

# RQJ0201UGDQA

Silicon P Channel MOS FET  
Power Switching

REJ03G1317-0300

Rev.3.00

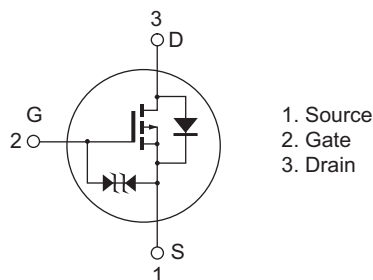
May 24, 2006

## Features

- Low on-resistance  
 $R_{DS(on)} = 53 \text{ m}\Omega$  typ ( $V_{GS} = -4.5 \text{ V}$ ,  $I_D = -1.8 \text{ A}$ )
- Low drive current
- High speed switching
- 2.5 V gate drive

## Outline

RENESAS Package code: PLSP0003ZB-A  
(Package name: MPAK)



Note: Marking is "UG".

## Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-20	V
Gate to source voltage	$V_{GSS}$	+8 / -12	V
Drain current	$I_D$	-3.4	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	-10	A
Body - drain diode reverse drain current	$I_{DR}$	-3.4	A
Channel dissipation	$P_{ch(pulse)}$ <sup>Note2</sup>	0.8	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 x 40 x 1 mm)

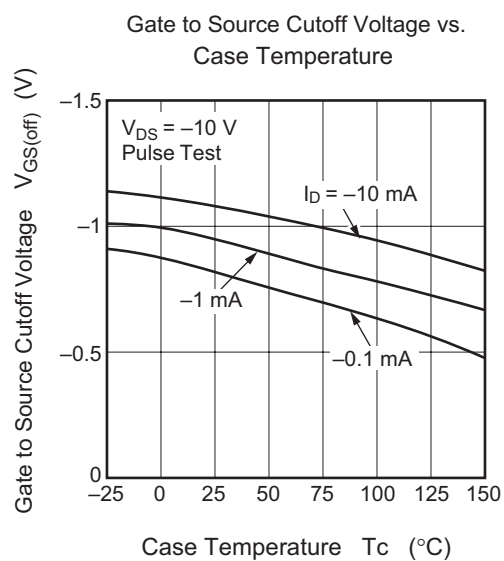
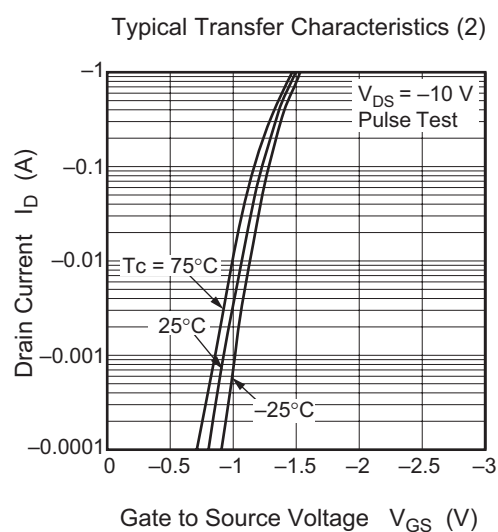
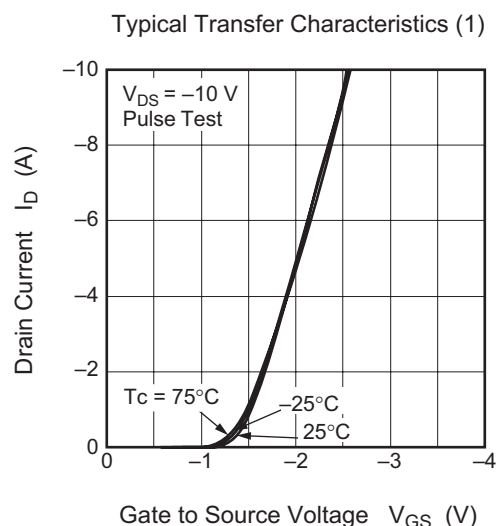
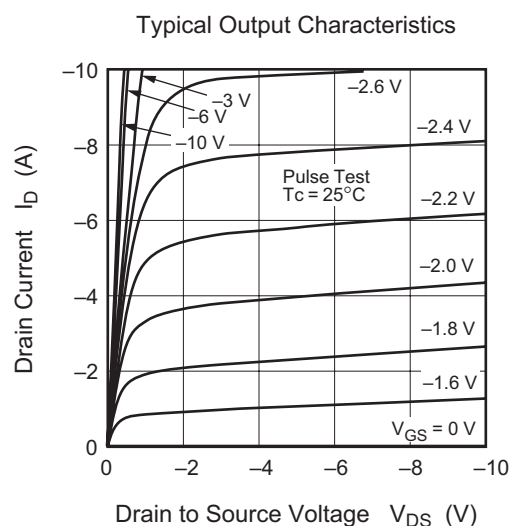
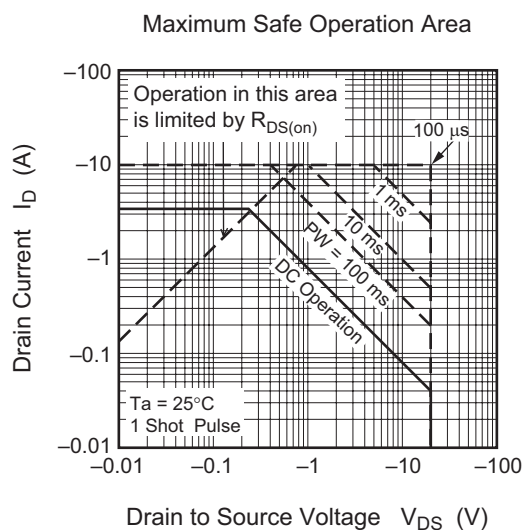
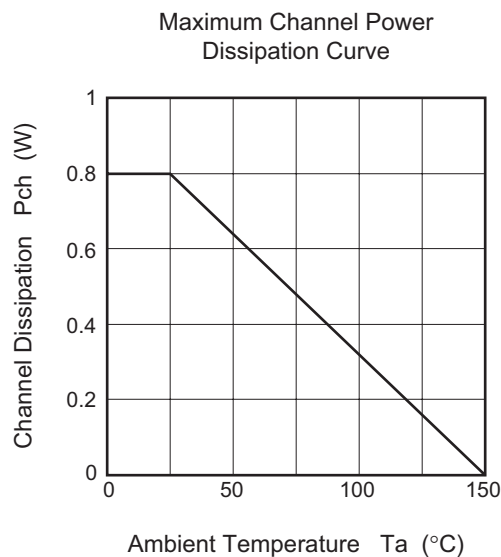
## Electrical Characteristics

