

HAT2137H

Silicon N Channel Power MOS FET Power Switching

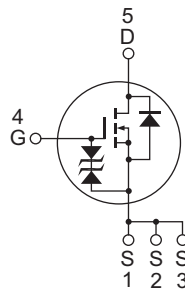
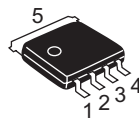
REJ03G1191-0400
(Previous: ADE-208-1579B)
Rev.4.00
Sep 07, 2005

Features

- Capable of 7 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 3.8 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)

Outline

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



1, 2, 3 Source
4 Gate
5 Drain

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	45	A
Drain peak current	I _{D (pulse)} ^{Note 1}	180	A
Body-drain diode reverse drain current	I _{DR}	45	A
Avalanche current	I _{AP} ^{Note 3}	30	A
Avalanche energy	E _{AR} ^{Note 3}	72	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. T_c = 25 °C
 3. Value at T_{ch} = 25°C, R_g ≥ 50 Ω

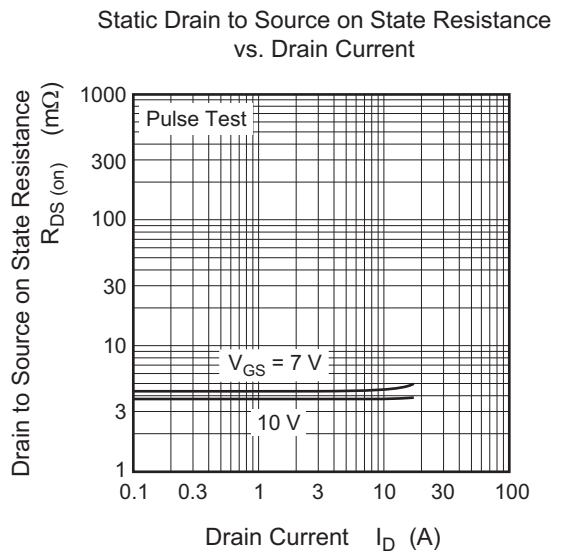
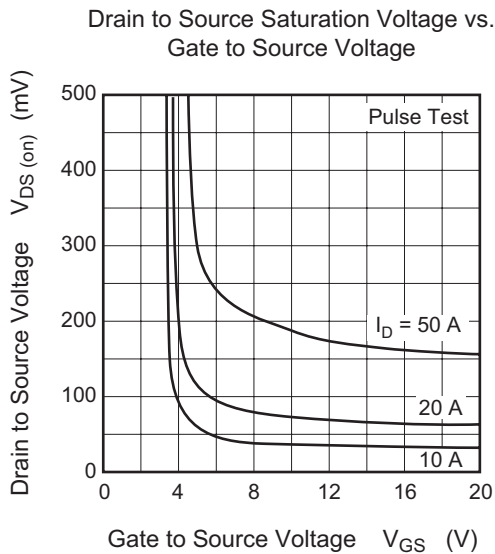
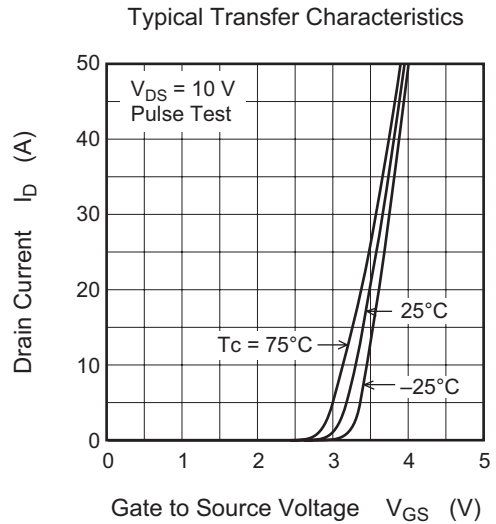
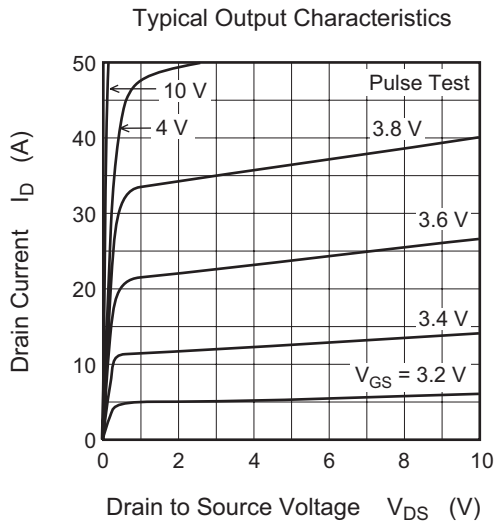
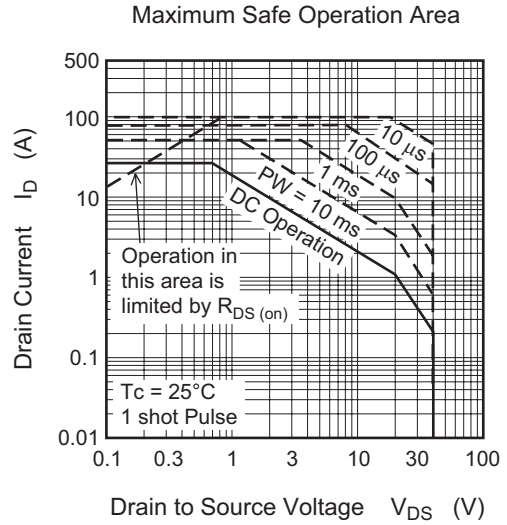
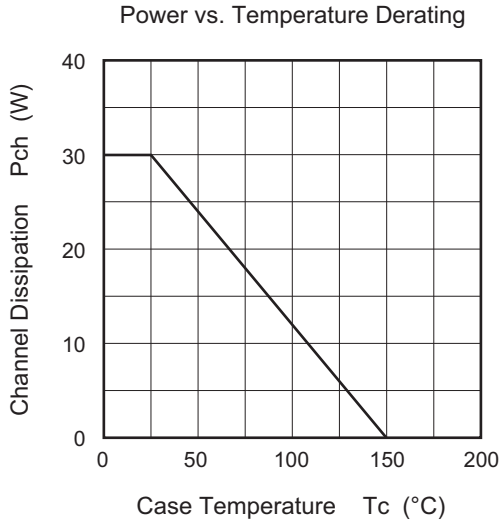
Electrical Characteristics

