



VEC2605 — P-Channel and N-Channel Silicon MOSFET

General-Purpose Switching Device Applications

Features

- Best suited for DC/DC converters.
- The VEC2605 incorporates a P-channel MOSFET and an N-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- 2.5V drive.
- Mounting height 0.75mm.

Specifications

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | P-channel | N-channel | Unit |
|-----------------------------|------------------|---|-------------|-----------|------|
| Drain-to-Source Voltage | V _{DSS} | | -20 | 20 | V |
| Gate-to-Source Voltage | V _{GSS} | | ±10 | ±10 | V |
| Drain Current (DC) | I _D | | -1 | 3 | A |
| Drain Current (Pulse) | I _{DP} | PW≤10μs, duty cycle≤1% | -4 | 12 | A |
| Allowable Power Dissipation | P _D | Mounted on a ceramic board (900mm ² ×0.8mm)1unit | 0.8 | 0.9 | 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 | |
| [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 | | | -1 | μA |
| Gate-to-Source Leakage Current | I _{GSS} | V _{GS} =±8V, V _{DS} =0 | | | ±10 | μA |
| 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 | 0.72 | 1.2 | | S |
| Static Drain-to-Source On-State Resistance | R _{DS(on)1} | I _D =-500mA, V _{GS} =-4V | | 380 | 500 | mΩ |
| | R _{DS(on)2} | I _D =-300mA, V _{GS} =-2.5V | | 540 | 760 | mΩ |
| Input Capacitance | C _{iss} | V _{DS} =-10V, f=1MHz | | 115 | | pF |
| Output Capacitance | C _{oss} | V _{DS} =-10V, f=1MHz | | 23 | | pF |
| Reverse Transfer Capacitance | C _{rss} | V _{DS} =-10V, f=1MHz | | 15 | | pF |

Marking : BV

Continued on next page.

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VEC2605

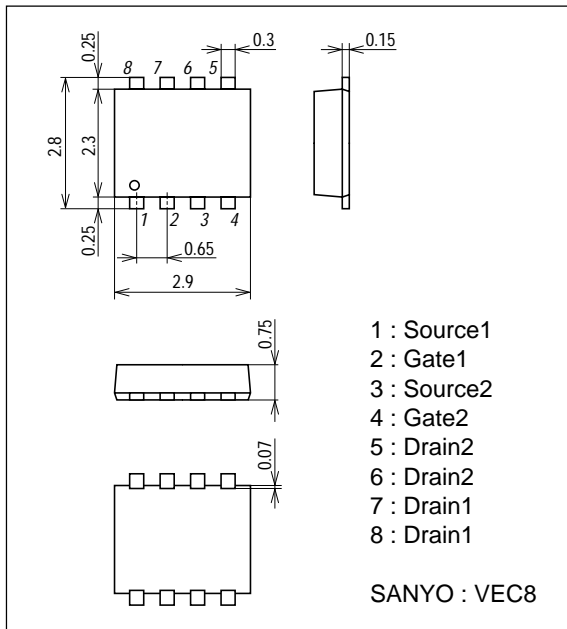
Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|------------------------------------|---------|-------|----------|-----------|
| | | | min | typ | max | |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 8 | | ns |
| Rise Time | t_r | See specified Test Circuit. | | 11 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit. | | 17 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | 13 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=-10V, V_{GS}=-4V, I_D=-1A$ | | 1.5 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=-10V, V_{GS}=-4V, I_D=-1A$ | | 0.4 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=-10V, V_{GS}=-4V, I_D=-1A$ | | 0.3 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=-1A, V_{GS}=0$ | | -0.89 | -1.2 | V |
| [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} | $V_{DS}=20V, V_{GS}=0$ | | | 1 | μA |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0$ | | | ± 10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$ | 0.5 | | 1.3 | V |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS}=10V, I_D=1.5A$ | 3.2 | 5.4 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=2A, V_{GS}=4V$ | | 44 | 58 | $m\Omega$ |
| | $R_{DS(on)2}$ | $I_D=1A, V_{GS}=2.5V$ | | 51 | 73 | $m\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=10V, f=1MHz$ | | 570 | | pF |
| Output Capacitance | C_{oss} | $V_{DS}=10V, f=1MHz$ | | 110 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS}=10V, f=1MHz$ | | 80 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 13.5 | | ns |
| Rise Time | t_r | See specified Test Circuit. | | 55 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit. | | 80 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | 70 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4V, I_D=3A$ | | 7.6 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=10V, V_{GS}=4V, I_D=3A$ | | 1.2 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=10V, V_{GS}=4V, I_D=3A$ | | 2.1 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=3A, V_{GS}=0$ | | 0.85 | 1.2 | V |

