

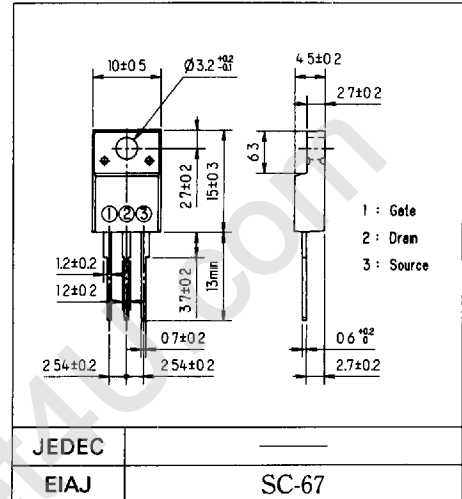
### Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- $V_{GSS} = \pm 30V$  Guarantee
- Avalanche-proof

### Applications

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

### Outline Drawings

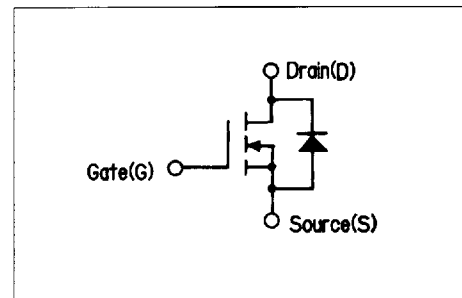


### Max. Ratings and Characteristics

● Absolute Maximum Ratings ( $T_c = 25^\circ C$ ):

| Items                                   | Symbols       | Ratings         | Units      |
|---|---------------|-----------------|------------|
| Drain-source voltage                    | $V_{DS}$      | 500             | V          |
| Continuous drain current                | $I_D$         | 10              | A          |
| Pulsed drain current                    | $I_{D(puls)}$ | 30              | A          |
| Continuous reverse drain current        | $I_{DR}$      | 10              | A          |
| Gate-source peak voltage                | $V_{GSS}$     | $\pm 30$        | V          |
| Max. power dissipation                  | $P_D$         | 50              | W          |
| Operating and storage temperature range | $T_{ch}$      | 150             | $^\circ C$ |
|   | $T_{stg}$     | $-55 \sim +150$ | $^\circ C$ |

### Equivalent Circuit Schematic



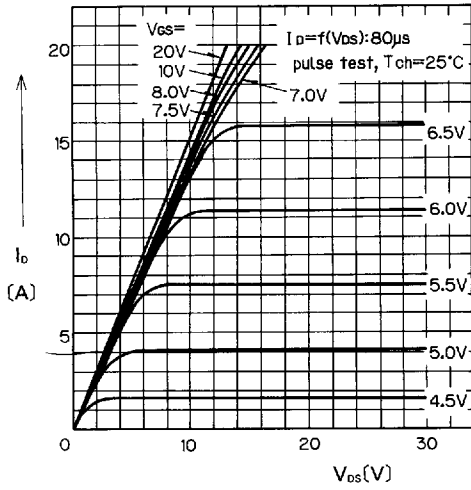
● Electrical Characteristics ( $T_c = 25^\circ C$ ):

