

Transistors

2.5V Drive Nch+Pch MOS FET

US6M2

●Structure

Silicon N-channel MOS FET /
Silicon P-channel MOS FET

●Features

- 1) Nch MOS FET and Pch MOS FET 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
	Basic ordering unit (pieces)	3000
US6M2		○

●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_w ≤ 10μs, Duty cycle ≤ 1%

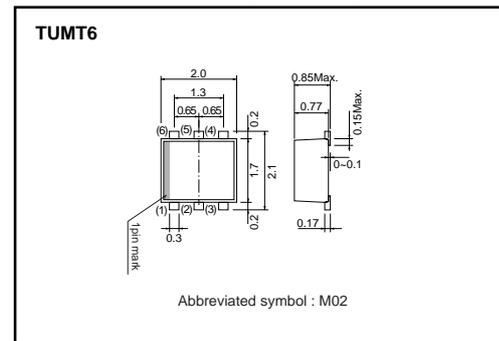
*2 Mounted on a ceramic board.

●Thermal resistance

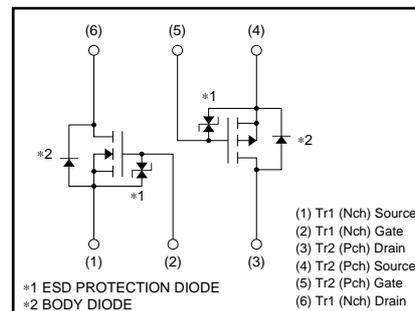
Parameter	Symbol	Limits	Unit
Channel to ambient	R _{th(ch-a)} *	125	°C/W / TOTAL
		179	°C/W / ELEMENT

* Mounted on a ceramic board

●External dimensions (Unit : mm)



●Inner circuit



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	mΩ	I _D = 1.5A, V _{GS} = 4.5V
		–	180	250	mΩ	I _D = 1.5A, V _{GS} = 4V
		–	240	340	mΩ	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} ≐ 15V I _D = 0.75A
Rise time	t _r *	–	9	–	ns	V _{GS} = 4.5V
Turn-off delay time	t _{d(off)} *	–	15	–	ns	R _L = 20Ω
Fall time	t _f *	–	6	–	ns	R _G =10Ω
Total gate charge	Q _g *	–	1.6	2.2	nC	V _{DD} ≐ 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 = 10Ω, 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 = 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	mΩ	I _D = –1A, V _{GS} = –4.5V
		–	310	430	mΩ	I _D = –1A, V _{GS} = –4V
		–	570	800	mΩ	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} ≐ –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 = 30Ω
Total gate charge	Q _g *	–	2.1	–	nC	R _G = 10Ω
Gate-source charge	Q _{gs} *	–	0.5	–	nC	V _{DD} ≐ –15V, V _{GS} = –4.5V
Gate-drain charge	Q _{gd} *	–	0.5	–	nC	I _D = –1A
						R _L = 15Ω, 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 = –0.4A, V _{GS} =0V

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