**5Ordering number : ENN7529**

N-Channel Silicon MOSFET

# CPH3425

## Ultrahigh-Speed Switching Applications

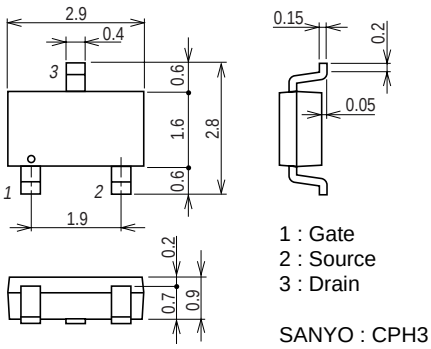
## Features

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

## Package Dimensions

unit : mm
2152A

[CPH3425]




## Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | 100 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±20 | V |
| Drain Current (DC) | $I_D$ | | 0.5 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 2 | A |
| Allowable Power Dissipation | $P_D$ | Mounted on a ceramic board (900mm²×0.8mm) | 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 | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=1mA, $V_{GS}$=0 | 100 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0 | | | 1 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±16V, $V_{DS}$=0 | | | ±10 | μA |
| Cutoff Voltage | $V_{GS}(off)$ | $V_{DS}$=10V, $I_D$=1mA | 1.2 | | 2.6 | V |
| Forward Transfer Admittance | $\|yfs\|$ | $V_{DS}$=10V, $I_D$=250mA | 0.4 | 0.8 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}(on)1$ | $I_D$=250mA, $V_{GS}$=10V | | 1.4 | 1.85 | Ω |
| | $R_{DS}(on)2$ | $I_D$=250mA, $V_{GS}$=4V | | 1.8 | 2.5 | Ω |

Marking : ZA

Continued on next page.



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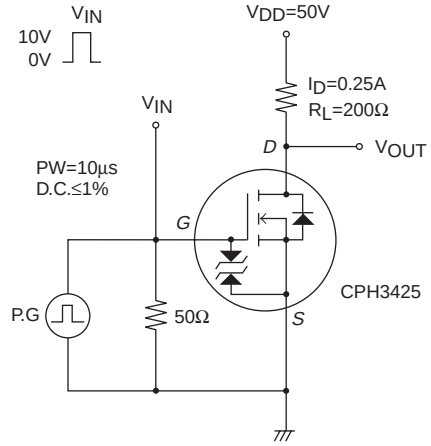
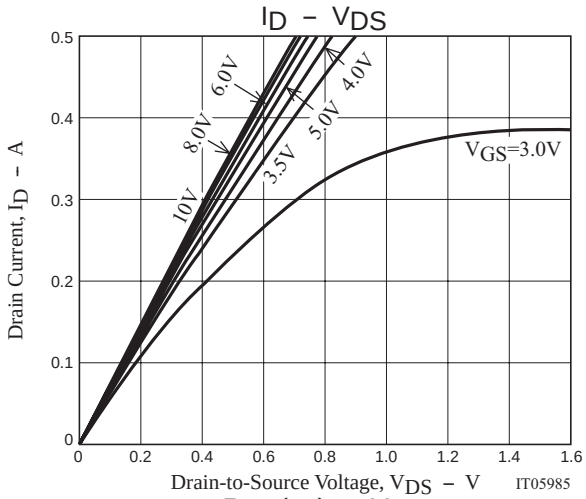
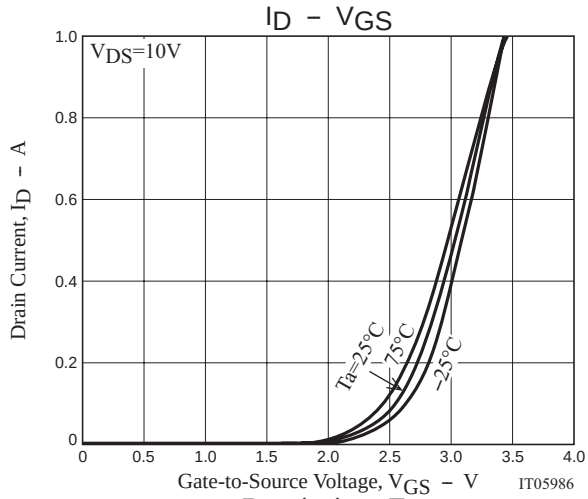
Continued from preceding page.