| Items   | Symbols               | Test Conditions   | Min.                   | Typ. | Max. | Units    |
|---|-----------------------|---|------------------------|------|------|----------|
| Drain-source breakdown voltage                          | $V_{(BR)DS}$          | $I_D = 1mA$ $V_{GS} = 0V$   | 500                    |      |      | V        |
| Gate threshold voltage                                  | $V_{GS(th)}$          | $I_D = 1mA$ $V_{DS} = V_{GS}$                                     | 2.5                    | 3.5  | 5.0  | V        |
| Zero gate voltage drain current                         | $I_{DSS}$             | $V_{DS} = 500V$<br>$V_{GS} = 0V$                                  | $T_{ch} = 25^\circ C$  | 10   | 500  | $\mu A$  |
|   |                       |   | $T_{ch} = 125^\circ C$ | 0.2  | 1.0  | mA       |
| Gate-source leakage current                             | $I_{GSS}$             | $V_{GS} = \pm 30V$ $V_{DS} = 0V$                                  |                        | 10   | 100  | nA       |
| Drain-source on-state resistance                        | $R_{DS(on)}$          | $I_D = 5A$ $V_{GS} = 10V$   |                        | 0.7  | 0.9  | $\Omega$ |
| Forward transconductance                                | $g_{fs}$              | $I_D = 5A$ $V_{DS} = 25V$   | 4.0                    | 6.5  |      | S        |
| Input capacitance                                       | $C_{iss}$             | $V_{DS} = 25V$  |                        | 1200 | 1800 |          |
| Output capacitance                                      | $C_{oss}$             | $V_{GS} = 0V$   |                        | 160  | 240  | pF       |
| Reverse transfer capacitance                            | $C_{rss}$             | $f = 1MHz$  |                        | 70   | 100  |          |
| Turn-on time $t_{on}$<br>( $t_{on} + t_{d(on)} + t_r$ ) | $t_{d(on)}$<br>$t_r$  | $V_{CC} = 300V$ $I_D = 10A$<br>$V_{GS} = 10V$<br>$R_G = 25\Omega$ |                        | 30   | 45   | ns       |
|   |                       |   |                        | 80   | 120  |          |
| Turn-off time $t_{off}$<br>( $t_{d(off)} + t_f$ )       | $t_{d(off)}$<br>$t_f$ | $V_{CC} = 300V$ $I_D = 10A$<br>$V_{GS} = 10V$<br>$R_G = 25\Omega$ |                        | 160  | 240  | ns       |
|   |                       |   |                        | 80   | 120  |          |
| Diode forward on-voltage                                | $V_{SD}$              | $I_F = 2 \times I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$       |                        | 1.10 | 1.5  | V        |
| Reverse recovery time                                   | $t_{rr}$              | $I_F = I_{DR}$ $dI/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$         |                        | 500  |      | ns       |

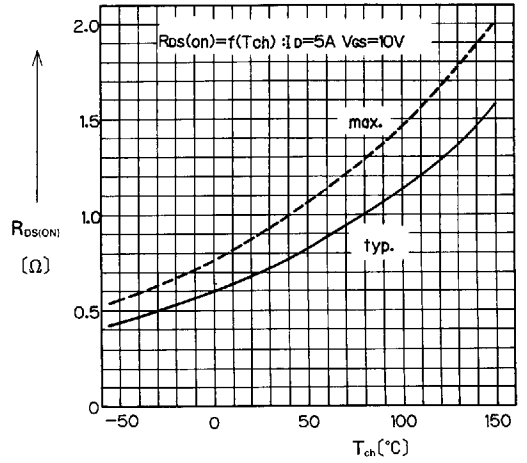
● Thermal Characteristics

| Items              | Symbols        | Test Conditions | Min. | Typ. | Max. | Units        |
|--------------------|----------------|-----------------|------|------|------|--------------|
| Thermal Resistance | $R_{th(ch-a)}$ | channel to air  |      |      | 62.5 | $^\circ C/W$ |
|                    | $R_{th(ch-c)}$ | channel to case |      |      | 2.5  | $^\circ C/W$ |

