

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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EOL announced Product

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SWITCHING

N-CHANNEL POWER MOS FET

DESCRIPTION

The 2SK2511 is N-Channel MOS Field Effect Transistors designed for high current switching applications.

FEATURES

- Super Low on-state resistance
 $R_{DS(on)1} = 27 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 20 \text{ A)}$
 $R_{DS(on)2} = 40 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4 \text{ V, } I_D = 20 \text{ A)}$
- Low input capacitance
 $C_{iss} = 1\ 210 \text{ pF TYP.}$
- Built-in G-S Protection Diode

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

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	60	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 20	V
Drain Current (DC)	$I_D \text{ (DC)}$	± 40	A
Drain Current (pulse)*	$I_D \text{ (pulse)}$	± 160	A
Total Power Dissipation ($T_c = 25 \text{ }^\circ\text{C}$)	P_{T1}	80	W
Total Power Dissipation ($T_A = 25 \text{ }^\circ\text{C}$)	P_{T2}	3.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

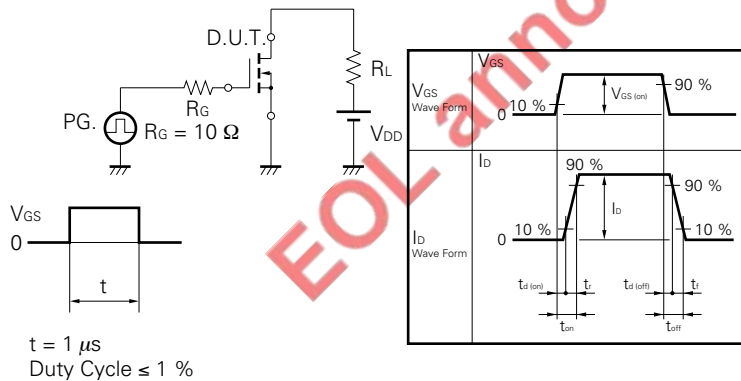
* $PW \leq 10 \text{ } \mu\text{s}$, Duty Cycle $\leq 1 \%$

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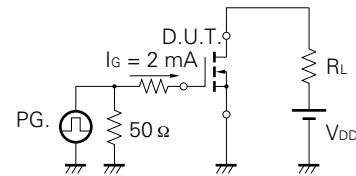
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-Resistance	R _{DS(on)1}		22	27	mΩ	V _{GS} = 10 V, I _D = 20 A
Drain to Source On-Resistance	R _{DS(on)2}		32	40	mΩ	V _{GS} = 4 V, I _D = 20 A
Gate to Source Cutoff Voltage	V _{GS(off)}	1.0	1.5	2.0	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	10			S	V _{DS} = 10 V, I _D = 20 A
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = V _{DSS} , V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0
Input Capacitance	C _{ISS}		1 210		pF	V _{DS} = 10 V
Output Capacitance	C _{OSS}		610		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{RSS}		270		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		32		ns	I _D = 20 A
Rise Time	t _r		300		ns	V _{GS} = 10 V
Turn-Off Delay Time	t _{d(off)}		160		ns	V _{DD} = 30 V
Fall Time	t _f		220		ns	R _G = 10 Ω
Total Gate Charge	Q _G		50		nC	I _D = 40 A
Gate to Source Charge	Q _{GS}		4.5		nC	V _{DD} = 48 V
Gate to Drain Charge	Q _{GD}		21		nC	V _{GS} = 10 V
Body Diode Forward Voltage	V _{F(S-D)}		1.0		V	I _F = 40 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		70		ns	I _F = 40 A, V _{GS} = 0
Reverse Recovery Charge	Q _{rr}		140		nC	di/dt = 100 A/μs

