

4V Drive Nch MOSFET

RHP020N06

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) High speed switching.
- 3) Wide SOA.

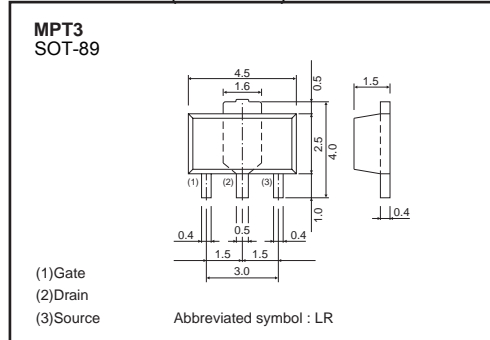
●Applications

Switching

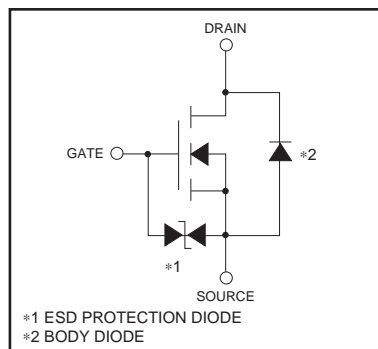
●Packaging specifications and hFE

| Type | Package | Taping |
|-----------|------------------------------|--------|
| | Code | T100 |
| | Basic ordering unit (pieces) | 1000 |
| RHP020N06 | | ○ |

●Dimensions (Unit : mm)



●Inner circuit



●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 | ± 2 A |
| | Pulsed | I_{DP} *1 | ± 8 A |
| Source current | Continuous | I_S | 2 A |
| | Pulsed | I_{SP} *1 | 8 A |
| Total power dissipation | P_D | 500 | mW |
| | | 2 | W *2 |
| Channel temperature | T_{ch} | 150 | °C |
| Range of storage temperature | T_{stg} | -55 to +150 | °C |

*1 $P_w \leq 10 \mu s$, Duty cycle $\leq 1\%$

*2 When mounted on a 40×40×0.7mm ceramic board

●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|--------------------|-----------|--------|--------|
| Channel to ambient | Rth(ch-a) | 250 | °C/W |
| | | 62.5 | °C/W * |

* When mounted on a 40×40×0.7mm ceramic board

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|------------------------|------|------|------|------|---|
| Gate-source leakage | I _{GSS} | – | – | ±10 | μA | 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} | – | – | 1 | 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)} * | – | 150 | 200 | mΩ | I _D = 2A, V _{GS} = 10V |
| | | – | 200 | 280 | mΩ | I _D = 2A, V _{GS} = 4.5V |
| | | – | 240 | 340 | mΩ | I _D = 2A, V _{GS} = 4V |
| Forward transfer admittance | Y _{fs} * | 2.0 | – | – | S | V _{DS} = 10V, I _D = 2A |
| Input capacitance | C _{iss} | – | 140 | – | pF | V _{DS} = 10V |
| Output capacitance | C _{oss} | – | 50 | – | pF | V _{GS} =0V |
| Reverse transfer capacitance | C _{rss} | – | 40 | – | pF | f=1MHz |
| Turn-on delay time | t _{d (on)} * | – | 7 | – | ns | V _{DD} ≐ 30V |
| Rise time | t _r * | – | 10 | – | ns | I _D = 1A |
| Turn-off delay time | t _{d (off)} * | – | 22 | – | ns | V _{GS} = 10V |
| Fall time | t _f * | – | 18 | – | ns | R _L =30Ω |
| Total gate charge | Q _g * | – | 7 | 14 | nC | V _{DD} ≐ 30V |
| Gate-source charge | Q _{gs} * | – | 1 | – | nC | V _{GS} = 10V |
| Gate-drain charge | Q _{gd} * | – | 2 | – | nC | I _D = 2A |

*Pulsed

●Body diode characteristics (Source-drain) (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-----------------|-----------------|------|------|------|------|--|
| Forward voltage | V _{SD} | – | – | 1.2 | V | I _S = 2A, V _{GS} =0V |

