

### N-CHANNEL MOS FET FOR SWITCHING

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.

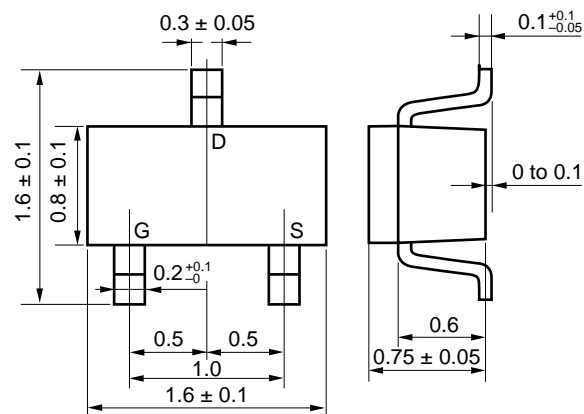
#### FEATURES

- 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

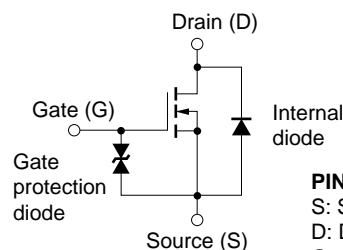
The internal diode in the right figure is a parasitic diode.

The protection diode is to protect the product from damage due to static electricity. If there is a danger that an extremely high voltage will be applied across the gate and source in the actual circuit, a gate protection circuit such as an external constant-voltage diode is necessary.

#### PACKAGE DIMENSIONS (in mm)



#### EQUIVALENT CIRCUIT



#### PIN CONNECTIONS

S: Source  
D: Drain  
G: Gate

Marking: B1

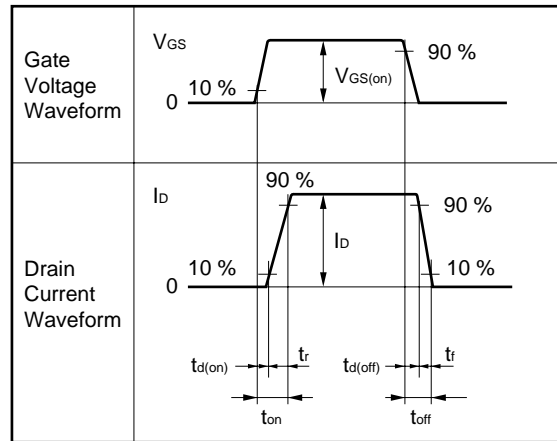
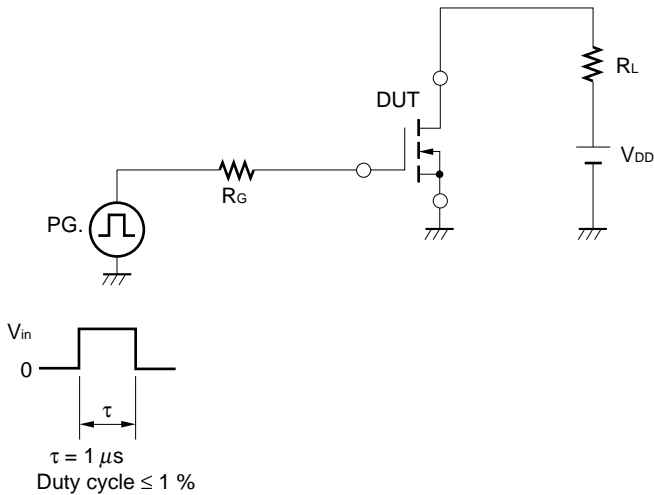
#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V <sub>DSS</sub>	V <sub>GS</sub> = 0	30	V
Gate to Source Voltage	V <sub>GSS</sub>	V <sub>DS</sub> = 0	±7	V
Drain Current (DC)	I <sub>D(DC)</sub>		±100	mA
Drain Current (Pulse)	I <sub>D(pulse)</sub>	PW ≤ 10 ms Duty cycle ≤ 50 %	±200	mA
Total Power Dissipation	P <sub>T</sub>	3.0 cm <sup>2</sup> × 0.64 mm, ceramic substrate used	200	mW
Channel Temperature	T <sub>ch</sub>		150	°C
Operating Temperature	T <sub>opt</sub>		-55 to +80	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