(Ta = 25°C)

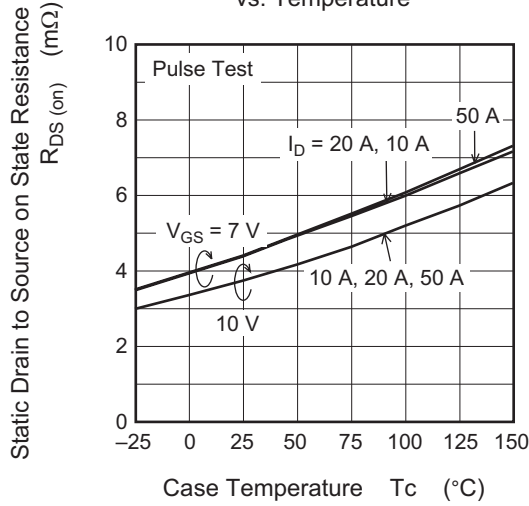
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR) DSS}	40	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source breakdown voltage	V _{(BR) GSS}	±20	—	—	V	I _G = ±100 μA, V _{DS} = 0
Gate to source leak current	I _{GSS}	—	—	±10	μA	V _{GS} = ±16 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	1	μA	V _{DS} = 40 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)}	—	3.8	4.8	mΩ	I _D = 22.5 A, V _{GS} = 10 V ^{Note 4}
	R _{DS (on)}	—	4.4	6.0	mΩ	I _D = 22.5 A, V _{GS} = 7 V ^{Note 4}
Forward transfer admittance	y _{fs}	38	64	—	S	I _D = 22.5 A, V _{DS} = 10 V ^{Note 4}
Input capacitance	C _{iss}	—	6200	—	pF	V _{DS} = 10 V
Output capacitance	C _{oss}	—	780	—	pF	V _{GS} = 0
Reverse transfer capacitance	C _{rss}	—	410	—	pF	f = 1 MHz
Total gate charge	Q _g	—	95	—	nC	V _{DD} = 10 V
Gate to source charge	Q _{gs}	—	24	—	nC	V _{GS} = 10 V
Gate to drain charge	Q _{gd}	—	14	—	nC	I _D = 45 A
Turn-on delay time	t _{d (on)}	—	27	—	ns	V _{GS} = 10 V, I _D = 22.5 A
Rise time	t _r	—	50	—	ns	V _{DD} ≅ 10 V
Turn-off delay time	t _{d (off)}	—	90	—	ns	R _L = 0.44 Ω
Fall time	t _f	—	14	—	ns	R _g = 4.7 Ω
Body-drain diode forward voltage	V _{DF}	—	0.84	1.10	V	I _F = 45 A, V _{GS} = 0 ^{Note 4}
Body-drain diode reverse recovery time	t _{rr}	—	40	—	ns	I _F = 45 A, V _{GS} = 0 di _F /dt = 100 A/μs

