

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 2SK4095

Phase-out/Discontinued

N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

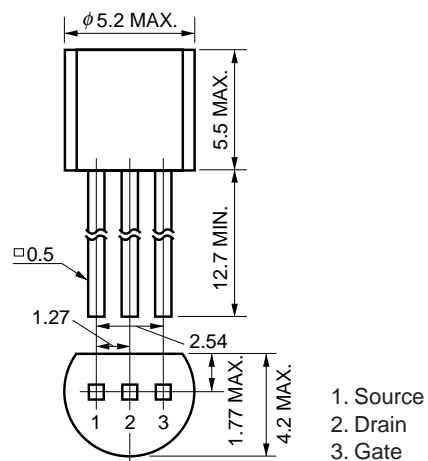
The 2SK4095 is the best switching element for the DC-DC converter usage from 24 to 48 V in the direct current input voltage.

It excels in the switching characteristics in low on-state resistance, and is the best for the high-speed switching usage.

FEATURES

- Low input capacitance
 $C_{iss} = 74 \text{ pF TYP.}$
- Low on-state resistance
 $R_{DS(on)} = 4.5 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 0.25 \text{ A)}$
- Through hole mount package (TO-92)

PACKAGE DRAWING (Unit: mm)



ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
2SK4095-AZ ^{Note}	Sn-Ag-Cu	Bagging 200 p/bag	TO-92 (SC-43A) typ. 0.26 g
2SK4095-T-AZ ^{Note}	Sn-Ag-Cu	Tape 2,500 p/reel	TO-92 (SC-43A) typ. 0.26 g

Note Pb-free (This product does not contain Pb in external electrode.)

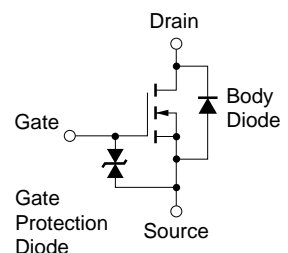
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

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) ($T_A = 25^\circ\text{C}$)	$I_{D(DC)}$	± 0.5	A
Drain Current (pulse) ^{Note}	$I_{D(pulse)}$	± 2.0	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_T	0.75	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 $\leq 1\%$

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.

EQUIVALENT CIRCUIT



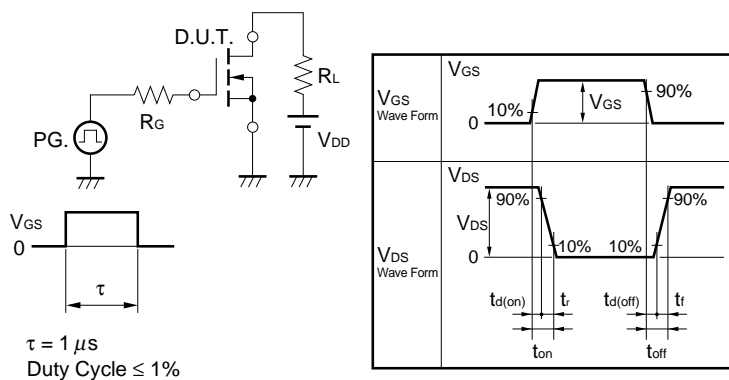
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

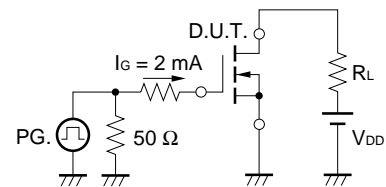
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 250 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1.0 mA	2.5	3.5	4.5	V
Forward Transfer Admittance Note	y _{fs}	V _{DS} = 10 V, I _D = 0.25 A	0.2	0.5		S
Drain to Source On-state Resistance Note	R _{DS(on)}	V _{GS} = 10 V, I _D = 0.25 A		3.2	4.5	Ω
Input Capacitance	C _{iss}	V _{DS} = 10 V		74		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		16		pF
Reverse Transfer Capacitance	C _{rss}	f = 1.0 MHz		7		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 125 V, I _D = 0.25 A		7		ns
Rise Time	t _r	V _{GS} = 10 V		5		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		12		ns
Fall Time	t _f			40		ns
Total Gate Charge	Q _G	V _{DD} = 200 V		4		nC
Gate to Source Charge	Q _{GS}	V _{GS} = 10 V		0.9		nC
Gate to Drain Charge	Q _{GD}	I _D = 0.5 A		2		nC
Body Diode Forward Voltage Note	V _{F(S-D)}	I _F = 0.5 A, V _{GS} = 0 V		0.84		V
Reverse Recovery Time	t _{rr}	I _F = 0.5 A, V _{GS} = 0 V		42		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		57		nC