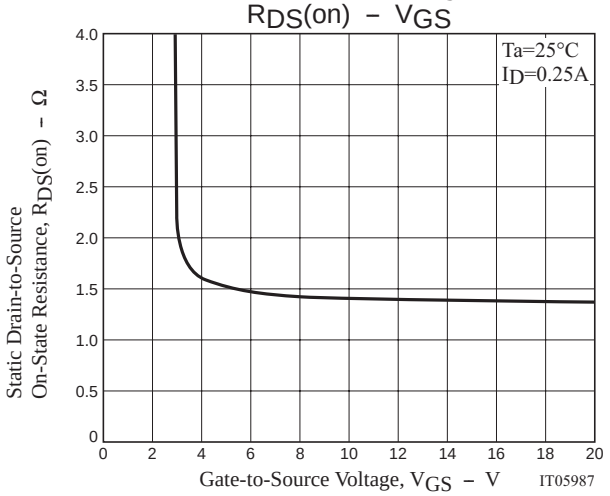
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Input Capacitance | Ciss | $V_{DS}$=20V, f=1MHz | | 80 | | pF |
| Output Capacitance | Coss | $V_{DS}$=20V, f=1MHz | | 6.5 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=20V, f=1MHz | | 4 | | pF |
| Turn-ON Delay Time | $t_{d}$(on) | See specified Test Circuit. | | 6 | | ns |
| Rise Time | $t_{r}$ | See specified Test Circuit. | | 3 | | ns |
| Turn-OFF Delay Time | $t_{d}$(off) | See specified Test Circuit. | | 14 | | ns |
| Fall Time | $t_{f}$ | See specified Test Circuit. | | 8 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=50V, $V_{GS}$=10V, $I_{D}$=0.5A | | 3.2 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=50V, $V_{GS}$=10V, $I_{D}$=0.5A | | 0.6 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=50V, $V_{GS}$=10V, $I_{D}$=0.5A | | 0.6 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_{S}$=0.5A, $V_{GS}$=0 | | 0.87 | 1.2 | V |

