



VEC2609 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

Features

- The best suited for inverter applications.
- The VEC2609 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, thereby enabling high-density mounting.
- Low voltage drive.
- Mounting height 0.75mm.

Specifications

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | N-channel | P-channel | Unit |
|-----------------------------|------------------|---|-------------|-----------|------|
| Drain-to-Source Voltage | V _{DSS} | | 30 | -12 | V |
| Gate-to-Source Voltage | V _{GSS} | | ±20 | ±8 | V |
| Drain Current (DC) | I _D | | 1.4 | -2 | A |
| Drain Current (Pulse) | I _{DP} | PW≤10μs, duty cycle≤1% | 5.6 | -8 | A |
| Allowable Power Dissipation | P _D | Mounted on a ceramic board (900mm ² ×0.8mm)1unit | 0.8 | | W |
| Total Dissipation | P _T | Mounted on a ceramic board (900mm ² ×0.8mm) | 1.0 | | 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 | |
| [N-channel] | | | | | | |
| Drain-to-Source Breakdown Voltage | V(BR)DSS | I _D =1mA, V _{GS} =0V | 30 | | | V |
| Zero-Gate Voltage Drain Current | I _{DSS} | V _{DS} =30V, V _{GS} =0V | | | 1 | μA |
| Gate-to-Source Leakage Current | I _{GSS} | V _{GS} =±16V, V _{DS} =0V | | | ±10 | μA |
| Cutoff Voltage | V _{GS(off)} | V _{DS} =10V, I _D =1mA | 1.2 | | 2.6 | V |
| Forward Transfer Admittance | y _{fs} | V _{DS} =10V, I _D =700mA | 0.66 | 1.1 | | S |
| Static Drain-to-Source On-State Resistance | R _{DS(on)1} | I _D =700mA, V _{GS} =10V | | 230 | 300 | mΩ |
| | R _{DS(on)2} | I _D =400mA, V _{GS} =4V | | 400 | 560 | mΩ |
| Input Capacitance | C _{iss} | V _{DS} =10V, f=1MHz | | 65 | | pF |
| Output Capacitance | C _{oss} | V _{DS} =10V, f=1MHz | | 14 | | pF |
| Reverse Transfer Capacitance | C _{rss} | V _{DS} =10V, f=1MHz | | 8 | | pF |

Marking : CF

Continued on next page.

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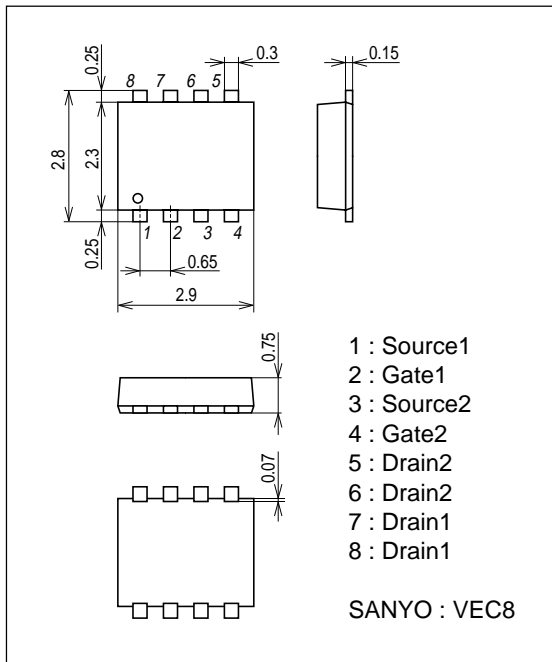
Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|---------------------------------------|---------|-------|----------|-----------|
| | | | min | typ | max | |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 5 | | ns |
| Rise Time | t_r | See specified Test Circuit. | | 4 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit. | | 11 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | 3 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$ | | 2.5 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$ | | 0.6 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=10V, V_{GS}=10V, I_D=1.4A$ | | 0.3 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=1.4A, V_{GS}=0V$ | | 0.87 | 1.2 | V |
| [P-channel] | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=-1mA, V_{GS}=0V$ | -12 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-12V, V_{GS}=0V$ | | | -10 | μA |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 6.4V, V_{DS}=0V$ | | | ± 10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}=-6V, I_D=-1mA$ | -0.3 | | -1.0 | V |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS}=-6V, I_D=-1.5A$ | 2.7 | 4.5 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-1.5A, V_{GS}=-4.5V$ | | 87 | 115 | $m\Omega$ |
| | $R_{DS(on)2}$ | $I_D=-0.8A, V_{GS}=-2.5V$ | | 122 | 172 | $m\Omega$ |
| | $R_{DS(on)3}$ | $I_D=-0.4A, V_{GS}=-1.8V$ | | 162 | 275 | $m\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=-6V, f=1MHz$ | | 450 | | pF |
| Output Capacitance | C_{oss} | $V_{DS}=-6V, f=1MHz$ | | 100 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS}=-6V, f=1MHz$ | | 85 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 15 | | ns |
| Rise Time | t_r | See specified Test Circuit. | | 75 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit. | | 64 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | 50 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$ | | 6.5 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$ | | 0.8 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$ | | 2.0 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=-2.5A, V_{GS}=0V$ | | -0.85 | -1.5 | V |

