

2.5V Drive Nch+Pch MOSFET

US6M2

●Structure

Silicon N-channel MOSFET /
Silicon P-channel MOSFET

●Features

- 1) Nch MOSFET and Pch MOSFET are put in TUMT6 package.
- 2) High-speed switching, low On-resistance.
- 3) Low voltage drive (2.5V drive).
- 4) Built-in G-S Protection Diode.

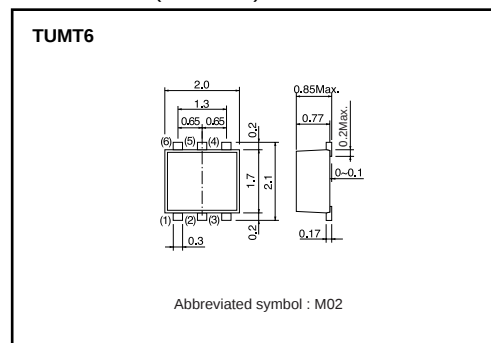
●Applications

Switching

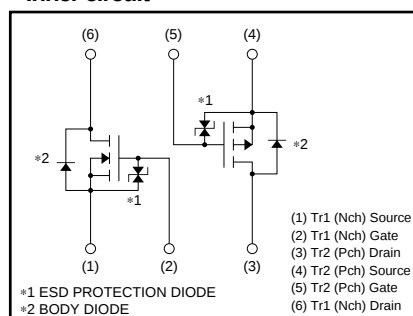
●Packaging specifications

Type	Package	Taping
	Code	TR
US6M2	Basic ordering unit (pieces)	3000
		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		Tr1 : Nchannel	Tr2 : Pchannel	
Drain-source voltage	V _{DSS}	30	-20	V
Gate-source voltage	V _{GSS}	12	-12	V
Drain current	Continuous	I _D	±1.5	A
	Pulsed	I _{DP} *1	±6	A
Source current (Body diode)	Continuous	I _S	0.6	A
	Pulsed	I _{SP} *1	6	A
Total power dissipation	P _D *2	1.0		W / TOTAL
		0.7		W / ELEMENT
Channel temperature	T _{ch}	150		°C
Storage temperature	T _{stg}	-55 to +150		°C

*1 P_{WS}≤10μs, Duty cycle≤1%

*2 Mounted on a ceramic board.

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	R _{th(ch-a)} *	125	°C/W / TOTAL
		179	°C/W / ELEMENT

* Mounted on a ceramic board

Transistors

N-ch

●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	$V_{(BR)DSS}$	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	$V_{GS(th)}$	0.5	—	1.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	—	170	240	m Ω	$I_D=1.5A, V_{GS}=4.5V$
		—	180	250	m Ω	$I_D=1.5A, V_{GS}=4V$
		—	240	340	m Ω	$I_D=1.5A, V_{GS}=2.5V$
Forward transfer admittance	$ Y_{fs} $ *	1.5	—	—	S	$V_{DS}=10V, I_D=1.5A$
Input capacitance	C_{iss}	—	80	—	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	—	13	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	12	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	7	—	ns	$V_{DD} \doteq 15V$
Rise time	t_r *	—	9	—	ns	$I_D=0.75A$
Turn-off delay time	$t_{d(off)}$ *	—	15	—	ns	$V_{GS}=4.5V$
Fall time	t_f *	—	6	—	ns	$R_L=20\Omega$
Total gate charge	Q_g *	—	1.6	2.2	nC	$V_{DD} \doteq 15V, V_{GS}=4.5V$
Gate-source charge	Q_{gs} *	—	0.5	—	nC	$I_D=1.5A$
Gate-drain charge	Q_{gd} *	—	0.3	—	nC	$R_L=10\Omega, R_G=10\Omega$

*Pulsed

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

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

Transistors

P-ch

●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	$R_{DS(on)}$ *	—	280	390	m Ω	$I_D = -1A, V_{GS} = -4.5V$
		—	310	430	m Ω	$I_D = -1A, V_{GS} = -4V$
		—	570	800	m Ω	$I_D = -0.5A, V_{GS} = -2.5V$
Forward transfer admittance	$ Y_{fs} $ *	0.7	—	—	S	$V_{DS} = -10V, I_D = -0.5A$
Input capacitance	C_{iss}	—	150	—	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	—	20	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	20	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	9	—	ns	$V_{DD} \doteq -15V$
Rise time	t_r *	—	8	—	ns	$I_D = -0.5A$
Turn-off delay time	$t_{d(off)}$ *	—	25	—	ns	$V_{GS} = -4.5V$
Fall time	t_f *	—	10	—	ns	$R_L = 30\Omega$
Total gate charge	Q_g *	—	2.1	—	nC	$V_{DD} \doteq -15V, V_{GS} = -4.5V$
Gate-source charge	Q_{gs} *	—	0.5	—	nC	$I_D = -1A$
Gate-drain charge	Q_{gd} *	—	0.5	—	nC	$R_L = 15\Omega, R_G = 10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	—	—	-1.2	V	$I_S = -0.4A, V_{GS} = 0V$

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