

# P100FA7R5EN

## Power MOSFETs

75V, 100A, N-channel

### Feature

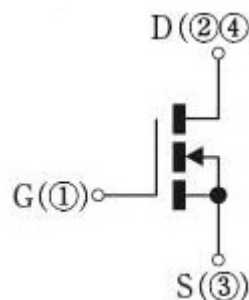
- N-channel
- Large Current
- Low Ron
- 10V Gate Drive
- Low Capacitance
- Pb free terminal
- RoHS:Yes

### OUTLINE

Package (House Name): FA  
 Package (JEDEC Code): TO-220AB  
 Package (JEITA Code): SC-46



### Equivalent circuit



### Absolute Maximum Ratings (unless otherwise specified : Tc=25°C)

| Item                           | Symbol           | Conditions  | Ratings    | Unit |
|--------------------------------|------------------|---|------------|------|
| Storage temperature            | Tstg             |   | -55 to 150 | °C   |
| Channel temperature            | Tch              |   | 150        | °C   |
| Drain-source voltage           | V <sub>DSS</sub> |   | 75         | V    |
| Gate-source voltage            | V <sub>GSS</sub> |   | ±20        | V    |
| Continuous drain current(DC)   | I <sub>D</sub>   |   | 100        | A    |
| Continuous drain current(Peak) | I <sub>DP</sub>  | Pulse width 10μs, duty=1/100                          | 400        | A    |
| Total power dissipation        | P <sub>T</sub>   |   | 140        | W    |
| Single avalanche current       | I <sub>AS</sub>  | Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C | 57         | A    |
| Single avalanche energy        | E <sub>AS</sub>  | Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C | 300        | mJ   |

\* : See the original Specifications

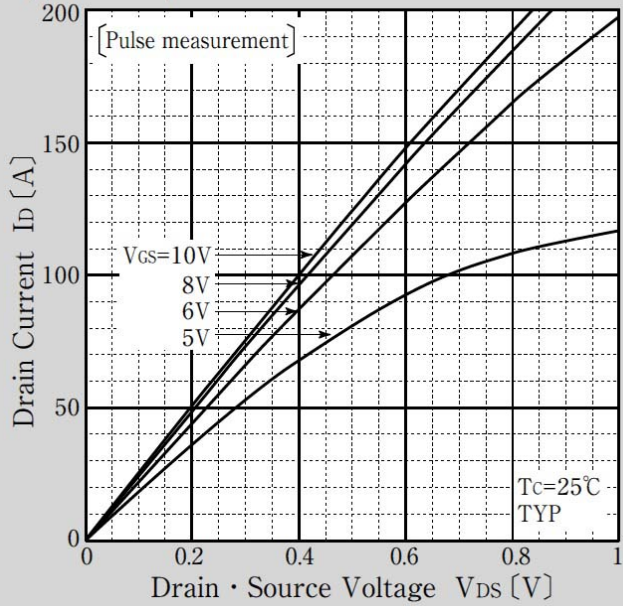
**Electrical Characteristics** (unless otherwise specified : Tc=25°C)