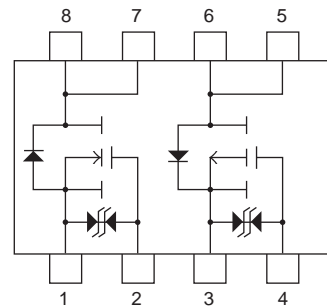
Package Dimensions

unit : mm

7012-002



Electrical Connection

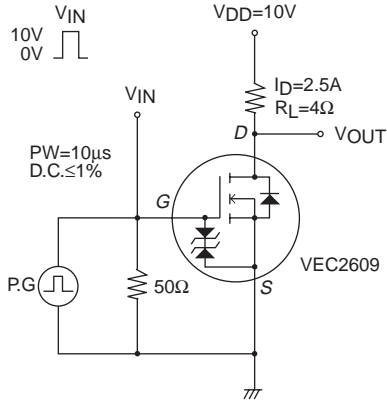


- 1 : Source1
 - 2 : Gate1
 - 3 : Source2
 - 4 : Gate2
 - 5 : Drain2
 - 6 : Drain2
 - 7 : Drain1
 - 8 : Drain1
- Top view

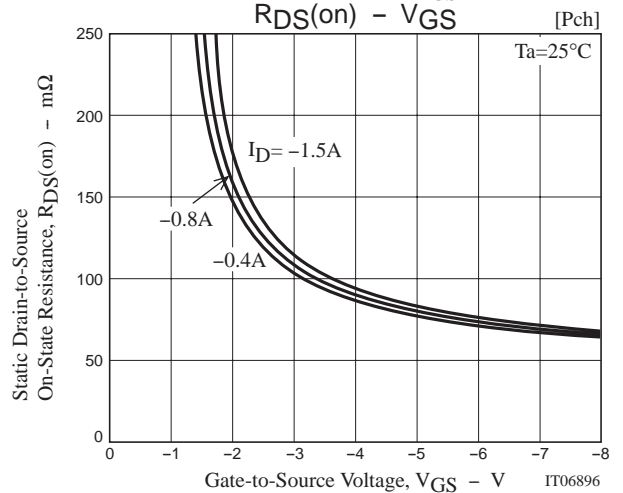
