

V_{DSS}	20V
$R_{DS(on)}$ (Max.)	72m Ω
I_D	$\pm 2.5A$
P_D	1.25W

● Features

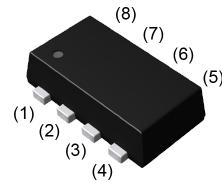
- 1) Low on - resistance.
- 2) High power package.
- 3) 1.5V drive

● Application

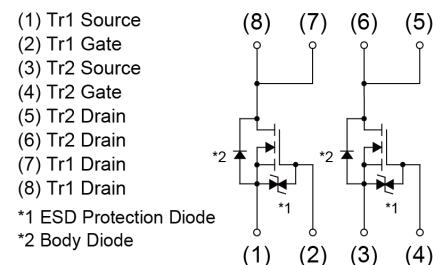
Switching

●Outline

TSST8



● Inner circuit



● Packaging specifications

Type	Packing	Embossed Tape
	Reel size (mm)	180
	Tape width (mm)	8
	Basic ordering unit (pcs)	3000
	Taping code	TR
	Marking	K01

- **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$) <It is the same ratings for the Tr1 and Tr2>

Parameter	Symbol	Value	Unit
Drain - Source voltage	V_{DSS}	20	V
Continuous drain current	I_D	± 2.5	A
Pulsed drain current	$I_{D,pulse}^{*1}$	± 10	A
Gate - Source voltage	V_{GSS}	± 10	V
Power dissipation	total	P_D^{*2}	1.25
	element		1.0
	total	P_D^{*3}	0.6
Junction temperature	T_j	150	°C
Range of storage temperature	T_{stg}	-55 to +150	°C

● Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - ambient	total	R_{thJA}^{*2}	-	-	100
	element		-	-	125
	total	R_{thJA}^{*3}	-	-	208

● Electrical characteristics ($T_a = 25^\circ\text{C}$) <It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}$, $I_D = 1\text{mA}$	20	-	-	V
Breakdown voltage temperature coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_j}$	$I_D = 1\text{mA}$ referenced to 25°C	-	29.0	-	mV°C
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$	-	-	1	μA
Gate - Source leakage current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 10\text{V}$	-	-	± 10	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = 10\text{V}$, $I_D = 1\text{mA}$	0.3	-	1.0	V
Gate threshold voltage temperature coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_j}$	$I_D = 1\text{mA}$ referenced to 25°C	-	-1.6	-	mV°C
Static drain - source on - state resistance	$R_{DS(on)}^{*4}$	$V_{GS} = 4.5\text{V}$, $I_D = 2.5\text{A}$	-	52	72	$\text{m}\Omega$
		$V_{GS} = 2.5\text{V}$, $I_D = 2.5\text{A}$	-	65	90	
		$V_{GS} = 1.8\text{V}$, $I_D = 1.2\text{A}$	-	85	120	
		$V_{GS} = 1.5\text{V}$, $I_D = 0.5\text{A}$	-	100	140	
Forward Transfer Admittance	$ Y_{fs} ^{*4}$	$V_{DS} = 10\text{V}$, $I_D = 2.5\text{A}$	2.7	-	-	S

●Electrical characteristics ($T_a = 25^\circ\text{C}$) <It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	C_{iss}	$V_{GS} = 0\text{V}$ $V_{DS} = 10\text{V}$ $f = 1\text{MHz}$	-	260	-	pF
Output capacitance	C_{oss}		-	65	-	
Reverse transfer capacitance	C_{rss}		-	35	-	
Turn - on delay time	$t_{d(on)}^*{}^4$	$V_{DD} \approx 10\text{V}, V_{GS} = 4.5\text{V}$ $I_D = 1.2\text{A}$ $R_L = 8.3\Omega$ $R_G = 10\Omega$	-	9	-	ns
Rise time	$t_r^*{}^4$		-	17	-	
Turn - off delay time	$t_{d(off)}^*{}^4$		-	28	-	
Fall time	$t_f^*{}^4$		-	17	-	

●Gate charge characteristics ($T_a = 25^\circ\text{C}$) <It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	$Q_g^*{}^4$	$V_{DD} \approx 10\text{V}$ $I_D = 2.5\text{A}$ $V_{GS} = 4.5\text{V}$	-	3.6	-	nC
Gate - Source charge	$Q_{gs}^*{}^4$		-	0.7	-	
Gate - Drain charge	$Q_{gd}^*{}^4$		-	0.6	-	

●Body diode electrical characteristics (Source-Drain) ($T_a = 25^\circ\text{C}$)

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Body diode continuous forward current	I_S	$T_a = 25^\circ\text{C}$	-	-	0.8	A
Body diode pulse current	$I_{SP}^*{}^1$		-	-	10	
Forward voltage	$V_{SD}^*{}^4$	$V_{GS} = 0\text{V}, I_S = 2.5\text{A}$		-	1.2	V

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

*2 Mounted on a ceramic board (30×30×0.8mm)

*3 Mounted on a FR4 (20×20×0.8mm)

