To all our customers

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

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2SK3274(L), 2SK3274(S)

Slilicon N Channel MOS FET
High Speed Power Switching

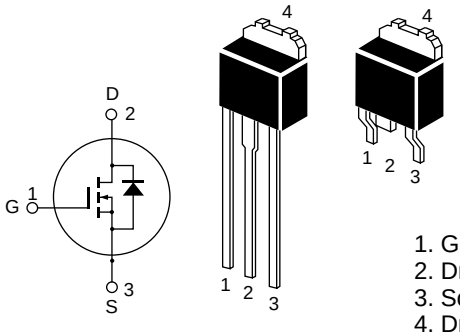
ADE-208-960 (Z)
1st. Edition
Mar. 2001

Features

- Low on-resistance
- $R_{DS(on)}$ = 10 mΩ typ.
- 4.5 V gate drive device
- High speed switching

External View

DPAK-2



1. Gate
2. Drain
3. Source
4. Drain

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	30	A
Drain peak current	I_D (pulse)*[1]	120	A
Body-drain diode reverse drain current	I_{DR}	30	A
Avalanche current	I_{AP}*[3]	20	A
Avalanche energy	E_{AR}*[3]	40	mJ
Channel dissipation	Pch*[2]	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

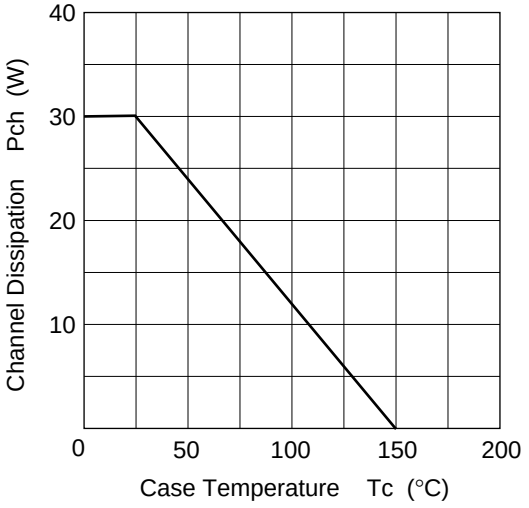
Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. Value at Tch = 25°C: Rg ≥ 50 Ω

Electrical Characteristics (Ta = 25°C)

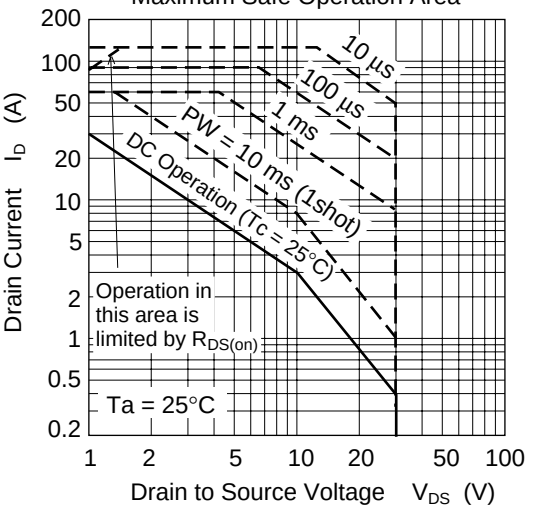
Item	Symbol	Min	Typ	Max	Unijt	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±20 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 30 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	3.0	V	V_{DS} = 10 V, I_D = 1 mA*[1]
Forward transfer admittance	$\|y_{fs}\|$	18	30	—	S	I_D = 15 A, V_{DS} = 10 V*[1]
Static drain to source on state resistance	$R_{DS(on)}$	—	10	13	mΩ	I_D = 15 A, V_{GS} = 10 V*[1]
	$R_{DS(on)}$	—	20	30	mΩ	I_D = 15 A, V_{GS} = 4.5 V*[1]
Input capacitance	Ciss	—	1500	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	500	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	250	—	pF	f = 1 MHz
Total gate charge	Qg	—	27	—	nc	V_{DD} = 10 V
Gate to source charge	Qgs	—	6	—	nc	V_{GS} = 10 V
Gate to drain charge	Qgd	—	5	—	nc	I_D = 30 A
Turn-on delay time	td(on)	—	22	—	ns	V_{GS} = 10 V
Rise time	tr	—	170	—	ns	I_D = 15 A
Turn-off delay time	td(off)	—	110	—	ns	R_L = 2 Ω
Fall time	tf	—	145	—	ns	
Body-drain diode forward voltage	V_{DF}	—	1.0	—	V	I_F = 30 A, V_{GS} = 0
Body-drain diode reverse recovery time	trr	—	35	—	ns	I_F = 30 A, V_{GS} = 0 diF/dt = 50 A/µs

