

# MOS FIELD EFFECT TRANSISTOR 2SK1584

### N-CHANNEL MOS FET FOR SWITCHING

#### DESCRIPTION

The 2SK1584 is a switching device which can be driven directly by a 5-V power source.

The 2SK1584 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as actuator driver.

#### FEATURES

- Can be driven by a 5-V power source.
- Low On-state resistance :  
 $R_{DS(on)1} = 2.0 \Omega \text{ MAX. (} V_{GS} = 4 \text{ V, } I_D = 0.3 \text{ A)}$   
 $R_{DS(on)2} = 1.5 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 0.3 \text{ A)}$

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

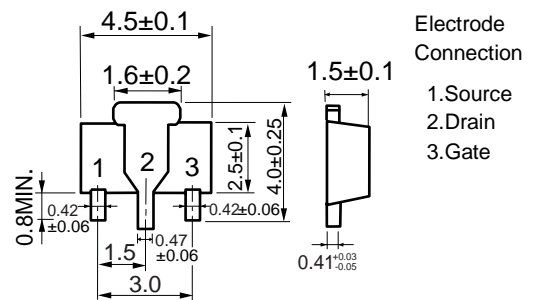
Drain to Source Voltage ( $V_{GS} = 0 \text{ V}$ )	$V_{DSS}$	30	V
Gate to Source Voltage ( $V_{DS} = 0 \text{ V}$ )	$V_{GSS}$	$\pm 20$	V
Drain Current (DC) ( $T_C = 25^\circ\text{C}$ )	$I_{D(DC)}$	$\pm 500$	mA
Drain Current (pulse) <sup>Note1</sup>	$I_{D(pulse)}$	$\pm 1.0$	A
Total Power Dissipation ( $T_A = 25^\circ\text{C}$ ) <sup>Note2</sup>	$P_T$	2.0	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

**Notes1.**  $PW \leq 10 \text{ ms}$ , Duty Cycle  $\leq 50\%$

**2.** Mounted on ceramic board of  $16 \text{ cm}^2 \times 0.7 \text{ mm}$

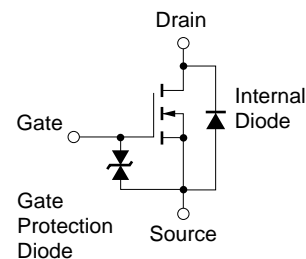
**Remark** The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