| Item                                    | Symbol        | Conditions  | Ratings |        |       | Unit |
|---|---------------|---|---------|--------|-------|------|
|   |               |   | MIN     | TYP    | MAX   |      |
| Drain-Source breakdown voltage          | $V_{(BR)DSS}$ | ID=1mA, VGS=0V  | 75      |        |       | V    |
| Zero gate voltage drain current         | $I_{DSS}$     | VDS=75V, VGS=0V   |         |        | 1     | μA   |
| Gate-source leakage current             | $I_{GSS}$     | VGS=±20V, VDS=0V  |         |        | ±0.1  | μA   |
| Forward transconductance                | $g_{fs}$      | ID=50A, VDS=10V   | 31      |        |       | S    |
| Static drain-source on-state resistance | $R_{DS(ON)}$  | ID=50A, VGS=10V   |         | 0.0042 | 0.005 | Ω    |
| Gate threshold voltage                  | $V_{th}$      | ID=1mA, VDS=10V   | 2       | 3      | 4     | V    |
| Source-drain diode forward voltage      | $V_{SD}$      | IS=100A, VGS=0V   |         |        | 1.5   | V    |
| Thermal resistance                      | $R_{th(j-c)}$ | Junction to case  |         |        | 0.89  | °C/W |
| Total gate charge                       | $Q_g$         | VDD=60V, VGS=10V, ID=100A                                 |         | 104    |       | nC   |
| Gate to source charge                   | $Q_{gs}$      | VDD=60V, VGS=10V, ID=100A                                 |         | 26     |       | nC   |
| Gate to drain charge                    | $Q_{gd}$      | VDD=60V, VGS=10V, ID=100A                                 |         | 36     |       | nC   |
| Input capacitance                       | $C_{iss}$     | VDS=25V, VGS=0V, f=1MHz                                   |         | 5720   |       | pF   |
| Reverse transfer capacitance            | $C_{rss}$     | VDS=25V, VGS=0V, f=1MHz                                   |         | 345    |       | pF   |
| Output capacitance                      | $C_{oss}$     | VDS=25V, VGS=0V, f=1MHz                                   |         | 745    |       | pF   |
| Turn-on delay time                      | $t_{d(on)}$   | ID=50A, RL=0.75Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V |         | 12     |       | ns   |
| Rise time                               | $t_r$         | ID=50A, RL=0.75Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V |         | 46     |       | ns   |
| Turn-off delay time                     | $t_{d(off)}$  | ID=50A, RL=0.75Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V |         | 53     |       | ns   |
| Fall time                               | $t_f$         | ID=50A, RL=0.75Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V |         | 55     |       | ns   |
| Diode reverse recovery time             | $t_{rr}$      | IF=100A, VGS=0V, di/dt=100A/μs                            |         | 55     |       | ns   |
| Diode reverse recovery charge           | $Q_{rr}$      | IF=100A, VGS=0V, di/dt=100A/μs                            |         | 106    |       | nC   |

