

H7N1005LD, H7N1005LS, H7N1005LM

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0391-0200

Rev.2.00

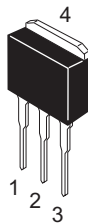
Oct 16, 2006

Features

- Low on-resistance
 $R_{DS(on)} = 85 \text{ m}\Omega$ typ.
- Low drive current
- Capable of 4.5 V gate drive

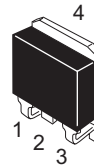
Outline

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



H7N1005LD

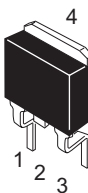
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(Package name: LDKPAK (S)-(1))



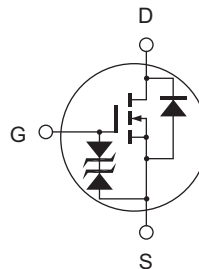
H7N1005LS

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

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



H7N1005LM



Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|---|--|-------------|------|
| Drain to source voltage | V _{DSS} | 100 | V |
| Gate to source voltage | V _{GSS} | ±20 | V |
| Drain current | I _D | 15 | A |
| Drain peak current | I _{D (pulse)} ^{Note 1} | 30 | A |
| Body to drain diode reverse drain current | I _{DR} | 30 | A |
| Avalanche current | I _{AP} ^{Note 3} | 8 | A |
| Avalanche energy | E _{AR} ^{Note 3} | 6.4 | mJ |
| Channel dissipation | P _{ch} ^{Note 2} | 30 | 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

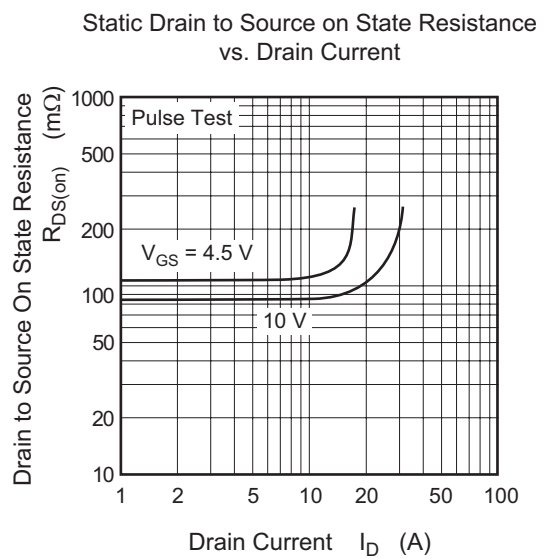
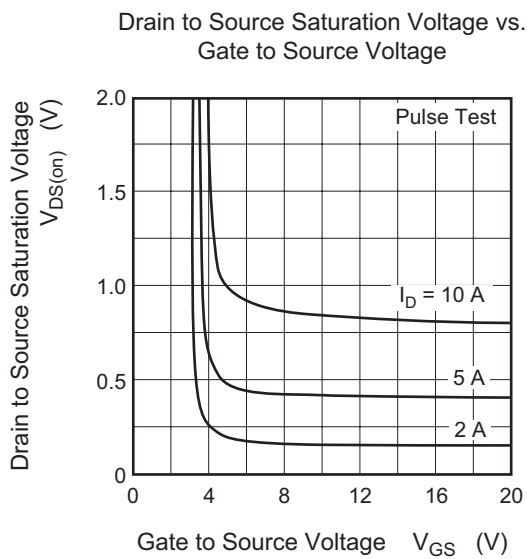
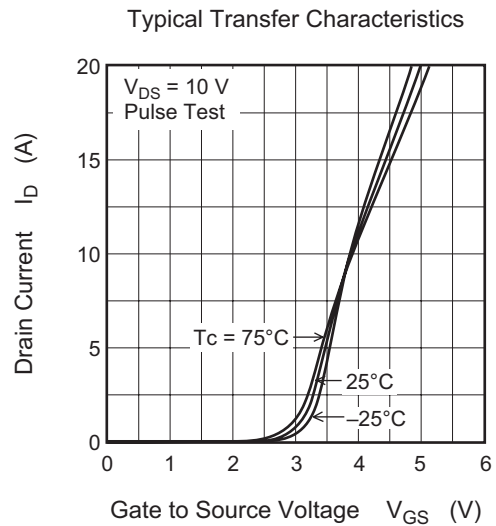
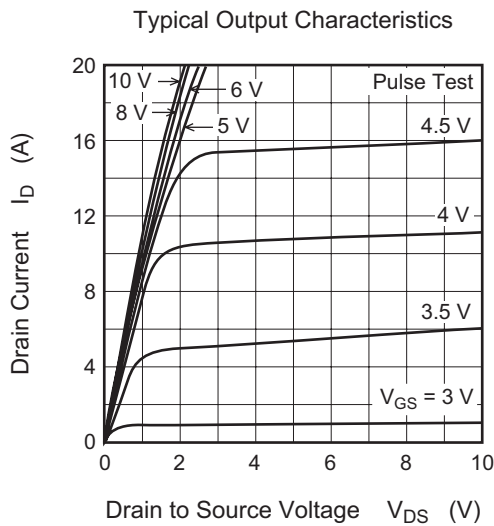
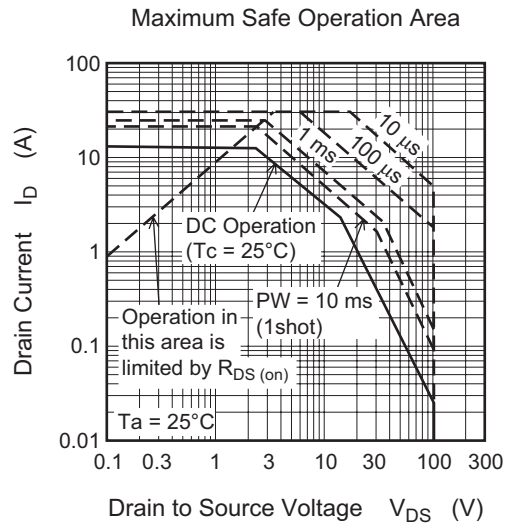
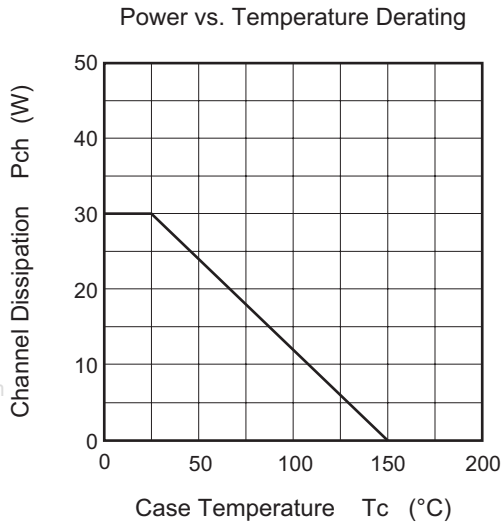
Electrical Characteristics

