

## N-CHANNEL SILICON POWER MOSFET

## FAP-IIS SERIES

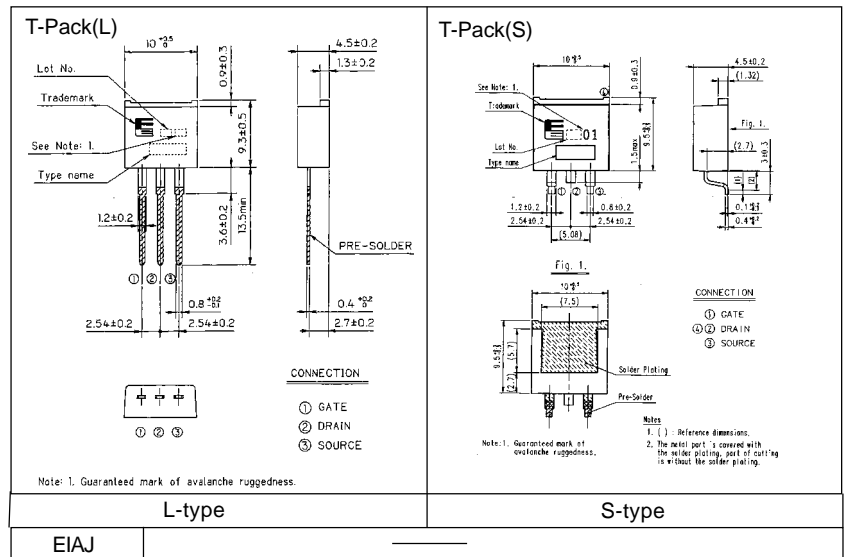
### Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- Avalanche-proof

### Applications

- Switching regulators
- DC-DC converters
- General purpose power amplifier

### Outline Drawings



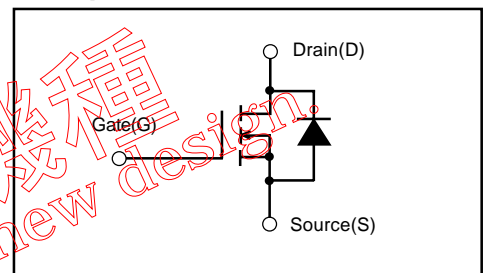
### Maximum ratings and characteristics

#### Absolute maximum ratings (Tc=25°C unless otherwise specified)

| Item                                    | Symbol                              | Rating              | Unit | Remarks                 |
|---|-------------------------------------|---------------------|------|-------------------------|
| Drain-source voltage                    | V <sub>DS</sub>                     | 450                 | V    |                         |
| Continuous drain current                | I <sub>D</sub>                      | ±10                 | A    |                         |
| Pulsed drain current                    | I <sub>D</sub> [puls]               | ±40                 | A    |                         |
| Gate-source peak voltage                | V <sub>GS</sub>                     | ±35                 | V    |                         |
| Repetitive or non-repetitive            | I <sub>AR</sub>                     | 10                  | A    | T <sub>ch</sub> ≤ 150°C |
| Maximum avalanche energy                | E <sub>AV</sub>                     | 181                 | mJ   | *1                      |
| Maximum power dissipation               | P <sub>D</sub>                      | 80                  | W    |                         |
| Operating and storage temperature range | T <sub>ch</sub><br>T <sub>stg</sub> | +150<br>-55 to +150 | °C   |                         |

