

HAT2141H

Silicon N Channel Power MOS FET
Power Switching

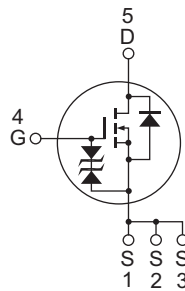
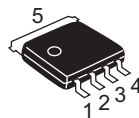
REJ03G1193-0700
(Previous: ADE-208-1582E)
Rev.7.00
Sep 07, 2005

Features

- Capable of 7 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 22 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)

Outline

RENESAS Package code: PTZZ0005DA-A
(Package name: LFPAK)



1, 2, 3 Source
4 Gate
5 Drain

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|--|--|-------------|------|
| Drain to source voltage | V _{DS} | 100 | V |
| Gate to source voltage | V _{GS} | ±20 | V |
| Drain current | I _D | 15 | A |
| Drain peak current | I _{D (pulse)} ^{Note 1} | 60 | A |
| Body-drain diode reverse drain current | I _{DR} | 15 | A |
| Avalanche current | I _{AP} ^{Note 3} | 15 | A |
| Avalanche energy | E _{AR} ^{Note 3} | 22.5 | mJ |
| Channel dissipation | P _{ch} ^{Note 2} | 20 | 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. Value at T_{ch} = 25°C, R_g ≥ 50 Ω

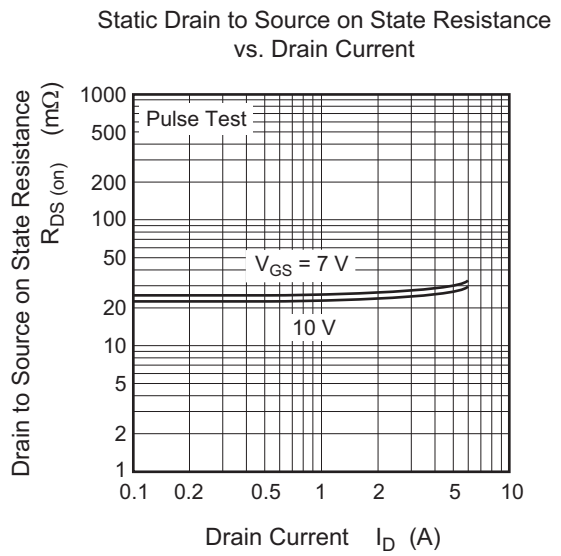
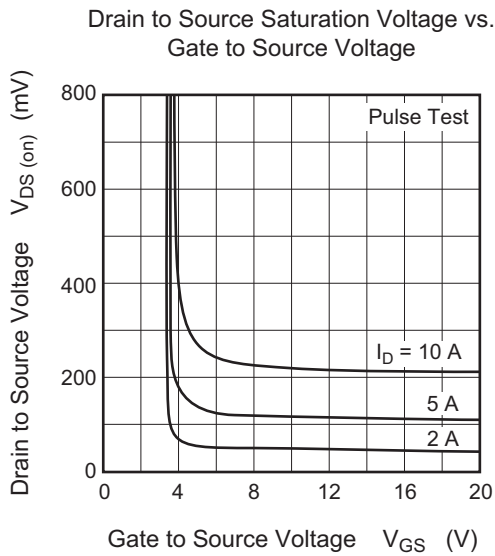
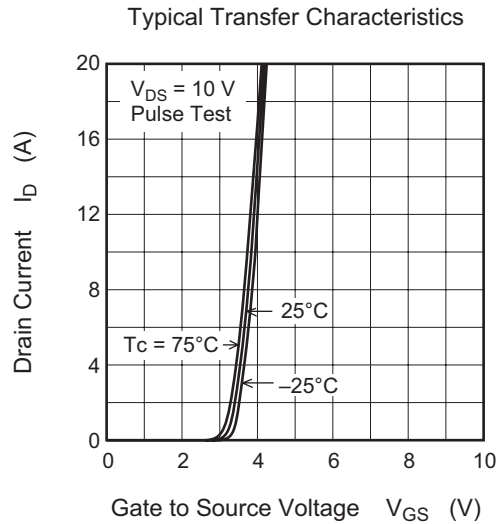
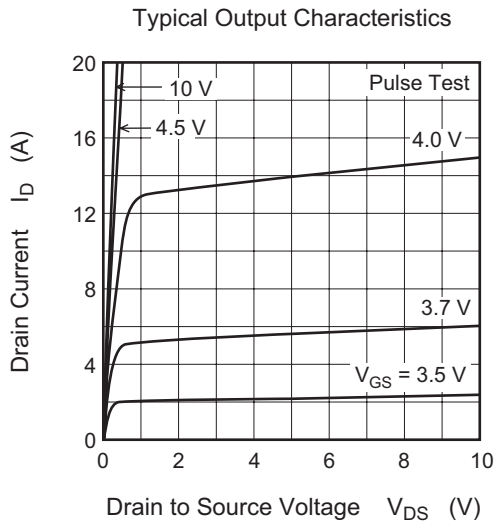
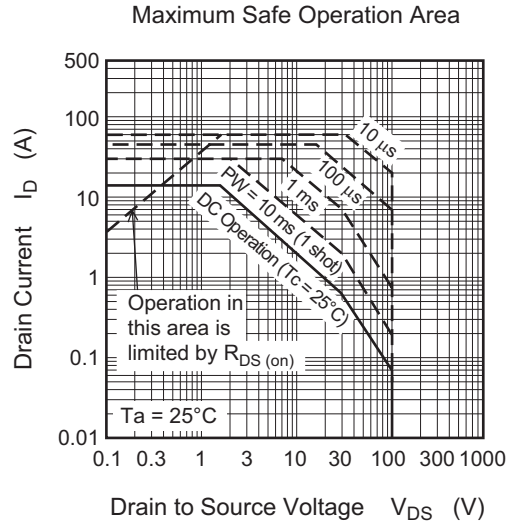
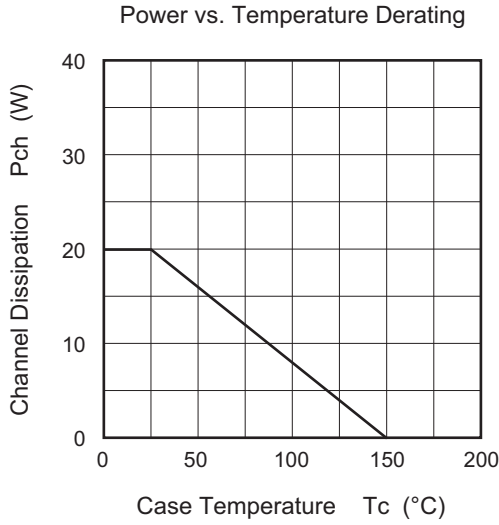
Electrical Characteristics

