

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# RQJ0304DQDQS

Silicon P Channel MOS FET  
Power Switching

REJ03G1778-0100

Rev.1.00

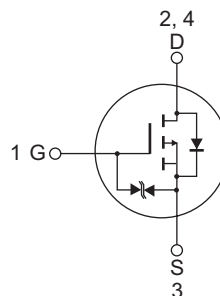
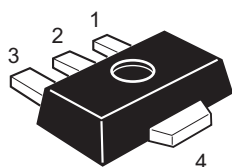
Mar 16, 2009

## Features

- Low gate drive  
 $V_{DSS}$  : -30 V and 2.5 V gate drive
- Low drive current
- High speed switching
- Small traditional Power package (UPAK)

## Outline

RENESAS package code: PLZZ0004CA-A  
(Package name: UPAK®)



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

Notes: Marking is "DQ".

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-30	V
Gate to source voltage	$V_{GSS}$	+8 / -12	V
Drain current	$I_D$	-2.6	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	-10	A
Body - drain diode reverse drain current	$I_{DR}$	2.6	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1.5	W
Thermal resistance	$R_{th(ch-a)}$ <sup>Note2</sup>	83	$^\circ\text{C} / \text{W}$
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Notes: 1.  $PW \leq 10 \mu\text{s}$ , Duty cycle  $\leq 1\%$

2. When using the glass epoxy board (FR-4 40 × 40 × 1 mm)

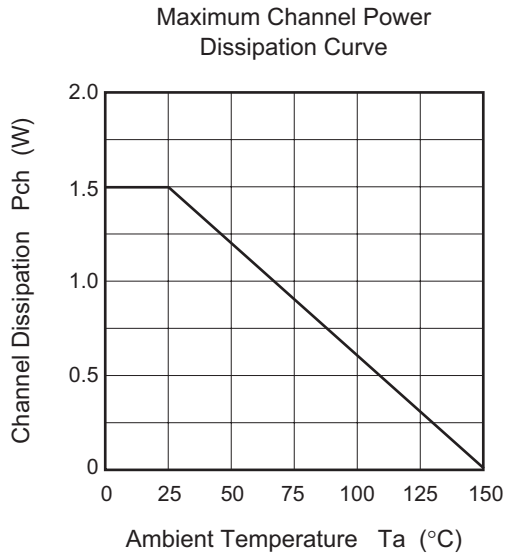
## Electrical Characteristics

(Ta = 25°C)