\*1 L=3.31mH, V<sub>CC</sub>=45V

#### Equivalent circuit schematic



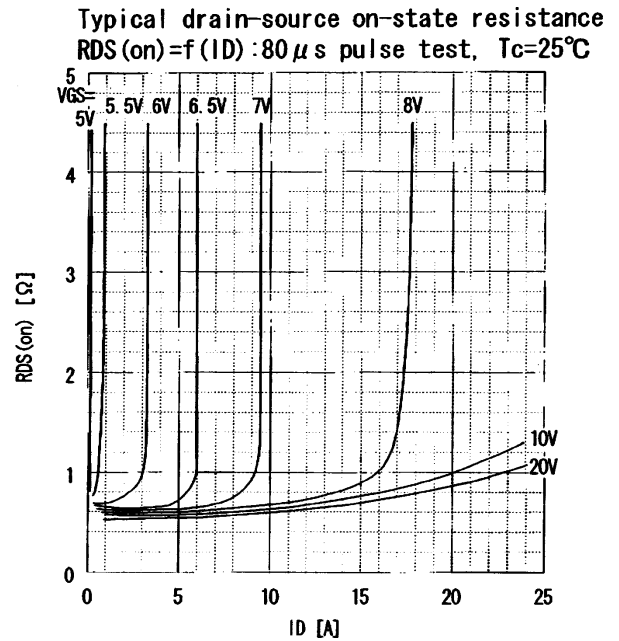
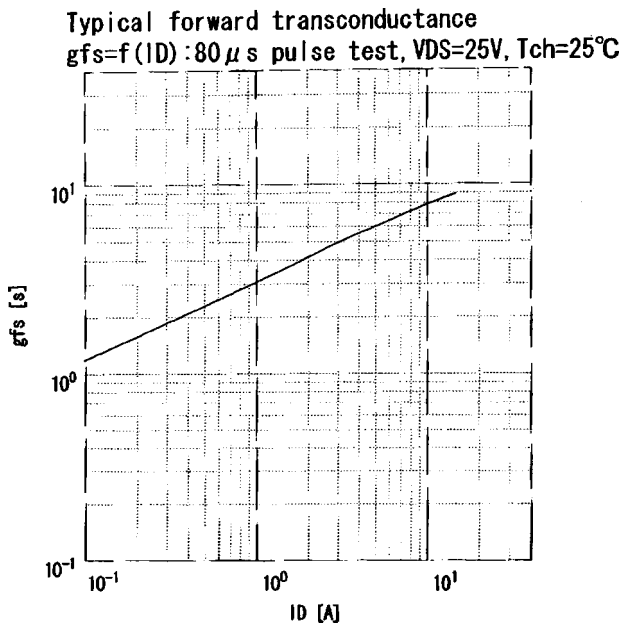
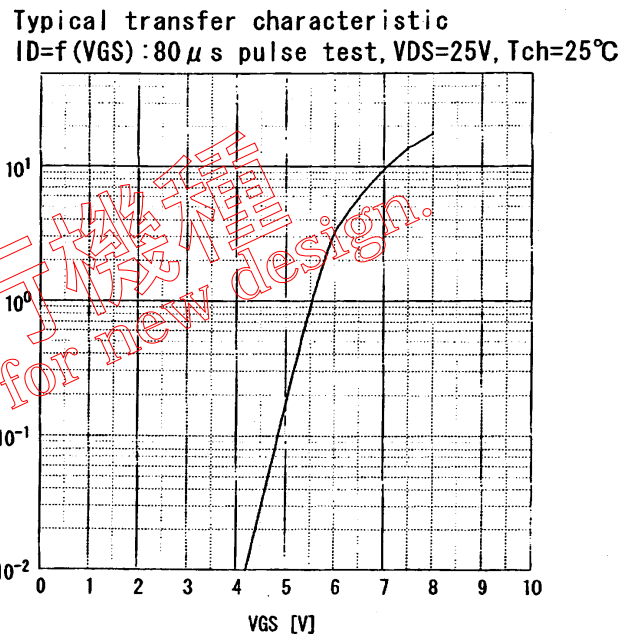
