

# RQM2201DNS

## Silicon N Channel MOS FET Power Switching

REJ03G1492-0200

Rev.2.00

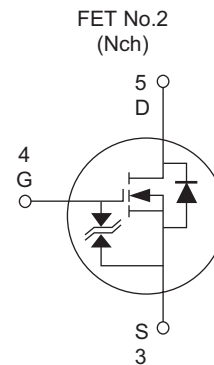
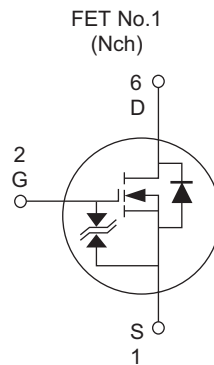
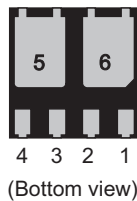
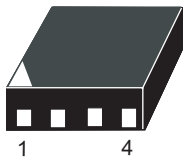
Apr 16, 2007

### Features

- Small, thin and leadless type package (3 × 3 mm, t = 0.8 mm max.)
- Two FET chips are mounted in one package
- High density mounting
- High speed switching. (Ciss = 200 pF typ)
- $V_{DSS} \geq 60$  V and capable of 2.5 V gate drive

### Outline

RENESAS Package code: PWSN0006ZA-A  
(Package name: WSON0303-6 <HWSON-6>)



1, 3: Source  
2, 4: Gate  
5, 6: Drain

- Notes:
1. Marking is "M2201".
  2. The following maximum ratings and electric characteristics are applied to both FET1 and FET2.

### Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	$\pm 12$	V
Drain current	$I_D$	2	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	8	A
Body - drain diode reverse drain current	$I_{DR}$	2	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1	W
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	1.5	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. 1 Drive operation: When using the glass epoxy board (FR-4 40 × 40 × 1 mm)

3. 2 Drive operation: When using the glass epoxy board (FR-4 40 × 40 × 1 mm)

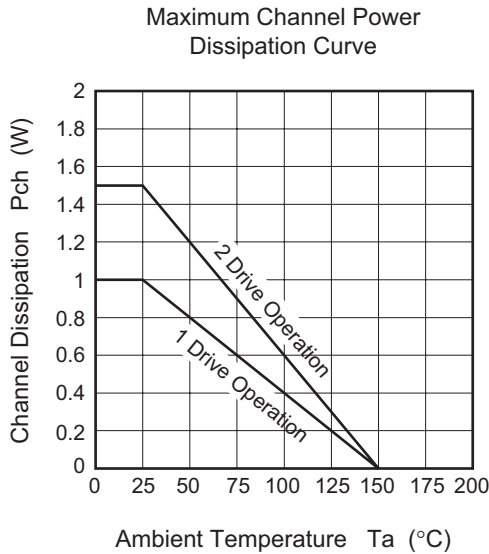
## Electrical Characteristics

(Ta = 25°C)

