4V Drive Nch + Nch MOSFET

TT8K11

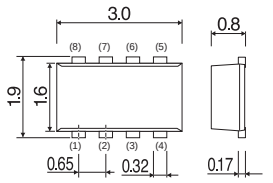
● Structure
Silicon N-channel MOSFET

● Features
1) Low on-resistance.
2) Low voltage drive(4V drive).
3) Small surface mount package(TSST8).

● Application
Switching

● Dimensions (Unit : mm)

TSST8

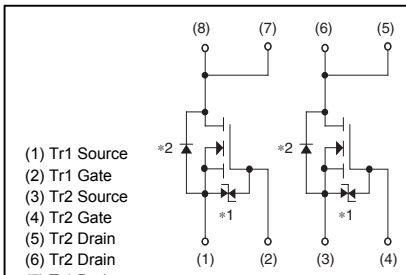


Abbreviated symbol : K11

● Packaging specifications

Type	Package	Taping
	Code	TCR
	Basic ordering unit (pieces)	3000
TT8K11		○

● Inner circuit



*1 ESD PROTECTION DIODE
*2 BODY DIODE

● Absolute maximum ratings (Ta = 25°C)
<It is the same ratings for the Tr1 and Tr2.>

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±3	A
	Pulsed	I_{DP} *1	±12	A
Source current (Body Diode)	Continuous	I_S	0.8	A
	Pulsed	I_{SP} *1	12	A
Power dissipation		P_D *2	1.25	W / TOTAL
			1.0	W / ELEMENT
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

*1 Pw≤10μs, Duty cycle≤1%

*2 Mounted on a ceramic board.

● Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to Ambient	Rth (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}=±20V, 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	$V_{GS\ (th)}$	1.0	-	2.5	V	V_{DS}=10V, I_D=1A
Static drain-source on-state resistance	$R_{DS\ (on)}$ *	-	51	71	mΩ	I_D=3A, V_{GS}=10V
		-	67	94		I_D=3A, V_{GS}=4.5V
		-	78	109		I_D=3A, V_{GS}=4V
Forward transfer admittance	$\|Y_{fs}\|$*	2.0	-	-	S	V_{DS}=10V, I_D=3A
Input capacitance	C_{iss}	-	140	-	pF	V_{DS}=10V
Output capacitance	C_{oss}	-	55	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	28	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	5	-	ns	V_{DD}≒15V, I_D=1.5A
Rise time	t_r *	-	13	-	ns	V_{GS}=4.5V
Turn-off delay time	$t_{d(off)}$*	-	20	-	ns	R_L=10Ω
Fall time	t_f *	-	3	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	2.5	-	nC	V_{DD}≒15V, I_D=3A
Gate-source charge	Q_{gs} *	-	0.8	-	nC	V_{GS}=5V
Gate-drain charge	Q_{gd} *	-	0.6	-	nC	

*Pulsed

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD} *	-	-	1.2	V	I_s=3A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (Ⅰ)

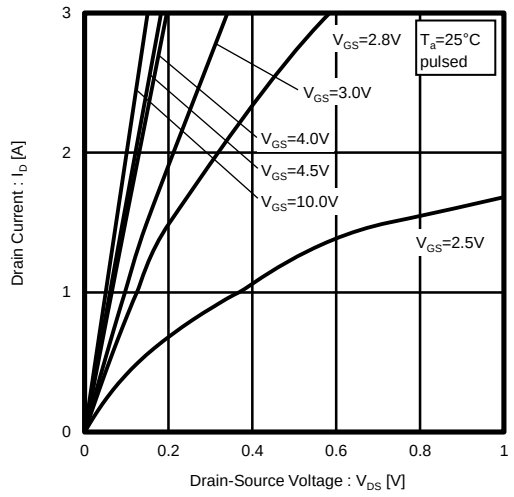


Fig.2 Typical Output Characteristics (Ⅱ)