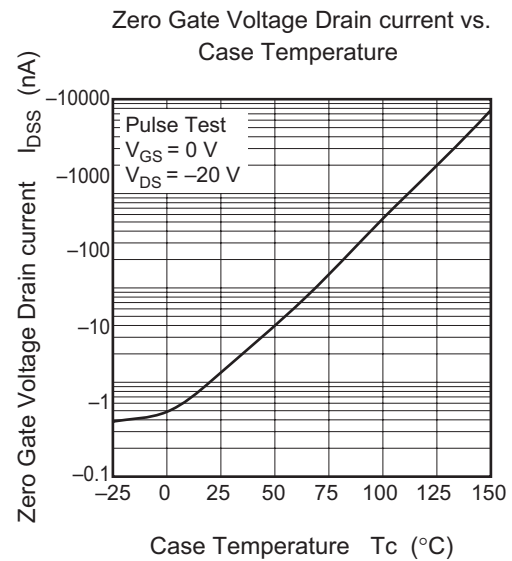
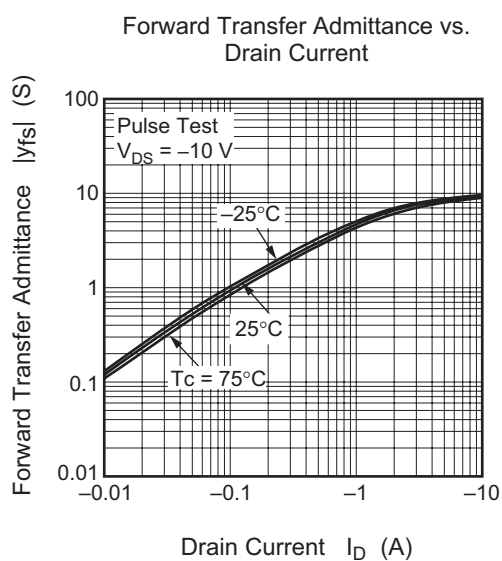
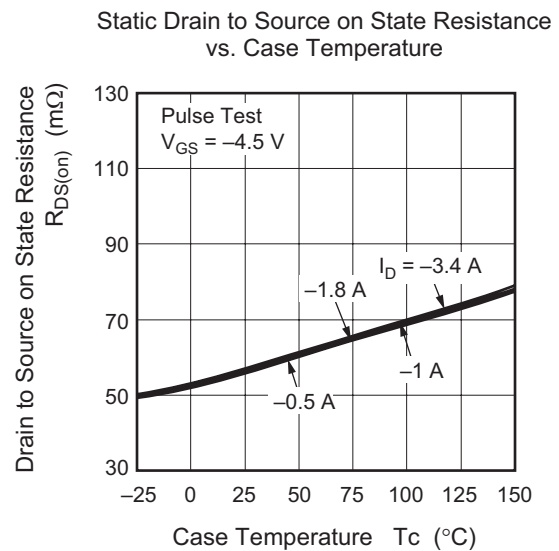
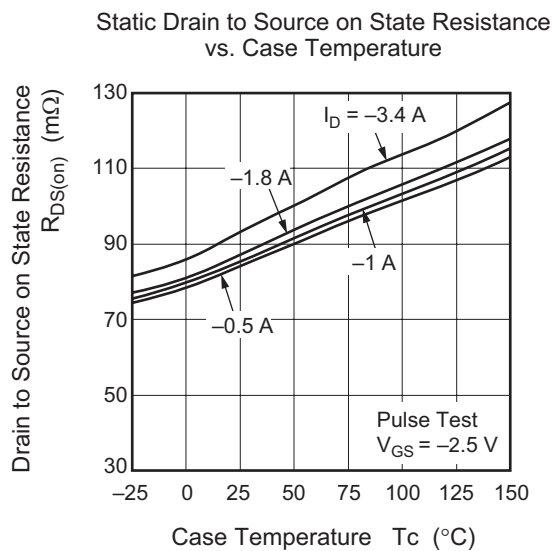
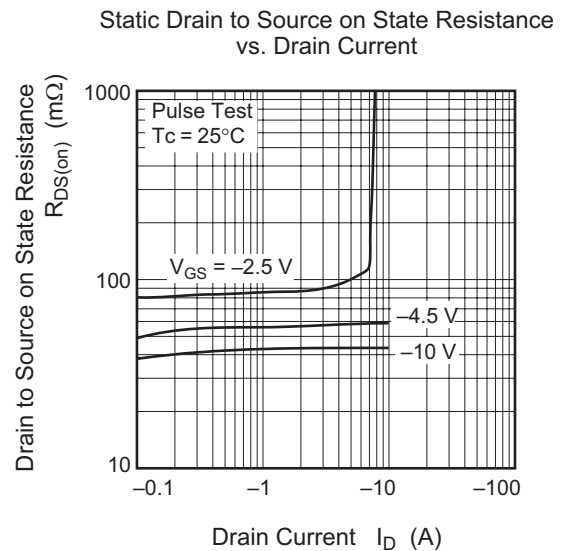
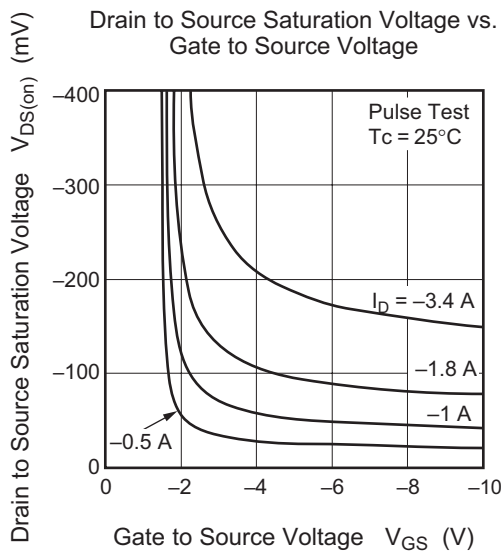
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-20	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	+8	—	—	V	$I_G = +100 \text{ } \mu\text{A}$ , $V_{DS} = 0$
	$V_{(BR)GSS}$	-12	—	—	V	$I_G = -100 \text{ } \mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	+10	$\mu\text{A}$	$V_{GS} = +6 \text{ V}$ , $V_{DS} = 0$
	$I_{GSS}$	—	—	-10	$\mu\text{A}$	$V_{GS} = -10 \text{ V}$ , $V_{DS} = 0$
Drain to source leak current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -20 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	53	69	$\text{m}\Omega$	$I_D = -1.8 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>
	$R_{DS(on)}$	—	80	112	$\text{m}\Omega$	$I_D = -1.8 \text{ A}$ , $V_{GS} = -2.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	4.5	6.5	—	S	$I_D = -1.8 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	597	—	pF	$V_{DS} = -10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	149	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	93	—	pF	
Turn - on delay time	$t_{d(on)}$	—	18	—	ns	$I_D = -1.8 \text{ A}$ $V_{GS} = -4.5 \text{ V}$ $R_L = 5.5 \text{ } \Omega$ $R_g = 4.7 \text{ } \Omega$
Rise time	$t_r$	—	43	—	ns	
Turn - off delay time	$t_{d(off)}$	—	37	—	ns	
Fall time	$t_f$	—	12	—	ns	
Total gate charge	$Q_g$	—	6.3	—	nC	$V_{DD} = -10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	1.1	—	nC	$V_{GS} = -4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	2.5	—	nC	$I_D = -3.4 \text{ A}$
Body - drain diode forward voltage	$V_{DF}$	—	-0.85	-1.1	V	$I_F = -3.4 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>

