

**Phase-out/Discontinued**

**SWITCHING  
N-CHANNEL POWER MOS FET  
INDUSTRIAL USE**

**DESCRIPTION**

The 2SK1794 is N-channel MOS Field Effect Transistor designed for high voltage switching applications.

**FEATURES**

- Low On-state Resistance  
 $R_{DS(on)} \leq 2.8 \Omega$  ( $V_{GS} = 10 \text{ V}$ ,  $I_D = 3 \text{ A}$ )
- Low  $C_{iss}$   $C_{iss} = 1\,000 \text{ pF TYP.}$
- Built-in G-S Gate Protection Diode
- High Avalanche Capability Ratings

**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.

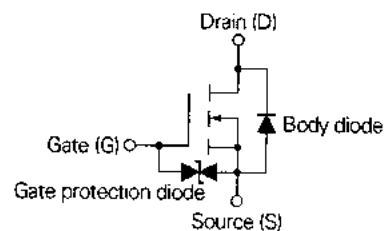
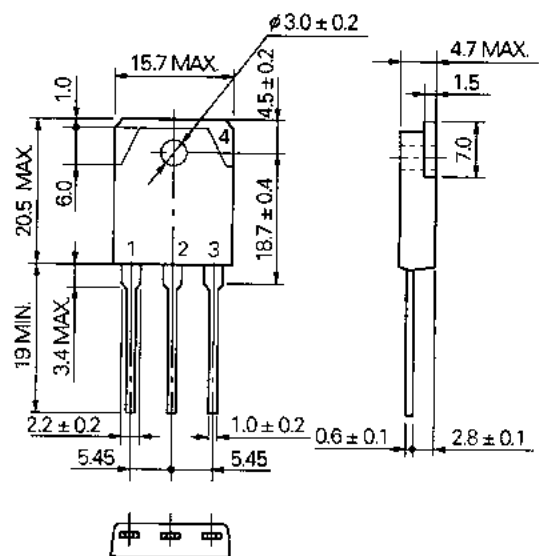
**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25 \text{ }^\circ\text{C}$ )**

Drain to Source Voltage	$V_{DSS}$	900	V
Gate to Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current (DC)	$I_{D(DC)}$	$\pm 6.0$	A
Drain Current (pulse)	$I_{D(pulse)}^*$	$\pm 12$	A
Total Power Dissipation ( $T_c = 25 \text{ }^\circ\text{C}$ )	$P_T$	100	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Single Avalanche Current	$I_{AS}^{**}$	6.0	A
Single Avalanche Energy	$E_{AS}^{**}$	22	mJ

\*  $PW \leq 10 \mu\text{s}$ , Duty Cycle  $\leq 1 \%$

\*\* Starting  $T_{ch} = 25 \text{ }^\circ\text{C}$ ,  $R_G = 25 \Omega$ ,  $V_{GS} = 20 \text{ V} \rightarrow 0$

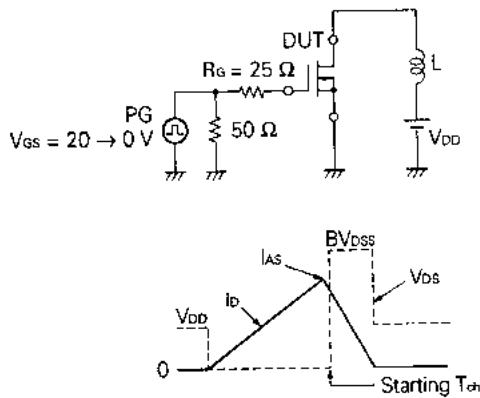
**PACKAGE DIMENSIONS**  
(in millimeters)



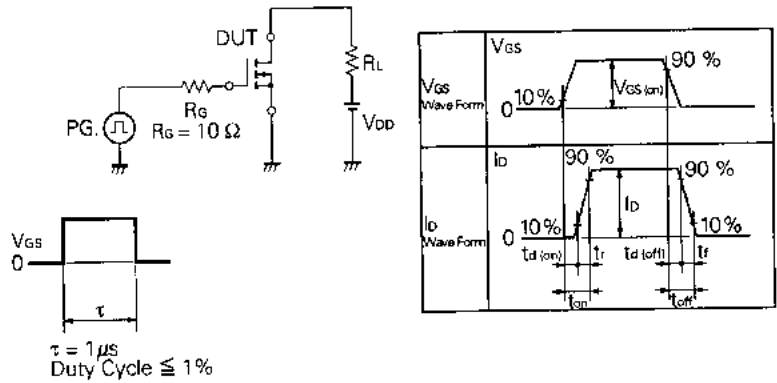
**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R <sub>DS(on)</sub>		2.4	2.8	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A
Gate to Source Cutoff Voltage	V <sub>GS(off)</sub>	2.5		3.5	V	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA
Forward Transfer Admittance	y <sub>fe</sub>	2.0	6.0		S	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 3 A
Drain Leakage Current	I <sub>DSS</sub>			100	μA	V <sub>DS</sub> = 900 V, V <sub>GS</sub> = 0
Gate to Source Leakage Current	I <sub>GSS</sub>			±10	μA	V <sub>GS</sub> = ±30 V, V <sub>DS</sub> = 0
Input Capacitance	C <sub>iss</sub>		1 000		pF	V <sub>DS</sub> = 10 V V <sub>GS</sub> = 0
Output Capacitance	C <sub>oss</sub>		170		pF	f = 1 MHz
Reverse Transfer Capacitance	C <sub>res</sub>		60		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		20		ns	V <sub>GS</sub> = 10 V
Rise Time	t <sub>r</sub>		30		ns	V <sub>DD</sub> = 150 V
Turn-Off Delay Time	t <sub>d(off)</sub>		85		ns	I <sub>D</sub> = 3 A, R <sub>θ</sub> = 10 Ω
Fall Time	t <sub>f</sub>		20		ns	R <sub>L</sub> = 50 Ω
Total Gate Charge	Q <sub>G</sub>		42		nC	V <sub>GS</sub> = 10 V
Gate to Source Charge	Q <sub>GS</sub>		10		nC	I <sub>D</sub> = 6 A
Gate to Drain Charge	Q <sub>GD</sub>		17		nC	V <sub>DD</sub> = 720 V
Diode Forward Voltage	V <sub>F(S-D)</sub>		0.9		V	I <sub>F</sub> = 6 A, V <sub>GS</sub> = 0
Reverse Recovery Time	t <sub>rr</sub>		680		ns	I <sub>F</sub> = 6 A
Reverse Recovery Charge	Q <sub>rr</sub>		4.8		μC	di/dt = 50 A/μs

**Test Circuit 1: Avalanche Capability**



**Test Circuit 2: Switching Time**



**Test Circuit 3: Gate Charge**