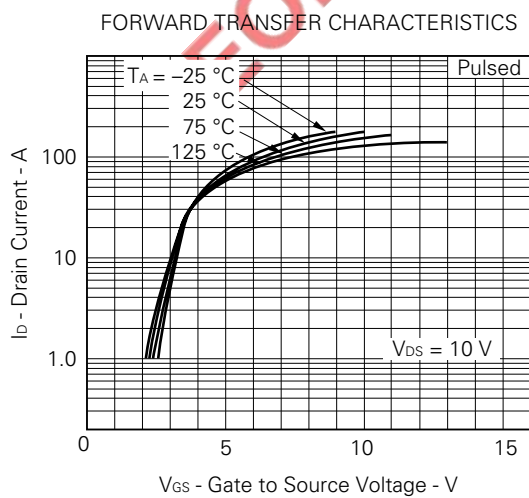
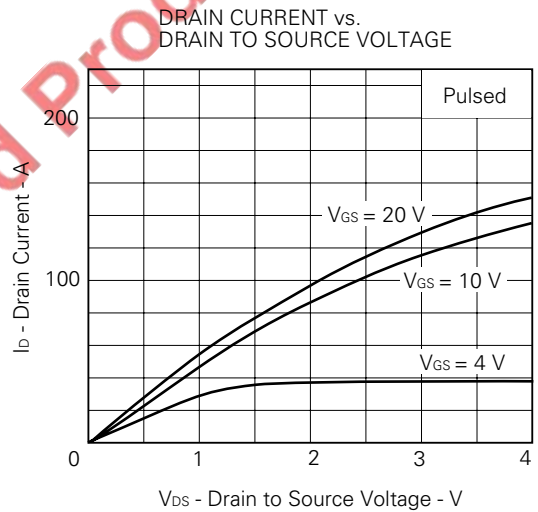
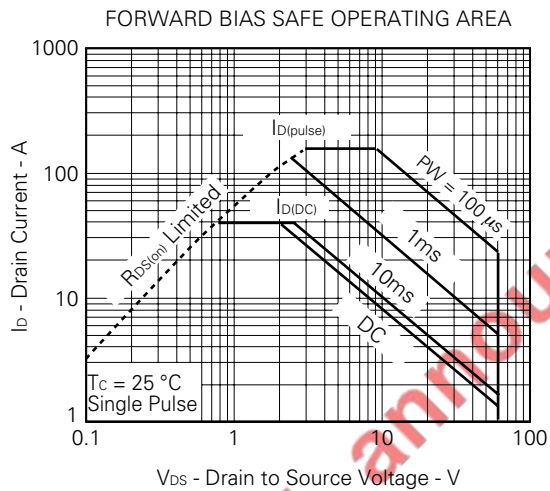
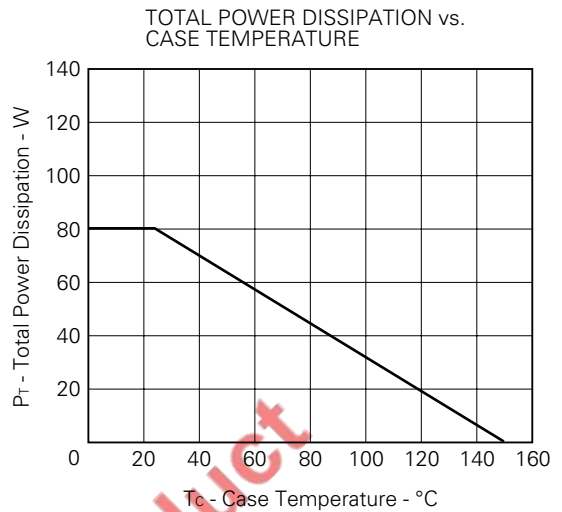
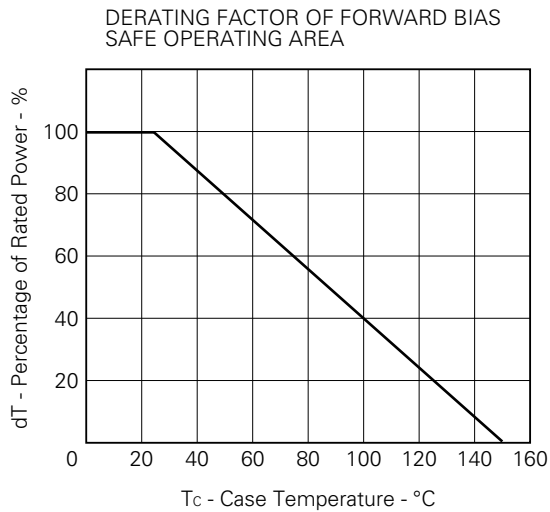
Test Circuit 1 Switching Time



