



**2SK3416**

## DC / DC Converter Applications

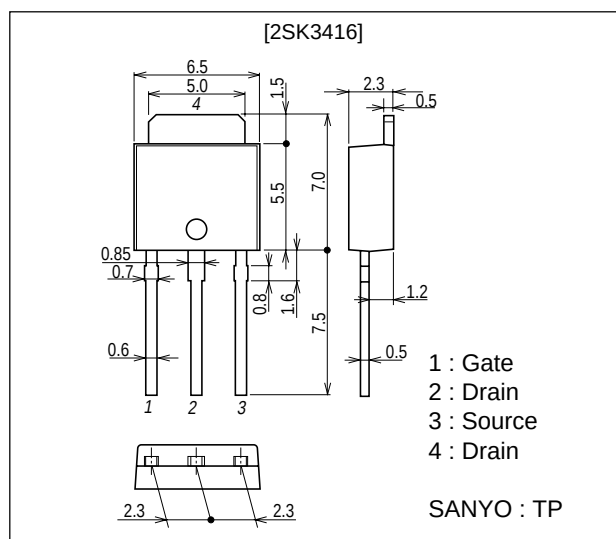
## Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

## Package Dimensions

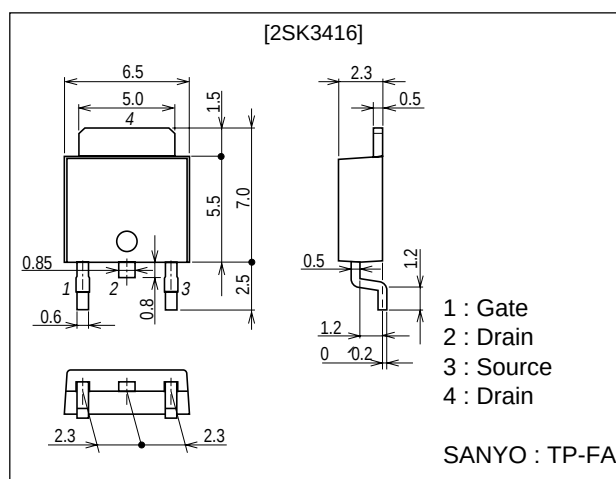
unit : mm

2083B



unit : mm

2092B



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21004 TS IM TA-100477 No.7440-1/4