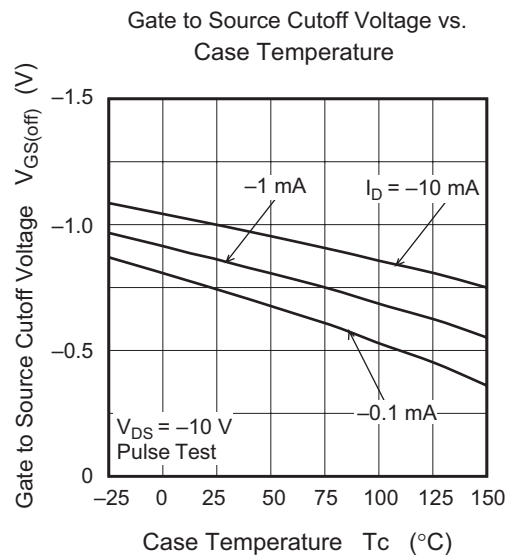
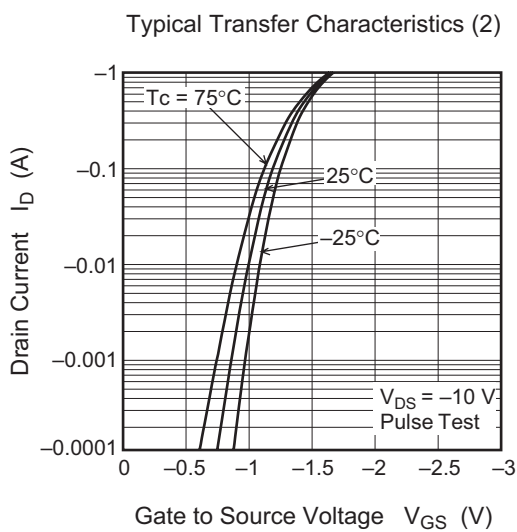
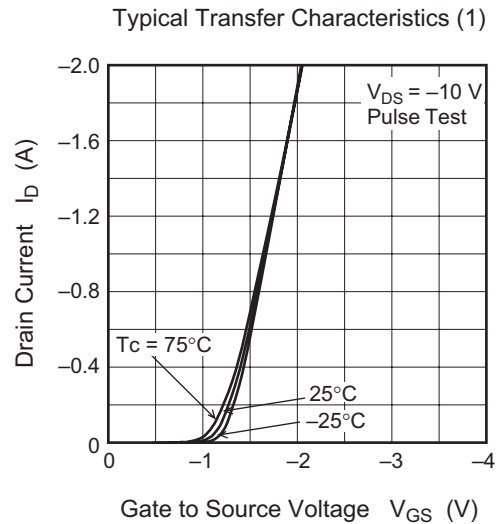
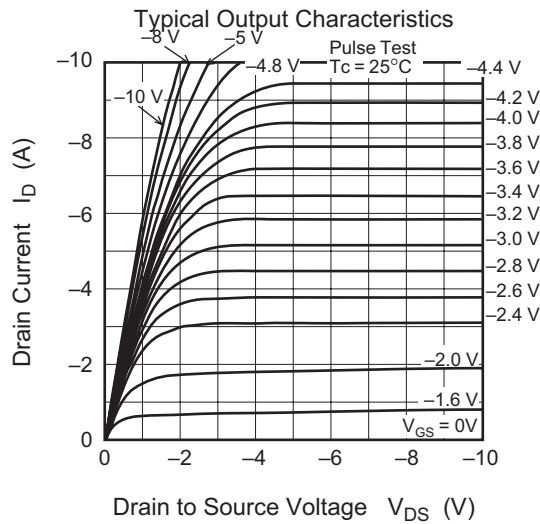
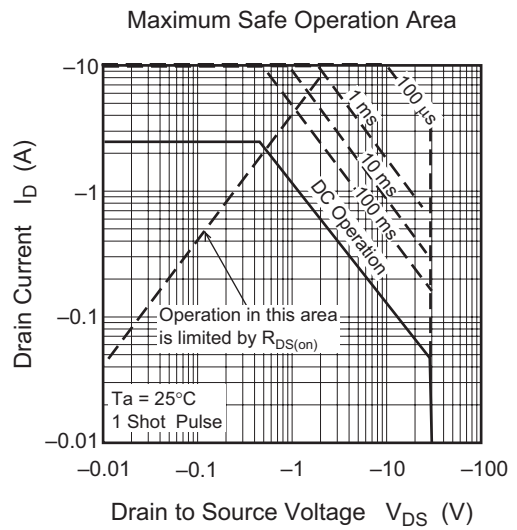
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	+8	—	—	V	$I_G = +100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	-12	—	—	V	$I_G = -100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	+10	$\mu\text{A}$	$V_{GS} = +6 \text{ V}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	-10	$\mu\text{A}$	$V_{GS} = -10 \text{ V}$ , $V_{DS} = 0$
Drain to source leak current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -30 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-0.4	—	-1.4	V	$V_{DS} = -10 \text{ V}$ , $I_D = -1 \text{ mA}$
Drain to source on state resistance	$R_{DS(on)}$	—	195	245	$\text{m}\Omega$	$I_D = -1.3 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>
Drain to source on state resistance	$R_{DS(on)}$	—	300	420	$\text{m}\Omega$	$I_D = -1.3 \text{ A}$ , $V_{GS} = -2.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	1.8	2.5	—	S	$I_D = -1.3 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	185	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	45	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	25	—	pF	
Turn - on delay time	$t_{d(on)}$	—	18	—	ns	$I_D = -1.0 \text{ A}$ $V_{GS} = -4.5 \text{ V}$ $R_L = 10 \text{ }\Omega$ $R_g = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	33	—	ns	
Turn - off delay time	$t_{d(off)}$	—	22	—	ns	
Fall time	$t_f$	—	5	—	ns	
Total gate charge	$Q_g$	—	1.9	—	nC	$V_{DD} = -10 \text{ V}$
Gate to Source charge	$Q_{gs}$	—	0.4	—	nC	$V_{GS} = -4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	0.7	—	nC	$I_D = -2.0 \text{ A}$
Body - drain diode forward voltage	$V_{DF}$	—	-0.9	-1.3	V	$I_F = -2.6 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>