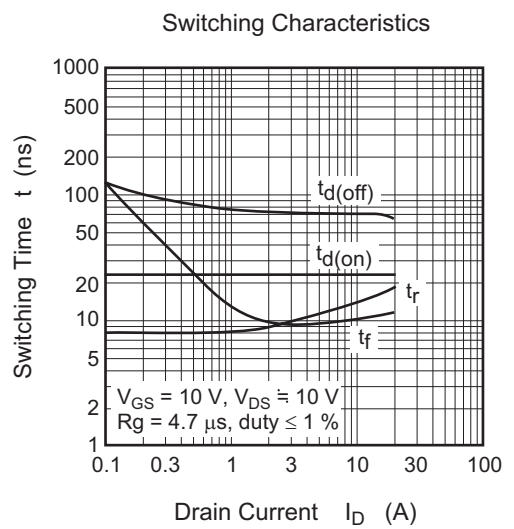
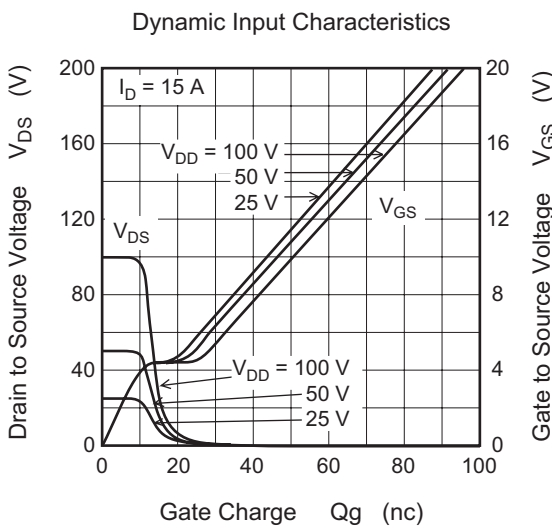
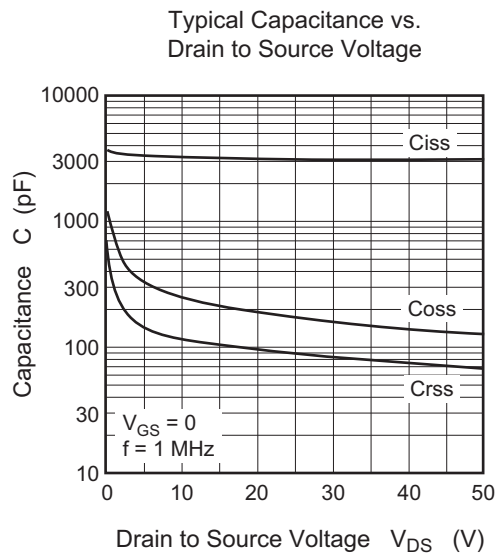
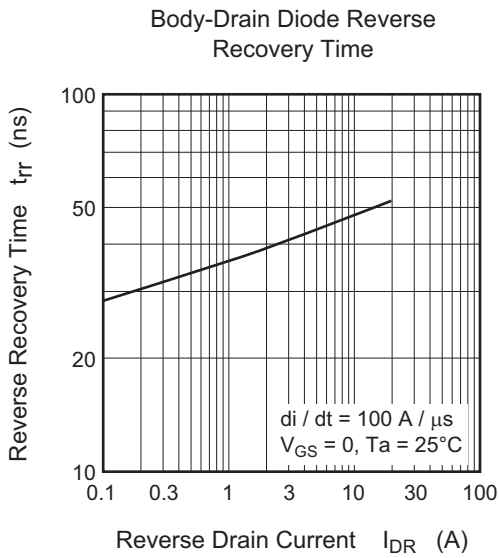
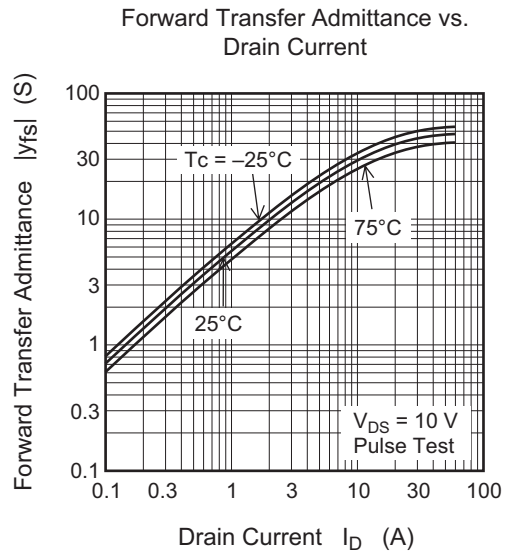
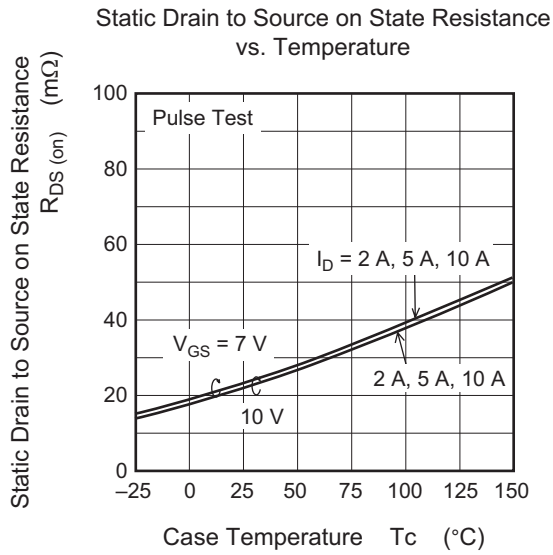
(Ta = 25°C)

