

H7N0405LD, H7N0405LS, H7N0405LM

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G1367-0100

Rev.1.00

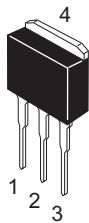
Sep 25, 2006

Features

- Low on-resistance
 $R_{DS(on)} = 4.0 \text{ m}\Omega$ typ.
- Low drive current.
- Capable of 4.5 V gate drive

Outline

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



H7N0405LD

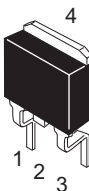
RENESAS Package code: PRSS0004AE-B
(Package name: LDPAK (S)-(1))



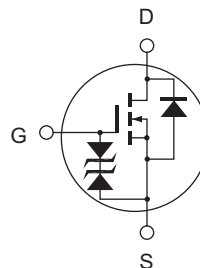
H7N0405LS

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

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



H7N0405LM



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Rating	Unit
Drain to source voltage	V _{DSS}	40	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	80	A
Drain peak current	I _D (pulse) ^{Note1}	320	A
Body drain diode reverse drain current	I _{DR}	80	A
Avalanche current	I _{AP} ^{Note3}	40	A
Avalanche energy	E _{AR} ^{Note3}	213	mJ
Channel dissipation	P _{ch} ^{Note2}	80	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

2. T_c = 25°C

3. T_{ch} = 25°C, R_g ≥ 50 Ω

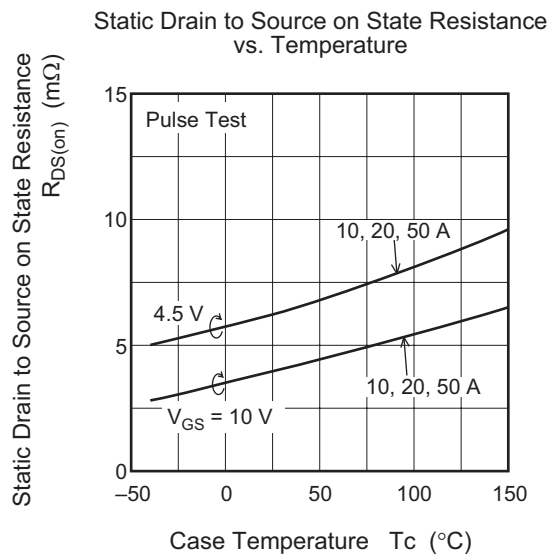
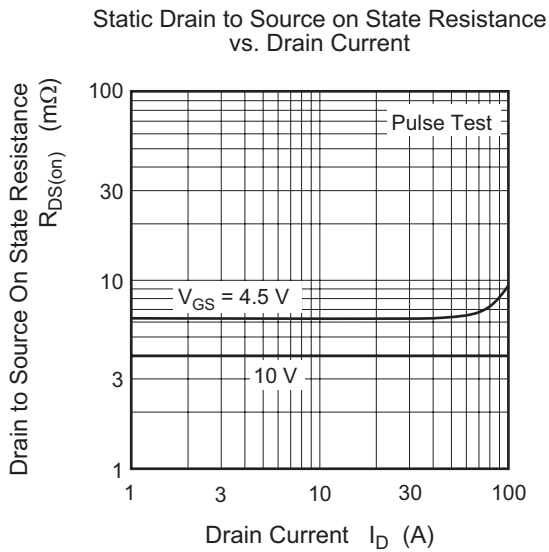
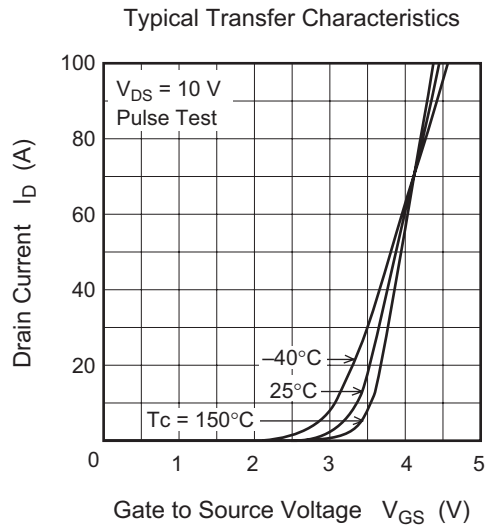
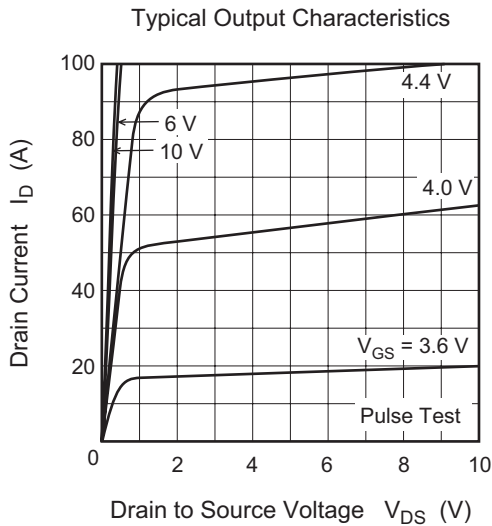
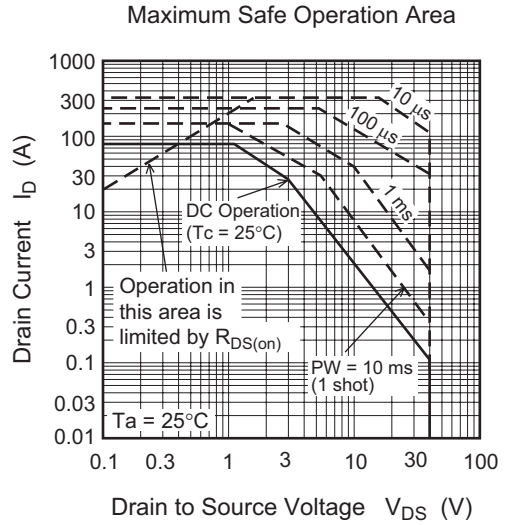
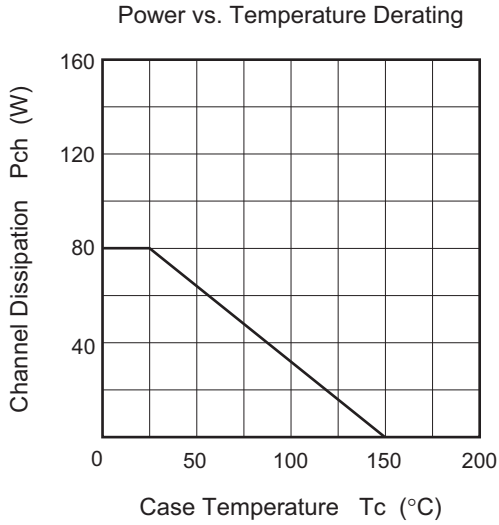
Electrical Characteristics