## Specifications

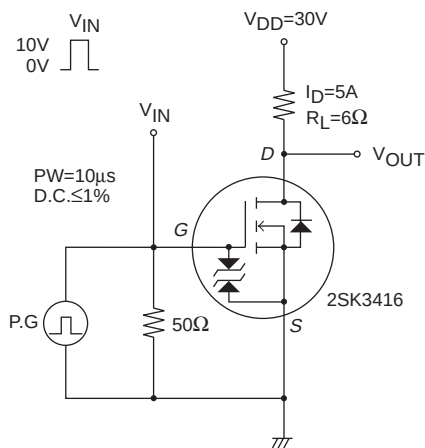
### Absolute Maximum Ratings at Ta=25°C

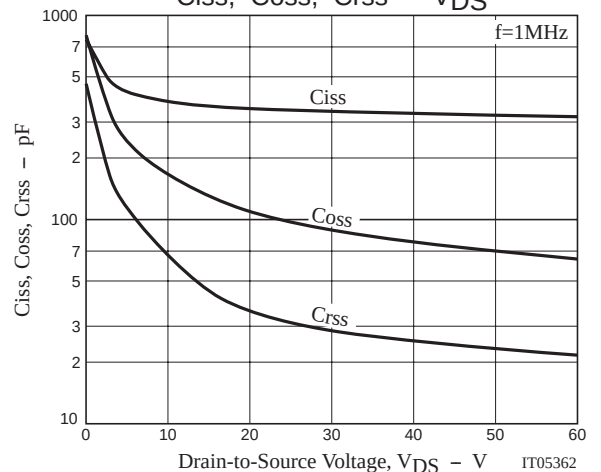
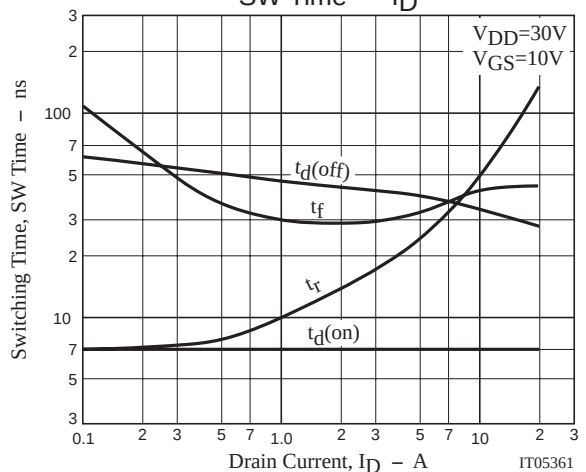
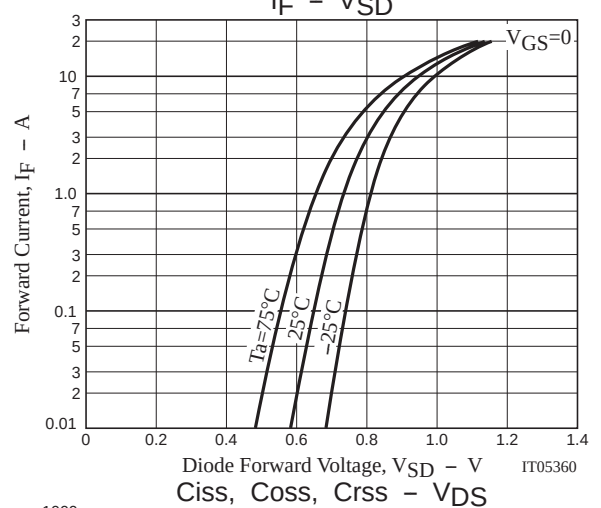
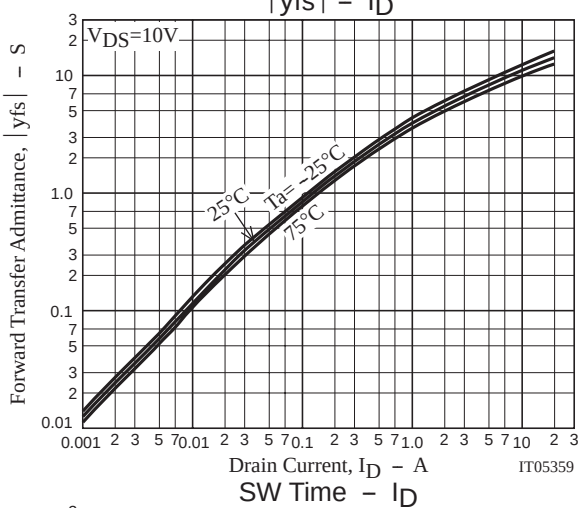
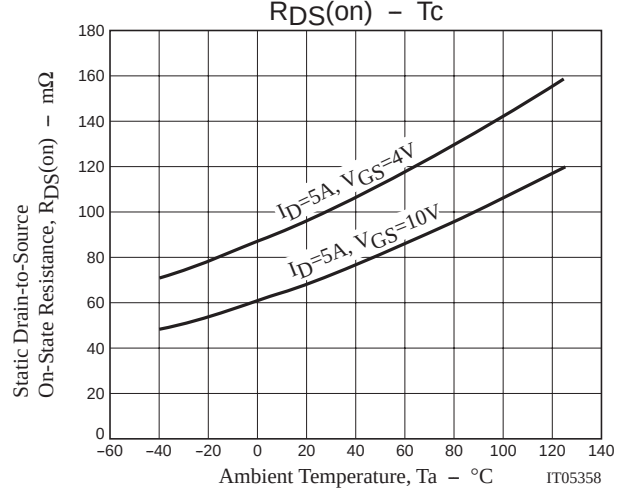
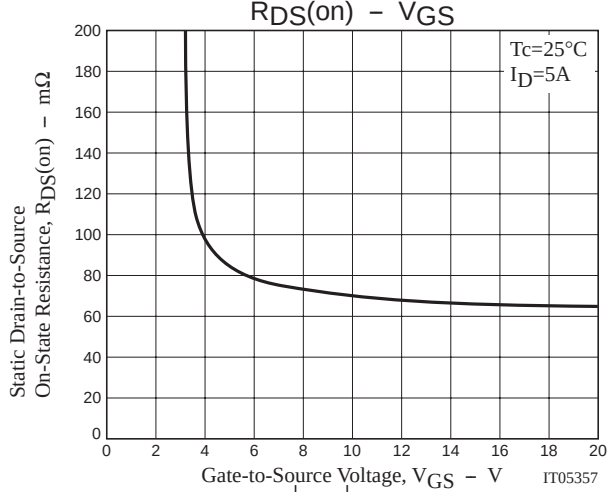
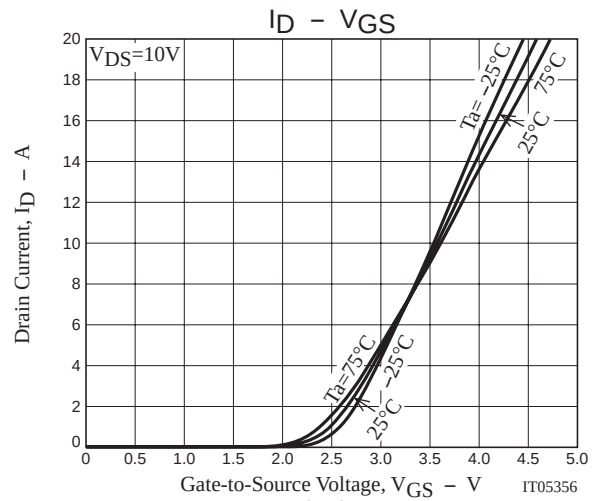
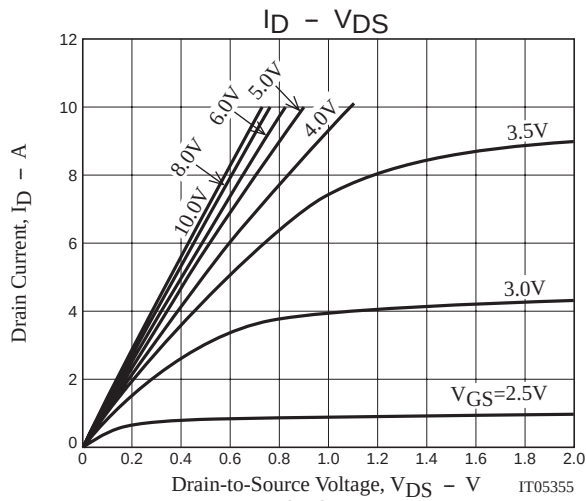
| Parameter                   | Symbol    | Conditions                                | Ratings     | Unit |
|-----------------------------|-----------|-------------------------------------------|-------------|------|
| Drain-to-Source Voltage     | $V_{DS}$  |                                           | 60          | V    |
| Gate-to-Source Voltage      | $V_{GS}$  |                                           | ±20         | V    |
| Drain Current               | $I_D$     |                                           | 10          | A    |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10\mu s$ , duty cycle $\leq 1\%$ | 40          | A    |
| Allowable Power Dissipation | $P_D$     |                                           | 1           | W    |
|                             |           | $T_c = 25^\circ C$                        | 20          | W    |
| Channel Temperature         | $T_{ch}$  |                                           | 150         | °C   |
| Storage Temperature         | $T_{stg}$ |                                           | -55 to +150 | °C   |

