# 4V Drive  Nch  MOS FET

●**Structure**

TY N-channel MOS FET

●**Features**

1) Low On-resistance.

2) Space saving, small surface mount package (TSMT6).
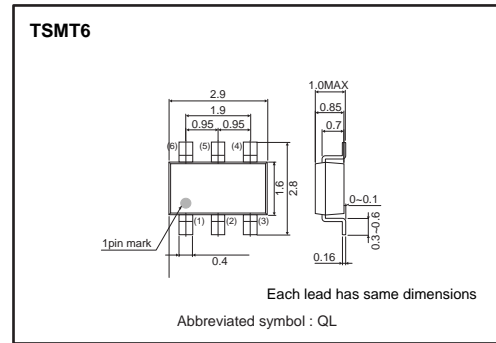
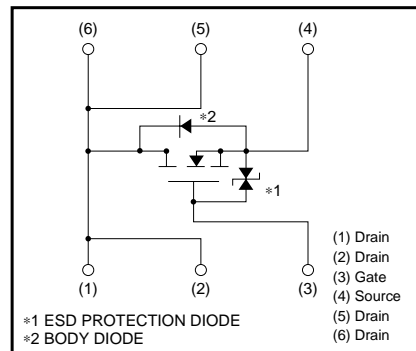3) Low voltage drive (4V drive).

●**Applications**

Switching

●**External dimensions** (Unit : mm)



TSMT6

Each lead has same dimensions

Abbreviated symbol : QL

●**Packaging specifications**

| Type | Package | | Taping |
|---|---|---|---|
| | Code | | TR |
| | Basic ordering unit (pieces) | | 3000 |
| RSQ045N03 | | | ○ |

●**Inner circuit**



(1) Drain
(2) Drain
(3) Gate
(4) Source
(5) Drain
(6) Drain

∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

●**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 | $I_D$ | ±4.5 | A |
| | Pulsed | $I_{DP}$ ∗1 | ±18 | A |
| Source current (Body diode) | Continuous | $I_S$ | 1.0 | A |
| | Pulsed | $I_{SP}$ ∗1 | 18 | A |
| Total power dissipation | | $P_D$ ∗2 | 1.25 | W |
| Channel temperature | | Tch | 150 | °C |
| Range of storage temperature | | Tstg | −55 to +150 | °C |

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Mounted on a ceramic board

●**Thermal resistance**

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to ambient | Rth(ch-a) ∗ | 100 | °C/W |

∗ Mounted on a 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 | $V_{(BR)\,DSS}$ | 30 | – | – | V | $I_D$= 1mA, $V_{GS}$=0V |
| Zero gate voltage drain current | $I_{DSS}$ | – | – | 1 | 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 | $R_{DS\,(on)}{}^{*}$ | – | 27 | 38 | mΩ | $I_D$= 4.5A, $V_{GS}$= 10V |
| | | – | 36 | 51 | mΩ | $I_D$= 4.5A, $V_{GS}$= 4.5V |
| | | – | 40 | 56 | mΩ | $I_D$= 4.5A, $V_{GS}$= 4V |
| Forward transfer admittance | $|Y_{fs}|$ * | 3.5 | – | – | S | $V_{DS}$= 10V, $I_D$= 4.5A |
| Input capacitance | $C_{iss}$ | – | 520 | – | pF | $V_{DS}$= 10V |
| Output capacitance | $C_{oss}$ | – | 150 | – | pF | $V_{GS}$=0V |
| Reverse transfer capacitance | $C_{rss}$ | – | 95 | – | pF | f=1MHz |
| Turn-on delay time | $t_{d\,(on)}$ * | – | 12 | – | ns | $V_{DD}$≒ 15V |
| Rise time | $t_r$ * | – | 19 | – | ns | $I_D$= 2.25A |
| Turn-off delay time | $t_{d\,(off)}$ * | – | 41 | – | ns | $V_{GS}$= 10V $R_L$=6.67Ω |
| Fall time | $t_f$ * | – | 14 | – | ns | $R_G$=10Ω |
| Total gate charge | $Q_g$ * | – | 6.8 | 9.5 | nC | $V_{DD}$≒15V $V_{GS}$= 5V |
| Gate-source charge | $Q_{gs}$ * | – | 1.6 | – | nC | $I_D$= 4.5A |
| Gate-drain charge | $Q_{gd}$ * | – | 2.3 | – | nC | $R_L$=3.33Ω $R_G$=10Ω |

*Pulsed

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward voltage | $V_{SD}$ | – | – | 1.2 | V | $I_S$= 1.0A, $V_{GS}$=0V |