# Switching (30V, 3.5A)

## RDS035L03

### ●Features

1) Low Qg.
2) Low on-resistance.
3) Exellent resistance to damage from static electricity.

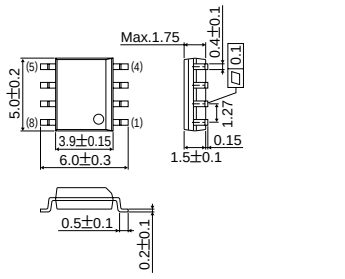
### ●Application

Switching

### ●Structure

Silicon N-channel
MOS FET

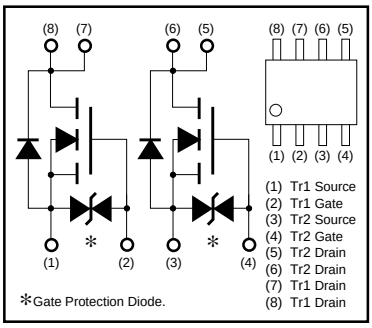
### ●External dimensions (Units : mm)




ROHM : SOP8

Each lead has same dimensions

### ●Equivalent circuit




✻ A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use.Use a protection circuit when the fixed voltage are exceeded.

### ●Absolute maximum ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | V |
| Drain Current | Continuous | $I_D$ | 3.5 | A |
| | Pulsed | $I_{DP}$* | 14 | A |
| Reverse Drain Current | Continuous | $I_{DR}$ | 3.5 | A |
| | Pulsed | $I_{DRP}$* | 14 | A |
| Source Current (Body Diode) | Continuous | $I_S$ | 1.3 | A |
| | Pulsed | $I_{SP}$* | 5.2 | A |
| Total Power Dissipation(Tc=25˚C) | | $P_D$ | 2 | W |
| Channel Temperature | | Tch | 150 | ˚C |
| Storage Temperature | | Tstg | −55~+150 | ˚C |

✻ Pw≤10ms, Duty cycle≤1%

●**Thermal resistance** (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to Ambient | Rth(ch-A) | 62.5 | ˚C / W |

●**Electrical characteristics** (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Gate-Source Leakage | $I_{GSS}$ | – | – | ±10 | μA | $V_{GS}$=±20V, $V_{DS}$=0V |
| Drain-Source Breakdown Voltage | $V_{(BR)\ DSS}$ | 30 | – | – | V | $I_D$=1mA, $V_{GS}$=0V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | – | – | 10 | μA | $V_{DS}$=30V, $V_{GS}$=0V |
| Gate Threshold Voltage | $V_{GS\ (th)}$ | 1.0 | – | 2.5 | V | $V_{DS}$=10V, $I_D$=1mA |
| Static Drain-Source On-State Resistance | $R_{DS\ (on)}$ | – | 62 | 80 | mΩ | $I_D$=3.5A, $V_{GS}$=10V |
| | | – | 105 | 134 | | $I_D$=3.5A, $V_{GS}$=4.5V |
| | | – | 132 | 172 | | $I_D$=3.5A, $V_{GS}$=4V |
| Forward Transfer Admittance | $\|Y_{fs}\|$* | 2.5 | – | – | S | $I_D$=3.5A, $V_{DS}$=10V |
| Input Capacitance | $C_{iss}$ | – | 180 | – | pF | $V_{DS}$=10V |
| Output Capacitance | $C_{oss}$ | – | 95 | – | pF | $V_{GS}$=0V |
| Reverse Transfer Capacitance | $C_{rss}$ | – | 38 | – | pF | f=1MHz |
| Turn-On Delay Time | $t_{d\ (on)}$* | – | 6 | – | ns | $I_D$=2A, $V_{DD}$≒15V |
| Rise Time | $t_r$* | – | 12 | – | ns | $V_{GS}$=10V |
| Turn-Off Delay Time | $t_{d\ (off)}$* | – | 20 | – | ns | $R_L$=7.5Ω |
| Fall Time | $t_f$* | – | 6 | – | ns | $R_{GS}$=10Ω |
| Total Gate Charge | $Q_g$* | – | 6.5 | – | nC | $V_{DD}$=15V |
| Gate-Source Charge | $Q_{gs}$* | – | 1.2 | – | nC | $V_{GS}$=10V |
| Gate-Drain Charge | $Q_{gd}$* | – | 1.8 | – | nC | $I_D$=3.5A |

* Pulsed

●**Body diode characteristics (Source-Drain Characteristics)** (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_{SD}$* | – | – | 1.5 | V | $I_S$=3.5A, $V_{GS}$=0V |
| Reverse Recovery Time | $t_{rr}$* | – | 26 | – | ns | $I_{DR}$=3.5A, $V_{GS}$=0V |
| Reverse Recovery Charge | $Q_{rr}$* | – | 24 | – | nC | di/dt=50A/μs |