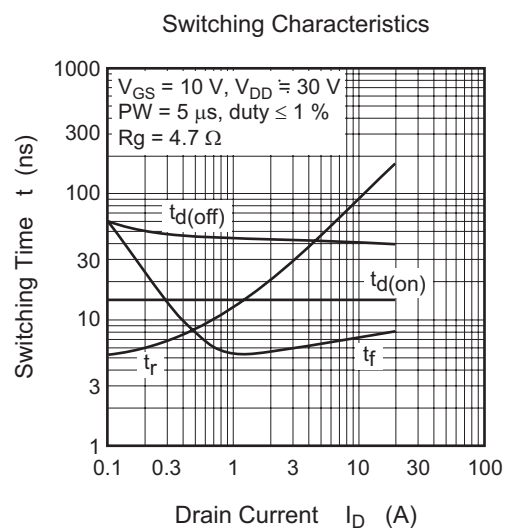
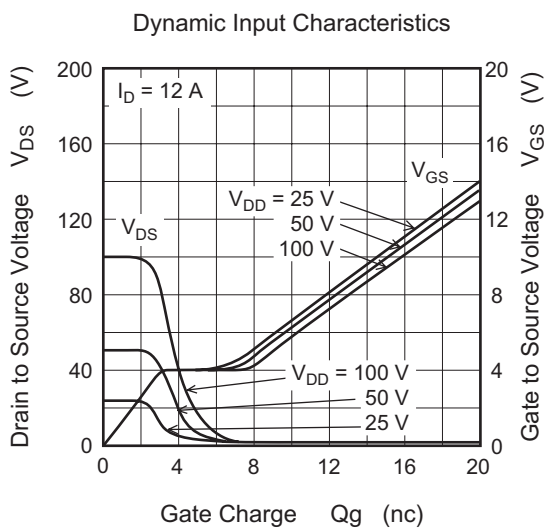
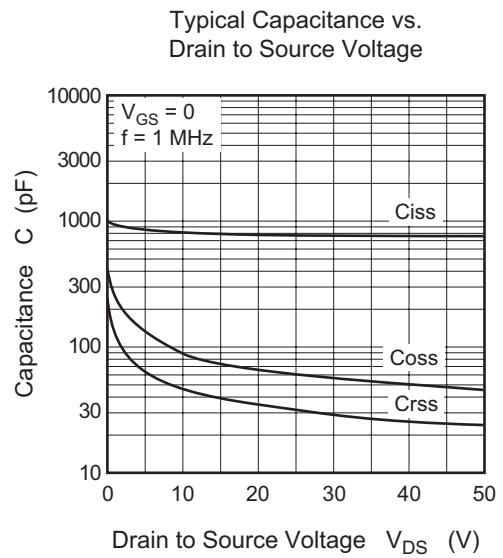
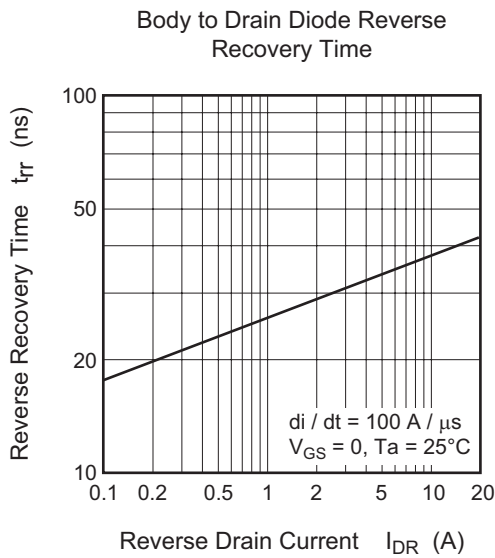
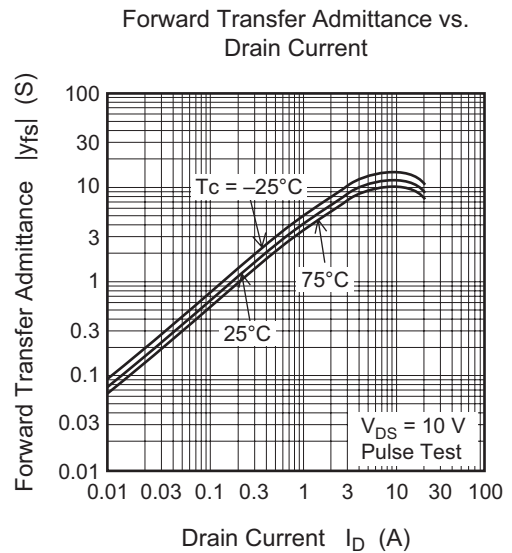
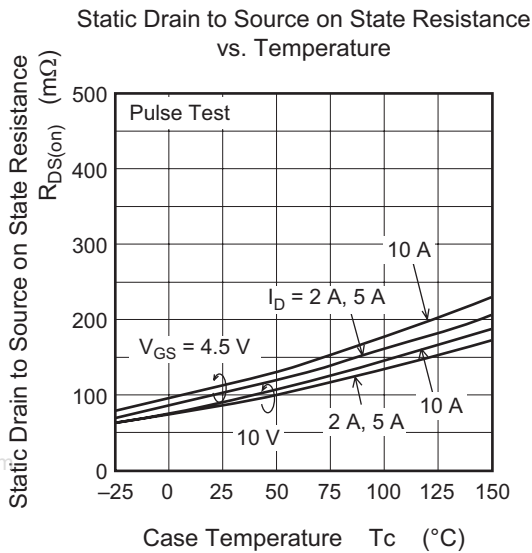
(Ta = 25°C)