Note: 4. Pulse test

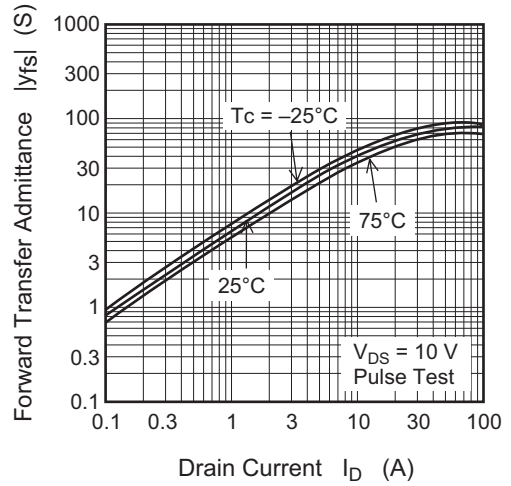
Main Characteristics



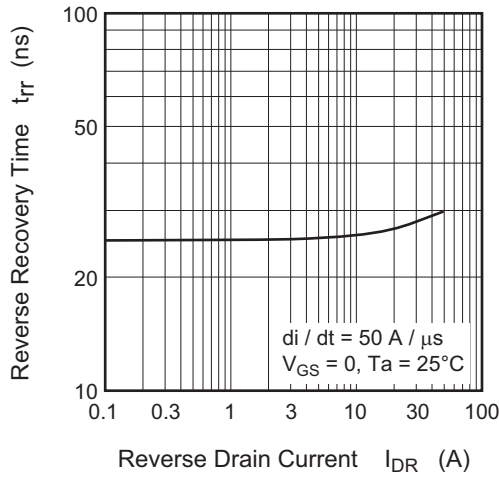
Static Drain to Source on State Resistance vs. Temperature



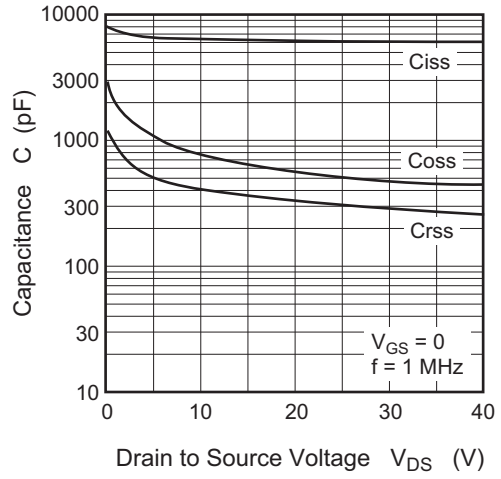
Forward Transfer Admittance vs. Drain Current