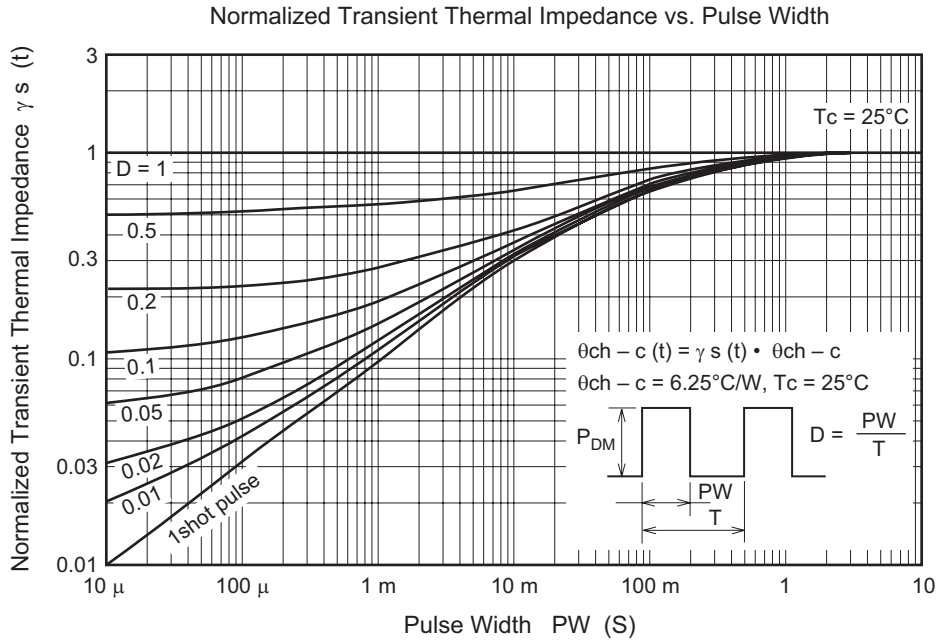
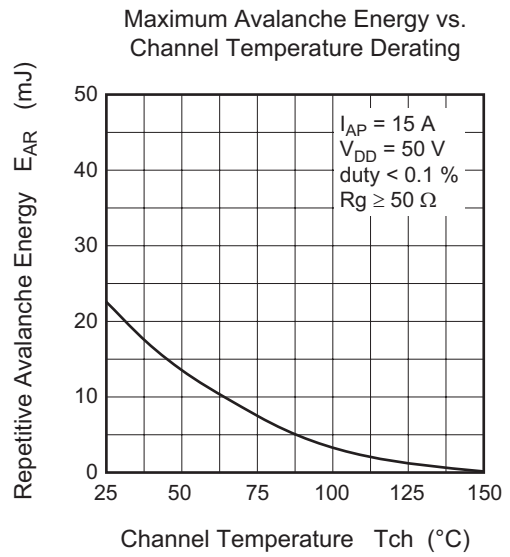
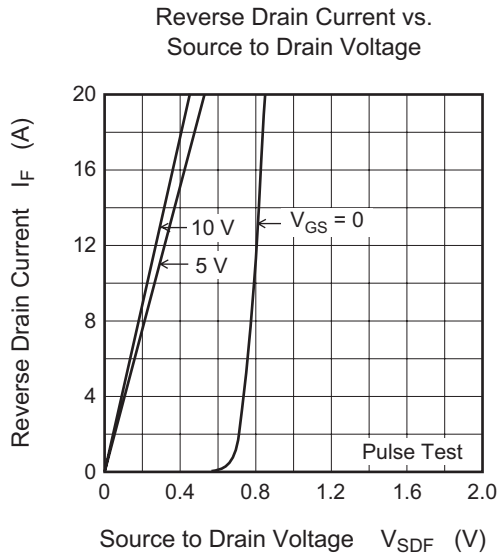
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------------------|-----|------|------|------|--|
| Drain to source breakdown voltage | V _{(BR) DSS} | 100 | — | — | V | I _D = 10 mA, V _{GS} = 0 |
| Gate to source breakdown voltage | V _{(BR) GSS} | ±20 | — | — | V | I _G = ±100 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} | — | — | 1 | μA | V _{DS} = 100 V, V _{GS} = 0 |
| Gate to source cutoff voltage | V _{GS (off)} | 2.0 | — | 3.5 | V | V _{DS} = 10 V, I _D = 1 mA |
| Static drain to source on state resistance | R _{DS (on)} | — | 22 | 27.5 | mΩ | I _D = 7.5 A, V _{GS} = 10 V ^{Note 4} |
| | R _{DS (on)} | — | 23.5 | 32 | mΩ | I _D = 7.5 A, V _{GS} = 7 V ^{Note 4} |
| Forward transfer admittance | y _{fs} | 15 | 25 | — | S | I _D = 7.5 A, V _{DS} = 10 V ^{Note 4} |
| Input capacitance | C _{iss} | — | 3200 | — | pF | V _{DS} = 10 V |
| Output capacitance | C _{oss} | — | 255 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 125 | — | pF | f = 1 MHz |
| Total gate charge | Q _g | — | 46 | — | nC | V _{DD} = 50 V |
| Gate to source charge | Q _{gs} | — | 11 | — | nC | V _{GS} = 10 V |
| Gate to drain charge | Q _{gd} | — | 10 | — | nC | I _D = 15 A |
| Turn-on delay time | t _{d (on)} | — | 22 | — | ns | V _{GS} = 10 V, I _D = 7.5 A |
| Rise time | t _r | — | 13 | — | ns | V _{DD} ≅ 30 V |
| Turn-off delay time | t _{d (off)} | — | 70 | — | ns | R _L = 4 Ω |
| Fall time | t _f | — | 10 | — | ns | R _g = 4.7 Ω |
| Body-drain diode forward voltage | V _{DF} | — | 0.82 | 1.07 | V | I _F = 15 A, V _{GS} = 0 ^{Note 4} |
| Body-drain diode reverse recovery time | t _{rr} | — | 50 | — | ns | I _F = 15 A, V _{GS} = 0 di _F /dt = 100 A/μs |

