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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

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H7N0401LD, H7N0401LS, H7N0401LM

Silicon N Channel MOS FET
High Speed Power Switching

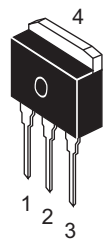
REJ03G1129-0500
(Previous: ADE-208-1527C)
Rev.5.00
Apr 07, 2006

Features

- Low on-resistance
 $R_{DS(on)} = 3.1 \text{ m}\Omega$ typ.
- 4.5 V gate drive devices
- High Speed Switching

Outline

RENESAS Package code: PRSS0004AE-A
(Package name: LDKPAK (L))



H7N0401LD

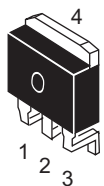
RENESAS Package code: PRSS0004AE-B
(Package name: LDKPAK (S)-(1))



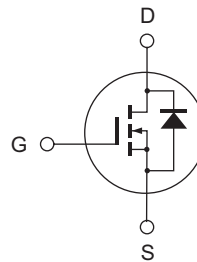
H7N0401LS

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

RENESAS Package code: PRSS0004AE-C
(Package name: LDKPAK (S)-(2))



H7N0401LM



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V _{DSS}	40	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	95	A
Drain peak current	I _{D (pulse)} ^{Note 1}	380	A
Body to drain diode reverse drain current	I _{DR}	95	A
Avalanche current	I _{AP} ^{Note 3}	65	A
Avalanche energy	E _{AR} ^{Note 3}	560	mJ
Channel dissipation	P _{ch} ^{Note 2}	100	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-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