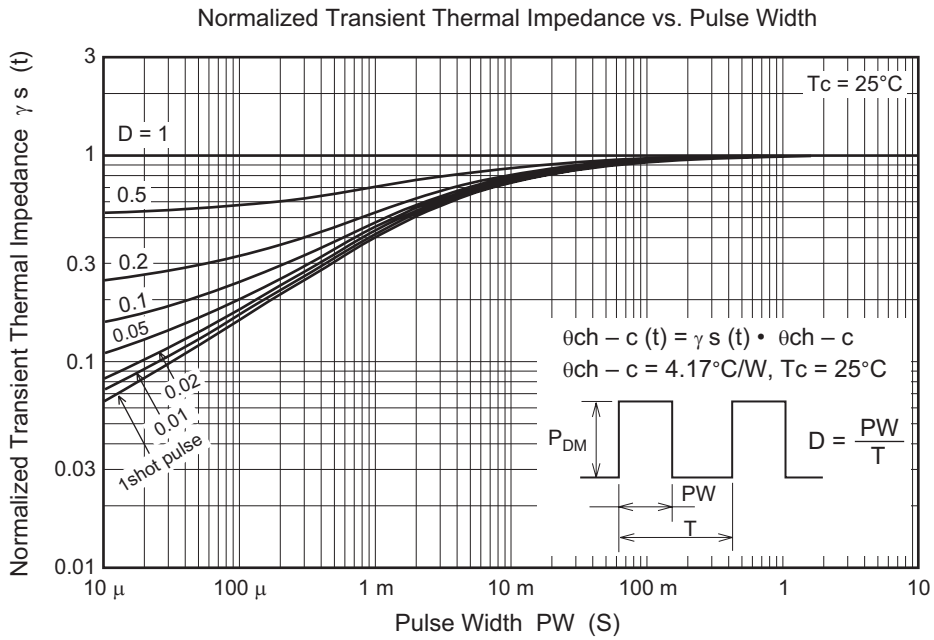
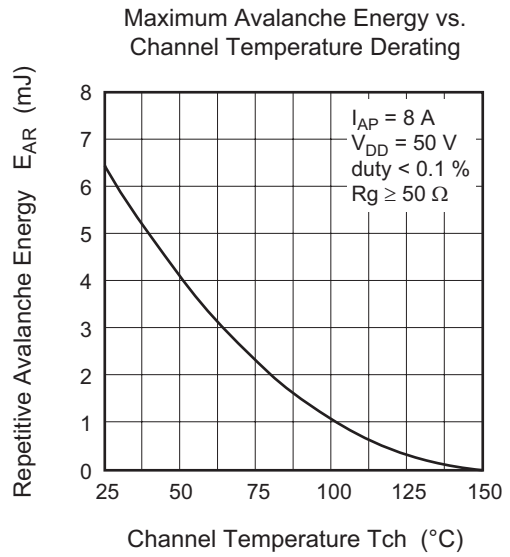
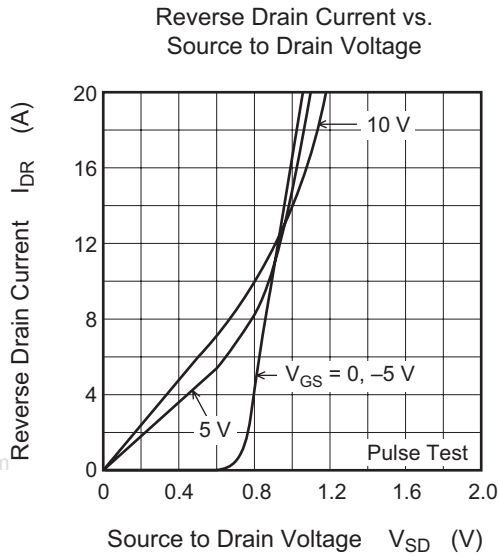
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------------------|-----|------|-----|------|--|
| Drain to source breakdown voltage | V _{(BR) DSS} | 100 | — | — | V | I _D = 10 mA, V _{GS} = 0 |
| Gate to source breakdown voltage | V _{(BR) GSS} | ±20 | — | — | V | I _G = ±100 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} = 100 V, V _{GS} = 0 |
| Gate to source cutoff voltage | V _{GS (off)} | 1.5 | — | 2.5 | V | I _D = 1 mA, V _{DS} = 10 V ^{Note 4} |
| Static drain to source on state resistance | R _{DS (on)} | — | 85 | 110 | mΩ | I _D = 7.5 A, V _{GS} = 10 V ^{Note 4} |
| | | — | 105 | 155 | mΩ | I _D = 7.5 A, V _{GS} = 4.5 V ^{Note 4} |
| Forward transfer admittance | y _{fs} | 6.5 | 11 | — | S | I _D = 7.5 A, V _{GS} = 10 V ^{Note 4} |
| Input capacitance | C _{iss} | — | 830 | — | pF | V _{DS} = 10 V |
| Output capacitance | C _{oss} | — | 90 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 55 | — | pF | f = 1 MHz |
| Total gate charge | Q _g | — | 15 | — | nC | V _{DD} = 50 V |
| Gate to source charge | Q _{gs} | — | 3 | — | nC | V _{GS} = 10 V |
| Gate to drain charge | Q _{gd} | — | 4 | — | nC | I _D = 15 A |
| Turn-on delay time | t _{d (on)} | — | 15 | — | ns | V _{GS} = 10 V, I _D = 7.5 A |
| Rise time | t _r | — | 85 | — | ns | R _L = 4 Ω |
| Turn-off delay time | t _{d (off)} | — | 42 | — | ns | R _g = 4.7 Ω |
| Fall time | t _f | — | 6.8 | — | ns | |
| Body to drain diode forward voltage | V _{DF} | — | 0.93 | — | V | I _F = 15 A, V _{GS} = 0 |
| Body to drain diode reverse recovery time | t _{rr} | — | 41 | — | ns | I _F = 15 A, V _{GS} = 0 di _F /dt = 100 A/μs |

