

1.5V Drive Pch+Pch MOSFET

TT8J21

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) High Power Package.
- 3) Low voltage drive. (1.5 V)

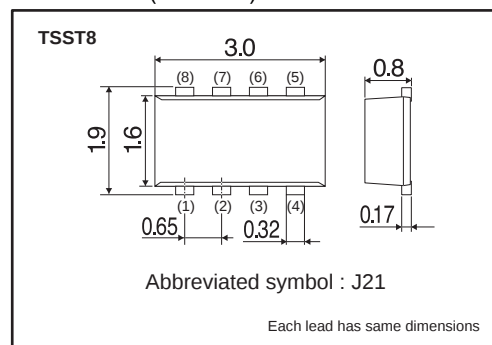
●Applications

Switching

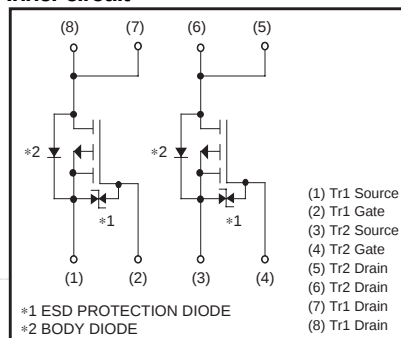
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
TT8J21		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

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

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	-20	V
Gate-source voltage	V_{GS}	±10	V
Drain current	Continuous	I_D	A
	Pulsed	I_{DP} *1	A
Source current (Body diode)	Continuous	I_S	A
	Pulsed	I_{SP} *1	A
Total power dissipation	P_D *2	1.25	W / TOTAL
		1.0	W / ELEMENT
Channel temperature	T_{ch}	150	°C
Range of Storage temperature	T_{stg}	-55 to +150	°C

*1 $P_{ws} \leq 10\mu s$, Duty cycles $\leq 1\%$

*2 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	100	°C / W / TOTAL
		125	°C / W / ELEMENT

* Mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	±10	μA	$V_{GS}=±10V$, $V_{DS}=0V$
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	$V_{DS} = -10V$, $I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	—	49	68	mΩ	$I_D = -2.5A$, $V_{GS} = -4.5V$
		—	68	95	mΩ	$I_D = -1.2A$, $V_{GS} = -2.5V$
		—	100	150	mΩ	$I_D = -1.2A$, $V_{GS} = -1.8V$
		—	140	280	mΩ	$I_D = -0.5A$, $V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	2.5	—	—	S	$V_{DS} = -10V$, $I_D = -2.5A$
Input capacitance	C_{iss}	—	1270	—	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	—	100	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	90	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	9	—	ns	$V_{DD} \hat{=} -10V$
Rise time	t_r *	—	30	—	ns	$V_{GS} = -4.5V$
Turn-off delay time	$t_{d(off)}$ *	—	120	—	ns	$I_D = -1.2A$
Fall time	t_f *	—	85	—	ns	$R_L \hat{=} 8.3\Omega$
Total gate charge	Q_g *	—	12	—	nC	$V_{DD} \hat{=} -10V$
Gate-source charge	Q_{gs} *	—	2.5	—	nC	$V_{GS} = -4.5V$
Gate-drain charge	Q_{gd} *	—	2.0	—	nC	$I_D = -2.5A$
						$R_L \hat{=} 4\Omega / R_G=10\Omega$

* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	—	—	−1.2	V	$I_S = -2.5A$, $V_{GS}=0V$

* Pulsed

●Electrical characteristic curves

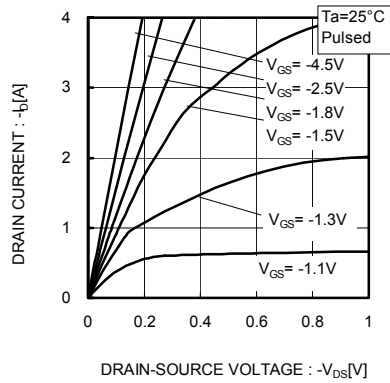


Fig.1 Typical Output Characteristics (I)