●Electrical characteristics curves

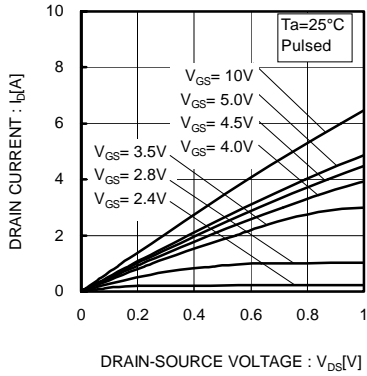


Fig.1 Typical Output Characteristics (I)

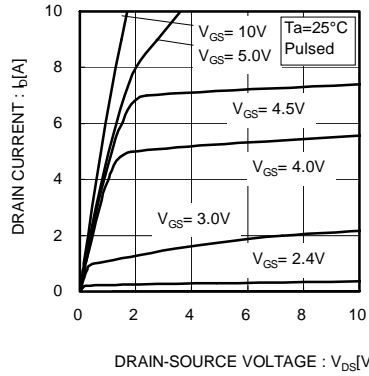


Fig.2 Typical Output Characteristics (II)

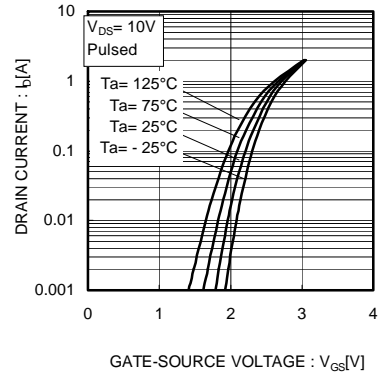


Fig.3 Typical Transfer Characteristics

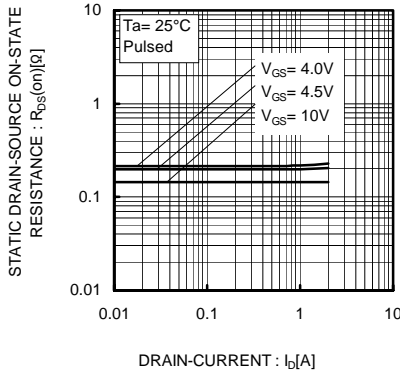


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

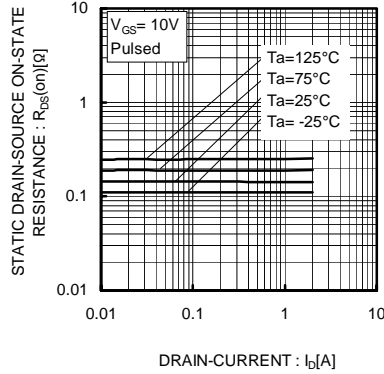


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

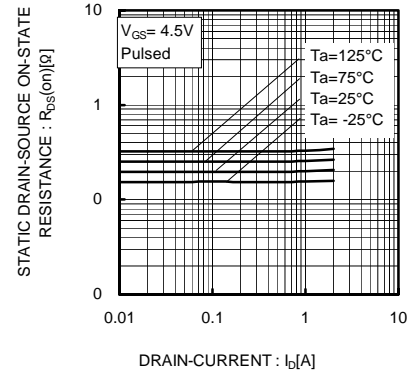


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

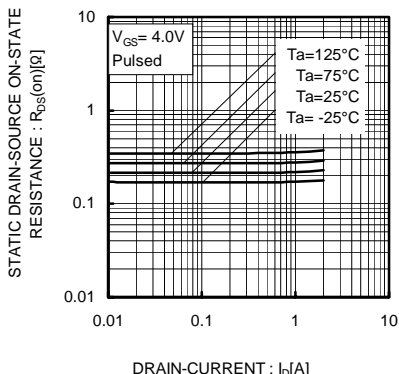


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

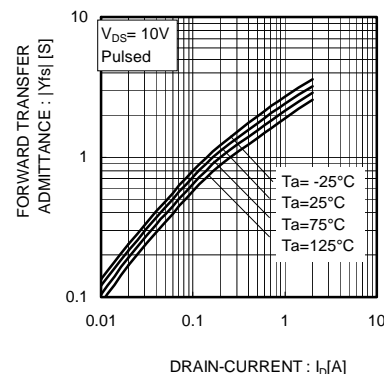