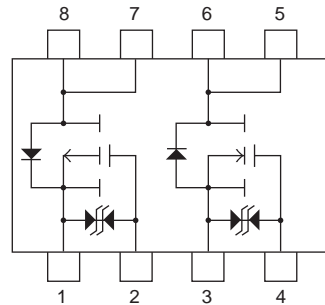
Package Dimensions

unit : mm

2227A



Electrical Connection



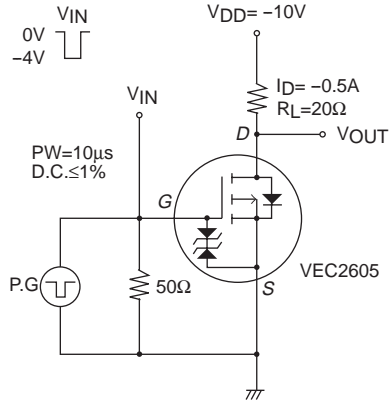
- 1 : Source1
- 2 : Gate1
- 3 : Source2
- 4 : Gate2
- 5 : Drain2
- 6 : Drain2
- 7 : Drain1
- 8 : Drain1

Top view

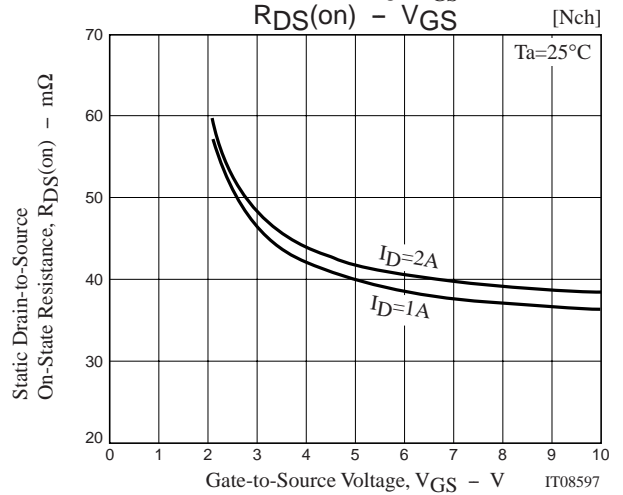
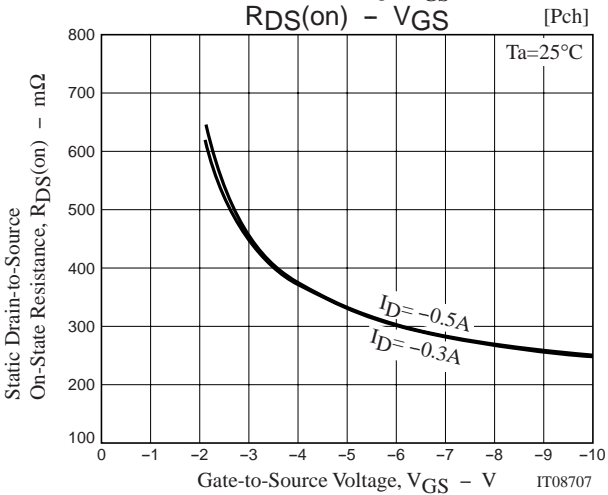
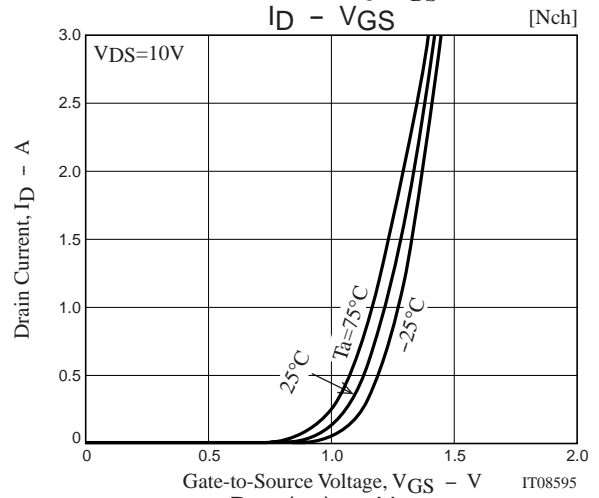
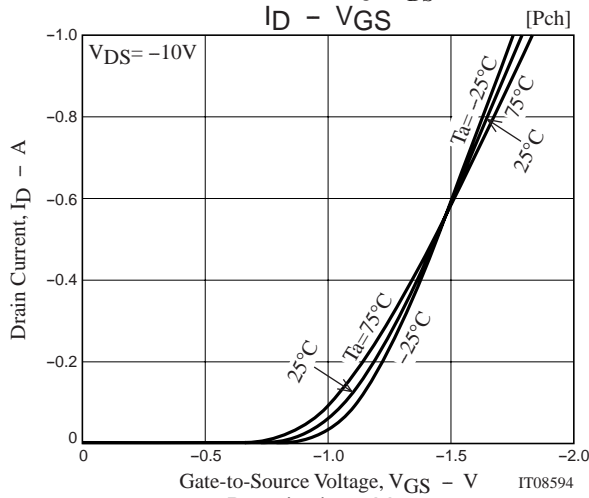
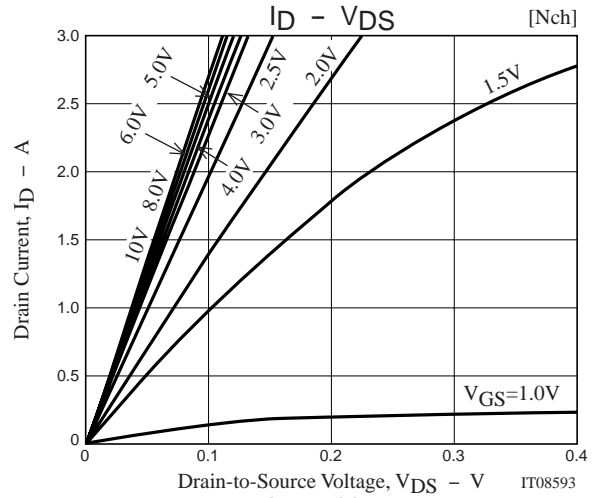
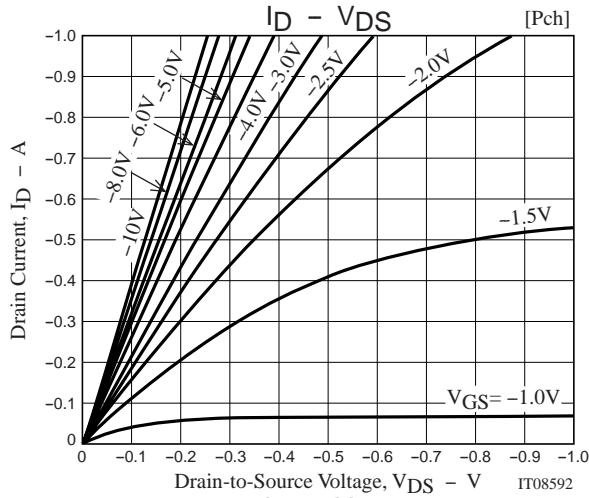
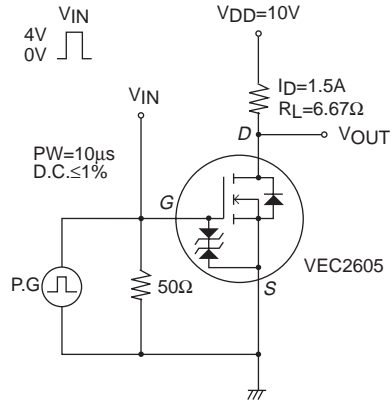
VEC2605

