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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

2SK1271

**SWITCHING
N-CHANNEL POWER MOS FET**

DESCRIPTION

The 2SK1271 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- High voltage rating ($V_{DSS} = 1400\text{ V}$)
- Low on-state resistance
 $R_{DS(on)} = 4.0\ \Omega\ \text{MAX.}$ ($V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$)
- Low C_{iss} $C_{iss} = 1800\text{ pF TYP.}$

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

Drain to Source Voltage ($V_{GS} = 0\text{ V}$)	V_{DSS}	1400	V
Gate to Source Voltage ($V_{DS} = 0\text{ V}$)	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 5.0	A
Drain Current (pulse) ^{Note}	$I_{D(pulse)}$	± 10	A
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_T	240	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

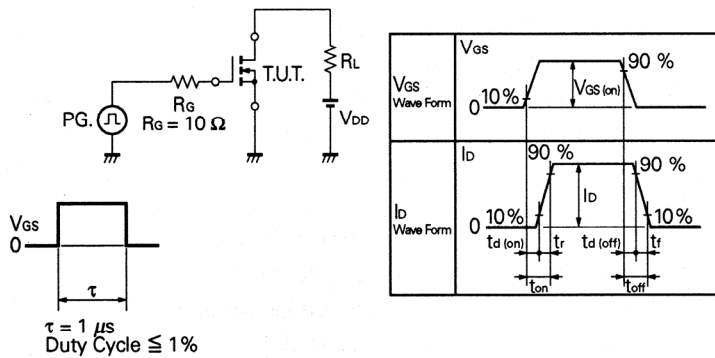
Note $PW \leq 10\ \mu\text{s}$, Duty cycle $\leq 1\%$

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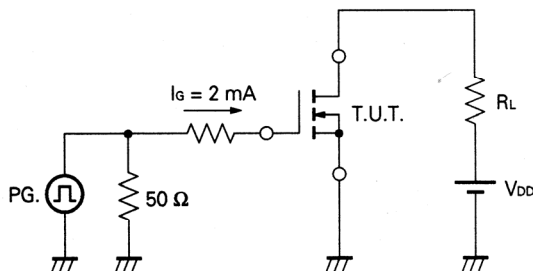
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{DS(on)}		3.5	4.0	Ω	V _{GS} = 10 V, I _D = 3 A
Gate to Source Cutoff Voltage	V _{GS(off)}	1.5		3.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	1.5			S	V _{DS} = 20 V, I _D = 3 A
Drain Leakage Current	I _{DSS}			100	μA	V _{DS} = 1 120 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±100	μA	V _{GS} = ±20 V, V _{DS} = 0
Input Capacitance	C _{iss}		1 800		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		500		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{res}		360		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		25		ns	V _{GS} = 10 V
Rise Time	t _r		30		ns	V _{DD} = 150 V
Turn-Off Delay Time	t _{d(off)}		220		ns	I _D = 3 A, R _G = 10 Ω
Fall Time	t _f		40		ns	R _L = 50 Ω
Total Gate Charge	Q _G		125		nC	V _{GS} = 10 V
Gate to Source Charge	Q _{GS}		15		nC	I _D = 5 A
Gate to Drain Charge	Q _{GD}		70		nC	V _{DD} = 450 V
Diode Forward Voltage	V _{F(S-D)}		0.9		V	I _F = 5 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		1 400		ns	I _F = 5 A
Reverse Recovery Charge	Q _{rr}		30		μC	di/dt = 50 A/μs