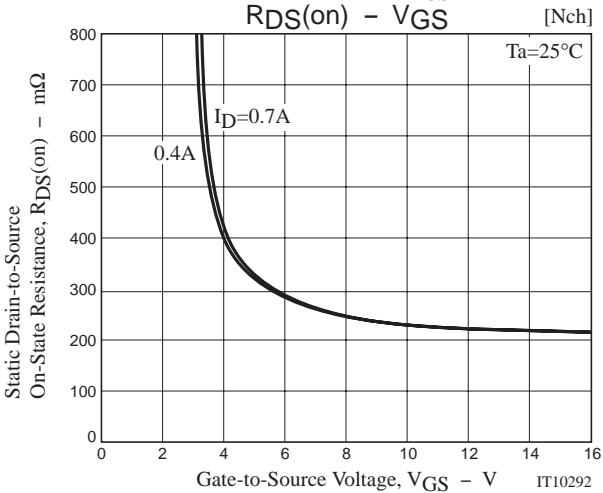
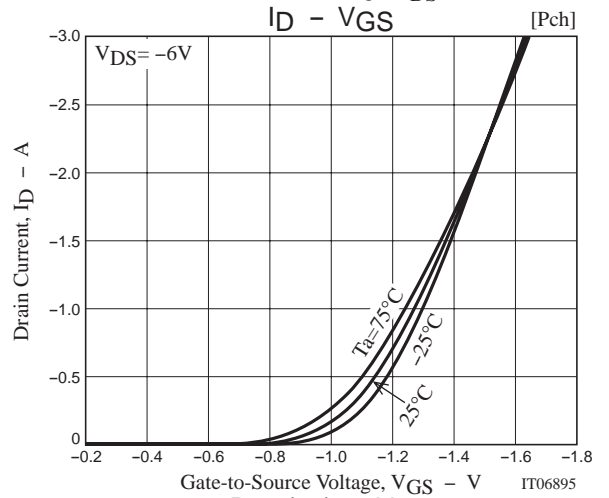
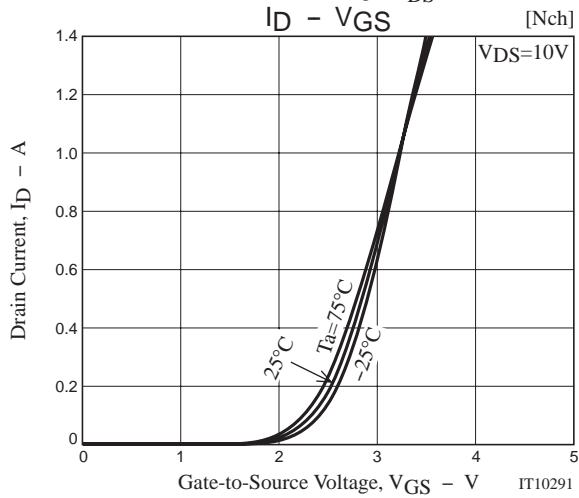
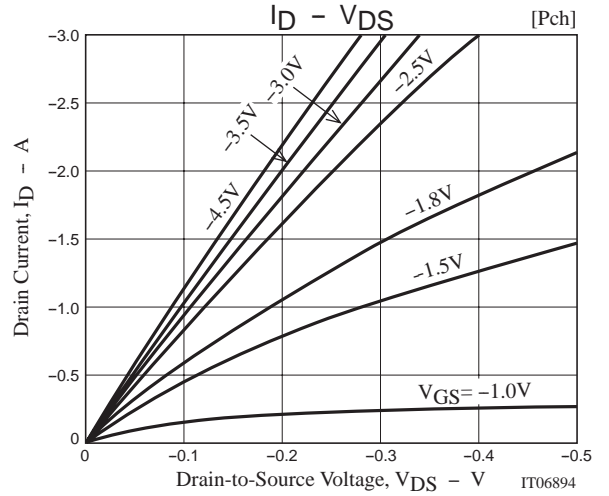
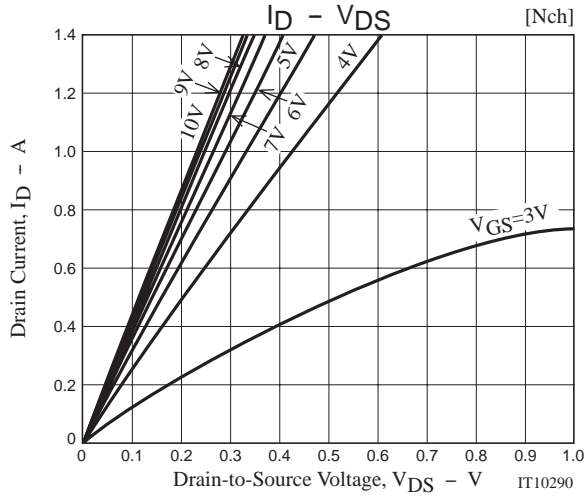
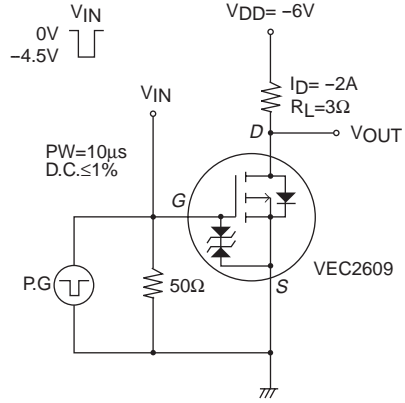
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Switching Time Test Circuit

