

Small switching (60V, 2A)

2SK3065

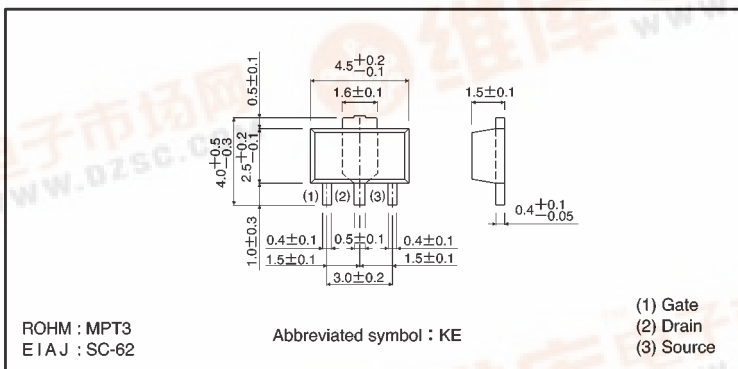
●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low-voltage drive (2.5V) that is perfect for portable devices.
- 4) Easily designed drive circuits.
- 5) Easy to use in parallel.
- 6) Excellent resistance to damage from static electricity.

●Structure

Silicon N-channel
MOSFET

●External dimensions (Units: mm)



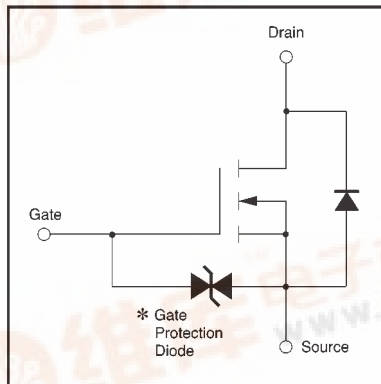
●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 20	V
Drain current	Continuous	I_D 2	A
	Pulsed	I_{DP}^{*1} 8	A
Reverse drain current	Continuous	I_{DR} 2	A
	Pulsed	I_{DRP}^{*1} 8	A
Total power dissipation (Tc=25°C)	P_D	$\frac{0.5}{2^{*2}}$	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55~+150	°C

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

*2 When mounted on a 40 × 40 × 0.7 mm alumina board.

●Equivalent circuit



* A protection diode has been built in between the gate and the source to protect against static electricity when the product is in use. Use the protection circuit when rated voltages are exceeded.

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR) DSS}$	60	—	—	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	0.8	—	1.5	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}$	—	0.25	0.32	Ω	$I_D = 1A, V_{GS} = 4V$
	$R_{DS(on)}$	—	0.35	0.45	Ω	$I_D = 1A, V_{GS} = 2.5V$
Forward transfer admittance	$ Y_{fs} ^{dB}$	1.5	—	—	S	$I_D = 1A, V_{DS} = 10V$
Input capacitance	C_{iss}	—	160	—	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	—	85	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	25	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$I_D = 1A, V_{DD} \approx 30V$
Rise time	t_r	—	50	—	ns	$V_{GS} = 4V$
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	$R_L = 30\Omega$
Fall time	t_f	—	70	—	ns	$R_G = 10\Omega$