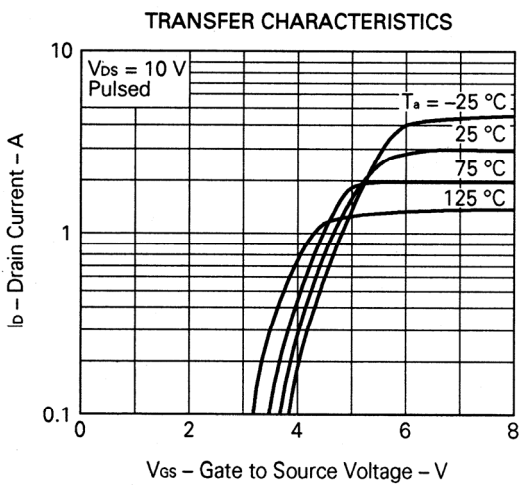
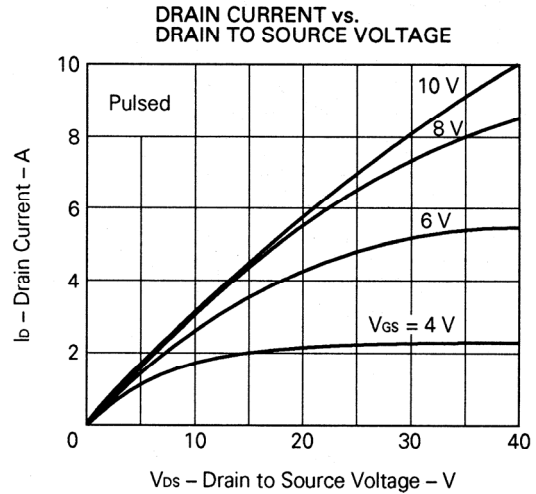
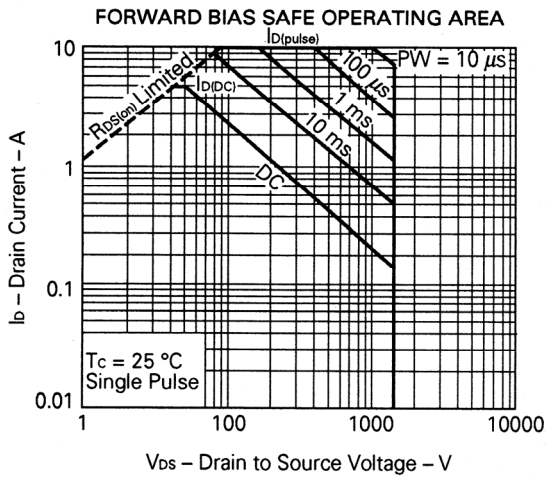
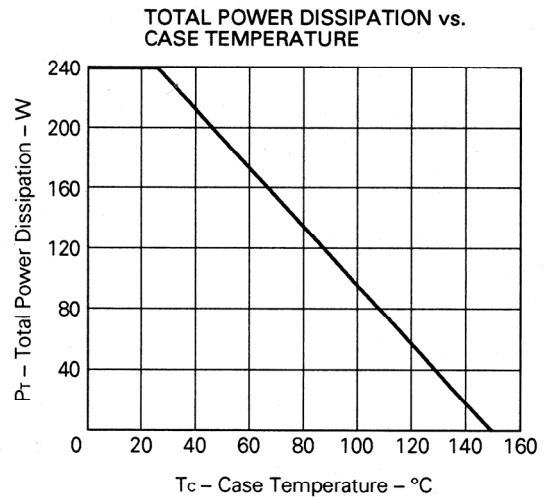
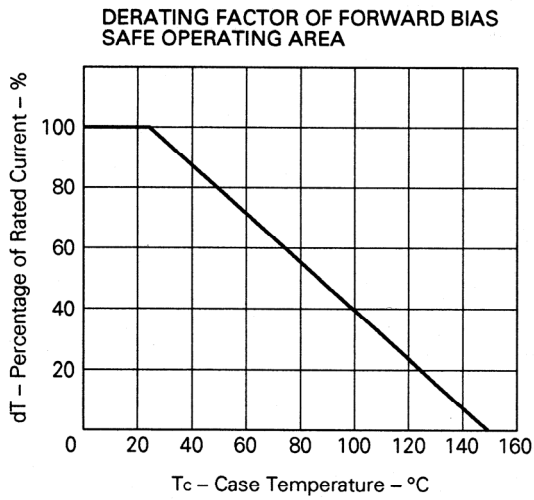
Test Circuit 1: Switching Time