*4 Pulsed

●Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

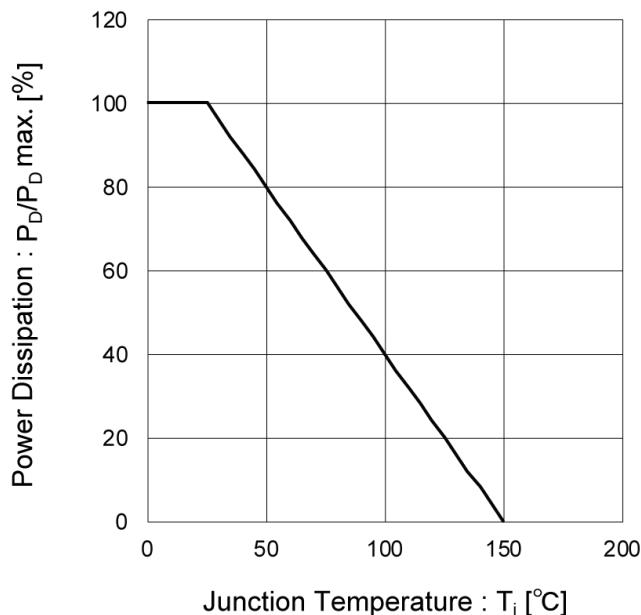


Fig.2 Maximum Safe Operating Area

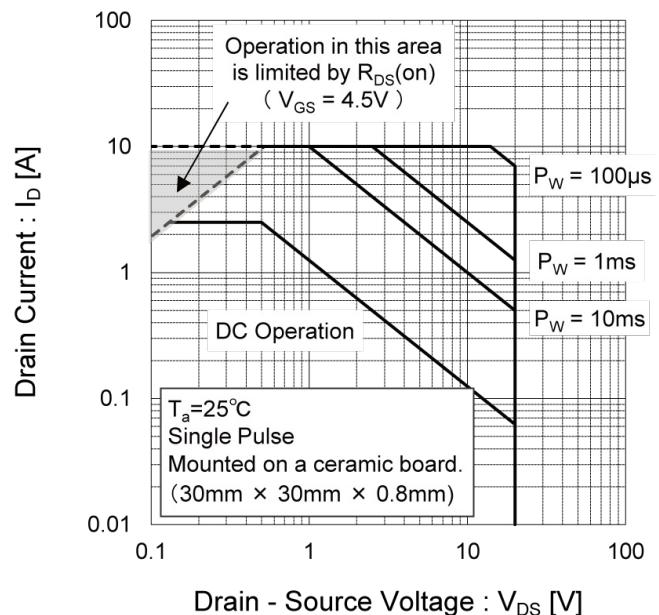


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

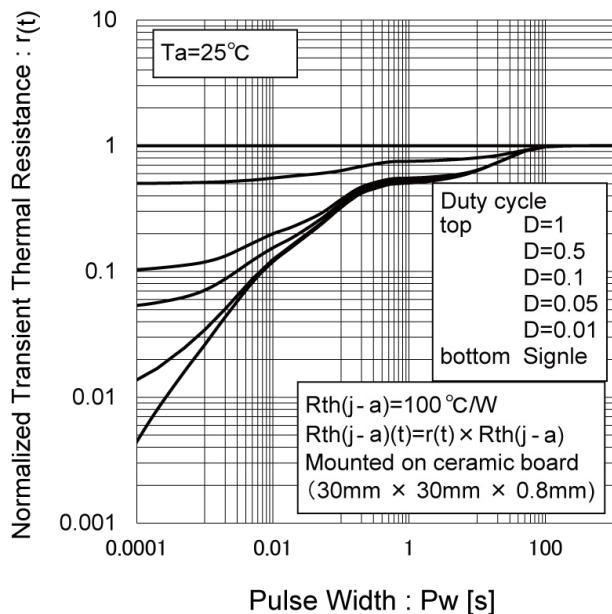
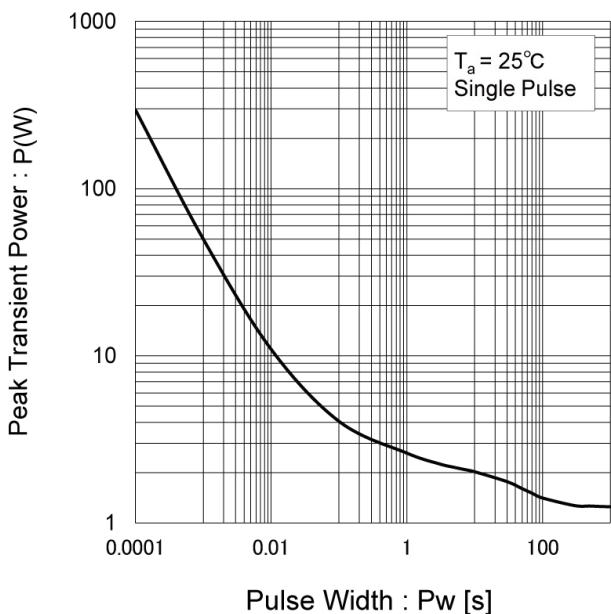