Switching Time Test Circuit

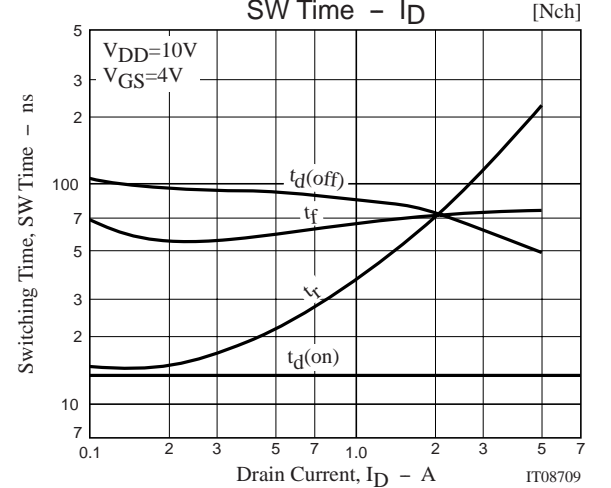
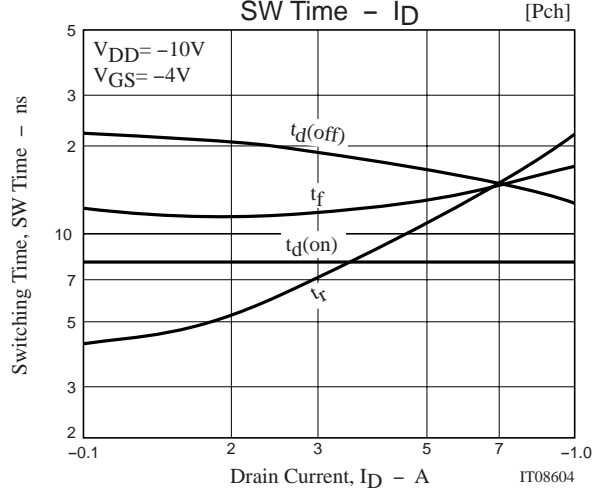
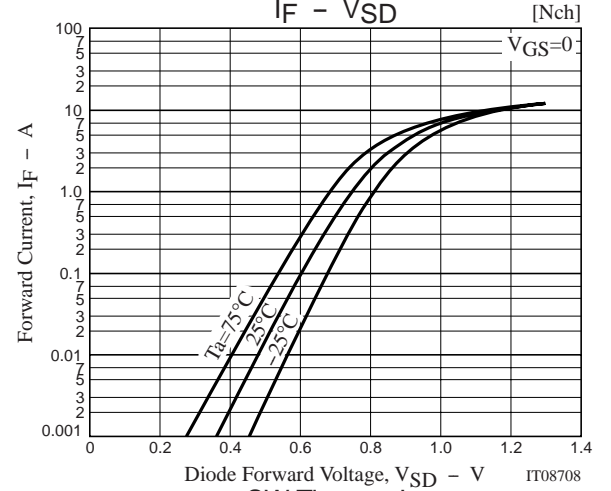
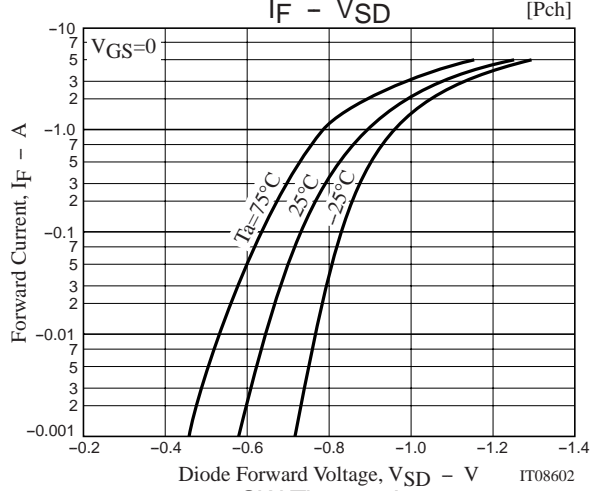