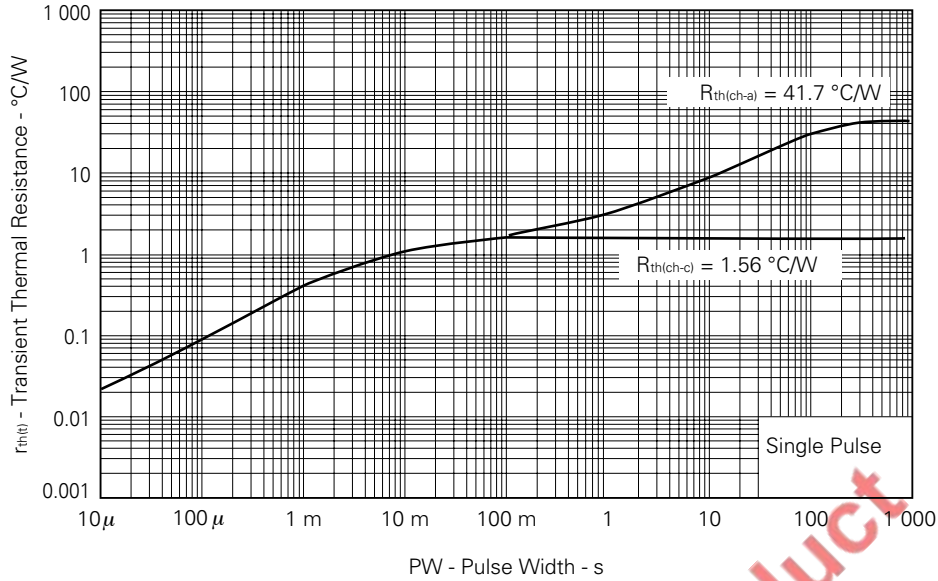
Test Circuit 2 Gate Charge



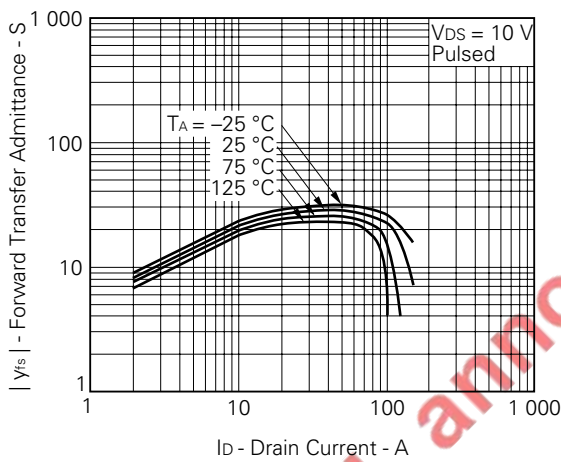
TYPICAL CHARACTERISTICS (T_A = 25 °C)



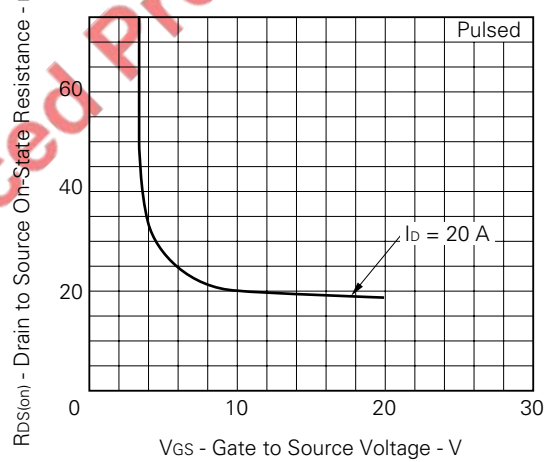
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



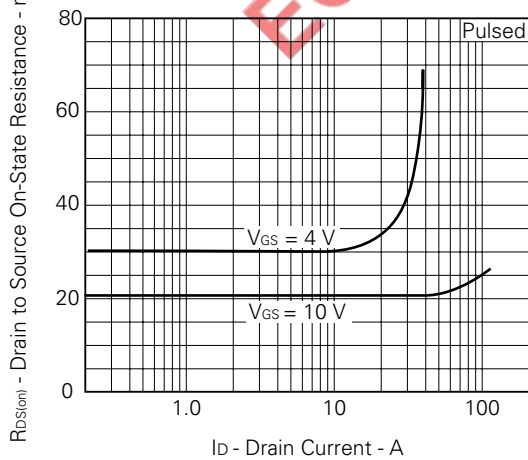
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