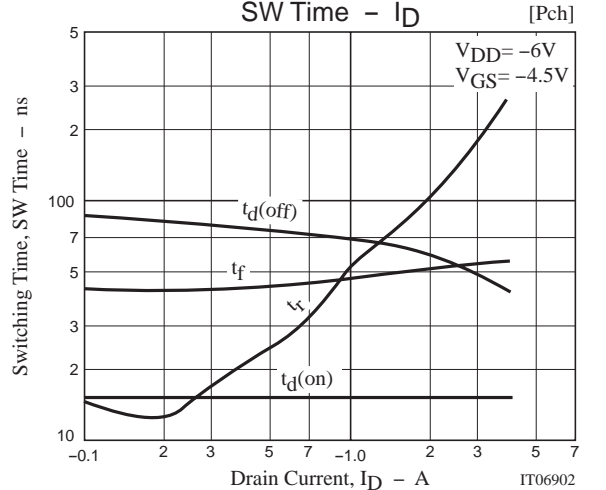
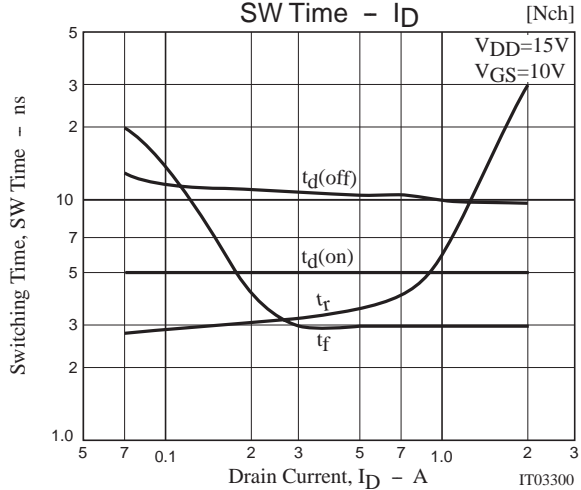
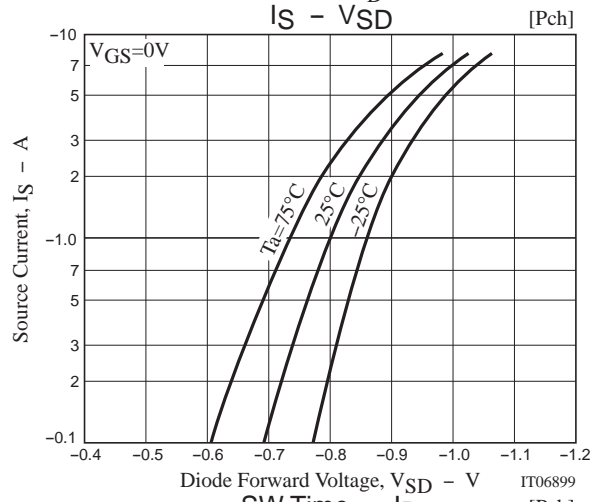
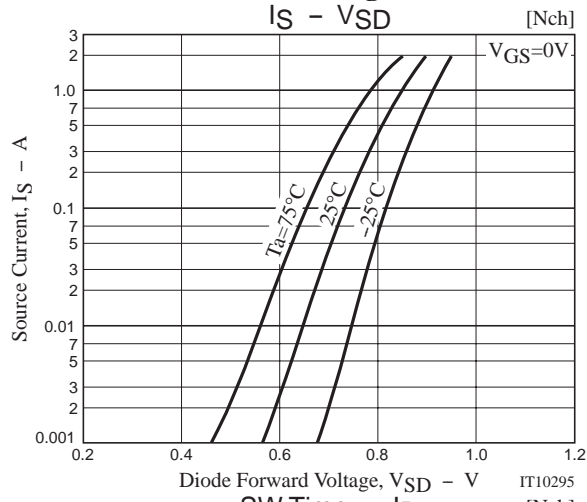
