4V Drive Nch+SBD MOSFET

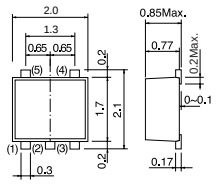
US5U2

●Structure
Silicon N-channel MOSFET /
Schottky barrier diode

●Features
1) Nch MOSFET and schottky barrier diode are put in TUMT5 package.
2) High-speed switching, Low On-resistance.
3) 4V drive.
4) Built-in Low V_F schottky barrier diode.

●Dimensions (Unit : mm)

TUMT5



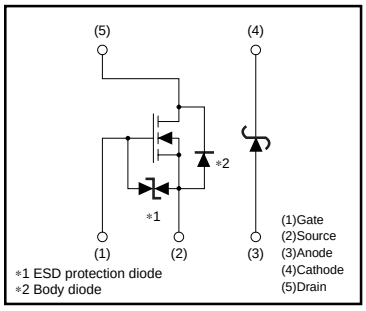
Abbreviated symbol : U02

●Applications
Switching

●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
US5U2		○

●Inner circuit



●Absolute maximum ratings (Ta=25°C)

<MOSFET>

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	20	V
Drain current	Continuous	I_D	±1.4	A
	Pulsed	I_{DP} *1	±5.6	A
Source current (Body diode)	Continuous	I_S	0.6	A
	Pulsed	I_{SP} *1	5.6	A
Power dissipation		P_D *2	0.7	W / ELEMENT
Channel temperature		Tch	150	°C

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

<Di>

Parameter	Symbol	Limits	Unit
Repetitive peak reverse voltage	V_{RM}	30	V
Reverse voltage	V_R	20	V
Forward current	I_F	0.5	A
Forward current surge peak	I_{FSM} ∗1	2.0	A
Power dissipation	P_D ∗2	0.5	W / ELEMENT
Junction temperature	Tj	150	°C

∗1 60Hz・1cycle
∗2 Mounted on ceramic board

<MOSFET and Di>

Parameter	Symbol	Limits	Unit
Total power dissipation	P_D ∗1	1.0	W / TOTAL
Range of storage temperature	Tstg	−55 to +150	°C

∗1 Mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

<MOSFET>

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	$R_{DS\ (on)}$∗	–	170	240	mΩ	I_D= 1.4A, V_{GS}= 10V
		–	250	350	mΩ	I_D= 1.4A, V_{GS}= 4.5V
		–	270	380	mΩ	I_D= 1.4A, V_{GS}= 4V
Forward transfer admittance	$\|Y_{fs}\|$ ∗	1.0	–	–	S	V_{DS}= 10V, I_D= 1.4A
Input capacitance	C_{iss}	–	70	–	pF	V_{DS}= 10V
Output capacitance	C_{oss}	–	15	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	12	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ ∗	–	6	–	ns	V_{DD}≒ 15V
Rise time	t_r ∗	–	6	–	ns	I_D= 0.7A
Turn-off delay time	$t_{d\ (off)}$ ∗	–	13	–	ns	V_{GS}= 10V R_L= 21Ω
Fall time	t_f ∗	–	8	–	ns	R_G=10Ω
Total gate charge	Q_g ∗	–	1.4	2.0	nC	V_{DD}≒15V, V_{GS}= 5V
Gate-source charge	Q_{gs} ∗	–	0.6	–	nC	I_D= 1.4A
Gate-drain charge	Q_{gd} ∗	–	0.3	–	nC	R_L= 11Ω, R_G= 10Ω

∗Pulsed

<Body diode characteristics (source-drain)>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	1.2	V	I_S= 0.6A, V_{GS}=0V

<Di>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_F	–	–	0.36	V	I_F= 0.1A
		–	–	0.47	V	I_F 0.5A
Reverse current	I_R	–	–	100	µA	V_R= 20V

