Transistors

# 10V Drive  Nch  MOSFET

## RK3055E

●**Structure**

Silicon N-channel MOSFET

●**Features**

1) Low On-resistance.
2) Fast switching speed.
3) Wide SOA (safe operating area).
4) 10V drive.
5) Drive circuits can be simple.
6) Parallel use is easy.

●**Applications**
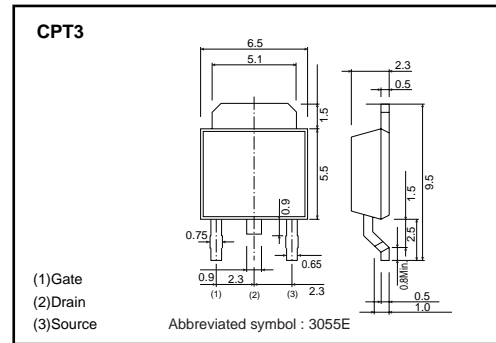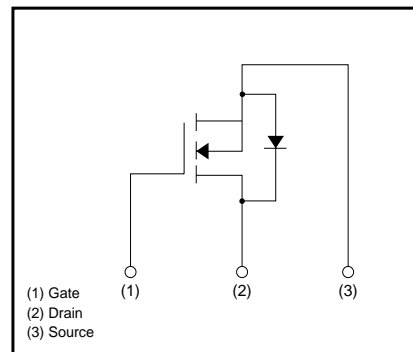
Switching

●**Dimensions** (Unit : mm)

CPT3

6.5
5.1
2.3
0.5
1.5
5.5
9.5
1.5
0.9
2.5
0.75
0.65
0.8Min
(1)Gate
(2)Drain
(3)Source
0.9
2.3
2.3
0.5
1.0
(1)
(2)
(3)

Abbreviated symbol : 3055E

●**Packaging specifications**

| Type | Package | Taping |
|------|---------|--------|
| | Code | TL |
| | Basic ordering unit (pieces) | 2500 |
| RK3055E | | ○ |

●**Inner circuit**

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

(1)   (2)   (3)

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

| Parameter | | Symbol | Limits | Unit |
|-----------|--|--------|--------|------|
| Drain-source voltage | | $V_{DSS}$ | 60 | V |
| Gate-source voltage | | $V_{GSS}$ | ±20 | V |
| Drain current | Continuous | $I_D$ | 8 | A |
| | Pulsed | $I_{DP}$* | 20 | A |
| Reverse drain current | Continuous | $I_{DR}$ | 8 | A |
| | Pulsed | $I_{DRP}$* | 20 | A |
| Total power dissipation (Tc=25°C) | | $P_D$ | 20 | W |
| Channel temperature | | Tch | 150 | °C |
| Storage temperature | | Tstg | −55 to +150 | °C |

＊ Pw≦10μs, Duty cycle≦1%

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## Transistors

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | – | – | ±100 | nA | $V_{GS}=±20V$, $V_{DS}=0V$ |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 60 | – | – | V | $I_D=1mA$, $V_{GS}=0V$ |
| Zero gate voltage drain current | $I_{DSS}$ | – | – | 10 | μA | $V_{DS}=60V$, $V_{GS}=0V$ |
| Gate threshold voltage | $V_{GS(th)}$ | 1.0 | – | 2.5 | V | $V_{DS}=10V$, $I_D=1mA$ |
| Static drain-source on-state resistance | $R_{DS(on)}$ | – | – | 0.15 | Ω | $I_D=4A$, $V_{GS}=10V$ |
| Forward transfer admittance | $|Y_{fs}|$ ＊ | 4.0 | – | – | S | $I_D=4A$, $V_{DS}=15V$ |
| Input capacitance | $C_{iss}$ | – | 520 | – | pF | $V_{DS}=10V$ |
| Output capacitance | $C_{oss}$ | – | 240 | – | pF | $V_G=0V$ |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | pF | f=1MHz |
| Turn-on delay time | $t_{d(on)}$ | – | 5.0 | – | ns | $I_D=2.5A$, $V_{DD}≒30V$ |
| Rise time | $t_r$ | – | 20 | – | ns | $V_{GS}=10V$ |
| Turn-off delay time | $t_{d(off)}$ | – | 50 | – | ns | $R_L=12Ω$ |
| Fall time | $t_f$ | – | 20 | – | ns | $R_G=10Ω$ |