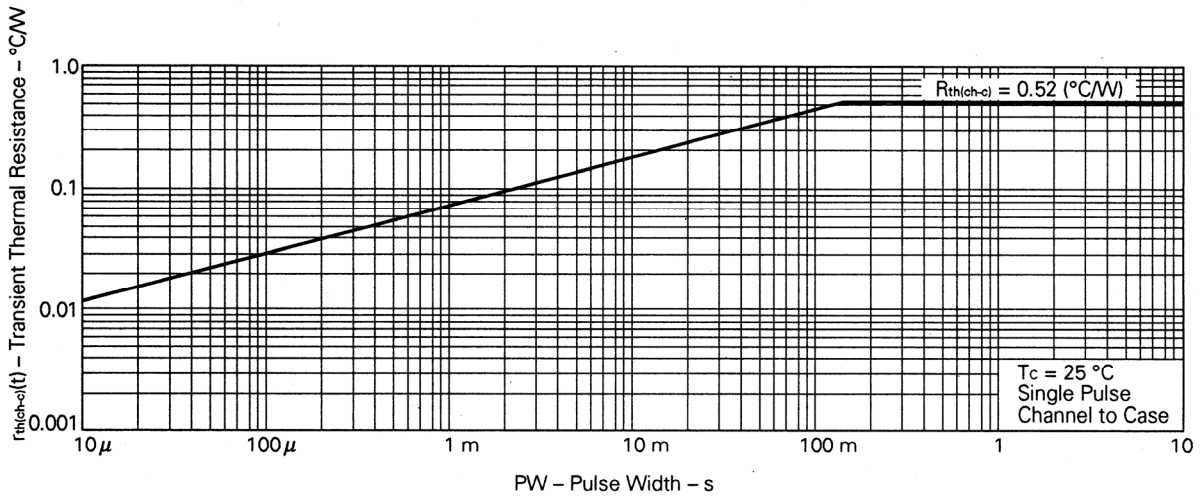
Test Circuit 2: Gate Charge



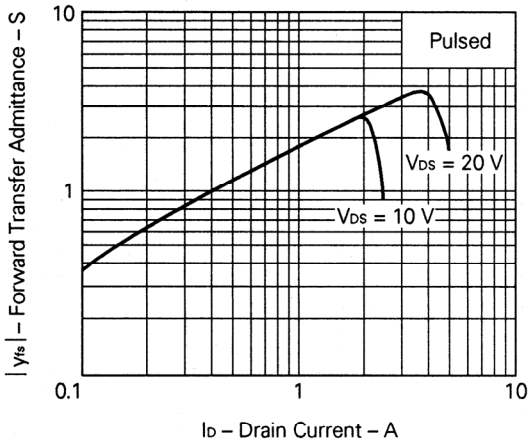
TYPICAL CHARACTERISTICS (T_a = 25 °C)



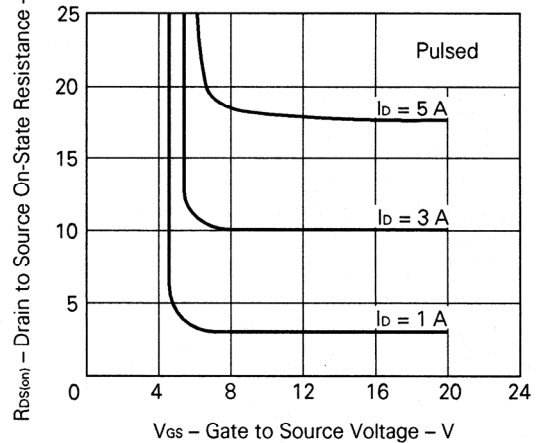
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



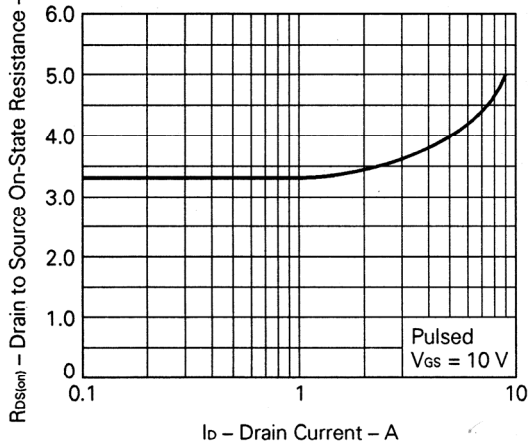
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



