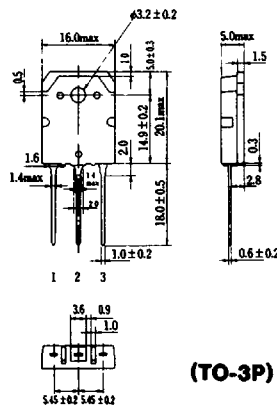
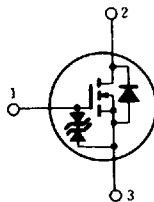


## SILICON N-CHANNEL MOS FET

### HIGH SPEED POWER SWITCHING

#### FEATURES

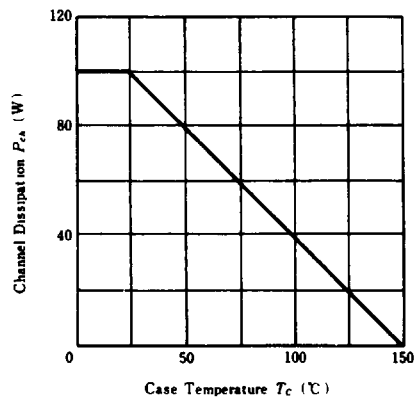
- Low On-Resistance
- High Speed Switching
- Low Drive Current
- No Secondary Breakdown
- Suitable for Switching Regulator and DC-DC Converter



1. Gate
2. Drain (Flange)
3. Source (Dimensions in mm)

(TO-3P)

### POWER VS. TEMPERATURE DERATING



#### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

| Item                                   | Symbol           | Rating          | Unit             |
|----------------------------------------|------------------|-----------------|------------------|
| Drain-Source Voltage                   | $V_{DS}$         | 250             | V                |
| Gate-Source Voltage                    | $V_{GS}$         | $\pm 20$        | V                |
| Drain Current                          | $I_D$            | 15              | A                |
| Drain Peak Current                     | $I_{D(pulse)}$ * | 60              | A                |
| Body-Drain Diode Reverse Drain Current | $I_{DR}$         | 15              | A                |
| Channel Dissipation                    | $P_{cs}$ **      | 100             | W                |
| Channel Temperature                    | $T_{ch}$         | 150             | $^\circ\text{C}$ |
| Storage Temperature                    | $T_{stg}$        | $-55 \sim +150$ | $^\circ\text{C}$ |

\*  $PW \leq 10\mu\text{s}$ , duty cycle  $\leq 1\%$

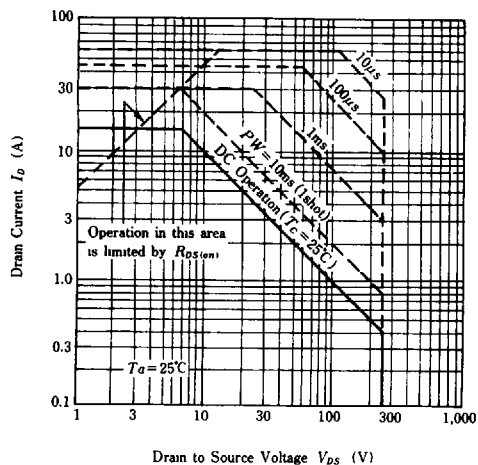
\*\* Value at  $T_c=25^\circ\text{C}$

#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )