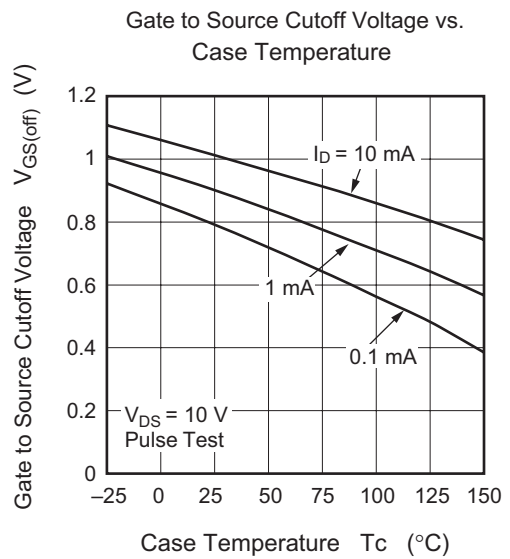
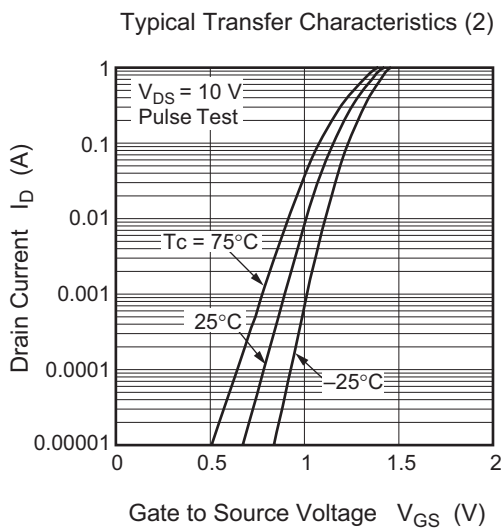
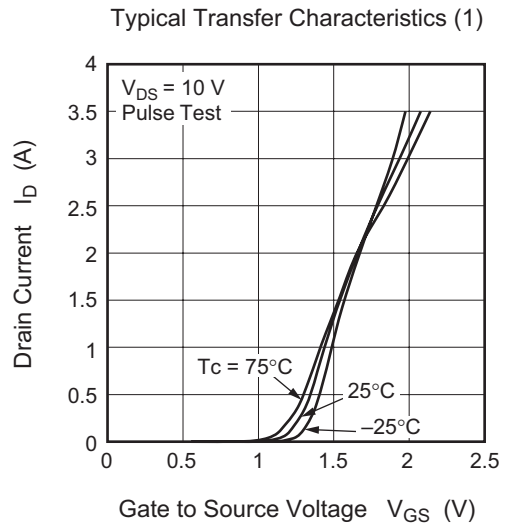
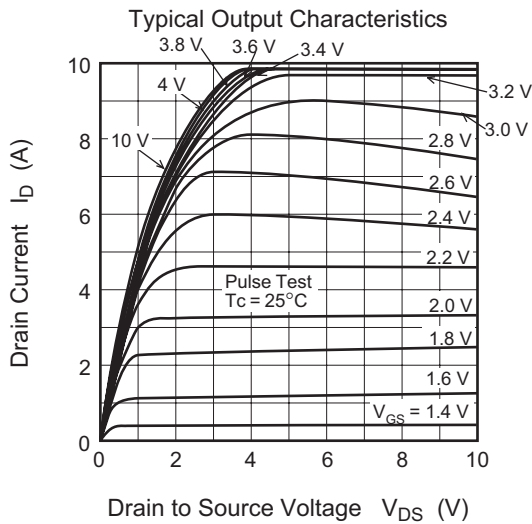
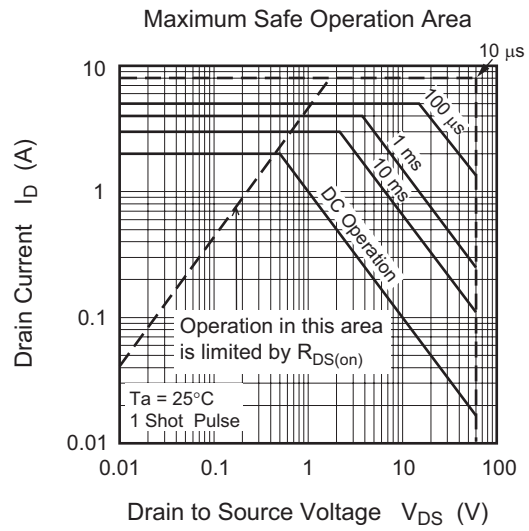
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	+12	—	—	V	$I_G = +100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	-12	—	—	V	$I_G = -100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	+10	$\mu\text{A}$	$V_{GS} = +10 \text{ V}$ , $V_{DS} = 0$
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	$\mu\text{A}$	$V_{DS} = 60 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	173	225	$\text{m}\Omega$	$I_D = 1 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note4</sup>
Drain to source on state resistance	$R_{DS(on)}$	—	207	290	$\text{m}\Omega$	$I_D = 1 \text{ A}$ , $V_{GS} = 2.5 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	2.3	3.5	—	S	$I_D = 1 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	200	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	25	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	13	—	pF	$f = 1 \text{ MHz}$
Turn - on delay time	$t_{d(on)}$	—	7	—	ns	$I_D = 1 \text{ A}$
Rise time	$t_r$	—	28	—	ns	$V_{GS} = 10 \text{ V}$
Turn - off delay time	$t_{d(off)}$	—	30	—	ns	$R_L = 10 \text{ }\Omega$
Fall time	$t_f$	—	4	—	ns	$R_g = 4.7 \text{ }\Omega$
Total gate charge	$Q_g$	—	2.4	—	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	$Q_{gd}$	—	0.4	—	nC	$I_D = 2 \text{ A}$
Body - drain diode forward voltage	$V_{DF}$	—	0.8	—	V	$I_F = 2 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>