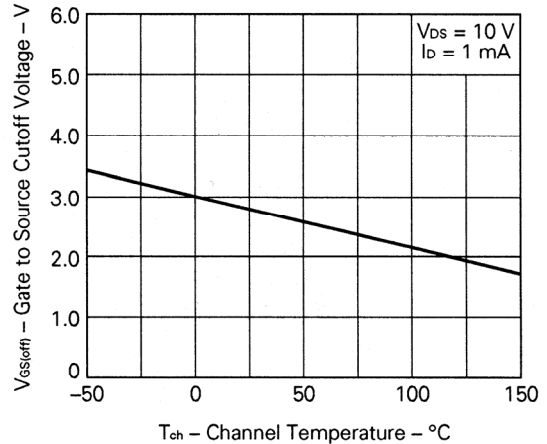
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

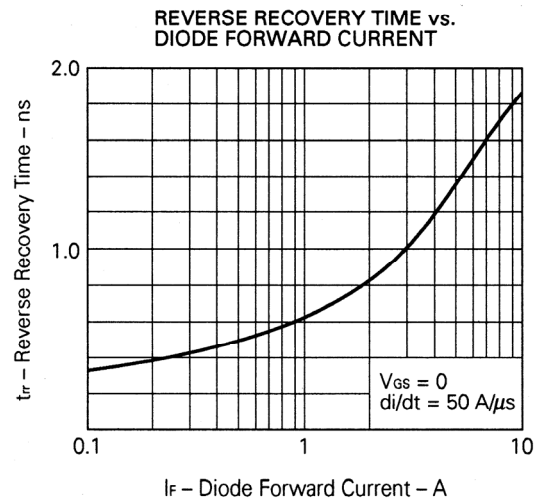
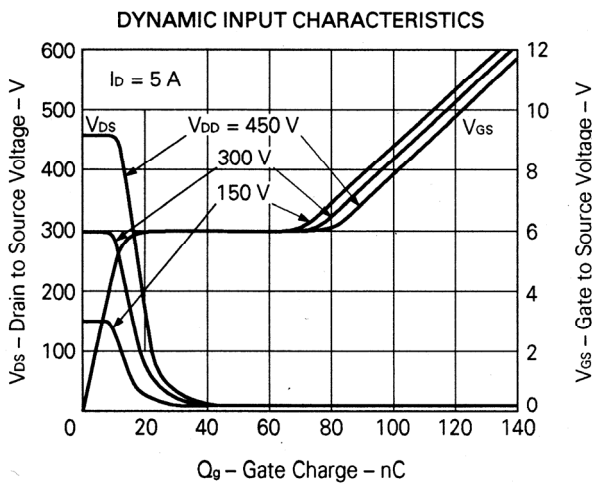
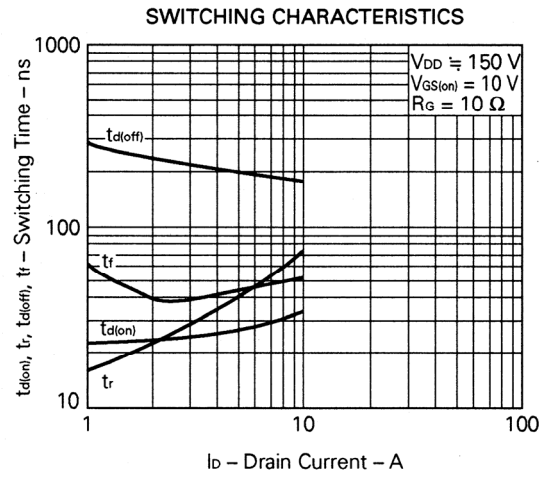
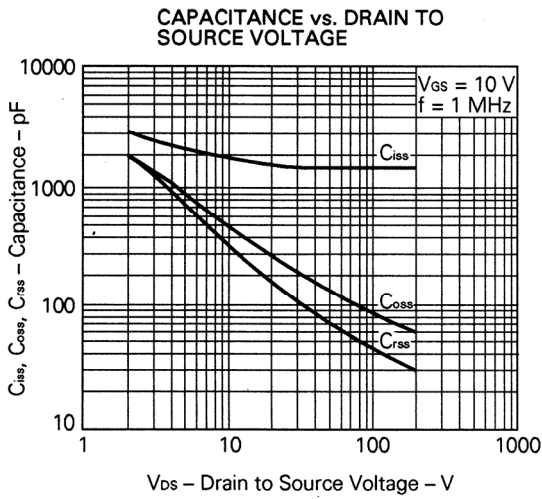
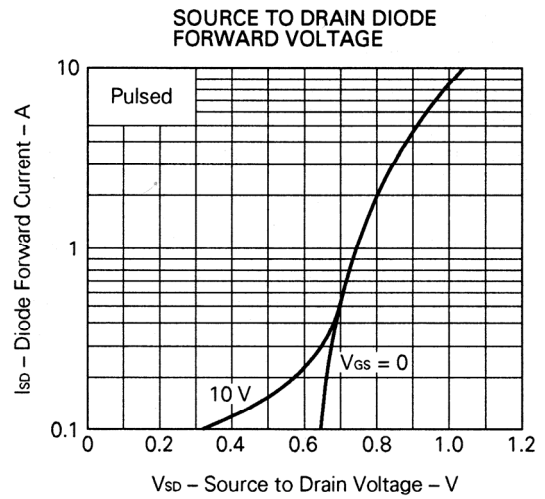
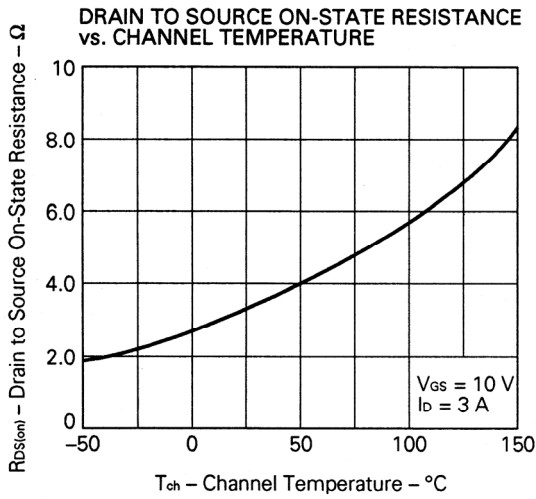


