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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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RQK0603CGDQS

Silicon N Channel MOS FET Power Switching

REJ03G0577-0400

Rev.4.00

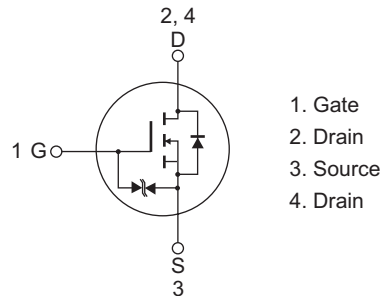
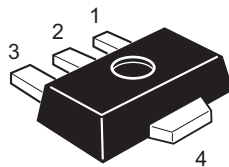
Jun 22, 2006

Features

- Low on-resistance
 $R_{DS(on)} = 205 \text{ m}\Omega$ typ ($V_{GS} = 10 \text{ V}$, $I_D = 1.4 \text{ A}$)
- Low drive current
- High speed switching
- 4.5 V gate drive

Outline

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



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

Note: Marking is "CG".

*UPAK is a trademark of Renesas Technology Corp.

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}	± 20	V
Drain current	I_D	2.8	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	4.1	A
Body - drain diode reverse drain current	I_{DR}	2.8	A
Channel dissipation	P_{ch} ^{Note2}	1.5	W
Channel dissipation	$P_{ch(pulse)}$ ^{Note1}	5	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 1 \text{ s}$, duty cycle $\leq 1\%$

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

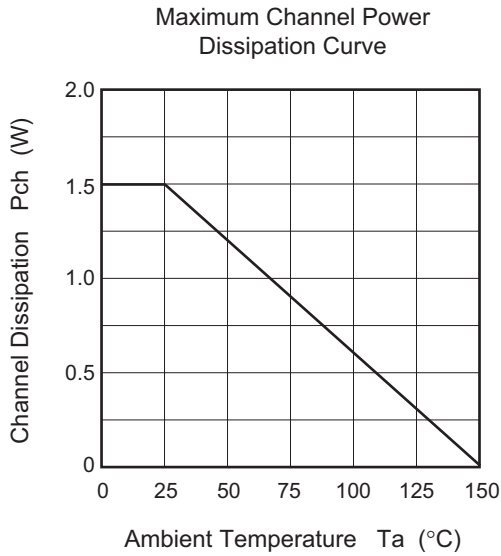
Electrical Characteristics

(Ta = 25°C)

