

V_{DSS}	30V
R _{DS(on)} (Max.)	90mΩ
I _D	±2.5A
P _D	1.25W

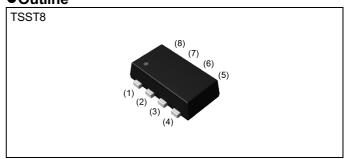
● Features

- 1) Low on resistance.
- 2) Built-in G-S protection diode.
- 3) Small surface mount package(TSST8)
- 4) 2.5V drive
- 5) Pb-free lead plating; RoHS compliant

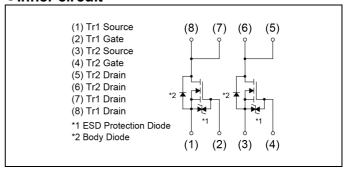
Application

Switching

Outline



•Inner circuit



Packaging specifications

	Packing	Embossed Tape
	Reel size (mm)	180
Туре	Tape width (mm)	8
	Basic ordering unit (pcs)	3000
	Taping code	TR
	Marking	K02

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

Parameter	Symbol	Value	Unit		
Drain - Source voltage	V _{DSS}	30	V		
Continuous drain current		I _D	±2.5	Α	
Pulsed drain current	I _{D,pulse} *1	±10	Α		
Gate - Source voltage	V_{GSS}	±12	V		
	total	P _D *2	1.25		
Power dissipation	element	P _D -	1.0	W	
	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		Cymbol	Values			Lleit
		Symbol	Min.	Тур.	Max.	Unit
	total	D *2	-	-	100	
Thermal resistance, junction - ambient	element	R _{thJA} *2	-	-	125	°C/W
	total	R _{thJA} *3	-	-	208	

ullet Electrical characteristics (T_a = 25°C) <It is the same characteristics for the Tr1 and Tr2>

Б		0 133	Values				
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit	
Drain - Source breakdown voltage	V _{(BR)DSS}	$V_{GS} = 0V$, $I_D = 1mA$	30	-	-	V	
Breakdown voltage temperature coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_{j}}$	I _D = 1mA referenced to 25°C	-	29	-	mV/°C	
Zero gate voltage drain current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA	
Gate - Source leakage current	I _{GSS}	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	±10	μA	
Gate threshold voltage	V _{GS(th)}	V _{DS} = 10V, I _D = 1mA	0.5	-	1.5	V	
Gate threshold voltage temperature coefficient	$\frac{\DeltaV_{GS(th)}}{\DeltaT_j}$	I _D = 1mA referenced to 25°C	-	-1.6	-	mV/°C	
		V _{GS} = 4.5V, I _D = 2.5A	-	65	90		
Static drain - source on - state resistance	R _{DS(on)} *4	V _{GS} = 4V, I _D = 2.5A	-	70	95	mΩ	
		V _{GS} = 2.5V, I _D = 2.5A	-	95	130		
Gate input resistance	R_G	f = 1MHz, open drain	-	20	-	Ω	
Forward Transfer Admittance	Y _{fs} *4	V _{DS} = 10V, I _D = 2.5A	2.2	-	-	S	

● Electrical characteristics (T_a = 25°C) < It is the same characteristics for the Tr1 and Tr2>

Doromotor	Cumb of	Conditions		Unit			
Parameter	Symbol Conditions —		Min.	Тур.	Max.	Orill	
Input capacitance	C _{iss}	V _{GS} = 0V	-	180	-		
Output capacitance	C _{oss}	V _{DS} = 10V	-	60	-	pF	
Reverse transfer capacitance	C _{rss}	f = 1MHz	1	35	-		
Turn - on delay time	t _{d(on)} *4	$V_{DD} \simeq 15V, V_{GS} = 4.5V$	ı	7	-		
Rise time	t _r *4	I _D = 1.2A	-	30	-	-	
Turn - off delay time	t _{d(off)} *4	$R_L = 12.5\Omega$	-	20	-	ns	
Fall time	t _f *4	$R_G = 10\Omega$	-	20	-		

● Gate charge characteristics (T_a = 25°C) < It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol Conditions			Unit		
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Offic
Total gate charge	Q _g *4	V _{DD} ≈ 15V	1	3.2	1	
Gate - Source charge	Q _{gs} *4	I _D = 2.5A	-	0.9	-	nC
Gate - Drain charge	Q _{gd} *4	V _{GS} = 4.5V	-	0.4	-	