Note: 1. Pulse test

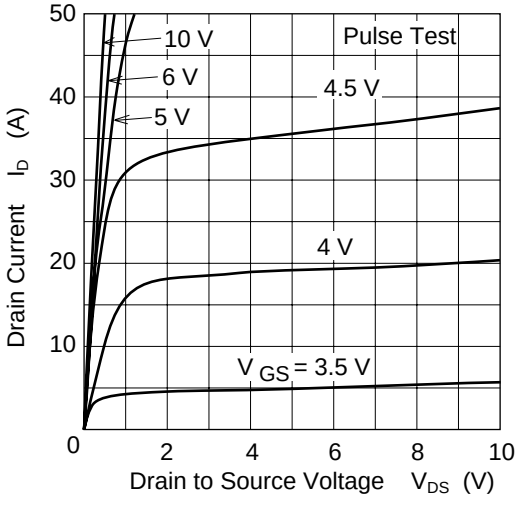
Power vs. Temperature Derating



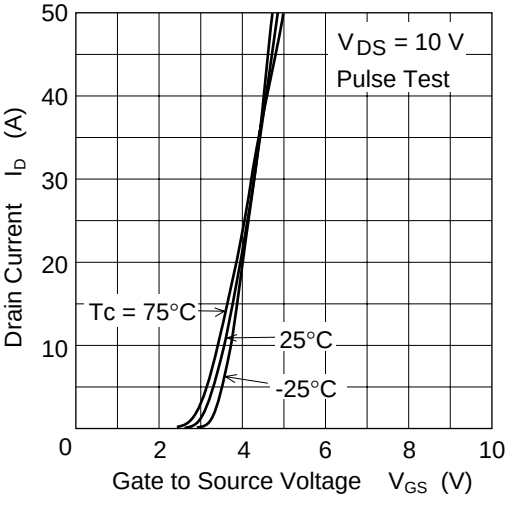
Maximum Safe Operation Area



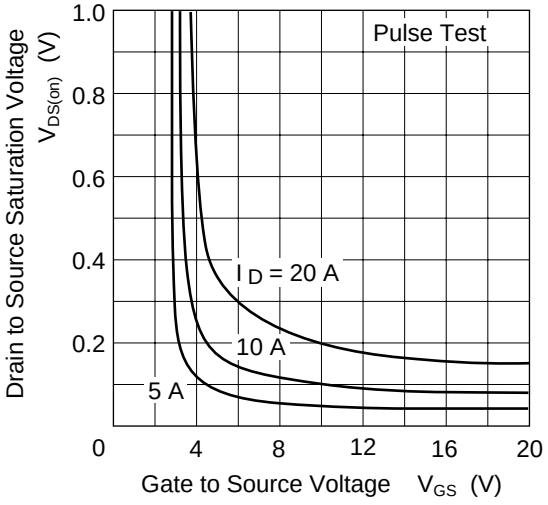
Typical Output Characteristics



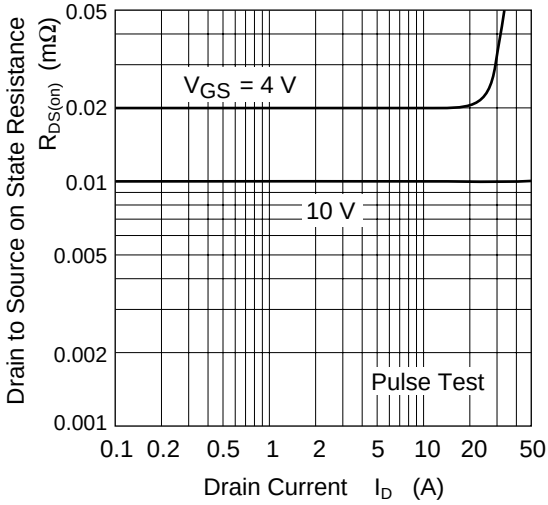
Typical Transfer Characteristics