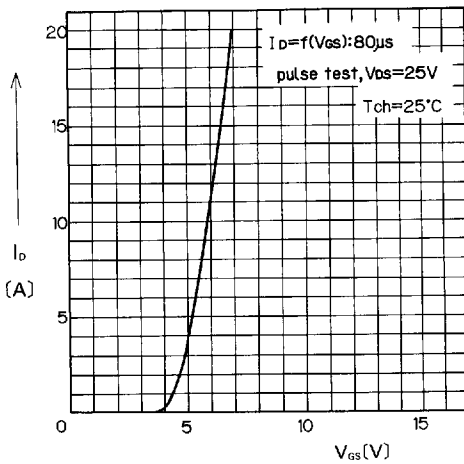
■ Characteristics



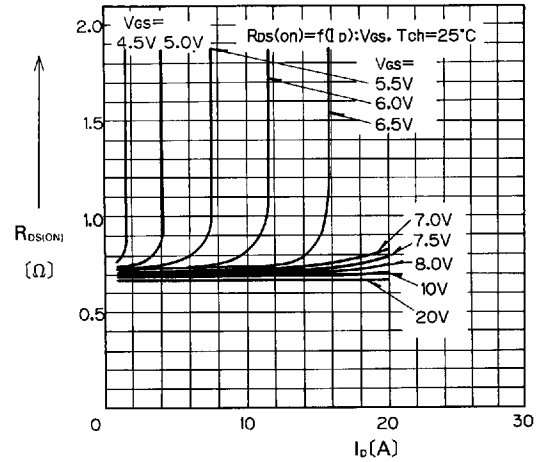
Typical Output Characteristics



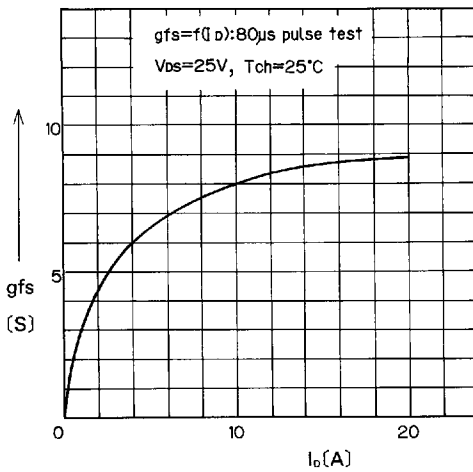
On State Resistance vs. Tch



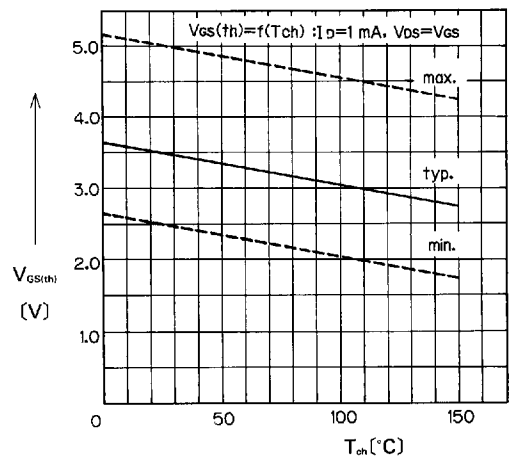
Typical Transfer Characteristics



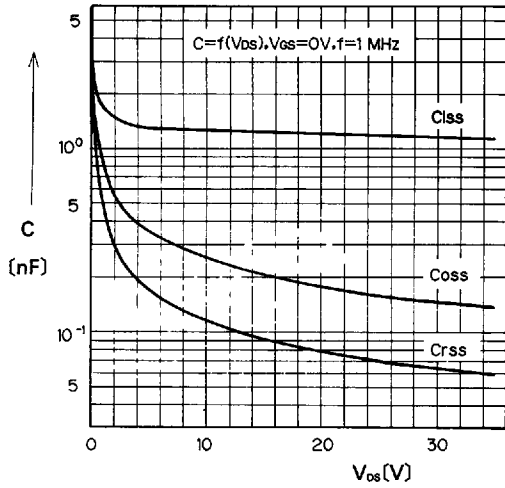
Typical Drain-Source on State Resistance vs. Id