Fig.4 Single Pulse Maximum Power dissipation



●Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

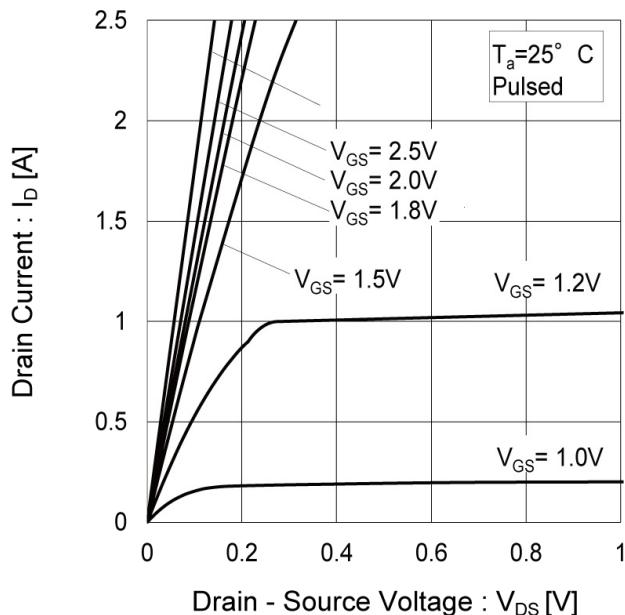


Fig.6 Typical Output Characteristics(II)

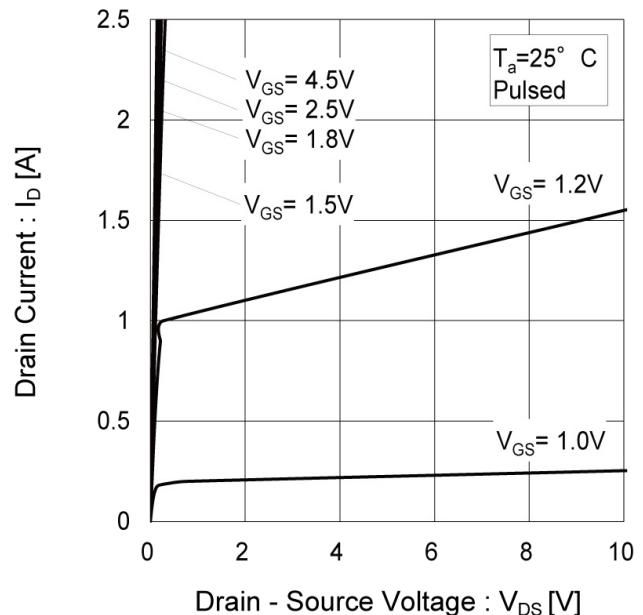


Fig.7 Breakdown Voltage vs. Junction Temperature

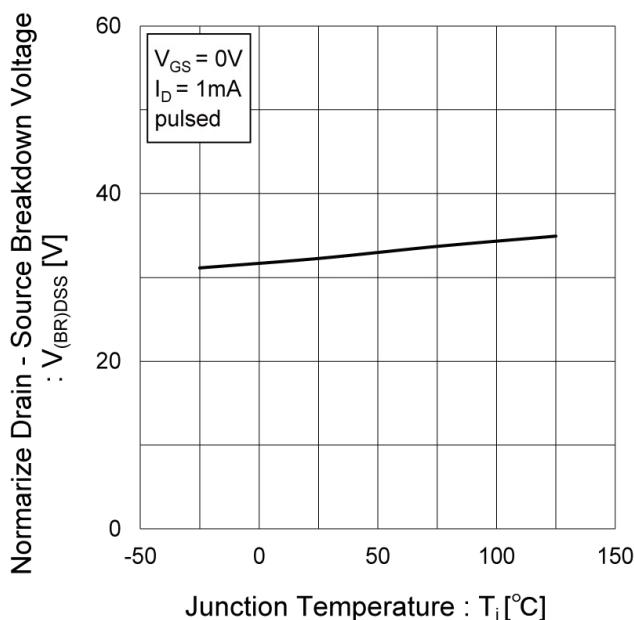
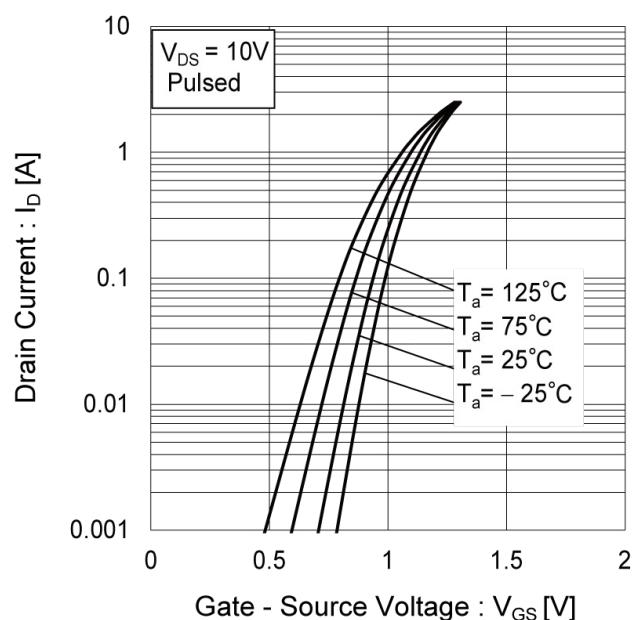