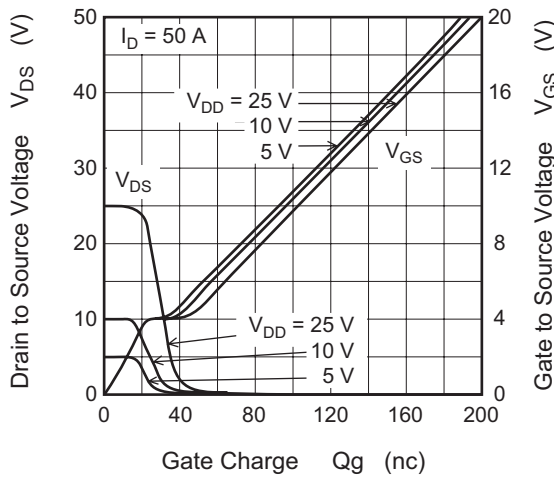
Body-Drain Diode Reverse Recovery Time



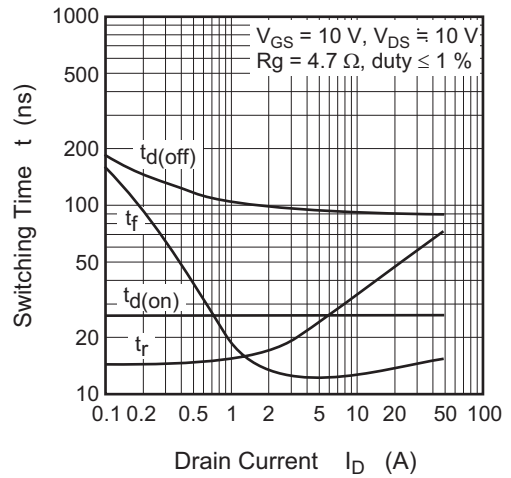
Typical Capacitance vs. Drain to Source Voltage

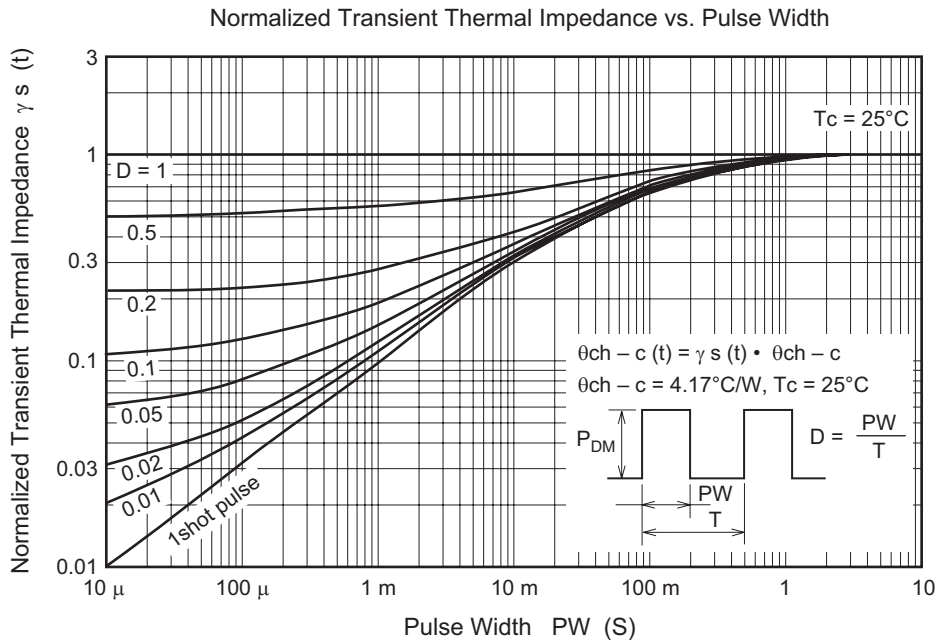
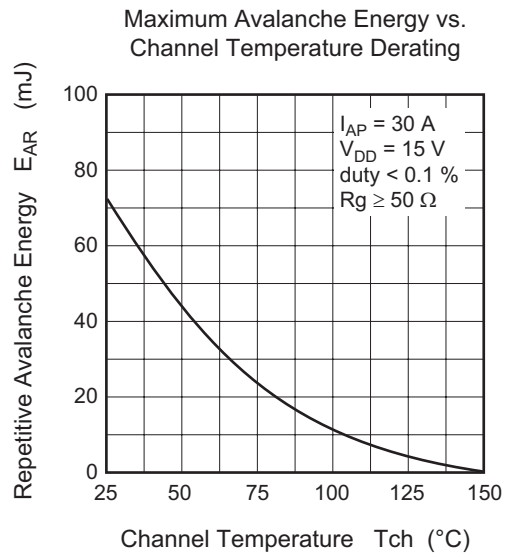
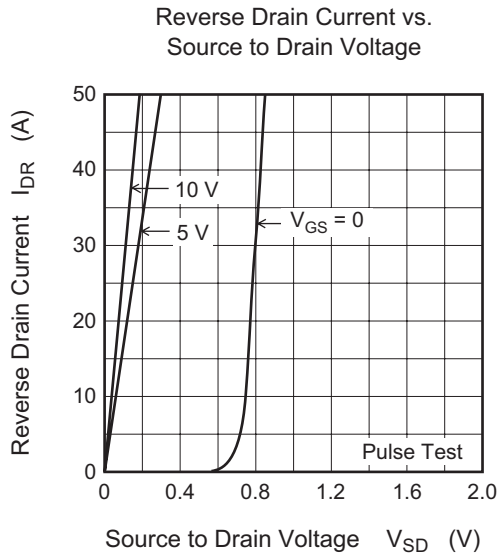