Note: 4. Pulse test

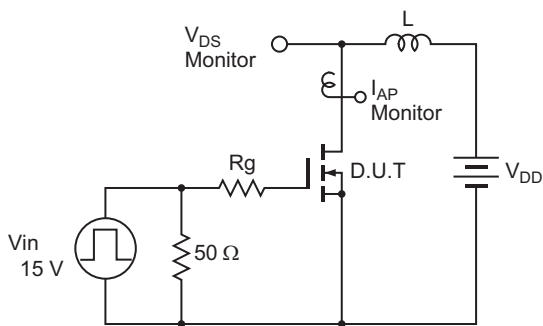
Main Characteristics



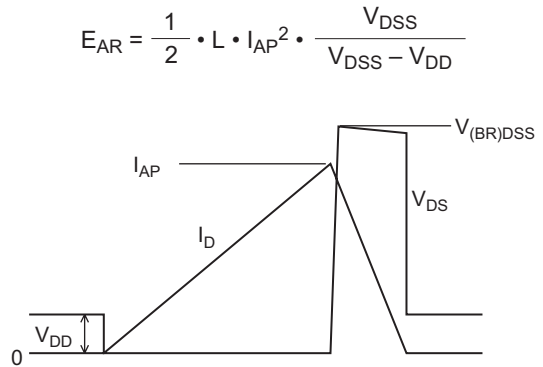




