Switching (−20V, −2.5A)

●**Features**
1) Low On-resistance.
2) Built-in G-S Protection Diode.
3) Small and Surface Mount Package (TSMT3).

●**Application**
Power switching, DC / DC converter.

●**Structure**
TY P-channel
MOS FET

●**External dimensions** (Unit : mm)

TSMT3

2.9±0.1
0.4 +0.1 −0.05 Each lead has same dimensions
(3)
2.8±0.2
1.6 +0.2 −0.1
(1)   (2)
0.95 0.95
1.9±0.2

1.0MAX.
0.85±0.1
0.7±0.1
0.3~0.6
0~0.1
0.16 +0.1 −0.06

Each lead has same dimensions

Abbreviated symbol : TY

●**Packaging specifications**
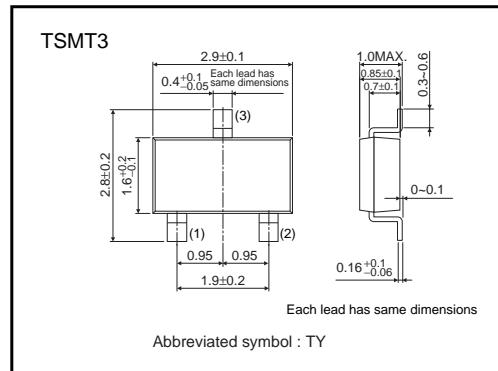
Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RTR025P02		○

●**Equivalent circuit**

(3)
(1) *1 *2
(2)

*1 ESD PROTECTION DIODE
*2 BODY DIODE

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

●**Absolute maximum ratings** (Ta=25°C)
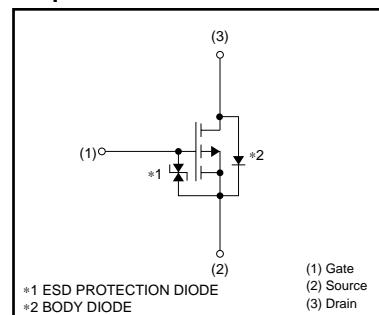
Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	−20	V
Gate-source voltage		V_{GSS}	±12	V
Drain current	Continuous	I_D	±2.5	A
	Pulsed	I_{DP} [1]	±10	A
Source current (Body diode)	Continuous	I_S	−0.8	A
	Pulsed	I_{SP} [1]	−3.2	A
Total power dissipation		P_D [2]	1.0	W
Channel temperature		Tch	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** (Ta=25°C)

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth (ch-A)	125	°C / W

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	µA	V_{GS}=±12V, 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	$V_{GS\,(th)}$	–0.7	–	–2.0	V	V_{DS}= –10V, I_D= –1mA
Static drain-source on-state resistance	$R_{DS\,(on)}$ *	–	70	95	mΩ	I_D= –2.5A, V_{GS}= –4.5V
		–	75	105	mΩ	I_D= –2.5A, V_{GS}= –4.0V
		–	115	160	mΩ	I_D= –1.25A, V_{GS}= –2.5V
Forward transfer admittance	$|Y_{fs}|$ *	2.3	–	–	S	V_{DS}= –10V, I_D= –1.2A
Input capacitance	C_{iss}	–	630	–	pF	V_{DS}= –10V
Output capacitance	C_{oss}	–	110	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	75	–	pF	f=1MHz
Turn-on delay time	$t_{d\,(on)}$ *	–	12	–	ns	I_D= –1.25A
Rise time	t_r *	–	18	–	ns	V_{DD}≒ –15V
Turn-off delay time	$t_{d\,(off)}$ *	–	50	–	ns	V_{GS}= –4.5V
Fall time	t_f *	–	20	–	ns	R_L=12Ω R_{GS}=10Ω
Total gate charge	Q_g	–	7	–	nC	V_{DD}≒–15V
Gate-source charge	Q_{gs}	–	1.5	–	nC	V_{GS}= –4.5V
Gate-drain charge	Q_{gd}	–	2.0	–	nC	I_D= –2.5A

∗Pulsed

Body diode characteristics (source-drain characteristics)

Forward voltage	V_{SD}	–	–	–1.2	V	I_S= –0.8A, V_{GS}=0V