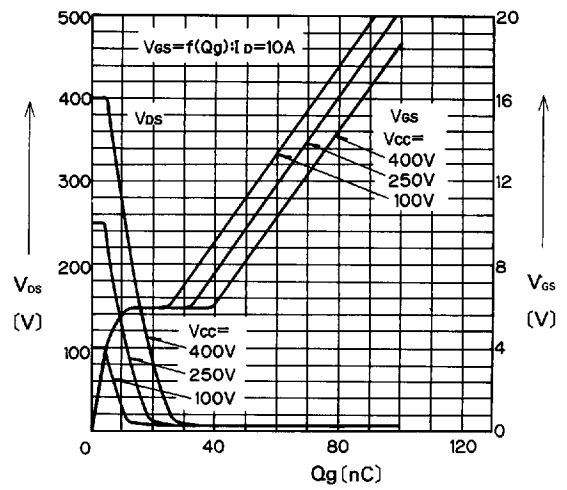
Typical Forward Transconductance vs. Id



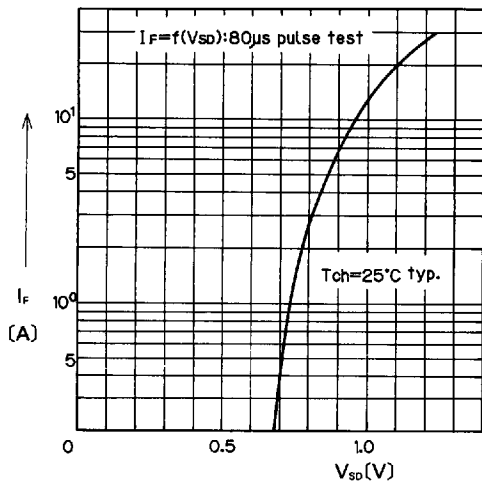
Gate Threshold Voltage vs. Tch



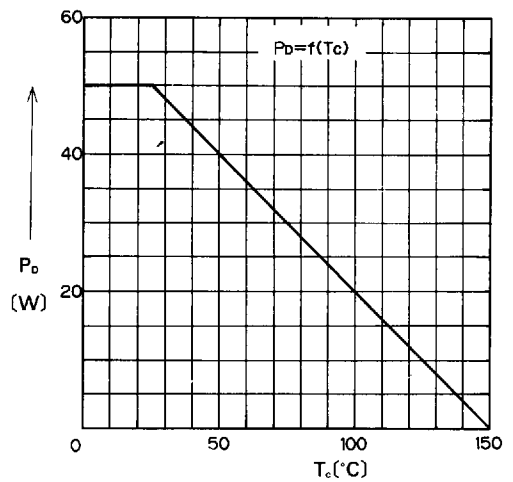
Typical Capacitance vs.  $V_{ds}$



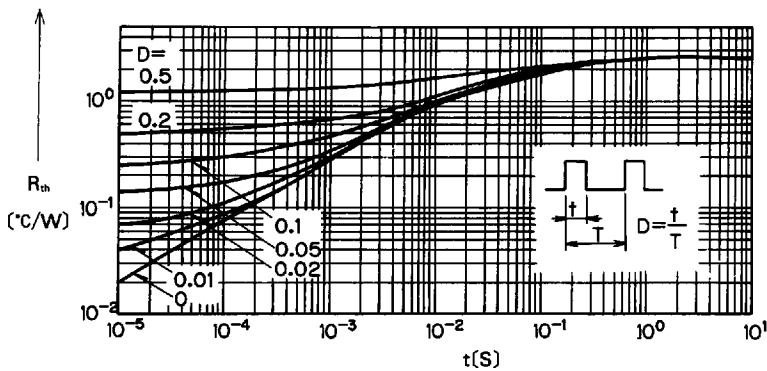
Typical Input Charge



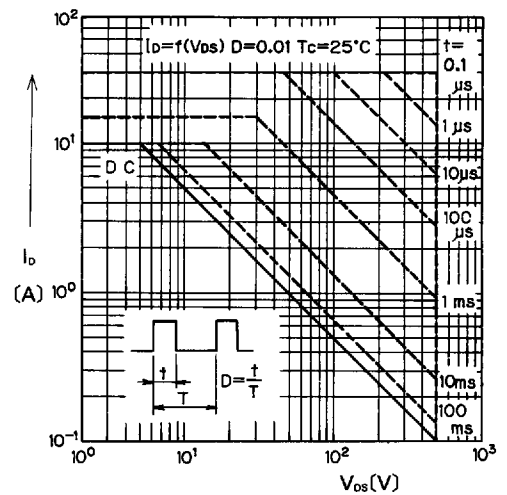
Forward Characteristic of Reverse Diode



Allowable Power Dissipation vs.  $T_c$



Transient Thermal Impedance



Safe Operating Area