Fig.8 Forward Transfer Admittance vs. Drain Current

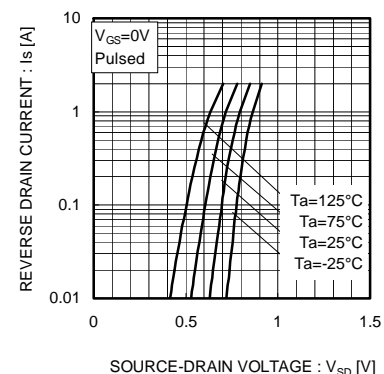


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

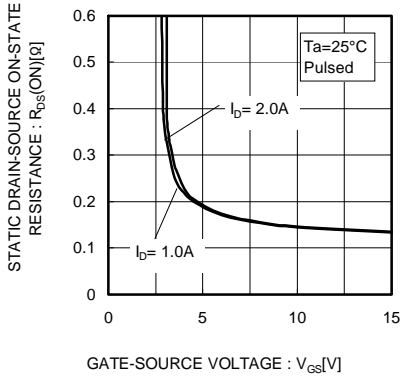


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

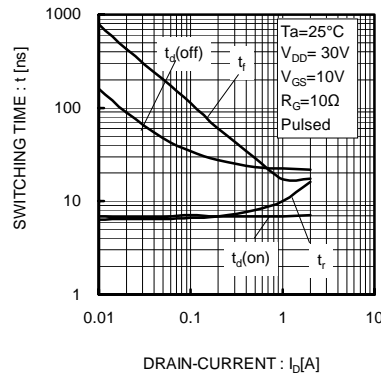


Fig.11 Switching Characteristics

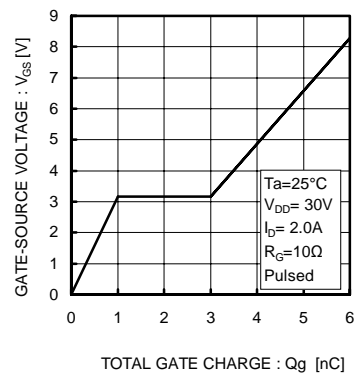


Fig.12 Dynamic Input Characteristics

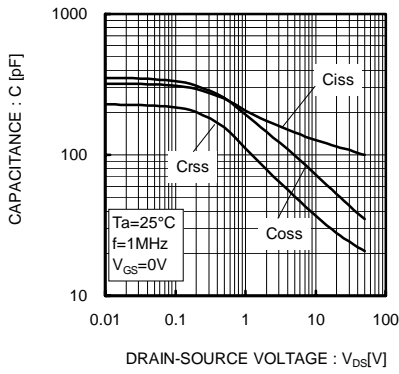


Fig.13 Typical Capacitance vs. Drain-Source Voltage

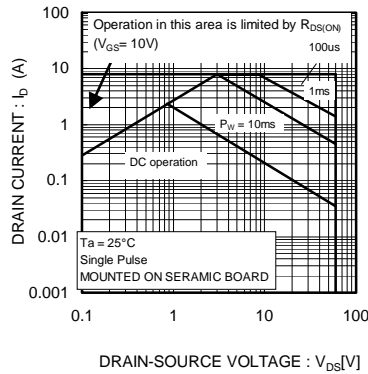


Fig.14 Maximum Safe Operating Area

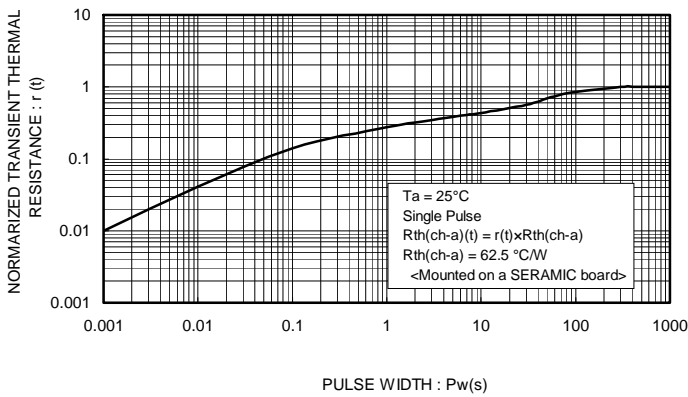


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

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