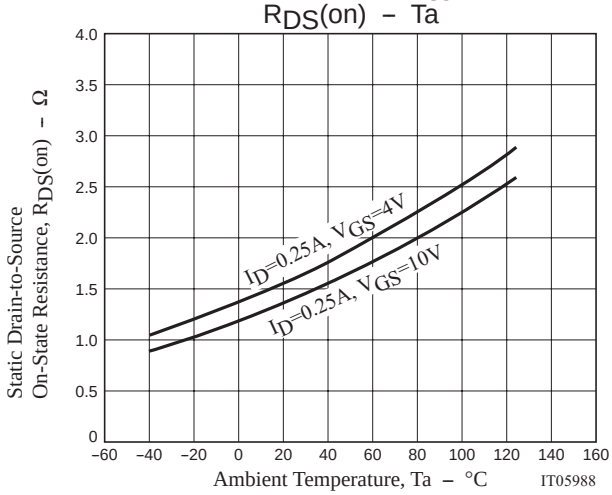
## Switching Time Test Circuit

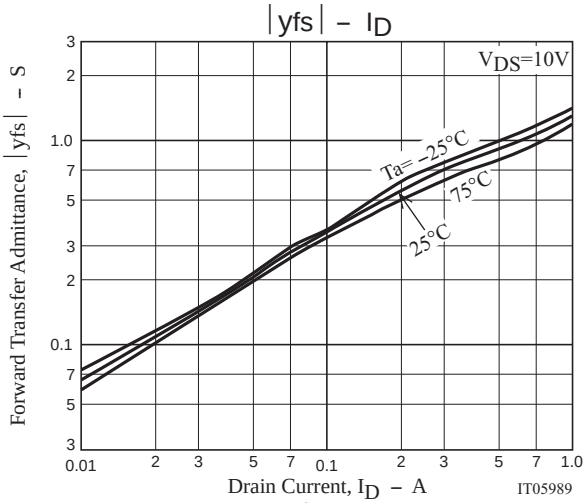


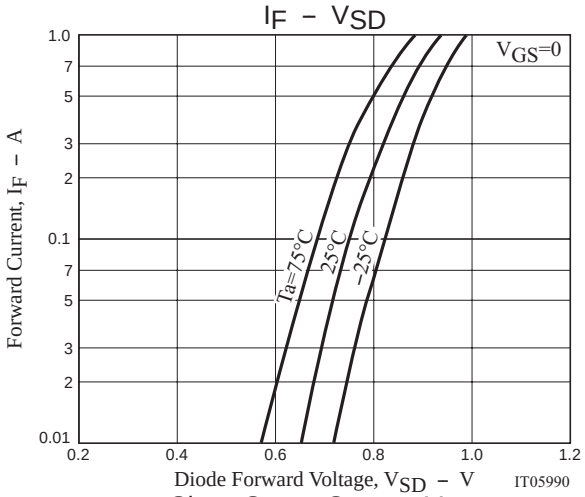



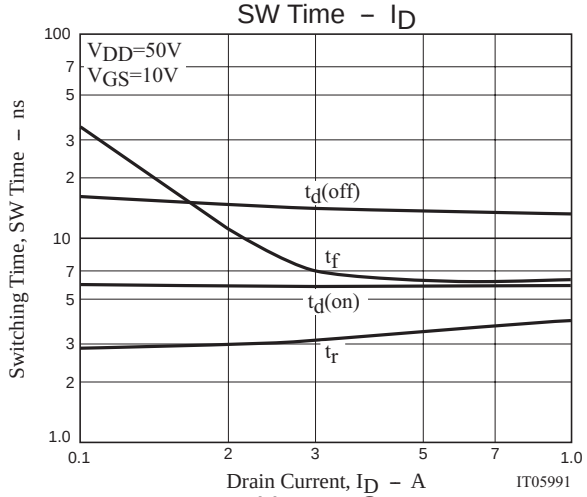



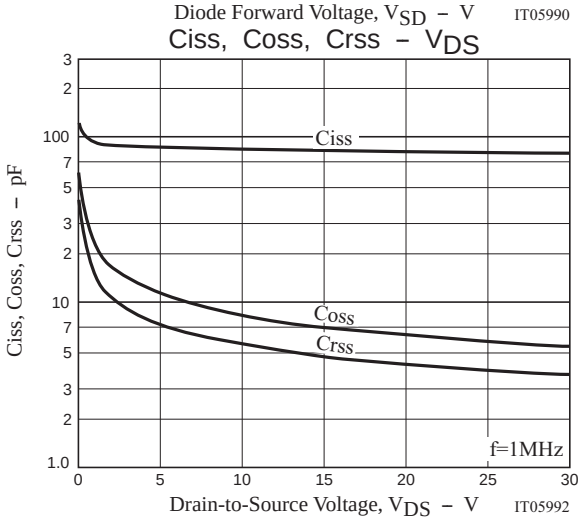



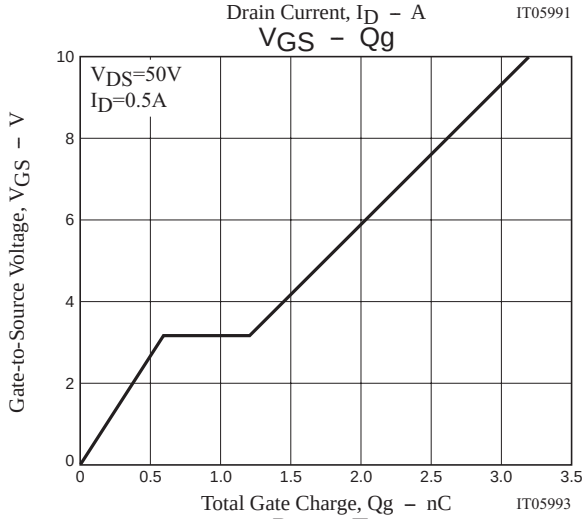



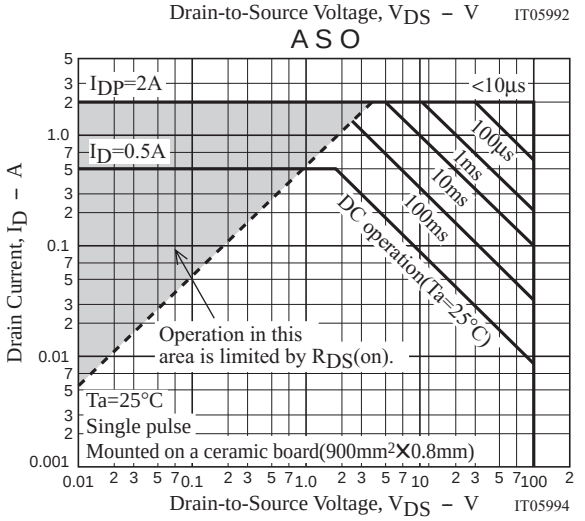

|yfs| – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT05989

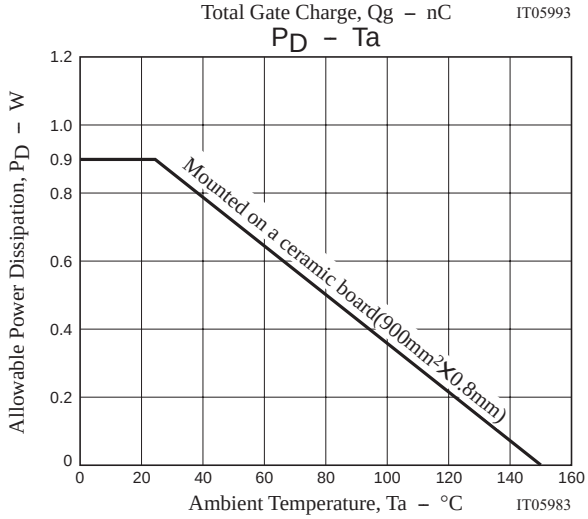

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT05990


SW Time – ID
VDD=50V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT05991


Ciss, Coss, Crss – VDS
Ciss
Coss
Crss
f=1MHz
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT05992


VGS – Qg
VDS=50V
ID=0.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT05993


ASO
IDP=2A
ID=0.5A
<10μs
100μs
1ms
10ms
100ms
DC operation(Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board(900mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT05994


PD – Ta
Mounted on a ceramic board(900mm²×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT05983

Note on usage : Since the CPH3425 is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.