

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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# 2SJ530(L), 2SJ530(S)

Silicon P Channel MOS FET  
High Speed Power Switching

**RENESAS**

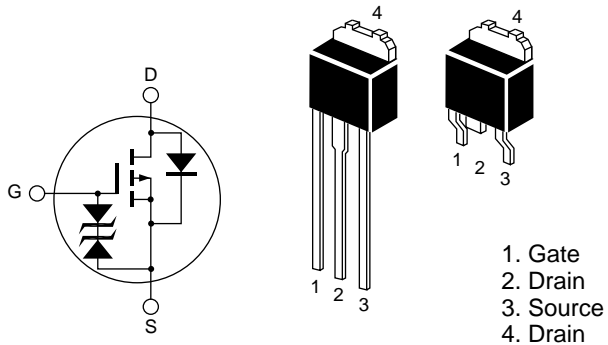
ADE-208-655C (Z)  
4th. Edition  
Mar. 2001

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.08\Omega$  typ.
- 4V gate drive devices.
- High speed switching.

## Outline

DPAK-2



## 2SJ530(L),2SJ530(S)

### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-60	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	-15	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	-60	A
Body-drain diode reverse drain current	$I_{DR}$	-15	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	-15	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	19	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

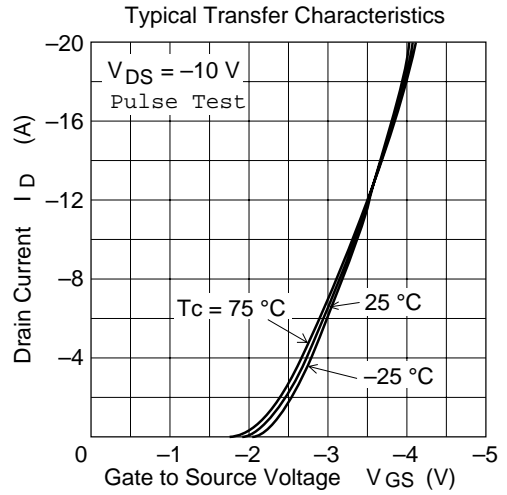
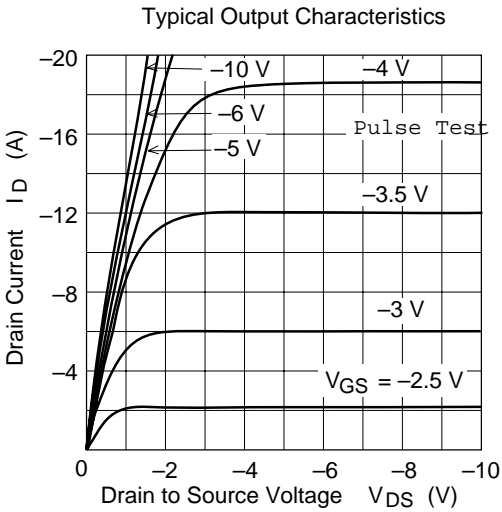
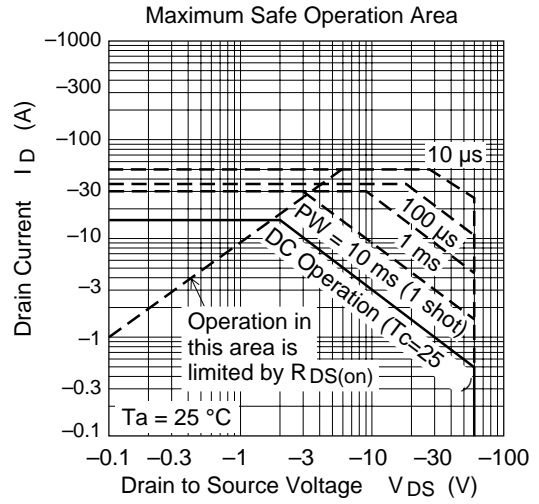
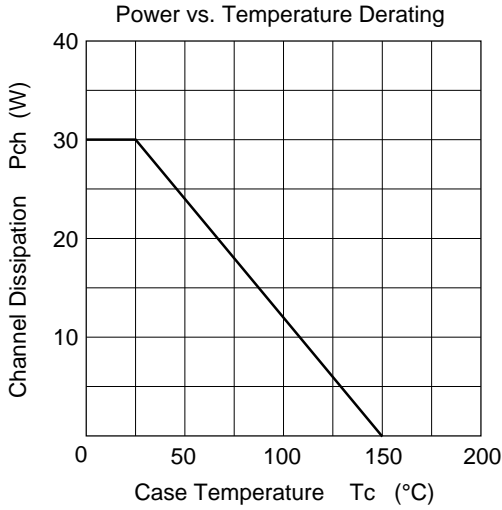
- Note: 1.  $PW \leq 10\mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$   
3. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50 \Omega$