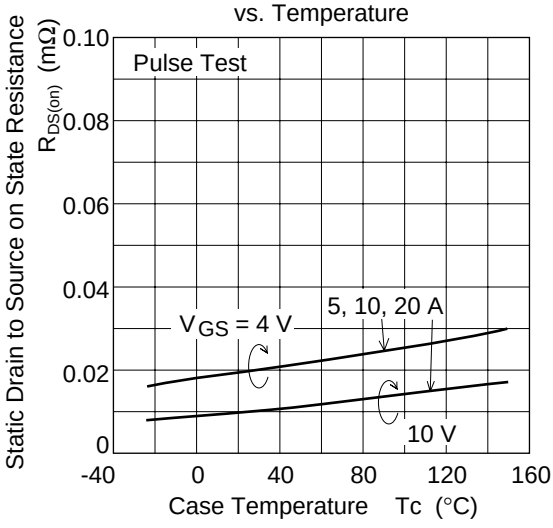
Drain to Source Saturation Voltage vs. Gate to Source Voltage



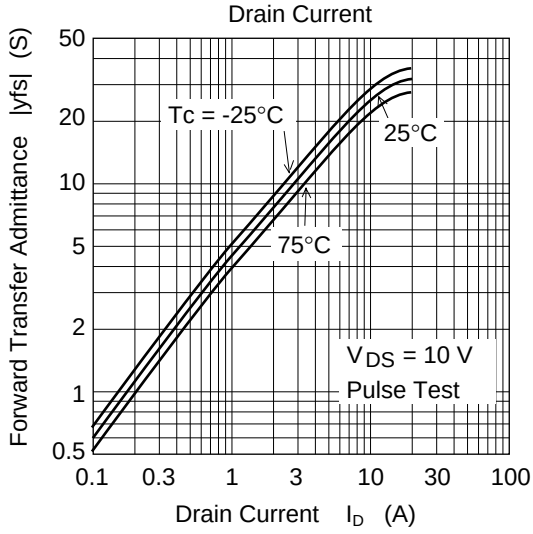
Static Drain to Source on State Resistance vs. Drain Current



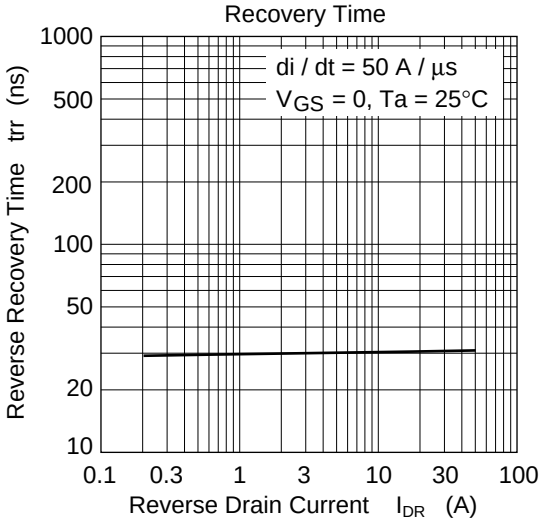
Static Drain to Source on State Resistance vs. Temperature