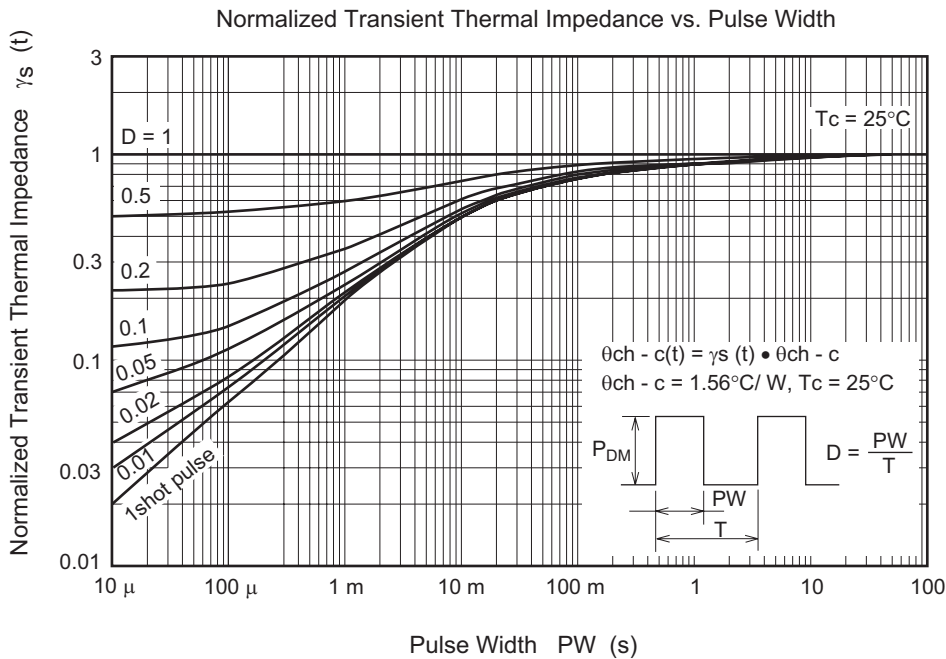
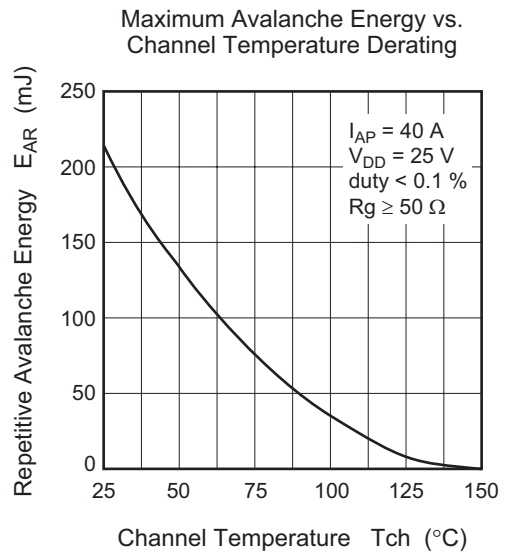
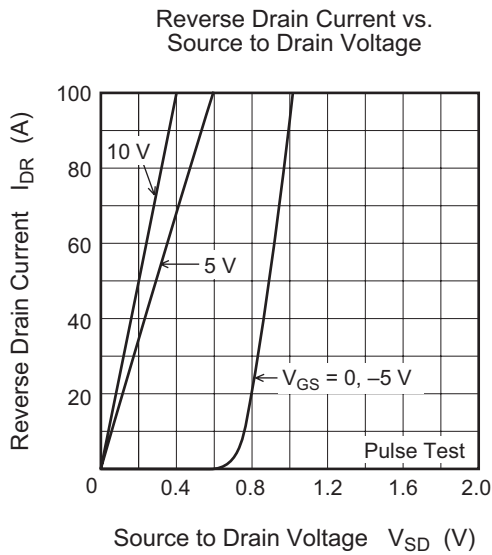
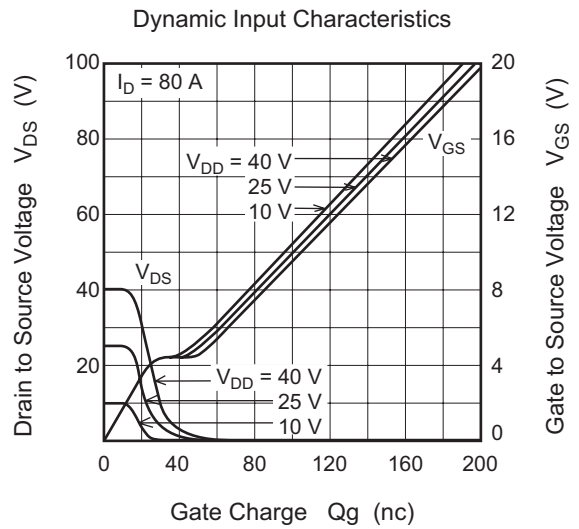
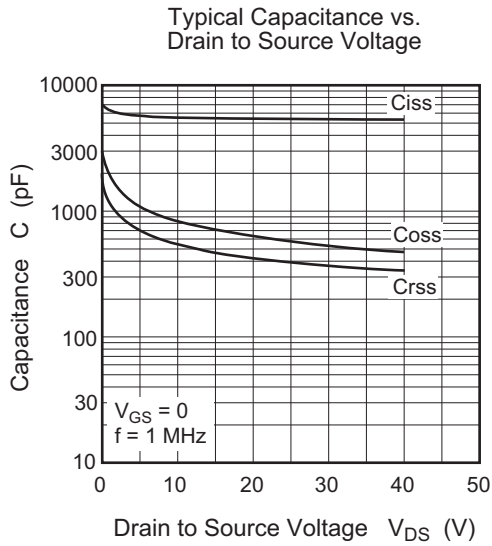
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source break down voltage	V _{(BR)DSS}	40	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source breakdown voltage	V _{(BR)GSS}	±20	—	—	V	I _G = ±100 μA, V _{DS} = 0
Gate to source leak current	I _{GSS}	—	—	±10	μA	V _{GS} = ±16 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	10	μA	V _{DS} = 40 V, V _{GS} = 0
Gate to source cut off voltage	V _{GS(off)}	1.5	—	2.5	V	I _D = 1 mA, V _{DS} = 10 V ^{Note4}
Static drain to source on state resistance	R _{DS(on)}	—	4.0	5.0	mΩ	I _D = 40 A, V _{GS} = 10 V ^{Note4}
		—	6.2	8.7	mΩ	I _D = 40 A, V _{GS} = 4.5 V ^{Note4}
Forward transfer admittance	y _{fs}	54	90	—	S	I _D = 40 A, V _{GS} = 10 V ^{Note4}
Input capacitance	C _{iss}	—	5600	—	pF	V _{DS} = 10 V, V _{GS} = 0, f = 1 MHz
Output capacitance	C _{oss}	—	825	—	pF	
Reverse transfer admittance	C _{rss}	—	550	—	pF	
Total gate charge	Q _g	—	100	—	nC	V _{DD} = 25 V, V _{GS} = 10 V, I _D = 80 A
Gate to source charge	Q _{gs}	—	25	—	nC	
Gate to drain charge	Q _{gd}	—	25	—	nC	
Turn-off delay time	t _{d(on)}	—	40	—	ns	V _{GS} = 10 V, I _D = 40 A, R _L = 0.75 Ω, R _g = 4.7 Ω
Rise time	t _r	—	400	—	ns	
Body-drain diode forward voltage	t _{d(off)}	—	100	—	ns	
Fall time	t _f	—	26	—	ns	
Body-drain diode forward voltage	V _{DF}	—	0.94	—	V	I _F = 80 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	40	—	ns	I _F = 80 A, V _{GS} = 0 di _F /dt = 100 A/μs