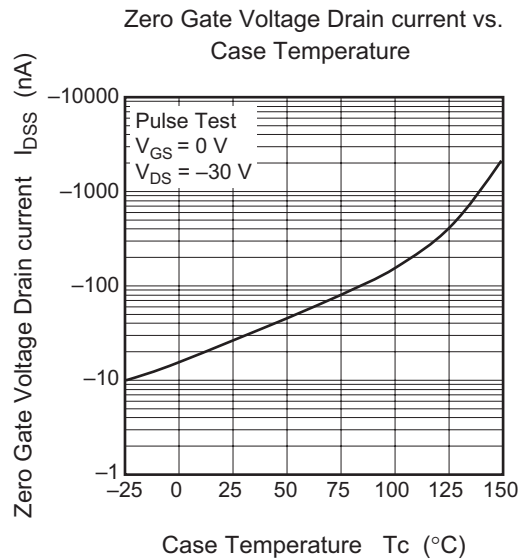
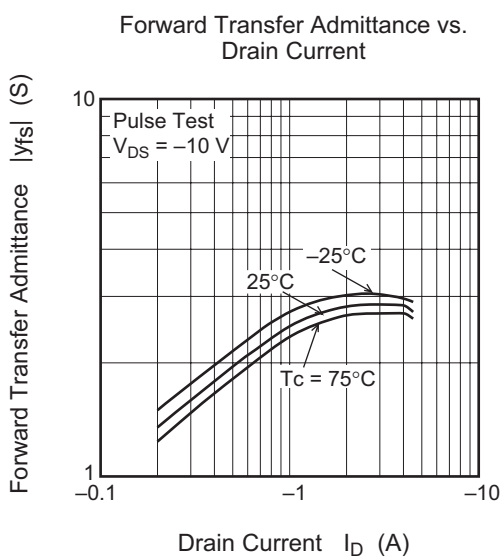
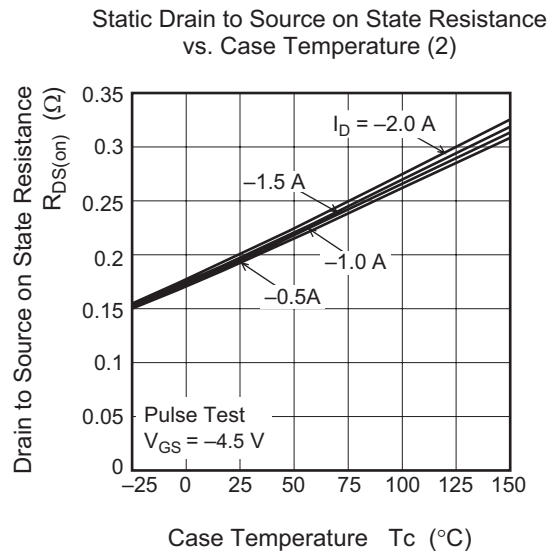
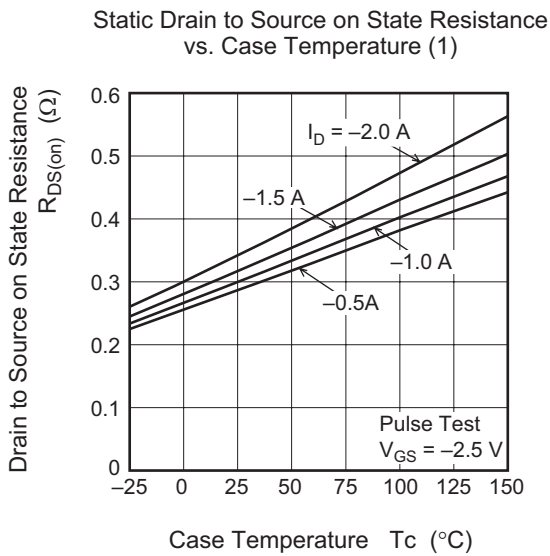
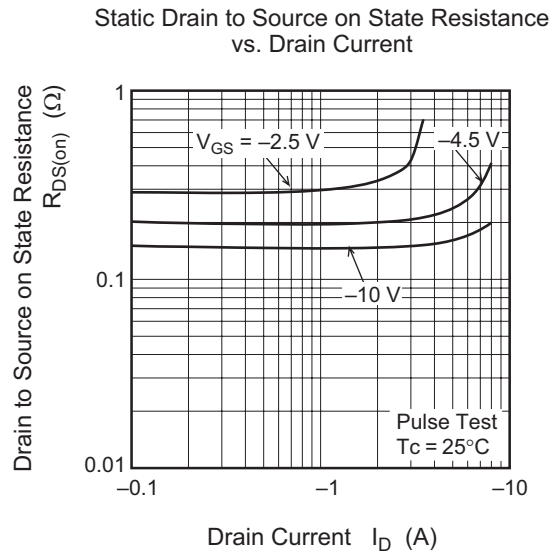
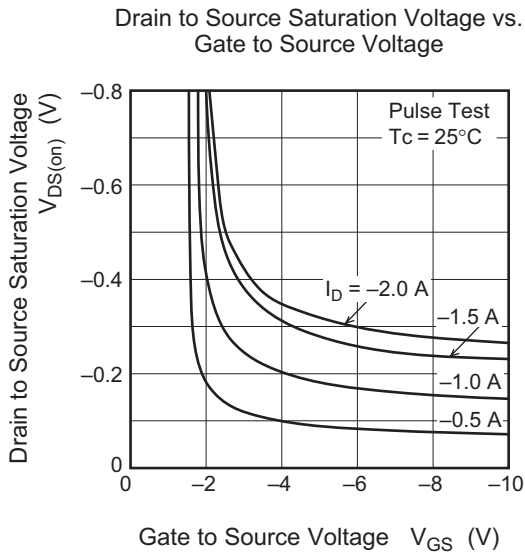
Notes: 3. Pulse test

