

**CPH5605**

## Ultrahigh-Speed Switching Applications

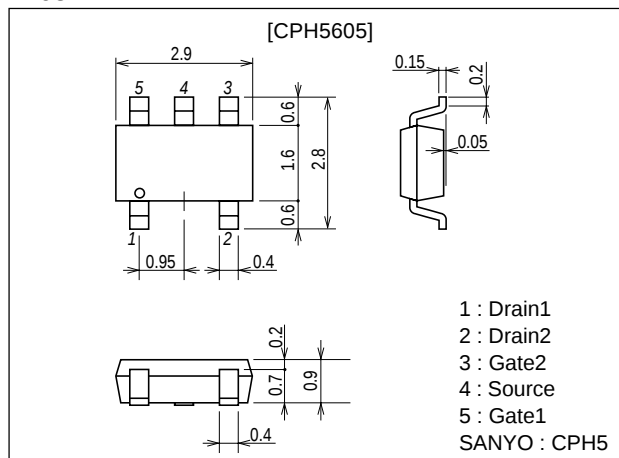
### Features

- The CPH5605 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON resistance and high-speed switching, thereby enabling high-density mounting.
- 2.5V drive.

### Package Dimensions

unit:mm

2168



### Specifications

Absolute Maximum Ratings at Ta = 25°C

| Parameter                   | Symbol    | Conditions                                      | Ratings     |           | Unit |
|-----------------------------|-----------|-------------------------------------------------|-------------|-----------|------|
|                             |           |                                                 | N-channel   | P-channel |      |
| Drain-to-Source Voltage     | $V_{DSS}$ |                                                 | 20          | -20       | V    |
| Gate-to-Source Voltage      | $V_{GSS}$ |                                                 | ±10         | ±10       | V    |
| Drain Current (DC)          | $I_D$     |                                                 | 1.4         | -1        | A    |
| Drain Current (pulse)       | $I_{DP}$  | PW≤10μs, duty cycle≤1%                          | 5.6         | -4        | A    |
| Allowable Power Dissipation | $P_D$     | Mounted on a ceramic board (600mm²×0.8mm) 1unit | 0.9         |           | W    |
| Channel Temperature         | Tch       |                                                 | 150         |           | °C   |
| Storage Temperature         | Tstg      |                                                 | -55 to +150 |           | °C   |

Electrical Characteristics at Ta = 25°C

| Parameter                                  | Symbol        | Conditions                | Ratings |     |          | Unit       |
|--------------------------------------------|---------------|---------------------------|---------|-----|----------|------------|
|                                            |               |                           | min     | typ | max      |            |
| [N-channel]                                |               |                           |         |     |          |            |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=1mA, V_{GS}=0$       | 20      |     |          | V          |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=20V, V_{GS}=0$    |         |     | 10       | $\mu A$    |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 8V, V_{DS}=0$ |         |     | $\pm 10$ | $\mu A$    |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$     | 0.4     |     | 1.3      | V          |
| Forward Transfer Admittance                | yfs           | $V_{DS}=10V, I_D=700mA$   | 1.8     | 2.5 |          | S          |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=700mA, V_{GS}=4V$    |         | 200 | 260      | m $\Omega$ |
|                                            | $R_{DS(on)2}$ | $I_D=400mA, V_{GS}=2.5V$  |         | 260 | 360      | m $\Omega$ |

Marking : FE

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**SANYO Electric Co.,Ltd. Semiconductor Company**