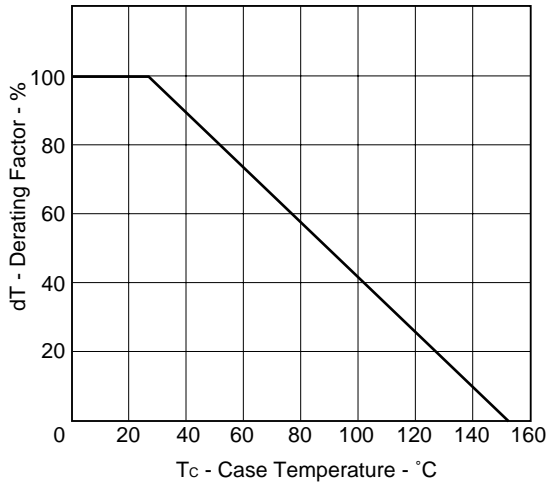
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±5 V, V <sub>DS</sub> = 0		±0.1	±3	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 μA	0.8	1.0	1.5	V
Forward Transfer Admittance	y <sub>ts</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 mA	20	50		mS
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1 mA		7	13	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		5	8	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 5.0 V, V <sub>GS</sub> = 0, f = 1 MHz		16		pF
Output Capacitance	C <sub>oss</sub>			14		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			2		pF
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 5V, I <sub>D</sub> = 10 mA V <sub>GS(on)</sub> = 5 V, R <sub>G</sub> = 10 Ω R <sub>L</sub> = 500 Ω		15		ns
Rise Time	t <sub>r</sub>			20		ns
Turn-Off Delay Time	t <sub>d(off)</sub>			100		ns
Fall Time	t <sub>f</sub>			100		ns

**SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS (Resistive Load)**

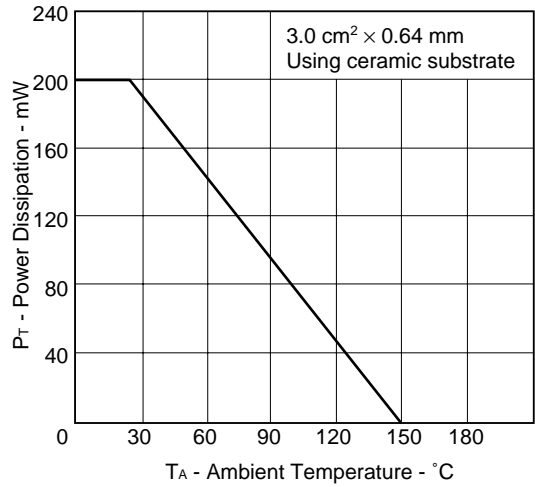


TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

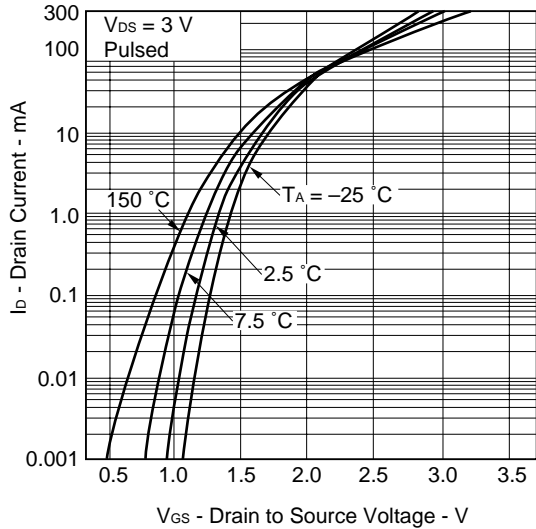
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



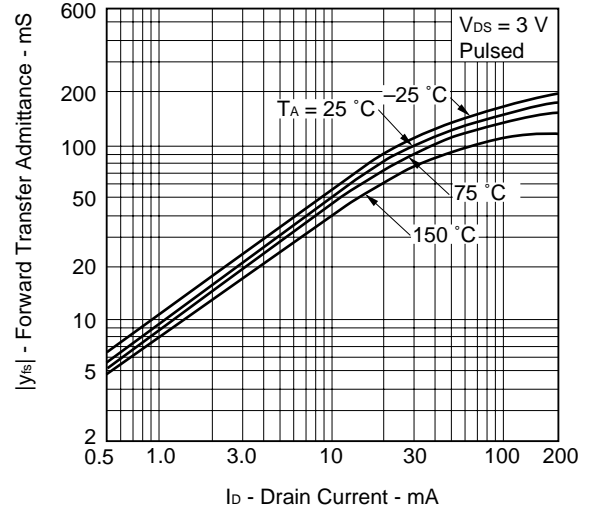
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