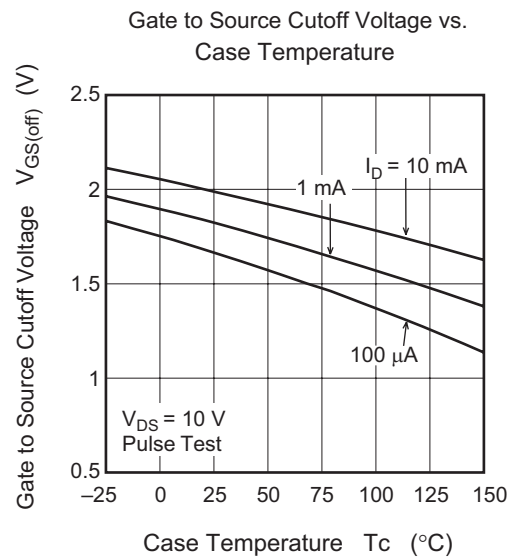
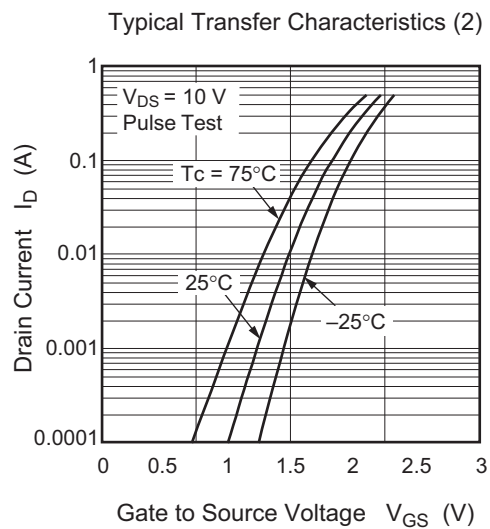
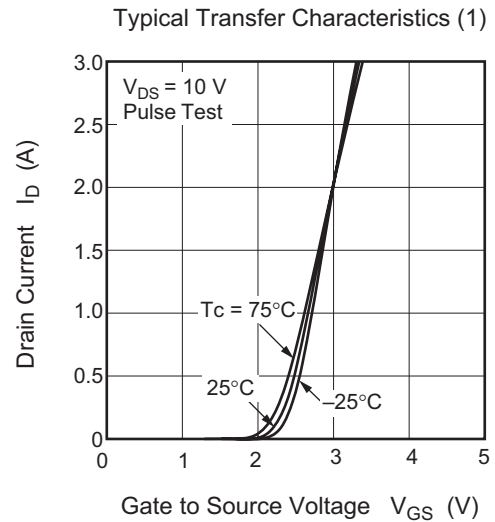
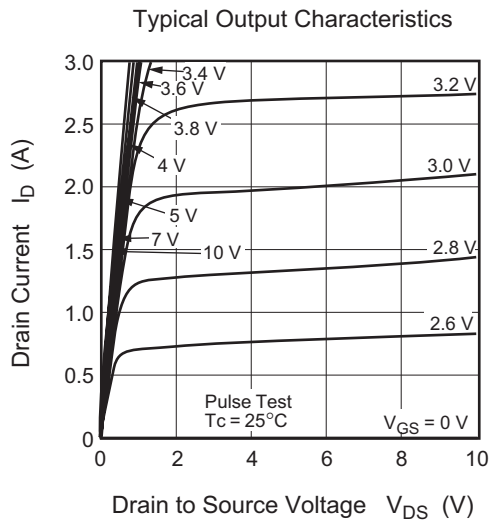
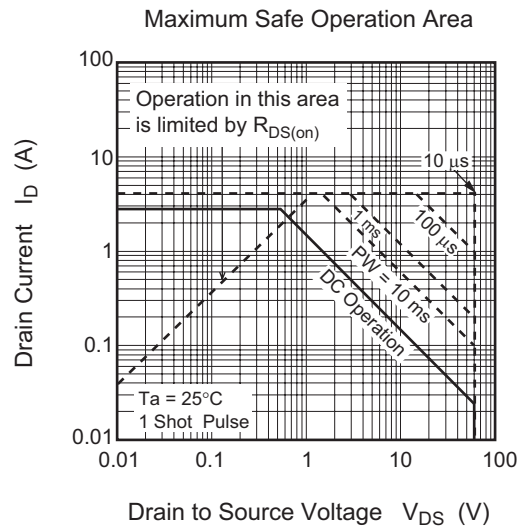
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Drain to source leak current	I_{DSS}	—	—	1	μA	$V_{DS} = 60 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Drain to source on state resistance	$R_{DS(on)}$	—	205	257	$\text{m}\Omega$	$I_D = 1.4 \text{ A}, V_{GS} = 10 \text{ V}^{\text{Note3}}$
	$R_{DS(on)}$	—	240	336	$\text{m}\Omega$	$I_D = 1.4 \text{ A}, V_{GS} = 4.5 \text{ V}^{\text{Note3}}$
Forward transfer admittance	$ y_{fs} $	1.8	3.0	—	S	$I_D = 1.4 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note3}}$
Input capacitance	C_{iss}	—	130	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	24	—	pF	
Reverse transfer capacitance	C_{rss}	—	9.3	—	pF	
Turn - on delay time	$t_{d(on)}$	—	7.7	—	ns	$I_D = 1 \text{ A}, V_{GS} = 10 \text{ V},$ $R_L = 10 \text{ }\Omega, R_g = 4.7 \text{ }\Omega$
Rise time	t_r	—	38	—	ns	
Turn - off delay time	$t_{d(off)}$	—	42	—	ns	
Fall time	t_f	—	7.0	—	ns	
Total gate charge	Q_g	—	2.7	—	nC	$V_{DD} = 10 \text{ V}, V_{GS} = 10 \text{ V},$ $I_D = 2.8 \text{ A}$
Gate to source charge	Q_{gs}	—	0.5	—	nC	
Gate to drain charge	Q_{gd}	—	0.4	—	nC	
Body - drain diode forward voltage	V_{DF}	—	0.85	—	V	$I_F = 1.5 \text{ A}, V_{GS} = 0^{\text{Note3}}$