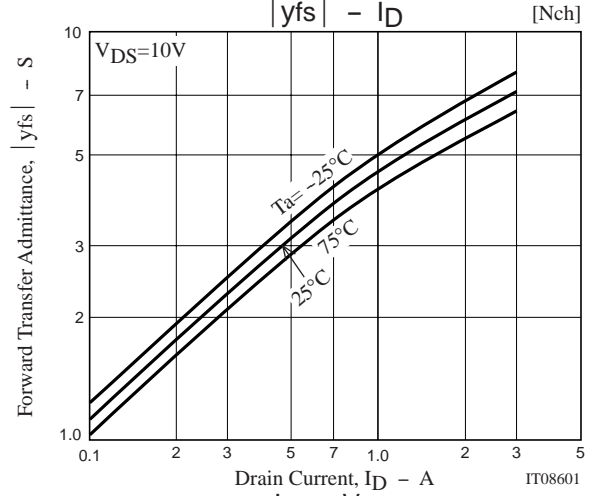
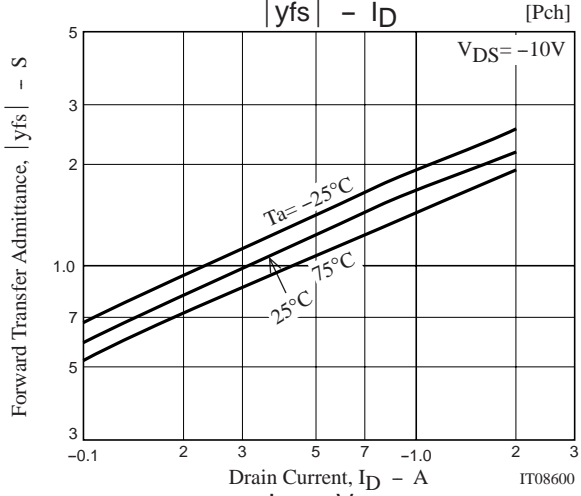
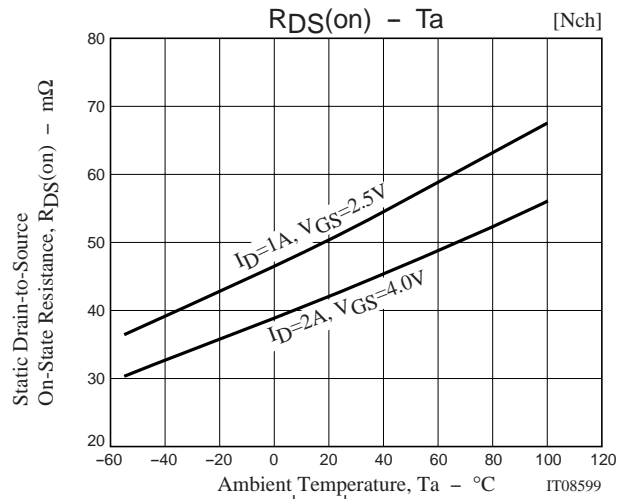
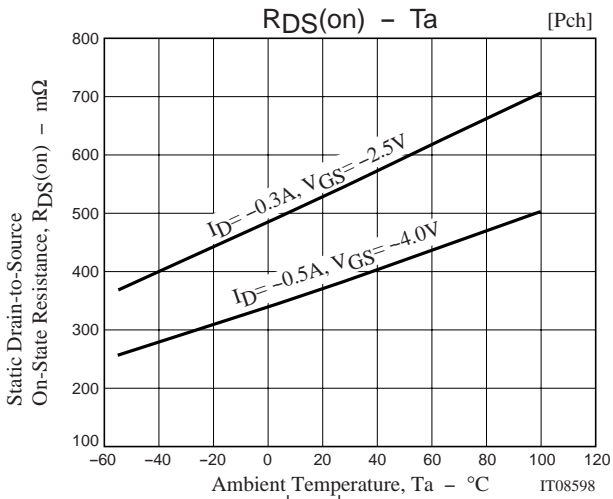
[P-channel]



