

# Small switching (30V, 2A)

## 2SK2103

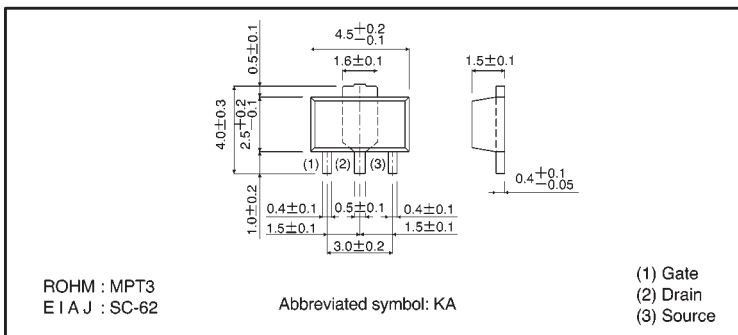
### ●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) Low-voltage drive (4V).
- 5) Easily designed drive circuits.
- 6) Easy to use in parallel.

### ●Structure

Silicon N-channel  
MOSFET

### ●External dimensions (Units: mm)



### ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DSS</sub>	30	V	
Gate-source voltage	V <sub>GSS</sub>	±20	V	
Drain current	Continuous	I <sub>D</sub>	2	A
	Pulsed	I <sub>DP</sub> *1	8	A
Reverse drain current	Continuous	I <sub>DR</sub>	2	A
	Pulsed	I <sub>DRP</sub> *1	8	A
Total power dissipation	P <sub>D</sub>	0.5 2*2	W	
Channel temperature	T <sub>ch</sub>	150	°C	
Storage temperature	T <sub>stg</sub>	-55~+150	°C	

\*1 P<sub>w</sub> ≤ 10 μs, Duty cycle ≤ 1% \*2 When mounted on a 40 × 40 × 0.7 mm alumina board.

### ●Packaging specifications

Type	Package	Taping
	Code	T100
	Basic ordering unit (pieces)	1000
2SK2103		○

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu A$	$V_{DS} = 30V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	—	2.5	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}$	—	0.25	0.4	$\Omega$	$I_D = 1A, V_{GS} = 10V$
		—	0.38	0.6		$I_D = 1A, V_{GS} = 4V$
Forward transfer admittance	$ Y_{fs} ^*$	1.0	—	—	S	$I_D = 1A, V_{DS} = 10V$
Input capacitance	$C_{iss}$	—	230	—	pF	$V_{DS} = 10V$
Output capacitance	$C_{oss}$	—	120	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	—	60	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$I_D = 1A, V_{DD} \approx 15V$
Rise time	$t_r$	—	25	—	ns	$V_{GS} = 10V$
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	$R_L = 15\Omega$
Fall time	$t_f$	—	60	—	ns	$R_G = 10\Omega$
Reverse recovery time	$t_{rr}$	—	70	—	ns	$I_{DR} = 2A, V_{GS} = 0V, di/dt = 50A/\mu s$