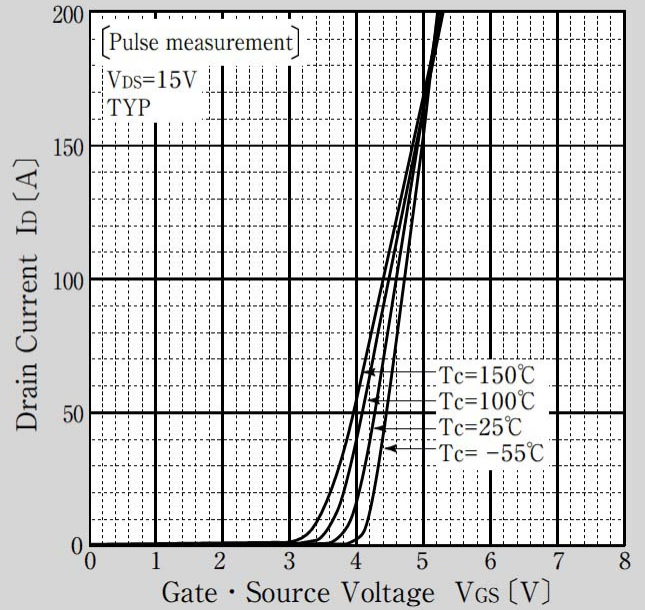
※ : See the original Specifications

# CHARACTERISTIC DIAGRAMS

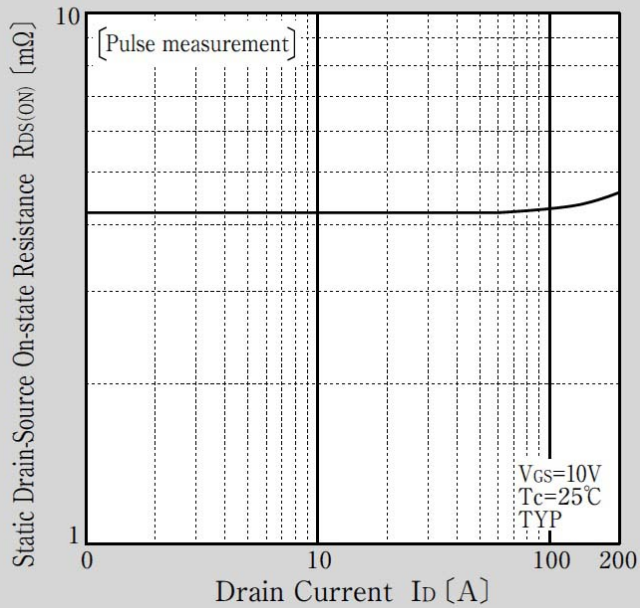
### Typical Output Characteristics



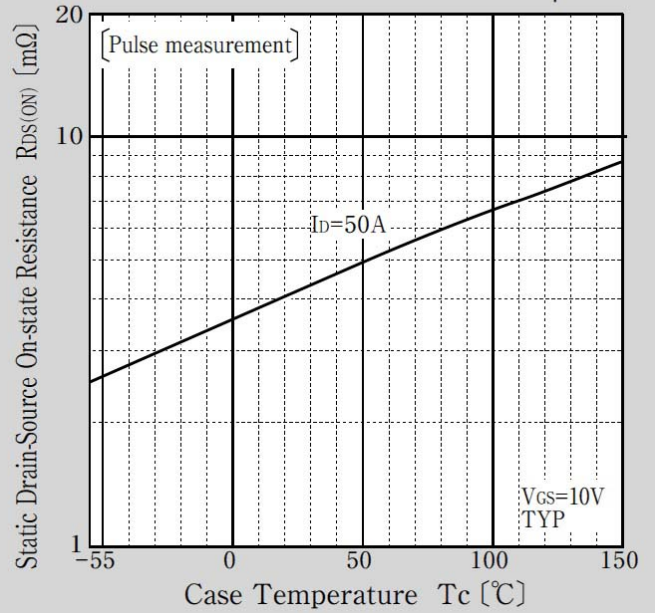
### Transfer Characteristics



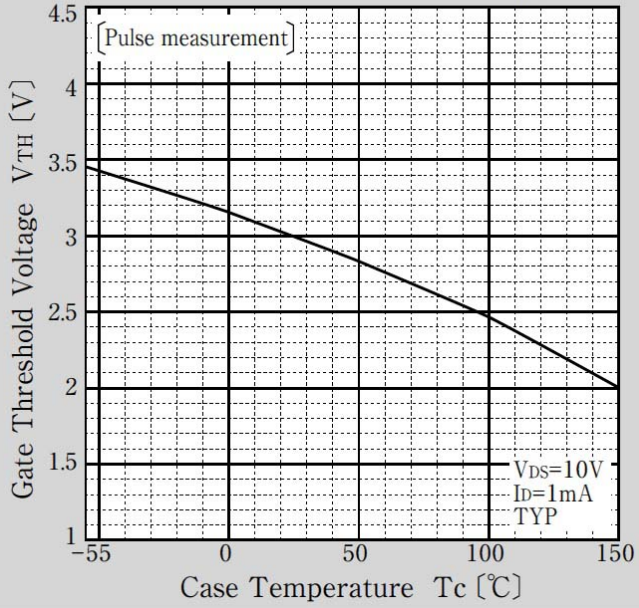
### Static Drain-Source On-state Resistance vs Drain Current