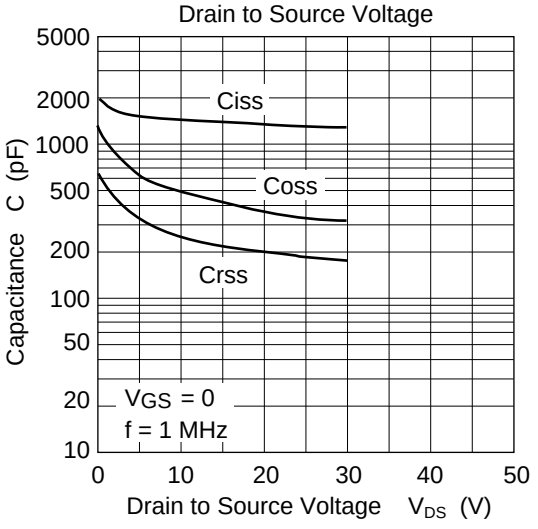
Forward Transfer Admittance vs. Drain Current



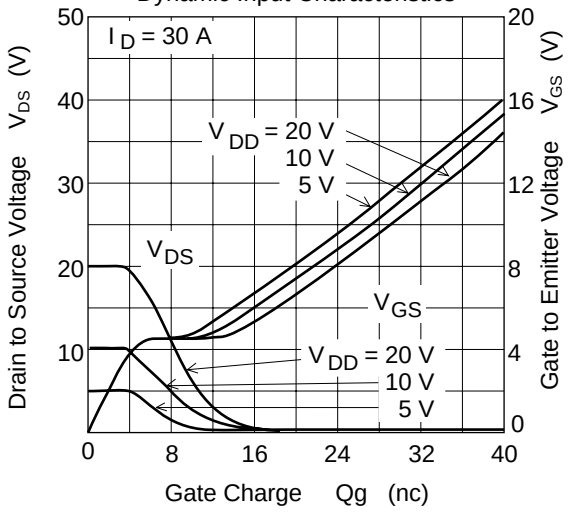
Body-Drain Diode Reverse Recovery Time



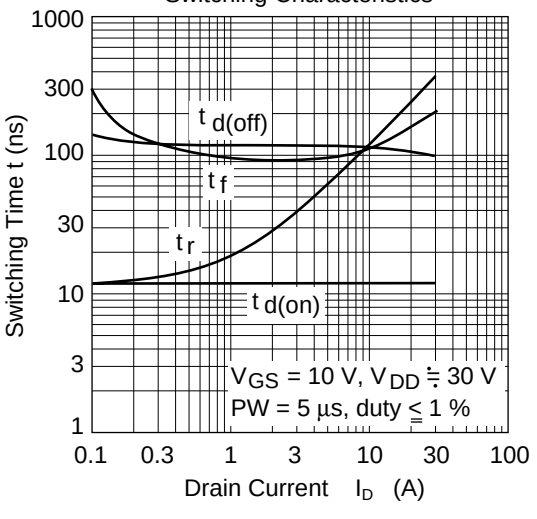
Typical Capacitance vs. Drain to Source Voltage