### Main Characteristics

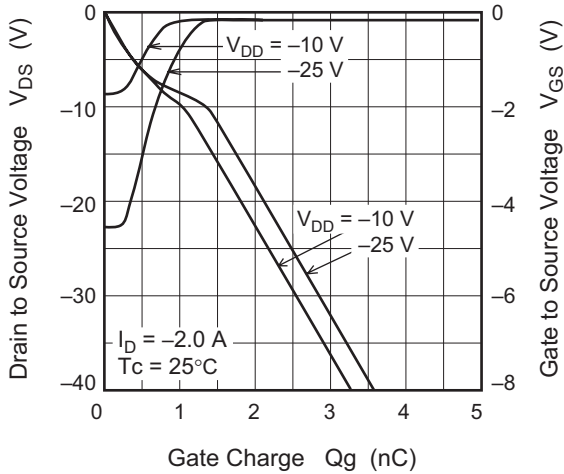


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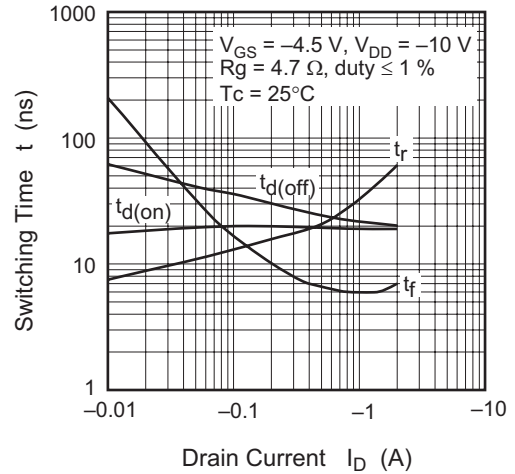




