| Turn-Off Delay Time *1 *2         | td(off)  | VDD=10V, VGS=4.0 to 0V, IS=1.25A |      | 0.55 |      | μs   |
| Fall Time *1 *2                   | tf       |                                  |      | 0.34 |      |      |
| Total Gate Charge *1              | Qg       | VDD=10V, VGS=0 to 4.0V, IS=1.25A |      | 3.5  |      | nC   |
| Gate-Source Charge *1             | Qgs      |                                  |      | 0.9  |      |      |
| Gate-Drain Charge *1              | Qgd      |                                  |      | 1.0  |      |      |

Note:

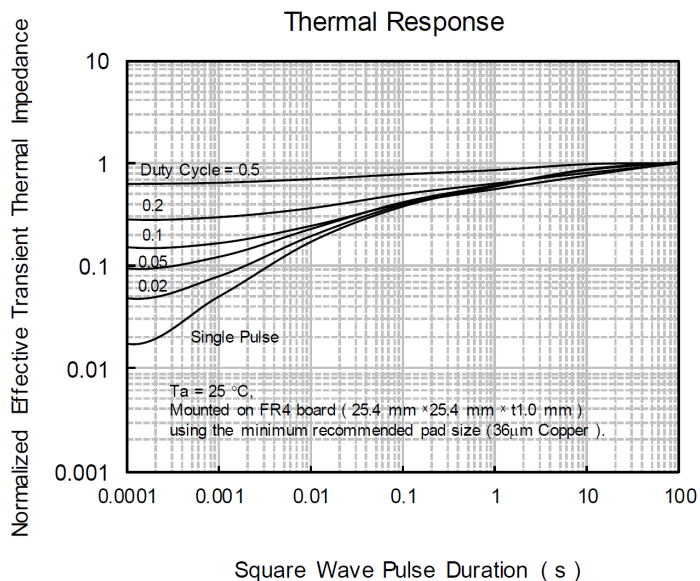
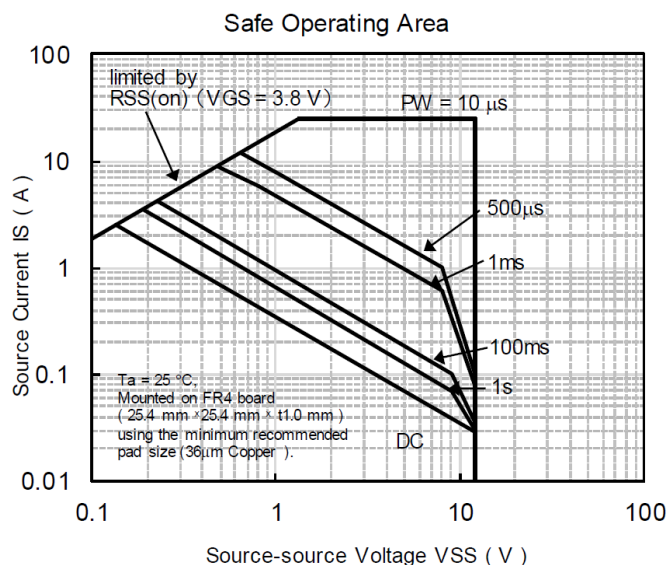
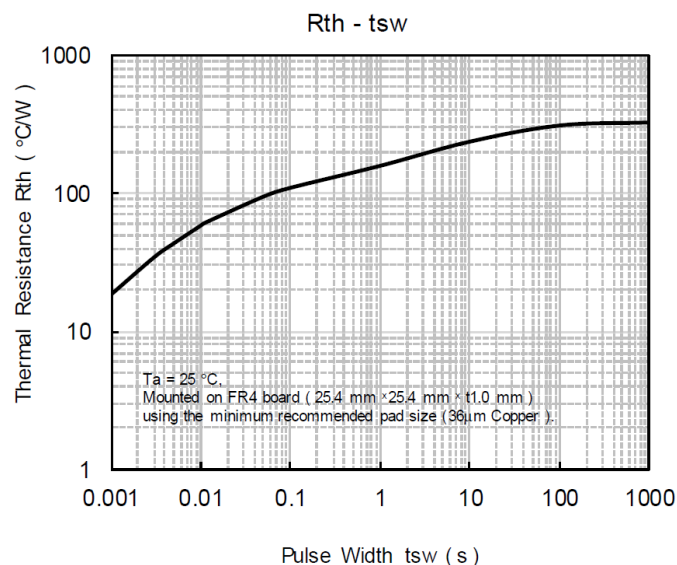
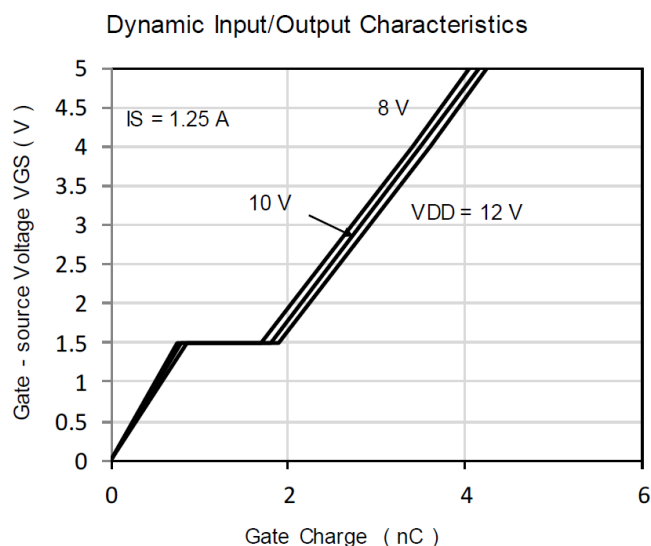
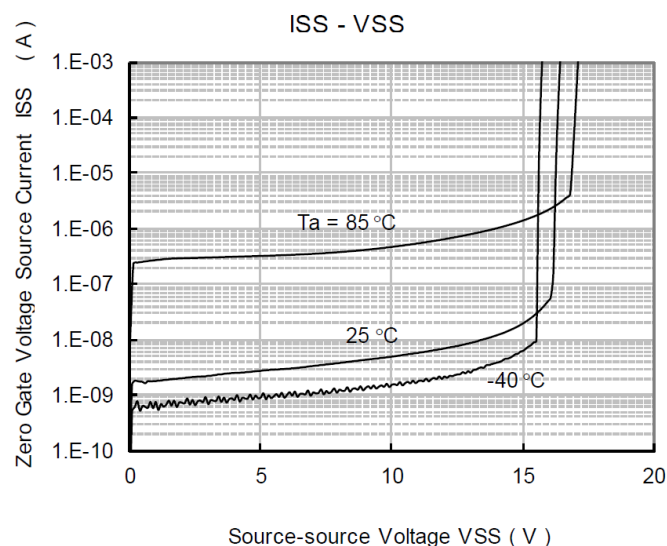
\*1 Guaranteed by design, not subject to production testing