Fig.8 Typical Transfer Characteristics



● Electrical characteristic curves

Fig.9 Gate Threshold Voltage vs.
Junction Temperature

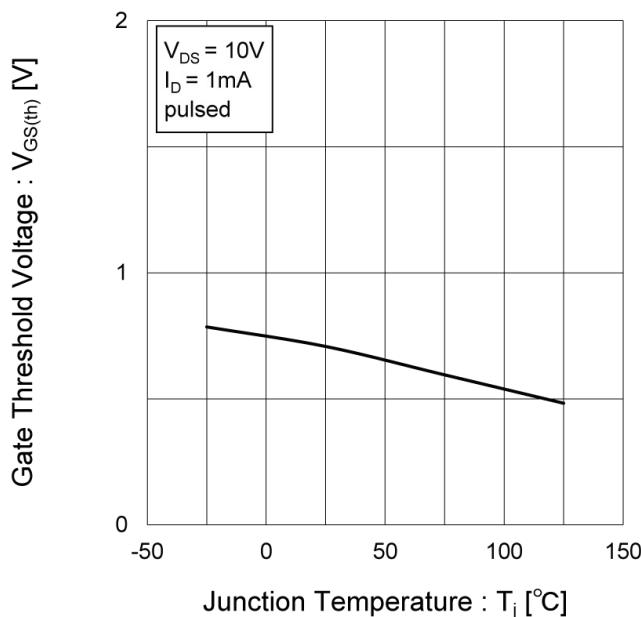


Fig.10 Forward Transfer Admittance vs.
Drain Current

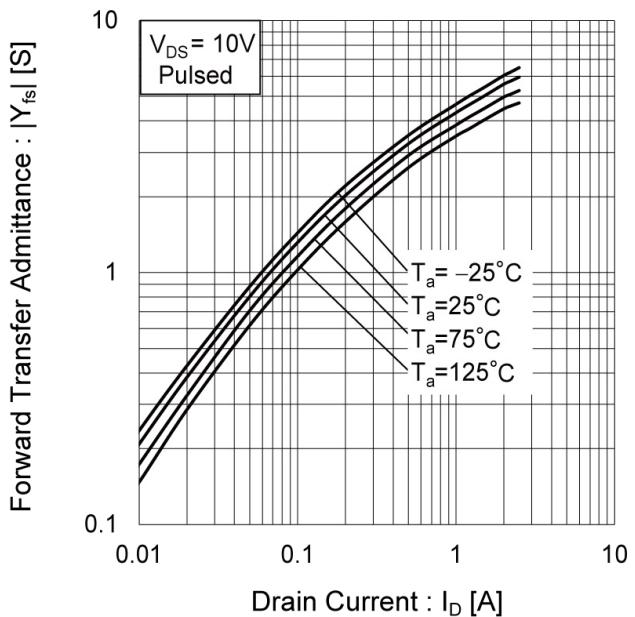


Fig.11 Drain Current Derating Curve

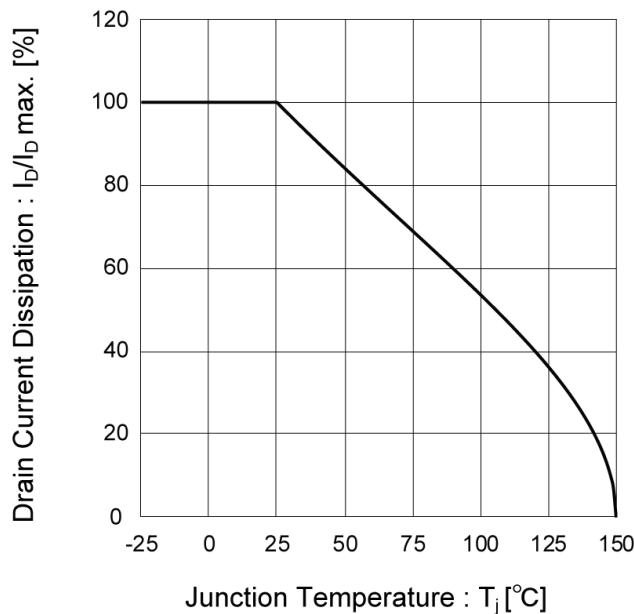
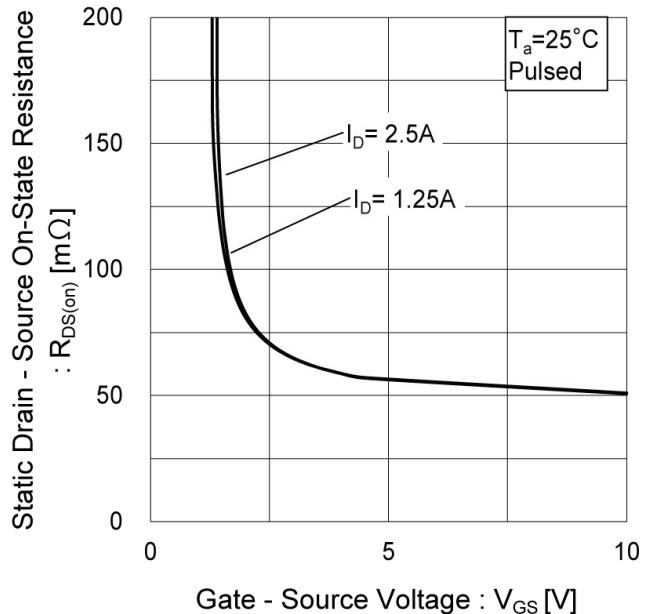