Dynamic Input Characteristics

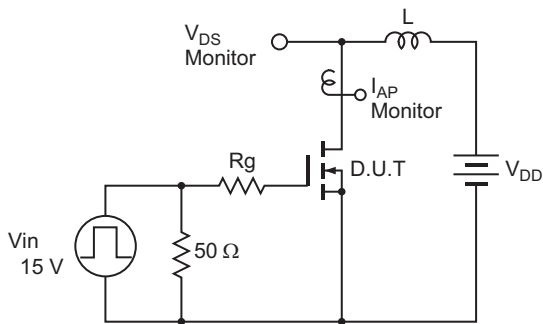


Switching Characteristics



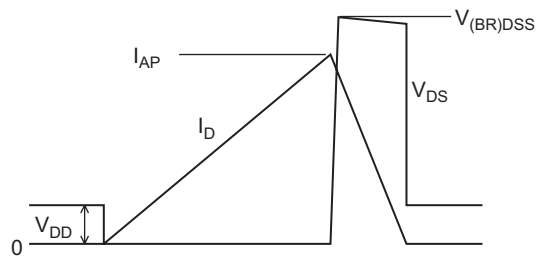


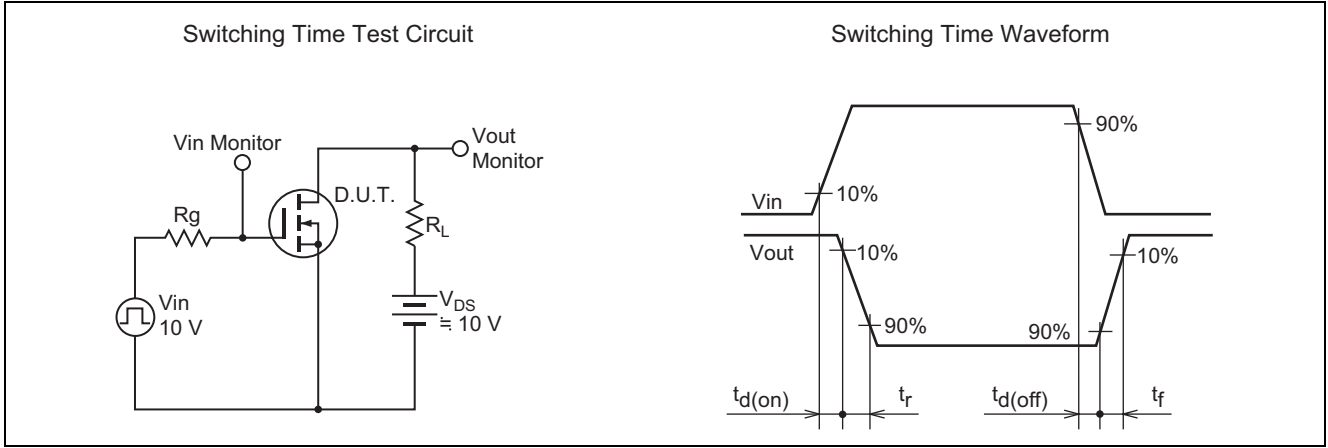
Avalanche Test Circuit



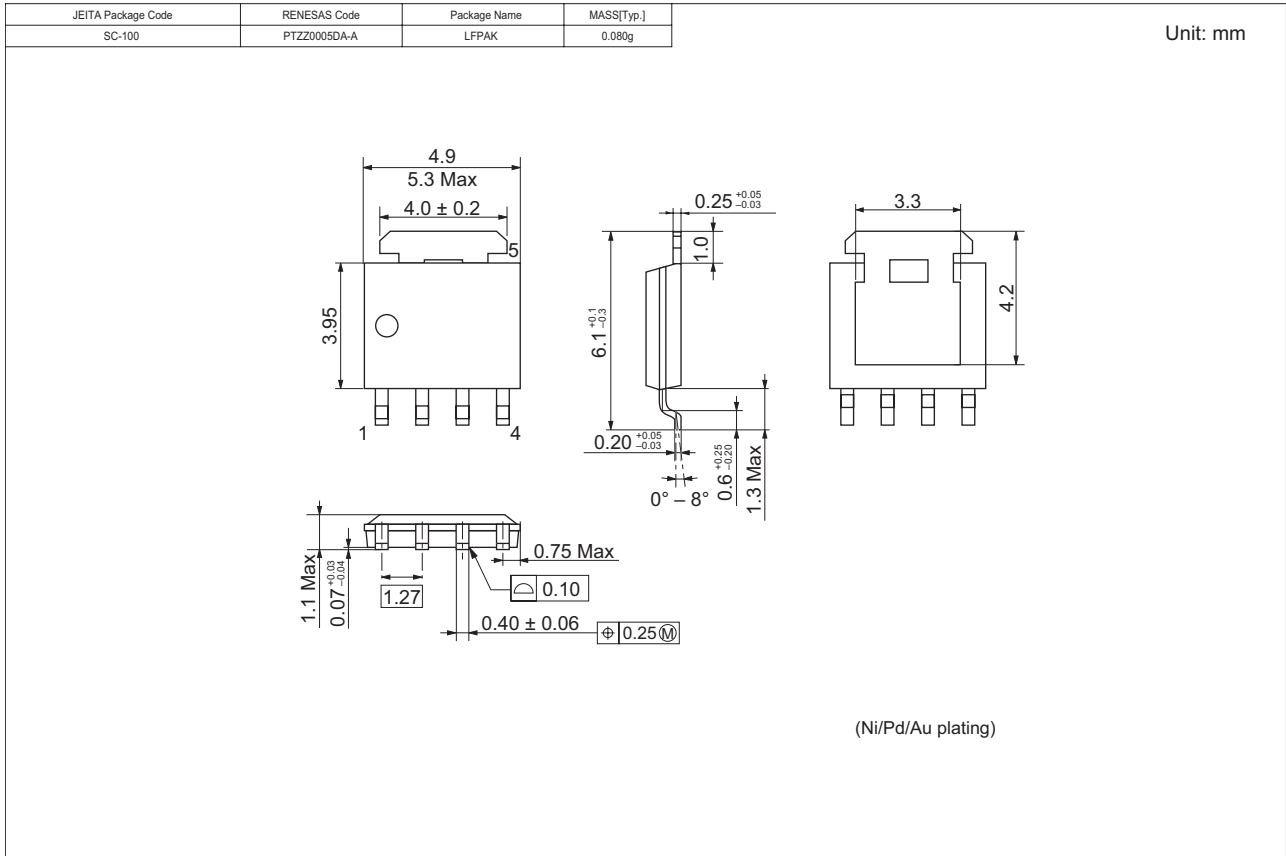
Avalanche Waveform

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





Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2137H-EL-E	2500 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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Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
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Renesas Technology Singapore Pte. Ltd.

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.

Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

Renesas Technology Malaysia Sdn. Bhd.

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510