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



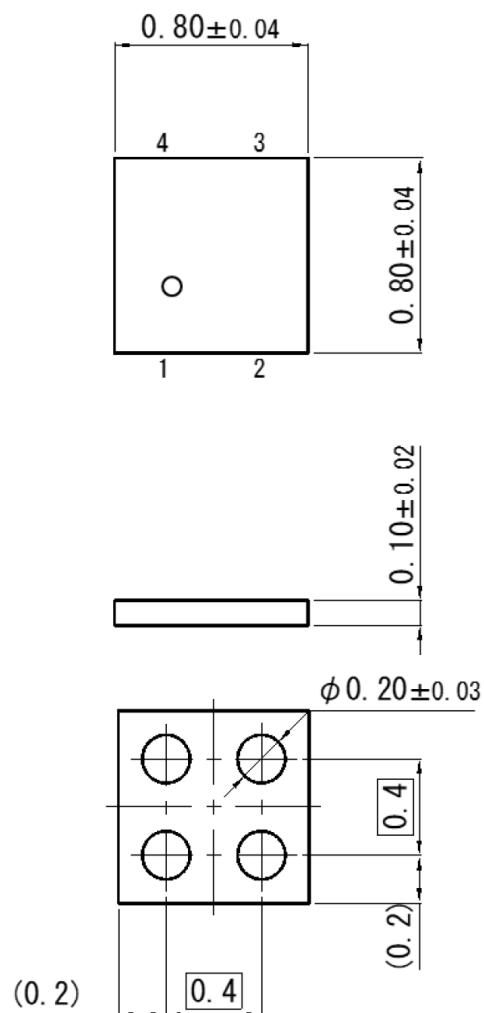
**Typical Electrical and Thermal Characteristics (Curves)**


## Typical Electrical and Thermal Characteristics (Curves)



**Package outline dimensions**

Unit : mm



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