Note Pulsed

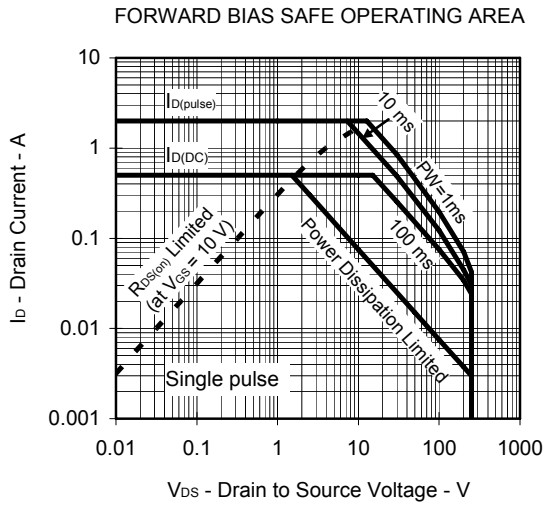
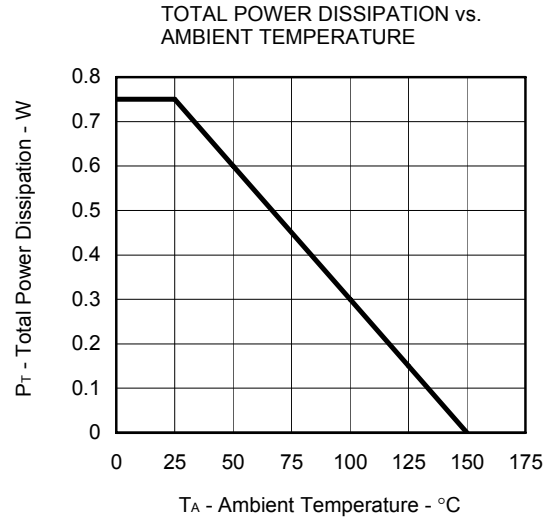
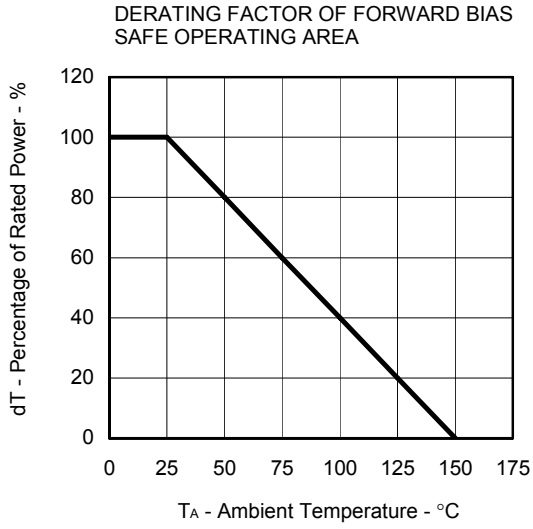
TEST CIRCUIT 1 SWITCHING TIME



