

1.2V Drive Nch + Nch MOSFET

VT6K1

● Structure

Silicon N-channel MOSFET

● 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		○

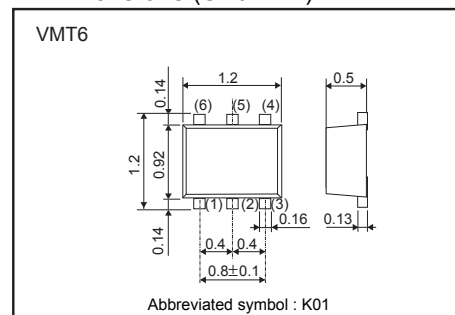
● Absolute maximum ratings (Ta = 25°C)

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		T_{ch}	150	°C
Range of storage temperature		T_{stg}	-55 to +150	°C

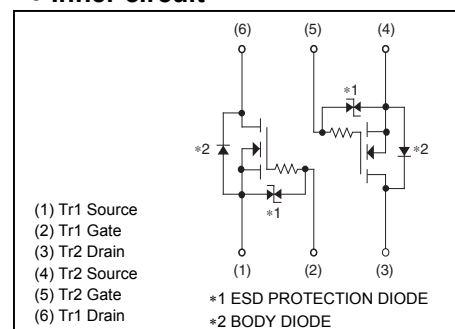
*1 $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$

*2 Each terminal mounted on a recommended land.

● Dimensions (Unit : mm)



● Inner circuit



● **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	$V_{GS} = \pm 8V, V_{DS} = 0V$
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	$V_{DS} = 10V, I_D = 100\mu A$
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	$R_L = 200\Omega$
Fall time	t_f^*	-	38	-	ns	$R_G = 10\Omega$

*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

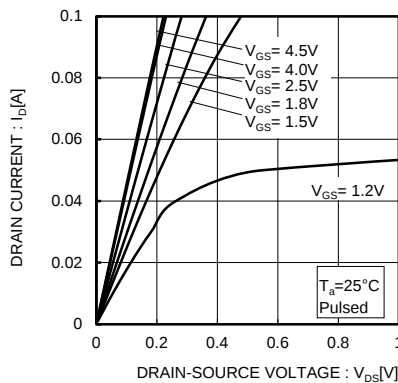


Fig.1 Typical Output Characteristics (I)

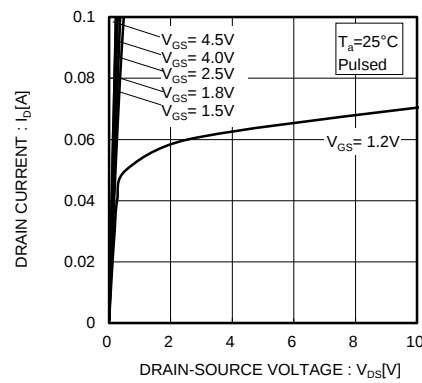


Fig.2 Typical Output Characteristics (II)