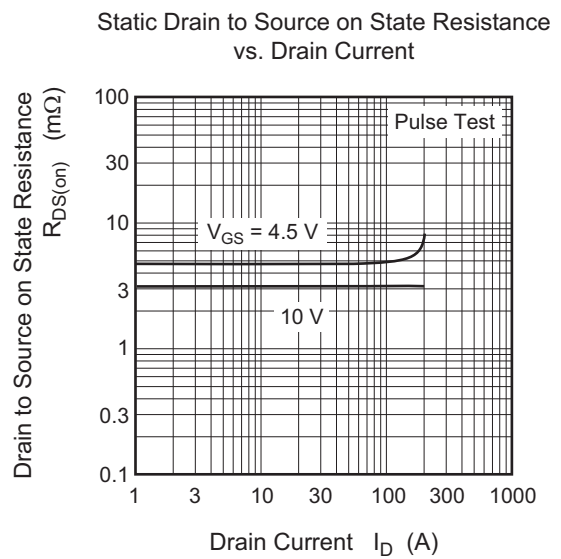
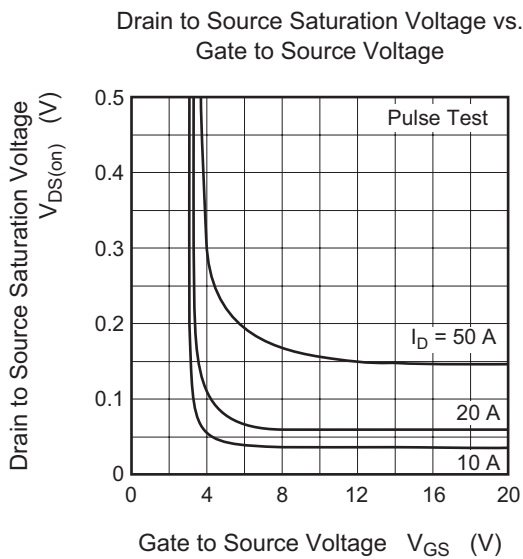
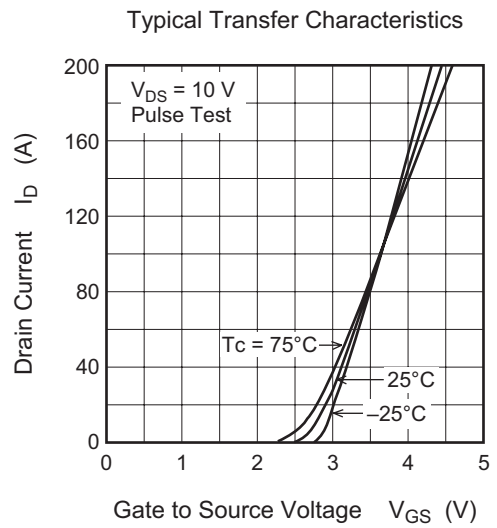
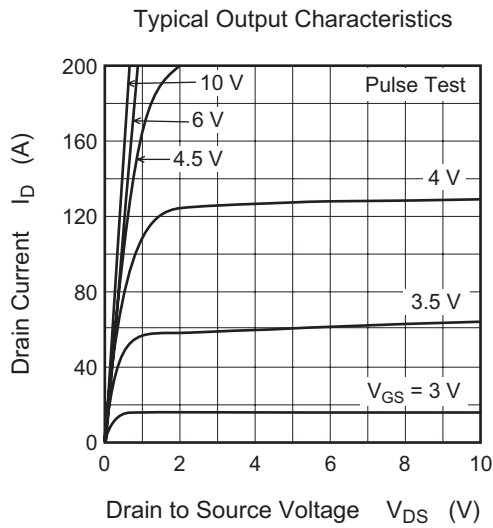
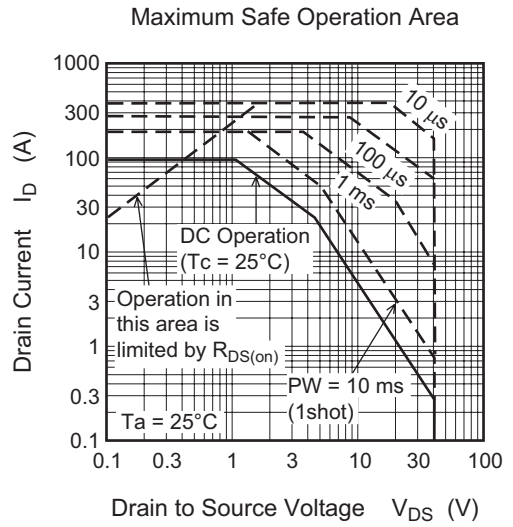
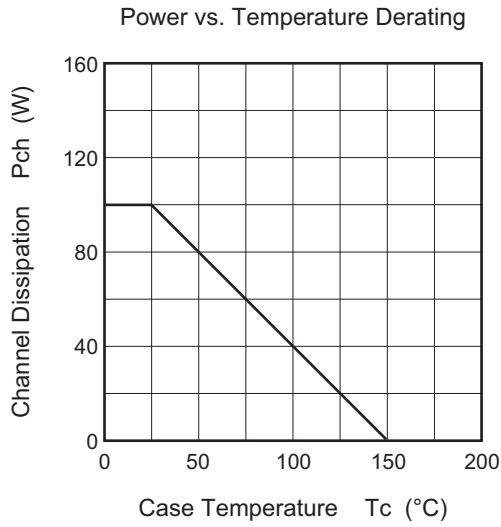
Electrical Characteristics

(Ta = 25°C)