#### PACKAGE DRAWING (Unit : mm)



Marking : NH

#### EQUIVALENT CIRCUIT

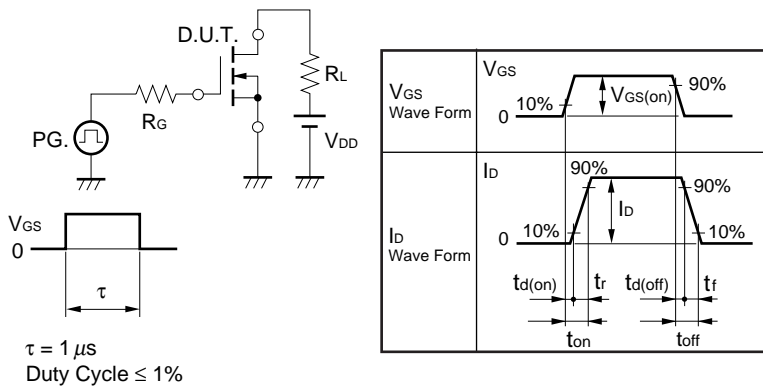


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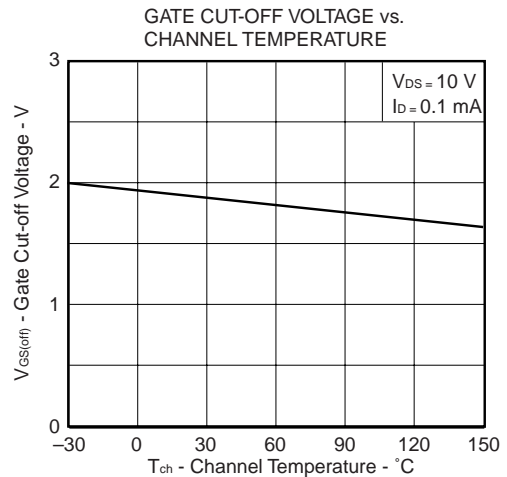
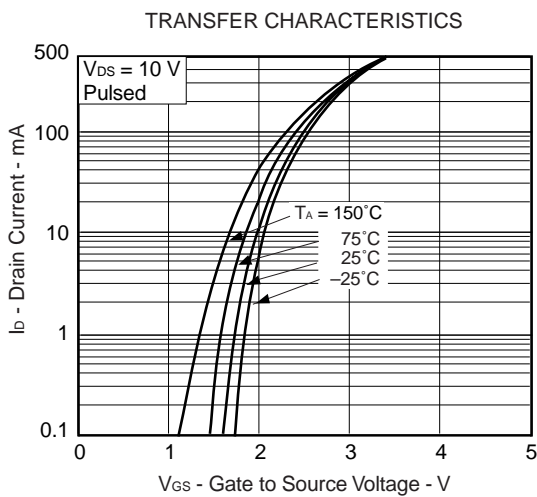
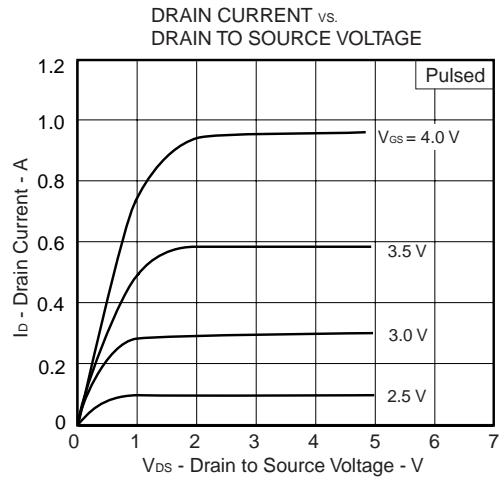
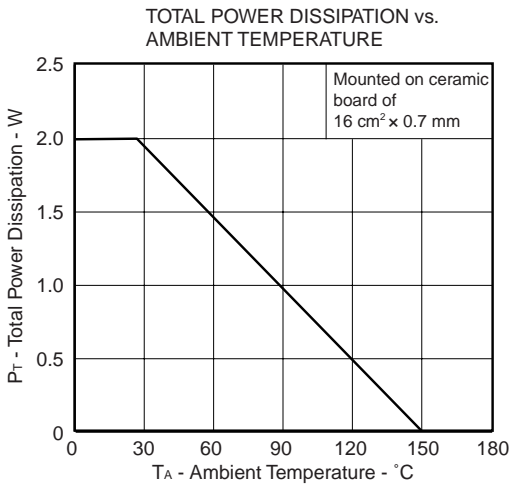
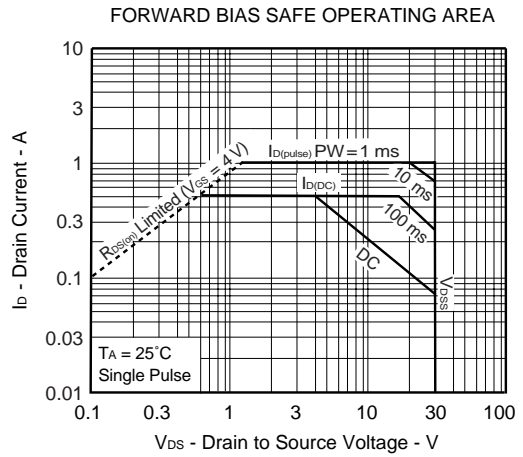
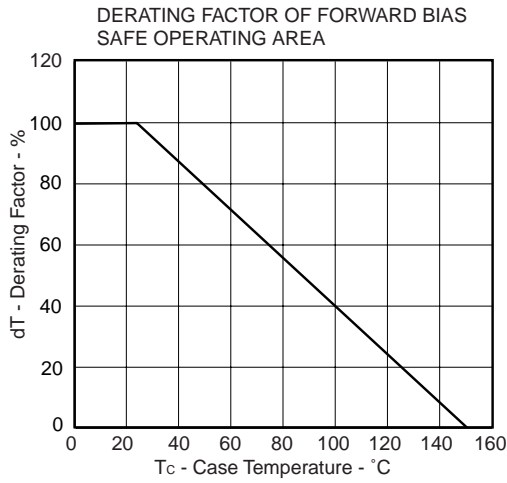
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