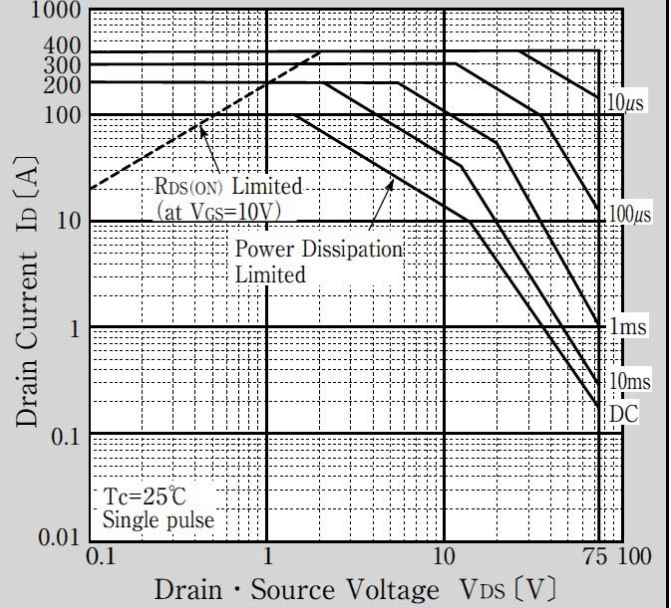
### Static Drain-Source On-state Resistance vs Case Temperature



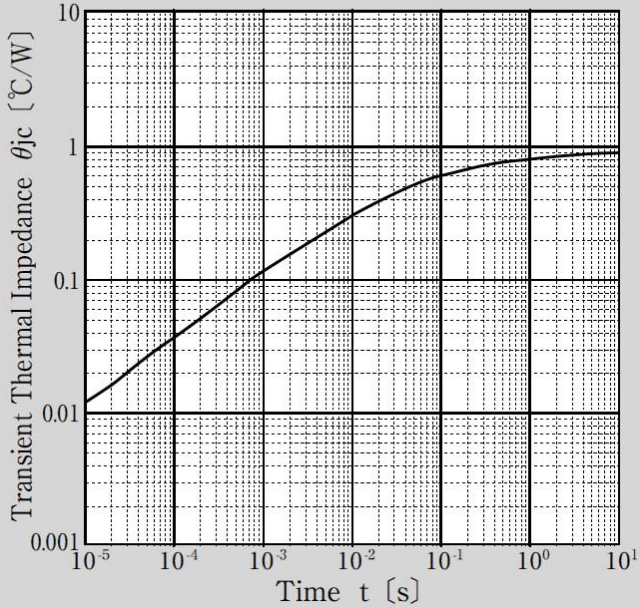
Gate Threshold Voltage vs Case Temperature