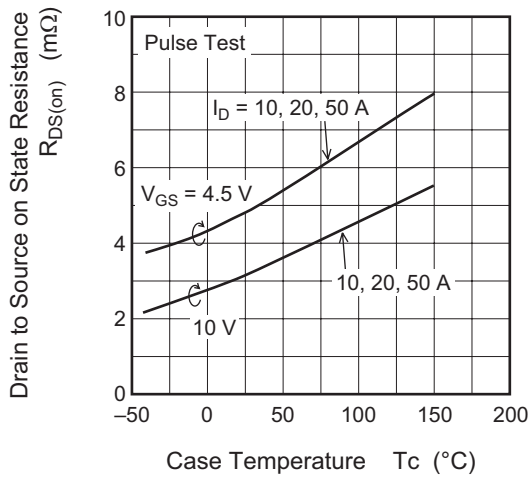
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR) DSS}	40	—	—	V	I _D = 10 mA, V _{GS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	10	μA	V _{DS} = 40 V, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±20 V, V _{DS} = 0
Gate to source cutoff voltage	V _{GS (off)}	1.5	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA ^{Note 4}
Forward transfer admittance	y _{fs}	60	100	—	S	I _D = 47.5 A, V _{DS} = 10 V ^{Note 4}
Static drain to source on state resistance	R _{DS (on)}	—	3.1	4.2	mΩ	I _D = 47.5 A, V _{GS} = 10 V ^{Note 4}
		—	4.8	7.0	mΩ	I _D = 47.5 A, V _{GS} = 4.5 V ^{Note 4}
Input capacitance	C _{iss}	—	9300	—	pF	V _{DS} = 10 V
Output capacitance	C _{oss}	—	1300	—	pF	V _{GS} = 0
Reverse transfer capacitance	C _{rss}	—	670	—	pF	f = 1 MHz
Total gate charge	Q _g	—	160	—	nC	V _{DD} = 25 V
Gate to source charge	Q _{gs}	—	36	—	nC	V _{GS} = 10 V
Gate to drain charge	Q _{gd}	—	40	—	nC	I _D = 95 A
Turn-on delay time	t _{d (on)}	—	45	—	ns	V _{GS} = 10 V
Rise time	t _r	—	270	—	ns	I _D = 47.5 A
Turn-off delay time	t _{d (off)}	—	130	—	ns	R _L = 0.63 Ω
Fall time	t _f	—	85	—	ns	R _g = 4.7 Ω
Body to drain diode forward voltage	V _{DF}	—	0.95	—	V	I _F = 95 A, V _{GS} = 0
Body to drain diode reverse recovery time	t _{rr}	—	50	—	ns	I _F = 95 A, V _{GS} = 0 di _F /dt = 100 A/μs

Note: 4. Pulse test

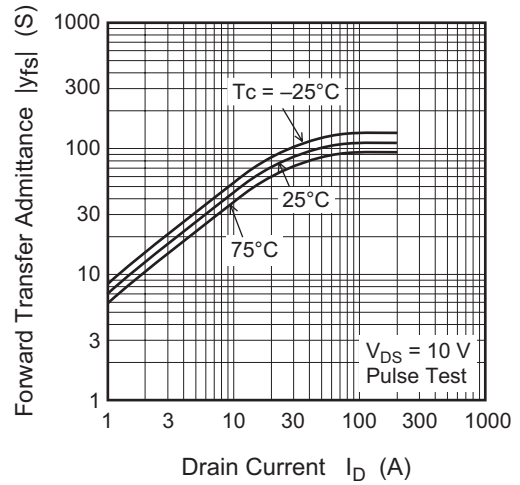
Main Characteristics



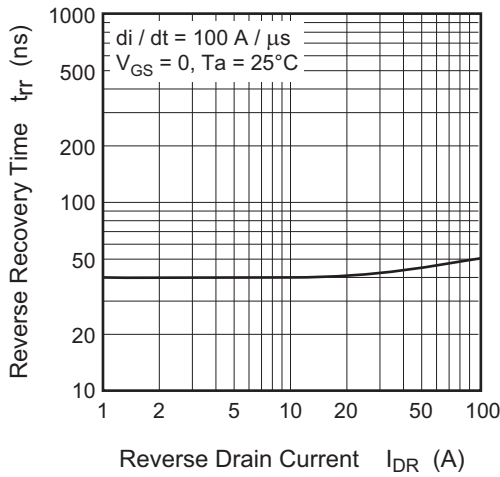
Static Drain to Source on State Resistance vs. Temperature



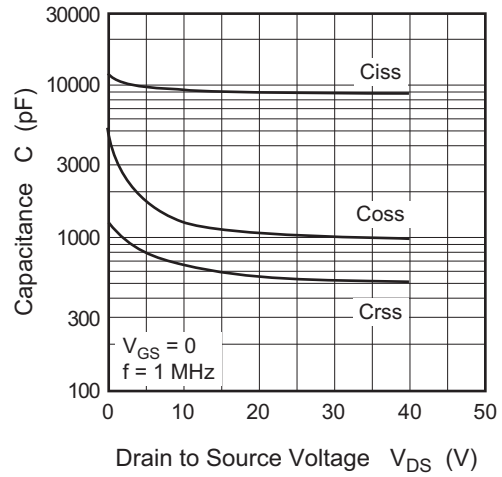
Forward Transfer Admittance vs. Drain Current



