

HAT2099H

Silicon N Channel Power MOS FET
Power Switching

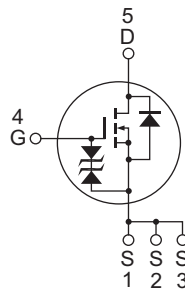
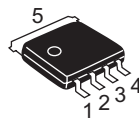
REJ03G1187-0500
(Previous: ADE-208-1432C)
Rev.5.00
Sep 07, 2005

Features

- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 2.9 \text{ m}\Omega$ 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}	30	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	50	A
Drain peak current	I _{D (pulse)} ^{Note 1}	200	A
Body-drain diode reverse drain current	I _{DR}	50	A
Avalanche current	I _{AP} ^{Note 3}	5	A
Avalanche energy	E _{AR} ^{Note 3}	2.5	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

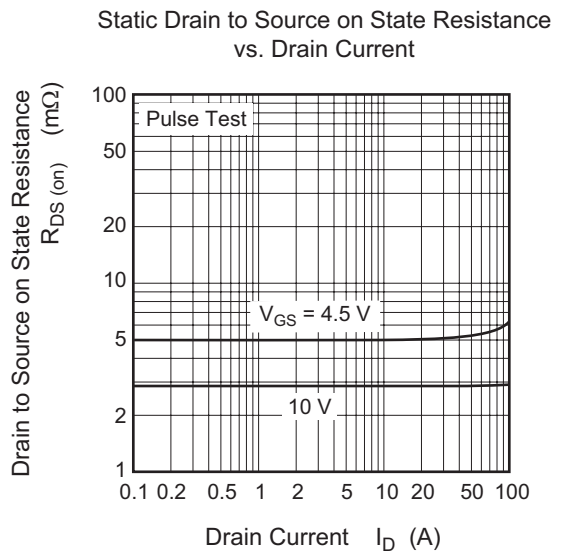
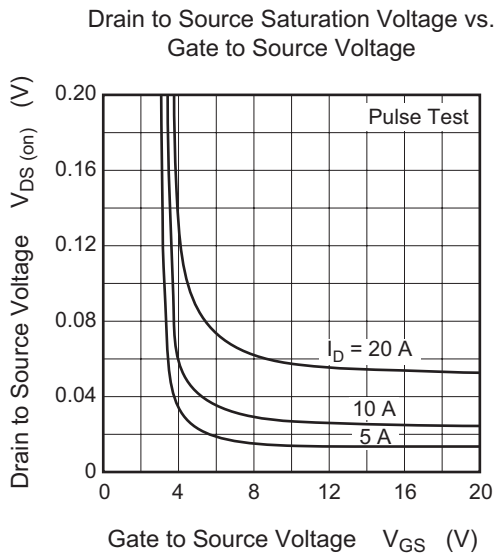
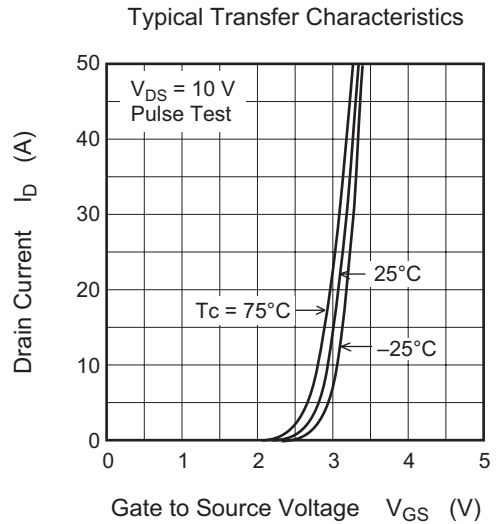
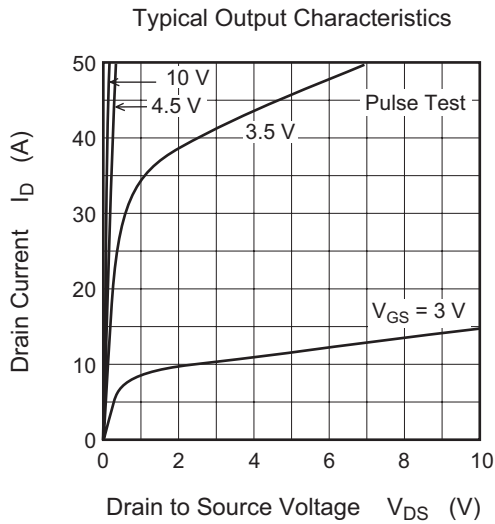
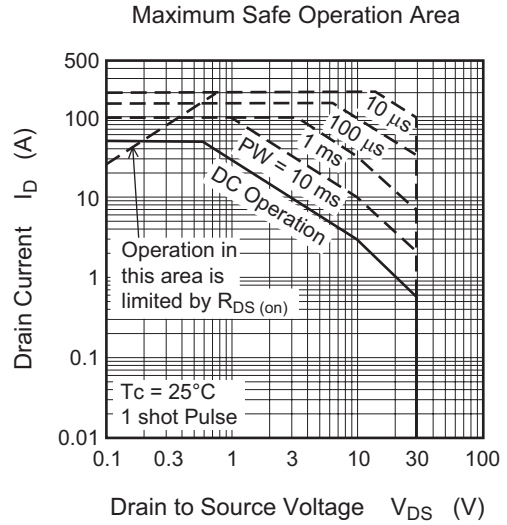
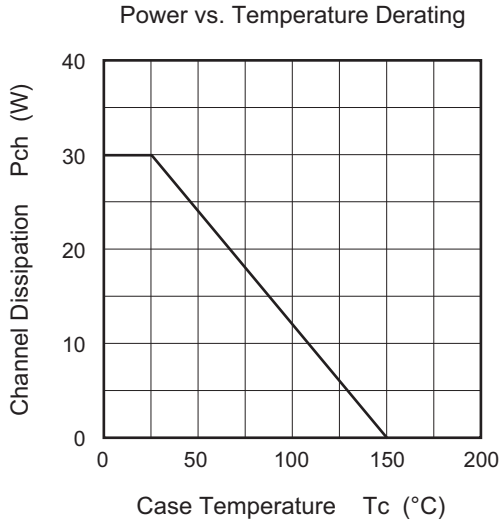
Electrical Characteristics

