

To our customers,

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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MOS FIELD EFFECT TRANSISTOR

2SK1824

N-CHANNEL MOS FET FOR SWITCHING

DESCRIPTION

The 2SK1824 is a N-channel vertical type MOS FET that is driven at 2.5 V.

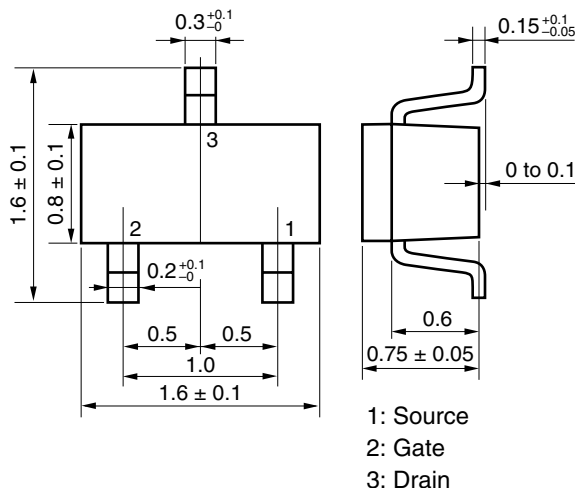
Because this MOS FET can be driven on a low voltage and because it is not necessary to consider the drive current, the 2SK1824 is ideal for driving the actuator of power-saving systems, such as VCR cameras and headphone stereo systems.

Moreover, the 2SK1824 is housed in a super small mini-mold package so that it can help increase the mounting density on the printed circuit board and lower the mounting cost, contributing to miniaturization of the application systems.

FEATURES

- Small mounting area: about 60% of the conventional mini-mold package (SC-70)
- Can be automatically mounted
- Can be directly driven by 3-V IC

★ PACKAGE DRAWING (Unit: mm)



★ ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1824	SC-75 (USM)

Marking: B1

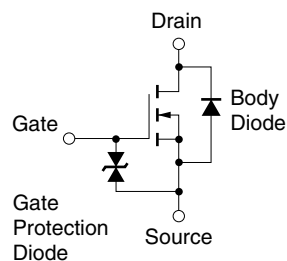
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0\text{ V}$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0\text{ V}$)	V_{GSS}	± 7.0	V
Drain Current (DC)	$I_D(\text{DC})$	± 100	mA
Drain Current (pulse) ^{Note1}	$I_D(\text{pulse})$	± 200	mA
Total Power Dissipation ^{Note2}	P_T	200	mW
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to $+150$	$^\circ\text{C}$

Notes 1. $PW \leq 10\text{ ms}$, Duty Cycle $\leq 50\%$

2. Mounted on ceramic substrate of $3.0\text{ cm}^2 \times 0.64\text{ mm}$

EQUIVALENT CIRCUIT



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

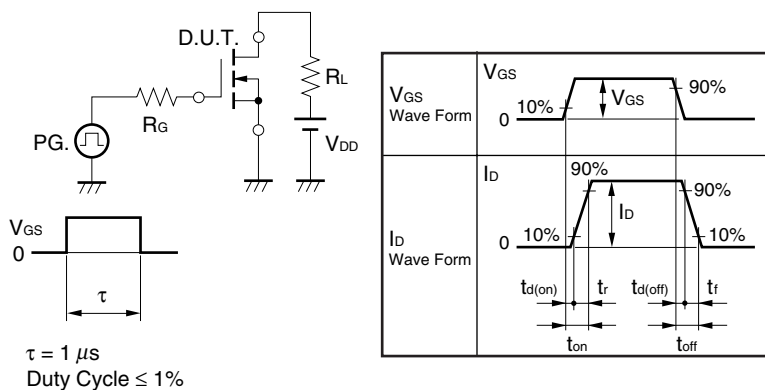
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