● Body diode electrical characteristics (Source-Drain) (T_a = 25°C)

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

Doromotor	Cumb al	Conditions		l lait			
Parameter	Symbol	Symbol Conditions -	Min.	Тур.	Max.	- Unit	
Body diode continuous forward current	I _S	T _a = 25°C	-	-	0.8		
Body diode pulse current	I _{SP} *1		-	-	10	Α	
Forward voltage	V _{SD} *4	V _{GS} = 0V, I _S = 2.5A	-	-	1.2	V	

^{*1} Pw≦10µs , Duty cycle≦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

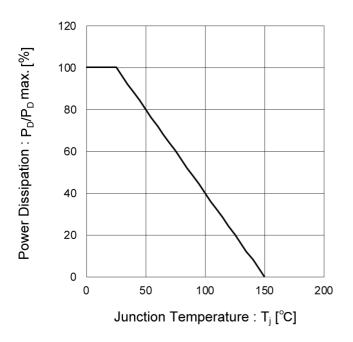
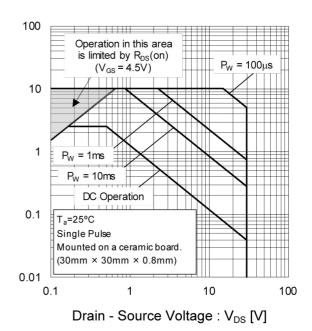


Fig.2 Maximum Safe Operating Area



Drain Current : I_D [A]

Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

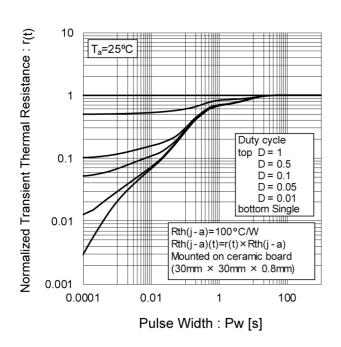
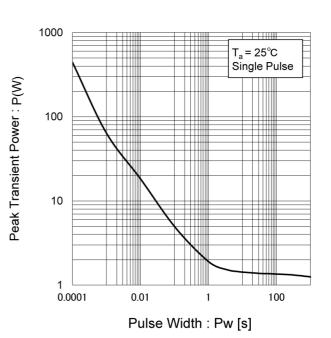


Fig.4 Single Pulse Maximum Power dissipation



• Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

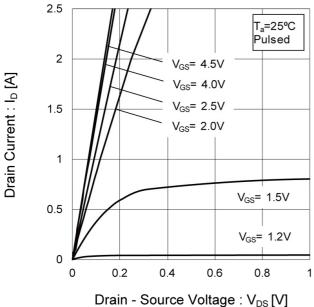
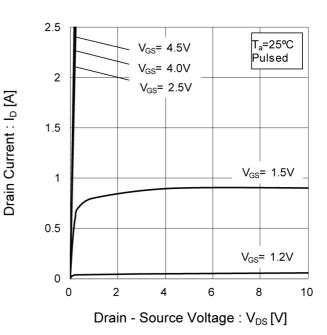


Fig.6 Typical Output Characteristics(II)



Drain - Source voltage . V_{DS}[V]

Fig.7 Breakdown Voltage vs.
Junction Temperature

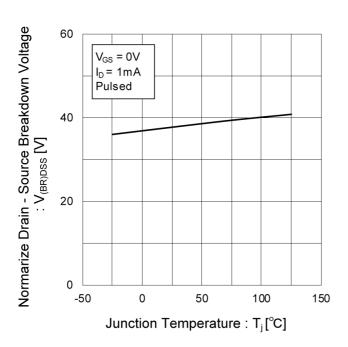
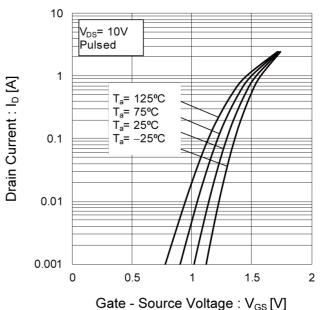