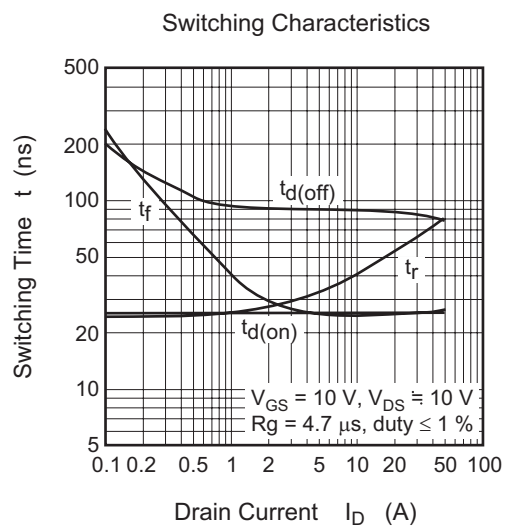
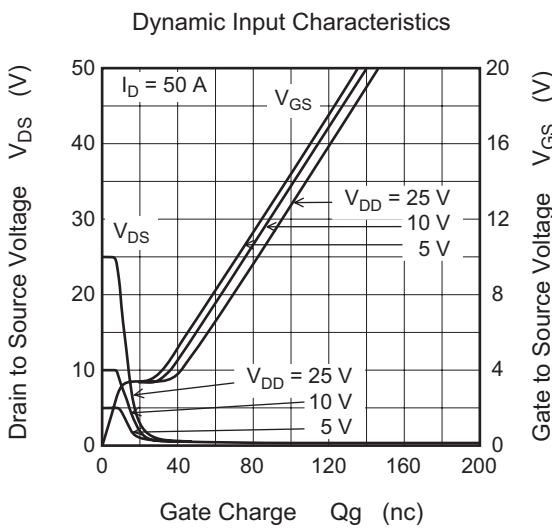
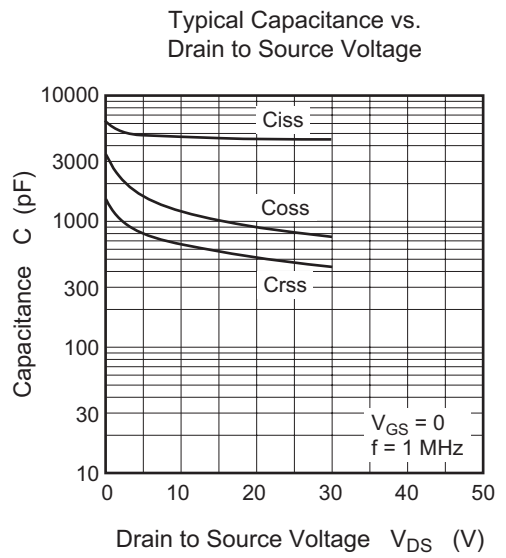
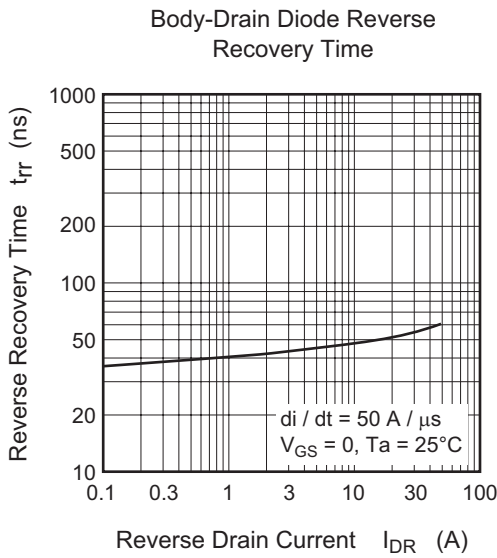
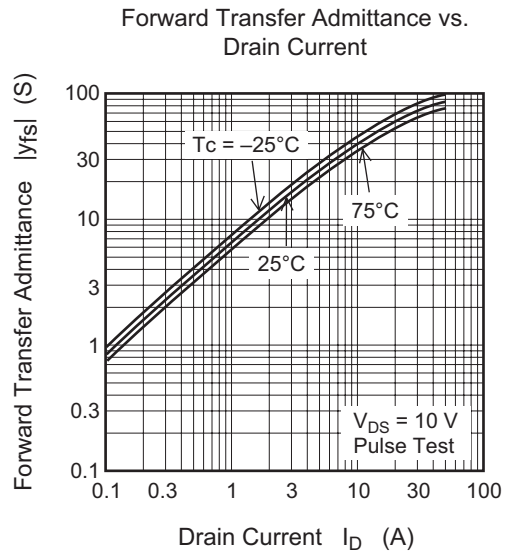
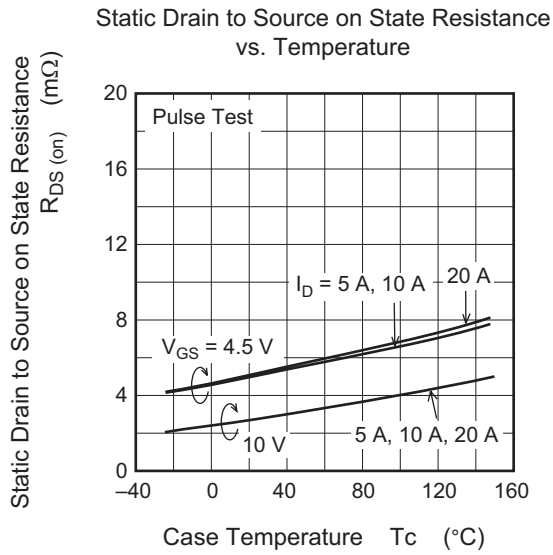
(Ta = 25°C)