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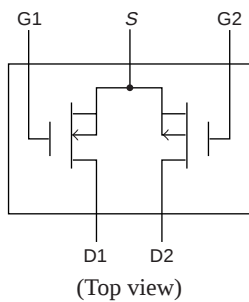
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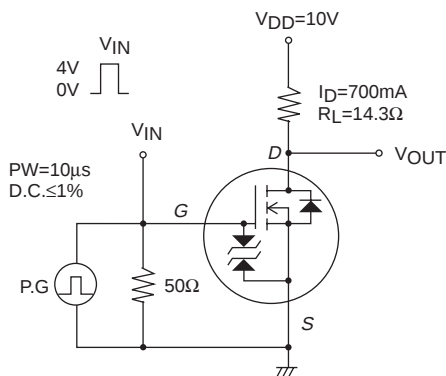
| Parameter                                  | Symbol        | Conditions                            | Ratings |      |          | Unit       |
|--------------------------------------------|---------------|---------------------------------------|---------|------|----------|------------|
|                                            |               |                                       | min     | typ  | max      |            |
| Input Capacitance                          | Ciss          | $V_{DS}=10V, f=1MHz$                  |         | 90   |          | pF         |
| Output Capacitance                         | Coss          | $V_{DS}=10V, f=1MHz$                  |         | 60   |          | pF         |
| Reverse Transfer Capacitance               | Crss          | $V_{DS}=10V, f=1MHz$                  |         | 28   |          | pF         |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit            |         | 10   |          | ns         |
| Rise Time                                  | $t_r$         | See specified Test Circuit            |         | 20   |          | ns         |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit            |         | 20   |          | ns         |
| Fall Time                                  | $t_f$         | See specified Test Circuit            |         | 20   |          | ns         |
| Total Gate Charge                          | Qg            | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$    |         | 6    |          | nC         |
| Gate-to-Source Charge                      | Qgs           | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$    |         | 1    |          | nC         |
| Gate-to-Drain "Miller" Charge              | Qgd           | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$    |         | 2    |          | nC         |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=1.4A, V_{GS}=0$                  |         | 0.9  | 1.2      | V          |
| [P-channel]                                |               |                                       |         |      |          |            |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=-1mA, V_{GS}=0$                  | -20     |      |          | V          |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=-20V, V_{GS}=0$               |         |      | -10      | $\mu A$    |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 8V, V_{DS}=0$             |         |      | $\pm 10$ | $\mu A$    |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=-10V, I_D=-1mA$               | -0.4    |      | -1.4     | V          |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=-10V, I_D=-500mA$             | 1.0     | 1.4  |          | S          |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-500mA, V_{GS}=-4V$              |         | 420  | 550      | m $\Omega$ |
|                                            | $R_{DS(on)2}$ | $I_D=-300mA, V_{GS}=-2.5V$            |         | 630  | 890      | m $\Omega$ |
| Input Capacitance                          | Ciss          | $V_{DS}=-10V, f=1MHz$                 |         | 100  |          | pF         |
| Output Capacitance                         | Coss          | $V_{DS}=-10V, f=1MHz$                 |         | 60   |          | pF         |
| Reverse Transfer Capacitance               | Crss          | $V_{DS}=-10V, f=1MHz$                 |         | 25   |          | pF         |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit            |         | 10   |          | ns         |
| Rise Time                                  | $t_r$         | See specified Test Circuit            |         | 25   |          | ns         |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit            |         | 27   |          | ns         |
| Fall Time                                  | $t_f$         | See specified Test Circuit            |         | 32   |          | ns         |
| Total Gate Charge                          | Qg            | $V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$ |         | 5    |          | nC         |
| Gate-to-Source Charge                      | Qgs           | $V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$ |         | 1    |          | nC         |
| Gate-to-Drain "Miller" Charge              | Qgd           | $V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$ |         | 1    |          | nC         |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=-1.0A, V_{GS}=0$                 |         | -0.9 | -1.5     | V          |