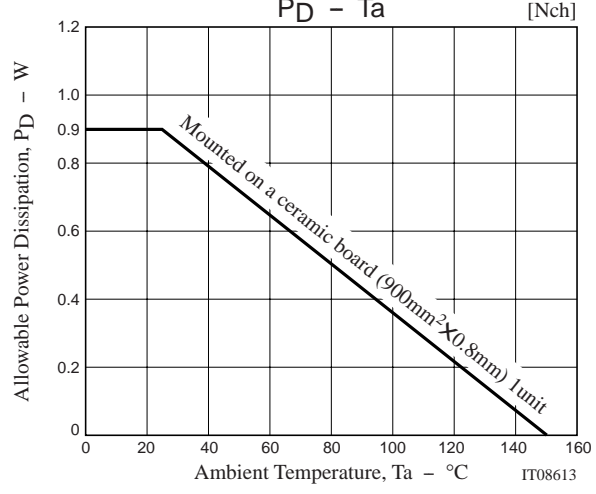
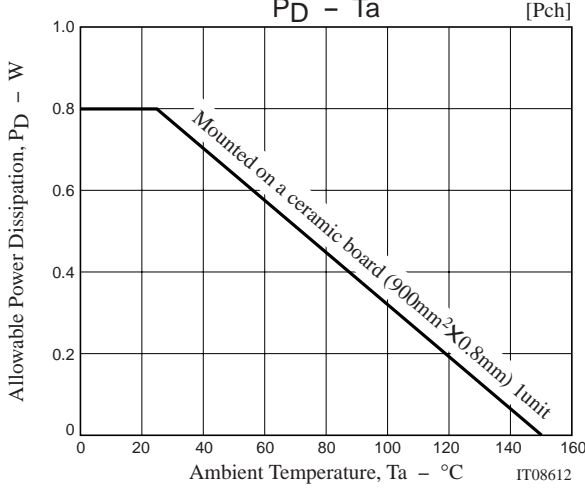
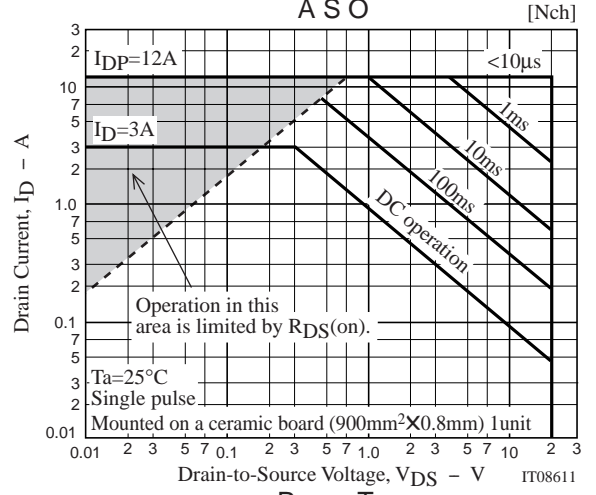
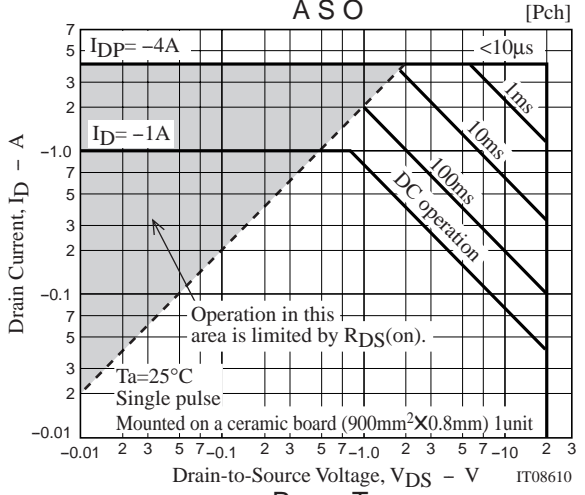
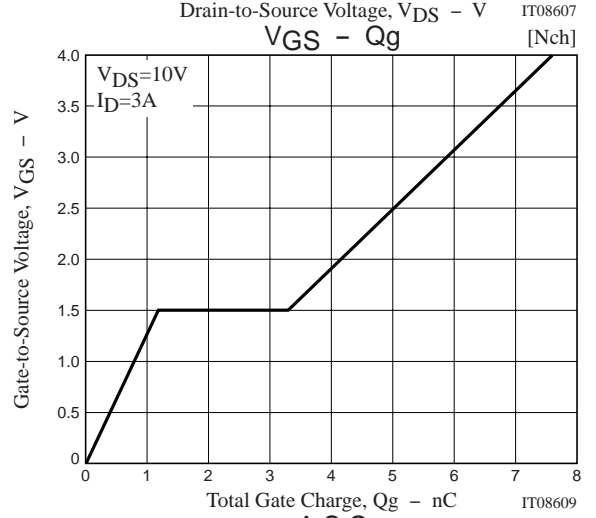
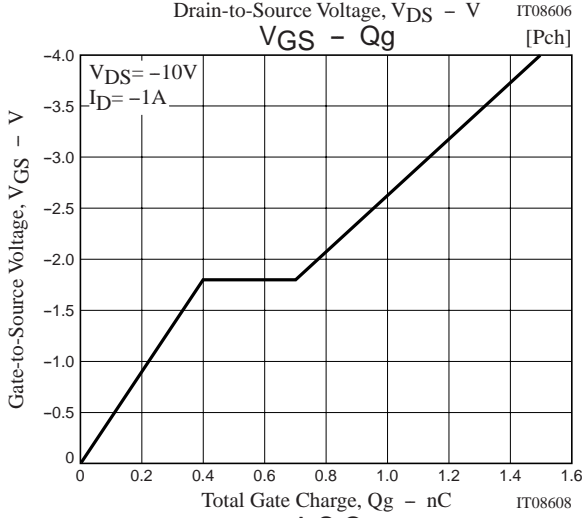