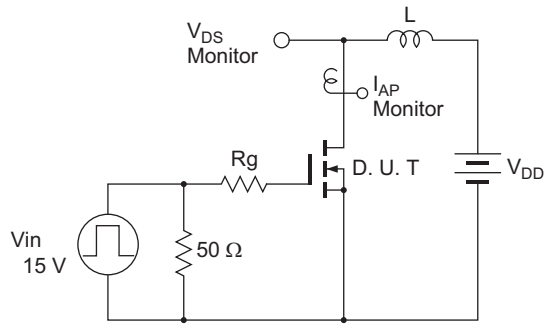
Notes: 4. Pulse test

Main Characteristics



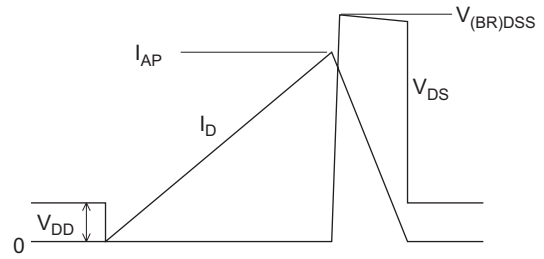


Avalanche Test Circuit

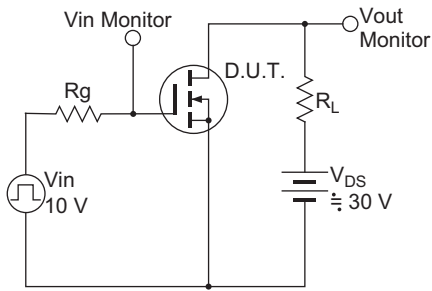


Avalanche Waveform

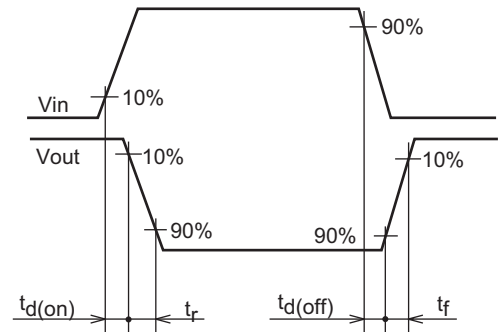
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Switching Time Test Circuit