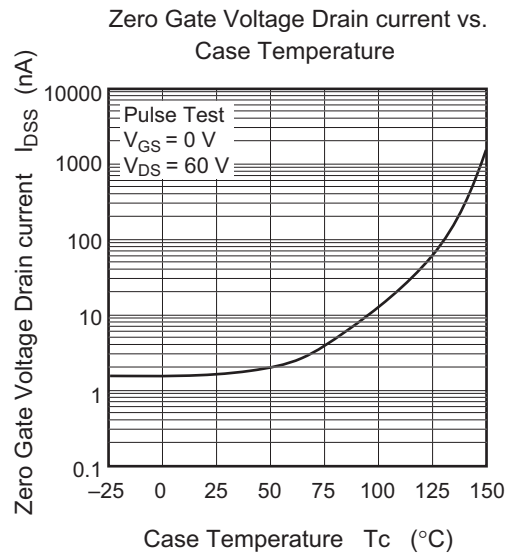
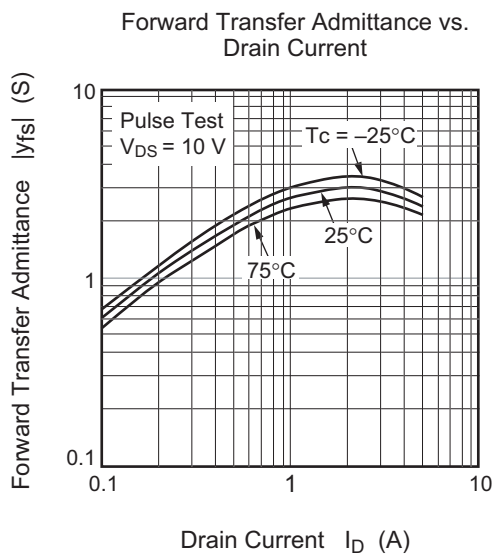
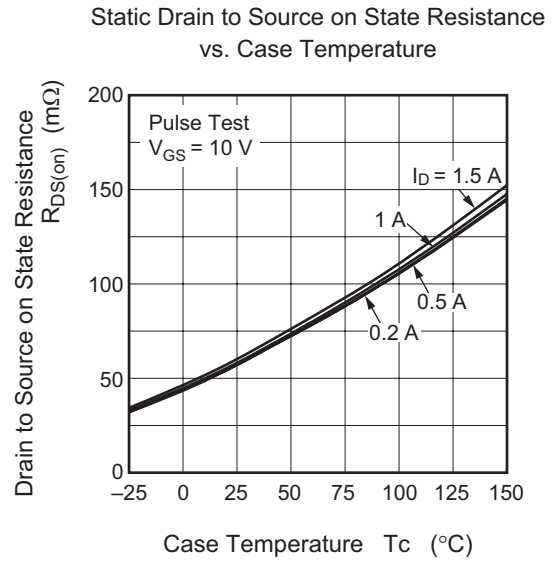
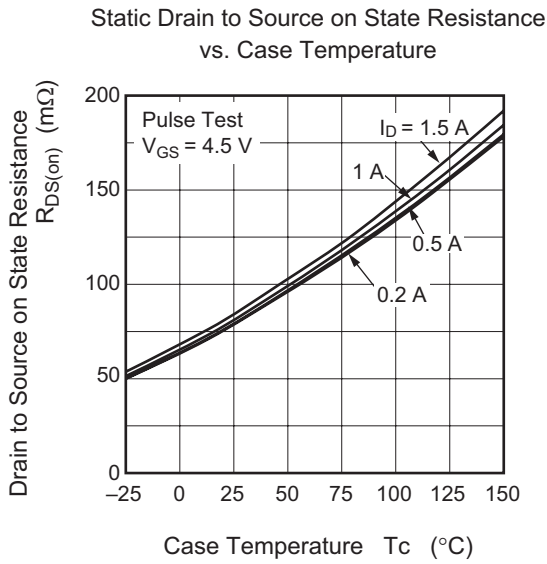
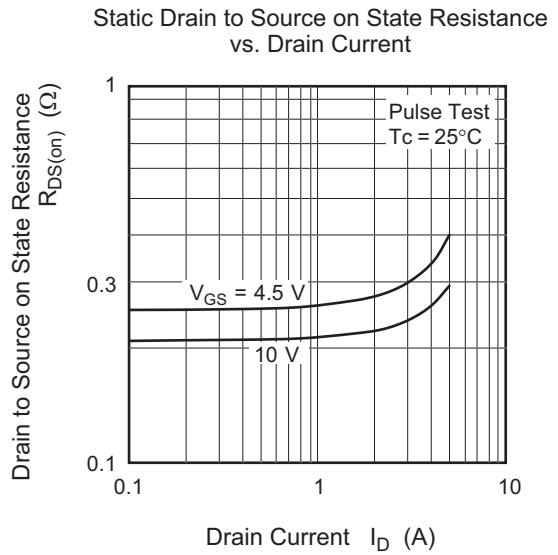
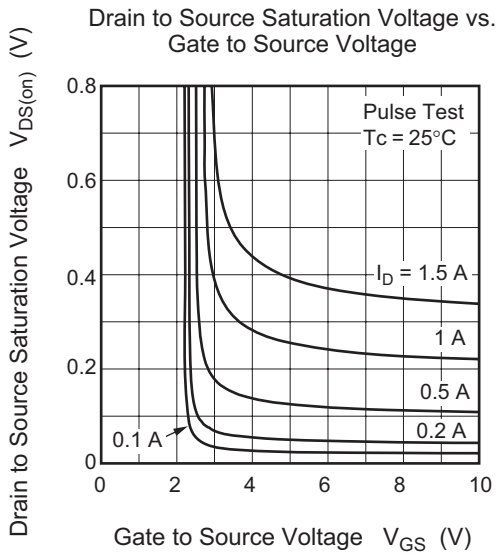
Notes: 3. Pulse test