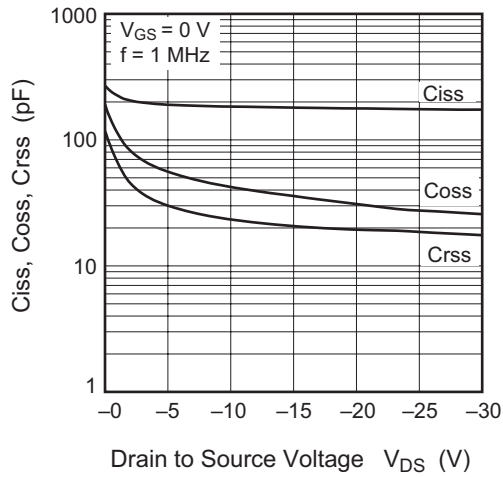
Dynamic Input Characteristics



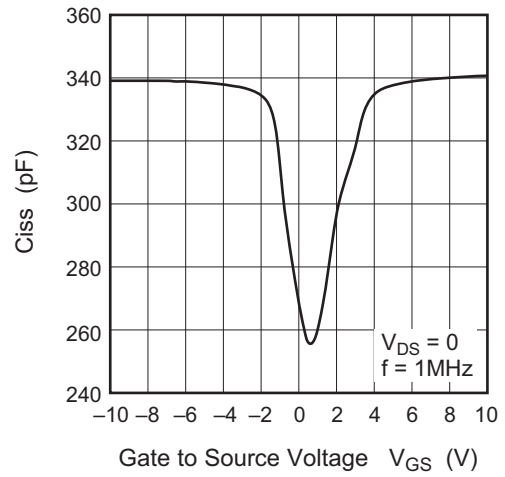
Switching Characteristics



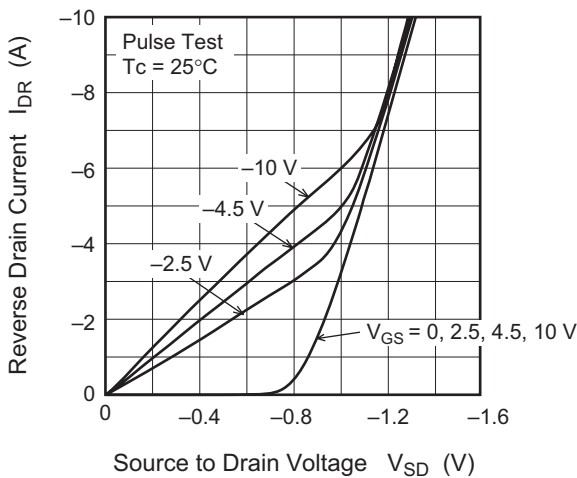
Typical Capacitance vs. Drain to Source Voltage



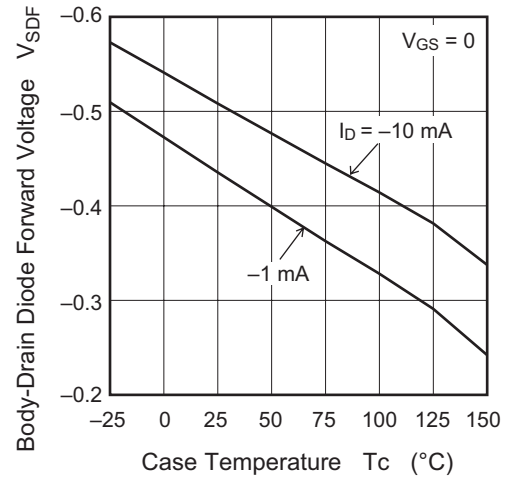
Input Capacitance vs. Gate to Source Voltage