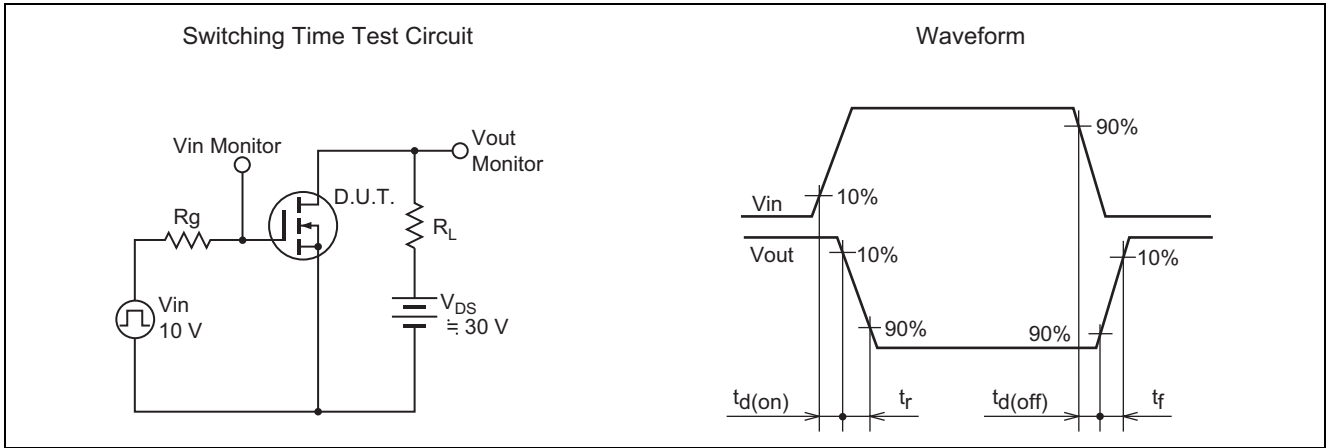
Avalanche Test Circuit



Avalanche Waveform

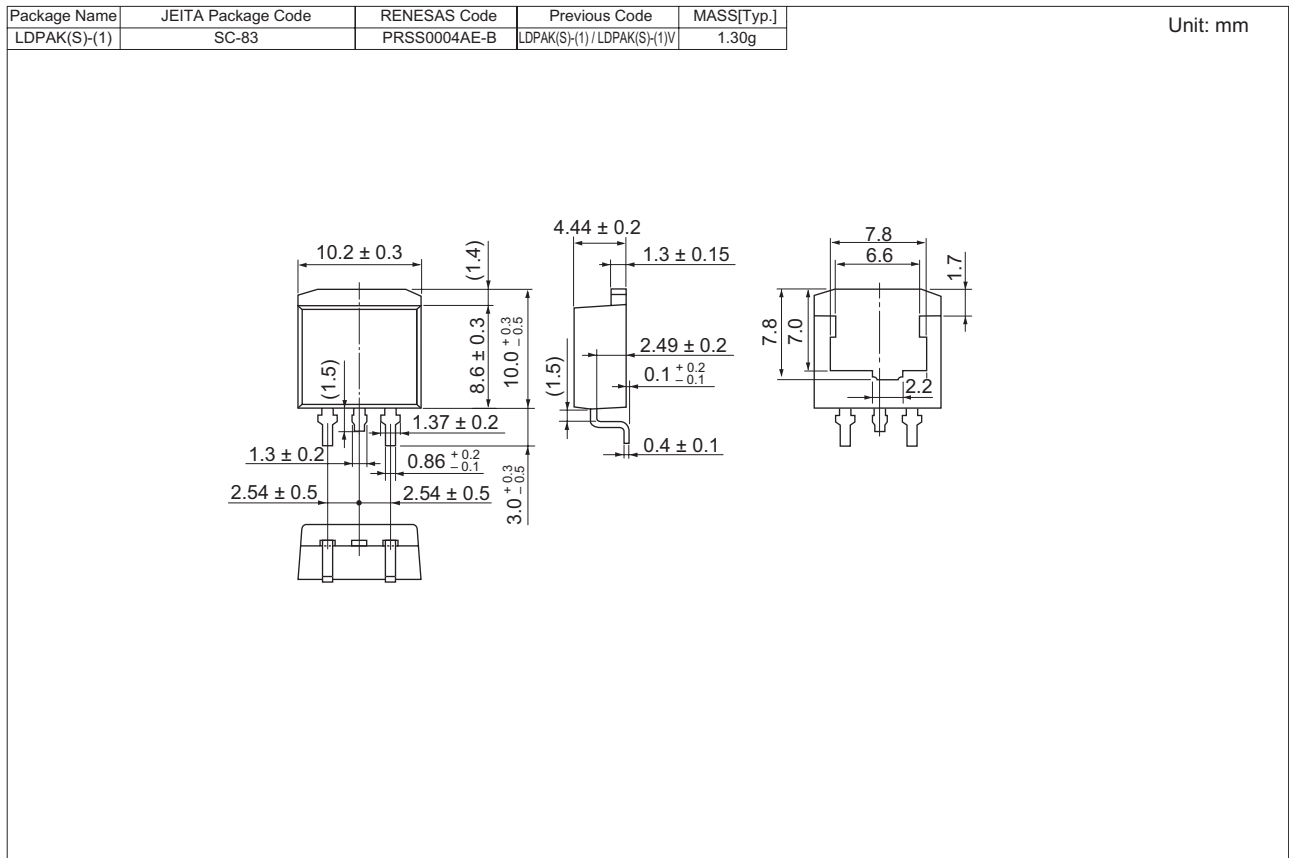
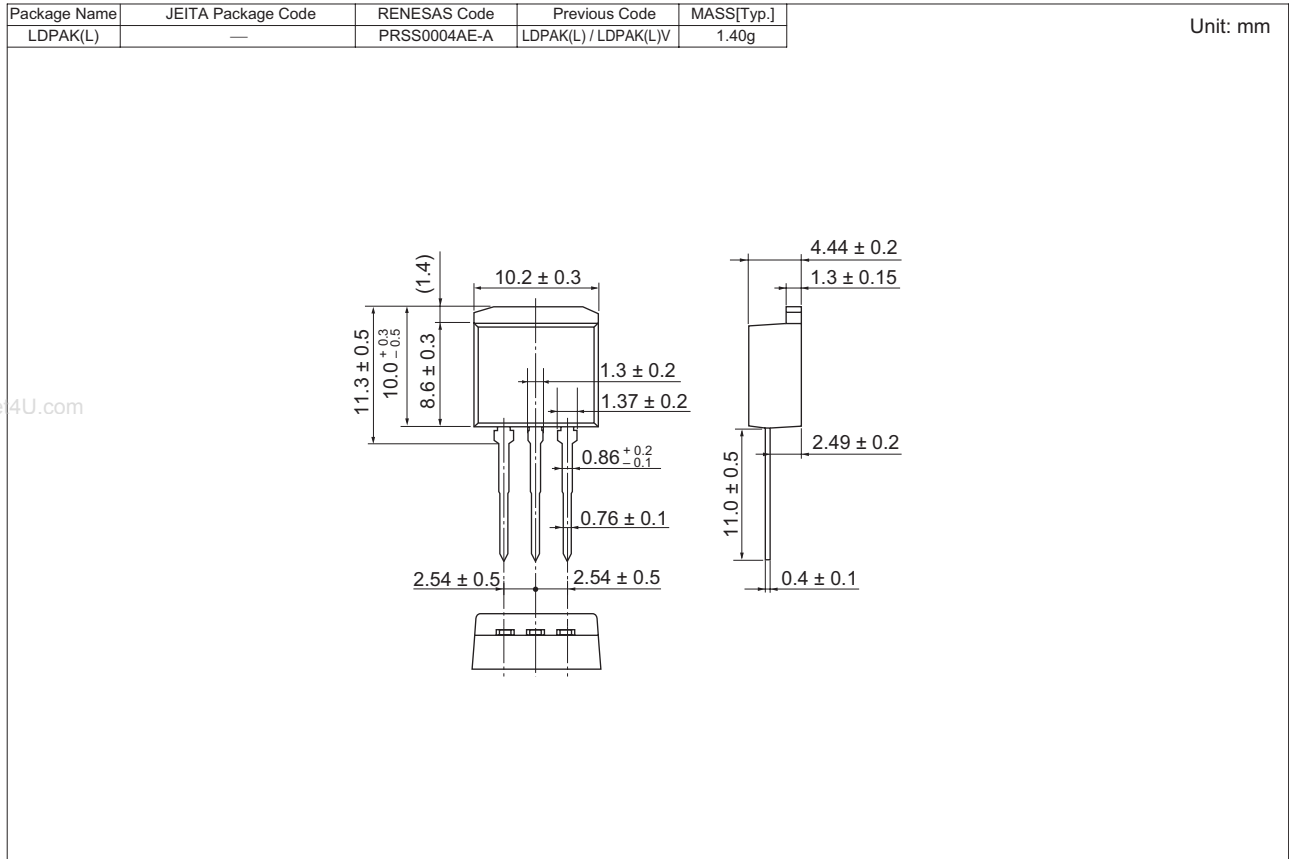