Main Characteristics

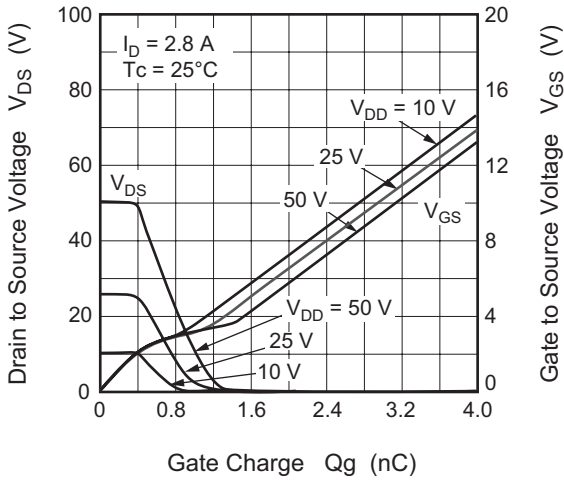


*When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

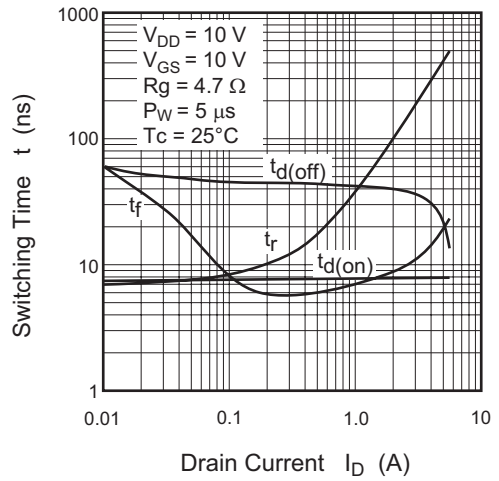




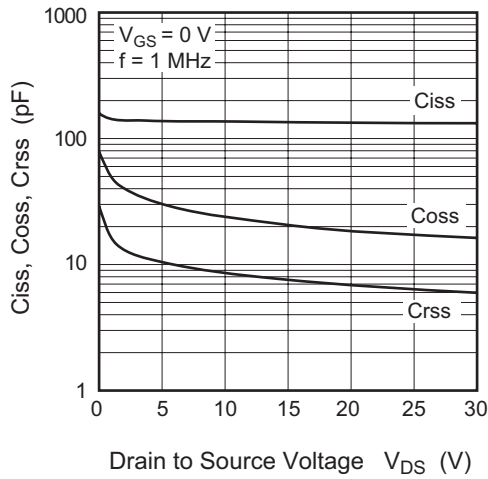
Dynamic Input Characteristics



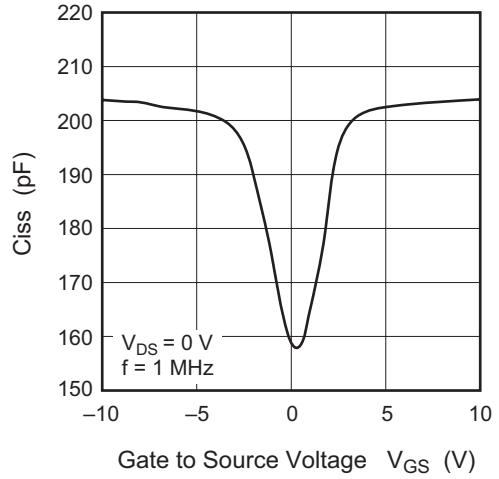
Switching Characteristics



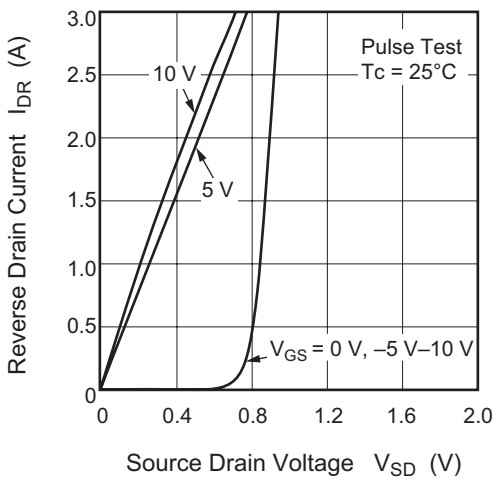
Typical Capacitance vs. Drain to Source Voltage



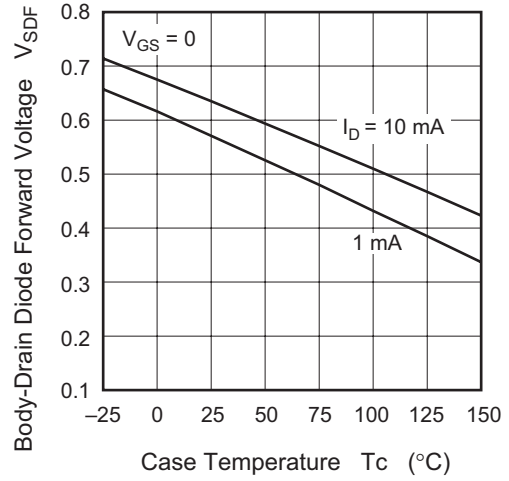
Input Capacitance vs. Gate to Source Voltage