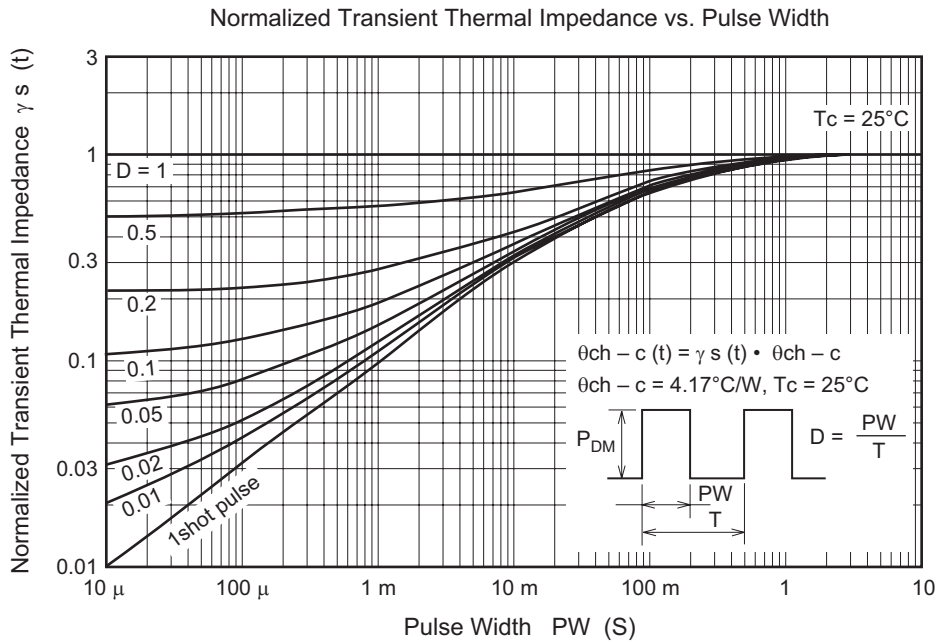
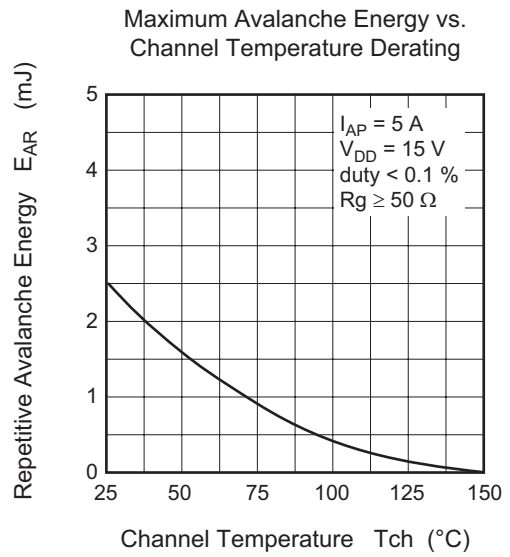
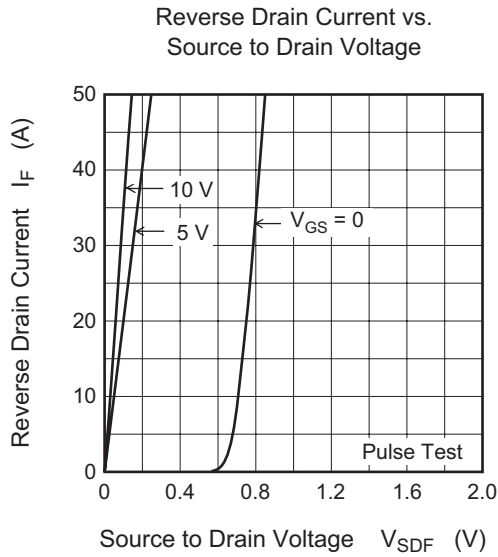
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR) DSS}	30	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source breakdown voltage	V _{(BR) GSS}	±20	—	—	V	I _G = ±100 μA, V _{DS} = 0
Gate to source leak current	I _{GSS}	—	—	±10	μA	V _{GS} = ±16 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	1	μA	V _{DS} = 30 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS (off)}	1.0	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA
Static drain to source on state resistance	R _{DS (on)}	—	2.9	3.7	mΩ	I _D = 25 A, V _{GS} = 10 V ^{Note 4}
	R _{DS (on)}	—	5.0	7.3	mΩ	I _D = 25 A, V _{GS} = 4.5 V ^{Note 4}
Forward transfer admittance	y _{fs}	39	65	—	S	I _D = 25 A, V _{DS} = 10 V ^{Note 4}
Input capacitance	C _{iss}	—	4750	—	pF	V _{DS} = 10 V
Output capacitance	C _{oss}	—	1180	—	pF	V _{GS} = 0
Reverse transfer capacitance	C _{rss}	—	650	—	pF	f = 1 MHz
Total gate charge	Q _g	—	75	—	nC	V _{DD} = 10 V
Gate to source charge	Q _{gs}	—	16	—	nC	V _{GS} = 10 V
Gate to drain charge	Q _{gd}	—	14	—	nC	I _D = 50 A
Turn-on delay time	t _{d (on)}	—	26	—	ns	V _{GS} = 10 V, I _D = 25 A
Rise time	t _r	—	60	—	ns	V _{DD} ≅ 10 V
Turn-off delay time	t _{d (off)}	—	85	—	ns	R _L = 0.4 Ω
Fall time	t _f	—	26	—	ns	R _g = 4.7 Ω
Body-drain diode forward voltage	V _{DF}	—	0.85	0.98	V	I _F = 50 A, V _{GS} = 0 ^{Note 4}
Body-drain diode reverse recovery time	t _{rr}	—	60	—	ns	I _F = 50 A, V _{GS} = 0 di _F /dt = 50 A/μs