＊ Pw ≤ 300μs, Duty cycle ≤ 1%

●**Electrical characteristics curve**
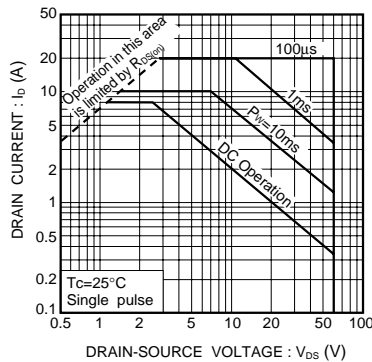


Fig.1  Maximum Safe Operating Area
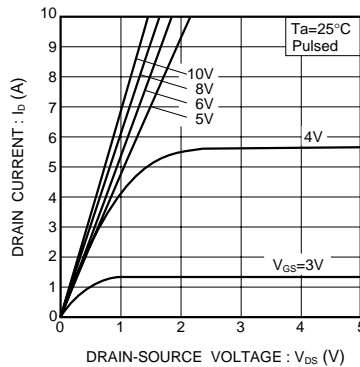


Fig.2  Typical Output Characteristics
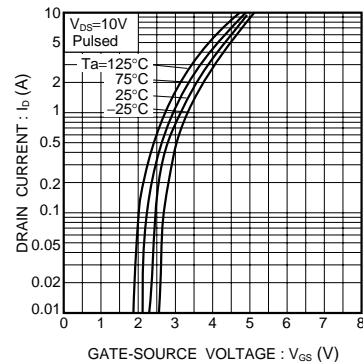


Fig.3  Typical Transfer Characteristics
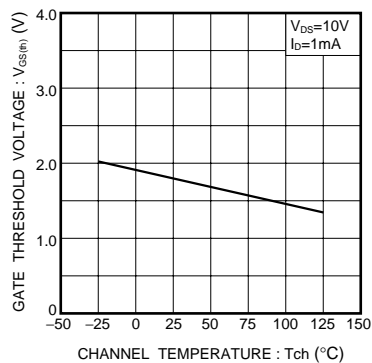


Fig.4  Gate Threshold Voltage
vs. Channel Temperature
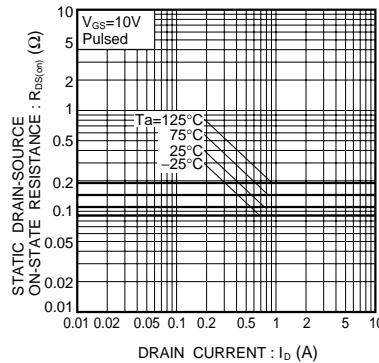


Fig.5  Static Drain-Source On-State Resistance
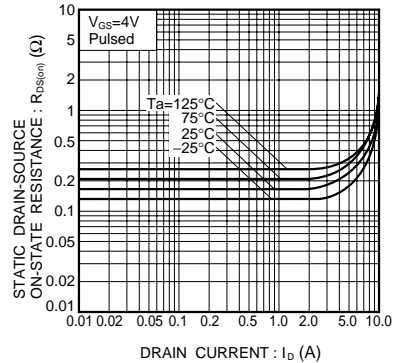vs. Drain Current ( I )



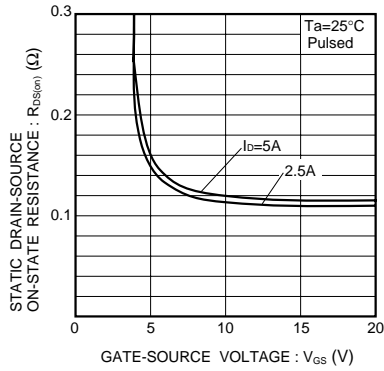Fig.6  Static Drain-Source On-State Resistance
vs. Drain Current ( II )

Fig.7 Static Drain-Source On-State Resistance
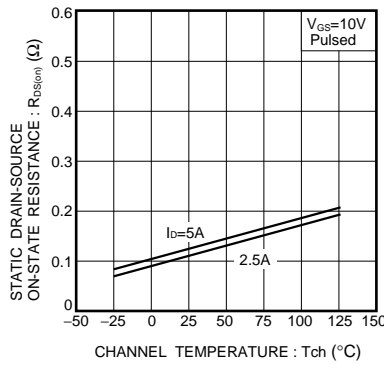vs. Gate-Source Voltage

Fig.8 Static Drain-Source On-State Resistance
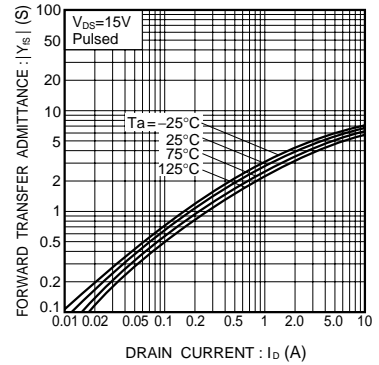vs. Channel Temperature