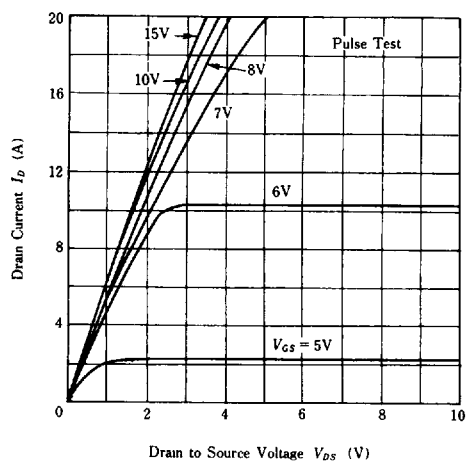
| Item                                    | Symbol        | Test Condition                                                   | min.     | typ. | max.     | Unit          |
|-----------------------------------------|---------------|------------------------------------------------------------------|----------|------|----------|---------------|
| Drain-Source Breakdown Voltage          | $V_{(BR)DS}$  | $I_D=10\text{mA}$ , $V_{GS}=0$                                   | 250      | —    | —        | V             |
| Gate-Source Breakdown Voltage           | $V_{(BR)GS}$  | $I_G=\pm 100\mu\text{A}$ , $V_{DS}=0$                            | $\pm 20$ | —    | —        | V             |
| Gate-Source Leak Current                | $I_{GSS}$     | $V_{GS}=\pm 16\text{V}$ , $V_{DS}=0$                             | —        | —    | $\pm 10$ | $\mu\text{A}$ |
| Zero Gate Voltage Drain Current         | $I_{DSS}$     | $V_{DS}=200\text{V}$ , $V_{GS}=0$                                | —        | —    | 250      | $\mu\text{A}$ |
| Gate-Source Cutoff Voltage              | $V_{GS(off)}$ | $I_D=1\text{mA}$ , $V_{DS}=10\text{V}$                           | 2.0      | —    | 4.0      | V             |
| Static Drain-Source on State Resistance | $R_{DS(on)}$  | $I_D=8\text{A}$ , $V_{GS}=10\text{V}$ *                          | —        | 0.16 | 0.22     | $\Omega$      |
| Forward Transfer Admittance             | $ y_{fs} $    | $I_D=8\text{A}$ , $V_{DS}=10\text{V}$ *                          | 5.0      | 8.5  | —        | S             |
| Input Capacitance                       | $C_{iss}$     | $V_{DS}=10\text{V}$ , $V_{GS}=0$ , $f=1\text{MHz}$               | —        | 1600 | —        | pF            |
| Output Capacitance                      | $C_{oss}$     |                                                                  | —        | 770  | —        | pF            |
| Reverse Transfer Capacitance            | $C_{rss}$     |                                                                  | —        | 230  | —        | pF            |
| Turn-On Delay Time                      | $t_{d(on)}$   |                                                                  | —        | 25   | —        | ns            |
| Rise Time                               | $t_r$         | $I_D=8\text{A}$ , $V_{GS}=10\text{V}$ , $R_L=3.75\Omega$         | —        | 130  | —        | ns            |
| Turn-Off Delay Time                     | $t_{d(off)}$  |                                                                  | —        | 110  | —        | ns            |
| Fall Time                               | $t_f$         |                                                                  | —        | 80   | —        | ns            |
| Body-Drain Diode Forward Voltage        | $V_{DF}$      | $I_F=15\text{A}$ , $V_{GS}=0$                                    | —        | 1.2  | —        | V             |
| Body-Drain Diode Reverse Recovery Time  | $t_{rr}$      | $I_F=15\text{A}$ , $V_{GS}=0$ , $di_F/dt=50\text{A}/\mu\text{s}$ | —        | 500  | —        | ns            |

\* Pulse Test

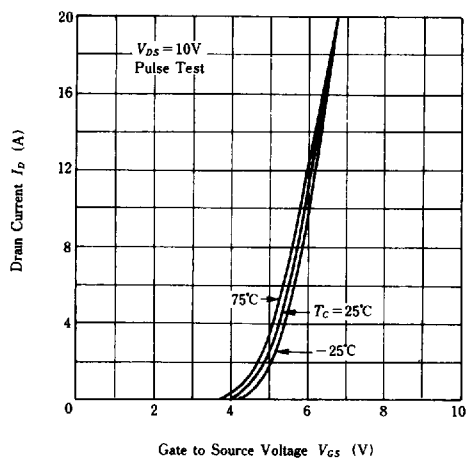
MAXIMUM SAFE OPERATION AREA



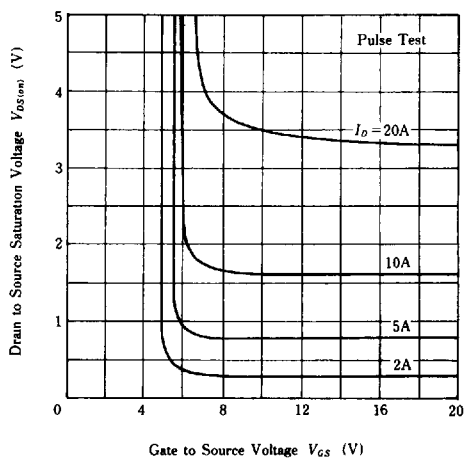
TYPICAL OUTPUT CHARACTERISTICS



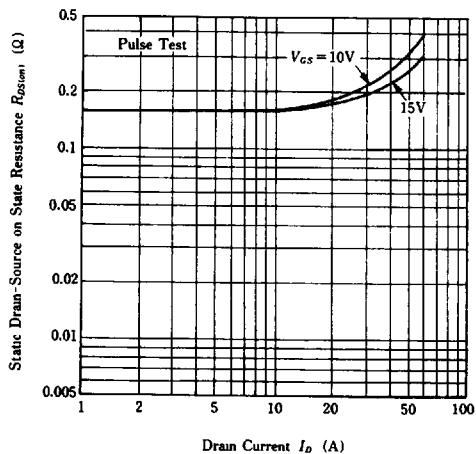
TYPICAL TRANSFER CHARACTERISTICS



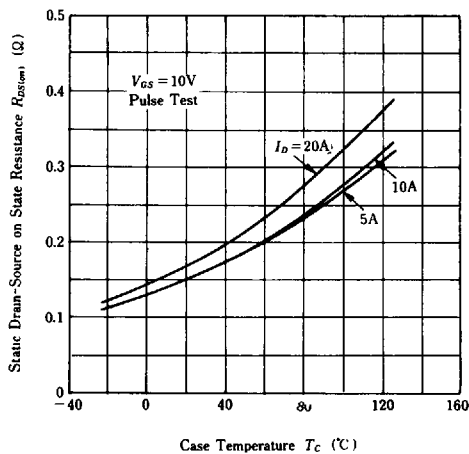
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