Fig.12 Static Drain - Source On - State
Resistance vs. Gate Source Voltage



●Electrical characteristic curves

Fig.13 Static Drain - Source On - State
Resistance vs. Junction Temperature

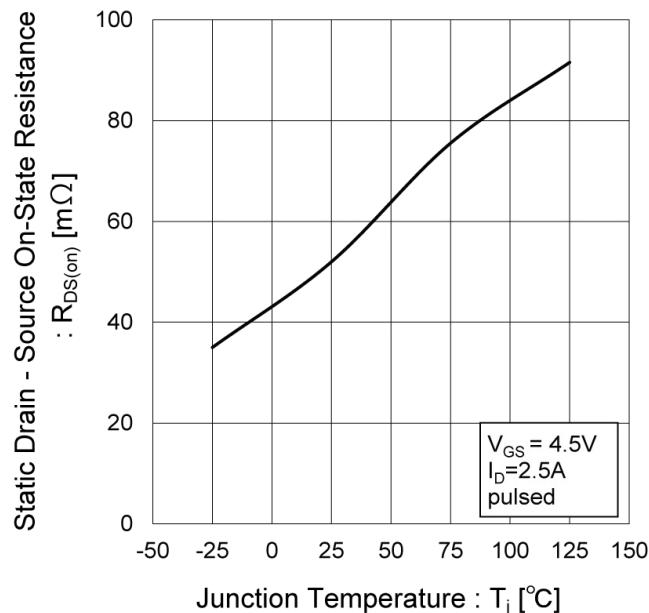
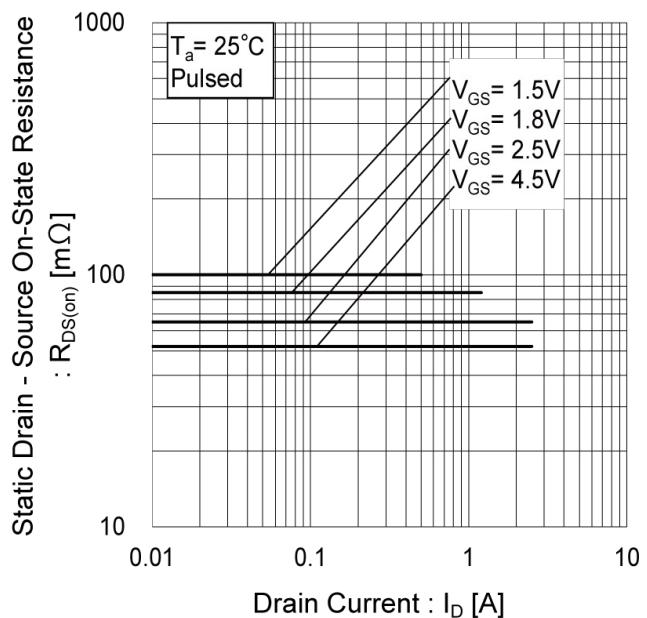


Fig.14 Static Drain - Source On - State
Resistance vs. Drain Current(I_D)



●Electrical characteristic curves

Fig.15 Static Drain - Source On - State
Resistance vs. Drain Current (II)

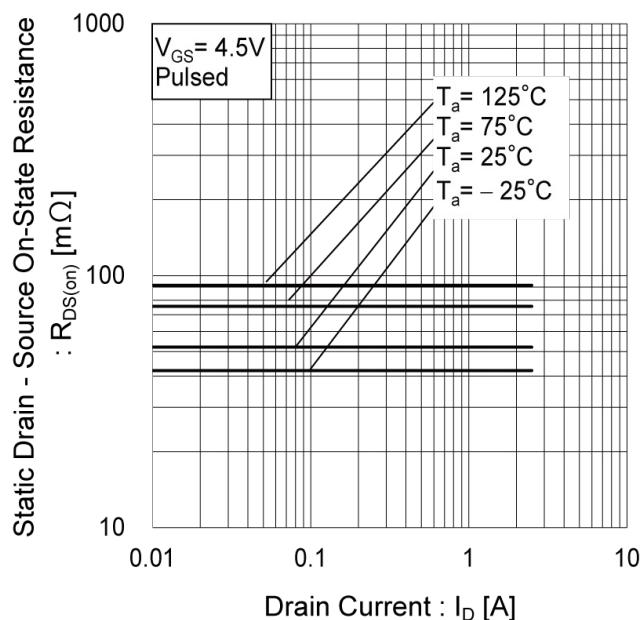


Fig.16 Static Drain - Source On - State
Resistance vs. Drain Current (III)

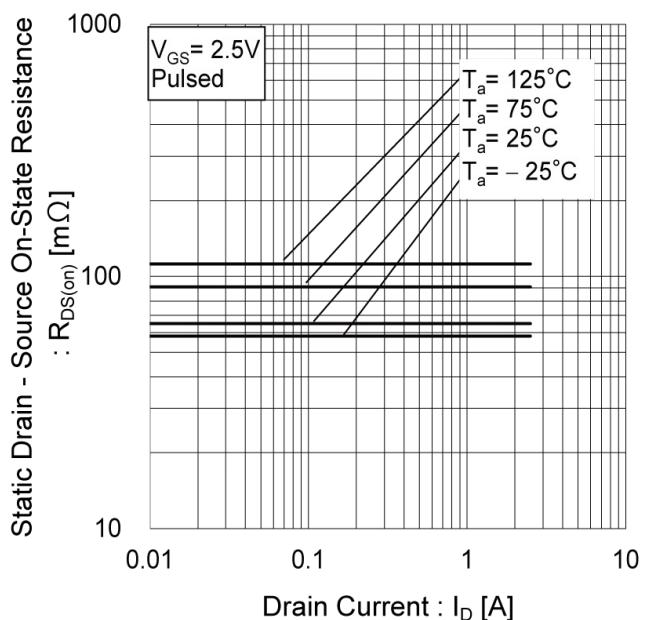


Fig.17 Static Drain - Source On - State
Resistance vs. Drain Current (IV)