\*  $P_w \leq 300 \mu s$ , Duty cycle  $\leq 1\%$

●Electrical characteristic curves

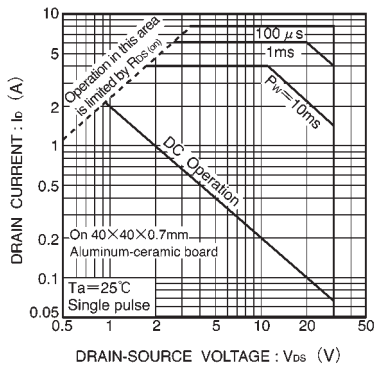


Fig.1 Maximum safe operating area

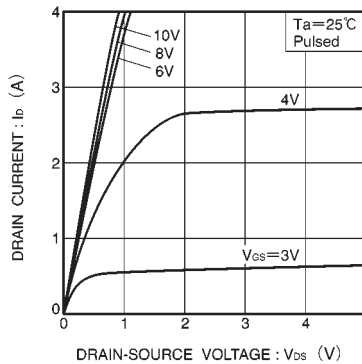


Fig.2 Typical output characteristics

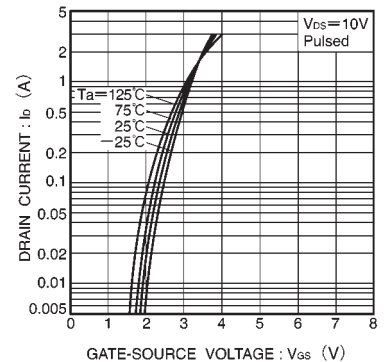


Fig.3 Typical transfer characteristics

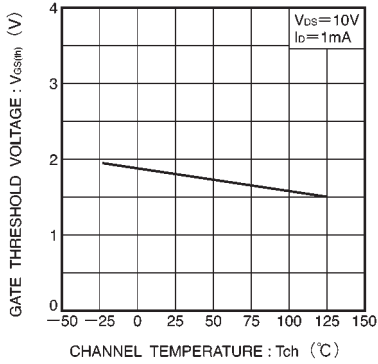


Fig.4 Gate threshold voltage vs. channel temperature

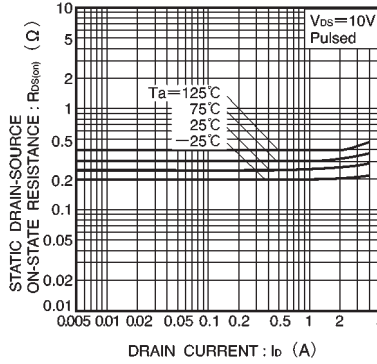


Fig.5 Static drain-source on-state resistance vs. drain current ( I )

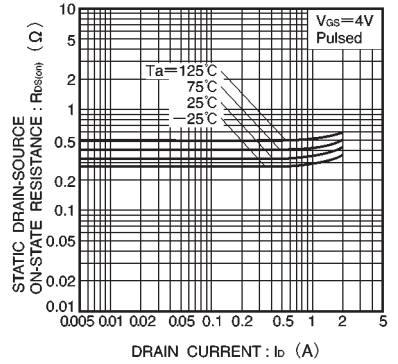


Fig.6 Static drain-source on-state resistance vs. drain current ( II )

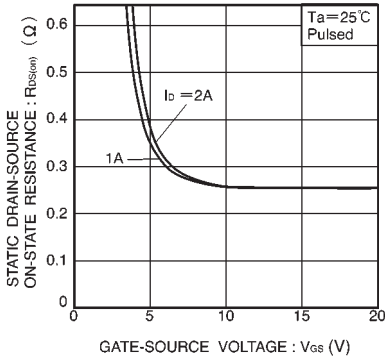


Fig.7 Static drain-source on-state resistance vs. gate-source voltage

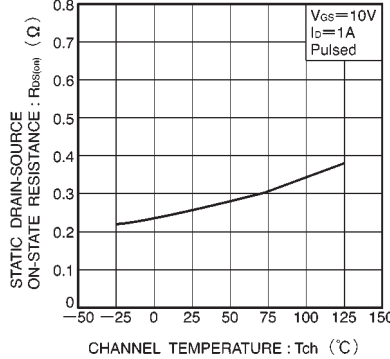


Fig.8 Static drain-source on-state resistance vs. channel temperature

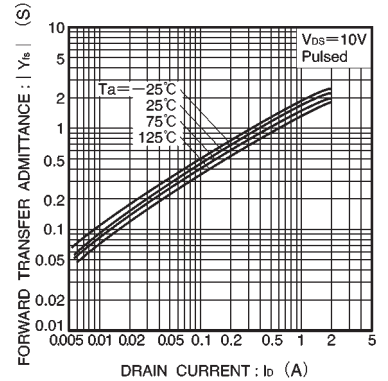


Fig.9 Forward transfer admittance vs. drain current

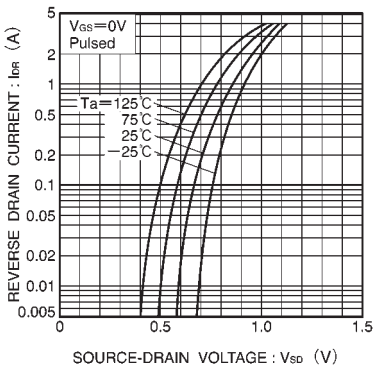


Fig.10 Reverse drain current vs. source-drain voltage ( I )