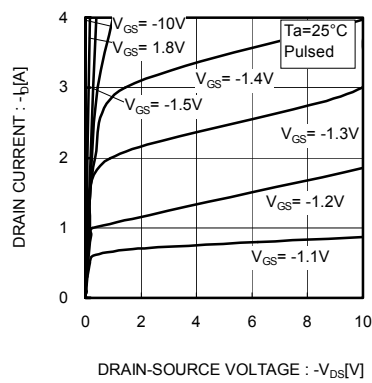


Fig.2 Typical Output Characteristics (II)

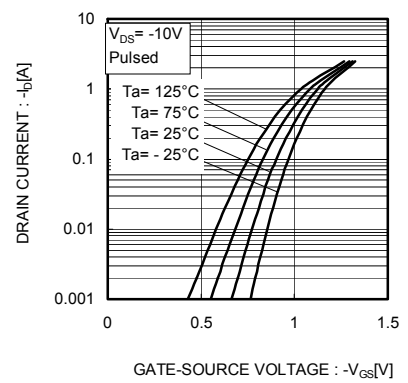


Fig.3 Typical Transfer Characteristics

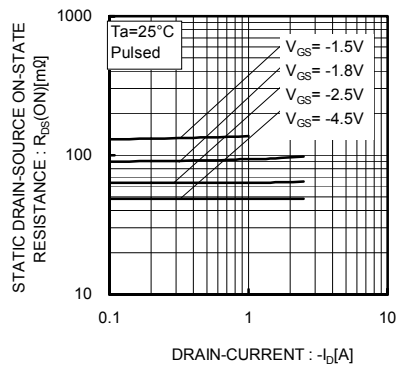


Fig.4 Static Drain-Source On-State Resistance vs. Drain

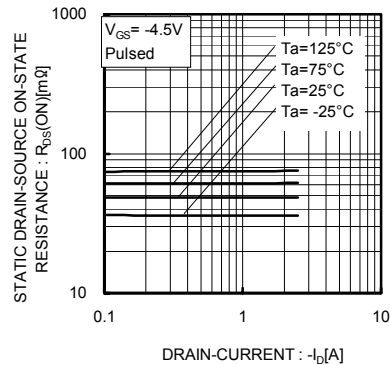


Fig.5 Static Drain-Source On-State Resistance vs. Drain

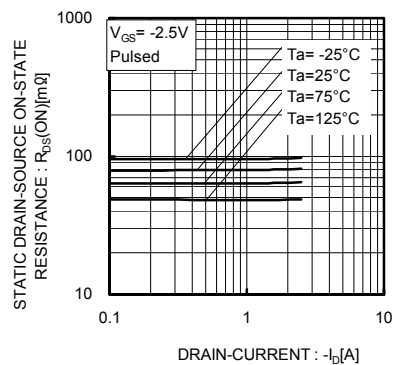


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

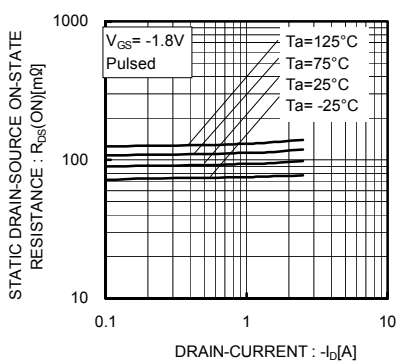


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

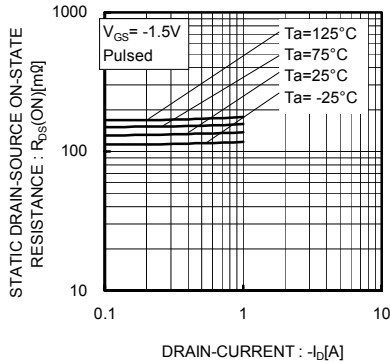


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(IV)