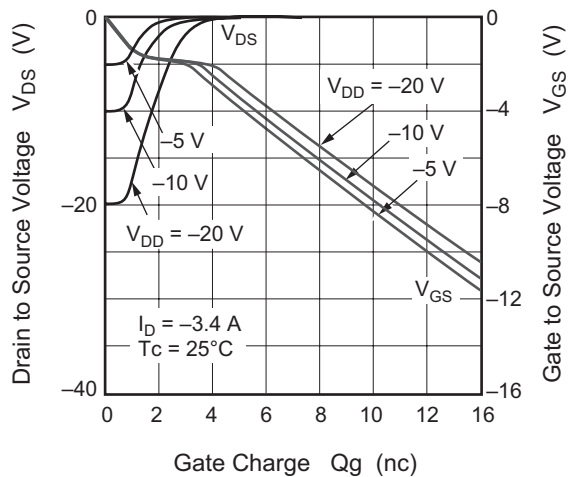
Notes: 3. Pulse test

## Main Characteristics

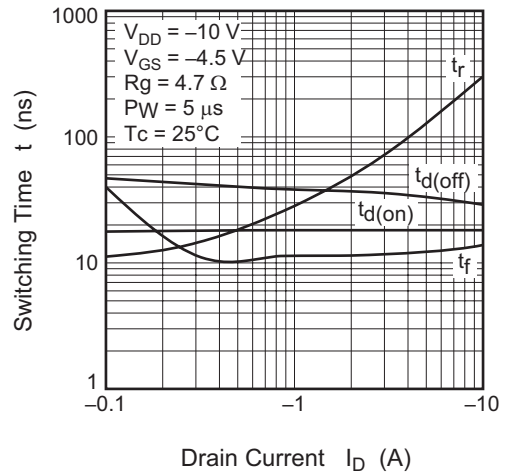
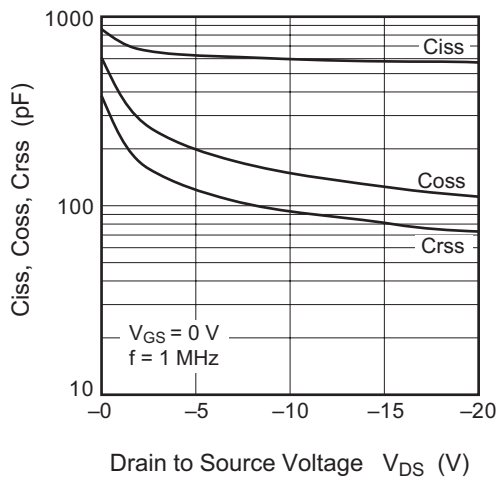
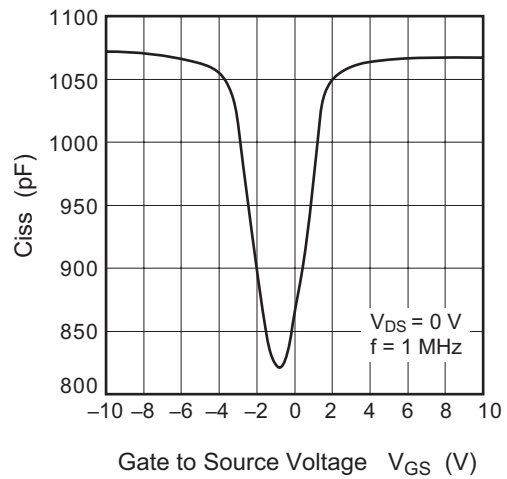
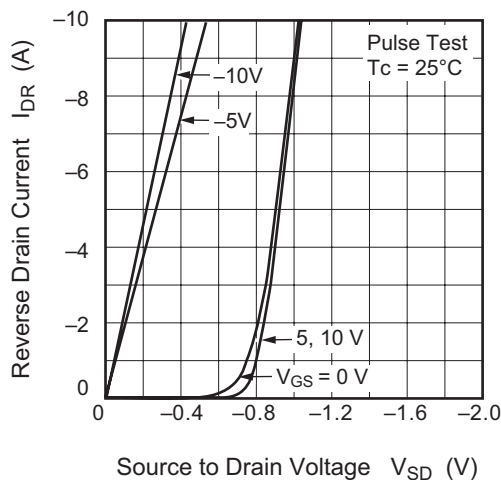
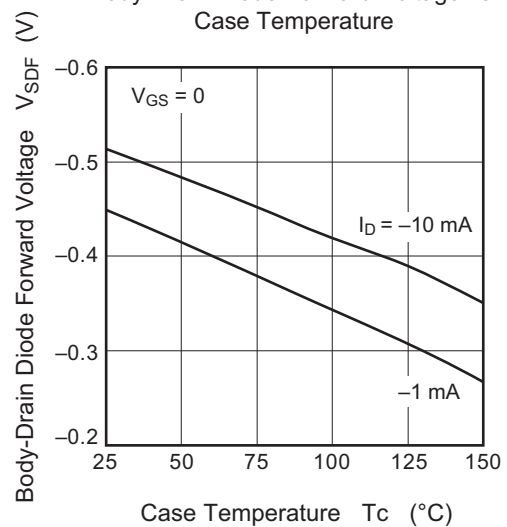