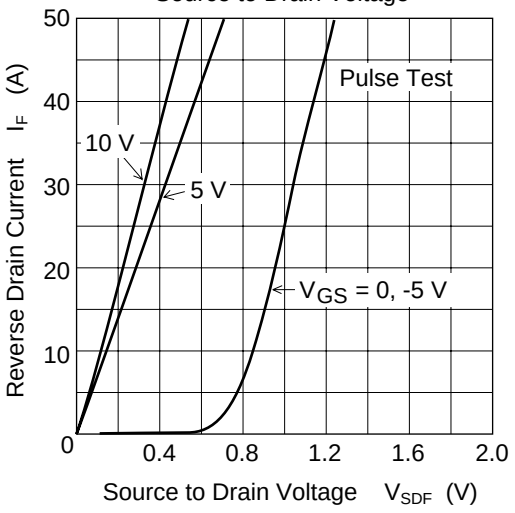
Dynamic Input Characteristics



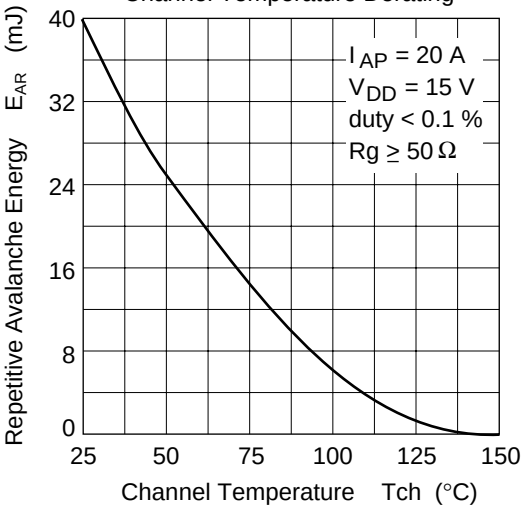
Switching Characteristics



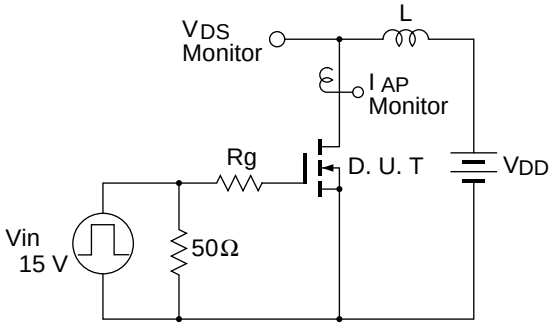
Reverse Drain Current vs.
Source to Drain Voltage