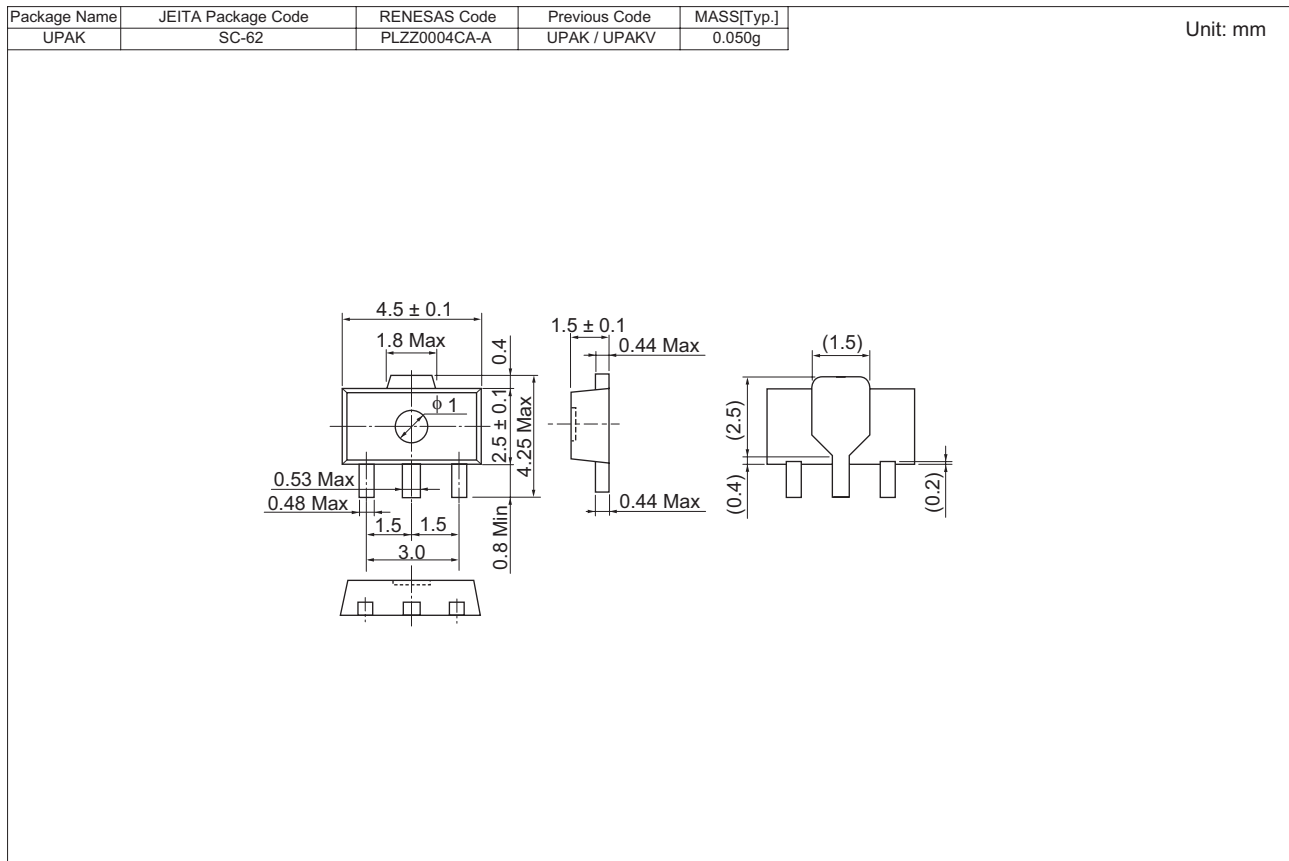
Reverse Drain Current vs. Source to Drain Voltage



Body-Drain Diode Forward Voltage vs. Case Temperature



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
RQK0603CGDQSTL-E	1000 pcs.	$\phi 178$ reel, 12 mm Emboss taping

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