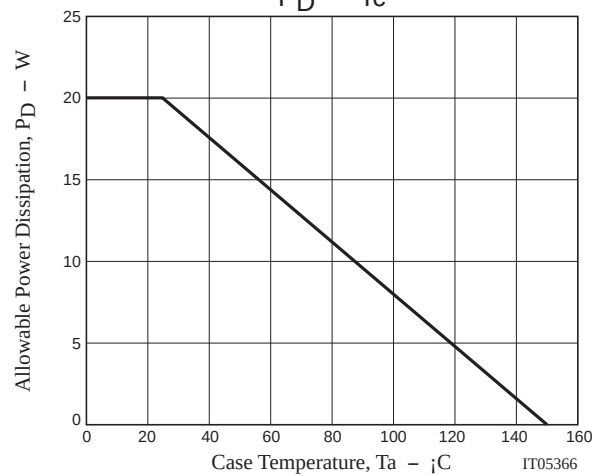
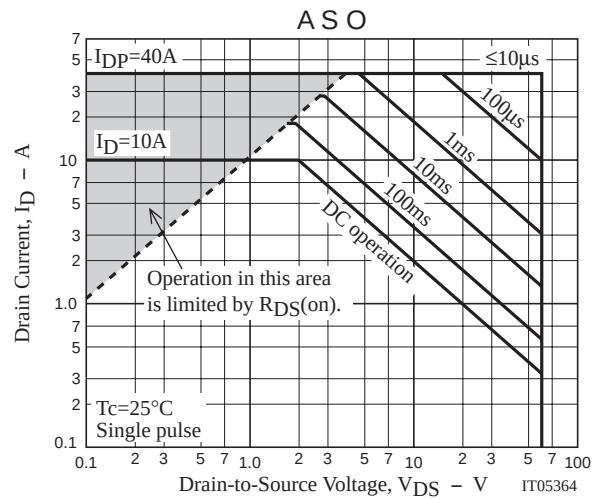
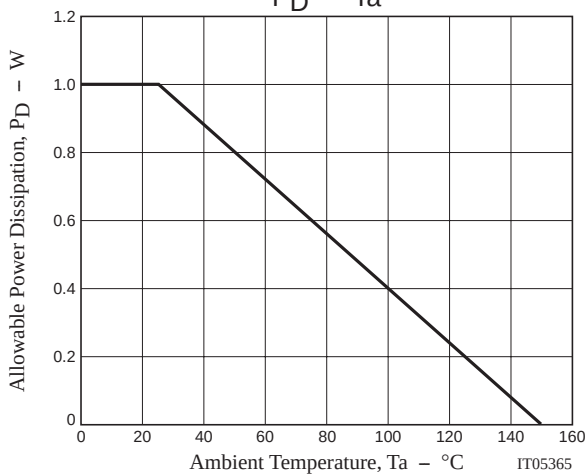
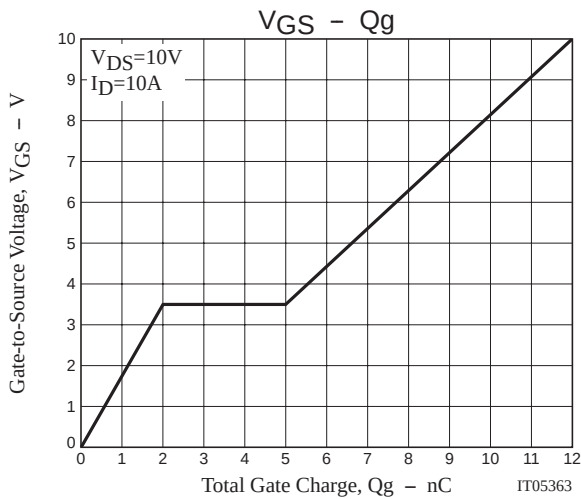
### Electrical Characteristics at Ta=25°C

