

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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MOS FIELD EFFECT TRANSISTOR

Phase-out/Discontinued

2SK1491

**SWITCHING
N-CHANNEL POWER MOS FET**

DESCRIPTION

The 2SK1491 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low on-state resistance
 $R_{DS(on)} = 0.15 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 13 \text{ A)}$
- Low input capacitance $C_{iss} = 1950 \text{ pF TYP.}$
- Built-in G-S gate protection diodes
- High avalanche capability ratings

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	250	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	±30	V
Drain Current (DC)	$I_{D(DC)}$	±25	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	±100	A
Total Power Dissipation (T _c = 25°C)	P_T	120	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C
Single Avalanche Current ^{Note2}	I_{AS}	37.5	A
Single Avalanche Energy ^{Note2}	E_{AS}	1250	mJ

Notes 1. $PW \leq 10 \mu s$, Duty Cycle $\leq 1\%$

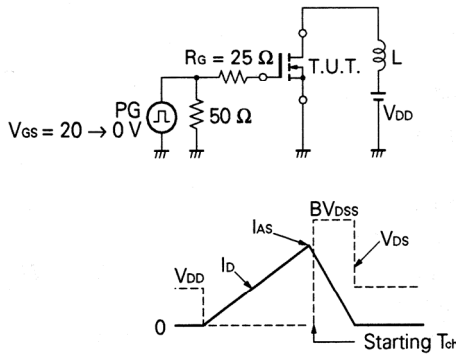
2. $T_{ch} = 25^\circ\text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \rightarrow 0 \text{ V}$

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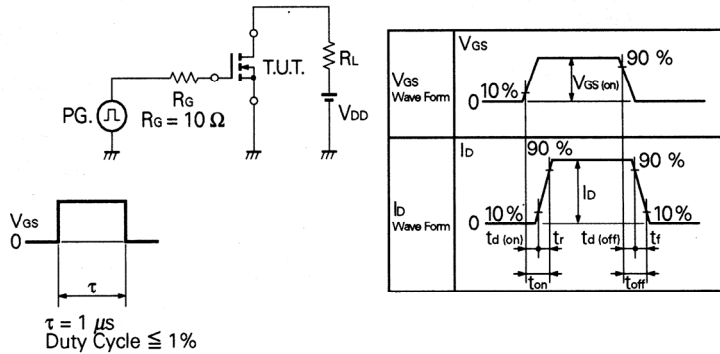
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{Ds(on)}		0.12	0.15	Ω	V _{GS} = 10 V, I _D = 13 A
Gate to Source Cutoff Voltage	V _{GS(off)}	2.5		3.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	7.0			S	V _{DS} = 10 V, I _D = 13 A
Drain Leakage Current	I _{DSS}			100	μA	V _{DS} = 250 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±30 V, V _{DS} = 0
Input Capacitance	C _{iss}		1 950		pF	V _{DS} = 10 V V _{GS} = 0 f = 1 MHz
Output Capacitance	C _{oss}		980		pF	
Reverse Transfer Capacitance	C _{res}		410		pF	
Turn-On Delay Time	t _{d(on)}		35		ns	V _{GS} = 10 V V _{DD} = 150 V I _D = 13 A, R _G = 10 Ω R _L = 11.5 Ω
Rise Time	t _r		110		ns	
Turn-Off Delay Time	t _{d(off)}		110		ns	
Fall Time	t _f		50		ns	
Total Gate Charge	Q _G		55		nC	V _{GS} = 10 V I _D = 25 A V _{DD} = 200 V
Gate to Source Charge	Q _{GS}		12		nC	
Gate to Drain Charge	Q _{GD}		32		nC	
Diode Forward Voltage	V _{F(S-D)}		1.0		V	I _F = 25 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		340		ns	I _F = 25 A, V _{GS} = 0 di/dt = 50 A/μs
Reverse Recovery Charge	Q _{rr}		2.3		μC	