## Electrical Connection



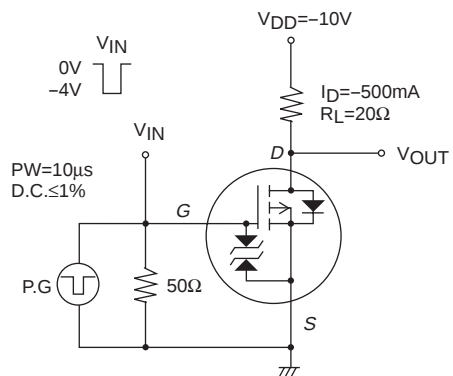
## Switching Time Test Circuit

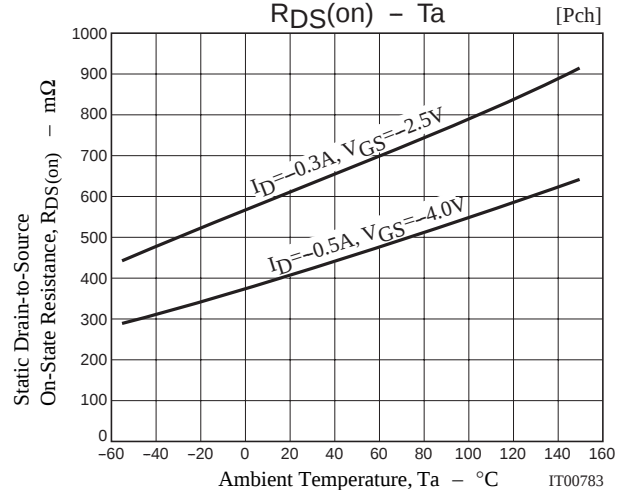
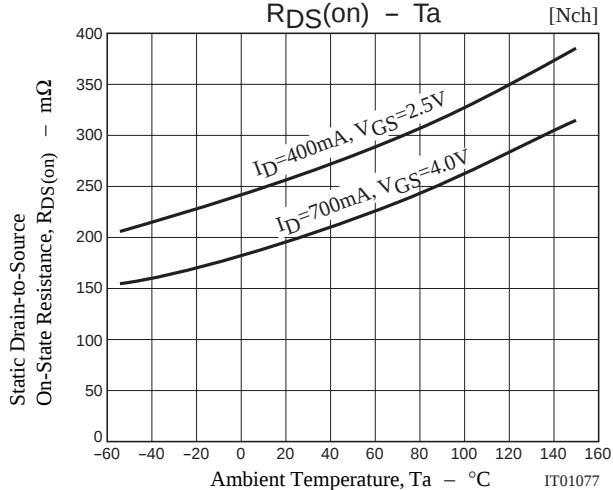
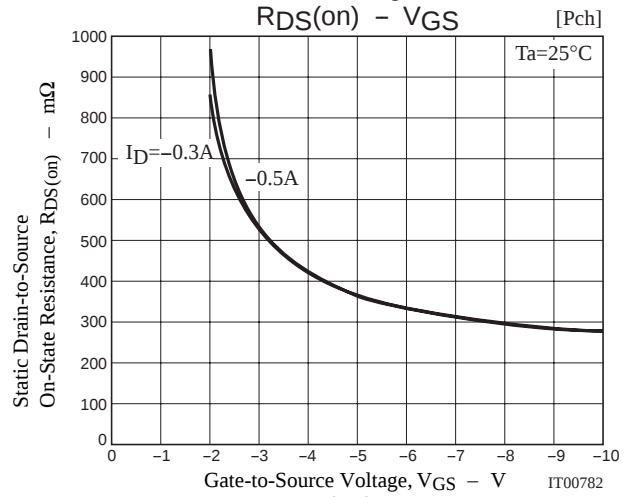