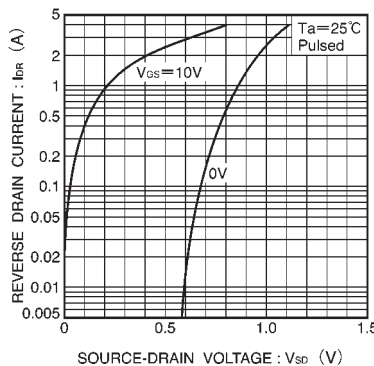


Fig.11 Reverse drain current vs. source-drain voltage ( II )

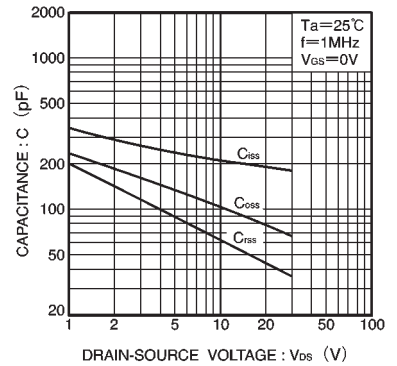


Fig.12 Typical capacitance vs. drain-source voltage

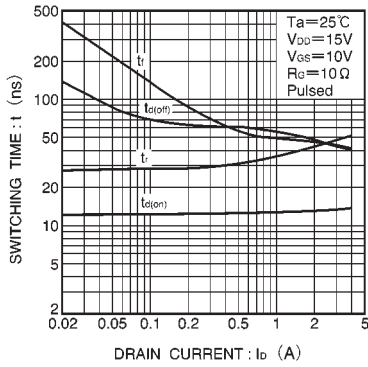


Fig.13 Switching characteristics  
(See Figure 15 and 16 for the measurement circuit and resultant waveforms)

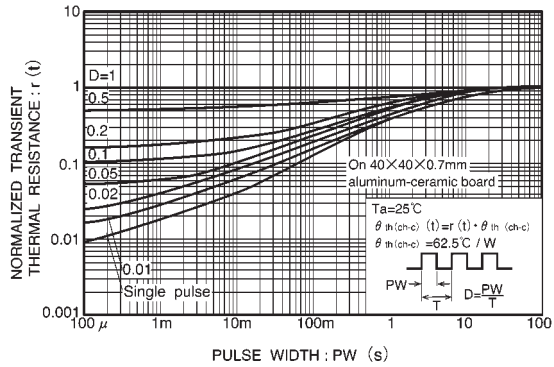


Fig.14 Normalized transient thermal resistance vs. pulse width

● Switching characteristics measurement circuit

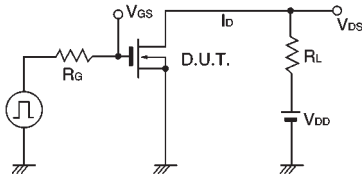


Fig.15 Switching time measurement circuit

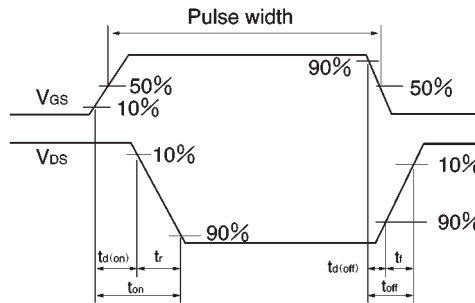


Fig.16 Switching time waveforms

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