* Pulsed

## ●Electrical characteristic curves

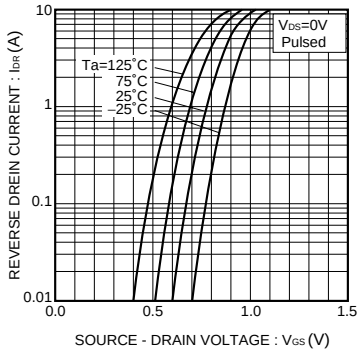



Fig.1 Reverse Drein Current vs. Source - Drain Voltage

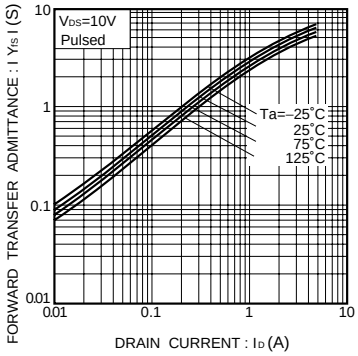



Fig.2 Forward Transfer Admittance vs. Drain Current

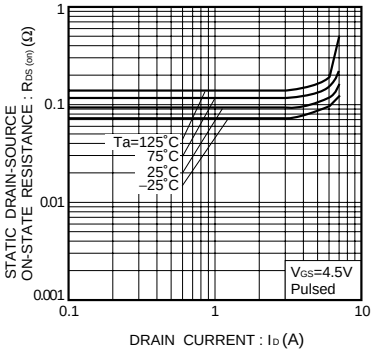



Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (Ⅰ)

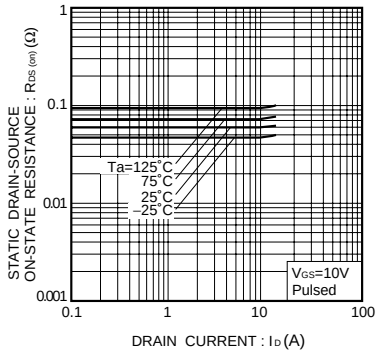



Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (Ⅱ)

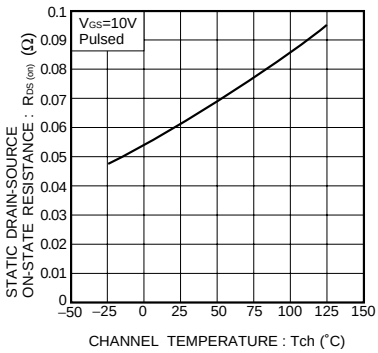



Fig.5 Static Drain-Source On-State Resistance vs. Channel Temperature

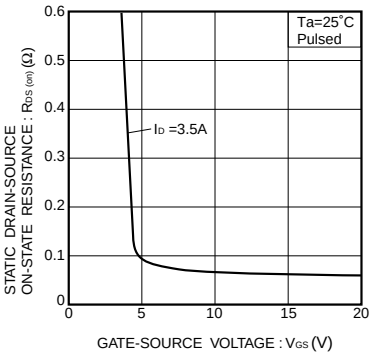



Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

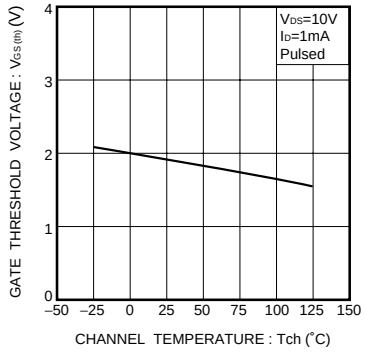



Fig.7 Gate Threshold Voltage vs. Channel Temperature

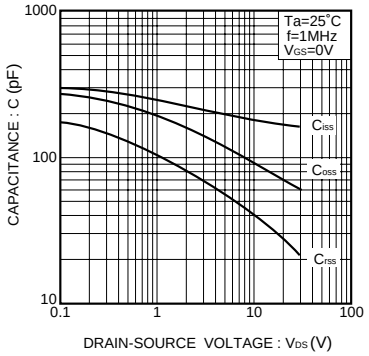



Fig.8 Typical Capacitance vs. Drain-Source Voltage

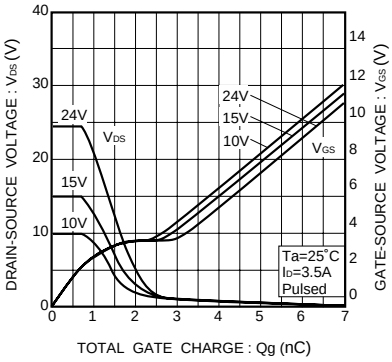



Fig.9 Dynamic Input Characteristics

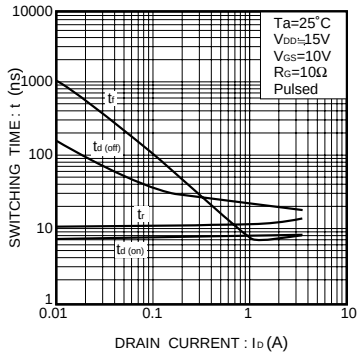



Fig.10 Switching Characteristics

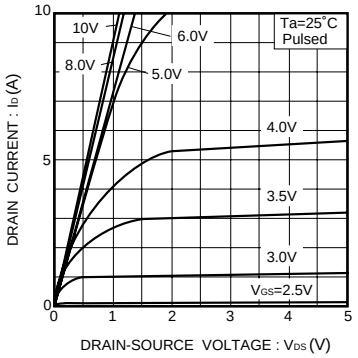



Fig.11 Typical Output Characteristics

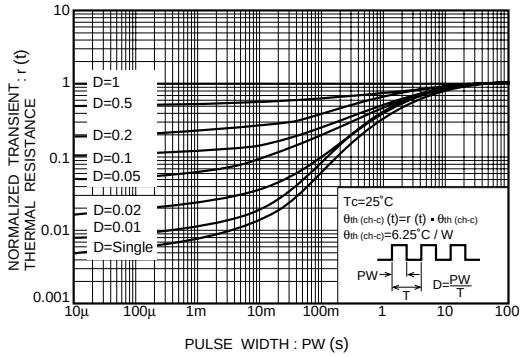



Fig.12 Normalized Transient Thermal Resistance vs. Pulse Width