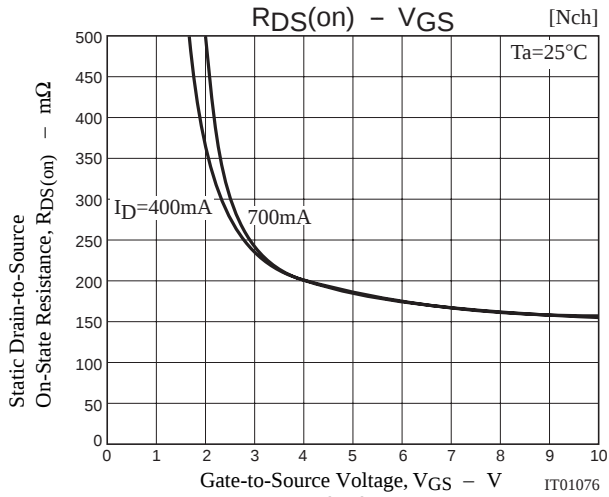
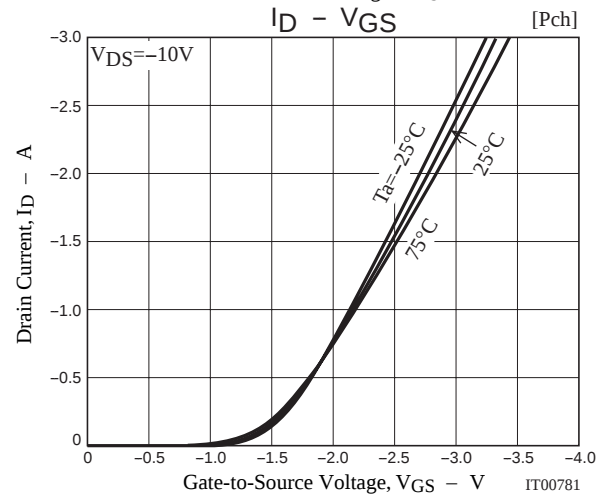
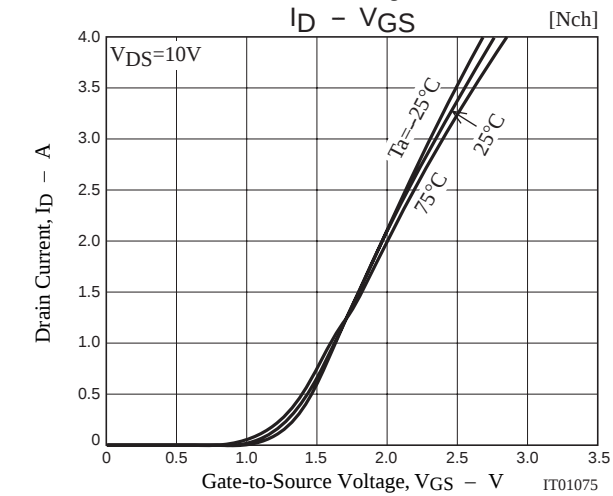
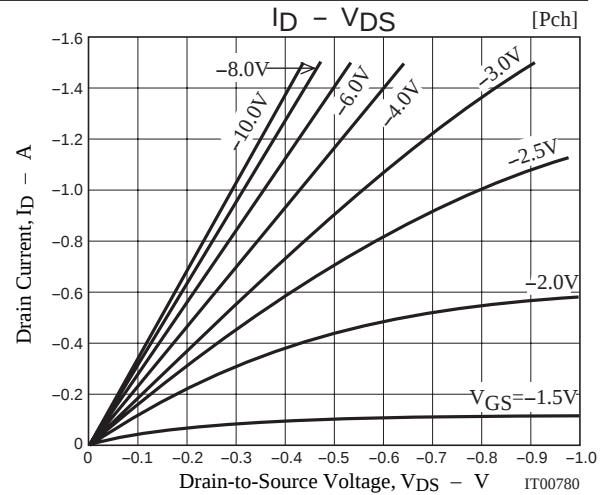
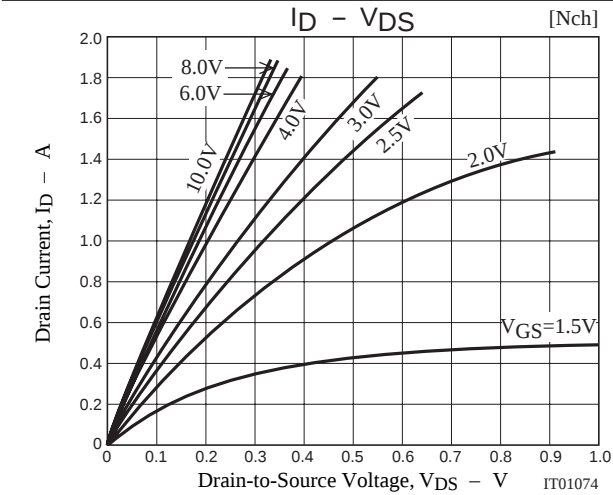
[N-channel]



