# 1.2V Drive Pch MOSFET

## RZE002P02

### ●Structure
Silicon P-channel MOSFET

### ●Features
1) High speed switching.
2) Small package (EMT3).
3) 1.2V drive.

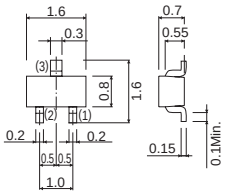
### ●Applications
Switching

### ●Package specifications

| | | |
|---|---|---|
| Type | Package | Taping |
| | Code | TL |
| | Basic ordering unit (pieces) | 3000 |
| RZE002P02 | | ○ |

### ●Dimensions (Unit : mm)

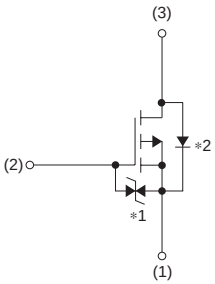
EMT3




(1)Source
(2)Gate
(3)Drain

Abbreviated symbol : YK

### ●Inner circuit




∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

(1) Source
(2) Gate
(3) Drain

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

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | −20 | V |
| Gate-source voltage | | $V_{GSS}$ | ±10 | V |
| Drain current | Continuous | $I_D$ | ±200 | mA |
| | Pulsed | $I_{DP}$ ∗1 | ±800 | mA |
| Souce current (Body diode) | Continuous | $I_S$ | −100 | mA |
| | Pulsed | $I_{SP}$ ∗1 | −800 | mA |
| Total power dissipation | | $P_D$ ∗2 | 150 | mW |
| Channel temperature | | Tch | 150 | °C |
| Range of storage temperature | | Tstg | −55 to +150 | °C |

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Each terminal mounted on a recommended land

### ●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to ambient | Rth(ch-a)∗ | 833 | °C/W |

∗ Each terminal mounted on a recommended land

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | – | – | ±10 | μA | $V_{GS}$= ±10V, $V_{DS}$=0V |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | –20 | – | – | V | $I_D$= –1mA, $V_{GS}$=0V |
| Zero gate voltage drain current | $I_{DSS}$ | – | – | –1 | μA | $V_{DS}$= –20V, $V_{GS}$=0V |
| Gate threshold voltage | $V_{GS\ (th)}$ | –0.3 | – | –1.0 | V | $V_{DS}$= –10V, $I_D$= –100μA |
| Static drain-source on-state resistance | $R_{DS\ (on)}$ * | – | 0.8 | 1.2 | Ω | $I_D$= –200mA, $V_{GS}$= –4.5V |
| | | – | 1.0 | 1.5 | Ω | $I_D$= –100mA, $V_{GS}$= –2.5V |
| | | – | 1.3 | 2.2 | Ω | $I_D$= –100mA, $V_{GS}$= –1.8V |
| | | – | 1.6 | 3.5 | Ω | $I_D$= –40mA, $V_{GS}$= –1.5V |
| | | – | 2.4 | 9.6 | Ω | $I_D$= –10mA, $V_{GS}$= –1.2V |
| Forward transfer admittance | $\|Y_{fs}\|$ * | 0.2 | – | – | S | $V_{DS}$= –10V, $I_D$= –200mA |
| Input capacitance | $C_{iss}$ | – | 115 | – | pF | $V_{DS}$= –10V |
| Output capacitance | $C_{oss}$ | – | 10 | – | pF | $V_{GS}$= 0V |
| Reverse transfer capacitance | $C_{rss}$ | – | 6 | – | pF | f=1MHz |
| Turn-on delay time | $t_{d\ (on)}$ * | – | 6 | – | ns | $V_{DD}$≒ –10V<br>$I_D$= –100mA<br>$V_{GS}$= –4.5V<br>$R_L$≒100Ω<br>$R_G$= 10Ω |
| Rise time | $t_r$ * | – | 4 | – | ns | |
| Turn-off delay time | $t_{d\ (off)}$ * | – | 17 | – | ns | |
| Fall time | $t_f$ * | – | 17 | – | ns | |
| Total gate charge | $Q_g$ * | – | 1.4 | – | nC | $V_{DD}$≒ –10V $R_L$≒50Ω |
| Gate-source charge | $Q_{gs}$ * | – | 0.3 | – | nC | $I_D$= –200mA $R_G$= 10Ω |
| Gate-drain charge | $Q_{gd}$ * | – | 0.3 | – | nC | $V_{GS}$= –4.5V |