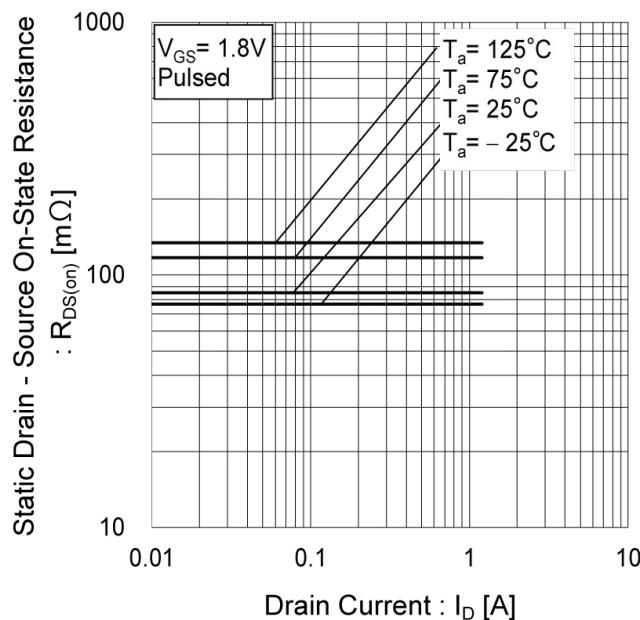
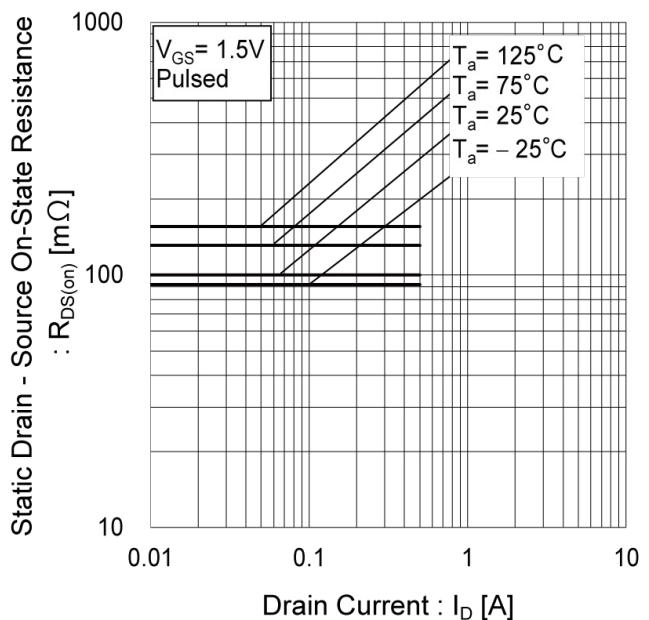


Fig.18 Static Drain - Source On - State
Resistance vs. Drain Current (V)