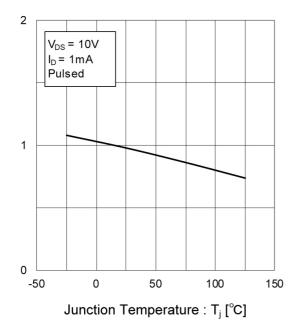
Fig.8 Typical Transfer Characteristics



Gate Threshold Voltage: VGS(th) [V]

• Electrical characteristic curves

Fig.9 Gate Threshold Voltage vs.
Junction Temperature



Forward Transfer Admittance $: |\mathsf{Y}_{\mathsf{fs}}| \, [\mathsf{S}]$

Fig.10 Forward Transfer Admittance vs.
Drain Current

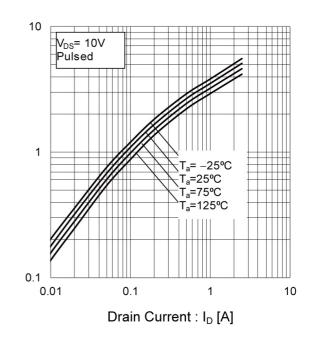


Fig.11 Drain Current Derating Curve

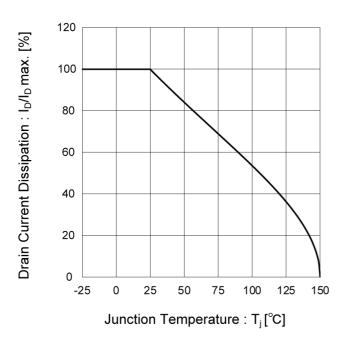
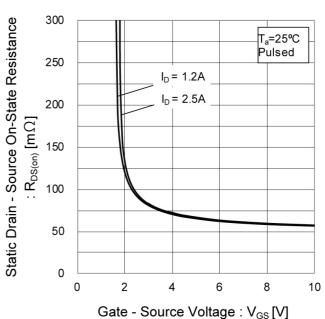


Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage



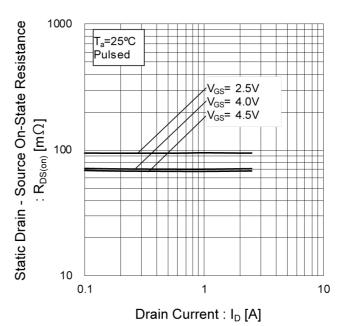
TT8K2

• Electrical characteristic curves

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

120 Static Drain - Source On-State Resistance 100 80 $: R_{DS(on)} [m\Omega]$ 60 40 $V_{GS} = 4.5V$ $I_{D} = 2.5A$ 20 Pulsed 25 50 -50 -25 75 100 125 150 Junction Temperature : T_i [°C]

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



ROHM

• Electrical characteristic curves

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

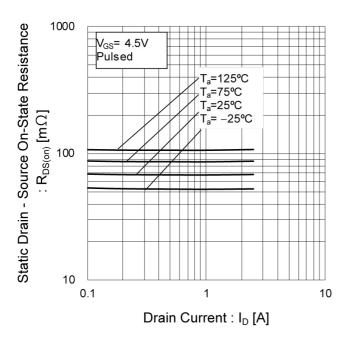


Fig.16 Static Drain - Source On - State Resistance vs. Drain Current(III)

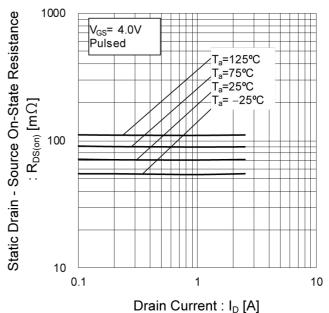
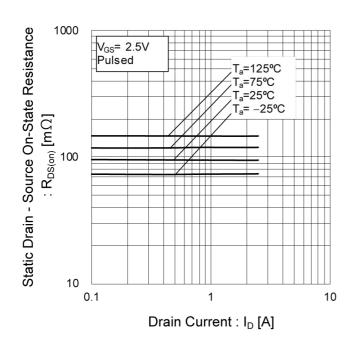


Fig.17 Static Drain - Source On - State Resistance vs. Drain Current(IV)



8/11

• Electrical characteristic curves

Fig.18 Typical Capacitance vs.