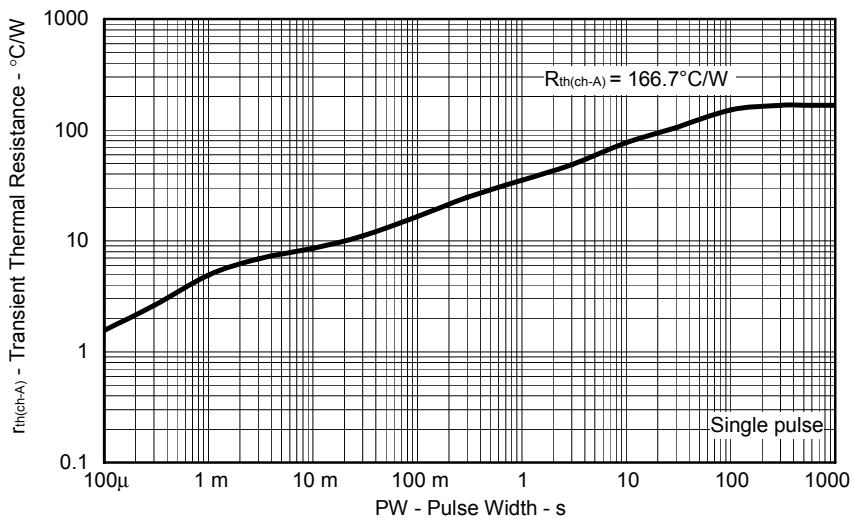
TEST CIRCUIT 2 GATE CHARGE



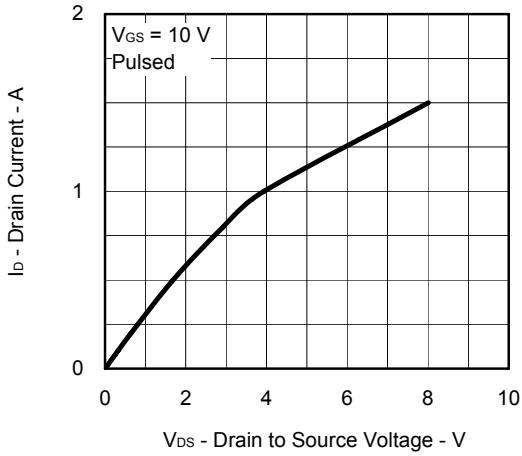
TYPICAL CHARACTERISTICS (T_A = 25°C)



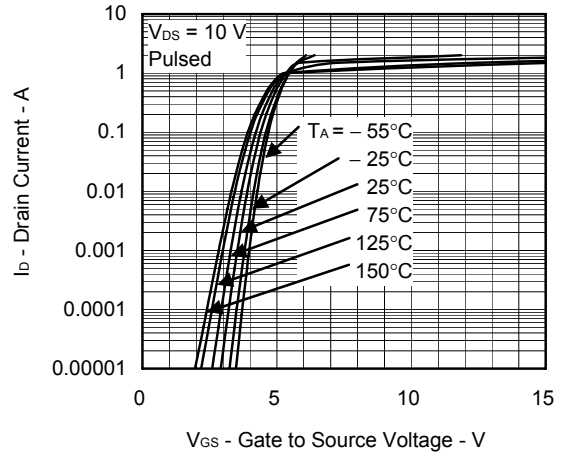
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



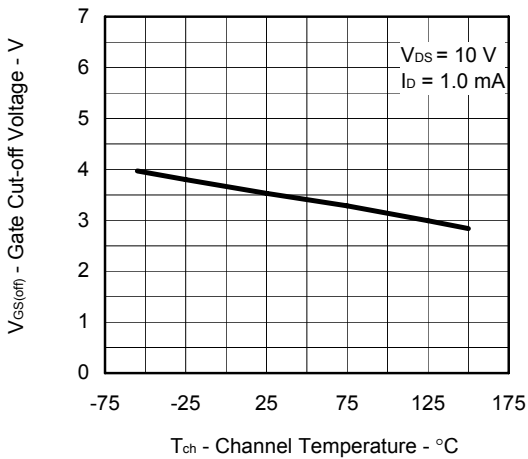
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