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

●Packaging specifications

Type	Package	Taping
	Code	T100
	Basic ordering unit (pieces)	1000
2SK3065		○

●Electrical characteristic curves

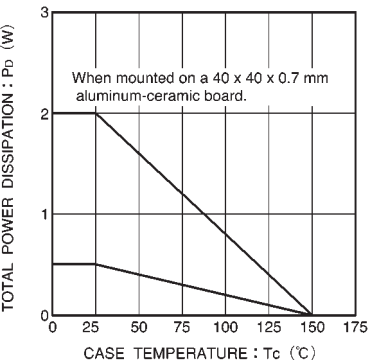


Fig.1 Total power dissipation vs. case temperature

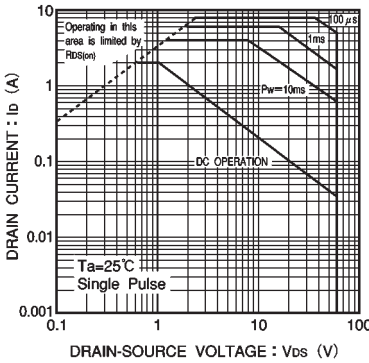


Fig.2 Maximum safe operating area

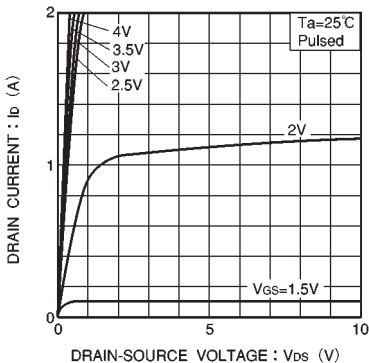


Fig.3 Typical output characteristics

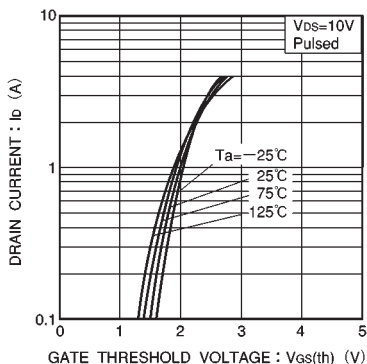


Fig.4 Typical transfer characteristics

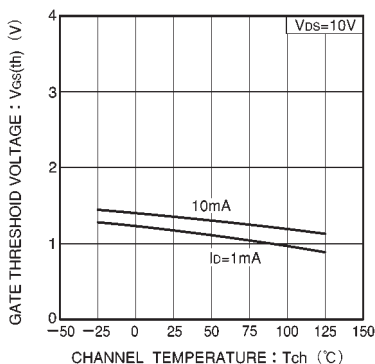


Fig.5 Gate threshold voltage vs. channel temperature

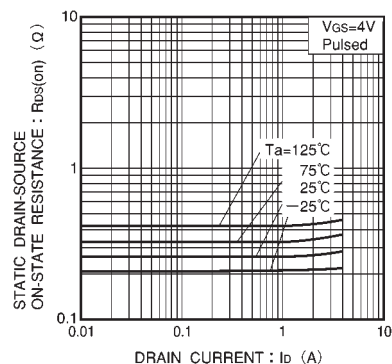


Fig.6 Static drain-source on-state resistance vs. drain current (I)

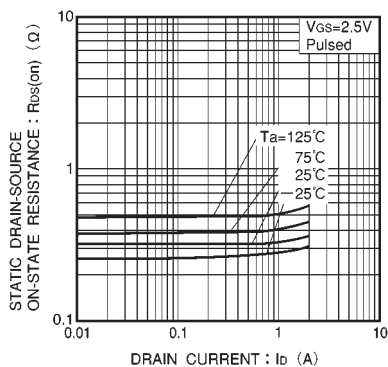


Fig.7 Static drain-source on-state resistance vs. drain current (II)

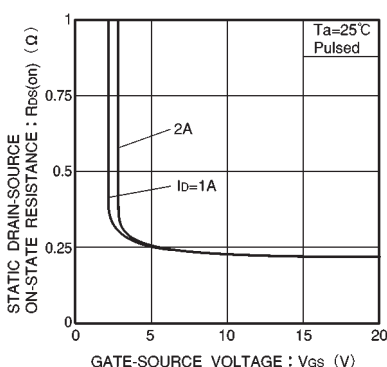


Fig.8 Static drain-source on-state resistance vs. gate-source voltage

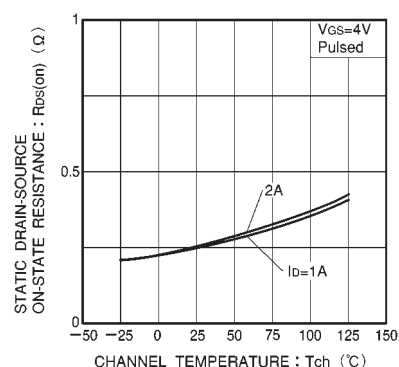


Fig.9 Static drain-source on-state resistance vs. channel temperature

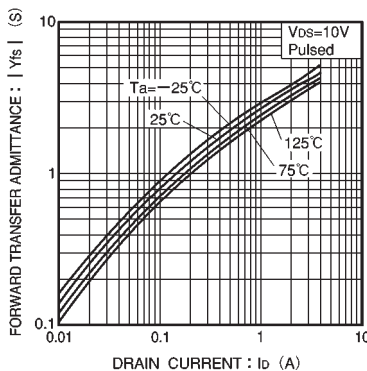


Fig.10 Forward transfer admittance vs. drain current

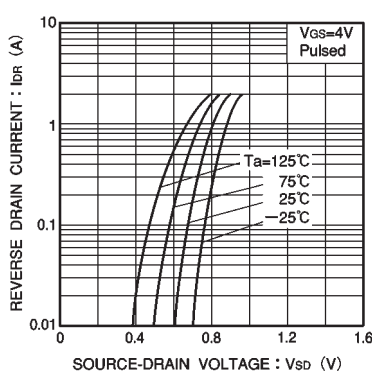


Fig.11 Reverse drain current vs. source-drain voltage (I)

