

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} $C_{iss} = 1\,400 \text{ pF TYP.}$
- Built-in G-S Gate Protection Diodes

QUALITY GRADE

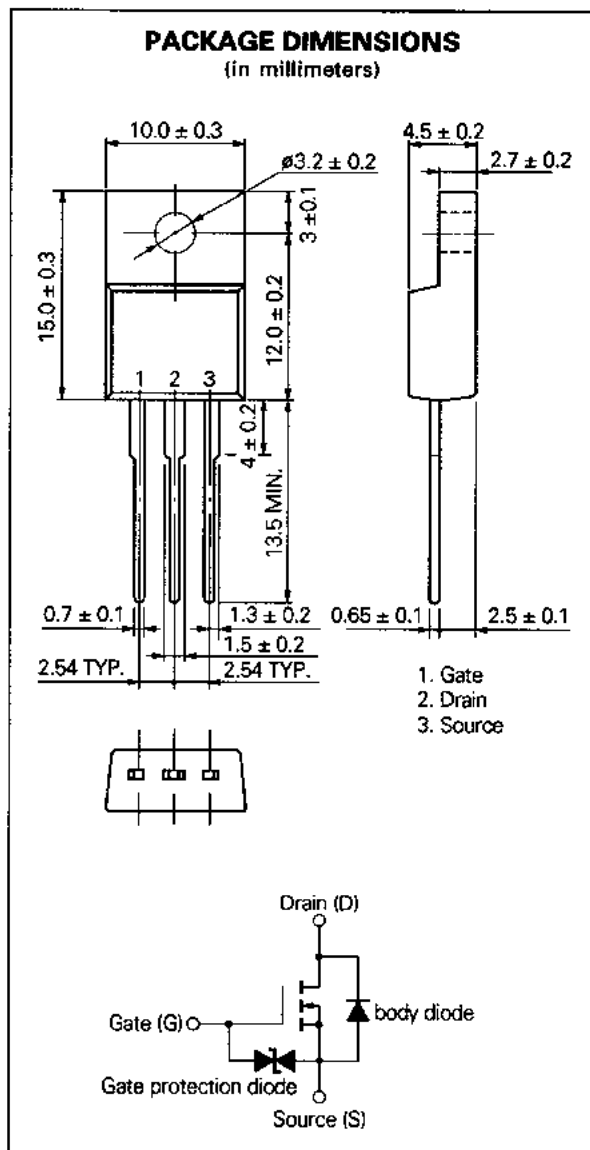
Standard

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

Drain to Source Voltage	V_{DSS}	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 ($T_a = 25 \text{ }^\circ\text{C}$)	P_{T1}	2.0	W
Total Power Dissipation ($T_c = 25 \text{ }^\circ\text{C}$)	P_{T2}	30	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

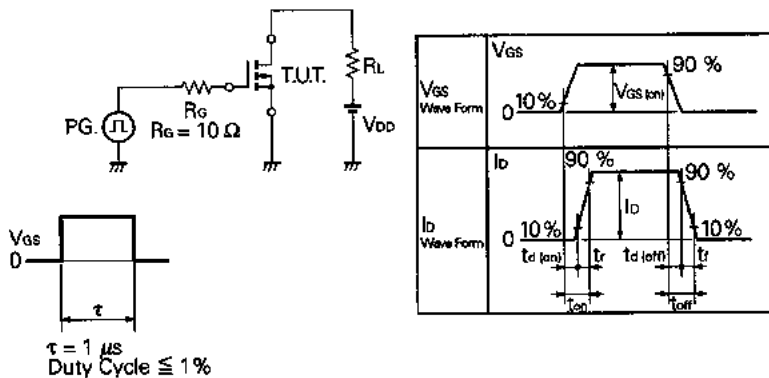
* $PW \leq 10 \text{ } \mu\text{s}$, Duty Cycle $\leq 1 \%$



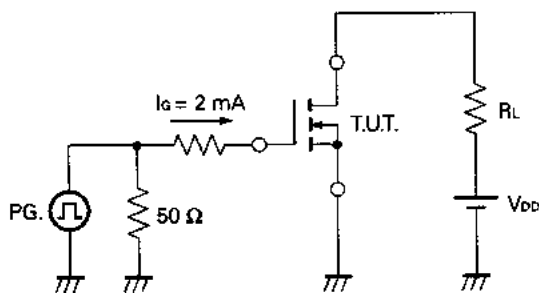
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{DS(on)}		55	70	mΩ	V _{GS} = 10 V, I _D = 8 A
Drain to Source On-state Resistance	R _{DS(on)}		80	95	mΩ	V _{GS} = 4.0 V, I _D = 8 A
Gate to Source Cutoff Voltage	V _{GS(off)}	1.0		2.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	7.0	14		S	V _{DS} = 10 V, I _D = 8 A
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = 60 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0
Input Capacitance	C _{iss}		1 400		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		500		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{rss}		130		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		25		ns	V _{GS(on)} = 10 V
Rise Time	t _r		160		ns	V _{DD} = 30 V
Turn-Off Delay Time	t _{d(off)}		130		ns	I _D = 10 A, R _θ = 10 Ω
Fall Time	t _f		80		ns	R _L = 3.0 Ω
Total Gate Charge	Q _g		30		nC	V _{GS} = 10 V
Gate to Source Charge	Q _{gs}		5		nC	I _D = 20 A
Gate to Drain Charge	Q _{gd}		10		nC	V _{DD} = 48 V
Diode Forward Voltage	V _{SD}		1.0		V	I _{SD} = 15 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		150		ns	I _r = 20 A, V _{GS} = 0
Reverse Recovery Charge	Q _{rr}		250		nC	di/dt = 50 A/μs

Test Circuit 1: Switching Time



Test Circuit 2: Gate Charge



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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