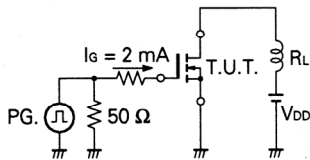
Test Circuit 1: Avalanche Capability



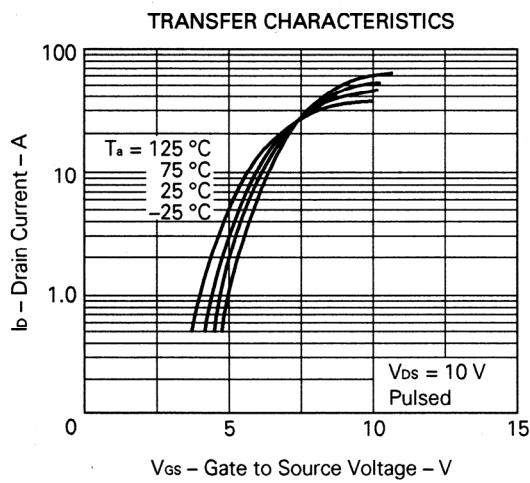
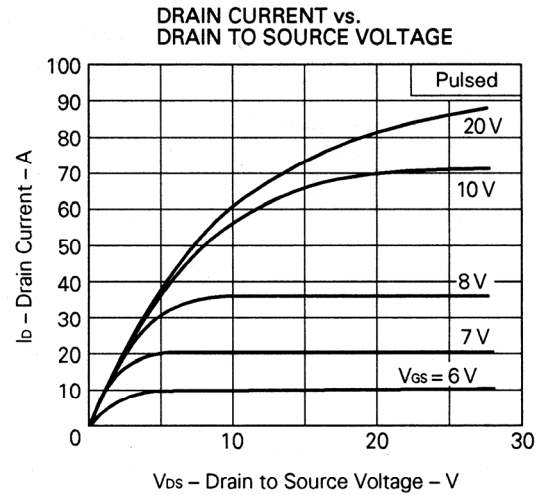
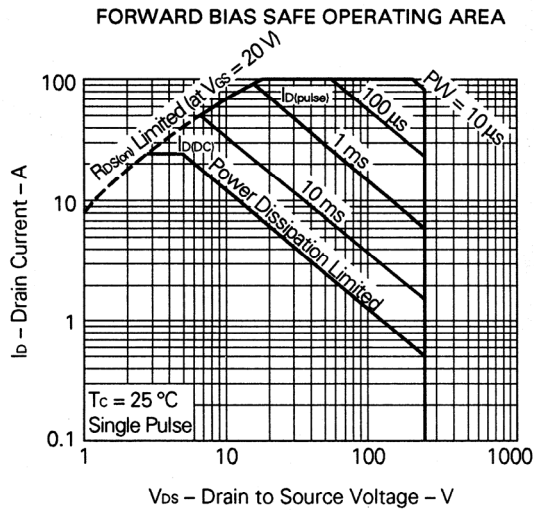
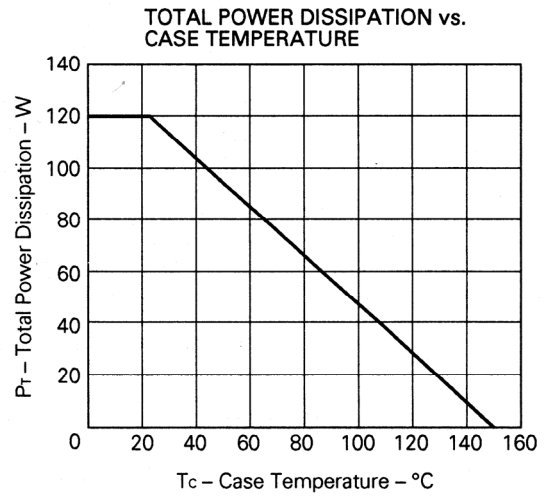
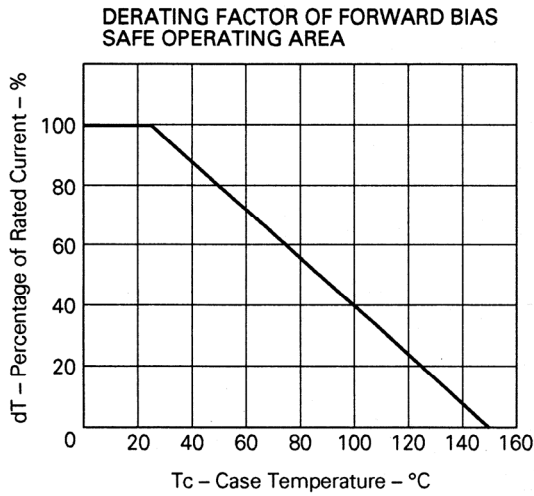
Test Circuit 2: Switching Time