●Electrical characteristics curves

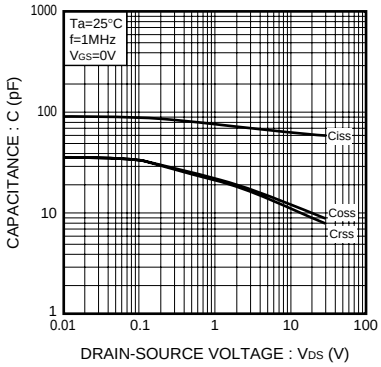


Fig.1 Typical Capacitance vs. Drain-Source Voltage

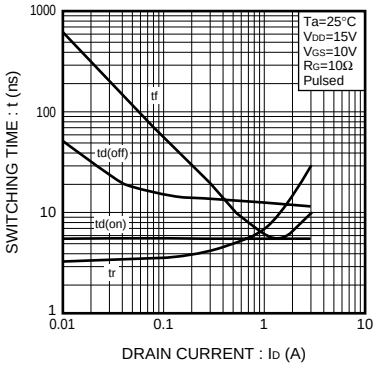


Fig.2 Switching Characteristics

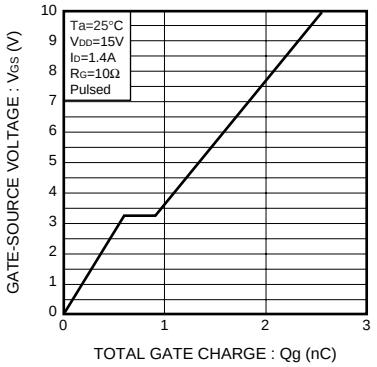


Fig.3 Dynamic Input Characteristics

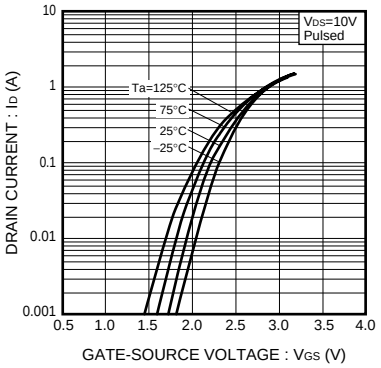


Fig.4 Typical Transfer Characteristics

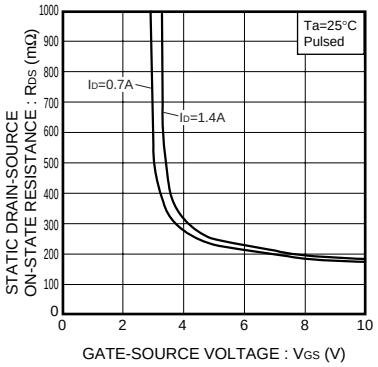


Fig.5 Static Drain-Source On-State Resistance vs. Gate-source Voltage

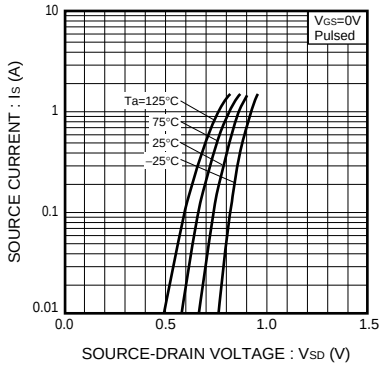


Fig.6 Source Current vs. Source-Drain Voltage

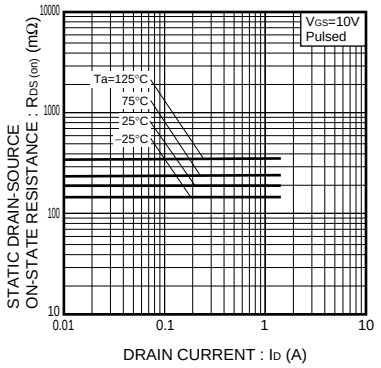


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

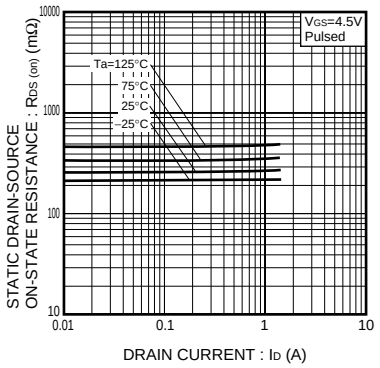


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

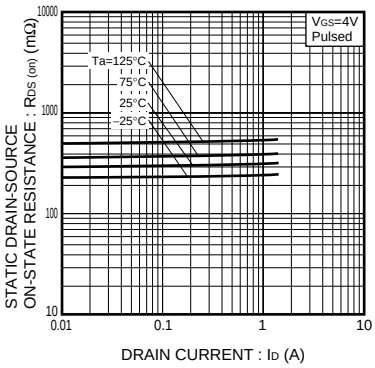


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

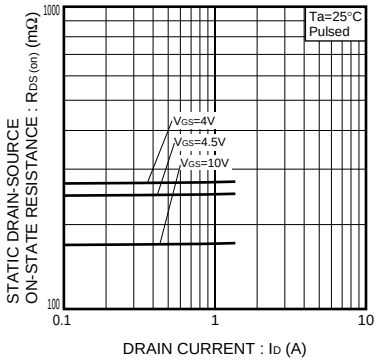


Fig.10 Static Drain-Source On-State Resistance vs. Drain Current (Ⅳ)

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