●Electrical characteristic curves

Fig.19 Typical Capacitance vs.
Drain - Source Voltage

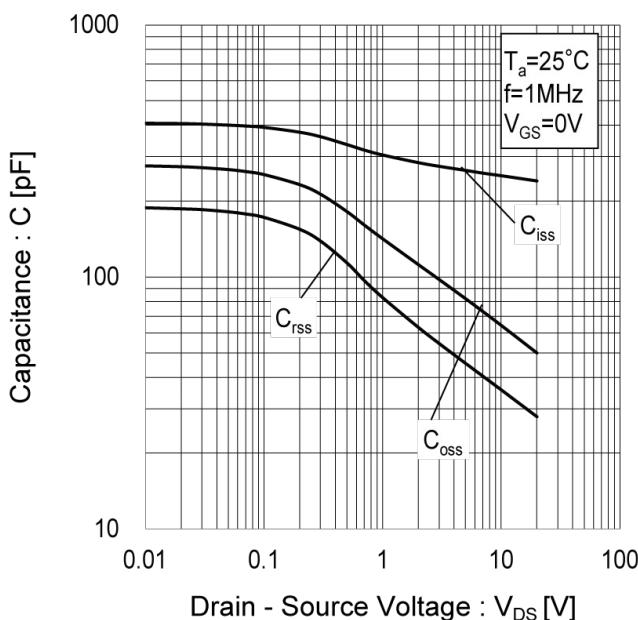


Fig.20 Switching Characteristics

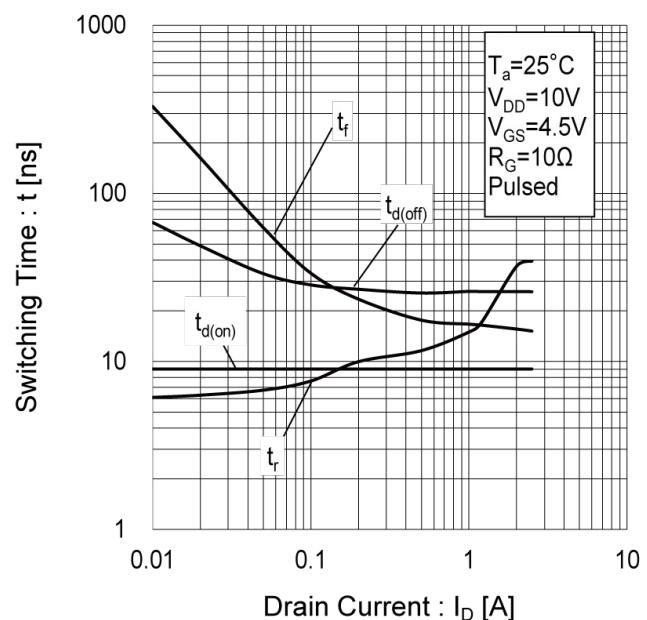


Fig.21 Dynamic Input Characteristics

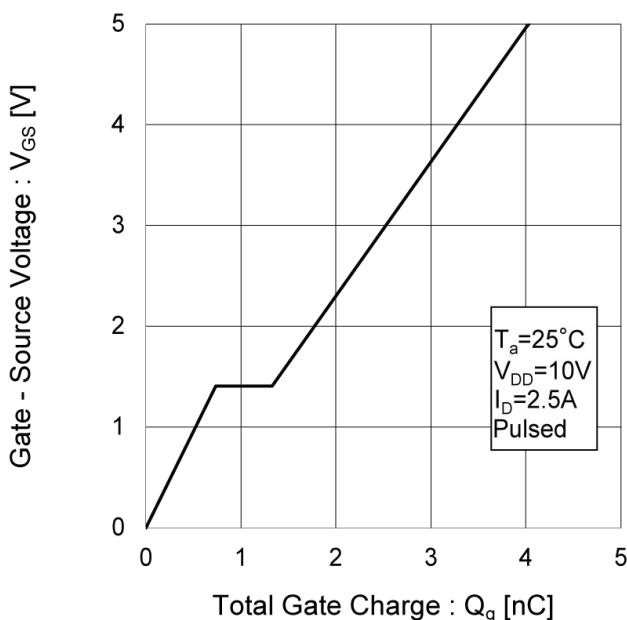
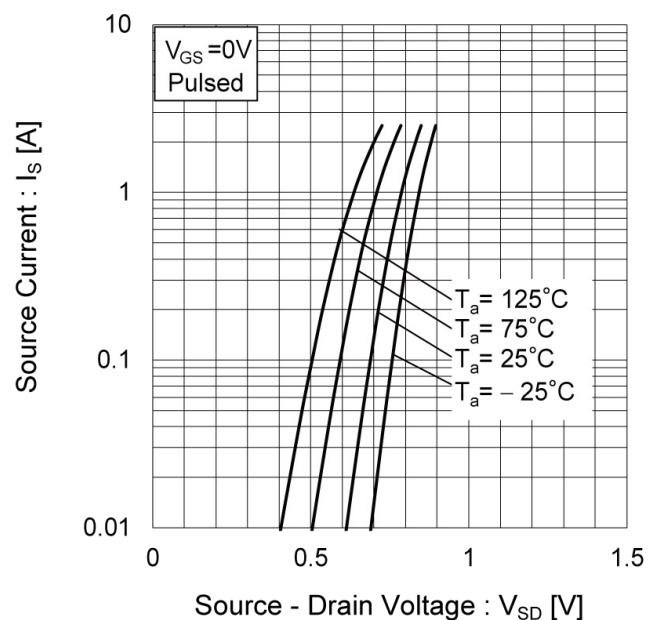