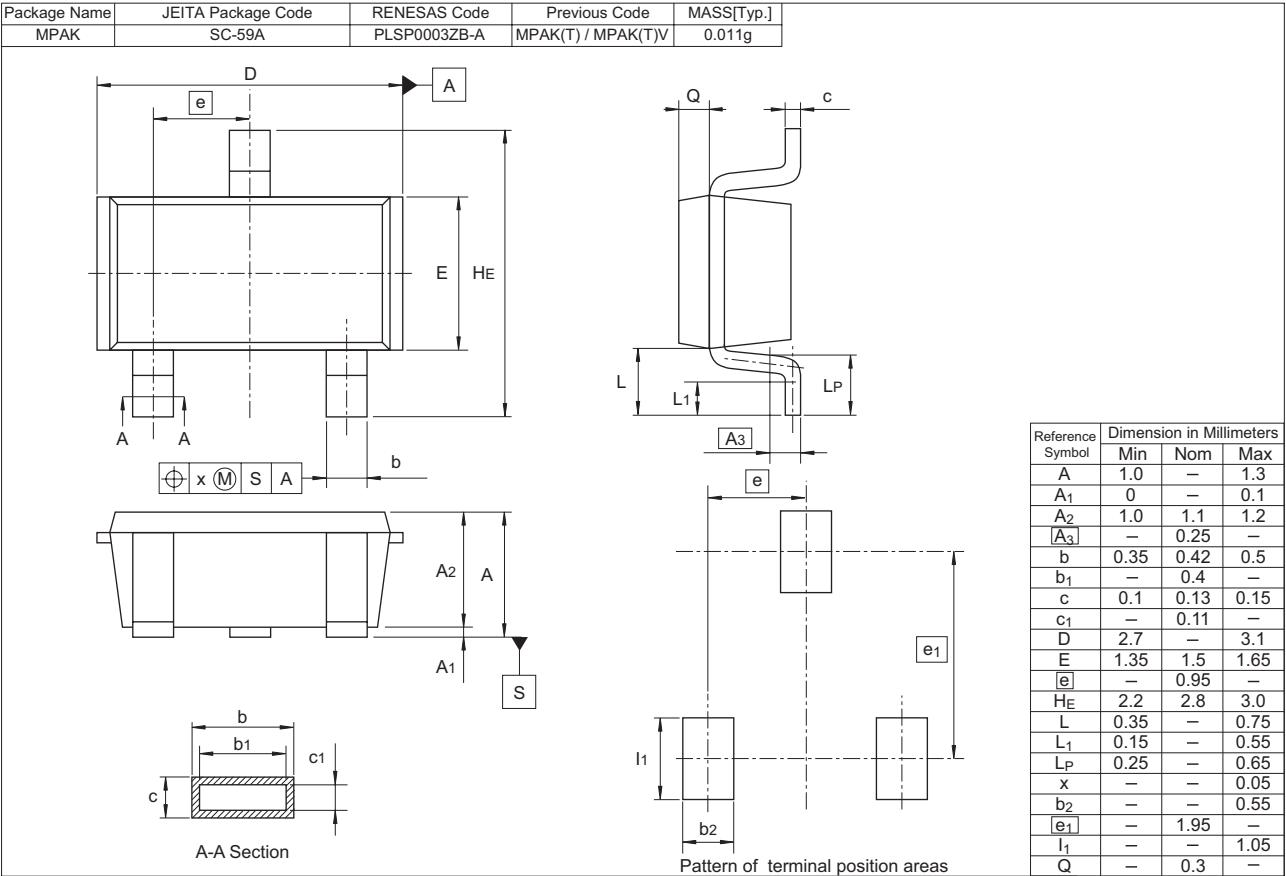
Dynamic Input Characteristics



Switching Characteristics

Typical Capacitance vs.  
Drain to Source VoltageInput Capacitance vs.  
Gate to Source VoltageReverse Drain Current vs.  
Source to Drain VoltageBody-Drain Diode Forward Voltage vs.  
Case Temperature

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
RQJ0201UGDQATL-E	3000 pcs.	φ178 mm reel, 8 mm Emboss taping

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