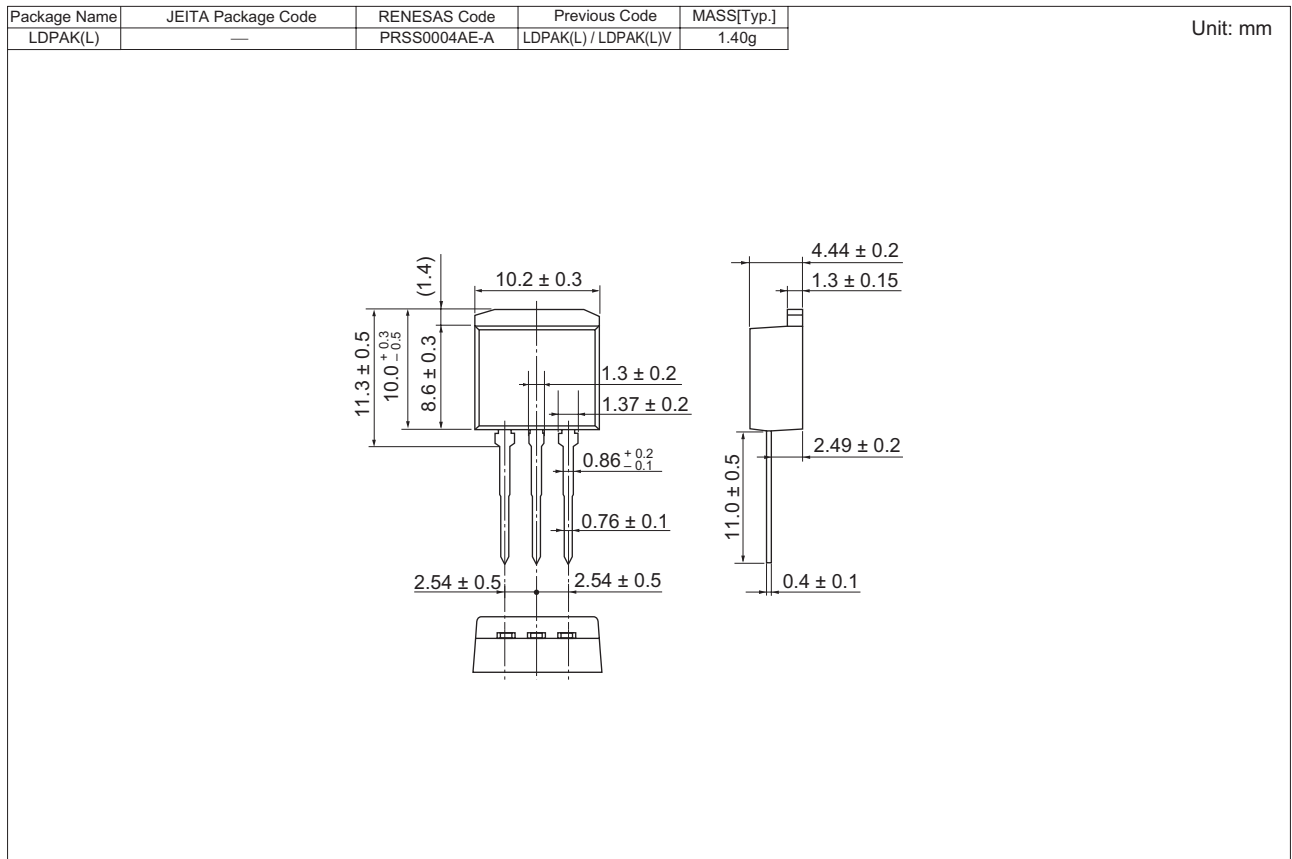


Switching Time Waveform

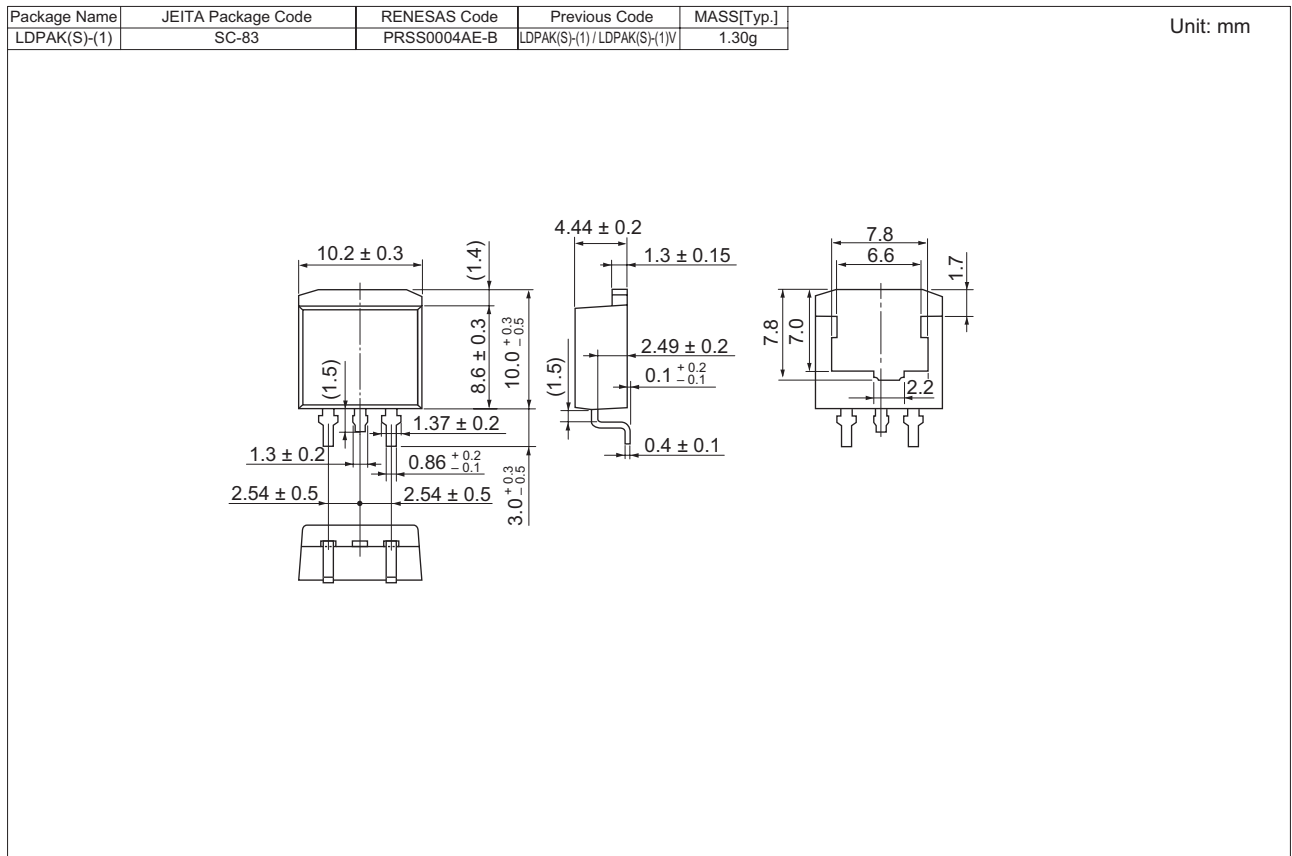


Package Dimensions

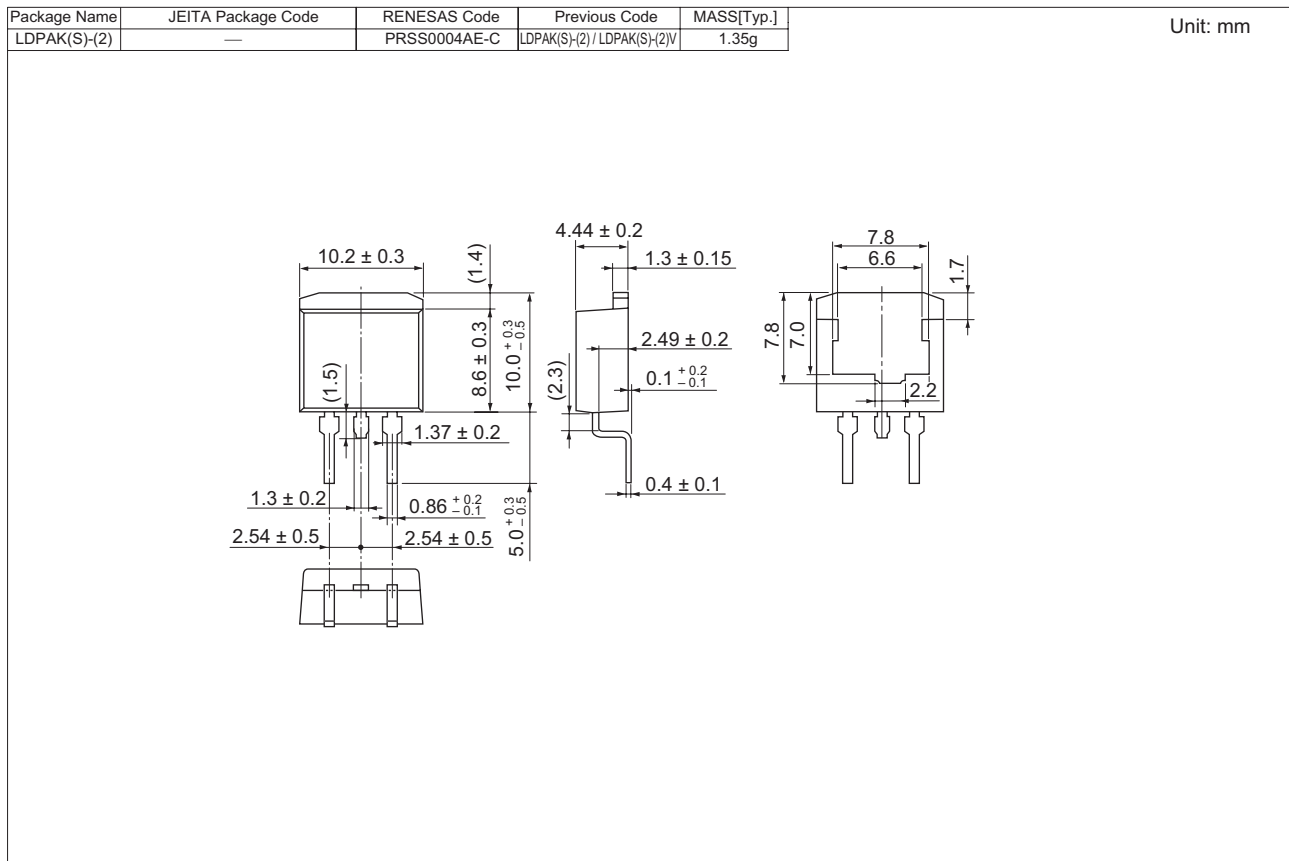
• H7N0405LD



• H7N0405LS



• H7N0405LM



Ordering Information

Part Name	Quantity	Shipping Container
H7N0405LD-E	500 pcs	Box (Conductive Sack)
H7N0405LSTL-E	1000 pcs	Taping
H7N0405LMTL-E	1000 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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