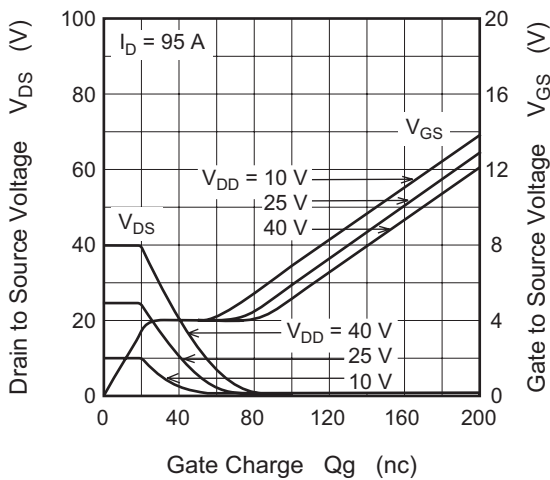
Body to Drain Diode Reverse Recovery Time



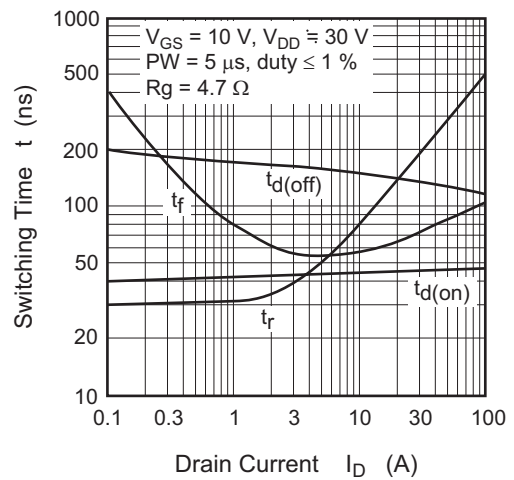
Typical Capacitance vs. Drain to Source Voltage

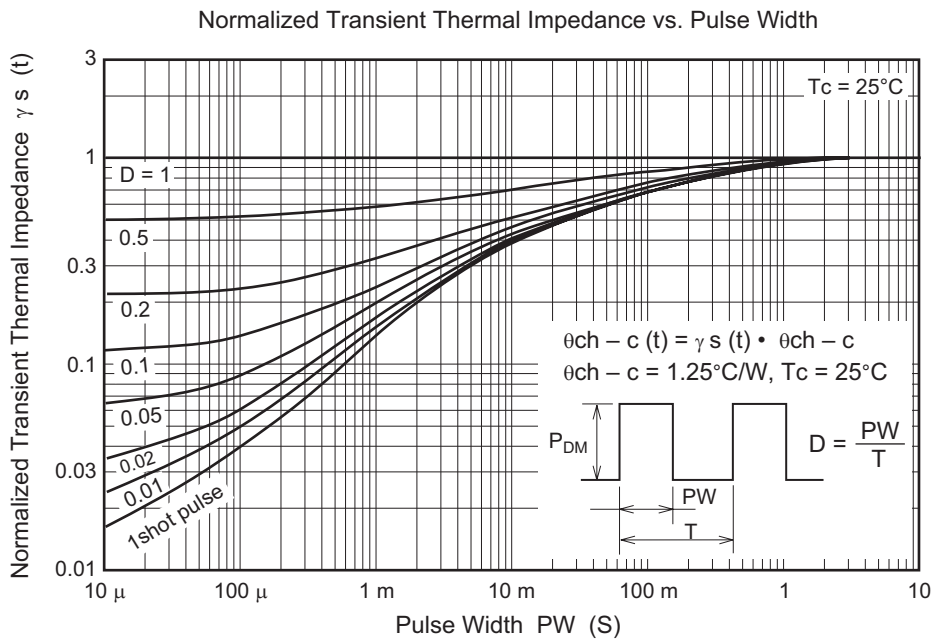
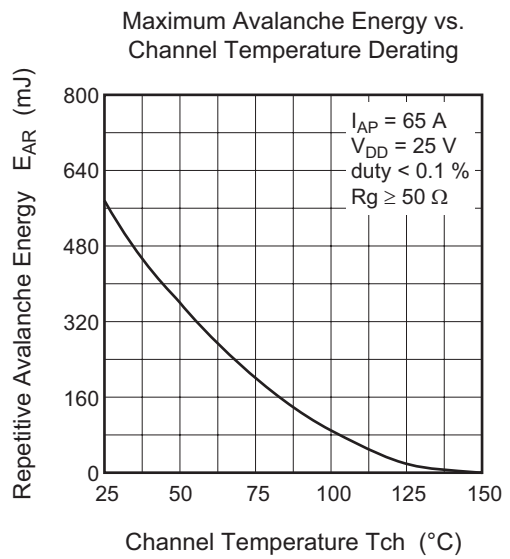
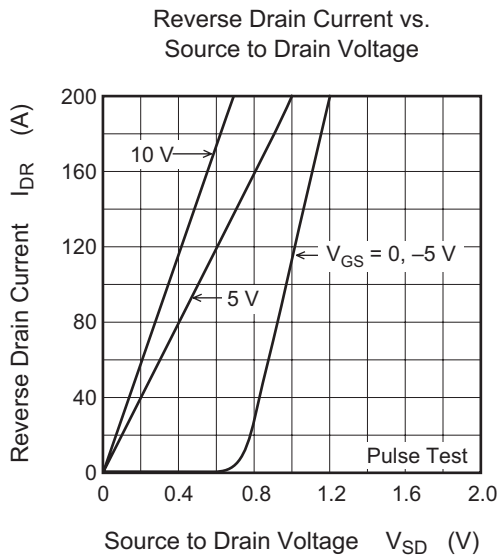