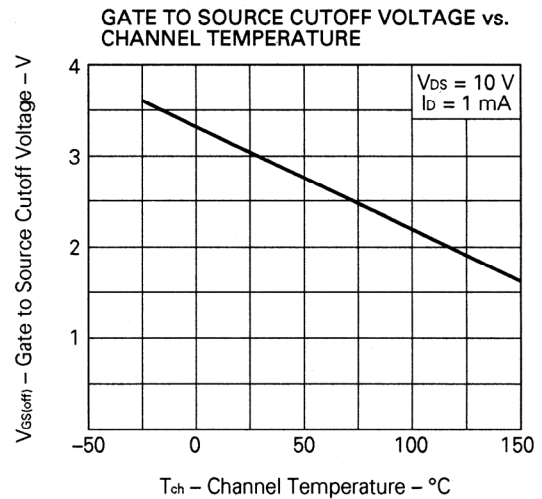
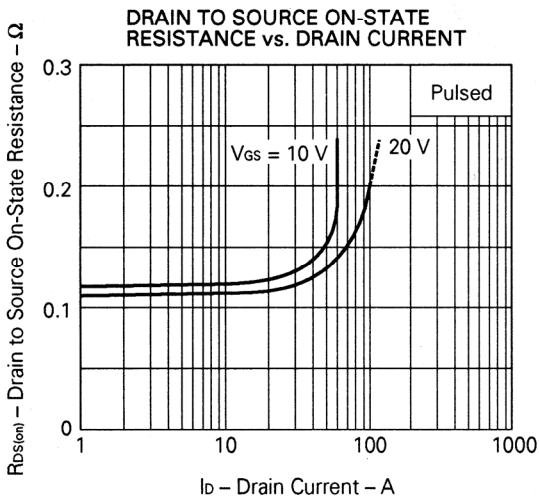
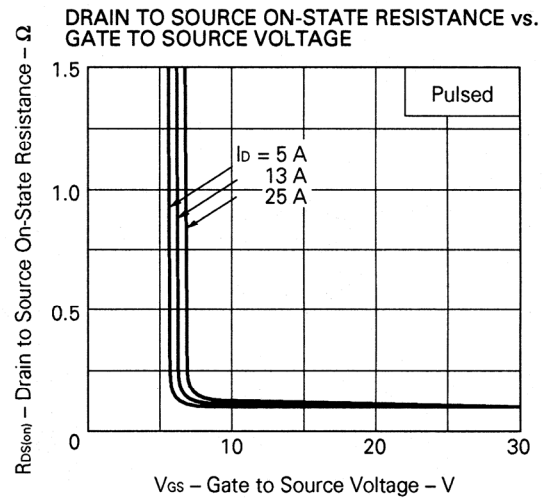
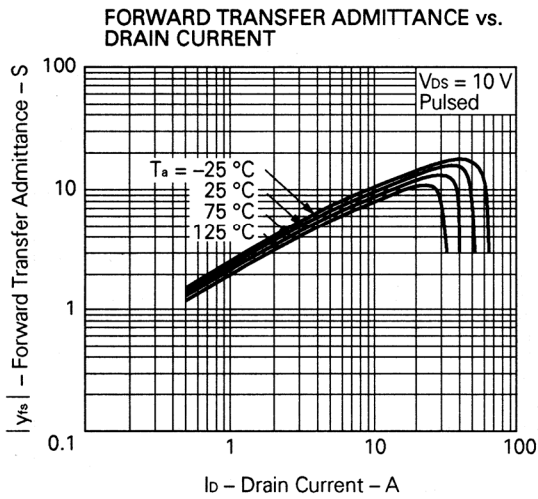
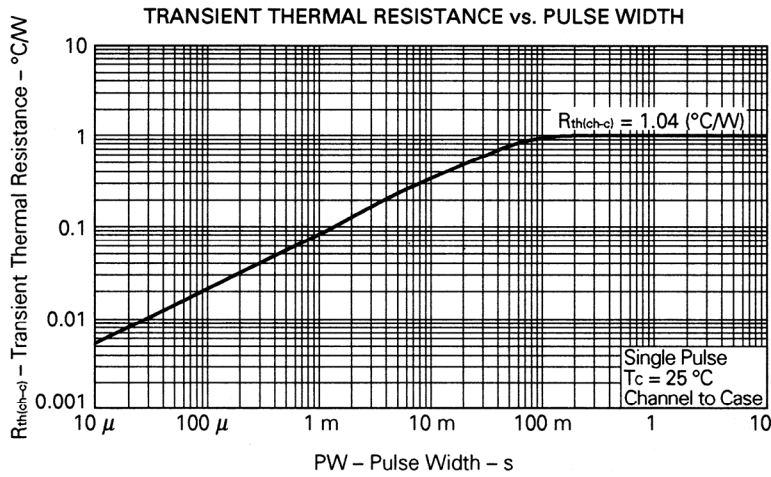


