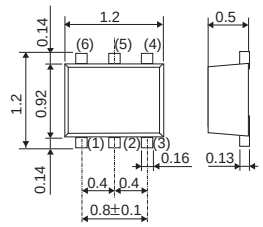
1.2V Drive Nch + Nch MOSFET

VT6K1

● Structure
Silicon N-channel MOSFET

● Dimensions (Unit : mm)

VMT6



Abbreviated symbol : K01

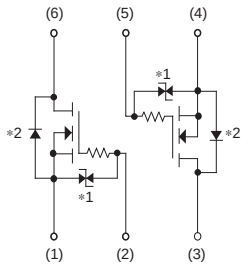
● Features
1) Low on-resistance.
2) Small package(VMT6).
3) Low voltage drive(1.2V drive).

● Application
Switching

● Packaging specifications

Type	Package	Taping
	Code	T2CR
	Basic ordering unit (pieces)	8000
VT6K1		○

● Inner circuit



(1) Tr1 Source
(2) Tr1 Gate
(3) Tr2 Drain
(4) Tr2 Source
(5) Tr2 Gate
(6) Tr1 Drain

∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	20	V
Gate-source voltage		V_{GSS}	±8	V
Drain current	Continuous	I_D	±100	mA
	Pulsed	I_{DP} *1	±400	mA
Power dissipation		P_D *2	0.15	W / TOTAL
			0.12	W / ELEMENT
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

*1 Pw≤10μs, Duty cycle≤1%

*2 Each terminal mounted on a recommended land.

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

<It is the same ratings for Tr1 and Tr2.>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	±10	μA	V_{GS}=±8V, 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	$V_{GS\ (th)}$	0.3	-	1.0	V	V_{DS}=10V, I_D=100μA
Static drain-source on-state resistance	$R_{DS\ (on)}$*	-	2.5	3.5	Ω	I_D=100mA, V_{GS}=4.5V
		-	3.0	4.2		I_D=100mA, V_{GS}=2.5V
		-	3.8	5.3		I_D=50mA, V_{GS}=1.8V
		-	4.5	9.0		I_D=20mA, V_{GS}=1.5V
		-	6.0	18.0		I_D=10mA, V_{GS}=1.2V
Forward transfer admittance	$\|Y_{fs}\|$*	180	-	-	mS	V_{DS}=10V, I_D=100mA
Input capacitance	C_{iss}	-	7.1	-	pF	V_{DS}=10V
Output capacitance	C_{oss}	-	3.3	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	1.7	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	5	-	ns	V_{DD}≒10V, I_D=50mA
Rise time	t_r *	-	4	-	ns	V_{GS}=4.5V
Turn-off delay time	$t_{d(off)}$*	-	20	-	ns	R_L=200Ω
Fall time	t_f *	-	38	-	ns	R_G=10Ω

*Pulsed

●**Body diode characteristics** (Source-Drain)

<It is the same ratings for Tr1 and Tr2.>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}*	-	-	1.2	V	I_s=100mA, V_{GS}=0V

*Pulsed

●Electrical characteristic curves

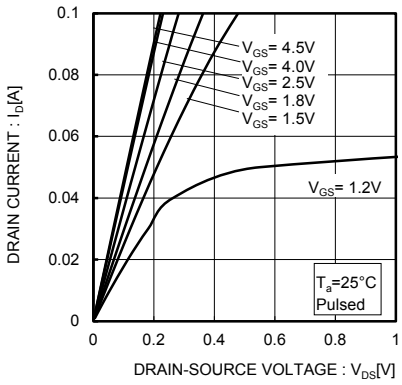


Fig.1 Typical Output Characteristics(Ⅰ)

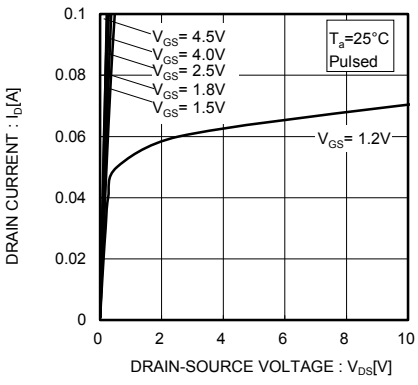


Fig.2 Typical Output Characteristics(Ⅱ)