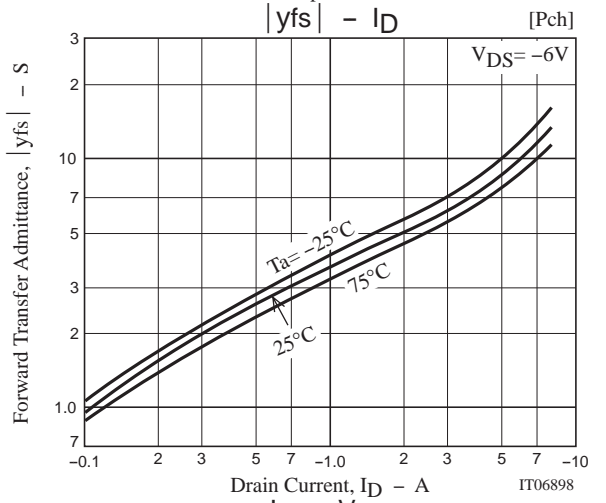
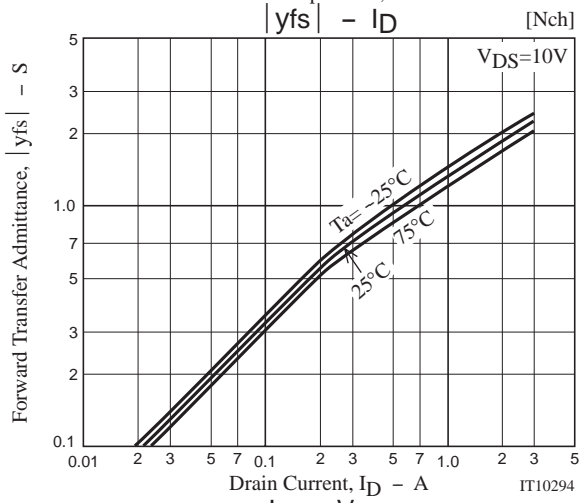
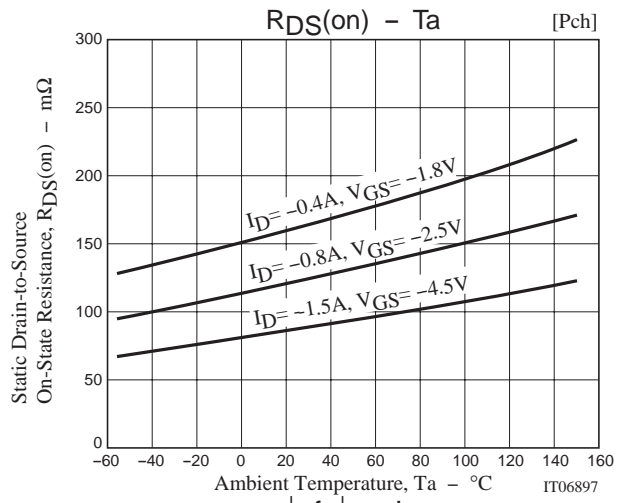
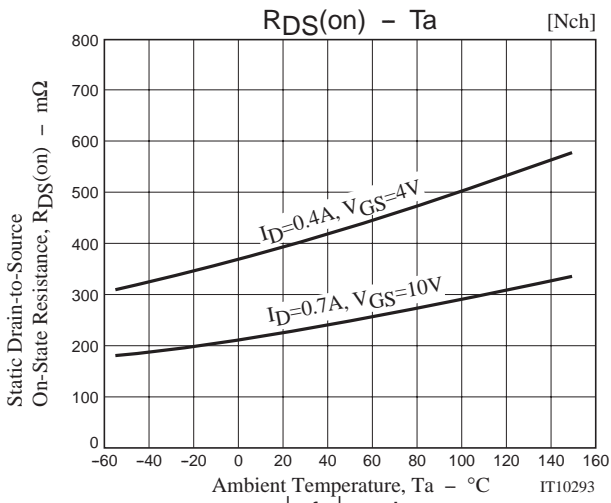
[N-channel]