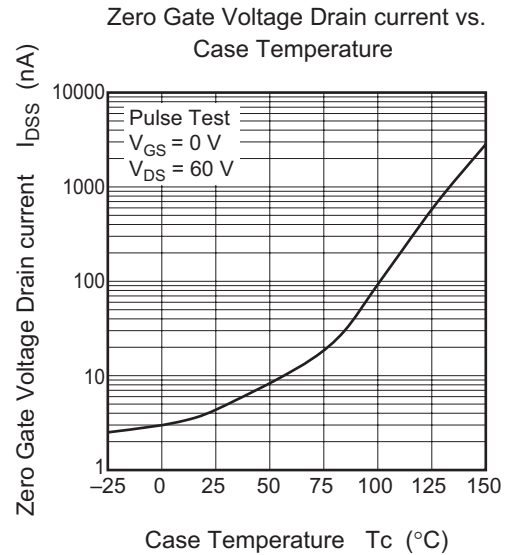
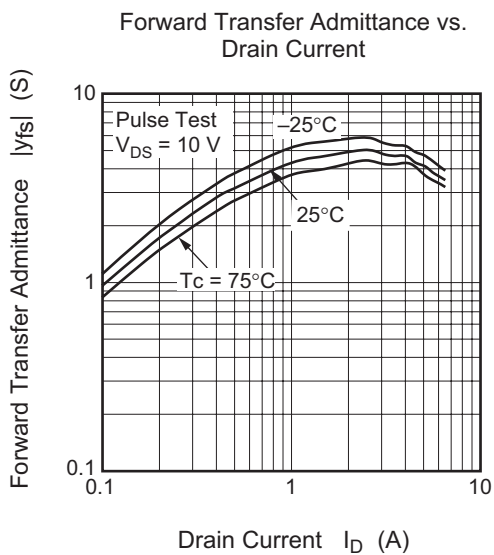
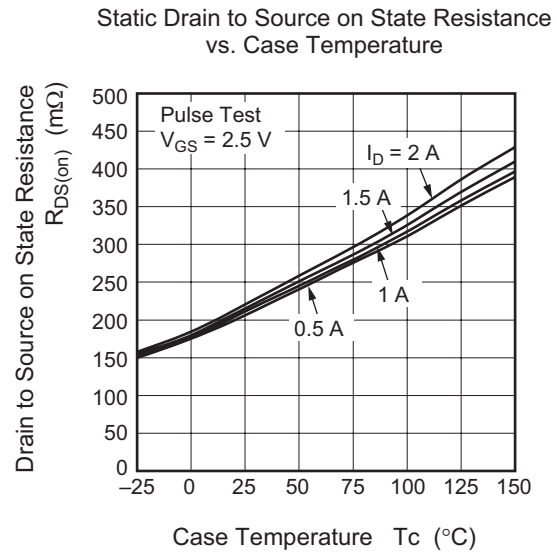
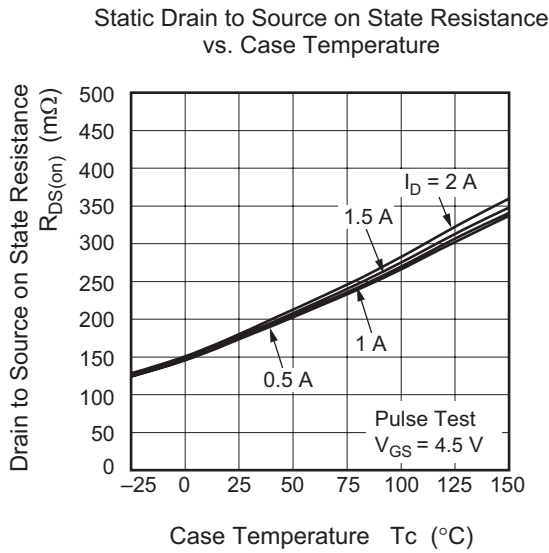
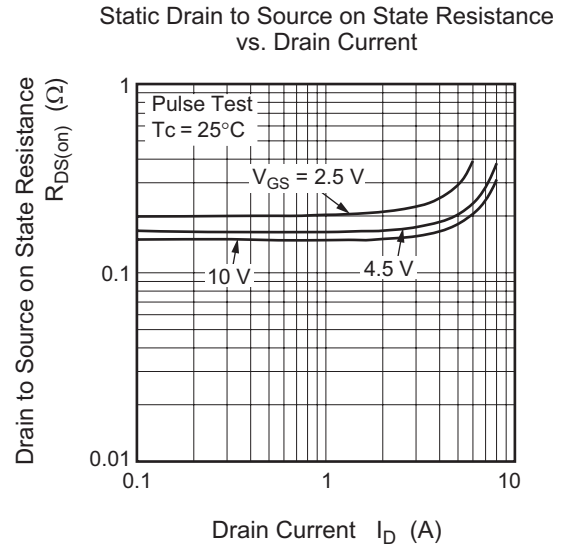
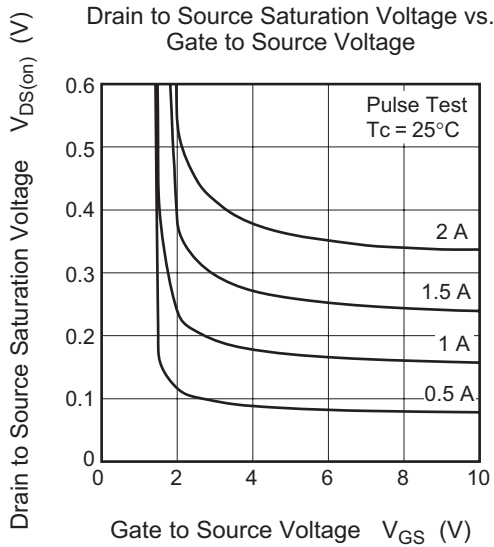
Notes: 4. Pulse test