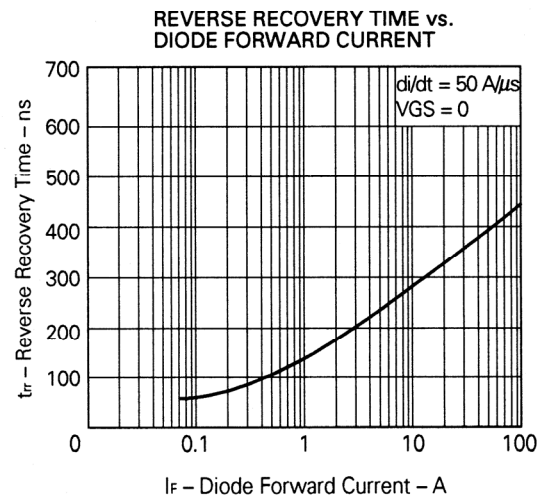
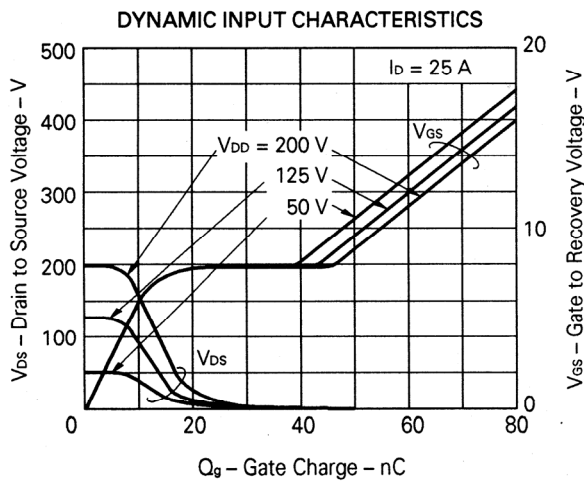
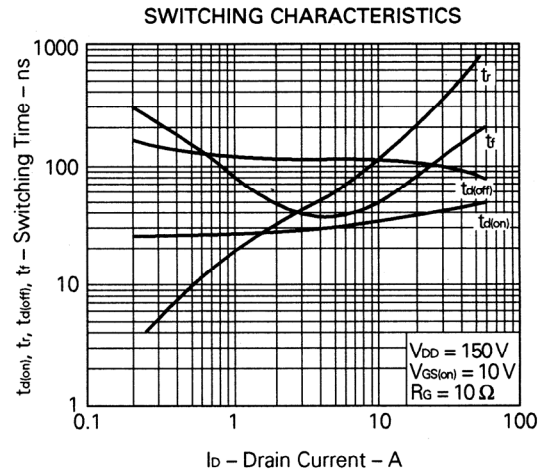
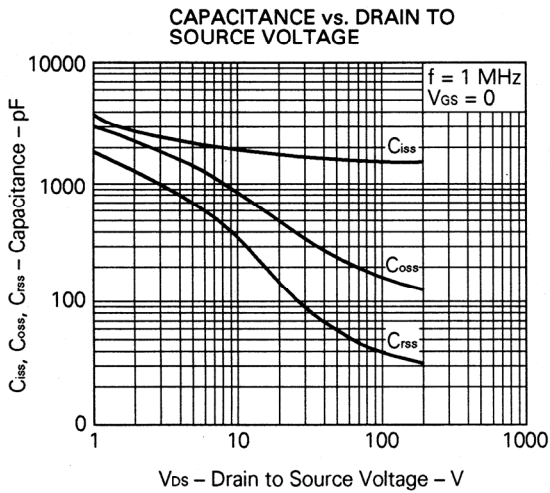
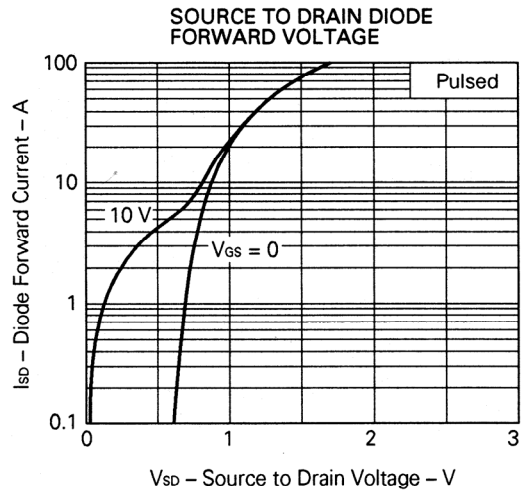
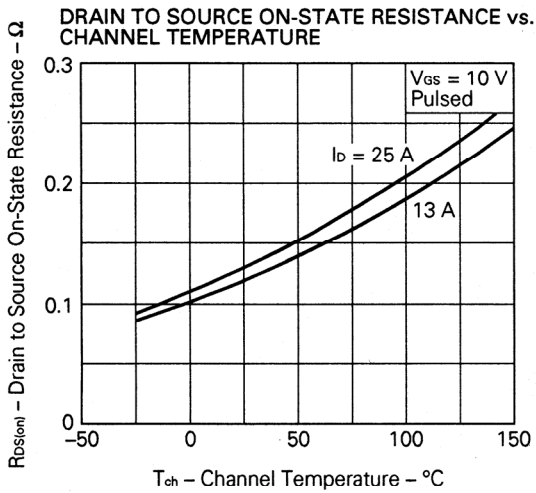
Test Circuit 3: Gate Charge