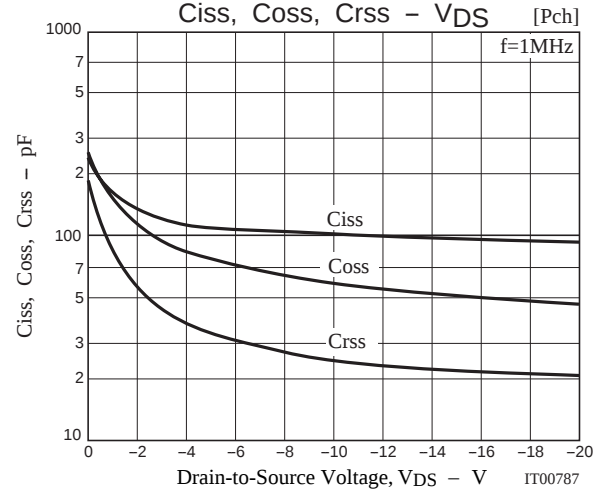
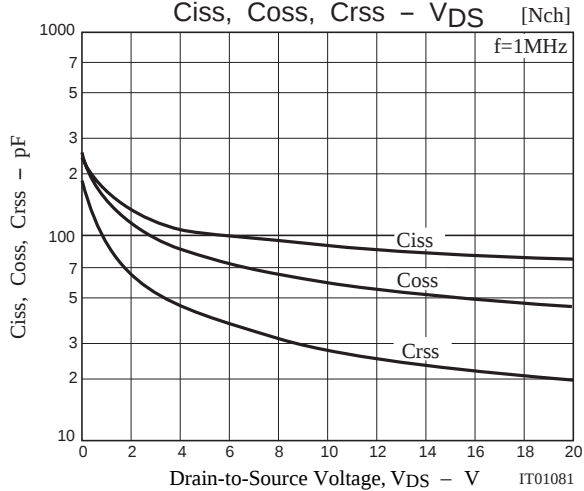
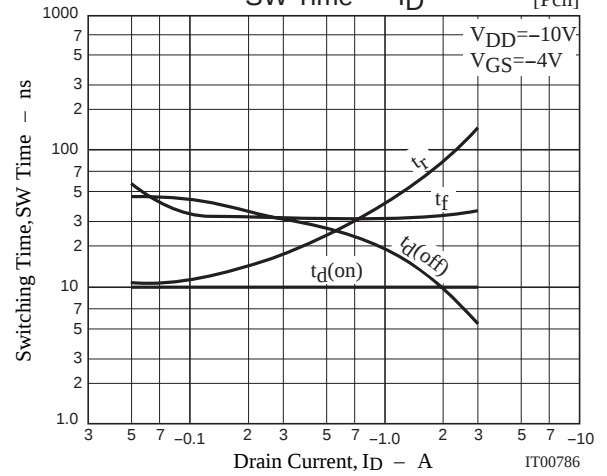
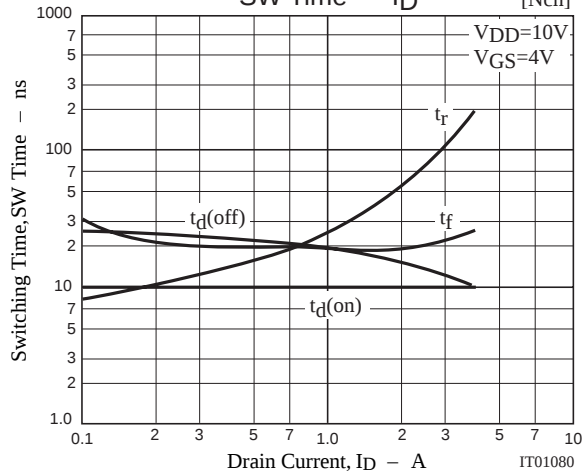