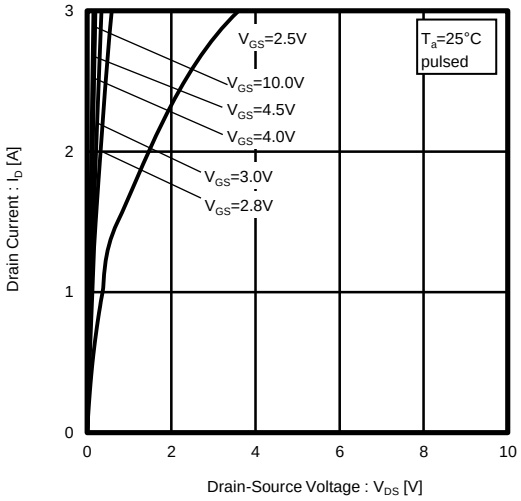


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

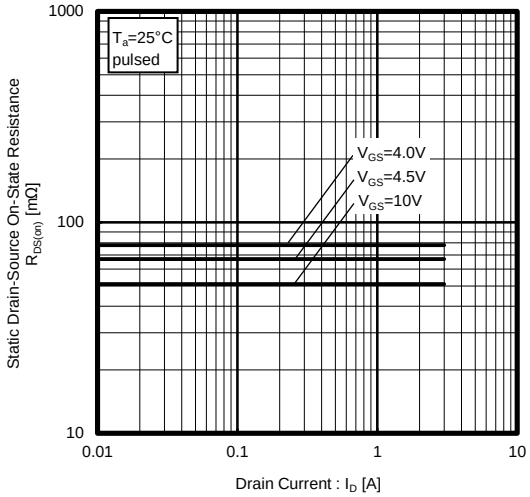


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

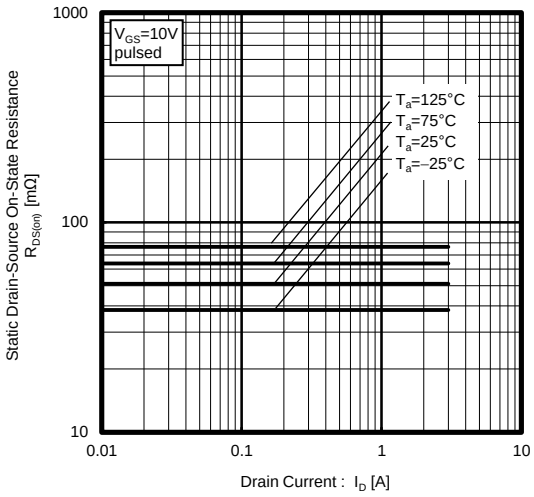


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

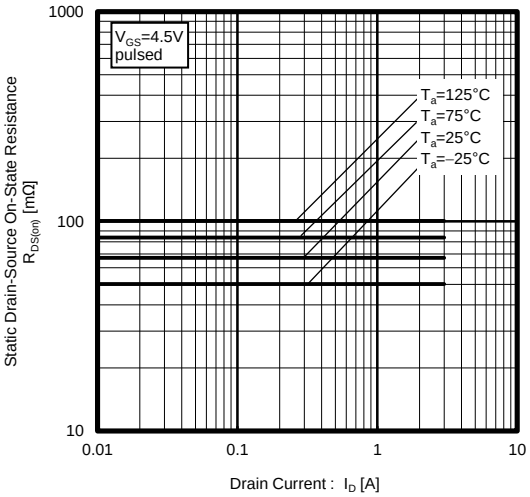


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

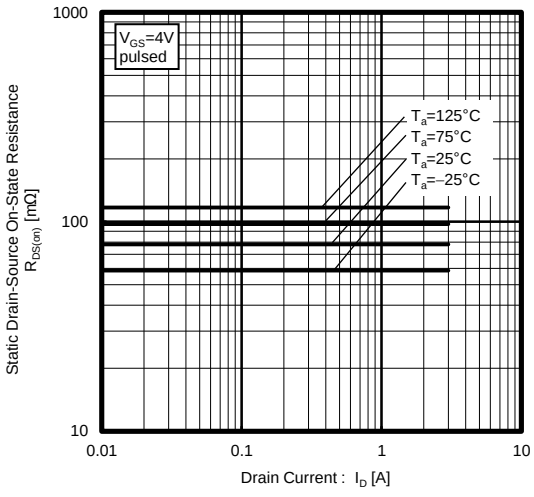


Fig.7 Forward Transfer Admittance vs. Drain Current

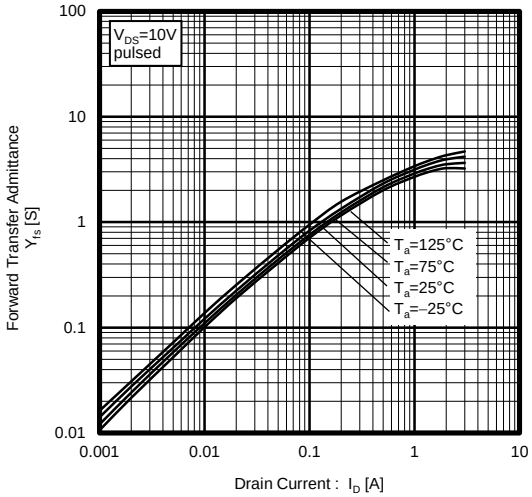


Fig.8 Typical Transfer Characteristics