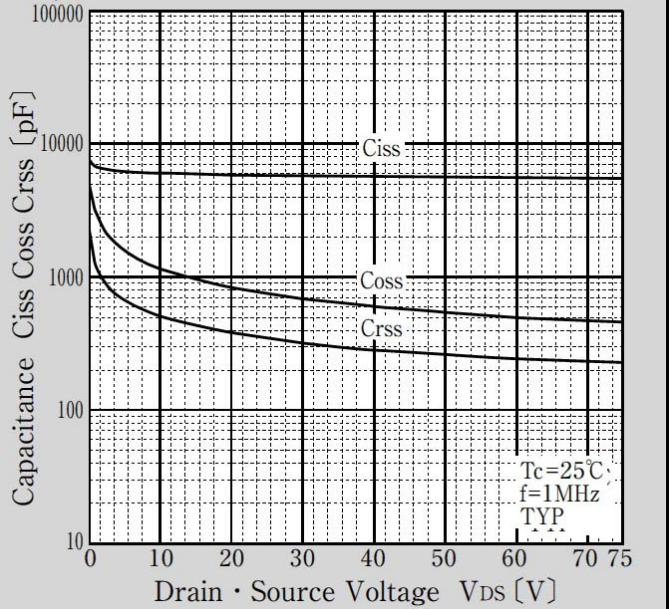
Safe Operating Area



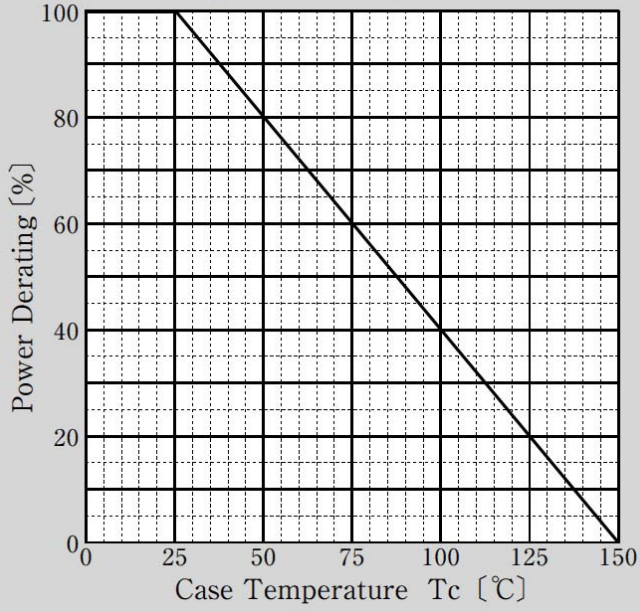
Transient Thermal Impedance



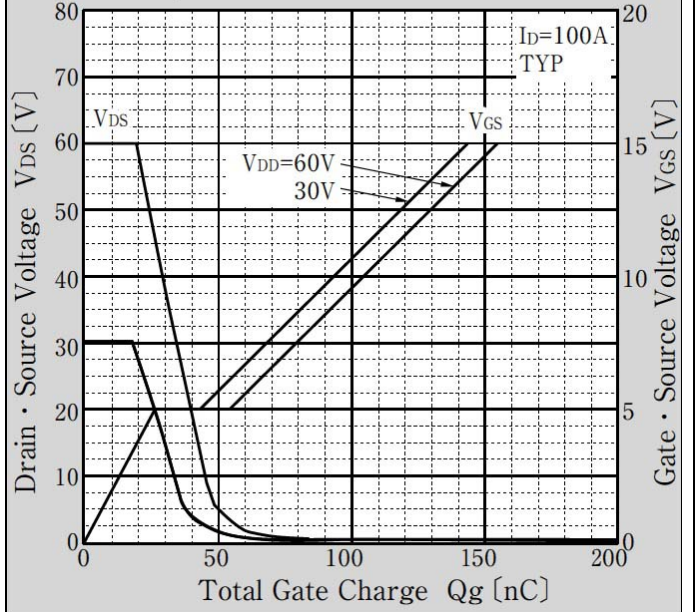
Capacitance Characteristics



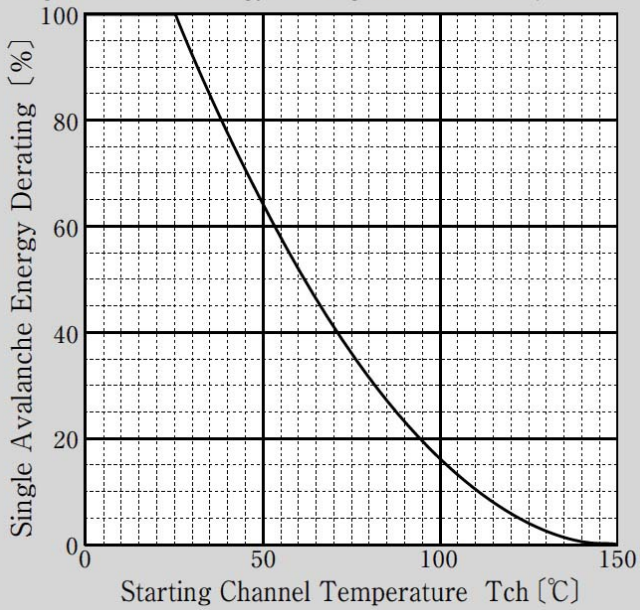
Power Derating - Case Temperature



Gate Charge Characteristics