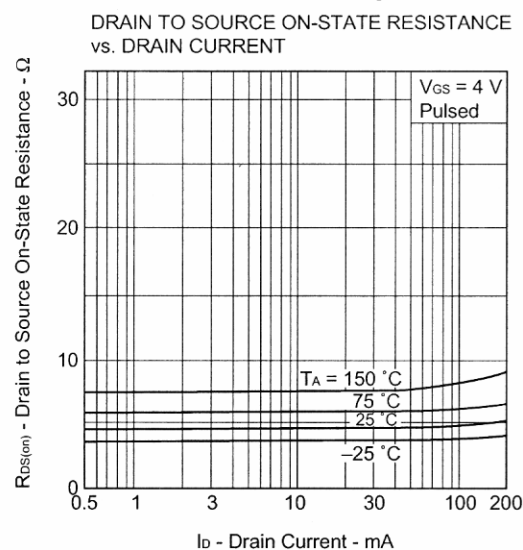
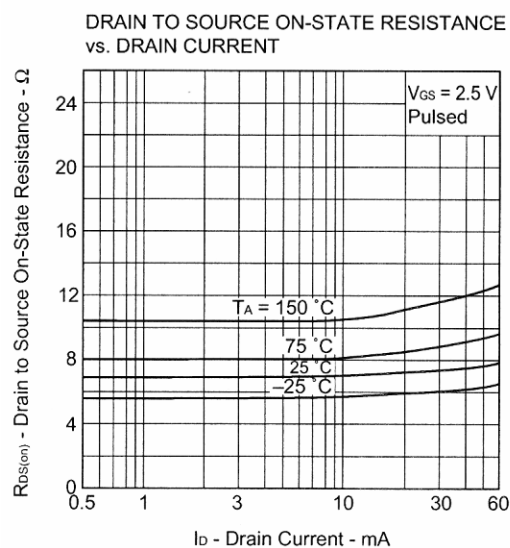
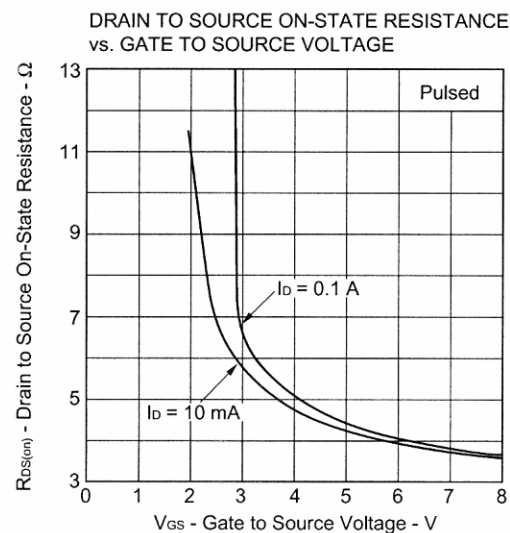
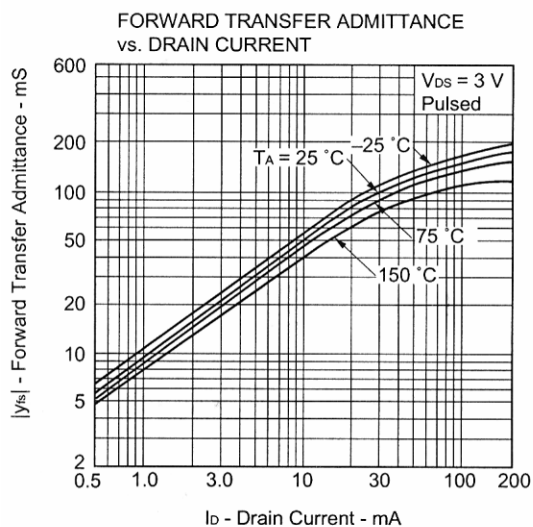
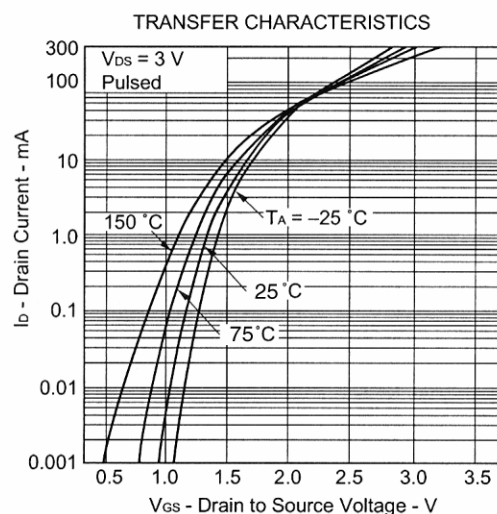
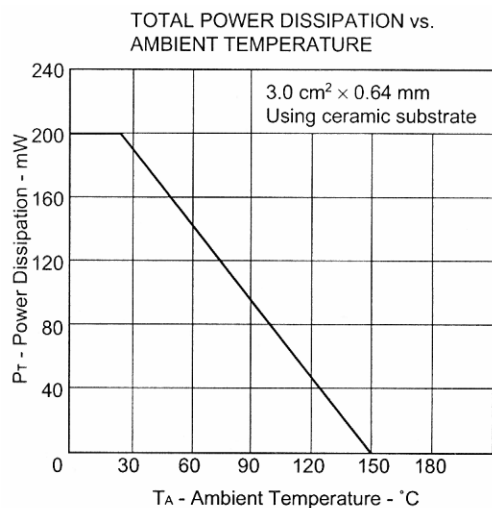
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±5.0 V, V _{DS} = 0 V		±0.1	±3.0	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 3.0 V, I _D = 10 μA	0.8	1.0	1.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = 3.0 V, I _D = 10 mA	20	50		mS
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = 2.5 V, I _D = 1.0 mA		7.0	13	Ω
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 10 mA		5.0	8.0	Ω
Input Capacitance	C _{iss}	V _{DS} = 5.0 V		16		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		14		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		2.0		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 5.0 V, I _D = 10 mA		15		ns
Rise Time	t _r	V _{GS} = 5.0 V		20		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		100		ns
Fall Time	t _f			100		ns