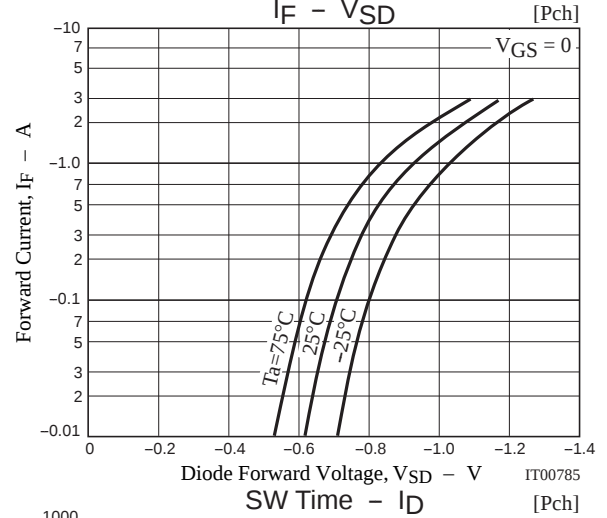
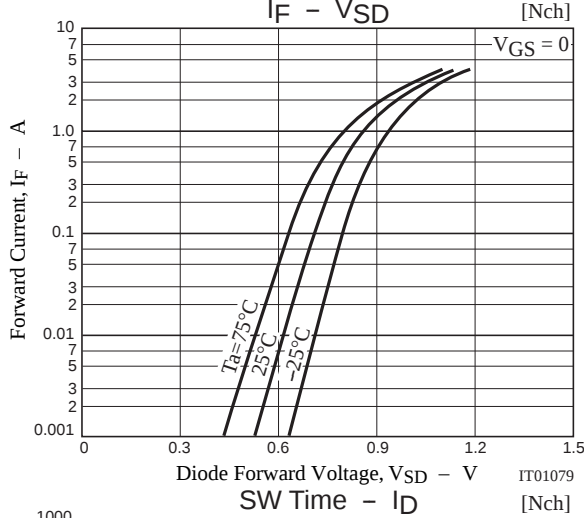
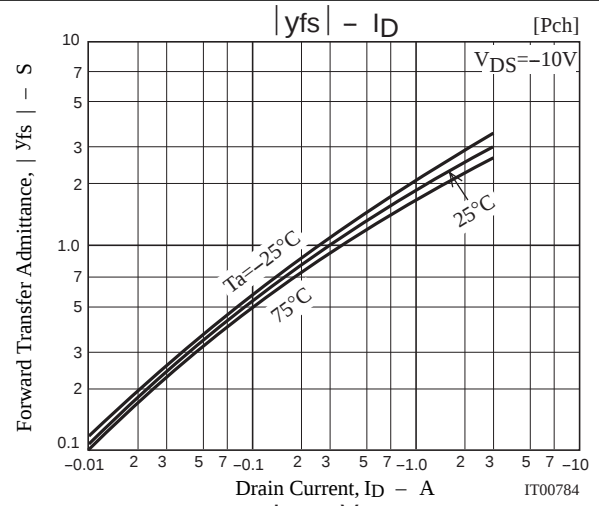
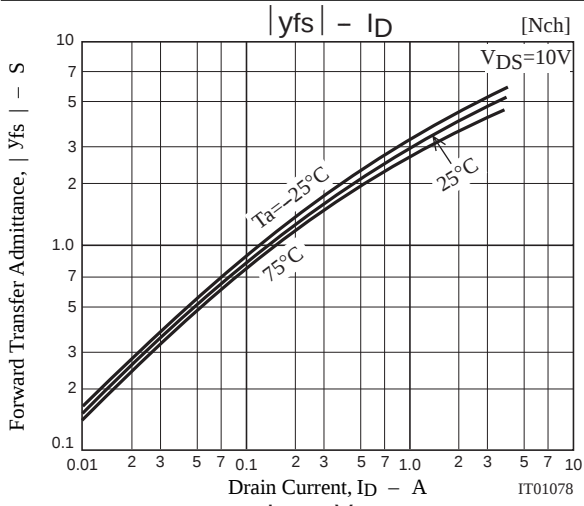
## Switching Time Test Circuit