$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



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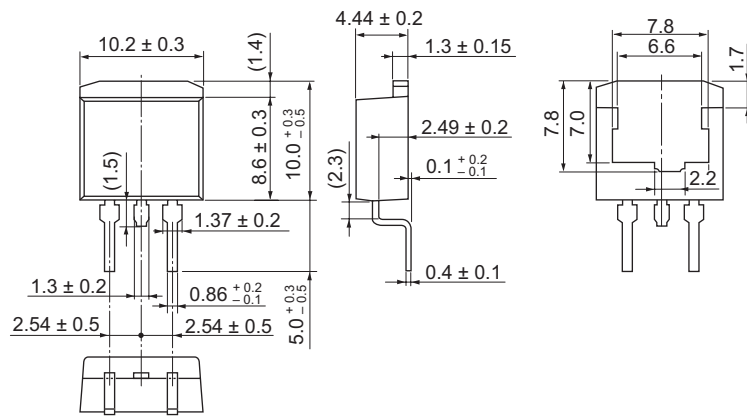
Package Dimensions



H7N1005LD, H7N1005LS, H7N1005LM

| 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 |
|---------------|----------|-----------------------|
| H7N1005LD-E | 500 pcs | Box (Conductive Sack) |
| H7N1005LSTL-E | 1000 pcs | Taping |
| H7N1005LMTL-E | 1000 pcs | Taping |

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