Main Characteristics

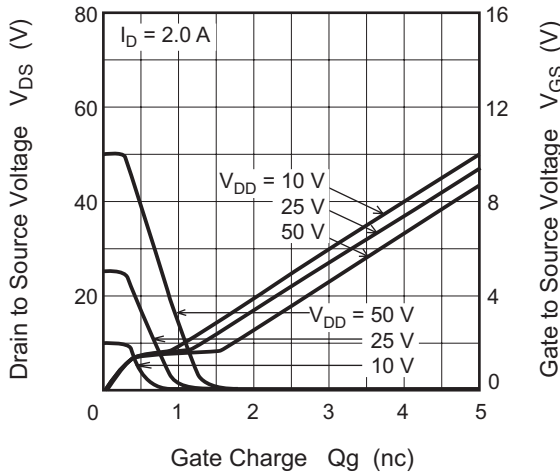


\*When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

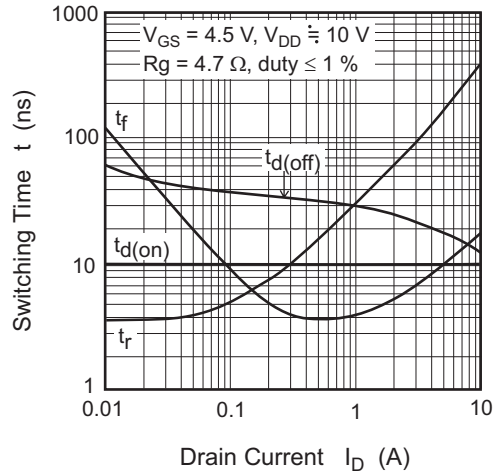




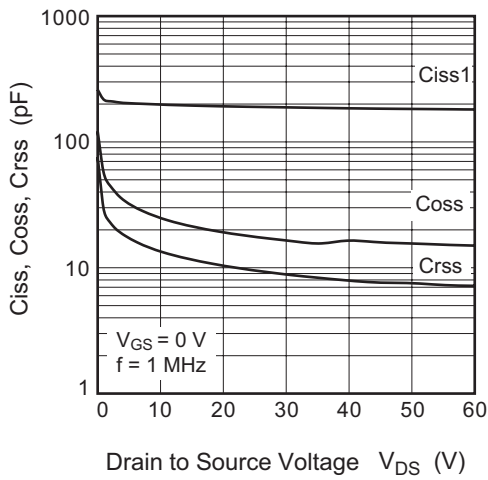
Dynamic Input Characteristics



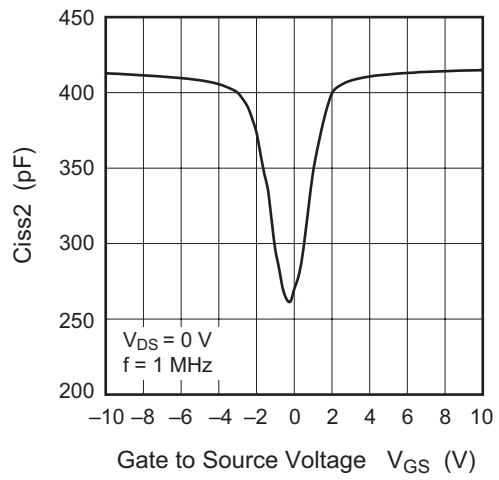
Switching Characteristics



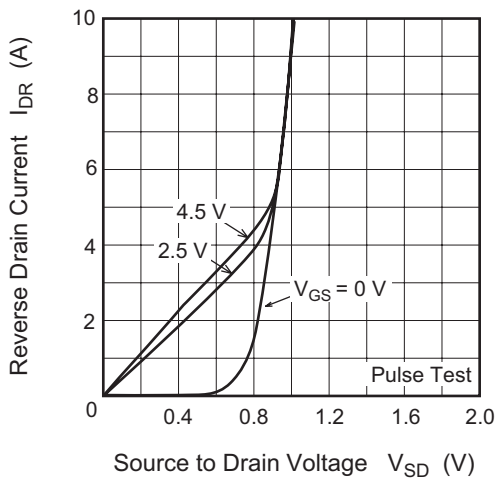
Typical Capacitance vs. Drain to Source Voltage



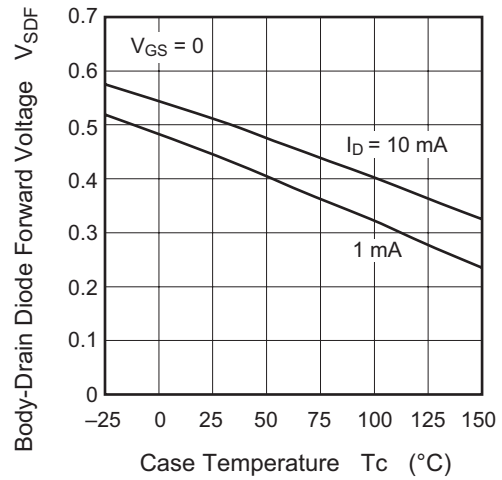
Input Capacitance vs. Gate to Source Voltage

