10V Drive Nch MOSFET

RK3055E

●Structure

Silicon N-channel MOSFET

● Features

- 1) Low On-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) 10V drive.
- 5) Drive circuits can be simple.
- 6) Parallel use is easy.

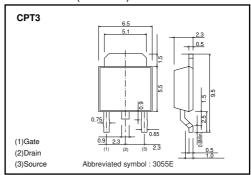
Applications

Switching

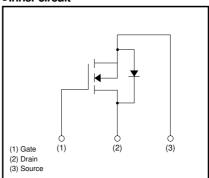
Packaging specifications

Туре	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
RK3055E		0

● Dimensions (Unit: mm)



•Inner circuit



● Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		VDSS	60	V
Gate-source voltage		Vgss	±20	V
Dunin augus et	Continuous	ΙD	8	А
Drain current	Pulsed	IDP*	20	А
Reverse drain	Continuous	IDR	8	А
current	Pulsed	IDRP*	20	А
Total power dissipation (Tc=25°C)		PD	20	W
Channel temperature	Tch	150	°C	
Storage temperature	Tstg	-55 to +150	°C	

^{*} Pw≤10μs, Duty cycle≤1%

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Conditions
Gate-source leakage	Igss	-	_	±100	nA	Vgs=±20V, Vps=0V
Drain-source breakdown voltage	V(BR)DSS	60	_	_	V	In=1mA, Vgs=0V
Zero gate voltage drain current	IDSS	-	-	10	μΑ	VDS=60V, VGS=0V
Gate threshold voltage	V _{GS(th)}	1.0	_	2.5	V	VDS=10V, ID=1mA
Static drain-source on-state resistance	RDS(on)	-	-	0.15	Ω	In=4A, Vgs=10V
Forward transfer admittance	Y _{fs} *	4.0	_	_	S	ID=4A, VDS=15V
Input capacitance	Ciss	-	520	-	pF	V _{DS} =10V
Output capacitance	Coss	-	240	_	pF	V _G =0V
Reverse transfer capacitance	Crss	_	100	_	pF	f=1MHz
Turn-on delay time	td(on)	-	5.0	-	ns	ID=2.5A, VDD ≒ 30V
Rise time	tr		20	_	ns	Vgs=10V
Turn-off delay time	td(off)	_	50	-	ns	R _L =12Ω
Fall time	tf		20	_	ns	R _G =10Ω

^{*} Pw \leq 300 μ s, Duty cycle \leq 1%

•Electrical characteristics curve

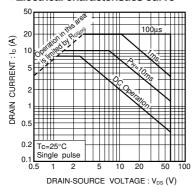


Fig.1 Maximum Safe Operating Area

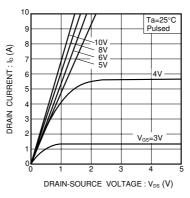


Fig.2 Typical Output Characteristics

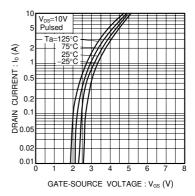


Fig.3 Typical Transfer Characteristics

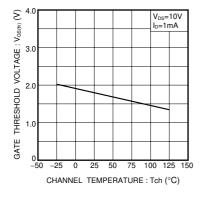


Fig.4 Gate Threshold Voltage vs. Channel Temperature

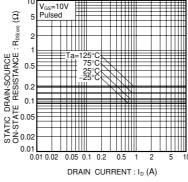


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (I)

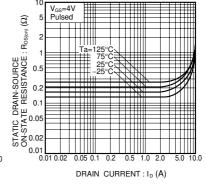
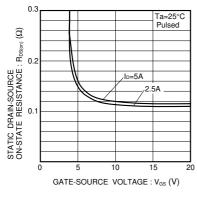


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (II)



0.6 V_{SS}=10V Pulsed

OBONOS V_{SS}=0V Pulsed

OBONOS V_{SS}=10V Pulsed

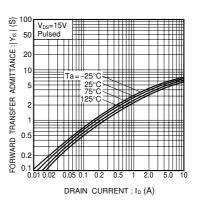
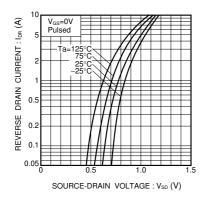
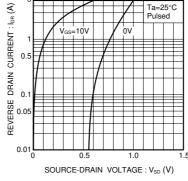


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

Fig.9 Forward Transfer Admittance vs. Drain Current





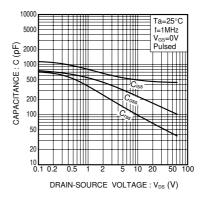


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (I)

Fig.11 Reverse Drain Current vs. Source-Drain Voltage (II)

Fig.12 Typical Capacitance vs. Drain-Source Voltage

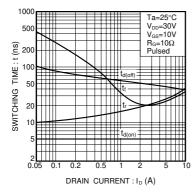


Fig.13 Switching Characteristics (See Figures 16 and 17 for the measurement circuit and resultant waveforms)

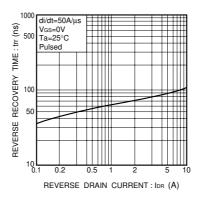


Fig.14 Reverse Recovery Time vs. Reverse Drain Current

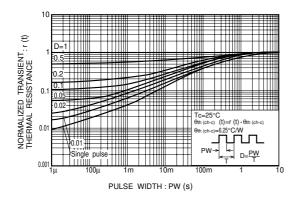
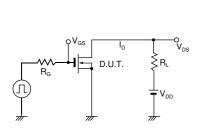


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

•Switching characteristics measurement circuit



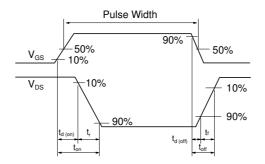


Fig.16 Switching Time Test Circuit

Fig.17 Switching Time Waveforms

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Notes

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www.rohm.com

Contact us : webmaster@rohm.co.jp

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ROHM CO., LTD. 21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585, Japan

TEL:+81-75-311-2121 FAX:+81-75-315-0172