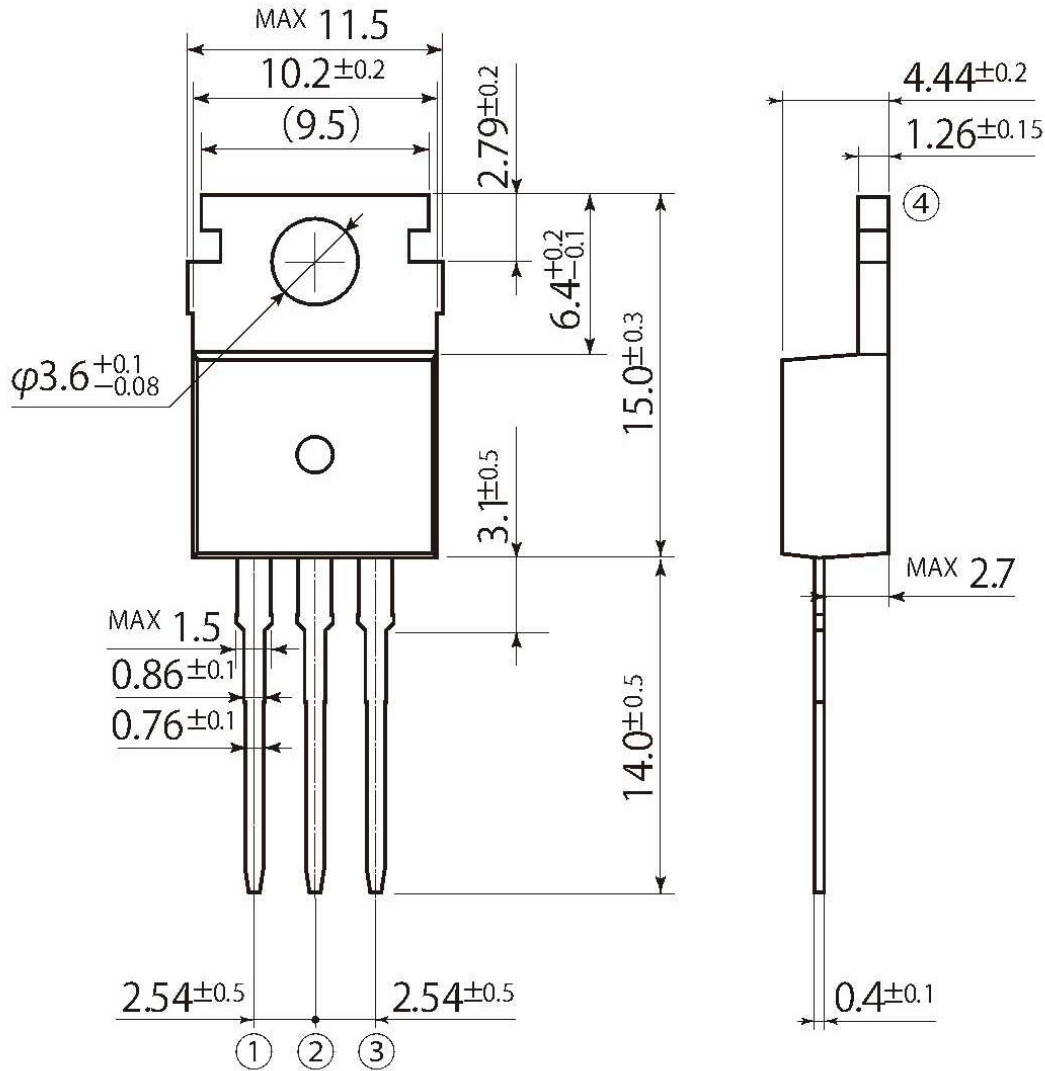


Single Avalanche Energy Derating vs Channel Temperature



J5

|            |          |
|------------|----------|
| JEDEC Code | TO-220AB |
| JEITA Code | SC-46    |
| House Name | FA       |



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