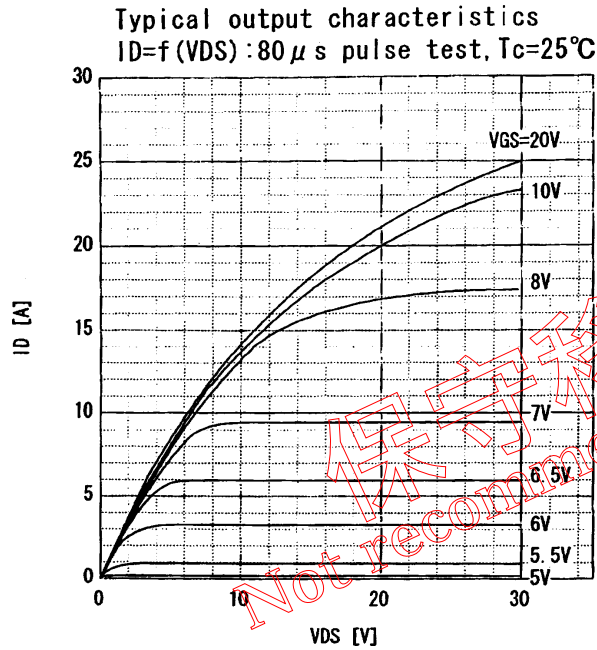
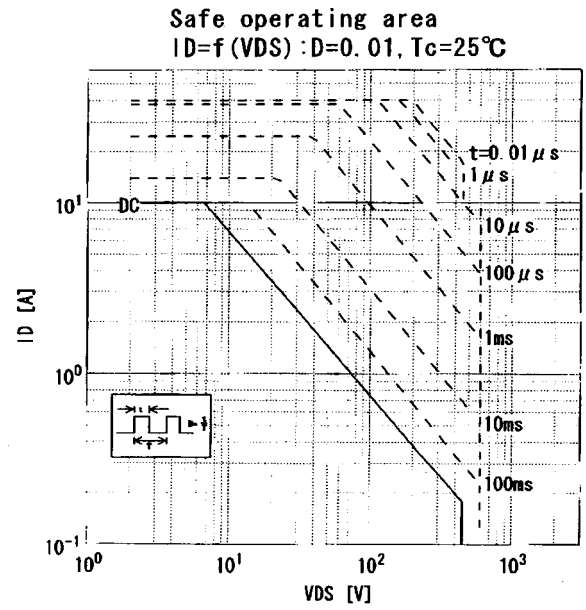
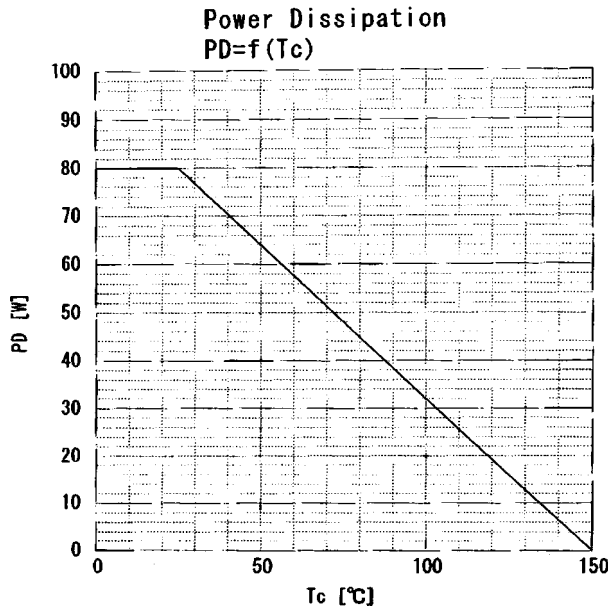
#### Electrical characteristics (Tc =25°C unless otherwise specified)