Drain - Source Voltage

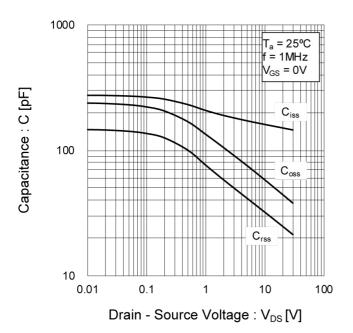


Fig.19 Switching Characteristics

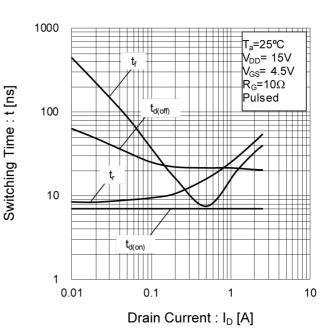


Fig.20 Dynamic Input Characteristics

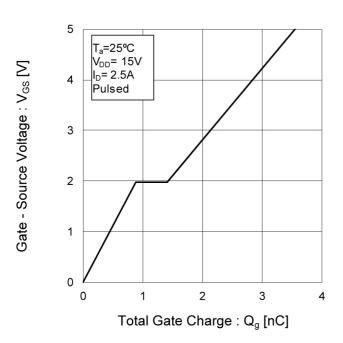
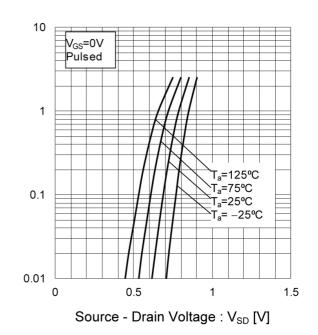


Fig.21 Source Current vs.

Source Drain Voltage



Source Current : Is [A]

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

Fig. 1-1 SWITCHING TIME MEASUREMENT CIRCUIT

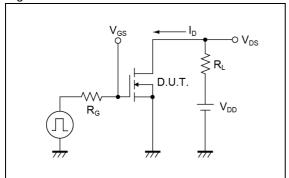


Fig. 2-1 GATE CHARGE MEASUREMENT CIRCUIT

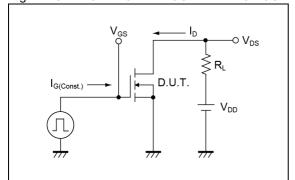


Fig. 1-2 SWITCHING WAVEFORMS

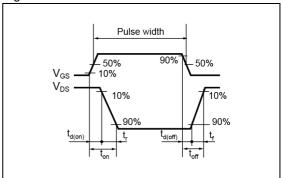
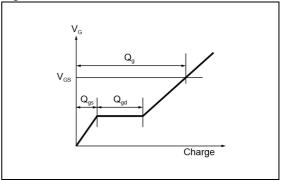
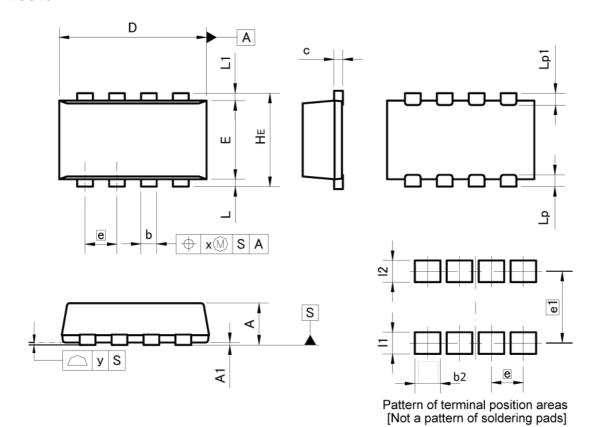


Fig. 2-2 GATE CHARGE WAVEFORM



Dimensions

TSST8



D.114	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	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
С	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
е	0.0	65	0.0	26
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
х	1	0.10	-	0.004
У	-	0.10	-	0.004

DIM		MILIM	ETERS	INC	HES
		MIN	MAX	MIN	MAX
	b2	_	0.52	-	0.020
	e1	1.46		0.0	57
	11	-	0.44	-	0.017
	12	0 -	0.44	-	0.017

Dimension in mm/inches



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