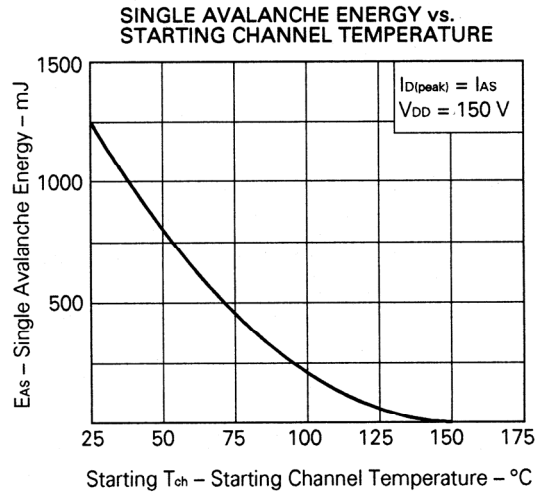
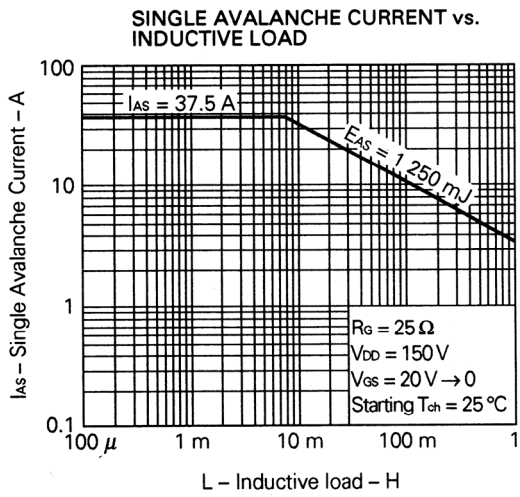