| Item                             | Symbol               | Test Conditions  | Min.                   | Typ. | Max. | Units |    |
|----------------------------------|----------------------|--|------------------------|------|------|-------|----|
| Drain-source breakdown voltage   | V <sub>(BR)DSS</sub> | I <sub>D</sub> =1mA V <sub>GS</sub> =0V                                    | 450                    |      |      | V     |    |
| Gate threshold voltage           | V <sub>GS(th)</sub>  | I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>                       | 3.5                    | 4.0  | 4.5  | V     |    |
| Zero gate voltage drain current  | I <sub>DSS</sub>     | V <sub>DS</sub> =450V V <sub>GS</sub> =0V                                  | T <sub>ch</sub> =25°C  |      | 10   | 500   | μA |
|                                  |                      |  | T <sub>ch</sub> =125°C |      | 0.2  | 1.0   | mA |
| Gate-source leakage current      | I <sub>GSS</sub>     | V <sub>GS</sub> =±35V V <sub>DS</sub> =0V                                  |                        | 10   | 100  | nA    |    |
| Drain-source on-state resistance | R <sub>DS(on)</sub>  | I <sub>D</sub> =5A V <sub>GS</sub> =10V V <sub>GS</sub> =4V                |                        | 0.58 | 0.65 | Ω     |    |
| Forward transconductance         | g <sub>fs</sub>      | I <sub>D</sub> =5A V <sub>DS</sub> =25V                                    | 3.0                    | 6.0  |      | S     |    |
| Input capacitance                | C <sub>iss</sub>     | V <sub>DS</sub> =25V   |                        | 950  | 1450 | pF    |    |
| Output capacitance               | C <sub>oss</sub>     | V <sub>GS</sub> =0V  |                        | 180  | 270  |       |    |
| Reverse transfer capacitance     | C <sub>rss</sub>     | f=1MHz   |                        | 80   | 120  |       |    |
| Turn-on time                     | t <sub>d(on)</sub>   | V <sub>CC</sub> =300V R <sub>G</sub> =10 Ω<br>I <sub>D</sub> =10A          |                        | 25   | 40   | ns    |    |
|                                  |                      |  |                        | 70   | 110  |       |    |
| Turn-off time                    | t <sub>d(off)</sub>  | V <sub>GS</sub> =10V   |                        | 70   | 110  |       |    |
|                                  |                      |  | t <sub>f</sub>         |      | 50   | 80    |    |
| Avalanche capability             | I <sub>AV</sub>      | L=1.31mH T <sub>ch</sub> =25°C   | 10                     |      |      | A     |    |
| Diode forward on-voltage         | V <sub>SD</sub>      | I <sub>F</sub> =2I <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C |                        | 1.10 | 1.65 | V     |    |
| Reverse recovery time            | t <sub>rr</sub>      | I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V                        |                        | 400  |      | ns    |    |
| Reverse recovery charge          | Q <sub>rr</sub>      | -di/dt=100A/μs T <sub>ch</sub> =25°C                                       |                        | 5.0  |      | μC    |    |