| Parameter                                  | Symbol        | Conditions                                    | Ratings |      |     | Unit |
|--------------------------------------------|---------------|-----------------------------------------------|---------|------|-----|------|
|                                            |               |                                               | min     | typ  | max |      |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = 1mA$ , $V_{GS} = 0$                    | 60      |      |     | V    |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 60V$ , $V_{GS} = 0$                 |         |      | 10  | μA   |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 16V$ , $V_{DS} = 0$             |         |      | ±10 | μA   |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = 10V$ , $I_D = 1mA$                  | 1.0     |      | 2.4 | V    |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 10V$ , $I_D = 5A$                   | 5.6     | 8    |     | S    |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D = 5A$ , $V_{GS} = 10V$                   |         | 74   | 96  | mΩ   |
|                                            | $R_{DS(on)1}$ | $I_D = 5A$ , $V_{GS} = 4V$                    |         | 98   | 140 | mΩ   |
| Input Capacitance                          | $C_{iss}$     | $V_{DS} = 20V$ , $f = 1MHz$                   |         | 350  |     | pF   |
| Output Capacitance                         | $C_{oss}$     | $V_{DS} = 20V$ , $f = 1MHz$                   |         | 110  |     | pF   |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS} = 20V$ , $f = 1MHz$                   |         | 35   |     | pF   |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit.                   |         | 7    |     | ns   |
| Rise Time                                  | $t_r$         | See specified Test Circuit.                   |         | 25   |     | ns   |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit.                   |         | 40   |     | ns   |
| Fall Time                                  | $t_f$         | See specified Test Circuit.                   |         | 35   |     | ns   |
| Total Gate Charge                          | $Q_g$         | $V_{DS} = 10V$ , $V_{GS} = 10V$ , $I_D = 10A$ |         | 12   |     | nC   |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS} = 10V$ , $V_{GS} = 10V$ , $I_D = 10A$ |         | 2    |     | nC   |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS} = 10V$ , $V_{GS} = 10V$ , $I_D = 10A$ |         | 3    |     | nC   |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S = 10A$ , $V_{GS} = 0$                    |         | 0.95 | 1.2 | V    |

### Switching Time Test Circuit







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