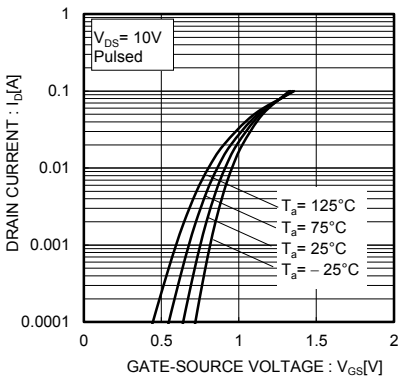


Fig.3 Typical Transfer Characteristics

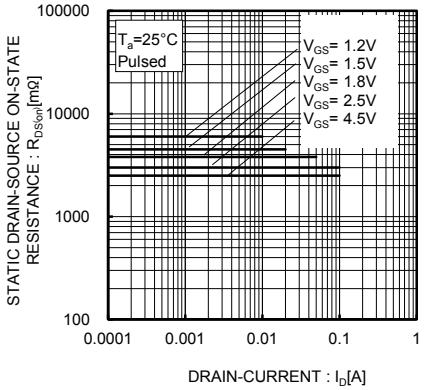


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

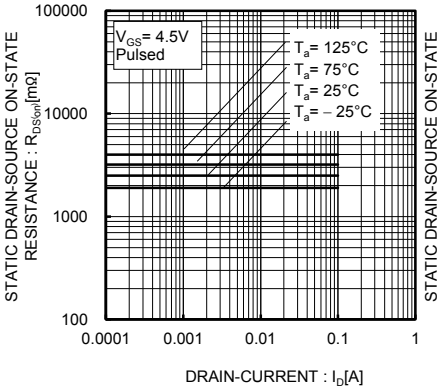


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

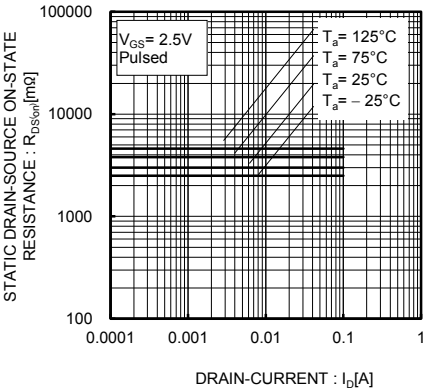


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

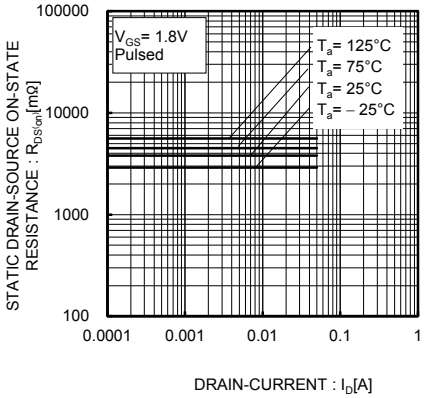


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

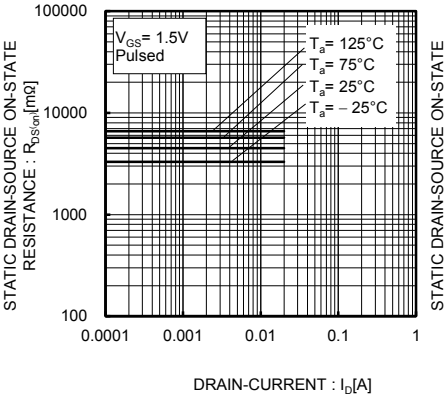


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(Ⅴ)

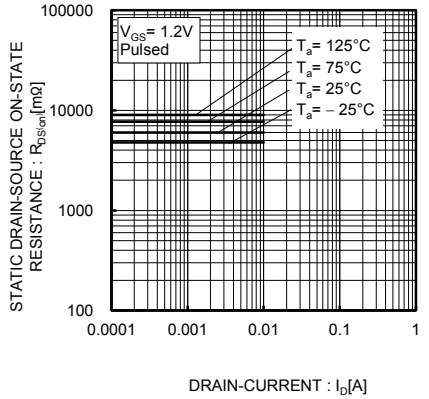


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current(Ⅵ)