Note: 4. Pulse test

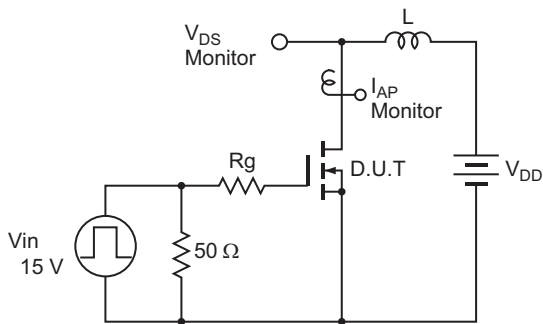
Main Characteristics



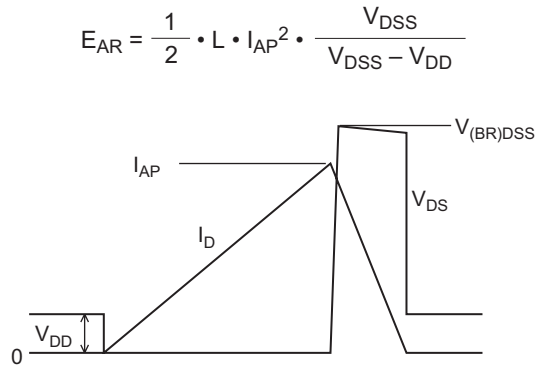


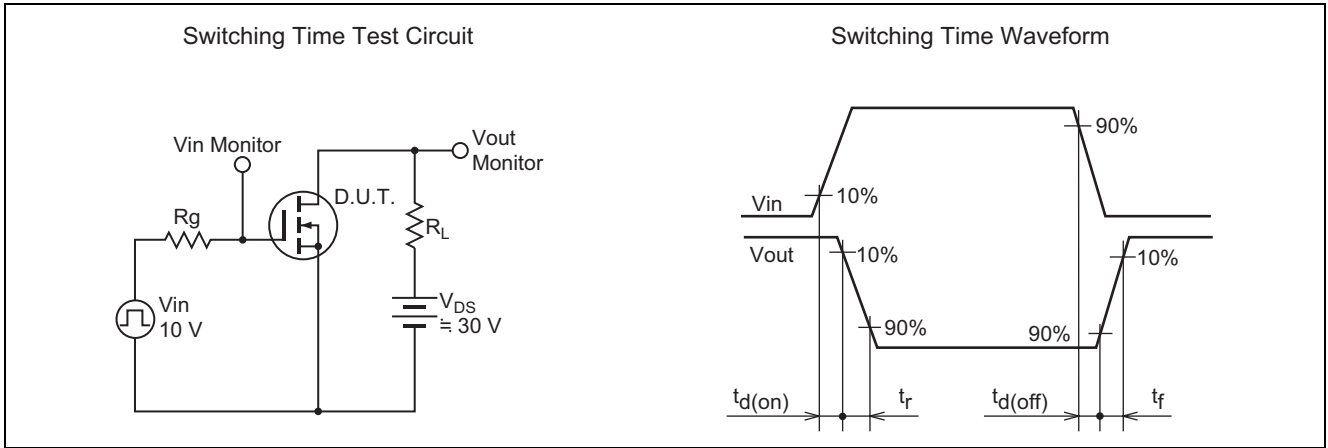


Avalanche Test Circuit

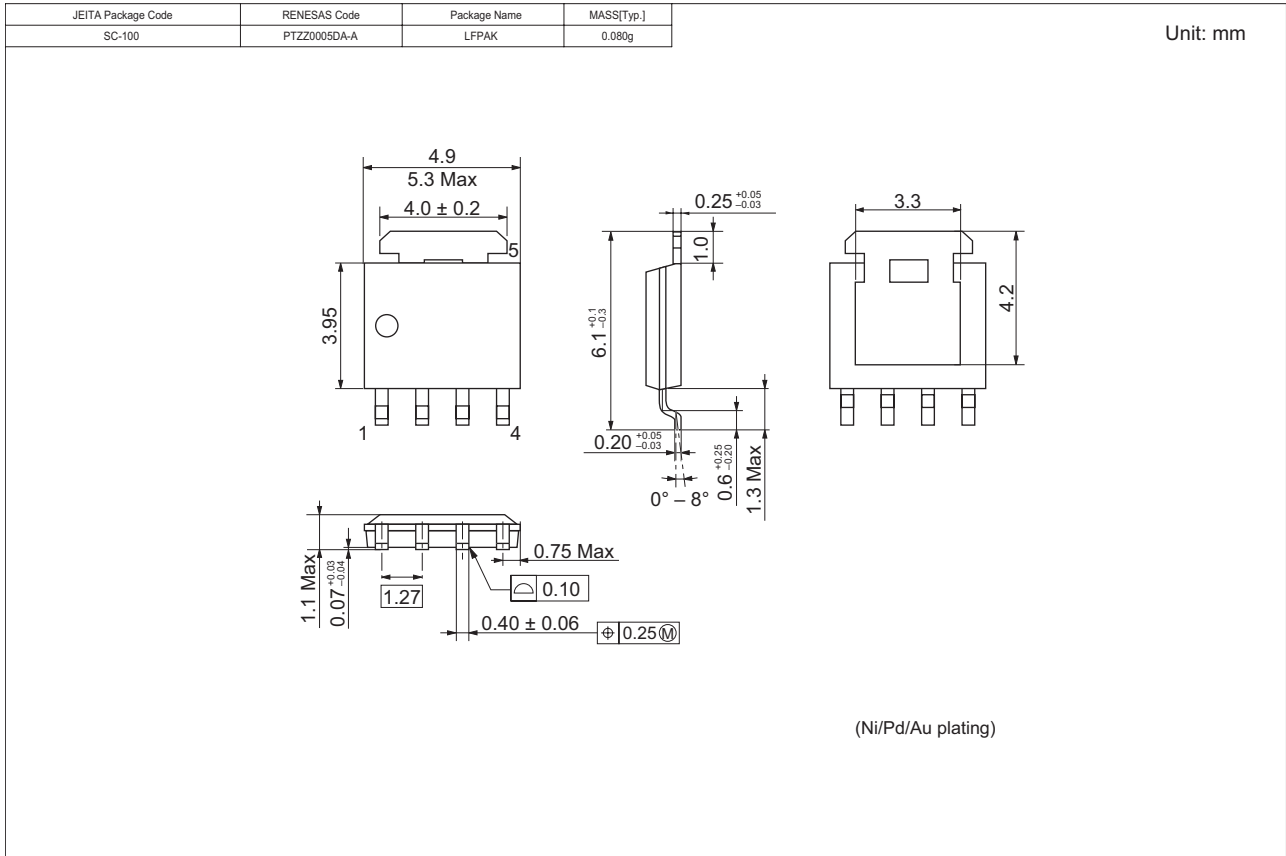


Avalanche Waveform





Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|---------------|----------|--------------------|
| HAT2141H-EL-E | 2500 pcs | Taping |

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