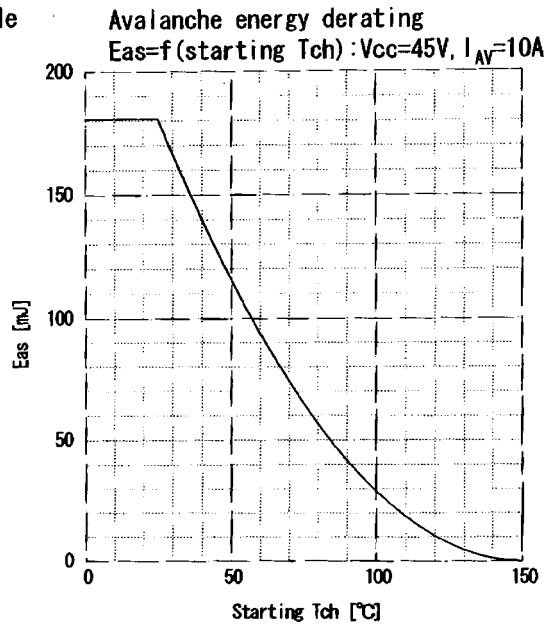
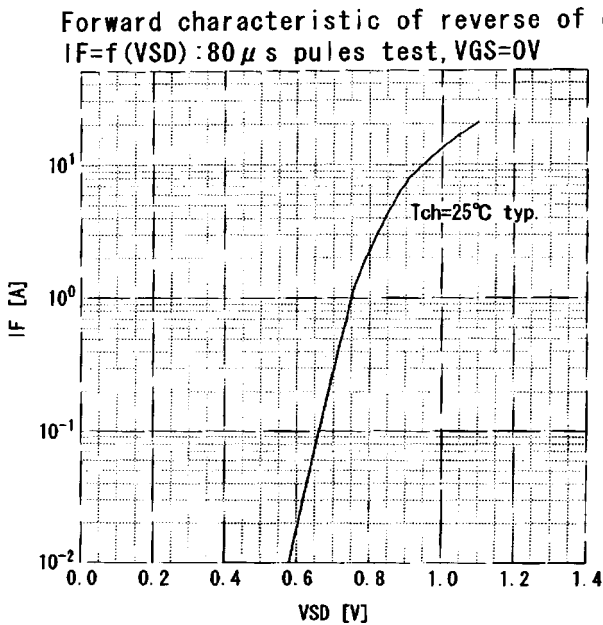
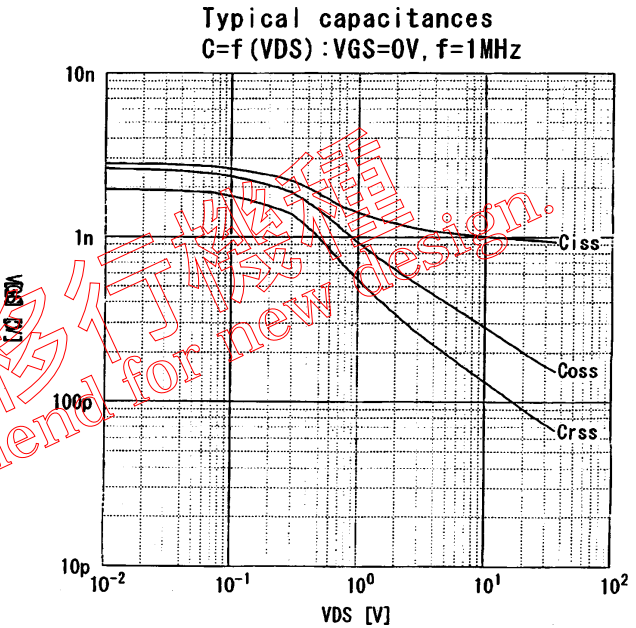
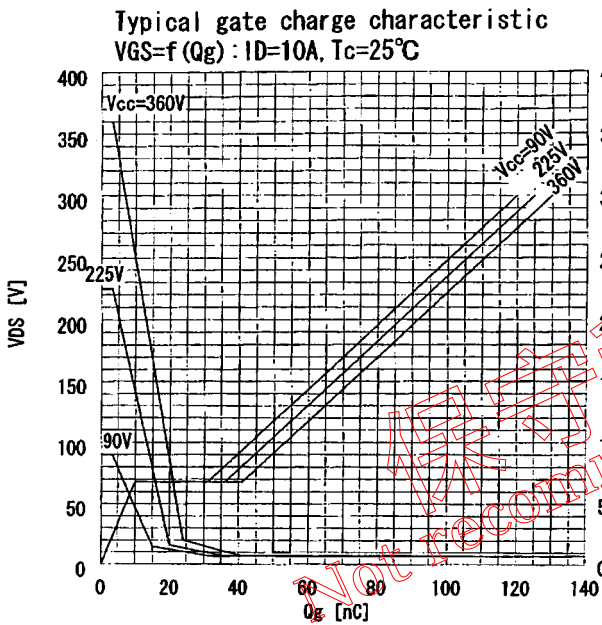
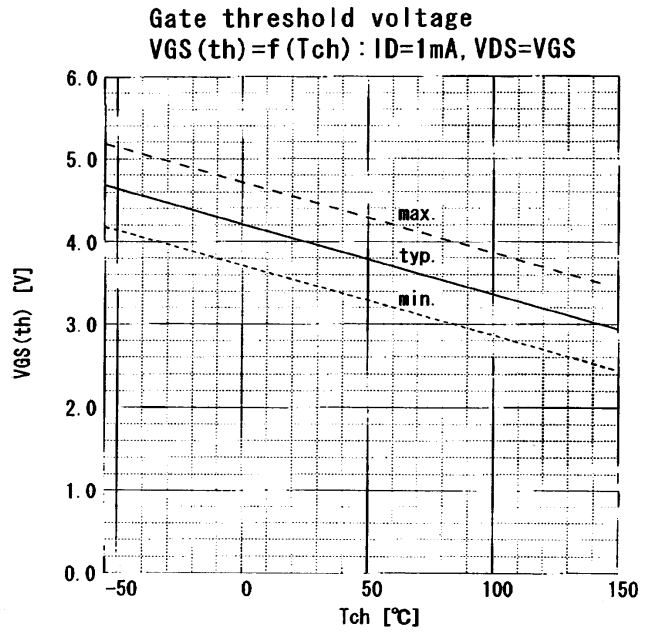
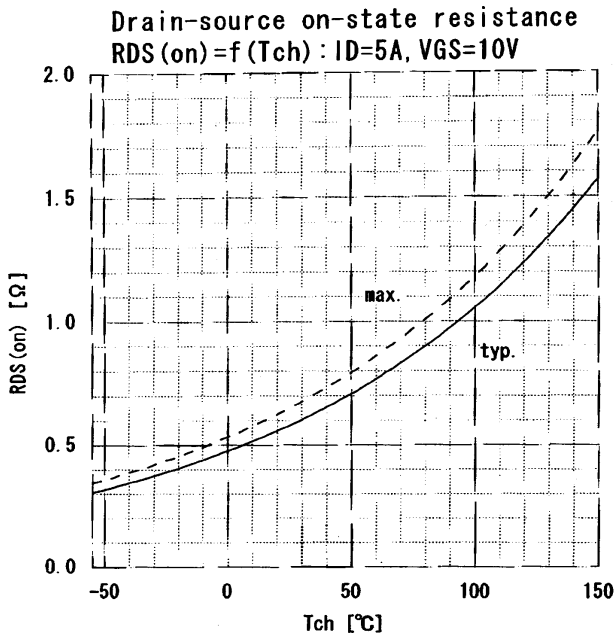
#### Thermal characteristics

