

MOS FIELD EFFECT POWER TRANSISTOR

2SK1286

SWITCHING

N-CHANNEL POWER MOS FET

INDUSTRIAL USE

DESCRIPTION

The 2SK1286 is N-channel MOS Field Effect Transistor designed for solenoid, motor and lamp driver.

FEATURES

- Low On-state Resistance
 $R_{DS(on)} \leq 70 \text{ m}\Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 8 \text{ A}$)
 $R_{DS(on)} \leq 95 \text{ m}\Omega$ ($V_{GS} = 4 \text{ V}$, $I_D = 8 \text{ A}$)
- Low C_{iss} $C_{iss} = 1400 \text{ pF TYP.}$
- Built-in G-S Gate Protection Diodes

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.

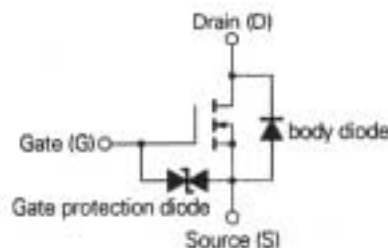
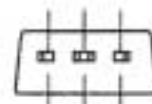
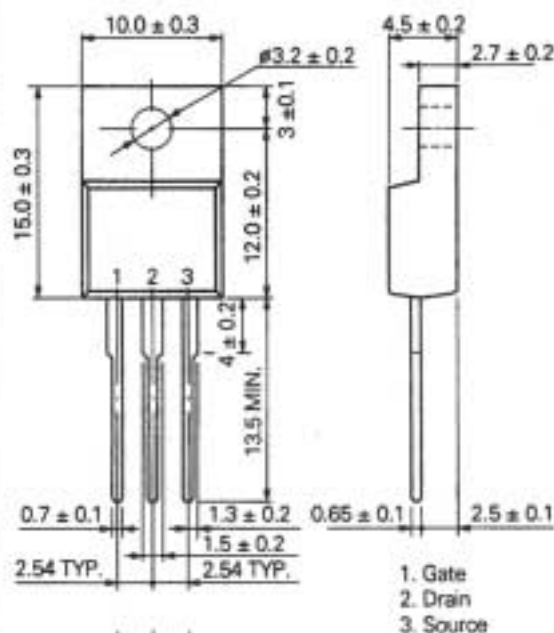
ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Drain to Source Voltage	V_{DS}	60	V
Gate to Source Voltage	$V_{GS(AC)}$	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 15	A
Drain Current (pulse)	$I_{D(pulse)}$	± 60	A
Total Power Dissipation ($T_a = 25^\circ\text{C}$)	P_{T1}	2.0	W
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_{T2}	30	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

PACKAGE DIMENSIONS

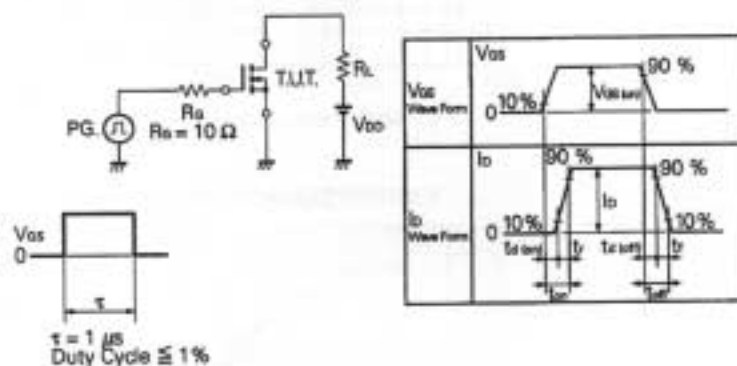
(in millimeters)



ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	$R_{DS(on)}$		55	70	m Ω	$V_{GS} = 10\text{ V}$, $I_D = 8\text{ A}$
Drain to Source On-state Resistance	$R_{DS(on)}$		80	95	m Ω	$V_{GS} = 4.0\text{ V}$, $I_D = 8\text{ A}$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	1.0		2.5	V	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$
Forward Transfer Admittance	$ y_{fs} $	7.0	14		S	$V_{DS} = 10\text{ V}$, $I_D = 8\text{ A}$
Drain Leakage Current	I_{DSS}			10	μA	$V_{GS} = 60\text{ V}$, $V_{DS} = 0$
Gate to Source Leakage Current	I_{GSS}			± 10	μA	$V_{DS} = \pm 20\text{ V}$, $V_{GS} = 0$
Input Capacitance	C_{iss}		1 400		pF	$V_{DS} = 10\text{ V}$ $V_{GS} = 0$ $f = 1\text{ MHz}$
Output Capacitance	C_{oss}		500		pF	
Reverse Transfer Capacitance	C_{rss}		130		pF	
Turn-On Delay Time	$t_{d(on)}$		25		ns	$V_{GS(on)} = 10\text{ V}$ $V_{DS} = 30\text{ V}$ $I_D = 10\text{ A}$, $R_G = 10\text{ }\Omega$ $R_L = 3.0\text{ }\Omega$
Rise Time	t_r		160		ns	
Turn-Off Delay Time	$t_{d(off)}$		130		ns	
Fall Time	t_f		80		ns	
Total Gate Charge	Q_g		30		nC	$V_{GS} = 10\text{ V}$ $I_D = 20\text{ A}$ $V_{DS} = 48\text{ V}$
Gate to Source Charge	Q_{gs}		5		nC	
Gate to Drain Charge	Q_{gd}		10		nC	
Diode Forward Voltage	V_{SD}		1.0		V	$I_{SD} = 15\text{ A}$, $V_{GS} = 0$
Reverse Recovery Time	t_{rr}		150		ns	$I_F = 20\text{ A}$, $V_{GS} = 0$
Reverse Recovery Charge	Q_{rr}		250		nC	$dI/dt = 50\text{ A}/\mu\text{s}$

Test Circuit 1: Switching Time



Test Circuit 2: Gate Charge