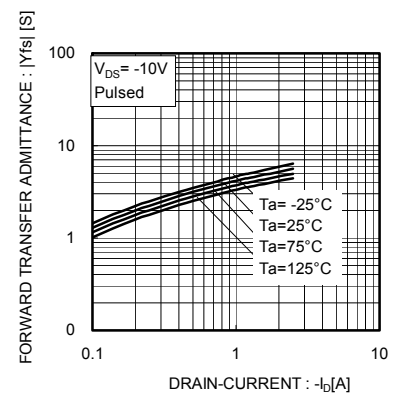


Fig.9 Forward Transfer Admittance vs. Drain Current

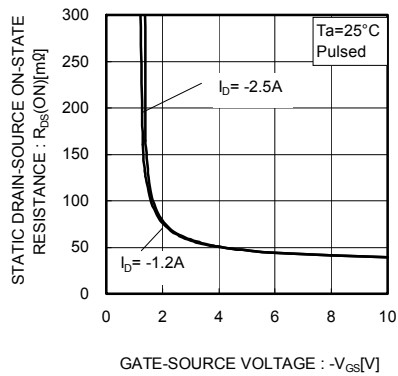


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

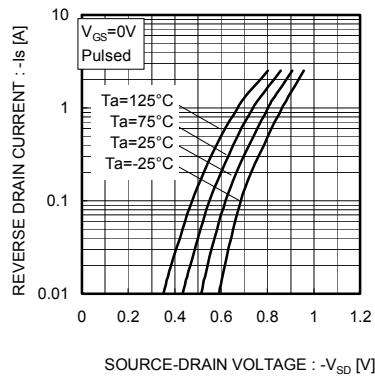


Fig.11 Reverse Drain Current vs. Source-Drain Voltage

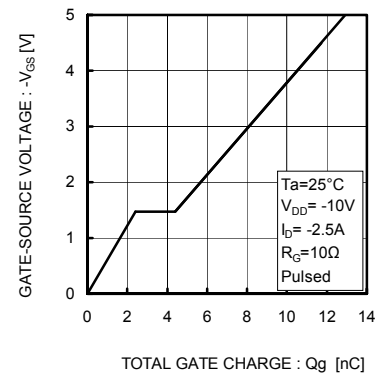


Fig.12 Dynamic Input Characteristics

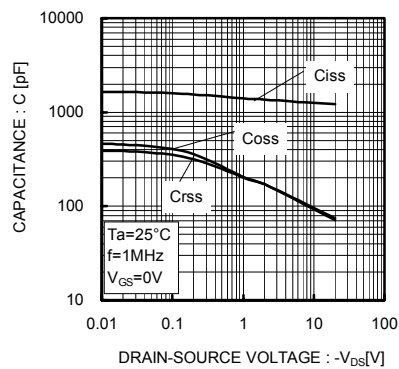


Fig.13 Typical Capacitance vs. Drain-Source

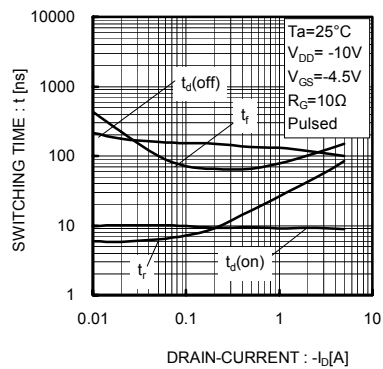


Fig.14 Switching Characteristics

●Measurement circuits

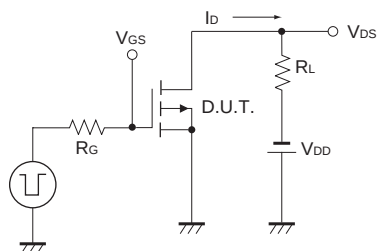


Fig.1-1 Switching Time Measurement Circuit

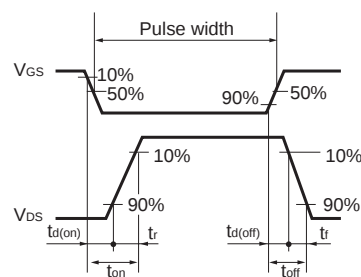


Fig.1-2 Switching Waveforms

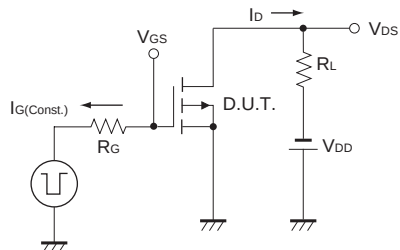


Fig.2-1 Gate Charge Measurement Circuit

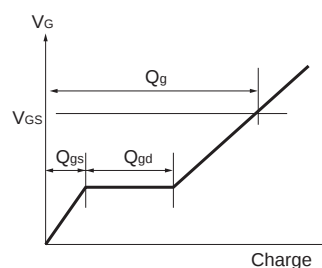


Fig.2-2 Gate Charge Waveform

●Notice

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

Notes

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