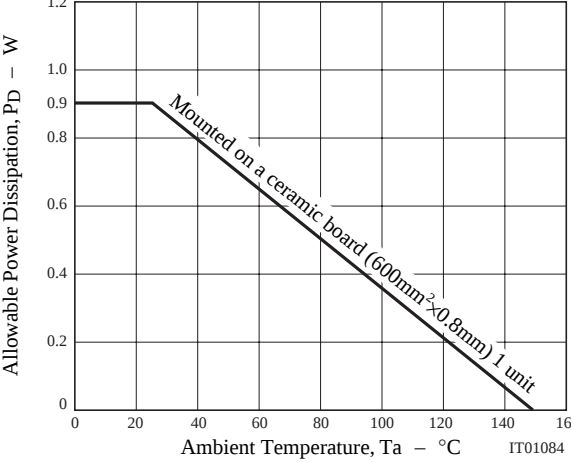
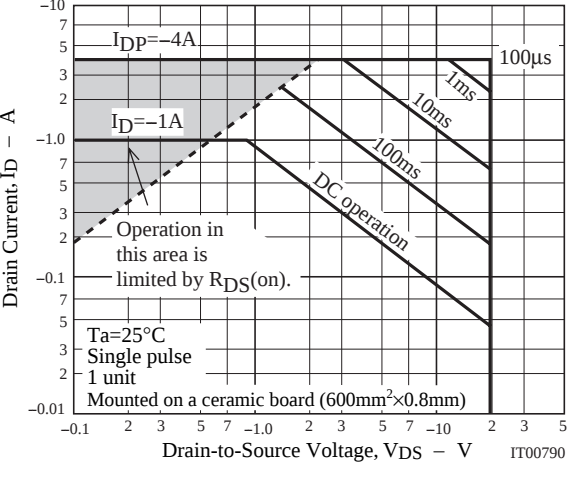
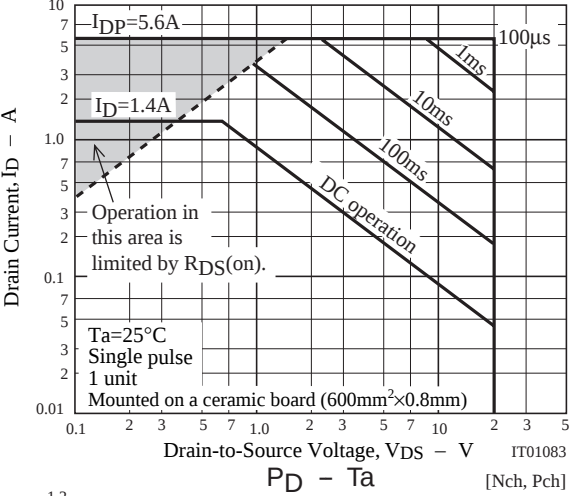
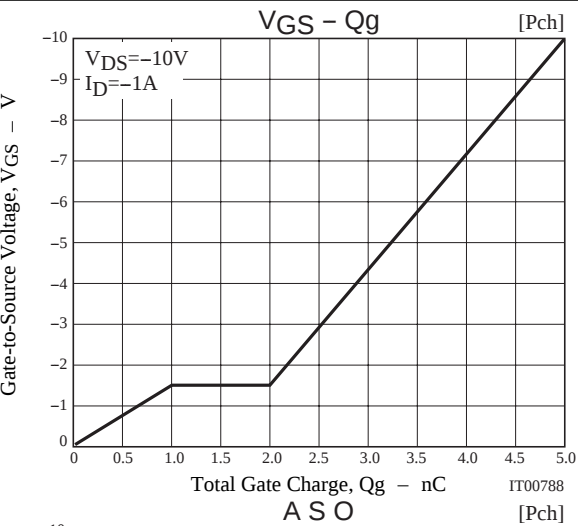
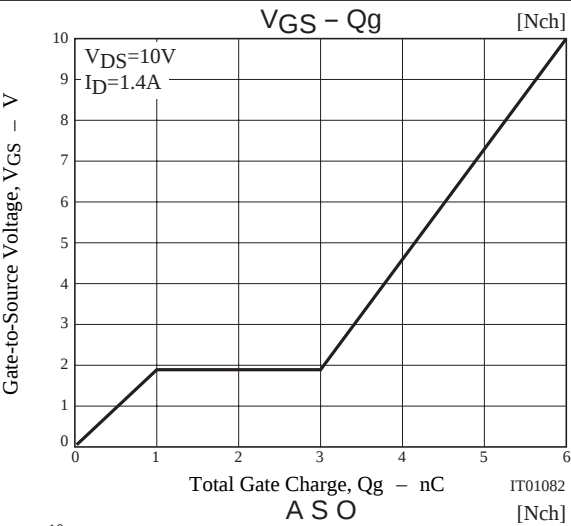
[P-channel]





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