Maximum Avalanche Energy vs.
Channel Temperature Derating

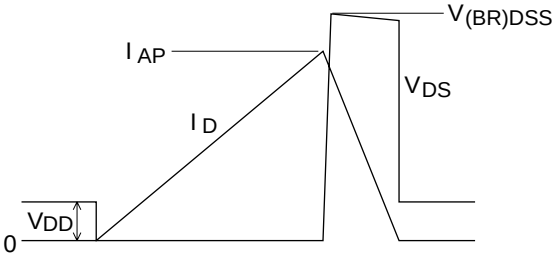


Avalanche Test Circuit

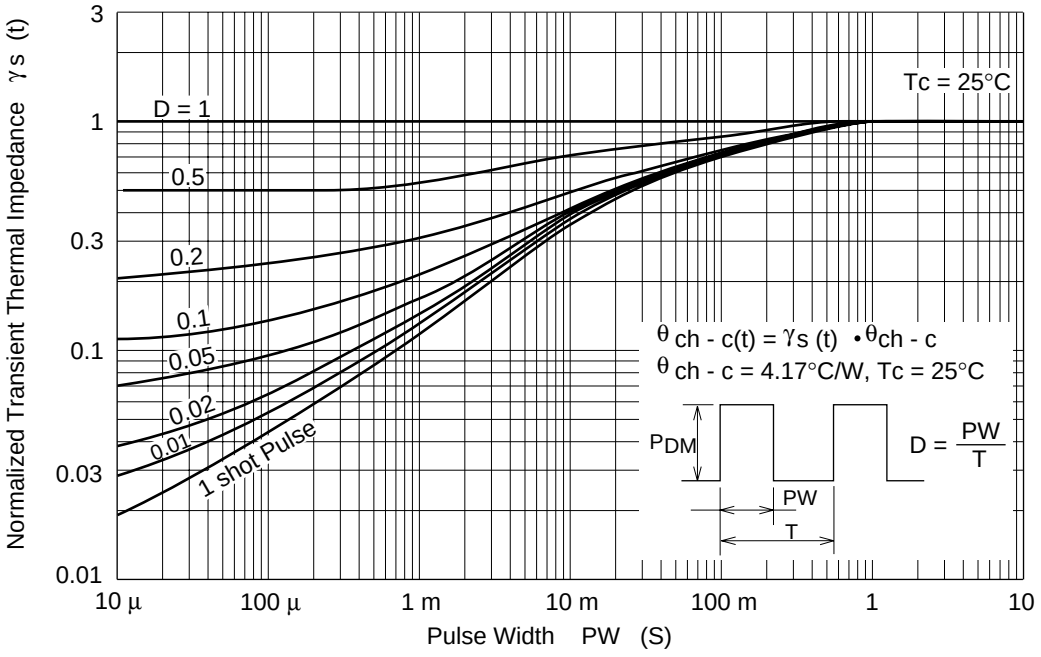


Avalanche Waveform

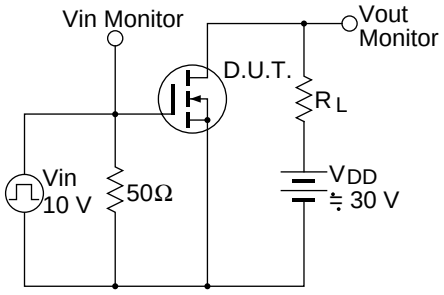
$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



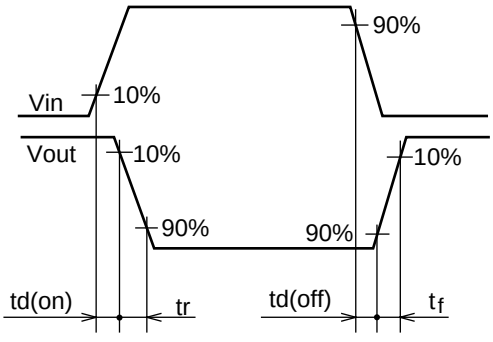
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