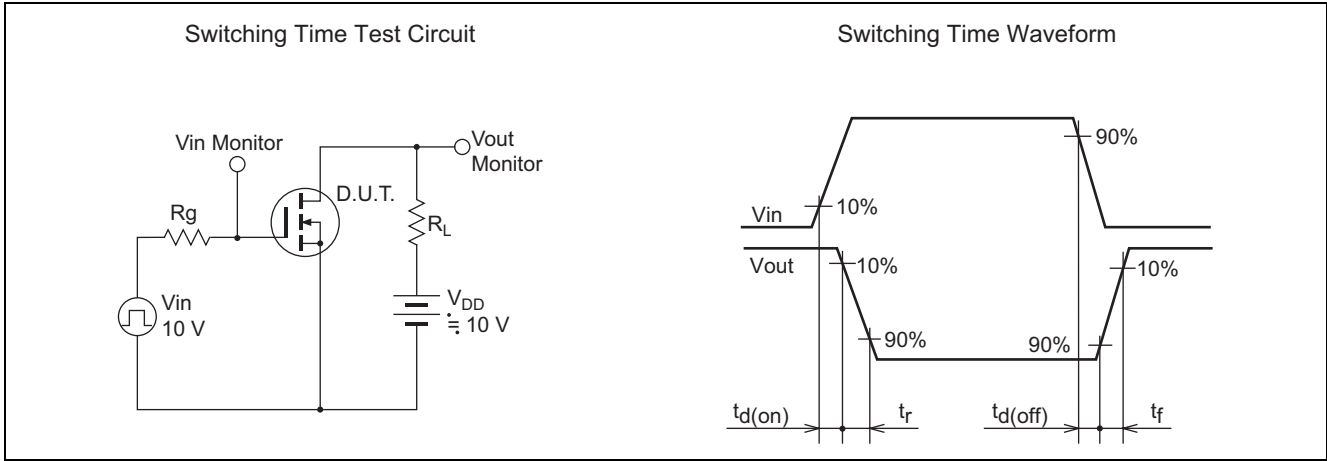


Reverse Drain Current vs. Source to Drain Voltage

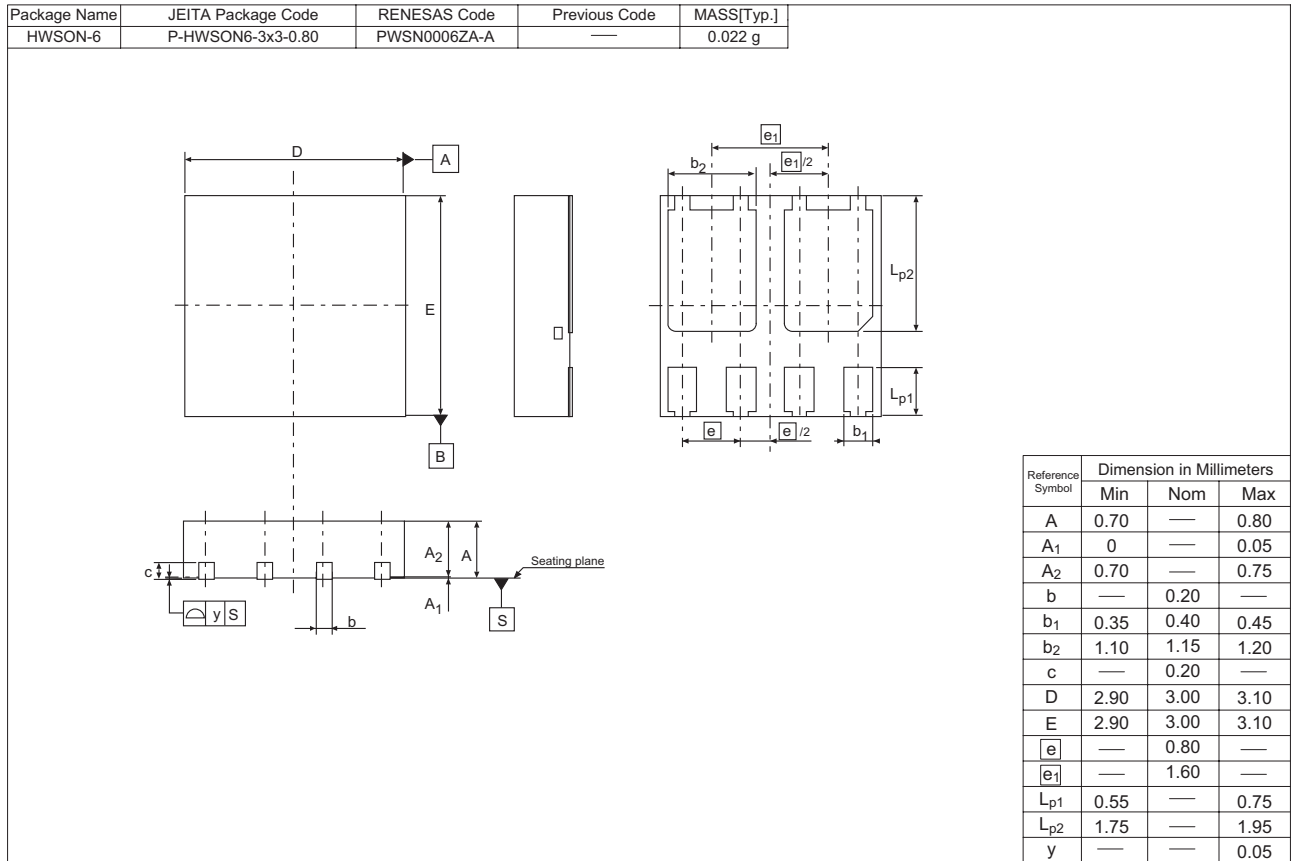


Body-Drain Diode Forward Voltage vs. Case Temperature





### Package Dimensions



### Ordering Information

Part No.	Quantity	Shipping Container
RQM2201DNSTL-E	2000 pcs.	φ178 mm reel, 8 mm Emboss taping
RQM2201DNSTR-E	2000 pcs.	φ178 mm reel, 8 mm Emboss taping

Notes:

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