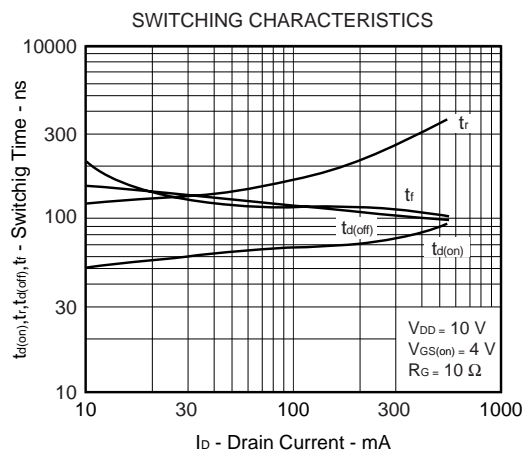
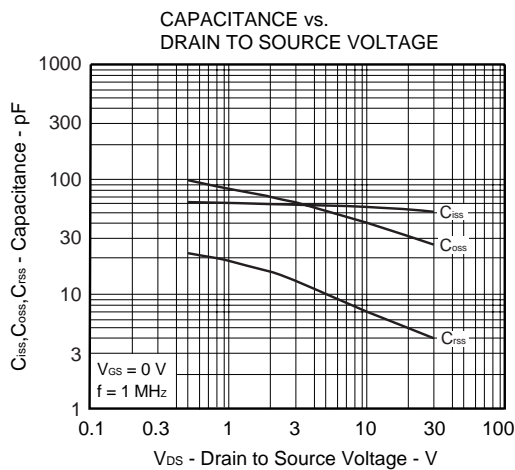
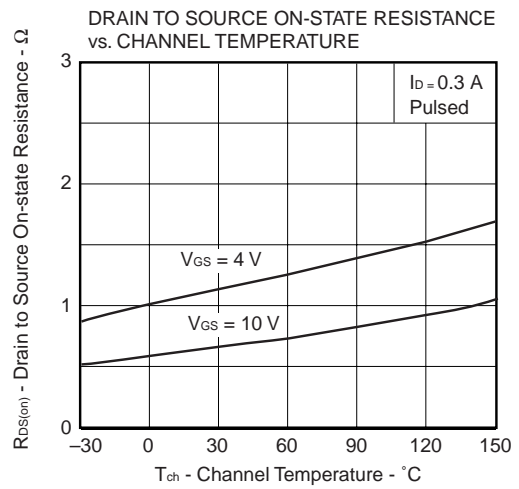
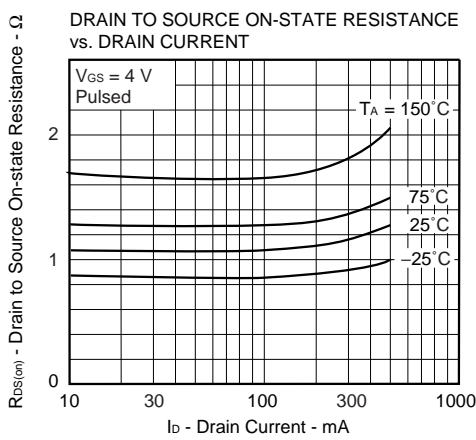
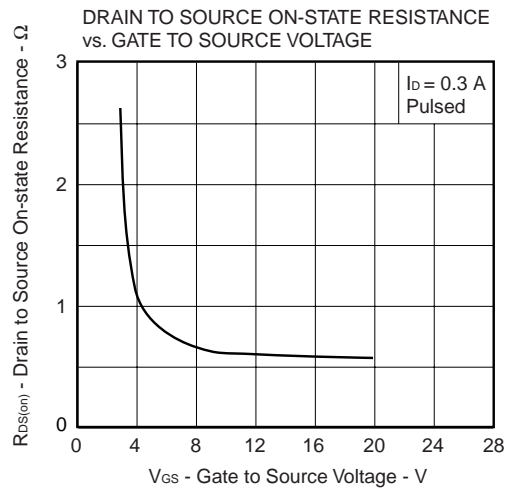
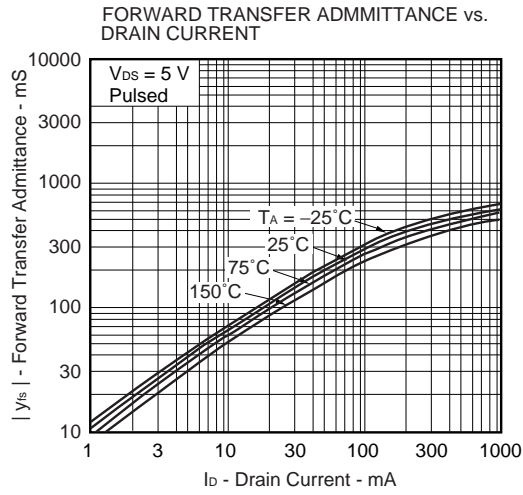
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V			±10	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.1 mA	1.3	1.85	2.5	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 0.5 A	350	440		mS
Drain to Source On-state Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 4 V, I <sub>D</sub> = 0.3 A		1.2	2.0	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.3 A		0.65	1.5	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10 V		60		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		50		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		9		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 10 V, I <sub>D</sub> = 0.3 A		80		ns
Rise Time	t <sub>r</sub>	V <sub>GS(on)</sub> = 4 V		270		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		100		ns
Fall Time	t <sub>f</sub>	R <sub>L</sub> = 33 Ω		110		ns

**TEST CIRCUIT SWITCHING TIME**

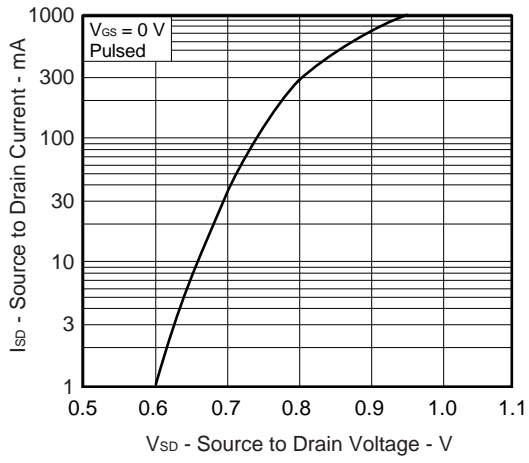


★ TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)





SOURCE TO DRAIN DIODE FORWARD VOLTAGE



[MEMO]

[MEMO]

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