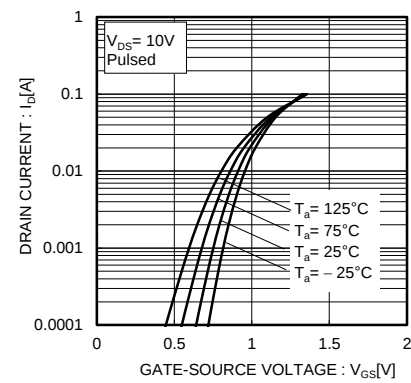


Fig.3 Typical Transfer Characteristics

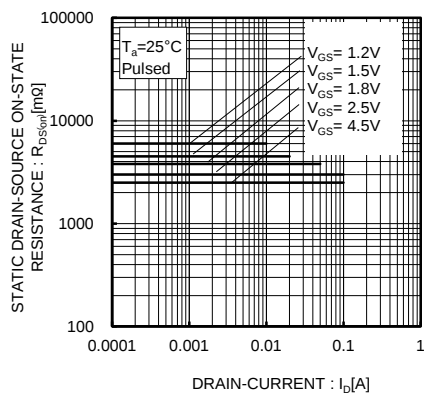


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

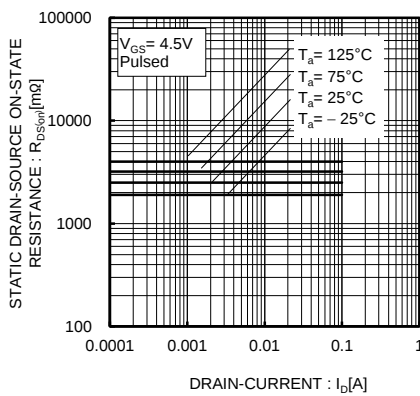


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

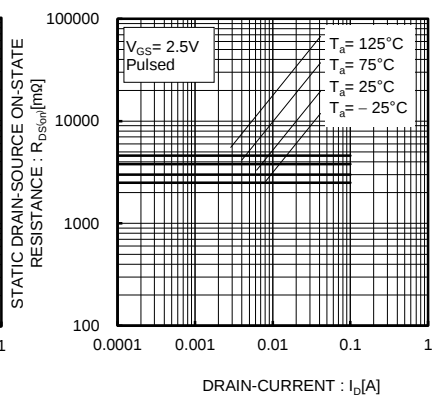


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

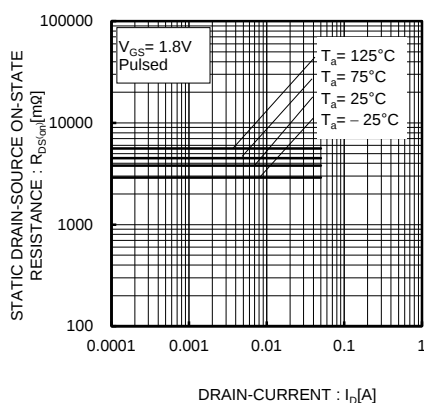


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

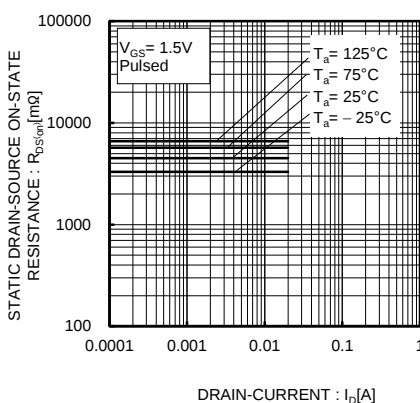


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (V)

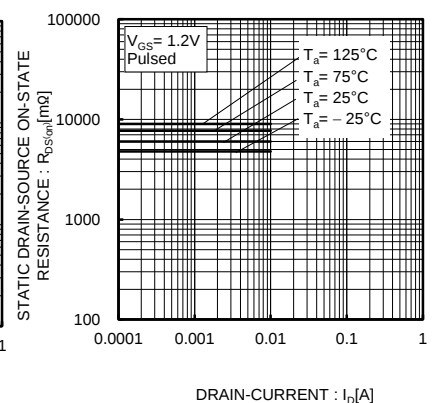


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (VI)

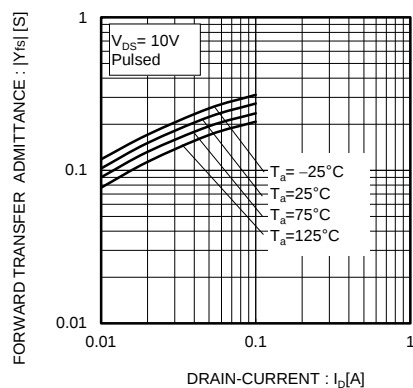


Fig.10 Forward Transfer Admittance vs. Drain Current

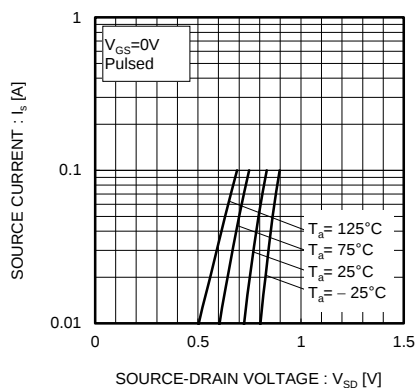


Fig.11 Reverse Drain Current vs. Source-Drain Voltage

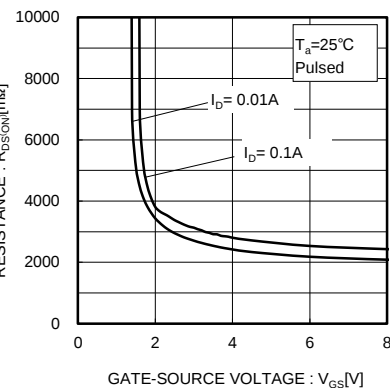


Fig.12 Static Drain-Source On-State Resistance vs. Gate Source Voltage

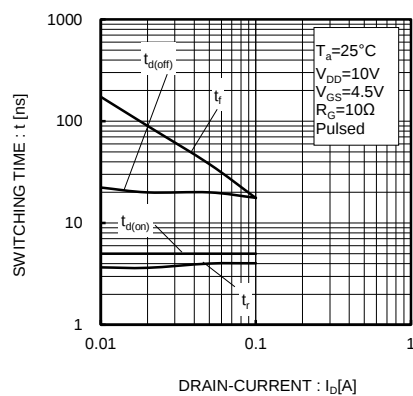


Fig.13 Switching Characteristics

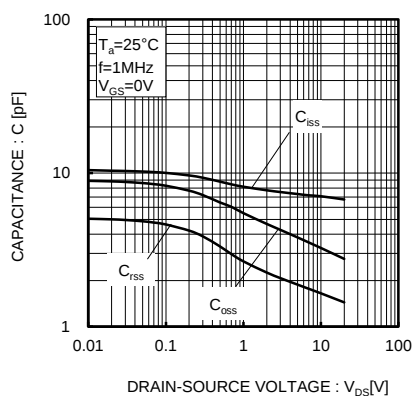


Fig.14 Typical Capacitance vs. Drain-Source Voltage

● Measurement circuits

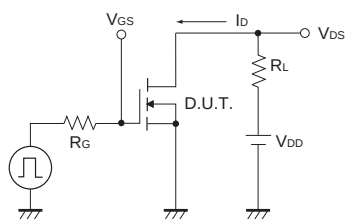


Fig.1-1 Switching Time Measurement Circuit

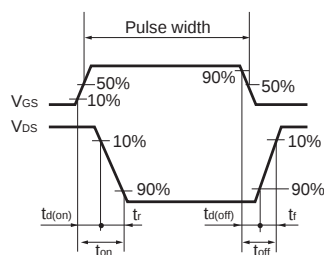


Fig.1-2 Switching Waveforms

● 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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