*Pulsed

## ●Body diode characteristics (Source-drain)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward voltage | $V_{SD}$ * | – | – | –1.2 | V | $I_S$= –200mA, $V_{GS}$=0V |

*Pulsed

## ●Electrical characteristics curves

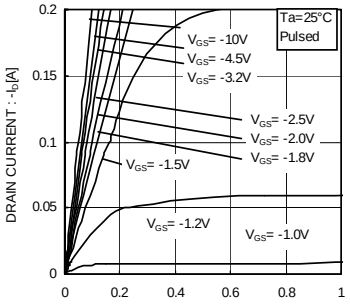



Fig.1 Typical Output Characteristics(Ⅰ)

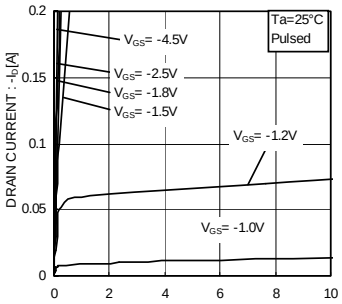



Fig.2 Typical Output Characteristics(Ⅱ)

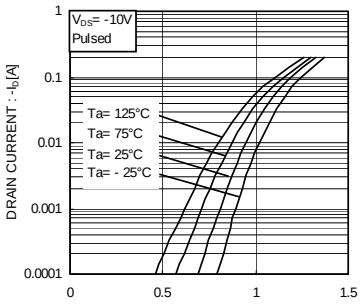



Fig.3 Typical Transfer Characteristics

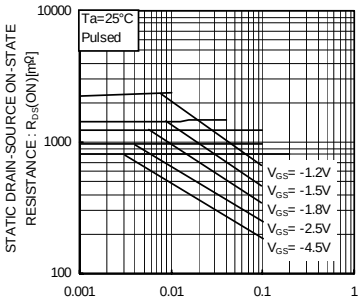



Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

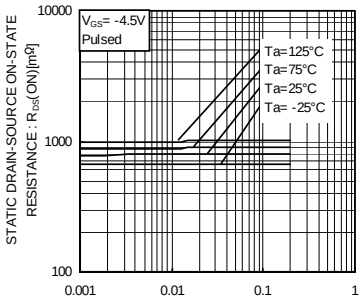



Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

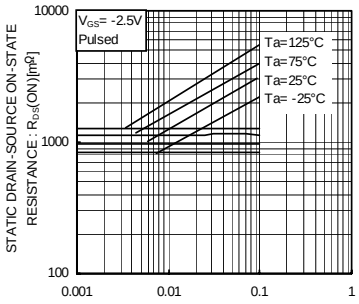



Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

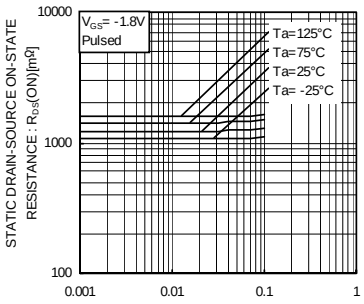



Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

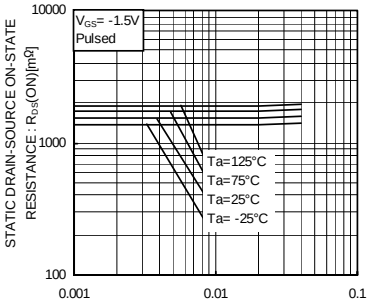



Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(Ⅴ)

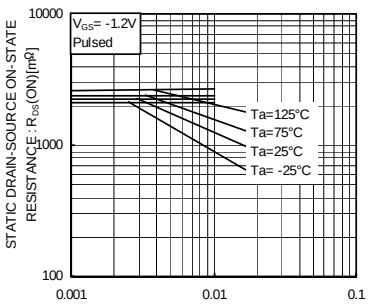



Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(Ⅵ)