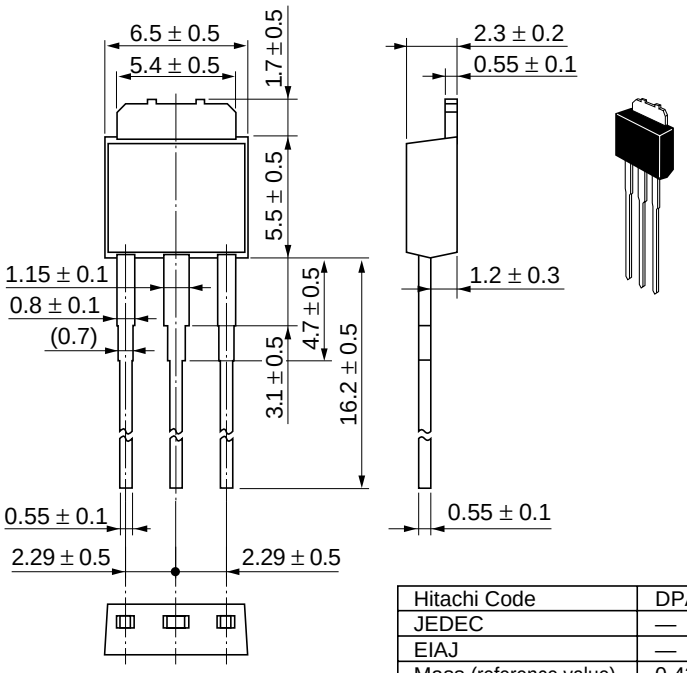
Waveform



Package Dimensions

As of January, 2001

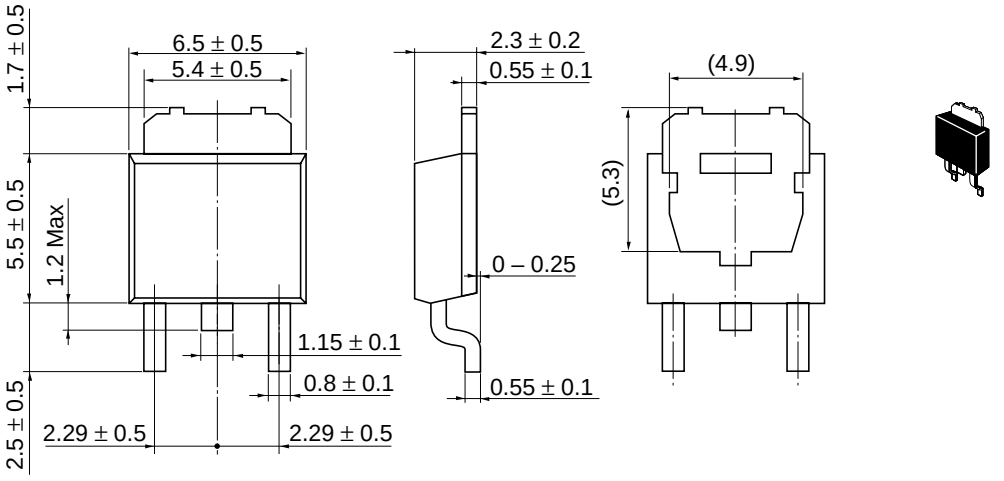
Unit: mm

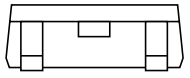


Hitachi Code	DPAK (L)-(2)
JEDEC	—
EIAJ	—
Mass (reference value)	0.42 g

As of January, 2001

Unit: mm

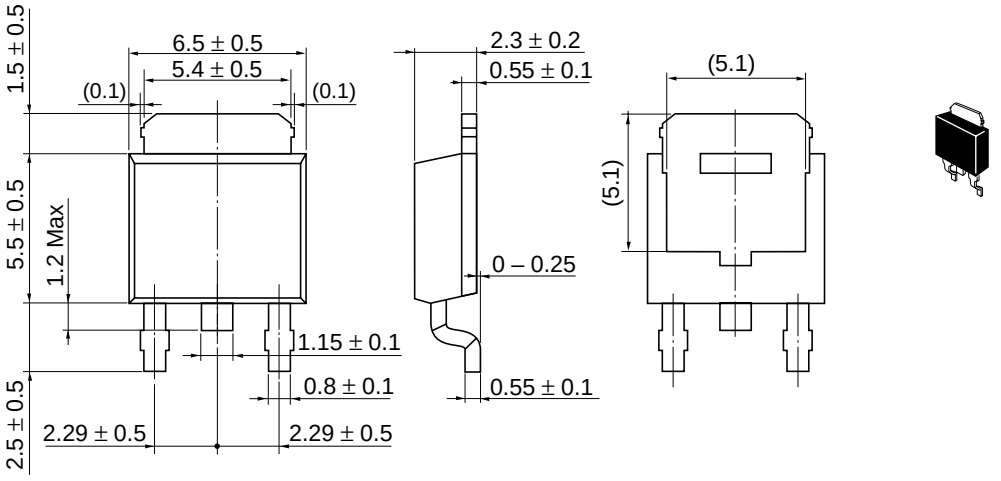


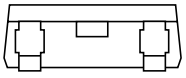


Hitachi Code	DPAK (S)-(1),(2)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.28 g

As of January, 2001

Unit: mm





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

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Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL
NorthAmerica : http://semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
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For further information write to:

Hitachi Semiconductor (America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic Components Group
Dornacher Straβe 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 585160

Hitachi Asia Ltd.
Hitachi Tower
16 Collyer Quay #20-00,
Singapore 049318
Tel : <65>-538-6533/538-8577
Fax : <65>-538-6933/538-3877
URL : http://www.hitachi.com.sg

Hitachi Asia Ltd.
(Taipei Branch Office)
4/F, No. 167, Tun Hwa North Road,
Hung-Kuo Building,
Taipei (105), Taiwan
Tel : <886>-(2)-2718-3666
Fax : <886>-(2)-2718-8180
Telex : 23222 HAS-TP
URL : http://www.hitachi.com.tw

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon,
Hong Kong
Tel : <852>-(2)-735-9218
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Colophon 2.0

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