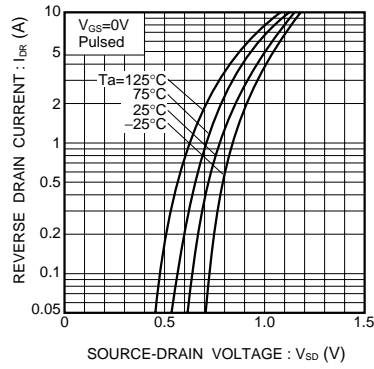Fig.9 Forward Transfer Admittance
vs. Drain Current

Fig.10 Reverse Drain Current
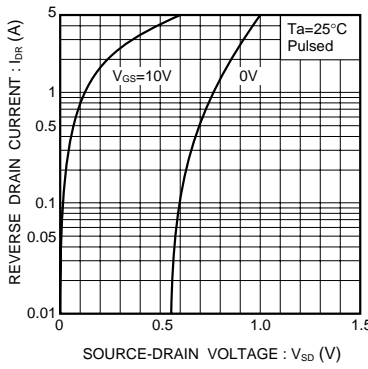vs. Source-Drain Voltage ( I )

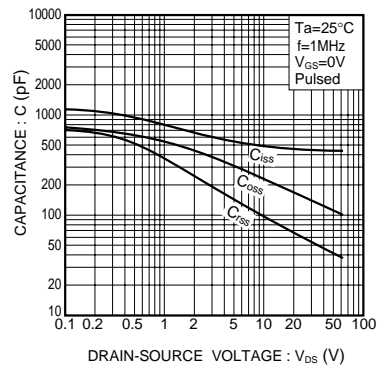Fig.11 Reverse Drain Current
vs. Source-Drain Voltage ( II )
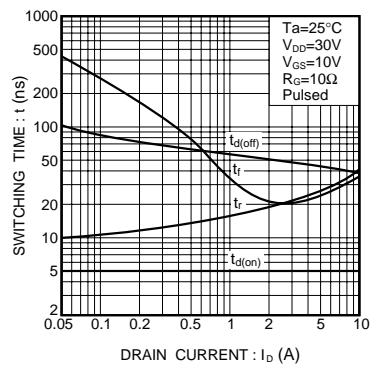
Fig.12 Typical Capacitance
vs. Drain-Source Voltage

Fig.13 Switching Characteristics
(See Figures 16 and 17 for
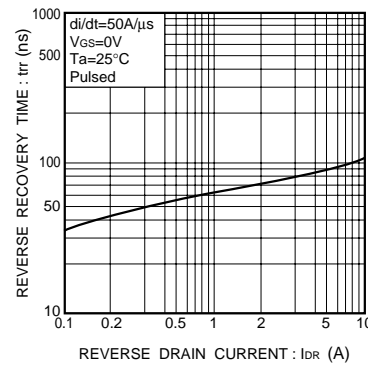the measurement circuit
and resultant waveforms)

Fig.14 Reverse Recovery Time
vs. Reverse Drain Current

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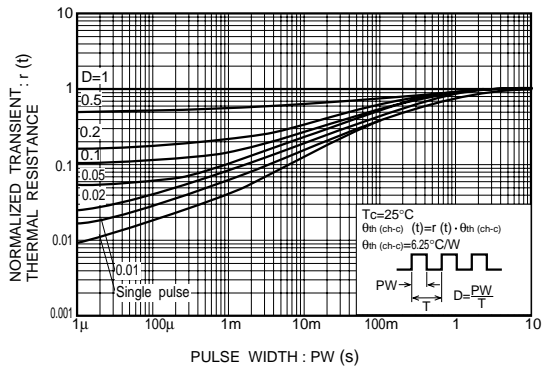
Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

PULSE WIDTH : PW (s)

Tc=25°C
$\theta_{th\ (ch-c)}$  (t)=r (t)·$\theta_{th\ (ch-c)}$
$\theta_{th\ (ch-c)}$=6.25°C/W

$D=\dfrac{PW}{T}$

●**Switching characteristics measurement circuit**
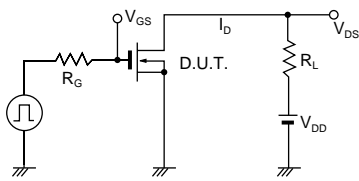
Fig.16 Switching Time Test Circuit
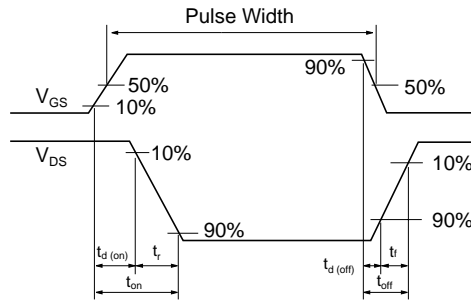
Fig.17 Switching Time Waveforms

Pulse Width

## Notes

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact your nearest sales office.

## ROHM Customer Support System

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