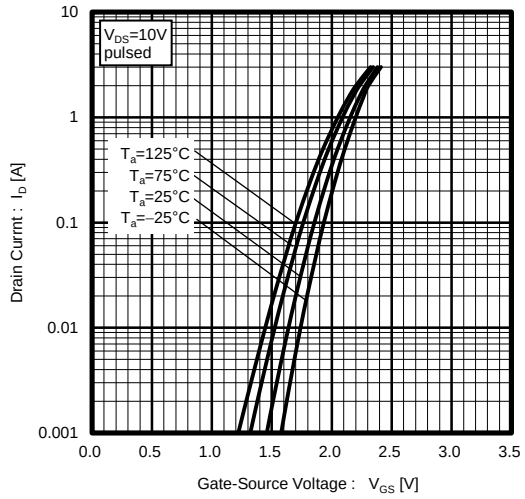


Fig.9 Source Current vs. Source-Drain Voltage

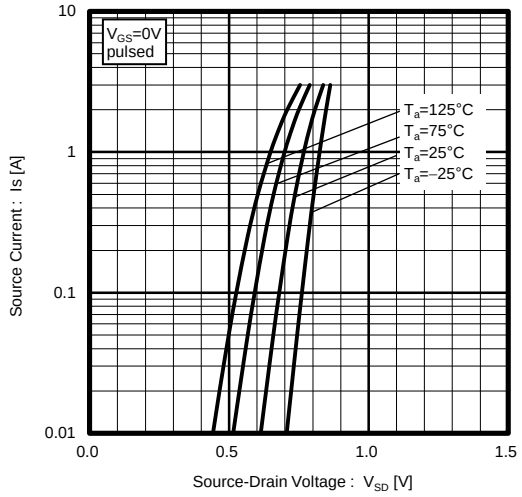


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

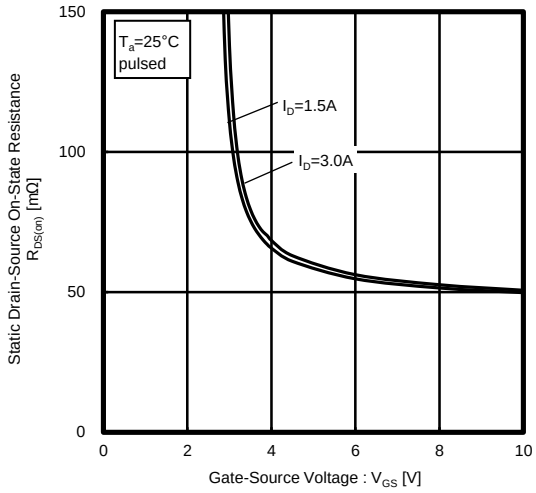


Fig.11 Switching Characteristics

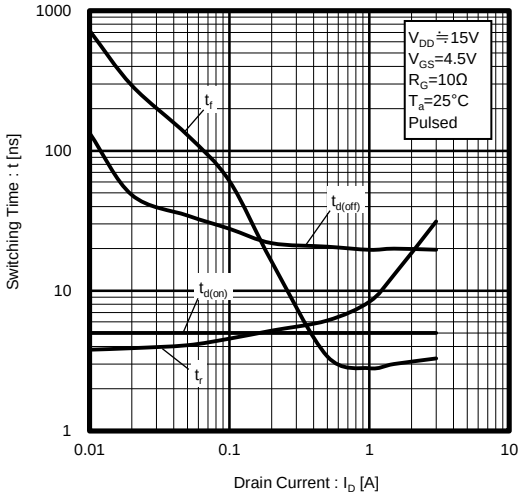


Fig.12 Dynamic Input Characteristics

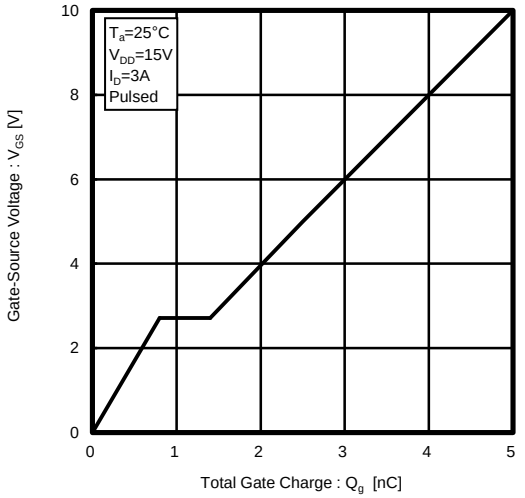


Fig.13 Typical Capacitance vs. Drain-Source Voltage

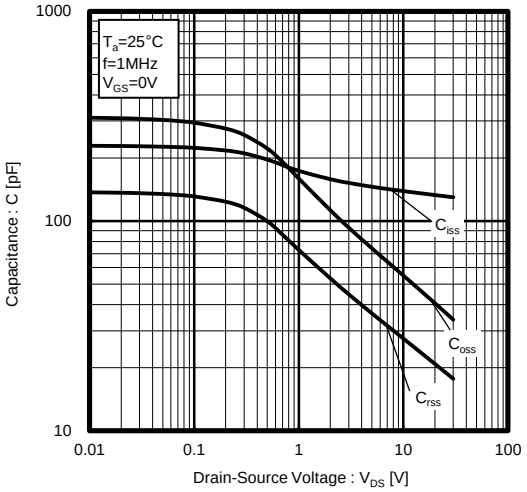


Fig.14 Maximum Safe Operating Area

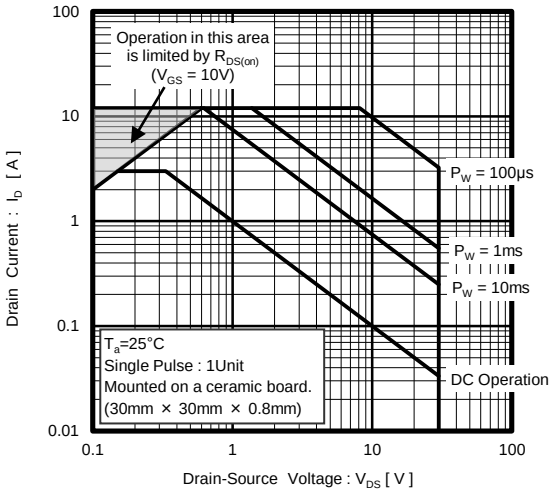