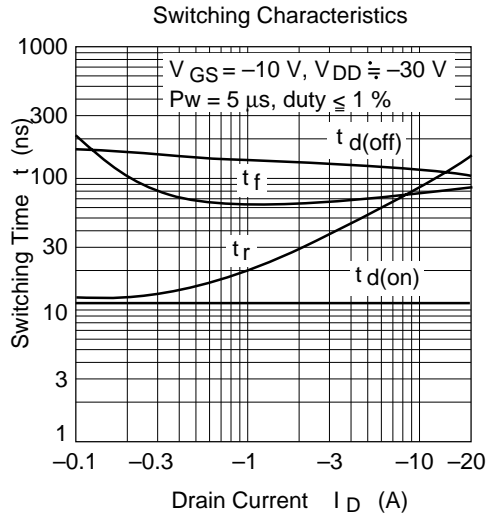
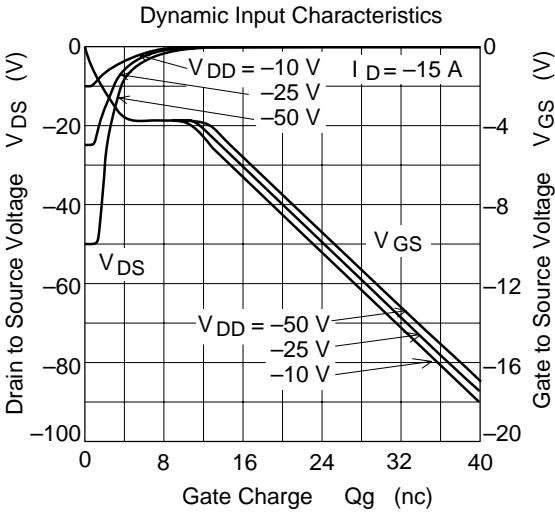
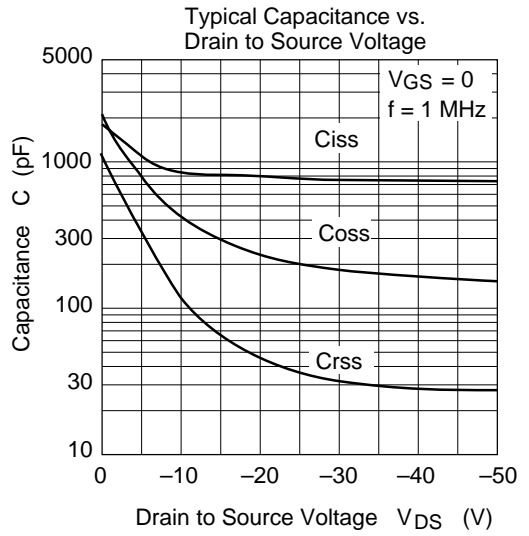
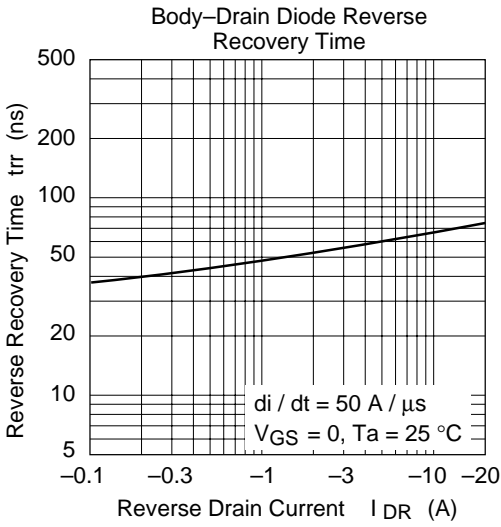
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10\text{mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100\mu\text{A}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-10	$\mu\text{A}$	$V_{DS} = -60\text{V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.0	V	$I_D = -1\text{mA}$ , $V_{DS} = -10\text{V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.08	0.10	$\Omega$	$I_D = -8\text{A}$ , $V_{GS} = -10\text{V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	0.11	0.16	$\Omega$	$I_D = -8\text{A}$ , $V_{GS} = -4\text{V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	6.5	11	—	S	$I_D = -8\text{A}$ , $V_{DS} = -10\text{V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	850	—	pF	$V_{DS} = -10\text{V}$
Output capacitance	$C_{oss}$	—	420	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	110	—	pF	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	$V_{GS} = -10\text{V}$ , $I_D = -8\text{A}$
Rise time	$t_r$	—	75	—	ns	$R_L = 3.75\Omega$
Turn-off delay time	$t_{d(off)}$	—	125	—	ns	
Fall time	$t_f$	—	75	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	-1.1	—	V	$I_F = -15\text{A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	70	—	ns	$I_F = -15\text{A}$ , $V_{GS} = 0$ $di_F/dt = 50\text{A}/\mu\text{s}$