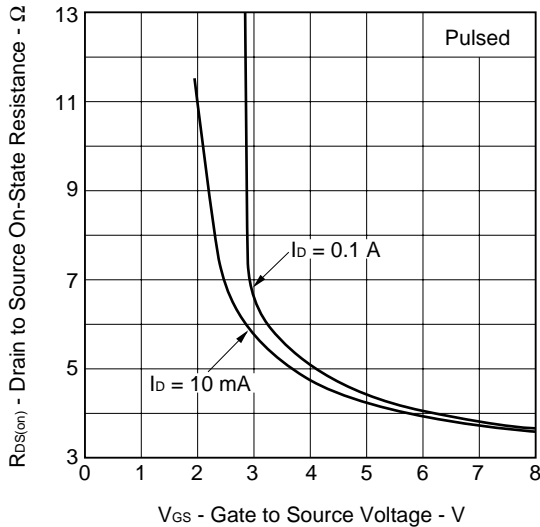
TRANSFER CHARACTERISTICS



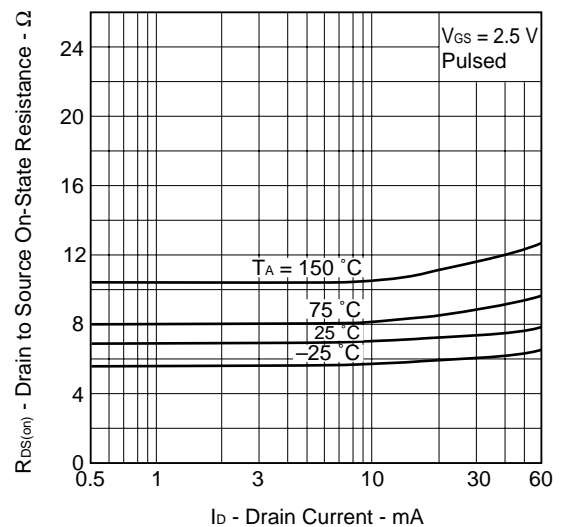
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



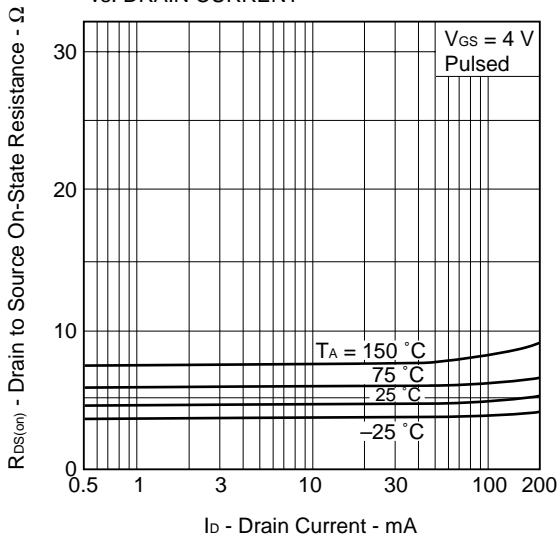
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



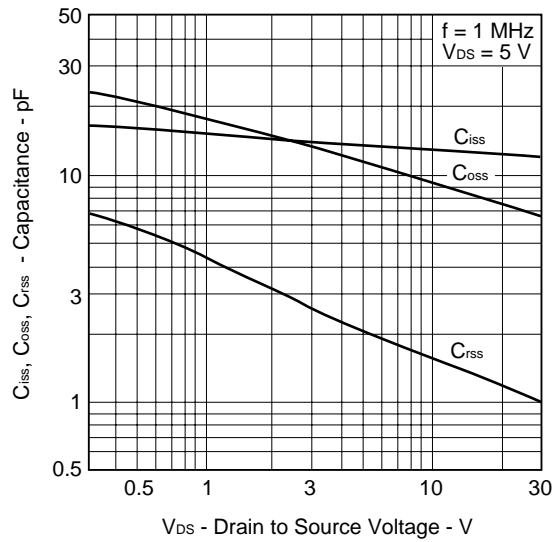
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



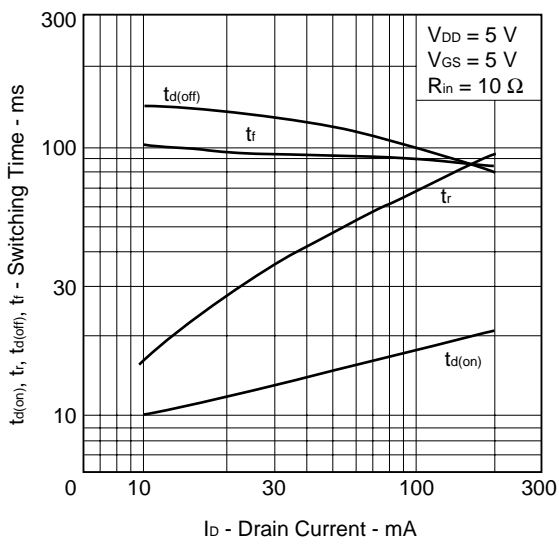
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



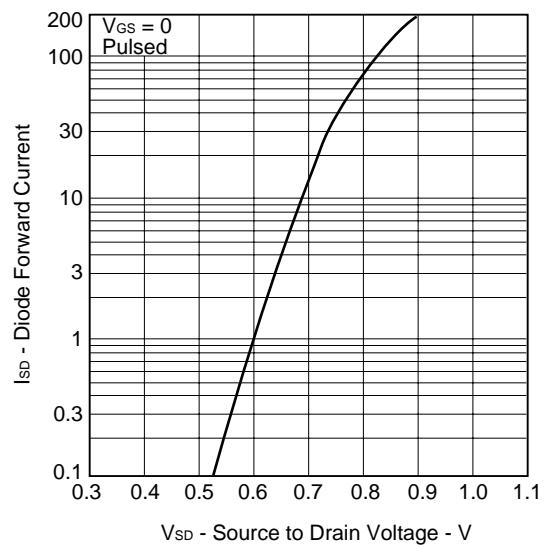
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



**REFERENCE**

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

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Anti-radioactive design is not implemented in this product.



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