Note: 4. Pulse test

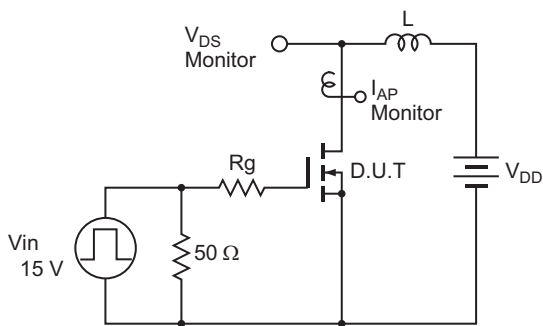
Main Characteristics





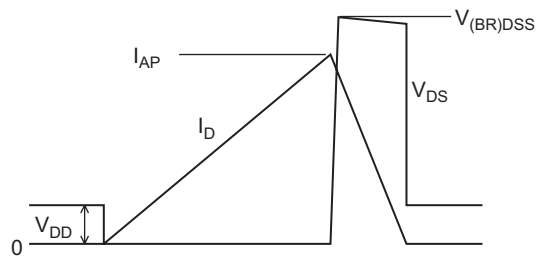


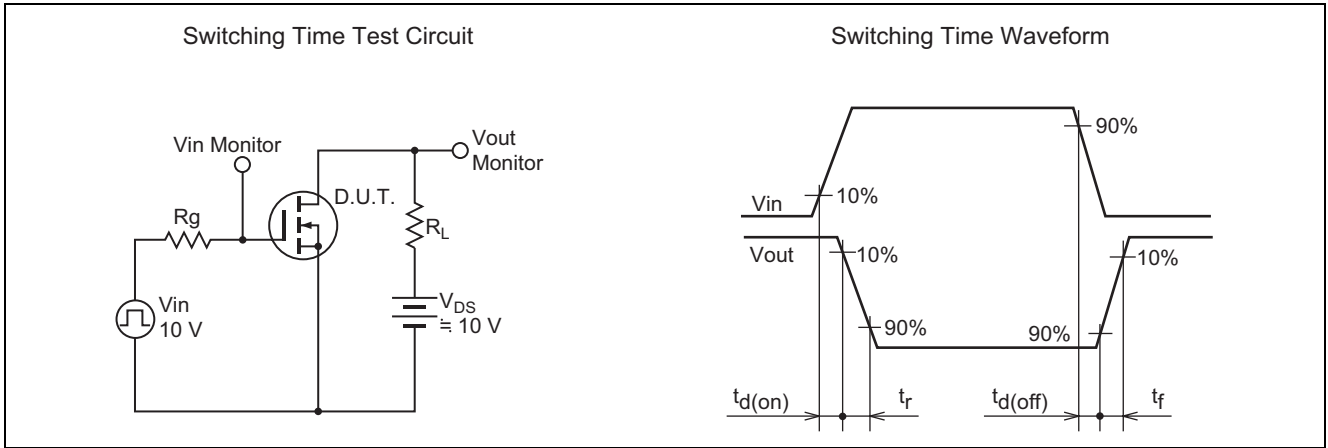
Avalanche Test Circuit



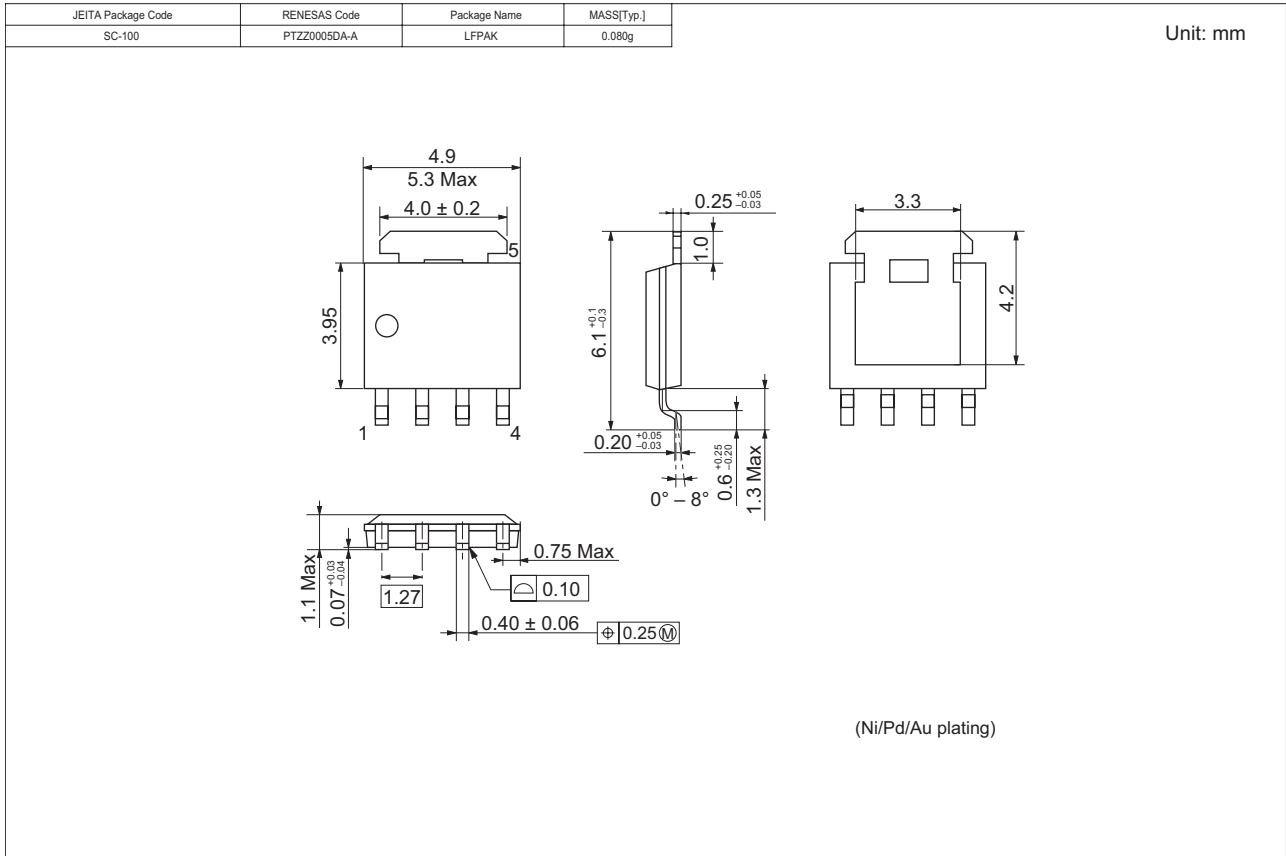
Avalanche Waveform

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





Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2099H-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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