DATA SHEET

# MOS FIELD EFFECT POWER TRANSISTOR **2SK1852**

## SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

### DESCRIPTION

The 2SK1852 is N-channel MOS Field Effect Transistor designed for solenoid, motor and lamp driver.

#### **FEATURES**

- Low On-state Resistance R<sub>DS(on)</sub> ≤ 0.15 Ω (V<sub>GS</sub> = 10 V, I<sub>D</sub> = 5.0 A) R<sub>DS(on)</sub> ≤ 0.2 Ω (V<sub>GS</sub> = 4 V, I<sub>D</sub> = 5.0 A)
- Low Ciss Ciss = 1 250 pF TYP.
- Built-in G-S Gate Protection Diode

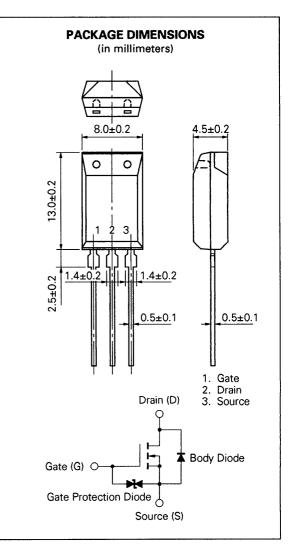
#### **QUALITY GRADE**

#### Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

#### **ABSOLUTE MAXIMUM RATINGS**

Drain to Source Voltage	VDSS		100	V
Gate to Source Voltage	VGSS(AC)		±20	V
Gate to Source Voltage	VGSS(DC)		+20, -10	V
Drain Current (DC)			±10	Α
Drain Current (pulse)	D(pulse)*		±40	Α
Total Power Dissipation (Ta	= 25 °C)	Рт	1.8	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		–55 to +150	°C
* PW ≦ 10 μs, Duty Cycle ≦	1 %			

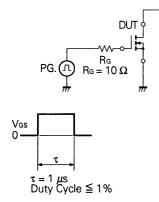


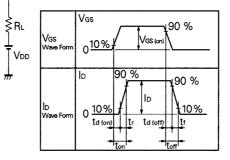
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CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	RDS(on)		0.12	0.15	Ω	Vgs = 10 V, ld = 5 A
Drain to Source On-state Resistance	RDS(on)		0.15	0.2	Ω	Vgs = 4 V, Id = 5 A
Gate to Source Cutoff Voltage	VGS(off)	1.0		2.5	v	Vos = 10 V, lo = 1 mA
Forward Transfer Admittance	yrs	5.5			s	VDS = 10 V, ID = 5 A
Drain Leakage Current	loss			10	μA	Vds = 100 V, Vgs = 0
Gate to Source Leakage Current	lgss			±10	μA	$V_{GS} = \pm 20 \text{ V}, \text{ V}_{DS} = 0$
Input Capacitance	Ciss		1 250		рF	Vps = 10 V Vgs = 0 f = 1 MHz
Output Capacitance	Совя		320		pF	
Reverse Transfer Capacitance	Crss		45		pF	
Turn-On Delay Time	td(on)		15		ns	$V_{GS(on)} = 10 V$ $V_{DD} = 50 V$ $I_D = 5 A, R_G = 10 \Omega$ $R_L = 10 \Omega$
Rise Time	tr		60		ns	
Turn-Off Delay Time	td(off)		130		ns	
Fall Time	tr		70		ns	
Total Gate Charge	QG		27		nC	Vgs = 10 V Id = 10 A Vdd = 80 V
Gate to Source Charge	Qgs		4		nC	
Gate to Drain Charge	Qgd		6		nC	
Diode Forward Voltage	VF(S-D)		1.0		v	Vgs = 0, Id = 10 A
Reverse Recovery Time	trr		150		ns	IF = 10 A, V <sub>GS</sub> = 0 di/dt = 50 A/μs
Reverse Recovery Charge	Qrr		300		nC	

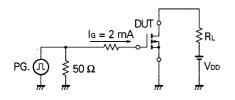
## ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

## **Test Circuit 1: Switching Time**

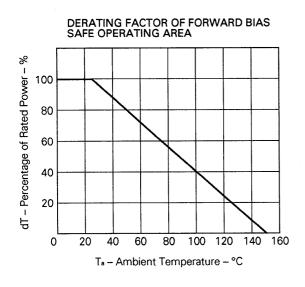




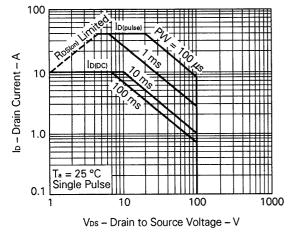
Test Circuit 2: Gate Charge



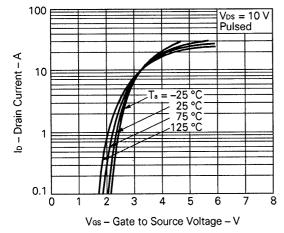
## TYPICAL CHARACTERISTICS (Ta = 25 °C)