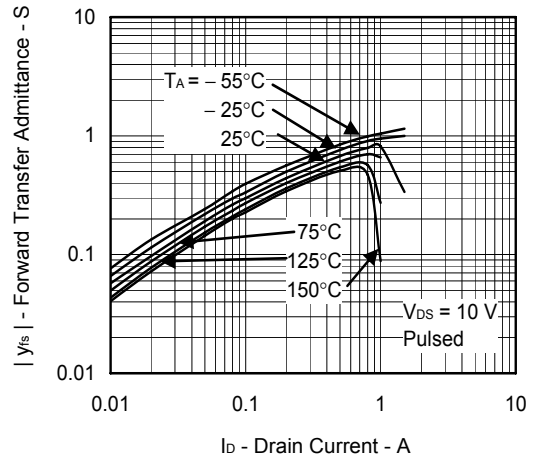
FORWARD TRANSFER CHARACTERISTICS



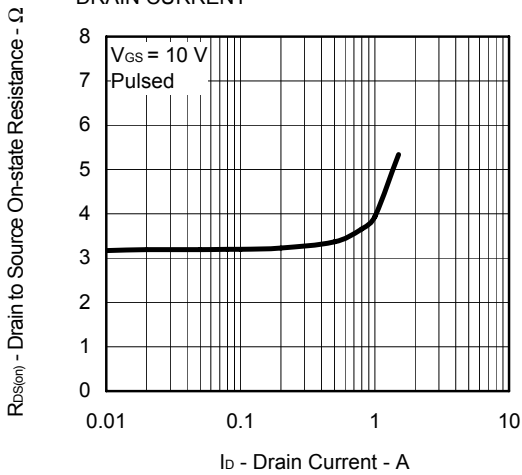
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



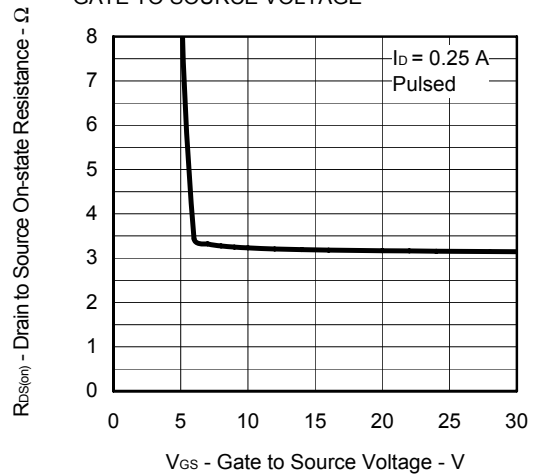
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



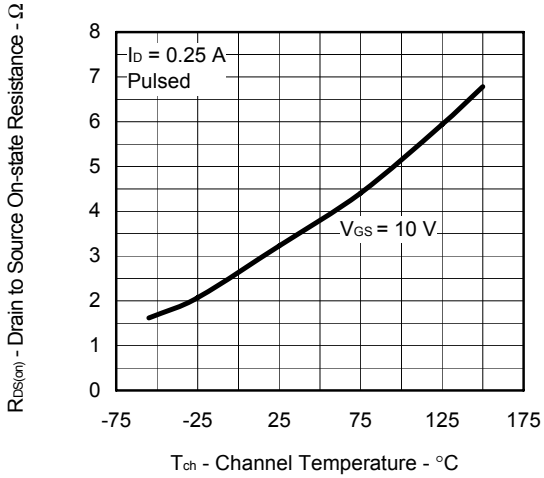
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



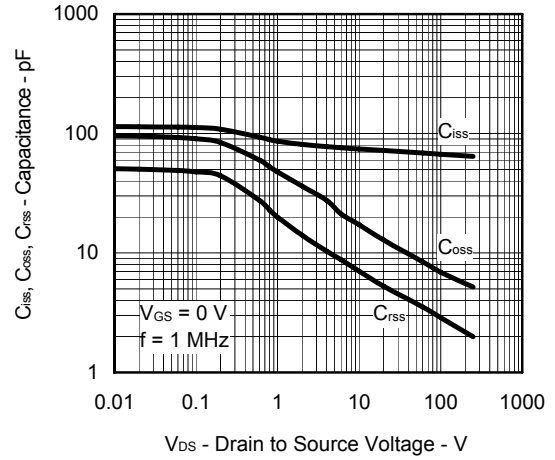
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