Note Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2%

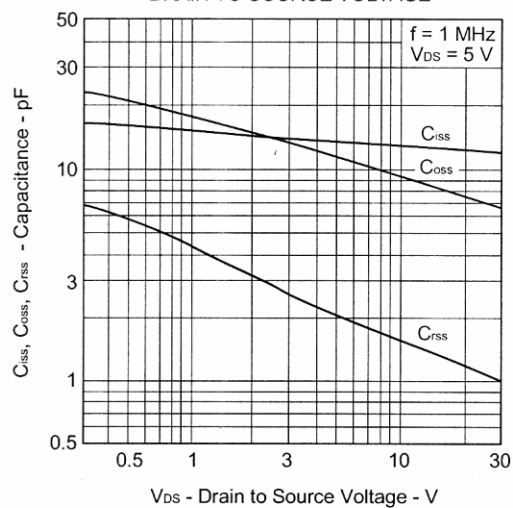
★ **TEST CIRCUIT SWITCHING TIME**



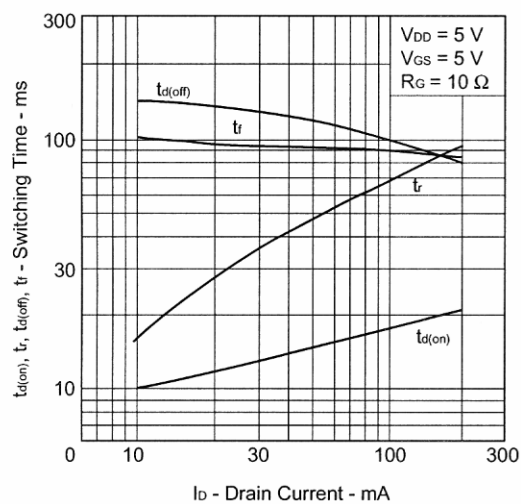
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



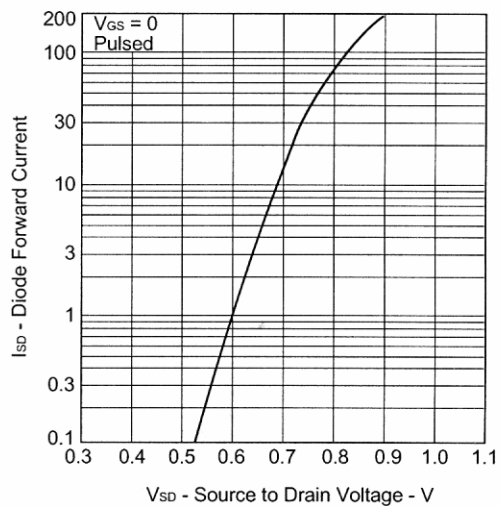
CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE
FORWARD VOLTAGE



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