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



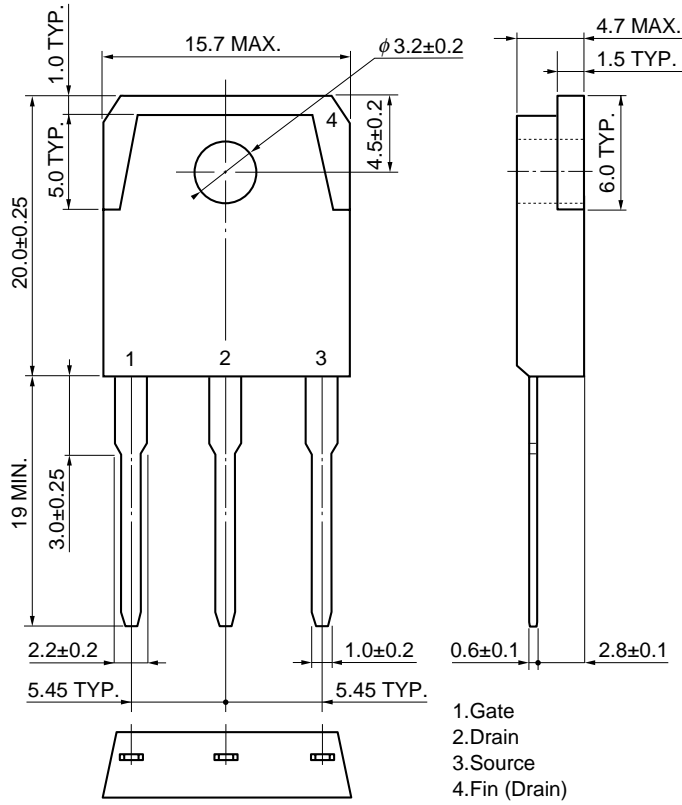
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



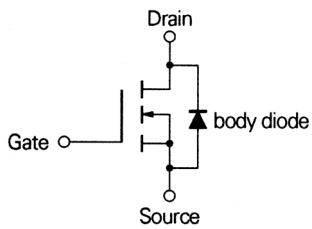


PACKAGE DRAWING (Unit: mm)

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



EQUIVALENT CIRCUIT



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