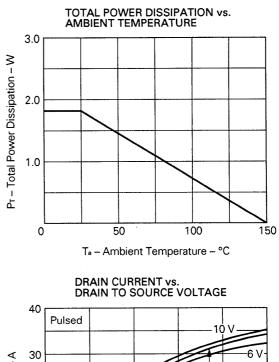


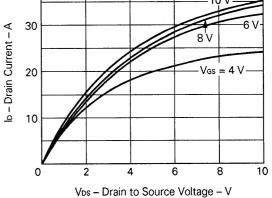


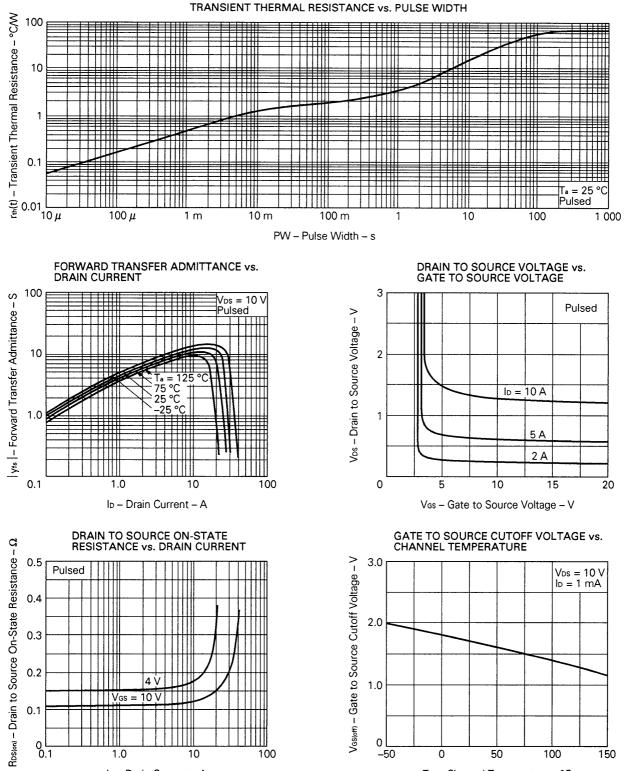


#### TRANSFER CHARACTERISTICS







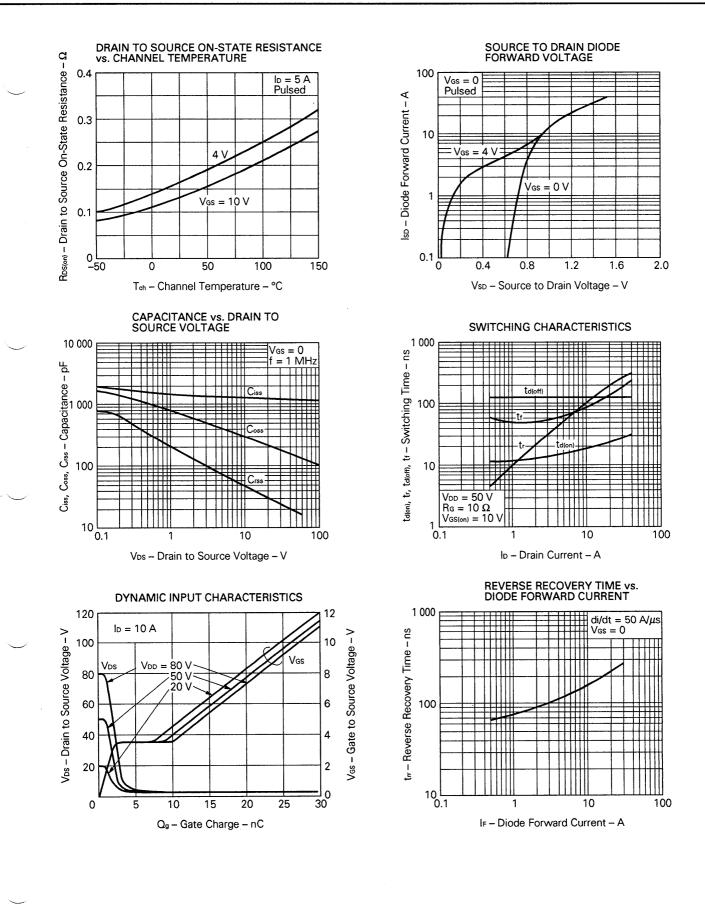


lo – Drain Current – A

Tch – Channel Temperature – °C

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#### Reference

Application note name	No.
Safe operating area of Power MOS FET.	TEA-1034
Application circuit using Power MOS FET.	TEA-1035
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207

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Application examples recommended by NEC Corporation.

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Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.

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