Fig.22 Source Current vs.
Source Drain Voltage



● **Measurement circuits** <It is the same for the Tr1 and Tr2>

Fig. 1-1 SWITCHING TIME MEASUREMENT CIRCUIT

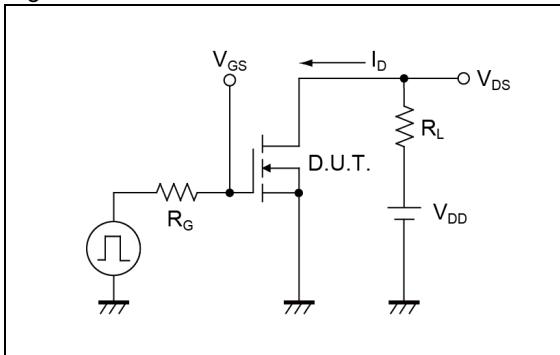


Fig. 1-2 SWITCHING WAVEFORMS

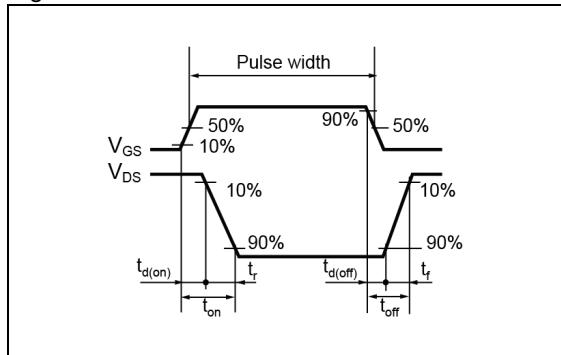


Fig. 2-1 GATE CHARGE MEASUREMENT CIRCUIT

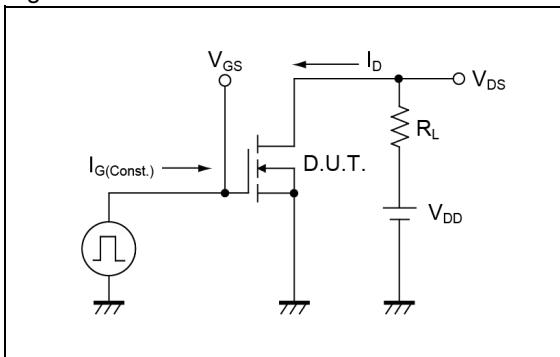
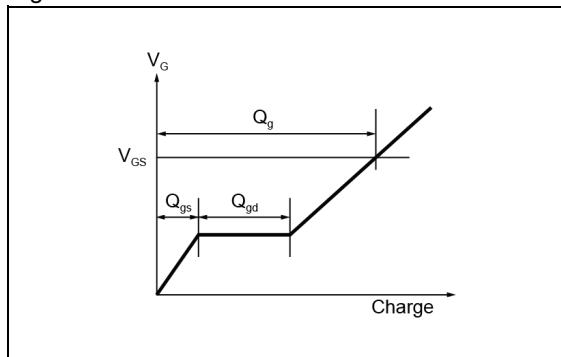


Fig. 2-2 GATE CHARGE WAVEFORM



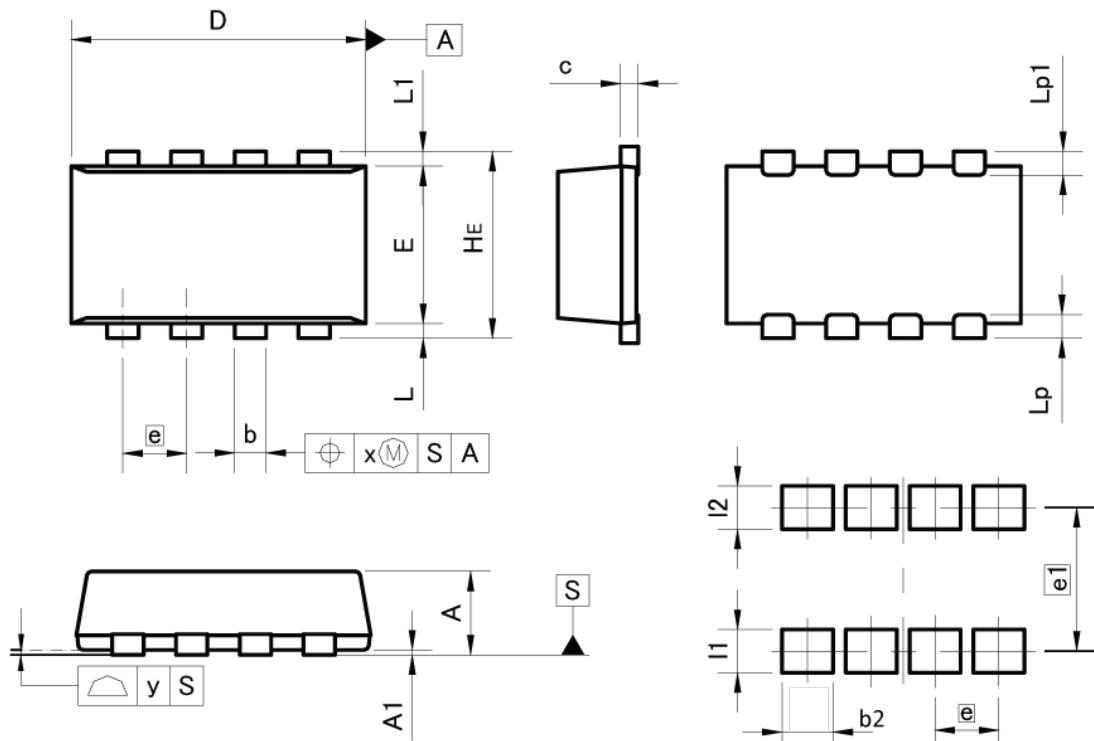
● **Notice**

This product might cause chip aging and breakdown under the large electrified environment.

Please consider to design ESD protection circuit.

●Dimensions

TSST8



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.75	0.85	0.030	0.033
A1	0.00	0.05	0.000	0.002
b	0.22	0.42	0.009	0.017
c	0.12	0.22	0.005	0.009
D	2.90	3.10	0.114	0.122
E	1.50	1.70	0.059	0.067
e	0.65		0.026	
HE	1.80	2.00	0.071	0.079
L	0.05	0.25	0.002	0.010
L1	0.05	0.25	0.002	0.010
Lp	0.15	0.34	0.006	0.013
Lp1	0.15	0.34	0.006	0.013
x	—	0.10	—	0.004
y	—	0.10	—	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	—	0.52	—	0.020
e1	1.46		0.057	
I1	—	0.44	—	0.017
I2	—	0.44	—	0.017

Dimension in mm/inches

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