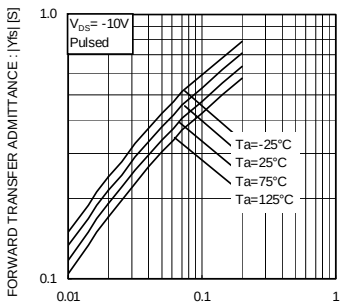



Fig.10 Forward Transfer Admittance vs. Drain Current

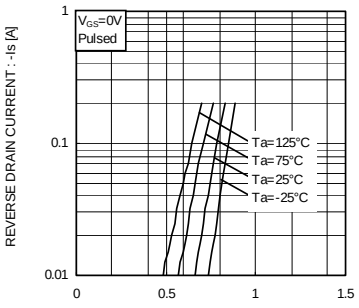



Fig.11 Reverse Drain Current vs. Sourse-Drain Voltage

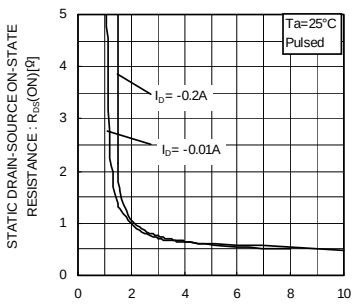



Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

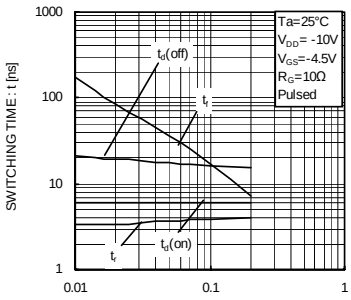



Fig.13 Switching Characteristics

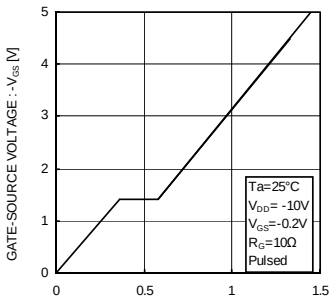



Fig.14 Dynamic Input Characteristics

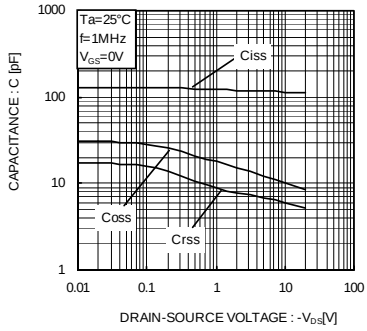



Fig.15 Typical Capacitance vs. Drain-Source Voltage

## ●Measurement circuit

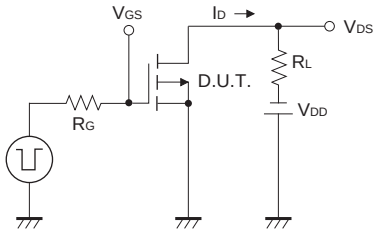



Fig.1-1 Switching Time Measurement Circuit

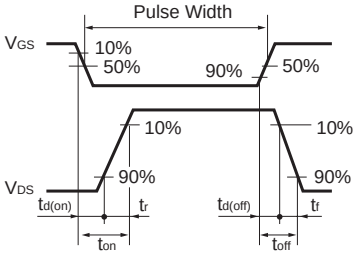



Fig.1-2 Switching Waveforms

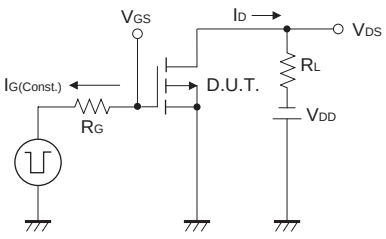



Fig.2-1 Gate Charge Measurement Circuit

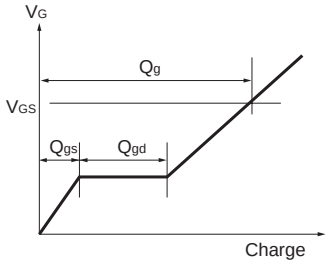



Fig.2-2 Gate Charge Waveform

## ●Notice

This product might cause chip aging and breakdown under the large electrified environment.

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