DC-DC Converter (-20V, -3.0A)

RTQ030P02

Features

- 1) Low On-resistance.(110m Ω at 2.5V)
- 2) High Power Package.
- 3) High speed switching.
- 4) Low voltage drive.(2.5V)

Applications

DC-DC converter

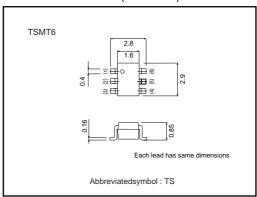
●Structure

Silicon P-channel **MOSFET**

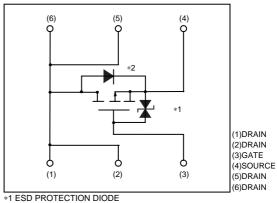
Packaging specifications

| Туре | Package | Taping |
|-----------|------------------------------|--------|
| | Code | TR |
| | Basic ordering unit (pieces) | 3000 |
| RTQ030P02 | 0 | |

●External dimensions (Units : mm)



●Equivalent circuit



- *2 BODY DIODE

● Absolute maximum ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit | |
|------------------------------|------------|--------|----------|------|--|
| Drain-source voltage | | Voss | -20 | V | |
| Gate-source voltage | | Vgss | ±12 | V | |
| Drain current | Continuous | ΙD | ±3 | A | |
| | Pulsed | IDP | ±12 | A *1 | |
| Source current (Body diode) | Continuous | ls | -1 | A | |
| | Pulsed | Isp | -4 | A *1 | |
| Total power dissipation | | Po | 1.25 | W*2 | |
| Channel temperature | | Tch | 150 | °C | |
| Range of Storage temperature | | Tstg | -55~+150 | °C | |

^{*1} Pw≦10μs, Duty cycle≦1% *2 Mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions | |
|--|----------------------|----------|--------|------|------|---|--|
| Gate-source leakage | Igss | - | _ | ±10 | μΑ | Vgs=±12V, Vps=0V | |
| Drain-source breakdown voltage | V _{(BR)DSS} | -20 | ı | - | V | ID=-1mA, VGS=0V | |
| Zero gate voltage drain current | IDSS | _ | ı | -1 | μΑ | VDS=-20V, VGS=0V | |
| Gate threshold voltage | V _{GS(th)} | -0.7 | ì | -2.0 | V | V _{DS} =-10V, I _D =-1mA | |
| Static drain-source on-state resistance | RDS(on) | | 60 | 80 | mΩ | In=-3A, Vgs=-4.5V | |
| | | _ | 65 | 90 | mΩ | ID=-3A, VGS=-4V | |
| | | _ | 110 | 150 | mΩ | ID=-1.5A, VGS=-2.5V | |
| Foward transfer admittance | Y _{fs} * | 2.0 | ı | - | S | VDS=-10V, ID=-1.5A | |
| Input capacitance | Ciss | _ | 800 | - | pF | | |
| Output capacitance | Coss | - | 150 | - | pF | V _{DS} =-10V,V _{GS} =0V f=1MHz | |
| Reverse transfer capacitance | Crss | - | 100 | - | pF | | |
| Turn-on delay time | td(on) * | - | 15 | _ | ns | Ip=-1.5A | |
| Rise time | tr * | _ | 27 | - | ns | V _{DD} =−15V | |
| Turn-off delay time | td(off) * | - | 50 | - | ns | V _{GS} =-4.5V R _L =10Ω | |
| Fall time | t _f * | _ | 20 | - | ns | Rgs=10Ω | |
| Total gate charge | Qg | _ | 9.0 | - | nC | \(\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | |
| Gate-source charge | Qgs | _ | 1.6 | - | nC | VDD≒-15V VGS=-4.5V ID=-3A | |
| Gate-drain charge | Qgd | _ | 4.6 | _ | nC | | |
| *PULSED Body diode characteristics (source | e-drain ch | aracteri | stics) | | | | |

| Forward voltage VSD1.2 V Is=-1A, Vgs=0V | |
|---|--|
|---|--|

Electrical characteristic curves

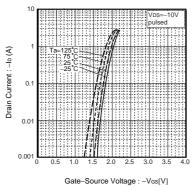


Fig.1 Typical Transfer Characteristics

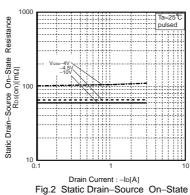


Fig.2 Static Drain–Source On–State Resistancevs.Drain Current

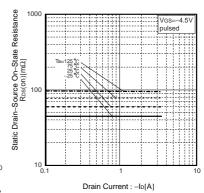


Fig.3 Static Drain–Source On–State Resistance vs.Drain Current

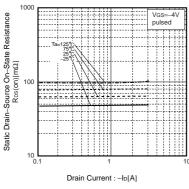


Fig.4 Static Drain–Source On–State Resistance vs.Drain–Current

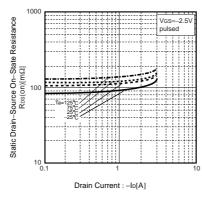


Fig.5 Static Drain–Source On–State Resistance vs.Drain–Current

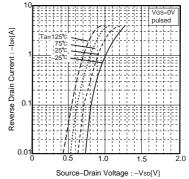
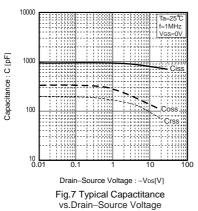


Fig.6 Reverse Drain Current vs. Source-Drain Voltage



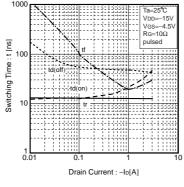


Fig.8 Switching Characteristics

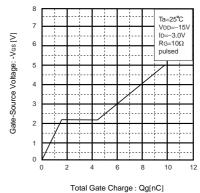


Fig.9 Dynamic Input Characteristics

Measurement circuits

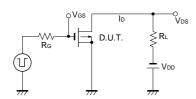


Fig.10 Switching Time Measurement Circuit

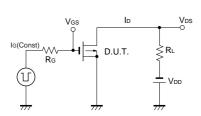


Fig.12 Gate Charge Measurement Circuit

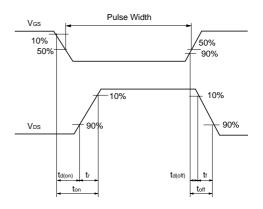


Fig.11 Switching Waveforms

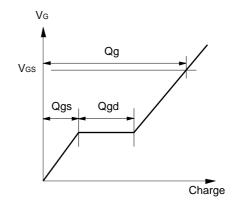


Fig.13 Gate Charge Waveforms

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