TYPICAL CHARACTERISTICS (T_a = 25 °C)



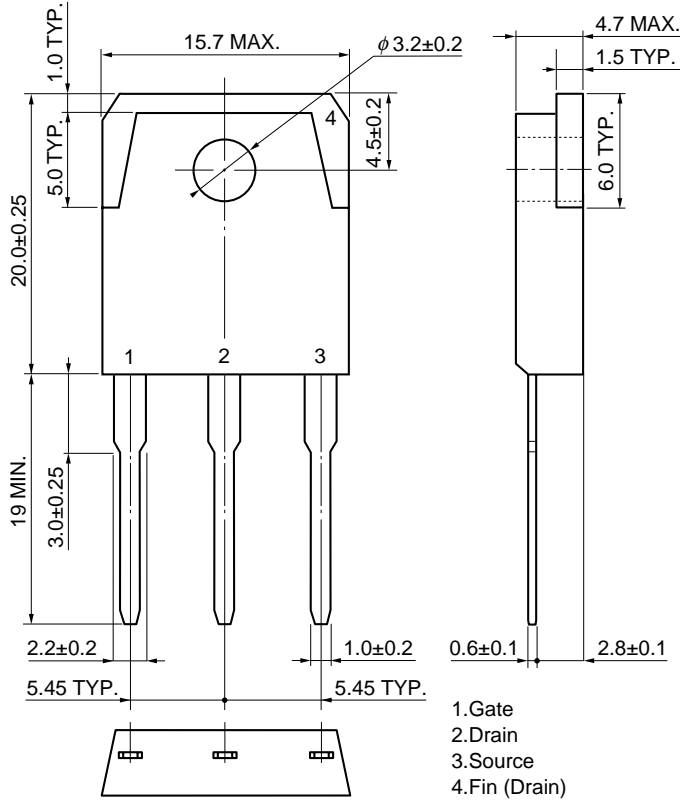




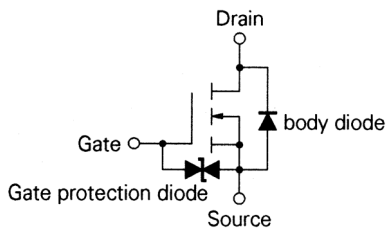


PACKAGE DRAWING (Unit: mm)

<R> TO-3P (MP-88)



EQUIVALENT CIRCUIT



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

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