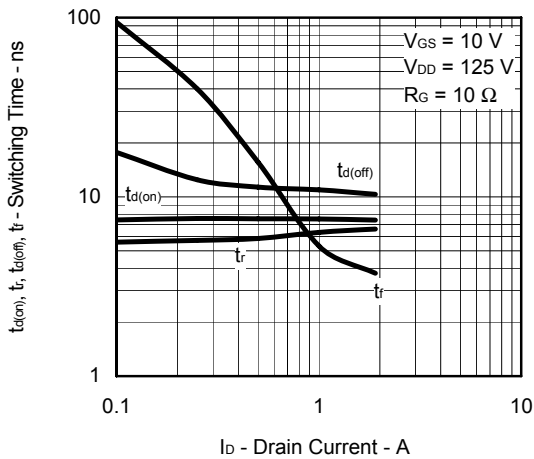
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



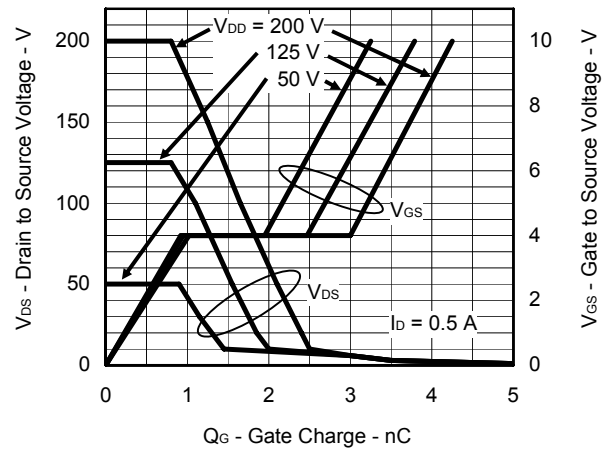
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



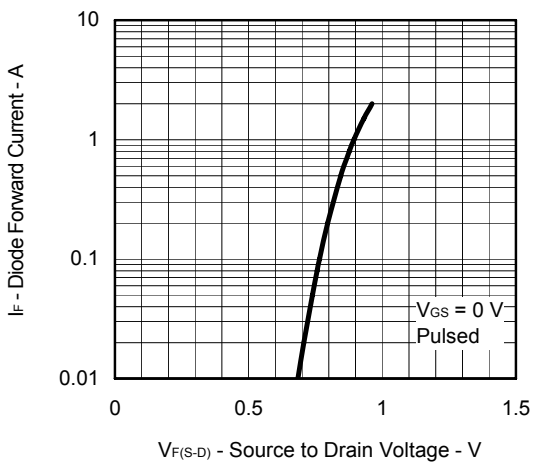
SWITCHING CHARACTERISTICS



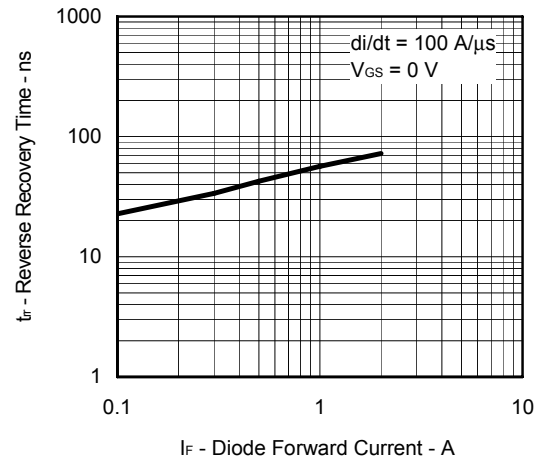
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



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