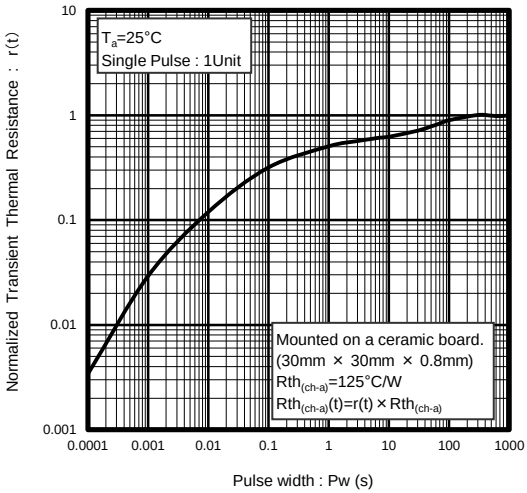


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



● Measurement circuits

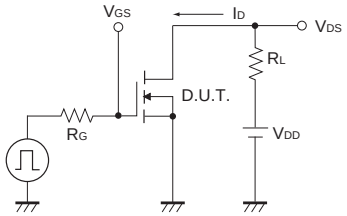


Fig.1-1 Switching Time Measurement Circuit

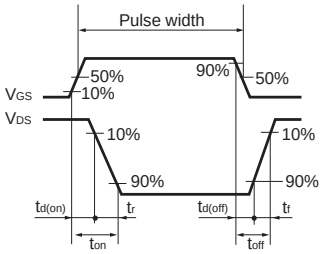


Fig.1-2 Switching Waveforms

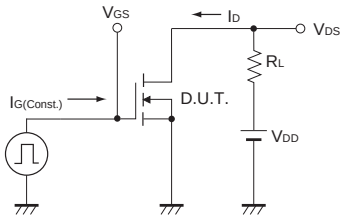


Fig.2-1 Gate Charge Measurement Circuit

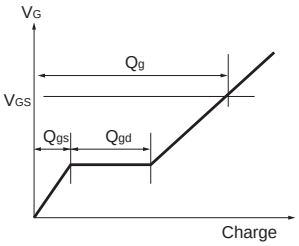


Fig.2-2 Gate Charge Waveform

● 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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