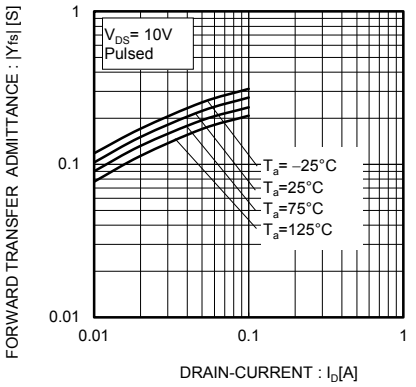


Fig.10 Forward Transfer Admittance vs. Drain Current

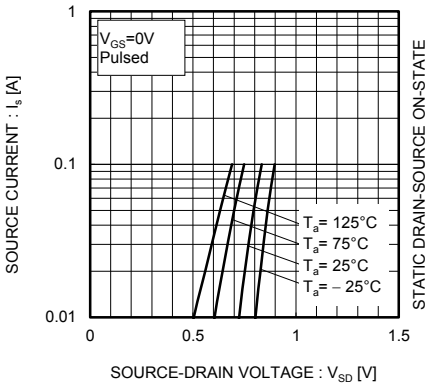


Fig.11 Reverse Drain Current vs. Sourse-Drain Voltage

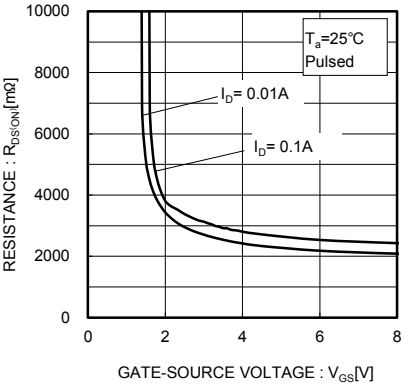


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

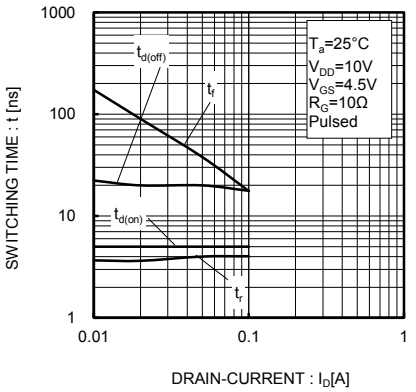


Fig.13 Switching Characteristics

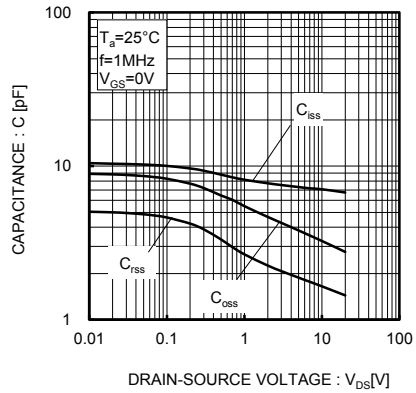


Fig.14 Typical Capacitance vs. Drain-Source Voltage

● **Measurement circuits**

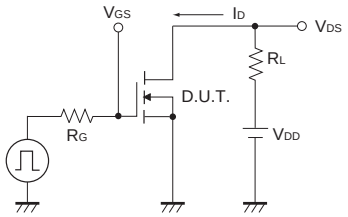


Fig.1-1 Switching Time Measurement Circuit

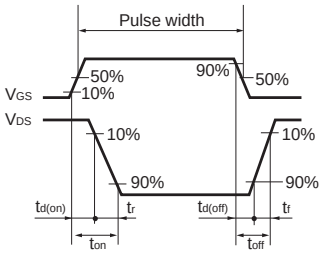


Fig.1-2 Switching Waveforms

● **Notice**

This product might cause chip aging and breakdown under the large electrified environment.
Please consider to design ESD protection circuit.

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