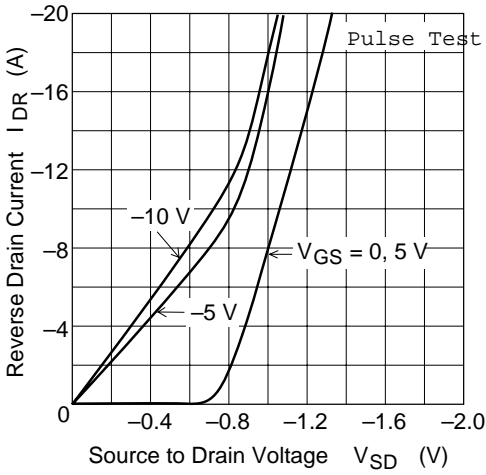
Note: 4. Pulse test

Main Characteristics

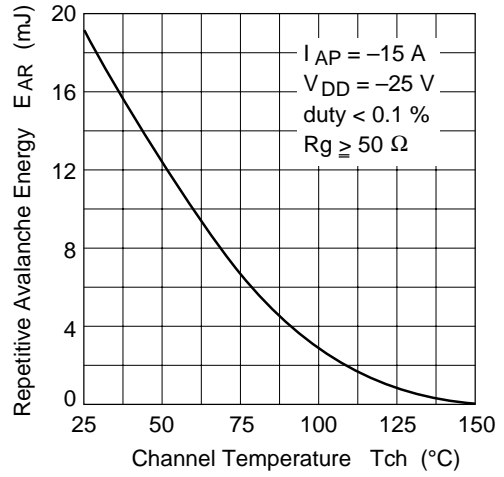




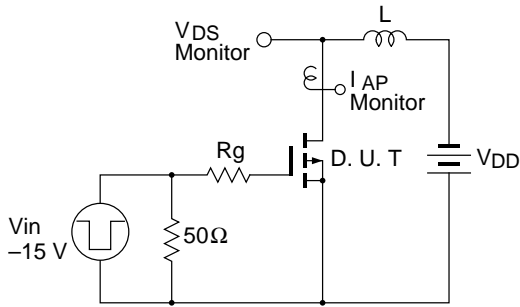
Reverse Drain Current vs. Source to Drain Voltage