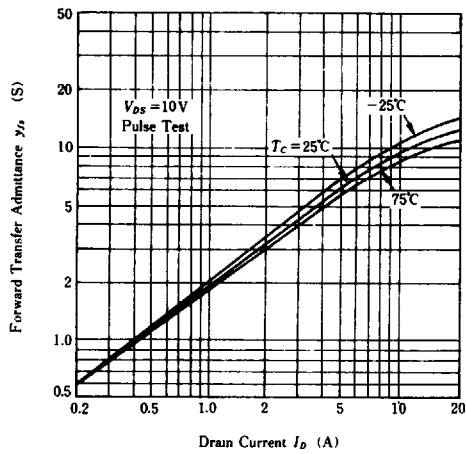
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



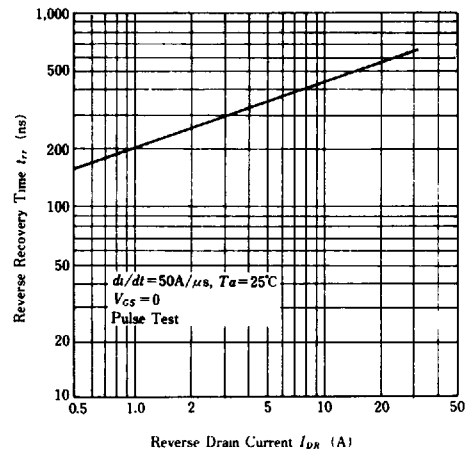
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



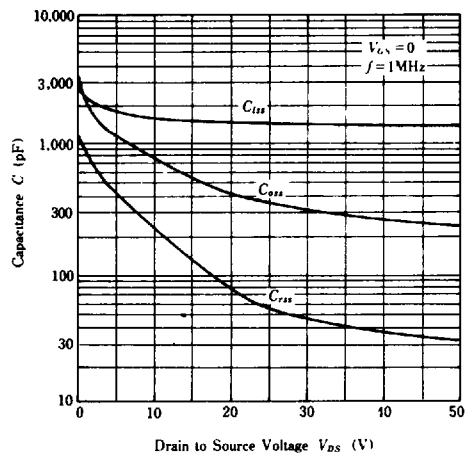
**FORWARD TRANSFER ADMITTANCE  
VS. DRAIN CURRENT**



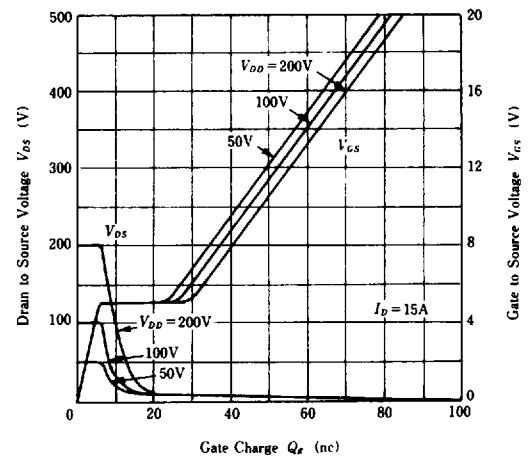
**BODY-DRAIN DIODE  
REVERSE RECOVERY TIME**



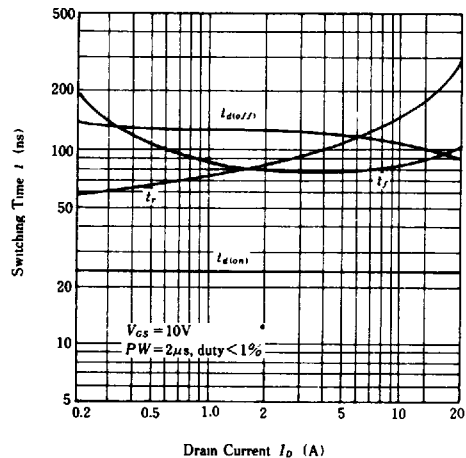
**TYPICAL CAPACITANCE  
VS. DRAIN-SOURCE VOLTAGE**



**DYNAMIC INPUT CHARACTERISTICS**



**SWITCHING CHARACTERISTICS**



**REVERSE DRAIN CURRENT VS.  
SOURCE TO DRAIN VOLTAGE**