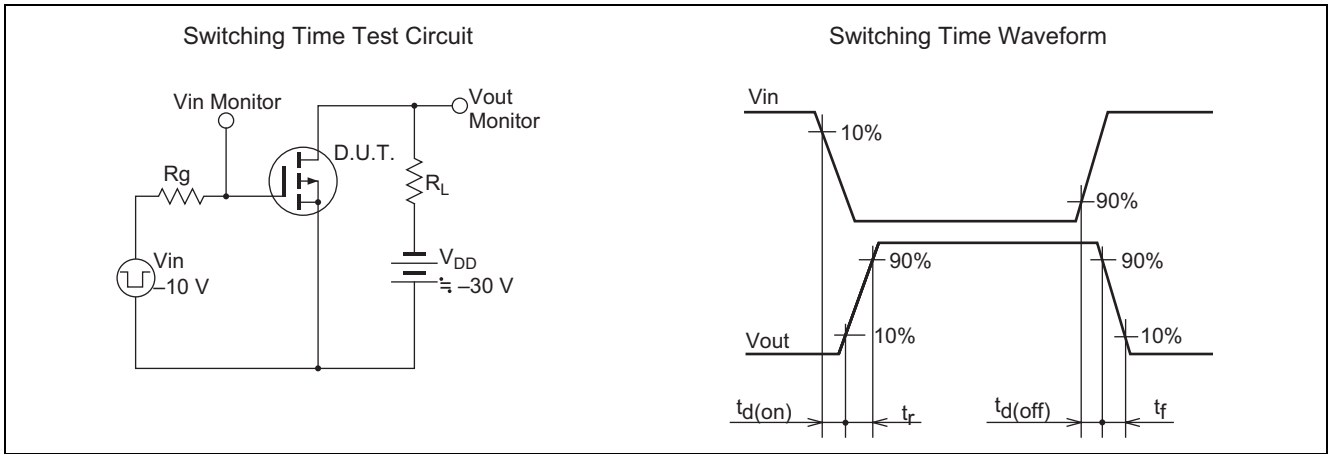


Reverse Drain Current vs. Source to Drain Voltage



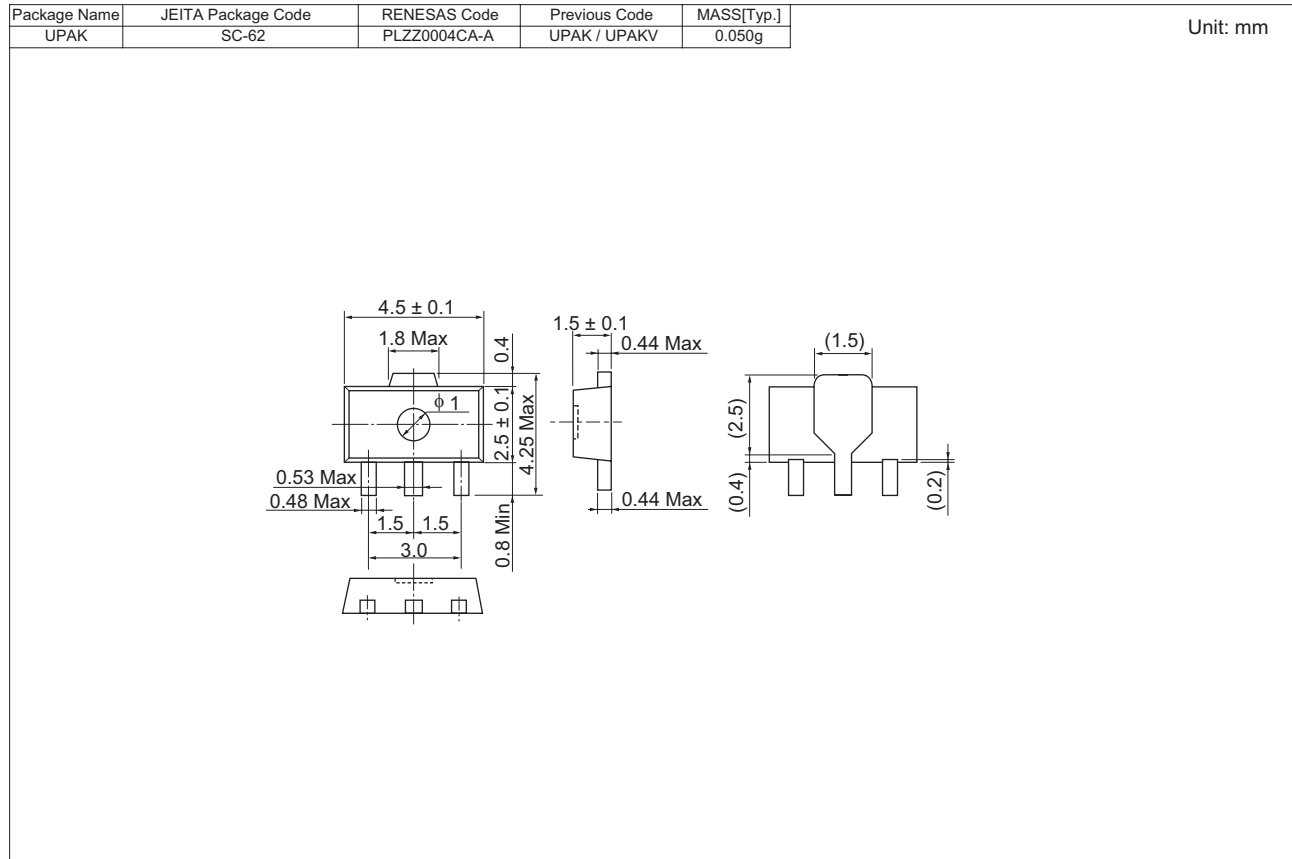
Body-Drain Diode Forward Voltage vs. Case Temperature







### Package Dimensions



### Ordering Information

Part No.	Quantity	Shipping Container
RQJ0304DQDQSTL-E	1000 pcs.	$\phi 178$ mm reel, 12 mm Emboss taping

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