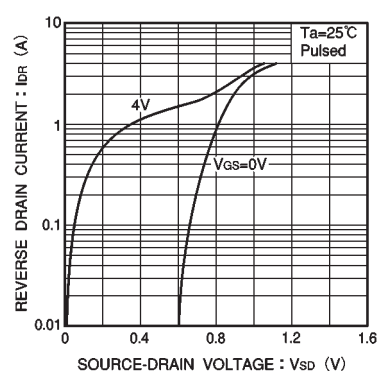


Fig.12 Reverse drain current vs. source-drain voltage (II)

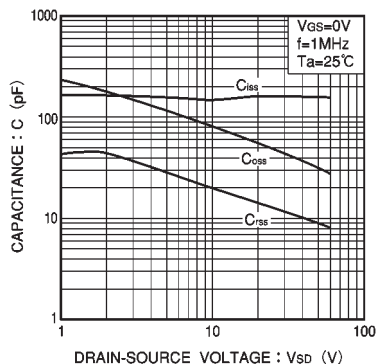


Fig.13 Typical capacitance vs. drain-source voltage

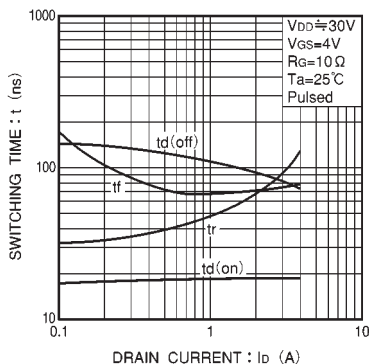


Fig.14 Switching characteristics
(See Figures 17 and 18 for the measurement circuit and resultant waveforms)

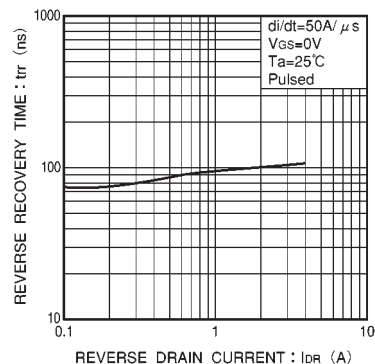


Fig.15 Reverse recovery time vs. reverse drain current

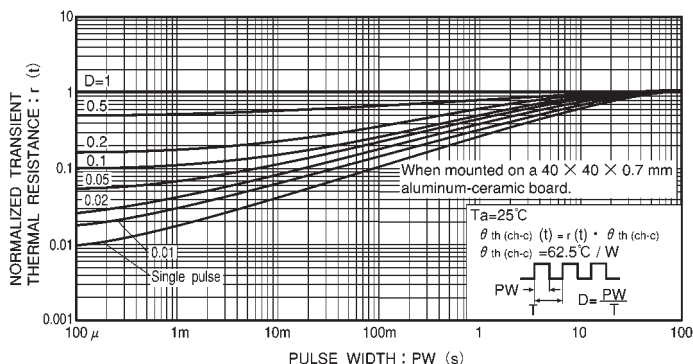


Fig.16 Normalized transient thermal resistance vs. pulse width

● Switching characteristics measurement circuit

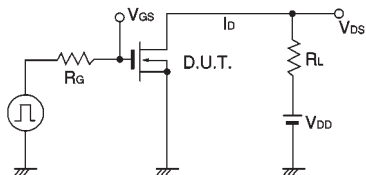


Fig17 Switching time measurement circuit

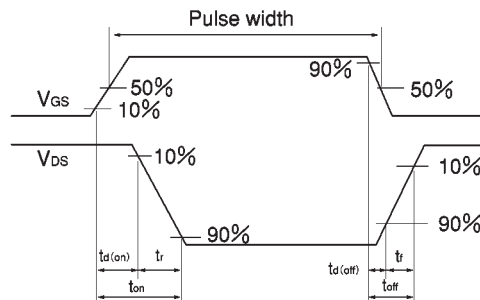


Fig18 Switching time waveforms