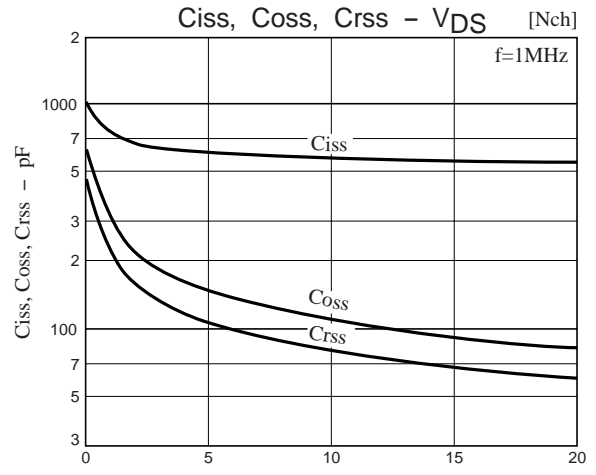
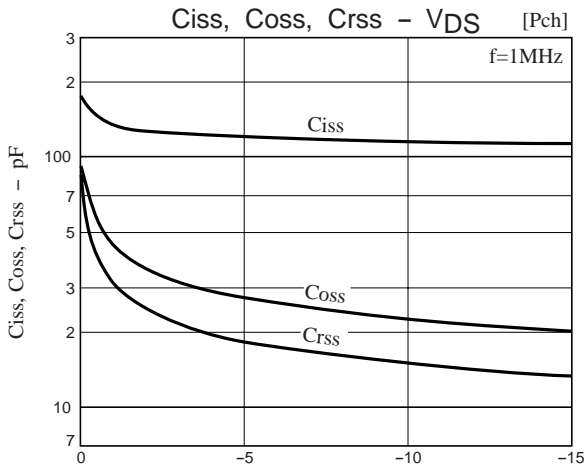
[N-channel]



VEC2605



VEC2605



Note on usage : Since the VEC2605 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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