Maximum Avalanche Energy vs. Channel Temperature Derating

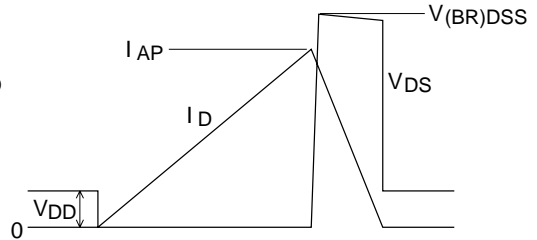


Avalanche Test Circuit

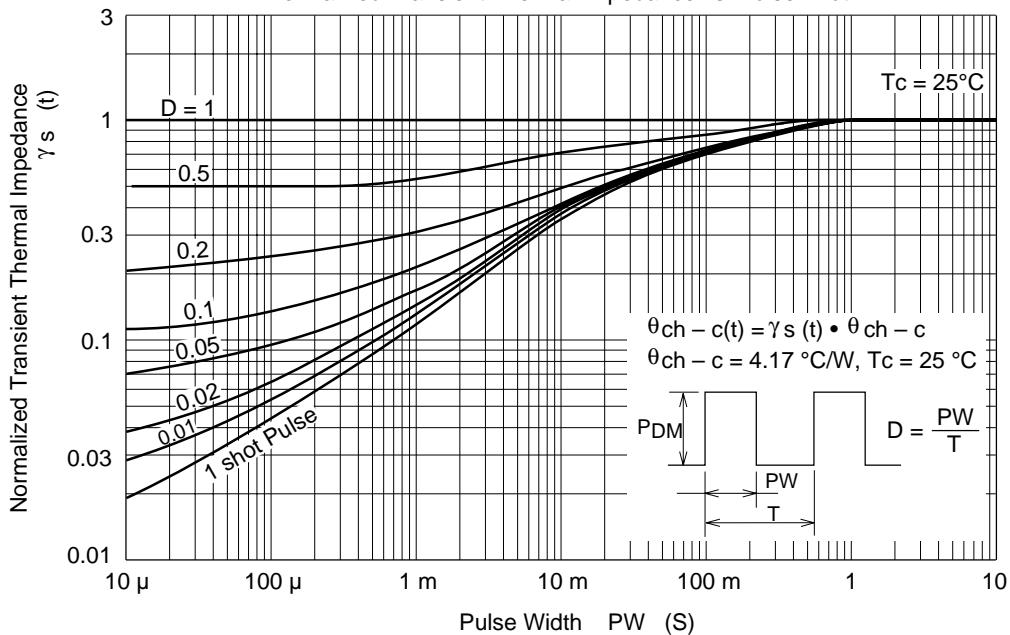


Avalanche Waveform

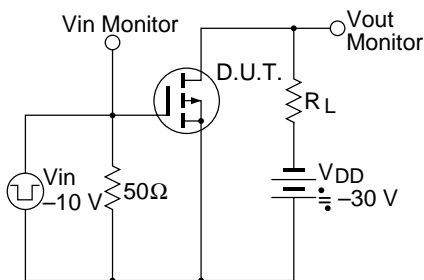
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



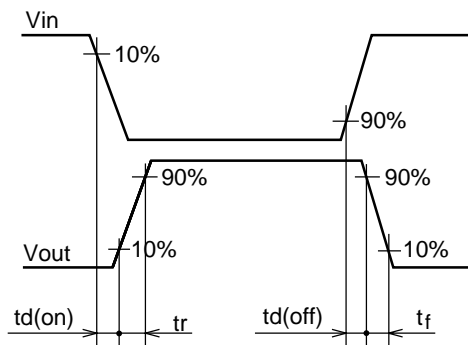
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



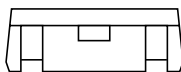
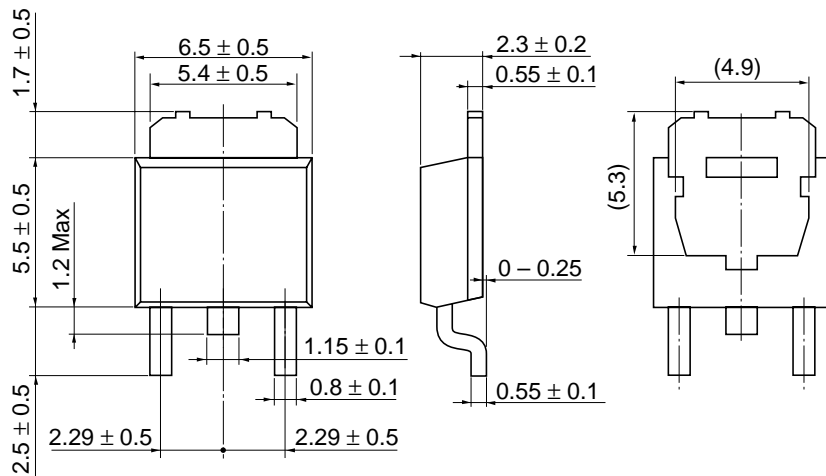
Waveform





As of January, 2001

Unit: mm

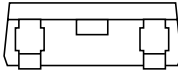
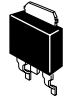
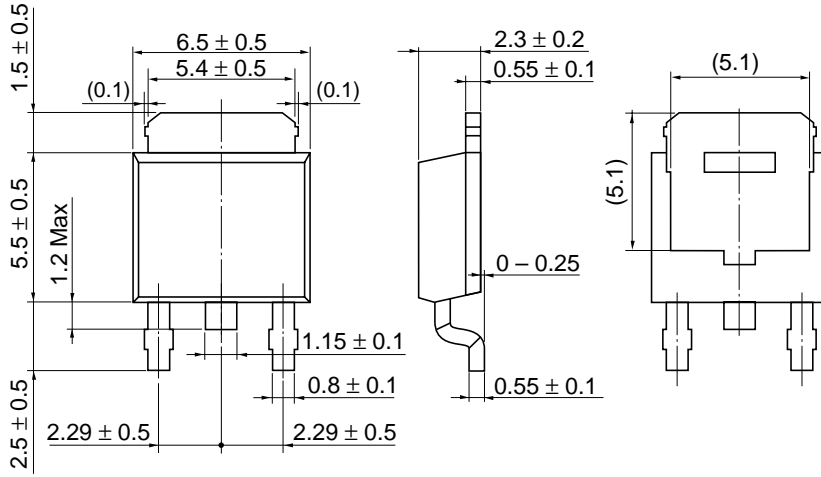


Hitachi Code	DPAK (S)-(1),(2)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.28 g

# 2SJ530(L),2SJ530(S)

As of January, 2001

Unit: mm



Hitachi Code	DPAK (S)-(3)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.28 g

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