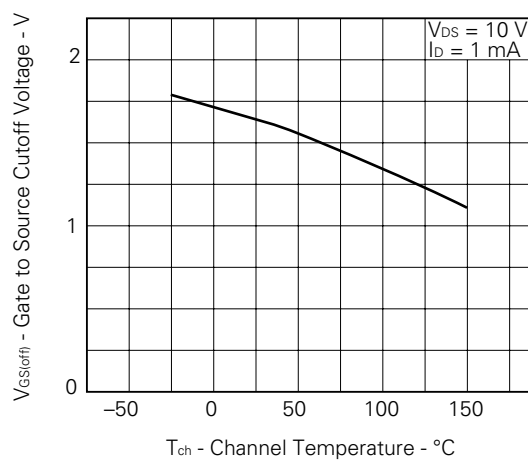
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



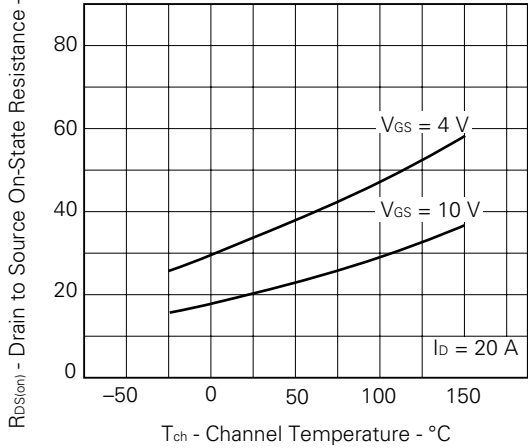
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



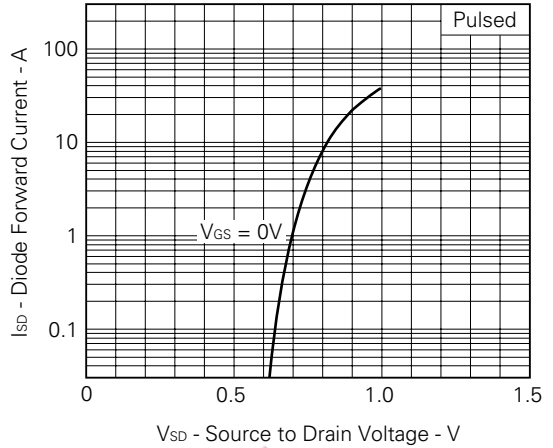
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



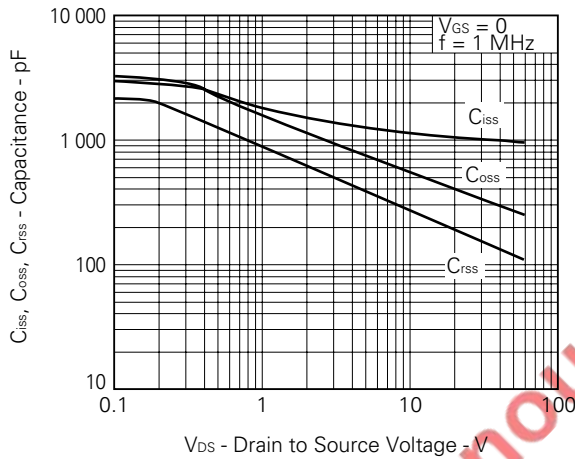
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



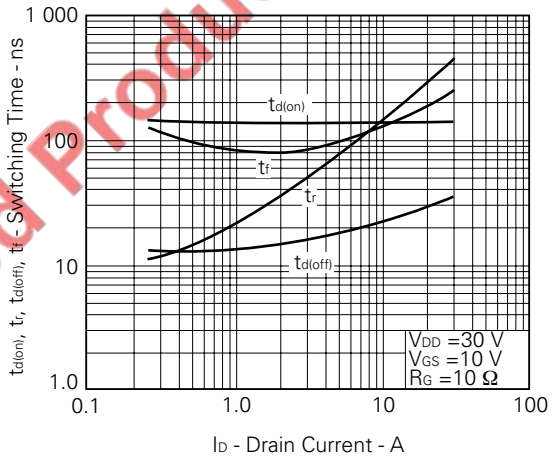
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