Dynamic Input Characteristics

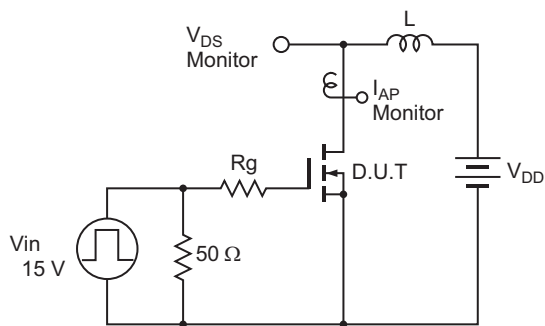


Switching Characteristics



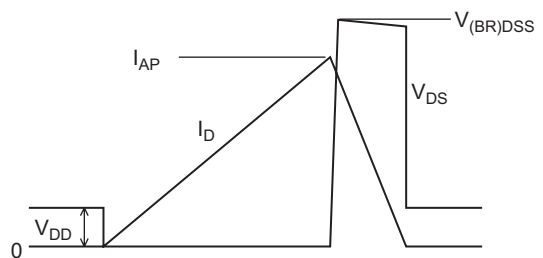


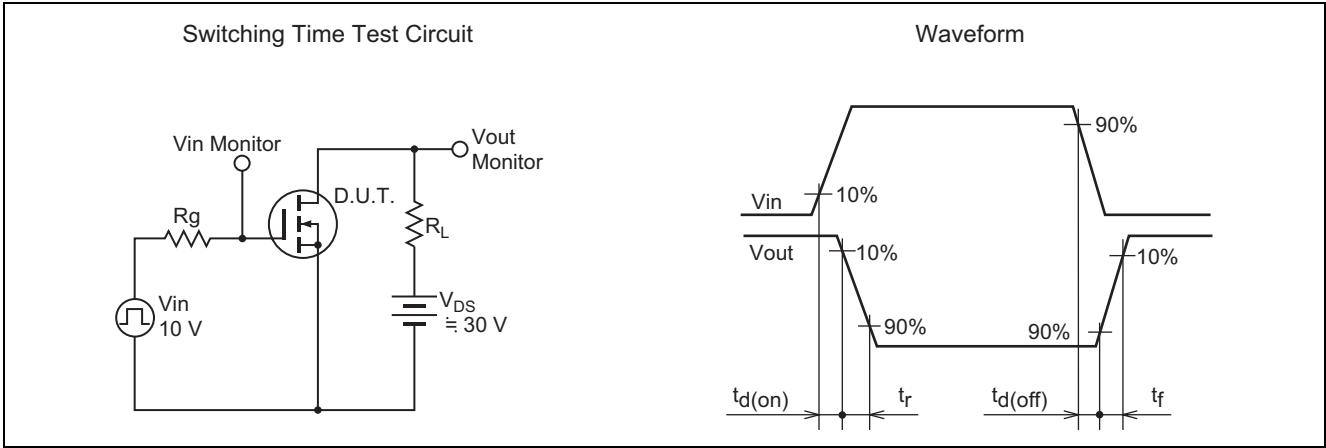
Avalanche Test Circuit



Avalanche Waveform

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

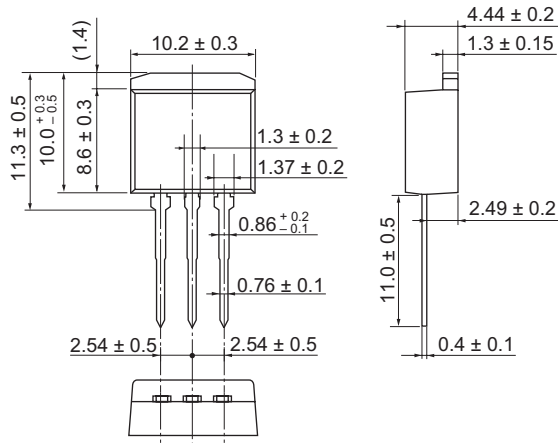




Package Dimensions

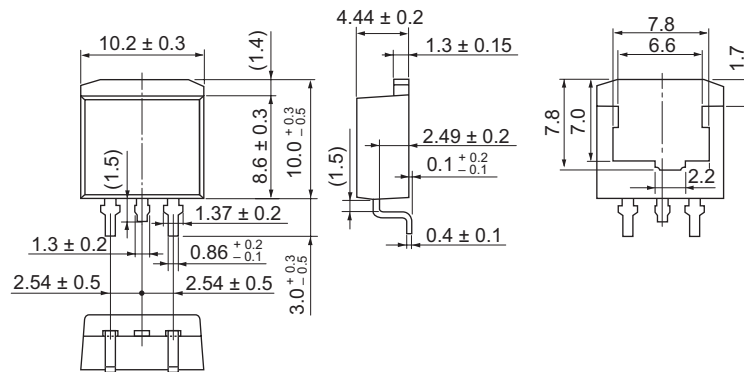
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(L)	—	PRSS0004AE-A	LDBPAK(L) / LDBPAK(L)V	1.40g

Unit: mm



Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(S)-(1)	SC-83	PRSS0004AE-B	LDBPAK(S)-(1) / LDBPAK(S)-(1)V	1.30g

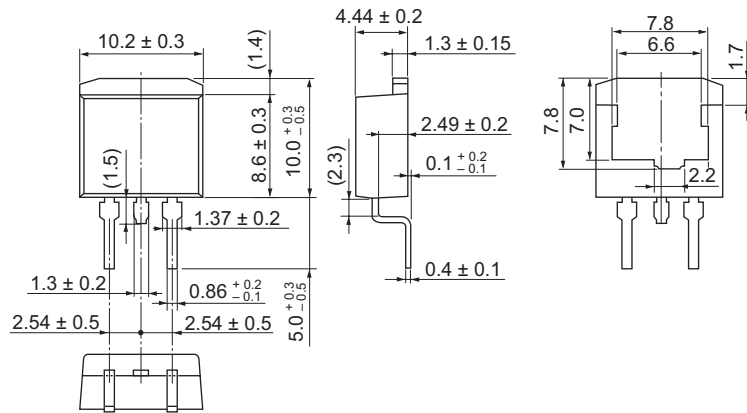
Unit: mm



H7N0401LD, H7N0401LS, H7N0401LM

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(S)-(2)	—	PRSS0004AE-C	LDBPAK(S)-(2) / LDBPAK(S)-(2)V	1.35g

Unit: mm



Ordering Information

Part Name	Quantity	Shipping Container
H7N0401LD-E	500 pcs	Box (Conductive Sack)
H7N0401LSTL-E	1000 pcs	Taping
H7N0401LMTL-E	1000 pcs	Taping

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