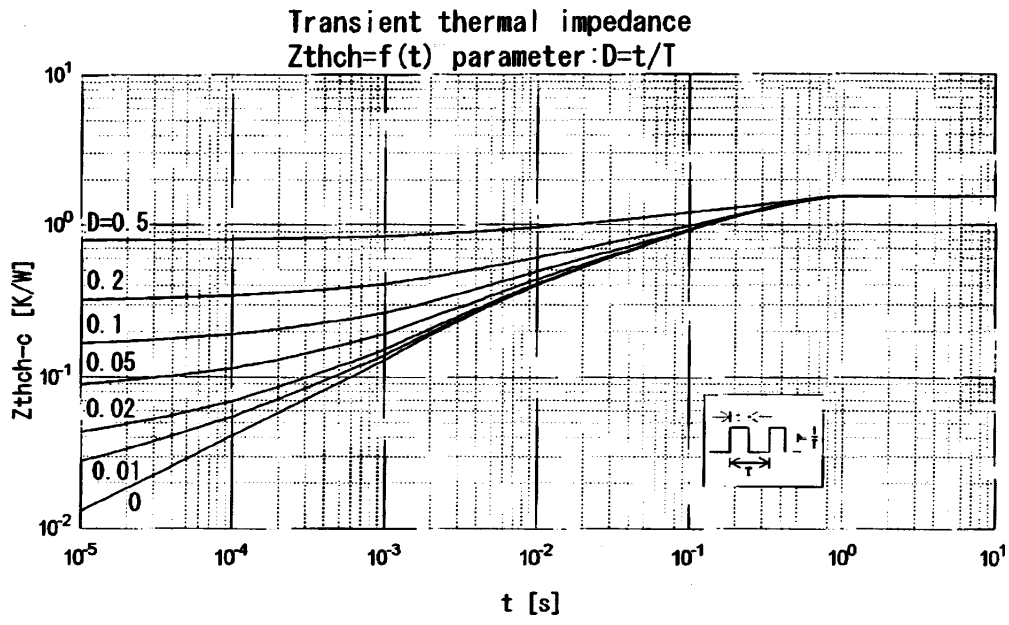
| Item               | Symbol                | Min. | Typ. | Max.  | Units |
|--------------------|-----------------------|------|------|-------|-------|
| Thermal resistance | R <sub>th(ch-c)</sub> |      |      | 1.56  | °C/W  |
|                    | R <sub>th(ch-a)</sub> |      |      | 125.0 | °C/W  |

Characteristics



保守設計を推奨  
 Not recommend for new design.





保守移行機種  
Not recommend for new design.