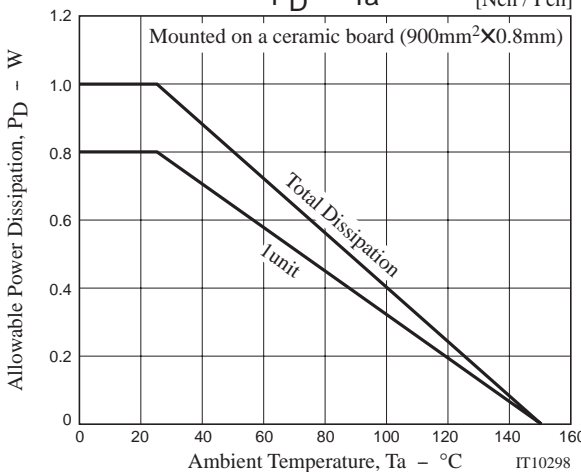
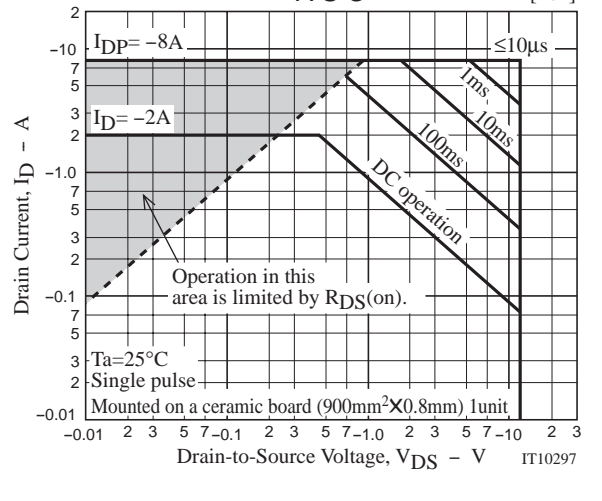
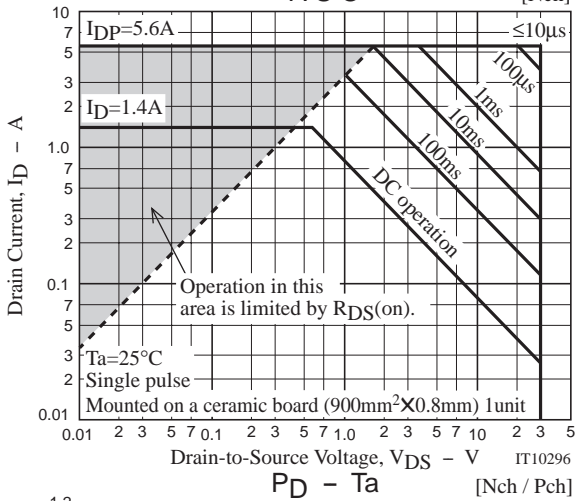
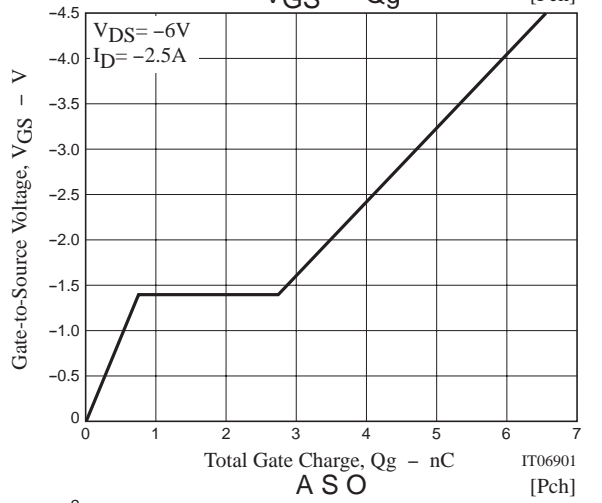
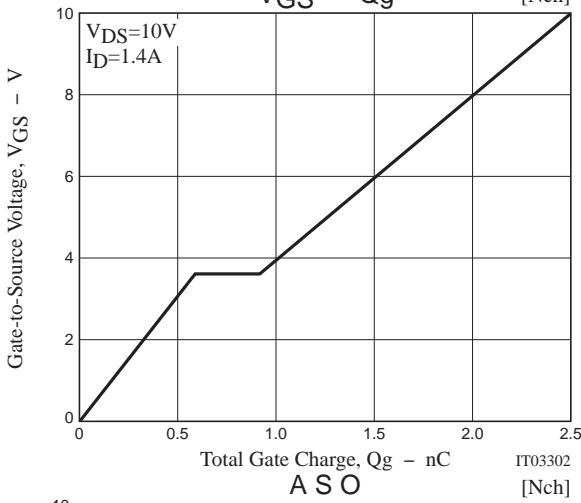
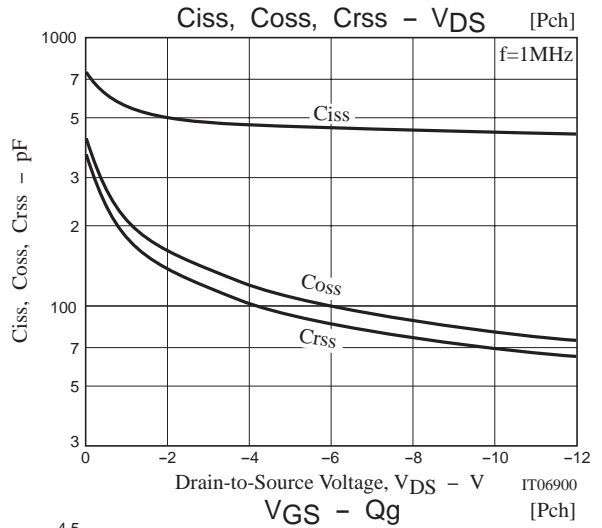
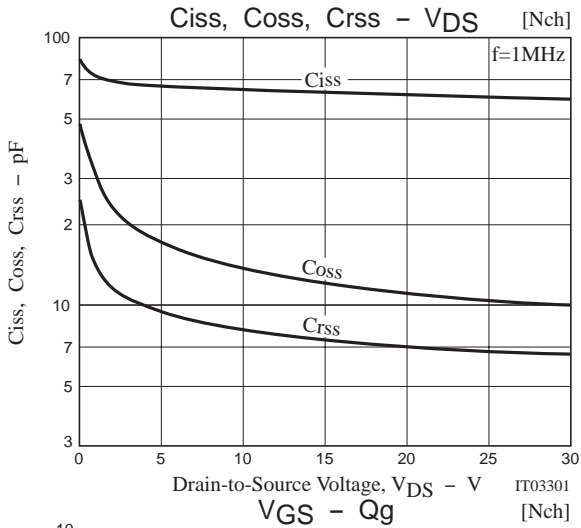
[P-channel]



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Note on usage : Since the VEC2609 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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