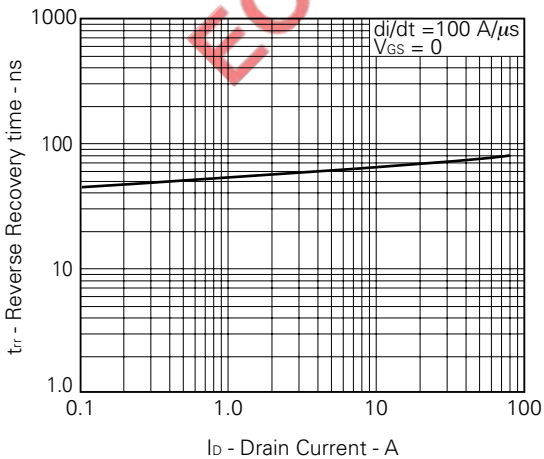
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



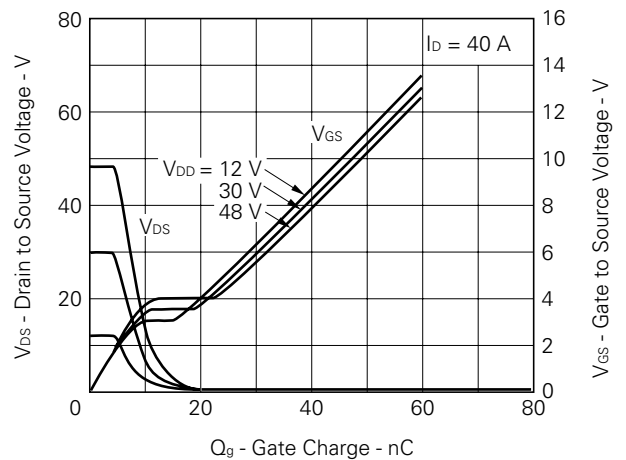
SWITCHING CHARACTERISTICS



REVERSE RECOVERY TIME vs. DRAIN CURRENT

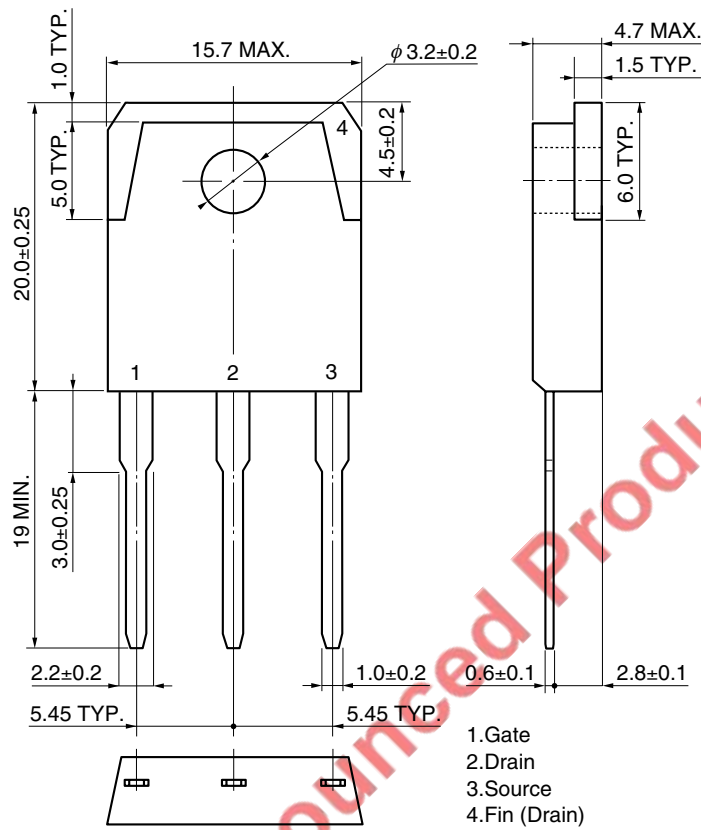


DYNAMIC INPUT/OUTPUT CHARACTERISTICS

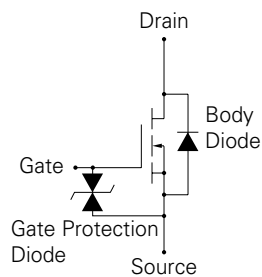


PACKAGE DRAWING (Unit: mm)

<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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